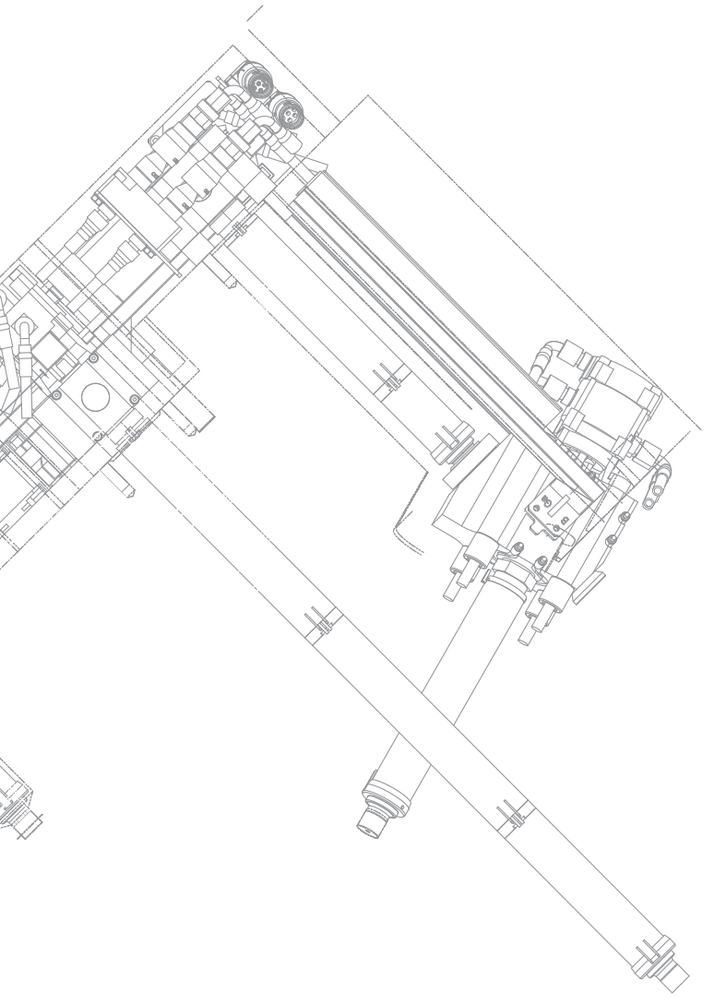
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Technical Catalogue

Rev. 66 03_25



Passion for expertise

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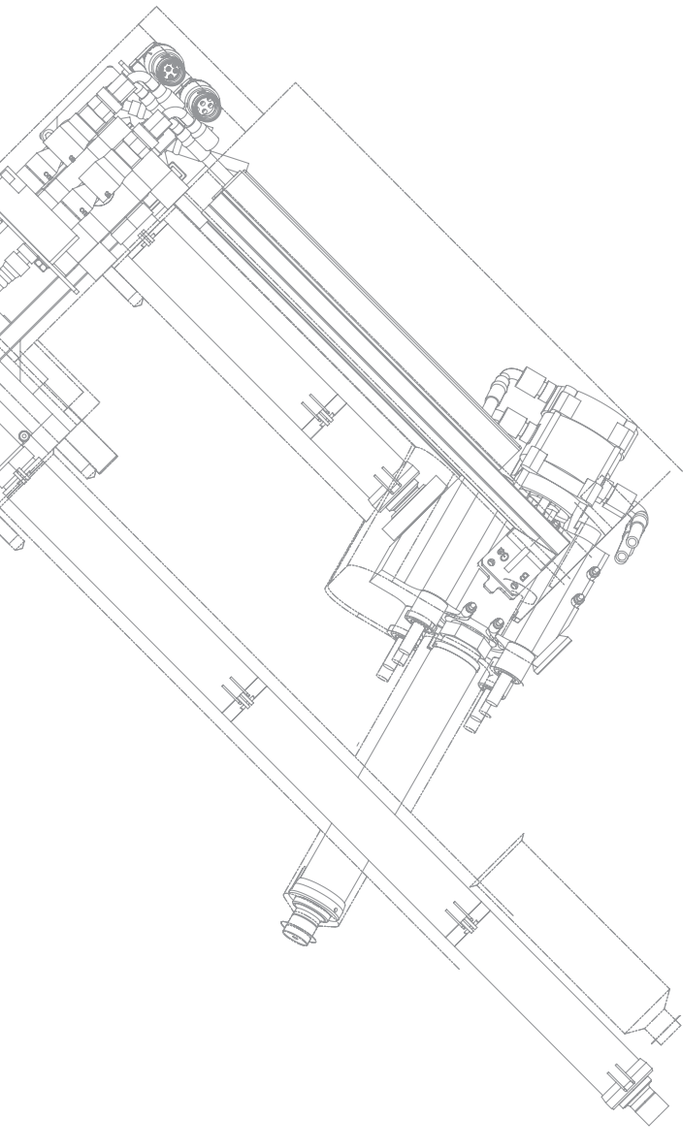
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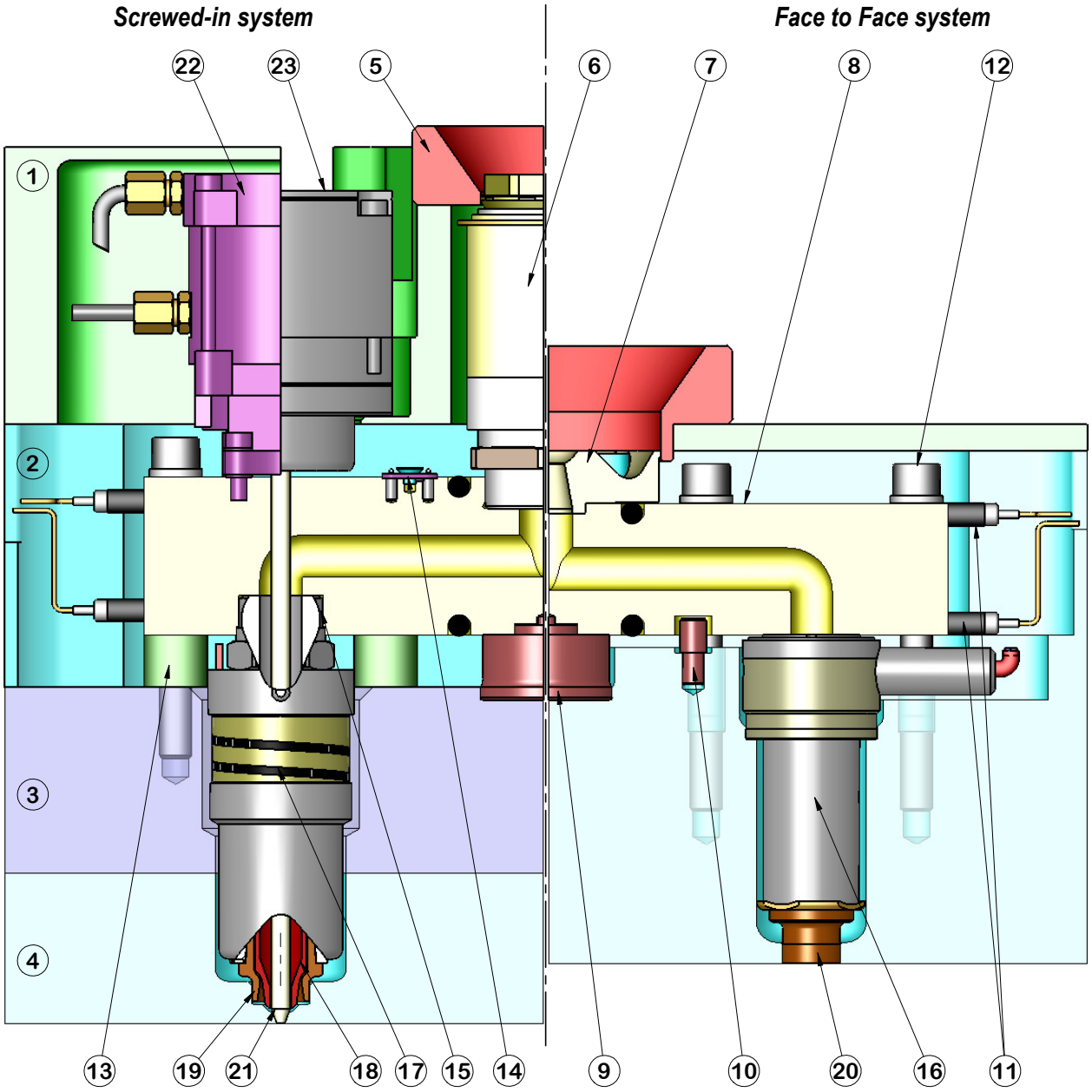


Technical information

Informazioni tecniche
Technische Informationen
Informations techniques
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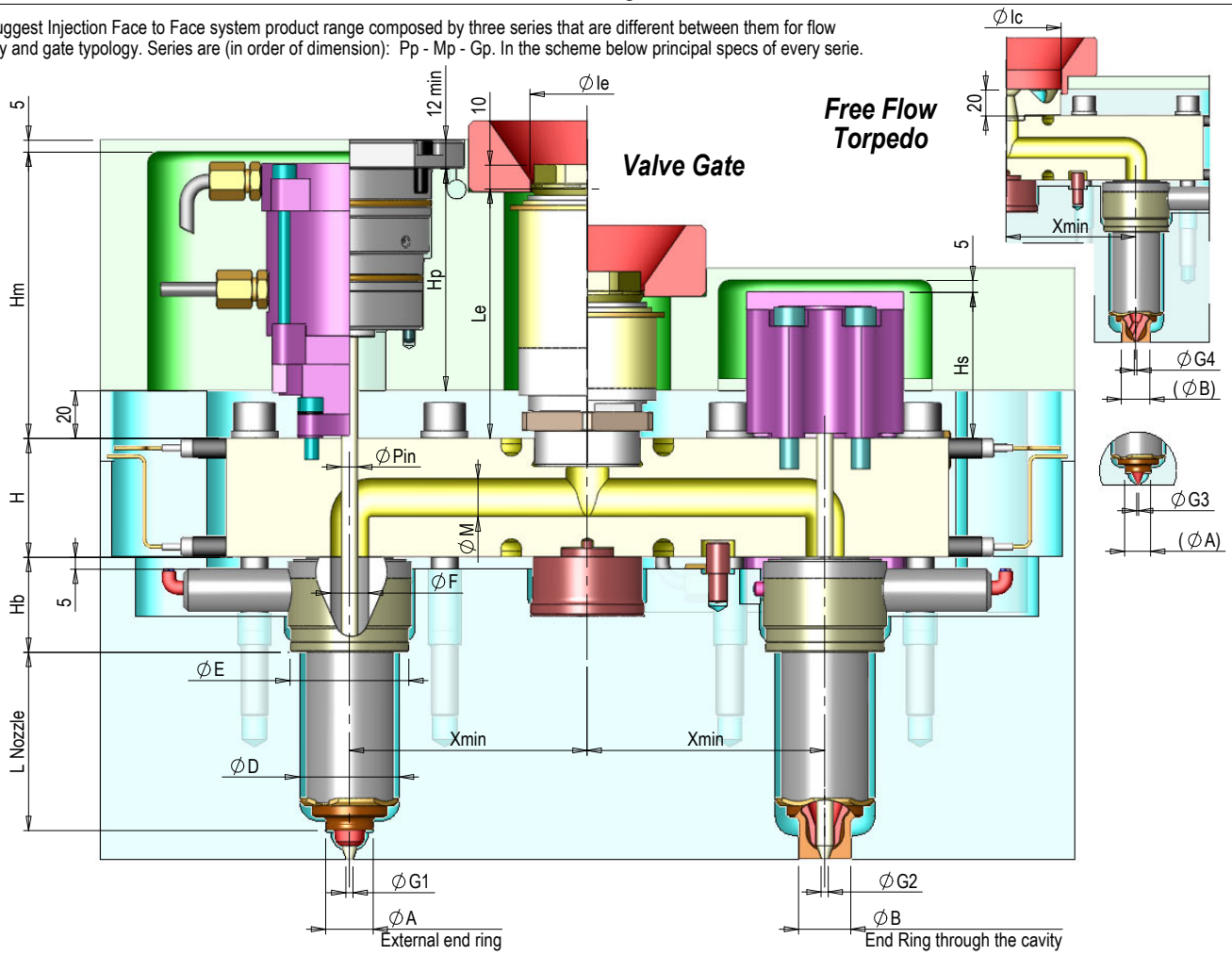


1	Clamping Plate	11	Manifold Heater	21	Valve Pin
2	Spacer Plate	12	Manifold clamping screw	22	Cylinder on manifold
3	Holder Plate	13	Thrust block	23	Cylinder on plate
4	Cavity Plate	14	Manifold Thermocouple		
5	Locating Ring	15	Screwed-in Nozzle		
6	Screwed heated inlet	16	Face to Face Nozzle		
7	Face to Face cold Inlet	17	Coil Heater		
8	Manifold	18	Tip		
9	Pressure disk	19	External End Ring		
10	Locating Pin	20	End Ring through the cavity		

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STANDARD PRODUCT RANGE
Face to Face systems

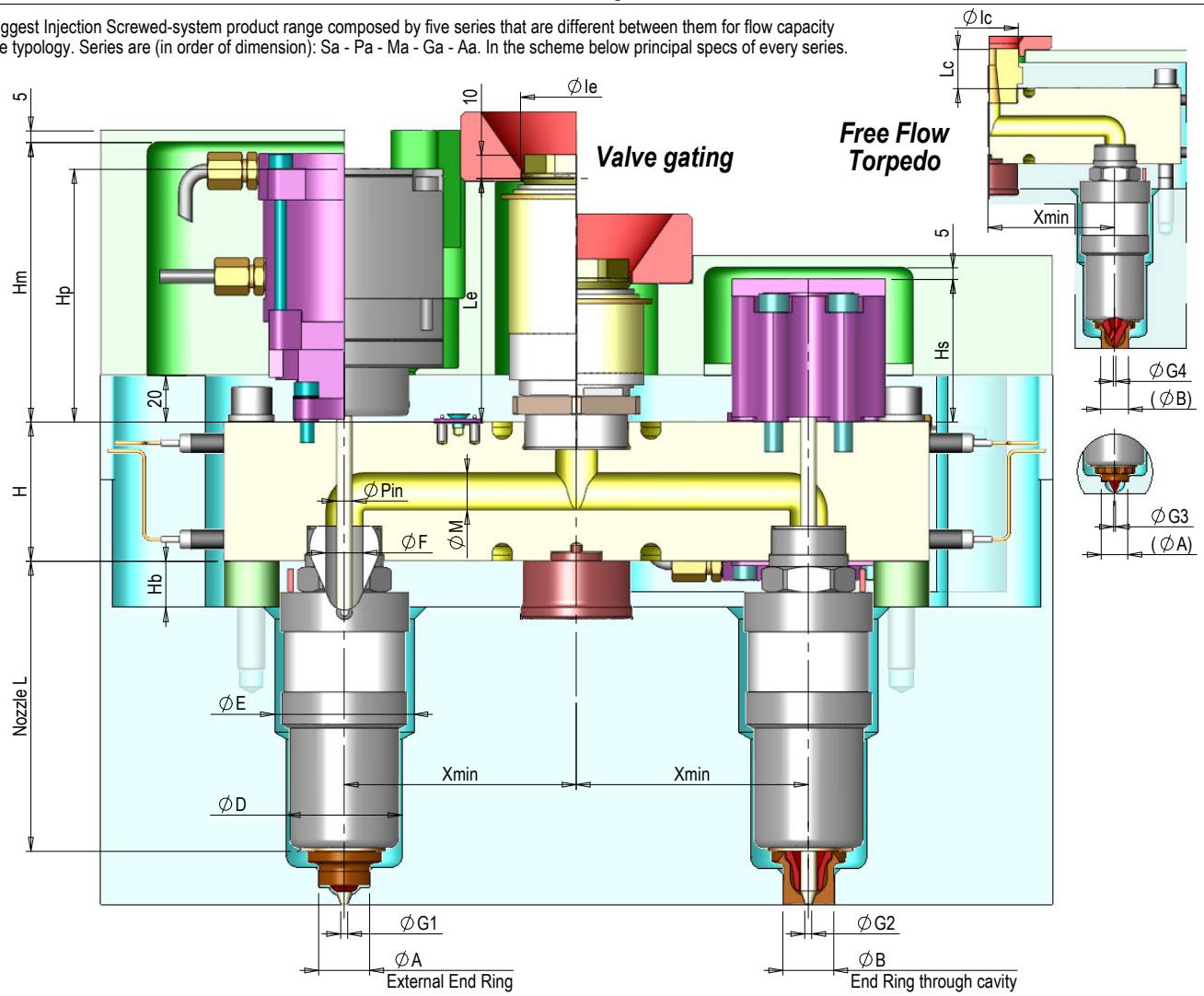
HRS suggest Injection Face to Face system product range composed by three series that are different between them for flow capacity and gate typology. Series are (in order of dimension): Pp - Mp - Gp. In the scheme below principal specs of every serie.



		Series		
		Pp	**Mp**	**Gp**
Max flow capacity per nozzle [cm³/s]		Min 2 - 70 Max	Min 10 - 265 Max	Min 100 - 1265 Max
Max part weight		200g Max	500g Max	2500g Max
Nozzle L		Min 35 - 155 Max	Min 35 - 315 Max	Min 75 - 824.99 Max
ØA	*Free Flow / Torpedo*	10.5	12 - 14	20
	Valve gating		12 - 14	20 - 22
ØB	*Free Flow / Torpedo*	12	14	22
	Valve gating	10.5 - 12		
ØD		26	32	42
ØE		30	38	42 - 45
ØF		8 - 10	8 - 10 - 12 -14	16 - 18 - 20
ØG1		1.5 - 1.8	2.0 - 2.5 - 3.0	3.0 - 4.0 - 5.0
ØG2		1.5 - 2.0	2.0 - 2.5 - 3.0	3.0 - 4.0 - 5.0
ØG3	*Free Flow*	Min 0.9 - 2.0 Max	Min 0.9 - 2.0 Max	Min 2.0 - 4.0 Max
	Torpedo	Min 1.2 - 2.0 Max	Min 1.5 - 3.0 Max	Min 1.5 - 4.0 Max
ØG4	*Free Flow*	1.0 - 1.2 - 1.5 - 1.8 - 2.0	1.2 - 1.5 - 1.8 - 2.0 - 2.5	2.0 - 3.0 - 4.0
	Torpedo	1.2 - 1.6 - 2.0	1.5 - 2.0 - 2.5- 3.0	2.0 - 3.0 - 4.0
H		40	40	50
Hb		32	40	40
Hm		Min 86 - 112.5 Max	Min 86 - 112.5 Max	Min 110 - 135.5 Max
Hp		Min 46	Min 64	Min 90 - 208 Max
Hs		-	-	66.5
Le		Min 50 - 300 Max	Min 50 - 300 Max	Min 40 - 520 Max
ØM		6- 8 -10	8 - 10 - 12 - 14	16 - 18 - 20
ØPin		3	5	7
ØIc		65	65	85
Øie		30	48	48
Xmin		70	70	90

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HRS suggest Injection Screwed-system product range composed by five series that are different between them for flow capacity and gate typology. Series are (in order of dimension): Sa - Pa - Ma - Ga - Aa. In the scheme below principal specs of every series.



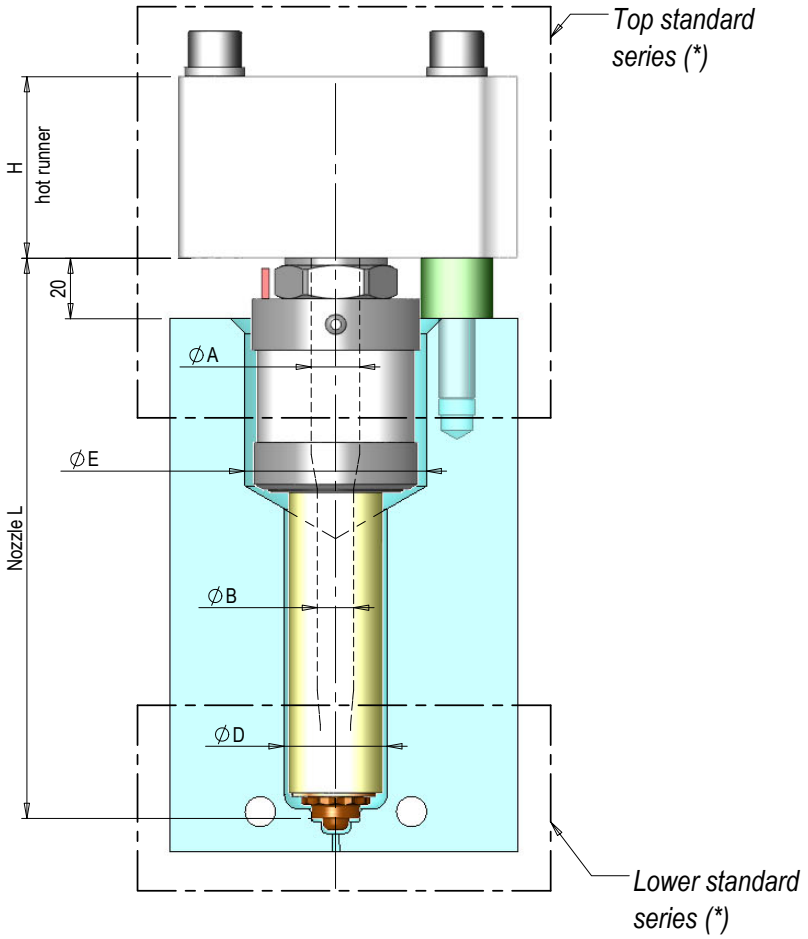
		Series				
		Sa	**Pa**	**Ma**	**Ga**	**Aa**
Max flow capacity per nozzle [cm³/s]		15 Max	Min 2 - 70 Max	Min 10 - 265 Max	Min 100 - 1265 Max	Min 270 - 3150 Max
Max part weight		15g Max	200g Max	500g Max	2500g Max	5000g Max
Nozzle L	with External End Ring	Min 50 - 160 Max	Min 75 - 345 Max	Min 75 - 300 Max	Min 100 - 500 Max	Min 100 - 800 Max
	with End Ring through the	Min 50 - 195 Max	Min 75 - 360 Max	Min 75 - 400 Max	Min 100 - 800 Max	Min 100 - 800 Max
ØA	Free Flow / Torpedo	8	11.5	16	22	26
	Valve gating		10.5 - 11.5	14 - 16		
ØB	Free Flow / Torpedo	8	12	14	22	24
	Valve gating		10.5 - 12			
ØD		20	28	42 - (34)	50 - (45)	60 - (52)
ØE		-	37 - (33)	50	60	70
ØF		4 - 5 - 6	8 - 10	8 - 10 - 12 -14	16 - 18 - 20	18 - 20 - 22 - 24
ØG1		1.0 - 1.2 - 1.4	1.5 - 1.8	2.0 - 2.5 - 3.0	3.0 - 4.0 - 5.0	4.0 - 5.0 - 6.0 - 7.0
ØG2		1.0 - 1.4	1.5 - 2.0	2.0 - 2.5 - 3.0	3.0 - 4.0 - 5.0	4.0 - 5.0 - 6.0 - 7.0
ØG3	Free Flow	0.8 - 1.0 - 1.2 - 1.4	Min 0.9 - 2.0 Max	Min 0.9 - 2.0 Max	Min 2.0 - 4.0 Max	Min 3.0 - 6.0 Max
	Torpedo		Min 1.2 - 2.0 Max	Min 1.5 - 3.0 Max	Min 1.5 - 4.0 Max	Min 3.0 - 6.0 Max
ØG4	Free Flow	1.0 - 1.4	1.0 - 1.2 - 1.5 - 1.8 - 2.0	1.2 - 1.5 - 1.8 - 2.0 - 2.5	2.0 - 3.0 - 4.0	3.0 - 4.0 - 5.0 - 6.0
	Torpedo		1.2 - 1.6 - 2.0	1.5 - 2.0 - 2.5- 3.0	2.0 - 3.0 - 4.0	3.0 - 4.0 - 5.0 - 6.0
H		40	40	50	60	70
Hb		10	10	20	20	20
Hm		Min 70 - 97 Max	Min 86 - 112.5 Max	Min 86 - 112.5 Max	Min 110 - 135.5 Max	Min 116 - 132.5 Max
Hp		-	-	94.5	109	-
Hs		-	-	-	66.5	72.5
Lc		23	20	23	31	31
Le		Min 50 - 305.09 Max	Min 50 - 300 Max	Min 40 - 309.99 Max	Min 40 - 550 Max	Min 40 - 550 Max
ØM		4 - 5 -6	6- 8 -10	8 - 10 - 12 - 14	16 - 18 - 20	18 - 20 - 22 - 24
ØPin		3	3	5	7	10
Øic		30	30	48	48	48
Øie		30	30	48	48 - 50	48 - 50
Xmin		70	70	70	90	90

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HRS suggests some hybrid series of nozzles named "Tapered". This allows to reduce the size of the nozzle near the injection point by changing from the standard dimensions of a bigger serie to those of a smaller one.
Tapered nozzles are available for screwed-in systems accordingly with the following scheme:

	Standard reference series			
	Top	Lower		Tapered nozzle series
Screwed-In system	Ma	Pa	==>	Ja
	Ga	Ma	==>	Ha
	Aa	Ga	==>	Ca

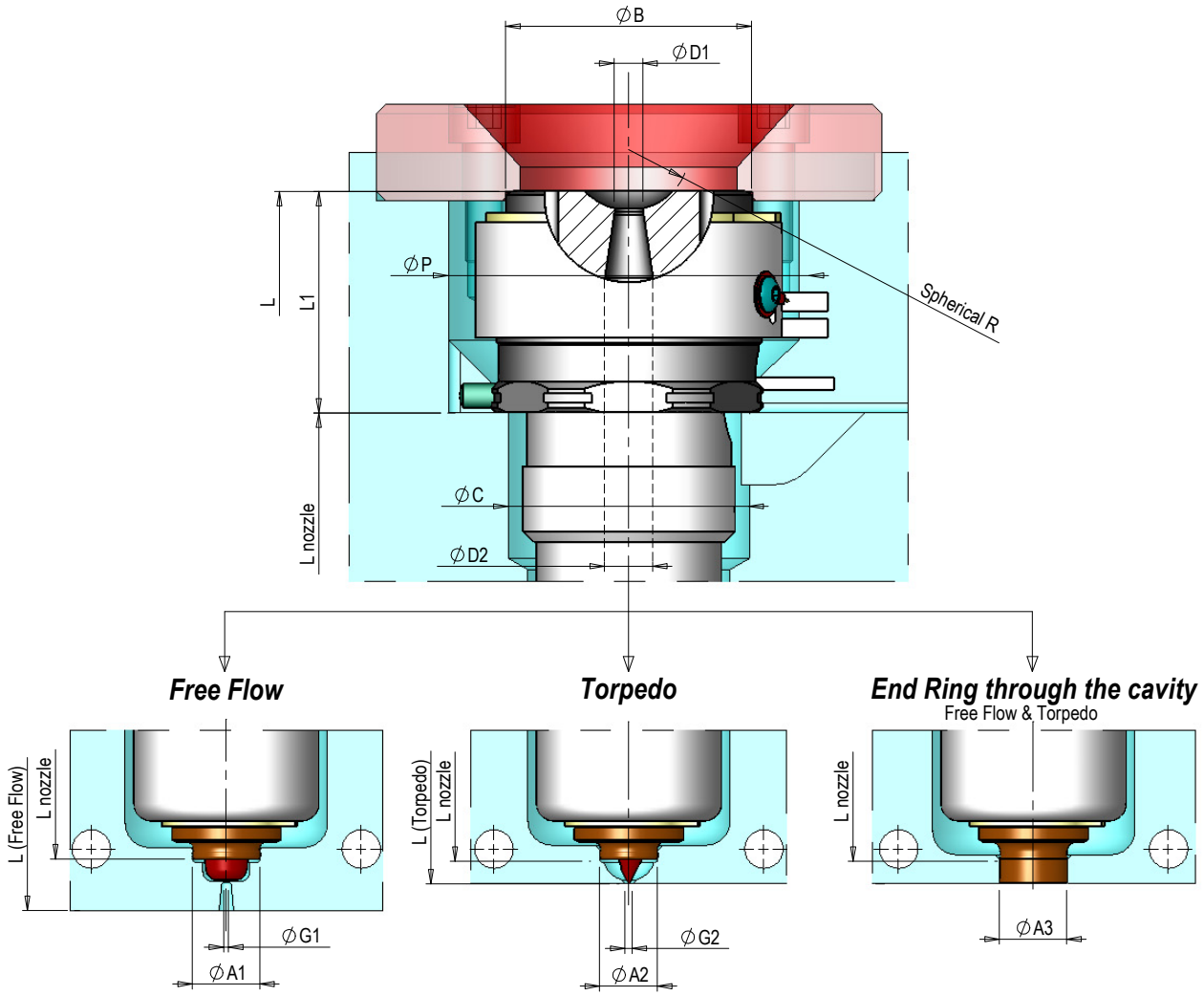
Tapered Screwed-In Nozzle



		Tapered Series		
		Ja	**Ha**	**Ca**
Nozzle L	with External End Ring	Min 175 - 350 Max	Min 225 - 350 Max	Min 225 - 500 Max
	with Bushing through cavity	Min 175 - 550 Max	Min 225 - 725 Max	Min 225 - 800 Max
ØA		12 - 14	16 - 18 - 20	22 - 24
ØB		8	10	16
ØD		50	60	70
ØE1		-	-	-
ØE		28	34	45
H		50	60	70
Hb		20	20	20

(*) for all the other dimensions not written in the table (endrings/manifold/cylinders etc..) please refer to the standard dimensions reported in the form 2.02.01 and 2.02.02

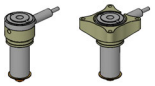
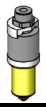
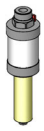
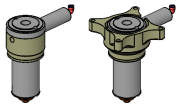
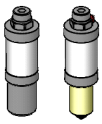
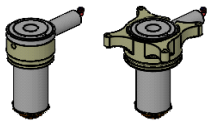
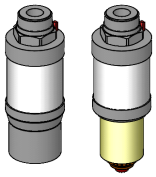
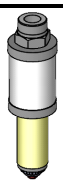
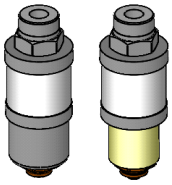
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		Series			
		Ps	**Ms**	**Gs**	**As**
Max flow capacity per nozzle [cm³/s]		Min 2 - 70 Max	Min 10 - 265 Max	Min 100 - 1265 Max	Min 270 - 3150 Max
Max part weight		200g Max	500g Max	2500g Max	5000g Max
L nozzle		Min 45 - 210 Max	Min 45 - 360 Max	Min 50 - 510 Max	Min 75 - 615 Max
L (Free Flow)		Min 91.05 - 256.76 Max	Min 101.55 - 417.80 Max	Min. 121.36 - 588.15 Max	Min 155.79 - 697.91 Max
L (Torpedo)		Min 86.05 - 251.76 Max	Min 96.05 - 412.30 Max	Min 115.86 - 582.65 Max	Min 151.79 - 693.91 Max
L1		36	46	56	66
ØA1		10.5	12 - 14	20	26
ØA2		10.5	12	20	26
ØA3		12	14	22	24
ØB		37	51	61	71
ØC		33	42	50	62
ØD1		4	6	10	12
ØD2		8	10 - 12	16 - 18	20 - 22
ØP		50	75	90	105
ØG3	*Free Flow*	Min 0.9 - 2.0 Max	Min 0.9 - 2.0 Max	Min 2.0 - 4.0 Max	Min 3.0 - 6.0 Max
	Torpedo	Min 1.2 - 2.0 Max	Min 1.5 - 3.0 Max	Min 1.5 - 4.0 Max	Min 3.0 - 6.0 Max
Spherical R		R0 - R12.7 - R15.5 - R19.1 - R25 - R40			

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Legend: (p): Plus - Face to Face series
(a): Screwed-in

Series	Nozzles	Plus (p) Scheme	Screwed-in (a) Scheme	Max Molding Weight
	(with indicating diameters available)	Face To Face		
S	**Sp - Sa**			15g
	Ø4-5-6			
T	**Tp**		Not available	20g
	Ø5-6-7			
V	**Vp - Vf**		Not available	60g (Vp) 8g (Vf)
	Ø7-8-9			
X	**Xp**		Not available	60g
	Ø8-10			
P	**Pp - Qp - Pa**			200g
	Ø8-10			
M	**Ja**	Not available		500g
	Ø12-14	**Tapered Series**		
	Mp - Np **Mh - Nh**			
	Ø(8)-10-12-14			
	Ma - Malux **Mz**			
	Ø (8)-10-12-14			
G	**Ha**	Not available		2500g
	Ø16-18-20	**Tapered Series**		
	Gp - Ep **Gh - Eh**			
	Ø16-18-20			
	Ga - Galux **Gz**			
	Ø14-16-18-20			
A	**Ca**	Not available		5000g
	Ø22-24		**Tapered Series**	
	Aa - Aalux			
	Ø16-18-20-22-24			

Note:

- (…) Brackets indicate that diameters are available only for lines dedicated to rubber molding;
- The "Tapered Series" have the terminal nozzle part with reduced section equivalent to the slightly lower series with relative tips and ring nuts;
- Nozzle (h)/(z): size equal to (p)/(a) but they use gate confgurations (Tip & End Ring) of the series just below.

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The maximun flow capacity of every nozzle is shown in the following tables.

MATERIAL CODE	NOZZLE SERIES					
Semi-crystalline polymers	SERIES Pp-Pa [cm³/s]			SERIES Mp-Ma [cm³/s]		
	Free flow	Torpedo	Valve gating	Free flow	Torpedo	Valve gating
PE-HD	51	26	51	100	100	172
PE-LD	51	26	51	100	100	172
PP	79	40	79	153	153	265
PA6.6	79	40	78	153	153	165

MATERIAL CODE	NOZZLE SERIES					
Amorphous polymers	SERIES Pp-Pa [cm³/s]			SERIES Mp-Ma [cm³/s]		
	Free flow	Torpedo	Valve gating	Free flow	Torpedo	Valve gating
SAN	30	15	30	58	58	101
SB	79	40	79	153	153	265
ABS	39	20	39	77	77	133
PMMA	31	16	31	61	61	106
PC	31	16	31	61	61	106
PS	31	16	31	61	61	106

MATERIAL CODE	NOZZLE SERIES					
Semi-crystalline polymers	SERIES Gp-Ga [cm³/s]			SERIES Aa [cm³/s]		
	Free flow	Torpedo	Valve gating	Free flow	Torpedo	Valve gating
PE-HD	408	408	798	1378	1378	3267
PE-LD	408	408	798	1378	1378	3267
PP	628	628	1227	2121	2121	5027
PA6.6	628	628	1227	2121	2121	5027

MATERIAL CODE	NOZZLE SERIES					
Amorphous polymers	SERIES Gp-Ga [cm³/s]			SERIES Aa [cm³/s]		
	Free flow	Torpedo	Valve gating	Free flow	Torpedo	Valve gating
SAN	239	239	466	806	806	1910
SB	628	628	1227	2121	2121	5027
ABS	314	314	614	1060	1060	2513
PMMA	251	251	491	848	848	2011
PC	251	251	491	848	848	2011
PS	251	251	491	848	848	2011

The values above must be considered only as a way of illustration and refer to families of materials and their different specific materials with different physical and chemical properties. For this reason, these flow table cannot be considered as a replacement for the rheological simulation but can be used only as a draft estimation of the same.

HRSflow is available to support you in order to find the most suitable solution based on the specific plastic material to be injected.

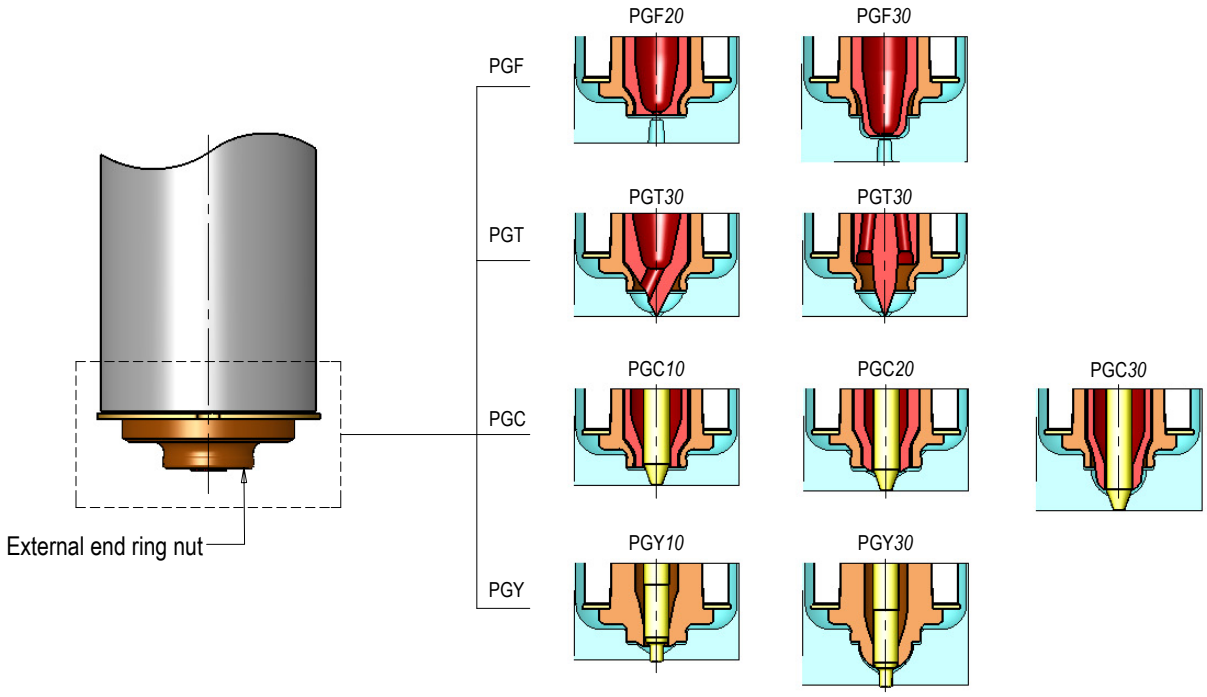
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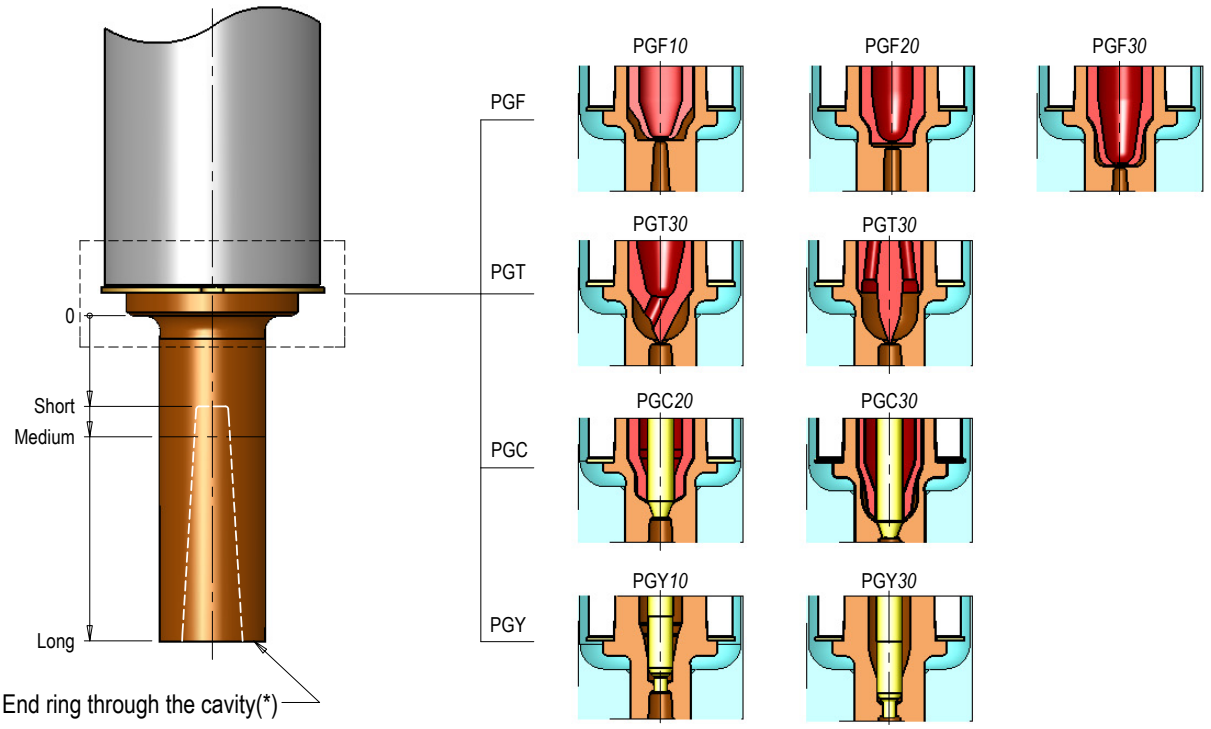
The following table shows different layouts of injection and the way for assembling the nozzle with the End Rings available for creating the configurations suitable.

Injection Type		VERSION	PG[a]
Free Flow	[PGF]		
Torpedo	[PGT]	*Monohole* *Multihole*	***10*** ***20***
Conical v. gating	[PGC]		***30***
Cylindrical v. gating	[PGY]		

(a) all the type of injection are available in several configurations (PG) that depends on the distance between the nozzle and the injection point.
Attention! The value of the PG written in the table (10, 20, etc.....) is indicative of a range of distances derived from the system series and from the type of injection.

See also pag. 2.07.01 - "Material Compatibility" table





(*) Available by three lenght: "Short", "Medium", "Long"

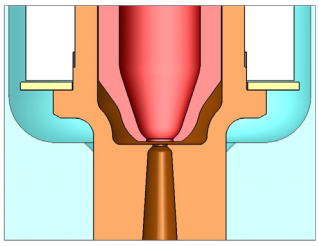
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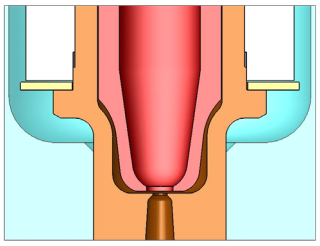
FREE FLOW

Free flow is characterized by the presence of a small sprue connected to the molded component or connected to the cold channel. The sprue is solidified during the cooling phase and serves to prevent the drooling of molten plastic from the gate. If the freezing of the sprue is achieved too much fast, for example during the packing stage, then the molded component might not well meet the packing density required, or might have some deformation or be affected by inaccurate size or weight. On the contrary, in case the sprue has difficulties to freeze, then this might lead to the problem of drooling or stringing from the gate. Consequently, when molding process requires a significantly larger molding temperature differential (in order to allow the sprue to freeze conveniently), then the process cycle time resulting is greater than that one obtained when using the torpedo gate type or similar.

Free flow is not recommended when there might be potential material problems regarding the stringing, such as with PP, ABS, etc. Generally speaking, free flow is applied when any potential imperfection at the point of injection is not a serious concern. This type of injection allow to optimize the packing phase, thereby achieving good dimensional stability and a reduction in residual stresses. In cases where amorphous or semi-crystalline materials such as PP or PE are injected, then a dedicated conditioning must be located nearby the gate.

PGF10 **PGF30**





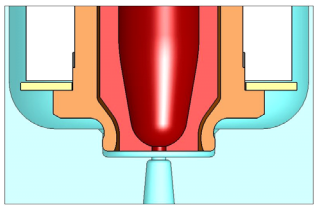
PGF10/30 - FREE FLOW WITH END RING THROUGH THE CAVITY

The main feature of this type is that the end ring enters directly into the cavity. This solution is recommended for applications with particularly deep injection, because it simplifies the cavity plate manufacturing.

PGF10 is recommended for semicrystalline polymer and polymers having additives (like glass fibers or similar) because the gate temperature is slightly higher than the type described below.

PGF30 is recomended for materials with whide moulding window because the gate is slightly colder than the type described above and can guarantee a good gate closure also with materials prone to stringing or drolling problems.

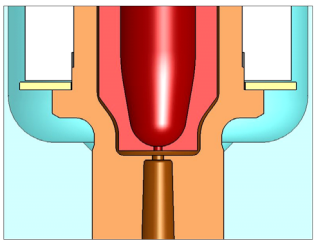
PGF20



PGF20 - FREE FLOW FOR ELASTOMER MATERIALS WITH EXTERNAL RING NUT

This solution is recommended for application with any kind of elastomers (elastic polymers, namely rubbers) that injects on cold runner (which is connected to the component to be produced). The small dimension of gate are optimized for injection of elastomers that requires high shear-rate.

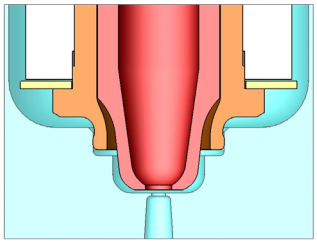
PGF20



PGF20 - FREE FLOW FOR ELASTOMER MATERIALS WITH END RING THROUGH THE CAVITY

The characteristic of this configuration is that the end ring enters directly into the cavity and helps to simplify the mold manufacturing. This solution is recommended for application with any kind of elastomers (elastic polymers, namely rubbers) that injects on cold runner (which is connected to the component to be produced). The small dimension of gate and the small dimension of cold sprue are optimized for injection of elastomers that requires high shear in order to fill the part completely and evenly.

PGF30



PGF30 - FREE FLOW WITH EXTERNAL RING NUT

This type is ideal when it is necessary to inject into cold channels or directly into the cavity (in this case there might be need to remove the sprue by cut), and whenever a high quality esthetic finishing is not a main requirement. There is a small sprue at injection, which length must be at least 5mm. The application is not recommended for polymers particularly prone to problems regarding the drooling or stringing. On the contrary, it is ideal for molding technical components where it is necessary to reduce residual stresses and maintain accurate precise dimensions. Especially recommended for amorphous polymers.

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TORPEDO

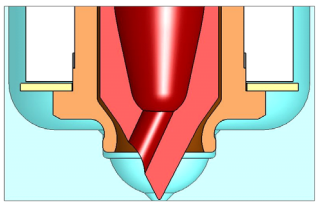
The torpedo tip injection type is recommended when a high quality finish at injection point is a main requirement.

The torpedo tip is not recommended when the molded materials are subject to deterioration as a consequence of high shear rates or if the percentage of additives (for example glass fibers) is high compared to the relatively small gate size. In general, the torpedo type can be applied with both semicrystalline and amorphous materials.

A torpedo tip is recommended as an alternative to free flow when the molded materials are subject to problems regarding the stringing, such as PP, ABS, etc.A torpedo tip is recommended as an alternative to free flow when the molded materials are subject to the problem of drooling such as PP, HDPE, PP/EPDM, PS, ABS and rubber.

In cases where amorphous or semi-crystalline materials such as PP or PE are molded, it is recommended to have an indipendent cooling circuit around the gate.

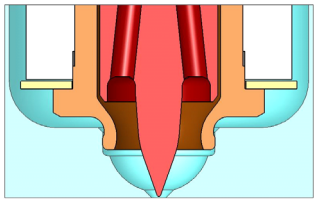
PGT30



PGT30 - SINGLE HOLE TORPEDO WITH EXTERNAL RING NUT

It has good performances both with low-temperature semicrystalline materials (PP-PE) and with amorphous materials. The vestige at the injection point is small, providing a good aesthetic finish. The layout is not suitable for polymers having high percentage of additives (like glass fibers) or for polymers potentially affected by the shear rate due to the relatively narrow gate size.

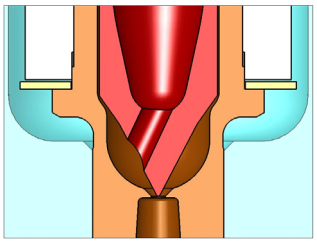
PGT30



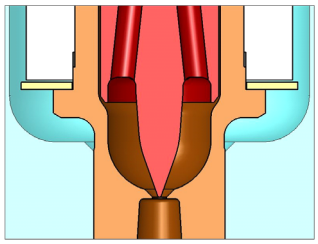
PGT30 - MULTIHOLE TORPEDO WITH EXTERNAL RING NUT

Compared to the above type, this kind of injection provides a more balanced flow and the absence of joint lines on the molded piece. This solution is ideal for molding where a good quality aesthetic finish is required or for components with a main symmetrical axis.

PGT30



PGT30



PGT30 - TORPEDO SINGLE HOLE WITH END RING THROUGH THE CAVITY

PGT30 - TORPEDO MULTIHOLE WITH END RING THROUGH THE CAVITY

This solution is recommended for applications with particularly deep injection, and simplifies the cavity plate manufacturing. This type is recommended for semicrystalline polymers because the temperature of the injection point of this torpedo tip is slightly higher than the type described above. A multihole torpedo tip type is recommended if it is necessary to inject into cold channels.

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VALVE GATING

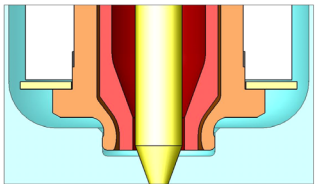
In the hot runner systems that apply this kind of gate (with conical or cylindrical valve gate) it is not required to wait long time for the gate solidification, because the gate is closed by a mechanism, so there is no concern for drooling or stringing.

This gate type allows relatively wider gates to be used and, consequently, it is recommended for those plastic materials that are affected by deterioration due to high shear rates and for those materials having high percentage of additives inside. Large gate sizes also helps optimize the packing (without the problem of sudden gate freezing typically associated with some plastic materials). Therefore, the valve gate systems are suitable for all technical applications where dimensional precision and accuracy is essential.

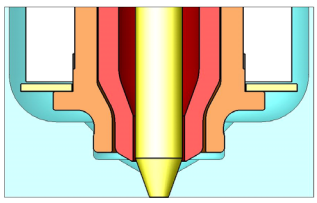
The aesthetic finishing at the injection point is also better than the one obtained from a free flow or torpedo tip system.

Therefore this injection type also solves the problem of drooling (typical of the following materials: PP, HDPE, PP/EPDM, PS, ABS and rubber) and the stringing (typical of the following materials: PP and ABS) as the gate is closed mechanically. Resulting, furthermore, in reduced cycle times.

PGC10



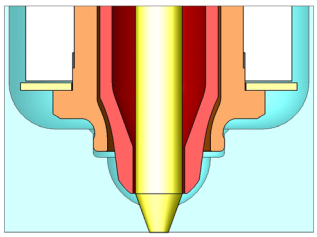
PGC20



PGC10 - PGC20 CONICAL V.GATING WITH EXTERNAL END RING NUT

This gate type allows excellent performances with amorphous and semicrystalline materials. The injection molding with a valve gate type allows the use of a wider gate, and it guarantees excellent packing results and a high-quality finishing at the injection point. As a result, low residual stresses and good dimensional stability are ensured for molded parts. Problems of drooling and stringing are eliminated.

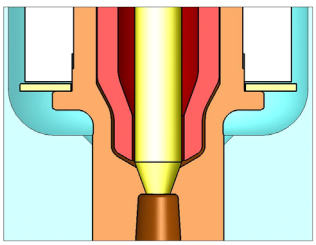
PGC30



PGC30 - EXTENDED CONICAL V. GATING WITH EXTERNAL END RING NUT

It has identical performance to the above type. It is ideal for injection points with cavity surfaces with an angle between 10 and 20° to the perpendicular nozzle axis and long nozzle dimension. Problems of drooling and stringing are eliminated.

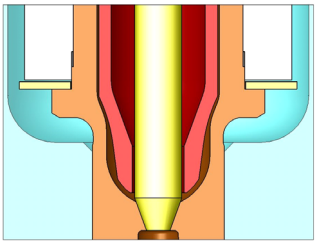
PGC20



PGC20 - CONICAL V. GATING WITH END RING THROUGH THE CAVITY

The main feature of this injection type is that the end ring enters directly into the cavity. This solution is recommended for applications with particularly deep injection, because it simplifies the cavity plate manufacturing. It is recommended for polymers subject to fast solidification (for example PA6/PA66) because the gate temperature is slightly higher than the two injection type described above.

PGC30

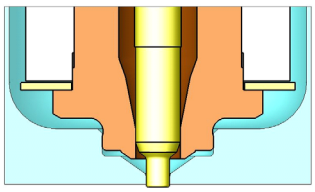


PGC30 - EXTENDED CONICAL V. GATING WITH END RING THROUGH THE CAVITY

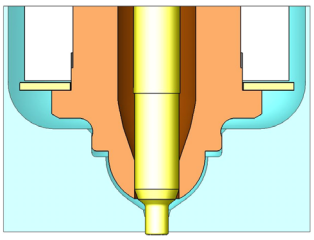
It has identical performance to the above type. It is ideal for injection points with cavity surfaces with an angle between 10 and 20° to the perpendicular nozzle axis. Problems of drooling and stringing are eliminated.

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PGY10



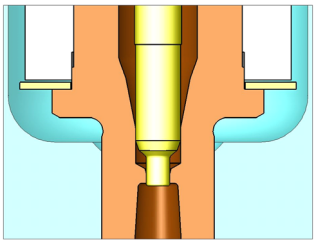
PGY30



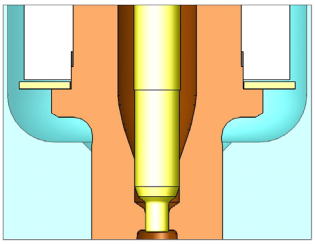
PGY10-PGY30 - CYLINDRICAL V. GATING WITH EXTERNAL END RING NUT

It has excellent performances with amorphous materials. Injection molding with cylindrical valve gate permits the use of a wider gate, excellent component packing, and an high-quality finishing at the injection point. As a result, low residual stresses and good dimensional stability are ensured for molded parts. This type of injection should be avoided where Glass filled materials are applied, because the gate wear could compromise injection-point quality.

PGY10



PGY30

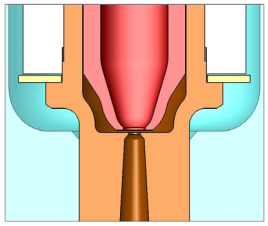
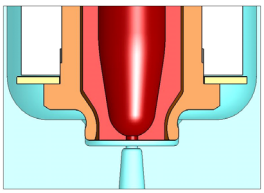
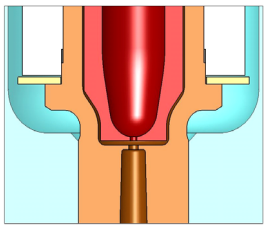
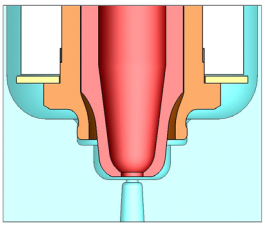
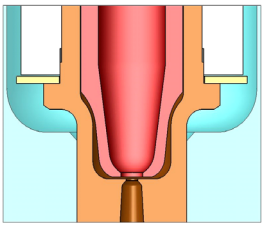


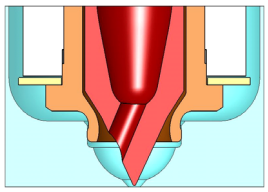
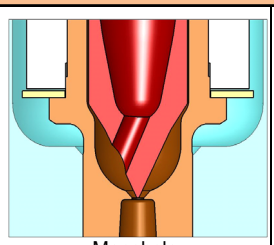
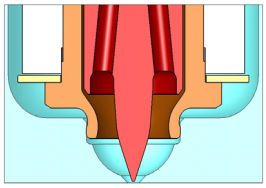
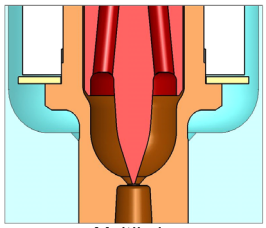
PGY10-PGY30 - CYLINDRICAL V. GATING WITH END RING THROUGH THE CAVITY

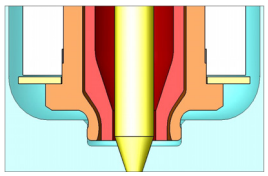
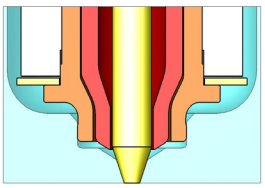
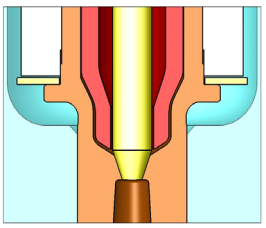
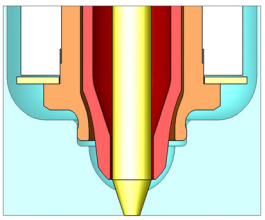
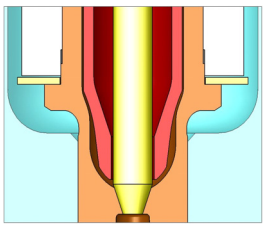
It has identical performances to the above type. Moreover this solution is recommended for applications with particularly deep injection, because it simplifies the cavity plate manufacturing.

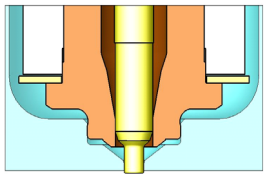
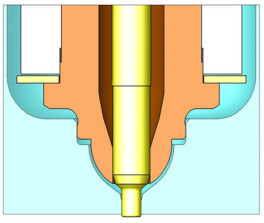
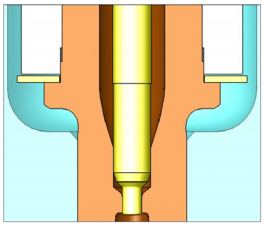
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The table below describes the available injection point configurations for each type of nozzle.

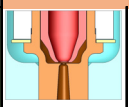
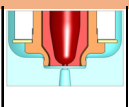
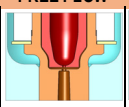
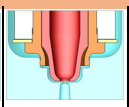
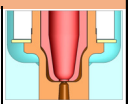
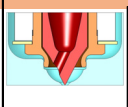
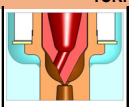
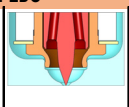
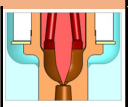
FREE FLOW				
				
PGF10	PGF20		PGF30	
Pp - Mp - Gp Pa - Ma - Ga - Aa	Pp - Mp Pa - Ma		Pp - Mp - Gp Pa - Ma - Ga - Aa	

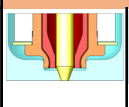
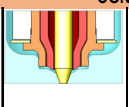
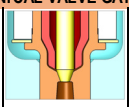
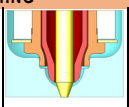
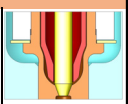
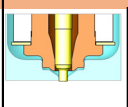
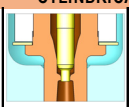
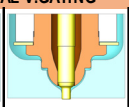
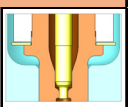
TORPEDO				
				
Monohole	Monohole	Multihole	Multihole	
PGT30				
Pp - Mp - Gp Pa - Ma - Ga - Aa				

CONICAL VALVE GATING				
				
PGC10	PGC20		PGC30	
Pp - Mp - Gp	Pp - Mp - Gp - Aa Pa - Ma - Ga - Aa		Pp - Mp - Gp Pa - Ma - Ga - Aa	

CYLINDRICAL VALVE GATING				
				
PGY10	PGY30			
Pp	Mp - Gp Ma - Ga - Aa	Mp - Gp Ma - Ga - Aa		

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MATERIAL	FREE FLOW					TORPEDO			
	 PGF10	 PGF20	 PGF20	 PGF30	 PGF30	 PGT30	 PGT30	 PGT30 - Multif	 PGT30 - Multif
CRYSTALLINE MATERIALS									
PP	○	○	○	●	●	●	●	●	●
PP + GF	○	○	○	●	●	○	○	●	●
PE	○	○	○	●	●	●	●	●	●
PA6 / PA66	●	○	○	○	○	○	●	○	●
PA6 / PA66 + GF	●	○	○	○	○	○	○	○	●
AMORPHOUS MATERIALS									
PS	○	○	○	●	●	●	●	●	●
SAN	○	○	○	●	●	●	●	●	●
ABS	○	○	○	●	●	●	●	●	●
PMMA	○	○	○	●	●	●	●	●	●
PC	○	○	○	●	●	●	●	●	●
PC-ABS	○	○	○	●	●	●	●	●	●
ELASTOMER MATERIALS									
TPE - TPV	○	●	●	○	○	●	●	●	●
ADDITIVE									
CALCIUM CARBONATE	◎	◎	◎	◎	◎	◎	◎	◎	◎
TALC DUST	◎	◎	◎	◎	◎	◎	◎	◎	◎
COLOUR CHANGES	◎	◎	◎	◎	◎	◎	◎	◎	◎

MATERIAL	CONICAL VALVE GATING					CYLINDRICAL V.GATING			
	 PG10	 PGC20	 PGC20	 PGC30	 PGC30	 PGY10	 PGY10	 PGY30	 PGY30
CRYSTALLINE MATERIALS									
PP	●	●	●	●	●	●	●	●	●
PP + GF	○	○	●	○	●	○	○	○	○
PE	●	●	●	●	●	●	●	●	●
PA6 / PA66	○	○	●	○	●	○	●	○	●
PA6 / PA66 + GF	○	○	●	○	●	○	○	○	○
AMORPHOUS MATERIALS									
PS	●	●	●	●	●	●	●	●	●
SAN	●	●	●	●	●	●	●	●	●
ABS	●	●	●	●	●	●	●	●	●
PMMA	●	●	●	●	●	●	●	●	●
PC	●	●	●	●	●	●	●	●	●
PC-ABS	●	●	●	●	●	●	●	●	●
ELASTOMER MATERIALS									
TPE - TPV	●	●	●	●	●	●	●	●	●
ADDITIVE									
CALCIUM CARBONATE	◎	◎	◎	◎	◎	◎	◎	◎	◎
TALC DUST	◎	◎	◎	◎	◎	◎	◎	◎	◎
COLOUR CHANGES	◎	◎	◎	◎	◎	◎	◎	◎	◎

● POSSIBLE, BEST CONFIGURATION

◎ GENERALLY POSSIBLE, DEPEND BY MATERIAL. For details contact HRS technical office

○ GENERALLY NOT POSSIBLE. For details contact HRS technical office

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TOLERANCES

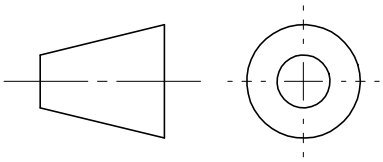
Following the general tolerances applying to the present catalogue
Metric system used for quoting

DIMENSIONS				ANGLES	
10	±0.20 mm	h13	H13	10	±1°
10.0	±0.05 mm	d10	H11	10.0	±10'
10.00	±0.01 mm	g6	H7	-	-

CONCENTRICITY	PARALLELISM	RADIUS	CHAMFERS	THREADS (UNI5541)		SURFACE ROUGHNESS $\sqrt{1}^{+0.5}_{-0}$
0.03 MAX	0.03 MAX	0.2 MAX	0.3x45° MAX	4h	4H	HARDNESS ±1 HRc

PROJECTION

European projection system used for graphic displaying



DIMENSION CONVERSION TABLE

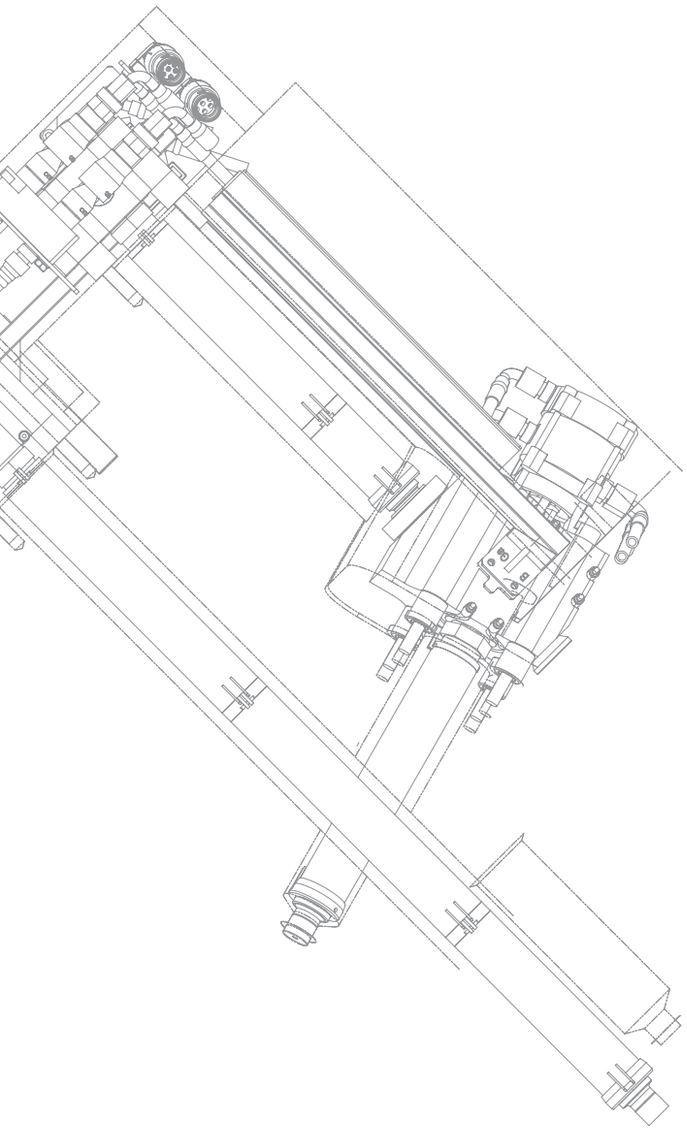
The following table allows translation of specific dimensions according to the International Unit System (SI)

DIMENSION	To achieve corresponding value in;	(SI) Multiply number of:	→
LENGTH	Inches	mm (millimetres)	x 0.03937008
VOLUME	Inches³	cm³ (centimetres)	x 0.06102376
TEMPERATURE	°F °R	°C (Celsius degrees)	(x 1.8)+32 x 0.8
MASS	Ounces (avoirdupois)	g (grams)	x 0.03527397
TORQUE	Lbf.ft	Nm (Newton meter)	x 0.7375621
POWER	Btu (Int. Table/hour)	W (Watt)	x 3.412141
PRESSURE	pound/inch²	bar	x 14.50377

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hrsflow

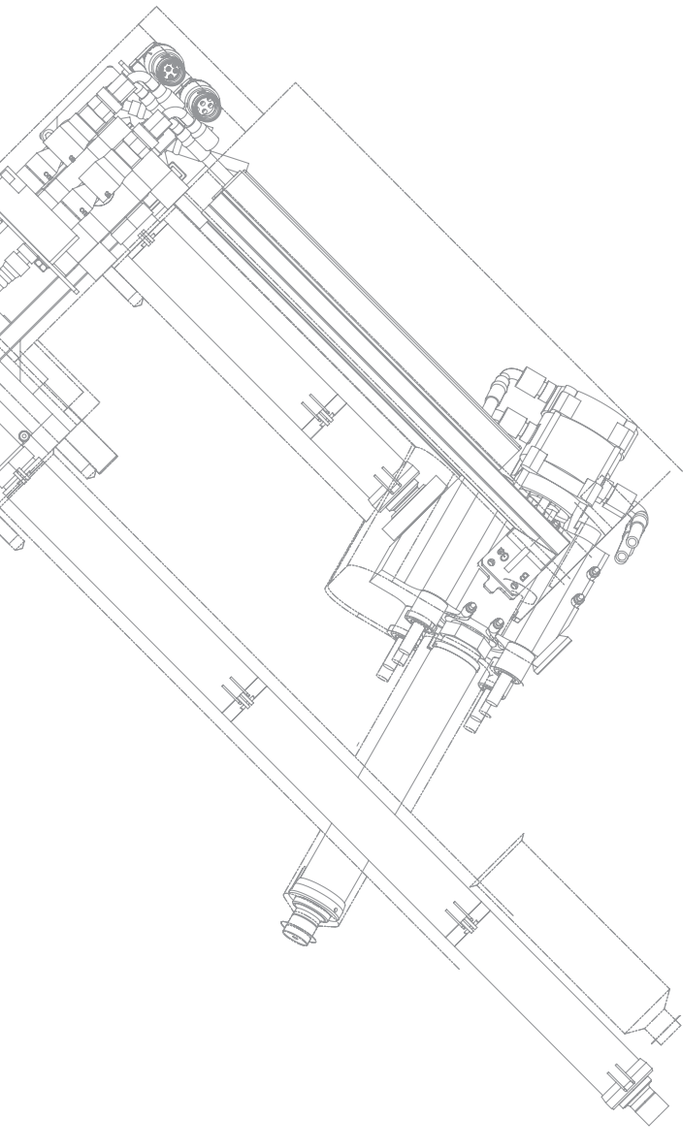


Nozzles and hot runners

Iniettori e camere calde
Einspritzdusen und Heisskanäle
Buses et blocs chauds
Inyectores y cámaras calientes
Injectores e câmaras quentes

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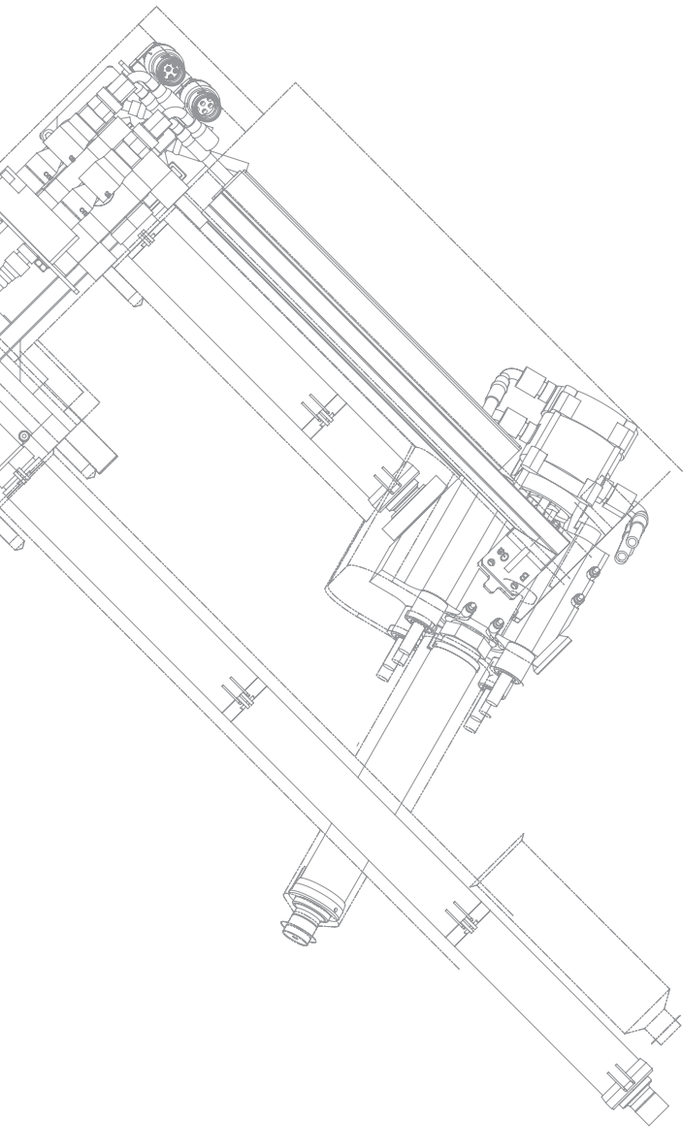
Plus Series

Serie Plus
Plus Serie
Plus Série
Plus Serie
Plus Série

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P

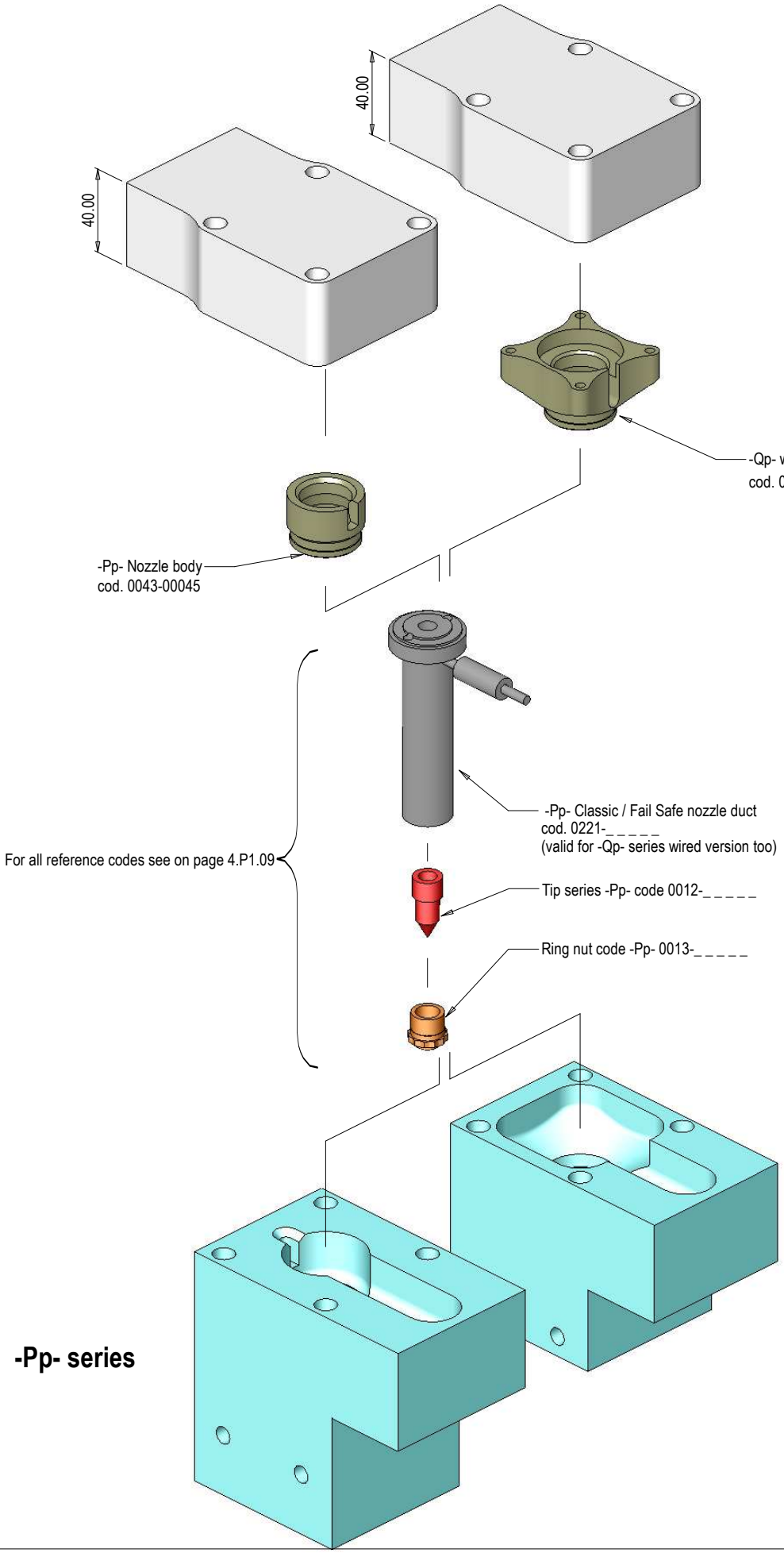
P Series 2÷70 cm³/s

Serie P
P Serie
P Série
P Serie
P Série

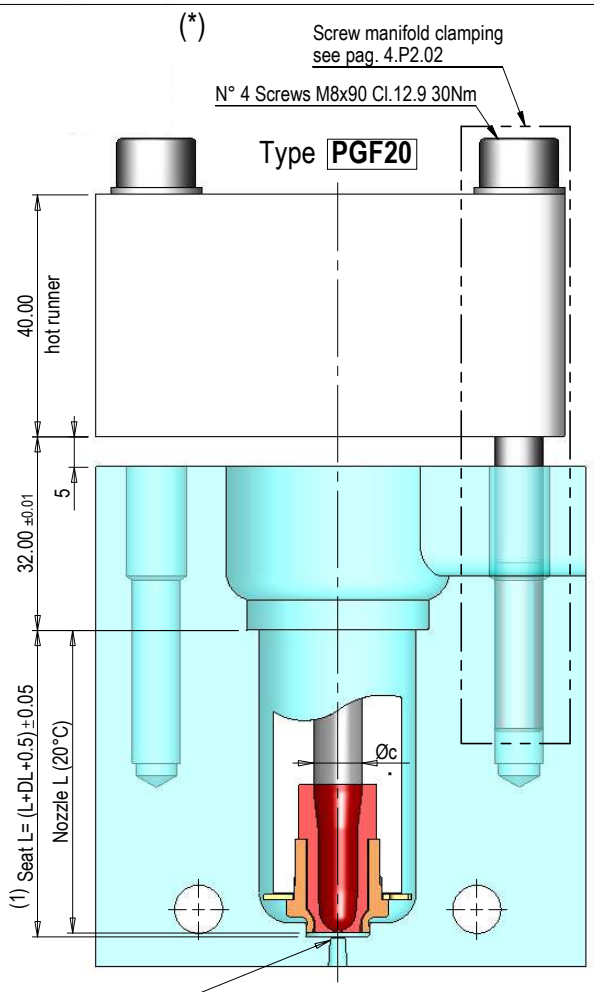
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EXPLODED NOZZLE COMPONENT

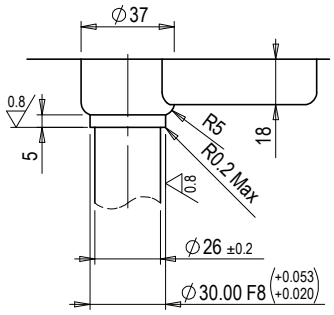


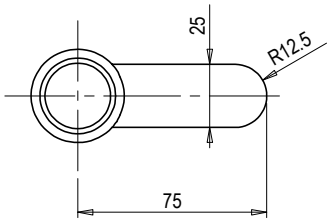
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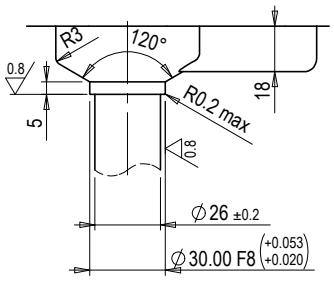
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

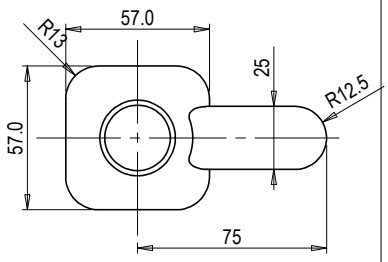
-Pp- series

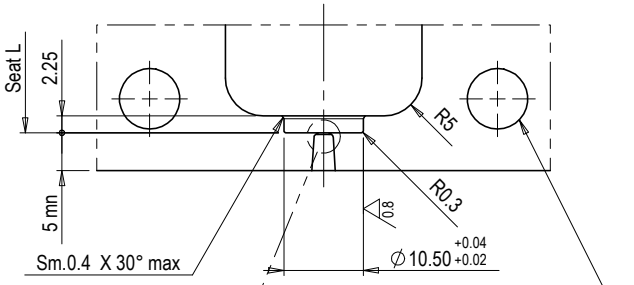




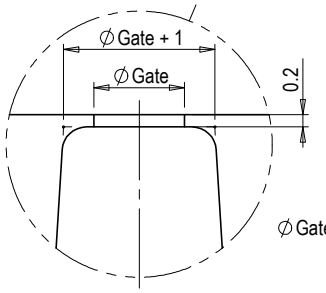
-Qp- series
(-Pp- wired version)







Conditioning circuit to be foreseen in the area of the injection point

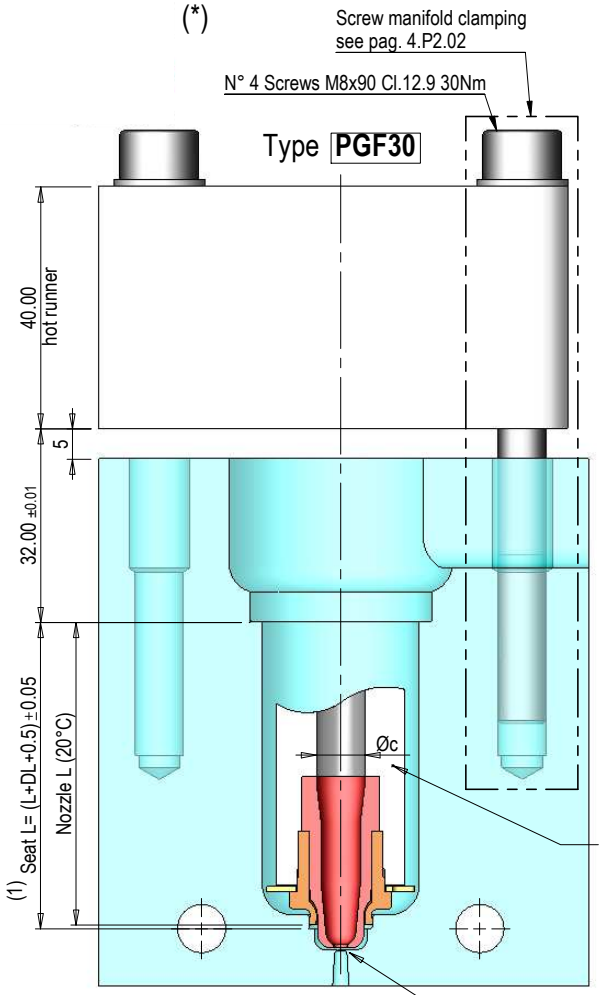


Ø Gate = min 0.9 ÷ 1.5 max

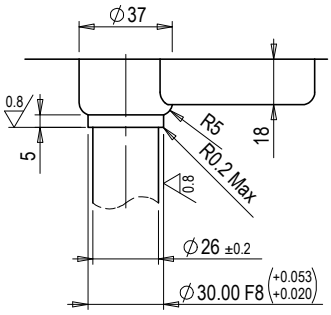
For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09b table A

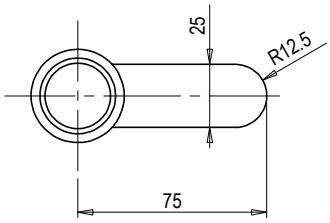
NOZZLE L
35
50
65
80
95
125
155

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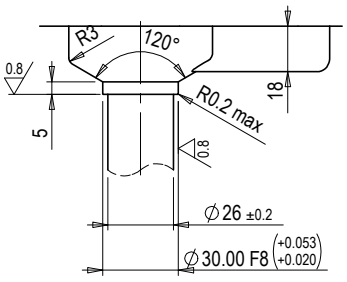


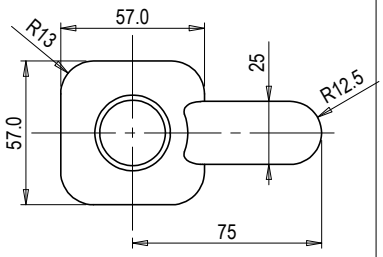
-Pp- series



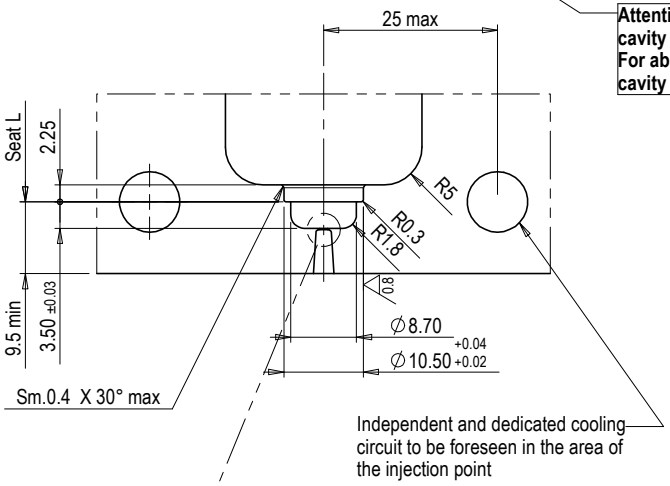


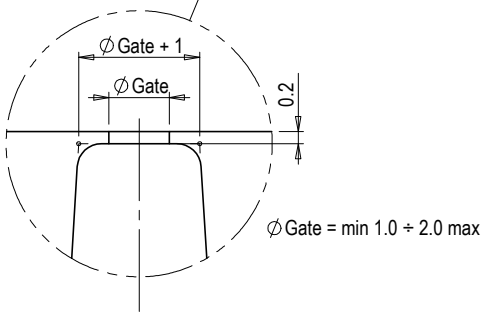
-Qp- series
(-Pp- wired version)





Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

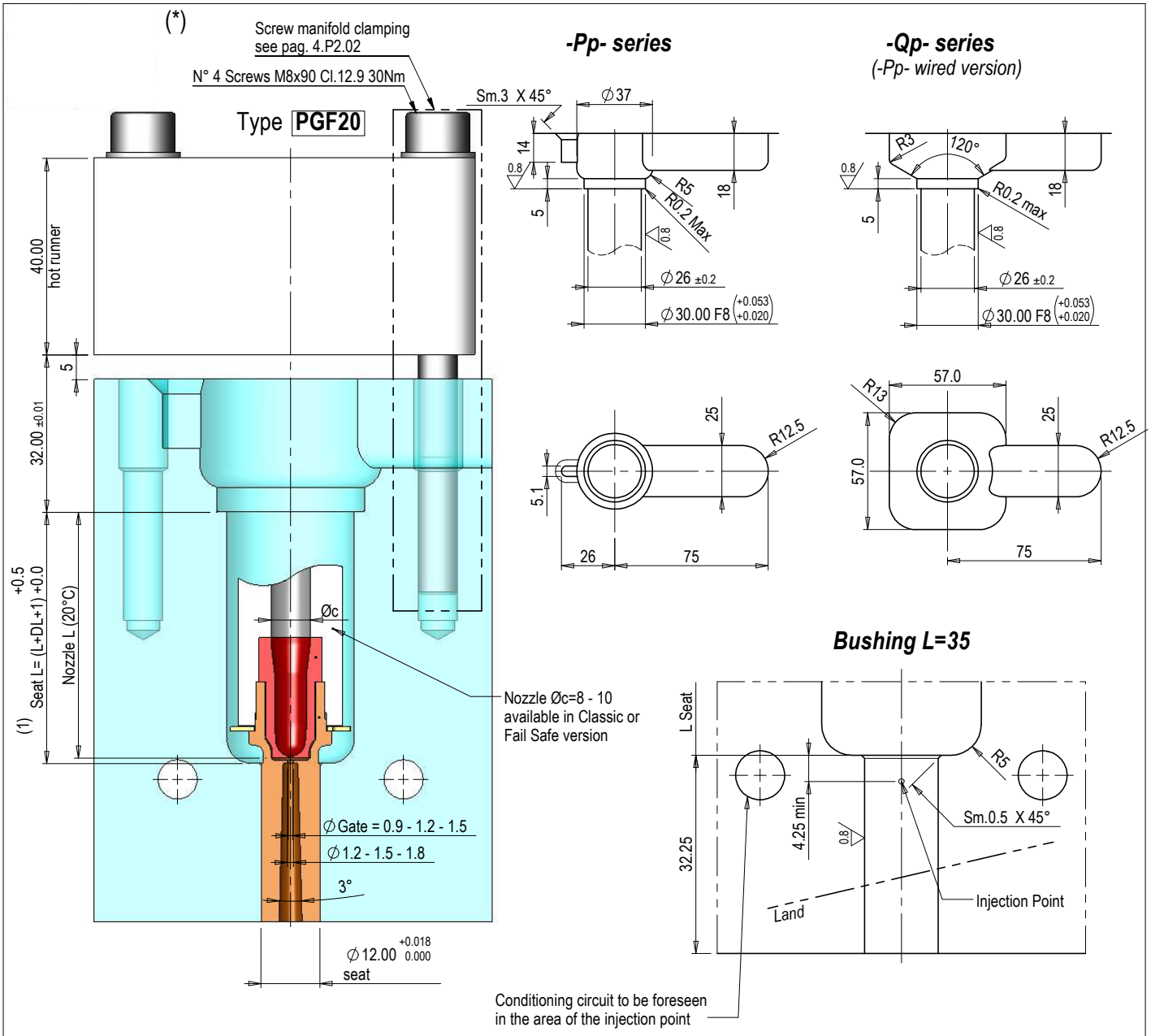




For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09b table A

NOZZLE *L*
35
50
65
80
95
125
155

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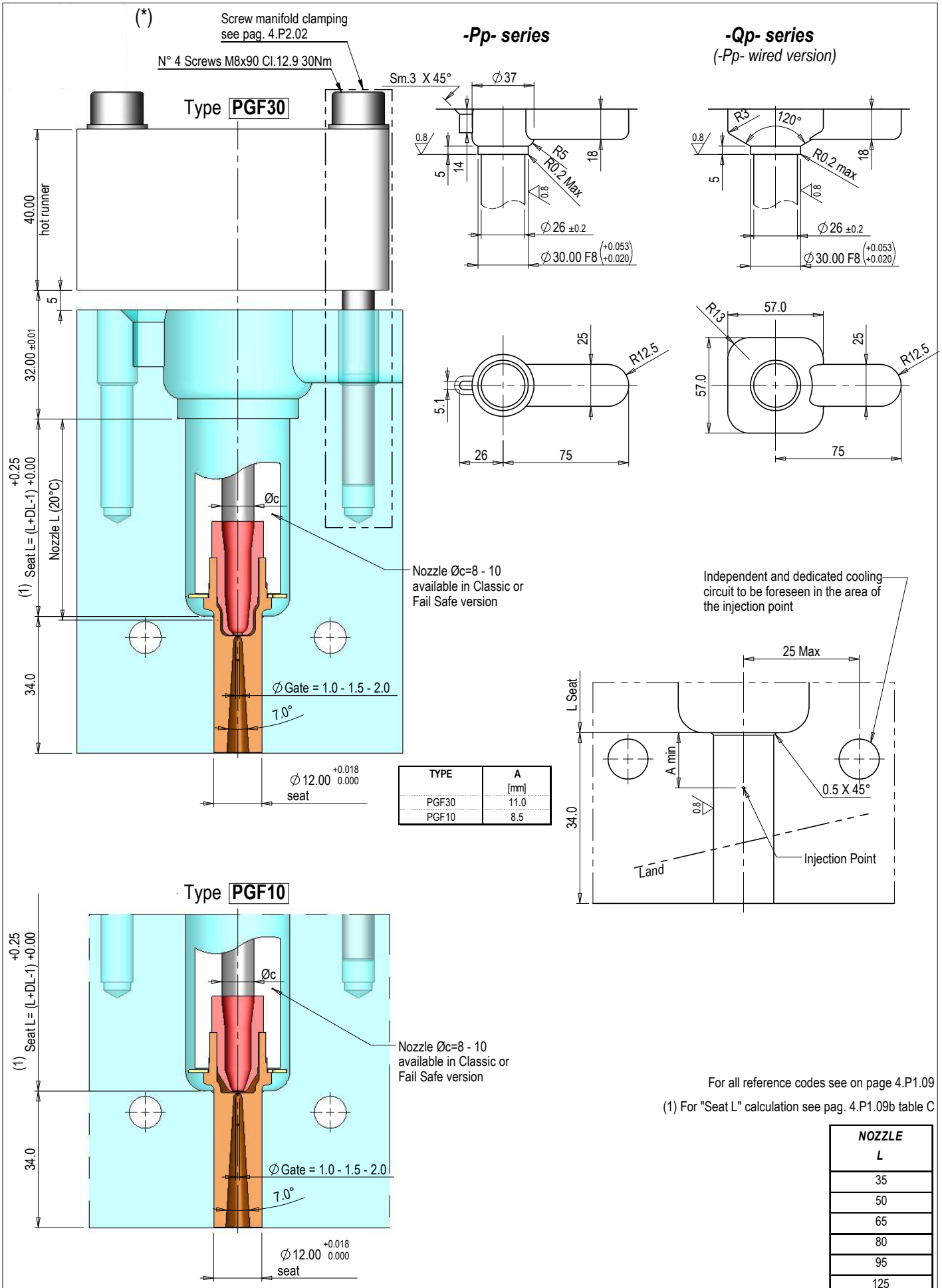


For all reference codes see on page 4.P1.09

(1) For "Seat L" calculation see pag. 4.P1.09b table B

NOZZLE L
35
50
65
80
95
125
155

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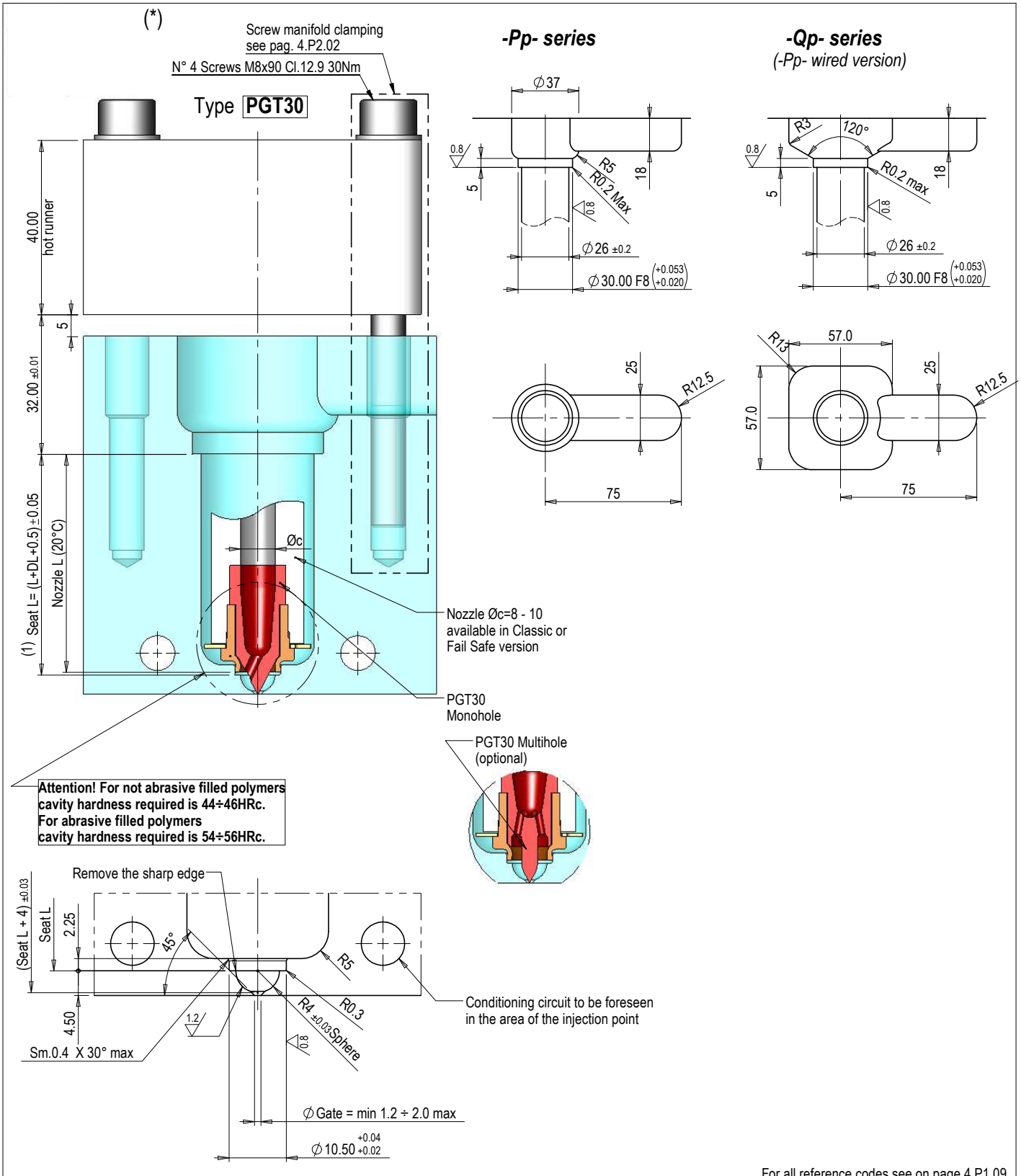
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PGF10	8.5

For all reference codes see on page 4.P1.09

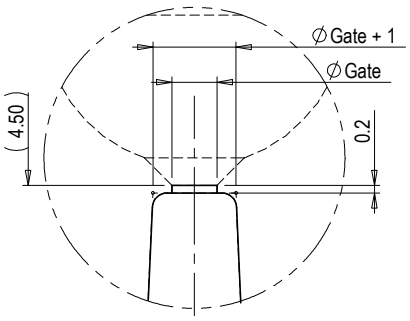
(1) For "Seat L" calculation see pag. 4.P1.09b table C

NOZZLE L
35
50
65
80
95
125
155

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With sprue

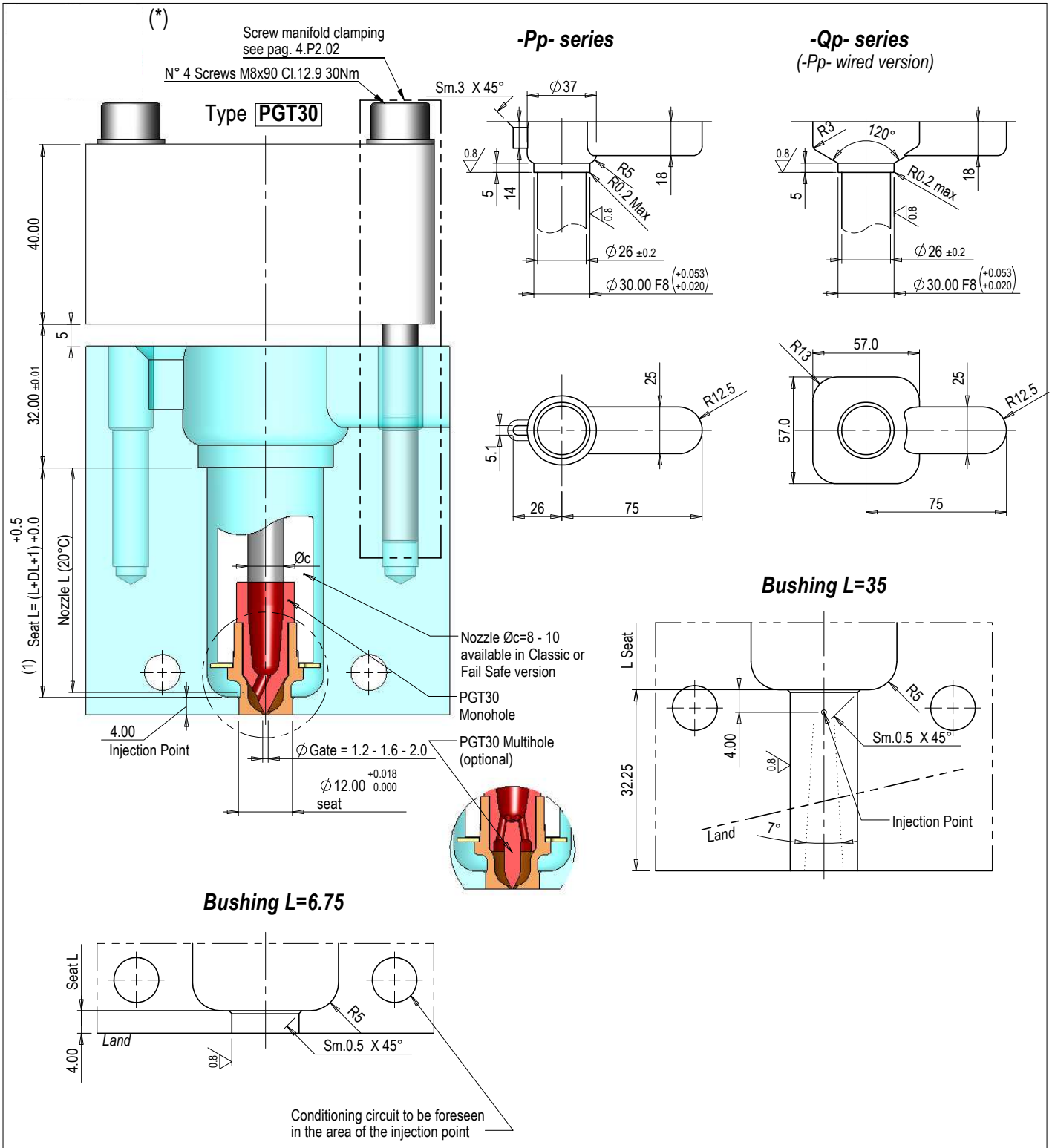


For all reference codes see on page 4.P1.09

(1) For "Seat L" calculation see pag. 4.P1.09b table A

NOZZLE *L*
35
50
65
80
95
125
155

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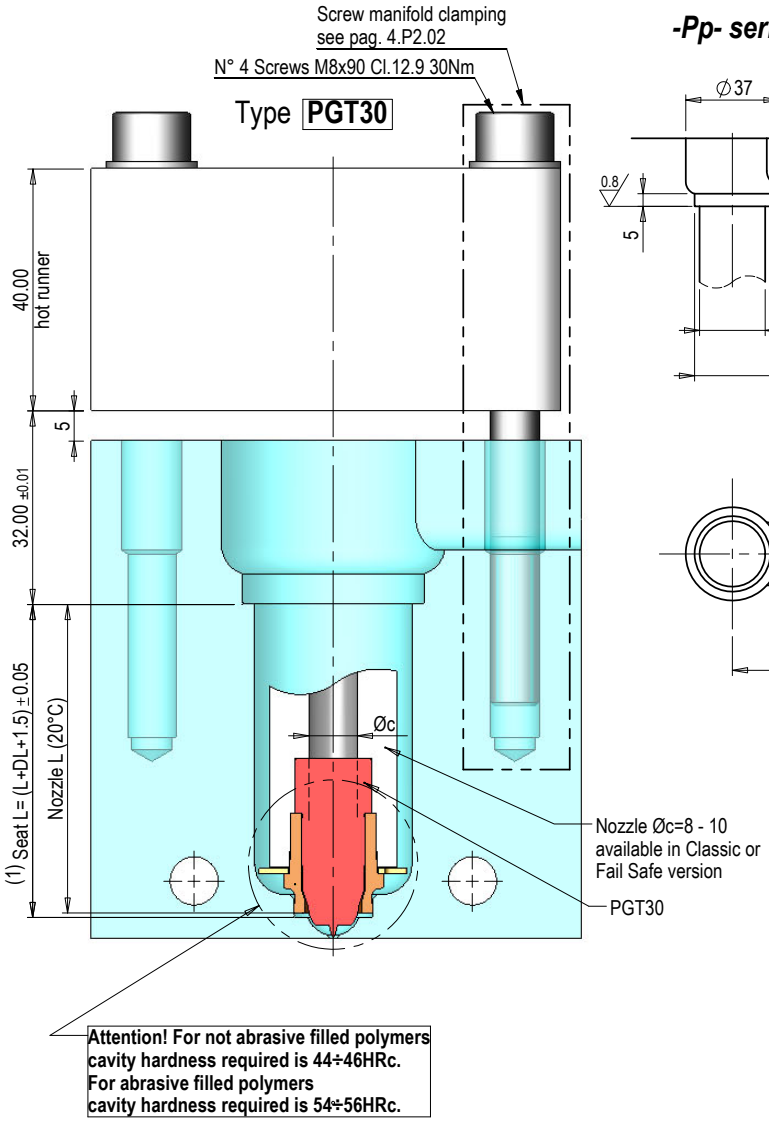
For all reference codes see on page 4.P1.09

(1) For "Seat L" calculation see pag. 4.P1.09b table B

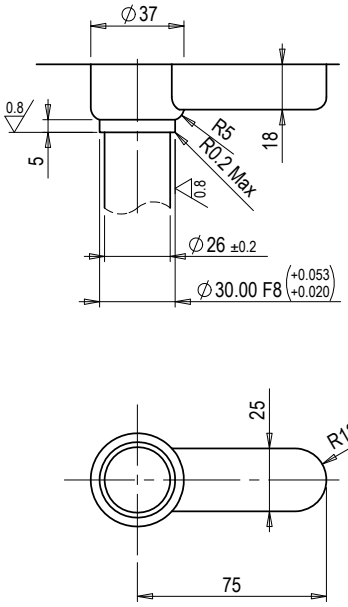
NOZZLE L
35
50
65
80
95
125
155

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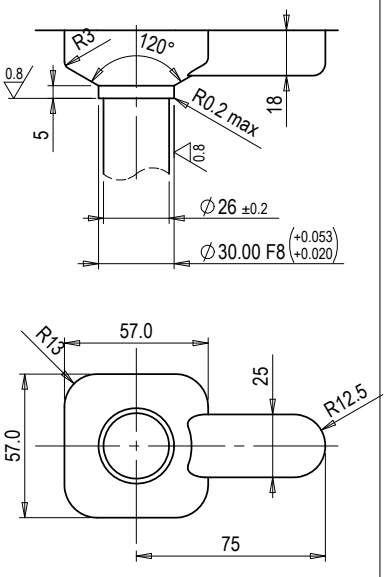
Nozzle TORPEDO with external end ring for engineering polymers

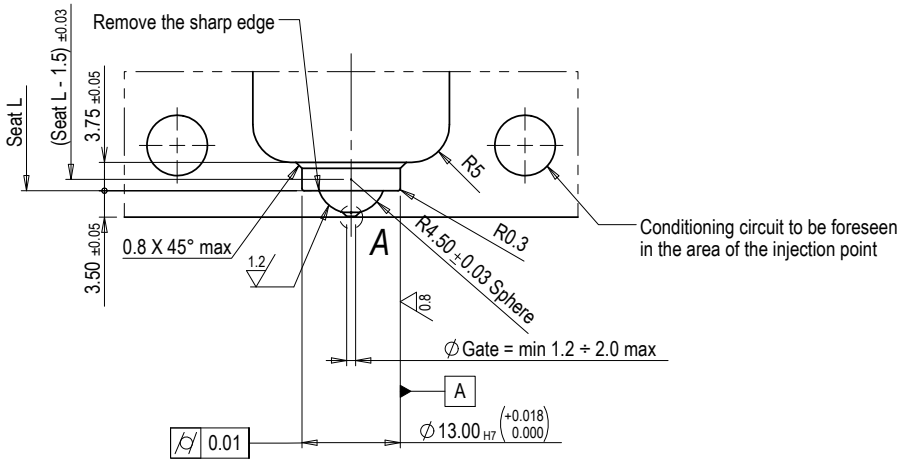


-Pp- series

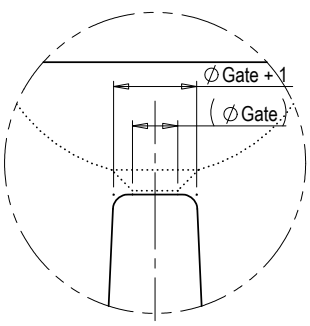


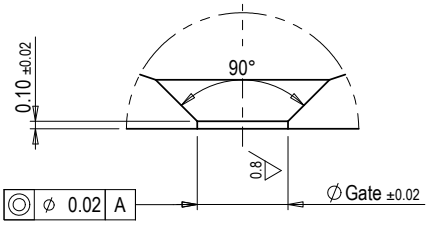
-Qp- series
(-Pp- wired version)





With sprue





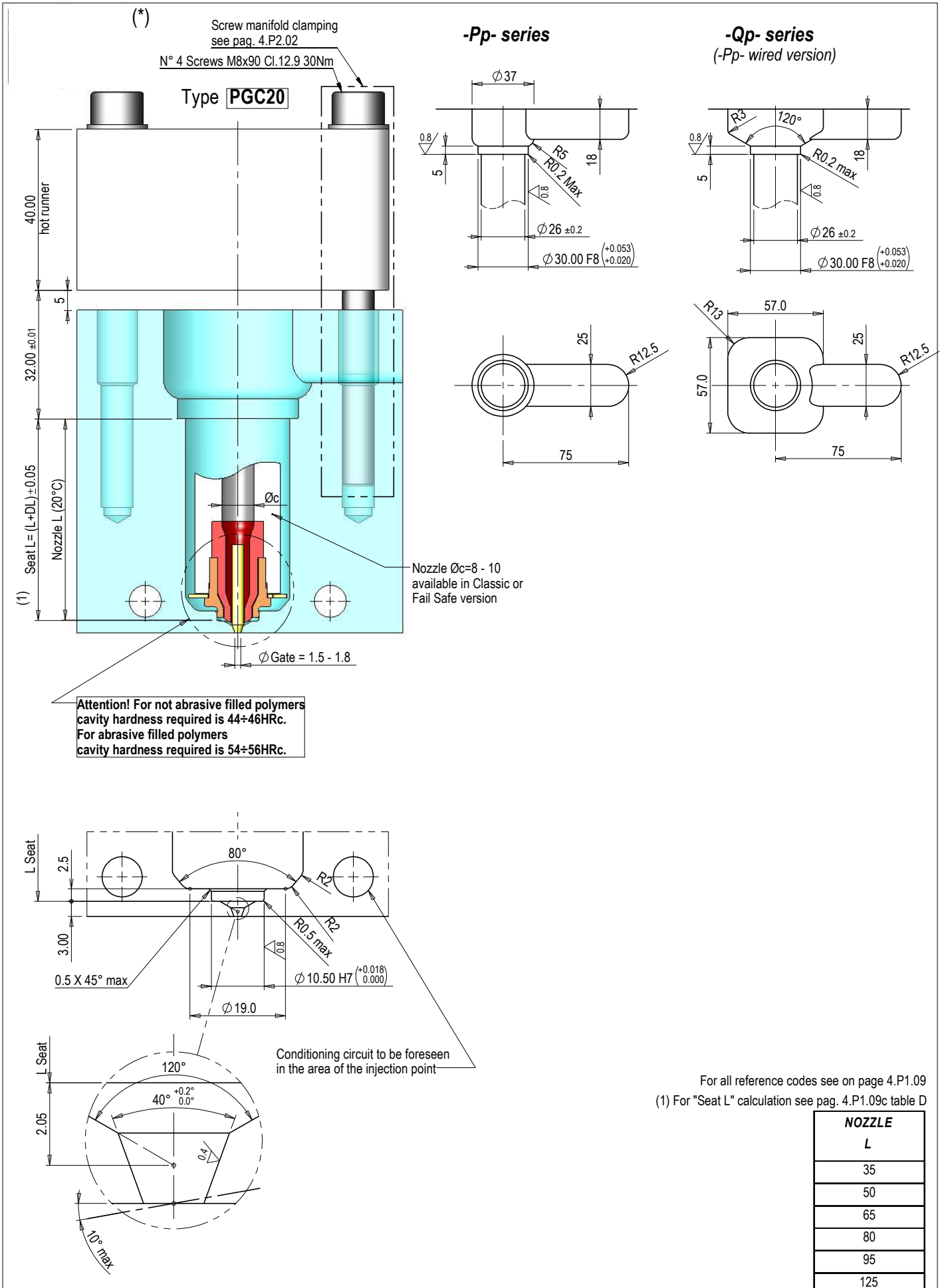
DETAIL A
SCALE 10 : 1

For all reference codes see on page 4.P1.09

(1) For "Seat L" calculation see pag. 4.P1.09b table A

NOZZLE *L*
35
50
65
80
95
125
155

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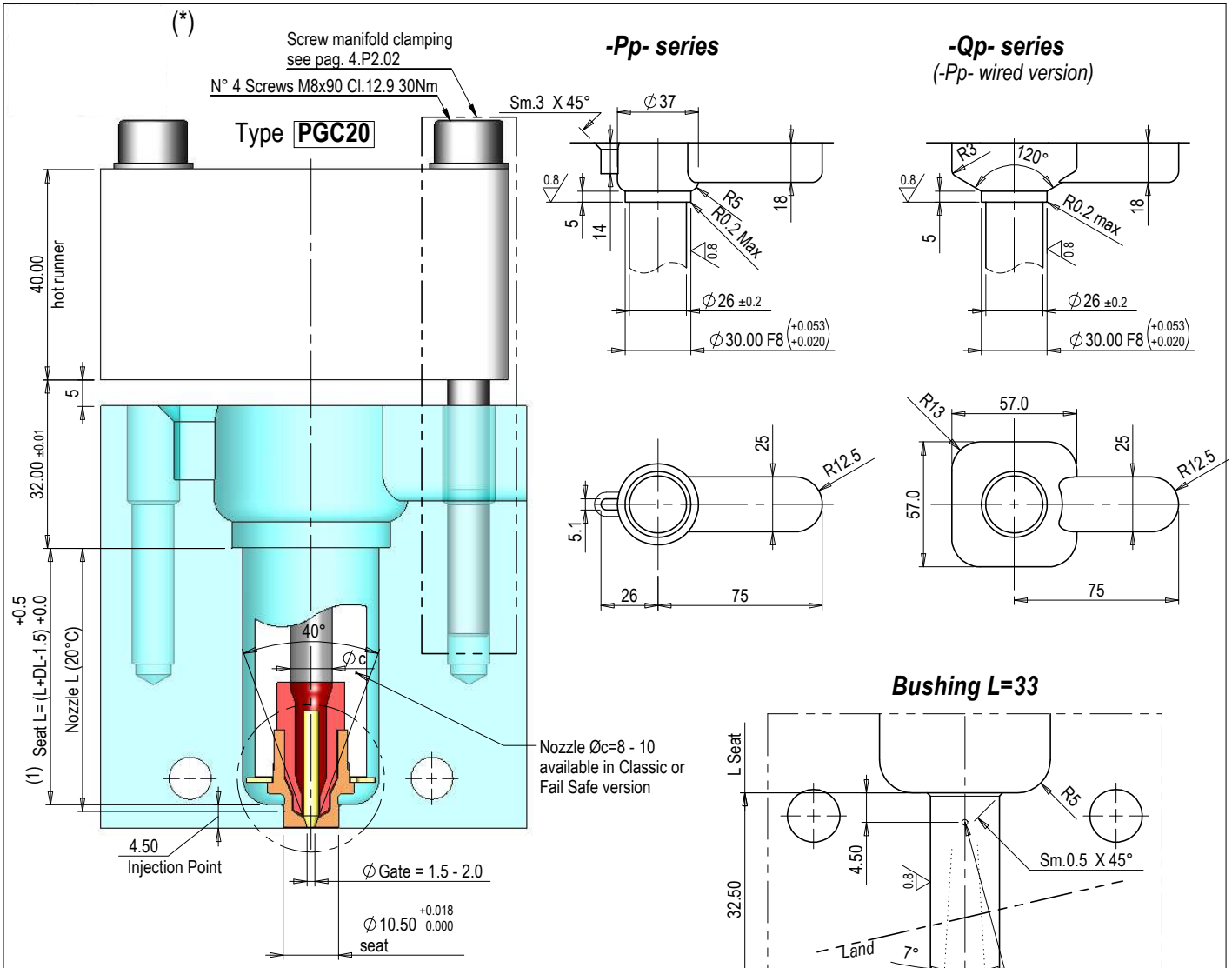


For all reference codes see on page 4.P1.09

(1) For "Seat L" calculation see pag. 4.P1.09c table D

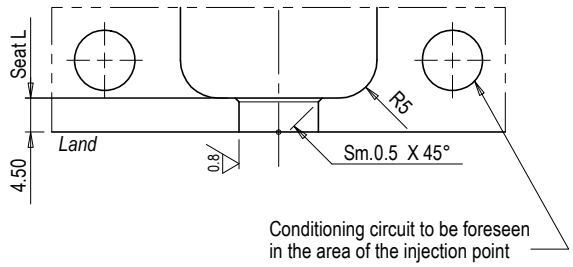
NOZZLE L
35
50
65
80
95
125
155

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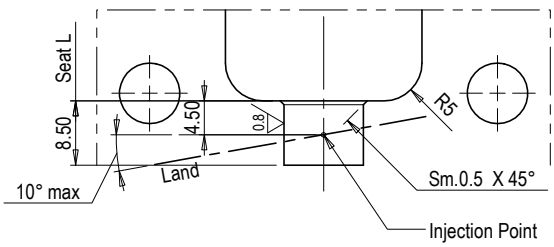


Bushing L=33

Bushing L=5.5



Bushing L=9

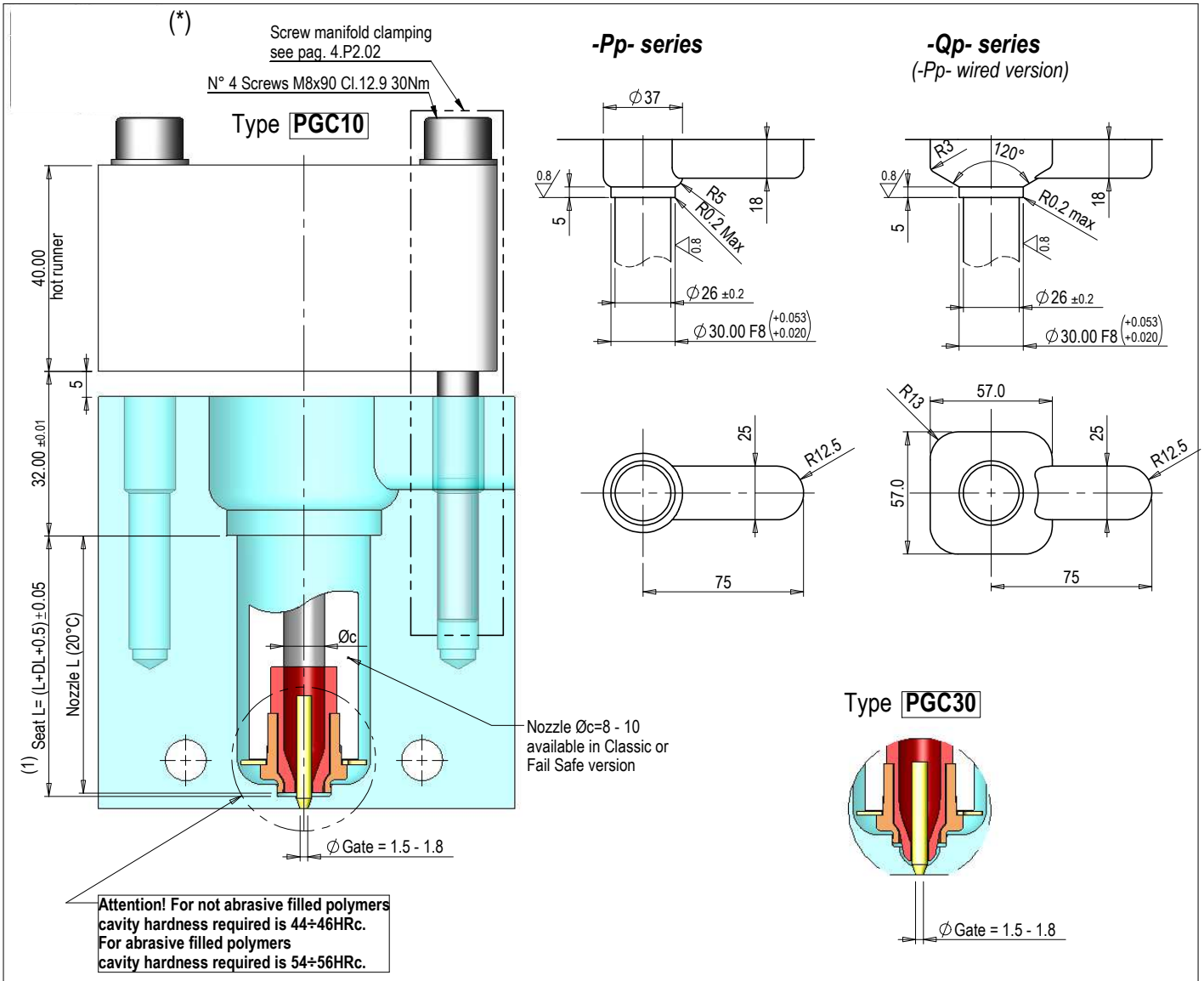


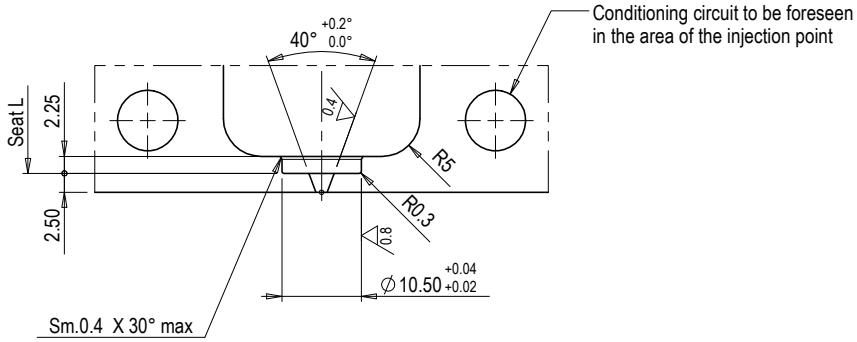
For all reference codes see on page 4.P1.09

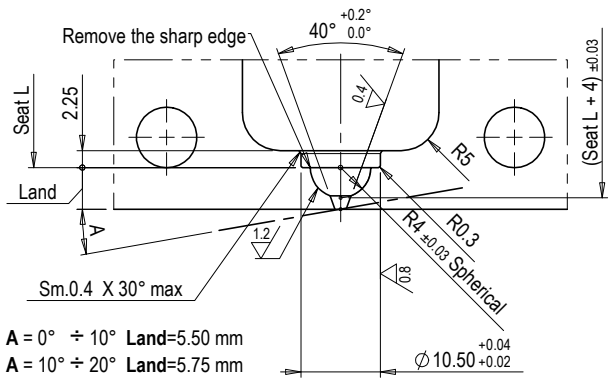
(1) For "Seat L" calculation see pag. 4.P1.09c table E

NOZZLE L
35
50
65
80
95
125
155

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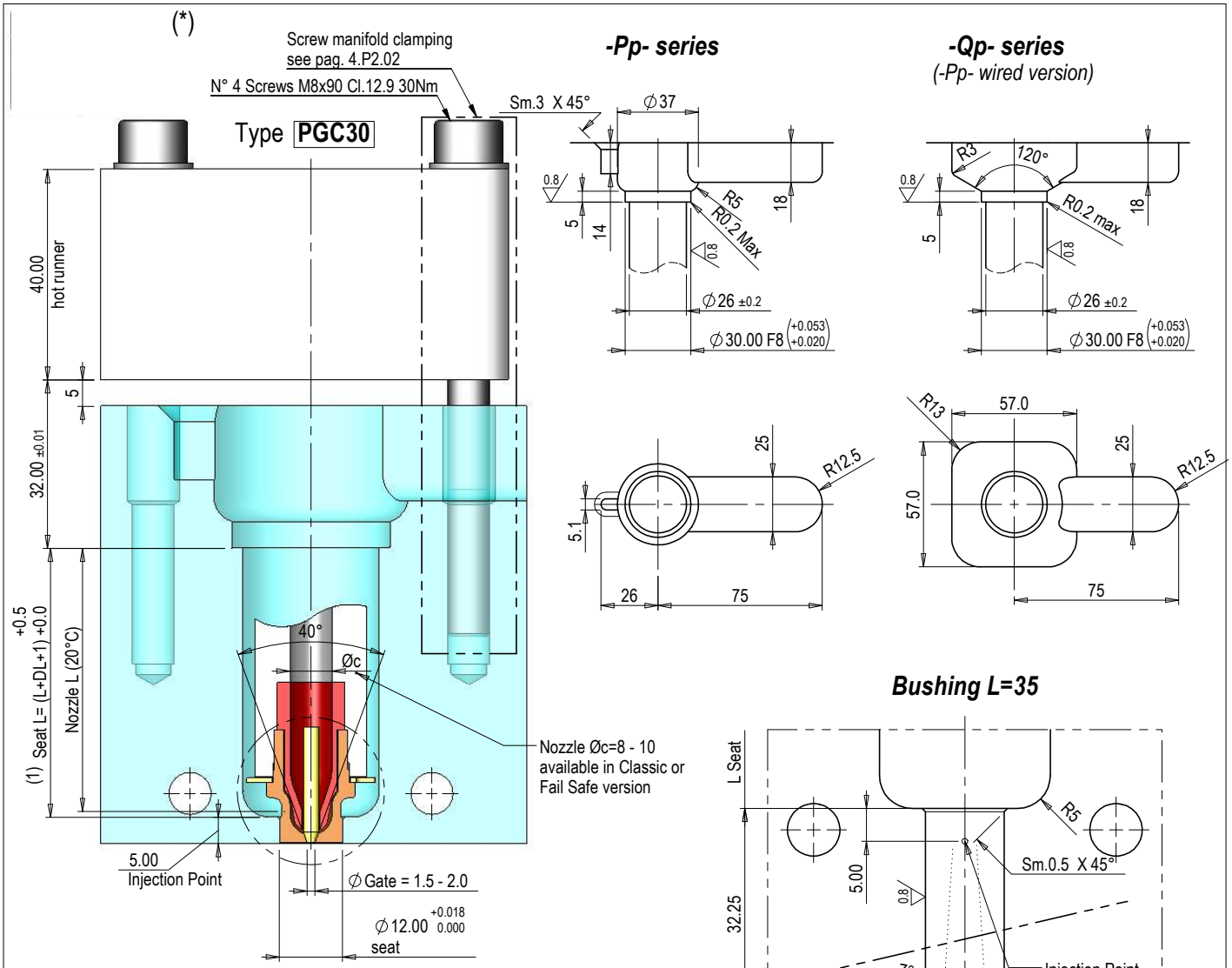


For all reference codes see on page 4.P1.09

(1) For "Seat L" calculation see pag. 4.P1.09b table A

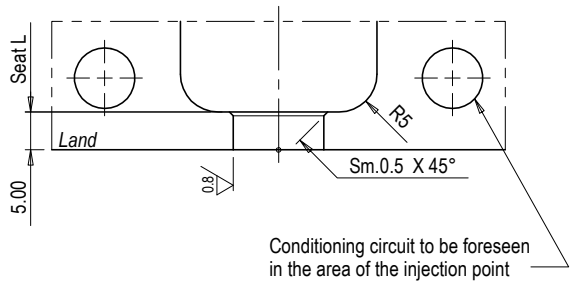
NOZZLE L
35
50
65
80
95
125
155

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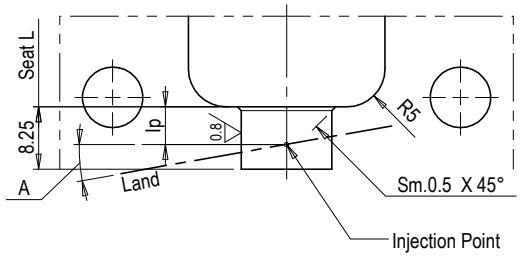


Bushing L=35

Bushing L=7.75



Bushing L=11



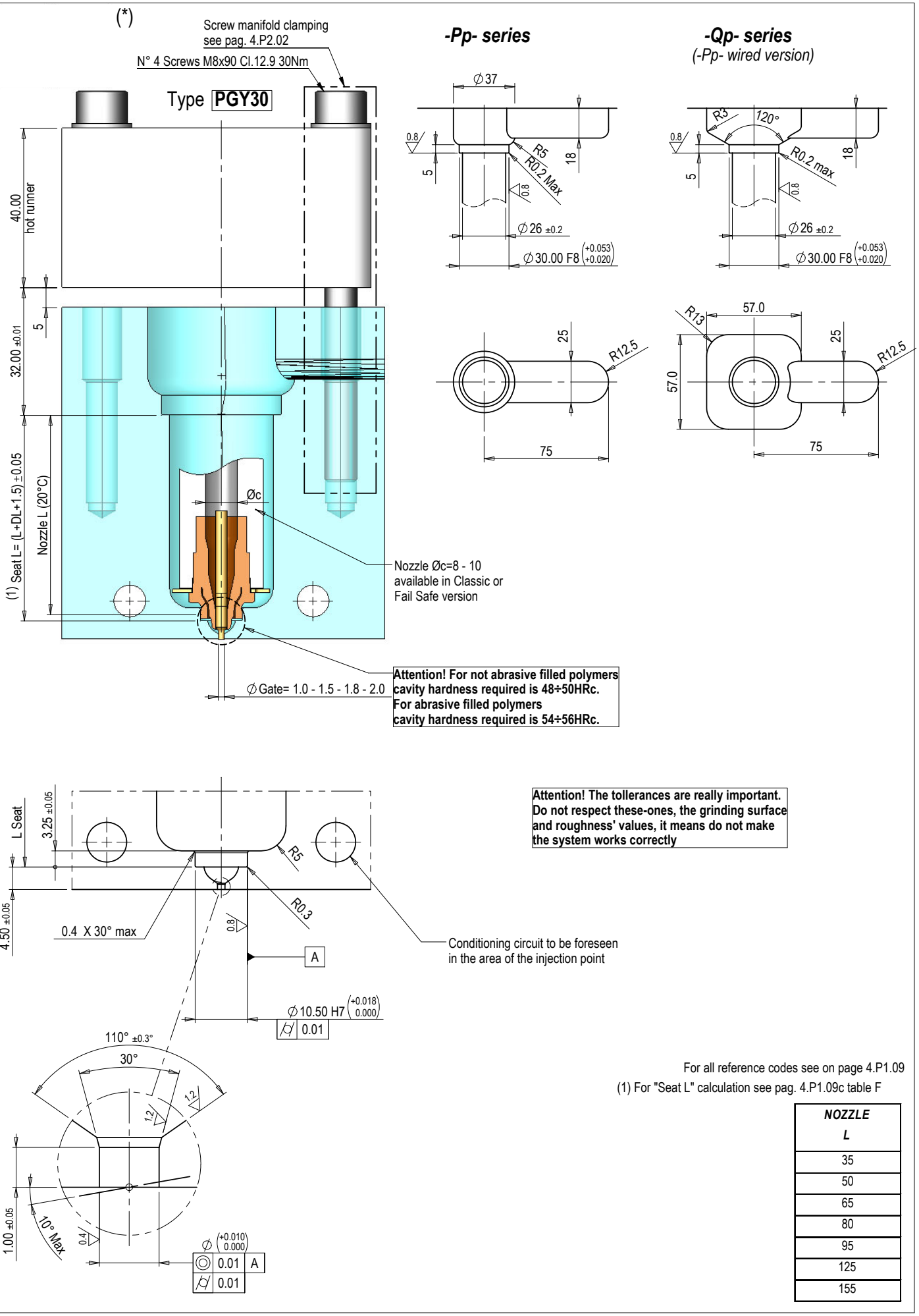
A = 0° ÷ 10° **lp**=5.00 mm
A = 10° ÷ 20° **lp**=5.20 mm

For all reference codes see on page 4.P1.09

(1) For "Seat L" calculation see pag. 4.P1.09b table B

NOZZLE L
35
50
65
80
95
125
155

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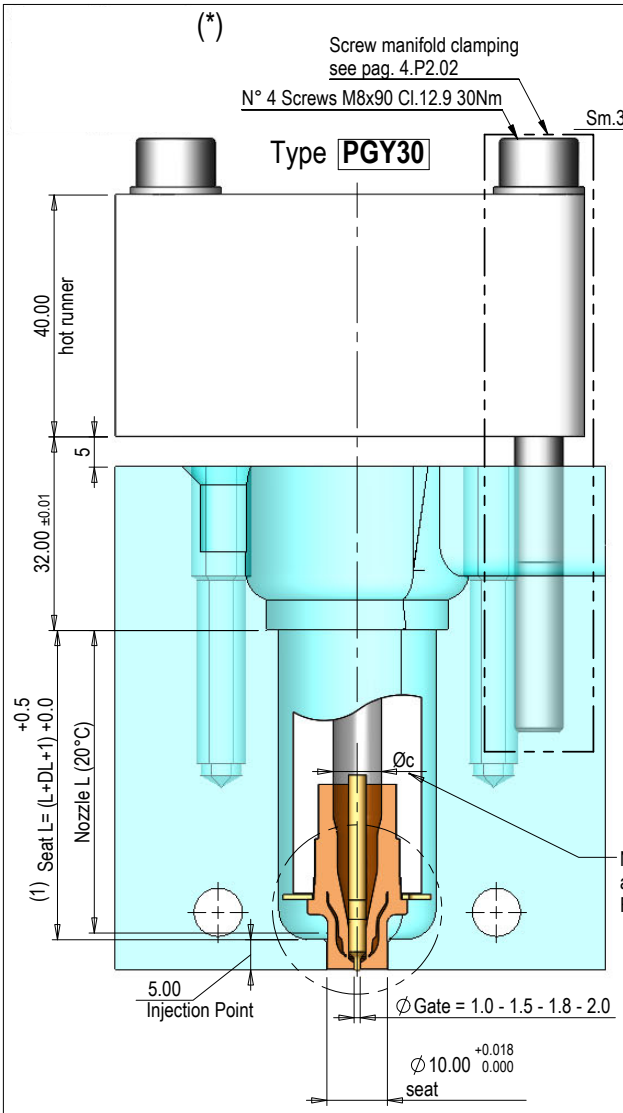
Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

For all reference codes see on page 4.P1.09

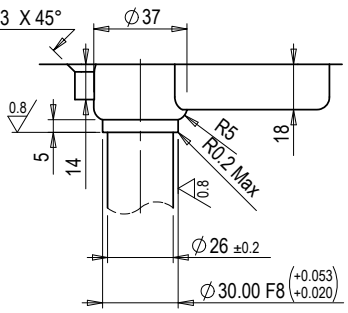
(1) For "Seat L" calculation see pag. 4.P1.09c table F

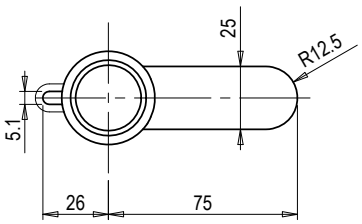
NOZZLE L
35
50
65
80
95
125
155

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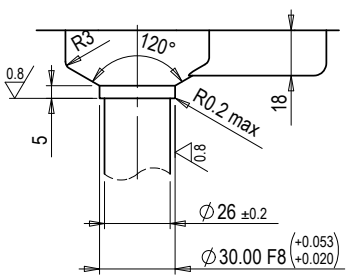


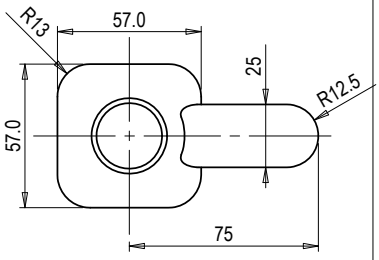
-Pp- series



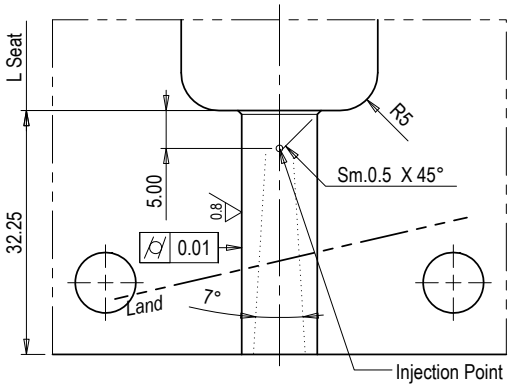


-Qp- series
(-Pp- wired version)

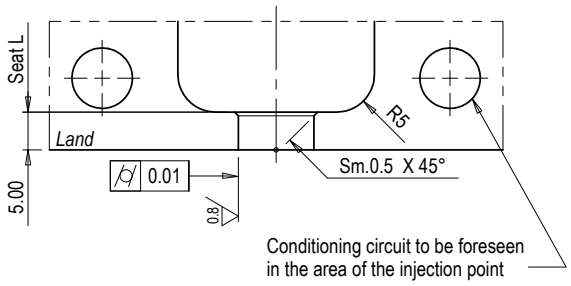




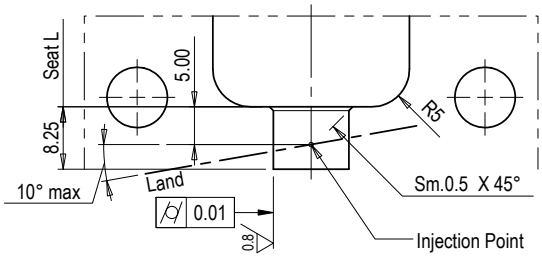
Bushing L=35



Bushing L=7.75



Bushing L=11



For all reference codes see on page 4.P1.09

(1) For "Seat L" calculation see pag. 4.P1.09b table B

NOZZLE L
35
50
65
80
95
125
155

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NOZZLE L	NOZZLE DUCT CODE		W (230V)
35	Classic	0221-00305	1x 210
	Fail Safe	0221-00312	2x 210
50	Classic	0221-00306	1x 300
	Fail Safe	0221-00313	2x 300
65	Classic	0221-00307	1x 300
	Fail Safe	0221-00314	2x 300
80	Classic	0221-00308	1x 360
	Fail Safe	0221-00315	2x 360
95	Classic	0221-00309	1x 360
	Fail Safe	0221-00316	2x 360
125	Classic	0221-00310	1x 400
	Fail Safe	0221-00317	2x 400
155	Classic	0221-00311	1x 450
	Fail Safe	0221-00318	2x 450

follows

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30 0012-00580 0012-00581 *for high resistance* ***PGF20*** **Ø0.9** 0012-00372 *(to be used with bushing Ø1.2)* **Ø1.2** 0012-00373 *(to be used with bushing Ø1.5)* **Ø1.5** 0012-00374 *(to be used with bushing Ø1.8)* ***PGF10*** 0012-00595 *for high resistance*	***External end ring nut*** **Ø10.5** 0013-00412 ***Free Flow with Bushing through the cavity*** *gate* / ***PGF30*** / ***PGF10*** / ***PGF20*** ***Ø1.0*** 0013-00912 / 0013-00925 / - ***Ø1.2*** - / - / 0013-00589 ***Ø1.5*** 0013-00913 / 0013-00926 / 0013-00590 ***Ø1.8*** - / - / 0013-00591 ***Ø2.0*** 0013-00914 / 0013-00927 / -	
TORPEDO		
PGT30 Monohole 0012-00255 0012-00256 *for high resistance* ***PGT30 Torpedo*** 0012-00257 0012-00258 *for high resistance* 0012-00990 *for engineering polymers* ***PGT30 for Rubber*** *for high conductibility* ***Ø0.45*** 0012-00375 0012-00378 ***Ø0.60*** 0012-00376 0012-00379 ***Ø0.75*** 0012-00377 0012-00380 ***PGT30 Multihole for Rubber*** *for high conductibility* ***Ø0.45*** 0012-00381 0012-00384 ***Ø0.60*** 0012-00382 0012-00385 ***Ø0.75*** 0012-00383 0012-00386	***External end ring nut*** **Ø10.5** 0013-00412 **Ø13.0** 0013-02108 for engineering polymers ***PGT30 Bushing through the cavity*** *gate* / ***L=6.75*** / ***L=35*** ***Ø1.2*** 0013-00414 / 0013-00416 ***Ø1.6*** 0013-00415 / 0013-00417 ***Ø2.0*** 0013-00543 / 0013-00418 ***PGT30 Bushing through the cavity for Rubber*** *gate* ***Ø0.9*** 0013-00594 *(to be used with tip Ø0.45)* ***Ø1.2*** 0013-00595 *(to be used with tip Ø0.60)* ***Ø1.5*** 0013-00596 *(to be used with tip Ø0.75)*	
CONICAL VALVE GATING		
PGC10 0012-00259 0012-00554 *For high conductibility with End Ring* 0012-00299 *for high resistance*	***External end ring nut*** ***Ø10.5*** 0013-00412 ***Ø10.5*** 0013-00904 *for high conductibility*	
PGC20 0012-00816 ***PGC20 Antistagnation*** 0012-00817	***PGC20 External end ring nut*** **Ø10.5** 0013-01387 ***PGC20 Bushing through the cavity*** *gate* / ***L=5.5*** / ***L=9*** / ***L=33*** ***Ø1.5*** 0013-01390 / 0013-01394 / 0013-01400 ***Ø2.0*** 0013-01391 / 0013-01395 / 0013-01401	0262-00062 { *for External ring nut* / *for Bushings through cavity*
PGC30 0012-00260 0012-00556 *For high conductibility with End Ring* ***PGC30 Antistagnation*** 0012-00769 *for high conductibility*	***External end ring nut*** ***Ø10.5*** 0013-00412 ***Ø10.5*** 0013-00904 *for high conductibility* ***PGC30 Bushing through the cavity*** *gate* / ***L=7.75*** / ***L=11*** / ***L=35*** ***Ø1.5*** 0013-00418 / 0013-00420 / 0013-00422 ***Ø2.0*** 0013-00419 / 0013-00421 / 0013-00423	0262-00054 { *for External ring nut* / *for Bushings through cavity*
CYLINDRICAL VALVE GATING		
	PGY30 External end ring nut ***Ø10.5*** 0013-01664 ***Ø10.5*** 0013-01665 *Antistagnation* ***PGY30 Bushing through the cavity*** *gate* / ***L=7.75*** / ***L=11*** / ***L=35*** ***Ø1.0*** 0013-01666 / 0013-01670 / 0013-01674 ***Ø1.5*** 0013-01667 / 0013-01671 / 0013-01675 ***Ø1.8*** 0013-01668 / 0013-01672 / 0013-01676 ***Ø2.0*** 0013-01669 / 0013-01673 / 0013-01677	0262-00069 *for External ring nut*

(*) Antistagnation Seal available only some polymers.

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)
k= (ΔT * 0.0008) - 0.04

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ) + k										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	0.08	0.11	0.13	0.16	0.18	0.20	0.23	0.25	0.28	0.30	0.33
50	0.10	0.13	0.16	0.18	0.21	0.24	0.27	0.30	0.32	0.35	0.38
65	0.12	0.15	0.18	0.21	0.24	0.28	0.31	0.34	0.37	0.40	0.43
80	0.14	0.17	0.21	0.24	0.28	0.31	0.35	0.38	0.42	0.45	0.49
95	0.15	0.19	0.23	0.27	0.31	0.35	0.39	0.43	0.46	0.50	0.54
125	0.19	0.24	0.28	0.33	0.37	0.42	0.47	0.51	0.56	0.60	0.65
155	0.23	0.28	0.33	0.39	0.44	0.49	0.55	0.60	0.65	0.70	0.76

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 0.5										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	35.58	35.61	35.63	35.66	35.68	35.70	35.73	35.75	35.78	35.80	35.83
50	50.60	50.63	50.66	50.68	50.71	50.74	50.77	50.80	50.82	50.85	50.88
65	65.62	65.65	65.68	65.71	65.74	65.78	65.81	65.84	65.87	65.90	65.93
80	80.64	80.67	80.71	80.74	80.78	80.81	80.85	80.88	80.92	80.95	80.99
95	95.65	95.69	95.73	95.77	95.81	95.85	95.89	95.93	95.96	96.00	96.04
125	125.69	125.74	125.78	125.83	125.87	125.92	125.97	126.01	126.06	126.10	126.15
155	155.73	155.78	155.83	155.89	155.94	155.99	156.05	156.10	156.15	156.20	156.26

Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 1										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	36.08	36.11	36.13	36.16	36.18	36.20	36.23	36.25	36.28	36.30	36.33
50	51.10	51.13	51.16	51.18	51.21	51.24	51.27	51.30	51.32	51.35	51.38
65	66.12	66.15	66.18	66.21	66.24	66.28	66.31	66.34	66.37	66.40	66.43
80	81.14	81.17	81.21	81.24	81.28	81.31	81.35	81.38	81.42	81.45	81.49
95	96.15	96.19	96.23	96.27	96.31	96.35	96.39	96.43	96.46	96.50	96.54
125	126.19	126.24	126.28	126.33	126.37	126.42	126.47	126.51	126.56	126.60	126.65
155	156.23	156.28	156.33	156.39	156.44	156.49	156.55	156.60	156.65	156.70	156.76

Tab. C - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL - 1										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	34.08	34.11	34.13	34.16	34.18	34.20	34.23	34.25	34.28	34.30	34.33
50	49.10	49.13	49.16	49.18	49.21	49.24	49.27	49.30	49.32	49.35	49.38
65	64.12	64.15	64.18	64.21	64.24	64.28	64.31	64.34	64.37	64.40	64.43
80	79.14	79.17	79.21	79.24	79.28	79.31	79.35	79.38	79.42	79.45	79.49
95	94.15	94.19	94.23	94.27	94.31	94.35	94.39	94.43	94.46	94.50	94.54
125	124.19	124.24	124.28	124.33	124.37	124.42	124.47	124.51	124.56	124.60	124.65
155	154.23	154.28	154.33	154.39	154.44	154.49	154.55	154.60	154.65	154.70	154.76

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Tab. D - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	35.08	35.11	35.13	35.16	35.18	35.20	35.23	35.25	35.28	35.30	35.33
50	50.10	50.13	50.16	50.18	50.21	50.24	50.27	50.30	50.32	50.35	50.38
65	65.12	65.15	65.18	65.21	65.24	65.28	65.31	65.34	65.37	65.40	65.43
80	80.14	80.17	80.21	80.24	80.28	80.31	80.35	80.38	80.42	80.45	80.49
95	95.15	95.19	95.23	95.27	95.31	95.35	95.39	95.43	95.46	95.50	95.54
125	125.19	125.24	125.28	125.33	125.37	125.42	125.47	125.51	125.56	125.60	125.65
155	155.23	155.28	155.33	155.39	155.44	155.49	155.55	155.60	155.65	155.70	155.76

Tab. E - "Seat L" Calculation

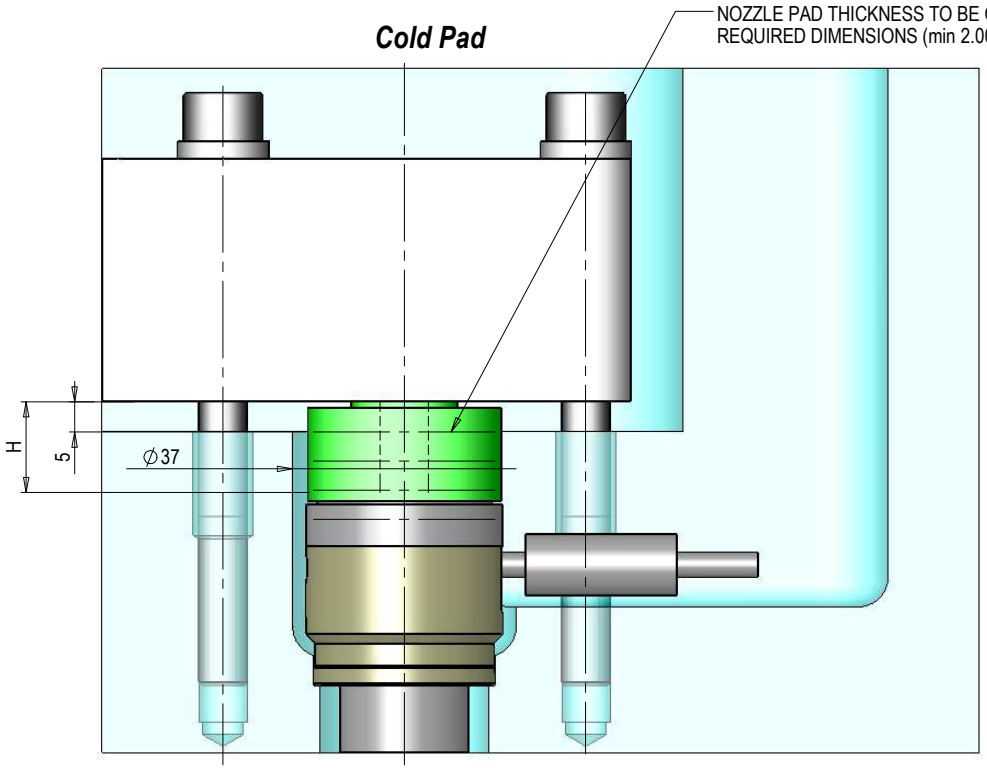
L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL - 1.5										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	33.58	33.61	33.63	33.66	33.68	33.70	33.73	33.75	33.78	33.80	33.83
50	48.60	48.63	48.66	48.68	48.71	48.74	48.77	48.80	48.82	48.85	48.88
65	63.62	63.65	63.68	63.71	63.74	63.78	63.81	63.84	63.87	63.90	63.93
80	78.64	78.67	78.71	78.74	78.78	78.81	78.85	78.88	78.92	78.95	78.99
95	93.65	93.69	93.73	93.77	93.81	93.85	93.89	93.93	93.96	94.00	94.04
125	123.69	123.74	123.78	123.83	123.87	123.92	123.97	124.01	124.06	124.10	124.15
155	153.73	153.78	153.83	153.89	153.94	153.99	154.05	154.10	154.15	154.20	154.26

Tab. F - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	= L + DL + 1.5										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	36.58	36.61	36.63	36.66	36.68	36.70	36.73	36.75	36.78	36.80	36.83
50	51.60	51.63	51.66	51.68	51.71	51.74	51.77	51.80	51.82	51.85	51.88
65	66.62	66.65	66.68	66.71	66.74	66.78	66.81	66.84	66.87	66.90	66.93
80	81.64	81.67	81.71	81.74	81.78	81.81	81.85	81.88	81.92	81.95	81.99
95	96.65	96.69	96.73	96.77	96.81	96.85	96.89	96.93	96.96	97.00	97.04
125	126.69	126.74	126.78	126.83	126.87	126.92	126.97	127.01	127.06	127.10	127.15
155	156.73	156.78	156.83	156.89	156.94	156.99	157.05	157.10	157.15	157.20	157.26

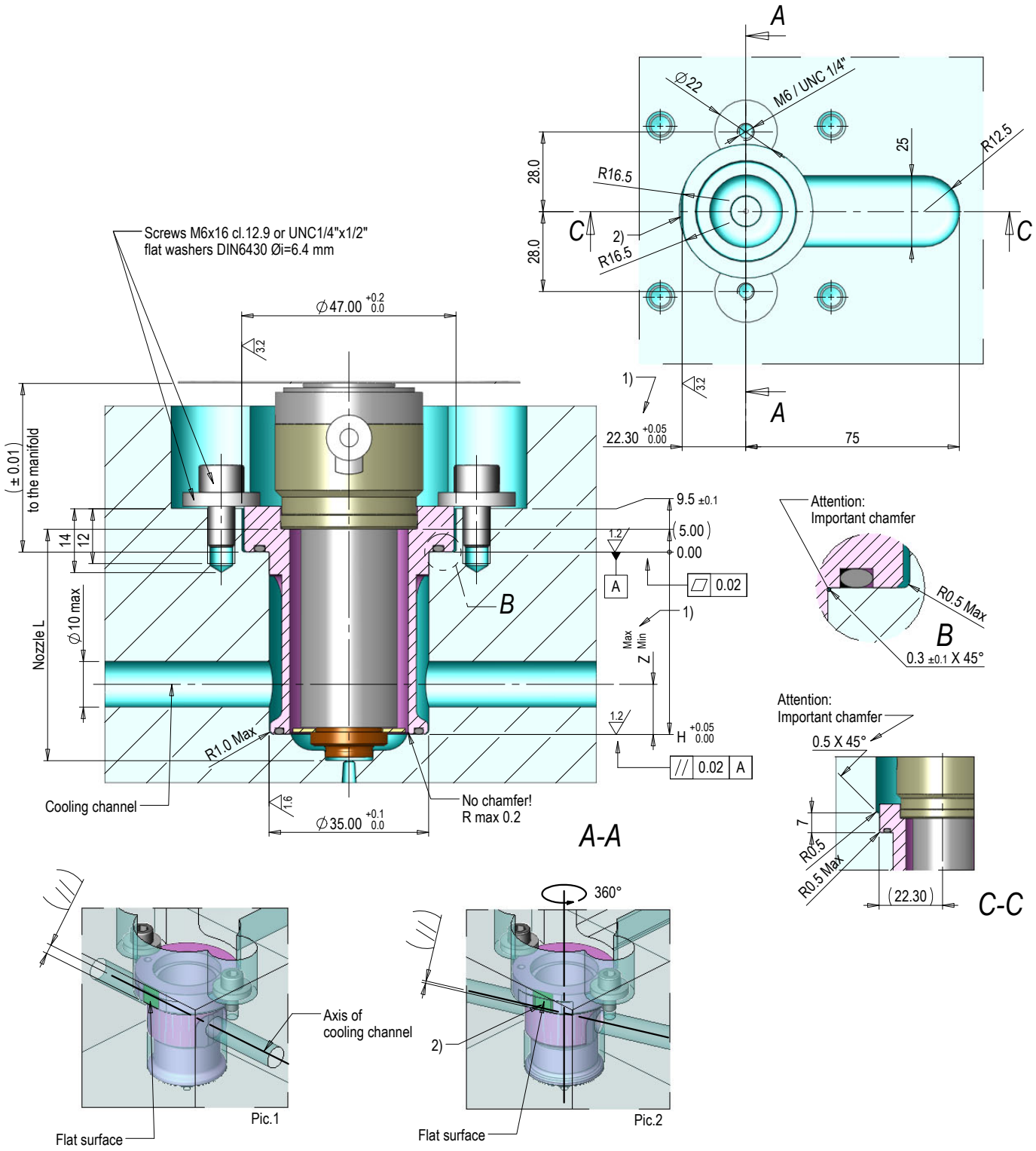
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NOZZLE PAD



H standard	CODE
5.00	0010-001326
10.00	0010-001327
15.00	0010-001328

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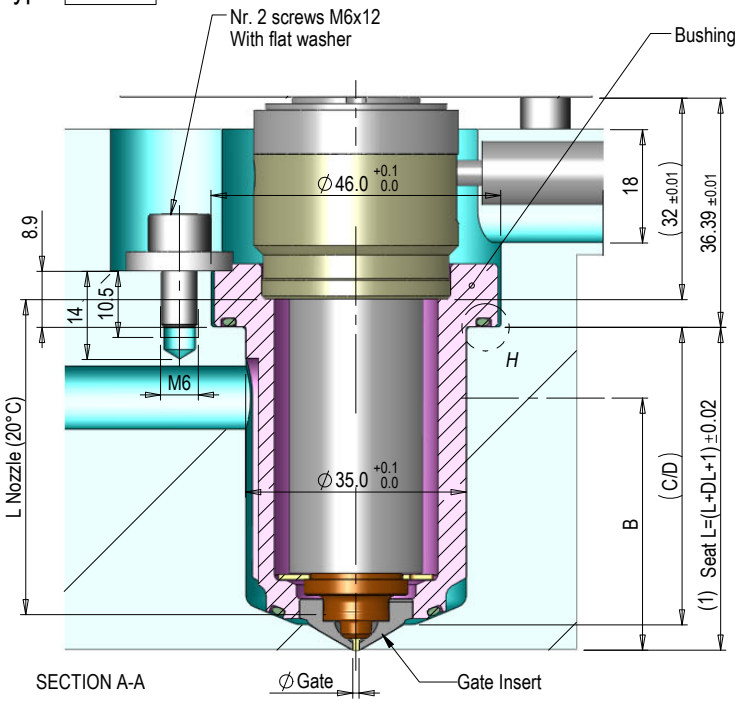


1) Attention: for cooling channels drilled with "Z Max" > 16 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
2) For all cases with "Z Max" > 16, then the positioning face can be located at any angle around the axis of the bushing and with respect to the fixing screws, in order to correctly intercept the customer cooling channels (Fig.2). For more details, please contact the Oerlikon HRSflow technical department.

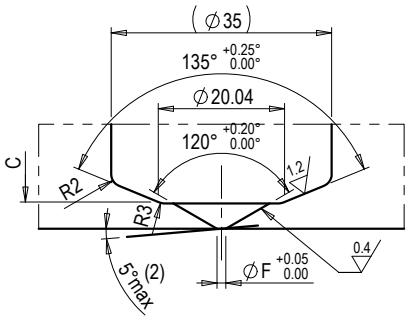
BUSHING CODE	*NOZZLE L*	*H*	Z	Z Min	Z Max	*BUSHING CODE*	*NOZZLE L*	*H*	Z	Z Min	Z Max
0121-00463	35	25.00	10	7	10.5	0121-00467	95	85.00	11	7	70.5
0121-00464	50	40.00	11	7	25.5	0121-00468	125	115.00	11	7	100.5
0121-00465	65	55.00	11	7	40.5	0121-00469	155	145.00	11	7	103
0121-00466	80	70.00	11	7	55.5						

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Type **PGY30**

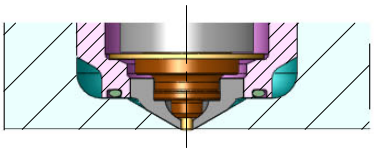


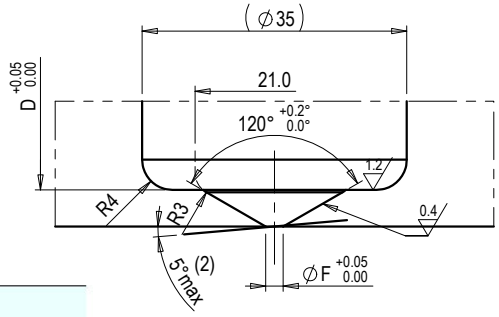
Standard Seat

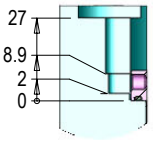


(2) Max angle allowed to the normal to the surface is 5°.
Should gates be placed on cosmetic surfaces/portions, the max angle allowed is 3° instead.
In case of any questions, please contact your technical reference within Oerlikon HRSflow.

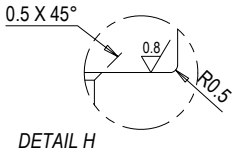
On plane OR Seat



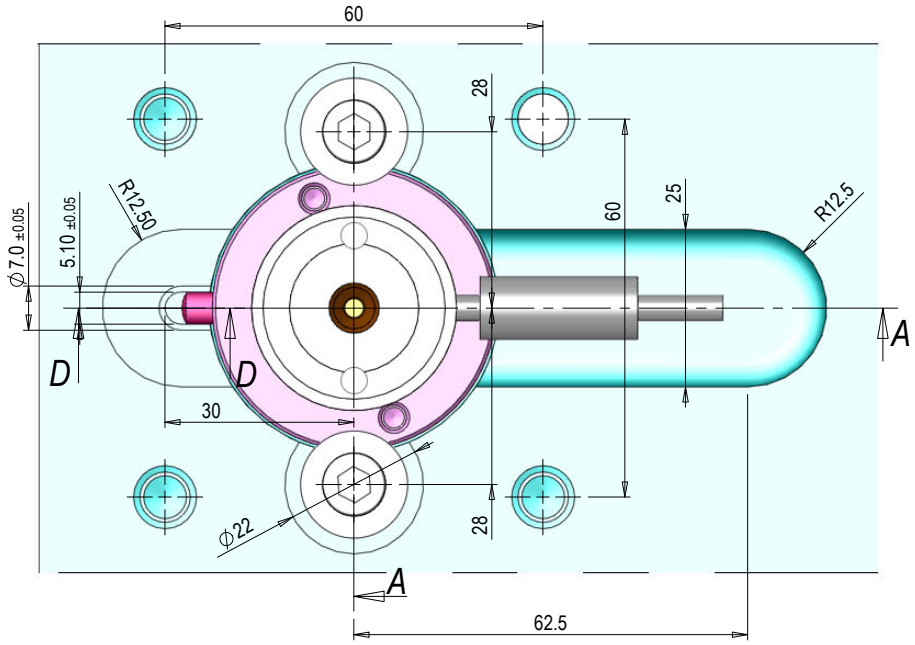




SECTION D-D



DETAIL H



GATE INSERT		
Code	**ØGate**	**ØF**
0335-00163	1.0	1.4
0335-00164	1.5	1.9
0335-00165	1.8	2.3
0335-00166	2.00	2.5

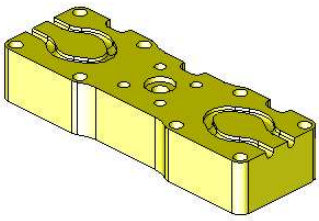
Installation KIT cod: 0283-00647

(1) For "Seat L" calculation see pag. 4.P1.09b table B

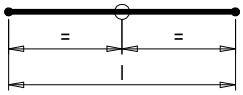
BUSHING CODE		NOZZLE L	C	D	B		BUSHING CODE		NOZZLE L	C	D	B	
STANDARD	ON PLANE OR				min	max	STANDARD	ON PLANE OR				min	max
0121-00411	0121-00418	35	31.97	31.35	15	25	0121-00417	0121-00424	155	152.26	151.64	15	110
0121-00412	0121-00419	50	47.01	46.39	15	40							
0121-00413	0121-00420	65	62.05	61.43	15	55							
0121-00414	0121-00421	80	77.08	76.46	15	70							
0121-00415	0121-00422	95	92.12	91.50	15	85							
0121-00416	0121-00423	125	122.19	121.57	15	110							

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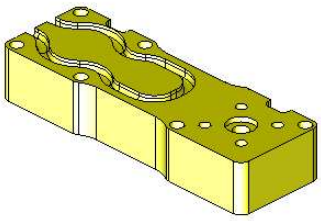
-HL-



Standard
l=150-200-250-300-350-400-450 mm



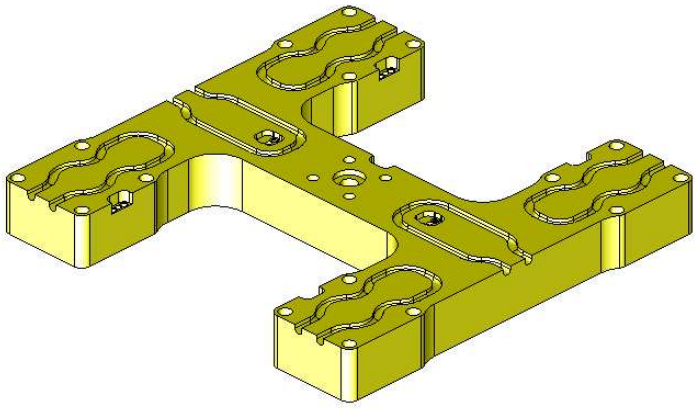
-HD-

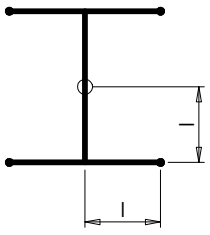


Standard
l=75-100-125-150-175-200-225 mm



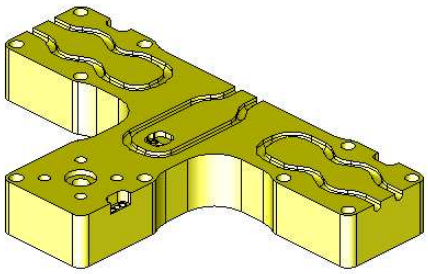
-HH-

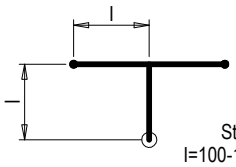




Standard
l=100-125-150 mm

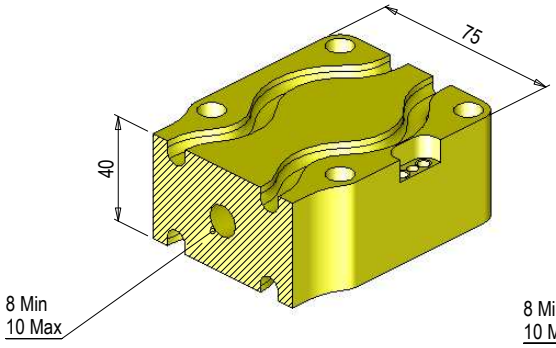
-HT-



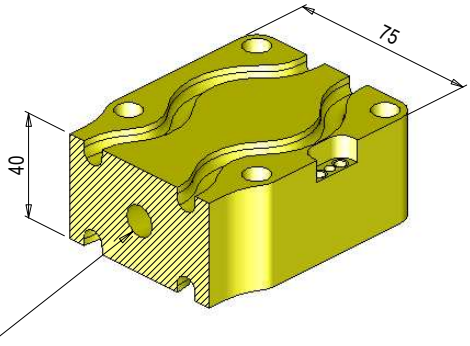


Standard
l=100-125-150 mm

P series



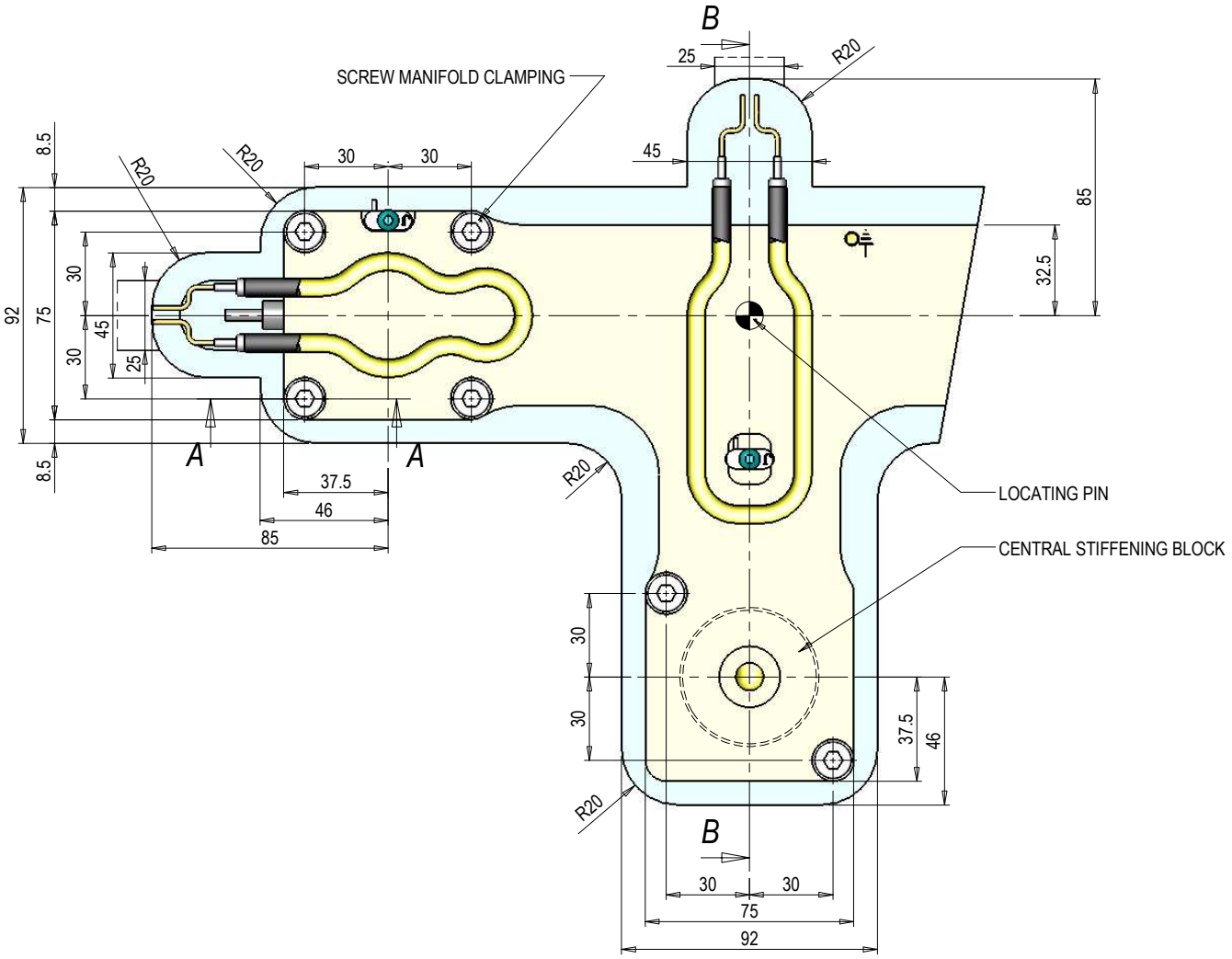
Q series



Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

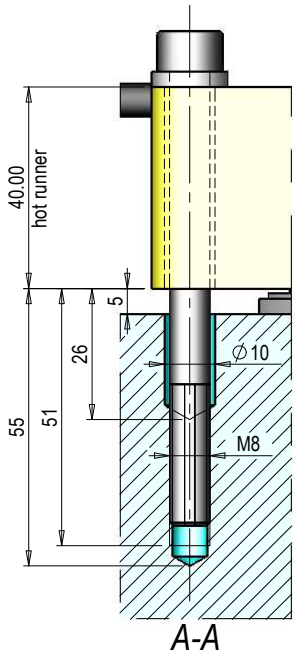
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The following profile is the typical one for
the standard not wired hot runner pocket
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)

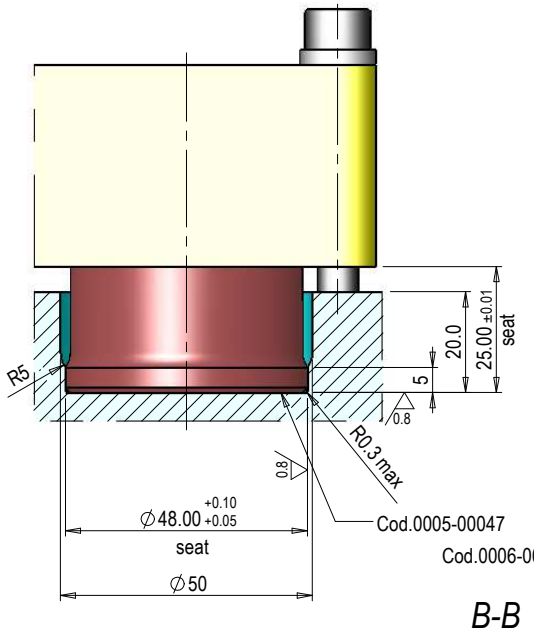


Screw manifold clamping

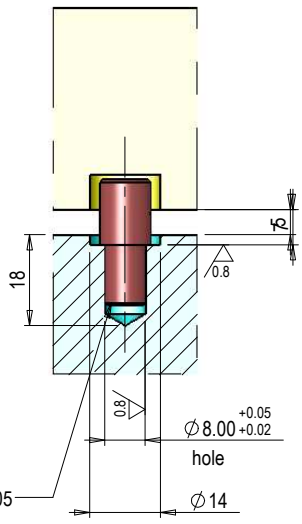
Screw M8x90 cl.12.9 30 Nm



Pocket central stiffening block

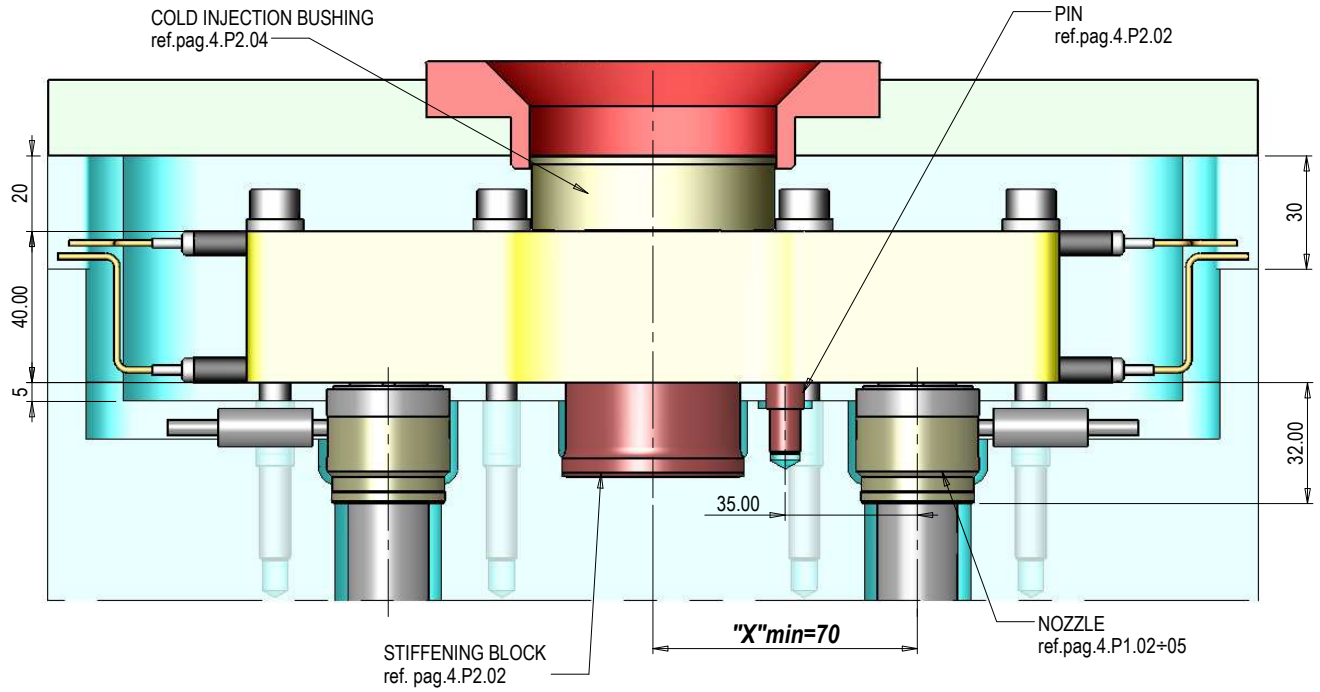


Pocket for locating pin



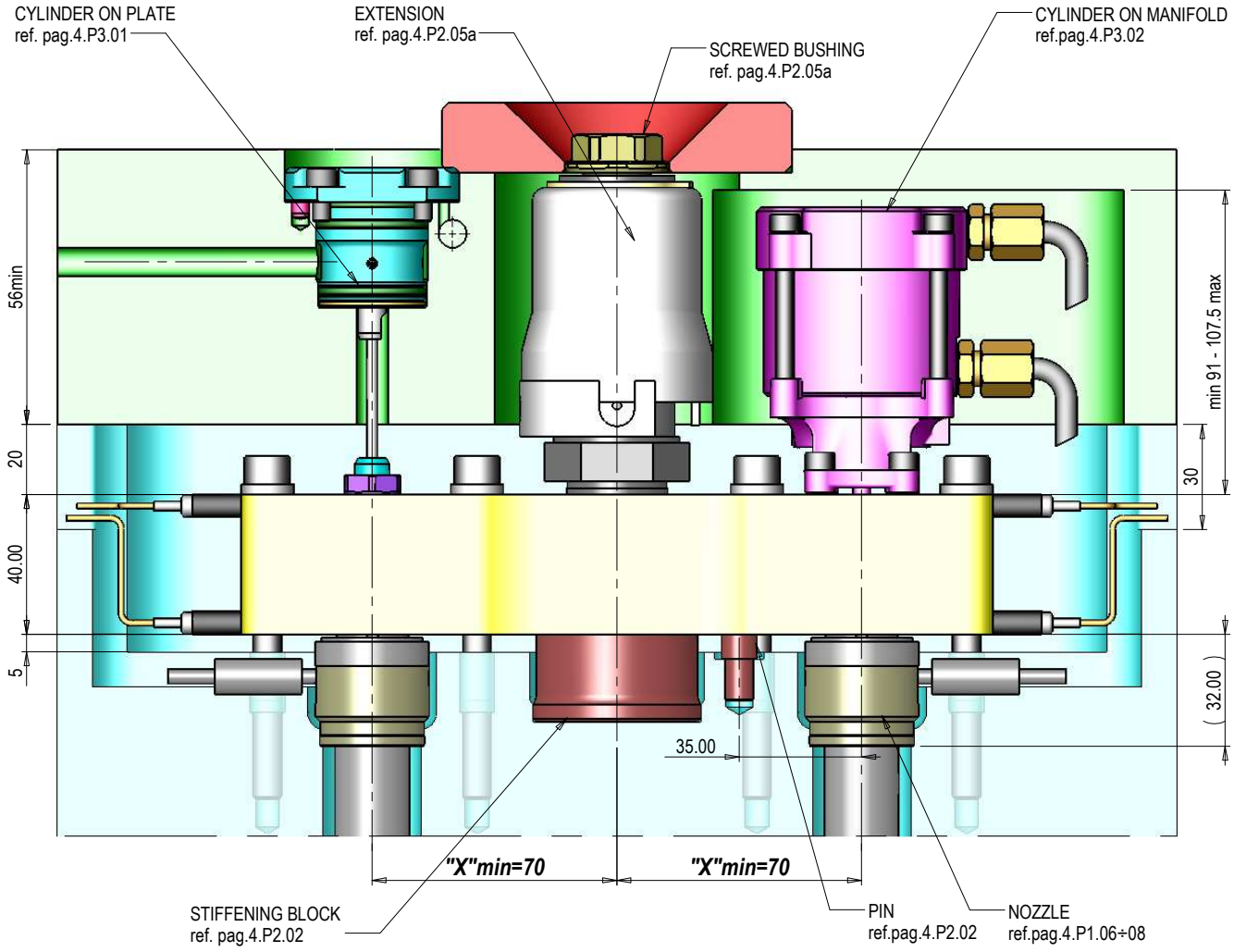
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Structure for TORPEDO or FREE FLOW systems

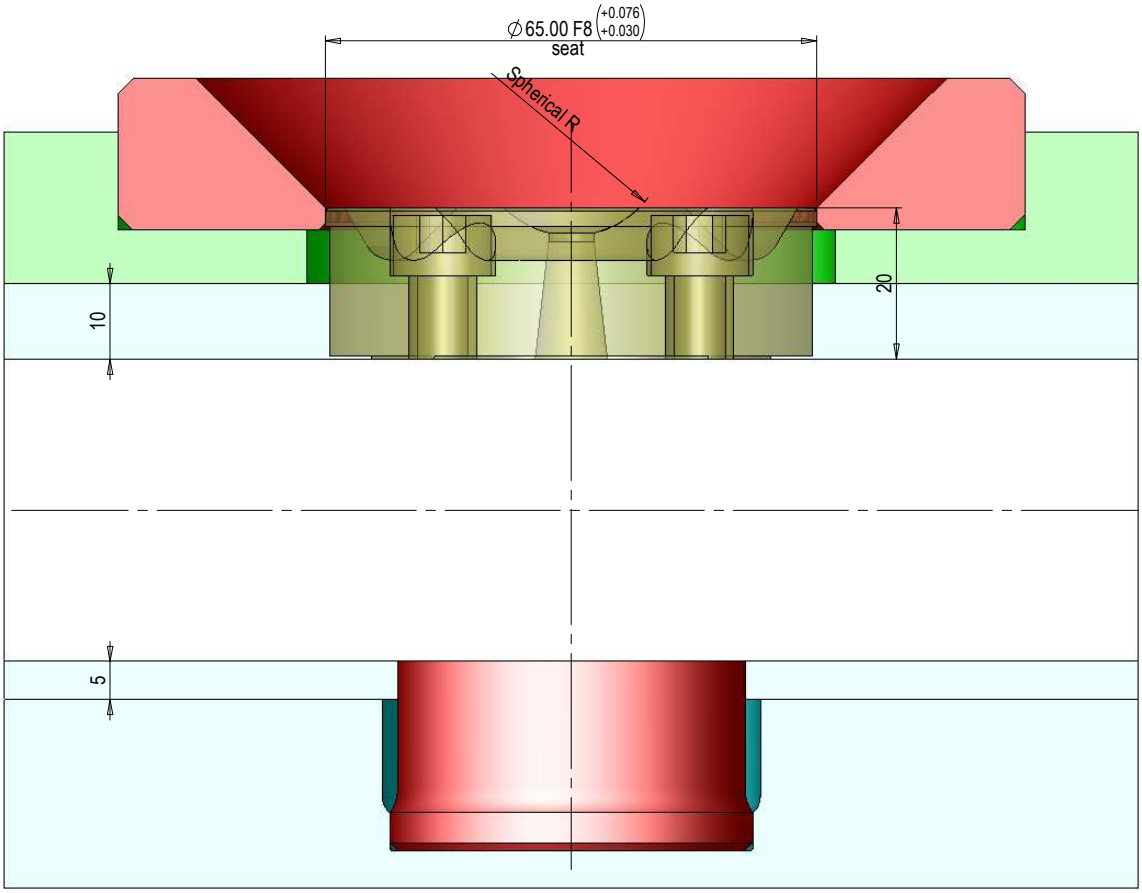


Xmin= min centre distance between injection bushing and nozzle for non standard systems

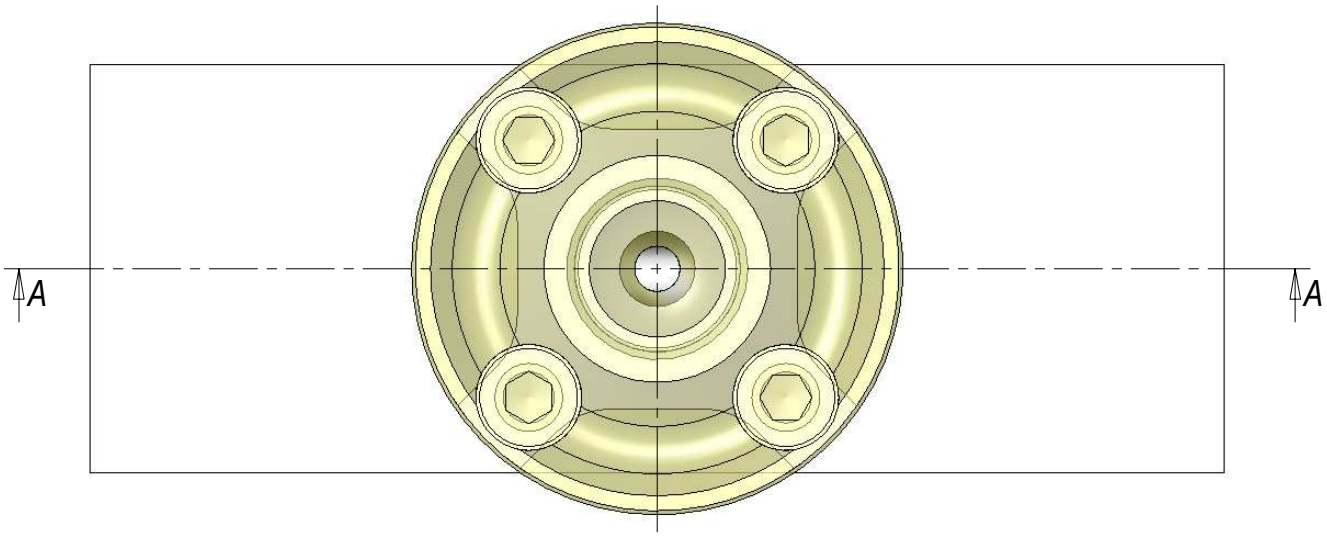
Structure for VALVE GATING systems



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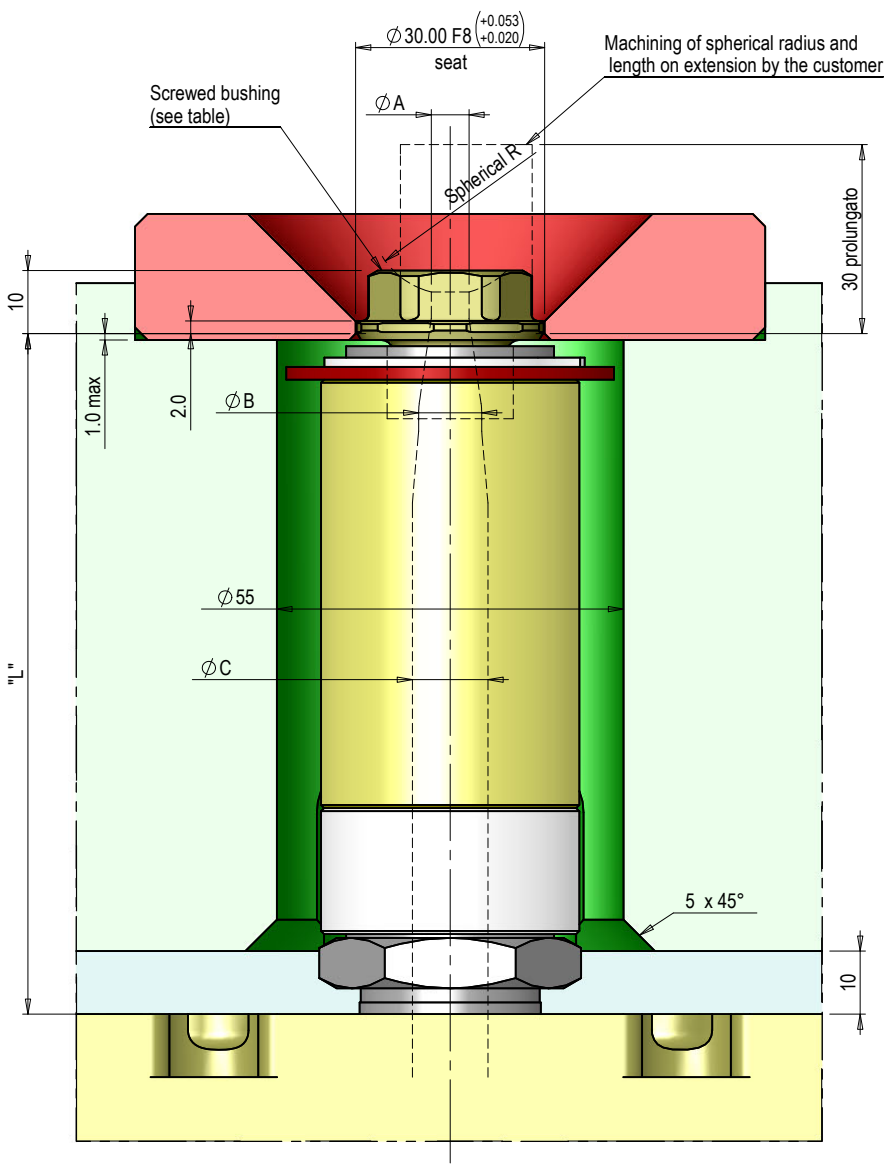
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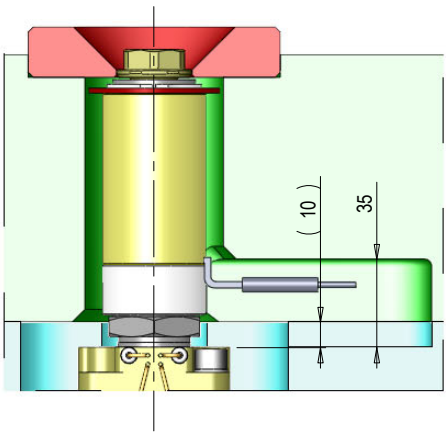


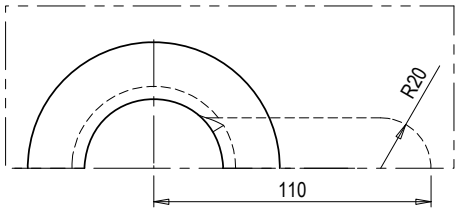
CODE	SPHERICAL R
0016-00165	R 0
0016-00166	R 12.7
0016-00167	R 15.5
0016-00168	R 19.1
0016-00169	R25
0016-00170	R 40

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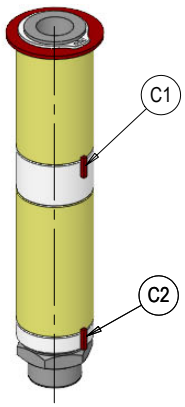
SCREWED EXTENSION -Pa-
application on -P- manifold series







Control Zones



"L" (*)	*MAXIMUN N° OF ZONES*
050.00 ÷ 204.89	1 [C1]
204.90 ÷ 305.09	2 [C1 + C2]

STANDARD DIAMETERS OF EXTENSIONS DUCT (**)	
ØB	**ØC**
8	10
10	12
	14

(*) L = min 050.00 ÷ 305.09 mm max

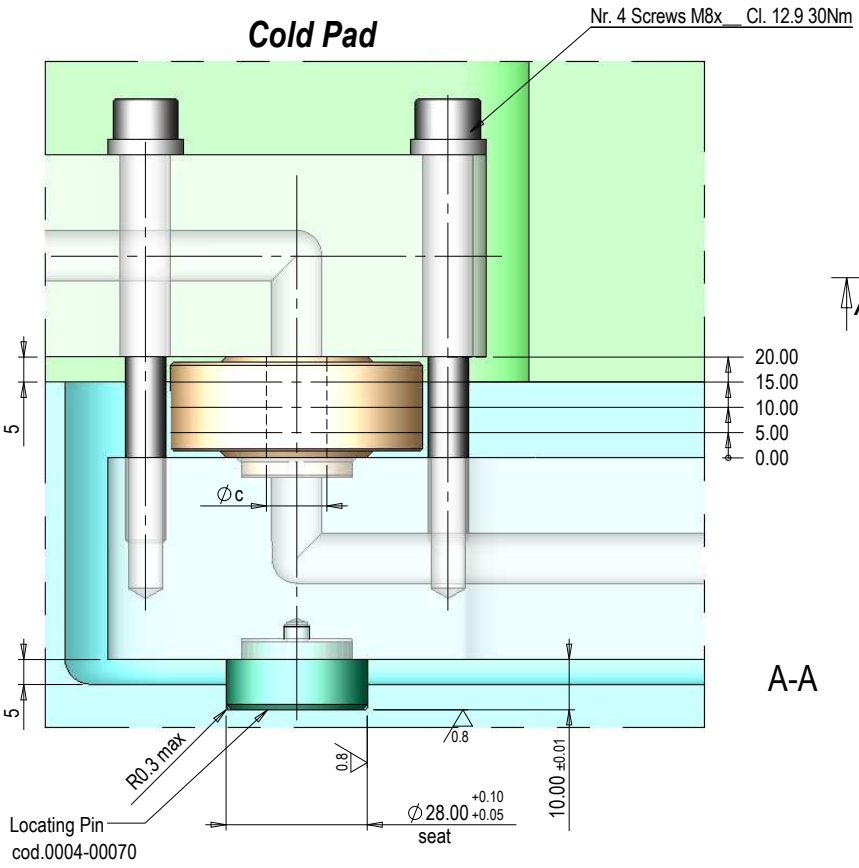
(**) Disponibili anche ØB=ØC=8,10 mm

SPHERE RADIUS	STANDARD SCREWED BUSHING CODE	
	ØA=6 | ØB=8	ØA=6 | ØB=10
Extension R0	0015-00439	0015-00405
R0	0015-00440	0015-00406
R 12.7	0015-00441	0015-00411
R 15.5	0015-00442	0015-00412
R 19.1	0015-00443	0015-00413
R 20	0015-00505	0015-00503
R 25	0015-00444	0015-00414
R40	0015-00445	0015-00415

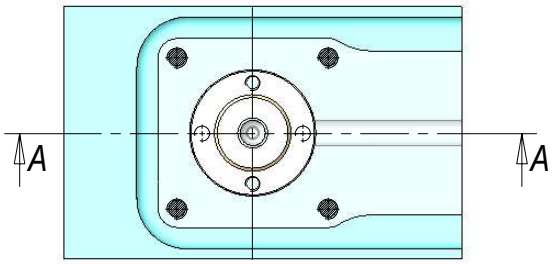
Index

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Cold Pad

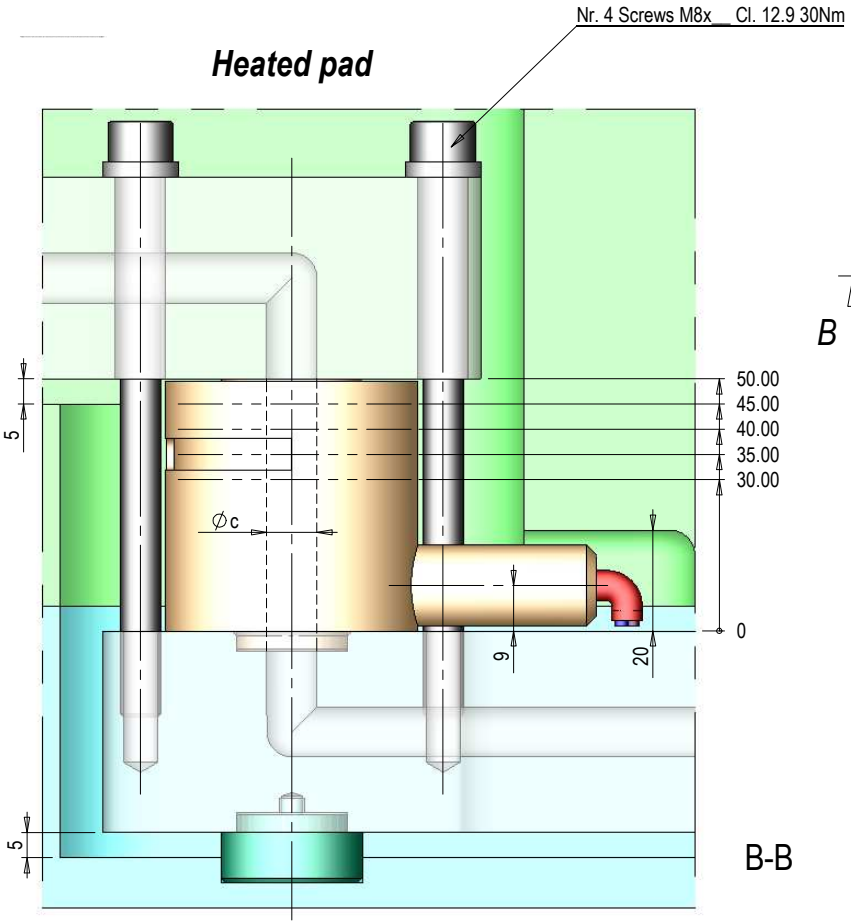


A-A

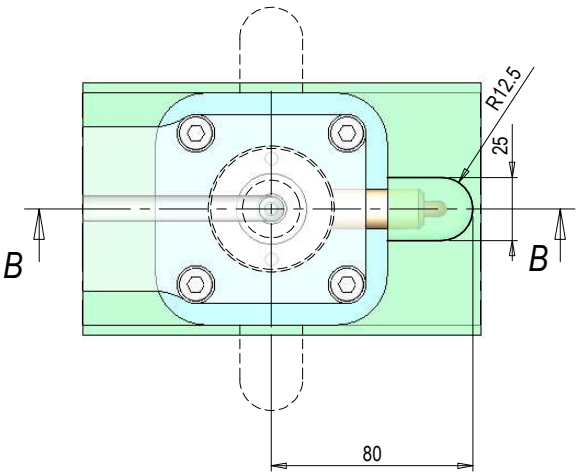


H Standard	Øc=8	Øc=10	Øc=12
5.00	0009-00379	0009-00383	0009-00387
10.00	0009-00380	0009-00384	0009-00388
15.00	0009-00381	0009-00385	0009-00389
20.00	0009-00382	0009-00386	0009-00390

Heated pad



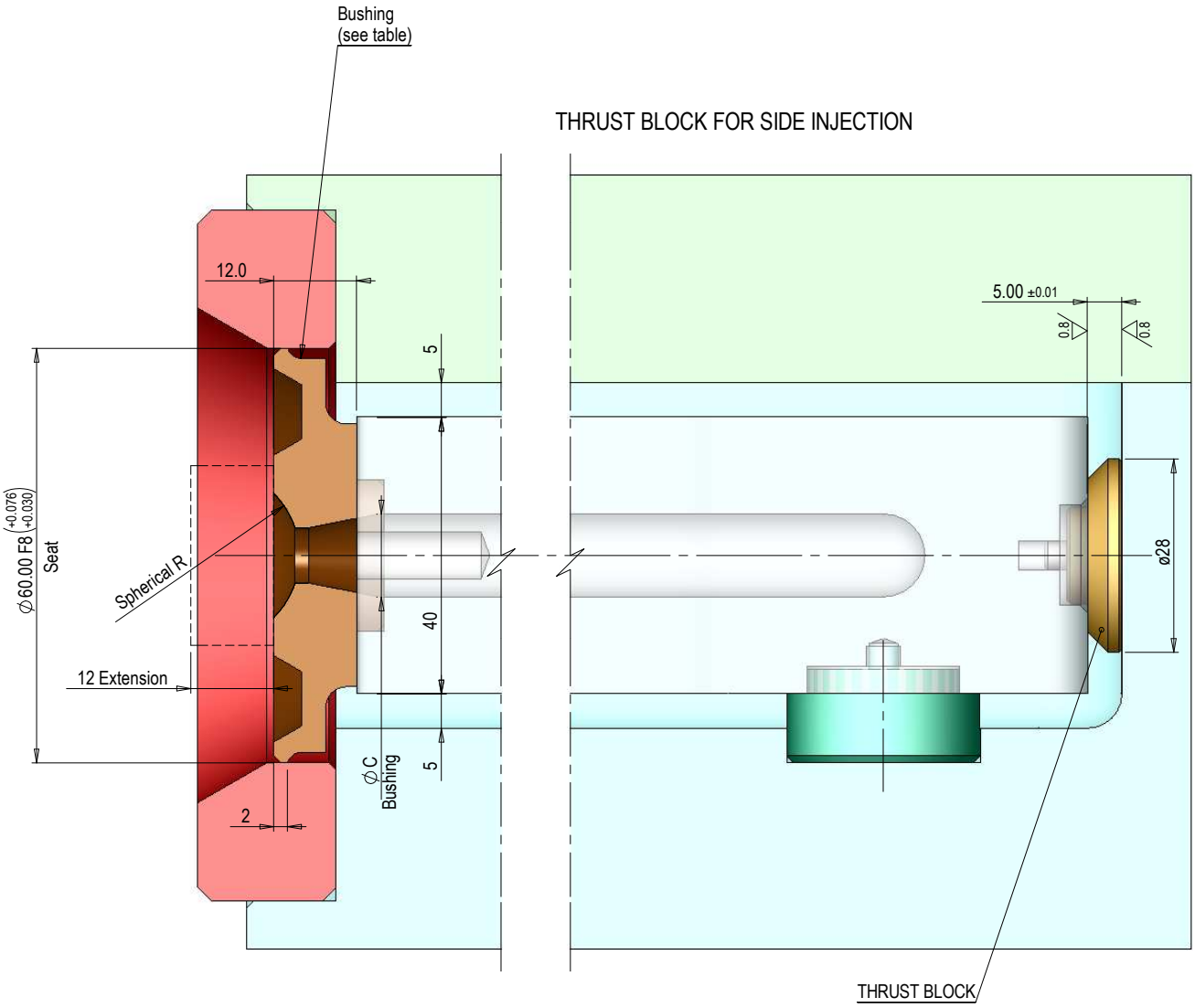
B-B



H Standard	Øc=8 [*]	Øc=12 [*]	W (230V)
30.00	0009-00441	0009-00446	2x210
35.00	0009-00442	0009-00447	2x210
40.00	0009-00443	0009-00448	2x360
45.00	0009-00444	0009-00449	2x360
50.00	0009-00445	0009-00450	2x360

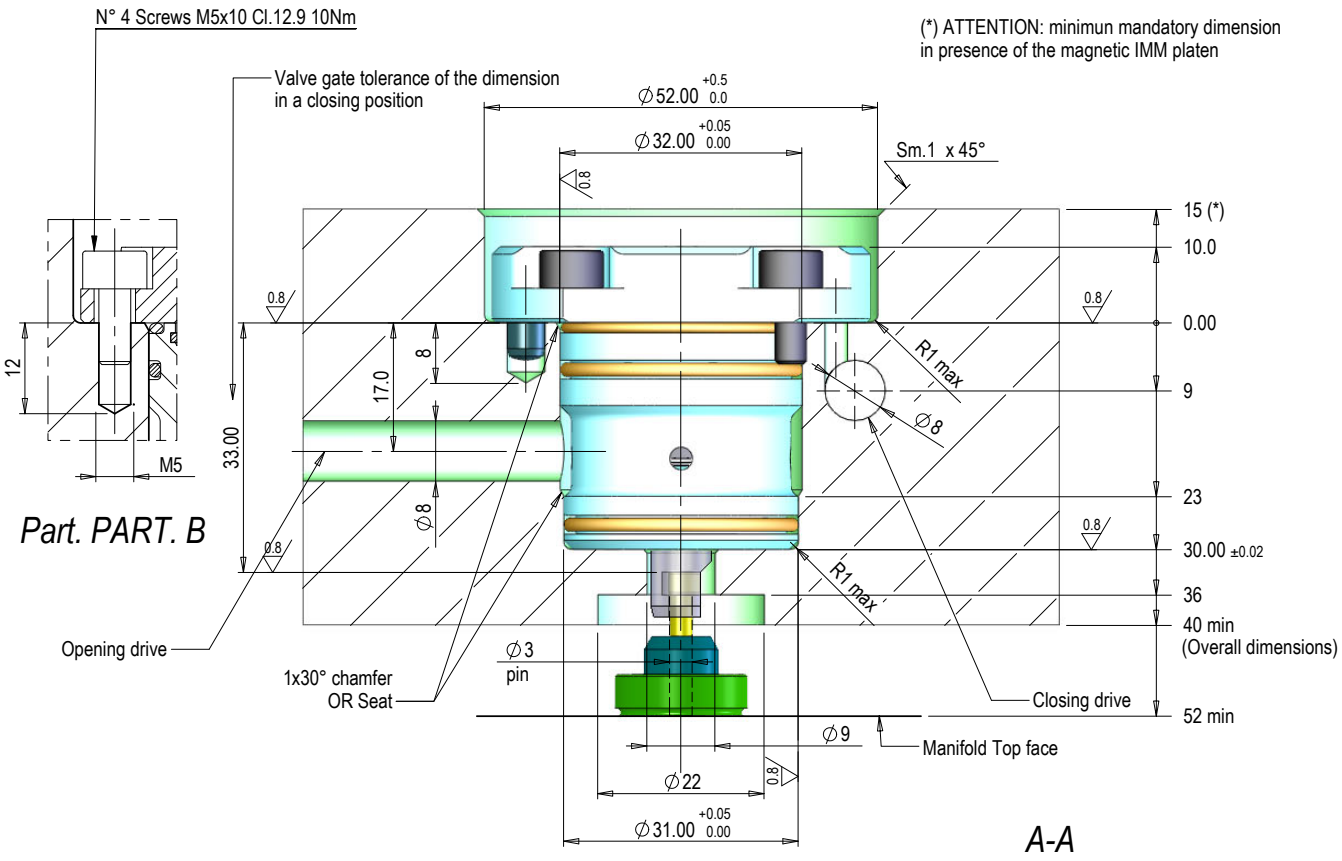
[*] Øc=10mm upon request

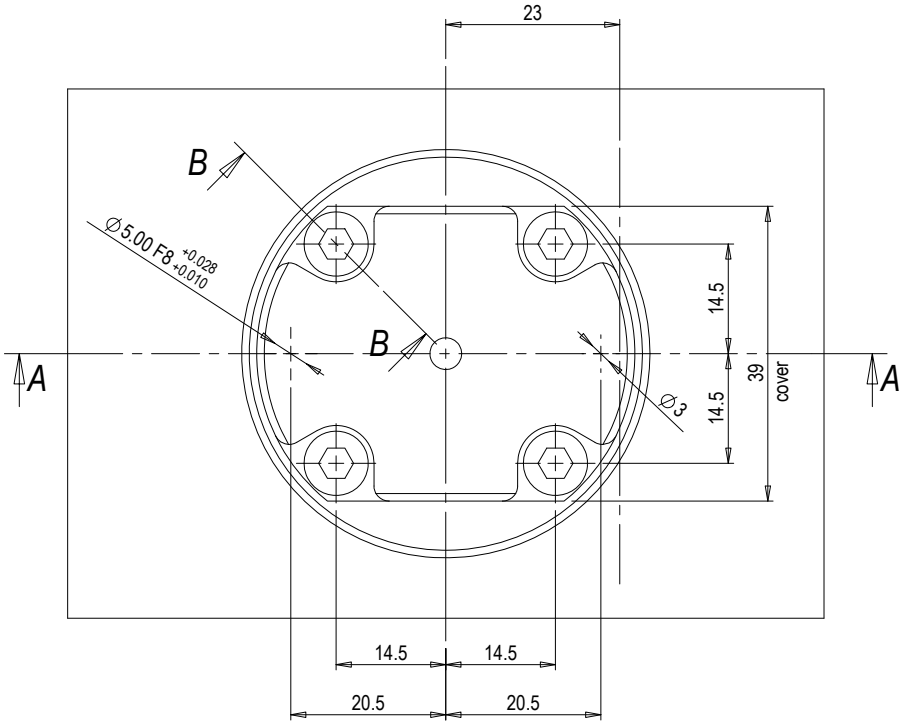
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THRUST BLOCK CODE	*BUSHING CODE*		*SPHERICAL RADIUS*
	Øc = 12	*Øc = 14*	
0007-00001	0016-00128	0016-00134	R 0
	0016-00129	0016-00135	R 12.7
	0016-00130	0016-00136	R 15.5
	0016-00131	0016-00137	R 19.1
	0016-00132	0016-00138	R 25
	0016-00133	0016-00139	R40
	0016-00144 Extension	0016-00145 Extension	R0

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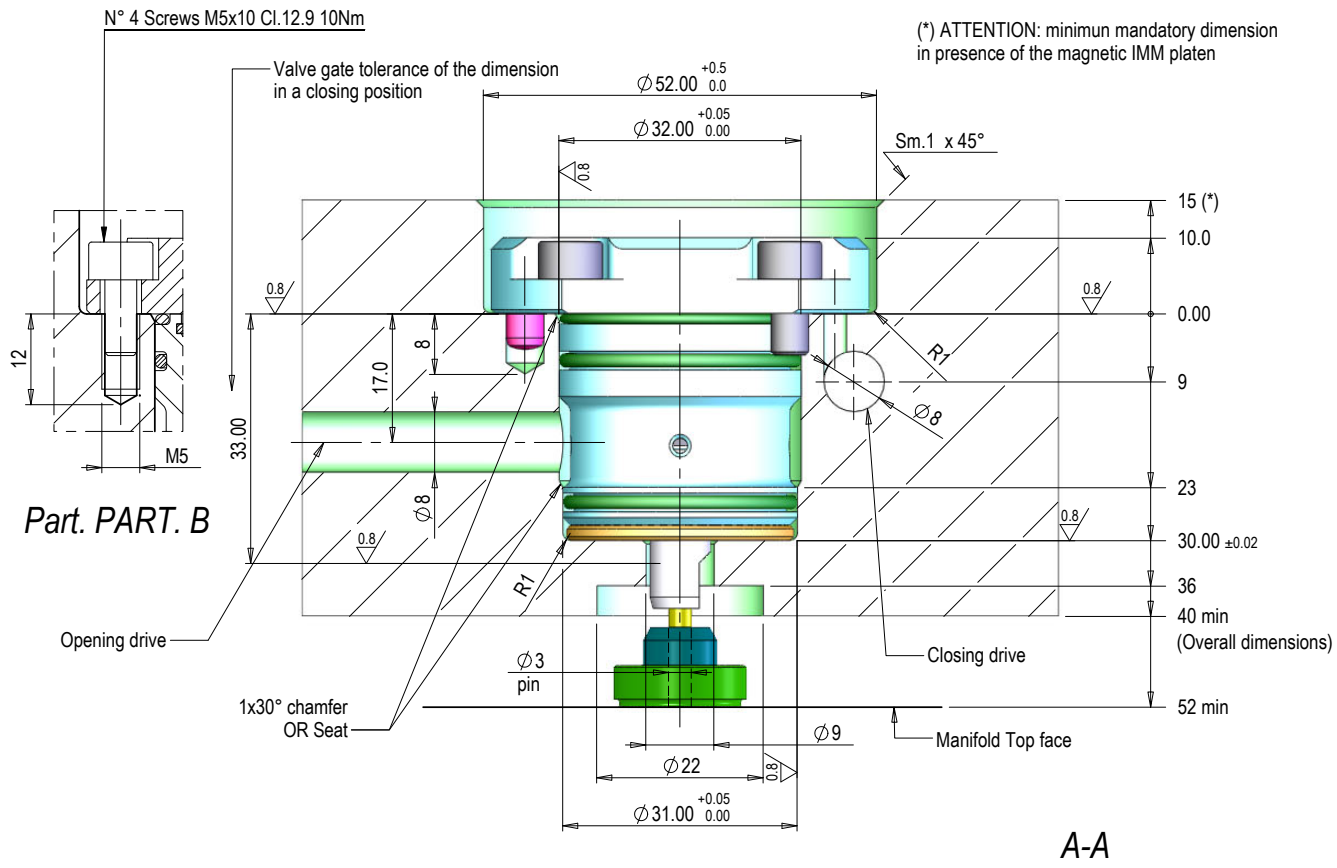


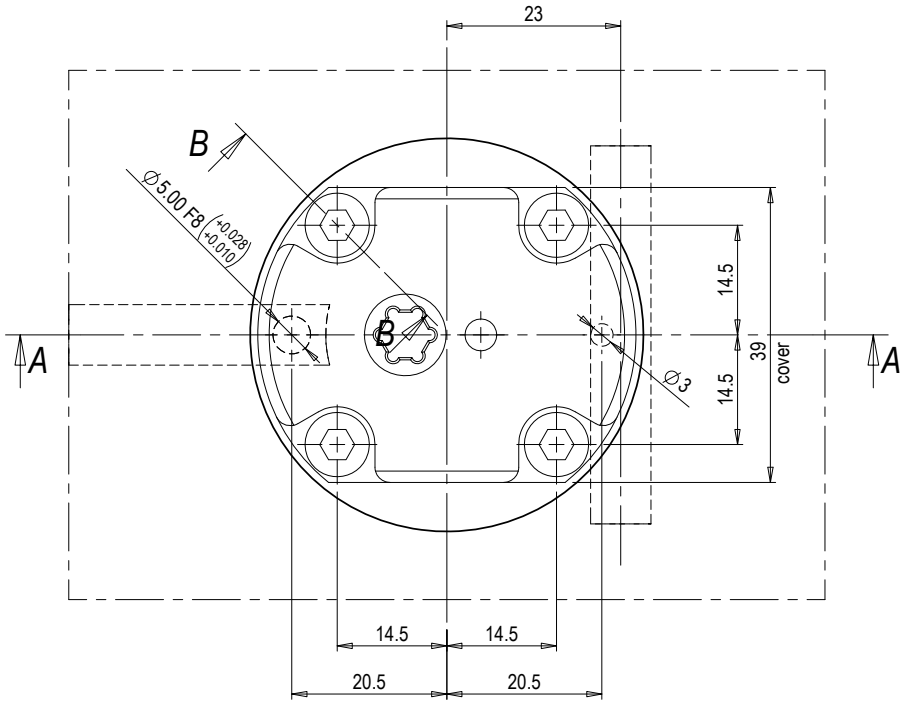
The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job

CODE	BORE	STROKE	WORKING		COMPLETE GASKET SET
0017-00006	24	7	AIR / OIL	$P_{min-max}$ = 6 - 80 BAR	0038-00068

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CYLINDER ON PLATE WITH VALVE PIN POSITIONED



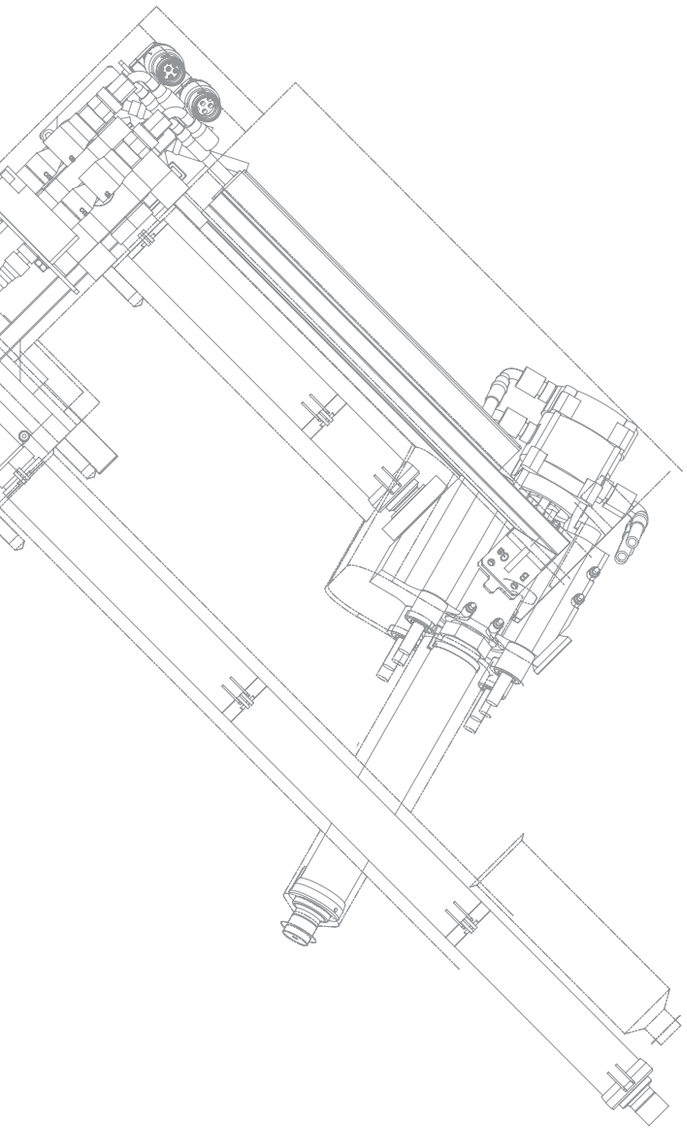


The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job

CODE	BORE	STROKE	WORKING		COMPLETE GASKET SET
0017-00106	24	7	AIR / OIL	$P_{min-max}$ = 6 - 80 BAR	0038-00069

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oerlikon
hrsflow



M

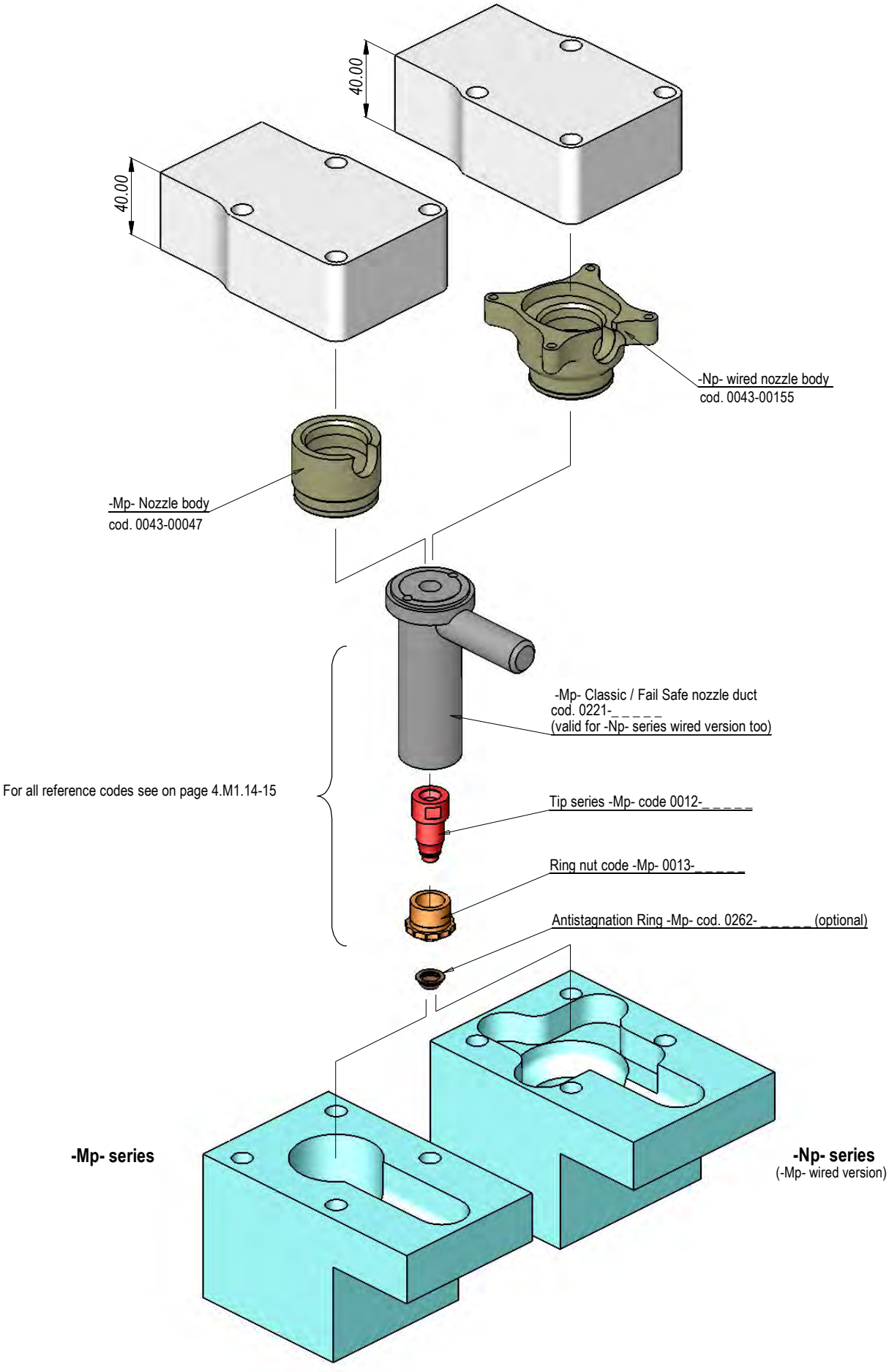
M Series 10÷265 cm³/s

Serie M
M Serie
M Série
M Serie
M Série

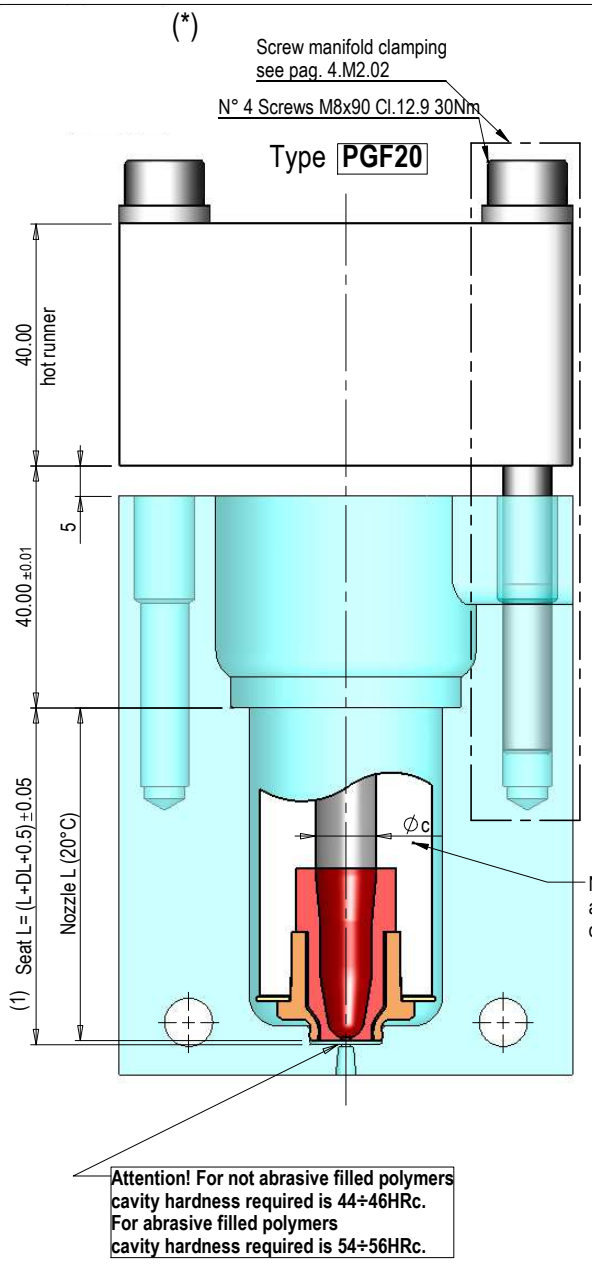
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EXPLODED NOZZLE COMPONENT

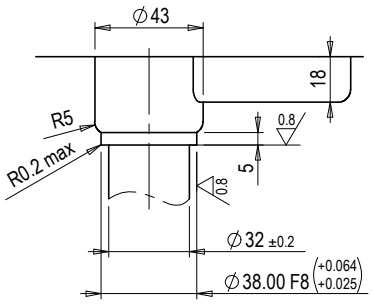


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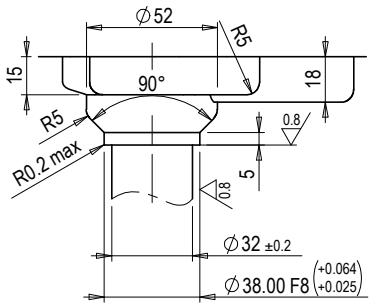


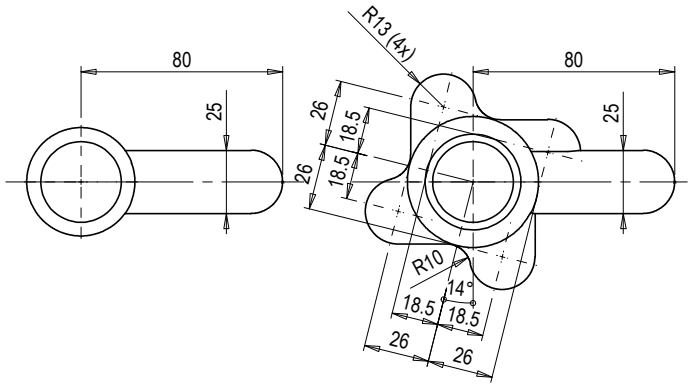
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

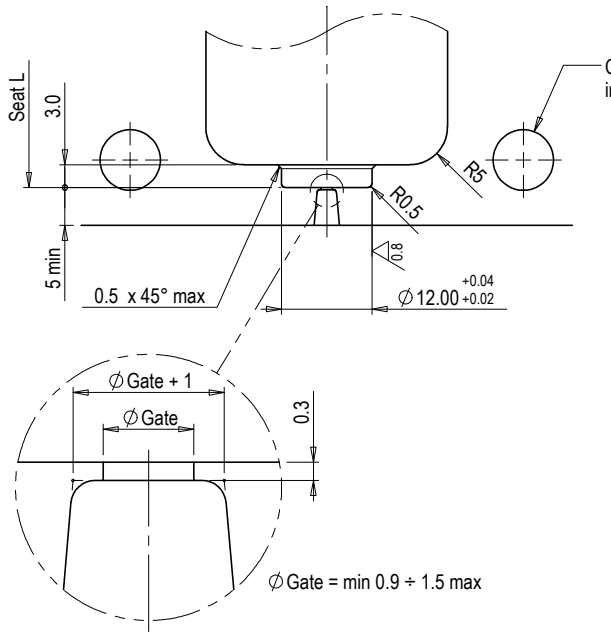
-Mp- series



-Np- series
(-Mp- wired version)



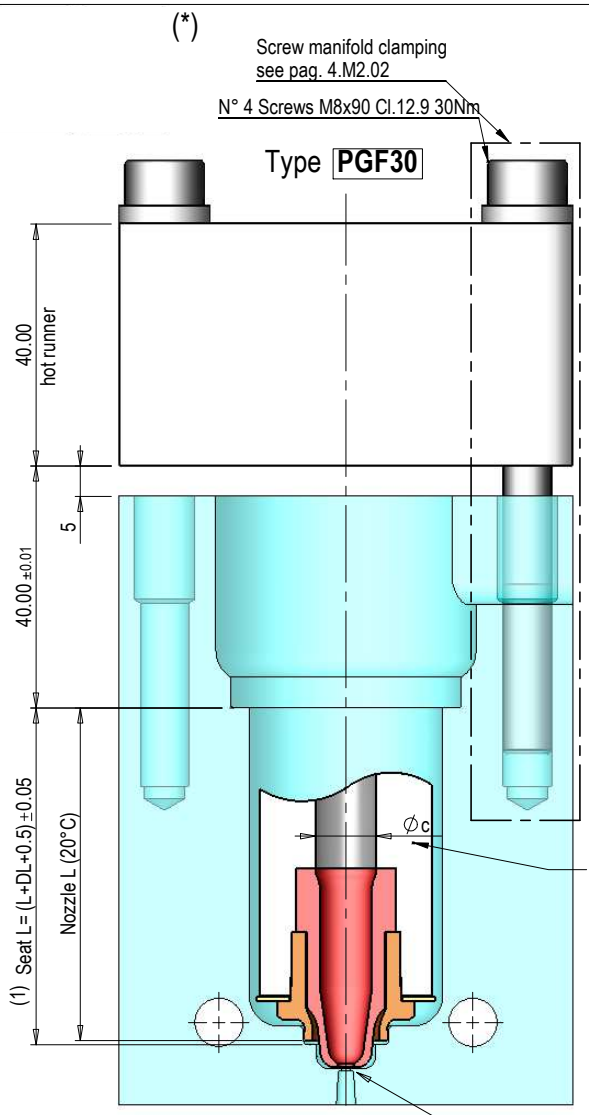




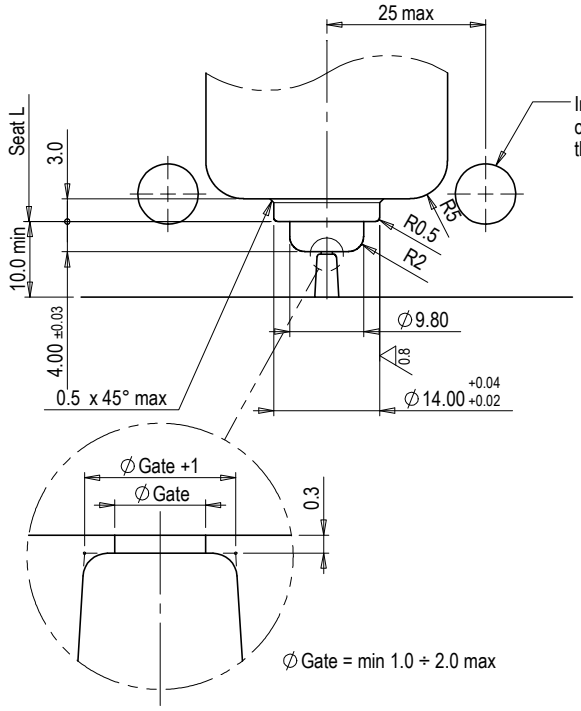
For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table A

NOZZLE L
35
55
75
95
115
135
155
195
235
275
315

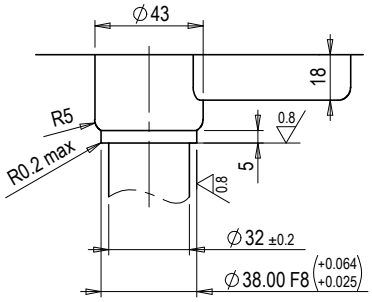
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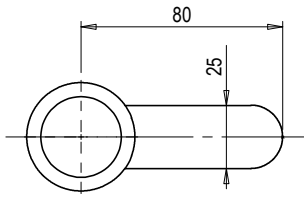


Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

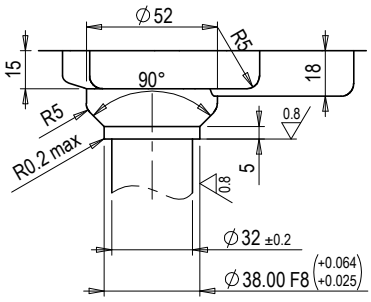


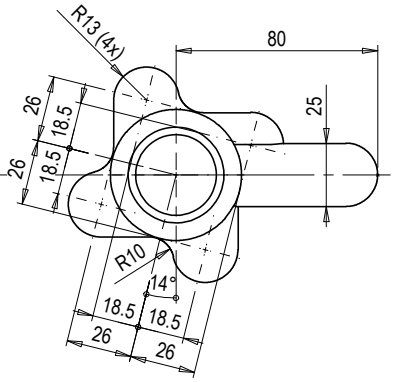
-Mp- series





-Np- series
(-Mp- wired version)



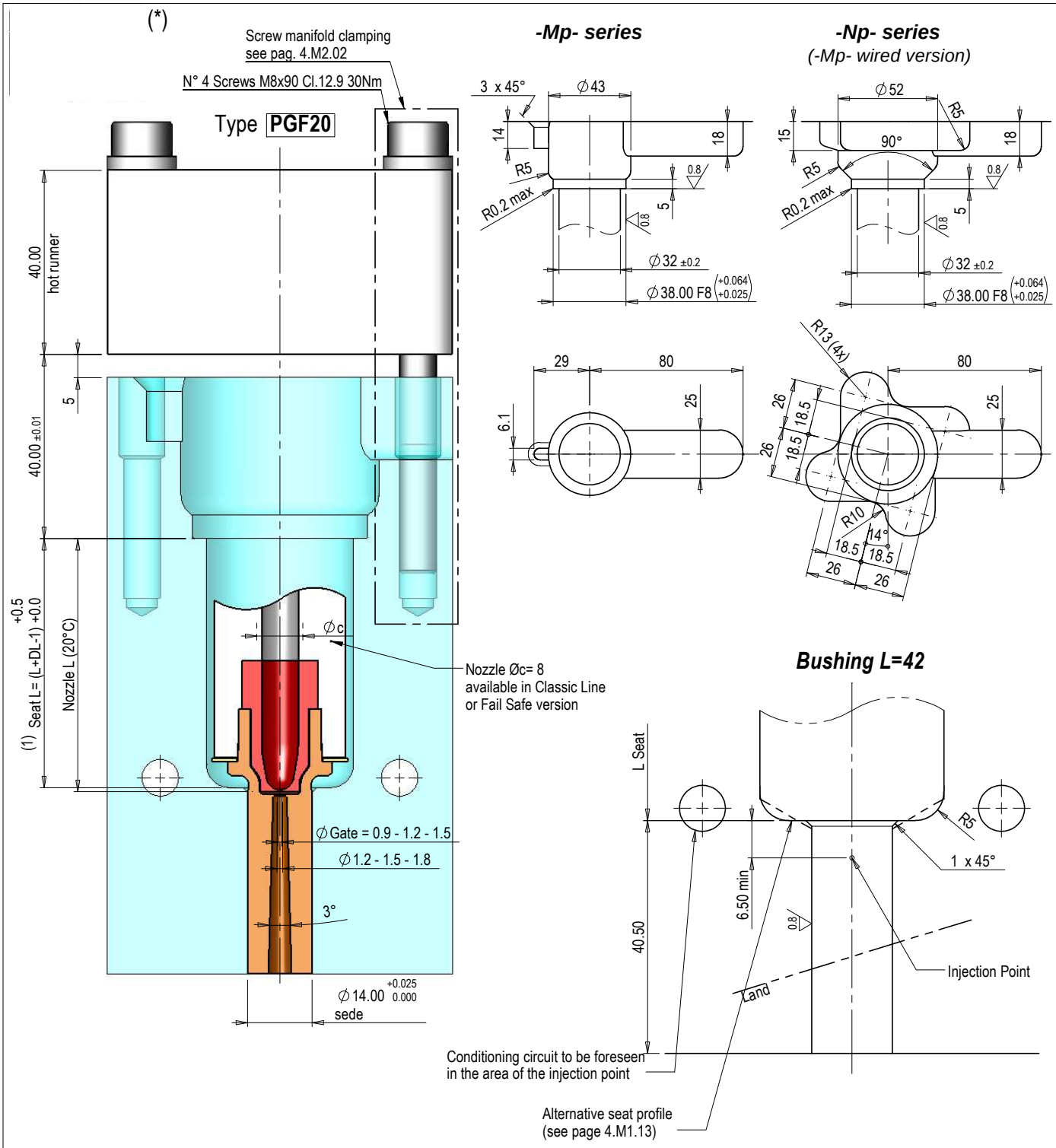


For all reference codes see on page 4.M1.14-15

(1) For "Seat L" calculation see pag. 4.M1.15b table A

NOZZLE L
35
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135
155
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235
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315

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For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table B

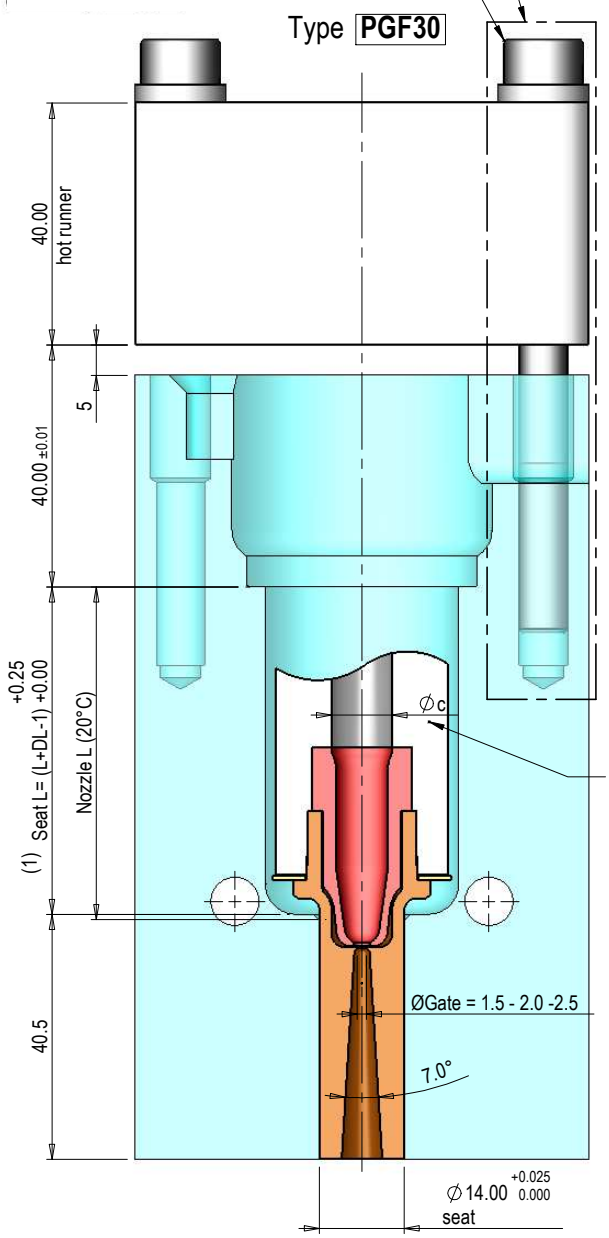
NOZZLE L
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(*) Screw manifold clamping see pag. 4.M2.02

N° 4 Screws M8x90 Cl.12.9 30Nm

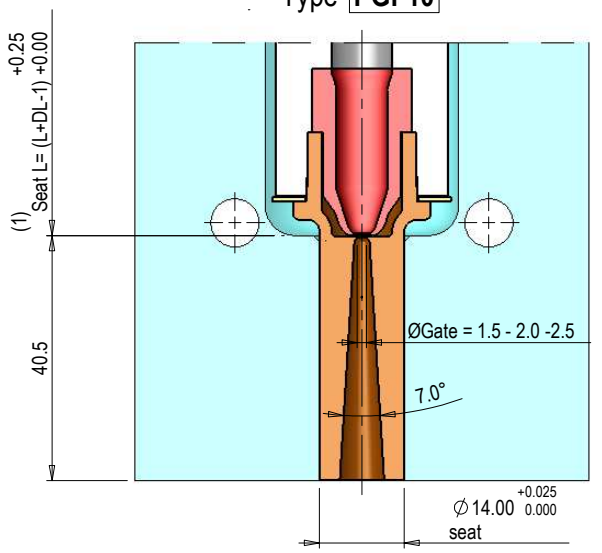
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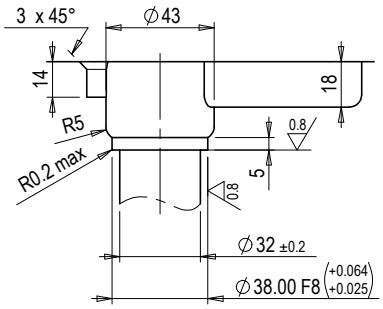
Nozzle Øc=10 - 12 - 14 available in Classic Line or Fail Safe version

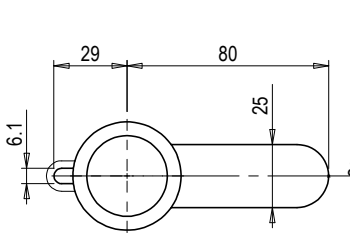
TYPE	A [mm]
PGF30	11.5
PGF10	10.3

Type **PGF10**

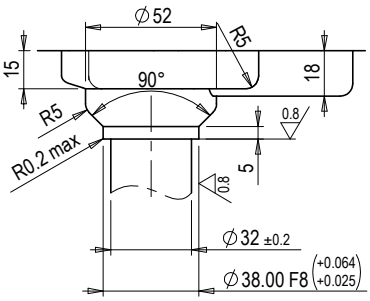


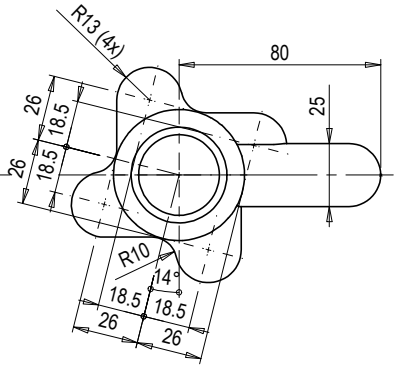
-Mp- series



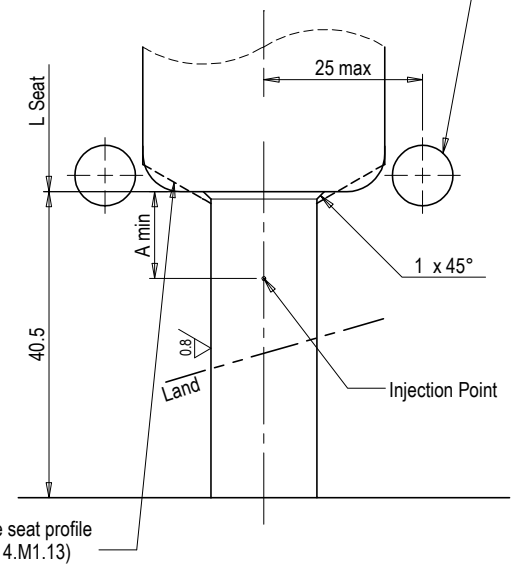


-Np- series
(-Mp- wired version)





Independent and dedicated cooling circuit to be foreseen in the area of the injection point



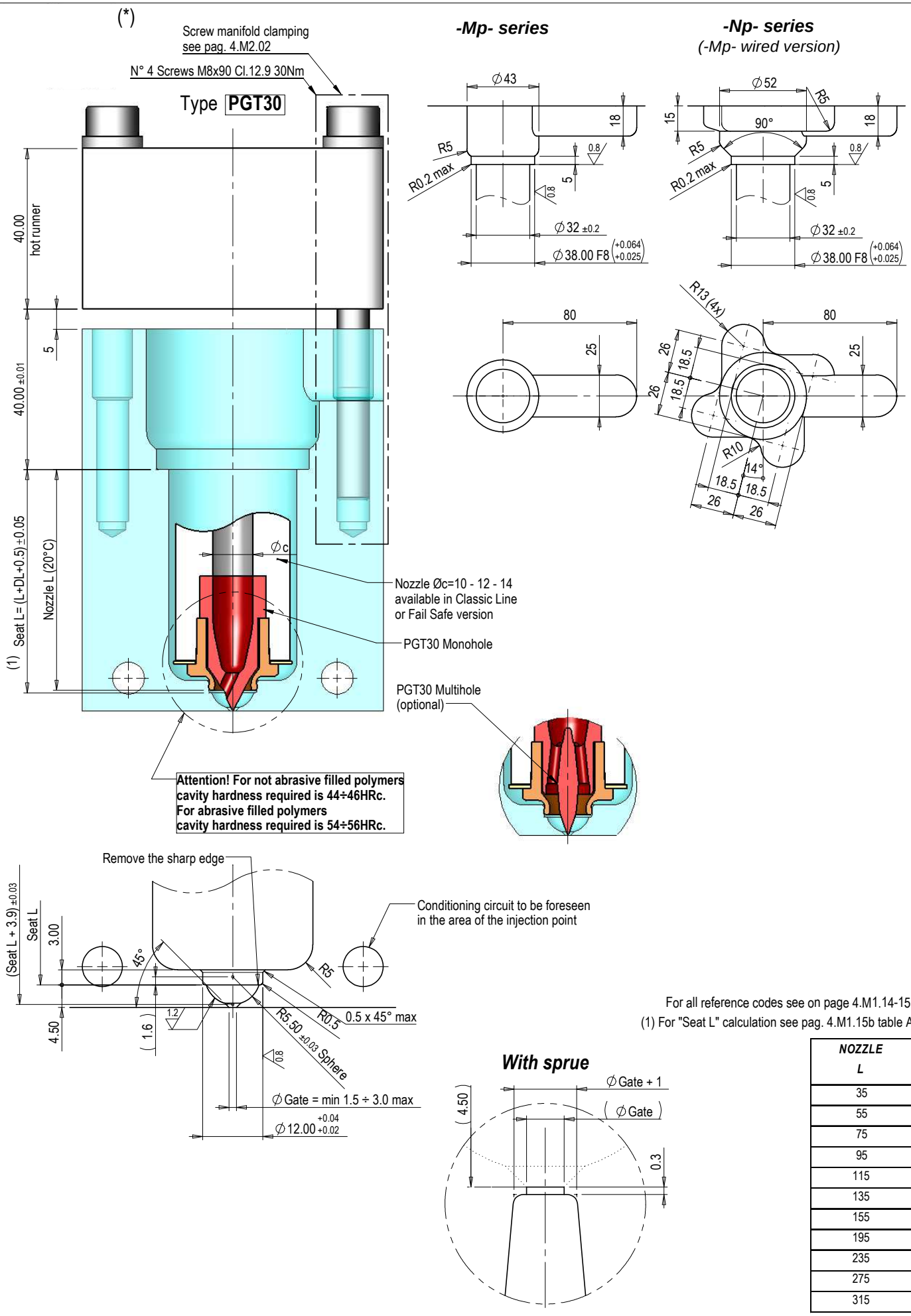
Alternative seat profile (see page 4.M1.13)

For all reference codes see on page 4.M1.14-15

(1) For "Seat L" calculation see pag. 4.M1.15b table B

NOZZLE L
35
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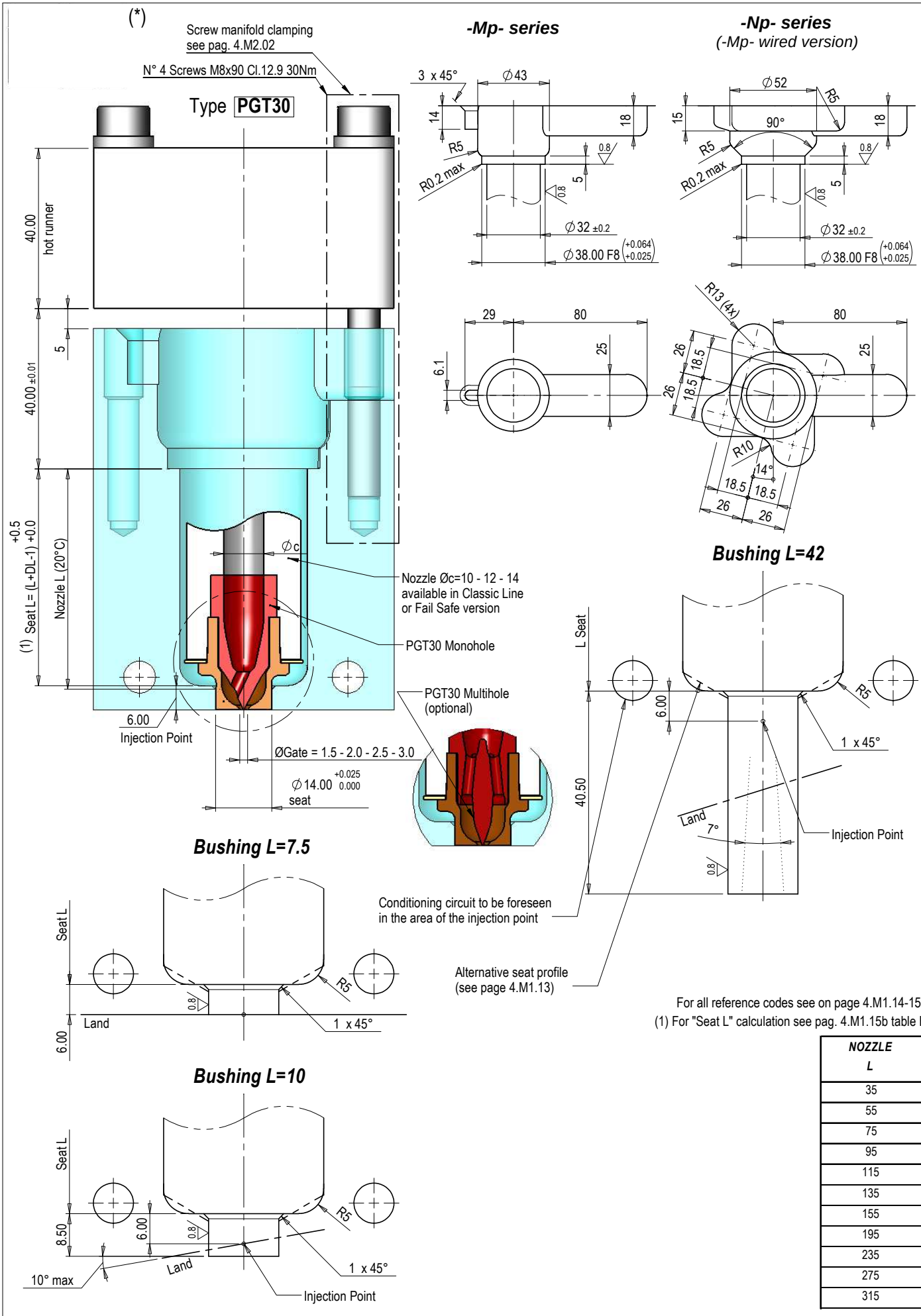


For all reference codes see on page 4.M1.14-15

(1) For "Seat L" calculation see pag. 4.M1.15b table A

NOZZLE L
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135
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235
275
315

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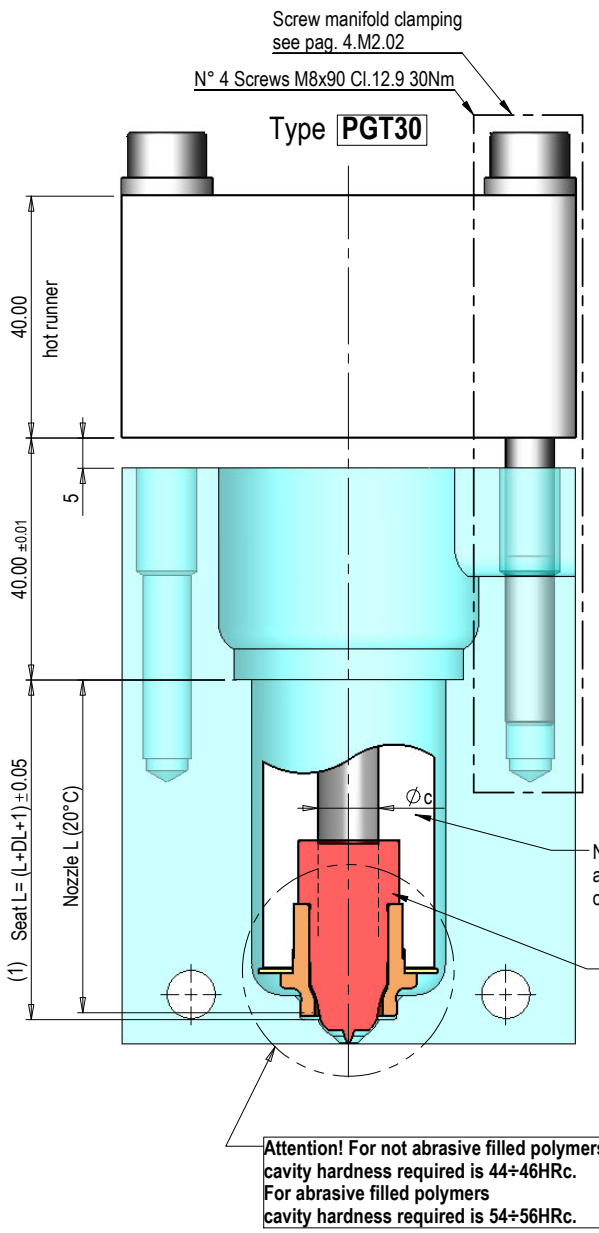
For all reference codes see on page 4.M1.14-15

(1) For "Seat L" calculation see pag. 4.M1.15b table B

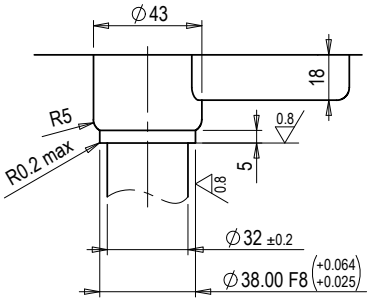
NOZZLE L
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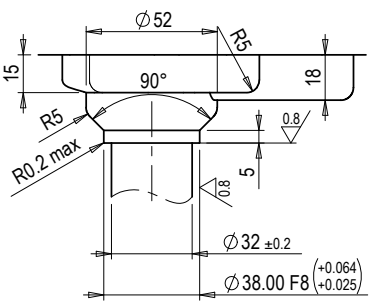
Nozzle TORPEDO with external end ring for engineering polymers

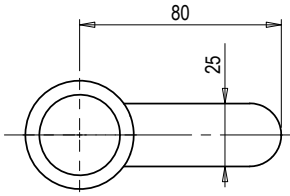


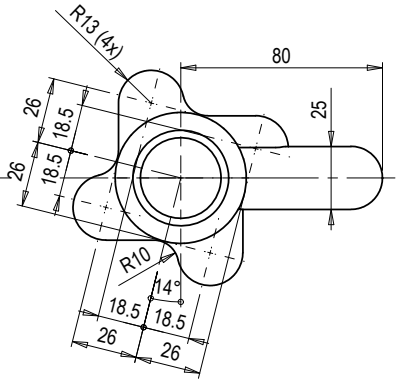
-Mp- series

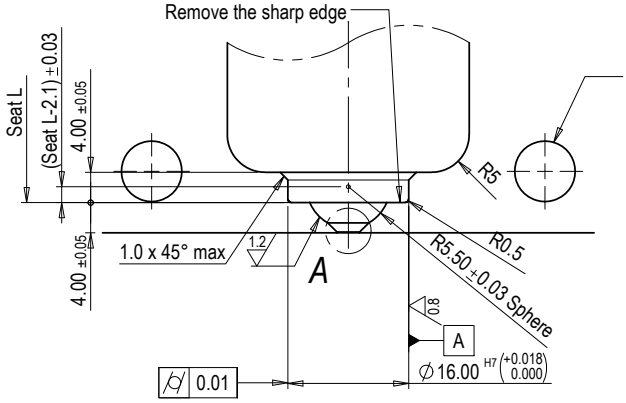


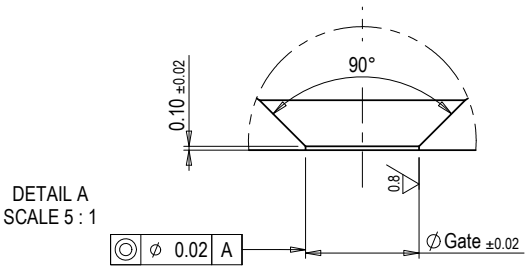
-Np- series
(-Mp- wired version)



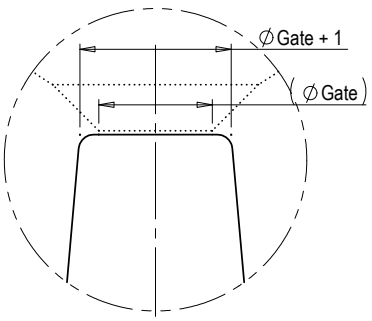








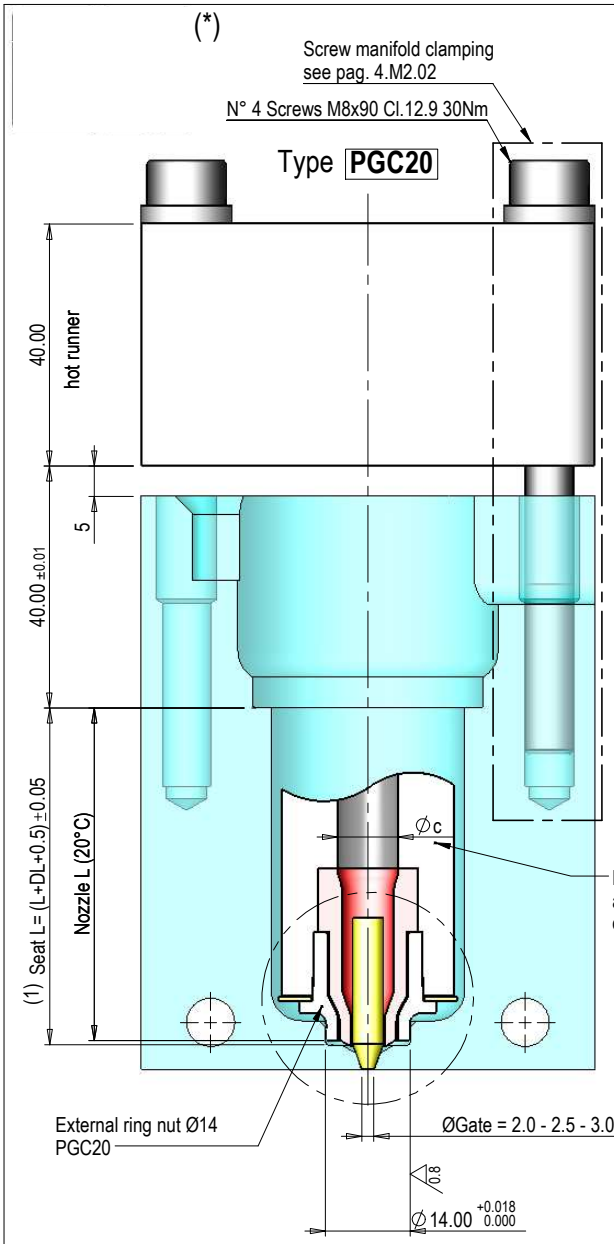
With sprue

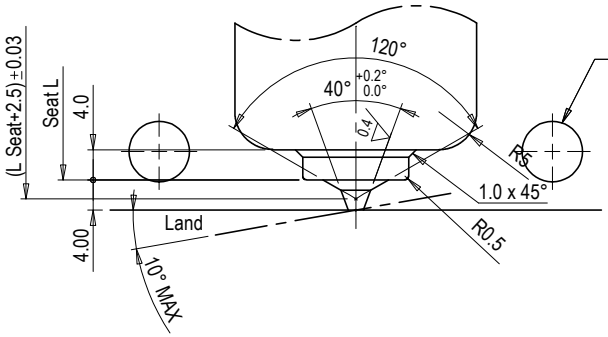


For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table A

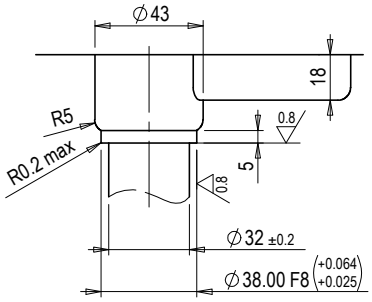
NOZZLE L
35
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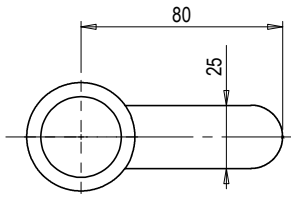
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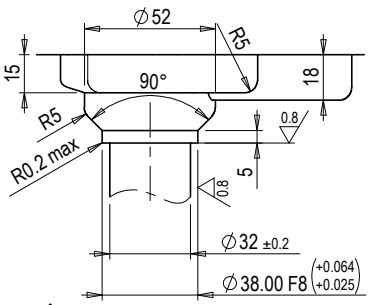


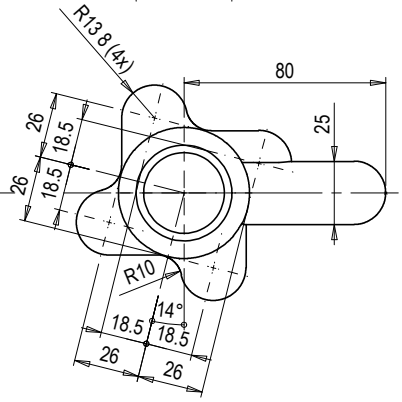
-Mp- series





-Np- series
(-Mp- wired version)



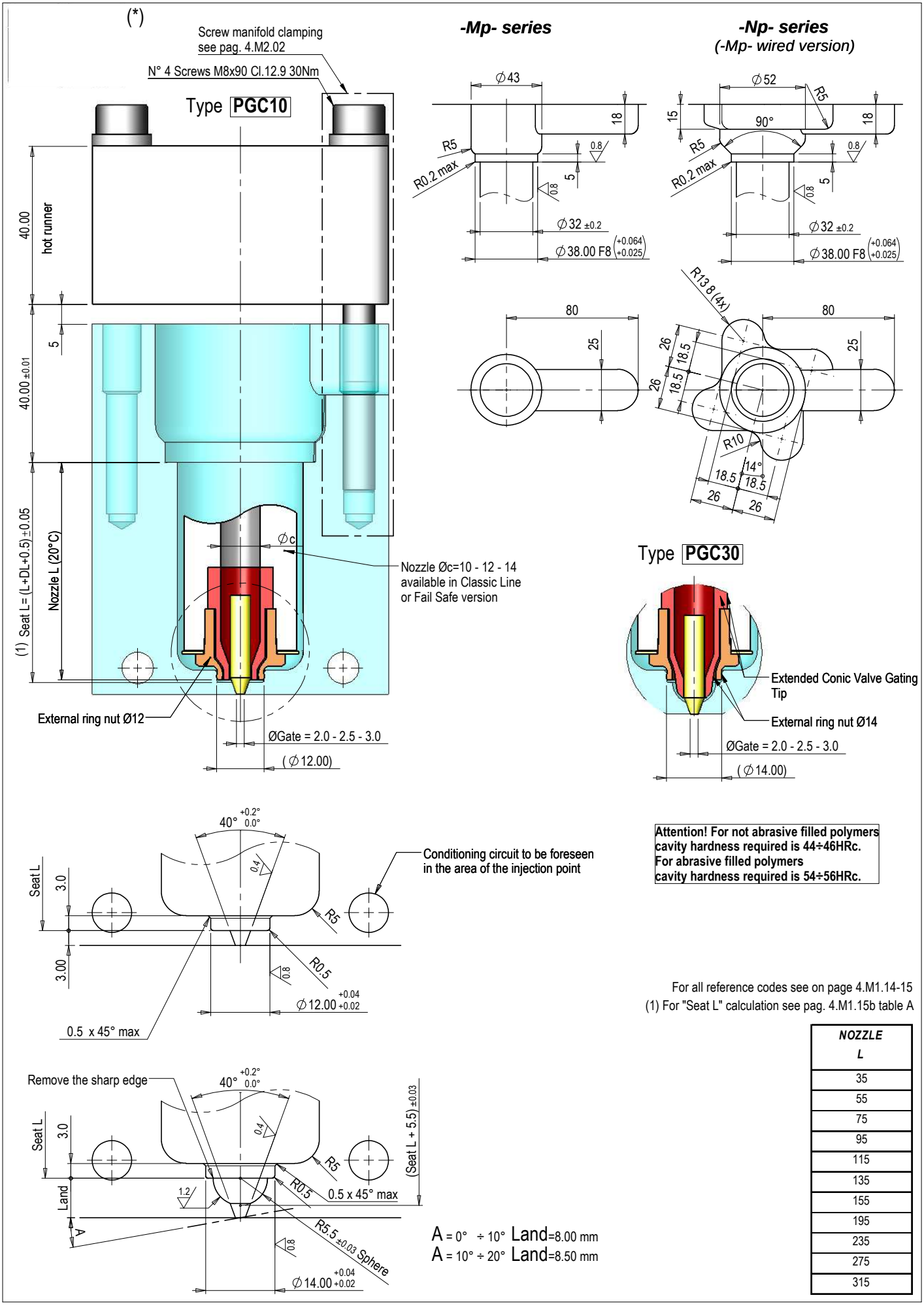


Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

For all reference codes see on page 4.M1.14-15
(1) For "DL" calculation see pag. 4.M1.15b table A

NOZZLE *L*
35
55
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115
135
155
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235
275
315

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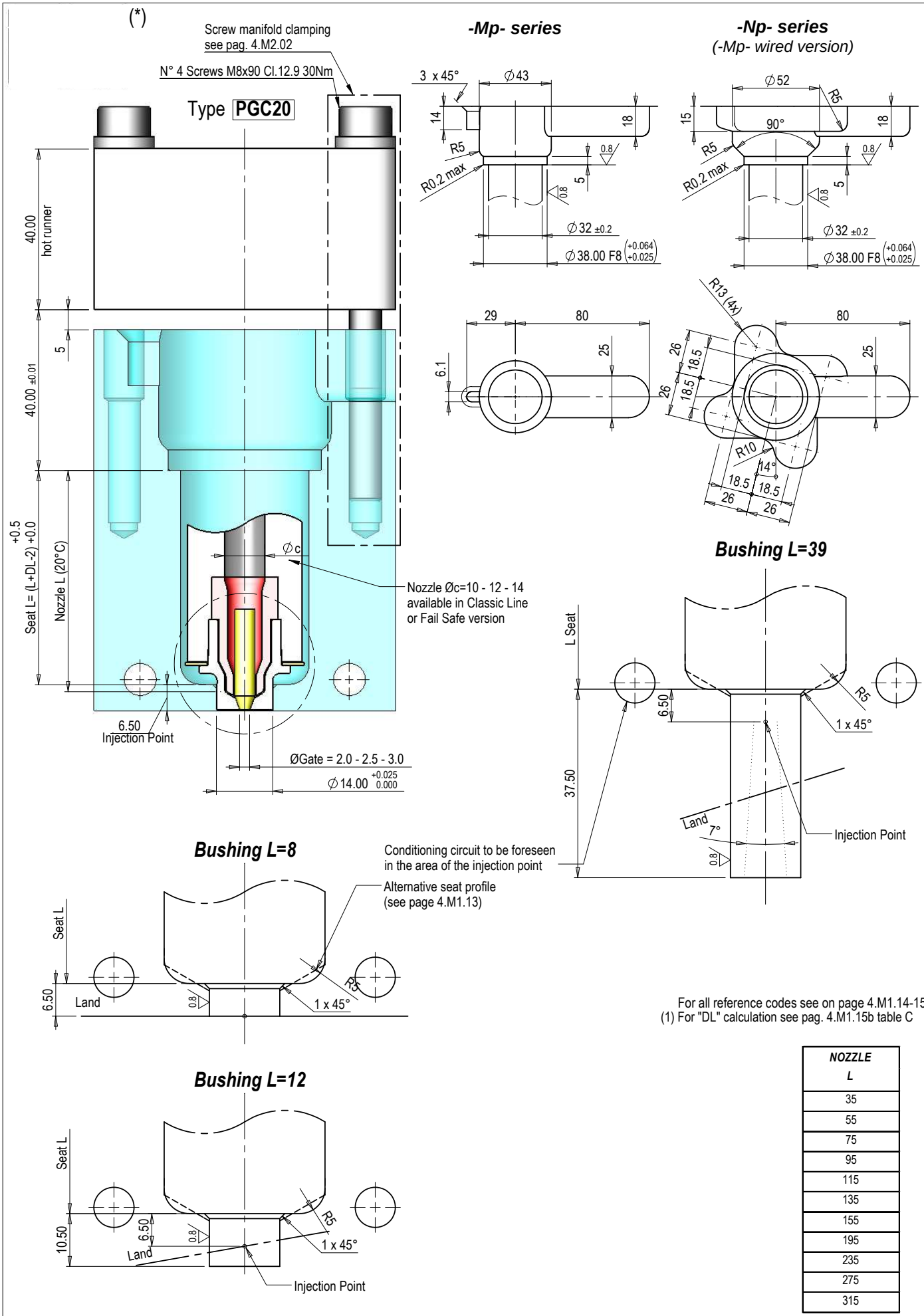
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

A = 0° ÷ 10° Land=8.00 mm
A = 10° ÷ 20° Land=8.50 mm

For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table A

NOZZLE L
35
55
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115
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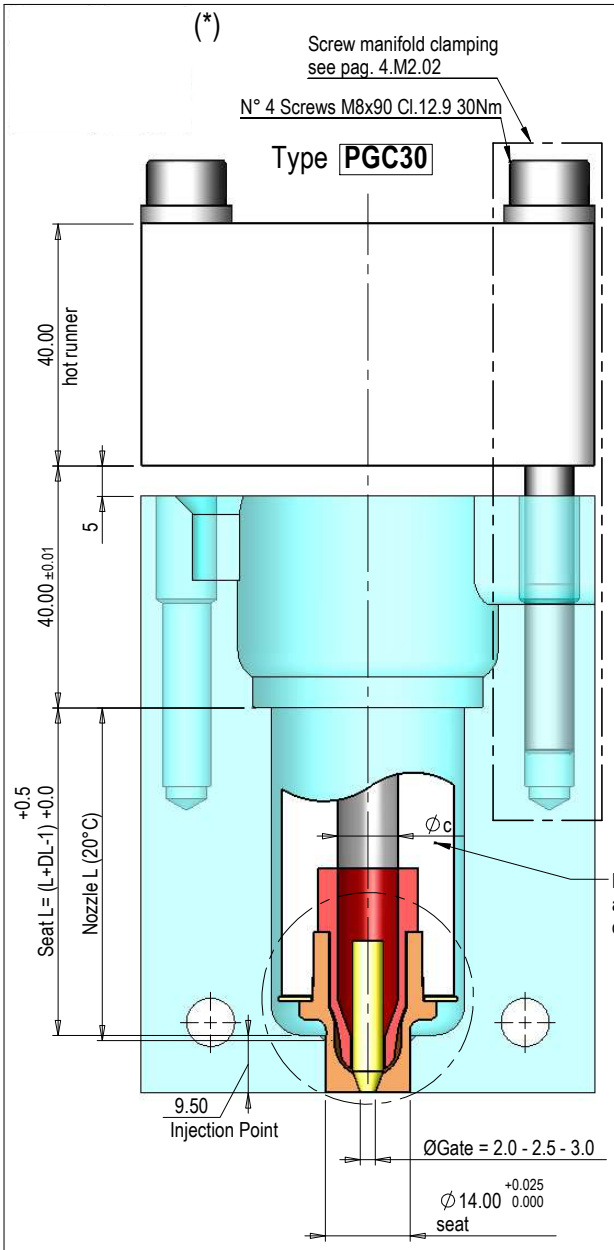
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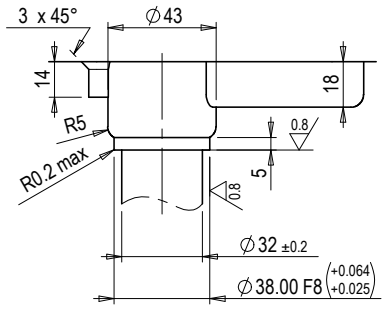


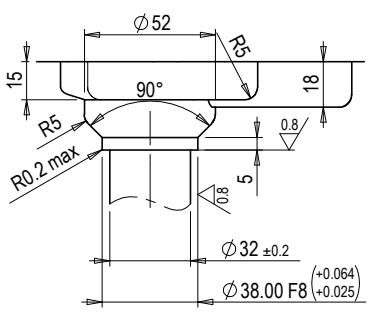
For all reference codes see on page 4.M1.14-15
(1) For "DL" calculation see pag. 4.M1.15b table C

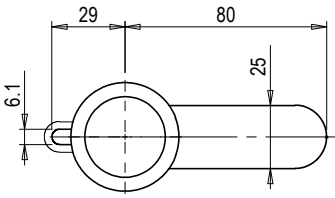
NOZZLE L
35
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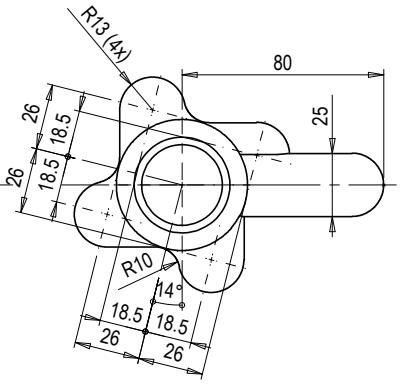
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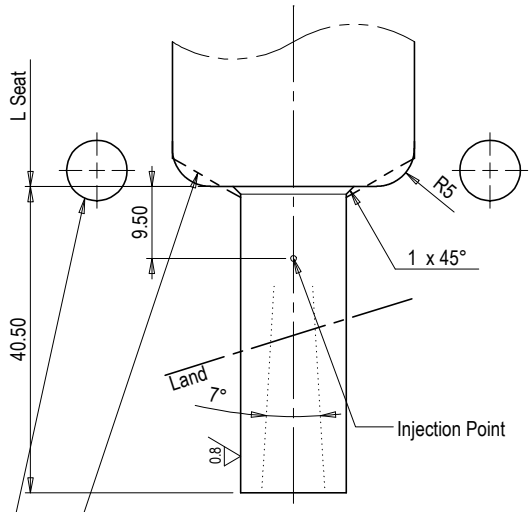








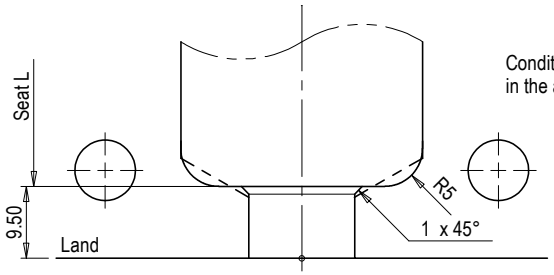
Bushing L=42



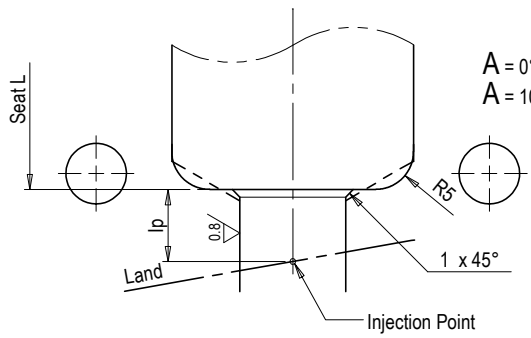
Conditioning circuit to be foreseen
in the area of the injection point

Alternative seat profile
(see page 4.M1.13)

Bushing L=11



Bushing L=15



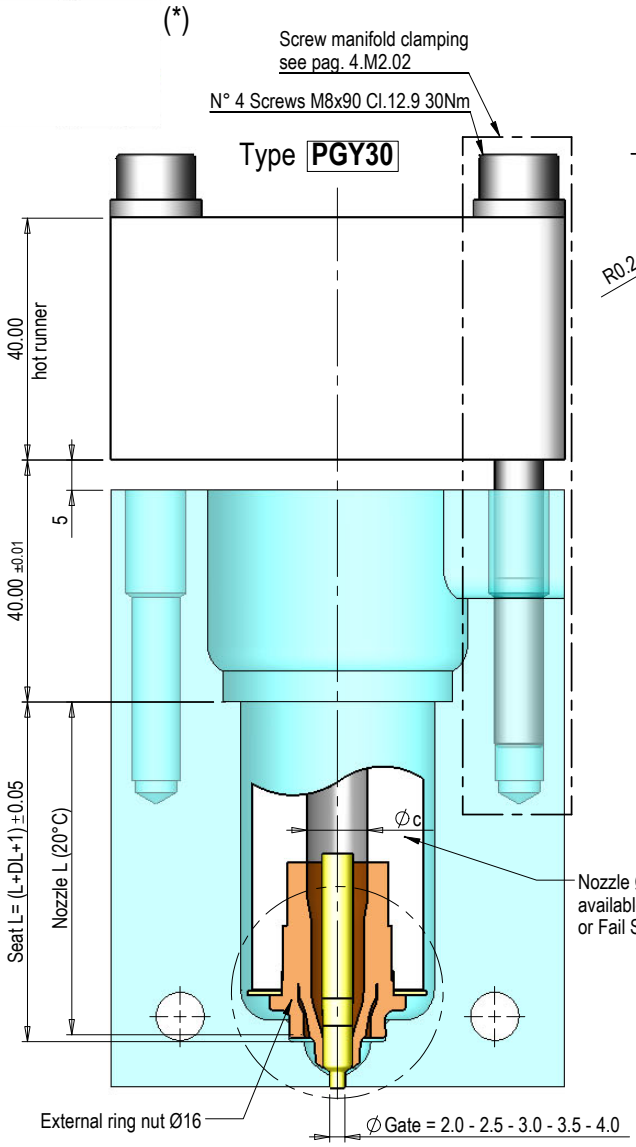
A = 0° ÷ 10° lp=9.50 mm
A = 10° ÷ 20° lp=9.70 mm

For all reference codes see on page 4.M1.14-15

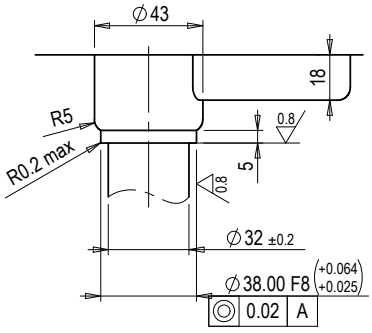
(1) For "Seat L" calculation see pag. 4.M1.15b table B

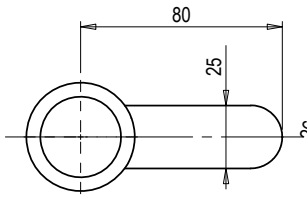
NOZZLE L
35
55
75
95
115
135
155
195
235
275
315

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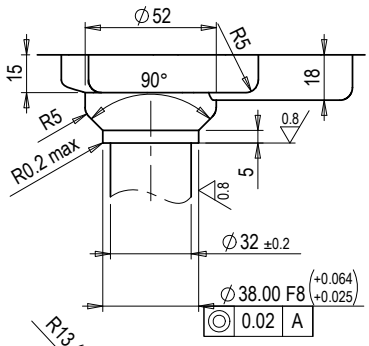


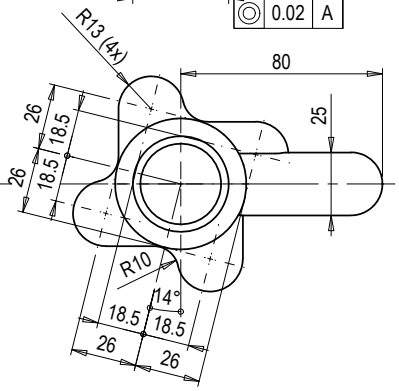
-Mp- series

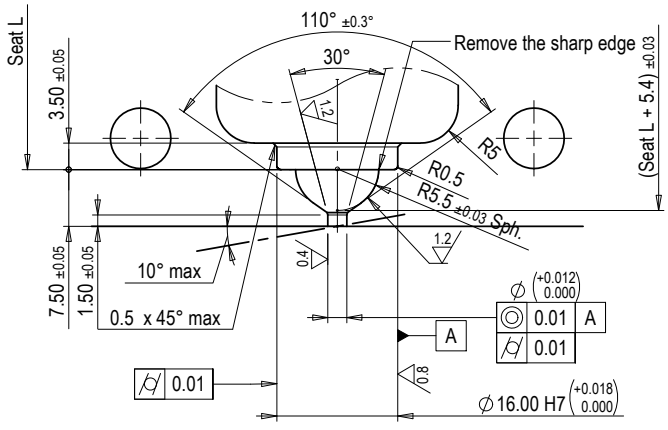




-Np- series
(-Mp- wired version)







Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

Attention! For not abrasive filled polymers cavity hardness required is 48÷50HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

For all reference codes see on page 4.M1.14-15

For "Seat L" calculation see pag. 4.M1.15c table D

NOZZLE L
35
55
75
95
115
135
155
195
235
275
315

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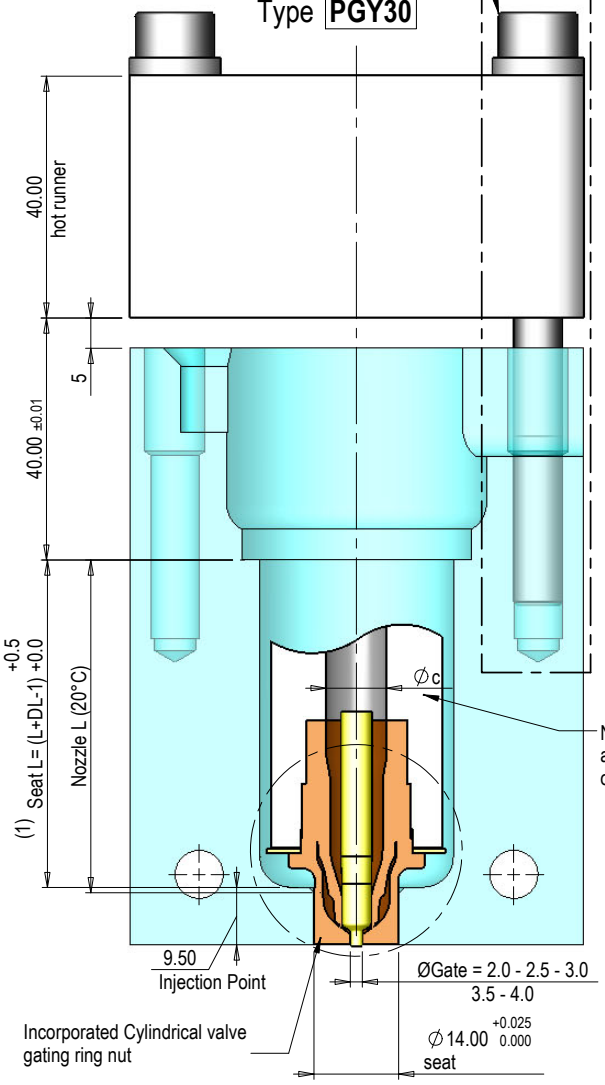
Nozzle CYLINDRICAL VALVE GATING with bushing through the cavity

(*)

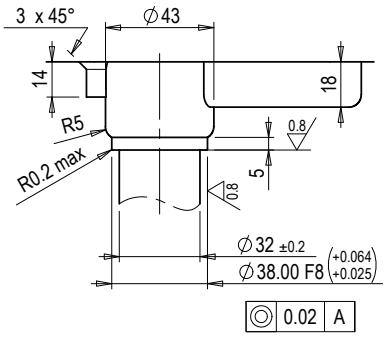
Screw manifold clamping
see pag. 4.M2.02

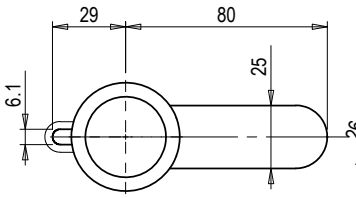
N° 4 Screws M8x90 Cl.12.9 30Nm

Type **PGY30**

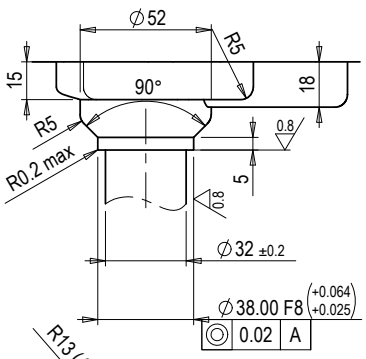


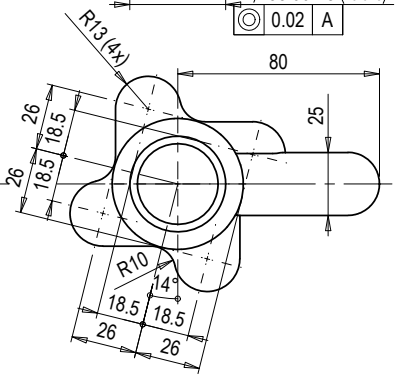
-Mp- series



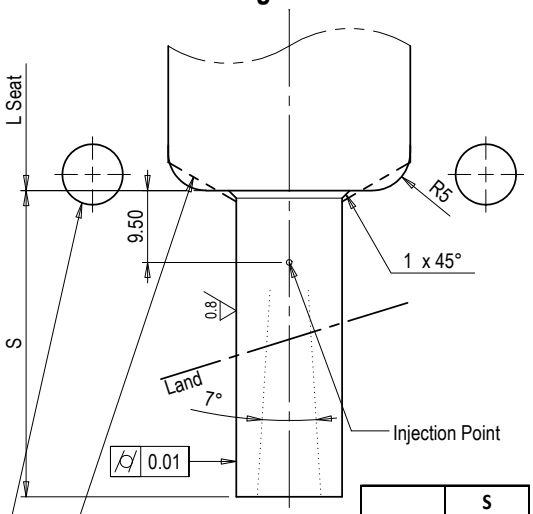


-Np- series
(-Mp- wired version)





Bushing L=27 / L=42

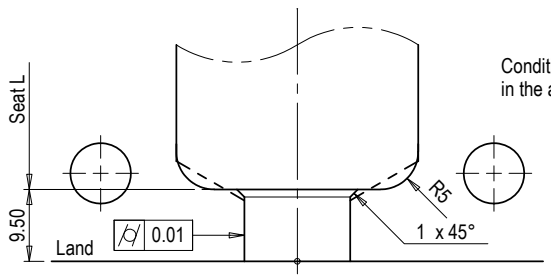


Conditioning circuit to be foreseen
in the area of the injection point

Alternative seat profile
(see page 4.M1.13)

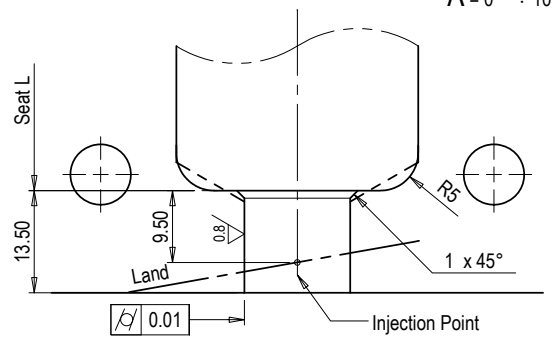
	S
L=27	26.5
L=42	41.5

Bushing L=11

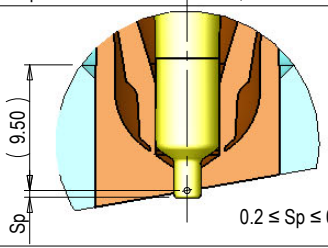


Bushing L=15

A = 0° ÷ 10° max



ATTENTION! In this configuration there is a protrusion "Sp" of the Pin from the bushing.
HRS recommends not to remove this protrusion.
The "Sp" dimension is function of ØGate and "A" angle



For all reference codes see on page 4.M1.14-15

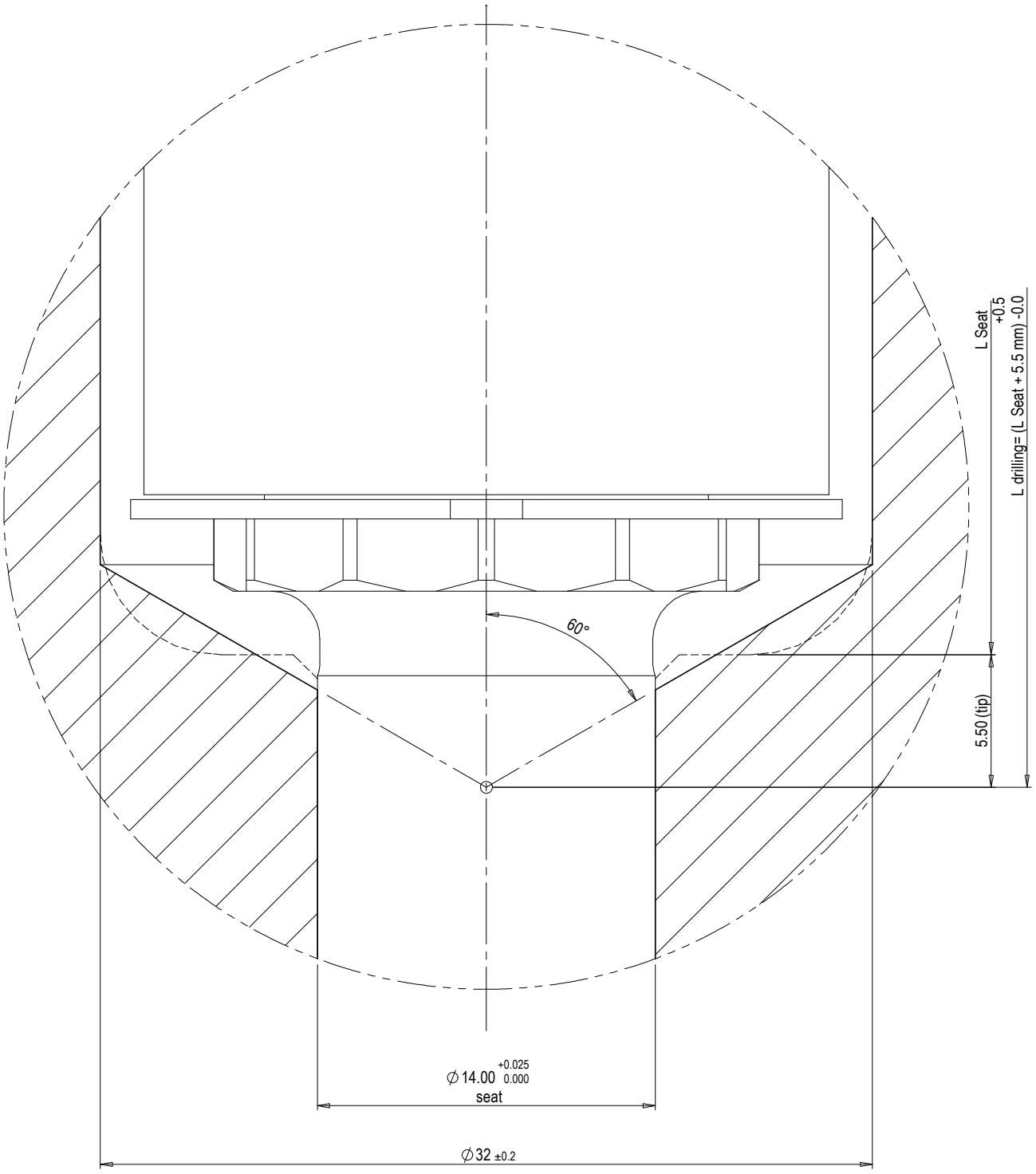
(1) For "Seat L" calculation see pag. 4.M1.15b table B

NOZZLE L
35
55
75
95
115
135
155
195
235
275
315

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Nozzles series -Mp- -Np- with BUSHING THROUGH CAVITY
Alternative seat contour 120°
(120° tips seat is easier to manufacture than the
standard seat but more difficult to measure)



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NOZZLE L	NOZZLE DUCT CODE		W (230V)
35	Øc=10 Classic	0221-00261	1x400
	Øc=12 Classic	0221-00283	
	Øc=10 Fail Safe	0221-00272	2x400
	Øc=12 Fail Safe	0221-00294	
55	Øc=10 Classic	0221-00262	1x400
	Øc=12 Classic	0221-00284	
	Øc=10 Fail Safe	0221-00273	2x400
	Øc=12 Fail Safe	0221-00295	
75	Øc=10 Classic	0221-00263	1x400
	Øc=12 Classic	0221-00285	
	Øc=10 Fail Safe	0221-00274	2x400
	Øc=12 Fail Safe	0221-00296	
95	Øc=10 Classic	0021-00264	1x450
	Øc=12 Classic	0221-00286	
	Øc=10 Fail Safe	0221-00275	2x450
	Øc=12 Fail Safe	0221-00297	
115	Øc=10 Classic	0221-00265	1x500
	Øc=12 Classic	0221-00287	
	Øc=10 Fail Safe	0221-00276	2x500
	Øc=12 Fail Safe	0221-00298	
135	Øc=10 Classic	0221-00266	1x550
	Øc=12 Classic	0221-00288	
	Øc=10 Fail Safe	0221-00277	2x550
	Øc=12 Fail Safe	0221-00299	
155	Øc=10 Classic	0221-00267	1x650
	Øc=12 Classic	0221-00289	
	Øc=10 Fail Safe	0221-00278	2x650
	Øc=12 Fail Safe	0221-00300	
195	Øc=10 Classic	0221-00268	1x650
	Øc=12 Classic	0221-00290	
	Øc=10 Fail Safe	0221-00279	2x650
	Øc=12 Fail Safe	0221-00301	
235	Øc=10 Classic	0221-00269	F
	Øc=12 Classic	0221-00291	
	Øc=10 Fail Safe	0221-00280	2x750
	Øc=12 Fail Safe	0221-00302	
275	Øc=10 Classic	0221-00270	1x850
	Øc=12 Classic	0221-00292	
	Øc=10 Fail Safe	0221-00281	2x850
	Øc=12 Fail Safe	0221-00303	
315	Øc=10 Classic	0221-00271	1x850
	Øc=12 Classic	0221-00293	
	Øc=10 Fail Safe	0221-00282	2x850
	Øc=12 Fail Safe	0221-00304	

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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FREE FLOW

PGF30

0012-00583	
0012-00584	for high resistance

PGF20

Ø0.9	0012-00387	(to be used with bushing Ø1.2)
Ø1.2	0012-00388	(to be used with bushing Ø1.5)
Ø1.5	0012-00389	(to be used with bushing Ø1.8)

PGF10

0012-00597	for high resistance

External

Ø12	0013-00428	PGF20
Ø14	0013-00429	

Free Flow through the cavity

gate	PGF30	PGF10	PGF20
Ø1.2	-	-	0013-00597
Ø1.5	0013-00915	0013-00928	0013-00598
Ø1.8	-	-	0013-00598
Ø2.0	0013-00916	0013-00929	-
Ø2.5	0013-00917	0013-00930	-

TORPEDO

PGT30 Monohole

0012-00268	
0012-00269	for high resistance
0012-00331	for high conductibility

PGT30 Torpedo

0012-00270	
0012-00271	for high resistance
0012-00328	for high conductibility
0012-01002	for engineering polymers

PGT30 for Rubber

		for high conductibility
Ø0.45	0012-00390	0012-00393
Ø0.60	0012-00391	0012-00394
Ø0.75	0012-00392	0012-00395

PGT30 Multihole for Rubber

		for high conductibility
Ø0.45	0012-00396	0012-00399
Ø0.60	0012-00397	0012-00400
Ø0.75	0012-00398	0012-00401

External end ring

Ø12	0013-00428	
Ø16	0013-02110	for engineering polymers

PGT30 Bushing through the cavity

gate	L=7.5	L=10	L=42
Ø1.5	0013-00431	0013-00434	0013-00437
Ø2.0	0013-00432	0013-00435	0013-00438
Ø2.5	0013-00433	0013-00436	0013-00439
Ø3.0	0013-00545	0013-00546	0013-00547

PGT30 Bushing through the cavity for Rubber

gate		
Ø0.9	0013-00602	(to be used with tip Ø0.45)
Ø1.2	0013-00604	(to be used with tip Ø0.60)
Ø1.5	0013-00604	(to be used with tip Ø0.75)

CONICAL VALVE GATING

PGC30

0012-00273	
0012-00533	For high conductibility with End Ring
0012-00324	For high conductibility with Bushing th.cavity
0012-00427	for high resistance

PGC30 Antistagnation

0012-00770	For high conductibility with End Ring
0012-00771	For high conductibility with Bushing th.cavity
0012-00805	for high resistance

External end ring

Ø14	0013-00429

PGC30 Bushing through the cavity

gate	L=11	L=15	L=42
Ø2.0	0013-00990	0013-00991	0013-00992
Ø2.5	0013-00440	0013-00442	0013-00444
Ø3.0	0013-00441	0013-00443	0013-00445

0262-00055 { for External end ring / for Bushings through cavity

PGC20

0012-00808	
0012-00810	for high resistance

PGC20 Antistagnation

0012-00809	
0012-00811	for high resistance

PGC20 External end ring

Ø14	0013-01310

PGC20 Bushing through the cavity

gate	L=8	L=12	L=39
Ø2.0	0013-01312	0013-01315	0013-01319
Ø2.5	0013-01313	0013-01316	0013-01320
Ø3.0	0013-01314	0013-01317	0013-01321

0262-00060

PGC10

0012-00272	
0012-00532	For high conductibility with End Ring
0012-00426	for high resistance

External end ring

Ø12	0013-00428

CYLINDRICAL VALVE GATING

PGY30 External end ring

Ø16	0013-01622	
Ø16	0013-01623	Antistagnation

PGY30 Bushing through the cavity

gate	L=11	L=15	L=27	L=42
Ø2.0	0013-01626	0013-01631	0013-01636	0013-01641
Ø2.5	0013-01627	0013-01632	0013-01637	0013-01642
Ø3.0	0013-01628	0013-01633	0013-01638	0013-01643
Ø3.5	0013-01629	0013-01634	0013-01639	0013-01644
Ø4.0	0013-01630	0013-01635	0013-01640	0013-01645

(*) Antistagnation Seal available only some polymers. For further information see sheet pag. 2.01.43

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)
k= (ΔT * 0.0008) - 0.04

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ) + k										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	0.08	0.11	0.13	0.16	0.18	0.20	0.23	0.25	0.28	0.30	0.33
55	0.11	0.14	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.37	0.40
75	0.13	0.16	0.20	0.23	0.27	0.30	0.33	0.37	0.40	0.44	0.47
95	0.15	0.19	0.23	0.27	0.31	0.35	0.39	0.43	0.46	0.50	0.54
115	0.18	0.22	0.27	0.31	0.35	0.40	0.44	0.48	0.53	0.57	0.61
135	0.20	0.25	0.30	0.35	0.40	0.44	0.49	0.54	0.59	0.64	0.69
155	0.23	0.28	0.33	0.39	0.44	0.49	0.55	0.60	0.65	0.70	0.76
195	0.27	0.34	0.40	0.46	0.53	0.59	0.65	0.71	0.78	0.84	0.90
235	0.32	0.39	0.47	0.54	0.61	0.68	0.76	0.83	0.90	0.97	1.05
275	0.37	0.45	0.53	0.62	0.70	0.78	0.86	0.94	1.03	1.11	1.19
315	0.42	0.51	0.60	0.69	0.78	0.88	0.97	1.06	1.15	1.24	1.33

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 0.5										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	35.58	35.61	35.63	35.66	35.68	35.70	35.73	35.75	35.78	35.80	35.83
55	55.61	55.64	55.66	55.69	55.72	55.75	55.78	55.81	55.84	55.87	55.90
75	75.63	75.66	75.70	75.73	75.77	75.80	75.83	75.87	75.90	75.94	75.97
95	95.65	95.69	95.73	95.77	95.81	95.85	95.89	95.93	95.96	96.00	96.04
115	115.68	115.72	115.77	115.81	115.85	115.90	115.94	115.98	116.03	116.07	116.11
135	135.70	135.75	135.80	135.85	135.90	135.94	135.99	136.04	136.09	136.14	136.19
155	155.73	155.78	155.83	155.89	155.94	155.99	156.05	156.10	156.15	156.20	156.26
195	195.77	195.84	195.90	195.96	196.03	196.09	196.15	196.21	196.28	196.34	196.40
235	235.82	235.89	235.97	236.04	236.11	236.18	236.26	236.33	236.40	236.47	236.55
275	275.87	275.95	276.03	276.12	276.20	276.28	276.36	276.44	276.53	276.61	276.69
315	315.92	316.01	316.10	316.19	316.28	316.38	316.47	316.56	316.65	316.74	316.83

Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL - 1										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	34.08	34.11	34.13	34.16	34.18	34.20	34.23	34.25	34.28	34.30	34.33
55	54.11	54.14	54.16	54.19	54.22	54.25	54.28	54.31	54.34	54.37	54.40
75	74.13	74.16	74.20	74.23	74.27	74.30	74.33	74.37	74.40	74.44	74.47
95	94.15	94.19	94.23	94.27	94.31	94.35	94.39	94.43	94.46	94.50	94.54
115	114.18	114.22	114.27	114.31	114.35	114.40	114.44	114.48	114.53	114.57	114.61
135	134.20	134.25	134.30	134.35	134.40	134.44	134.49	134.54	134.59	134.64	134.69
155	154.23	154.28	154.33	154.39	154.44	154.49	154.55	154.60	154.65	154.70	154.76
195	194.27	194.34	194.40	194.46	194.53	194.59	194.65	194.71	194.78	194.84	194.90
235	234.32	234.39	234.47	234.54	234.61	234.68	234.76	234.83	234.90	234.97	235.05
275	274.37	274.45	274.53	274.62	274.70	274.78	274.86	274.94	275.03	275.11	275.19
315	314.42	314.51	314.60	314.69	314.78	314.88	314.97	315.06	315.15	315.24	315.33

Tab. C - "Seat L" Calculation

0 [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL - 2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
35	33.08	33.11	33.13	33.16	33.18	33.20	33.23	33.25	33.28	33.30	33.33
55	53.11	53.14	53.16	53.19	53.22	53.25	53.28	53.31	53.34	53.37	53.40
75	73.13	73.16	73.20	73.23	73.27	73.30	73.33	73.37	73.40	73.44	73.47
95	93.15	93.19	93.23	93.27	93.31	93.35	93.39	93.43	93.46	93.50	93.54
115	113.18	113.22	113.27	113.31	113.35	113.40	113.44	113.48	113.53	113.57	113.61
135	133.20	133.25	133.30	133.35	133.40	133.44	133.49	133.54	133.59	133.64	133.69
155	153.23	153.28	153.33	153.39	153.44	153.49	153.55	153.60	153.65	153.70	153.76
195	193.27	193.34	193.40	193.46	193.53	193.59	193.65	193.71	193.78	193.84	193.90
235	233.32	233.39	233.47	233.54	233.61	233.68	233.76	233.83	233.90	233.97	234.05
275	273.37	273.45	273.53	273.62	273.70	273.78	273.86	273.94	274.03	274.11	274.19
315	313.42	313.51	313.60	313.69	313.78	313.88	313.97	314.06	314.15	314.24	314.33

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)
k= (ΔT * 0.0008) - 0.04

Tab. D - "Seat L" Calculation

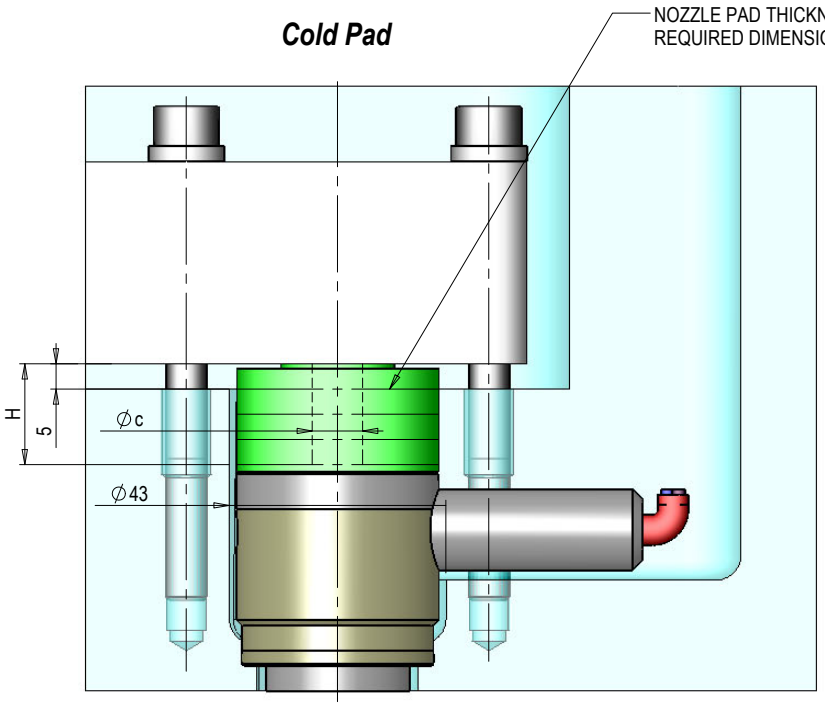
L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	Seat L = L + DL + 1										
35	36.08	36.11	36.13	36.16	36.18	36.20	36.23	36.25	36.28	36.30	36.33
55	56.11	56.14	56.16	56.19	56.22	56.25	56.28	56.31	56.34	56.37	56.40
75	76.13	76.16	76.20	76.23	76.27	76.30	76.33	76.37	76.40	76.44	76.47
95	96.15	96.19	96.23	96.27	96.31	96.35	96.39	96.43	96.46	96.50	96.54
115	116.18	116.22	116.27	116.31	116.35	116.40	116.44	116.48	116.53	116.57	116.61
135	136.20	136.25	136.30	136.35	136.40	136.44	136.49	136.54	136.59	136.64	136.69
155	156.23	156.28	156.33	156.39	156.44	156.49	156.55	156.60	156.65	156.70	156.76
195	196.27	196.34	196.40	196.46	196.53	196.59	196.65	196.71	196.78	196.84	196.90
235	236.32	236.39	236.47	236.54	236.61	236.68	236.76	236.83	236.90	236.97	237.05
275	276.37	276.45	276.53	276.62	276.70	276.78	276.86	276.94	277.03	277.11	277.19
315	316.42	316.51	316.60	316.69	316.78	316.88	316.97	317.06	317.15	317.24	317.33

Tab. E - "Seat L" Calculation

0 [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	= L + DL + 1.5										
35	36.58	36.61	36.63	36.66	36.68	36.70	36.73	36.75	36.78	36.80	36.83
55	56.61	56.64	56.66	56.69	56.72	56.75	56.78	56.81	56.84	56.87	56.90
75	76.63	76.66	76.70	76.73	76.77	76.80	76.83	76.87	76.90	76.94	76.97
95	96.65	96.69	96.73	96.77	96.81	96.85	96.89	96.93	96.96	97.00	97.04
115	116.68	116.72	116.77	116.81	116.85	116.90	116.94	116.98	117.03	117.07	117.11
135	136.70	136.75	136.80	136.85	136.90	136.94	136.99	137.04	137.09	137.14	137.19
155	156.73	156.78	156.83	156.89	156.94	156.99	157.05	157.10	157.15	157.20	157.26
195	196.77	196.84	196.90	196.96	197.03	197.09	197.15	197.21	197.28	197.34	197.40
235	236.82	236.89	236.97	237.04	237.11	237.18	237.26	237.33	237.40	237.47	237.55
275	276.87	276.95	277.03	277.12	277.20	277.28	277.36	277.44	277.53	277.61	277.69
315	316.92	317.01	317.10	317.19	317.28	317.38	317.47	317.56	317.65	317.74	317.83

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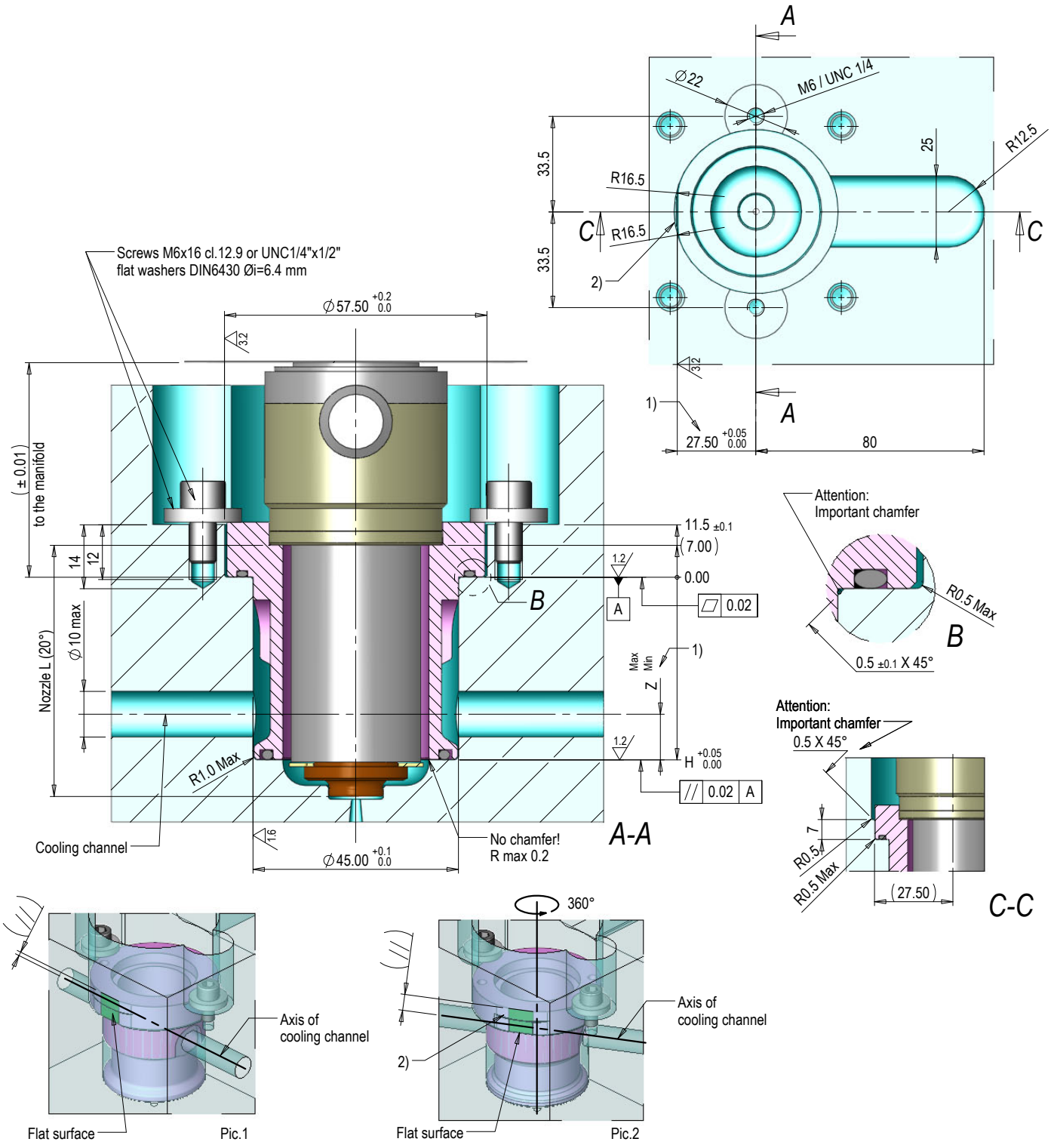
Cold Pad



H Standard	Øc=8	Øc=10	Øc=12
5.00	0010-01329	0010-01333	0010-01337
10.00	0010-01330	0010-01334	0010-01338
15.00	0010-01331	0010-01335	0010-01339
20.00	0010-01332	0010-01336	0010-01340

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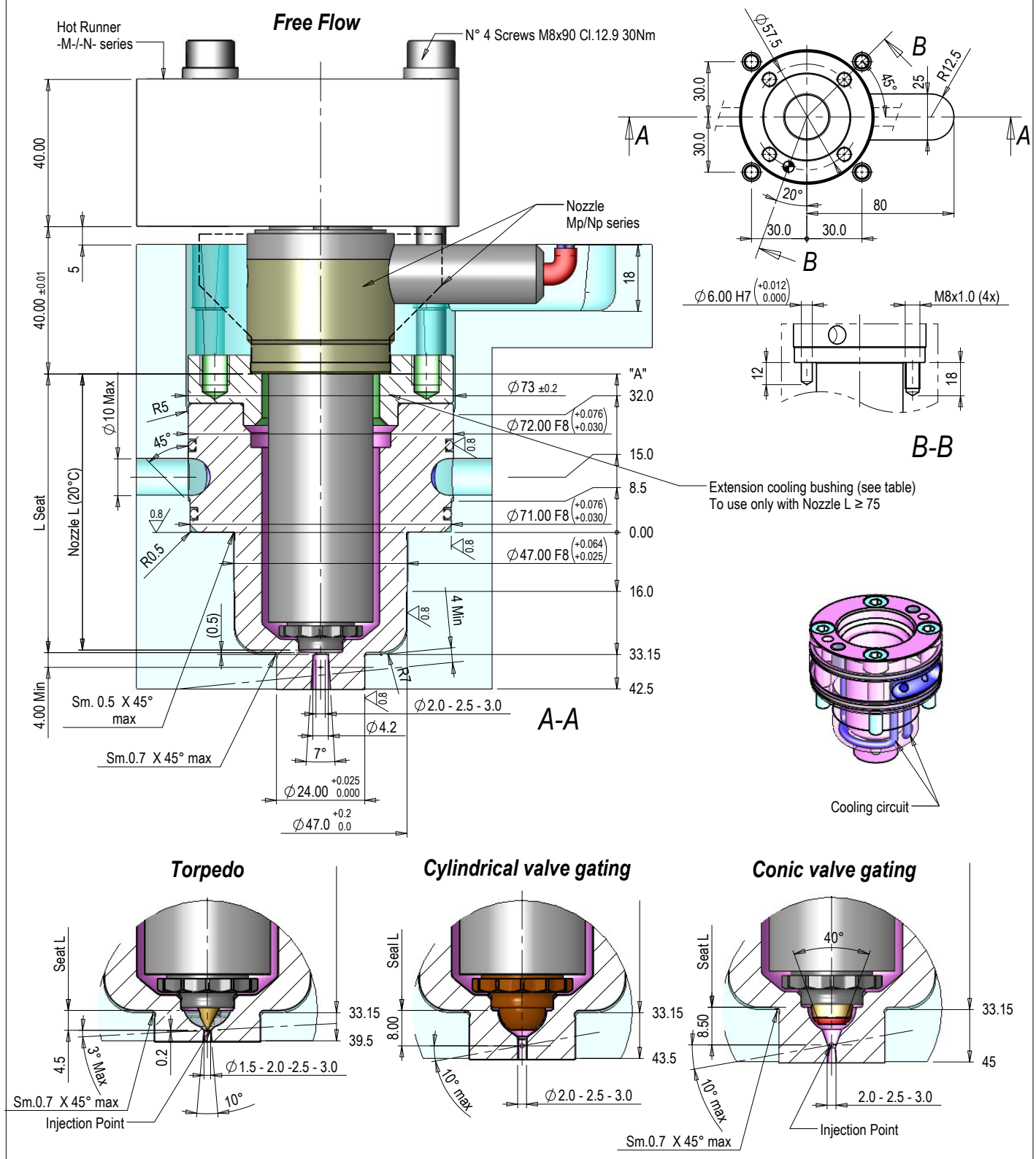
AXIAL SEAL COOLING BUSHING



1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
2) For all cases with "Z Max" > 18, then the positioning face can be located at any angle around the axis of the bushing and with respect to the fixing screws, in order to correctly intercept the customer cooling channels (Fig.2). For more details, please contact the Oerlikon HRSflow technical department.

BUSHING CODE	NOZZLE L	H	Z	Z Min	Z Max	BUSHING CODE	NOZZLE L	H	Z	Z Min	Z Max
0121-00470	35	20.00	7	7	7	0121-00477	175	160.00	12	7	103
0121-00471	55	40.00	12	7	27.5	0121-00478	195	180.00	12	7	103
0121-00472	75	60.00	12	7	47.5	0121-00479	215	200.00	12	7	103
0121-00473	95	80.00	12	7	67.5	0121-00480	235	220.00	12	7	103
0121-00474	115	100.00	12	7	87.5	0121-00481	275	260.00	12	7	103
0121-00475	135	120.00	12	7	103	0121-00482	315	300.00	12	7	103
0121-00476	155	140.00	12	7	103						

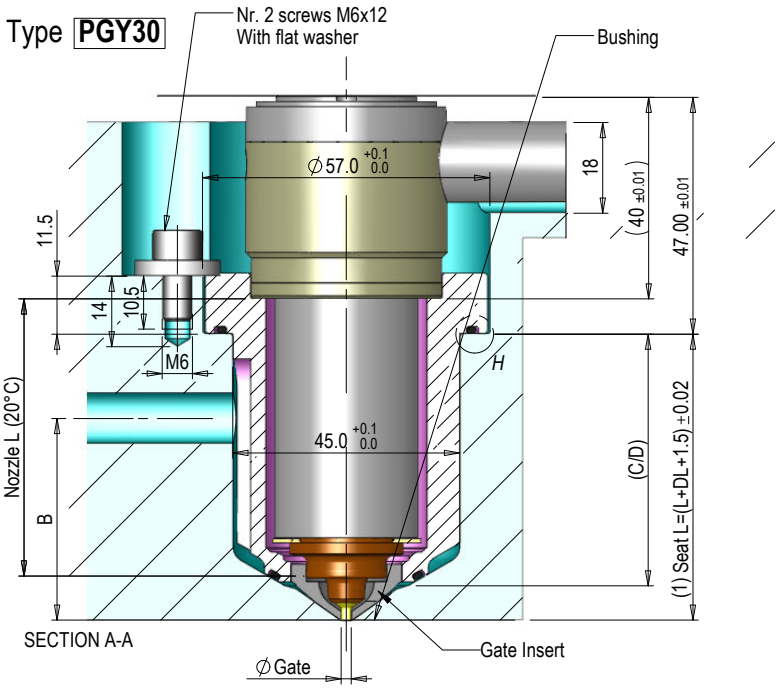
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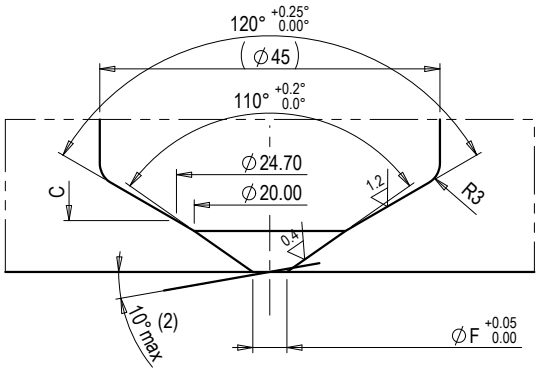
NOZZLE L	DL 200°C	L Seat	A	EXTENSION	COOLING BUSHING		
					Free Flow	Torpedo	Valve gating
55	0.14	55.64	23.00	-	Gate	Gate	Conical gate
75	0.19	75.69	43.05	0250-00013	Ø2.0 - 0002-00070	Ø1.5 - 0002-00073	Ø2.0 - 0002-00077
95	0.24	95.74	63.10	0250-00014	Ø2.5 - 0002-00071	Ø2.0 - 0002-00074	Ø2.5 - 0002-00078
115	0.29	115.79	83.15	0250-00015	Ø3.0 - 0002-00072	Ø2.5 - 0002-00075	Ø3.0 - 0002-00079
135	0.34	135.84	103.20	0250-00016		Ø3.0 - 0002-00076	Cylindrical gate
155	0.38	155.88	123.24	0250-00017			Ø2.0 - 0002-00077
195	0.48	195.98	163.34	0250-00018			Ø2.5 - 0002-00078
235	0.58	236.08	203.44	0250-00019			Ø3.0 - 0002-00079

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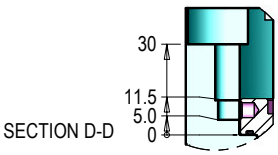
Type **PGY30**

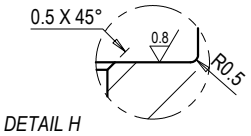


Standard Seat

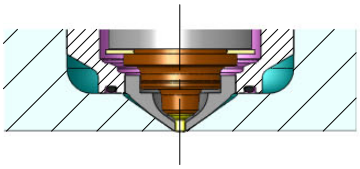


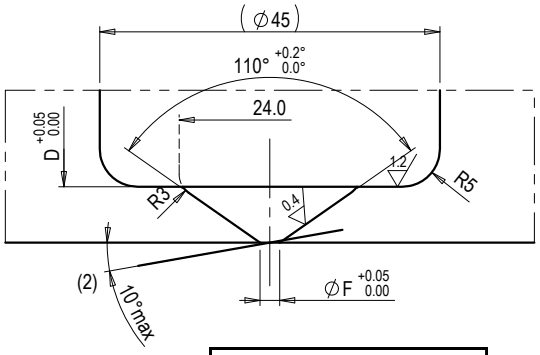
(2) Max angle allowed to the normal to the surface is 10°.
Should gates be placed on cosmetic surfaces/portions, the max angle allowed is 3° instead.
In case of any questions, please contact your technical reference within Oerlikon HRSflow.

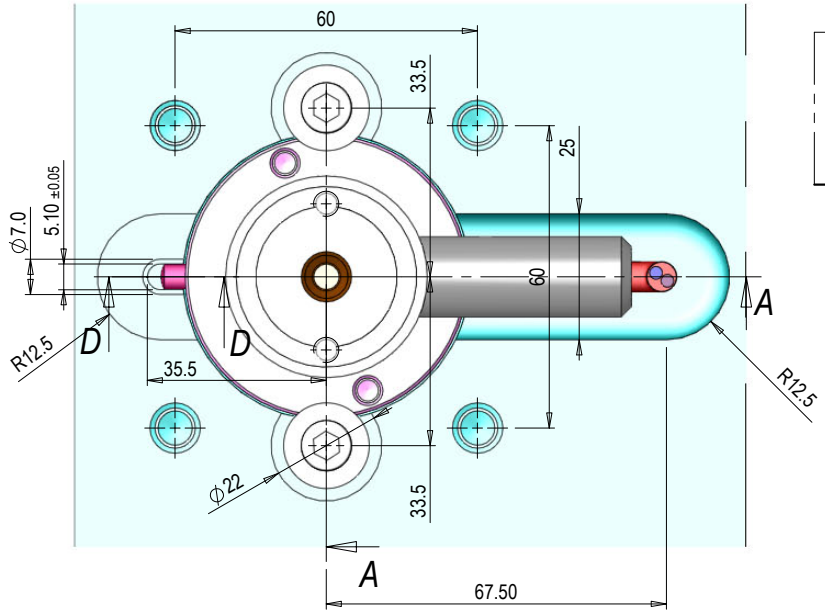




On plane OR Seat







GATE INSERT		
Code	**ØGate**	**ØF**
0335-00167	2.0	2.6
0335-00168	2.5	3.3
0335-00169	3.0	3.9
0335-00170	3.5	4.5
0335-00171	4.0	5.1

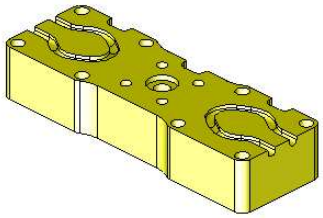
Installation KIT cod: 0283-00648

(1) For "Seat L" calculation see pag. 4.M1.15c table E

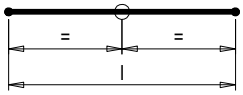
BUSHING CODE		NOZZLE L	C	D	B		BUSHING CODE		NOZZLE L	C	D	B	
STANDARD	ON PLANE OR				min	max	STANDARD	ON PLANE OR				min	max
0121-00425	0121-00437	35	29.91	29.30	20	25	0121-00431	0121-00443	155	150.20	149.59	20	110
0121-00426	0121-00438	55	49.96	49.35	20	45	0121-00432	0121-00444	175	170.25	169.64	20	110
0121-00427	0121-00439	75	70.01	69.40	20	65	0121-00433	0121-00445	195	190.30	189.69	20	110
0121-00428	0121-00440	95	90.06	89.45	20	90	0121-00434	0121-00446	215	210.35	209.74	20	110
0121-00429	0121-00441	115	110.11	109.50	20	105	0121-00435	0121-00447	235	230.39	229.78	20	110
0121-00430	0121-00442	135	130.15	129.54	20	110	0121-00436	0121-00448	275	270.49	269.88	20	110

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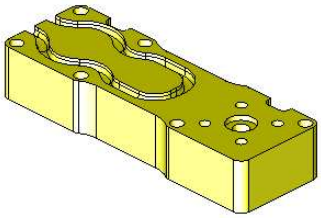
-HL-



Standard
l=150-200-250-300-350-400-450 mm



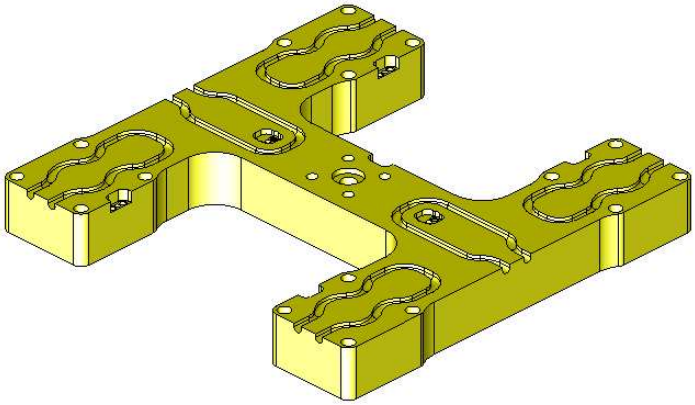
-HD-

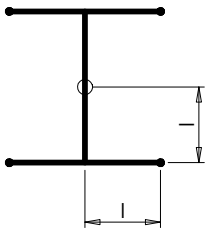


Standard
l=75-100-125-150-175-200-225 mm



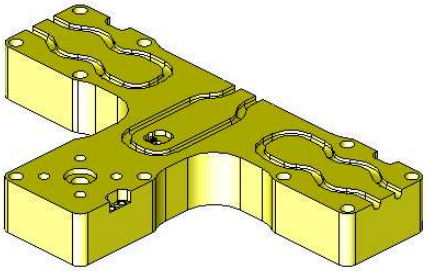
-HH-

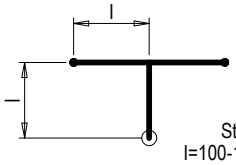




Standard
l=100-125-150 mm

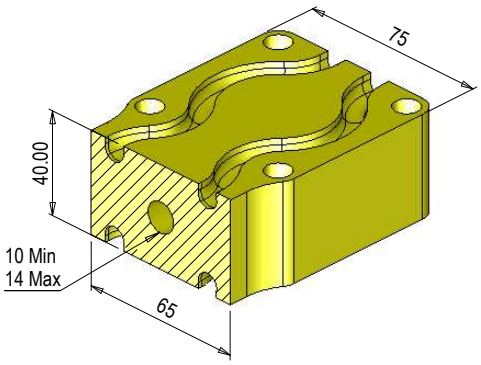
-HT-





Standard
l=100-125-150 mm

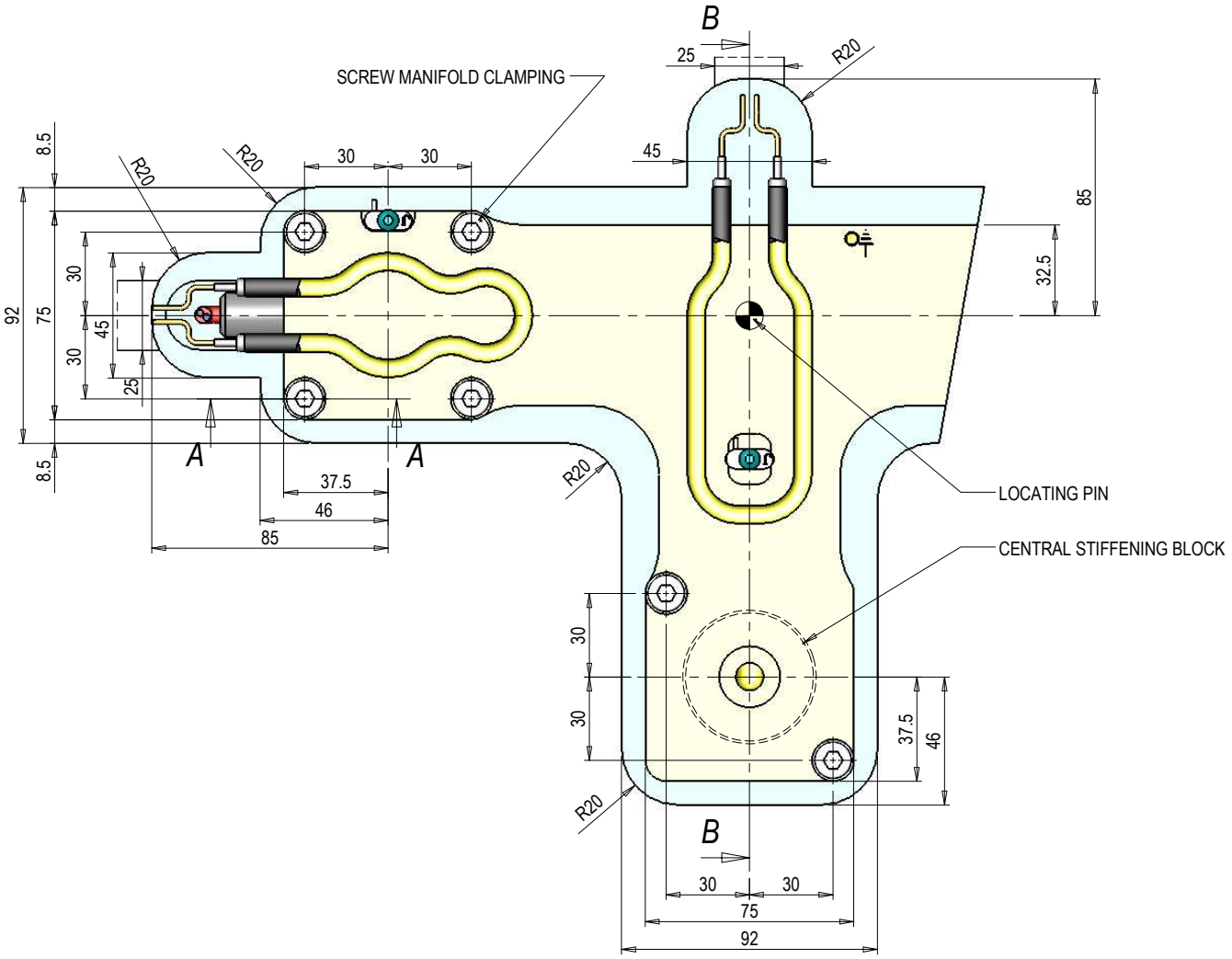
M - N (wired version) series



Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

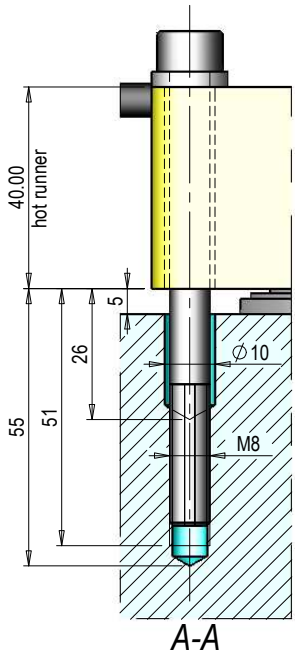
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The following profile is the typical one for
the standard not wired hot runner pocket
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)



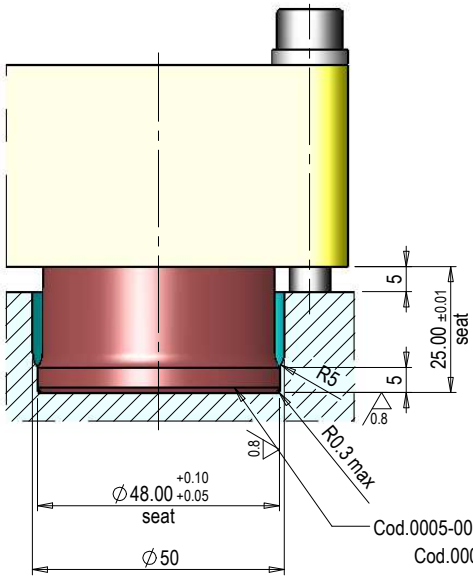
Screw manifold clamping

Screw M8x90 cl.12.9 30 Nm



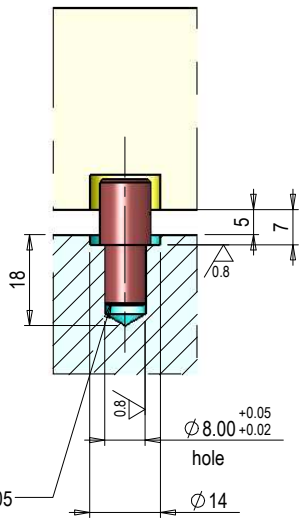
A-A

Pocket central stiffening block



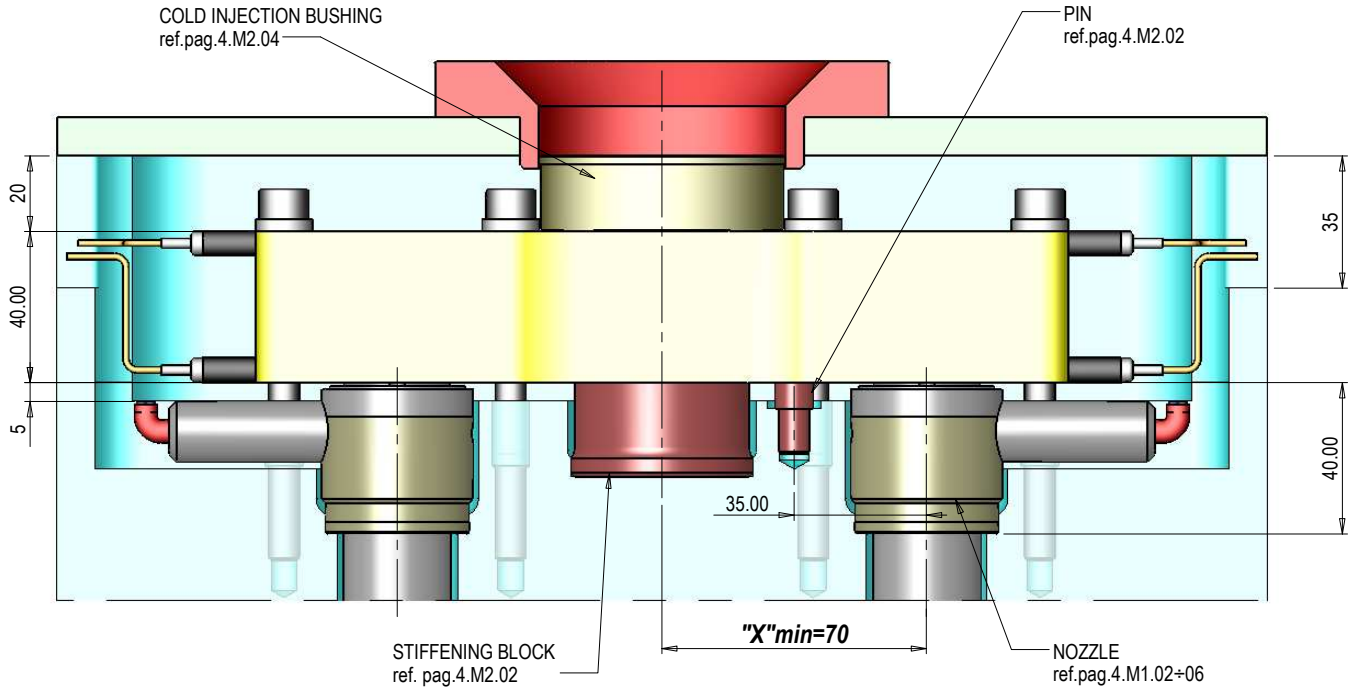
B-B

Pocket for locating pin



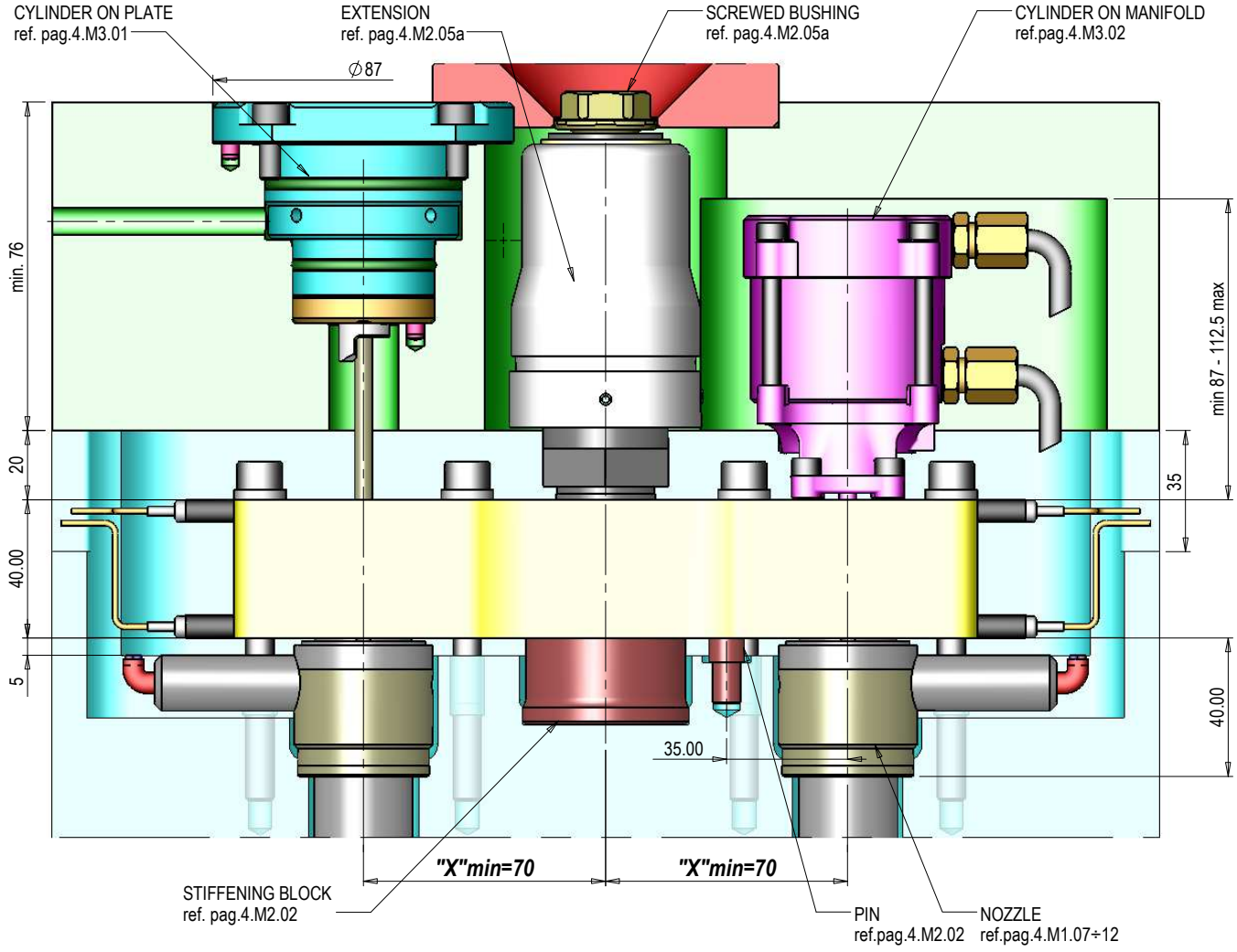
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Structure for TORPEDO or FREE FLOW systems

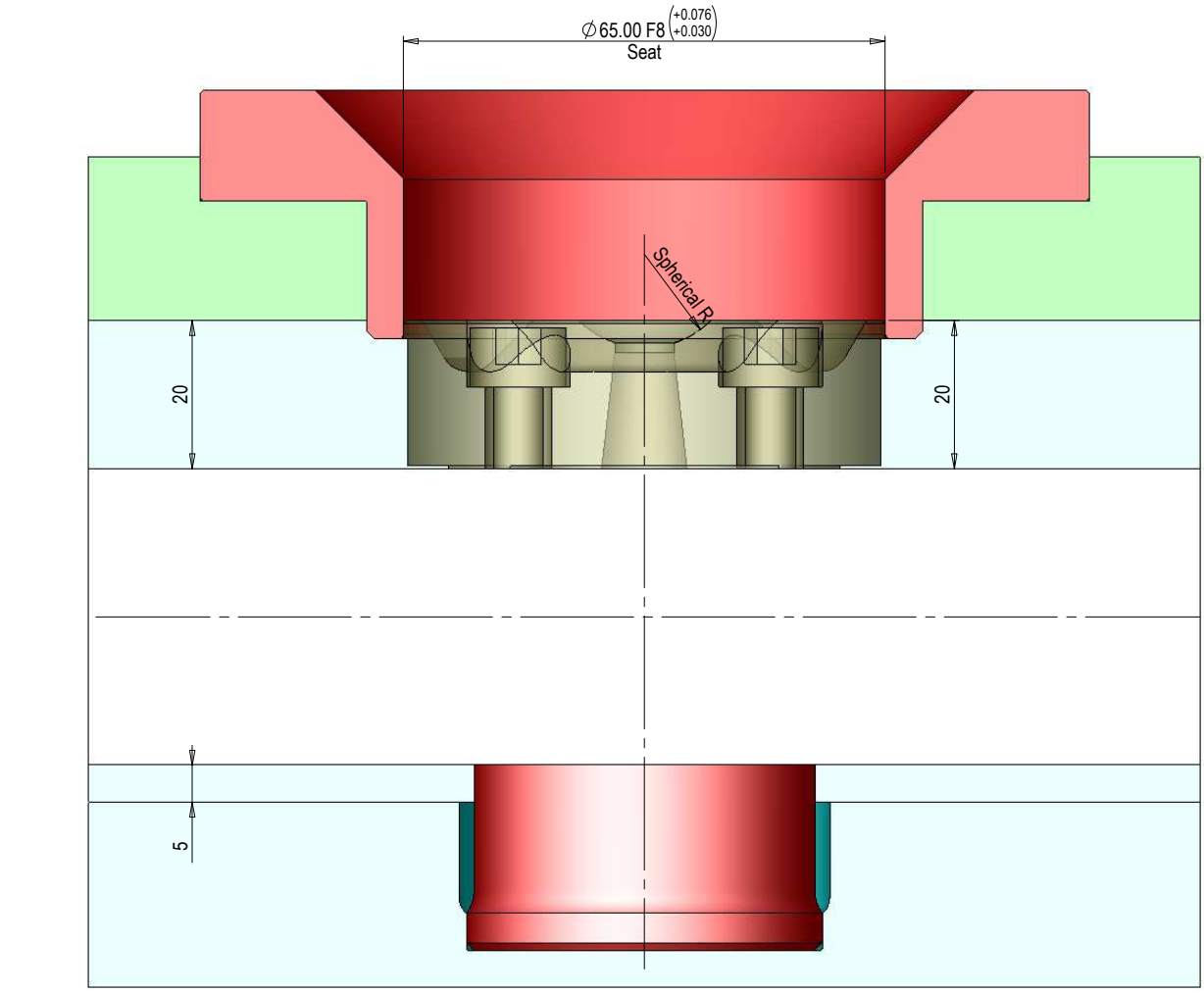


Xmin= min centre distance between injection bushing and nozzle for non standard systems

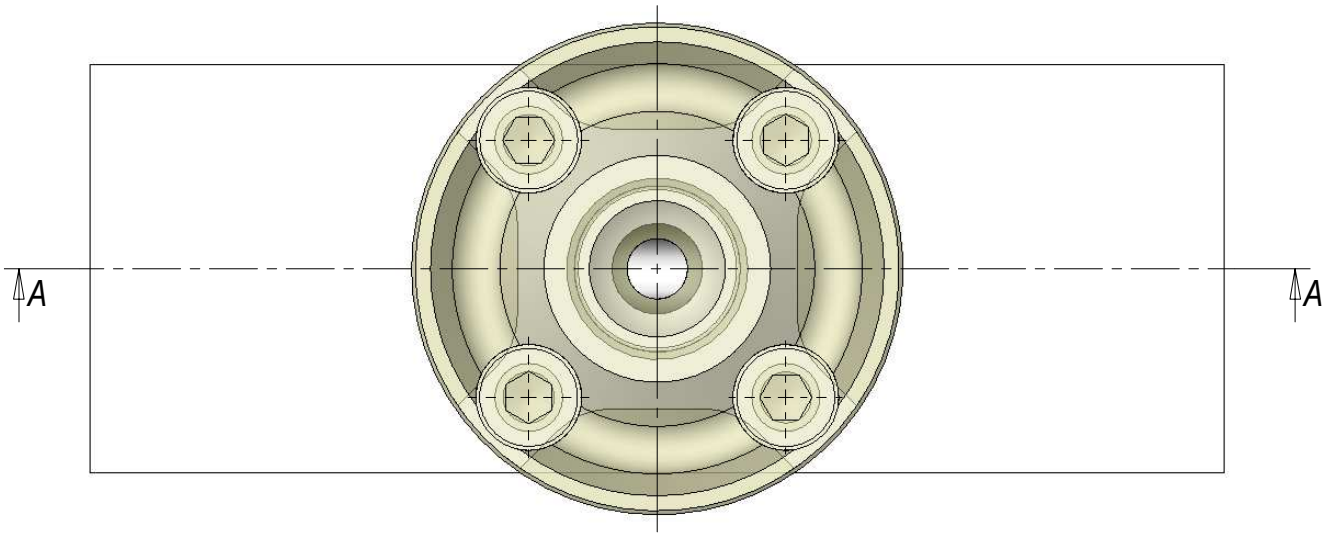
Structure for VALVE GATING systems



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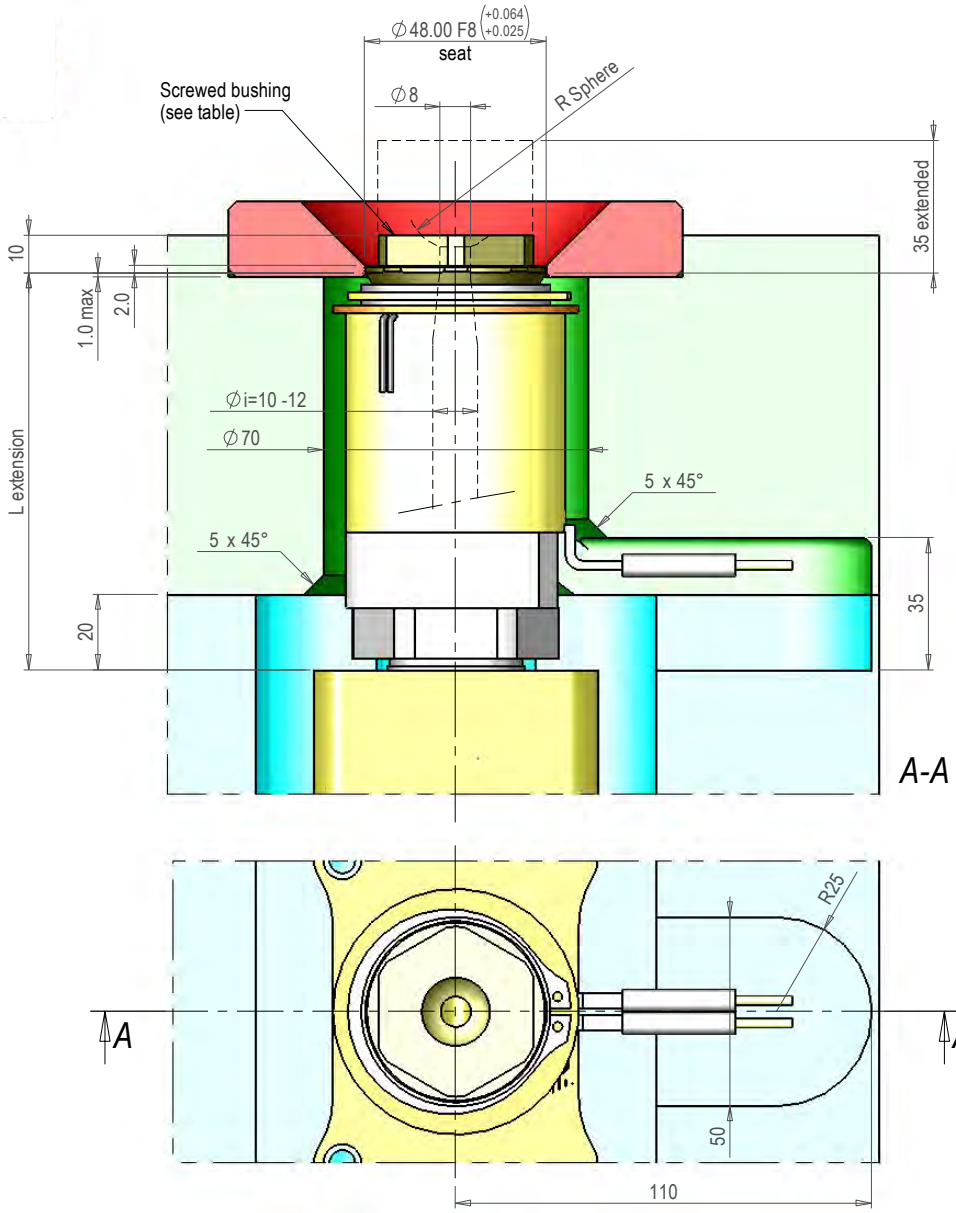
A-A



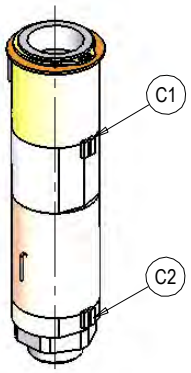
CODE	SPHERICAL R
0016-00001	R 0
0016-00002	R 12.7
0016-00003	R 15.5
0016-00004	R 19.1
0016-00048	R25
0016-00005	R 40

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SCREWED EXTENSION -Ma-
application on -M- manifold series



Control Zone

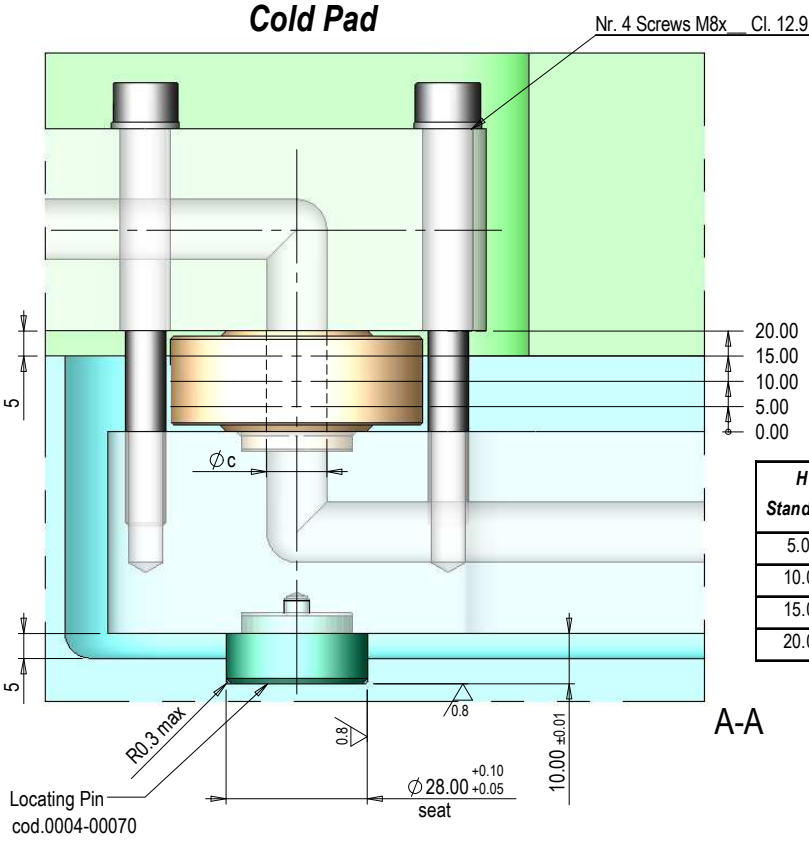


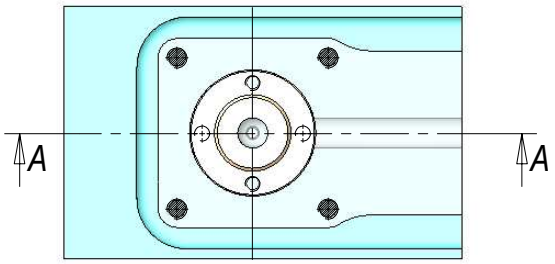
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	= Classic Line	Fail Safe System	C1	C2		
50	0014-00735	0014-00746	2x 225 W			
80	0014-00736	0014-00747	2x 225 W			
105	0014-00737	0014-00748	2x 330 W		0015-00447	R 0
130	0014-00738	0014-00749	2x 330 W		0015-00456	R 12.7
155	0014-00739	0014-00750	2x 500 W		0015-00457	R 15.5
180	0014-00740	0014-00751	2x 500 W		0015-00458	R 19.1
205	0014-00741	0014-00752	2x 330 W	2x 330 W	0015-00459	R 25
230	0014-00742	0014-00753	2x 330 W	2x 330 W	0015-00460	R40
255	0014-00743	0014-00754	2x 330 W	2x 330 W	Extended 0015-00449	R 0
280	0014-00744	0014-00755	2x 330 W	2x 330 W		
305	0014-00745	0014-00756	2x 330 W	2x 330 W		

Index

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Cold Pad

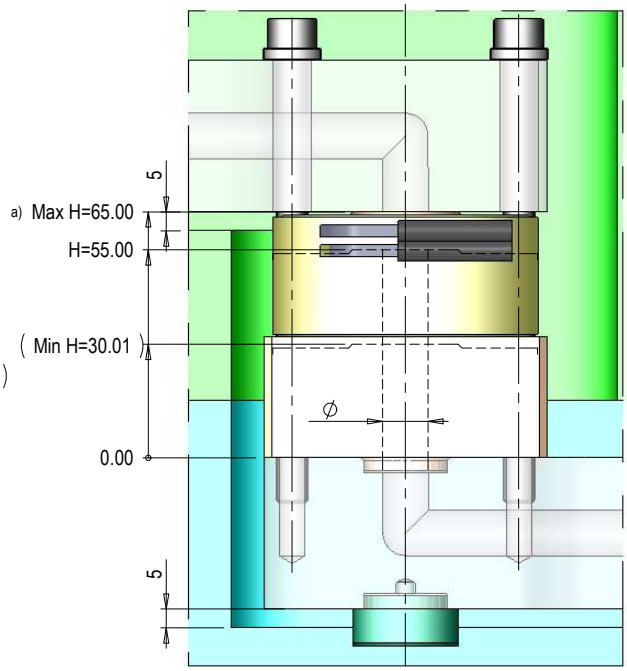




H Standard	Øc=8	Øc=10	Øc=12	Øc=14
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10.00	0009-00380	0009-00384	0009-00388	0009-00392
15.00	0009-00381	0009-00385	0009-00389	0009-00393
20.00	0009-00382	0009-00386	0009-00390	0009-00394

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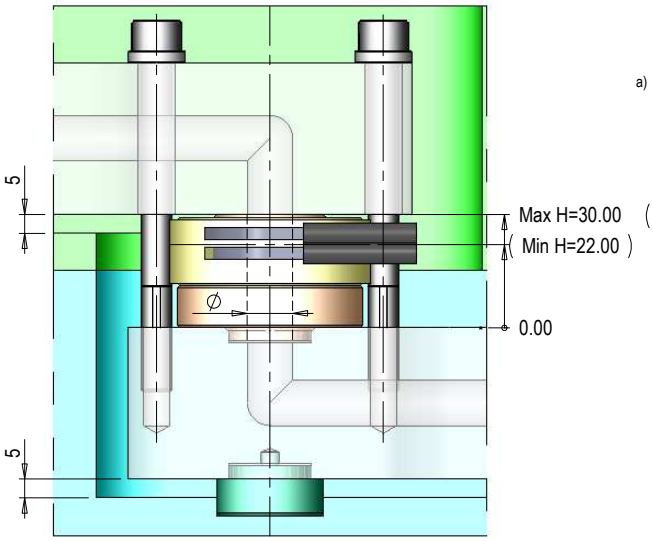
"Square Flange" version



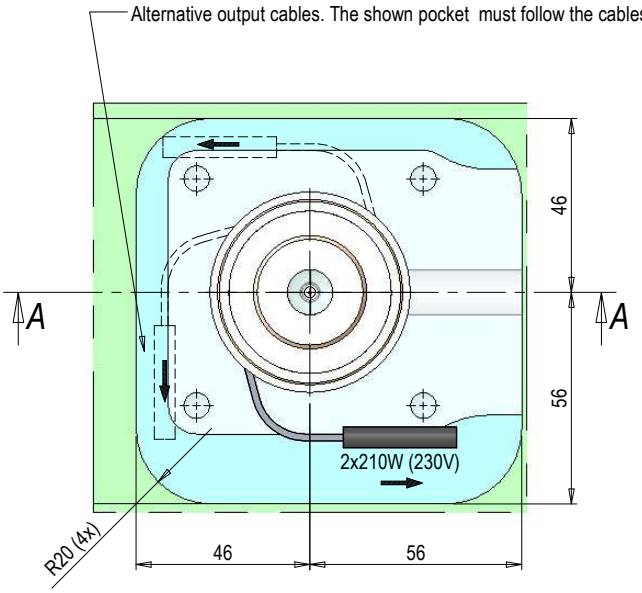
B-B

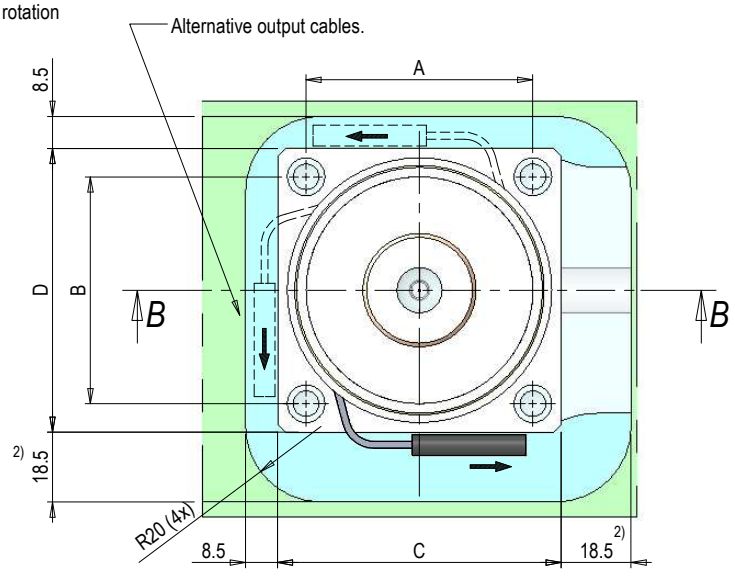
"Round" version

cod. 0009300515 (1)



A-A





(1) Standard reference for tickness H=30mm machinable until H=22mm
Available with holes: min 8 ≤ Ø ≤ 14 max

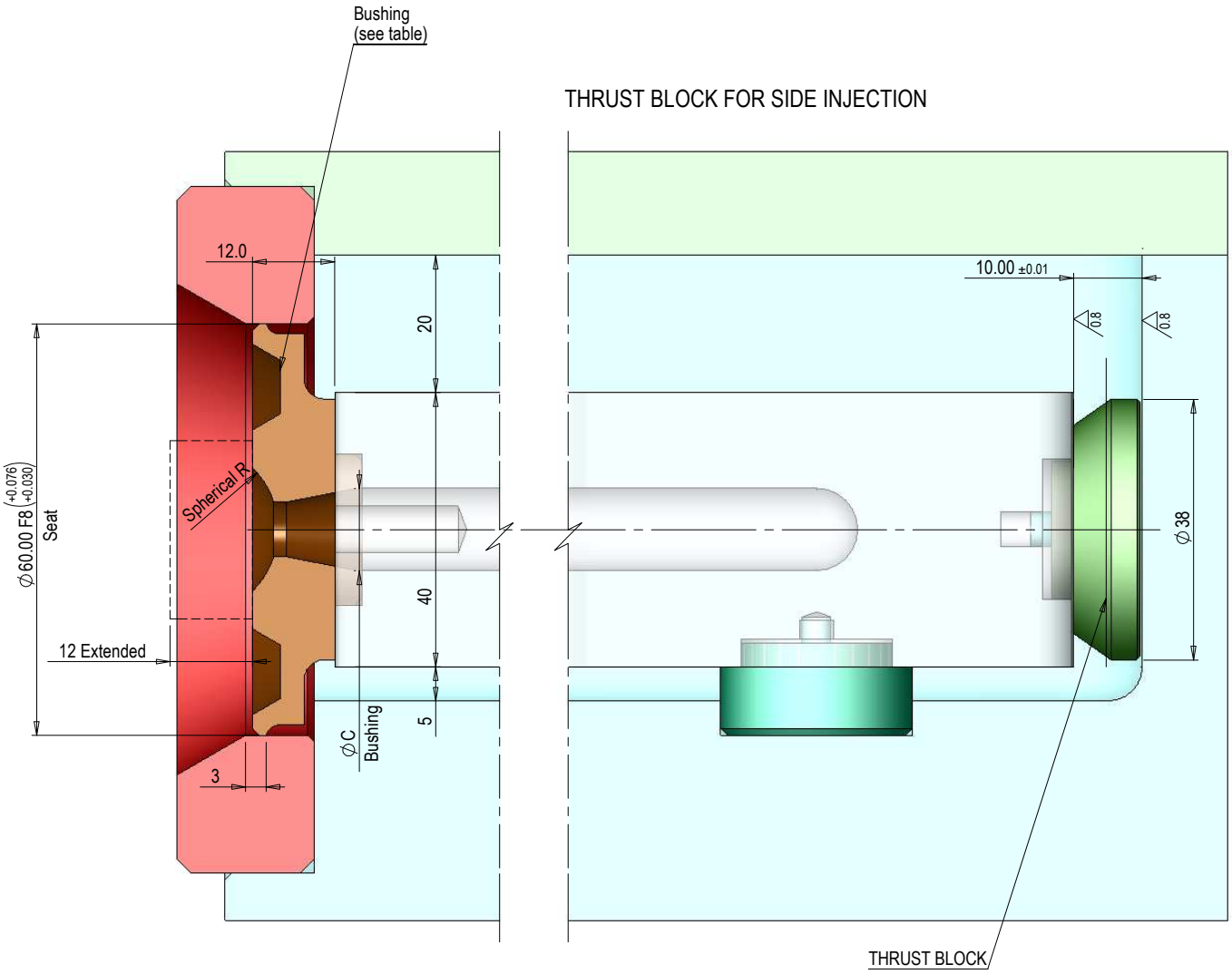
(2) Minimun distance from tickness wall in the corrner of output cables
(valid dimension for all version "AxB" and in all possible rotations)

VERSION A x B	CODE	H Min	H Max	POWER (230V) W	C x D
45 x 45	0009300503	30.01	55.00	2x 120	68 x 68
	0009300504	55.01	65.00	2x 210	
45 x 60	0009300505	30.01	55.00	2x 120	68 x 74
	0009300506	55.01	65.00	2x 210	
60 x 60	0009300507	30.01	55.00	2x 165	75 x 75
	0009300508	55.01	65.00	2x 300	

Available with holes: min 8 ≤ Ø ≤ 14 max

(a) In particular cases, the dim. "H" can be extended over the 65.00mm with the pocket's modification appropriate. The out of range tickness require the prior approval of the HRS techincal office

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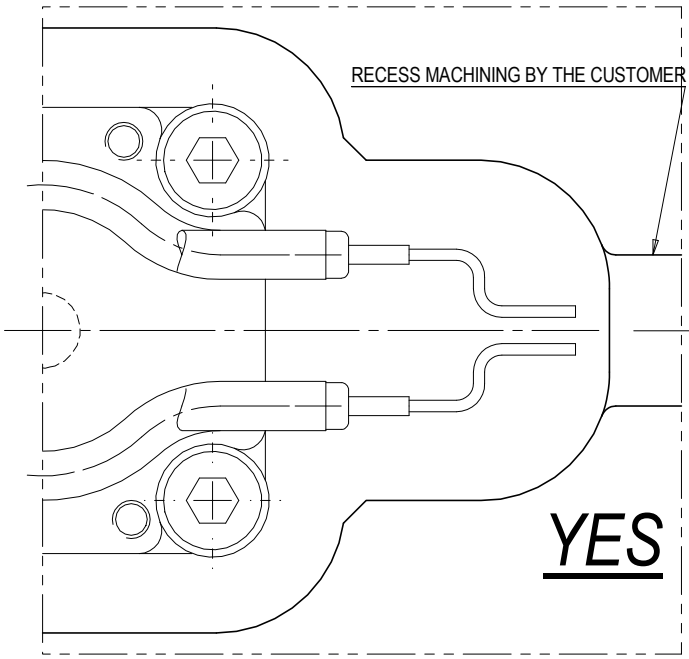


THRUST BLOCK CODE	*BUSHING CODE*		*SPHERICAL RADIUS*
	Øc = 12	*Øc = 14*	
0007-00058	0016-00128	0016-00134	R 0
	0016-00129	0016-00135	R 12.7
	0016-00130	0016-00136	R 15.5
	0016-00131	0016-00137	R 19.1
	0016-00132	0016-00138	R 25
	0016-00133	0016-00139	R40
	0016-00144 Extension	0016-00145 Extended	R0

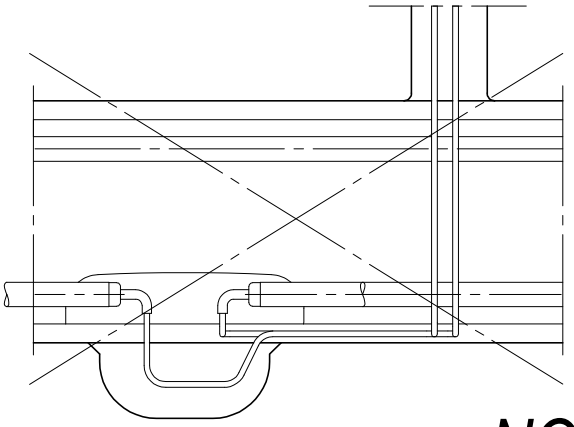
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Available for all series HRS

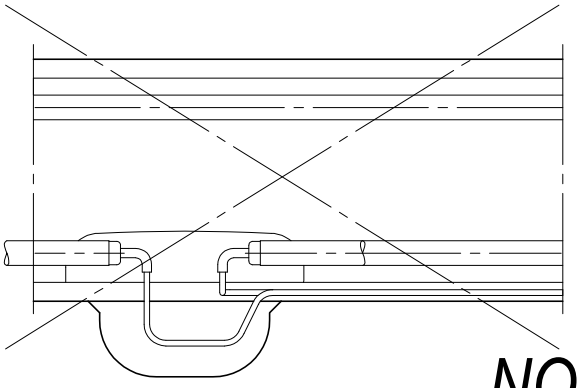
CORRECT WIRING



WRONG WIRING



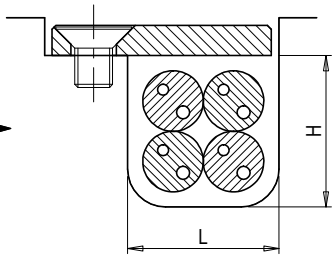
Wrong situation: the cables are not supposed to run over the hot runner



Wrong situation: the cables are not supposed to run at the side of the hot runner

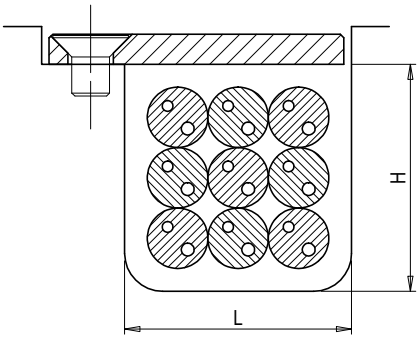
ADVISED CABLE PASSAGE SECTIONS:

Dim."A"



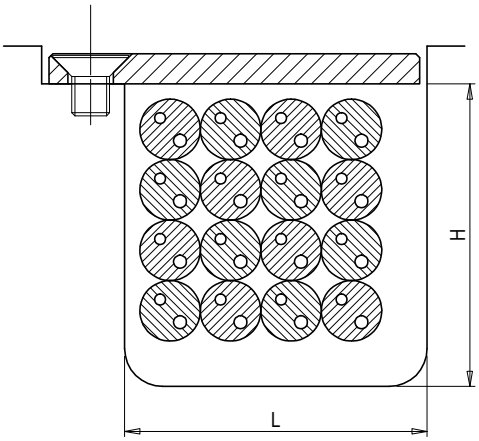
MAX 4 CABLES

Dim."B"



MAX 9 CABLES

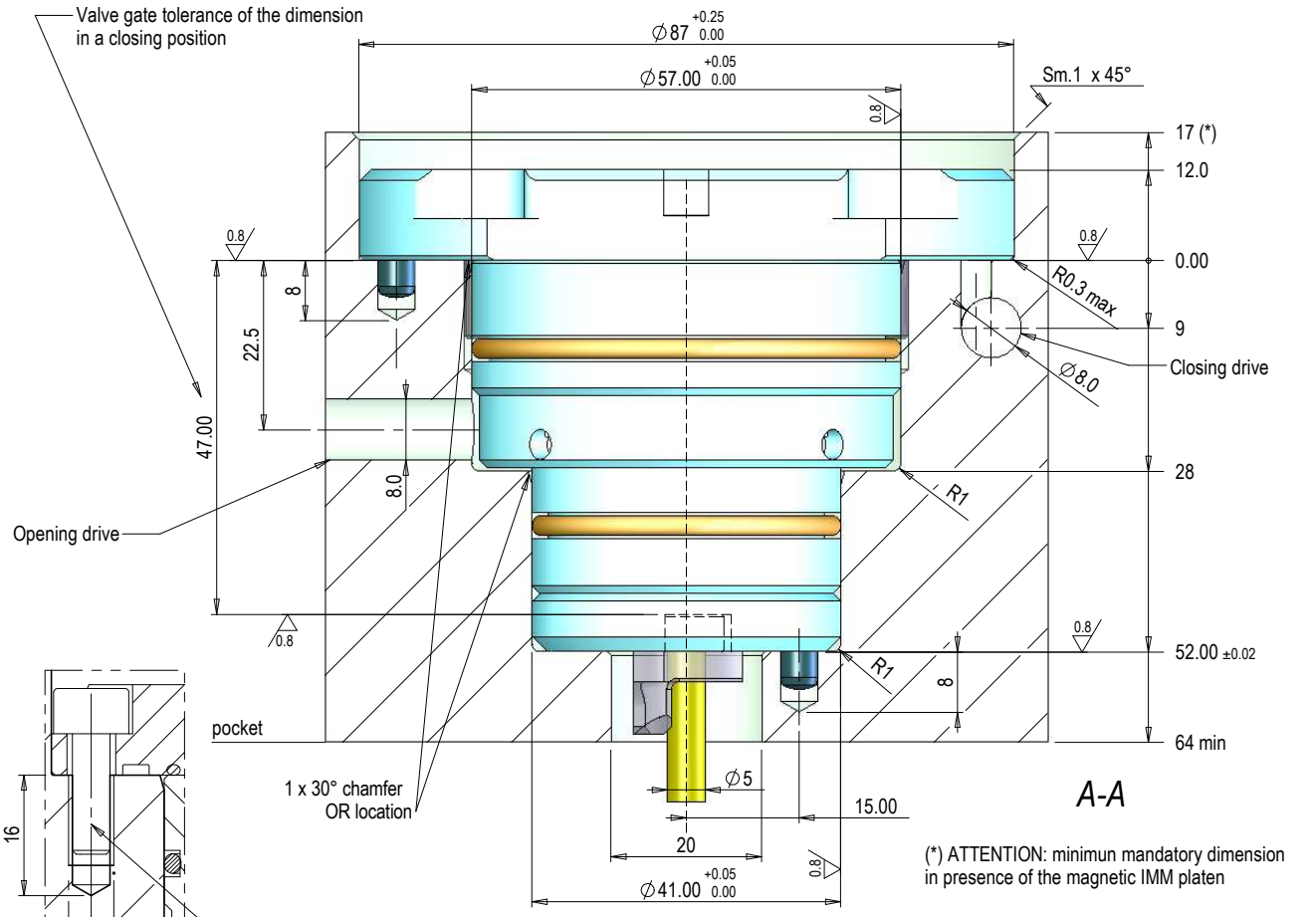
Dim."C"

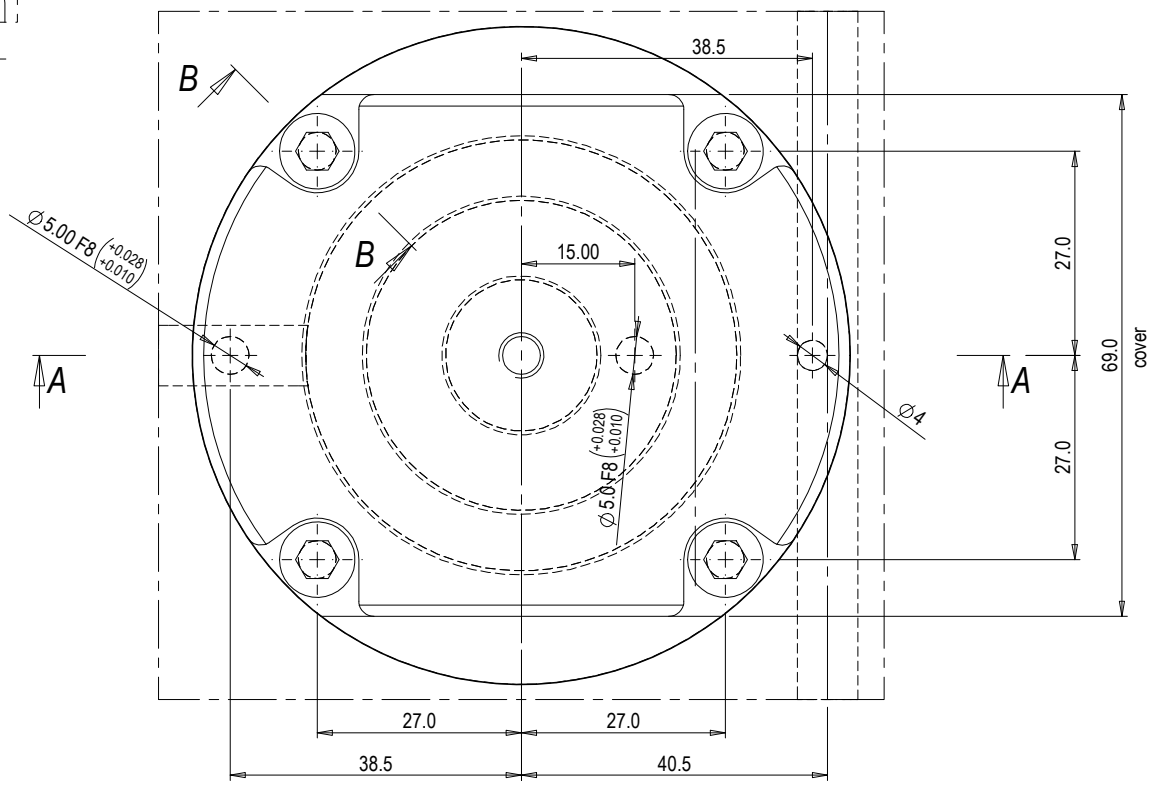


MAX 16 CABLES

	L	H
Dim. "A"	25	30
Dim. "B"	30	30
Dim. "C"	40	40

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The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job

CODE	BORE	STROKE	WORKING		COMPLETE GASKET SET
0017-00091	50	12	AIR	P_{min} = 6 BAR	0038-00032
0017-00099	30	10	OIL	P_{max} = 80 BAR	0038-00062

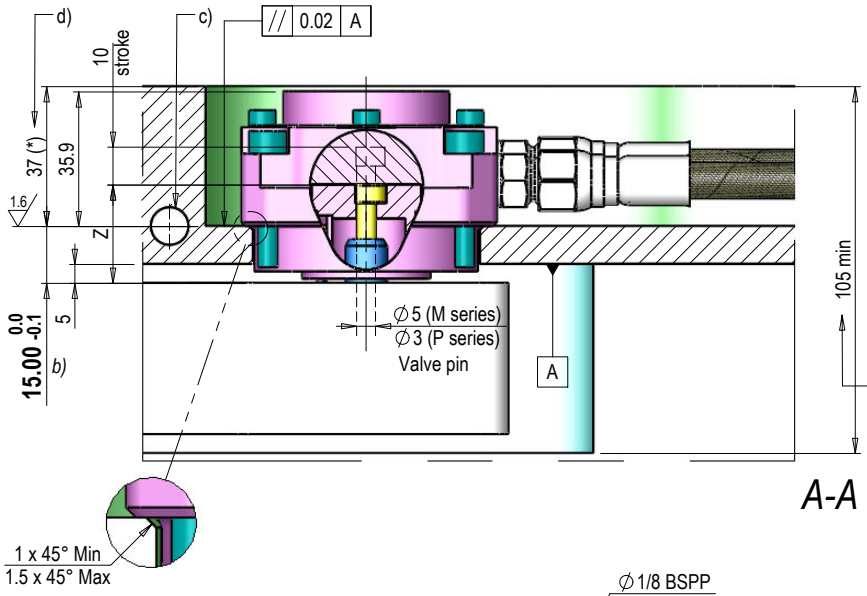
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CYLINDER ON PLATE
3rd VERSION

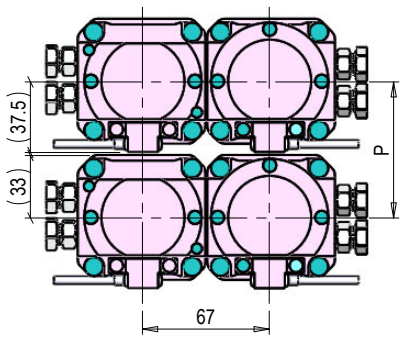
Hydraulic Cylinder: stroke 10 mm

a) Working PRESSURE: HYDRAULIC max 80 BAR

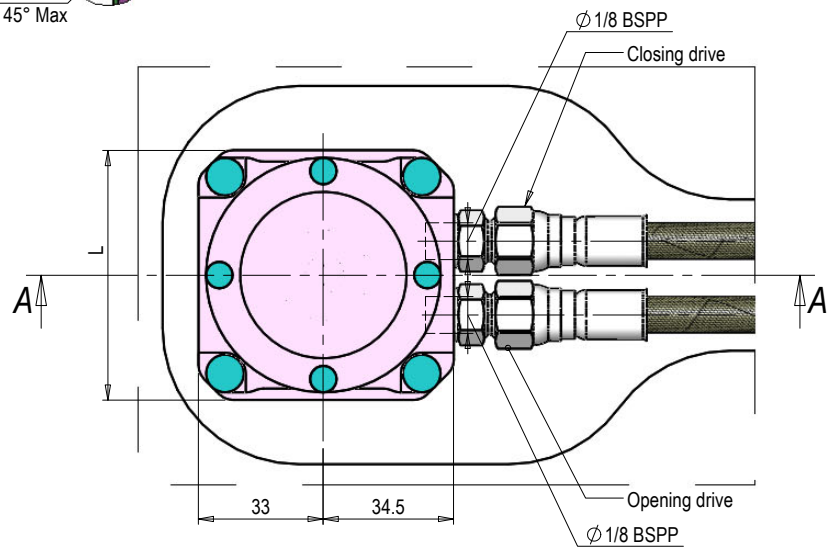
(*) ATTENTION: dimension indicated must be increased +8 mm
in presence of the magnetic IMM platen

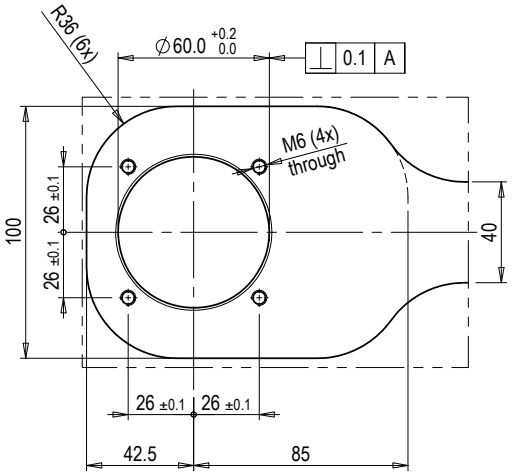


Minimum wheelbase available



Minimum dimension achievable
after check Technical Office HRS





CODE	VERSION (*)	ADJUSTABLE (*)	COMPLETE GASKET SET	L	P	Z
0017-01034	*(standard)*	×	0038-00140	66	67	26
0017-01038		✓				25 ±1
0017-01036	WITH END OF STROKE	×		75	72	26
0017-01040		✓				25 ±1

(*) Adjustment & Installation KIT cod: 0283-00673

NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

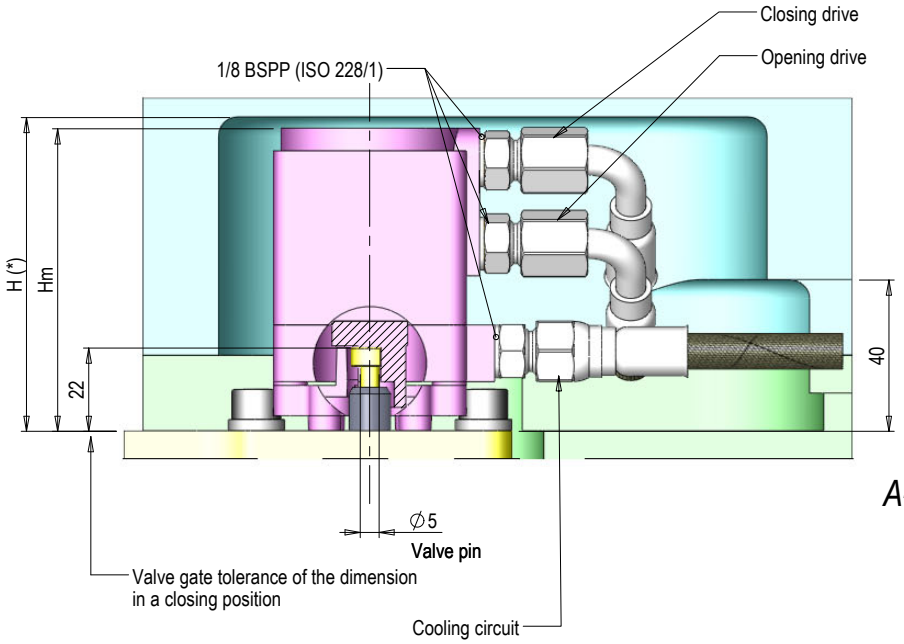
a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Very important dimension. Any derogations to the indicated value must be agreed before with the technical office HRS.
c) Maximum operating temperature of cylinders housing plate: 70°C [158 F°]. If is necessary, thermoregulate the plate temperature by providing cooling circuits dedicated for purpose.
d) Avoid the use any type of insulation plate between cylinders housing plate and IMM plate.

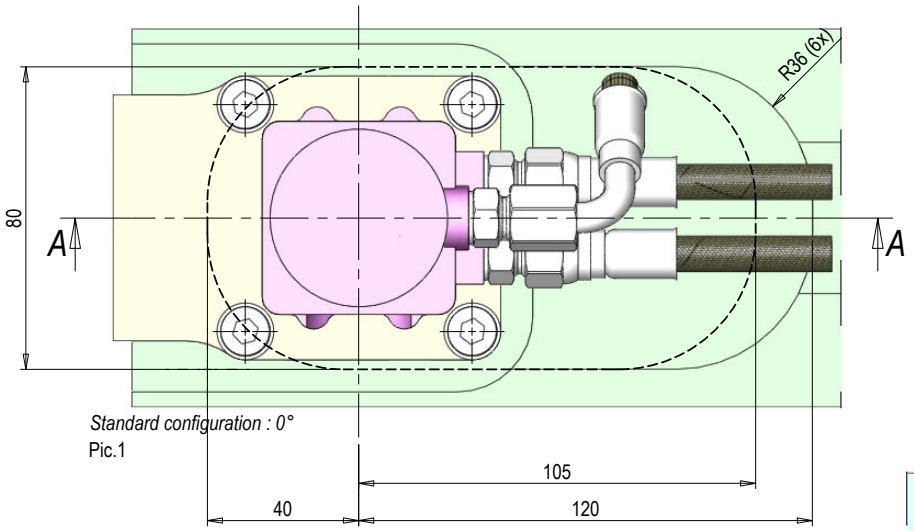
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Hydraulic Cylinder: bore 30 mm - stroke 12 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

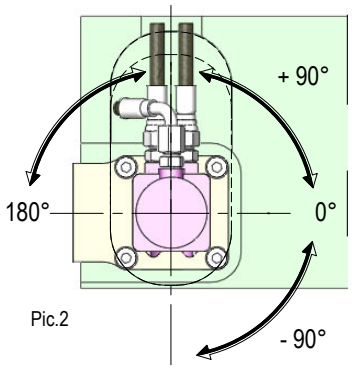
(*) ATTENTION: minimun mandatory dimension
in presence of the magnetic IMM platen





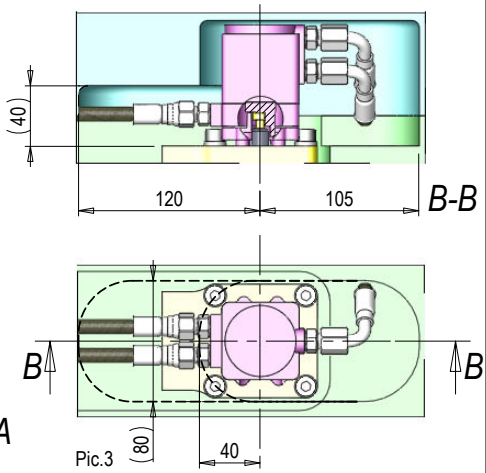
Standard configuration : 0°
Pic.1

b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



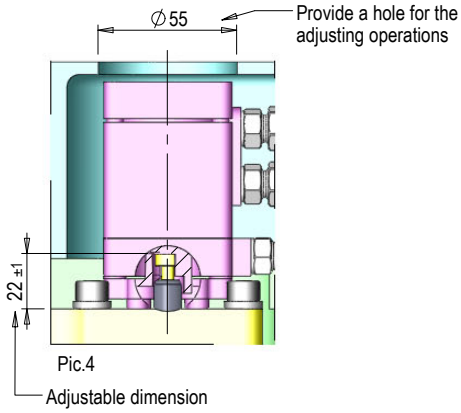
Pic.2

ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



Pic.3

ADJUSTABLE CYLINDER



Pic.4

CODE	VERSION	COMPLETE GASKET SET	Hm	H
0017-01074	*(standard)*	0038-00104	80	83
0017-01080	DAMPENED	0038-00105	80	83
0017-01086A	ADJUSTABLE	0038-00141	90	93
0017-01076A	WITH 1 END OF STROKE	0038-00106	99	102
0017-01078A	WITH DOUBLE END OF STROKE	0038-00106	99	102

NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

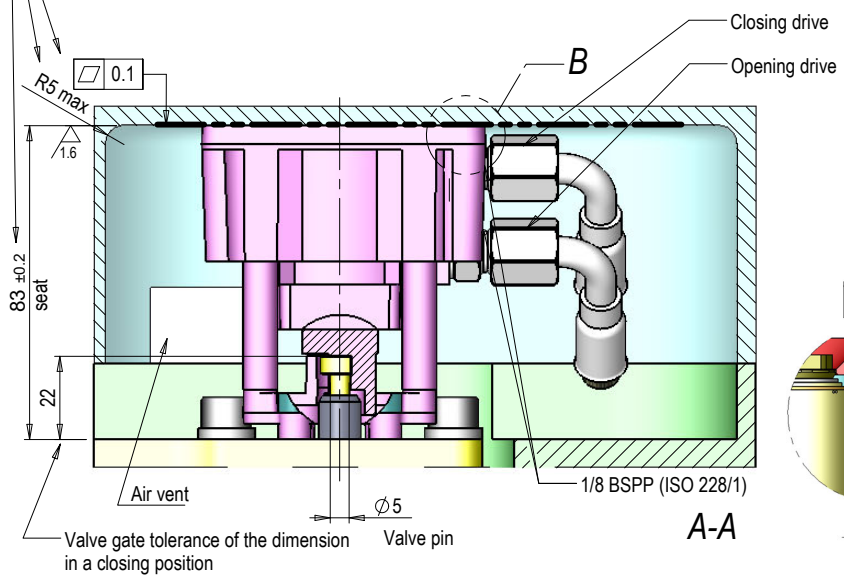
NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

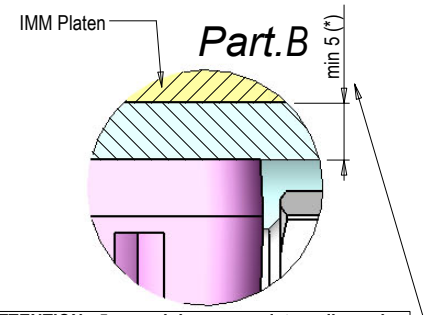
a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1;

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Hydraulic Cylinder: bore 30 mm - stroke 12 mm - passive cooling (HRS COOL)

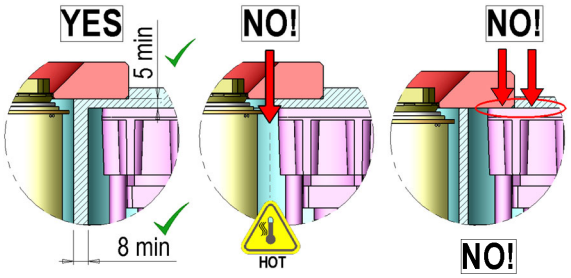
Cylinder's upper surface **totally in contact** with the lower surface of the seat obtained on the clamping plate. The contact surface **must be one and continuos**. The seat's tolerances must be respected!

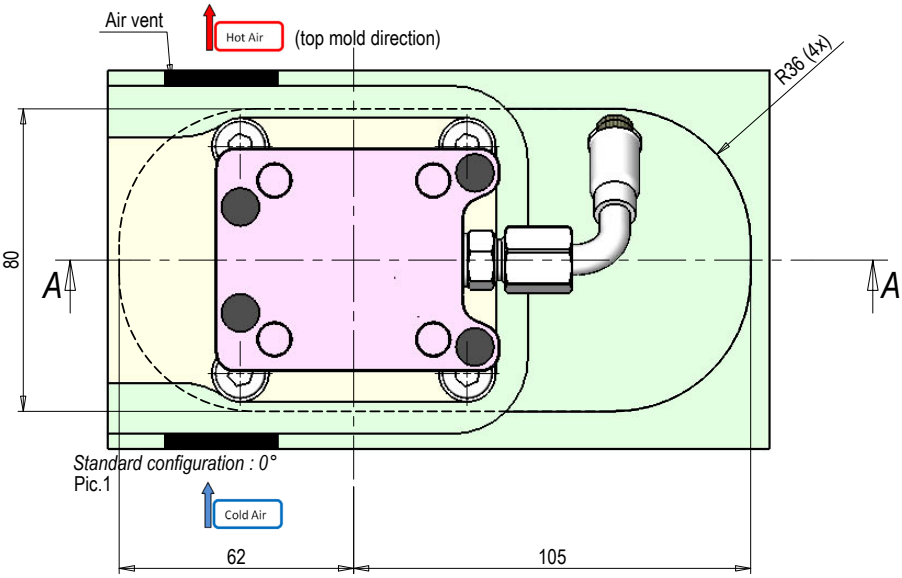


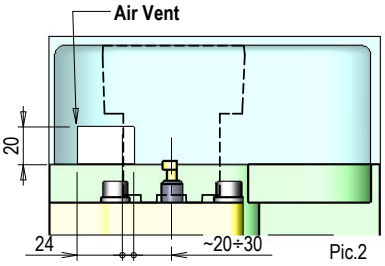


(*) ATTENTION: 5 mm minimum mandatory dimension. In presence of the magnetic IMM Platen increase dimension to "minimum 30 mm".

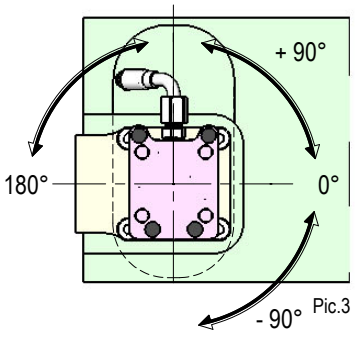
WARNINGS FOR THE SEAT REALIZATION







a) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



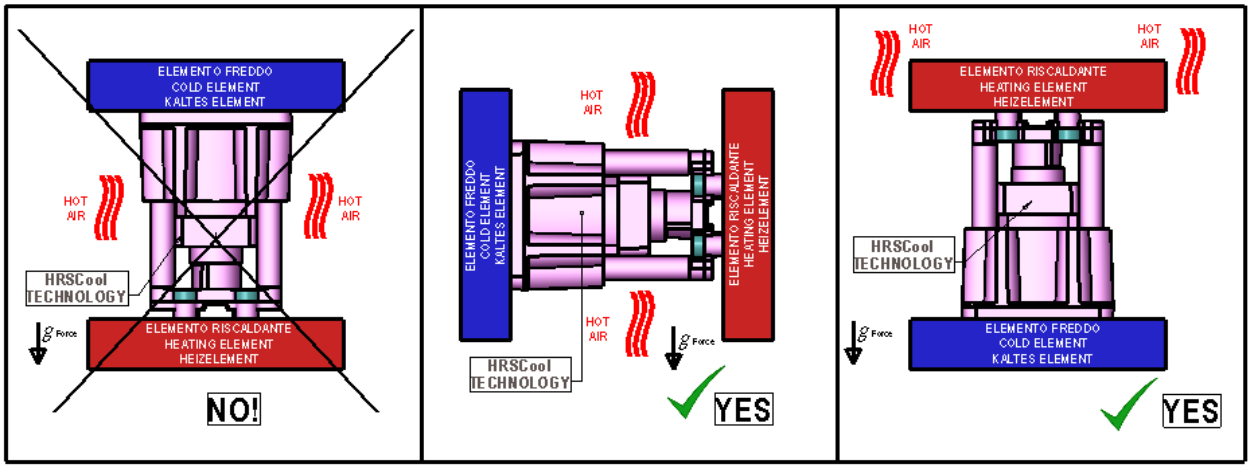
a) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1

CODE	VERSION	COMPLETE GASKET SET
0017-00542	*(standard)*	0038-00104
0017-00543	DAMPENED	0038-00105

follow

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VERTICAL I.M.M. HORIZONTAL I.M.M. VERTICAL I.M.M.



Pic.4

System requirements (**):

1- Maximum temperature allowed: T hot runner manifold: max 280°C [536°F] - T mold: max 60°C [140°F].
2- In case of cylinder plate temperature is higher than 60°C [140°F], it is mandatory to cool it at the temperature ≤ 60°C [140°F].
3- Working PRESSURE: HYDRAULIC max 80 BAR (absolute value).
The working pressure is only for reference: for the correct value of the maximum allowed working pressure, please refer to the specific steel plate provided for each HRSFlow job.
4- Air vents in the cylinder plate is highly recommended to evacuate hot air:
- The air vents must pass through the plate from bottom to top mold in proximity of the cylinders. Distance from the air vent to the valve pin axis: 20÷30mm (Pic.1 & Pic.2);
- Due to hot air, avoid the exit of the air vents in proximity of electrical boxes eventually present on top mold;
- The minimum dimensions requested for the air vents are: 30mm (width) x 20mm (depth).
5- The HRSCOOL technology is permitted in the vertical injection moulding machine but only if the heating elements (i.e.: the manifold) are placed in an upwards position in respect to the cylinders and to the cold elements (i.e.: mould plate). It's necessary to avoid the cylinder heated by the hot air coming from hot elements (Pic.4).
6- The minimum distance from cylinder to HRS extension "Xmin" must be respected: see notes pag. 4.M2.03. For special cases, please contact the HRS Technical Office.

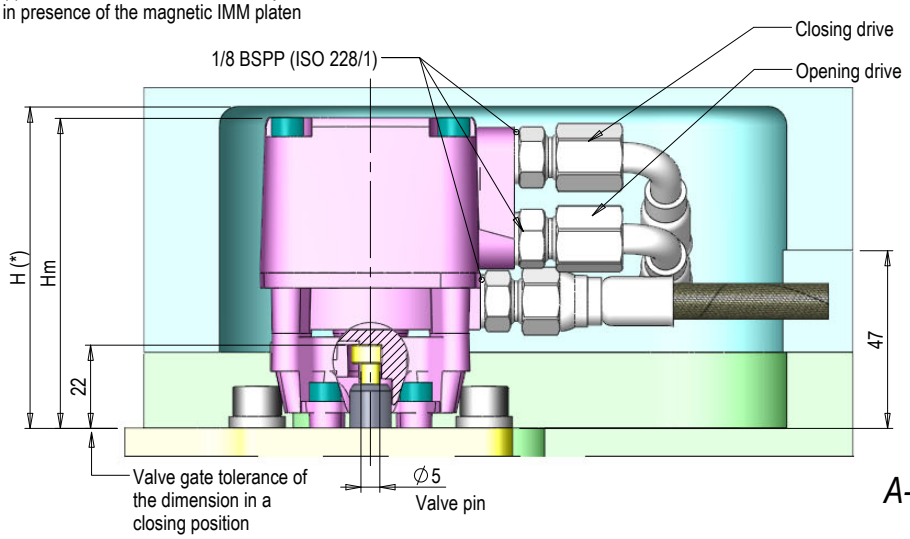
(**) ATTENTION: in particular conditions of the system, the seat of the cylinder ''HRS COOL'' might be modified. In this case the HRS Technical Office will provide the necessary documentation.

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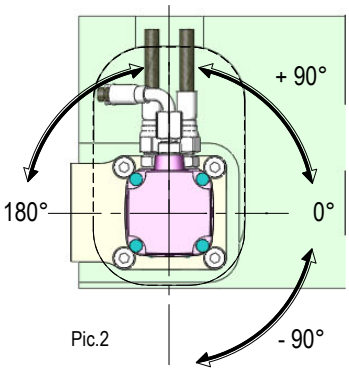
Pneumatic Cylinder: bore 50 mm - stroke 12 mm

a) Working PRESSURE: AIR max 12 BAR

(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen

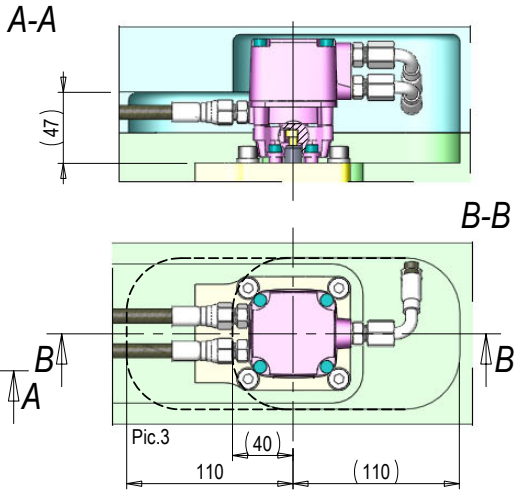


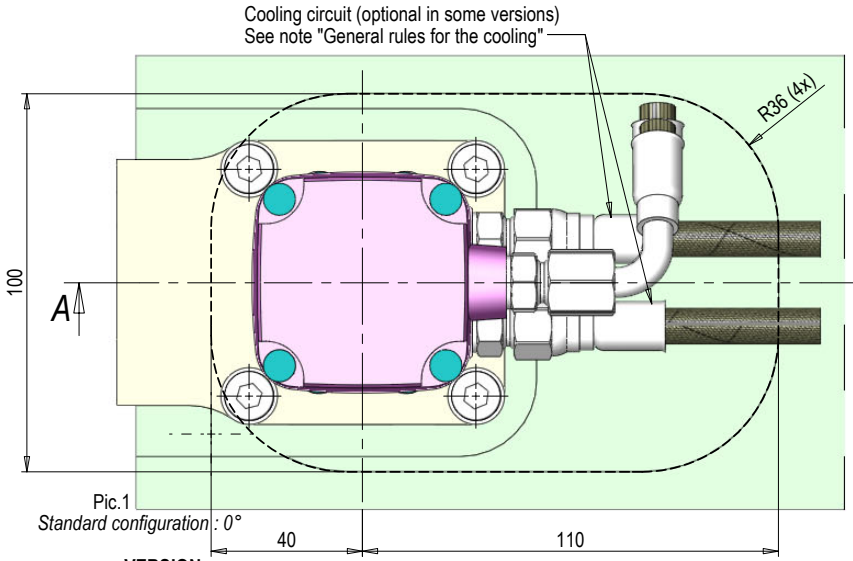
b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



Pic.2

c) **ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT**

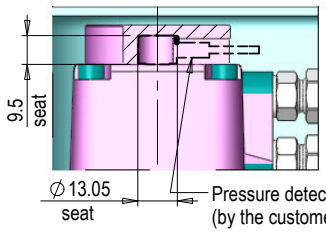




Pic.1

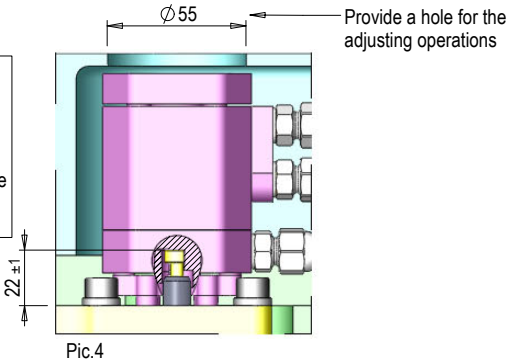
Standard configuration : 0°

VERSION PREARRANGED FOR TRANSDUCER



NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

ADJUSTABLE CYLINDER



Pic.4

CODE	VERSION	COOLED	DAMPENED	COMPLETE GASKET	Hm	H
0017-00892	(standard)	✓	×	0038-00128	82	85
0017-00893		×	×			
0017-00895		✓	✓	0038-00129		
0017-00896		×	✓			
0017-00898	WITH 1 END OF STROKE	✓	×	0038-00130	101.5	104.5
0017-00902		✓	✓	0038-00131		
0017-00900	WITH DOUBLE END OF STROKE	✓	×	0038-00130		
0017-00904		✓	✓	0038-00115		
0017-00906	PREARRANGED FOR TRANSDUCER	✓	×	0038-00131	95	98
0017-00907		×	×			
0017-01188	ADJUSTABLE	✓	×	0038-00128	92	95
0017-01189		×	×			

T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximum Mold temperature

GENERAL RULES FOR THE COOLING
- Versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of T1 ≤280°C [536°F] and T2 ≤80°C [176°F]
- Versions with end of stroke: cooling ALWAYS MANDATORY with T1≥200°C [392°F] also after shut off of the mold/hot runner systems.
- During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
  - 100°C [212°F] Temperature of the mold
  - 300°C [572°F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

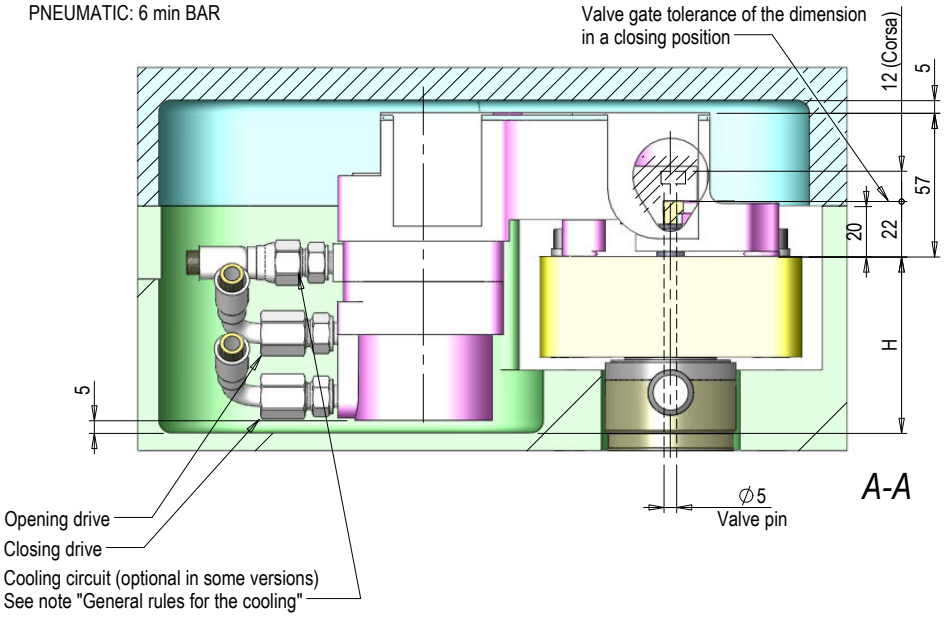
a) The working pressure is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1;

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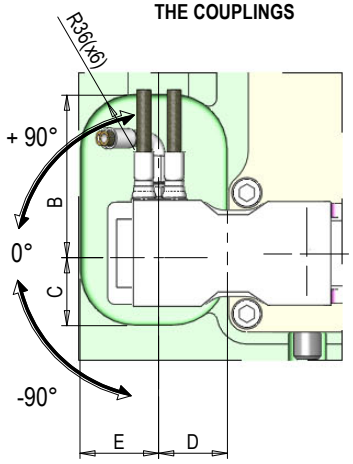
Oil cylinder: bore 42 mm - stroke 12 mm
Air cylinder: bore 70 mm - stroke 12 mm

(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen

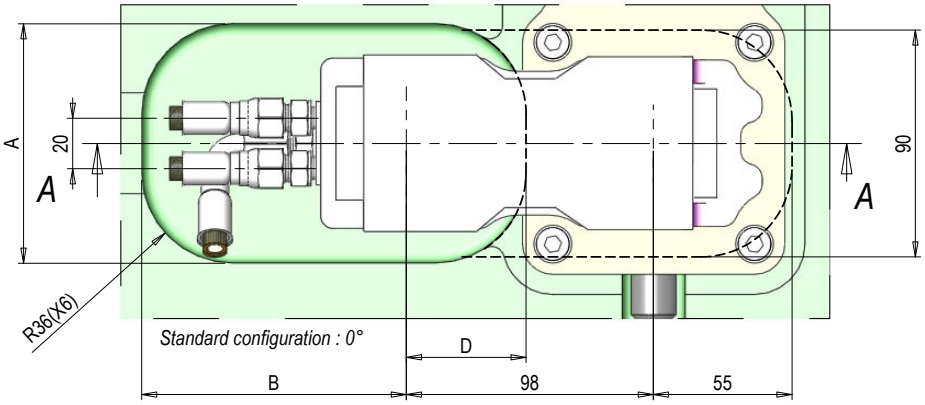
a) Working PRESSURE:
OIL: 40 max BAR
PNEUMATIC: 6 min BAR

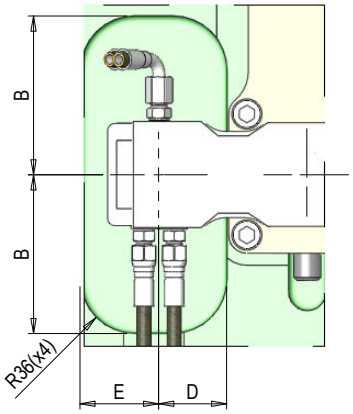


b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**

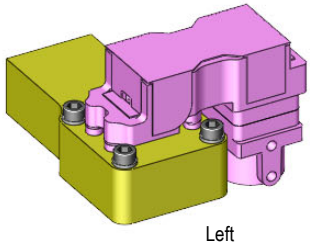


ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT

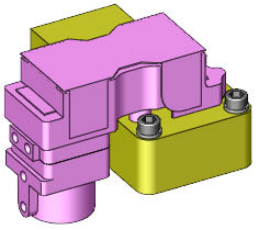




POSSIBILE ORIENTATIONS CYLINDER ON MANIFOLD



Left



Right

CODE	WORKING	DESCRIPTION	COOLED	COMPLETE GASKET SET	SEAT					
					A	B	C	D	E	H
0017-01146A	OIL	(standard)	✓	0038-00102	95	105	47.5	45	52	70
0017-00858A	AIR	(standard)	✓	0038-00133	110	120	55	55	55	59

GENERAL RULES FOR THE COOLING
- Pneaumatic versions with optional cooling: is NOT MANDATORY to cooling the cylinderin presence of T1 ≤280°C [536°F] and T2 ≤80°C [176°F]
- Versions with end of stroke: cooling ALWAYS MANDATORY with T1≥200°C [392°F] also after shut off of the mold/hot runner systems.
- During the shutdown phase of the HRS system, the cooling circuit

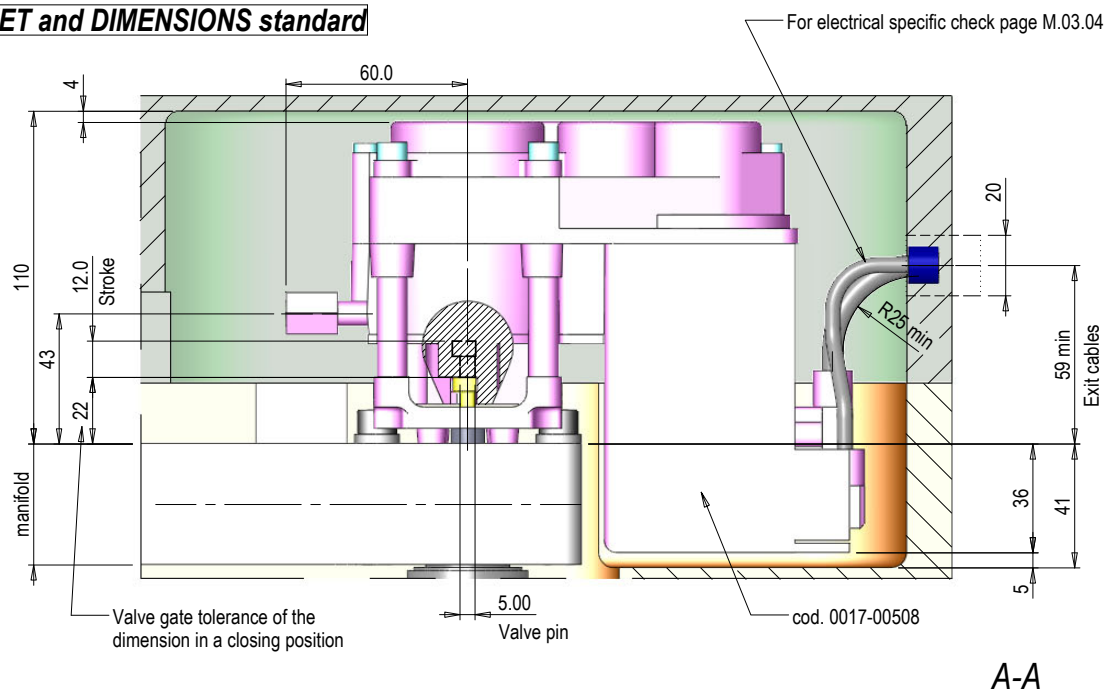
of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- HYDRAULIC => 60°C [140°F] Temperature of the mold - 280°C [536°F] Temperature of the hot runner system
- PNEUMATIC => 100°C [212°F] Temperature of the mold - 300°C [572°F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

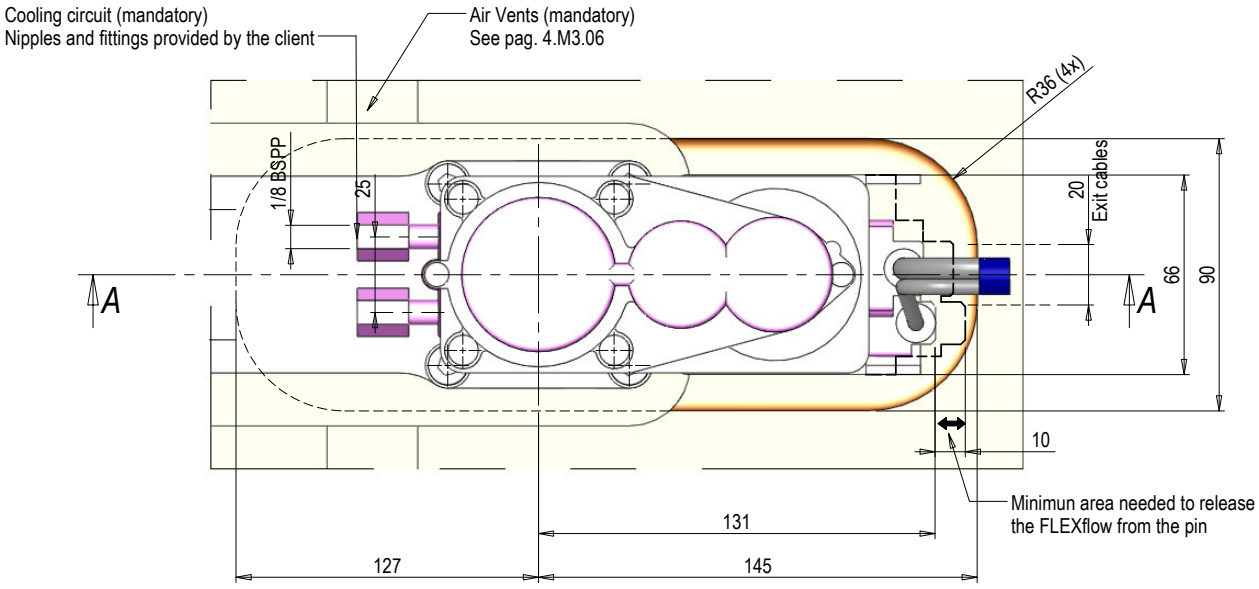
a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1;

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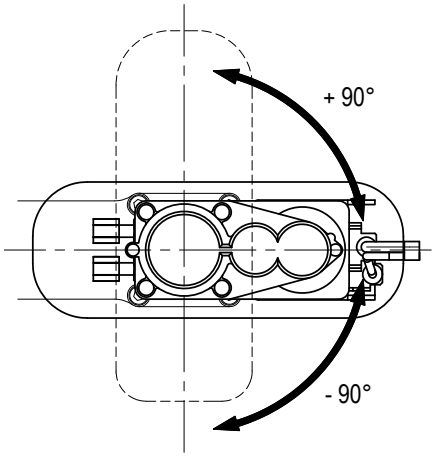
POCKET and DIMENSIONS standard



A-A



POSSIBLE ORIENTATIONS ON MANIFOLD



The configuration +/-90° is obtained turning the FLEXflow on manifold on the hot runner axis, together with its standard seat

General rules for the cooling of the FLEXflow on manifold

T1 (°C) = Max molding temperature of polymer
Tc (°C) = Coolant temperature

1) Maximum N° of actuators per single cooling circuit:

n°3 ==>		T1 ≤ 270°C [518°F]
n°2 ==>	[518°F] 270°C <	T1 ≤ 300°C [572°F]
n°1 ==>	[572°F] 300°C <	T1 ≤ 320°C [608°F]

2) Maximum incoming coolant temperature Tc ≤ 25°C [77°F]

3) Minimum flow rate for each cooling circuit: 3 l/min

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General rules for the cooling of the FLEXflow on manifold

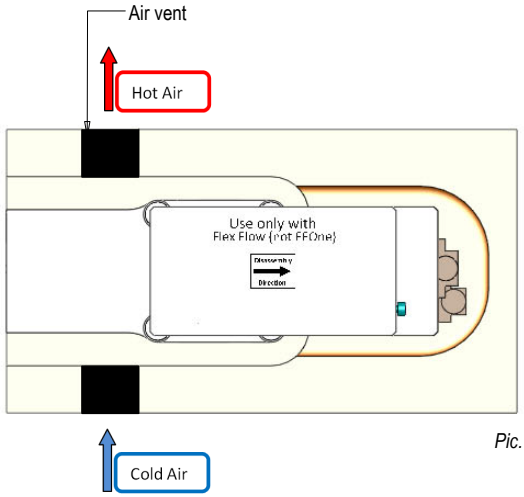
Air vents

It's **always** mandatory to provide air vents in the manifold plate for hot air removal.

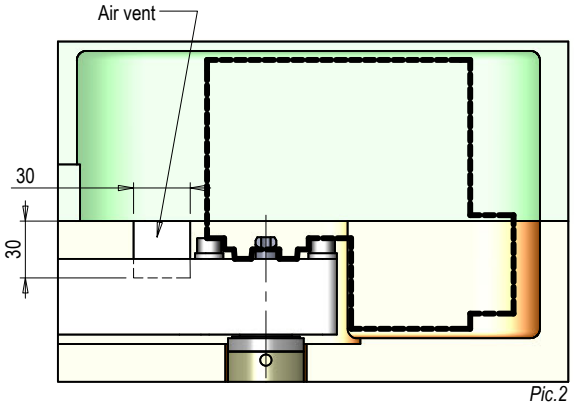
- The air vents must pass through the plate from bottom to top mold, avoiding to pass in the area of the electric motors (Pic.1/2)

- Avoid hot air exit from vents near electrical boxes eventually present on top mold, driver modules included.

- The minimum dimensions requested for Air vents are: 30mm (width) x 30mm (depth)



Pic.1

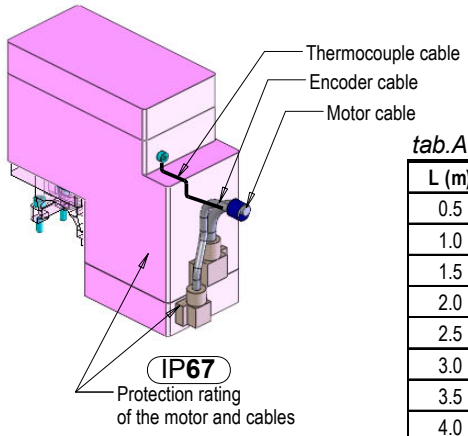


Pic.2

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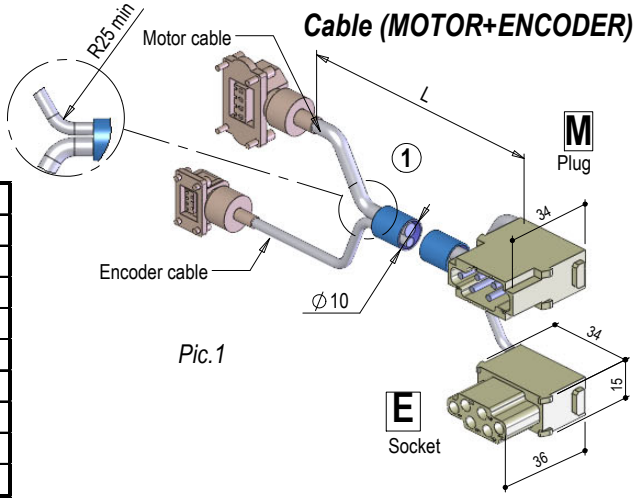
Electricals specification for FLEXflow

Every actuator group is electrically powered through a couple of cables (ENCODER+MOTOR). For cable codes with available lenghts see table "A".
The cable is supplied separated from the group; its lenght must be carefully calculated during wiring design.
The temperature of the actuator group is monitored through a ungrounded J Type thermocouple cable (supplied with actuator group).

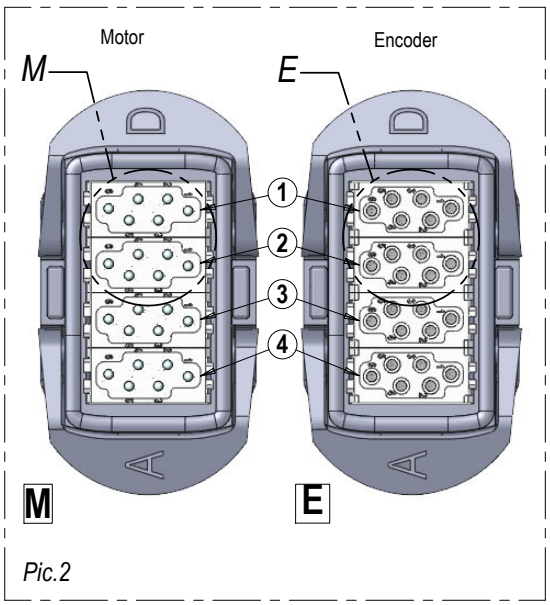


tab.A

L (m)	Code
0.5	0093-00173
1.0	0093-00174
1.5	0093-00135
2.0	0093-00136
2.5	0093-00137
3.0	0093-00138
3.5	0093-00139
4.0	0093-00140
4.5	0093-00175



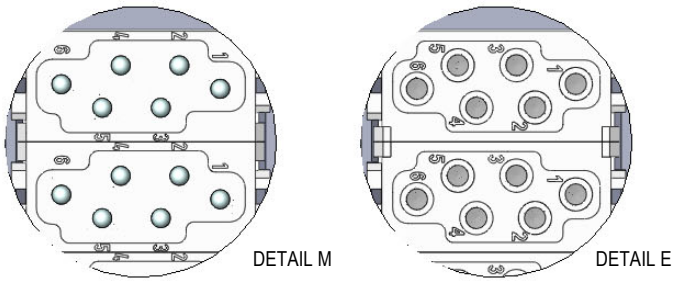
Pic.1



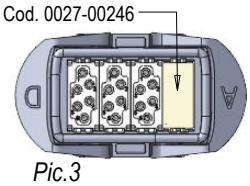
Pic.2

NOTES:

1) The Plug and Socket of the same cable must be put in their housing with the same sequence (Pic.1 & 2)

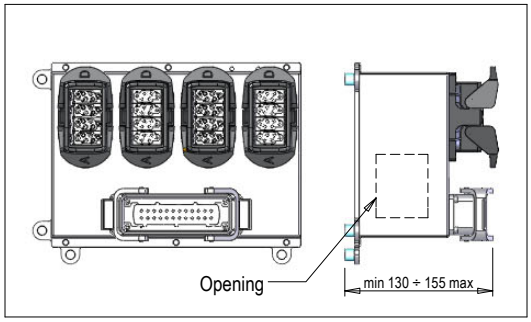


2) Always cover empty positions on the housing (Pic.3)

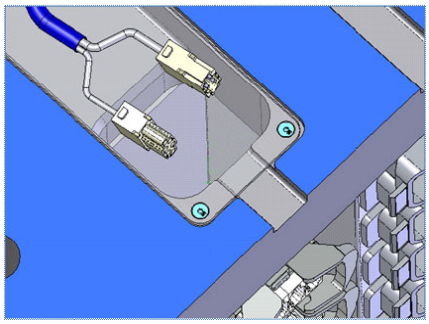


Pic.3

3) ENCODER+MOTOR cable (Pic.1) is provided yet wired. Openings on electrical box (supplied by HRS) or forced groove on the mold must take into consideration enough clearance for the connectors (see pic. 4-5)



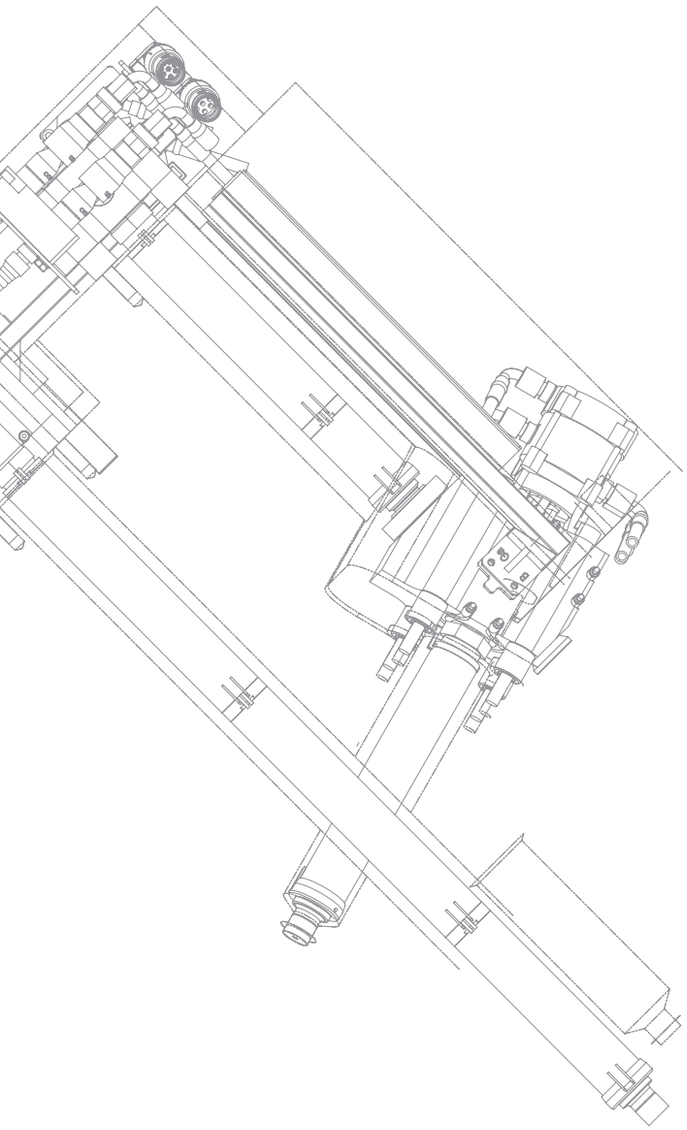
Pic.4



Pic.5

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oerlikon
hrsflow



G

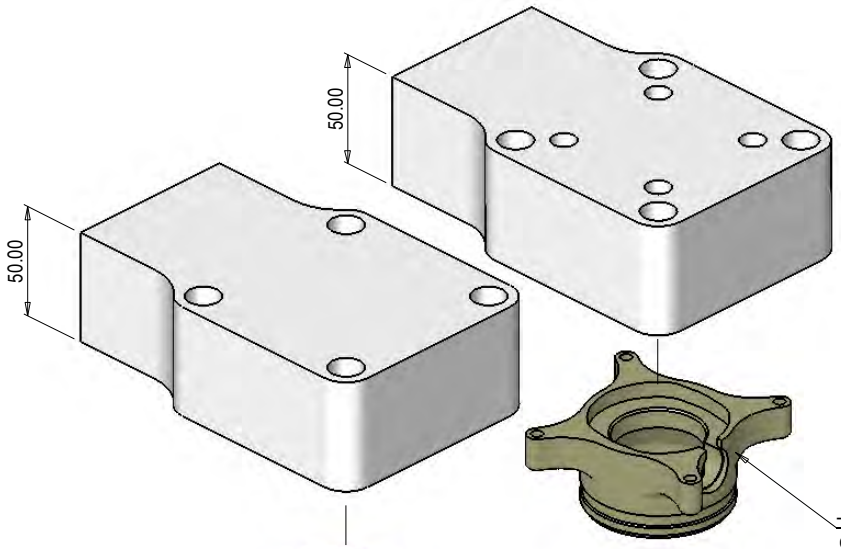
G Series 100÷1225 cm³/s

Serie G
G Serie
G Série
G Serie
G Série

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EXPLODED NOZZLE COMPONENT



-Ep- wired nozzle body
cod. 0043-00156

-Gp- Nozzle body
cod. 0043-00049 (single zone)
cod. 0043-00077 (double zone)

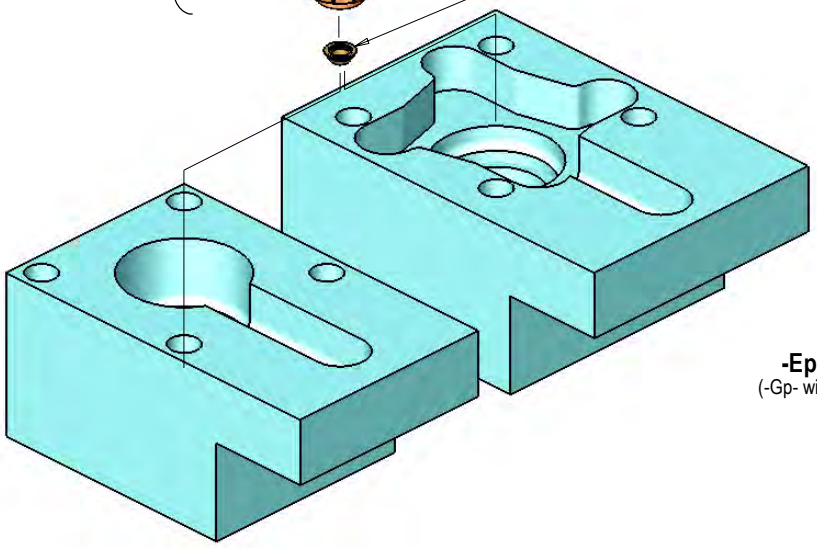
-Gp- Classic / Fail Safe nozzle duct
cod. 0221-_ _ _ _ _
(valid for -Ep- series wired version too)

For all reference codes see on page 4.G1.13-14

Tip series -Gp- code 0012-_ _ _ _ _

Ring nut code -Gp- 0013-_ _ _ _ _

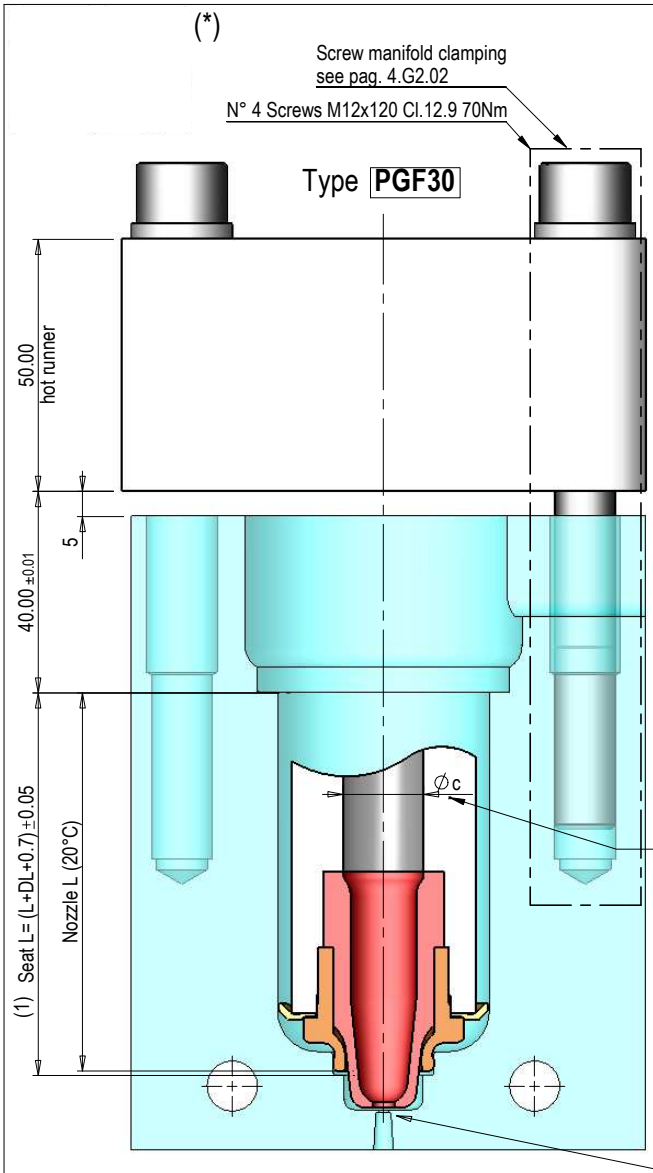
Antistagnation Ring -Gp- cod. 0262-_ _ _ _ _ (optional)



-Gp- series

-Ep- series
(-Gp- wired version)

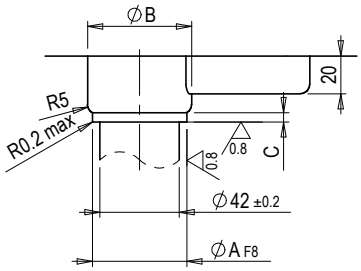
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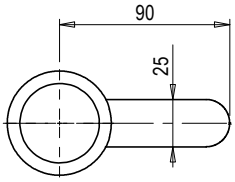
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

-Gp- series

Single zone / Double zone



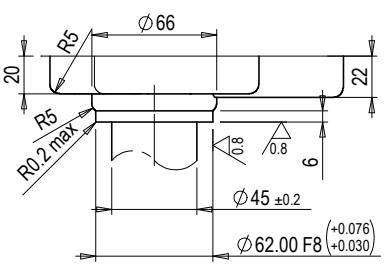
Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8

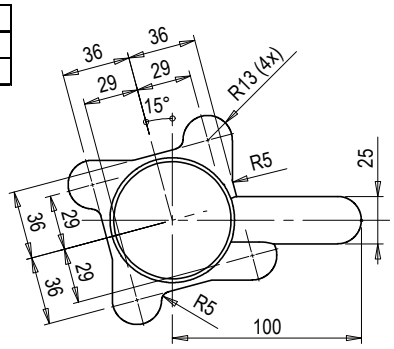


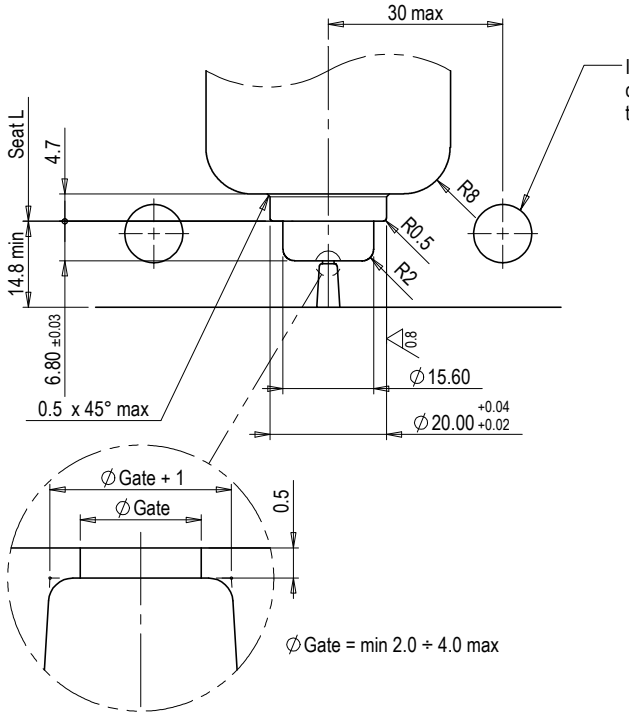
-Ep- series

(-Gp- wired version)

Single zone / Double zone







Independent and dedicated cooling circuit to be foreseen in the area of the injection point

For all reference codes see on page 4.G1.13-14

(1) For "Seat L" calculation see pag. 4.G1.14a table A

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**)Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

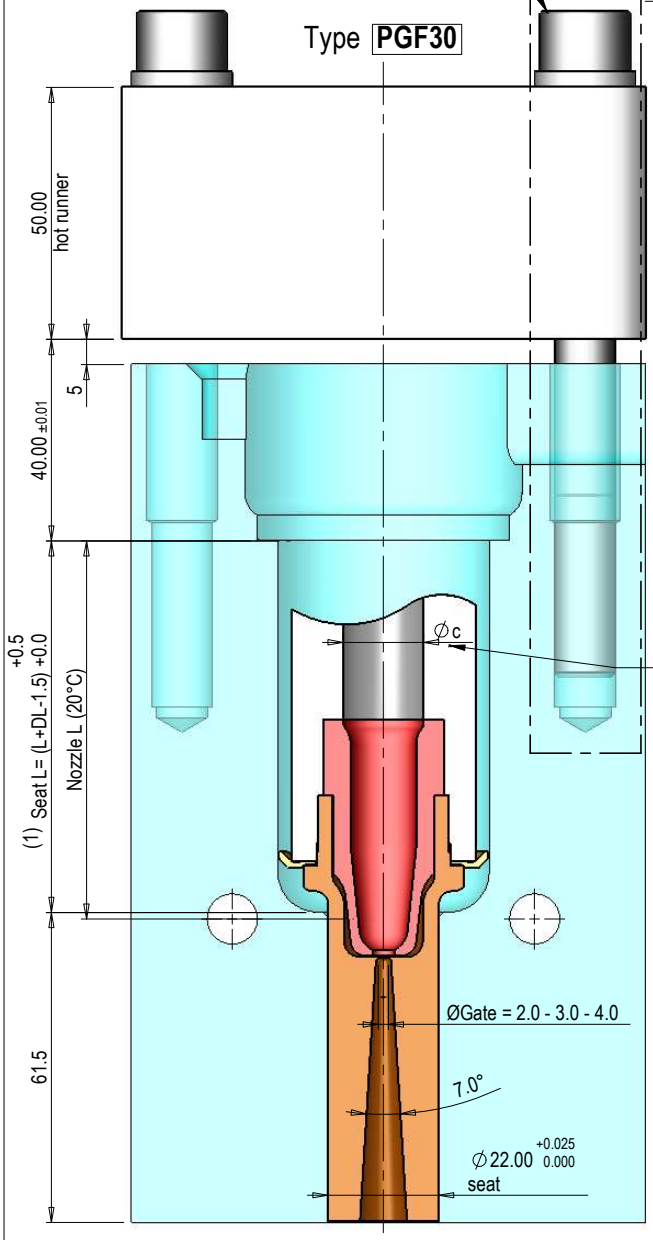
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(*)

Screw manifold clamping
see pag. 4.G2.02

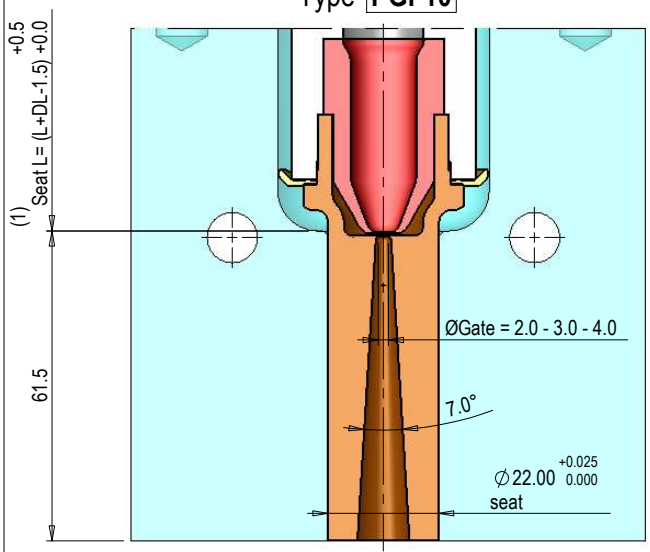
N° 4 Screws M12x120 Cl.12.9 70Nm

Type **PGF30**



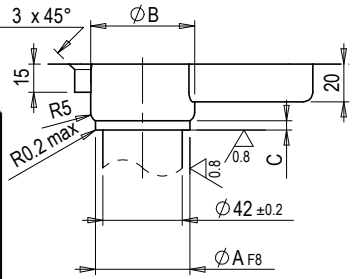
Nozzle Øc=16 - 18
available in Classic Line or
Fail Safe version

Type **PGF10**



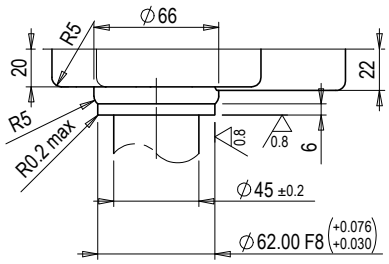
-Gp- series

Single zone / Double zone

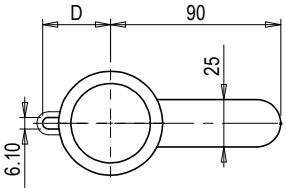


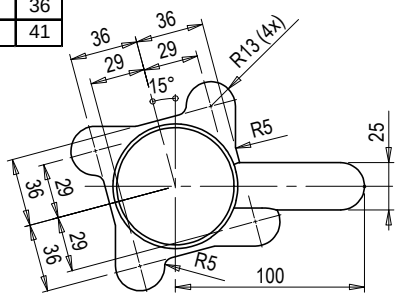
-Ep- series

(-Gp- wired version)
Single zone / Double zone

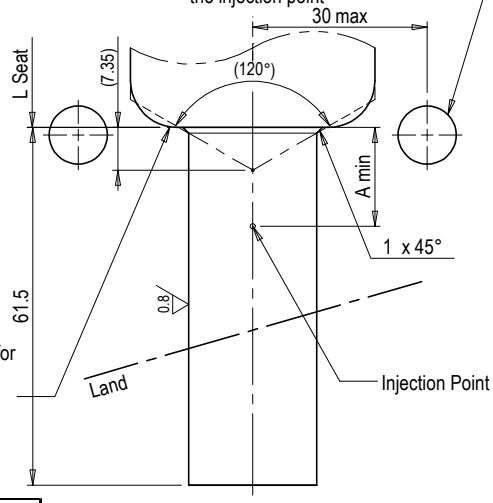


Iniettore con	A	B	C	D
Singola Zona	50.00	55	5	36
Doppia Zona	62.00	65	8	41





Independent and dedicated cooling circuit to be foreseen in the area of the injection point



On brackets dimensions for alternative seat profile (tool tip 120°)

TYPE	A [mm]
PGF30	17
PGF10	11

For all reference codes see on page 4.G1.13-14

(1) For "Seat L" calculation see pag. 4.G1.14a table B

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**) Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

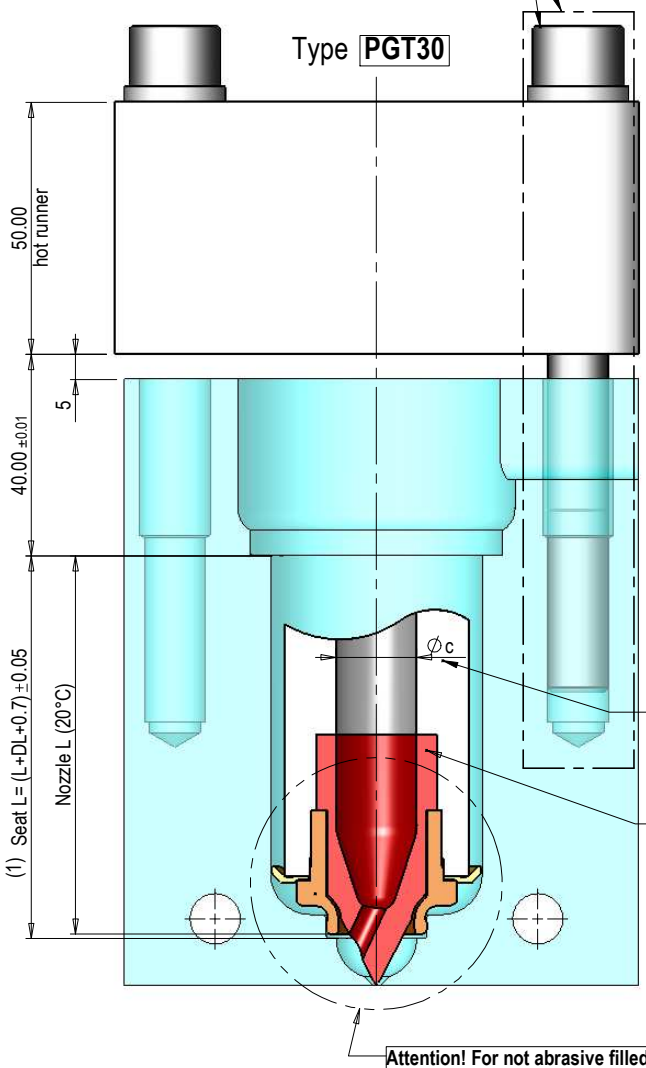
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(*)

Screw manifold clamping
see pag. 4.G2.02

N° 4 Screws M12x120 Cl.12.9 70Nm

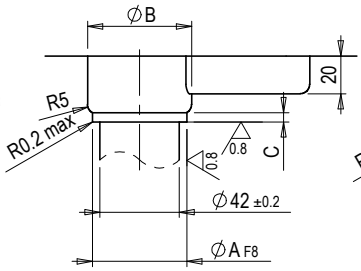
Type **PGT30**



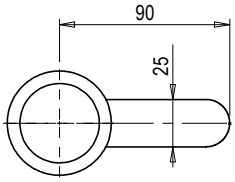
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

-Gp- series

Single zone / Double zone

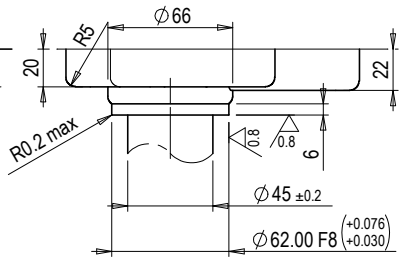


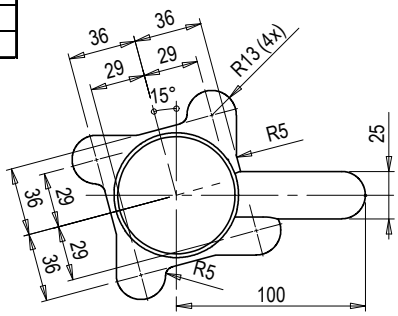
Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8

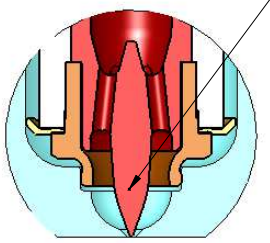


-Ep- series

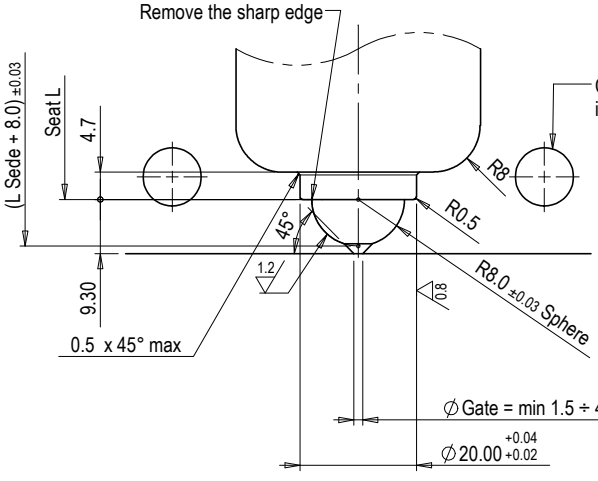
(-Gp- wired version)
Single zone / Double zone



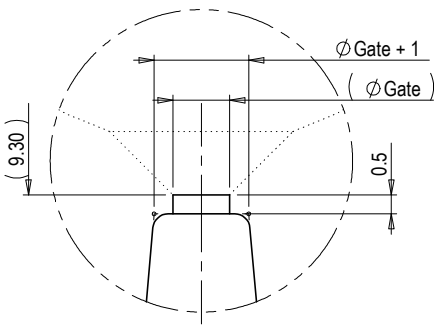




Remove the sharp edge



With sprue



For all reference codes see on page 4.G1.13-14
(1) For "Seat L" calculation see pag. 4.G1.14a table A

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**) Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

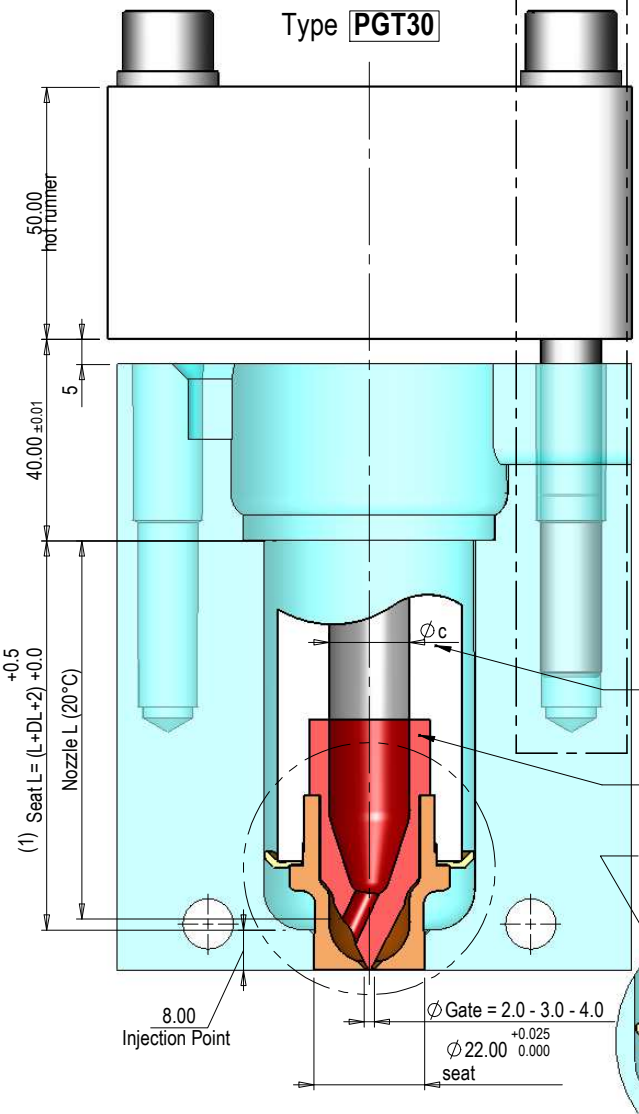
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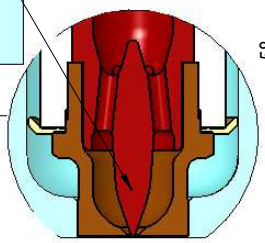
(*)

Screw manifold clamping
see pag. 4.G2.02

N° 4 Screws M12x120 Cl.12.9 70Nm

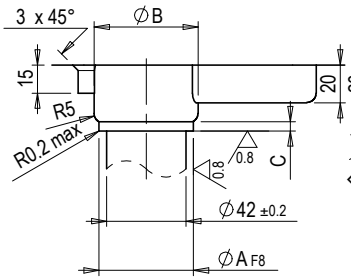
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-Gp- series

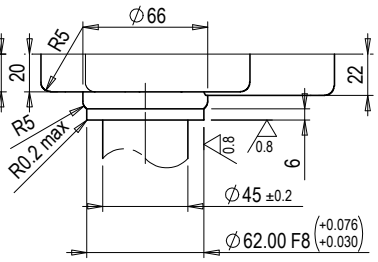
Single zone / Double zone



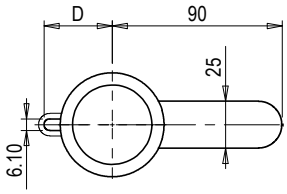
-Ep- series

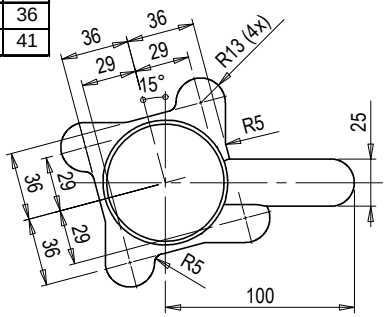
(-Gp- wired version)

Single zone / Double zone

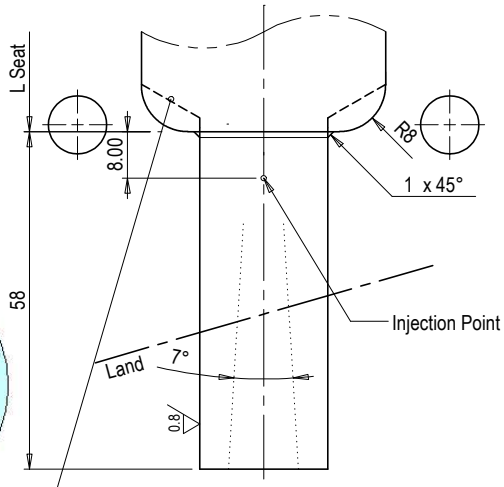


Iniettore con	A	B	C	D
Singola Zona	50.00	55	5	36
Doppia Zona	62.00	65	8	41

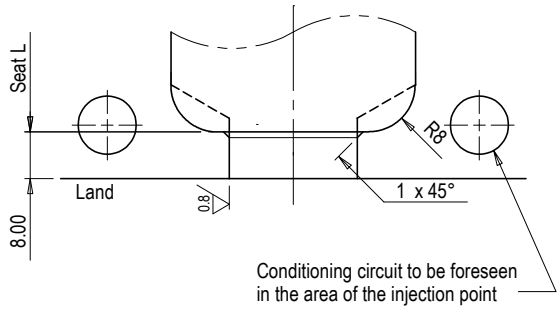




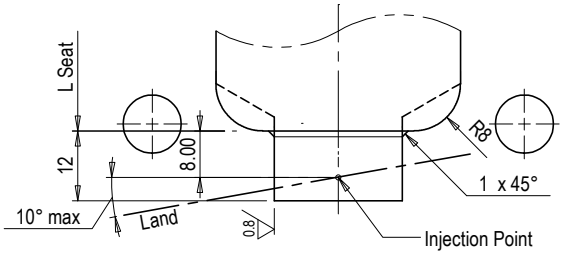
Bushing L=64



Bushing L=14



Bushing L=18



For all reference codes see on page 4.G1.13-14

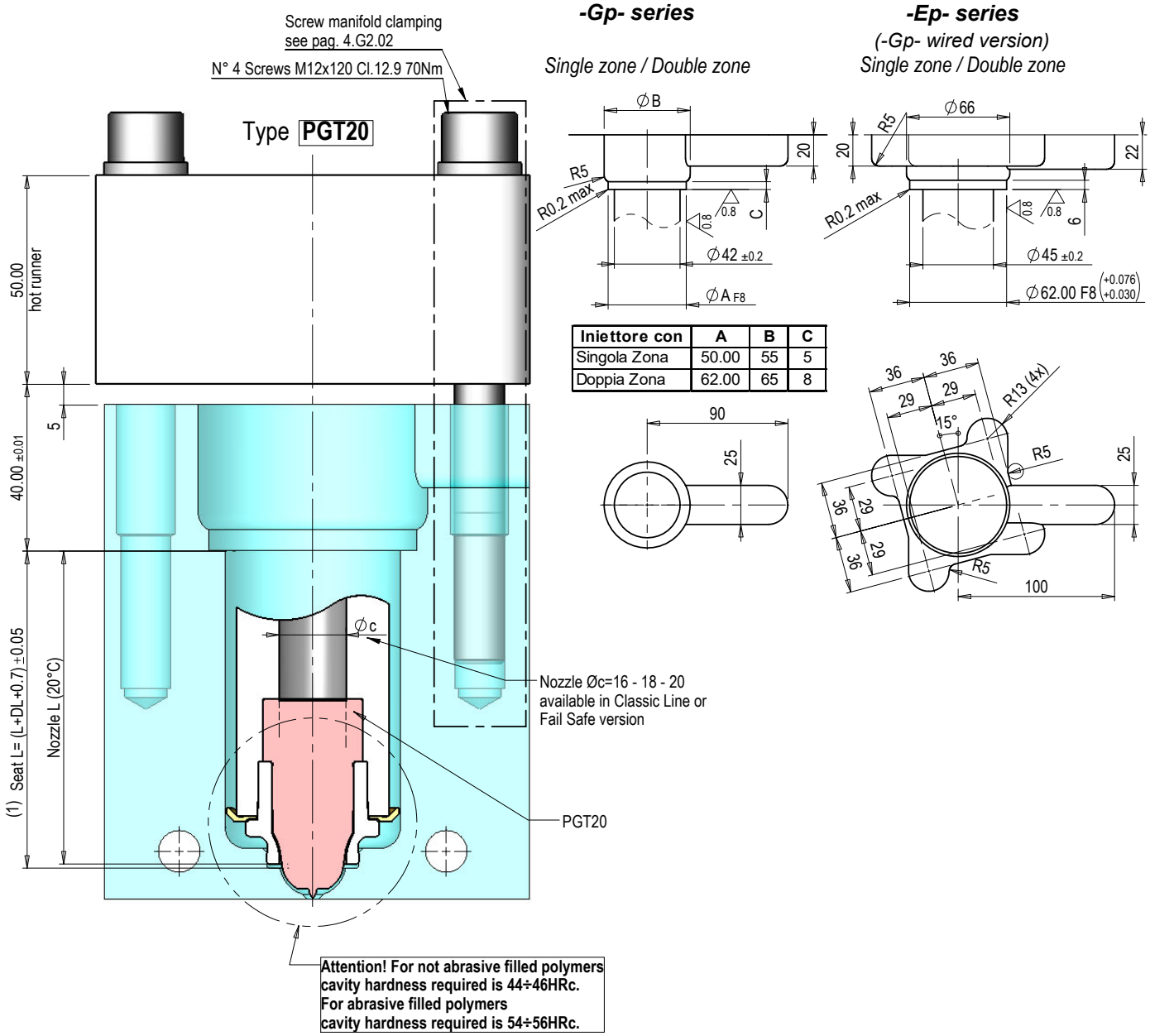
(1) For "Seat L" calculation see pag. 4.G1.14b table C

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**) Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

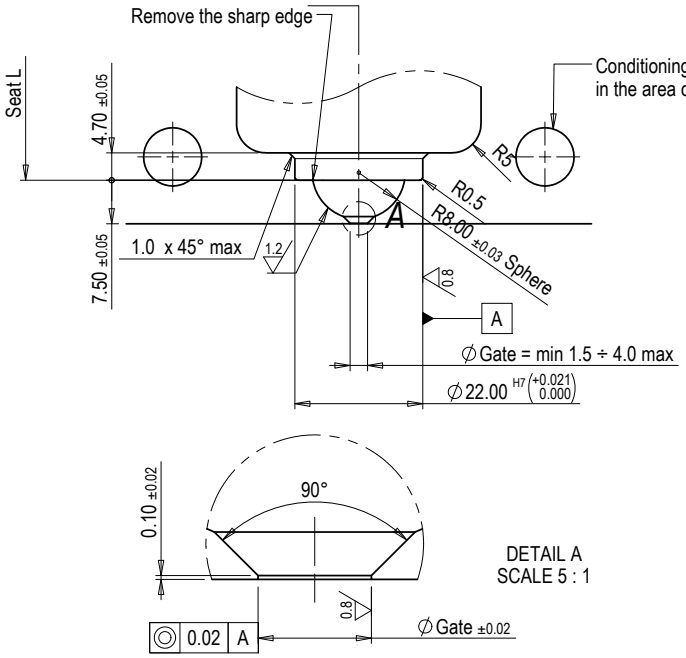
© All rights reserved

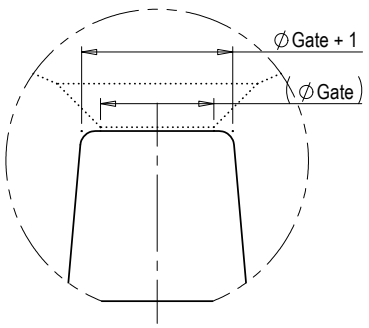
Screwed-in nozzle TORPEDO with external ring for engineering polymers



Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8

**Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.**



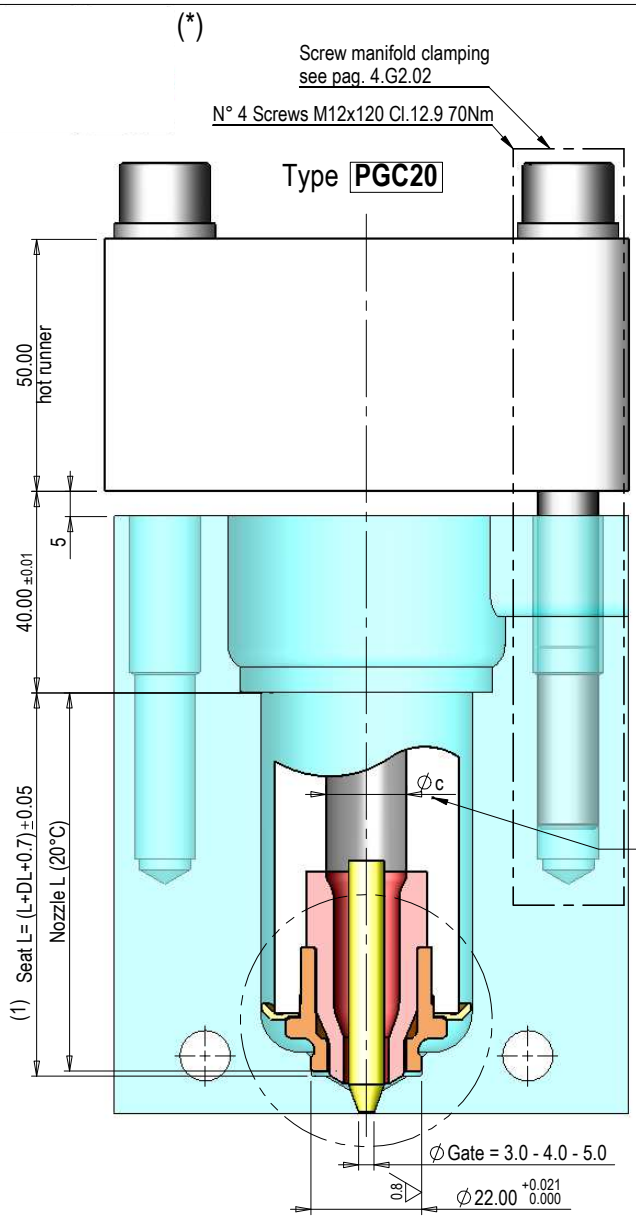


For all reference codes see on page 4.G1.13-14
(1) For "Seat L" calculation see pag. 4.G1.14a table A

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**) Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

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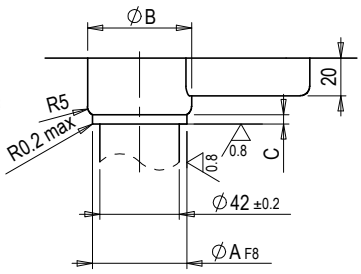


Nozzle Øc=16 - 18 - 20
available in Classic Line or
Fail Safe version

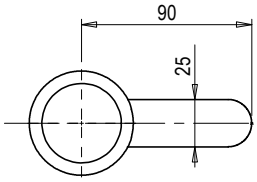
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

-Gp- series

Single zone / Double zone



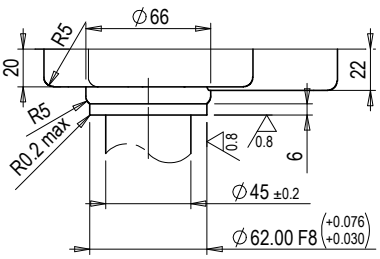
Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8

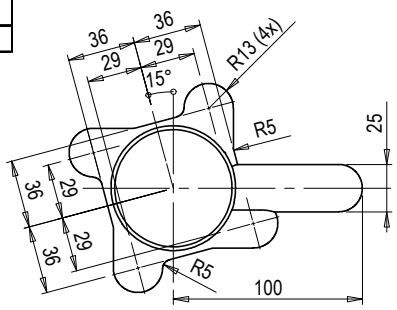


-Ep- series

(-Gp- wired version)

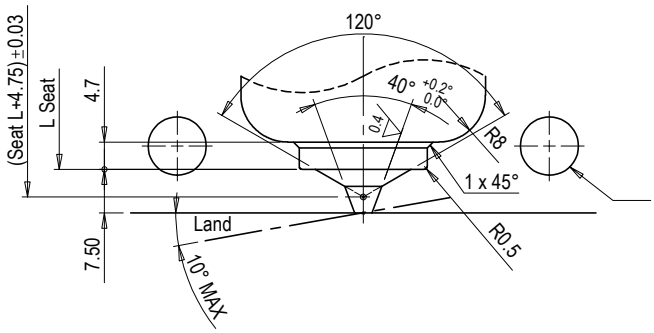
Single zone / Double zone





For all reference codes see on page 4.G1.13-14

(1) For "DL" calculation see pag. 4.G1.14a



Conditioning circuit to be foreseen
in the area of the injection point

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**) Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

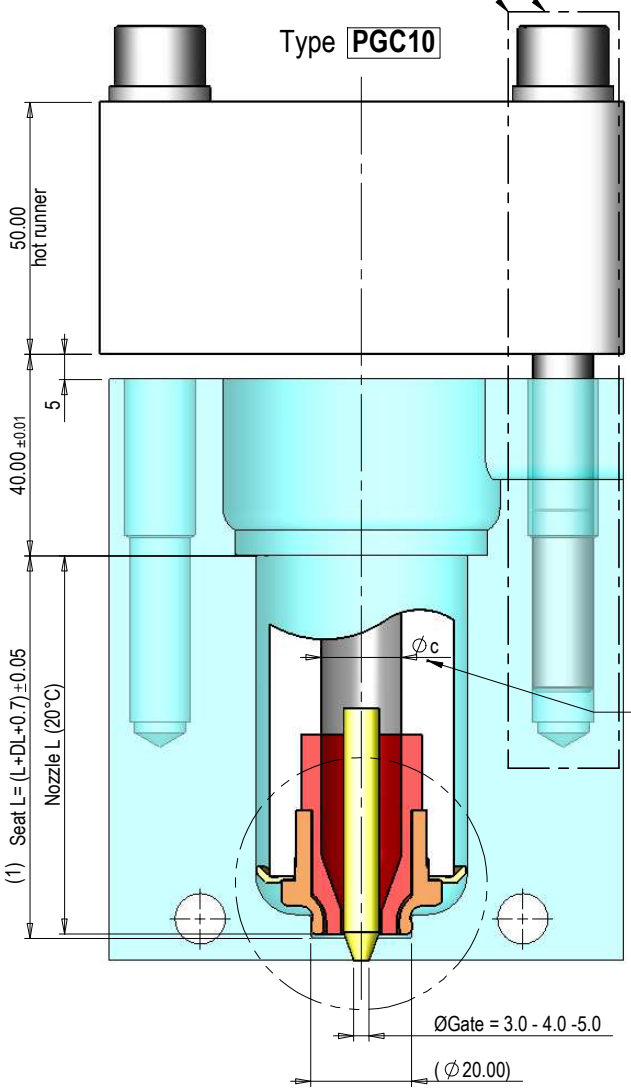
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(*)

Screw manifold clamping
see pag. 4.G2.02

N° 4 Screws M12x120 Cl.12.9 70Nm

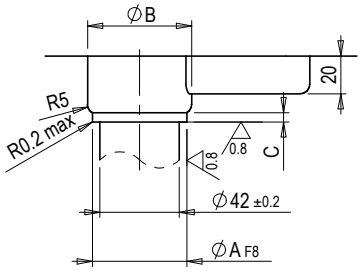
Type **PGC10**



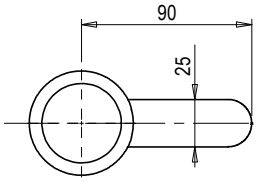
Nozzle Øc=16 - 18 - 20
available in Classic Line or
Fail Safe version

-Gp- series

Single zone / Double zone



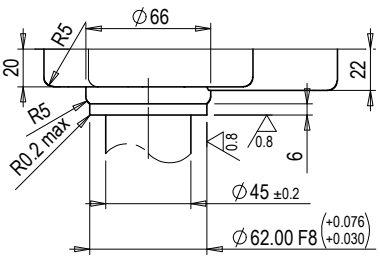
Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8

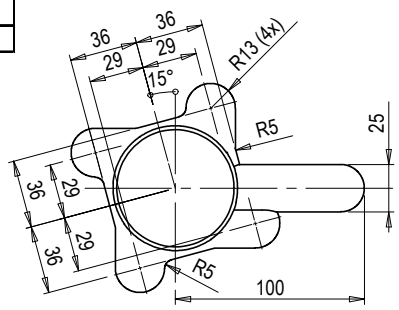


-Ep- series

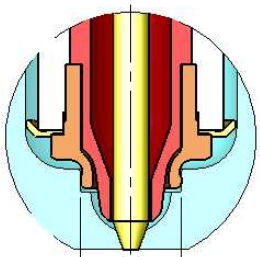
(-Gp- wired version)

Single zone / Double zone



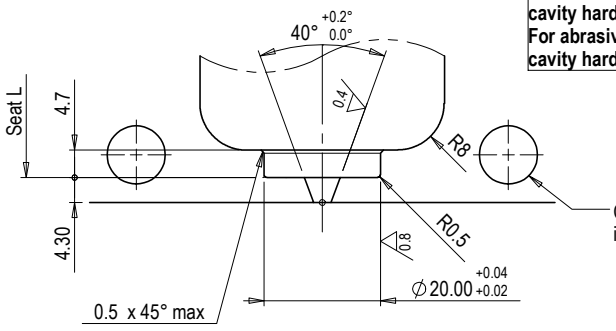


Type **PGC30**

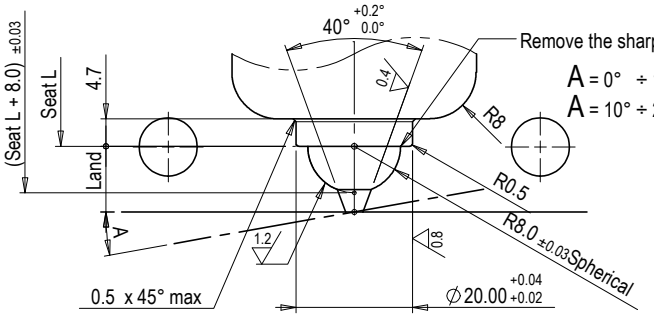


ØGate = 3.0 - 4.0 - 5.0
(Ø 20.00)

Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.



Conditioning circuit to be foreseen
in the area of the injection point



Remove the sharp edge

A = 0° ÷ 10° Land=11.30 mm

A = 10° ÷ 20° Land=12.00 mm

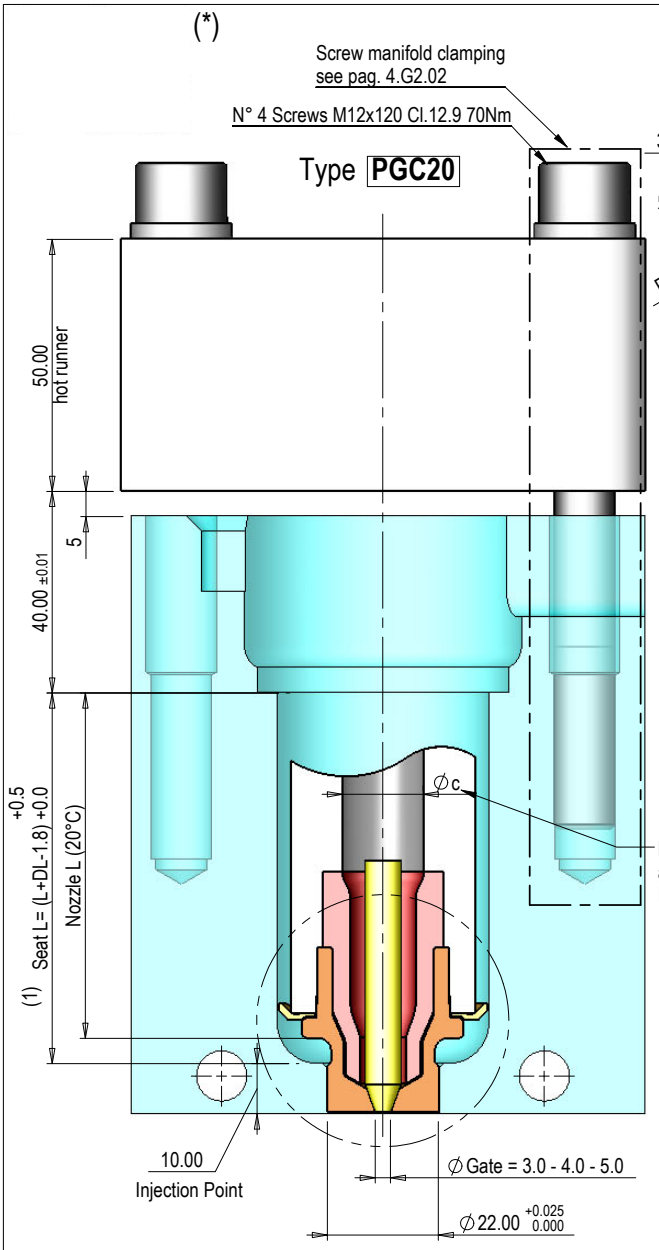
For all reference codes see on page 4.G1.13-14

(1) For "Seat L" calculation see pag. 4.G1.14a table A

NOZZLE *L*
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

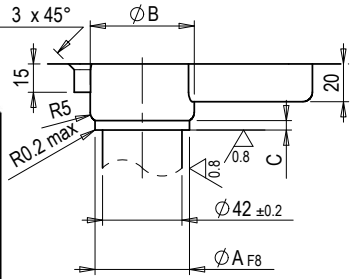
Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

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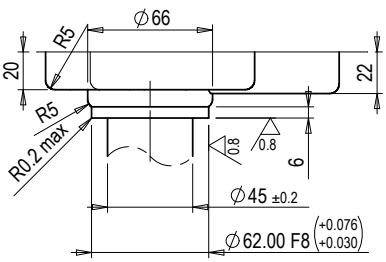
-Gp- series

Single zone / Double zone

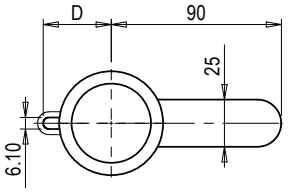


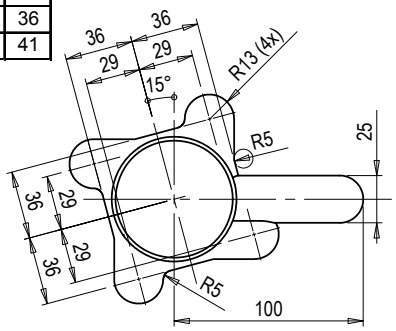
-Ep- series

(-Gp- wired version)
Single zone / Double zone

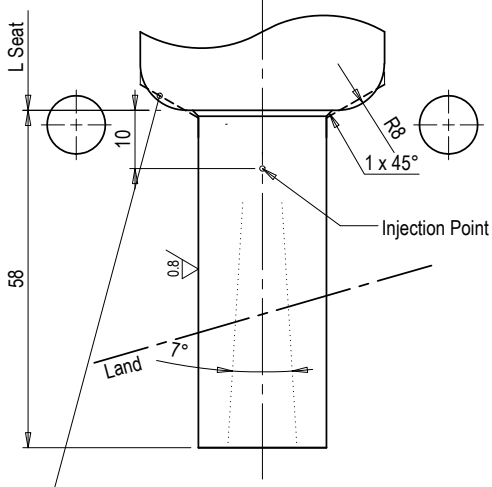


Nozzle with	A	B	C	D
Single Zone	50.00	55	5	36
Double Zones	62.00	65	8	41





Bushing L=59

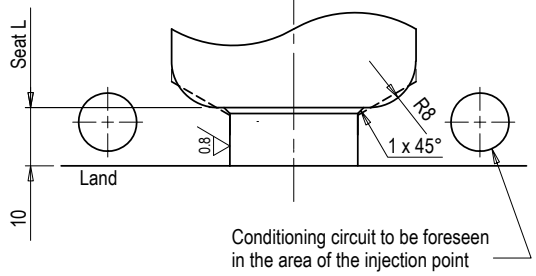


Alternative seat profile
(see page 4.G1.12)

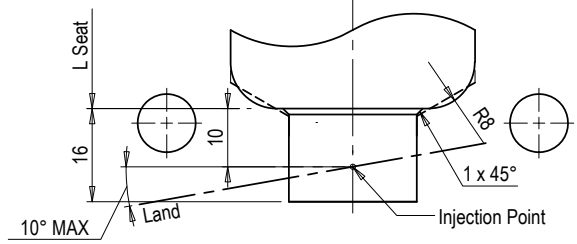
For all reference codes see on page 4.G1.13-14

(1) For "DL" calculation see pag. 4.G1.14a

Bushing L=11



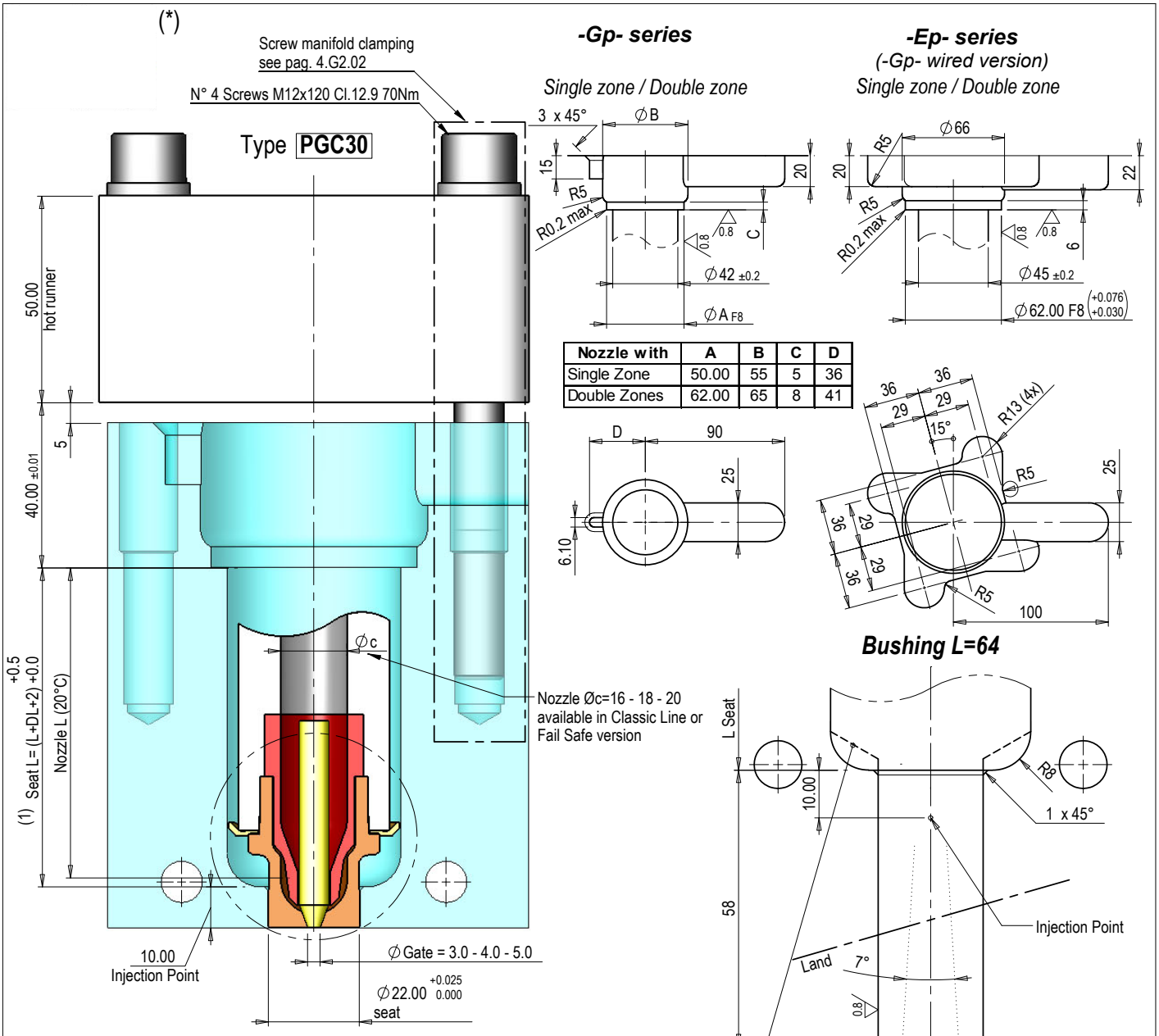
Bushing L=17



NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**)Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

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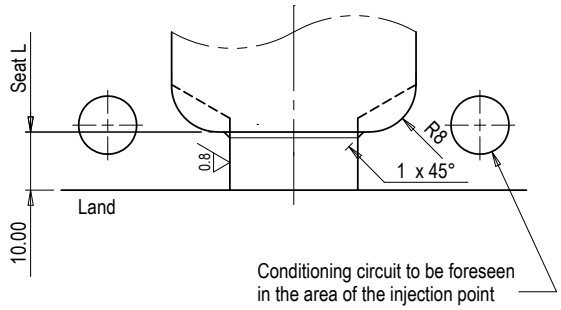


Nozzle with	A	B	C	D
Single Zone	50.00	55	5	36
Double Zones	62.00	65	8	41

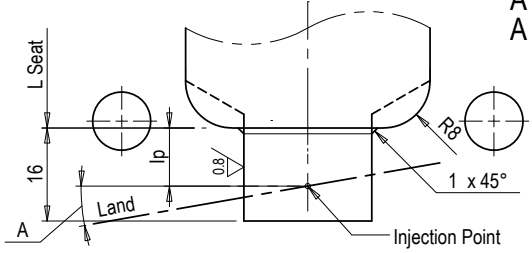
Bushing L=64

Alternative seat profile
(see page 4.G1.12)

Bushing L=16



Bushing L=22



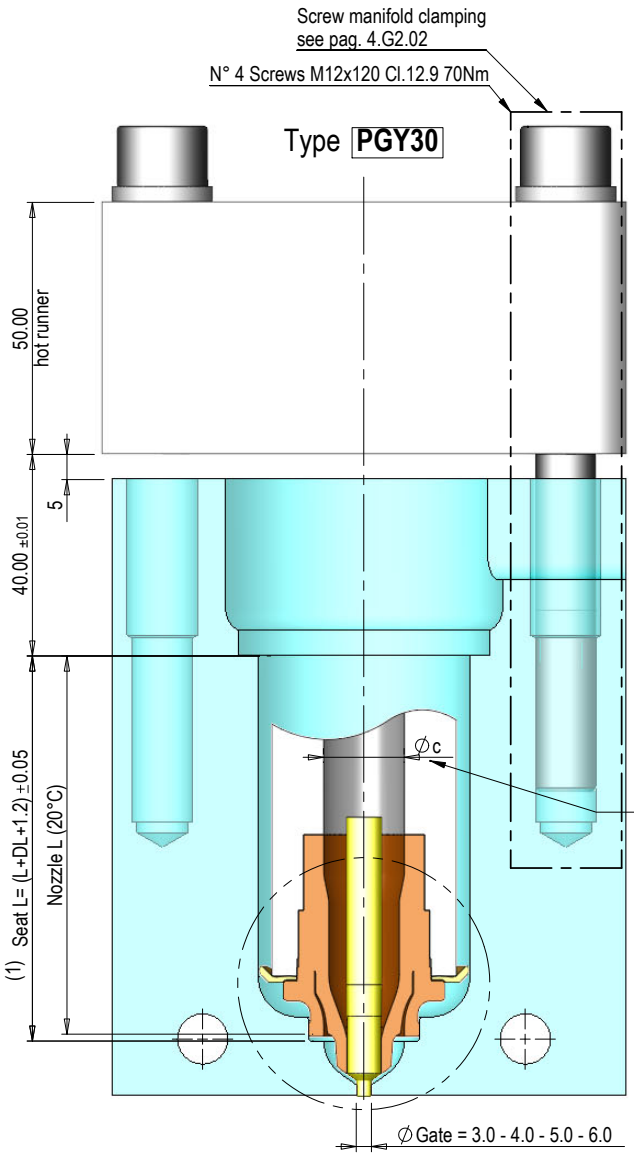
A = 0° ÷ 10° lp=10.00 mm
A = 10° ÷ 20° lp=10.40 mm

For all reference codes see on page 4.G1.13-14
(1) For "Seat L" calculation see pag. 4.G1.14b table C

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

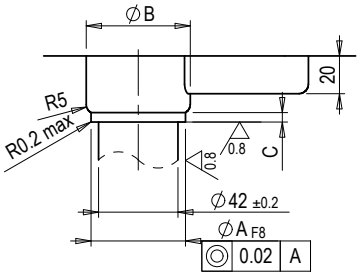
Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

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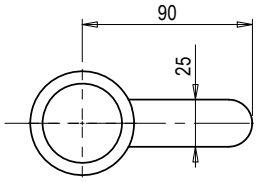


-Gp- series

Single zone / Double zone



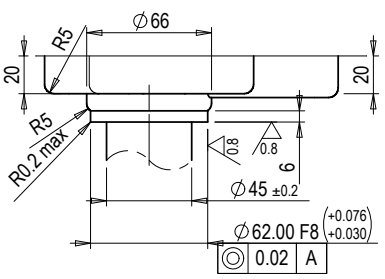
Nozzle with	A	B	C
Single Zone	50.00	55	5
Double Zones	62.00	65	8

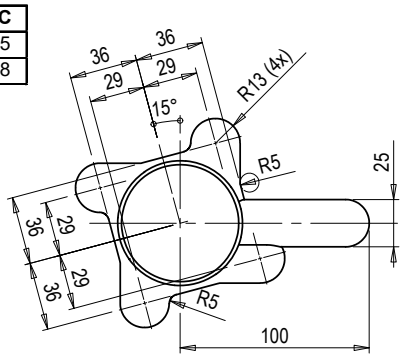


-Ep- series

(-Gp- wired version)

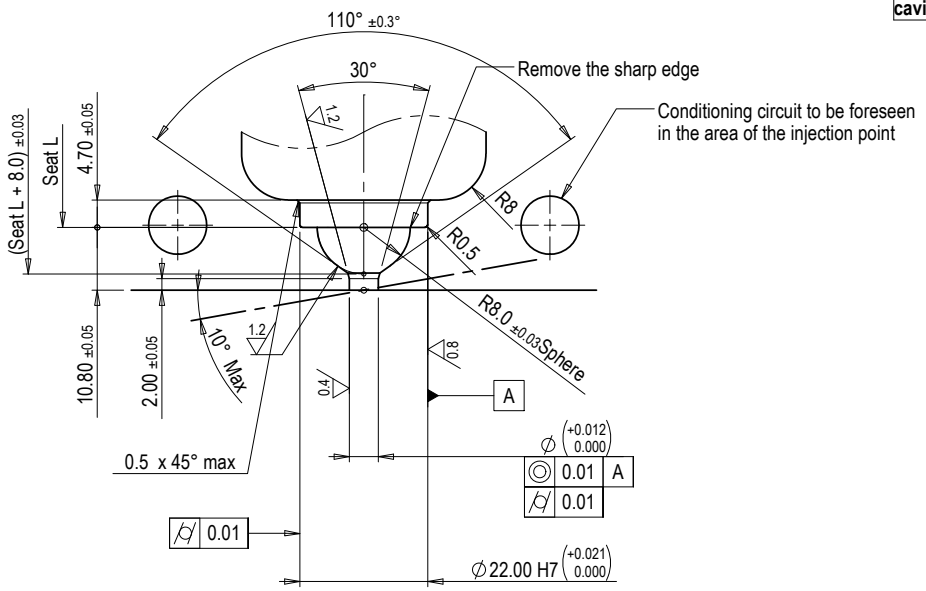
Single zone / Double zone





Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

Attention! For not abrasive filled polymers cavity hardness required is 48÷50HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.



For all reference codes see on page 4.G1.13-14

(1) For "Seat L" calculation see pag. 4.G1.14b table E

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**) Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

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Nozzle CYLINDRICAL VALVE GATING with bushing through the cavity

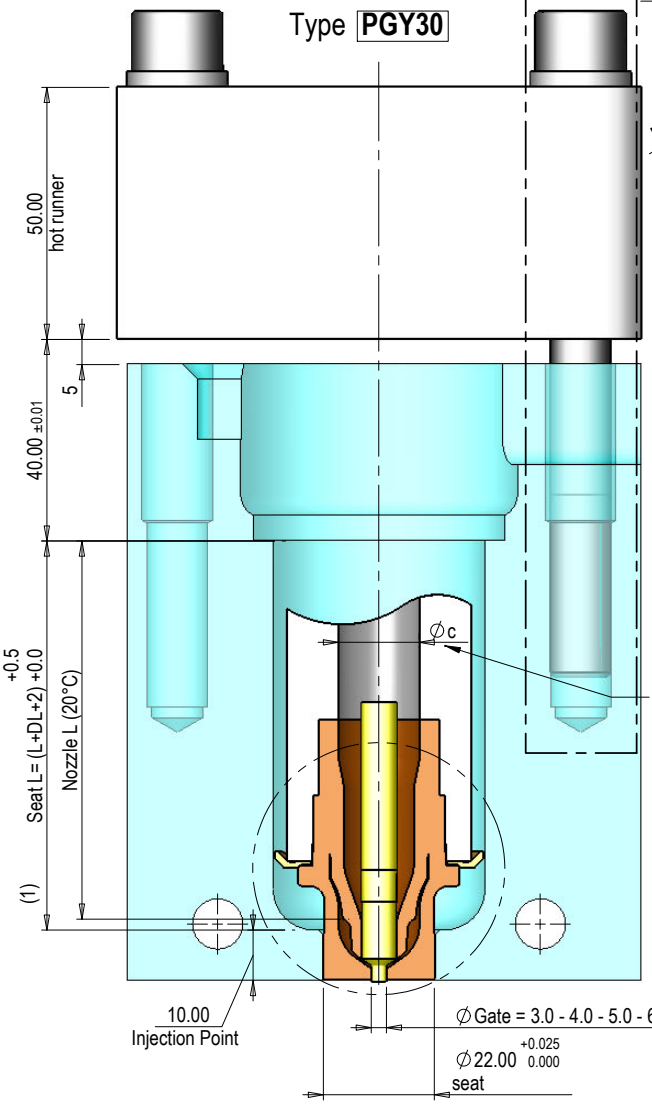
oerlikon hrsflow

(*)

Screw manifold clamping see pag. 4.G2.02

N° 4 Screws M12x120 Cl.12.9 70Nm

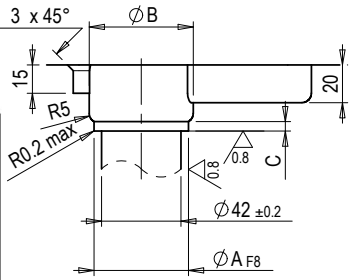
Type **PGY30**



Nozzle Øc=16 - 18 - 20 available in Classic Line or Fail Safe version

-Gp- series

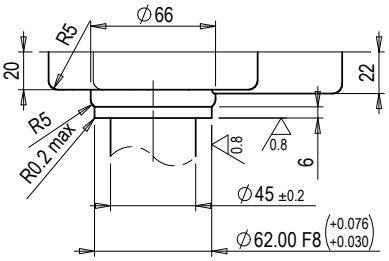
Single zone / Double zone



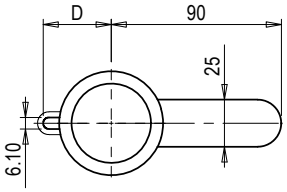
-Ep- series

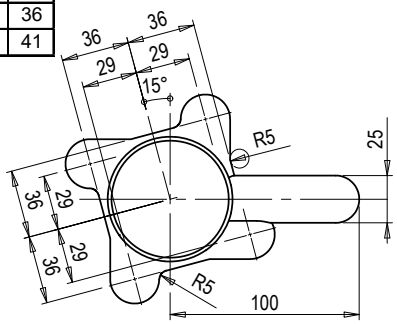
(-Gp- wired version)

Single zone / Double zone

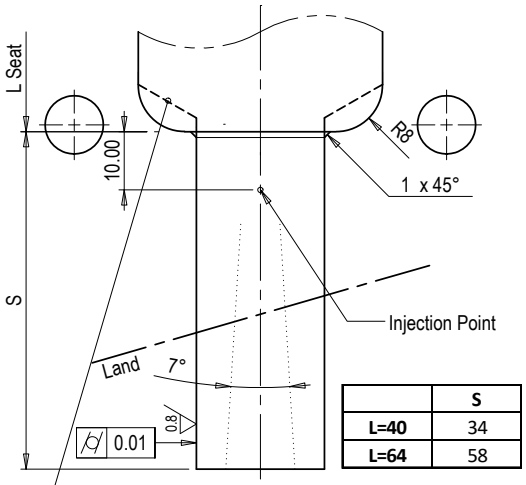


Iniettore con	A	B	C	D
Singola Zona	50.00	55	5	36
Doppia Zona	62.00	65	8	41





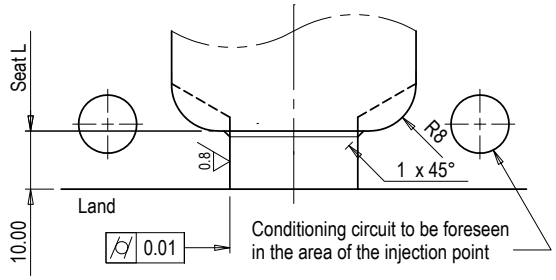
Bushing L=40 / L=64



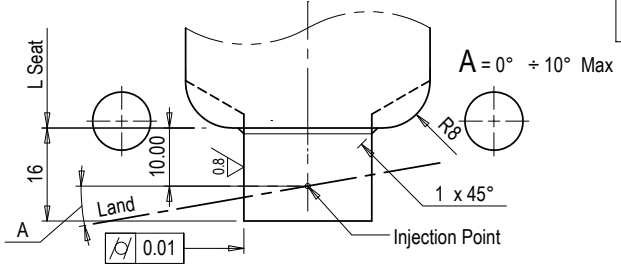
	S
L=40	34
L=64	58

Alternative seat profile (see page 4.G1.12)

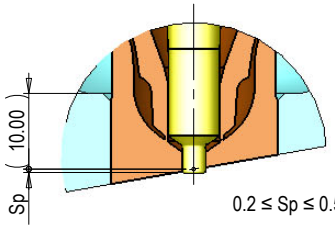
Bushing L=16



Bushing L=22



ATTENTION! In this configuration there is a protrusion "Sp" of the Pin from the bushing.
HRS recommends not to remove this protrusion.
The "Sp" dimension is function of ØGate and "A" angle



For all reference codes see on page 4.G1.13-14

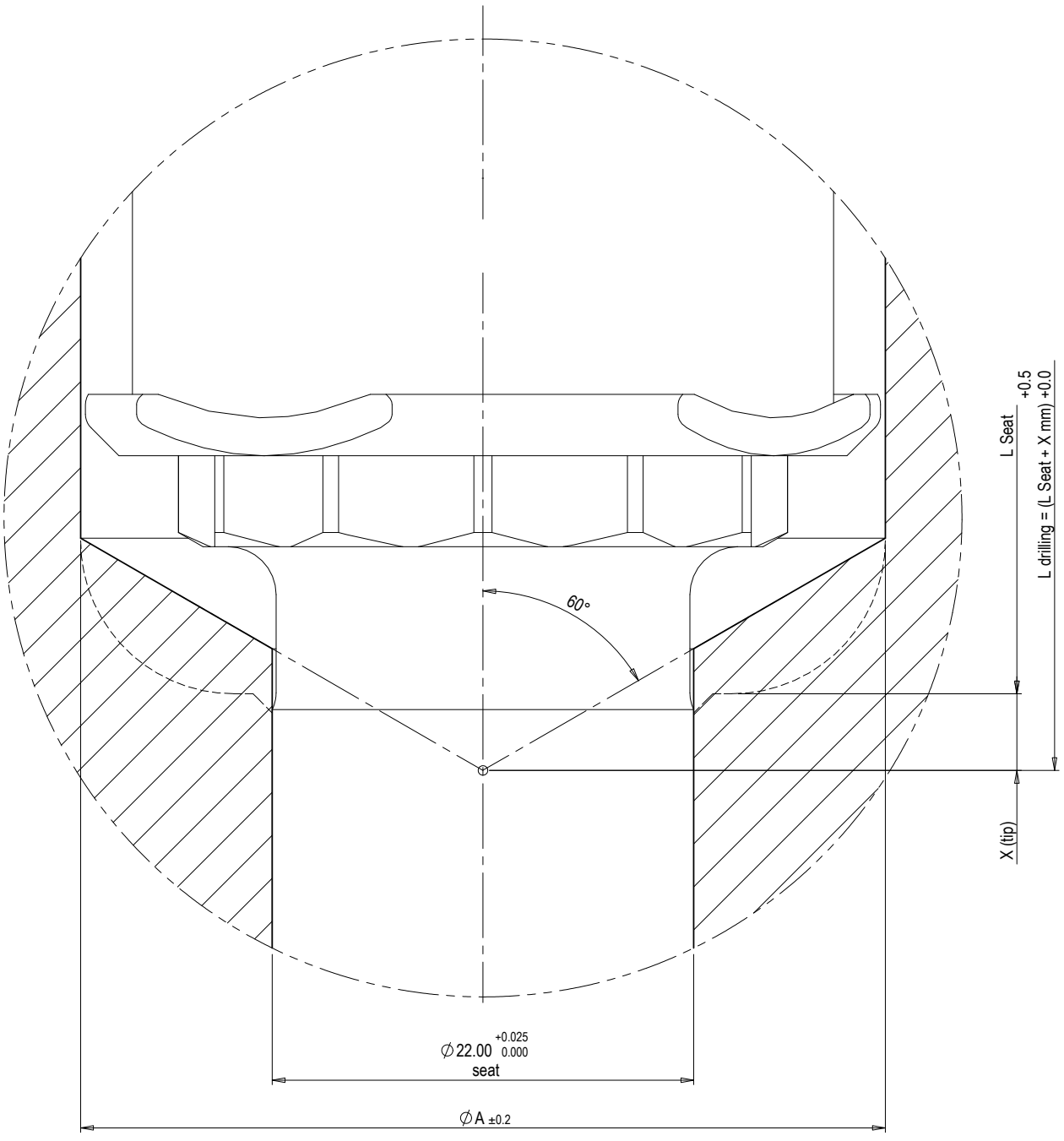
(1) For "Seat L" calculation see pag. 4.G1.14b table C

NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

(**) Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

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Nozzles series -Gp- -Ep- with BUSHING THROUGH CAVITY
Alternative seat contour 120°
(120° tips seat is easier to manufacture than the
standard seat but more difficult to measure)



ØA	Series
42	Gp
45	Ep

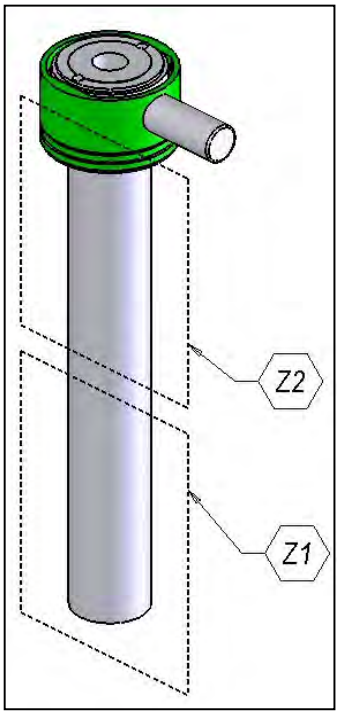
X=4.0 mm for all configurations, except { **PGF10** => X = 7.35 mm
PGF30 => X = 7.35 mm
PGC20 => X = 7.50 mm

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NOZZLES CODES TABLE

NOZZLE L	NOZZLE DUCT CODE Single Zone		W 230V
50	Øc=16 Classic	0221-00179	1x400
	Øc=18 Classic	0221-00209	
	Øc=16 Fail Safe	0221-00194	2x400
	Øc=18 Fail Safe	0221-00224	
75	Øc=16 Classic	0221-00180	1x470
	Øc=18 Classic	0221-00210	
	Øc=16 Fail Safe	0221-00195	2x470
	Øc=18 Fail Safe	0221-00225	
100	Øc=16 Classic	0221-00181	1x470
	Øc=18 Classic	0221-00211	
	Øc=16 Fail Safe	0221-00196	2x470
	Øc=18 Fail Safe	0221-00226	
125	Øc=16 Classic	0221-00182	1x550
	Øc=18 Classic	0221-00212	
	Øc=16 Fail Safe	0221-00197	2x550
	Øc=18 Fail Safe	0221-00227	
150	Øc=16 Classic	0221-00183	1x620
	Øc=18 Classic	0221-00213	
	Øc=16 Fail Safe	0221-00198	2x620
	Øc=18 Fail Safe	0221-00228	
175	Øc=16 Classic	0221-00184	1x620
	Øc=18 Classic	0221-00214	
	Øc=16 Fail Safe	0221-00199	2x620
	Øc=18 Fail Safe	0221-00229	
200	Øc=16 Classic	0221-00185	1x620
	Øc=18 Classic	0221-00215	
	Øc=16 Fail Safe	0221-00200	2x620
	Øc=18 Fail Safe	0221-00230	

NOZZLE DUCT CODE Double Zone		Z1 [W] 230V	Z2 [W] 230V
- available for models from 250 to 600 -			
Øc=16 Classic	0221-00493	1x300	1x450
Øc=18 Classic	0221-00501		
Øc=16 Fail Safe	0221-00509	2x300	2x450
Øc=18 Fail Safe	0221-00517		
Øc=16 Classic	0221-00494	1x300	1x550
Øc=18 Classic	0221-00502		
Øc=16 Fail Safe	0221-00510	2x300	2x550
Øc=18 Fail Safe	0221-00518		
Øc=16 Classic	0221-00495	1x300	1x550
Øc=18 Classic	0221-00503		
Øc=16 Fail Safe	0221-00511	2x300	2x550
Øc=18 Fail Safe	0221-00519		
Øc=16 Classic	0221-00496	1x300	1x550
Øc=18 Classic	0221-00504		
Øc=16 Fail Safe	0221-00512	2x300	2x550
Øc=18 Fail Safe	0221-00520		
Øc=16 Classic	0221-00497	1x300	1x750
Øc=18 Classic	0221-00505		
Øc=16 Fail Safe	0221-00513	2x300	2x750
Øc=18 Fail Safe	0221-00521		
Øc=16 Classic	0221-00498	1x300	1x750
Øc=18 Classic	0221-00506		
Øc=16 Fail Safe	0221-00514	2x300	2x750
Øc=18 Fail Safe	0221-00522		
Øc=16 Classic	0221-00499	1x300	1x950
Øc=18 Classic	0221-00507		
Øc=16 Fail Safe	0221-00515	2x300	2x950
Øc=18 Fail Safe	0221-00523		
Øc=16 Classic	0221-00500	1x300	1x950
Øc=18 Classic	0221-00508		
Øc=16 Fail Safe	0221-00516	2x300	2x950
Øc=18 Fail Safe	0221-00524		



HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30 0012-00586 0012-00587 *for high resistance* **PGF10** 0012-00599 *for high resistance*	**External end ring** **Ø20** 0013-00452 **Free Flow through the cavity** *gate* / **PGF30** / **PGF10** **Ø2.0** 0013-00918 / 0013-00931 **Ø3.0** 0013-00919 / 0013-00932 **Ø4.0** 0013-00920 / 0013-00933	
TORPEDO		
PGT30 Monohole 0012-00281 0012-00282 *for high resistance* 0012-00333 *for high conductibility* 0012-01008 *for engineering polymers* **PGT30 Torpedo** 0012-00283 0012-00284 *for high resistance* 0012-00334 *for high conductibility*	**External end ring** **Ø20** 0013-00452 Ø22 0013-02112 for engineering polymers **PGT30 Bushing through the cavity** *gate* / **L=14** / **L=18** / **L=64** **Ø2.0** 0013-00454 / 0013-00457 / 0013-00460 **Ø3.0** 0013-00455 / 0013-00458 / 0013-00461 **Ø4.0** 0013-00456 / 0013-00459 / 0013-00462	
CONICAL VALVE GATING		
PGC30 0012-00286 0012-00535 *For high conductibility with End Ring* 0012-00326 *For high conductibility with Bushing th.cavity* 0012-00431 *for high resistance* **PGC30 Antistagnation** 0012-00772 *For high conductibility with End Ring* 0012-00773 *For high conductibility with Bushing th.cavity* 0012-00806 *for high resistance*	**PGC30 External end ring** **Ø20** 0013-00452 **PGC30 Bushing through the cavity** *gate* / **L=16** / **L=22** / **L=64** **Ø3.0** 0013-00501 / 0013-00502 / 0013-00701 **Ø4.0** 0013-00463 / 0013-00465 / 0013-00467 **Ø5.0** 0013-00464 / 0013-00466 / 0013-00468	0262-00056 { *for External end ring* / *for Bushings through cavity*
PGC20 0012-00812 0012-00814 *for high resistance* **PGC20 Antistagnation** 0012-00813 0012-00815 *for high resistance*	**PGC20 External end ring** **Ø22** 0013-01345 **PGC20 Bushing through the cavity** *gate* / **L=11** / **L=17** / **L=59** **Ø3.0** 0013-01348 / 0013-01360 / 0013-01375 **Ø4.0** 0013-01350 / 0013-01362 / 0013-01377 **Ø5.0** 0013-01352 / 0013-01364 / 0013-01379	0262-00061
PGC10 0012-00285 0012-00534 *For high conductibility with End Ring* 0012-00430 *for high resistance*	**External end ring** **Ø20** 0013-00452	
CYLINDRICAL VALVE GATING		
	PGY30 External end ring **Ø20** 0013-01705 **Ø20** 0013-01706 *Antistagnation* **PGY30 Bushing through the cavity** *gate* / **L=16** / **L=22** / **L=40** / **L=64** **Ø3.0** 0013-01707 / 0013-01711 / 0013-01715 / 0013-01719 **Ø4.0** 0013-01708 / 0013-01712 / 0013-01716 / 0013-01720 **Ø5.0** 0013-01709 / 0013-01713 / 0013-01717 / 0013-01721 **Ø6.0** 0013-01710 / 0013-01714 / 0013-01718 / 0013-01722	

(*) Antistagnation Seal available only some polymers. For further information see sheet pag. 2.01.43

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NOZZLE EXPANSION Table - "SEAT L" dimension

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 $T2
λ= 0.000012 (1/°C)
k= (ΔT * 0.0008) $0.03

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ) + k										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	0.11	0.14	0.17	0.19	0.22	0.25	0.28	0.31	0.33	0.36	0.39
75	0.14	0.17	0.21	0.24	0.28	0.31	0.34	0.38	0.41	0.45	0.48
100	0.17	0.21	0.25	0.29	0.33	0.37	0.41	0.45	0.49	0.53	0.57
125	0.20	0.25	0.29	0.34	0.38	0.43	0.48	0.52	0.57	0.61	0.66
150	0.23	0.28	0.33	0.39	0.44	0.49	0.54	0.59	0.65	0.70	0.75
175	0.26	0.32	0.38	0.43	0.49	0.55	0.61	0.67	0.72	0.78	0.84
200	0.29	0.35	0.42	0.48	0.55	0.61	0.67	0.74	0.80	0.87	0.93
250	0.35	0.43	0.50	0.58	0.65	0.73	0.81	0.88	0.96	1.03	1.11
300	0.41	0.50	0.59	0.67	0.76	0.85	0.94	1.03	1.11	1.20	1.29
350	0.47	0.57	0.67	0.77	0.87	0.97	1.07	1.17	1.27	1.37	1.47
400	0.53	0.64	0.75	0.87	0.98	1.09	1.20	1.31	1.43	1.54	1.65
450	0.59	0.71	0.84	0.96	1.09	1.21	1.33	1.46	1.58	1.71	1.83
500	0.65	0.79	0.92	1.06	1.19	1.33	1.47	1.60	1.74	1.87	2.01
550	0.71	0.86	1.01	1.15	1.30	1.45	1.60	1.75	1.89	2.04	2.19
600	0.77	0.93	1.09	1.25	1.41	1.57	1.73	1.89	2.05	2.21	2.37

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 0.7										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	50.81	50.84	50.87	50.89	50.92	50.95	50.98	51.01	51.03	51.06	51.09
75	75.84	75.87	75.91	75.94	75.98	76.01	76.04	76.08	76.11	76.15	76.18
100	100.87	100.91	100.95	100.99	101.03	101.07	101.11	101.15	101.19	101.23	101.27
125	125.90	125.95	125.99	126.04	126.08	126.13	126.18	126.22	126.27	126.31	126.36
150	150.93	150.98	151.03	151.09	151.14	151.19	151.24	151.29	151.35	151.40	151.45
175	175.96	176.02	176.08	176.13	176.19	176.25	176.31	176.37	176.42	176.48	176.54
200	200.99	201.05	201.12	201.18	201.25	201.31	201.37	201.44	201.50	201.57	201.63
250	251.05	251.13	251.20	251.28	251.35	251.43	251.51	251.58	251.66	251.73	251.81
300	301.11	301.20	301.29	301.37	301.46	301.55	301.64	301.73	301.81	301.90	301.99
350	351.17	351.27	351.37	351.47	351.57	351.67	351.77	351.87	351.97	352.07	352.17
400	401.23	401.34	401.45	401.57	401.68	401.79	401.90	402.01	402.13	402.24	402.35
450	451.29	451.41	451.54	451.66	451.79	451.91	452.03	452.16	452.28	452.41	452.53
500	501.35	501.49	501.62	501.76	501.89	502.03	502.17	502.30	502.44	502.57	502.71
550	551.41	551.56	551.71	551.85	552.00	552.15	552.30	552.45	552.59	552.74	552.89
600	601.47	601.63	601.79	601.95	602.11	602.27	602.43	602.59	602.75	602.91	603.07

Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL - 1.5										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	48.61	48.64	48.67	48.69	48.72	48.75	48.78	48.81	48.83	48.86	48.89
75	73.64	73.67	73.71	73.74	73.78	73.81	73.84	73.88	73.91	73.95	73.98
100	98.67	98.71	98.75	98.79	98.83	98.87	98.91	98.95	98.99	99.03	99.07
125	123.70	123.75	123.79	123.84	123.88	123.93	123.98	124.02	124.07	124.11	124.16
150	148.73	148.78	148.83	148.89	148.94	148.99	149.04	149.09	149.15	149.20	149.25
175	173.76	173.82	173.88	173.93	173.99	174.05	174.11	174.17	174.22	174.28	174.34
200	198.79	198.85	198.92	198.98	199.05	199.11	199.17	199.24	199.30	199.37	199.43
250	248.85	248.93	249.00	249.08	249.15	249.23	249.31	249.38	249.46	249.53	249.61
300	298.91	299.00	299.09	299.17	299.26	299.35	299.44	299.53	299.61	299.70	299.79
350	348.97	349.07	349.17	349.27	349.37	349.47	349.57	349.67	349.77	349.87	349.97
400	399.03	399.14	399.25	399.37	399.48	399.59	399.70	399.81	399.93	400.04	400.15
450	449.09	449.21	449.34	449.46	449.59	449.71	449.83	449.96	450.08	450.21	450.33
500	499.15	499.29	499.42	499.56	499.69	499.83	499.97	500.10	500.24	500.37	500.51
550	549.21	549.36	549.51	549.65	549.80	549.95	550.10	550.25	550.39	550.54	550.69
600	599.27	599.43	599.59	599.75	599.91	600.07	600.23	600.39	600.55	600.71	600.87

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Tab. C - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	52.11	52.14	52.17	52.19	52.22	52.25	52.28	52.31	52.33	52.36	52.39
75	77.14	77.17	77.21	77.24	77.28	77.31	77.34	77.38	77.41	77.45	77.48
100	102.17	102.21	102.25	102.29	102.33	102.37	102.41	102.45	102.49	102.53	102.57
125	127.20	127.25	127.29	127.34	127.38	127.43	127.48	127.52	127.57	127.61	127.66
150	152.23	152.28	152.33	152.39	152.44	152.49	152.54	152.59	152.65	152.70	152.75
175	177.26	177.32	177.38	177.43	177.49	177.55	177.61	177.67	177.72	177.78	177.84
200	202.29	202.35	202.42	202.48	202.55	202.61	202.67	202.74	202.80	202.87	202.93
250	252.35	252.43	252.50	252.58	252.65	252.73	252.81	252.88	252.96	253.03	253.11
300	302.41	302.50	302.59	302.67	302.76	302.85	302.94	303.03	303.11	303.20	303.29
350	352.47	352.57	352.67	352.77	352.87	352.97	353.07	353.17	353.27	353.37	353.47
400	402.53	402.64	402.75	402.87	402.98	403.09	403.20	403.31	403.43	403.54	403.65
450	452.59	452.71	452.84	452.96	453.09	453.21	453.33	453.46	453.58	453.71	453.83
500	502.65	502.79	502.92	503.06	503.19	503.33	503.47	503.60	503.74	503.87	504.01
550	552.71	552.86	553.01	553.15	553.30	553.45	553.60	553.75	553.89	554.04	554.19
600	602.77	602.93	603.09	603.25	603.41	603.57	603.73	603.89	604.05	604.21	604.37

Tab. D - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL - 1.8										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	48.31	48.34	48.37	48.39	48.42	48.45	48.48	48.51	48.53	48.56	48.59
75	73.34	73.37	73.41	73.44	73.48	73.51	73.54	73.58	73.61	73.65	73.68
100	98.37	98.41	98.45	98.49	98.53	98.57	98.61	98.65	98.69	98.73	98.77
125	123.40	123.45	123.49	123.54	123.58	123.63	123.68	123.72	123.77	123.81	123.86
150	148.43	148.48	148.53	148.59	148.64	148.69	148.74	148.79	148.85	148.90	148.95
175	173.46	173.52	173.58	173.63	173.69	173.75	173.81	173.87	173.92	173.98	174.04
200	198.49	198.55	198.62	198.68	198.75	198.81	198.87	198.94	199.00	199.07	199.13
250	248.55	248.63	248.70	248.78	248.85	248.93	249.01	249.08	249.16	249.23	249.31
300	298.61	298.70	298.79	298.87	298.96	299.05	299.14	299.23	299.31	299.40	299.49
350	348.67	348.77	348.87	348.97	349.07	349.17	349.27	349.37	349.47	349.57	349.67
400	398.73	398.84	398.95	399.07	399.18	399.29	399.40	399.51	399.63	399.74	399.85
450	448.79	448.91	449.04	449.16	449.29	449.41	449.53	449.66	449.78	449.91	450.03
500	498.85	498.99	499.12	499.26	499.39	499.53	499.67	499.80	499.94	500.07	500.21
550	548.91	549.06	549.21	549.35	549.50	549.65	549.80	549.95	550.09	550.24	550.39
600	598.97	599.13	599.29	599.45	599.61	599.77	599.93	600.09	600.25	600.41	600.57

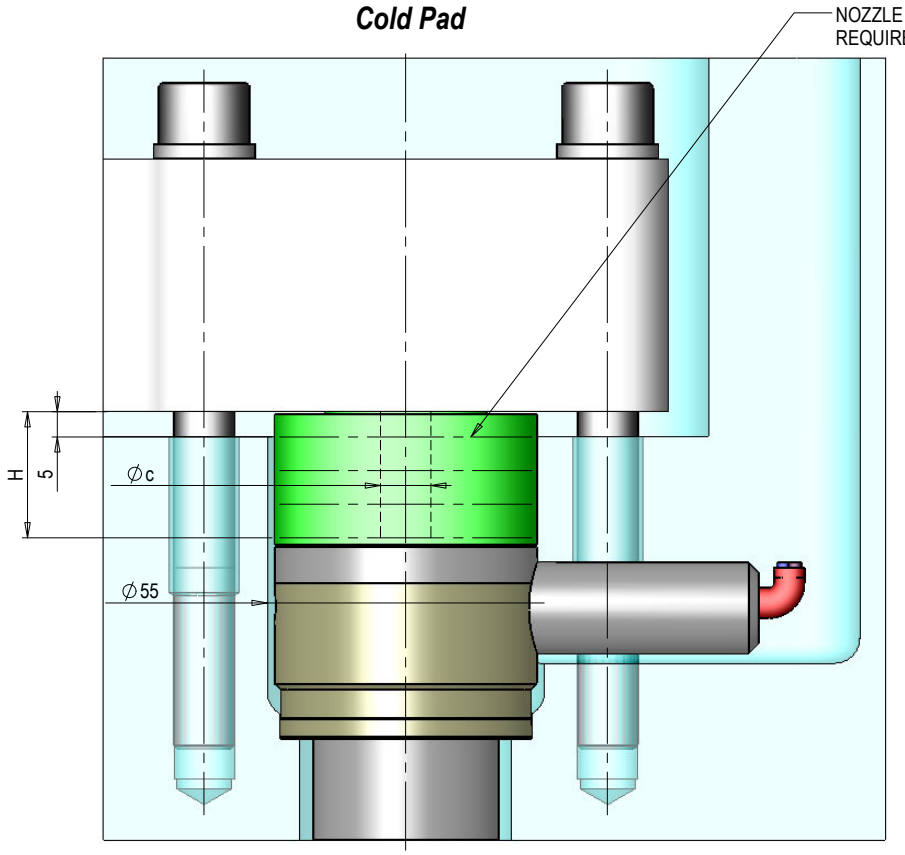
Tab. E - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	= L + DL + 1.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	51.31	51.34	51.37	51.39	51.42	51.45	51.48	51.51	51.53	51.56	51.59
75	76.34	76.37	76.41	76.44	76.48	76.51	76.54	76.58	76.61	76.65	76.68
100	101.37	101.41	101.45	101.49	101.53	101.57	101.61	101.65	101.69	101.73	101.77
125	126.40	126.45	126.49	126.54	126.58	126.63	126.68	126.72	126.77	126.81	126.86
150	151.43	151.48	151.53	151.59	151.64	151.69	151.74	151.79	151.85	151.90	151.95
175	176.46	176.52	176.58	176.63	176.69	176.75	176.81	176.87	176.92	176.98	177.04
200	201.49	201.55	201.62	201.68	201.75	201.81	201.87	201.94	202.00	202.07	202.13
250	251.55	251.63	251.70	251.78	251.85	251.93	252.01	252.08	252.16	252.23	252.31
300	301.61	301.70	301.79	301.87	301.96	302.05	302.14	302.23	302.31	302.40	302.49
350	351.67	351.77	351.87	351.97	352.07	352.17	352.27	352.37	352.47	352.57	352.67
400	401.73	401.84	401.95	402.07	402.18	402.29	402.40	402.51	402.63	402.74	402.85
450	451.79	451.91	452.04	452.16	452.29	452.41	452.53	452.66	452.78	452.91	453.03
500	501.85	501.99	502.12	502.26	502.39	502.53	502.67	502.80	502.94	503.07	503.21
550	551.91	552.06	552.21	552.35	552.50	552.65	552.80	552.95	553.09	553.24	553.39
600	601.97	602.13	602.29	602.45	602.61	602.77	602.93	603.09	603.25	603.41	603.57

Index

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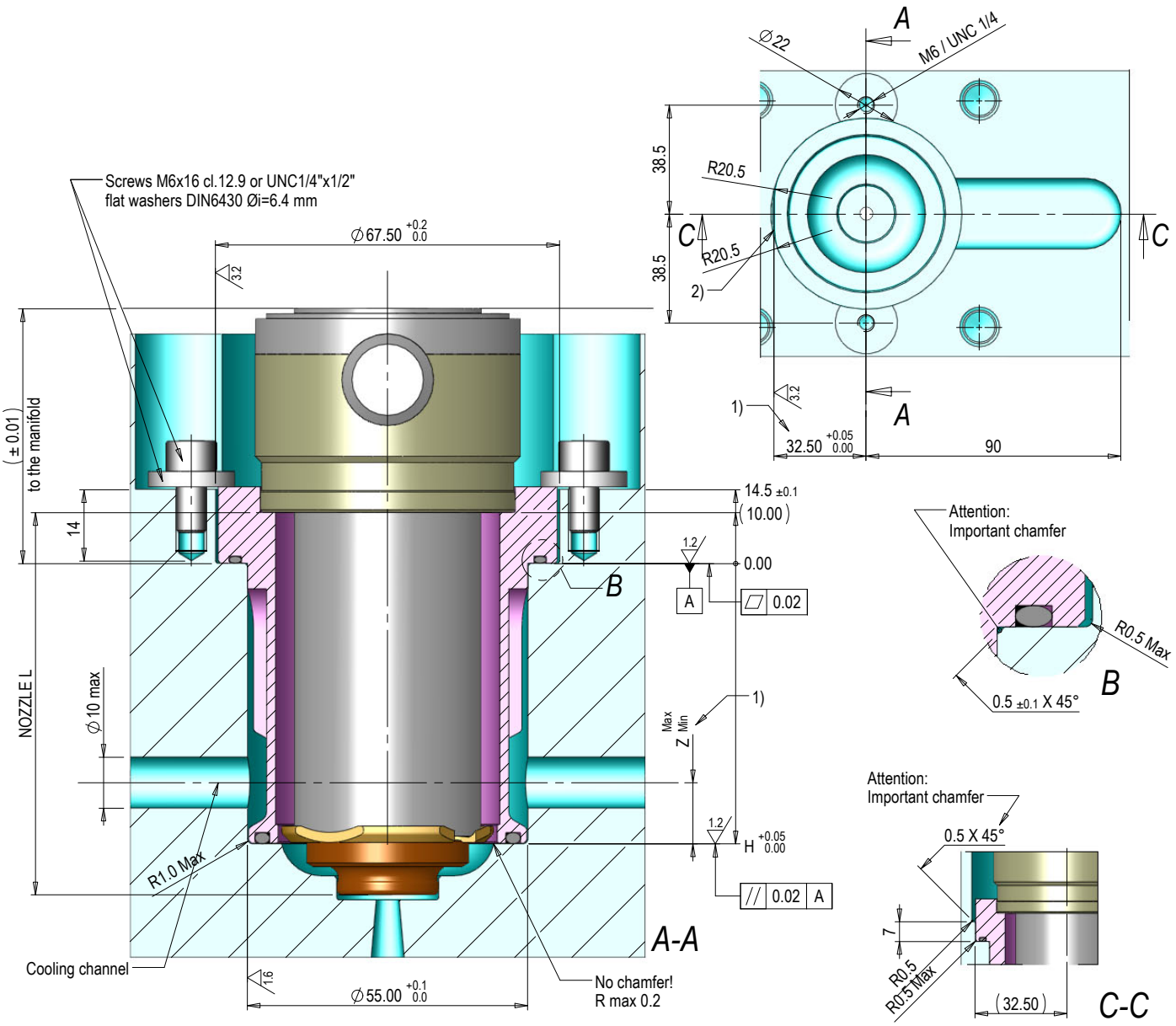
Cold Pad

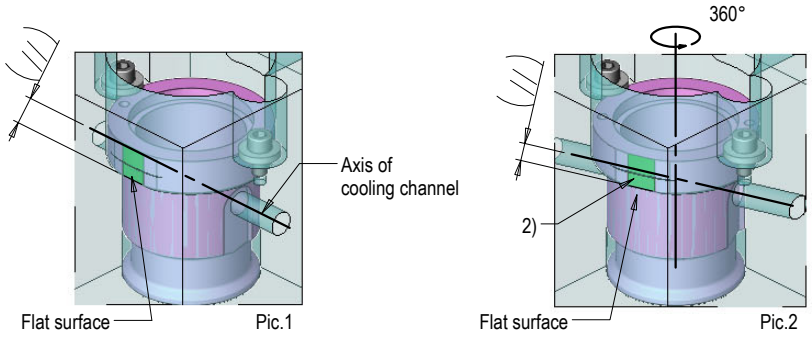


H standard	Øc=16	Øc=18
5.00	0010-01364	0013-01369
10.00	0010-01365	0013-01370
15.00	0010-01366	0013-01371
20.00	0010-01367	0013-01372
25.00	0010-01368	0013-01373

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AXIAL SEAL COOLING BUSHING



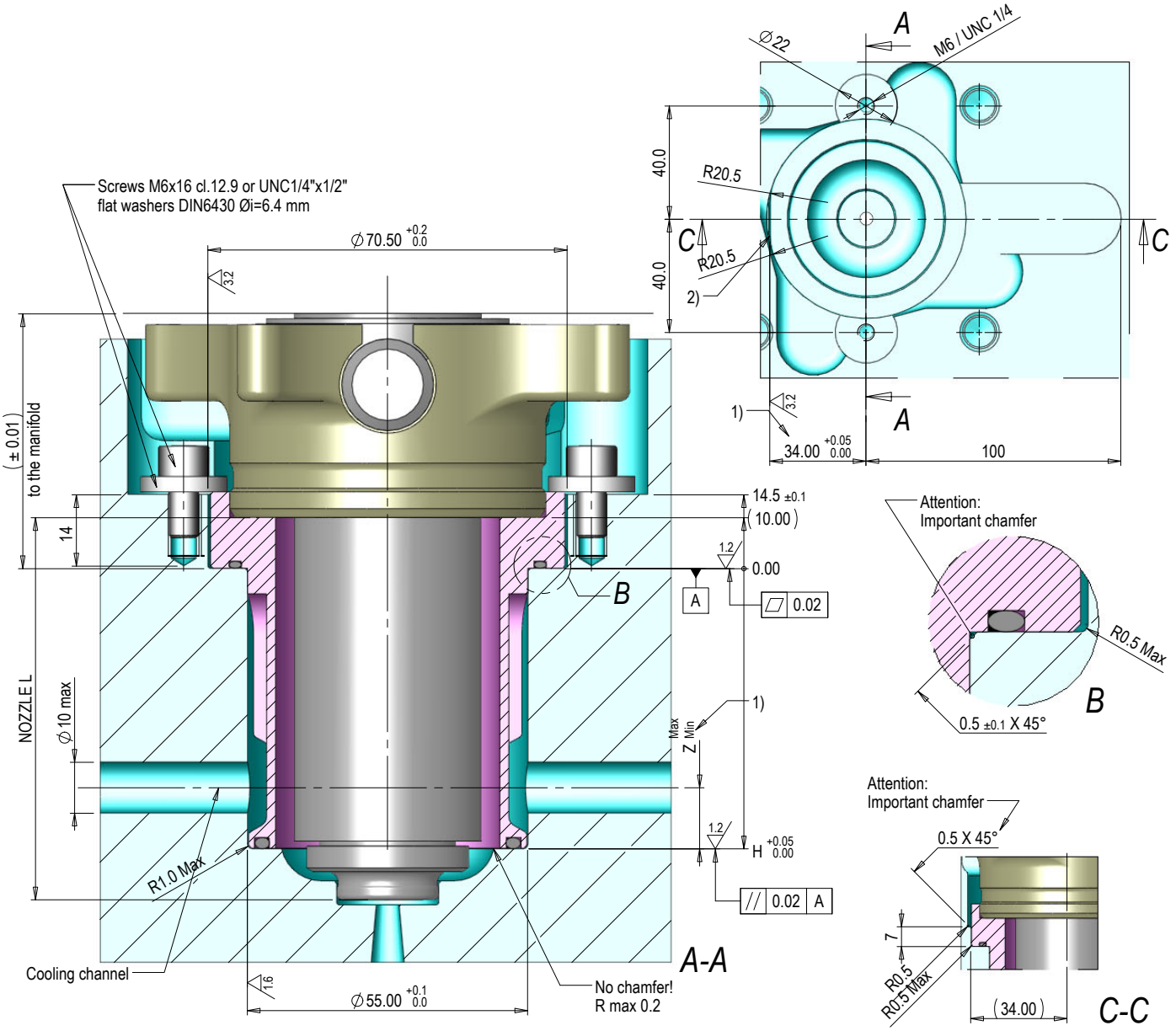


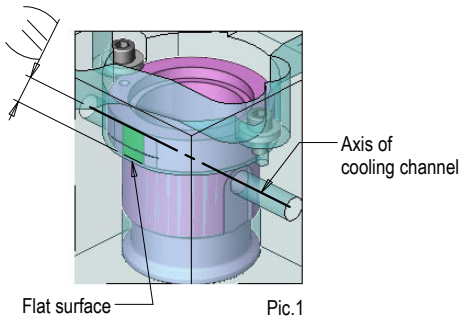
1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
2) For all cases with "Z Max" > 18, then the positioning face can be located at any angle around the axis of the bushing and with respect to the fixing screws, in order to correctly intercept the customer cooling channels (Fig.2). For more details, please contact the Oerlikon HRSflow technical department.

BUSHING CODE	NOZZLE L	H	Z	Z Min	Z Max	BUSHING CODE	NOZZLE L	H	Z	Z Min	Z Max
0121-00483	50	30.00	12	7	20	0121-00487	150	130.00	12	7	103
0121-00484	75	55.00	12	7	43	0121-00488	175	155.00	12	7	103
0121-00485	100	80.00	12	7	68	0121-00489	200	180.00	12	7	103
0121-00486	125	105.00	12	7	93	0121-00490	225	205.00	12	7	103

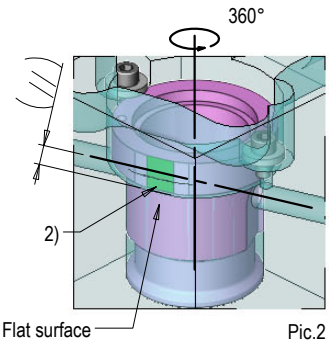
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AXIAL SEAL COOLING BUSHING





Pic.1

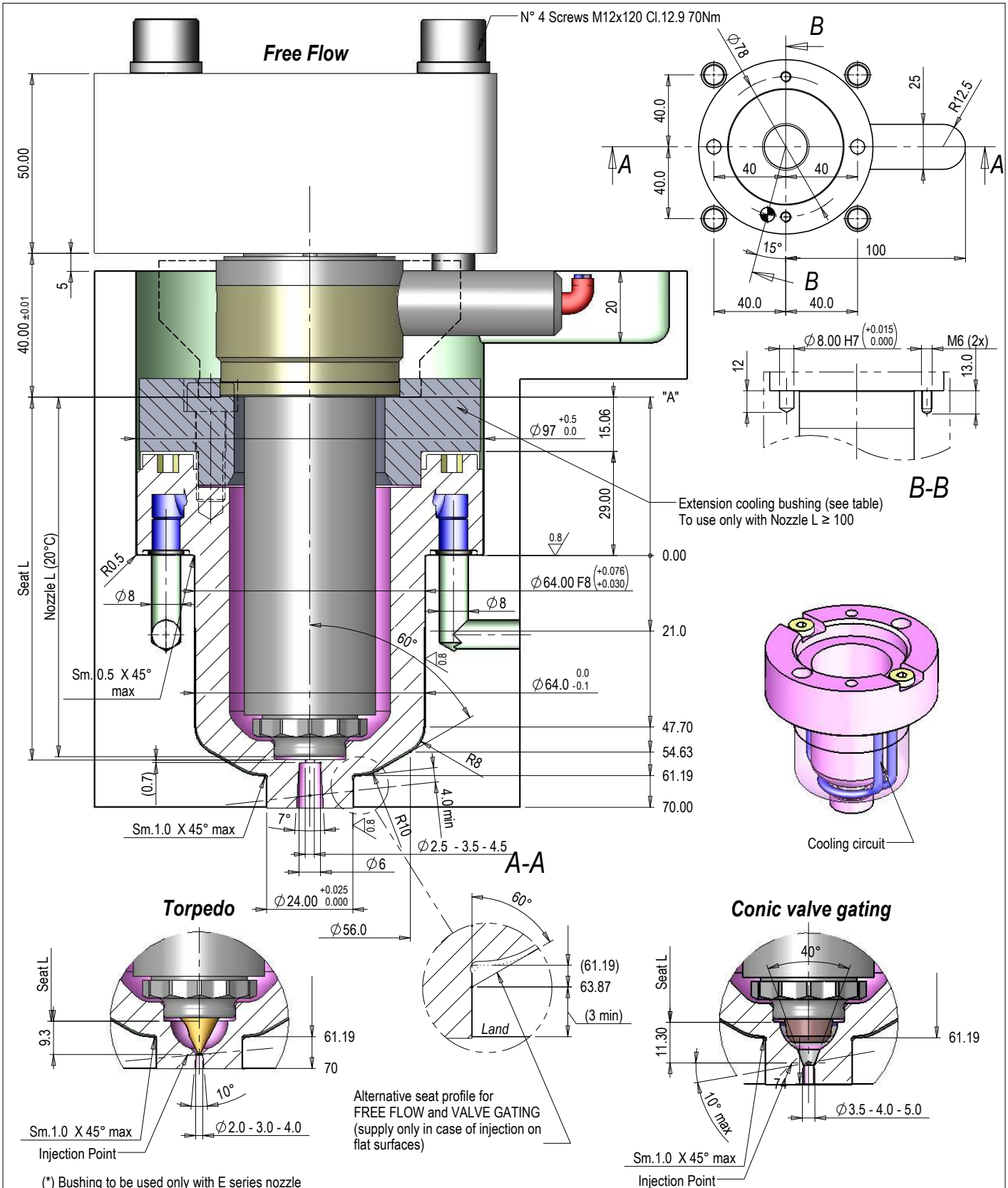


Pic.2

1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
2) For all cases with "Z Max" > 18, then the positioning face can be located at any angle around the axis of the bushing and with respect to the fixing screws, in order to correctly intercept the customer cooling channels (Fig.2). For more details, please contact the Oerlikon HRSflow technical department.

BUSHING CODE	NOZZLE L	H	Z	Z Min	Z Max	BUSHING CODE	NOZZLE L	H	Z	Z Min	Z Max
0121-00501	50	30.00	12	7	20	0121-00507	200	180.00	12	7	103
0121-00502	75	55.00	12	7	43	0121-00508	225	205.00	12	7	103
0121-00503	100	80.00	12	7	68	0121-00509	250	230.00	12	7	103
0121-00504	125	105.00	12	7	93	0121-00510	275	255.00	12	7	103
0121-00505	150	130.00	12	7	103	0121-00511	300	280.00	12	7	103
0121-00506	175	155.00	12	7	103						

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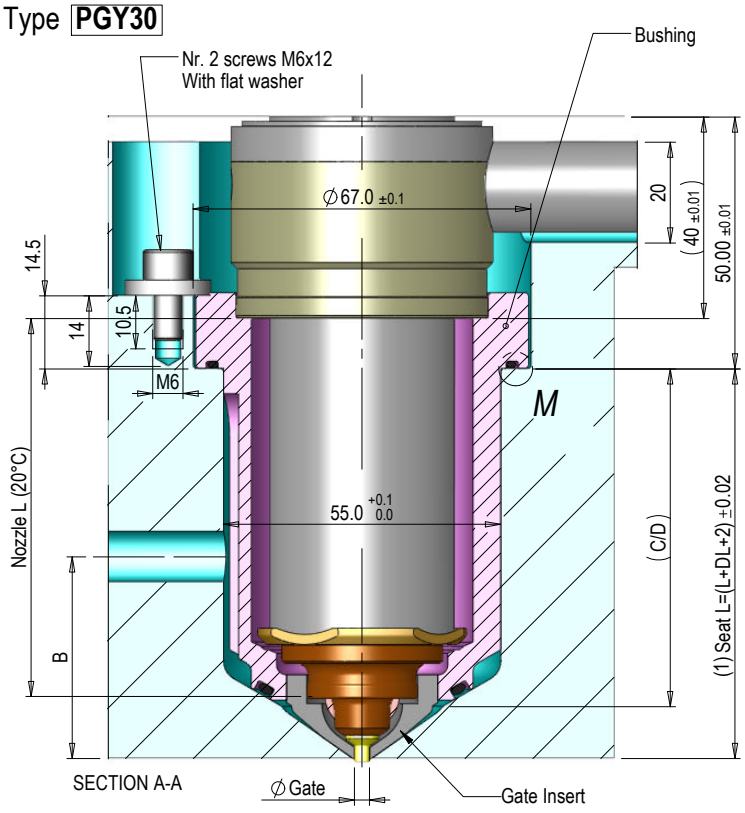


(*) Bushing to be used only with E series nozzle

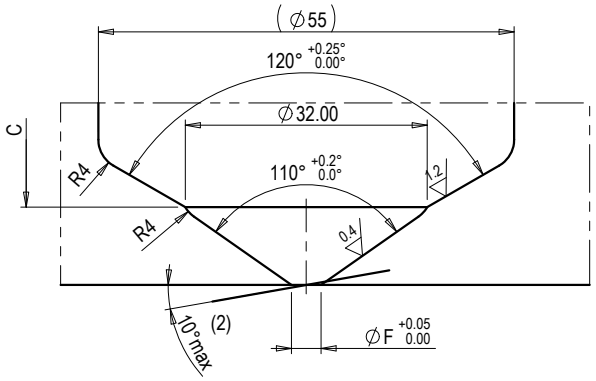
NOZZLE L	DL 200°C	SEAT L	A	EXTENSION		COOLING BUSHING		
				G series	E series	Free Flow	Torpedo	Valve gating
75 (*)	0.19	75.89	19.00	-	-	Gate	Gate	Gate
100	0.25	100.95	44.06	0250-00001	0250-00007	Ø2.5 - 0002-00061	Ø2.0 - 0002-00064	Ø3.0 - 0002-00239
125	0.31	126.01	69.12	0250-00002	0250-00008	Ø3.5 - 0002-00062	Ø3.0 - 0002-00065	Ø4.0 - 0002-00240
150	0.37	151.07	94.18	0250-00003	0250-00009	Ø4.5 - 0002-00063	Ø4.0 - 0002-00066	Ø5.0 - 0002-00241
175	0.43	176.13	119.24	0250-00004	0250-00010			
200	0.49	201.19	144.30	0250-00005	0250-00011			
250	0.61	251.31	194.42	0250-00006	0250-00012			

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Type **PGY30**

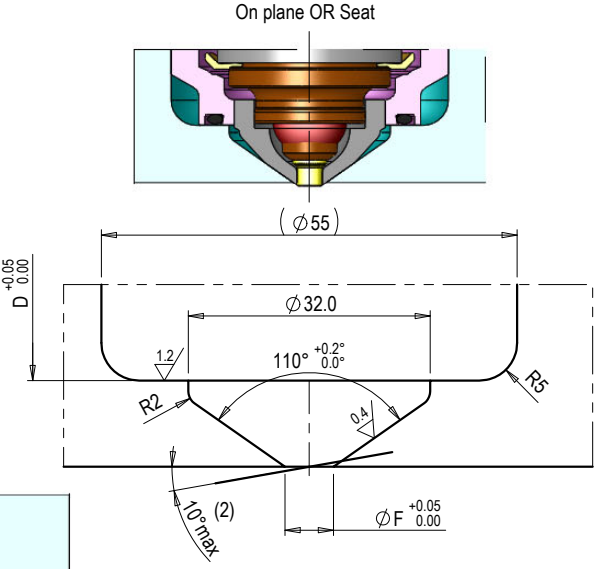


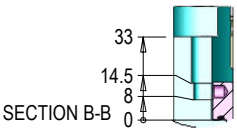
Standard Seat

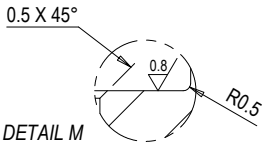


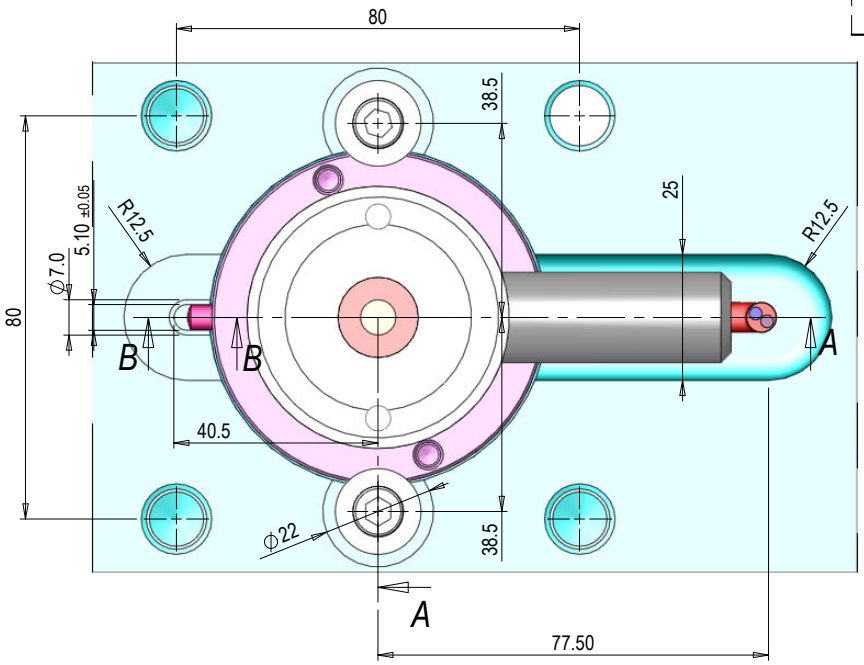
(2) Max angle allowed to the normal to the surface is 10°.
Should gates be placed on cosmetic surfaces/portions, the max angle allowed is 3° instead.
In case of any questions, please contact your technical reference within Oerlikon HRSflow.

On plane OR Seat









GATE INSERT		
Code	**ØGate**	**ØF**
0335-00172	3.0	3.9
0335-00173	4.0	5.1
0335-00174	5.0	6.4
0335-00175	6.0	7.6

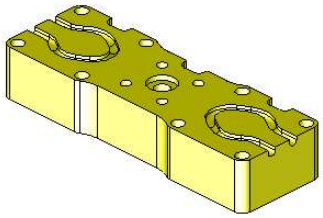
Installation KIT cod: 0283-00649

(1) For "Seat L" calculation see pag. 4.G1.14b table C

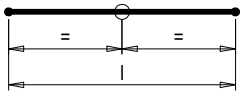
BUSHING CODE		NOZZLE L	C	D	B		BUSHING CODE		NOZZLE L	C	D	B	
STANDARD	ON PLANE OR				min	max	STANDARD	ON PLANE OR				min	max
0121-00449	0121-00456	50	41.96	40.85	25	40	0121-00455	0121-00462	200	192.32	191.21	25	115
0121-00450	0121-00457	75	67.02	65.91	25	65							
0121-00451	0121-00458	100	92.08	90.97	25	90							
0121-00452	0121-00459	125	117.14	116.03	25	115							
0121-00453	0121-00460	150	142.20	141.09	25	115							
0121-00454	0121-00461	175	167.26	166.15	25	115							

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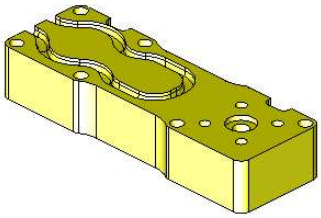
-HL-



Standard
l=150-200-250-300-350-400-450 mm



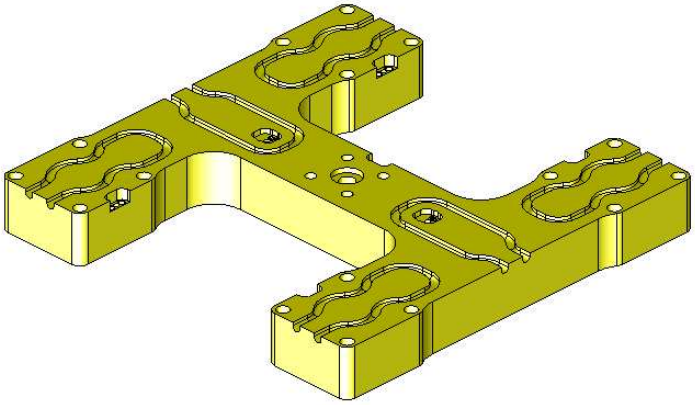
-HD-

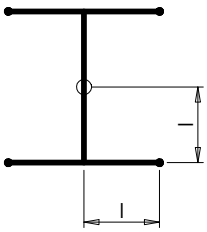


Standard
l=75-100-125-150-175-200-225 mm



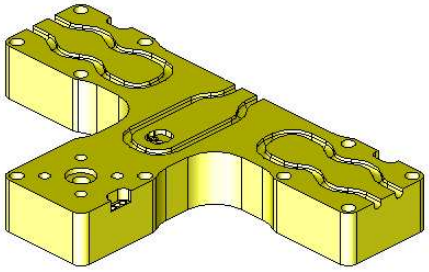
-HH-

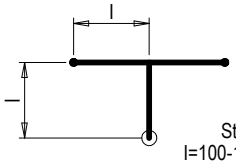




Standard
l=100-125-150 mm

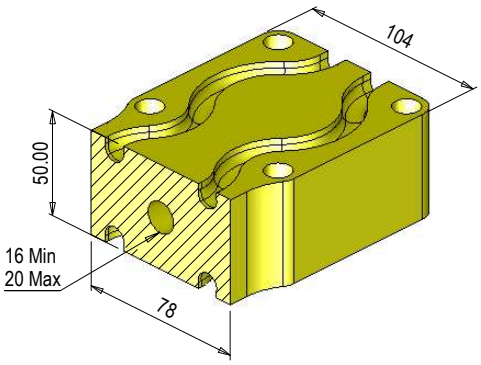
-HT-





Standard
l=100-125-150 mm

G - E (wired version) series

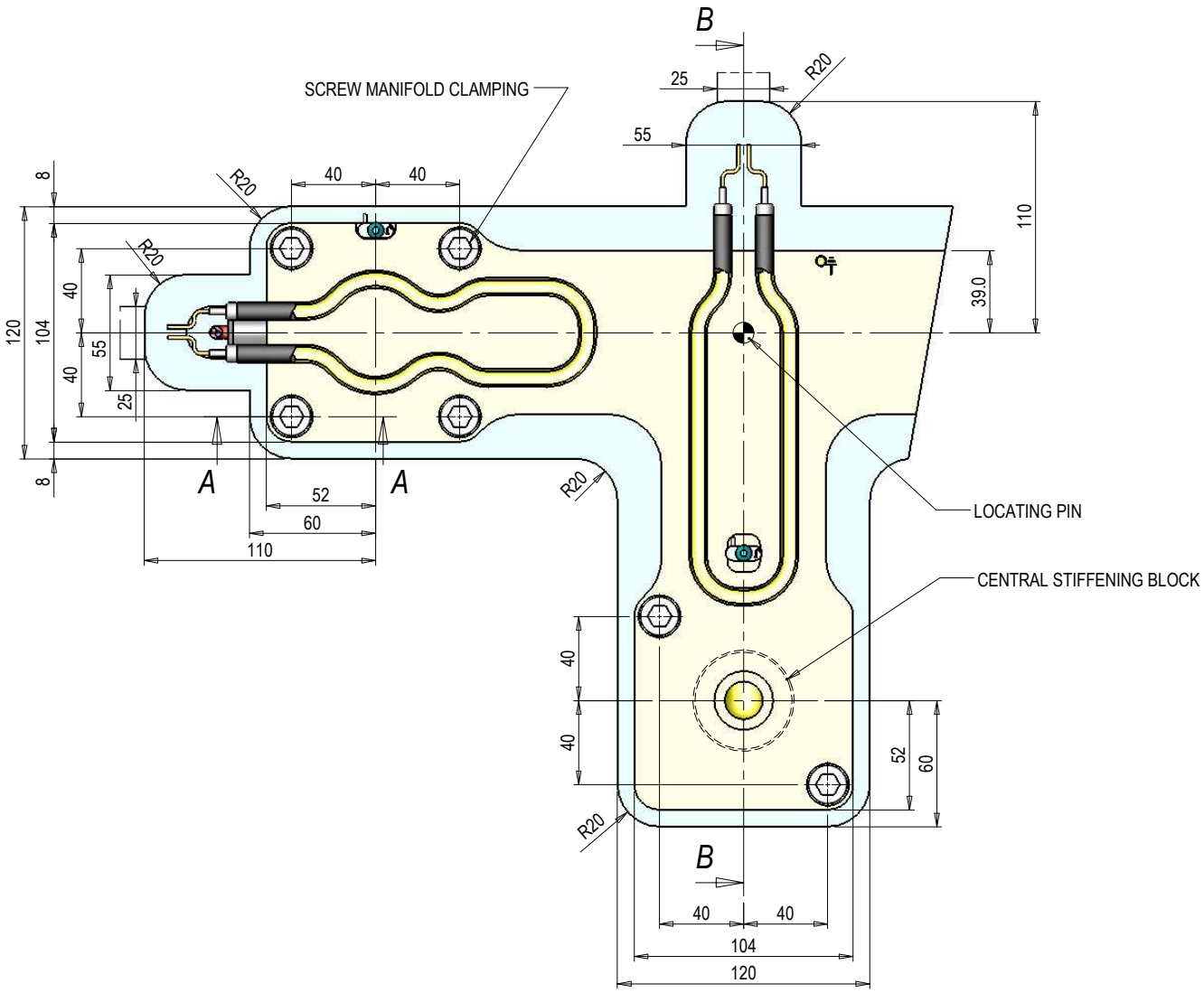


Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

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The following profile is the typical one for
the standard not wired hot runner pocket

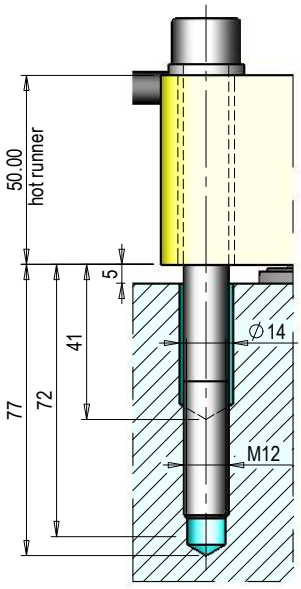
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)



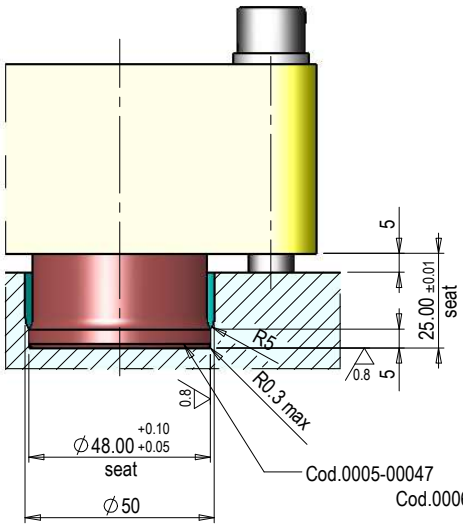
Screw manifold clamping
Screw M12x120 cl.12.9 70 Nm

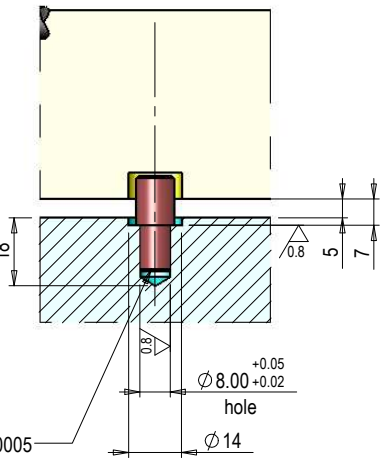
Pocket central stiffening block

Pocket for locating pin



A-A

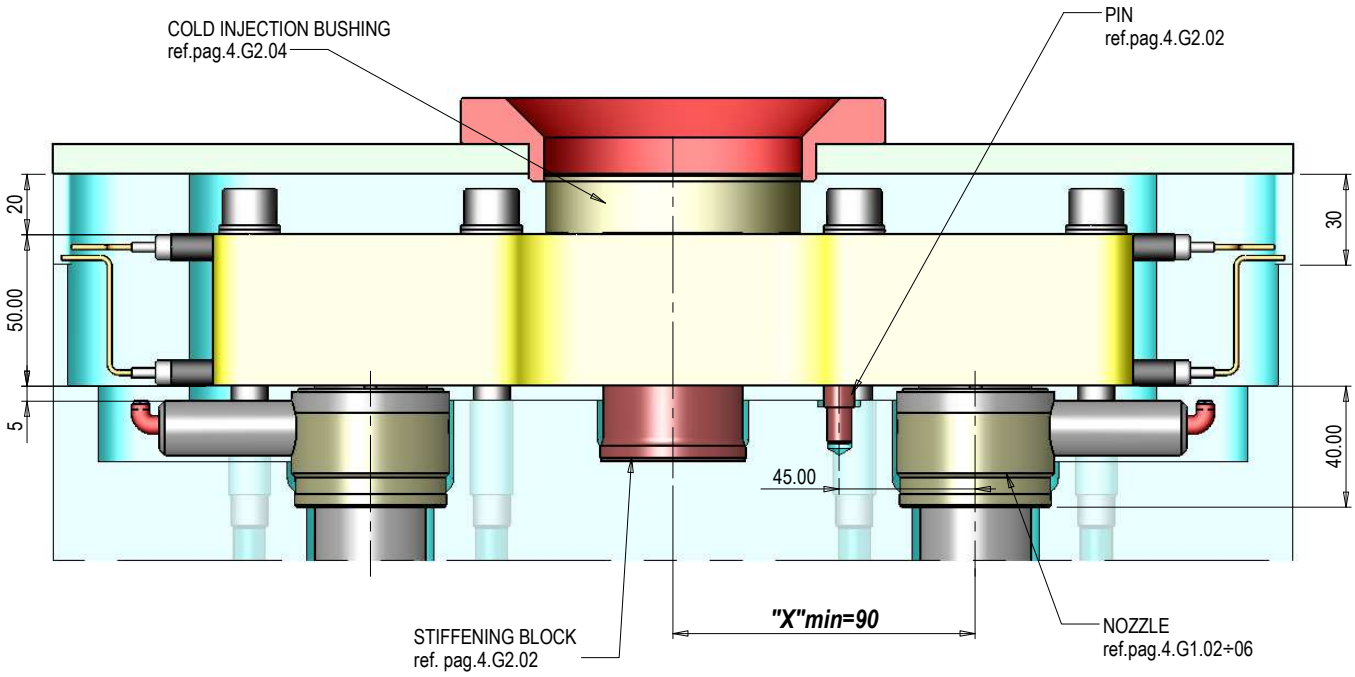




B-B

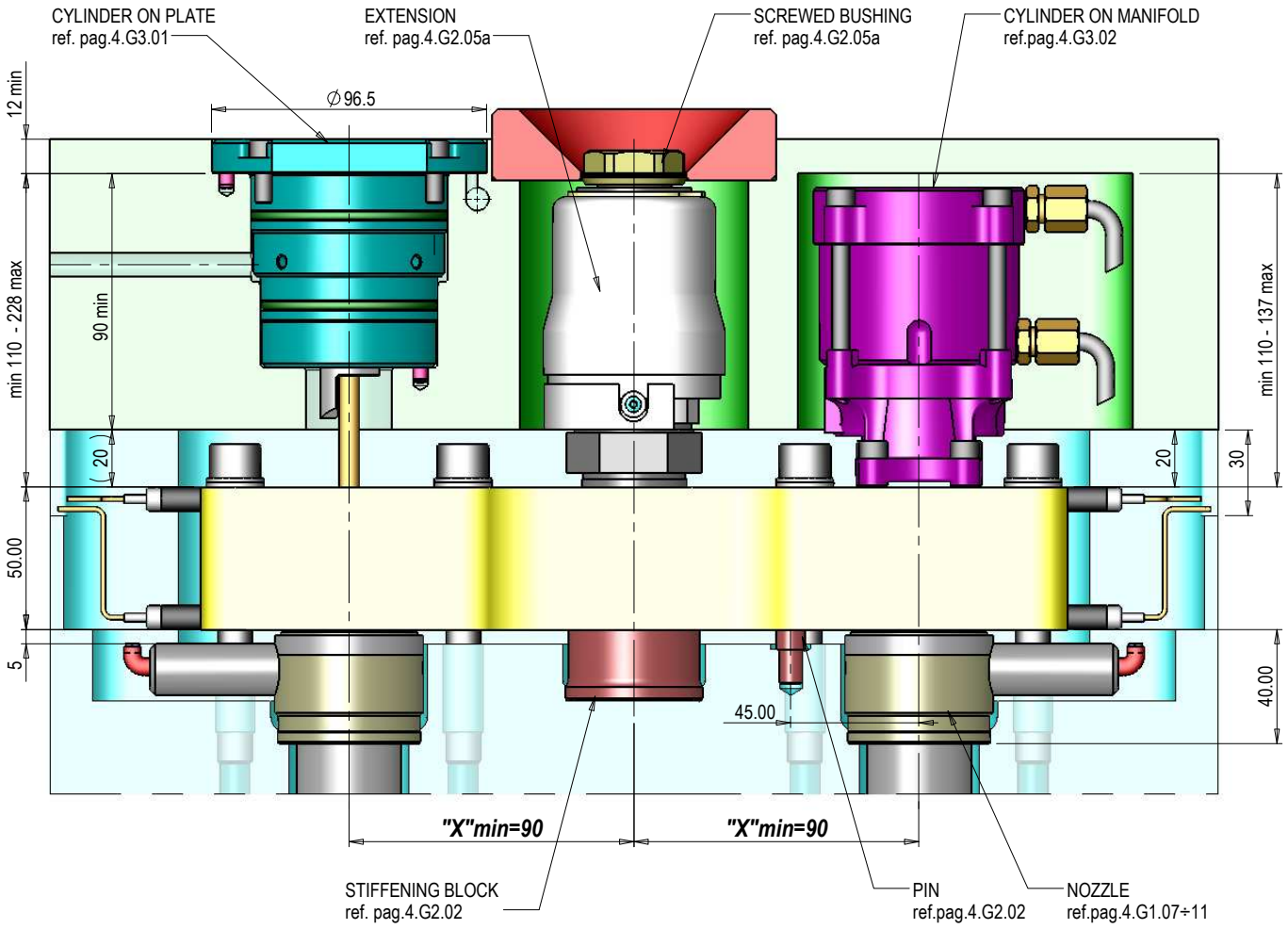
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Structure for TORPEDO or FREE FLOW systems

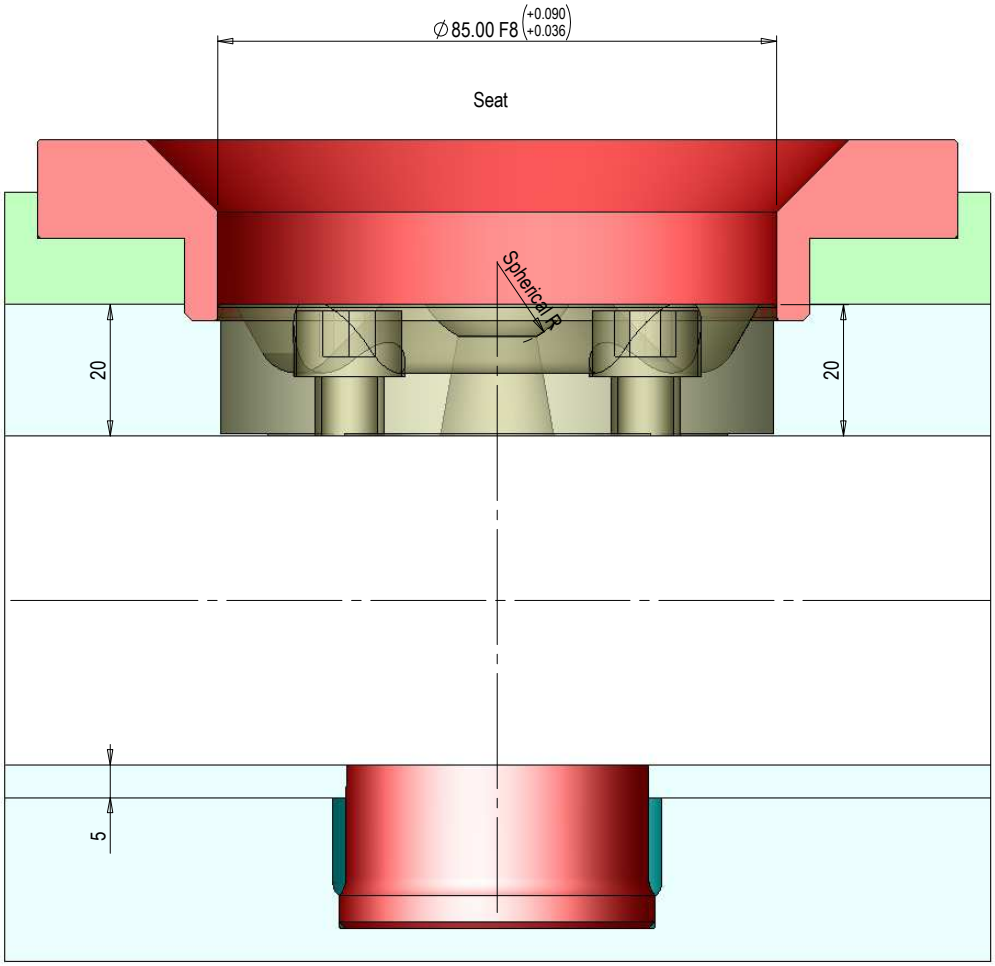


Xmin= min centre distance between injection bushing and nozzle for non standard systems

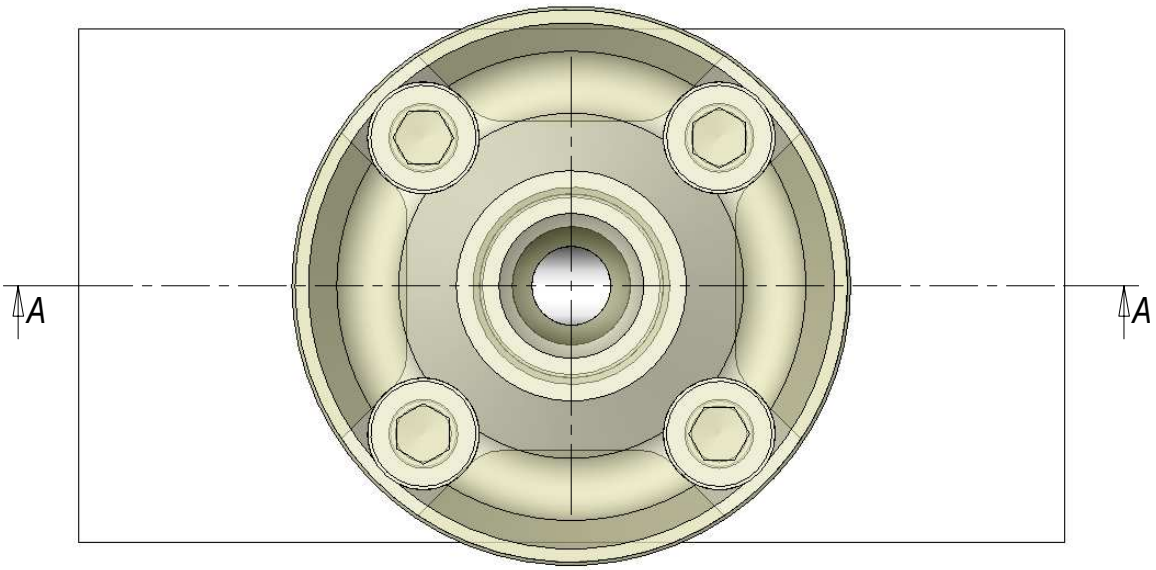
Structure for VALVE GATING systems



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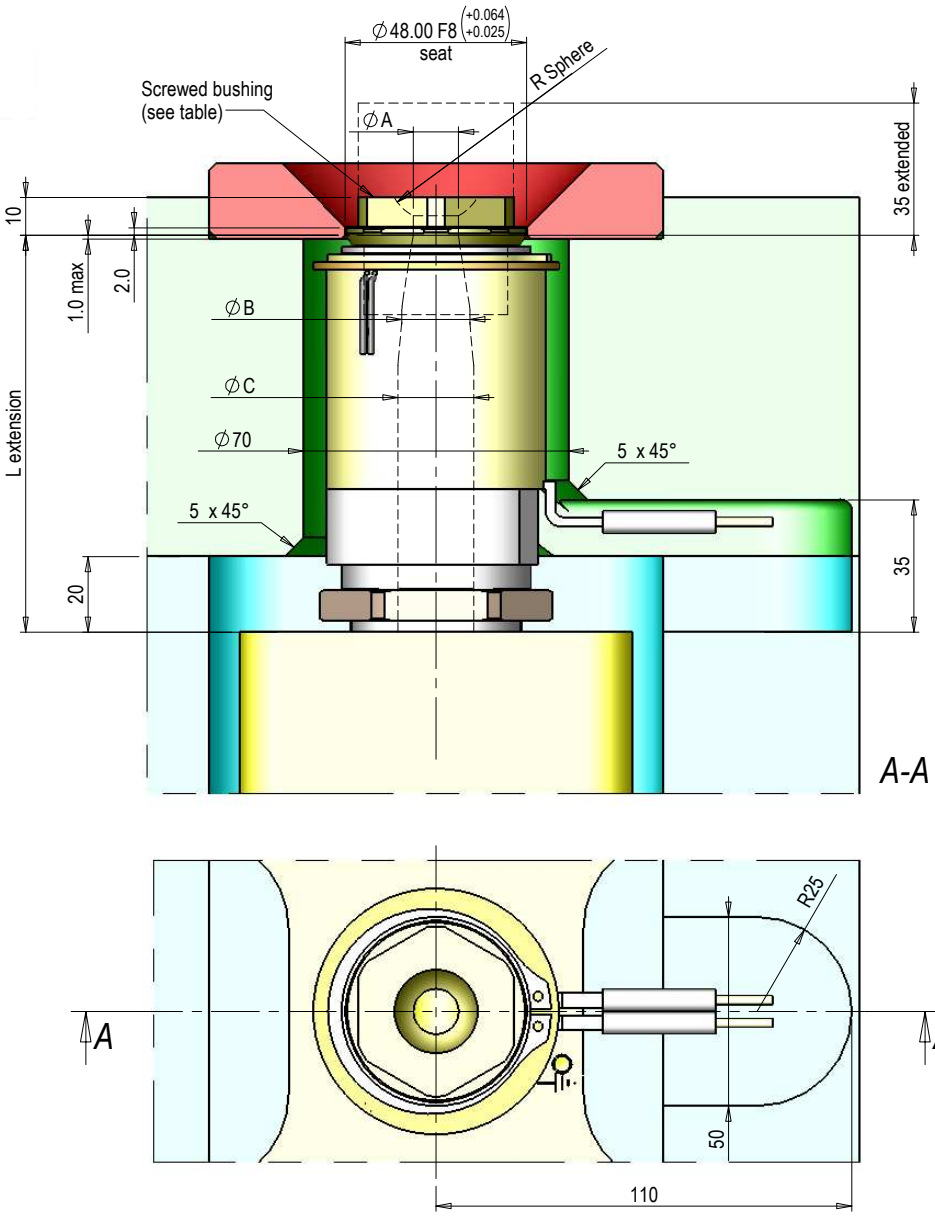
A-A



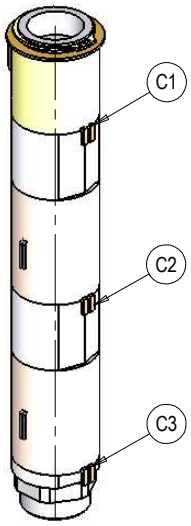
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0016-00012	R 12.7
0016-00013	R 15.5
0016-00014	R 19.1
0016-00050	R25
0016-00015	R 40

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SCREWED EXTENSION -Ga-
application on -G- manifold series



Control Zone



"L" (*)	MAXIMUN N° OF ZONES
040.00 ÷ 205.69	1 [C1]
205.70 ÷ 356.39	2 [C1 + C2]
356.40 ÷ 520.00	3 [C1 + C2 + C3]

STANDARD DIAMETERS OF EXTENSIONS DUCT (**)	
ØB	ØC
18	18
	20
	22
	24

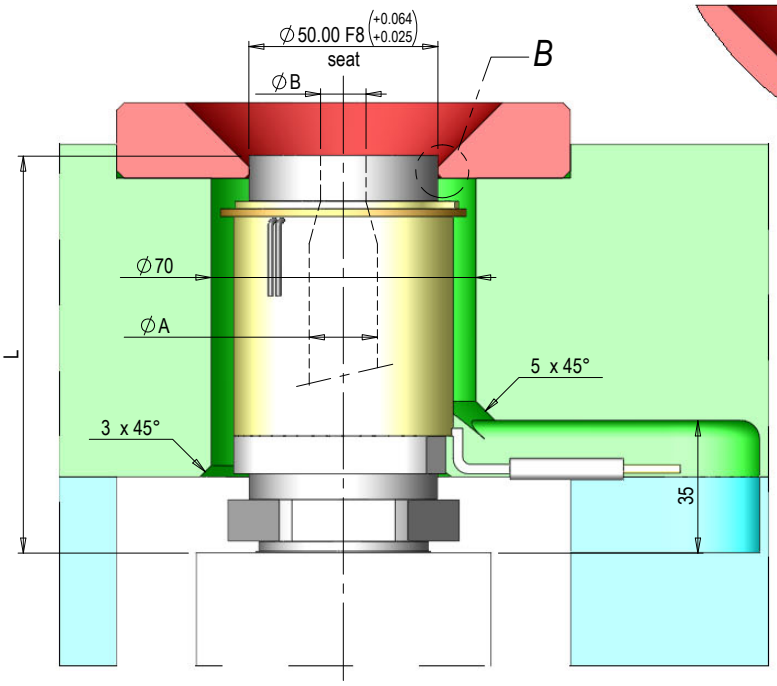
(*) L = min 040.00 ÷ 520.00 mm max
(**) Available also ØB=ØC=16,22 mm
(***) Re-workable according to the needs of the customer (by HRS)

STANDARD SCREWED BUSHING CODE	SPHERE RADIUS	ØA	ØB
0015-00448	R 0	12	18
0015-00462	R 12.7		
0015-00463	R 15.5		
0015-00464	R 19.1		
0015-00509	R 20		
0015-00465	R 25		
0015-00466	R40		
Extended 0015-00449 (***)	R 0	4	4

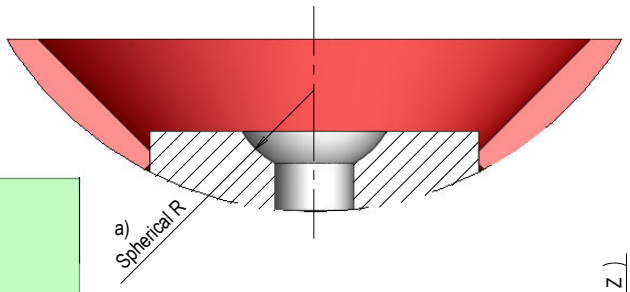
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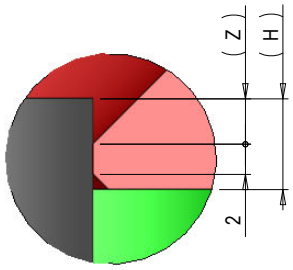
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MONOCOMPONENT SCREWED EXTENSION -Ga-
application on -G- manifold series



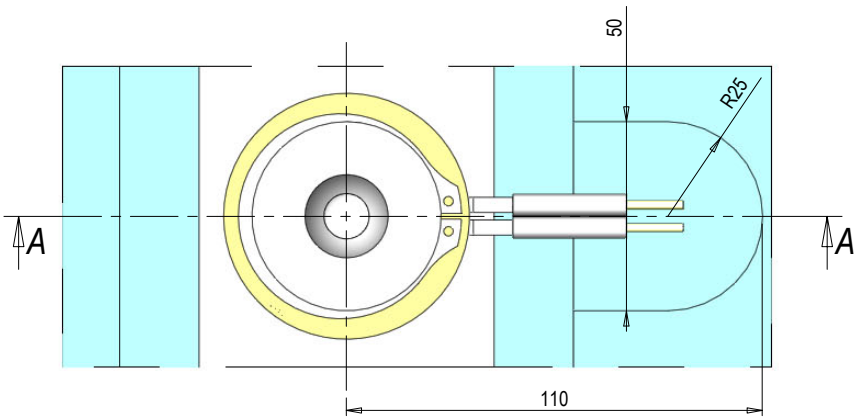
A-A



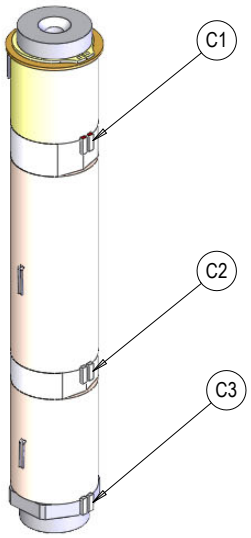


DETAIL B

L	H	Z
35.00-54.99	3.50	1.0
55.00-555.00	max 9.0	min 3.0



Control Zone

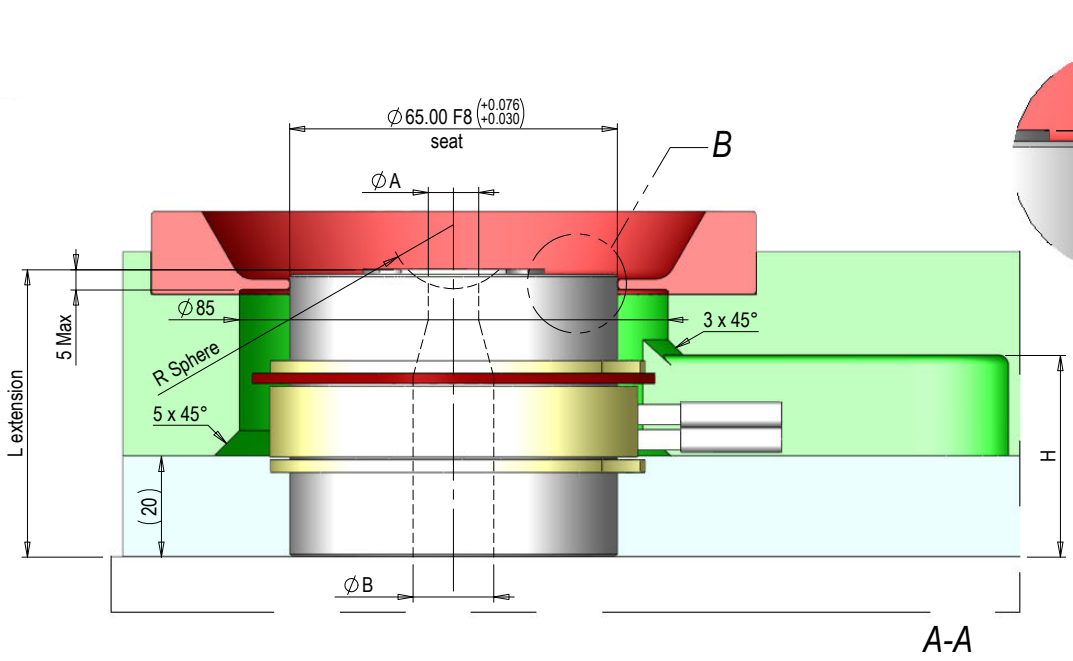


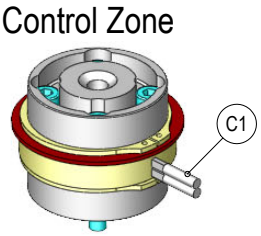
a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

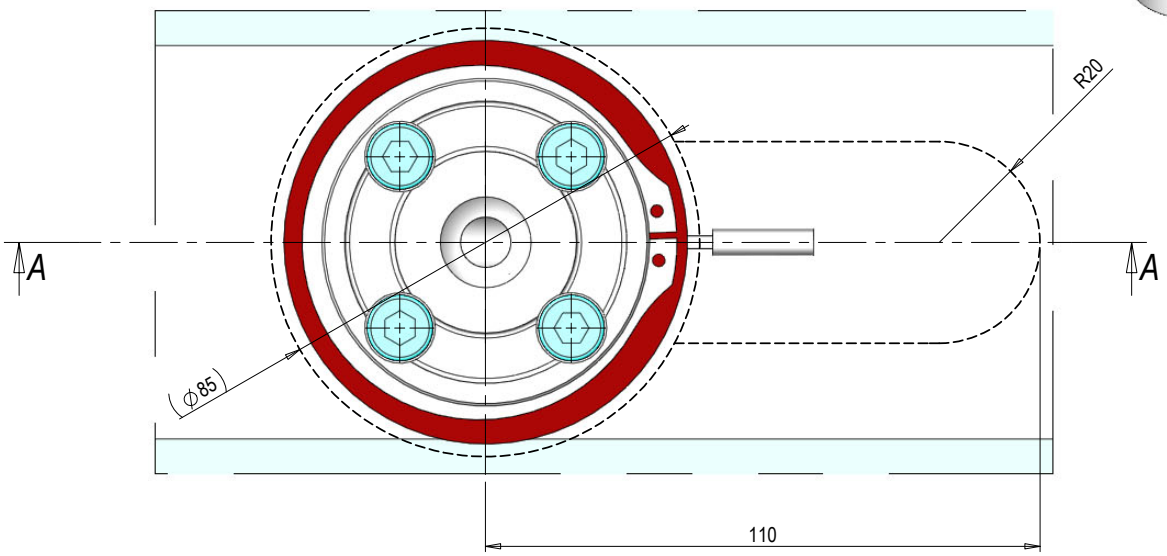
"L" (*)	*MAXIMUN N° OF ZONES*	STANDARD DIAMETERS OF EXTENSIONS DUCT	
		ØA	ØB
035.00 ÷ 212.89	1 [C1]	8	8
212.90 ÷ 363.19	2 [C1 + C2]	10	8 - 8.5 - 10
363.20 ÷ 555.00	3 [C1 + C2 + C3]	12	8 - 10 - 12
(*) L = min 055.00 ÷ 555.00 mm max		14	8 - 8.5 - 10 - 12 - 14
		16	8 - 10 - 12 - 14 - 16
		18	10 - 12 - 14 - 16 - 18
		20	8 - 9 - 10 - 12 - 14 - 15.5 - 16 - 18
		22	8 - 8.5 - 9 - 10 - 12 - 13 - 14 - 16 - 18
		24	10 - 12 - 12.5 - 14 - 16 - 18 - 19

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SCREWED EXTENSION S65 WITH SCREWS
application available also for -M- -A- series







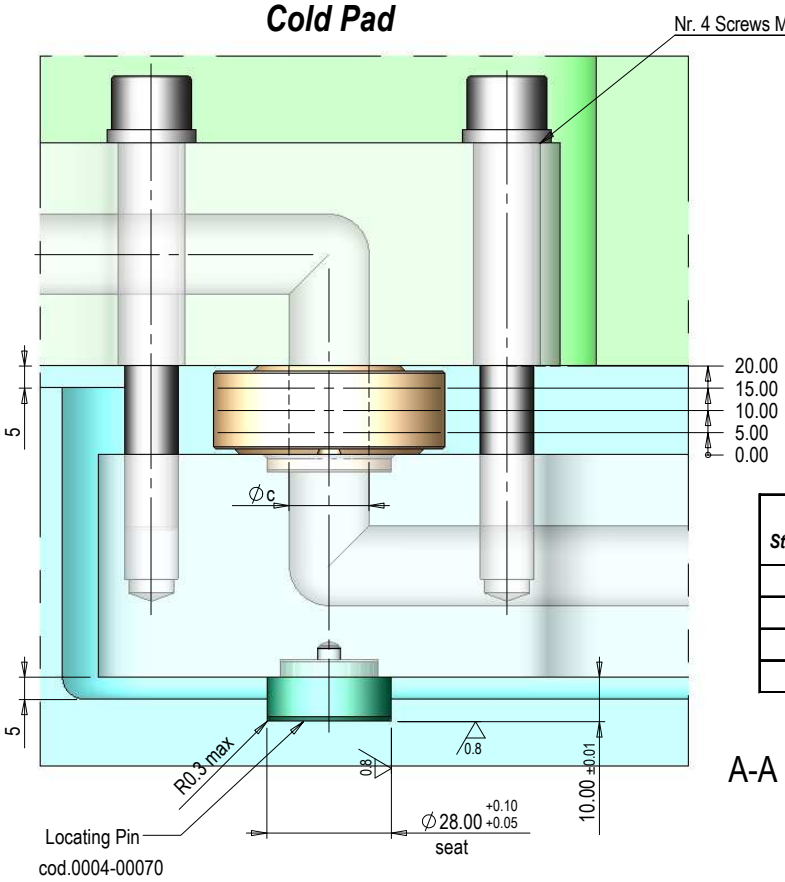
a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

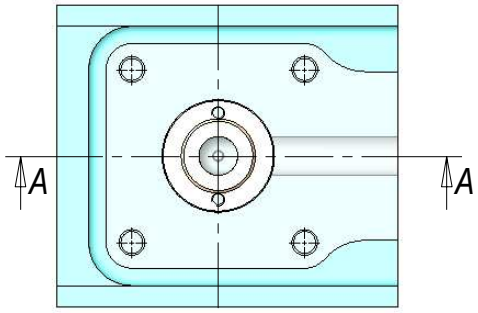
"L" (*)	*H*	*SERIES*	STANDARD DIAMETERS OF EXTENSIONS DUCT	
			ØA	ØB
31.50 ÷ 37.00	20	M	8	8
37.01 ÷ 42.00	25		10	8 - 8.5 - 10
42.01 ÷ 47.00	30		12	8 - 10 - 12
47.01 ÷ 52.00	35		14	8 - 8.5 - 10 - 12 - 14
52.01 ÷ 57.00	40	G	16	8 - 10 - 12 - 14 - 16
(*) L = min 31.50 ÷ 57.00 mm max			18	10 - 12 - 14 - 16 - 18
Max n° of zone for all configurations: 1 (C1)		A	20	8 - 9 - 10 - 12 - 14 - 15.5 - 16 - 18
			22	8 - 8.5 - 9 - 10 - 12 - 13 - 14 - 16 - 18
			24	10 - 12 - 12.5 - 14 - 16 - 18 - 19

Index

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Cold Pad





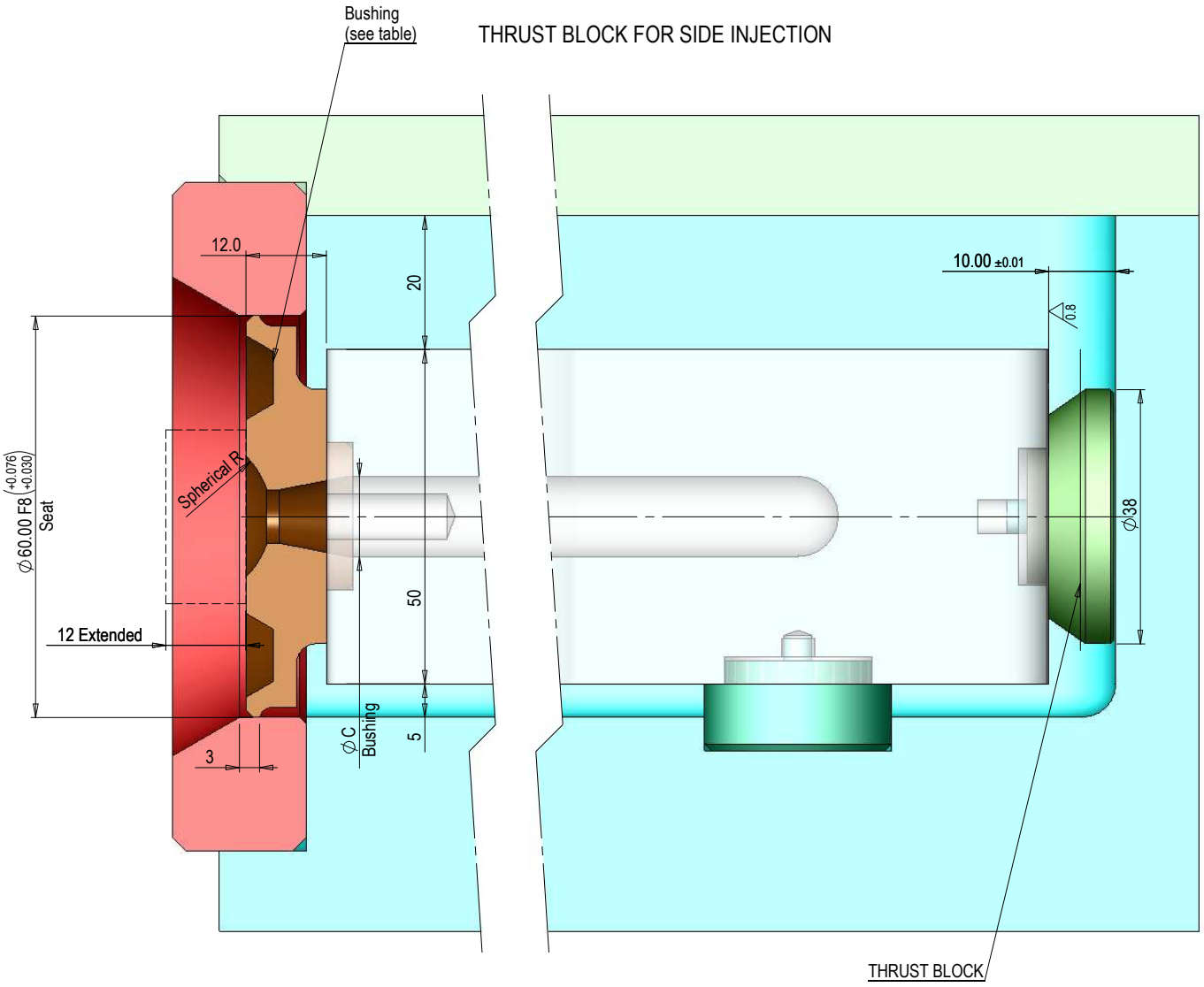
A-A

H Standard	Øc=8	Øc=16	Øc=18	Øc=20
5.00	0009-00395	0009-00399	0009-00403	0009-00407
10.00	0009-00396	0009-00400	0009-00404	0009-00408
15.00	0009-00397	0009-00401	0009-00405	0009-00409
20.00	0009-00398	0009-00402	0009-00406	0009-00410

[*] Øc=10-14mm upon request

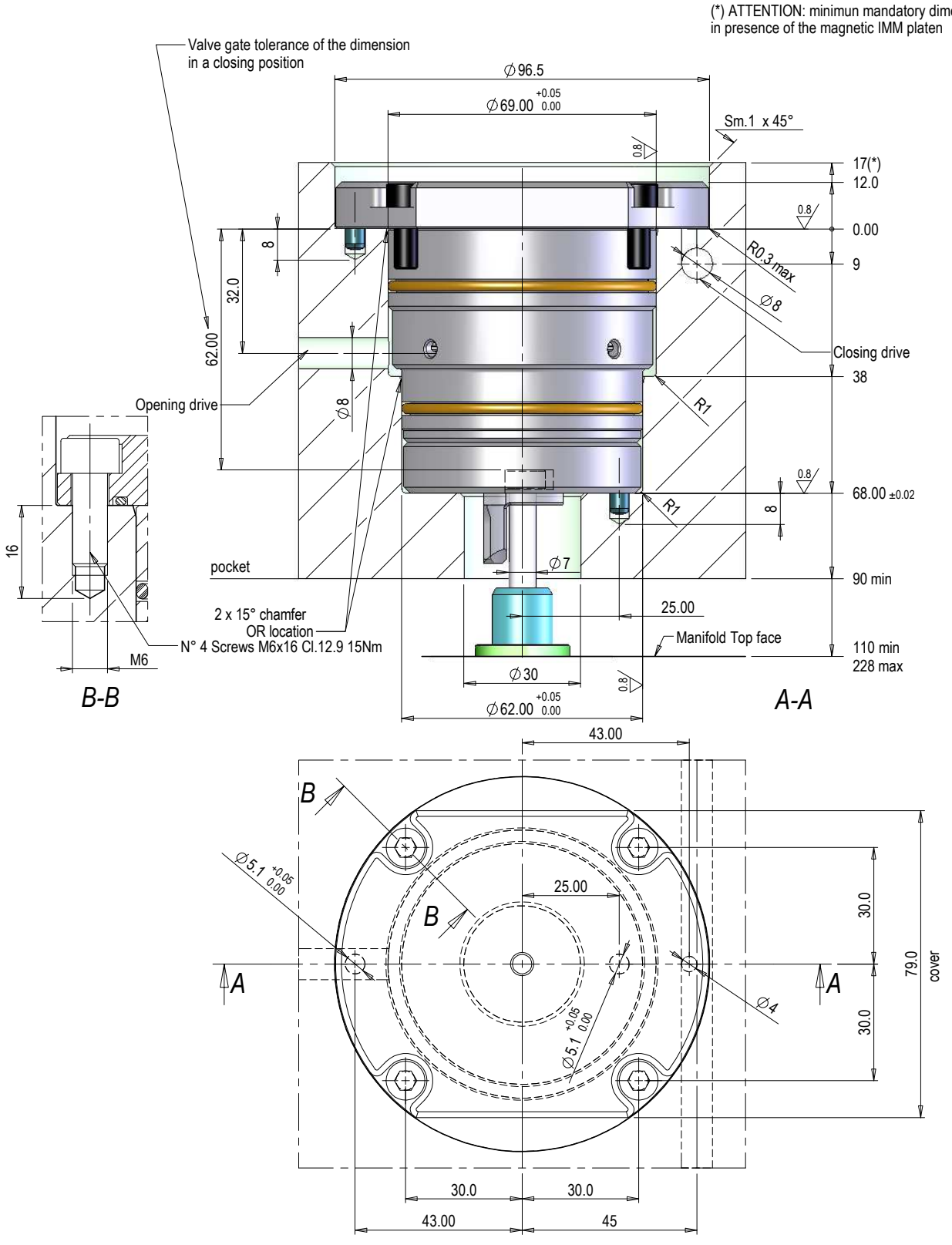
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THRUST BLOCK FOR SIDE INJECTION



THRUST BLOCK CODE	*BUSHING CODE*		*SPHERICAL RADIUS*
	Øc = 18	*Øc = 20*	
0007-00004	0016-00148	0016-00154	R 0
	0016-00149	0016-00155	R 12.7
	0016-00150	0016-00156	R 15.5
	0016-00151	0016-00157	R 19.1
	0016-00152	0016-00158	R 25
	0016-00153	0016-00159	R40
	0016-00162 Extension	0016-00163 Extended	R0

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The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job

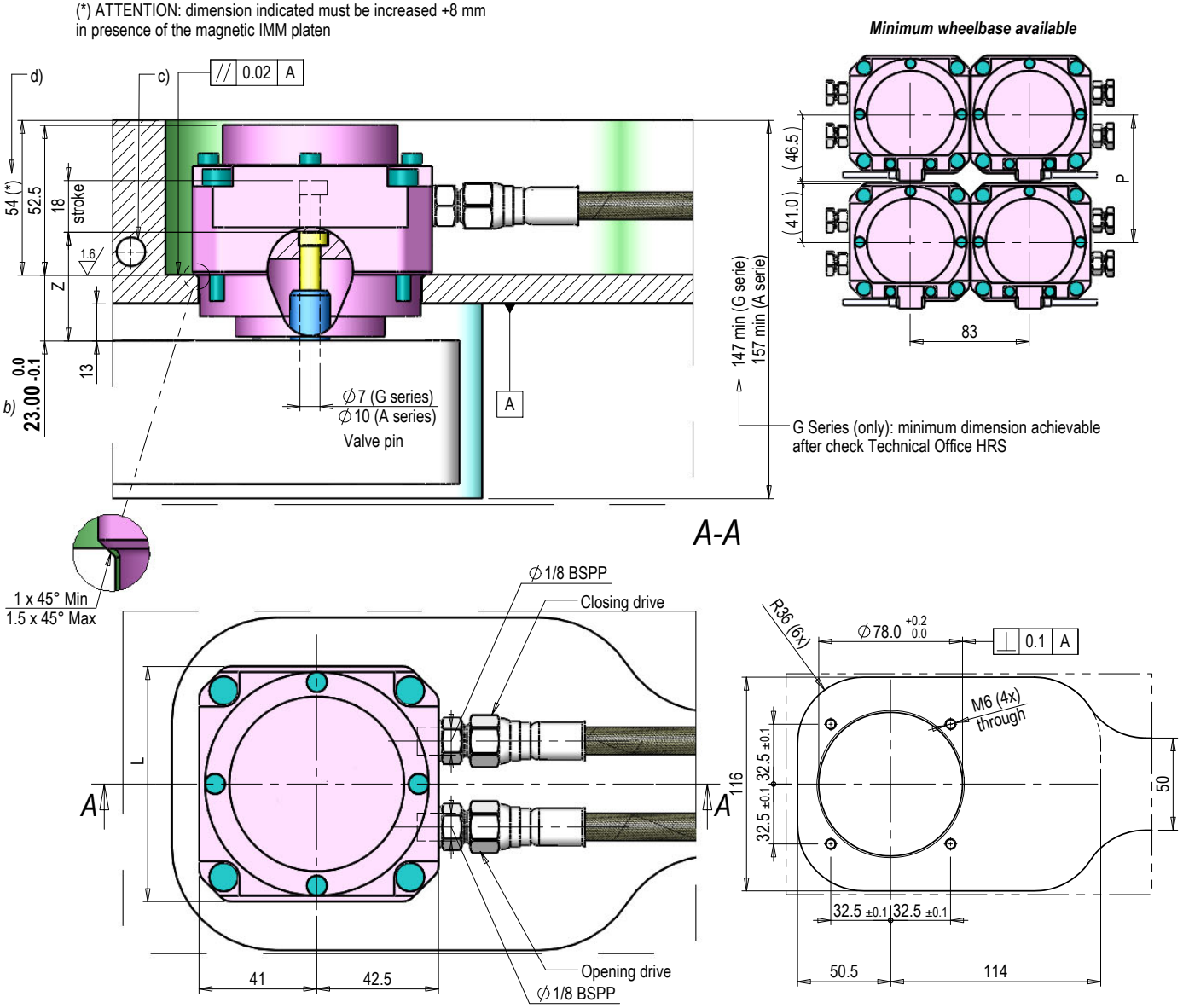
CODE	BORE	STROKE	WORKING		COMPLETE GASKET SET
0017-00078	62	18	AIR	P_{min} = 6 BAR	0038-00010
0017-00079	42	18	OIL	P_{max} = 80 BAR	0038-00067

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CYLINDER ON PLATE
3rd VERSION

Hydraulic Cylinder: stroke 18 mm

a) Working PRESSURE: HYDRAULIC max 80 BAR
(*) ATTENTION: dimension indicated must be increased +8 mm
in presence of the magnetic IMM platen



CODE		VERSION (*)	ADJUSTABLE (*)	COMPLETE GASKET SET	L	P	Z
G series	A series						
0017-01044	0017-01052	(standard)	×	0038-00143	82	83	38
0017-01048	0017-01056		✓				37 ±1
0017-01046	0017-01054	WITH END OF STROKE	×		93	89	38
0017-01050	0017-01058		✓				37 ±1

(*) Adjustment & Installation KIT cod: 0283-00681

NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

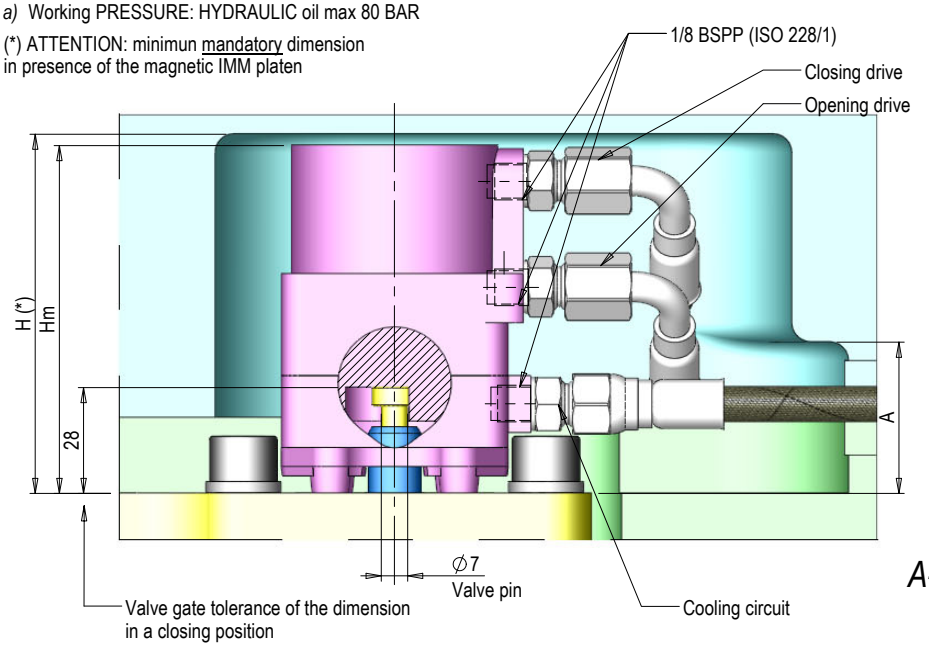
a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Very important dimension. Any derogations to the indicated value must be agreed before with the technical office HRS.
c) Maximum operating temperature of cylinders housing plate: 70°C [158 F°]. If is necessary, thermoregulate the plate temperature by providing cooling circuits dedicated for purpose.
d) Avoid the use any type of insulation plate between cylinders housing plate and IMM plate.

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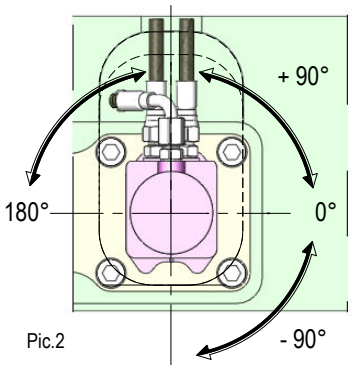
Hydraulic Cylinder: bore 42 mm - stroke 12 or 18 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen

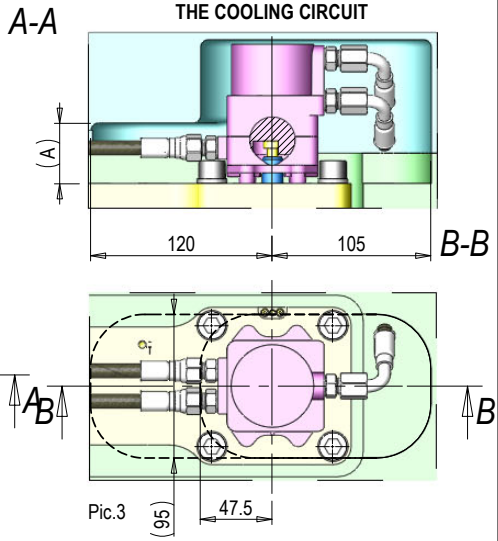


b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**

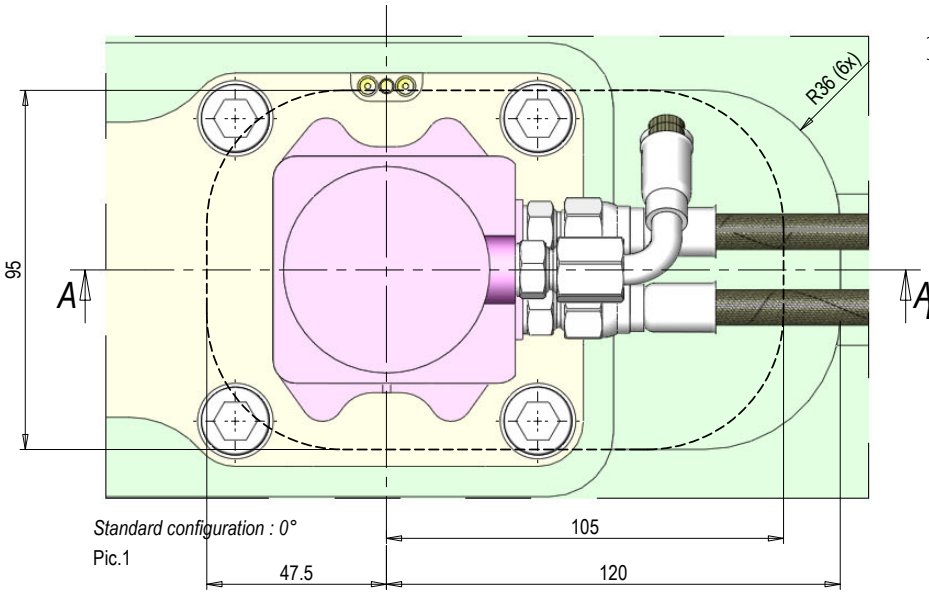


Pic.2

ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



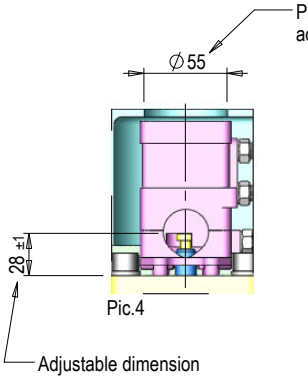
Pic.3



Standard configuration : 0°

Pic.1

ADJUSTABLE CYLINDER



Pic.4

CODE stroke=18	CODE stroke=12	VERSION	COMPLETE GASKET SET	Hm stroke=18	H stroke=18	Hm stroke=12	H stroke=12	A
0017-01088	-	COMPACT	0038-00102	92	95	-	-	40
-	0017-01111	REGULAR	0038-00102	-	-	96	99	
0017-01092	0017-01117	DAMPENED	0038-00103	102	105	96	99	50
0017-01109	-	ADJUSTABLE	0038-00142	102	105	-	-	50
0017-01094	0017-01113	WITH 1 END OF STROKE	0038-00107	122	125	116	119	50
0017-01096	0017-01115	WITH DOUBLE END OF STROKE	0038-00107	127	130	116	119	50

NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

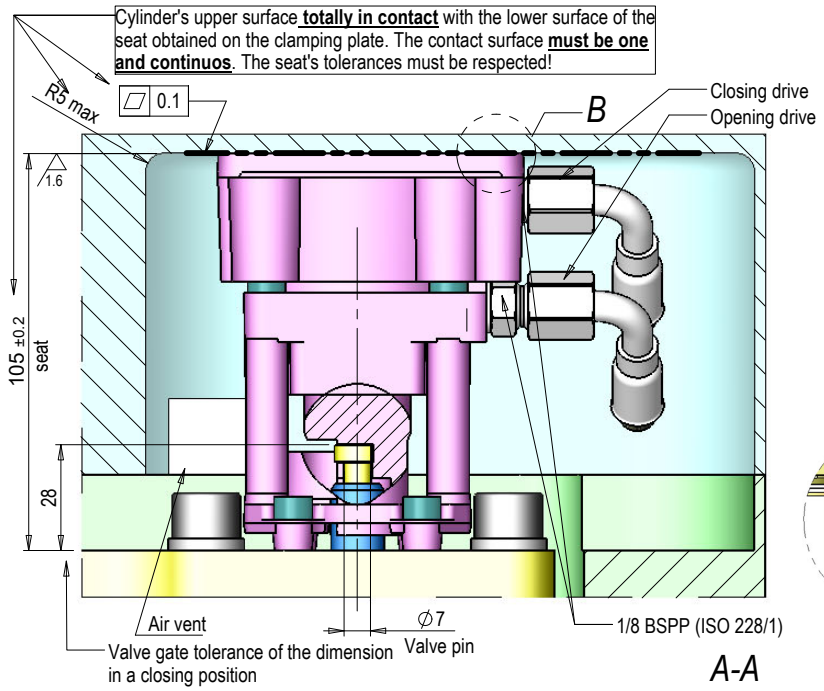
NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

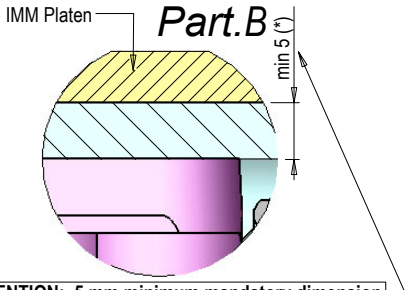
a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1;

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HYDRAULIC CYLINDER ON MANIFOLD
"HRS COOL" version

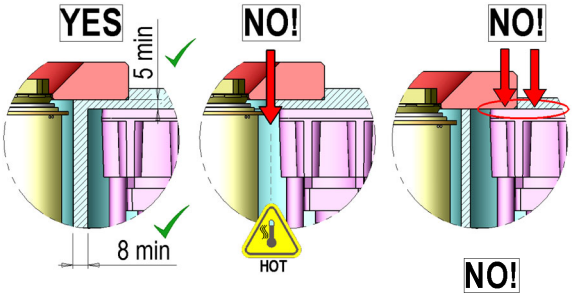
Hydraulic Cylinder: bore 42 mm - stroke 12 or 18 mm - passive cooling (HRS COOL)

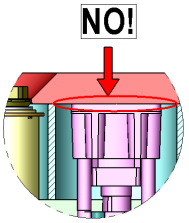


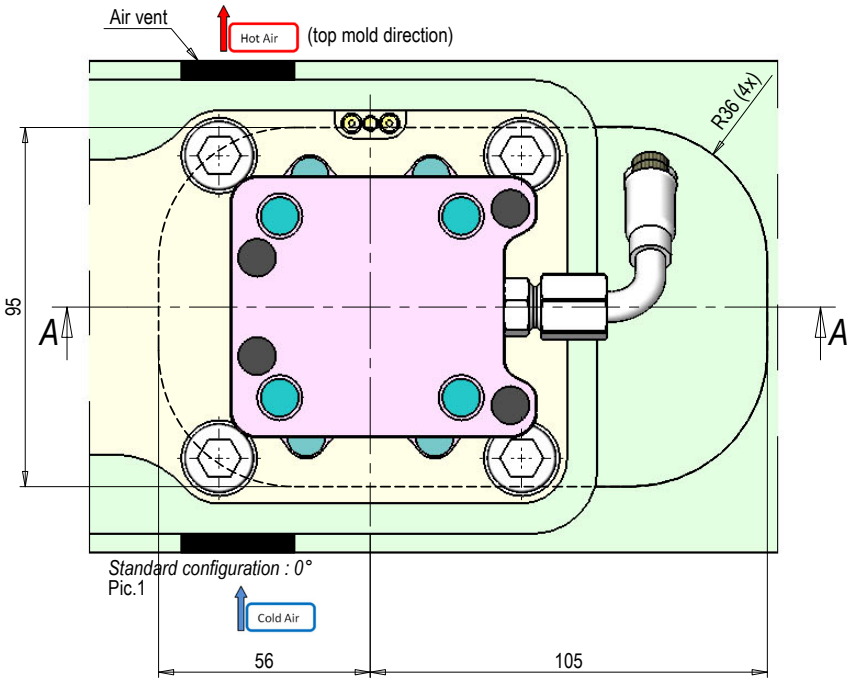


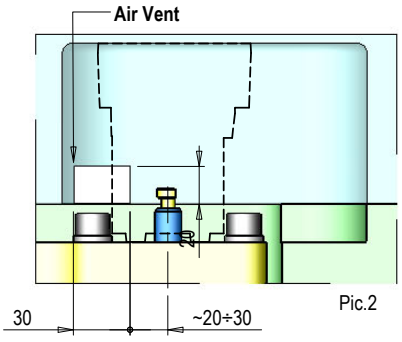
(*) ATTENTION: 5 mm minimum mandatory dimension. In presence of the magnetic IMM Platen increase dimension to "minimum 30 mm".

WARNINGS FOR THE SEAT CONSTRUCTION







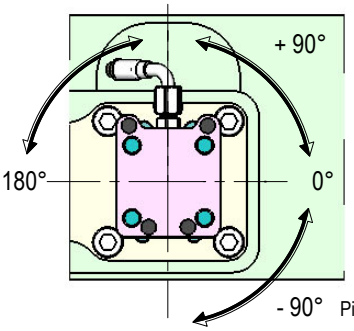


Pic.2

a) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1

CODE stroke = 18	CODE stroke = 12	VERSION	COMPLETE GASKET SET	H stroke = 18	H stroke = 12
0017-00544	0017-00880A	*(standard)*	0038-00102	105	99
0017-00545	0017-00885A	DAMPENED	0038-00103		

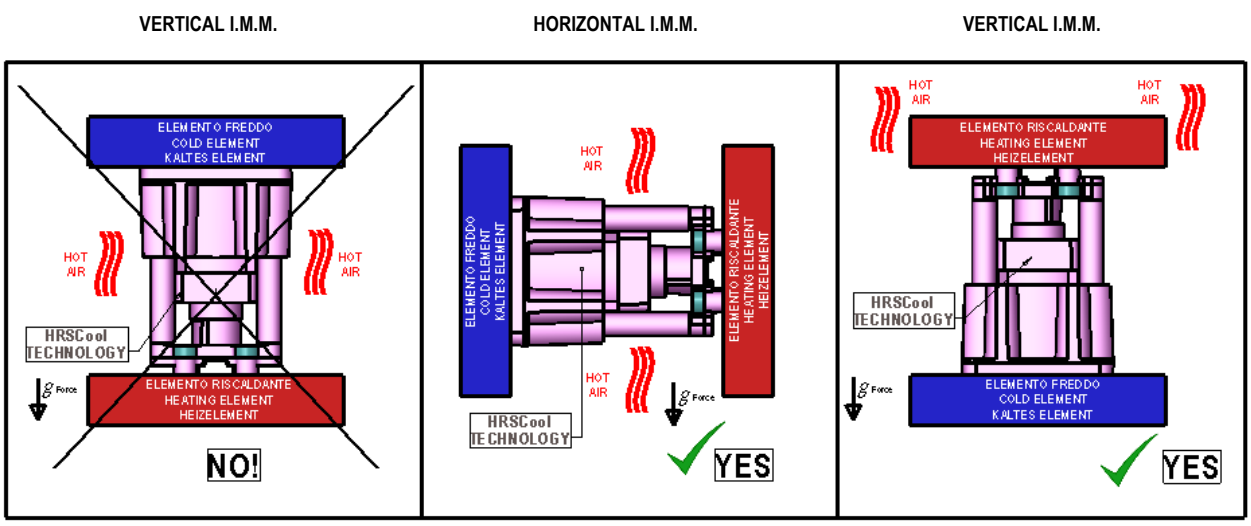
a) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



Pic.3

follow

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Pic.4

System requirements (**):

1- Maximum temperature allowed: T hot runner manifold: max 280°C [536°F] - T mold: max 60°C [140°F].
2- In case of cylinder plate temperature is higher than 60°C [140°F], it is mandatory to cool it at the temperature ≤ 60°C [140°F].
3- Working PRESSURE: HYDRAULIC max 80 BAR (absolute value).
The working pressure is only for reference: for the correct value of the maximum allowed working pressure, please refer to the specific steel plate provided for each HRSFlow job.
4- Air vents in the cylinder plate is highly recommended to evacuate hot air:
- The air vents must pass through the plate from bottom to top mold in proximity of the cylinders. Distance from the air vent to the valve pin axis: 20÷30mm (Pic.1 & Pic.2);
- Due to hot air, avoid the exit of the air vents in proximity of electrical boxes eventually present on top mold;
- The minimum dimensions requested for the air vents are: 30mm (width) x 20mm (depth).
5- The HRSCOOL technology is permitted in the vertical injection moulding machine but only if the heating elements (i.e.: the manifold) are placed in an upwards position in respect to the cylinders and to the cold elements (i.e.: mould plate). It's necessary to avoid the cylinder heated by the hot air coming from hot elements (Pic.4).
6- The minimum distance from cylinder to HRS extension "Xmin" must be respected: see notes pag. 4.G2.03. For special cases, please contact the HRS Technical Office.

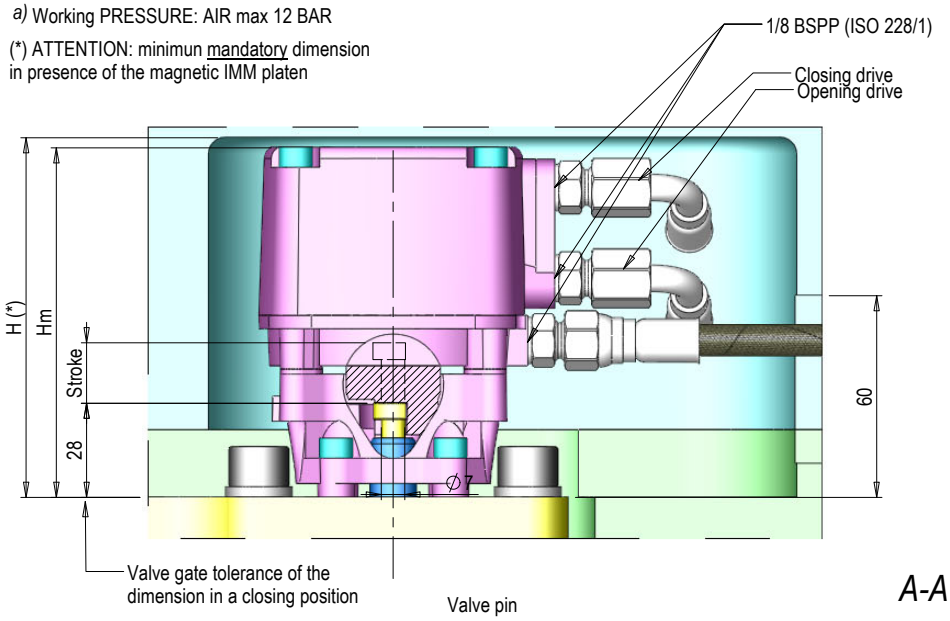
(**) ATTENTION: in particular conditions of the system, the seat of the cylinder ''HRS COOL'' might be modified. In this case the HRS Technical Office will provide the necessary documentation.

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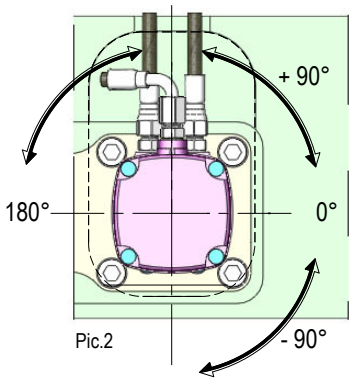
Pneumatic Cylinder: bore 70 mm - stroke 12 or 18 mm

a) Working PRESSURE: AIR max 12 BAR

(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen

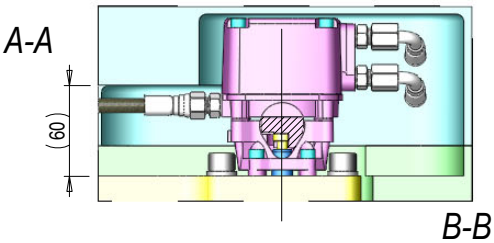


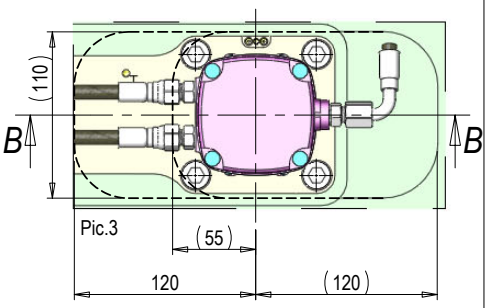
b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



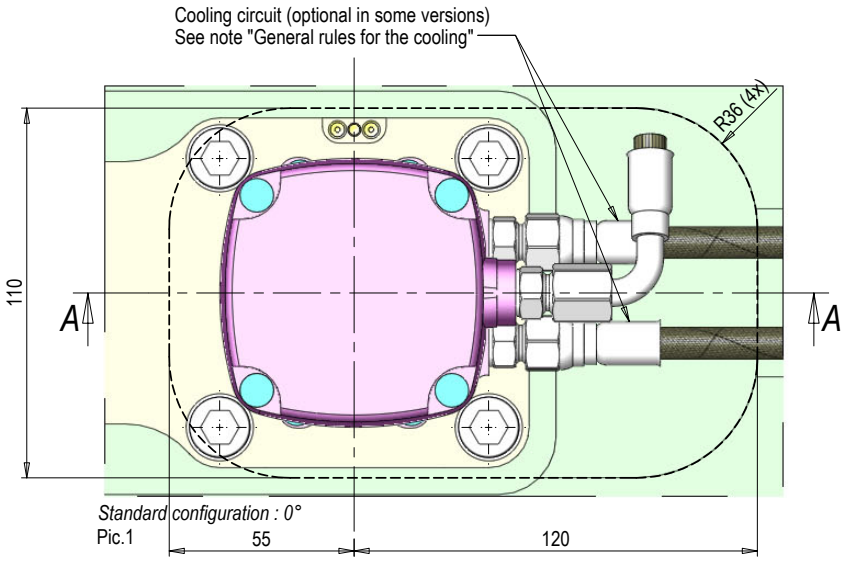
Pic.2

ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT





Pic.3



Pic.1

CODE Stroke = 18 mm	CODE Stroke = 12 mm	VERSION	COOLED	DAMPENED	COMPLETE GASKET SET	Hm Stroke = 18 mm	H Stroke = 18 mm	Hm Stroke = 12 mm	H Stroke = 12 mm
0017-00916	0017-00940	(standard)	✓	×	0038-00133	104	107	98	101
0017-00917	0017-00941		×	×					
0017-00919	0017-00943		✓	✓	0038-00134				
0017-00920	0017-00944		×	✓					
0017-00922	0017-00946	WITH 1 END OF STROKE	✓	×	0038-00135	124.5	127.5	117.5	120.5
0017-00926	0017-00950		✓	✓	0038-00136				
0017-00924	0017-00948	WITH DOUBLE END OF STROKE	✓	×	0038-00135	129.5	132.5		
0017-00928	0017-00952		✓	✓	0038-00136				
0017-00930	0017-00954	PREARRANGED FOR TRANSDUCER	✓	×	0038-00137	117	120	111	114
0017-00931	0017-00955		×	×					
0017-01194	-	ADJUSTABLE	✓	×	0038-00133	112.5	115.5	-	-
0017-01195	-		×	×					

T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximum Mold temperature

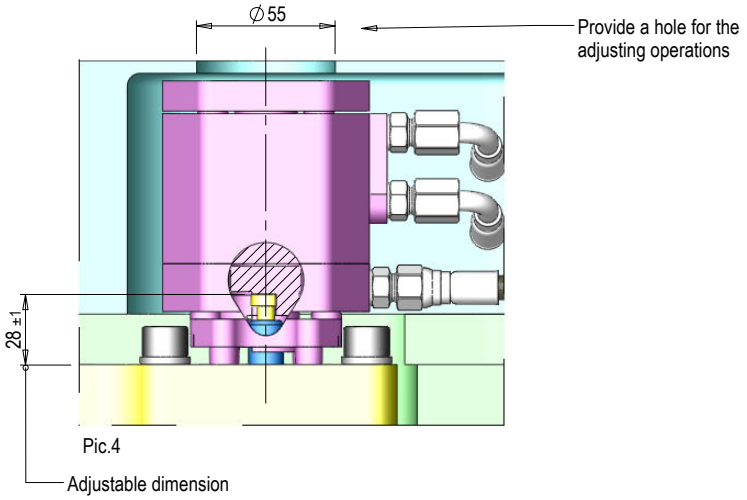
GENERAL RULES FOR THE COOLING
- Versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of T1 ≤280°C [536°F] and T2 ≤80°C [176°F]
- Versions with end of stroke: cooling ALWAYS MANDATORY with T1≥200°C [392°F] also after shut off of the mold/hot runner systems.
- During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
  - 100°C [212°F] Temperature of the mold
  - 300°C [572°F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

a) The working pressure is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

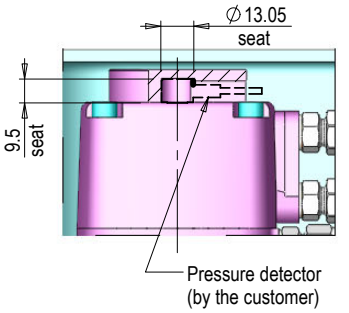
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ADJUSTABLE CYLINDER



Pic.4

VERSION PREARRANGED FOR TRANSDUCER



NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

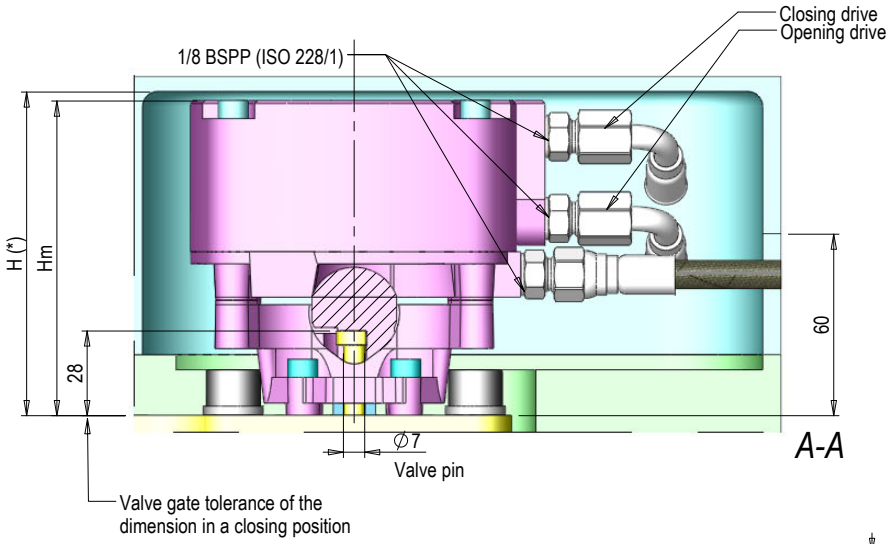
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PNEUMATIC CYLINDER ON MANIFOLD Ø100
2nd VERSION

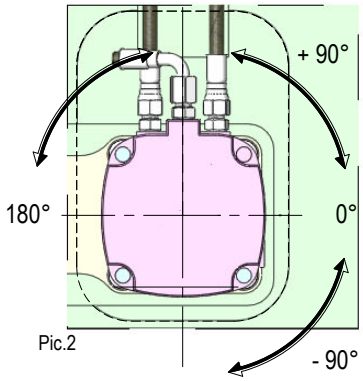
Pneumatic Cylinder: bore 100 mm - stroke 18 mm

a) Working PRESSURE: AIR max 12 BAR

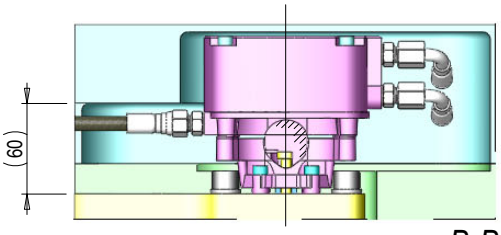
(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen

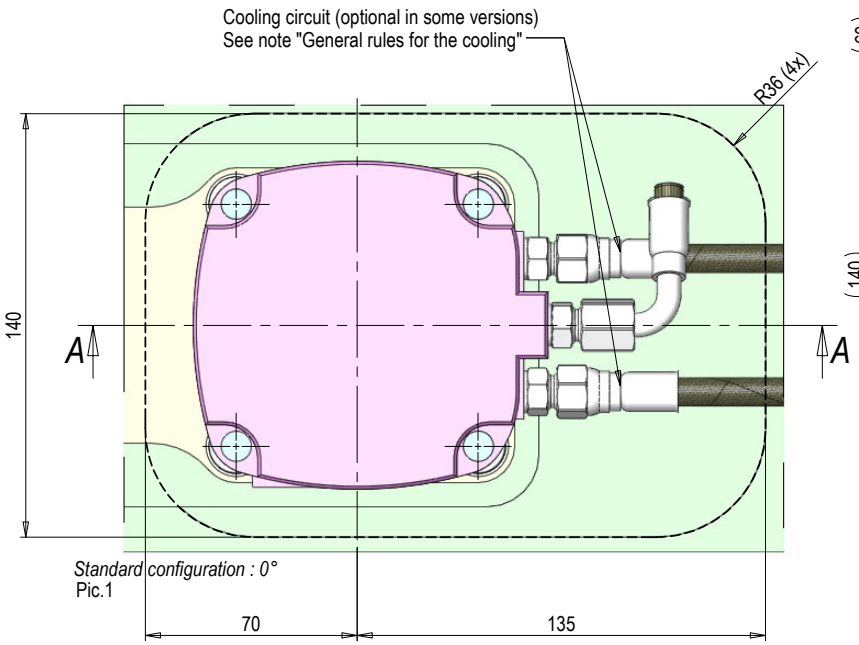


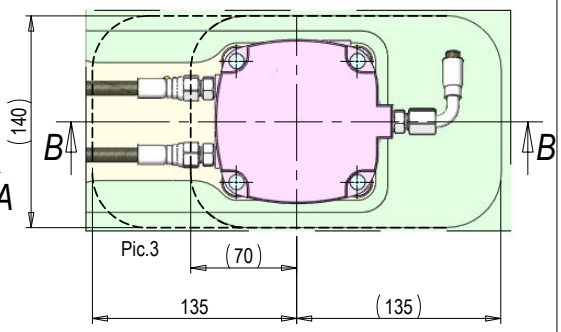
b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



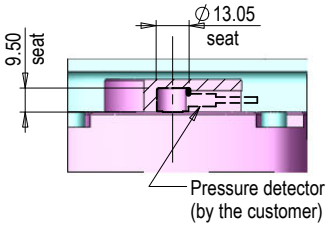
ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT







VERSION PREARRANGED FOR TRANSDUCER



CODE	VERSION	COOLED	DAMPENED	COMPLETE GASKET SET	Hm	H
0017-00791	(standard)	✓	×	0038-00123	104	107
0017-00792		×	×			
0017-00794		✓	✓	038-00124		
0017-00795		×	✓			
0017-00797	WITH 1 END OF STROKE	✓	×	0038-00125	124.5	127.5
0017-00801		✓	✓	0038-00126		
0017-00799	WITH DOUBLE END OF STROKE	✓	×	0038-00125	129.5	132.5
0017-00803		✓	✓	0038-00126		
0017-00805	VERSION PREARRANGED FOR TRANSDUCER	✓	×	0038-00127	117	120
0017-00806		×	×			

T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximum Mold temperature

GENERAL RULES FOR THE COOLING
- Versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of T1 ≤280°C [536°F] and T2 ≤80°C [176°F]
- Versions with end of stroke: cooling ALWAYS MANDATORY with T1≥200°C [392°F].
- During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
  - 100°C [212°F] Temperature of the mold
  - 300°C [572°F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

a) The working pressure is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

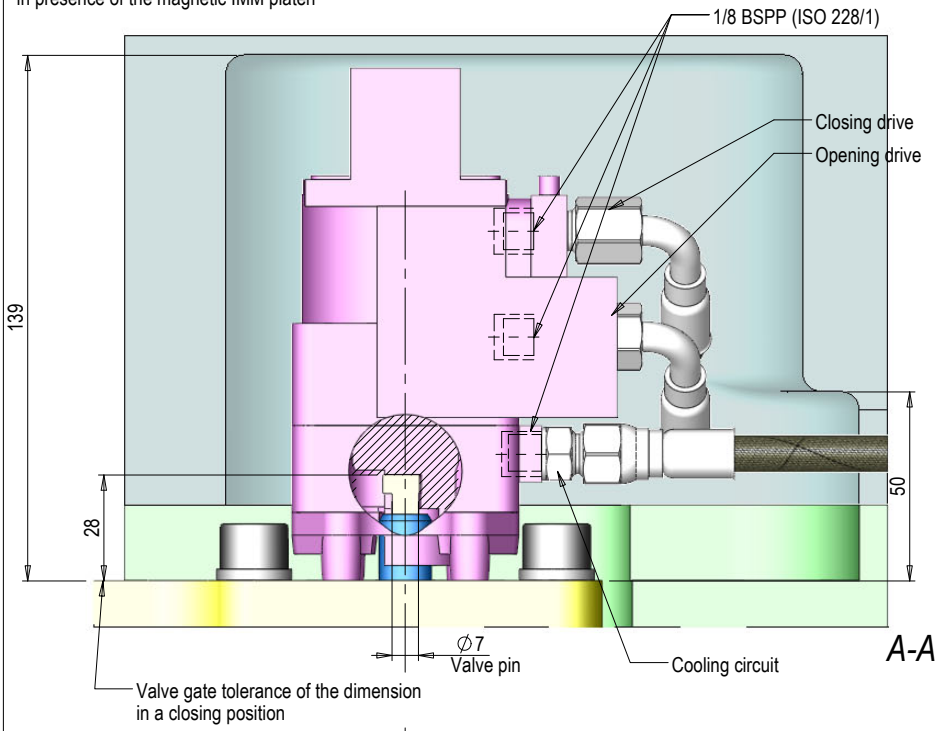
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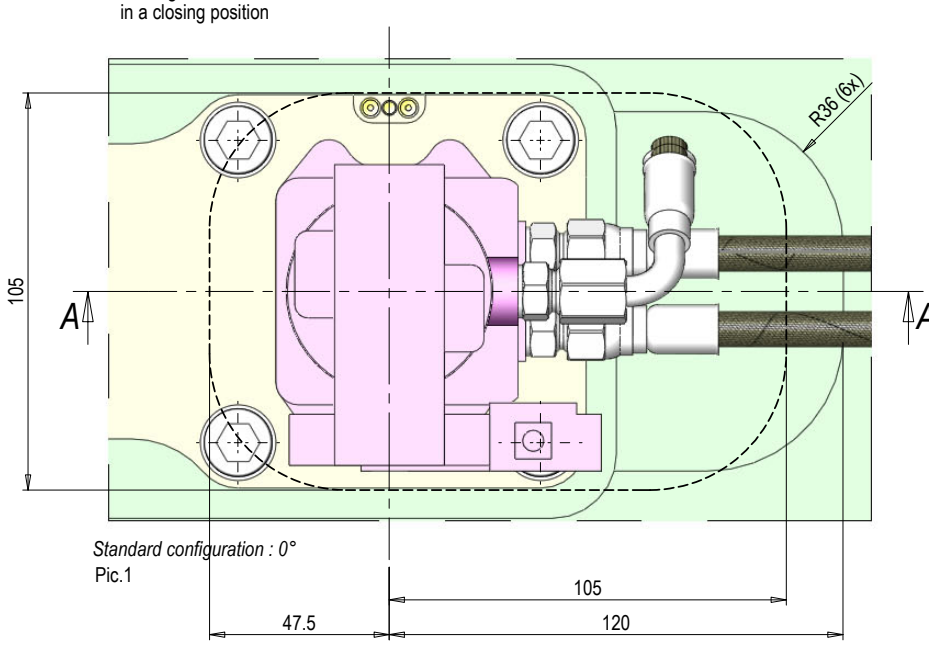
HYDRAULIC CYLINDER ON MANIFOLD
HYFLOW

Hydraulic Cylinder: bore 42 mm - stroke 18 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

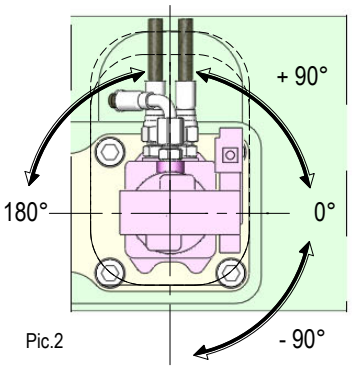
(*) ATTENTION: minimun mandatory dimension
in presence of the magnetic IMM platen





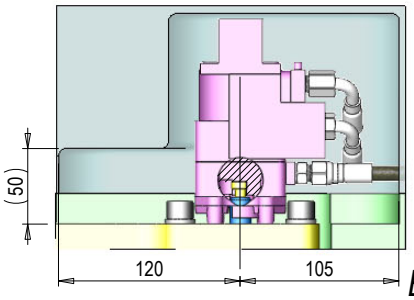
Standard configuration : 0°
Pic.1

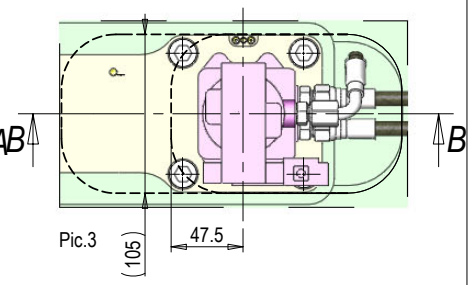
b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



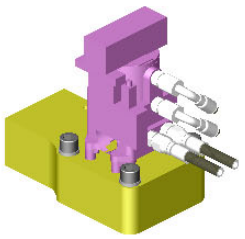
Pic.2

ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT

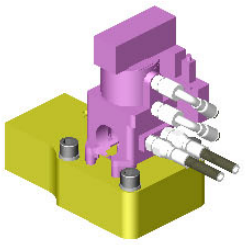




Pic.3



LEFT SENSOR VERSION



RIGHT SENSOR VERSION

CODE	VERSION	COMPLETE
0017-01099	LEFT SENSOR VERSION	0038-00107
0017-01101	WITH DOUBLE END OF STROKE	
0017-01103	RIGHT SENSOR VERSION	
0017-01105	WITH DOUBLE END OF STROKE	

NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

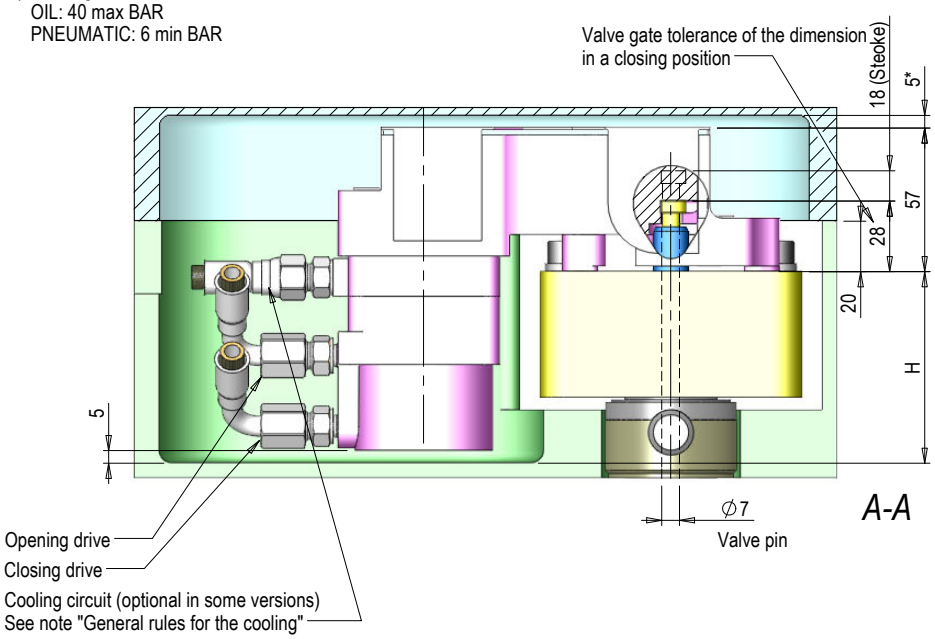
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SIDE CYLINDER
2nd VERSION

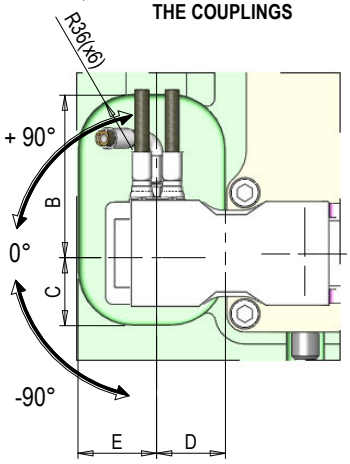
Oil cylinder: bore 42 mm - stroke 18 mm
Air cylinder: bore 70 mm - stroke 18 mm

(*) ATTENTION: minimun mandatory dimension
in presence of the magnetic IMM platen

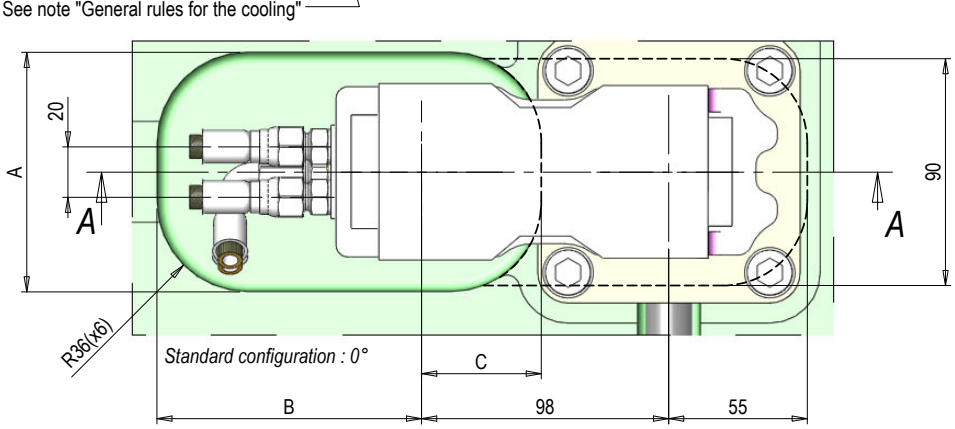
a) Working PRESSURE:
OIL: 40 max BAR
PNEUMATIC: 6 min BAR

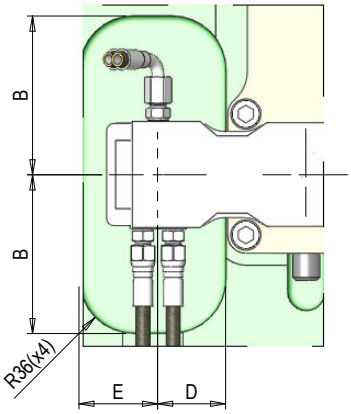


b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



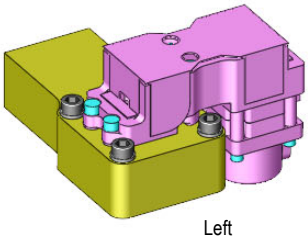
ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



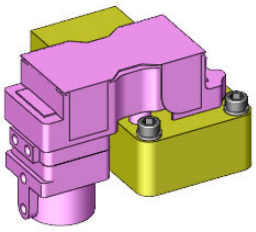


CODE	WORKING	DESCRIPTION	COOLED	COMPLETE GASKET SET	SEAT					
					A	B	C	D	E	H
0017-01147	OIL	(standard)	✓	0038-00102	95	105	47.5	45	52	76
0017-01148		WITH 1 END OF STROKE	✓	0038-00107						96
0017-01149		WITH DOUBLE END OF STROKE	✓							101
0017-00847	AIR	(standard)	✓	0038-00133	110	120	55	55	55	65
0017-00848			×							
0017-00851		WITH 1 END OF STROKE	✓	0038-00135						85.5
0017-00852			×							
0017-00853		WITH DOUBLE END OF STROKE	✓							90.5
0017-00854			×							

POSSIBILE ORIENTATIONS CYLINDER ON MANIFOLD



Left



Right

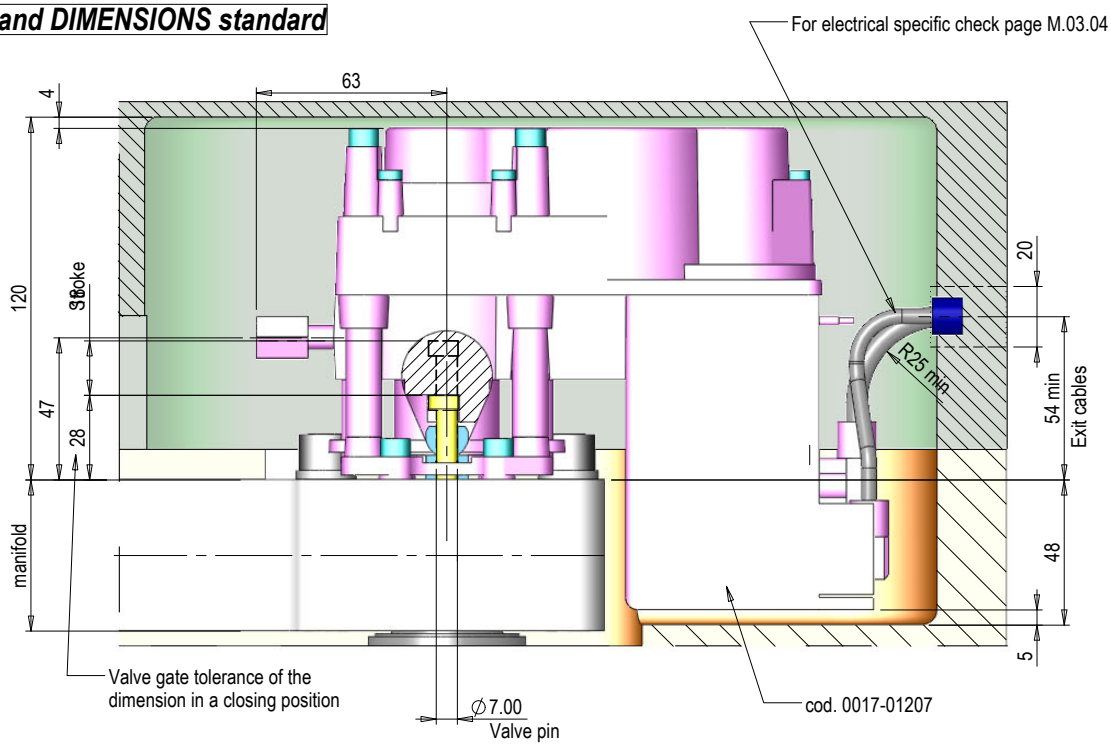
GENERAL RULES FOR THE COOLING
- Pneaumatic versions with optional cooling: is NOT MANDATORY to cooling the cylinderin presence of T1 ≤280°C [536°F] and T2 ≤80°C [176°F]
- Versions with end of stroke: cooling ALWAYS MANDATORY with T1≥200°C [392°F] also after shut off of the mold/hot runner systems.
- During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
  - HYDRAULIC => 60°C [140°F] Temperature of the mold - 280°C [536°F] Temperature of the hot runner system
  - PNEUMATIC => 100°C [212°F] Temperature of the mold - 300°C [572°F] Temperature of the hot runner system

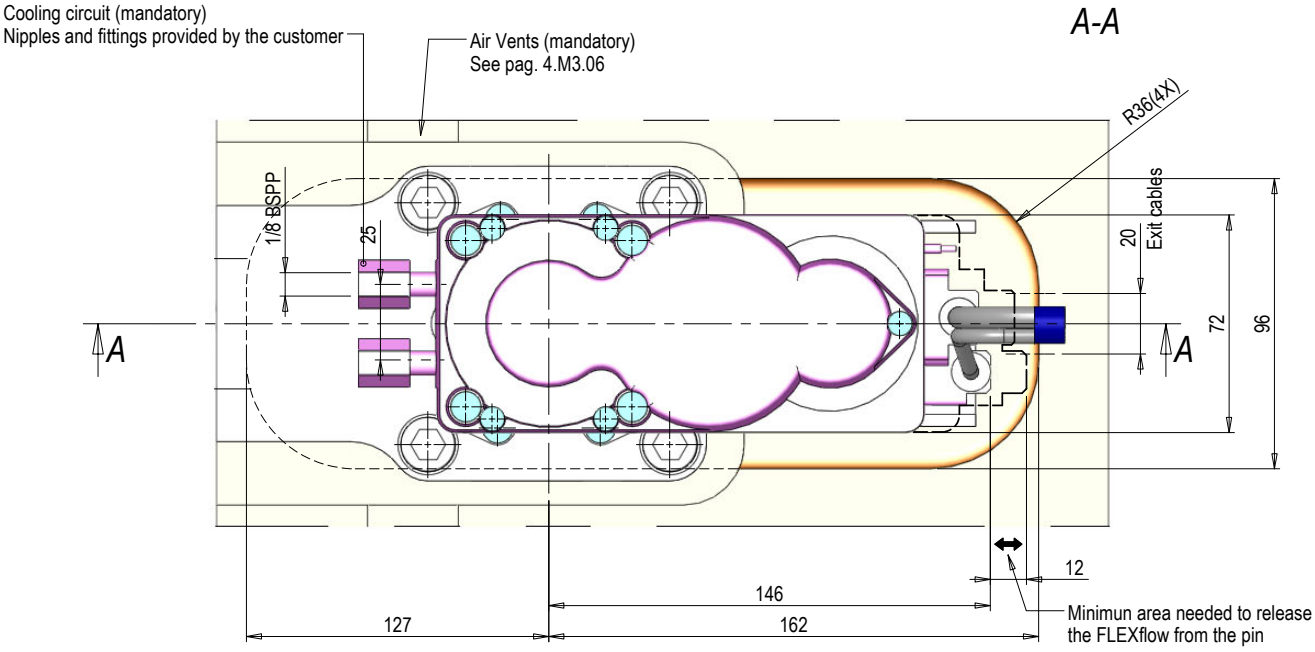
Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

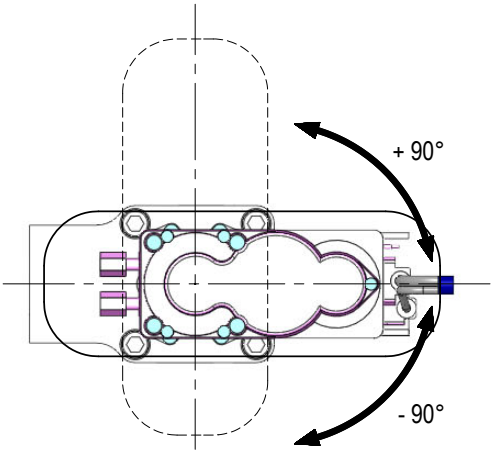
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POCKET and DIMENSIONS standard





POSSIBLE ORIENTATIONS ON MANIFOLD



The configuration +/-90° is obtained turning the Flexflow Evo on the manifold axis, together with its standard seat

General rules for the cooling of the FLEXflow on manifold

T1 (°C) = Max molding temperature of polymer
Tc (°C) = Coolant temperature

1) Maximum N° of actuators per single cooling circuit:

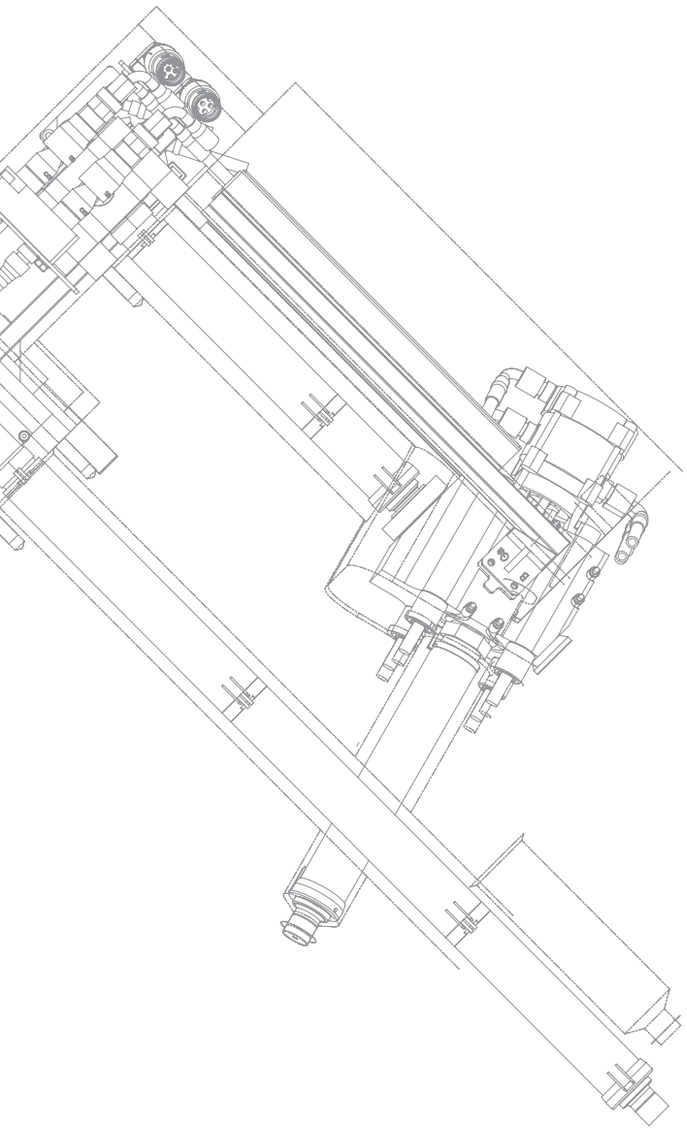
n°3	==>	T1 ≤ 270°C [518°F]
n°2	==>	[518°F] 270°C < T1 ≤ 300°C [572°F]
n°1	==>	[572°F] 300°C < T1 ≤ 320°C [608°F]

2) Maximum incoming coolant temperature Tc ≤ 25°C [77°F]

3) Minimum flow rate for each cooling circuit: 3 l/min

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oerlikon
hrsflow



Mh

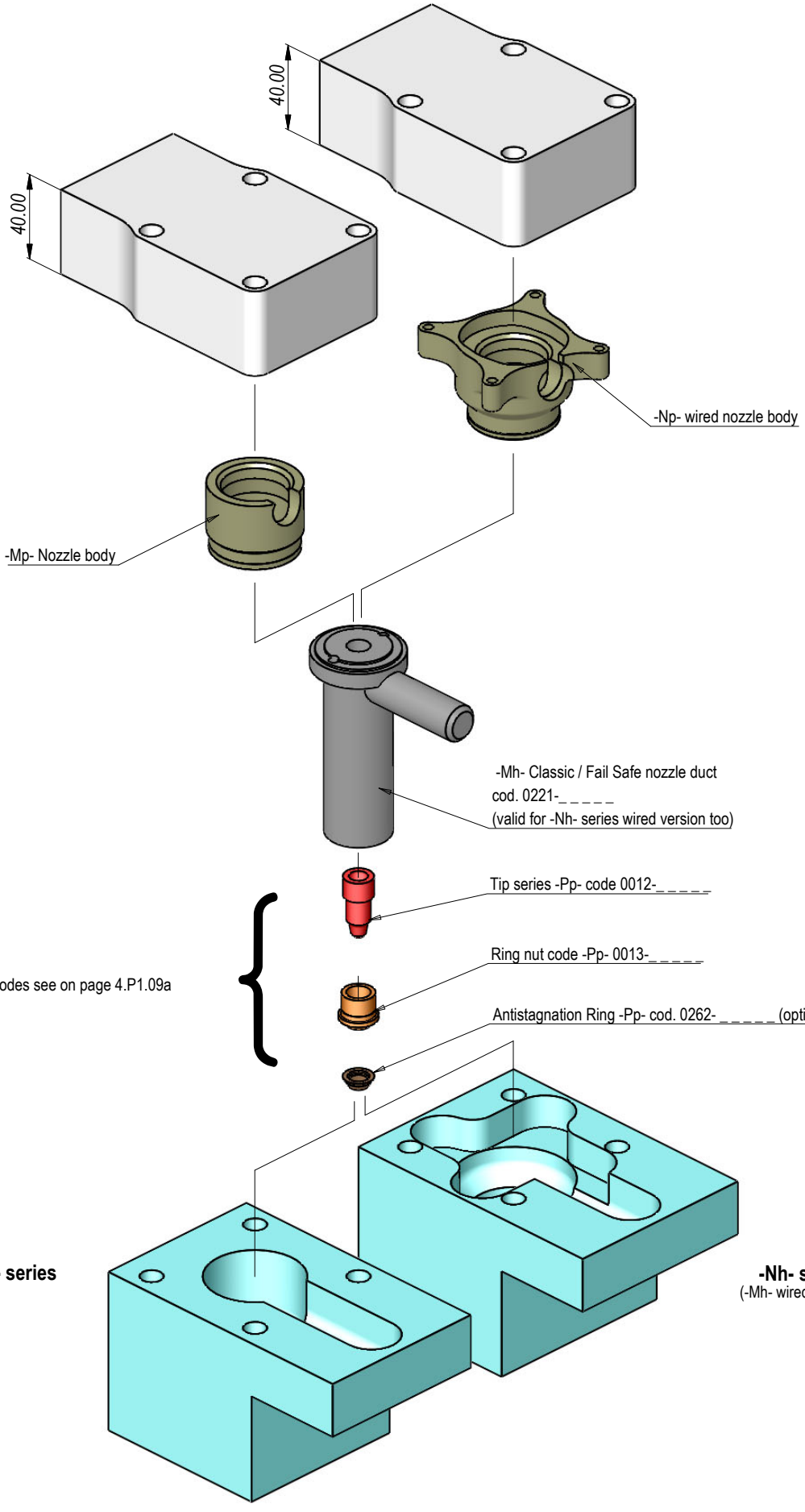
Mh series 10÷265 cm3/s

Serie Mh
Mh Serie
Mh Série
Mh Serie
Mh Série

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EXPLODED NOZZLE COMPONENT



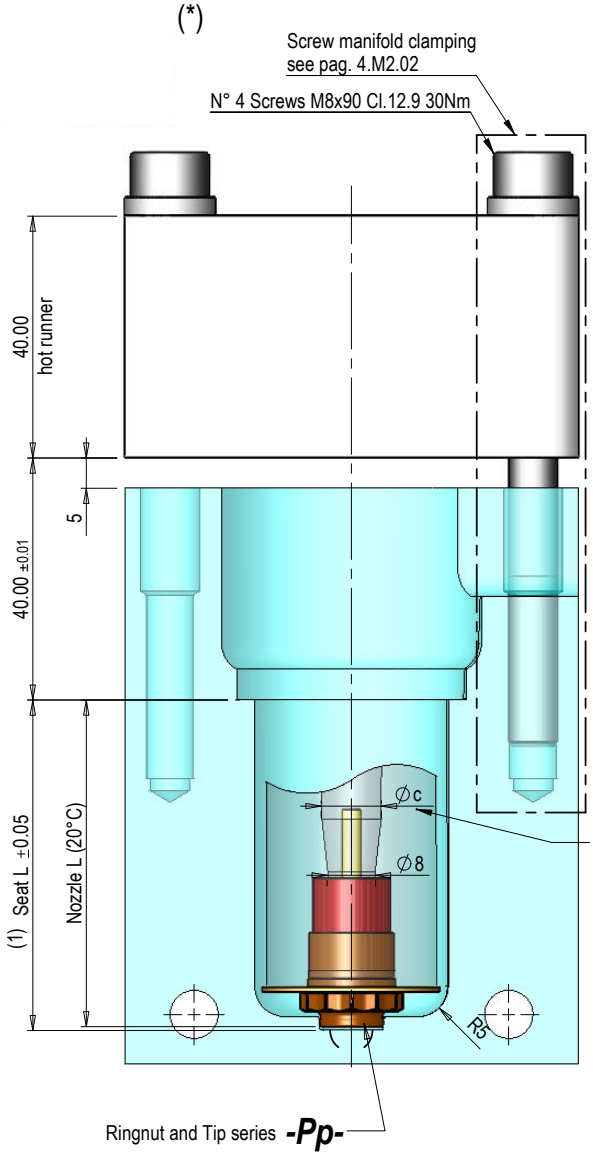
For all reference codes see on page 4.P1.09a

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NOZZLE (HYBRID series) with EXTERNAL ring only for VALVE GATING

(*)

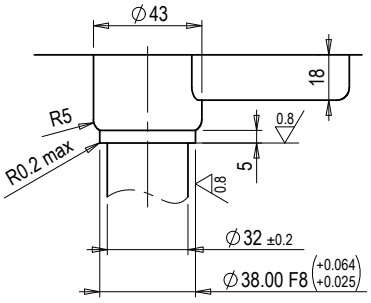


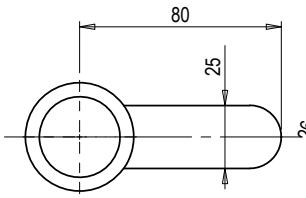
Nozzle Øc=10 - 12 - 14
available in Classic Line
or Fail Safe version

Ringnut and Tip series ***-Pp-***

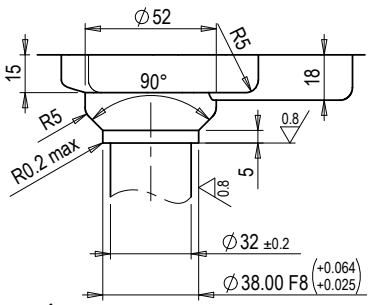
For detailed dimensions of the injection point follow the instructions of the series -Pp- nozzles technical sheets (Page 4.P1.12 ->)

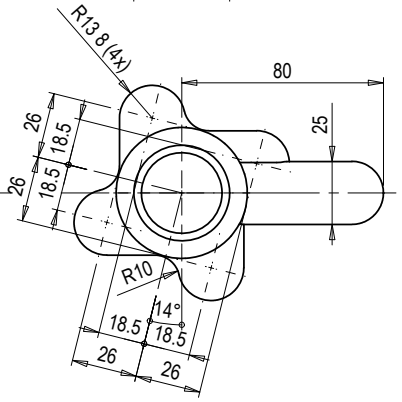
-Mh- series





-Nh- series
(-Mh- wired version)





For Tips and Ring nuts reference codes go on page 4.P1.09a

NOZZLE L	Øc=10 NOZZLE DUCT CODE		Øc=12 NOZZLE DUCT CODE		Øc=14 NOZZLE DUCT CODE		POWER (W) 230V	
	Classic	Fail Safe	Classic	Fail Safe	Classic	Fail Safe	Classic	Fail Safe
34	0221-00995	0221-01002	0221-01009	0221-01016	0221-01023	0221-01030	1x400	2x400
54	0221-00996	0221-01003	0221-01010	0221-01017	0221-01024	0221-01031	1x400	2x400
74	0221-00997	0221-01004	0221-01011	0221-01018	0221-01025	0221-01032	1x400	2x400
94	0221-00998	0221-01005	0221-01012	0221-01019	0221-01026	0221-01033	1x450	2x450
114	0221-00999	0221-01006	0221-01013	0221-01020	0221-01027	0221-01034	1x500	2x500
134	0221-01000	0221-01007	0221-01014	0221-01021	0221-01028	0221-01035	1x550	2x550
154	0221-01001	0221-01008	0221-01015	0221-01022	0221-01029	0221-01036	1x650	2x650

(1) "L Seat" calculation with external ring nut according to the specifications of Injection type:

Seat L = L + DL	=> PGC20
Seat L = L + DL + 0.5	=> PGC10, PGC30
Seat L = L + DL + 1.5	=> PGY30

For "DL" values, see table on page 4.Mh1.03

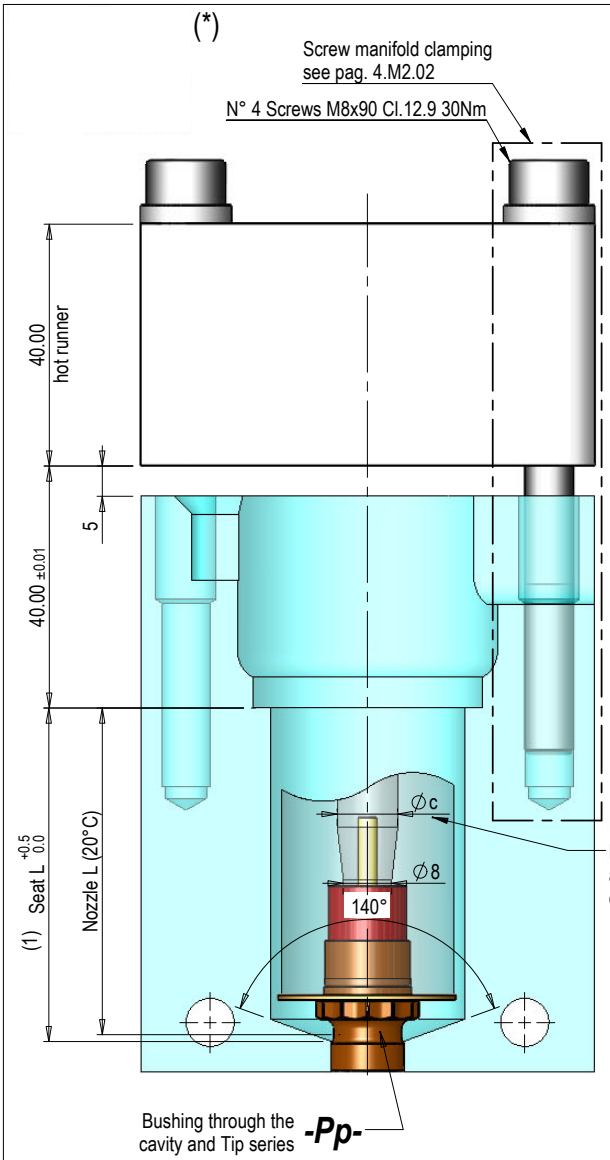
HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

Index

(*) Fail Safe not available for U.S. and Canadian markets

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NOZZLE (HYBRID series) with bushing through the cavity only for VALVE GATING

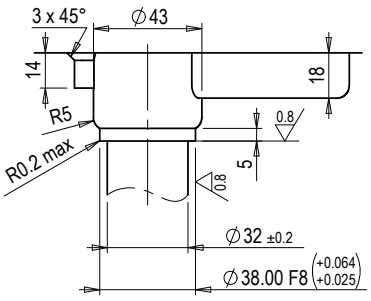


Nozzle Øc=10 - 12 - 14
available in Classic Line
or Fail Safe version

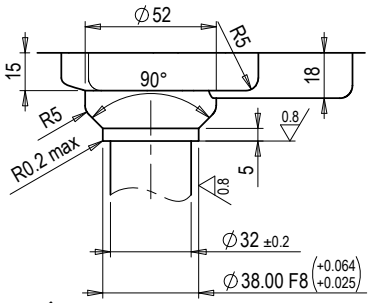
Bushing through the cavity and Tip series **-Pp-**

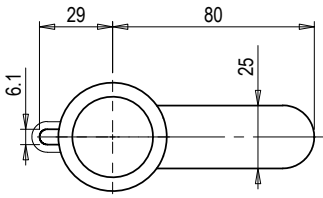
For detailed dimensions of the injection point follow the instructions of the series -Pp- nozzles technical sheets (Page 4.P1.13 ->)

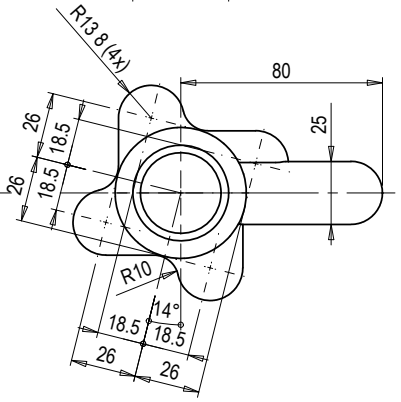
-Mh- series



-Nh- series
(-Mh- wired version)







For Tips and Ring nuts reference codes go on page 4.P1.09a

NOZZLE L	Øc=10 NOZZLE DUCT CODE		Øc=12 NOZZLE DUCT CODE		Øc=14 NOZZLE DUCT CODE		POWER 230V	
	Classic	Fail Safe	Classic	Fail Safe	Classic	Fail Safe	Classic	Fail Safe
34	0221-00995	0221-01002	0221-01009	0221-01016	0221-01023	0221-01030	400	2x400
54	0221-00996	0221-01003	0221-01010	0221-01017	0221-01024	0221-01031	400	2x400
74	0221-00997	0221-01004	0221-01011	0221-01018	0221-01025	0221-01032	400	2x400
94	0221-00998	0221-01005	0221-01012	0221-01019	0221-01026	0221-01033	450	2x450
114	0221-00999	0221-01006	0221-01013	0221-01020	0221-01027	0221-01034	500	2x500
134	0221-01000	0221-01007	0221-01014	0221-01021	0221-01028	0221-01035	550	2x550
154	0221-01001	0221-01008	0221-01015	0221-01022	0221-01029	0221-01036	650	2x650

(1) "L Seat" calculation with bushing through the cavity according to the specifications of Injection type:

Seat L = L + DL - 1.5 => PGC20
Seat L = L + DL + 1.0 => PGC30, PGY30

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)
k= (ΔT * 0.0008) - 0.04

L Iniettore - Nozzle - Duse [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ) + k										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
34	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.27	0.30	0.32
54	0.10	0.13	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.37	0.39
74	0.13	0.16	0.20	0.23	0.26	0.30	0.33	0.37	0.40	0.43	0.47
94	0.15	0.19	0.23	0.27	0.31	0.35	0.38	0.42	0.46	0.50	0.54
114	0.18	0.22	0.26	0.31	0.35	0.39	0.44	0.48	0.52	0.57	0.61
134	0.20	0.25	0.30	0.35	0.39	0.44	0.49	0.54	0.59	0.63	0.68
154	0.22	0.28	0.33	0.38	0.44	0.49	0.54	0.60	0.65	0.70	0.75

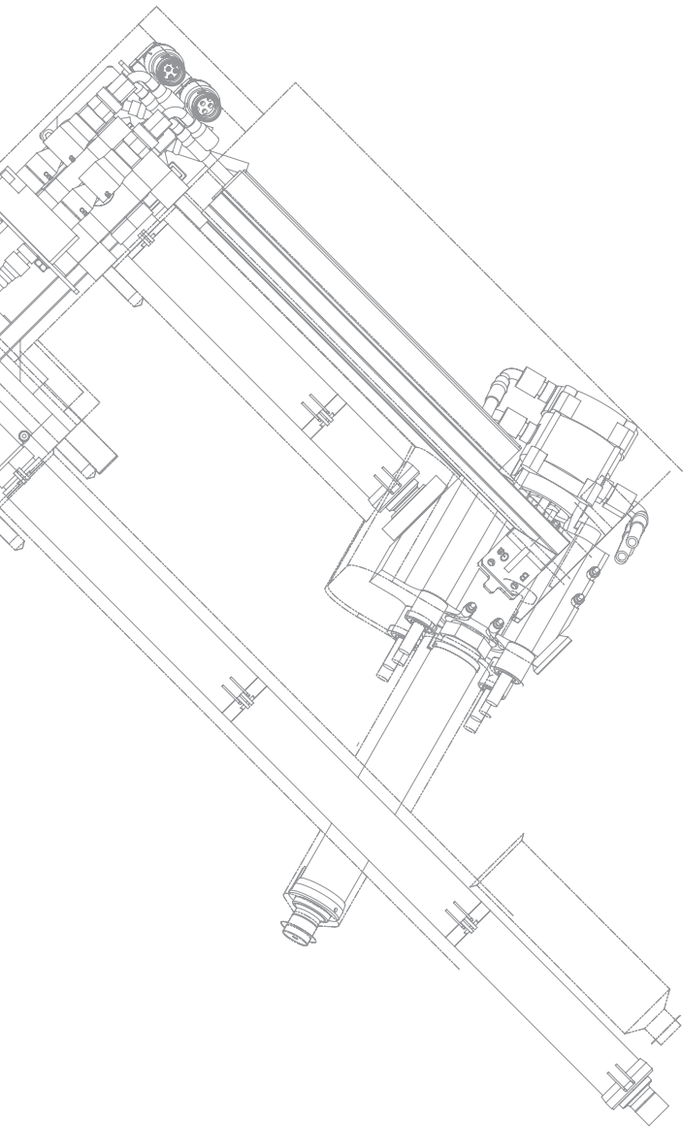
HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

(*) Fail Safe not available for U.S. and Canadian markets

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hrsflow



Gh

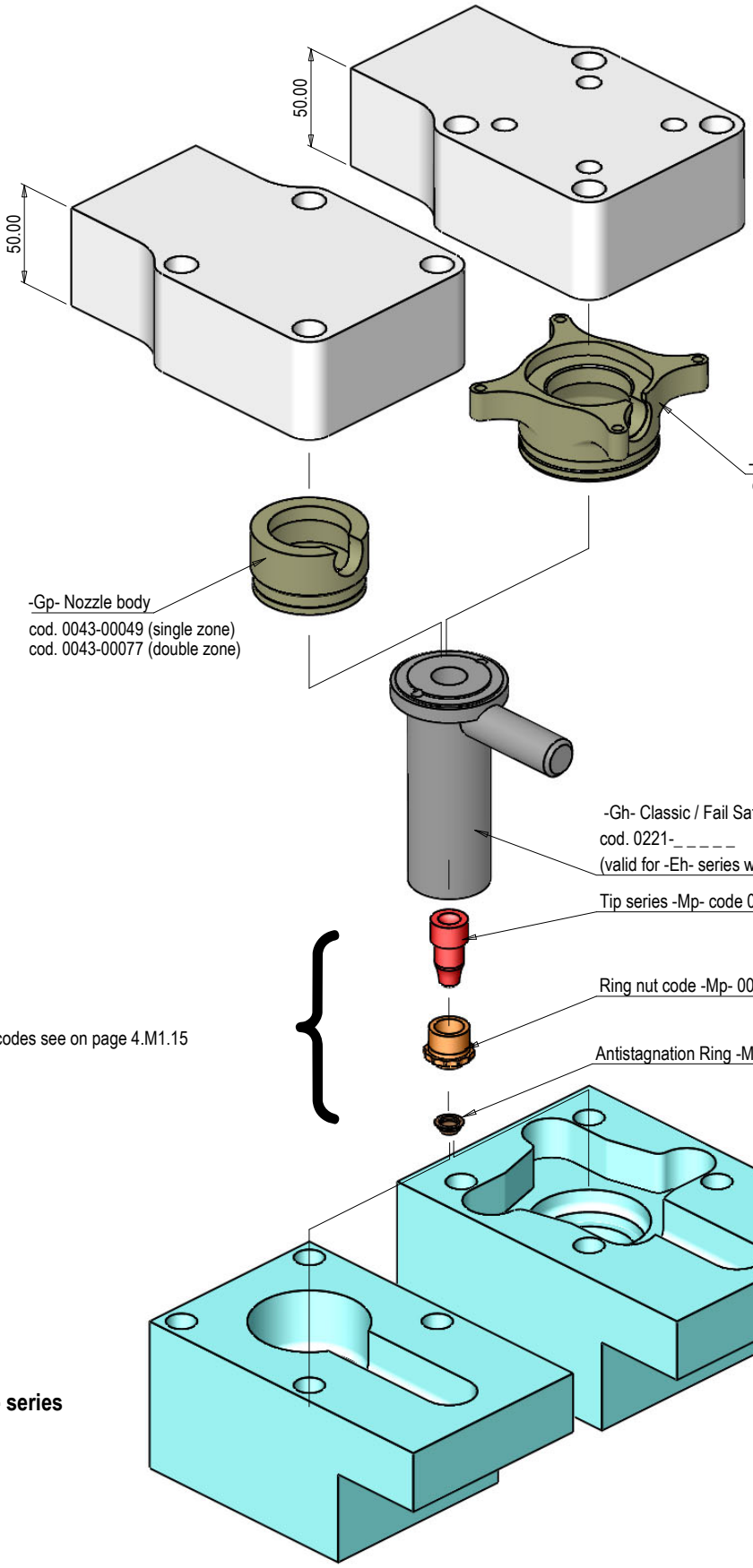
Gh series 100÷1265 cm3/s

Serie Gh
Gh Serie
Gh Série
Gh Serie
Gh Série

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EXPLODED NOZZLE COMPONENT



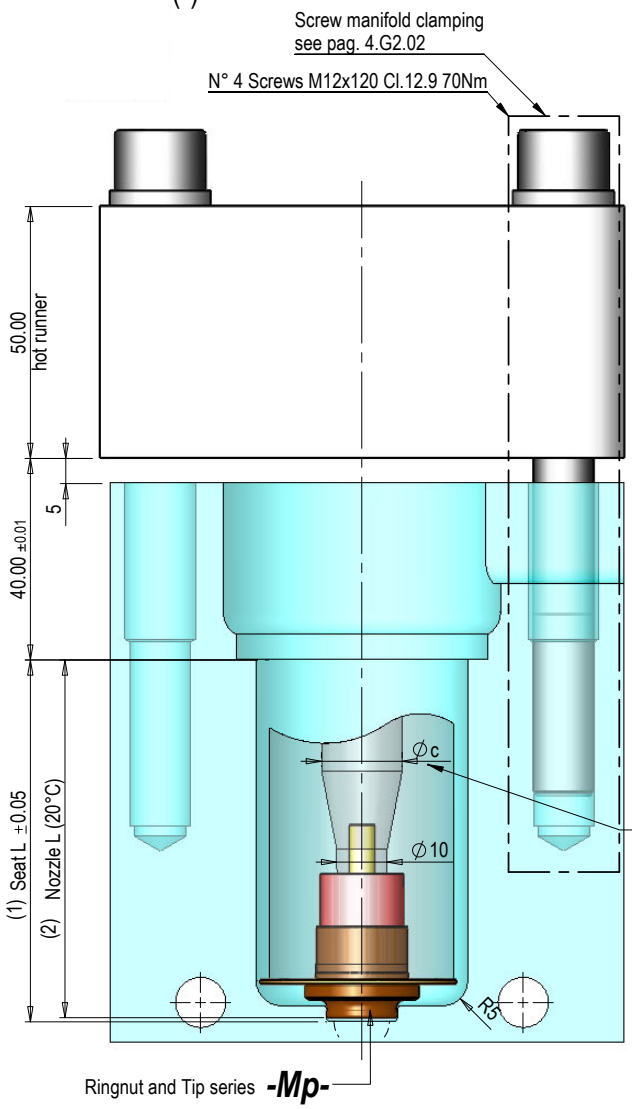
For all reference codes see on page 4.M1.15

Index

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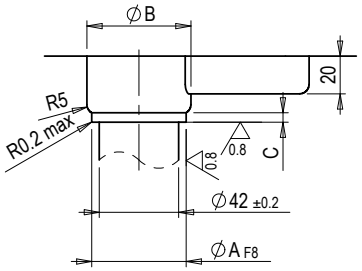
NOZZLE (HYBRID series) with EXTERNAL ring only for VALVE GATING

(*)

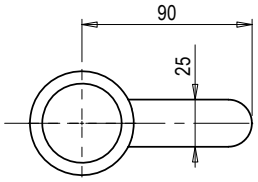


-Gh- series

Single zone / Double zone



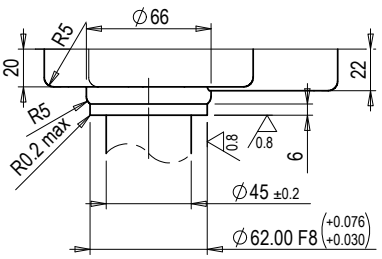
Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8

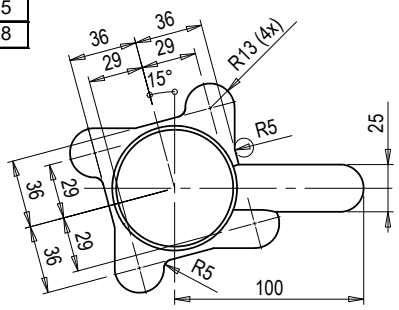


-Eh- series

(-Gh- wired version)

Single zone / Double zone





For detailed dimensions of the injection point follow the instructions of the series -Mp- nozzles technical sheets (Page 4.M1.07 ->)

(1) "L Seat" calculation with external ring nut according to the specifications of Injection type:

Seat L = L + DL + 0.5 => PGC10, PGC20, PGC30
Seat L = L + DL + 1.0 => PGY30

For "DL" values, see table on page 4.Gh1.03

(2) For all configurations with External Ring, max Nozzle Lengt allowed: L=346 mm

For Tips and Ring nuts reference codes go on page 4.M1.15

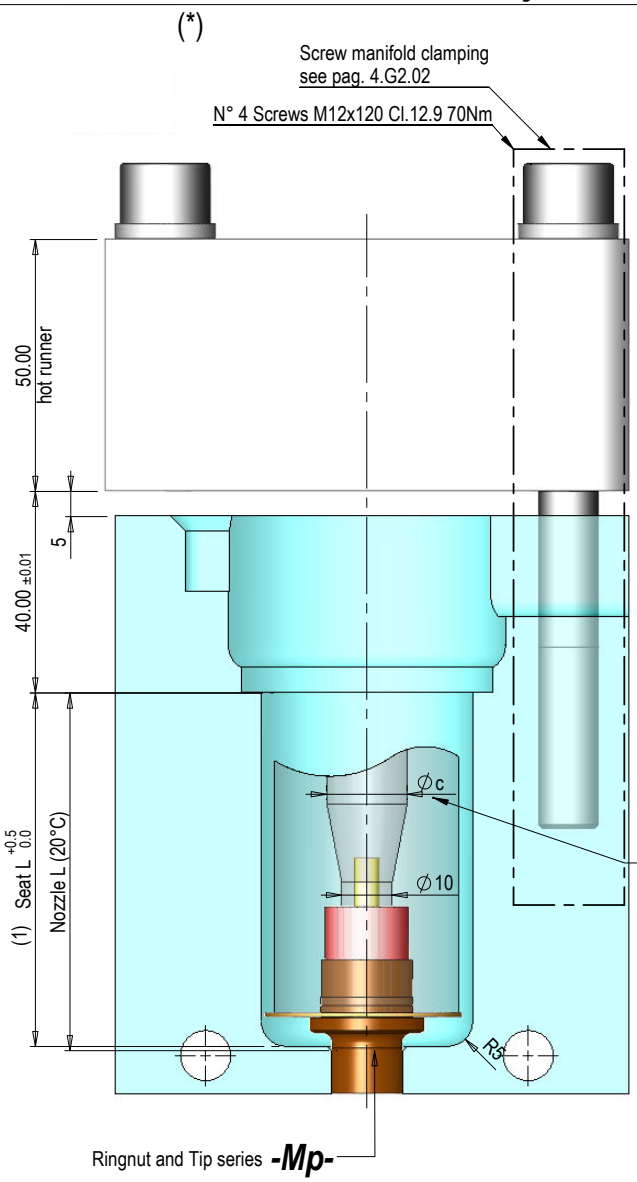
NOZZLE L	Øc=14 NOZZLE DUCT CODE		Øc=16 NOZZLE DUCT CODE		Øc=18 NOZZLE DUCT CODE		Øc=20 NOZZLE DUCT CODE		POWER (W) 230V	
	Classic	Fail Safe	Classic	Fail Safe	Classic	Fail Safe	Classic	Fail Safe	Classic	Fail Safe
046	0221-01037	0221-01069	0221-01045	0221-01077	0221-01053	0221-01085	0221-01061	0221-01093	1x400	2x400
071	0221-01038	0221-01070	0221-01046	0221-01078	0221-01054	0221-01086	0221-01062	0221-01094	1x470	2x470
096	0221-01039	0221-01071	0221-01047	0221-01079	0221-01055	0221-01087	0221-01063	0221-01095	1x470	2x470
121	0221-01040	0221-01072	0221-01048	0221-01080	0221-01056	0221-01088	0221-01064	0221-01096	1x550	2x550
146	0221-01041	0221-01073	0221-01049	0221-01081	0221-01057	0221-01089	0221-01065	0221-01097	1x620	2x620
171	0221-01042	0221-01074	0221-01050	0221-01082	0221-01058	0221-01090	0221-01066	0221-01098	1x620	2x620
196	0221-01043	0221-01075	0221-01051	0221-01083	0221-01059	0221-01091	0221-01067	0221-01099	1x620	2x620
221	0221-01044	0221-01076	0221-01052	0221-01084	0221-01060	0221-01092	0221-01068	0221-01100	1x620	2x620
246 (**)	0221-01101	0221-01121	0221-01106	0221-01126	0221-01111	0221-01131	0221-01116	0221-01136	1x300+1x450	2x300+2x450
271 (**)	0221-01102	0221-01122	0221-01107	0221-01127	0221-01112	0221-01132	0221-01117	0221-01137	1x300+1x450	2x300+2x450
296 (**)	0221-01103	0221-01123	0221-01108	0221-01128	0221-01113	0221-01133	0221-01118	0221-01138	1x300+1x500	2x300+2x500
346 (**)	0221-01104	0221-01124	0221-01109	0221-01129	0221-01114	0221-01134	0221-01119	0221-01139	1x300+1x650	2x300+2x650
396 (**)	0221-01105	0221-01125	0221-01110	0221-01130	0221-01115	0221-01135	0221-01120	0221-01140	1x300+1x650	2x300+2x650

(**)Double zone configurations available only for models from 246 to 396. For special materials to mold, HRS will make exclusive use of these configurations.

(*) Fail Safe not available for U.S. and Canadian markets

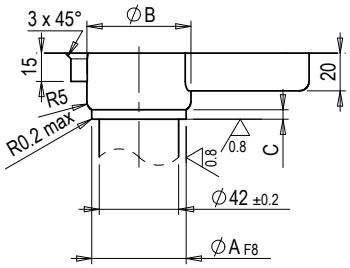
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NOZZLE (HYBRID series) with bushing through the cavity only for VALVE GATING

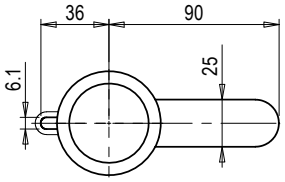


-Gh- series

Single zone / Double zone



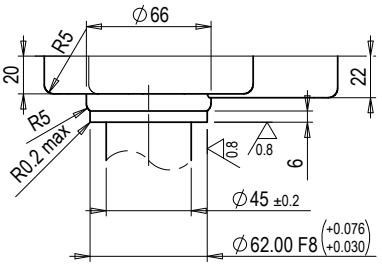
Nozzle with	A	B	C
Single Zone	50.00	55	5
Double Zones	62.00	65	8

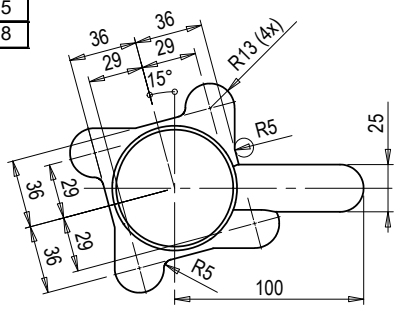


-Eh- series

(-Gh- wired version)

Single zone / Double zone





For detailed dimensions of the injection point follow the instructions of the series -Mp- nozzles technical sheets (Page 4.M1.07 ->)

(1) "L Seat" calculation with bushing through the cavity according to the specifications of Injection type:

Seat L = L + DL - 2.0 => PGC20
Seat L = L + DL - 1.0 => PGC30, PGY30

Per all nozzle codes see pag. 4.Gh1.02

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

$\Delta T = T1 - T2$
$\lambda = 0.000012$ (1/°C)
$k = (\Delta T * 0.0008) - 0.03$

L Iniettore - Nozzle - Duse [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ) + k										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
46	0.11	0.13	0.16	0.19	0.21	0.24	0.27	0.29	0.32	0.35	0.38
71	0.14	0.17	0.20	0.23	0.27	0.30	0.33	0.37	0.40	0.43	0.47
96	0.17	0.20	0.24	0.28	0.32	0.36	0.40	0.44	0.48	0.52	0.56
121	0.20	0.24	0.29	0.33	0.38	0.42	0.47	0.51	0.56	0.60	0.65
146	0.23	0.28	0.33	0.38	0.43	0.48	0.53	0.58	0.63	0.68	0.74
171	0.26	0.31	0.37	0.43	0.48	0.54	0.60	0.65	0.71	0.77	0.83
196	0.29	0.35	0.41	0.47	0.54	0.60	0.66	0.73	0.79	0.85	0.92
221	0.32	0.38	0.45	0.52	0.59	0.66	0.73	0.80	0.87	0.94	1.01
246 (**)	0.35	0.42	0.50	0.57	0.65	0.72	0.80	0.87	0.95	1.02	1.10
271 (**)	0.38	0.46	0.54	0.62	0.70	0.78	0.86	0.94	1.02	1.10	1.19
296 (**)	0.41	0.49	0.58	0.67	0.75	0.84	0.93	1.01	1.10	1.19	1.28
346 (**)	0.47	0.56	0.66	0.76	0.86	0.96	1.06	1.16	1.26	1.36	1.46
396 (**)	0.53	0.64	0.75	0.86	0.97	1.08	1.19	1.30	1.41	1.52	1.64

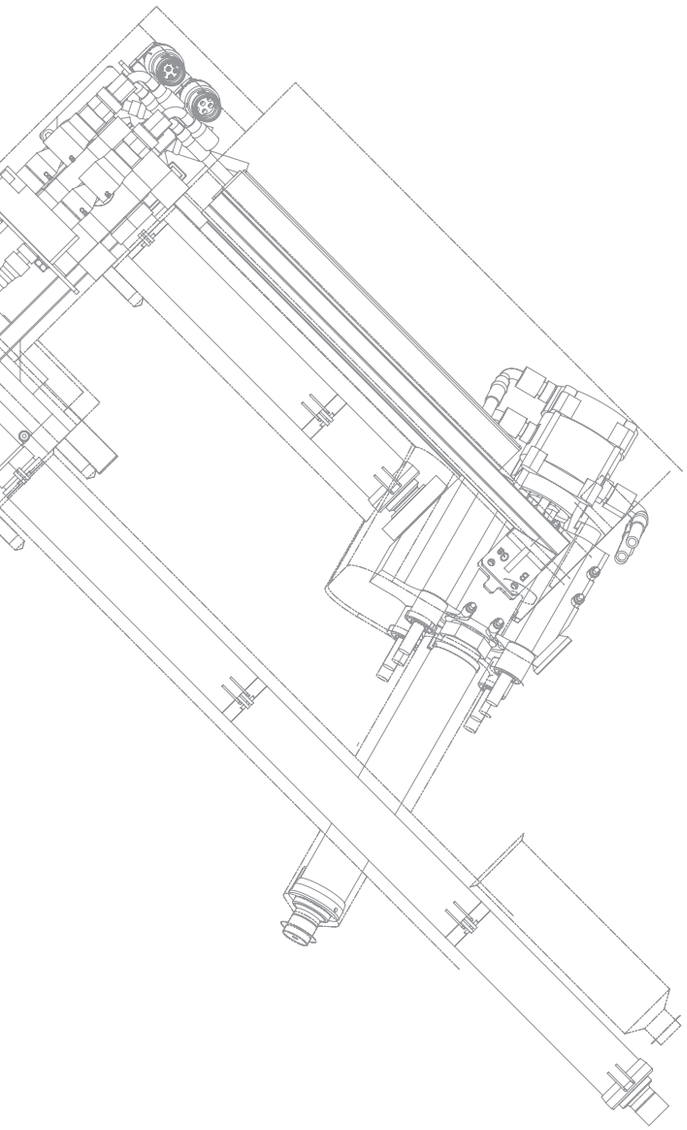
(**)Double zone configurations available only for models from 246 to 396. For special materials to mold, HRS will make exclusive use of these configurations.

(*) Fail Safe not available for U.S. and Canadian markets

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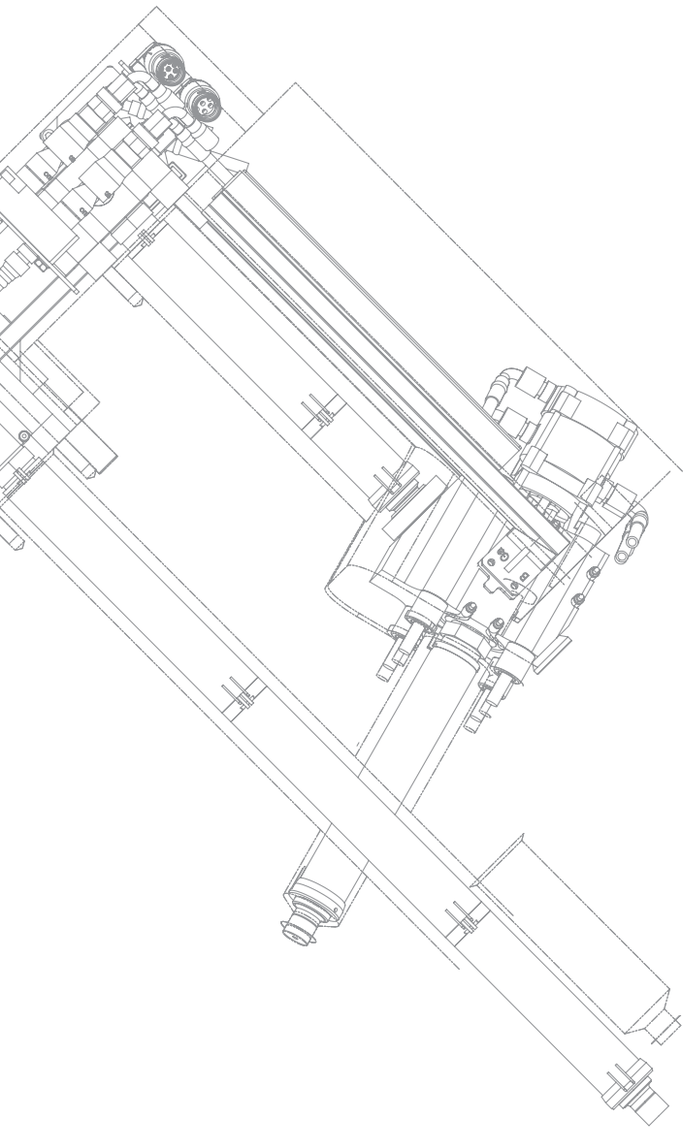
Screwed in Series

Serie Avvitata
Geschraubte Serie
Série Visse
Serie Roscada
Série Roscada

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hrsflow



Sa

Sa Series

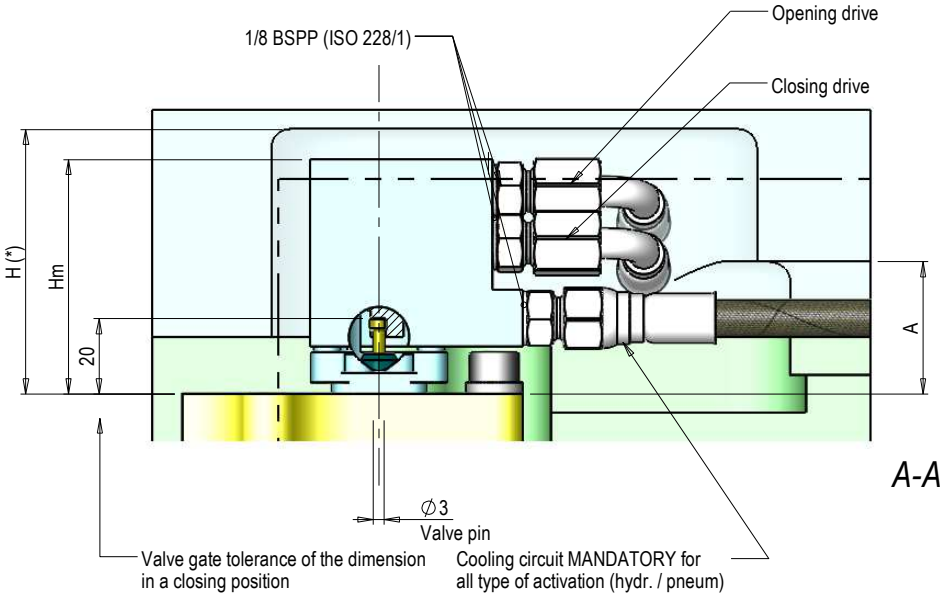
Serie Sa
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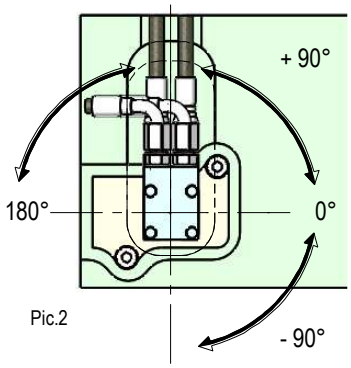
Cylinder: bore 24 mm - stroke 10 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 60 BAR
Working PRESSURE: PNEUMATIC air max 12 BAR

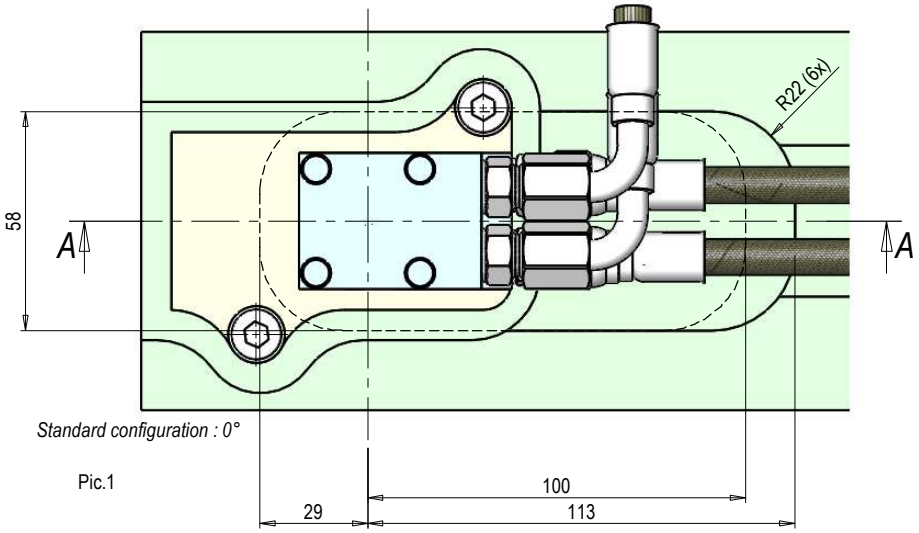
(*) Dimension reduction only after checking with HRS technical office.



b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**

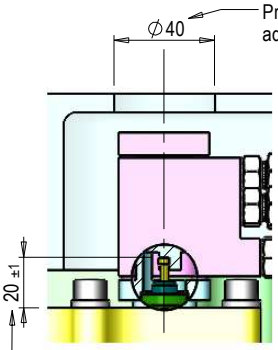


Pic.2



Pic.1

ADJUSTABLE CYLINDER



Pic.3

Adjustable dimension

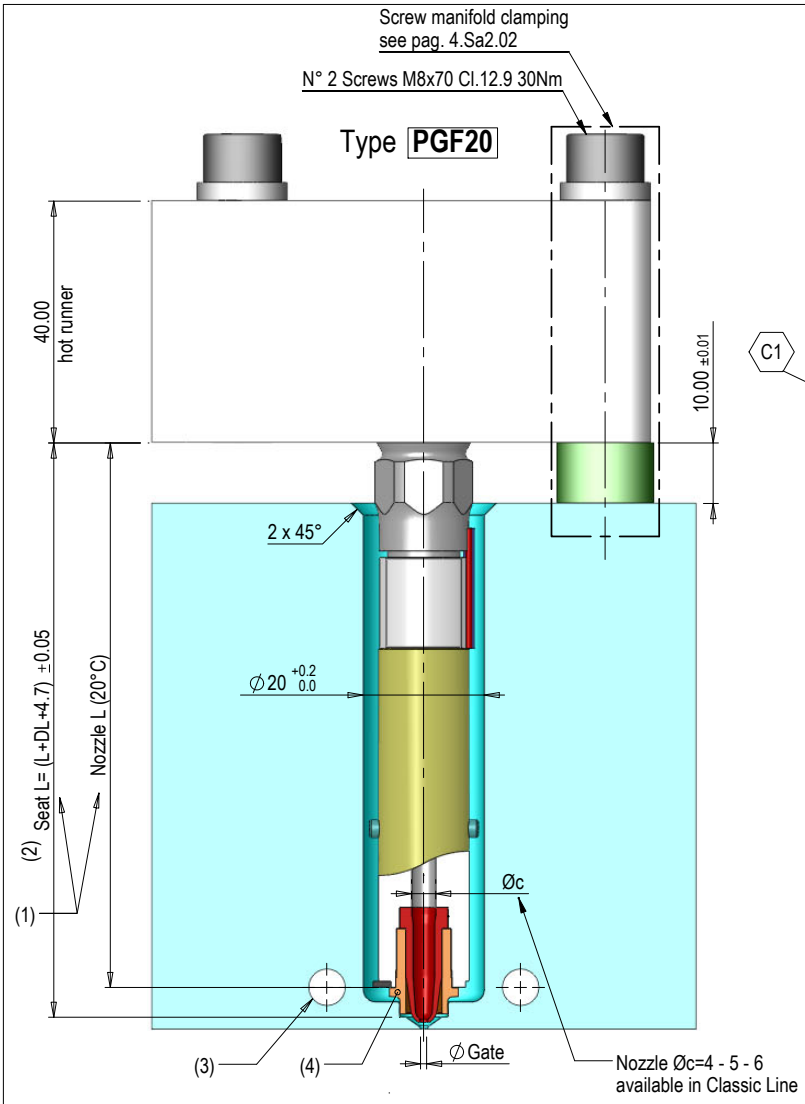
CODE	VERSION	ACTIVATION	DAMPENED	COMPLETE GASKET	Hm	H	A
0017-01021	(standard)	HYDR.	×	0038-00139	62	65	35
0017-01107			✓		70	73	42
0017-01067		PNEUM.	×	0038-00144	62	65	35
0017-01175	WITH 1 END OF STROKE	HYDR.	×	0038-00147	89	92	42
0017-01179			✓				
0017-01183		PNEUM.	×	0038-00148			
0017-01177	WITH DOUBLE END OF STROKE	HYDR.	×	0038-00147	89	92	42
0017-01181			✓				
0017-01185		PNEUM.	×	0038-00148			
0017-01023	ADJUSTABLE	HYDR.	×	0038-00139	69.5	72.5	35
0017-01068		PNEUM.	×	0038-00144			

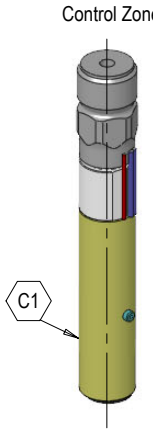
NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system
Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

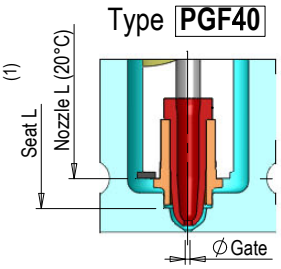
a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1;

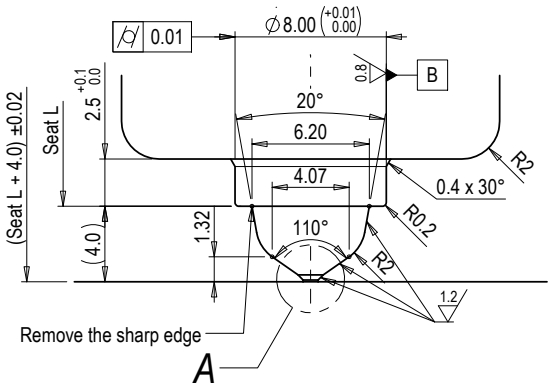
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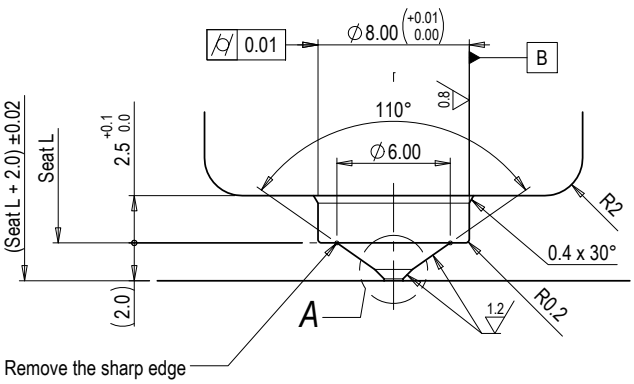




Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

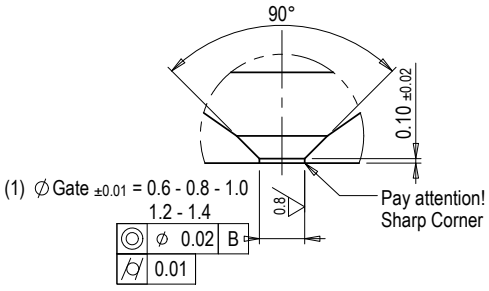






NOTES:
(1) "Nozzle L" nominal Lenght. For a correct design of the "Seat L" and "Ø gate" keep in touch with the Oerlikon HRSflow technical office;
(2) For "DL" calculation see table pag. 4.Sa1.11;
(3) Conditioning circuit to be foreseen in the area of the injection point;
(4) For all reference codes see on page 4.Sa1.10.

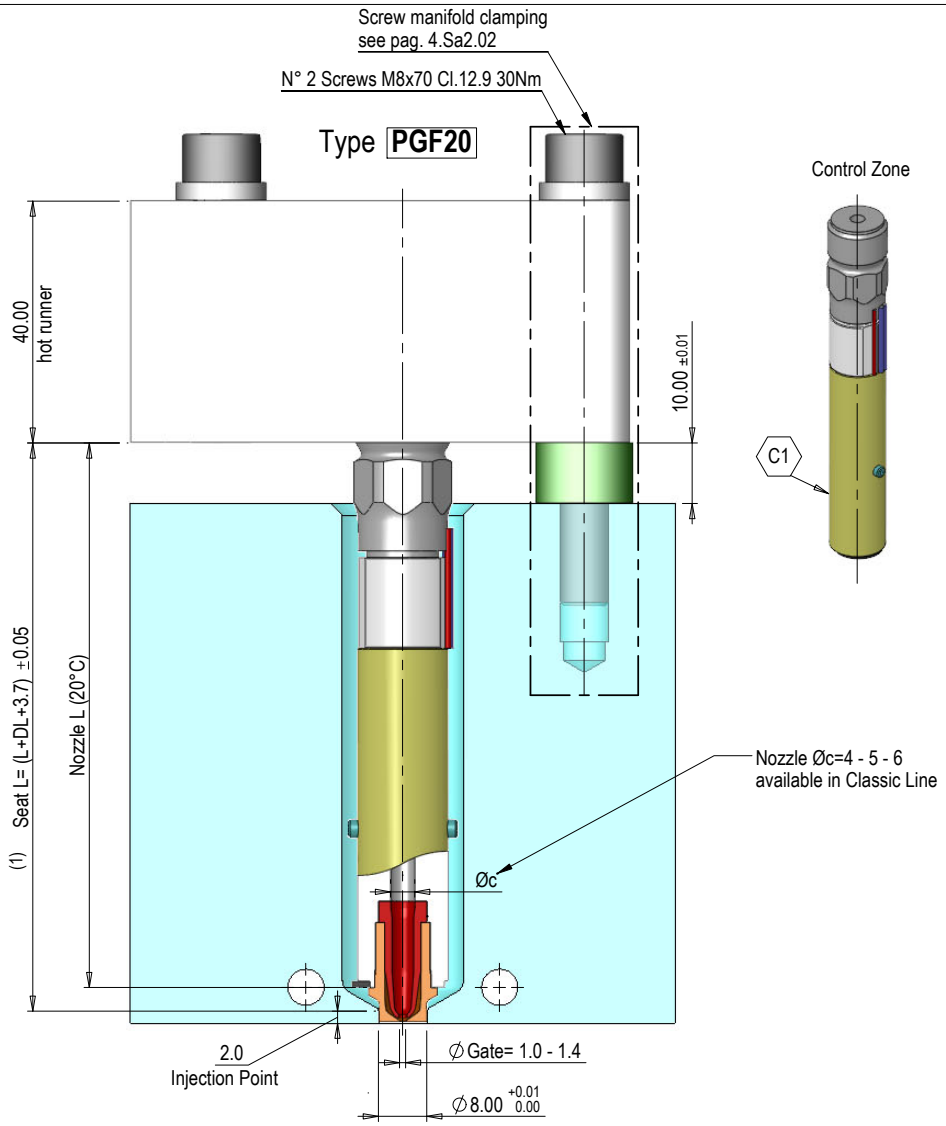
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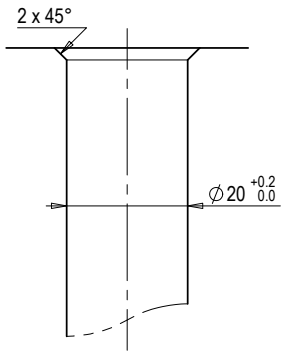


NOZZLE L
50 ÷ 195

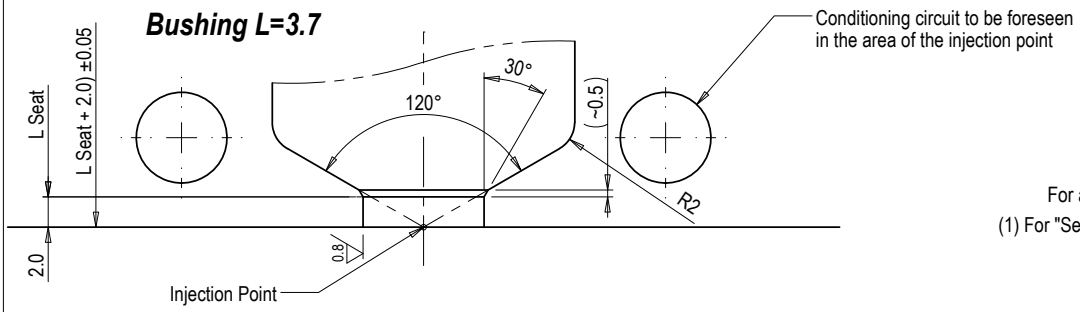
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Screwed-in nozzle FREE FLOW with bushing through the cavity





Bushing L=3.7

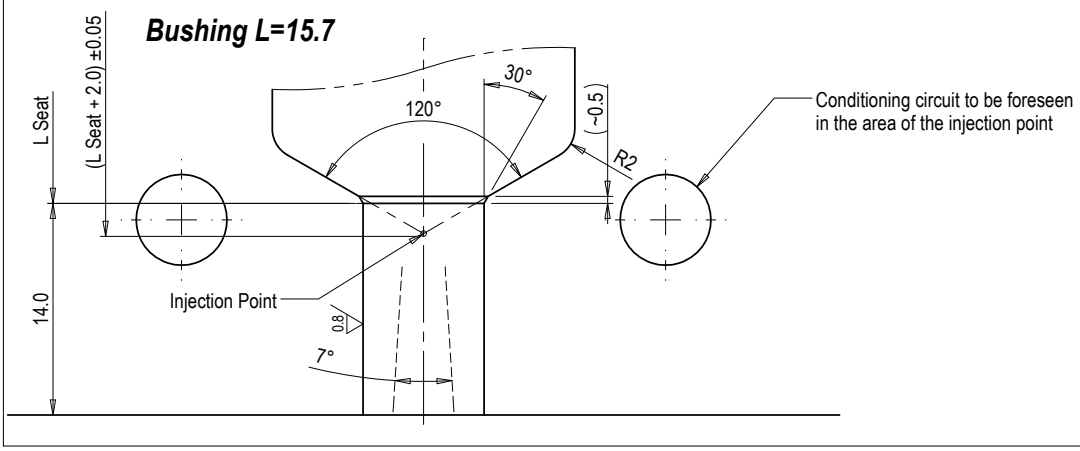


For all reference codes see on page 4.Sa1.10

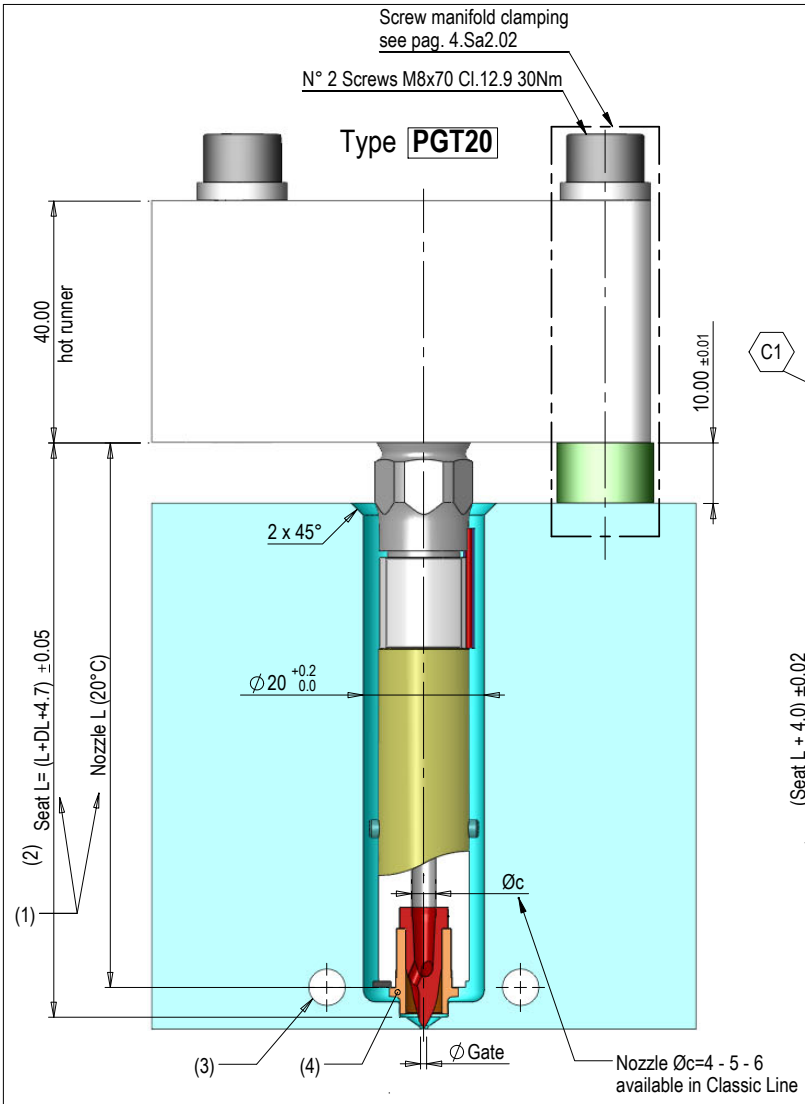
(1) For "Seat L" calculation see pag. 4.Sa1.11 table A

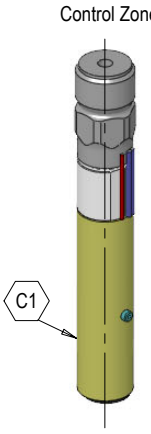
NOZZLE L
50 ÷ 195

Bushing L=15.7

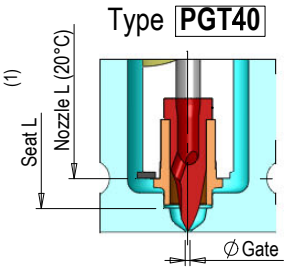


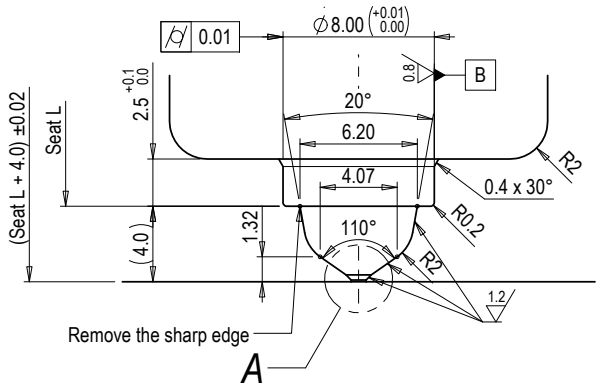
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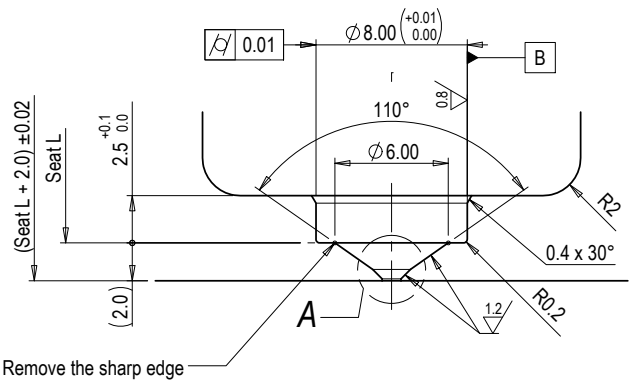




**Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.**

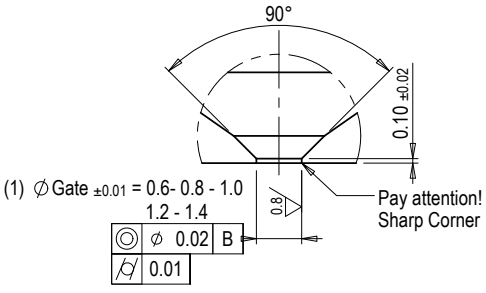






NOTES:
(1) "Nozzle L" nominal Lenght. For a correct design of the "Seat L" and "Ø gate" keep in touch with the Oerlikon HRSflow technical office;
(2) For "DL" calculation see table pag. 4.Sa1.11;
(3) Conditioning circuit to be foreseen in the area of the injection point;
(4) For all reference codes see on page 4.Sa1.10.

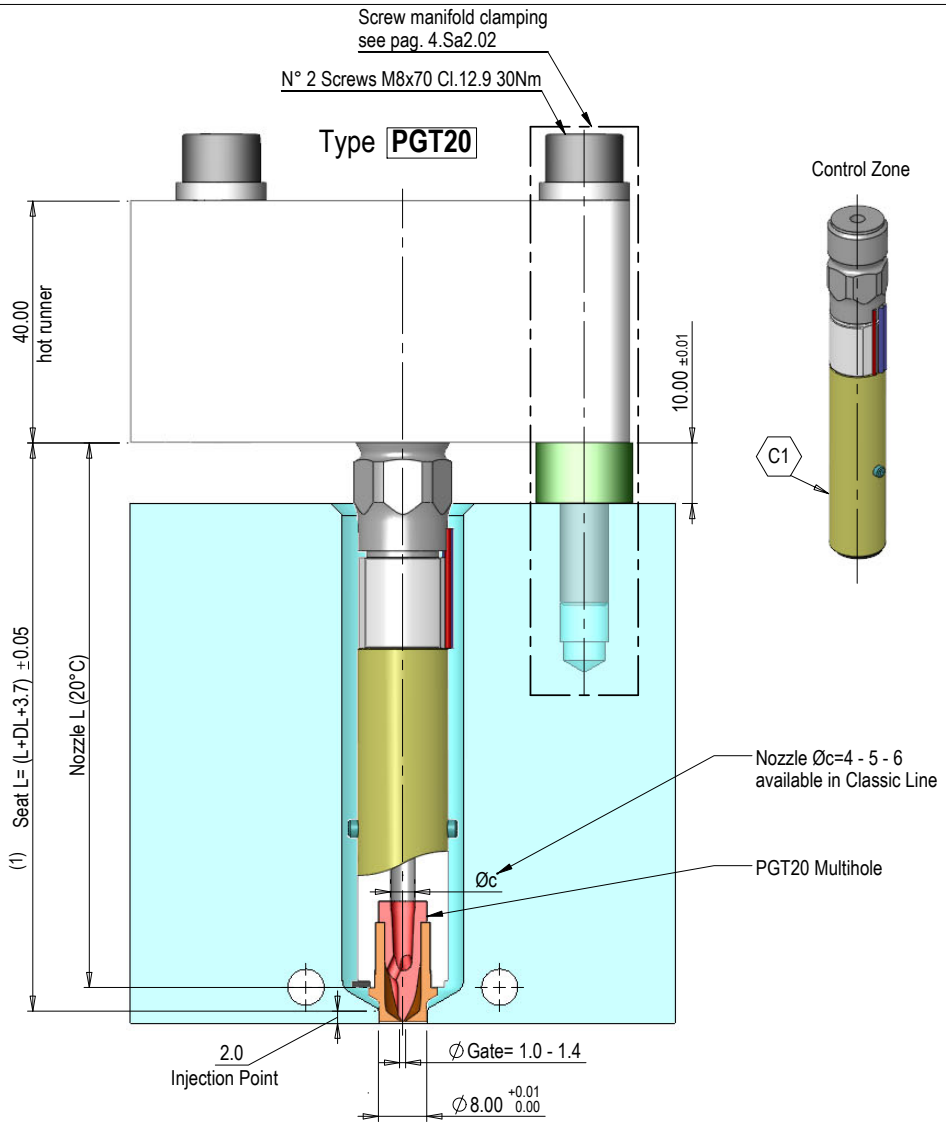
DETAIL A

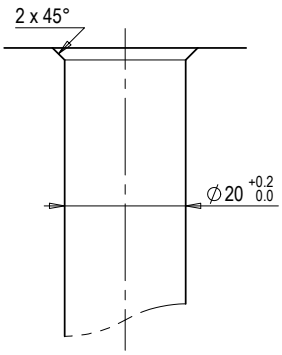


NOZZLE L
50 ÷ 195

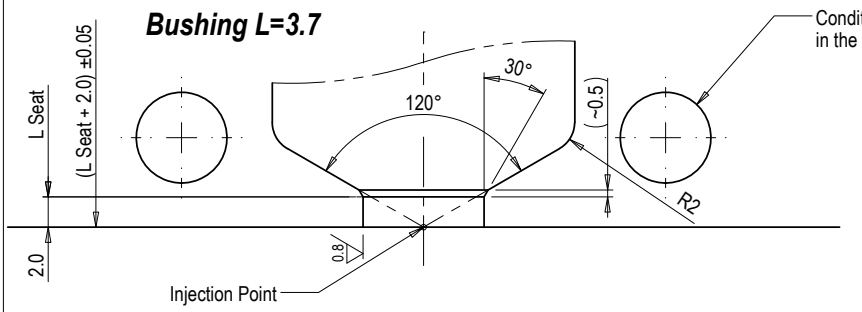
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Screwed-in nozzle TORPEDO with bushing through the cavity





Bushing L=3.7

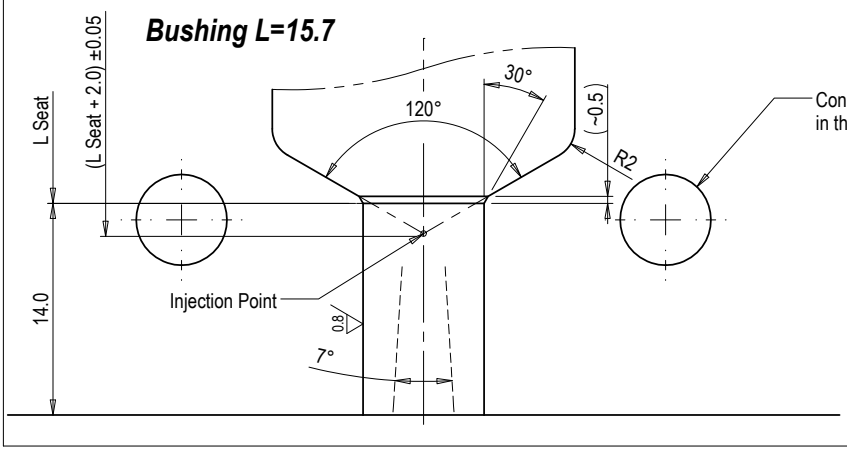


For all reference codes see on page 4.Sa1.10

(1) For "Seat L" calculation see pag. 4.Sa1.11 table A

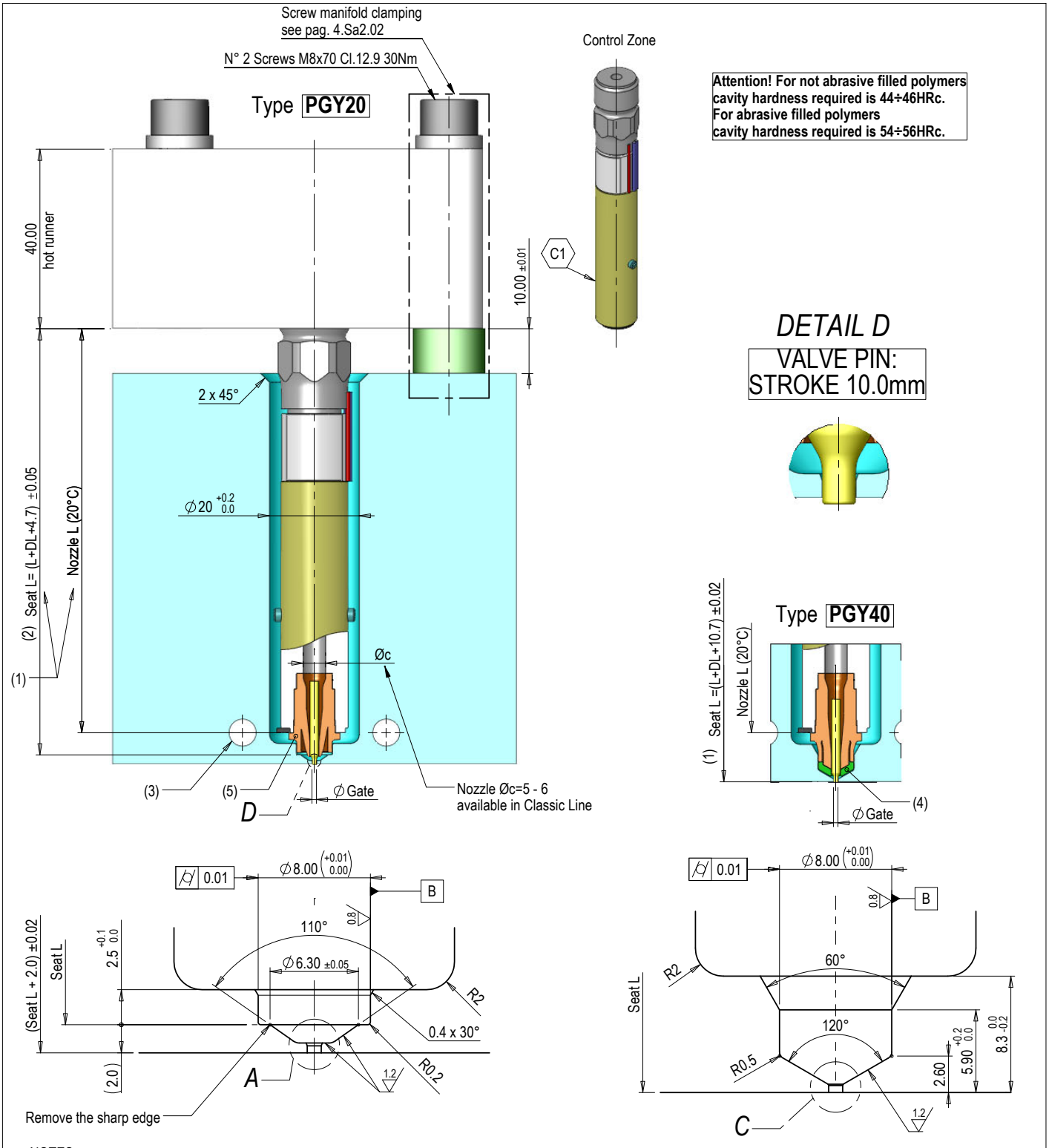
NOZZLE L
50 ÷ 195

Bushing L=15.7



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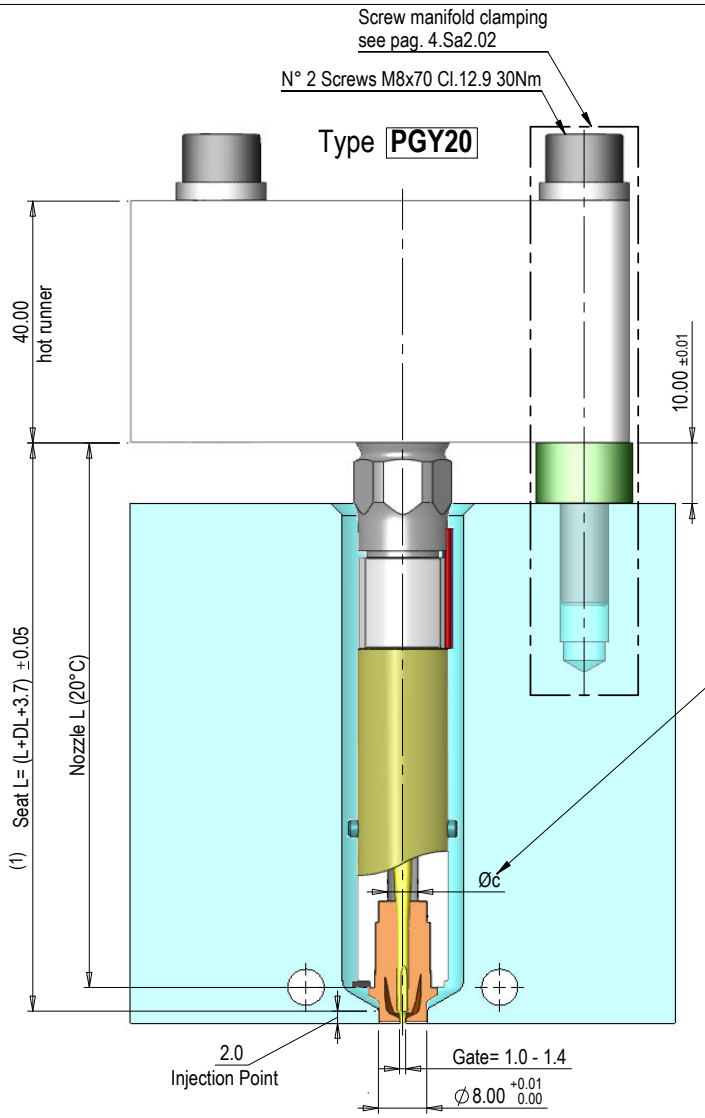
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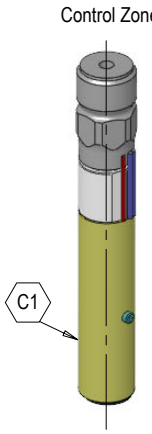


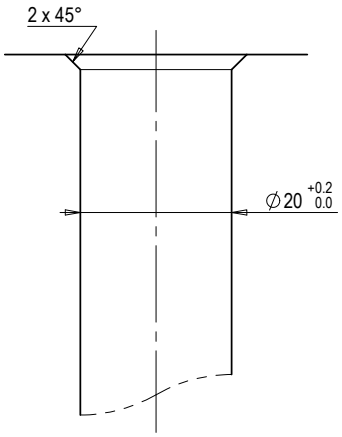
NOTES:
(1) "Nozzle L" nominal Lenght. For a correct design of the "Seat L" and "Ø gate" keep in touch with the Oerlikon HRSflow technical office;
(2) For "DL" calculation see table pag. 4.Sa1.11;
(3) Conditioning circuit to be foreseen in the area of the injection point;
(4) Bushing for change color and avoid materia's leakage (optional); only PGY40; Max molding temperature 280°C [536°F];
(5) For all reference codes see on page 4.Sa1.10.

NOZZLE L
50 ÷ 195

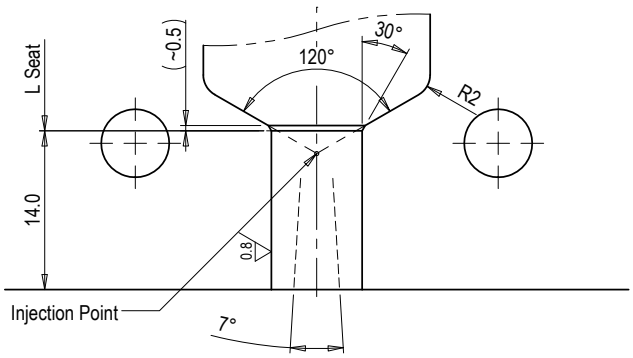
© All rights reserved



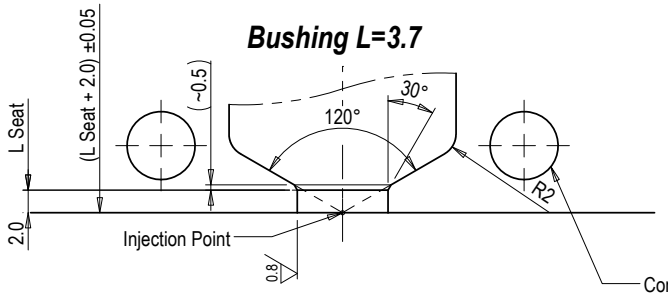




Bushing L=15.7

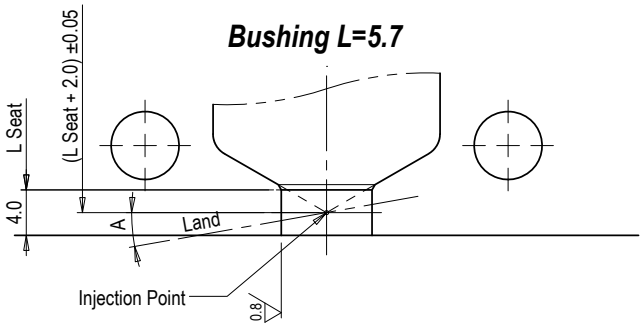


Bushing L=3.7



Conditioning circuit to be foreseen in the area of the injection point

Bushing L=5.7



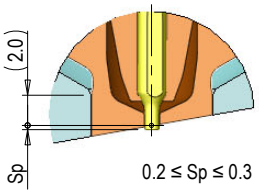
A = 0° ÷ 10° max

For all reference codes see on page 4.Sa1.10

(1) For "Seat L" calculation see pag. 4.Sa1.11 table A

NOZZLE
L
50 ÷ 195

ATTENTION! In this configuration there is a protrusion "Sp" of the Pin from the bushing.
HRS recommends not to remove this protrusion.
The "Sp" dimension is function of ∅Gate and "A" angle



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TIPS - END RINGS CODE TABLE

TIP CODE	BUSHING CODE
FREE FLOW	
PGF20 0012-00984 0012-00986 *for high resistance* ***PGF40*** 0012-00980 0012-00981 *for high resistance*	***External End Ring*** 0013-02087
PGF20 0012-00984 0012-00986 *for high resistance*	***End Ring through the cavity*** *Gate* **L=3.7** **L=15.7** ***Ø1.0*** 0013-01489 0013-01491 ***Ø1.4*** 0013-01490 0013-01492
TORPEDO	
PGT20 0012-00866 0012-00868 *for high resistance* ***PGT40*** 0012-00982 0012-00983 *for high resistance*	***External End Ring*** 0013-02087
PGT20 0012-00866 0012-00868 *for high resistance*	***End Ring through the cavity*** *Gate* **L=3.7** **L=15.7** ***Ø1.0*** 0013-01489 0013-01491 ***Ø1.4*** 0013-01490 0013-01492
CYLINDRICAL VALVE GATING	
	External End Ring **PGY20** 0013-02156 **PGY40** 0013-02082 ***End Ring through the cavity PGY20*** ***Gate*** ***L=3.7*** ***L=5.7*** *Ø1.0* 0013-01515 0013-01527 *Ø1.4* 0013-01516 0013-01528

NOTES:

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (*) (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	0.06	0.07	0.08	0.10	0.11	0.12	0.13	0.14	0.16	0.17	0.18
60	0.07	0.09	0.10	0.12	0.13	0.14	0.16	0.17	0.19	0.20	0.22
70	0.08	0.10	0.12	0.13	0.15	0.17	0.18	0.20	0.22	0.24	0.25
90	0.11	0.13	0.15	0.17	0.19	0.22	0.24	0.26	0.28	0.30	0.32
110	0.13	0.16	0.18	0.21	0.24	0.26	0.29	0.32	0.34	0.37	0.40
130	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.37	0.41	0.44	0.47
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
160 (a)	0.19	0.23	0.27	0.31	0.35	0.38	0.42	0.46	0.50	0.54	0.58
170	0.20	0.24	0.29	0.33	0.37	0.41	0.45	0.49	0.53	0.57	0.61
195	0.23	0.28	0.33	0.37	0.42	0.47	0.51	0.56	0.61	0.66	0.70

Tab. A - "Seat L" Calculation

L (*) (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Seat = L + DL + 3.7										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	53.76	53.77	53.78	53.80	53.81	53.82	53.83	53.84	53.86	53.87	53.88
60	63.77	63.79	63.80	63.82	63.83	63.84	63.86	63.87	63.89	63.90	63.92
70	73.78	73.80	73.82	73.83	73.85	73.87	73.88	73.90	73.92	73.94	73.95
90	93.81	93.83	93.85	93.87	93.89	93.92	93.94	93.96	93.98	94.00	94.02
110	113.83	113.86	113.88	113.91	113.94	113.96	113.99	114.02	114.04	114.07	114.10
130	133.86	133.89	133.92	133.95	133.98	134.01	134.04	134.07	134.11	134.14	134.17
150	153.88	153.92	153.95	153.99	154.02	154.06	154.10	154.13	154.17	154.20	154.24
160 (a)	163.89	163.93	163.97	164.01	164.05	164.08	164.12	164.16	164.20	164.24	164.28
170	173.90	173.94	173.99	174.03	174.07	174.11	174.15	174.19	174.23	174.27	174.31
195	198.93	198.98	199.03	199.07	199.12	199.17	199.21	199.26	199.31	199.36	199.40

NOTES:

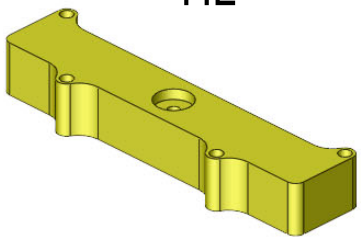
(*) You can order nozzles with "L" different from the standard within the indicated limits (min 50 - max 195 mm).

(a) Max Lenght available in case of nozzles equipped with EXTERNAL RING. For further information contact HRS technical office.

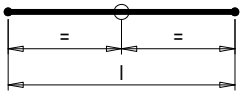
Index

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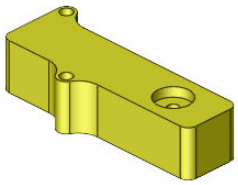
-HL-



Standard
l=150-200-250-300-350-400-450 mm



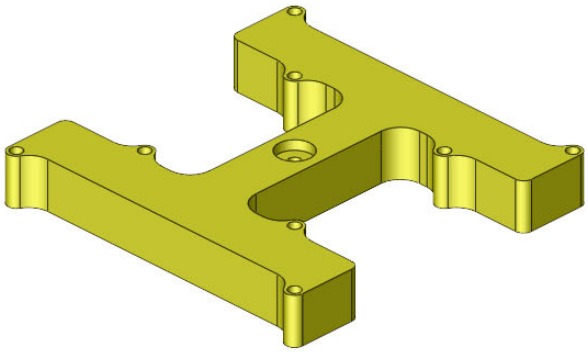
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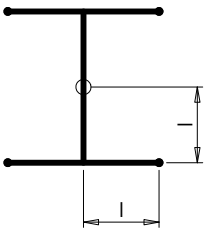


Standard
l=75-100-125-150-175-200-225 mm



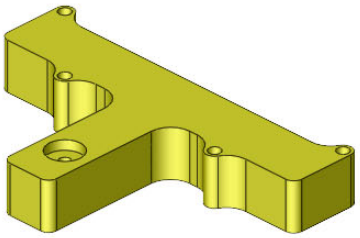
-HH-

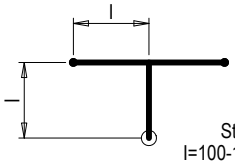




Standard
l=100-125-150 mm

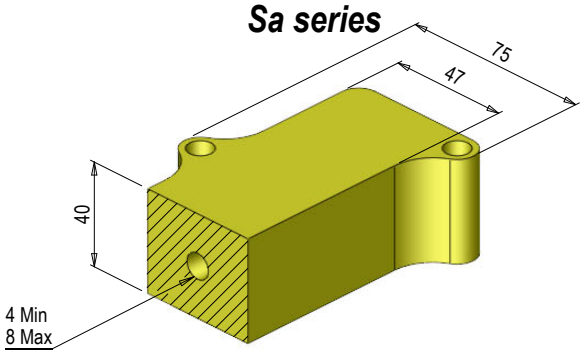
-HT-





Standard
l=100-125-150 mm

Sa series

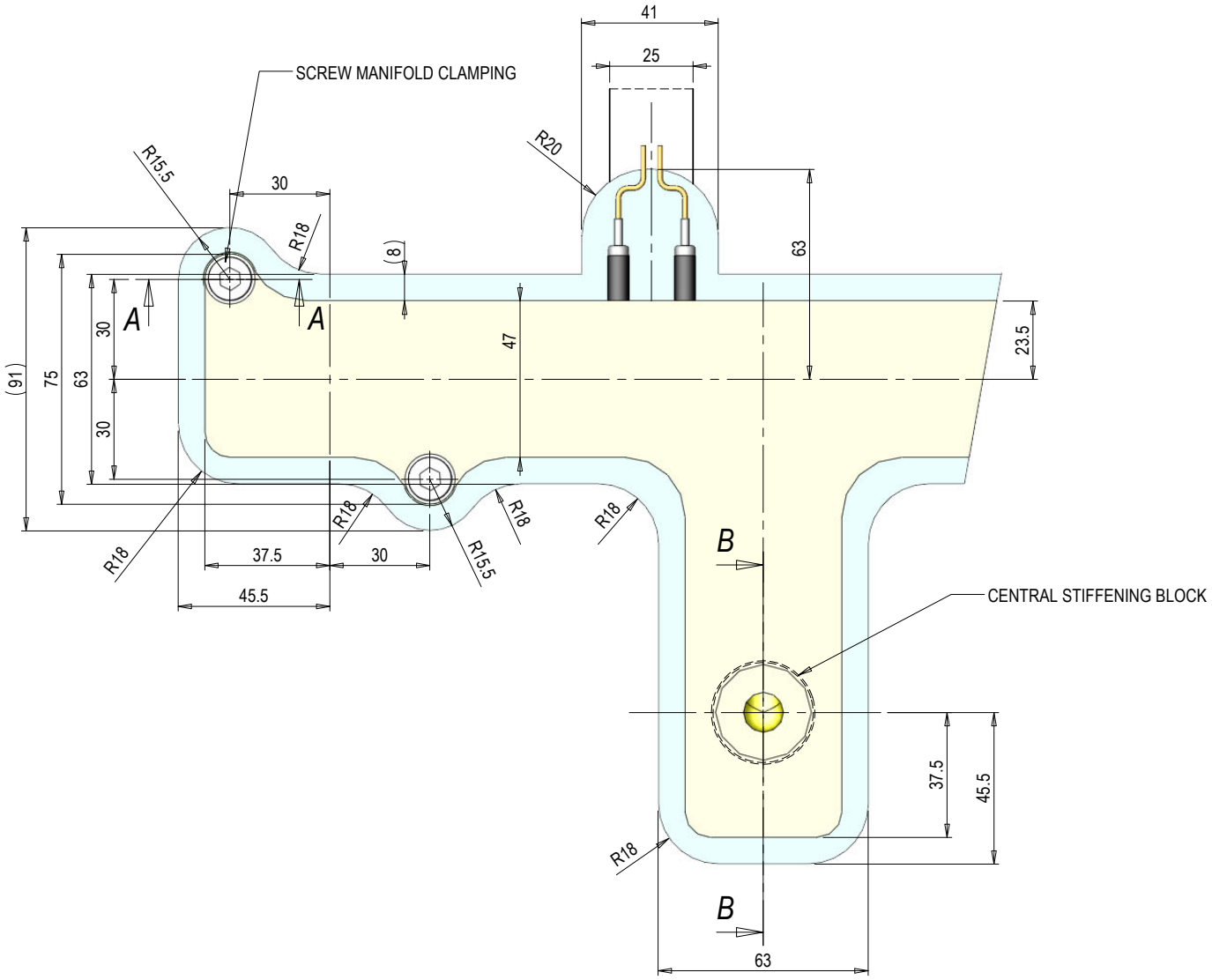


Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

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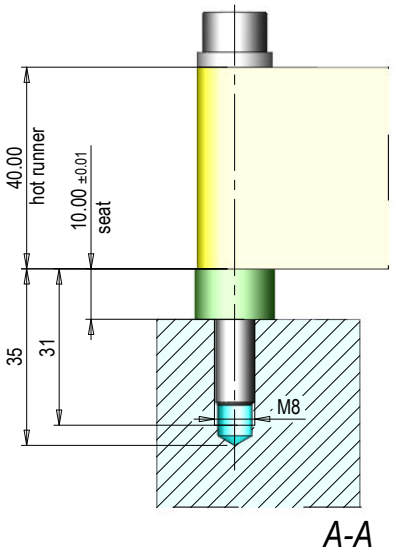
The following profile is the typical one for
the standard not wired hot runner pocket

(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)



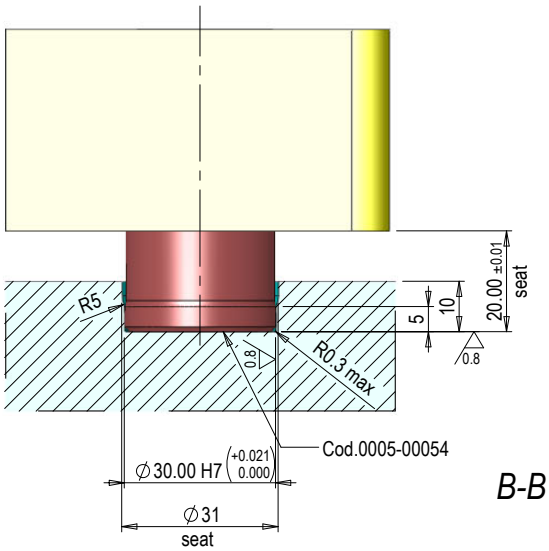
Screw manifold clamping

Screw M8x70 cl.12.9 30 Nm



A-A

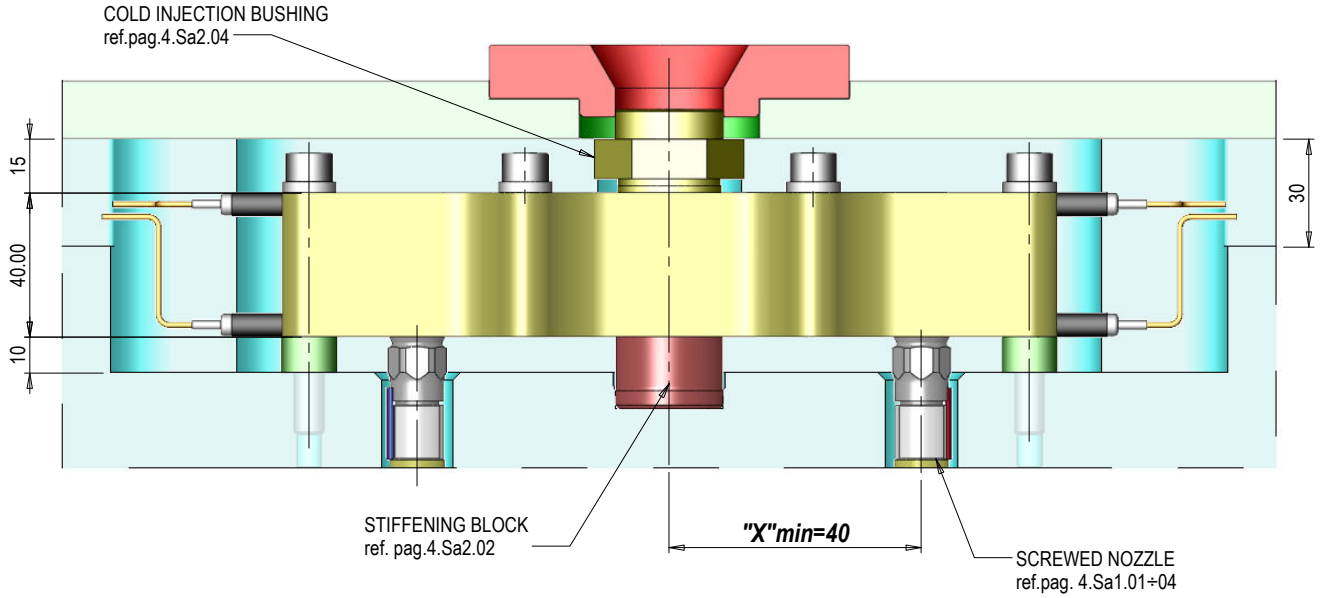
Pocket central stiffening block



B-B

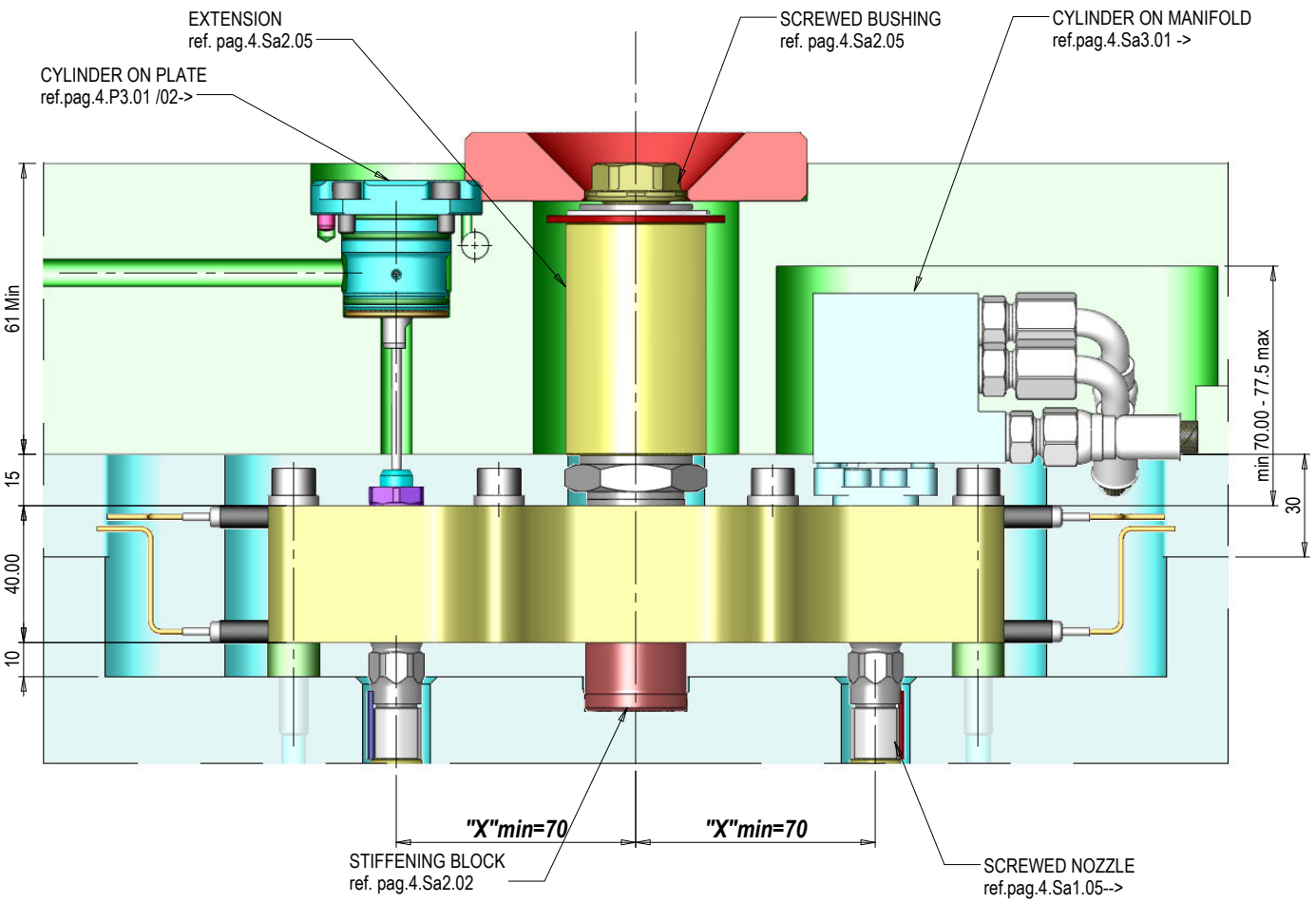
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Structure for TORPEDO or FREE FLOW systems

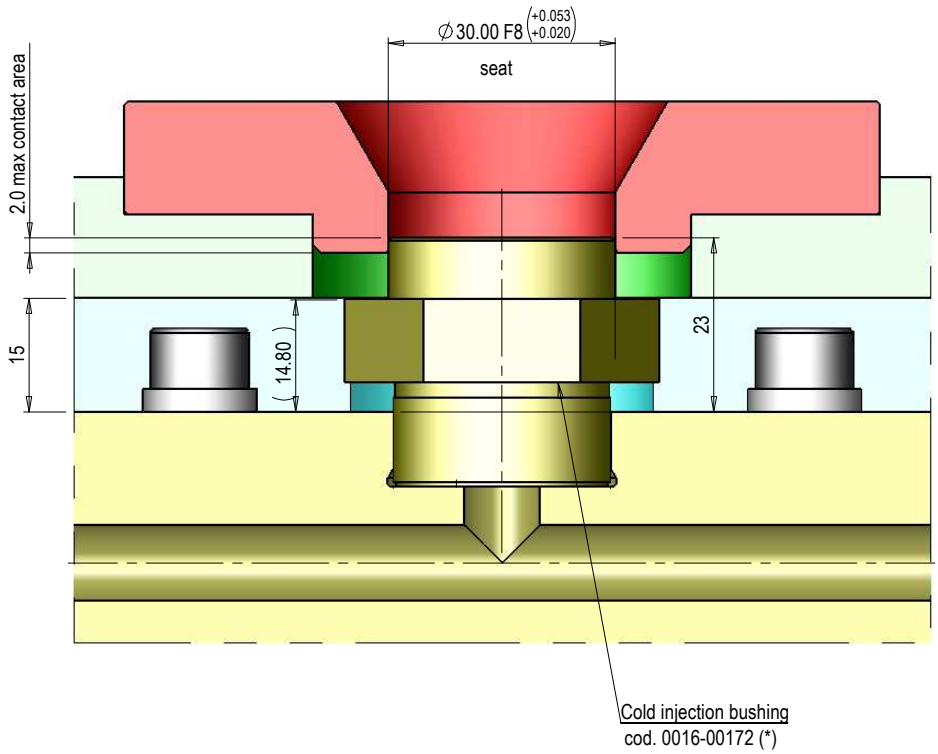


Xmin= min centre distance between injection bushing and nozzle for non standard systems

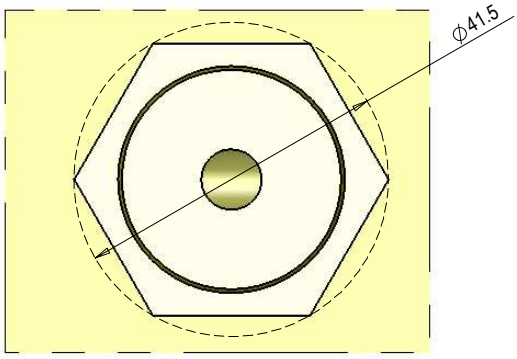
Structure for VALVE GATING systems



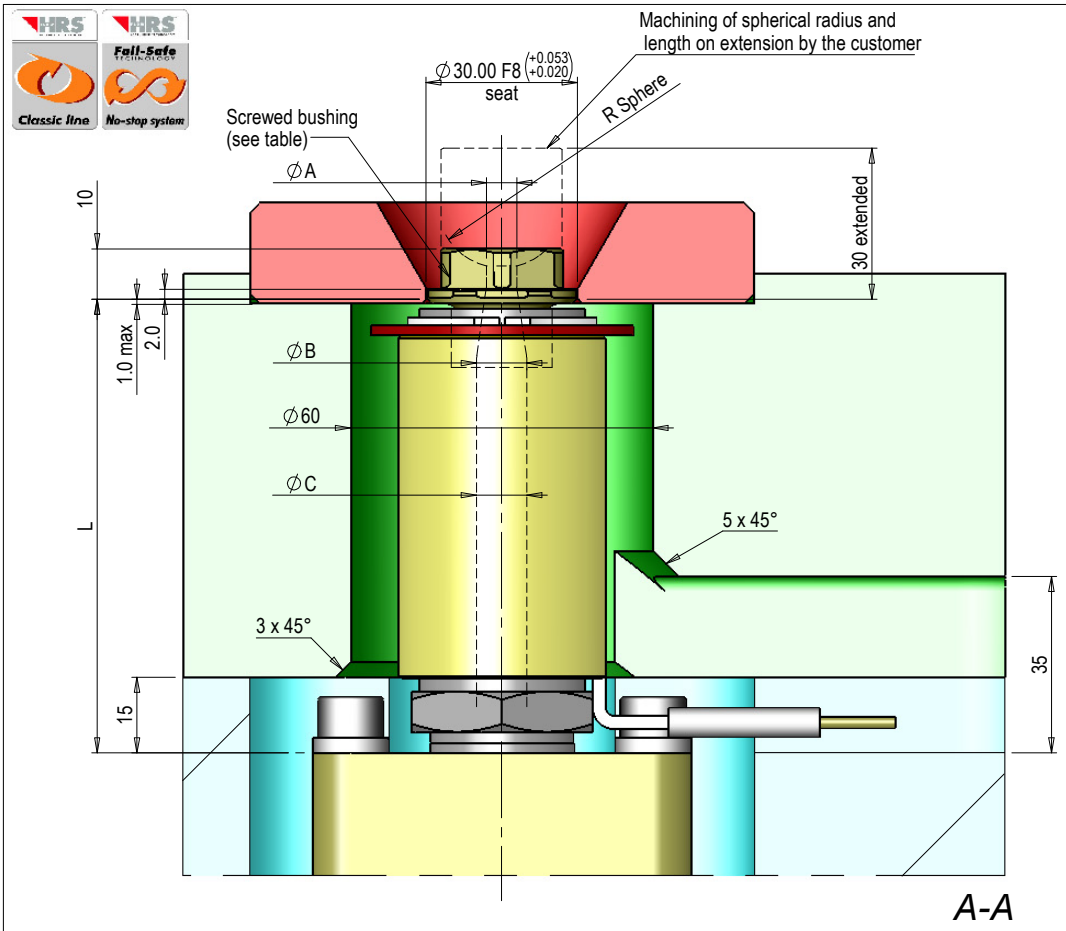
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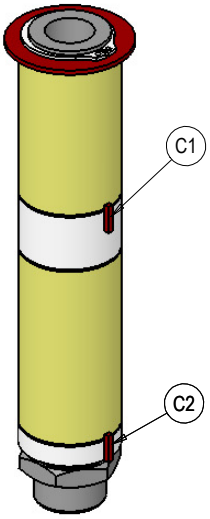
(*)Standard code with R sphere=0. Others R sphere sizes to be required.



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Control Zones



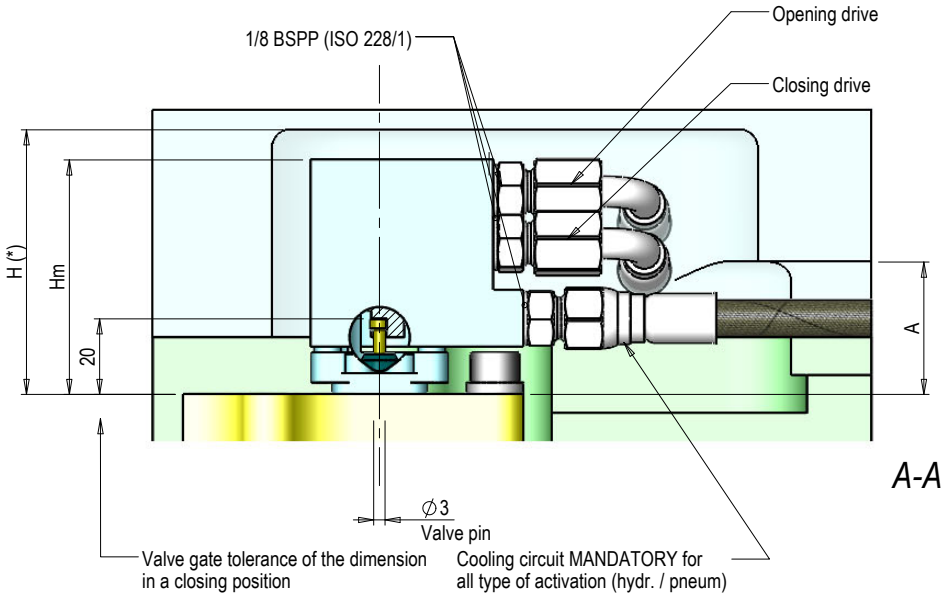
"L" (*)	MAXIMUN N° OF ZONES	SPHERE RADIUS	STANDARD SCREWED BUSHING CODE	
			ØA = ØB =4	ØA=4 | ØB=5
050.00 ÷ 204.89	1 [C1]	Extension R0	0015-00525	0015-00534
204.90 ÷ 305.09	2 [C1 + C2]	R0	0015-00526	0015-00535
STANDARD DIAMETERS OF EXTENSIONS DUCT		R 12.7	0015-00527	0015-00536
		R 15.5	0015-00528	0015-00537
ØC		R 19.1	0015-00529	0015-00538
4		R 20	0015-00530	0015-00539
5		R 25	0015-00531	0015-00540
6		R40	0015-00532	0015-00541
8			ØA=4 | ØB=6	ØA=4 | ØB=8
(*) L = min 050.00 ÷ 305.09 mm max		Extension R0	0015-00543	0015-00552
		R0	0015-00544	0015-00553
		R 12.7	0015-00545	0015-00554
		R 15.5	0015-00546	0015-00555
		R 19.1	0015-00547	0015-00556
		R 20	0015-00548	0015-00557
		R 25	0015-00549	0015-00558
		R40	0015-00550	0015-00559

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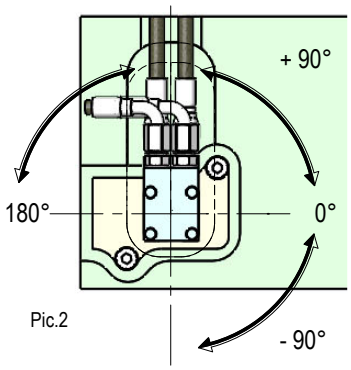
Cylinder: bore 24 mm - stroke 10 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 60 BAR
Working PRESSURE: PNEUMATIC air max 12 BAR

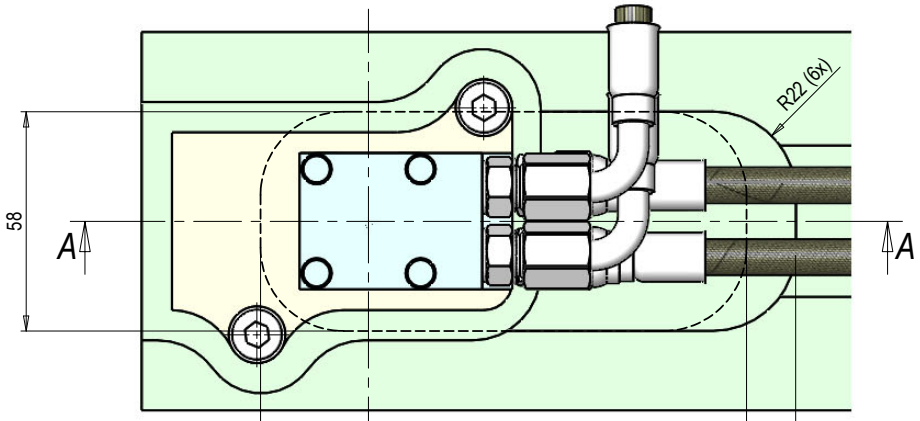
(*) Dimension reduction only after checking with HRS technical office.



b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



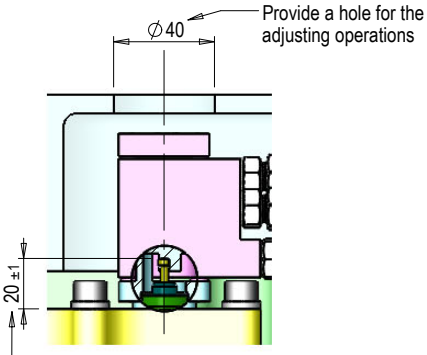
Pic.2



Standard configuration : 0°

Pic.1

ADJUSTABLE CYLINDER



Pic.3

Adjustable dimension

CODE	*VERSION*	*ACTIVATION*	*DAMPENED*	*COMPLETE GASKET*	*Hm*	*H*	*A*
0017-01021	*(standard)*	HYDR.	×	0038-00139	62	65	35
0017-01107			✓		70	73	42
0017-01067		PNEUM.	×	0038-00144	62	65	35
0017-01175	WITH 1 END OF STROKE	HYDR.	×	0038-00147	89	92	42
0017-01179			✓				
0017-01183		PNEUM.	×	0038-00148			
0017-01177	WITH DOUBLE END OF STROKE	HYDR.	×	0038-00147	89	92	42
0017-01181			✓				
0017-01185		PNEUM.	×	0038-00148			
0017-01023	ADJUSTABLE	HYDR.	×	0038-00139	69.5	72.5	35
0017-01068		PNEUM.	×	0038-00144			

NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

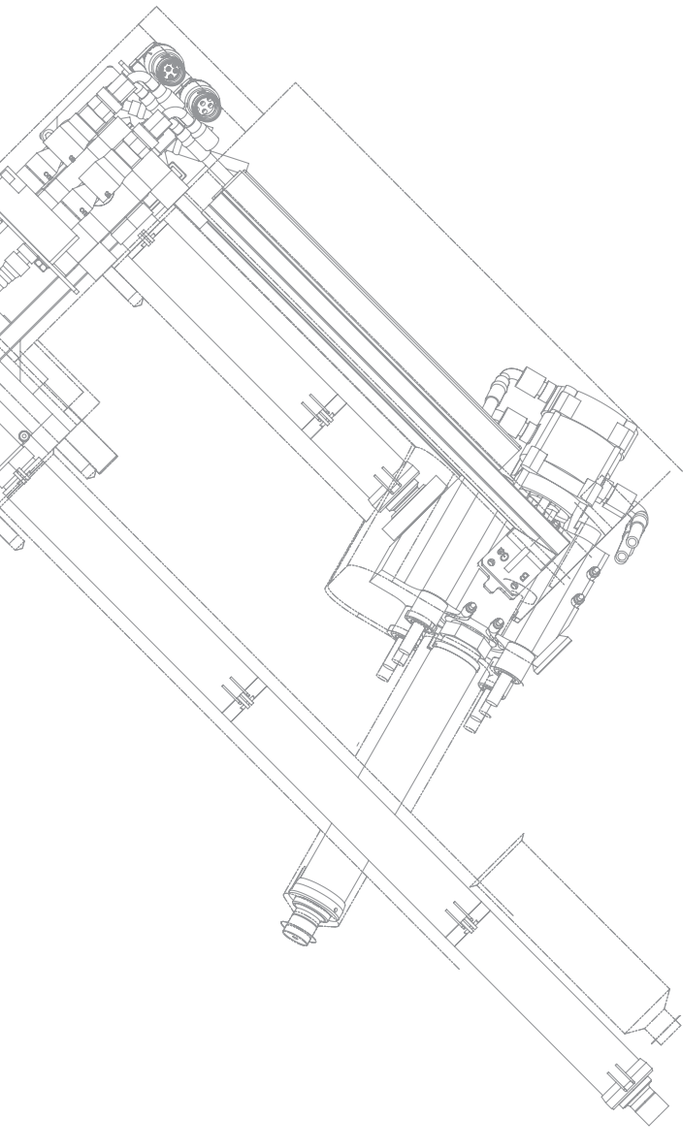
Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1;

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hrsflow



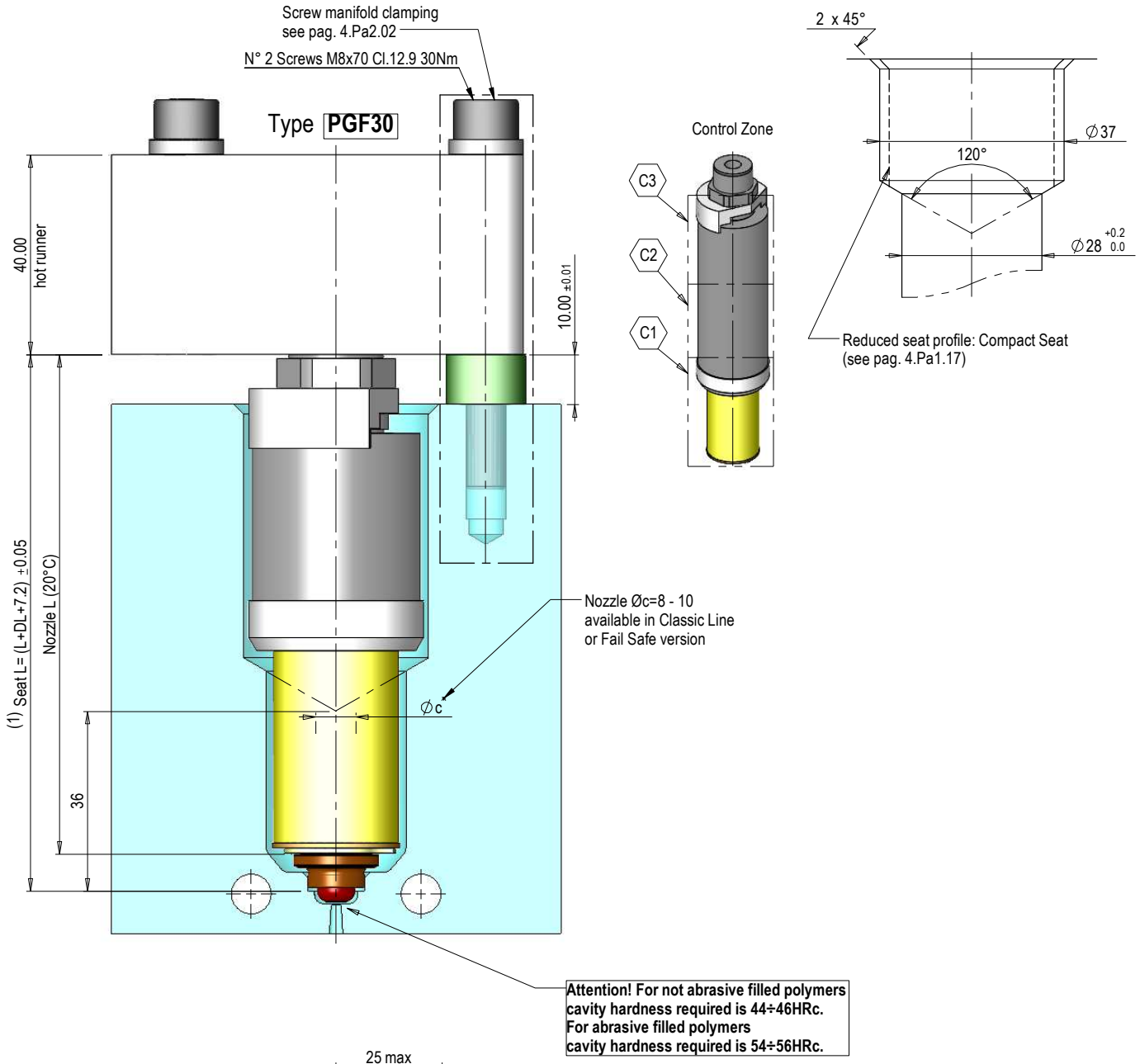
Pa

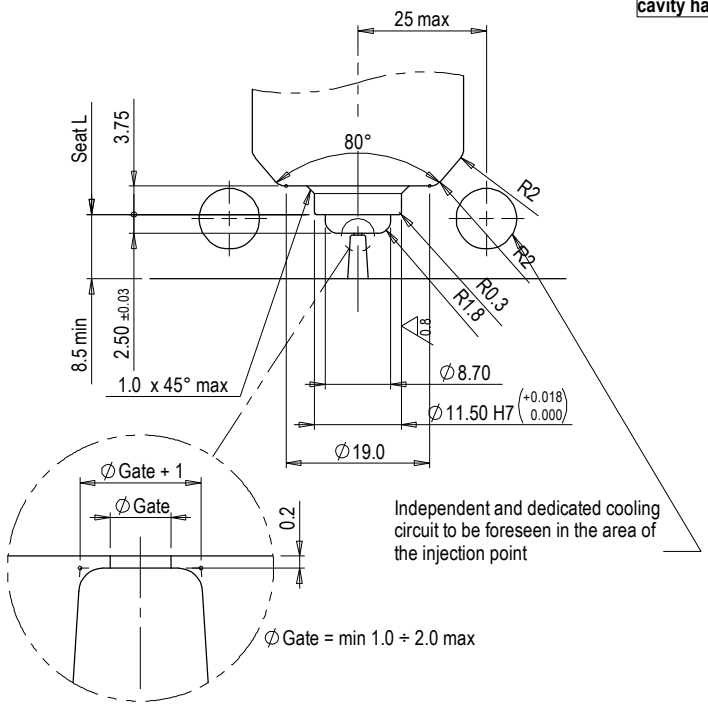
Pa Series

Serie Pa
Pa Serie
Pa Série
Pa Serie
Pa Série

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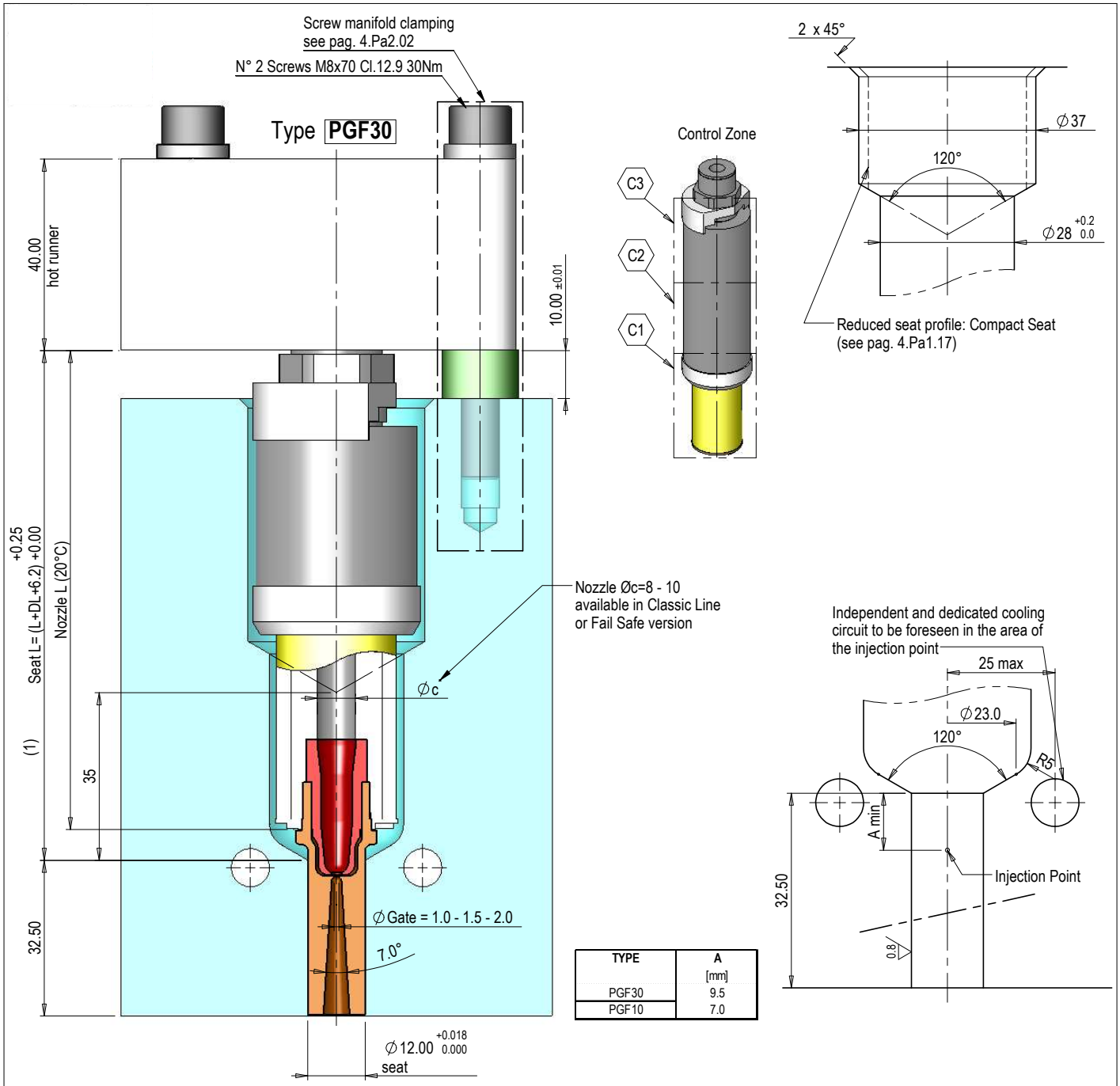


For all reference codes see on page 4.Pa1.10-11

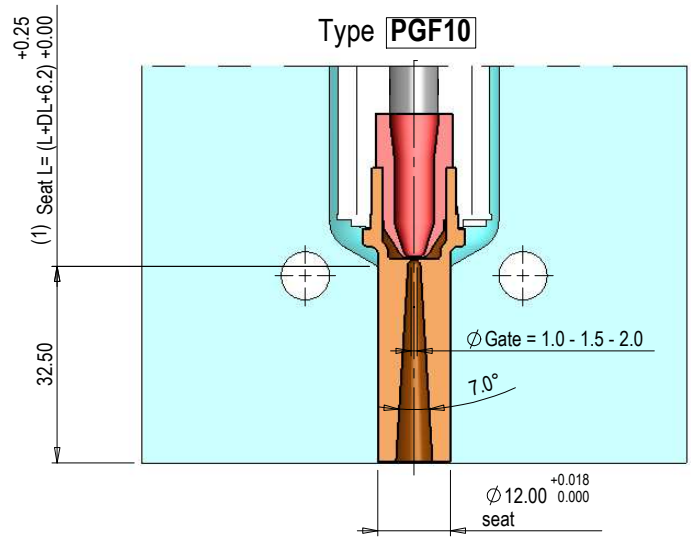
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

NOZZLE *L*
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345

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TYPE	A [mm]
PGF30	9.5
PGF10	7.0

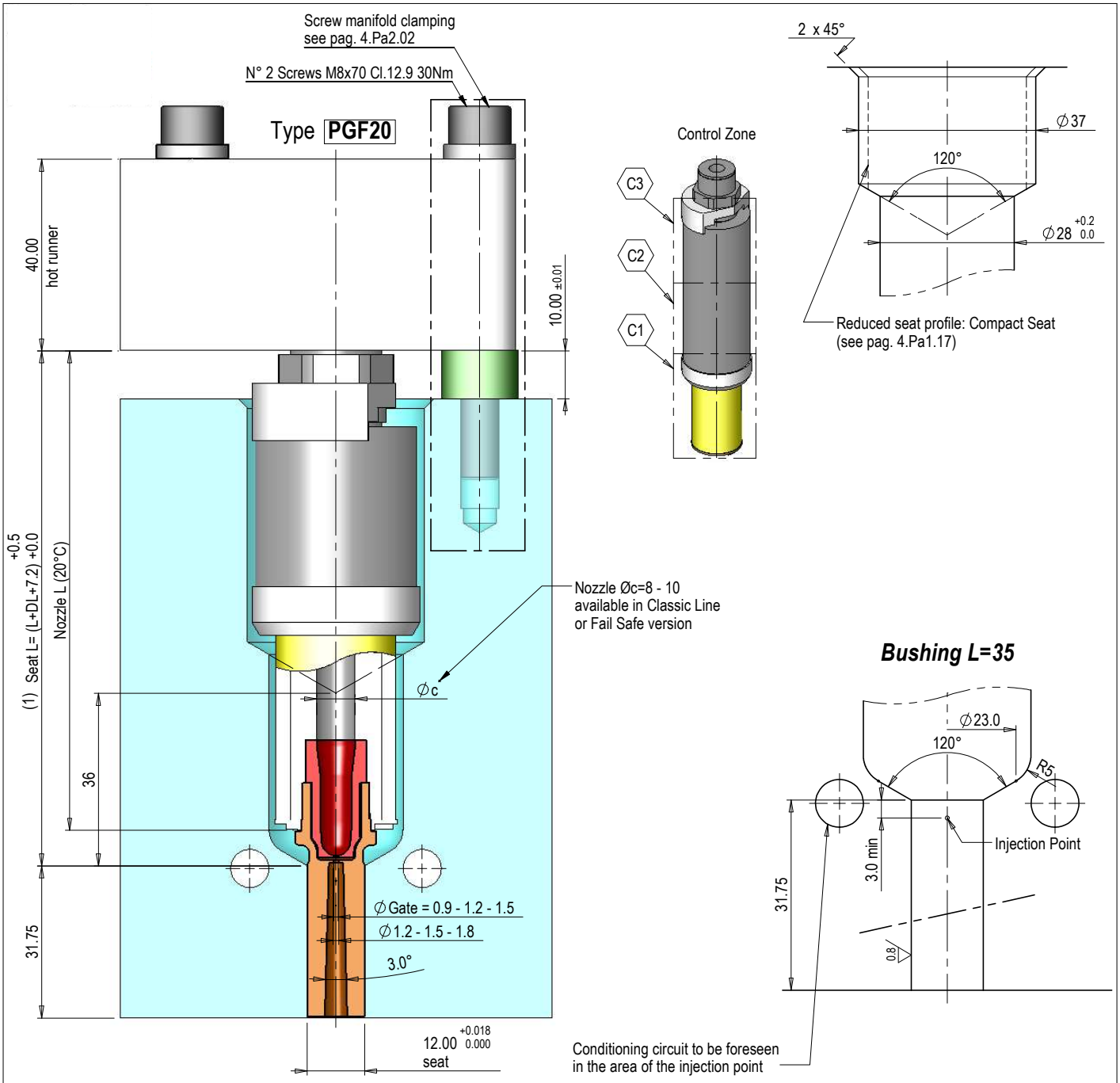


For all reference codes see on page 4.Pa1.10-11

(1) For "Seat L" calculation see pag. 4.Pa1.10a table B

NOZZLE L
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150
165
180
195
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360

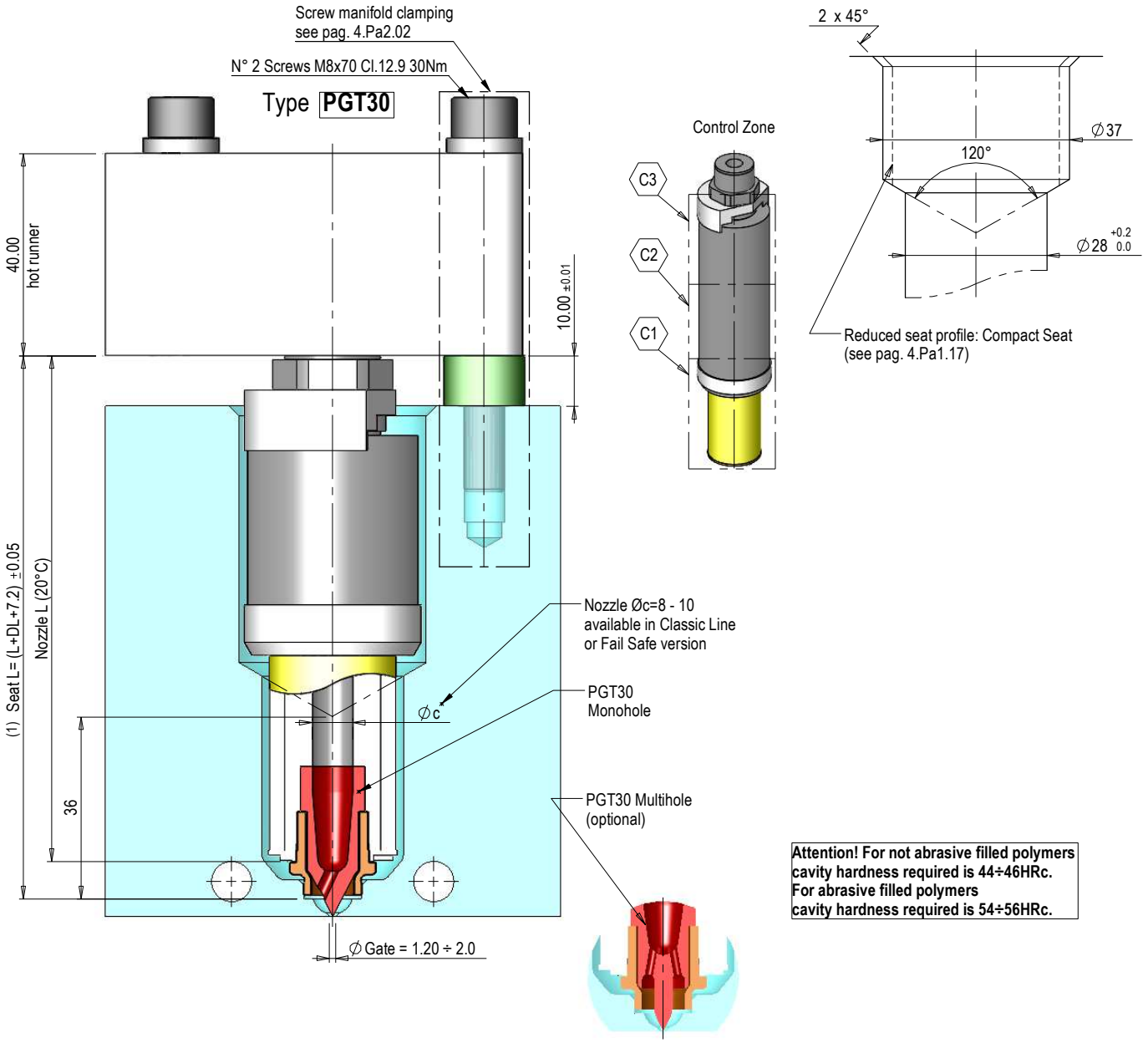
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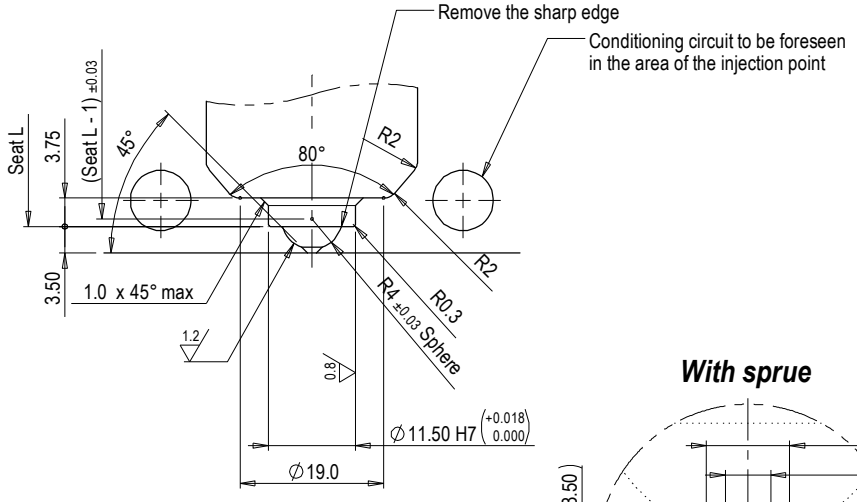
For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

NOZZLE L
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285
300
315
330
345
360

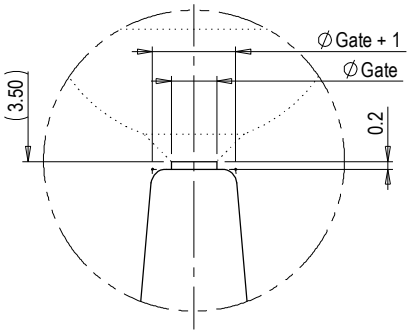
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Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.



With sprue



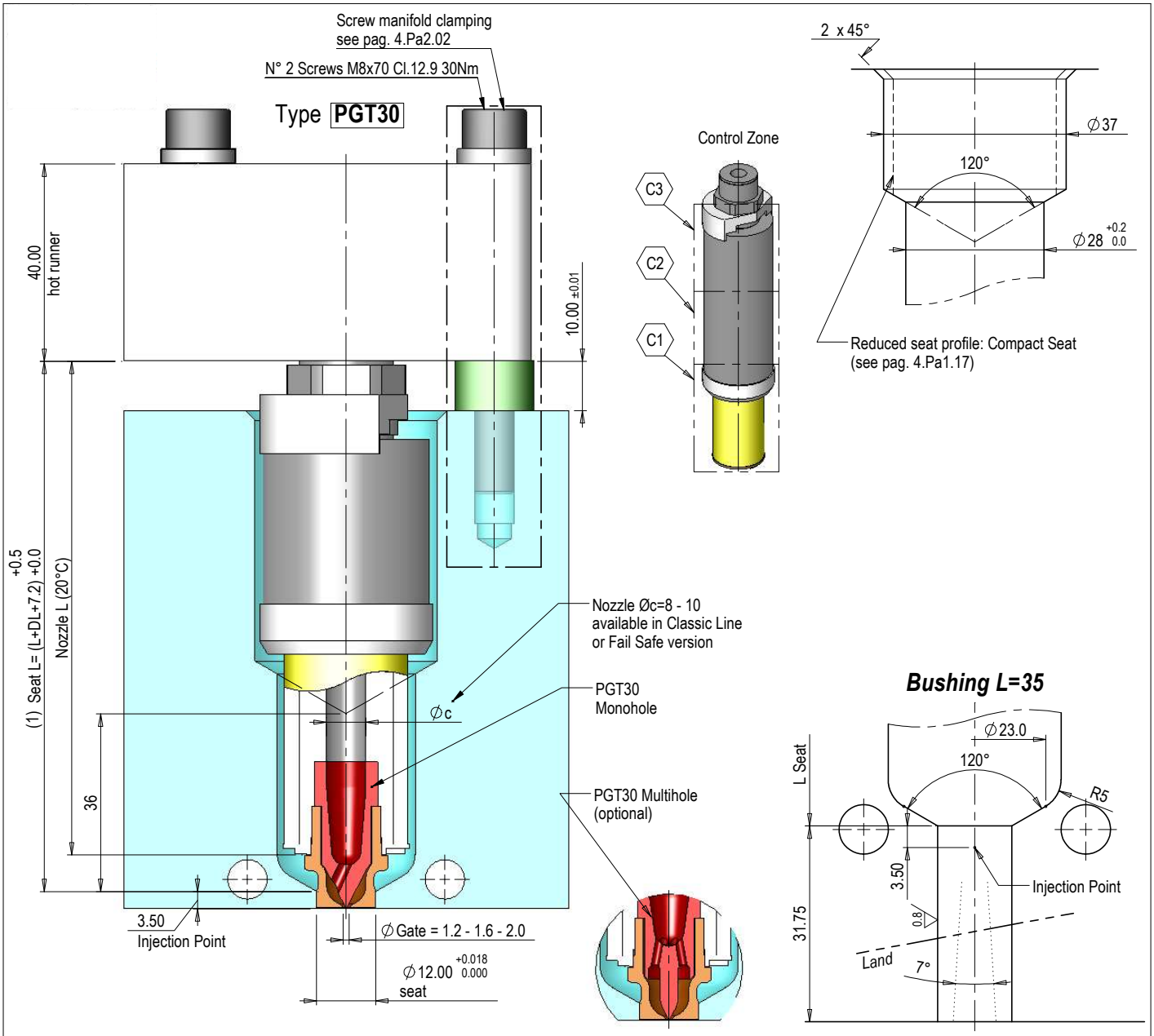
For all reference codes see on page 4.Pa1.10-11

(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

NOZZLE L
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210
225
240
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270
285
300
315
330
345

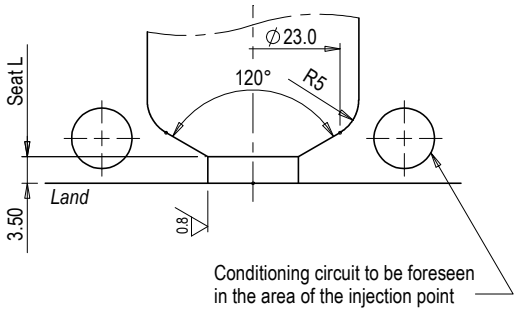
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Screwed-in Nozzle TORPEDO with bushing through the cavity



Bushing L=35

Bushing L=6.75



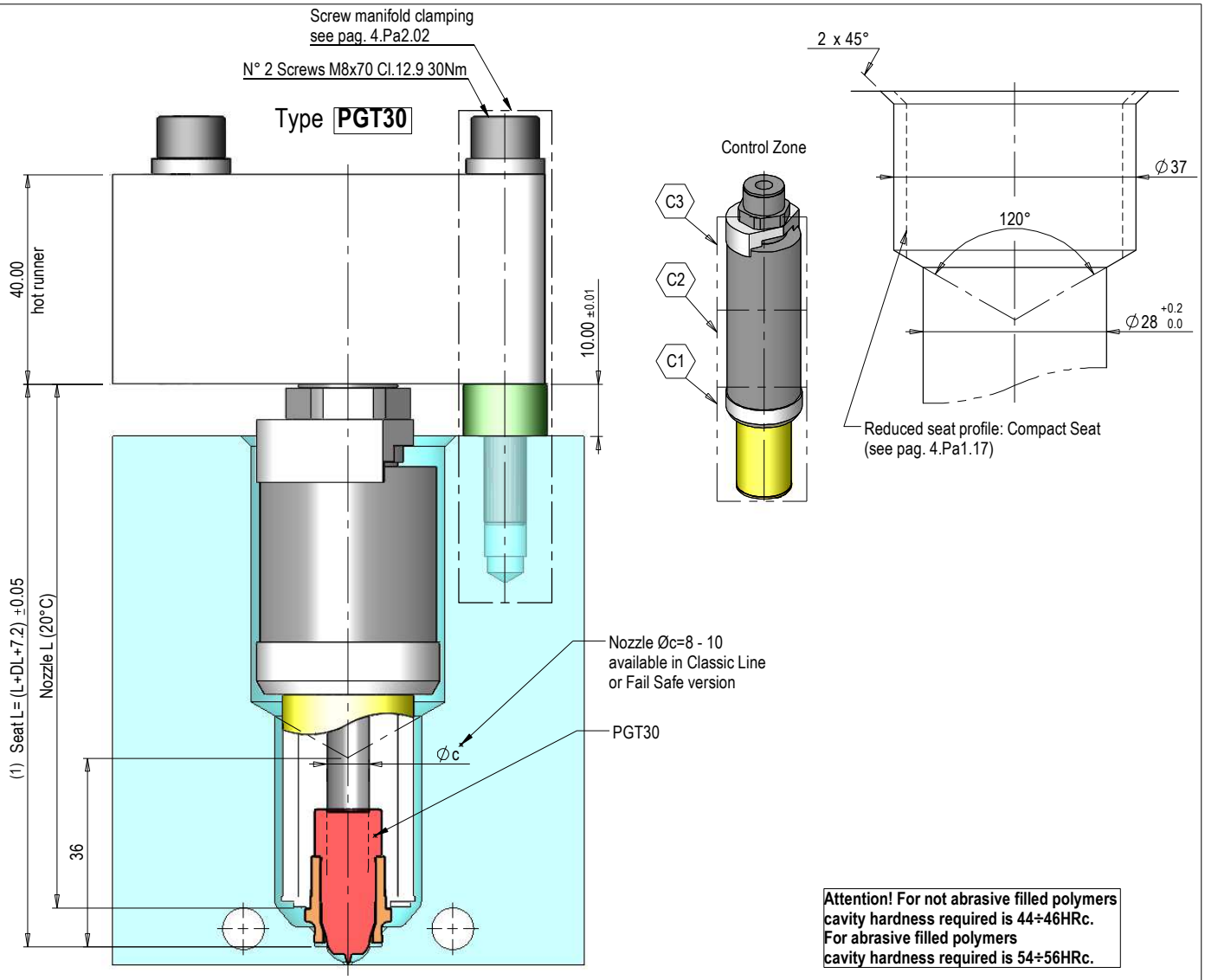
For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

NOZZLE L
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300
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345
360

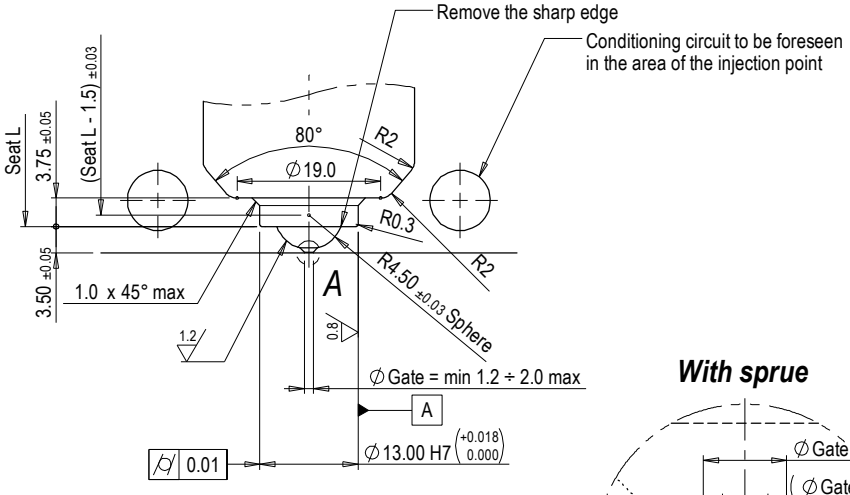
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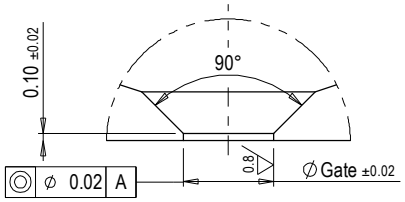
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Screwed-in nozzle TORPEDO with external ring for engineering polymers



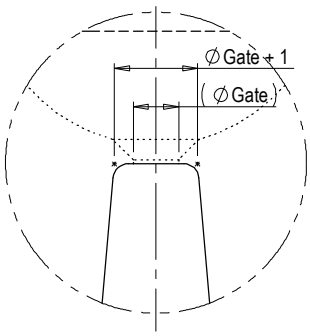
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.





DETAIL A
SCALE 10 : 1

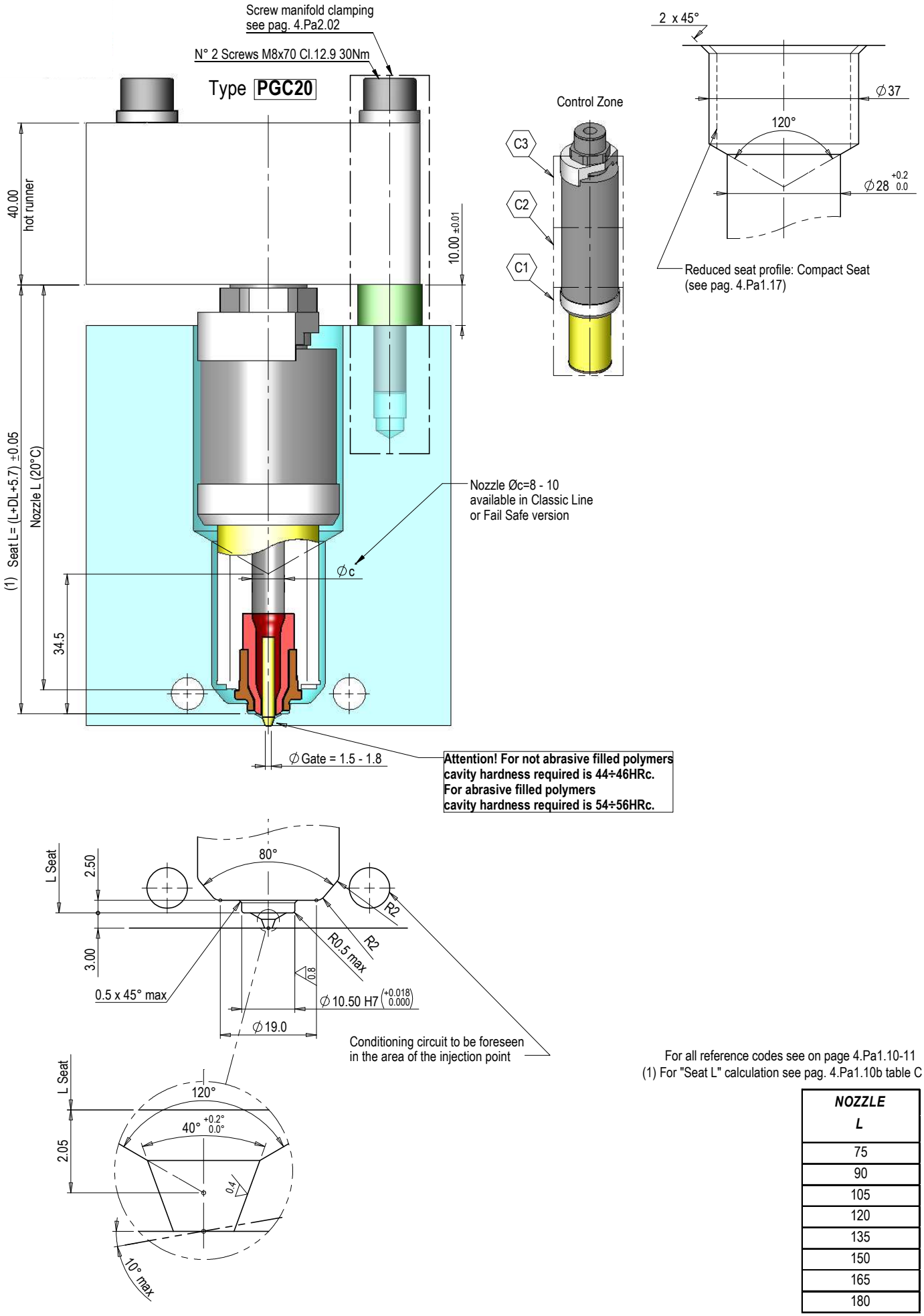
With sprue



For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

NOZZLE L
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90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345

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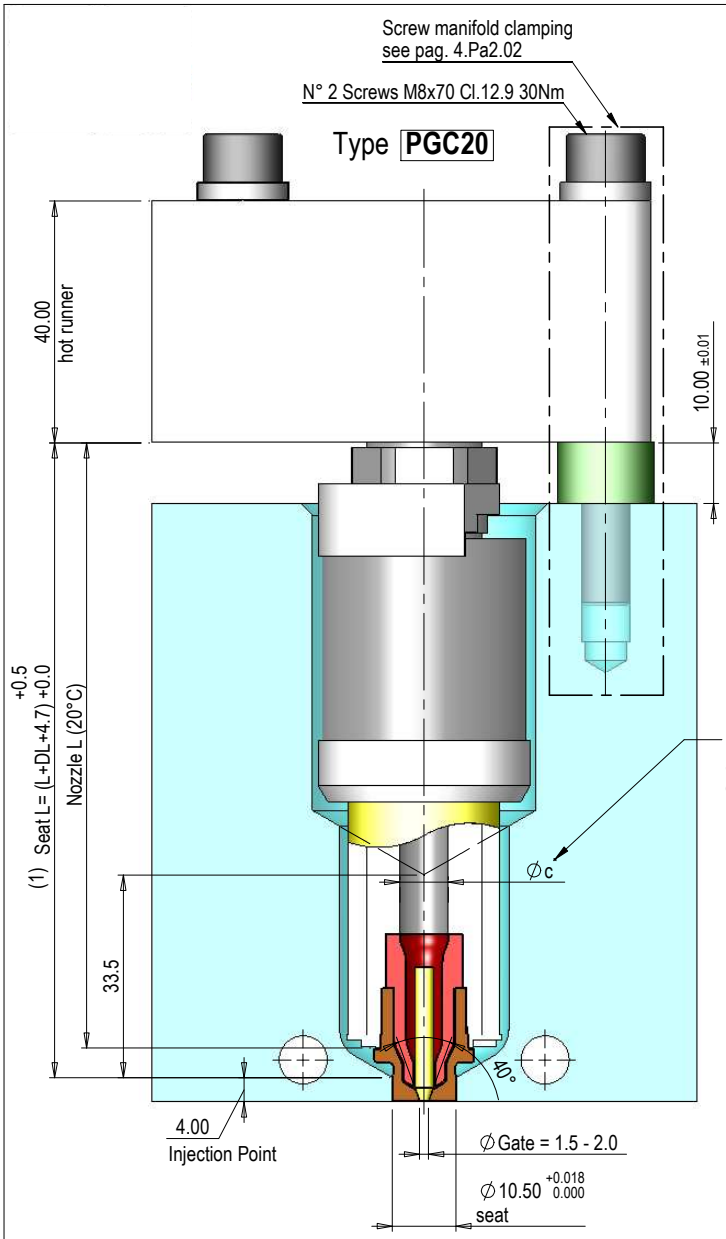
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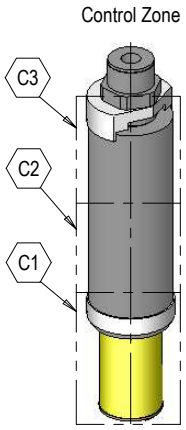
(1) For "Seat L" calculation see pag. 4.Pa1.10b table C

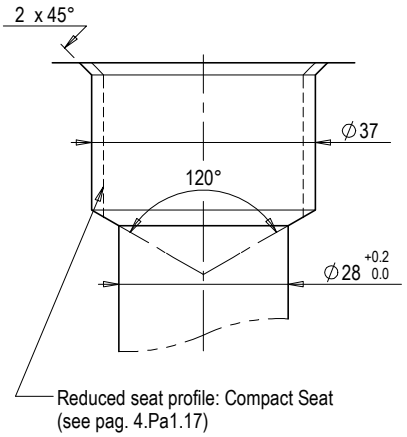
NOZZLE *L*
75
90
105
120
135
150
165
180

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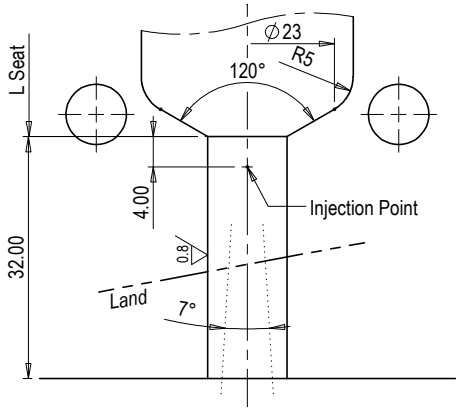
Screwed-in nozzle CONICAL VALVE GATING with bushing through the cavity



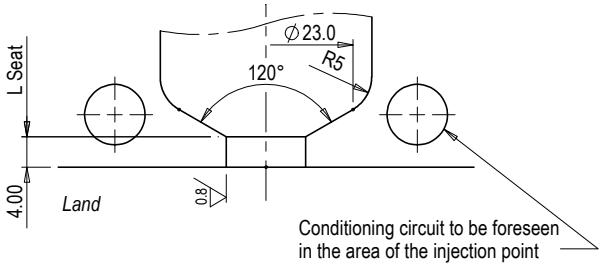




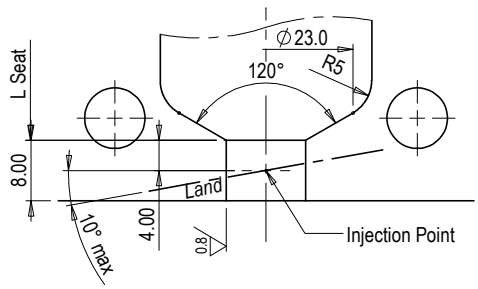
Bushing L=33



Bushing L=5.5



Bushing L=9

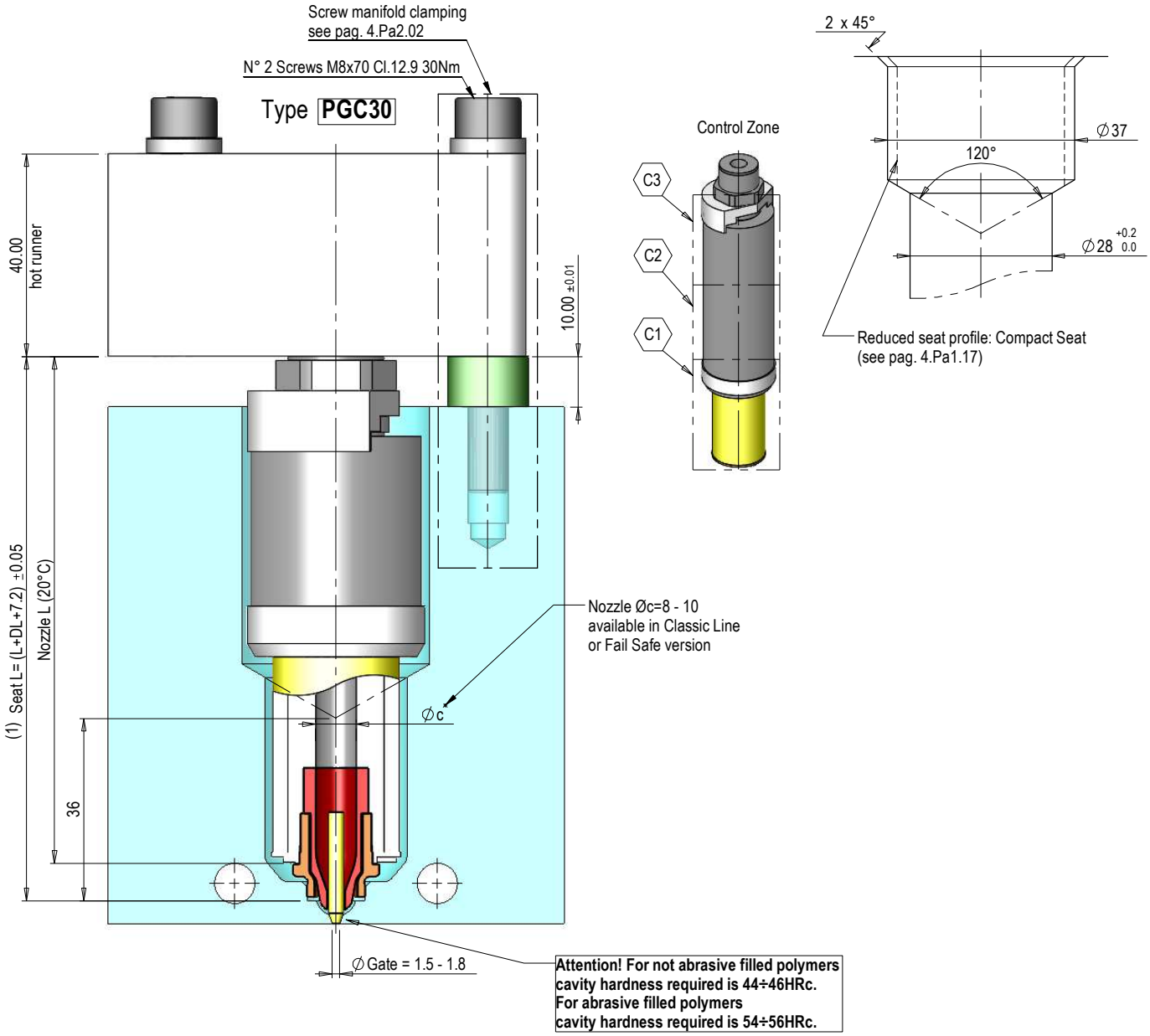


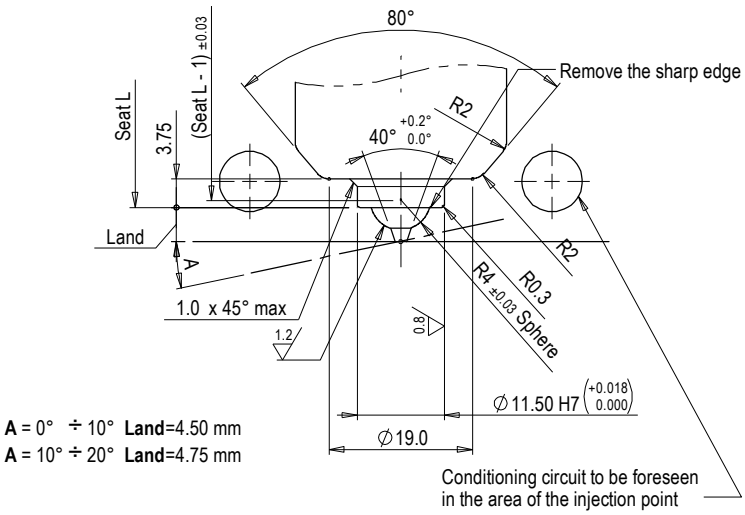
For all reference codes see on page 4.Pa1.10-11

(1) For "Seat L" calculation see pag. 4.Pa1.10c table D

NOZZLE L
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90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
360

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A = 0° ÷ 10° **Land**=4.50 mm
A = 10° ÷ 20° **Land**=4.75 mm

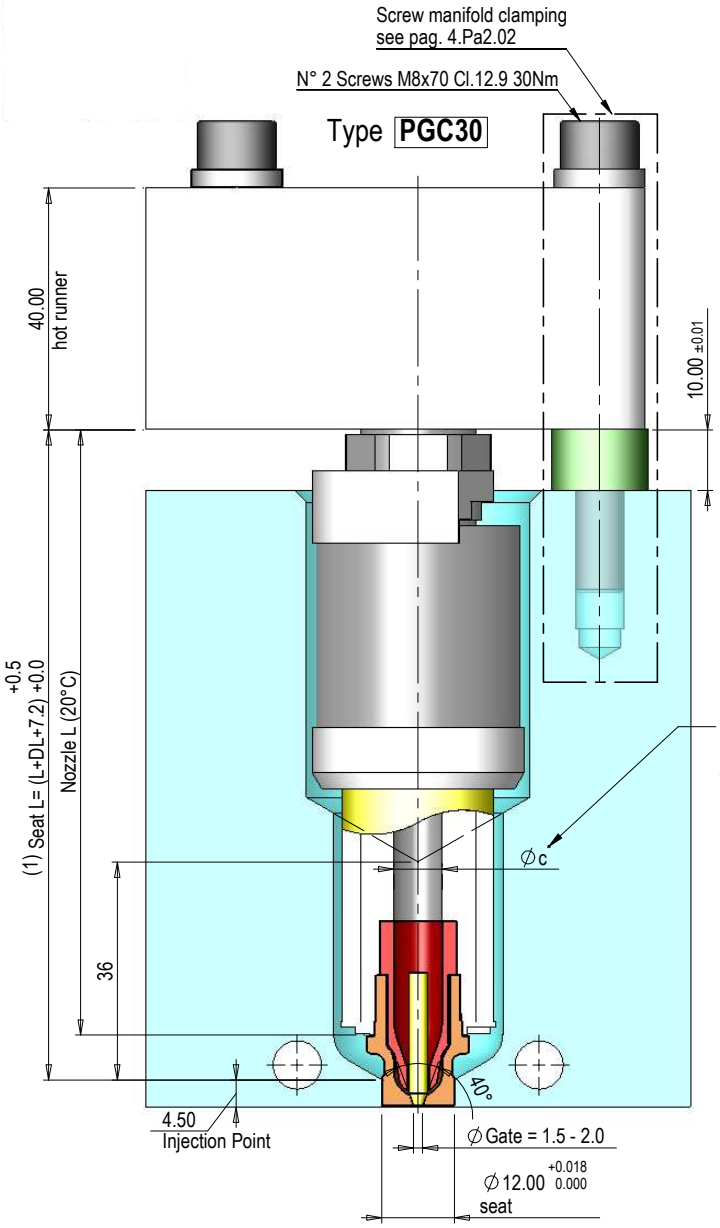
For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

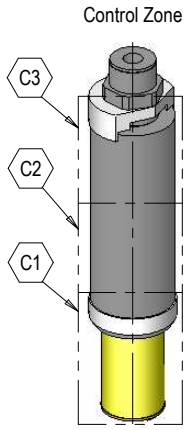
NOZZLE L
75
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180
195
210
225
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270
285
300
315
330
345

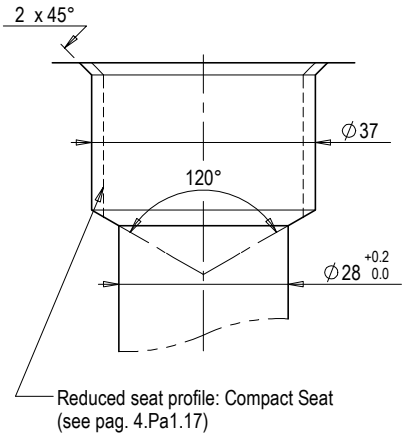
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Screwed-in nozzle CONICAL VALVE GATING with bushing through the cavity

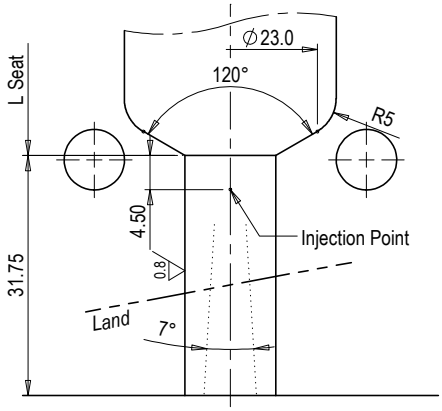
oerlikon hrsflow



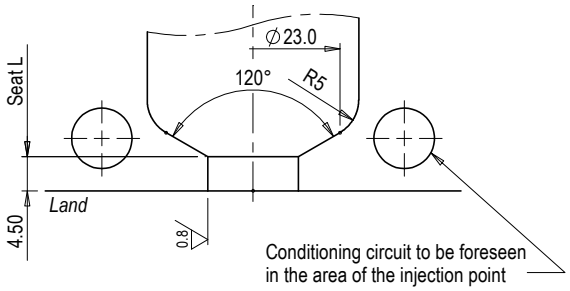




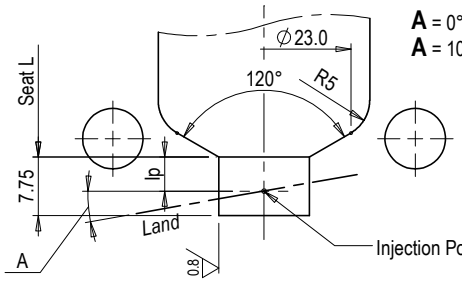
Bushing L=35



Bushing L=7.75



Bushing L=11

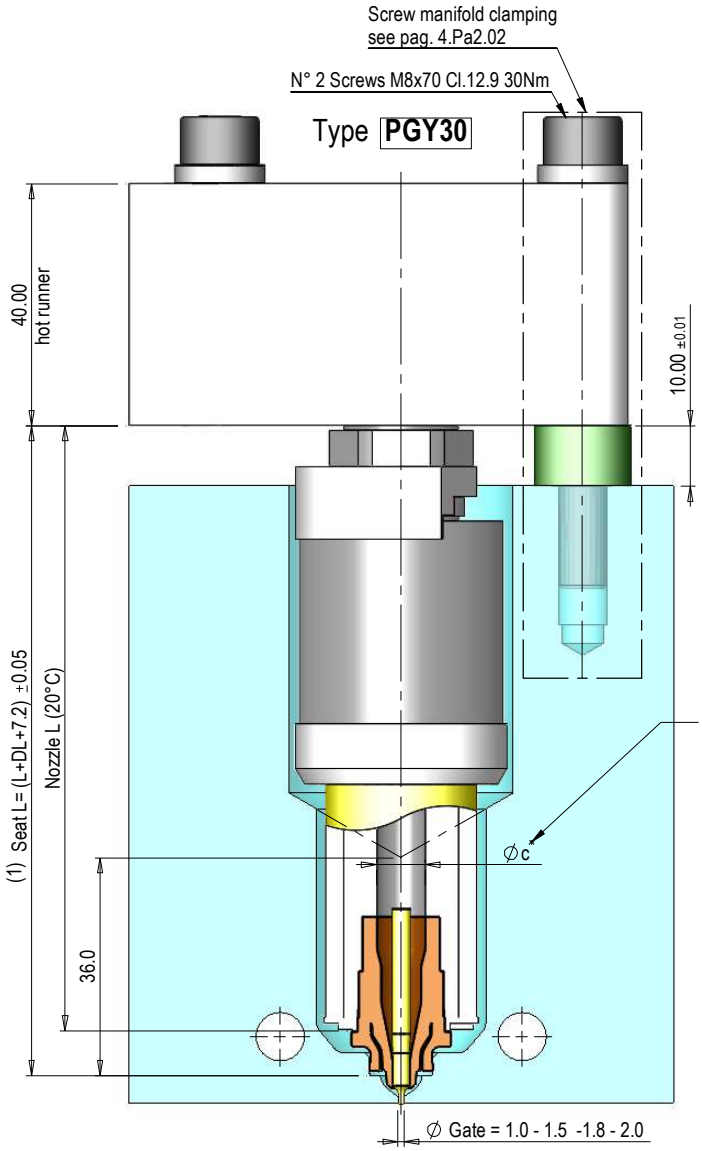


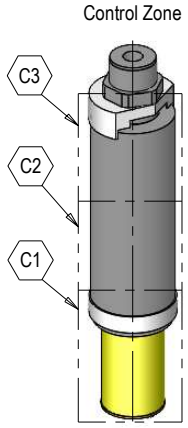
A = 0° ÷ 10° **lp**=4.50 mm
A = 10° ÷ 20° **lp**=4.70 mm

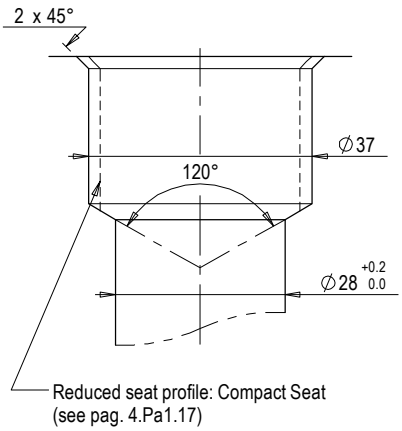
For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
360

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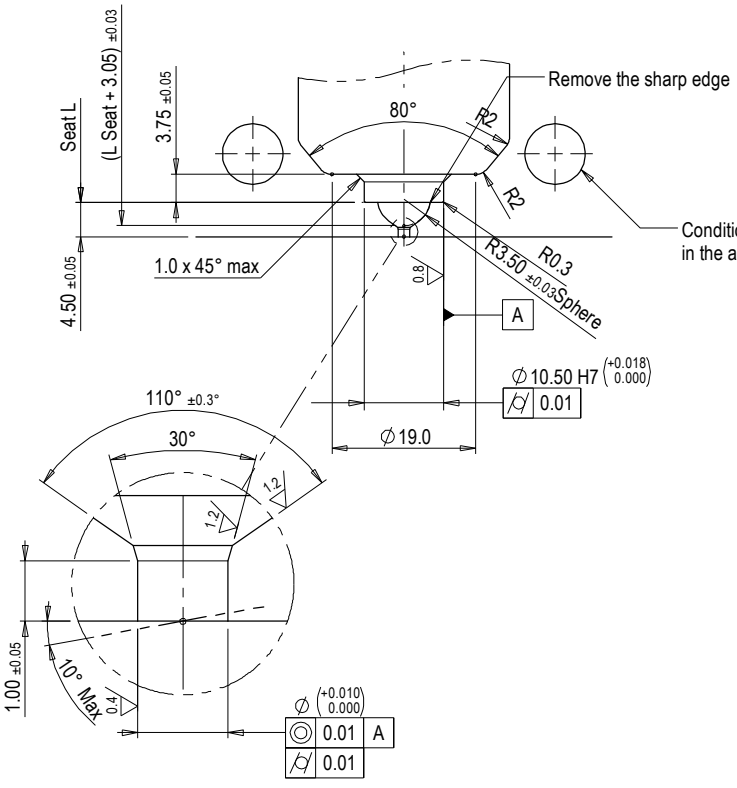






Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

Attention! For not abrasive filled polymers cavity hardness required is 48÷50HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

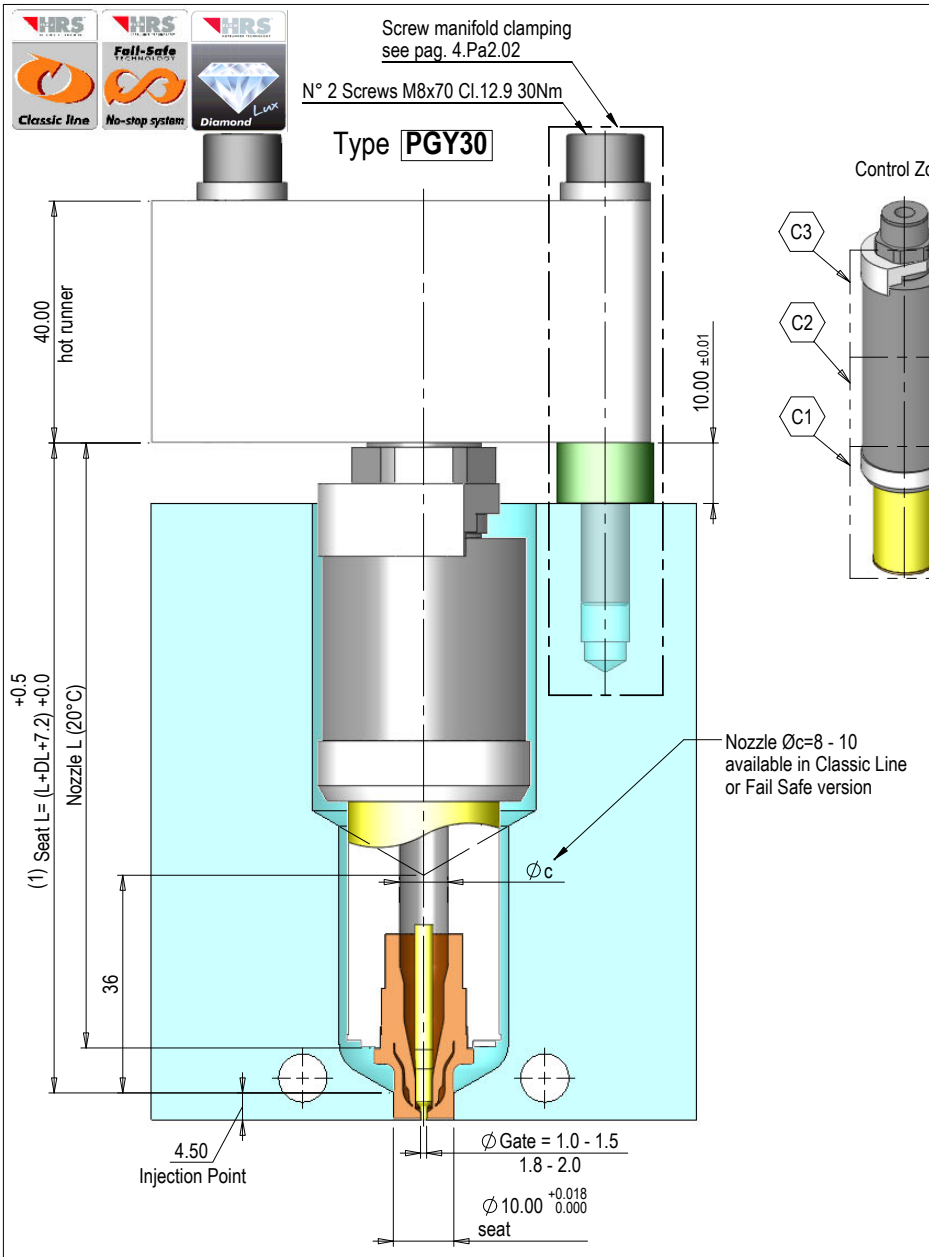


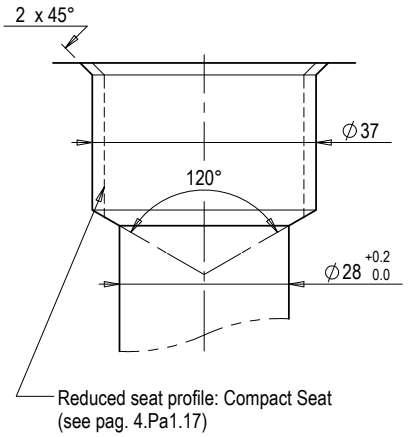
For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345

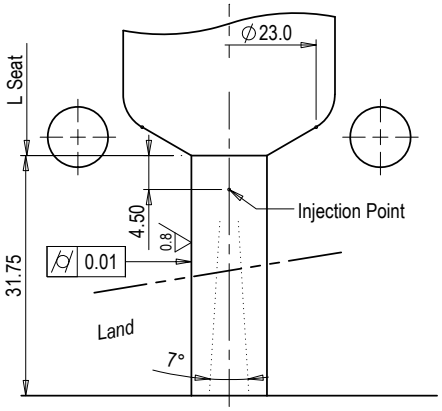
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Screwed-in nozzle CYLINDRICAL VALVE GATING with bushing through the cavity

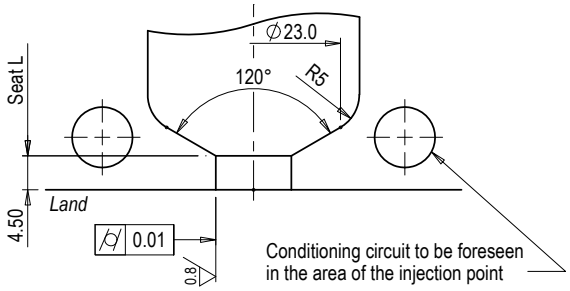




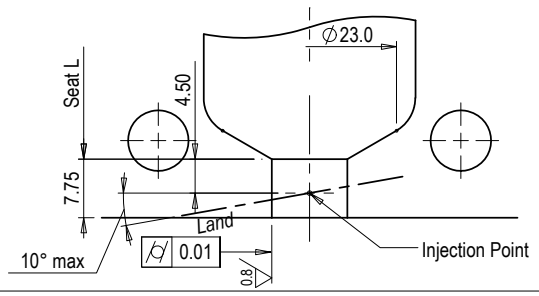
Bushing L=35



Bushing L=7.75



Bushing L=11



For all reference codes see on page 4.Pa1.10-11

(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
360

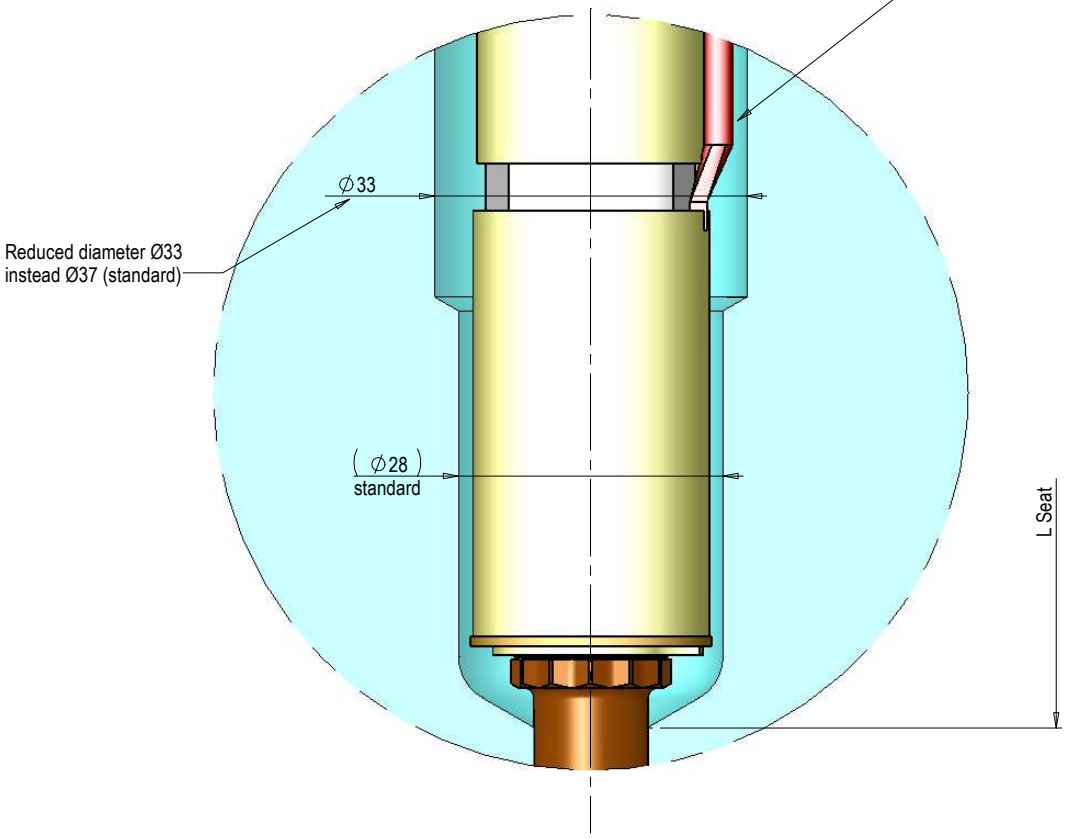
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Compact Seat

Nozzles -Pa- series with BUSHING THROUGH THE CAVITY / EXTERNAL RING

Alternative seat profile to the standard of this catalogue (Compact Seat).

WARNING! With "Compact seat", the nozzles will be provided without the protection casings around the coils heater. HRS refuse all responsability about the possible damage of nozzle components arising from the placement on pocket.



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NOZZLES CODES TABLE

NOZZLE L	NOZZLE CODE Øc=8		POWER (230V)				
L	= Classic L.	= Fail Safe			C1	C2	C3
75	0011-02171	0011-02191	1x	2x	180		
90	0011-02172	0011-02192	1x	2x	180		
105	0011-02173	0011-02193	1x	2x	180		
120	0011-02174	0011-02194	1x	2x	180		
135	0011-02175	0011-02195	1x	2x	300	180	
150	0011-02176	0011-02196	1x	2x	300	180	
165	0011-02177	0011-02197	1x	2x	300	180	
180	0011-02178	0011-02198	1x	2x	300	180	
195	0011-02179	0011-02199	1x	2x	300	350	180
210	0011-02180	0011-02200	1x	2x	300	350	180
225	0011-02181	0011-02201	1x	2x	300	350	180
240	0011-02182	0011-02202	1x	2x	300	350	180
255	0011-02183	0011-02203	1x	2x	300	350	180
270	0011-02184	0011-02204	1x	2x	300	350	180
285	0011-02185	0011-02205	1x	2x	300	350	180
300	0011-02186	0011-02206	1x	2x	300	350	180
315	0011-02187	0011-02207	1x	2x	300	350	180
330	0011-02188	0011-02208	1x	2x	300	350	180
345	0011-02189	0011-02209	1x	2x	300	350	180
360	0011-02190	0011-02210	1x	2x	300	350	180

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

(*) You can order nozzles with "L" different from the standard (min 75 - max 360 mm) and manifold Øc=10

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TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30	***External end ring***	
0012-00580	***Ø11.5 (LUX)*** 0013-01232	
0012-00581 *for high resistance*		
	Free Flow through the cavity	
PGF20	*gate* ***PGF30*** ***PGF10*** ***PGF20***	
Ø0.9 0012-00372 *(to be used with bushing Ø1.2)*	***Ø1.0*** 0013-00912 0013-00925 -	
Ø1.2 0012-00373 *(to be used with bushing Ø1.5)*	***Ø1.2*** - - 0013-00589	
Ø1.5 0012-00374 *(to be used with bushing Ø1.8)*	***Ø1.5*** 0013-00913 0013-00926 0013-00590	
PGF10	***Ø1.8*** - - 0013-00591	
0012-00595 *for high resistance*	***Ø2.0*** 0013-00914 0013-00927 -	
TORPEDO		
PGT30 Monohole	***External end ring***	
0012-00255	***Ø11.5 (LUX)*** 0013-01232	
0012-00256 *for high resistance*	***Ø13.0*** 0013-02108 for engineering polymers	
	PGT30 Bushing through the cavity	
PGT30 Torpedo	*gate* ***L=6.75*** ***L=35***	
0012-00257	***Ø1.2*** 0013-00414 0013-00416	
0012-00258 *for high resistance*	***Ø1.6*** 0013-00415 0013-00417	
0012-00990 *for engineering polymers*	***Ø2.0*** 0013-00543 0013-00418	
PGT30 for Rubber		
for high conductibility		
Ø0.45 0012-00375 0012-00378		
Ø0.60 0012-00376 0012-00379		
Ø0.75 0012-00377 0012-00380	***PGT30 Bushing through the cavity for Rubber***	
PGT30 Multihole for Rubber	*gate*	
for high conductibility	***Ø0.9*** 0013-00594 *(to be used with tip Ø0.45)*	
Ø0.45 0012-00381 0012-00384	***Ø1.2*** 0013-00595 *(to be used with tip Ø0.60)*	
Ø0.60 0012-00382 0012-00385	***Ø1.5*** 0013-00596 *(to be used with tip Ø0.75)*	
Ø0.75 0012-00383 0012-00386		
CONICAL VALVE GATING		
PGC20	***PGC20 External end ring***	
0012-00816	***Ø10.5*** 0013-01387	
PGC20 Antistagnation	***PGC20 Bushing through the cavity***	
0012-00817	*gate* ***L=5.5*** ***L=9*** ***L=33***	0262-00062 { *for External end ring* / *for Bushings through cavity*
	Ø1.5 0013-01390 0013-01394 0013-01400	
	Ø2.0 0013-01391 0013-01395 0013-01401	
PGC30	***External end ring***	
0012-00260	***Ø11.5 (LUX)*** 0013-01232	
0012-00556 *for high conductibility*	***Ø11.5 (LUX)*** 0013-01233 *for high conductibility*	
PGC30 Antistagnation	***PGC30 Bushing through the cavity***	
0012-00557 *For high conductibility with End Ring*	*gate* ***L=7.75*** ***L=11*** ***L=35***	0262-00054 { *for External end ring* / *for Bushings through cavity*
	Ø1.5 0013-00418 0013-00420 0013-00422	
	Ø2.0 0013-00419 0013-00441 0013-00423	
CYLINDRICAL VALVE GATING		
	PGY30 External end ring nut	
	Ø10.5 0013-01664	
	Ø10.5 0013-01665 *Antistagnation*	0262-00069 *for External end ring*
	PGY30 Bushing through the cavity	
	gate ***L=7.75*** ***L=11*** ***L=35***	
	Ø1.0 0013-01666 0013-01670 0013-01674	
	Ø1.5 0013-01667 0013-01671 0013-01675	
	Ø1.8 0013-01668 0013-01672 0013-01676	
	Ø2.0 0013-01669 0013-01673 0013-01677	

(*) Antistagnation Seal available only some polymers. For further information see sheet pag. 2.01.43

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 $T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	0.09	0.11	0.13	0.14	0.16	0.18	0.20	0.22	0.23	0.25	0.27
90	0.11	0.13	0.15	0.17	0.19	0.22	0.24	0.26	0.28	0.30	0.32
105	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.35	0.38
120	0.14	0.17	0.20	0.23	0.26	0.29	0.32	0.35	0.37	0.40	0.43
135	0.16	0.19	0.23	0.26	0.29	0.32	0.36	0.39	0.42	0.45	0.49
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
165	0.20	0.24	0.28	0.32	0.36	0.40	0.44	0.48	0.51	0.55	0.59
180	0.22	0.26	0.30	0.35	0.39	0.43	0.48	0.52	0.56	0.60	0.65
195	0.23	0.28	0.33	0.37	0.42	0.47	0.51	0.56	0.61	0.66	0.70
210	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.66	0.71	0.76
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
240	0.29	0.35	0.40	0.46	0.52	0.58	0.63	0.69	0.75	0.81	0.86
255	0.31	0.37	0.43	0.49	0.55	0.61	0.67	0.73	0.80	0.86	0.92
270	0.32	0.39	0.45	0.52	0.58	0.65	0.71	0.78	0.84	0.91	0.97
285	0.34	0.41	0.48	0.55	0.62	0.68	0.75	0.82	0.89	0.96	1.03
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
315	0.38	0.45	0.53	0.60	0.68	0.76	0.83	0.91	0.98	1.06	1.13
330	0.40	0.48	0.55	0.63	0.71	0.79	0.87	0.95	1.03	1.11	1.19
345	0.41	0.50	0.58	0.66	0.75	0.83	0.91	0.99	1.08	1.16	1.24
360	0.43	0.52	0.60	0.69	0.78	0.86	0.95	1.04	1.12	1.21	1.30

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Seat = L + DL + 7.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	82.29	82.31	82.33	82.34	82.36	82.38	82.40	82.42	82.43	82.45	82.47
90	97.31	97.33	97.35	97.37	97.39	97.42	97.44	97.46	97.48	97.50	97.52
105	112.33	112.35	112.38	112.40	112.43	112.45	112.48	112.50	112.53	112.55	112.58
120	127.34	127.37	127.40	127.43	127.46	127.49	127.52	127.55	127.57	127.60	127.63
135	142.36	142.39	142.43	142.46	142.49	142.52	142.56	142.59	142.62	142.65	142.69
150	157.38	157.42	157.45	157.49	157.52	157.56	157.60	157.63	157.67	157.70	157.74
165	172.40	172.44	172.48	172.52	172.56	172.60	172.64	172.68	172.71	172.75	172.79
180	187.42	187.46	187.50	187.55	187.59	187.63	187.68	187.72	187.76	187.80	187.85
195	202.43	202.48	202.53	202.57	202.62	202.67	202.71	202.76	202.81	202.86	202.90
210	217.45	217.50	217.55	217.60	217.65	217.70	217.75	217.80	217.86	217.91	217.96
225	232.47	232.52	232.58	232.63	232.69	232.74	232.79	232.85	232.90	232.96	233.01
240	247.49	247.55	247.60	247.66	247.72	247.78	247.83	247.89	247.95	248.01	248.06
255	262.51	262.57	262.63	262.69	262.75	262.81	262.87	262.93	263.00	263.06	263.12
270	277.52	277.59	277.65	277.72	277.78	277.85	277.91	277.98	278.04	278.11	278.17
285	292.54	292.61	292.68	292.75	292.82	292.88	292.95	293.02	293.09	293.16	293.23
300	307.56	307.63	307.70	307.78	307.85	307.92	307.99	308.06	308.14	308.21	308.28
315	322.58	322.65	322.73	322.80	322.88	322.96	323.03	323.11	323.18	323.26	323.33
330	337.60	337.68	337.75	337.83	337.91	337.99	338.07	338.15	338.23	338.31	338.39
345	352.61	352.70	352.78	352.86	352.95	353.03	353.11	353.19	353.28	353.36	353.44
360	367.63	367.72	367.80	367.89	367.98	368.06	368.15	368.24	368.32	368.41	368.50

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Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	L Seat = L + DL + 6.2										
75	81.29	81.31	81.33	81.34	81.36	81.38	81.40	81.42	81.43	81.45	81.47
90	96.31	96.33	96.35	96.37	96.39	96.42	96.44	96.46	96.48	96.50	96.52
105	111.33	111.35	111.38	111.40	111.43	111.45	111.48	111.50	111.53	111.55	111.58
120	126.34	126.37	126.40	126.43	126.46	126.49	126.52	126.55	126.57	126.60	126.63
135	141.36	141.39	141.43	141.46	141.49	141.52	141.56	141.59	141.62	141.65	141.69
150	156.38	156.42	156.45	156.49	156.52	156.56	156.60	156.63	156.67	156.70	156.74
165	171.40	171.44	171.48	171.52	171.56	171.60	171.64	171.68	171.71	171.75	171.79
180	186.42	186.46	186.50	186.55	186.59	186.63	186.68	186.72	186.76	186.80	186.85
195	201.43	201.48	201.53	201.57	201.62	201.67	201.71	201.76	201.81	201.86	201.90
210	216.45	216.50	216.55	216.60	216.65	216.70	216.75	216.80	216.86	216.91	216.96
225	231.47	231.52	231.58	231.63	231.69	231.74	231.79	231.85	231.90	231.96	232.01
240	246.49	246.55	246.60	246.66	246.72	246.78	246.83	246.89	246.95	247.01	247.06
255	261.51	261.57	261.63	261.69	261.75	261.81	261.87	261.93	262.00	262.06	262.12
270	276.52	276.59	276.65	276.72	276.78	276.85	276.91	276.98	277.04	277.11	277.17
285	291.54	291.61	291.68	291.75	291.82	291.88	291.95	292.02	292.09	292.16	292.23
300	306.56	306.63	306.70	306.78	306.85	306.92	306.99	307.06	307.14	307.21	307.28
315	321.58	321.65	321.73	321.80	321.88	321.96	322.03	322.11	322.18	322.26	322.33
330	336.60	336.68	336.75	336.83	336.91	336.99	337.07	337.15	337.23	337.31	337.39
345	351.61	351.70	351.78	351.86	351.95	352.03	352.11	352.19	352.28	352.36	352.44
360	366.63	366.72	366.80	366.89	366.98	367.06	367.15	367.24	367.32	367.41	367.50

Tab. C - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	= L + DL + 5.7										
75	80.79	80.81	80.83	80.84	80.86	80.88	80.90	80.92	80.93	80.95	80.97
90	95.81	95.83	95.85	95.87	95.89	95.92	95.94	95.96	95.98	96.00	96.02
105	110.83	110.85	110.88	110.90	110.93	110.95	110.98	111.00	111.03	111.05	111.08
120	125.84	125.87	125.90	125.93	125.96	125.99	126.02	126.05	126.07	126.10	126.13
135	140.86	140.89	140.93	140.96	140.99	141.02	141.06	141.09	141.12	141.15	141.19
150	155.88	155.92	155.95	155.99	156.02	156.06	156.10	156.13	156.17	156.20	156.24
165	170.90	170.94	170.98	171.02	171.06	171.10	171.14	171.18	171.21	171.25	171.29
180	185.92	185.96	186.00	186.05	186.09	186.13	186.18	186.22	186.26	186.30	186.35
195	200.93	200.98	201.03	201.07	201.12	201.17	201.21	201.26	201.31	201.36	201.40
210	215.95	216.00	216.05	216.10	216.15	216.20	216.25	216.30	216.36	216.41	216.46
225	230.97	231.02	231.08	231.13	231.19	231.24	231.29	231.35	231.40	231.46	231.51
240	245.99	246.05	246.10	246.16	246.22	246.28	246.33	246.39	246.45	246.51	246.56
255	261.01	261.07	261.13	261.19	261.25	261.31	261.37	261.43	261.50	261.56	261.62
270	276.02	276.09	276.15	276.22	276.28	276.35	276.41	276.48	276.54	276.61	276.67
285	291.04	291.11	291.18	291.25	291.32	291.38	291.45	291.52	291.59	291.66	291.73
300	306.06	306.13	306.20	306.28	306.35	306.42	306.49	306.56	306.64	306.71	306.78
315	321.08	321.15	321.23	321.30	321.38	321.46	321.53	321.61	321.68	321.76	321.83
330	336.10	336.18	336.25	336.33	336.41	336.49	336.57	336.65	336.73	336.81	336.89
345	351.11	351.20	351.28	351.36	351.45	351.53	351.61	351.69	351.78	351.86	351.94
360	366.13	366.22	366.30	366.39	366.48	366.56	366.65	366.74	366.82	366.91	367.00

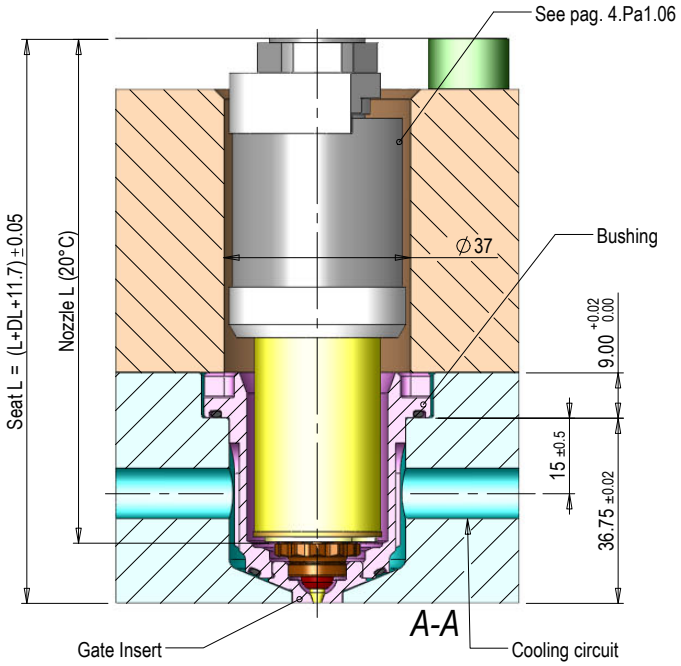
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Tab. D - "Seat L" Calculation

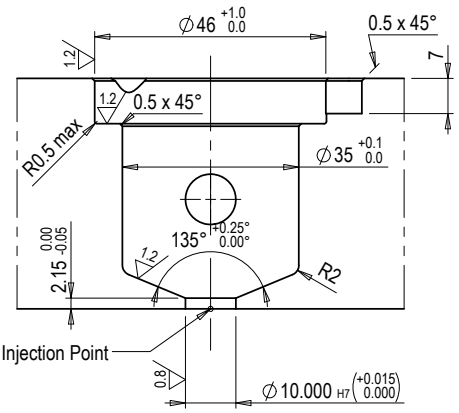
L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	L Seat = L + DL + 4.7										
75	79.79	79.81	79.83	79.84	79.86	79.88	79.90	79.92	79.93	79.95	79.97
90	94.81	94.83	94.85	94.87	94.89	94.92	94.94	94.96	94.98	95.00	95.02
105	109.83	109.85	109.88	109.90	109.93	109.95	109.98	110.00	110.03	110.05	110.08
120	124.84	124.87	124.90	124.93	124.96	124.99	125.02	125.05	125.07	125.10	125.13
135	139.86	139.89	139.93	139.96	139.99	140.02	140.06	140.09	140.12	140.15	140.19
150	154.88	154.92	154.95	154.99	155.02	155.06	155.10	155.13	155.17	155.20	155.24
165	169.90	169.94	169.98	170.02	170.06	170.10	170.14	170.18	170.21	170.25	170.29
180	184.92	184.96	185.00	185.05	185.09	185.13	185.18	185.22	185.26	185.30	185.35
195	199.93	199.98	200.03	200.07	200.12	200.17	200.21	200.26	200.31	200.36	200.40
210	214.95	215.00	215.05	215.10	215.15	215.20	215.25	215.30	215.36	215.41	215.46
225	229.97	230.02	230.08	230.13	230.19	230.24	230.29	230.35	230.40	230.46	230.51
240	244.99	245.05	245.10	245.16	245.22	245.28	245.33	245.39	245.45	245.51	245.56
255	260.01	260.07	260.13	260.19	260.25	260.31	260.37	260.43	260.50	260.56	260.62
270	275.02	275.09	275.15	275.22	275.28	275.35	275.41	275.48	275.54	275.61	275.67
285	290.04	290.11	290.18	290.25	290.32	290.38	290.45	290.52	290.59	290.66	290.73
300	305.06	305.13	305.20	305.28	305.35	305.42	305.49	305.56	305.64	305.71	305.78
315	320.08	320.15	320.23	320.30	320.38	320.46	320.53	320.61	320.68	320.76	320.83
330	335.10	335.18	335.25	335.33	335.41	335.49	335.57	335.65	335.73	335.81	335.89
345	350.11	350.20	350.28	350.36	350.45	350.53	350.61	350.69	350.78	350.86	350.94
360	365.13	365.22	365.30	365.39	365.48	365.56	365.65	365.74	365.82	365.91	366.00

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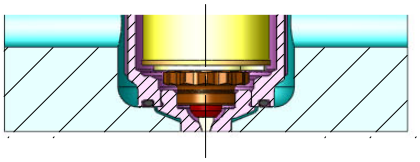
COOLING INSERT
TTC

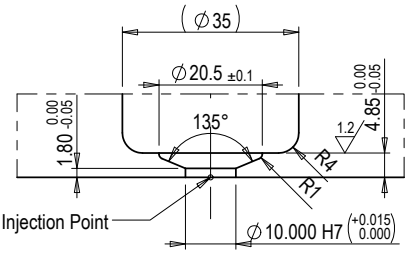


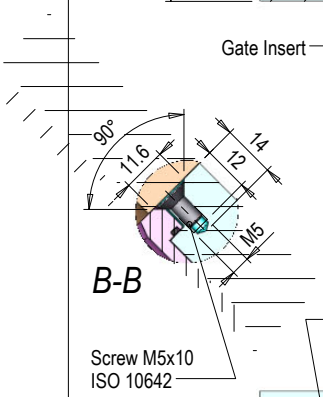
Standard Seat



On plane OR Seat

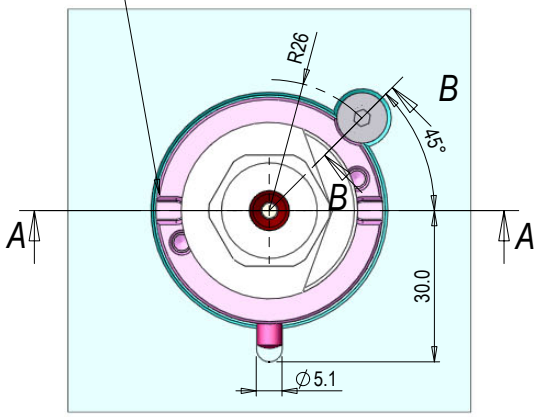




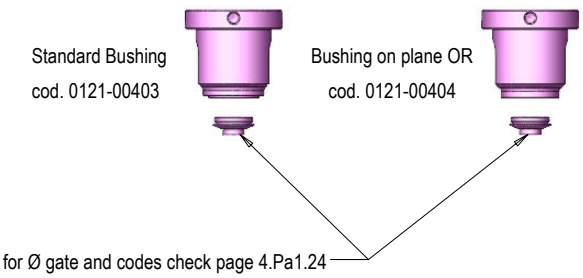


Slots for orientation of cooling insert
in case of extension (see pag. 4.Ma1.30)

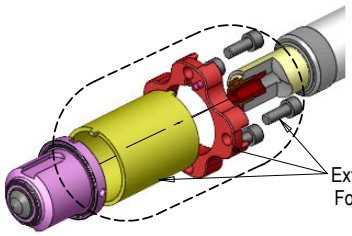
Screw M5x10
ISO 10642



1) Cooling note: suggested hole Ø10 to cool max 4 bushings
with only 1 circuit (range 4÷6 Bar)



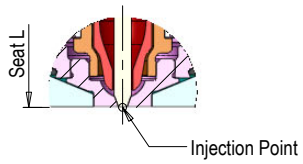
COOLING INSERT Extension



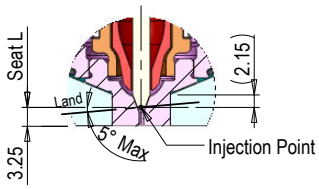
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Type **PGC30**

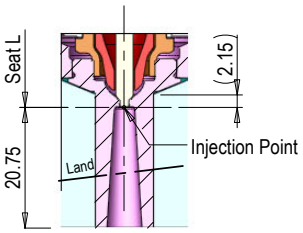
Version L=7.75



Version L=11

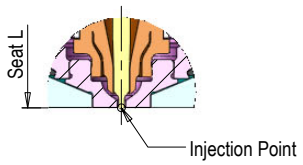


Version L=35

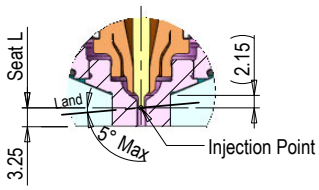


Type **PGY30**

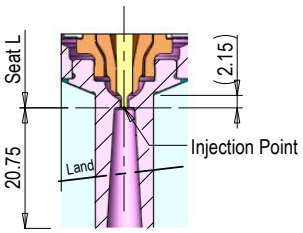
Version L=7.75



Version L=11



Version L=35

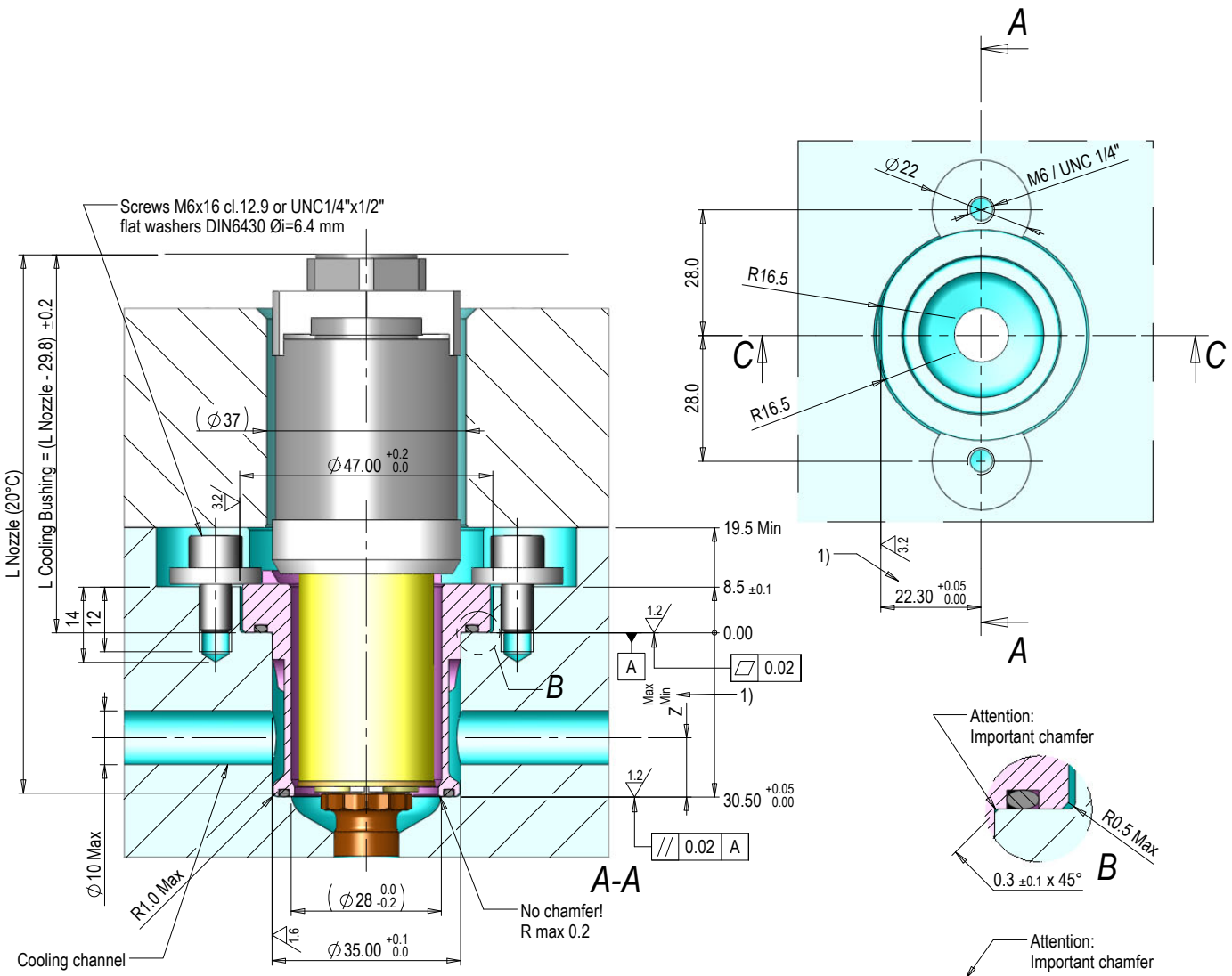


For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

GATE INSERT			
	Version L=7.75	***Version L=11***	***Version L=35***
PGC30	Gate Ø1.5 - 0335-00001 Ø2.0 - 0335-00002	Gate Ø1.5 - 0335-00003 Ø2.0 - 0335-00004	Gate Ø1.5 - 0335-00005 Ø2.0 - 0335-00006
PGY30	Gate Ø1.0 - 0335-00007 Ø1.5 - 0335-00008 Ø1.8 - 0335-00009 Ø2.0 - 0335-00010	Gate Ø1.0 - 0335-00011 Ø1.5 - 0335-00012 Ø1.8 - 0335-00013 Ø2.0 - 0335-00014	Gate Ø1.0 - 0335-00015 Ø1.5 - 0335-00016 Ø1.8 - 0335-00017 Ø2.0 - 0335-00018

Index

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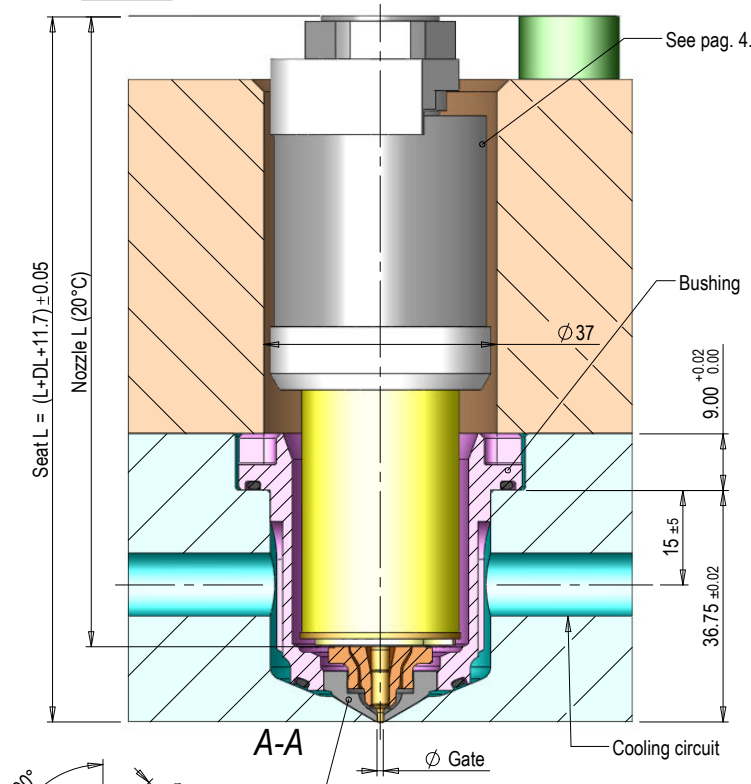
COOLING BUSHING(*)			
Code	**Z**	**Z Min**	**Z Max**
0121-00494	11	7	15

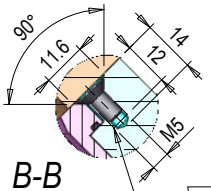
(*) Applicable to all type Nozzles Compact type

1) Attention: for cooling channels drilled with "Z Max" > 16 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
2) For all cases with "Z Max" > 16, then the positioning face can be located at any angle around the axis of the bushing and with respect to the fixing screws, in order to correctly intercept the customer cooling channels (Fig.2). For more details, please contact the Oerlikon HRSflow technical department.

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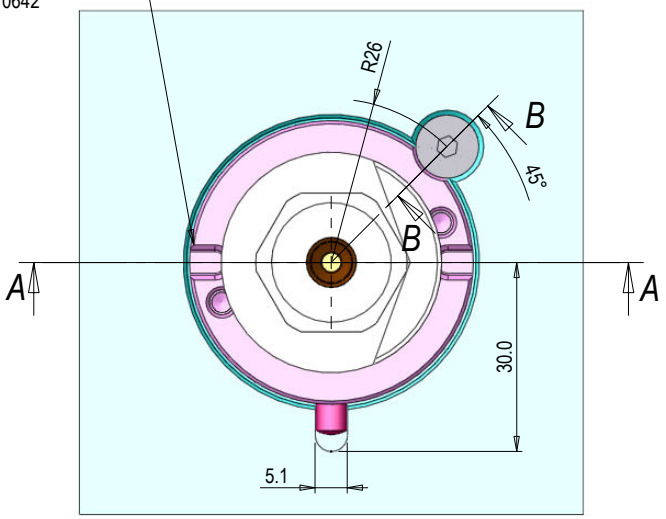
Type **PGY30**





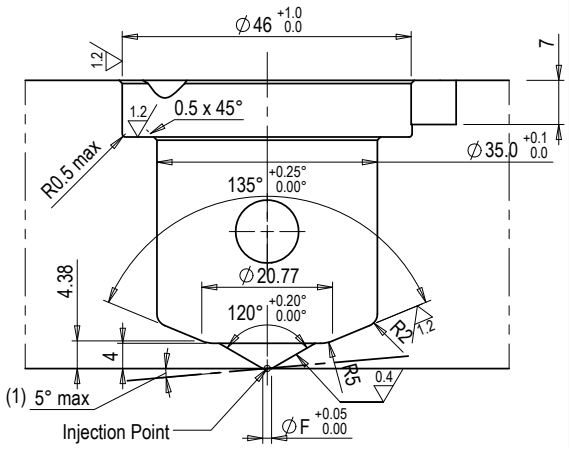
Screw M5x10
ISO 10642

Slots for orientation of cooling insert
in case of extension (see pag. 4.Ma1.30)
when used the extension (see pag. 4.Ma1.30)



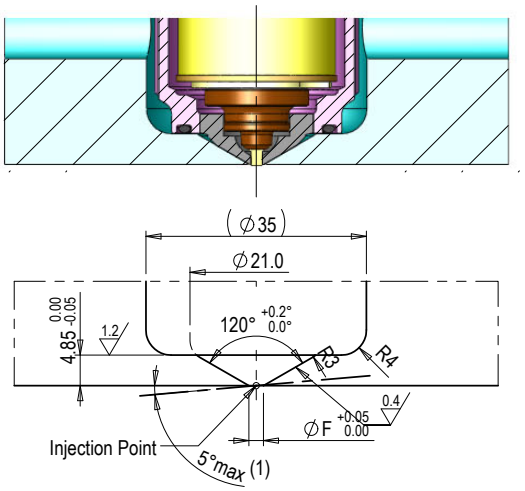
1) Cooling note: suggested hole Ø10 to cool max 4 bushings
with only 1 circuit (range 4÷6 Bar)

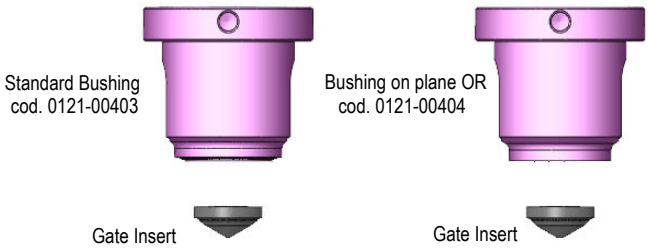
Standard Seat



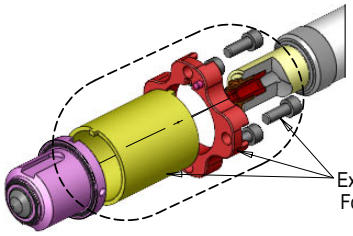
(1) Max angle allowed to the normal to the surface is 5°.
Should gates be placed on cosmetic surfaces/portions, the max angle allowed is 3° instead.
In case of any questions, please contact your technical reference within Oerlikon HRSflow.

On plane OR Seat





COOLING INSERT Extension

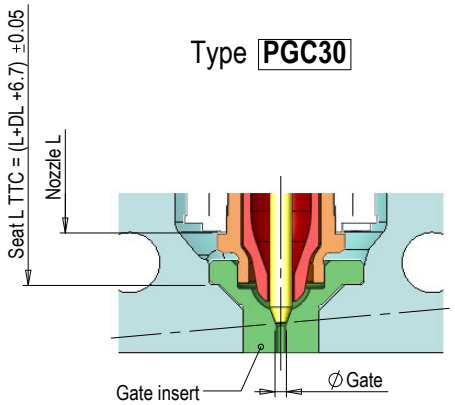


GATE INSERT		
Code	***Ø Gate***	***Ø F***
0335-00163	1.0	1.4
0335-00164	1.5	1.9
0335-00165	1.8	2.3
0335-00166	2.0	2.5

Installation KIT cod: 0283-00647

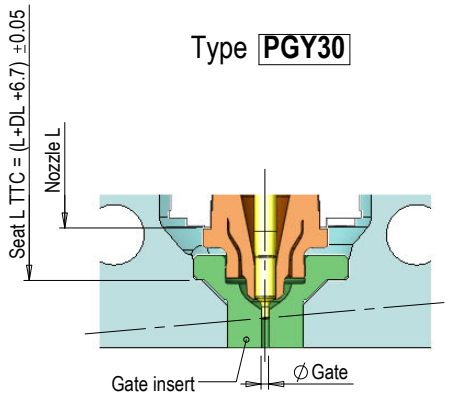
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Type **PGC30**

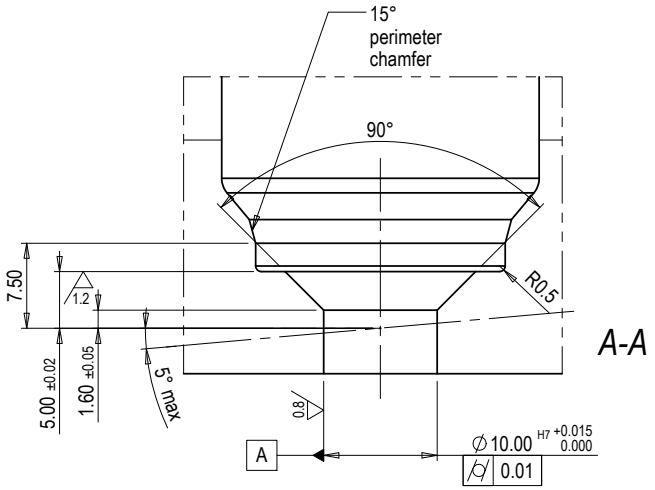


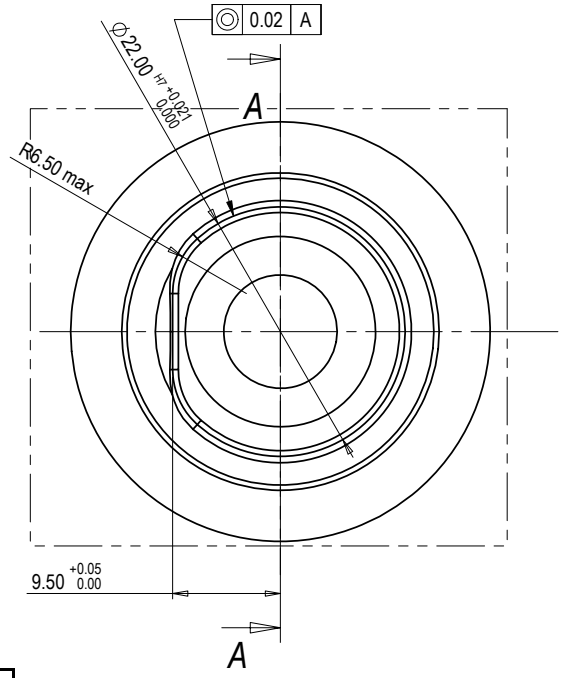
for missing nozzle dimensions check PGC30 config. in the previous pages

Type **PGY30**



for missing nozzle dimensions check PGY30 config. in the previous pages



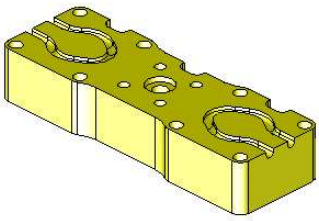


ØGate	PGC30	PGY30
1.0	-	0335-00178
1.5	0335-00176	0335-00179
1.8	-	0335-00180
2.0	0335-00177	0335-00181

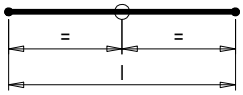
For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

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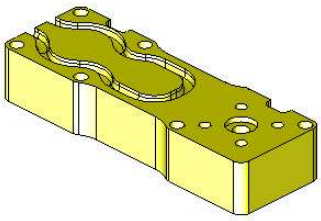
-HL-



Standard
l=150-200-250-300-350-400-450 mm



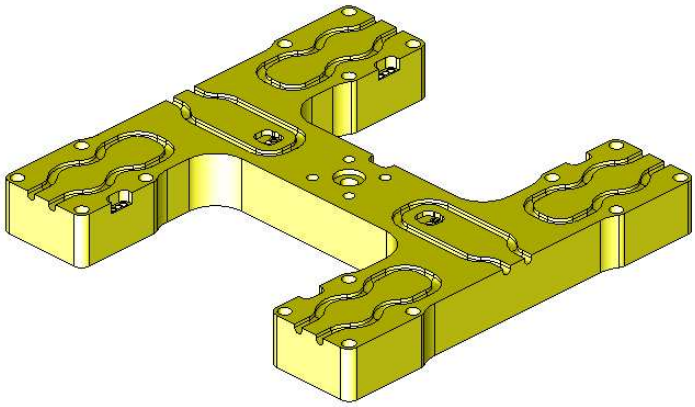
-HD-

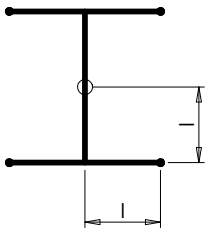


Standard
l=75-100-125-150-175-200-225 mm



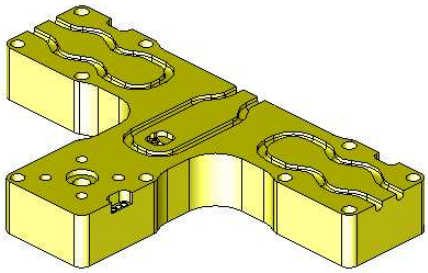
-HH-

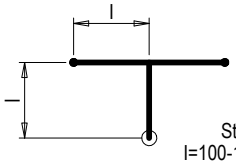




Standard
l=100-125-150 mm

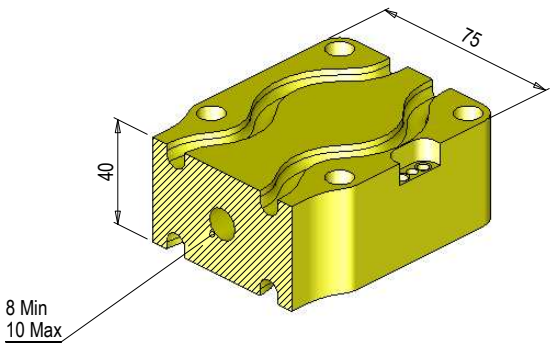
-HT-





Standard
l=100-125-150 mm

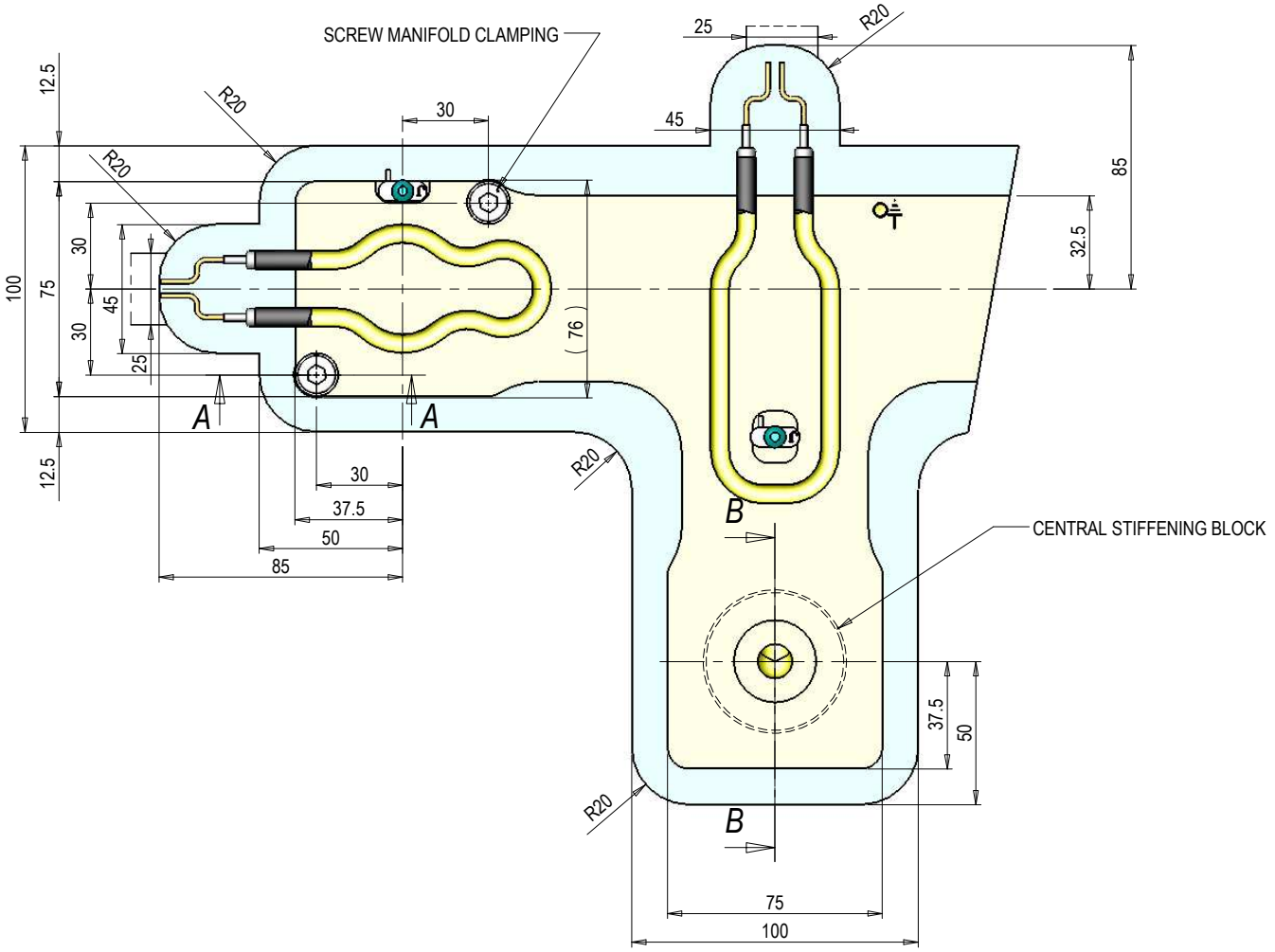
P series



Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

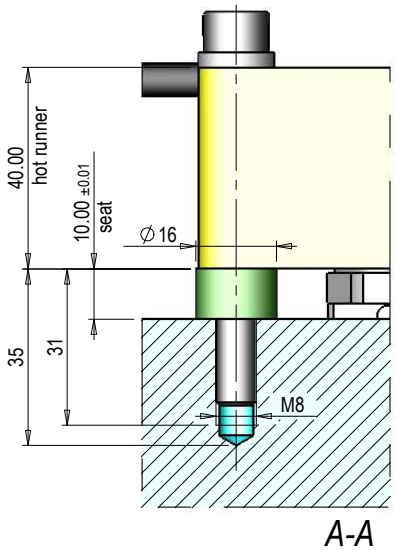
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The following profile is the typical one for
the standard not wired hot runner pocket
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)

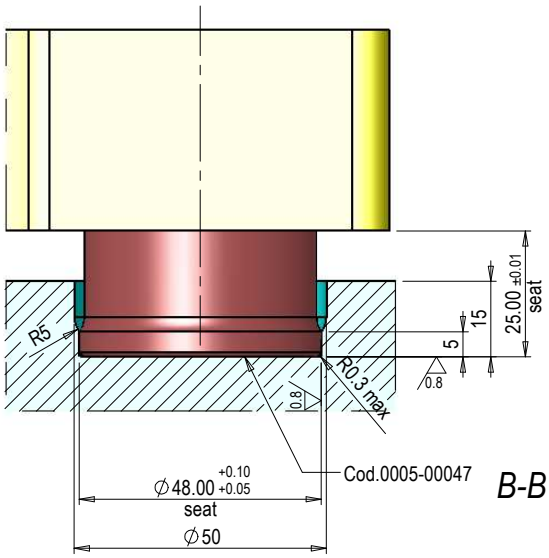


Screw manifold clamping

Screw M8x70 cl.12.9 30 Nm

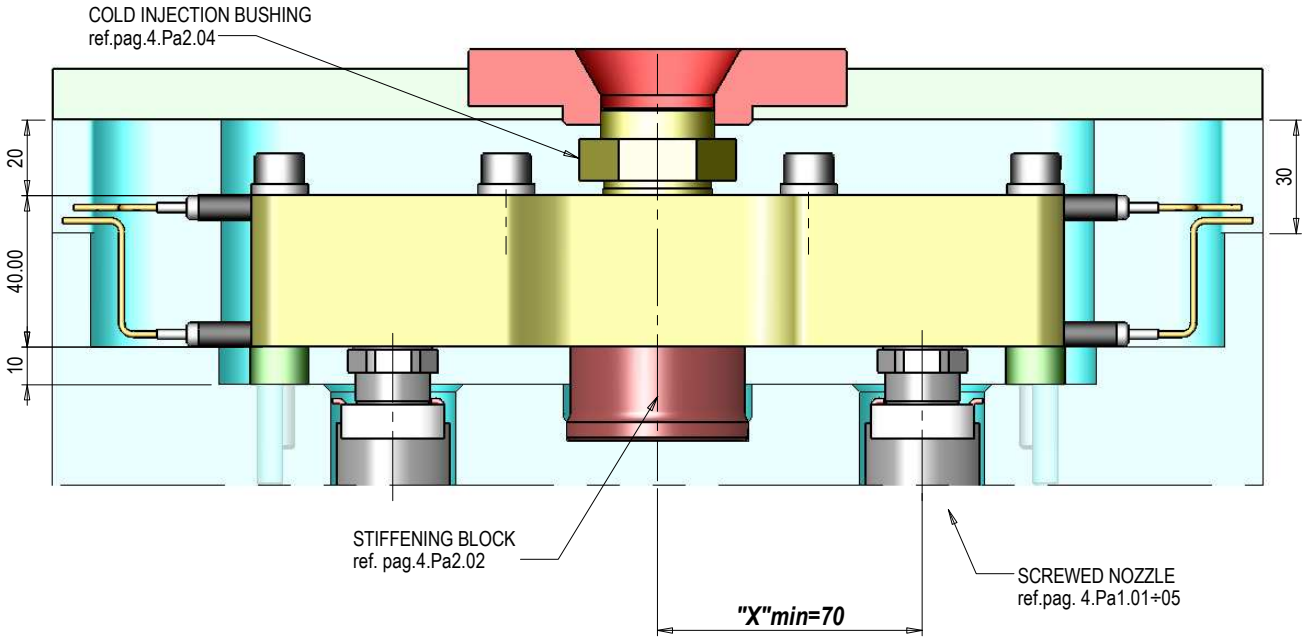


Pocket central stiffening block



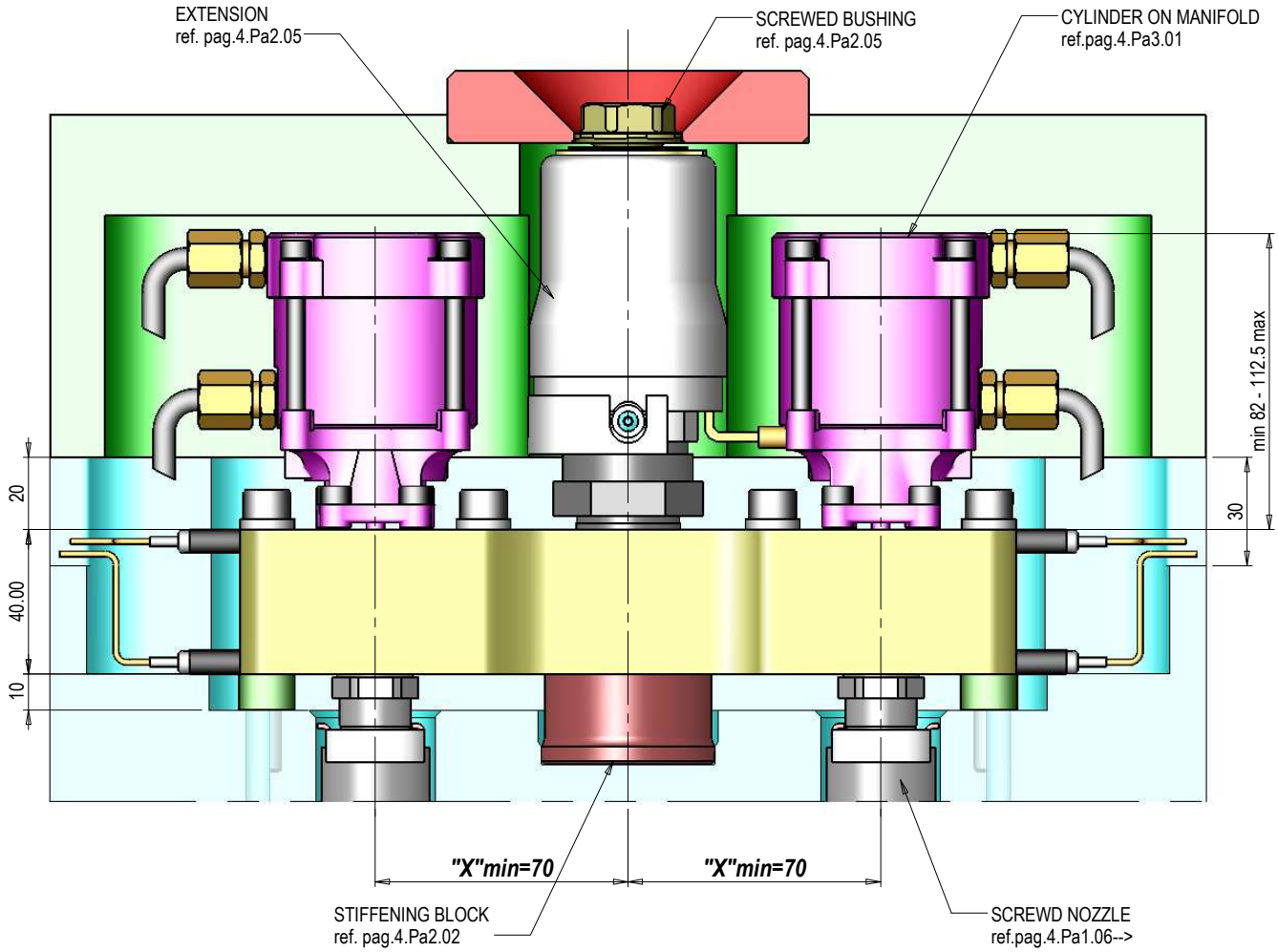
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Structure for TORPEDO or FREE FLOW systems

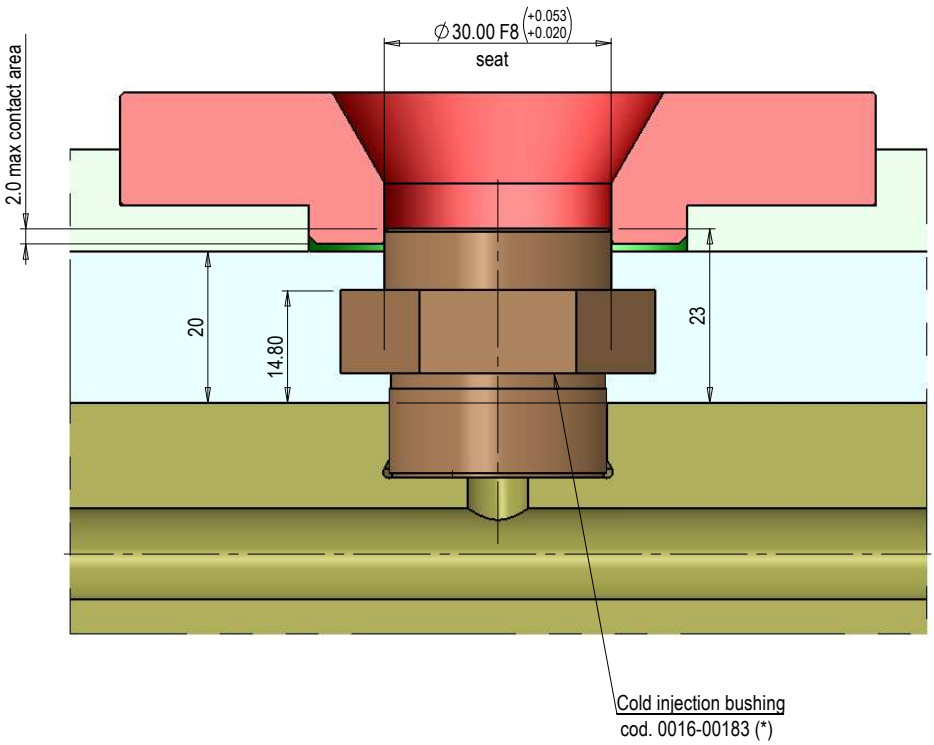


Xmin= min centre distance between injection bushing and nozzle for non standard systems

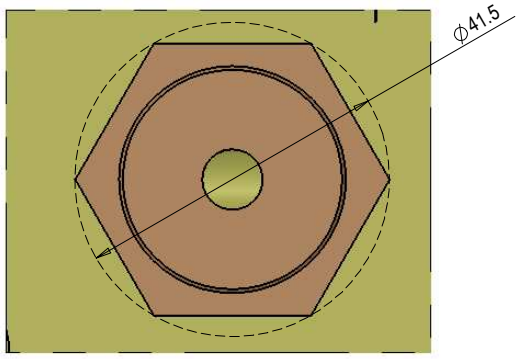
Structure for VALVE GATING systems



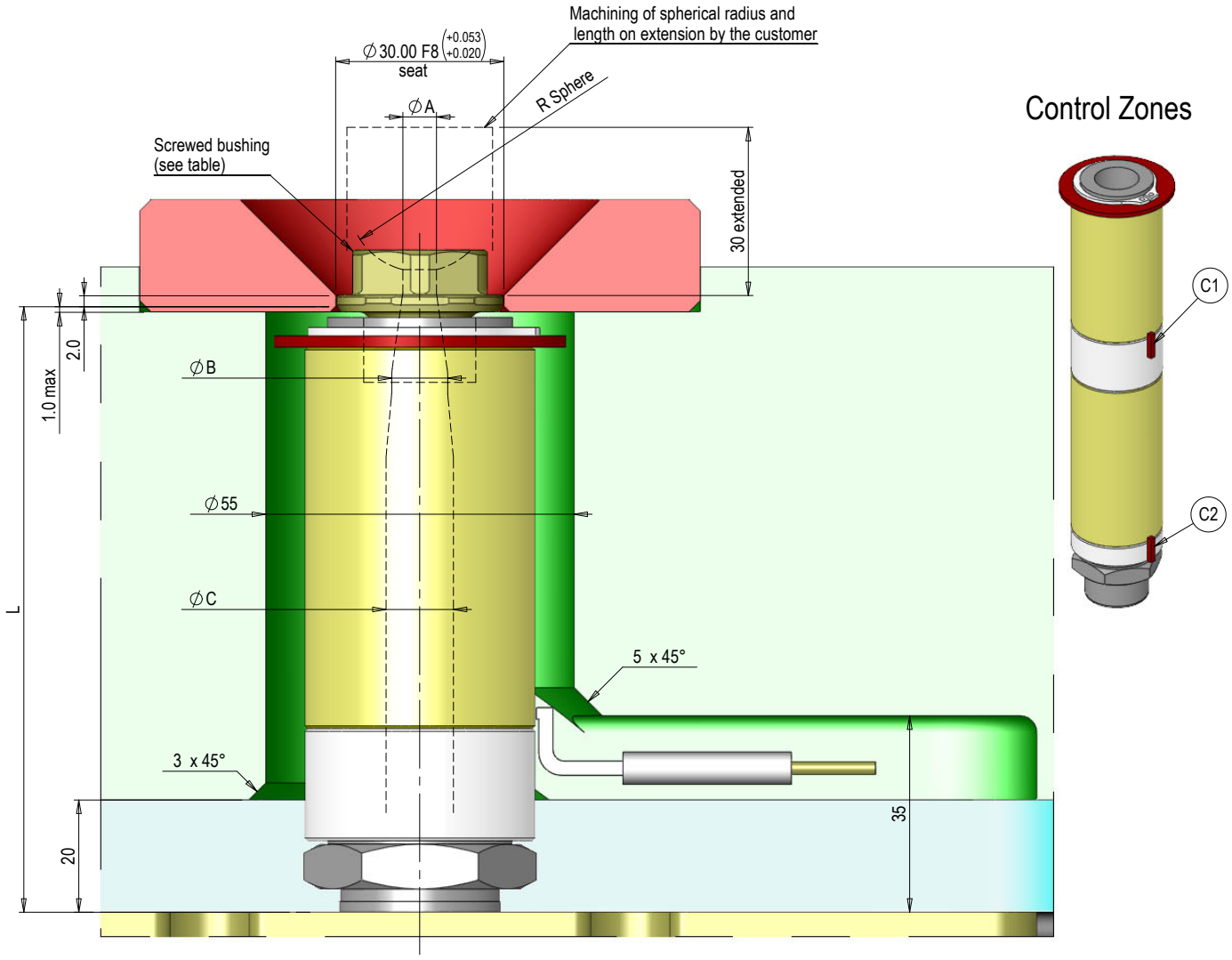
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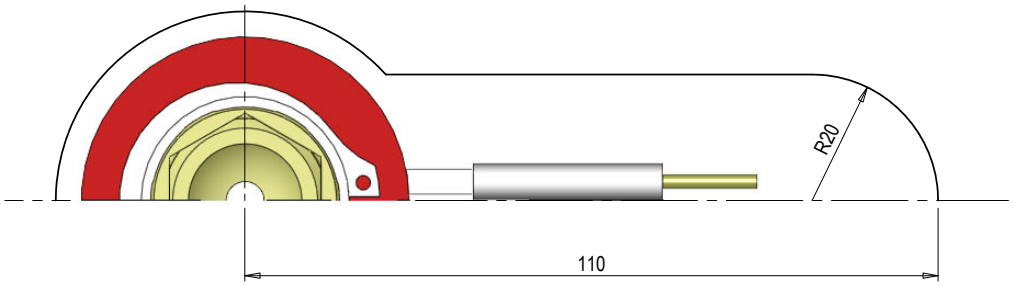


(*)Standard code with R sphere=0. Others R sphere sizes to be required.



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"L" (*)	*MAXIMUN N° OF ZONES*
050.00 ÷ 204.89	1 [C1]
204.90 ÷ 305.09	2 [C1 + C2]

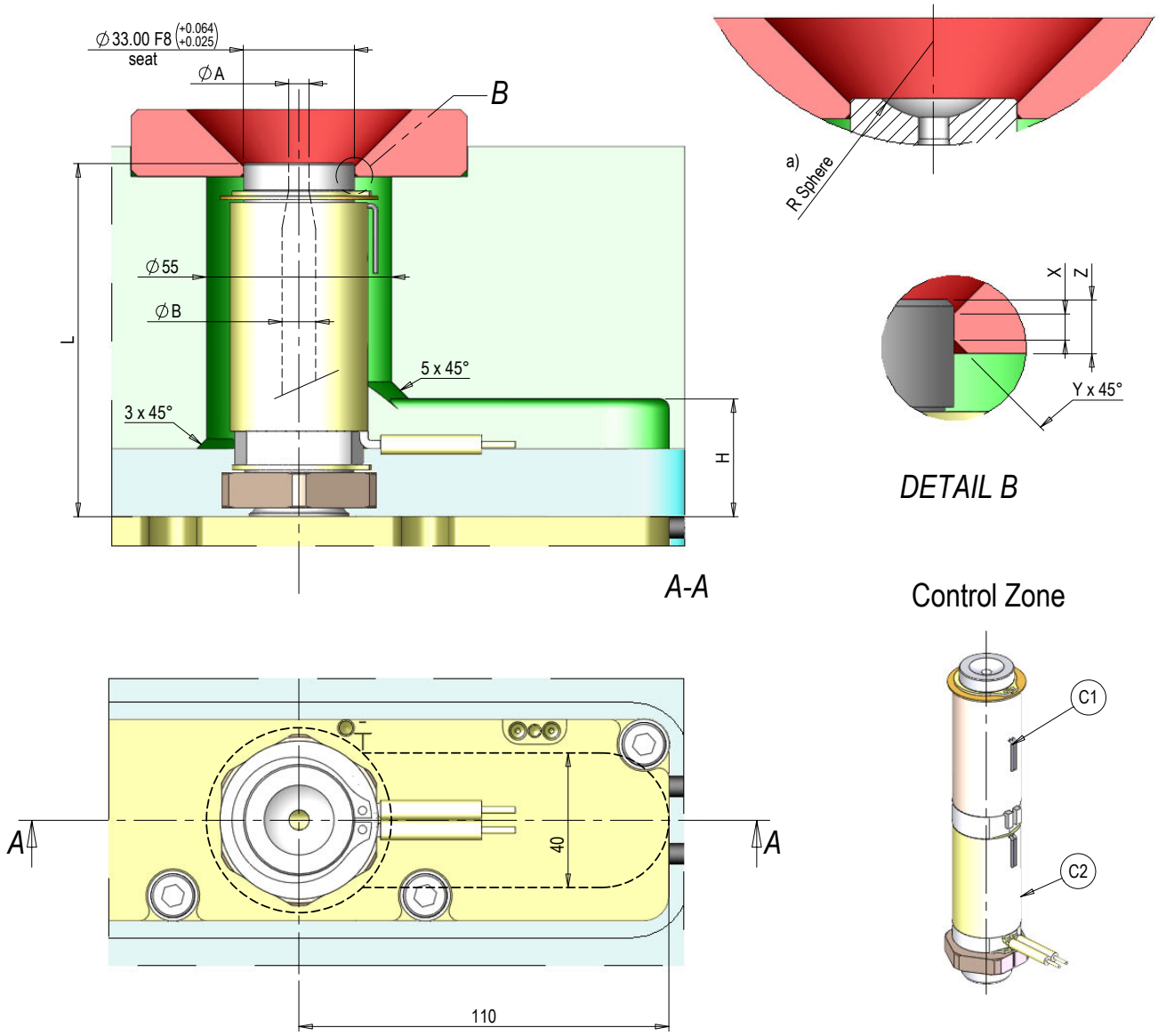
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)	
ØB	**ØC**
8	10
10	12
	14

(*) L = min 050.00 ÷ 305.09 mm max

(**) Disponibili anche ØB=ØC=8,10 mm

SPHERE RADIUS	**STANDARD SCREWED BUSHING CODE**	
	ØA=6 | ØB=8	ØA=6 | ØB=10
Extension R0	0015-00439	0015-00405
R0	0015-00440	0015-00406
R 12.7	0015-00441	0015-00411
R 15.5	0015-00442	0015-00412
R 19.1	0015-00443	0015-00413
R 20	0015-00505	0015-00503
R 25	0015-00444	0015-00414
R40	0015-00445	0015-00415

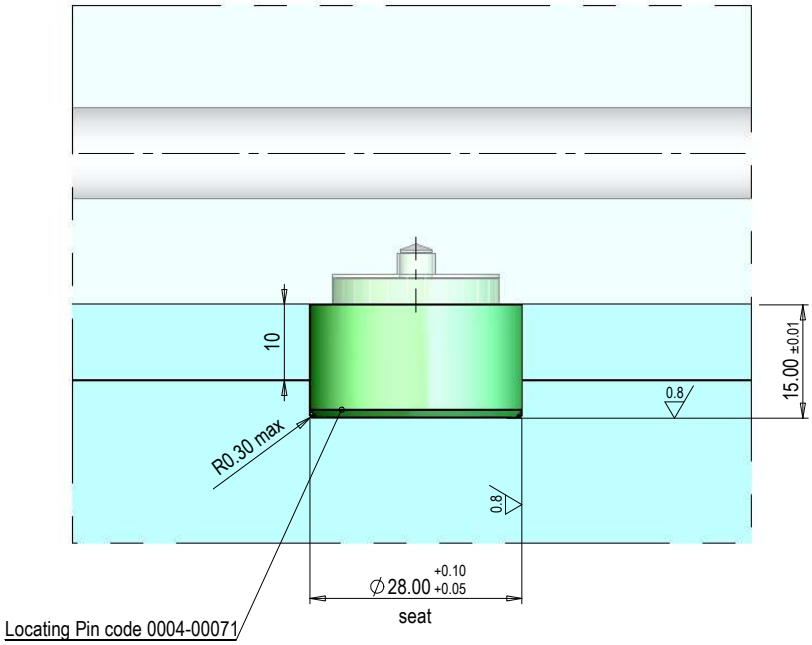
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a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

"L" (*)	*MAXIMUN N° OF ZONES*	STANDARD DIAMETERS OF EXTENSIONS DUCT	
		ØA	**ØB**
030.00 ÷ 199.99	1 [C1]	4	8 - 10 - 12
200.00 ÷ 450.00	2 [C1 + C2]	4.5	8 - 10 - 12
(*) L = min 30.00 ÷ 450.00 mm max		5	8 - 10 - 12
		5.5	8 - 10 - 12
		6	8 - 10 - 12 - 14
H *with*		6.5	8 - 10 - 12 - 14
20 30.00 ≤ L ≤ 44.99		7	8 - 10 - 12 - 14
35 L ≥ 45.00		7.5	8 - 10 - 12 - 14
		8	8 - 10 - 12 - 14
X **Y** **Z** *with*			
1.8min 0.5max 2.8max L ≤ 54.99			
2 1 4 L ≥ 55.00			

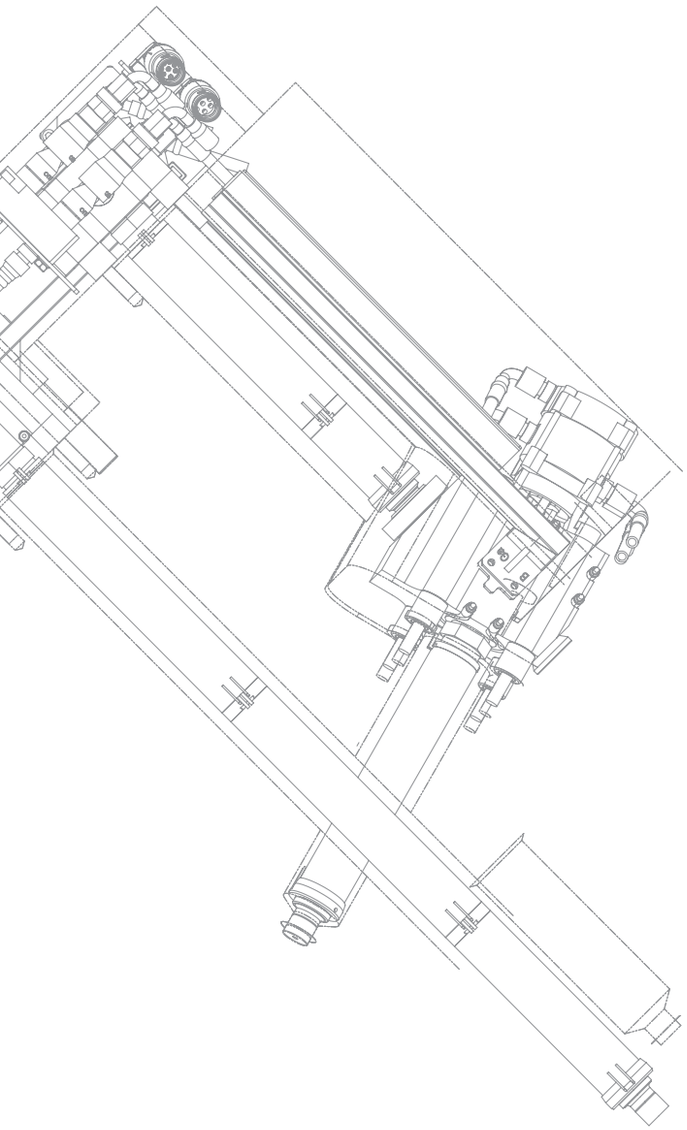
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oerlikon
hrsflow



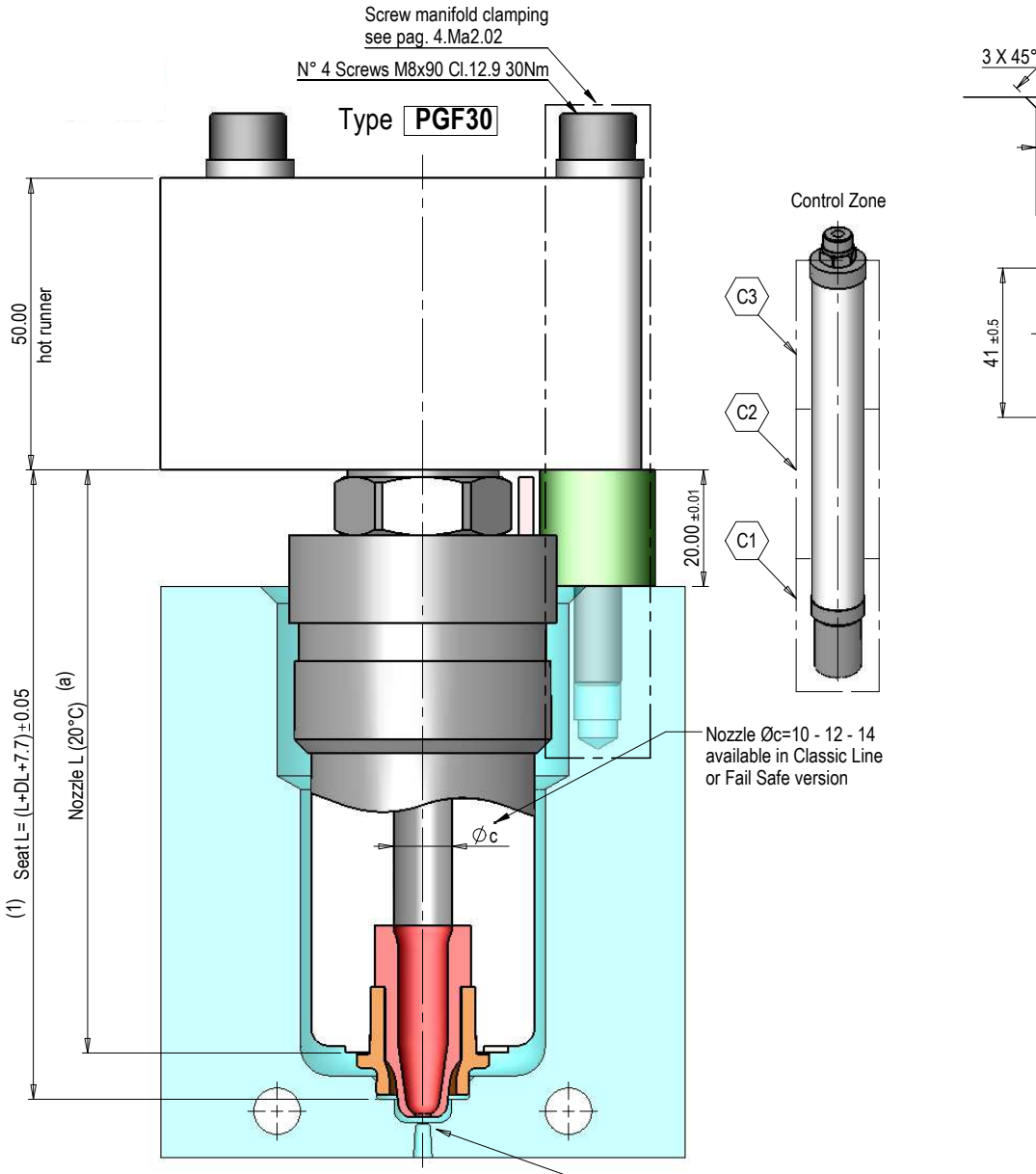
Ma

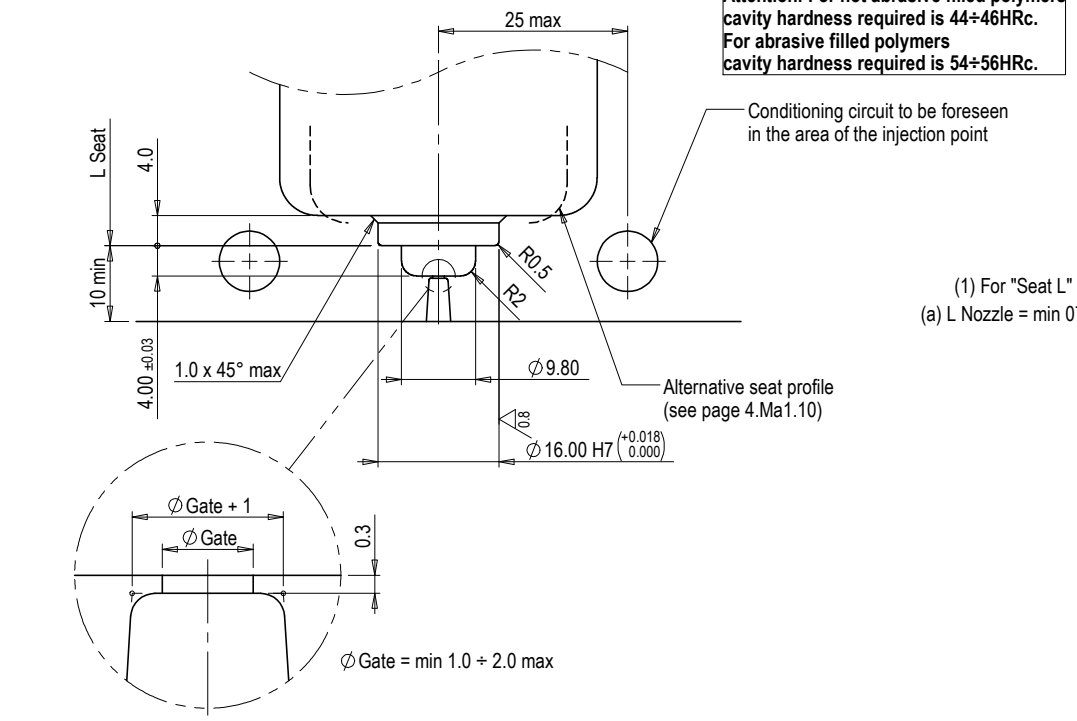
Ma Series 10÷265 cm³/s

Serie Ma
Ma Serie
Ma Série
Ma Serie
Ma Série

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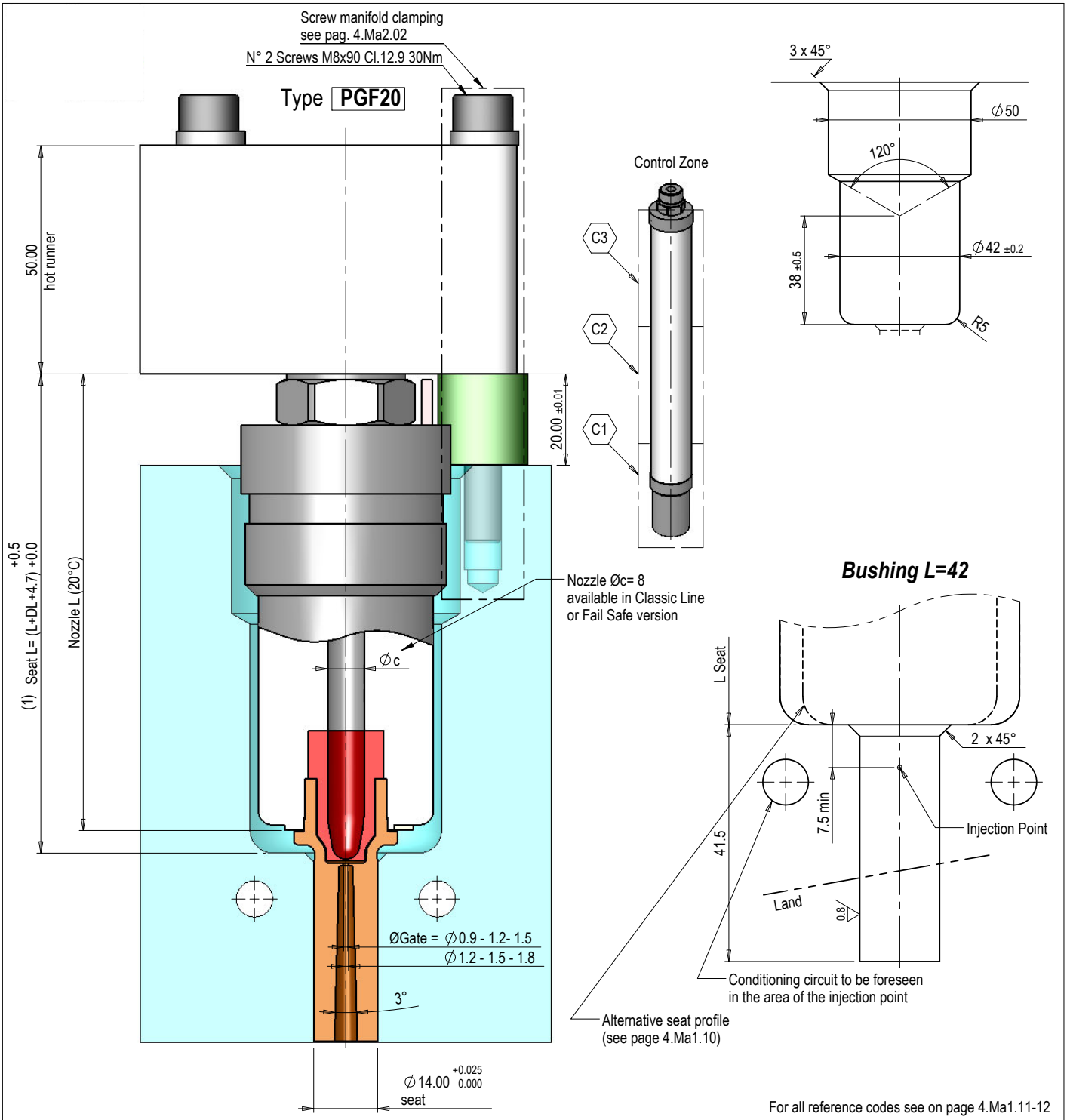




(1) For "Seat L" calculation see pag. 4.Ma1.17b table A
(a) L Nozzle = min 075 ÷ 300 mm max

NOZZLE *L*
75
100
125
150
175
200
225
250
275
300

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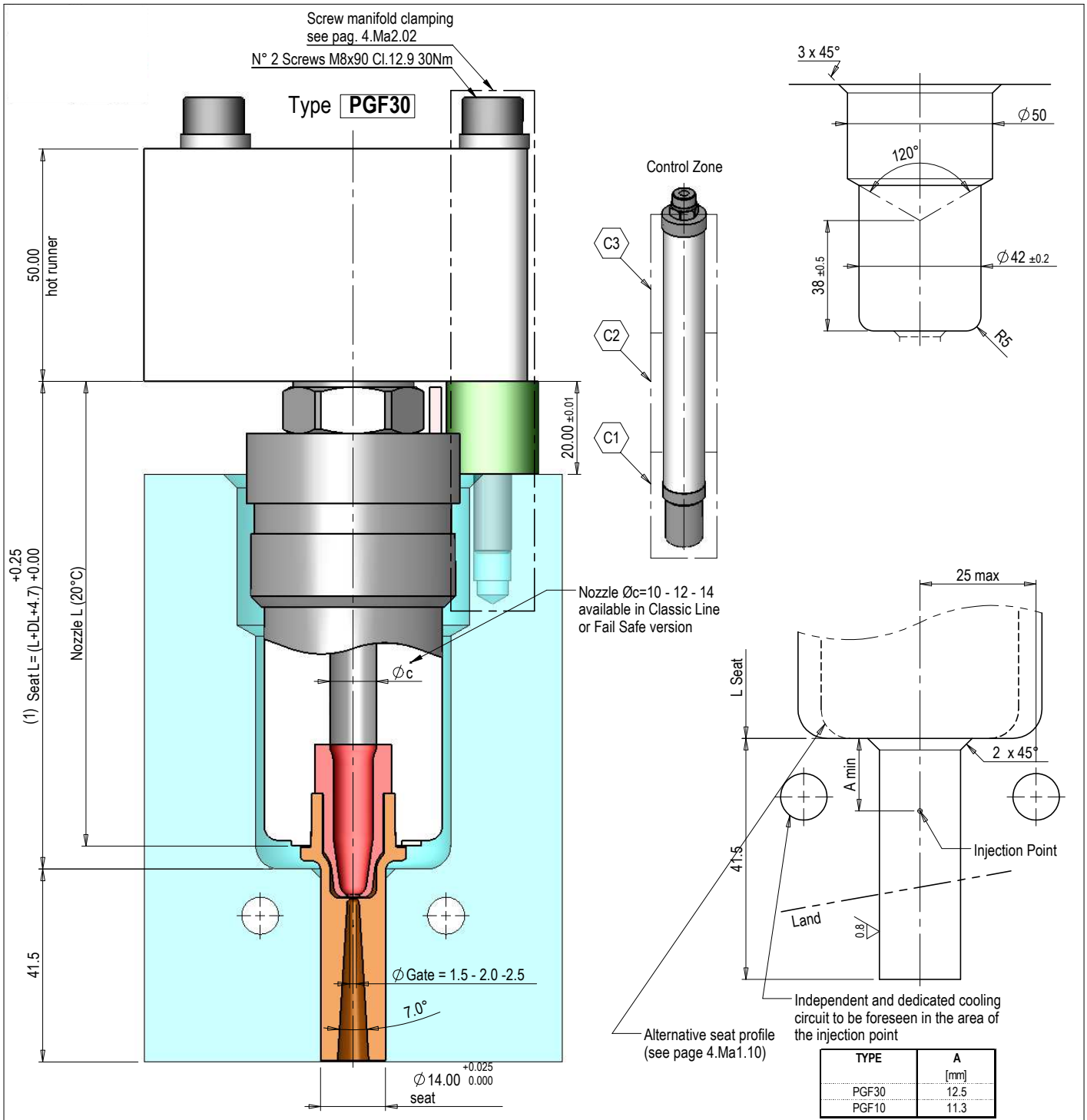


For all reference codes see on page 4.Ma1.11-12

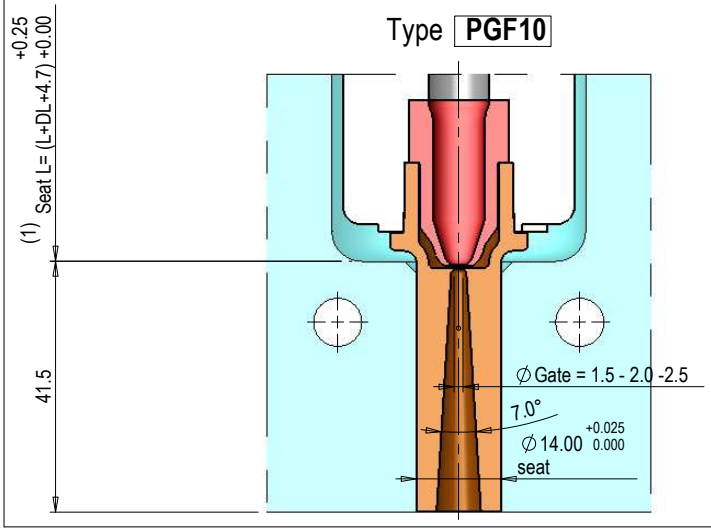
(1) For "Seat L" calculation see pag. 4.Ma1.17a table A

NOZZLE *L*
75
100
125
150
175
200
225
250
275
300
325
350
375
400

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TYPE	A [mm]
PGF30	12.5
PGF10	11.3

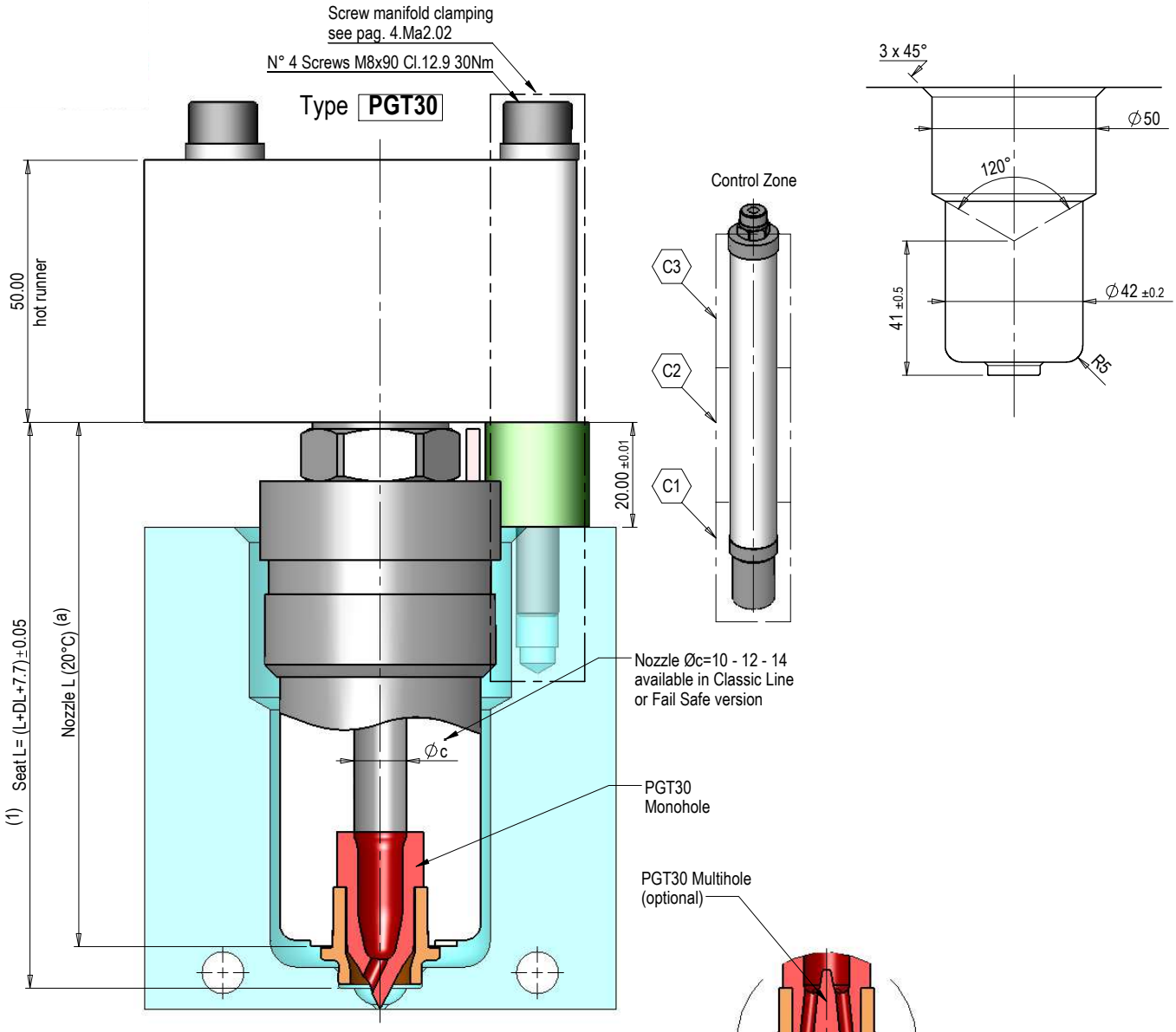


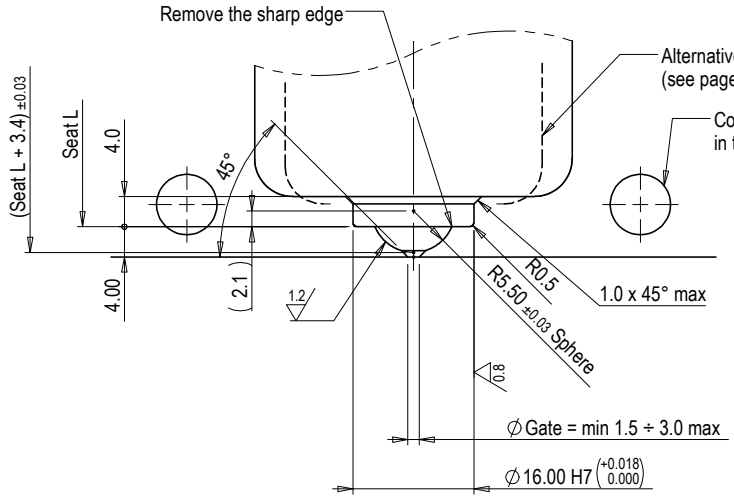
For all reference codes see on page 4.Ma1.11-12

(1) For "Seat L" calculation see pag. 4.Ma1.17a table A

NOZZLE L
75
100
125
150
175
200
225
250
275
300
325
350
375
400

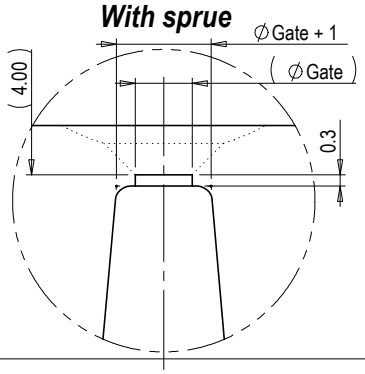
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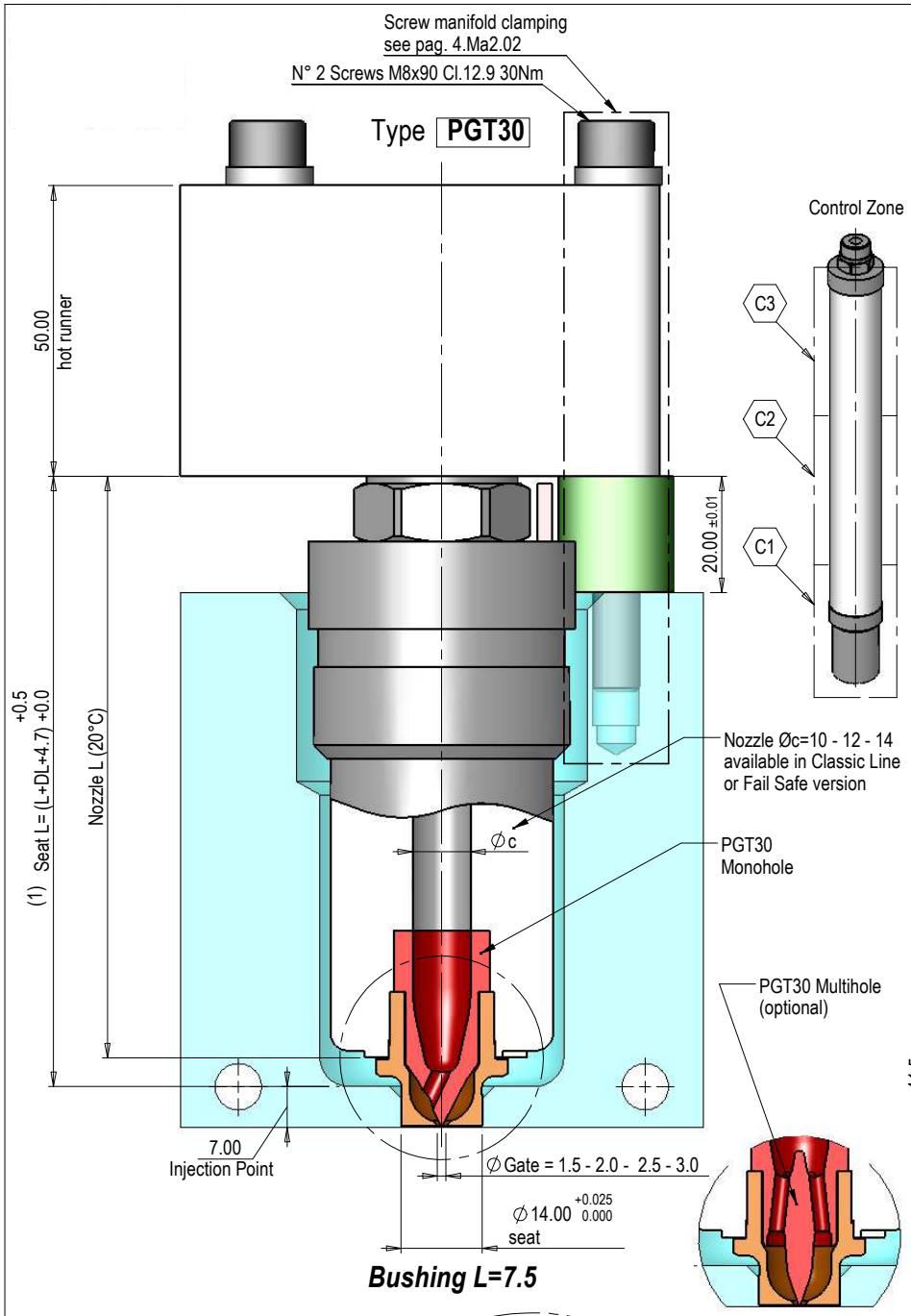
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

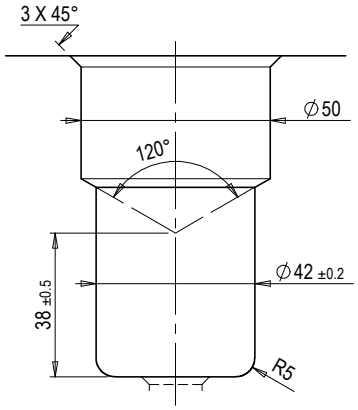
(1) For "Seat L" calculation see pag. 4.Ma1.17b table A
(a) L Nozzle = min 075 ÷ 300 mm max



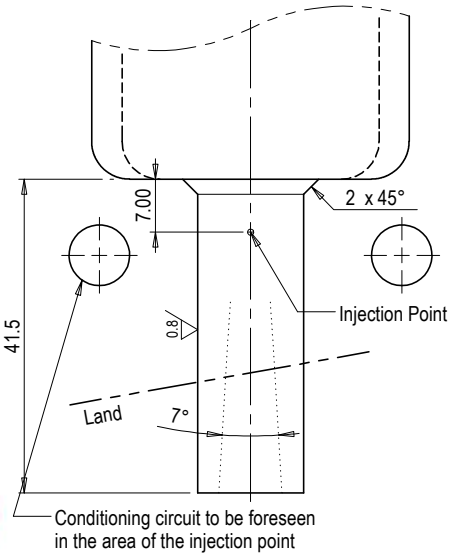
NOZZLE L
75
100
125
150
175
200
225
250
275
300

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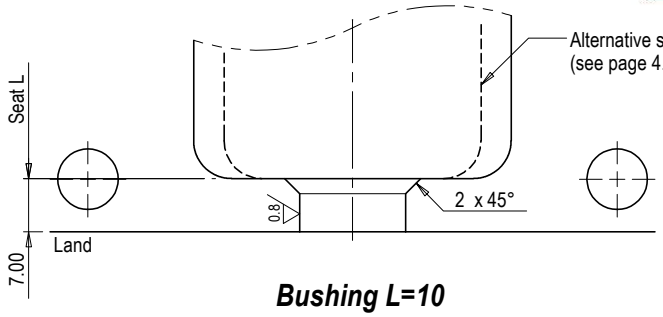




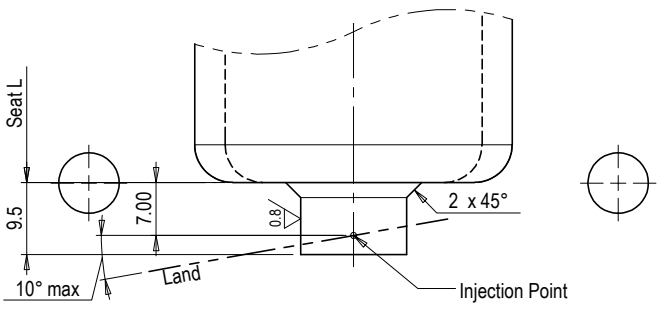
Bushing L=42



Bushing L=7.5



Bushing L=10



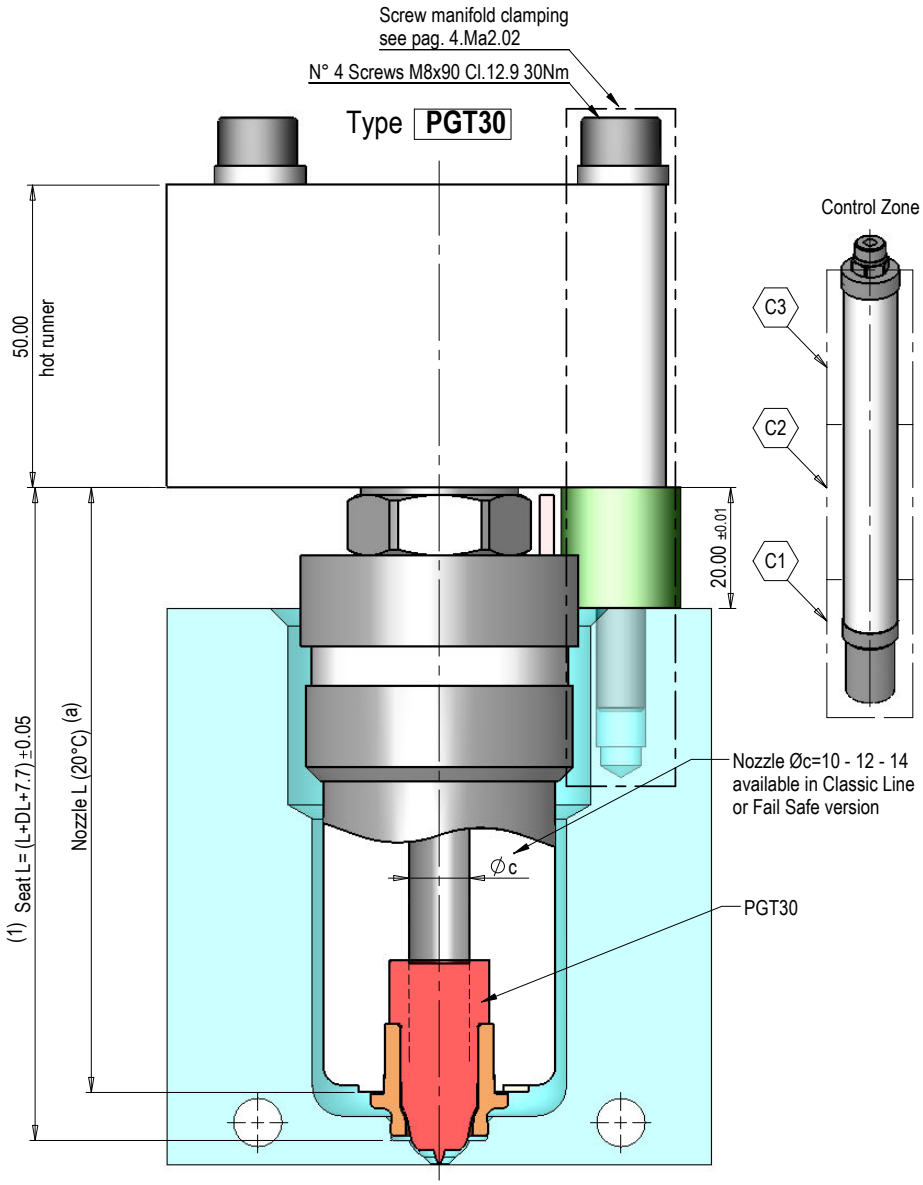
For all reference codes see on page 4.Ma1.11-12

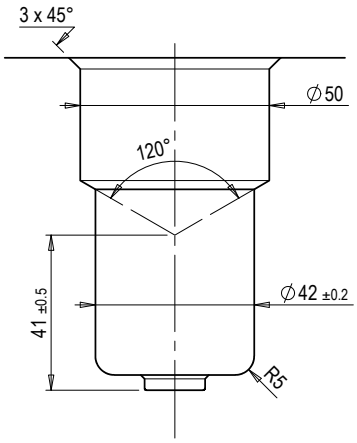
(1) For "Seat L" calculation see pag. 4.Ma1.17a table A

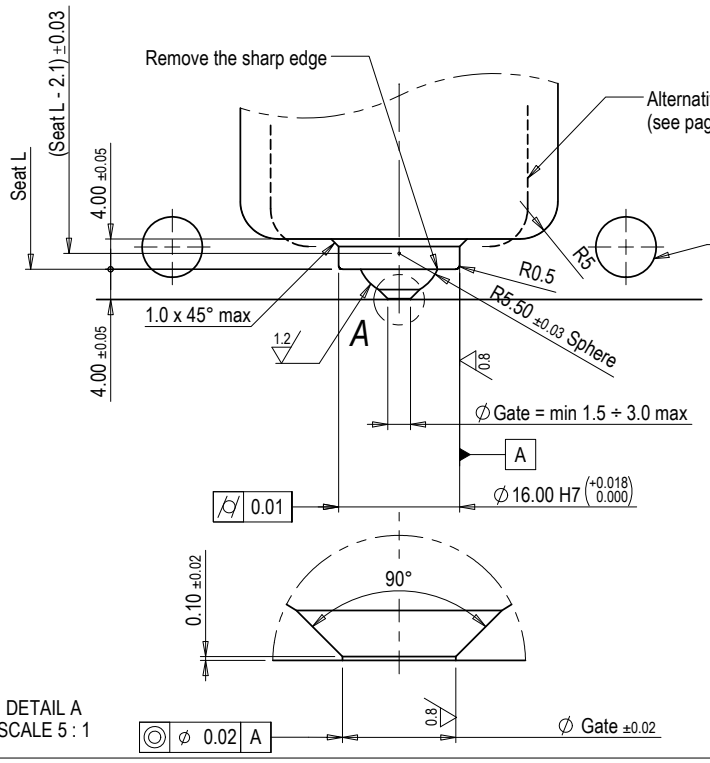
NOZZLE L
75
100
125
150
175
200
225
250
275
300
325
350
375
400

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Screwed-in nozzle TORPEDO with external ring for engineering polymers





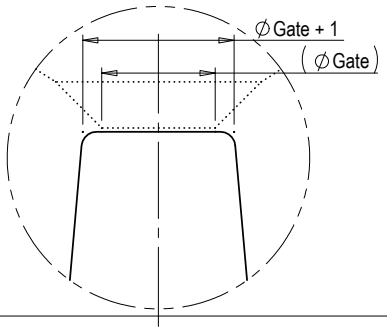


Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

(1) For "Seat L" calculation see pag. 4.Ma1.17b table A

(a) L Nozzle = min 075 ÷ 300 mm max

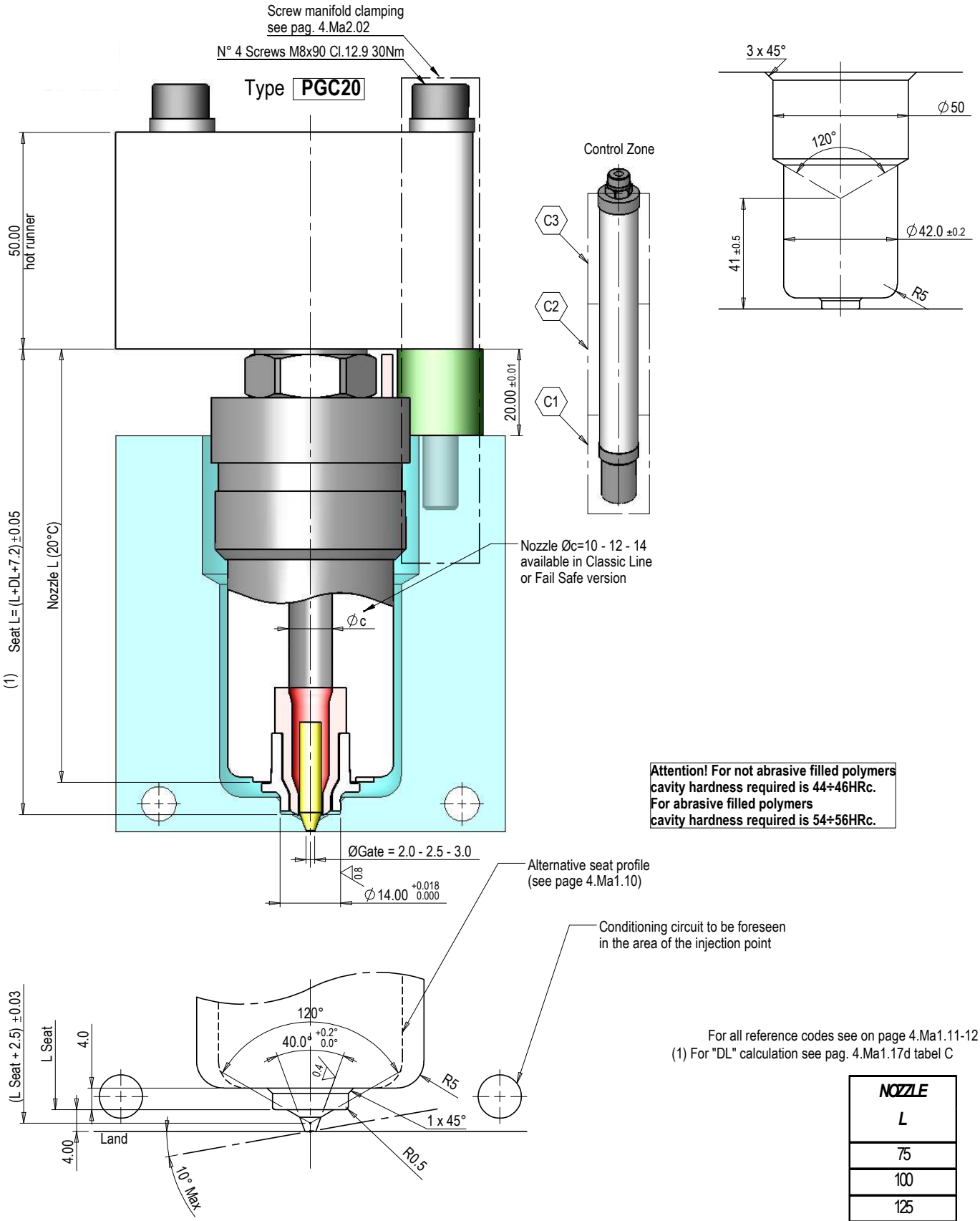
With sprue



NOZZLE *L*
75
100
125
150
175
200
225
250
275
300

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Screwed-in nozzle CONICAL VALVE GATING with external ring



Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

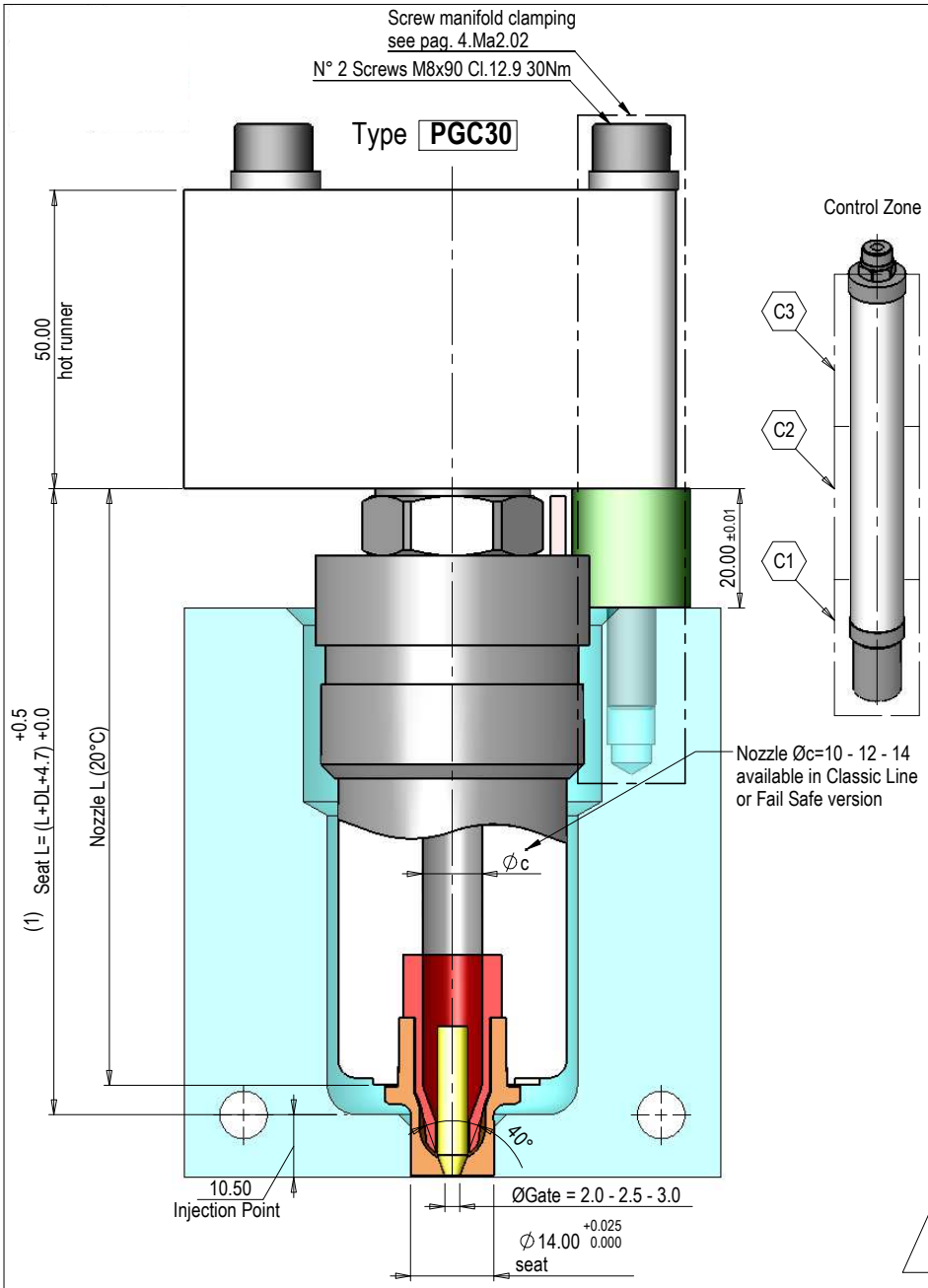
For all reference codes see on page 4.Ma1.11-12
(1) For "DL" calculation see pag. 4.Ma1.17d tabel C

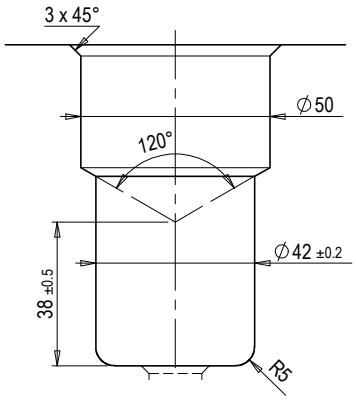
NOZZLE L
75
100
125
150
175
200
225
250
275
300

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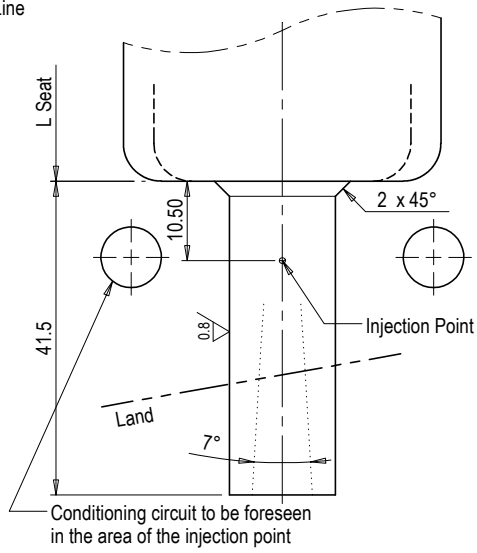
Screwed-in nozzle CONICAL VALVE GATING with bushing through the cavity

oerlikon hrsflow

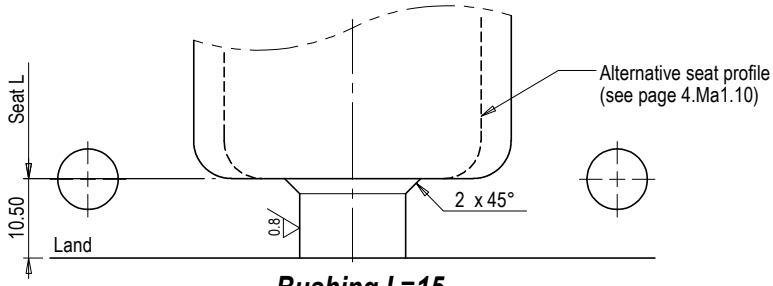




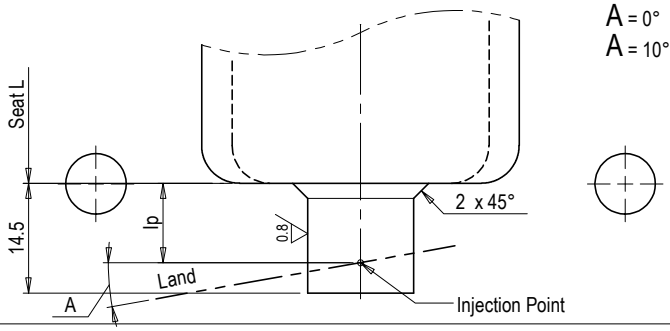
Bushing L=42



Bushing L=11



Bushing L=15



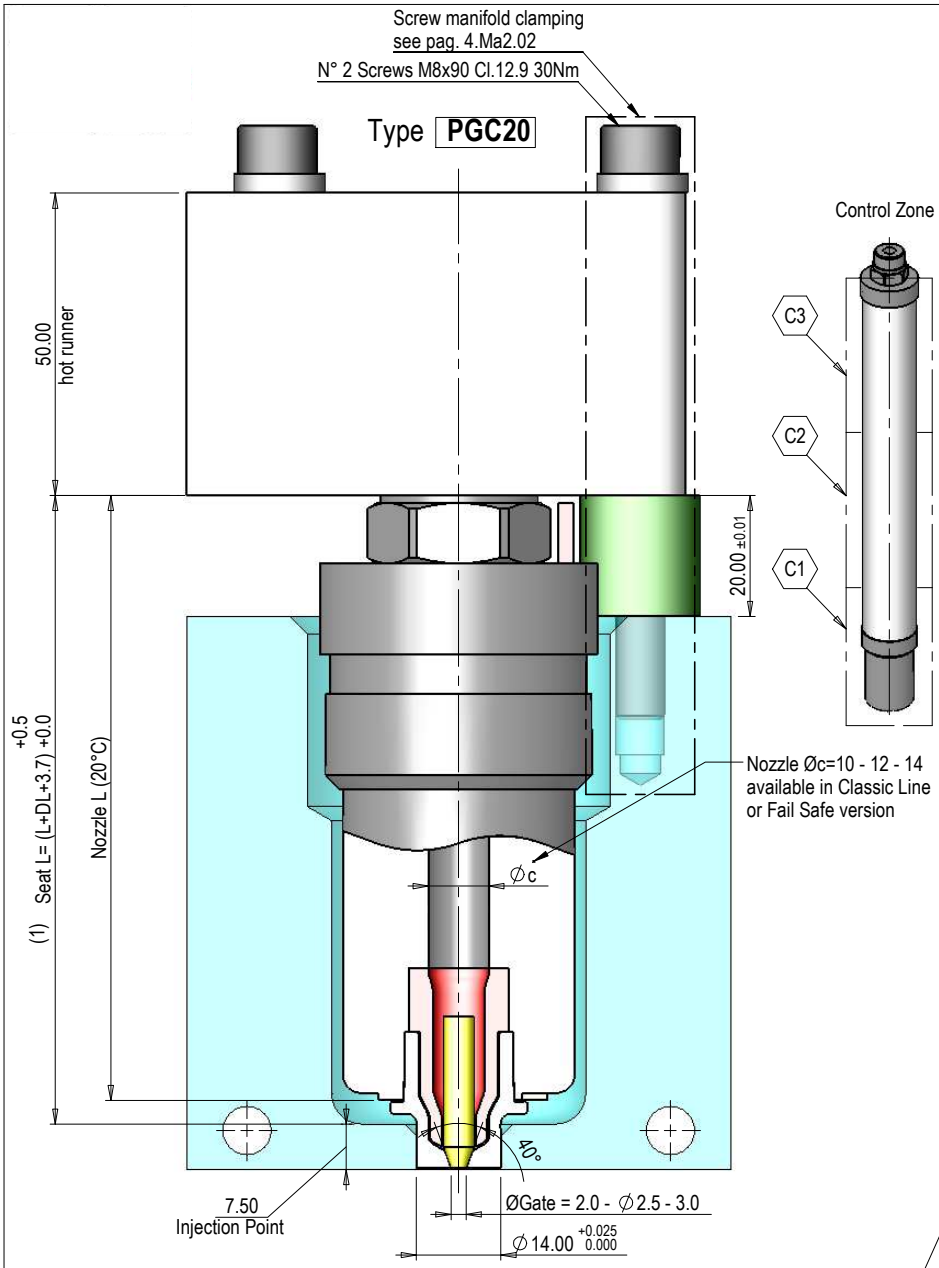
A = 0° ÷ 10° Ip=10.50 mm
A = 10° ÷ 20° Ip=10.70 mm

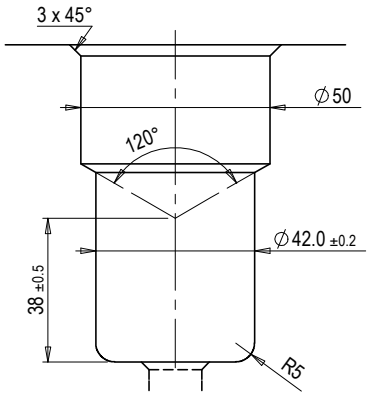
For all reference codes see on page 4.Ma1.11-12
(1) For "Seat L" calculation see pag. 4.Ma1.17a table A

NOZZLE L
75
100
125
150
175
200
225
250
275
300
325
350
375
400

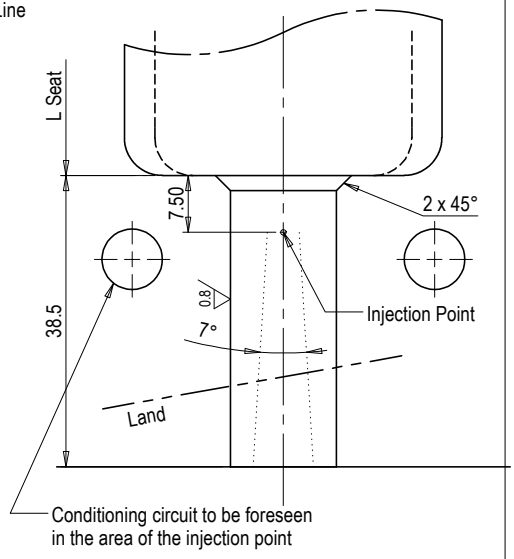
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Screwed-in nozzle CONICAL VALVE GATING with bushing through the cavity

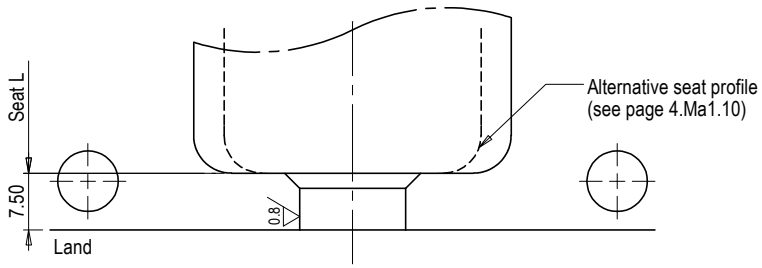




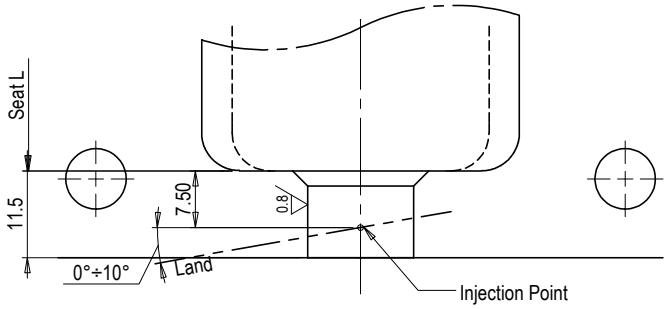
Bushing L=39



Bushing L=8



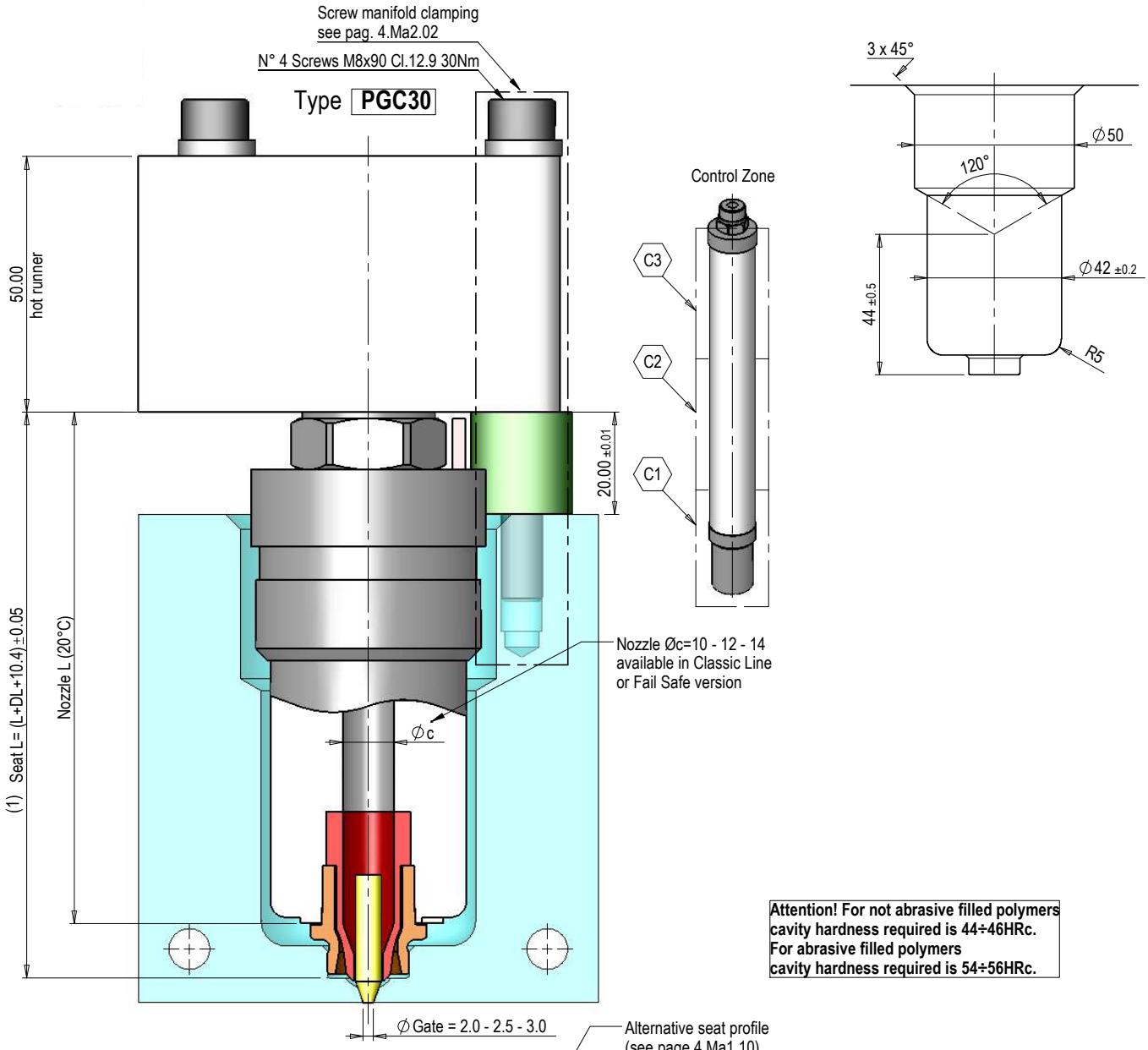
Bushing L=12

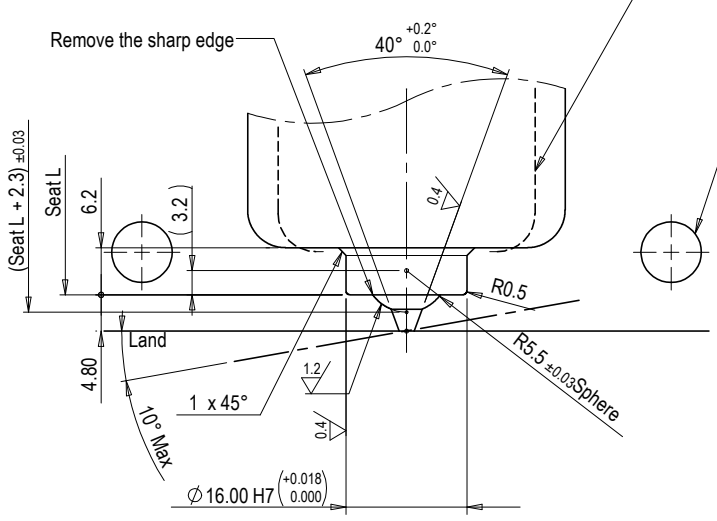


For all reference codes see on page 4.Ma1.11-12
(1) For "DL" calculation see pag. 4.Ma1.17b table C

NOZZLE L
75
100
125
150
175
200
225
250
275
300
325
350
375
400

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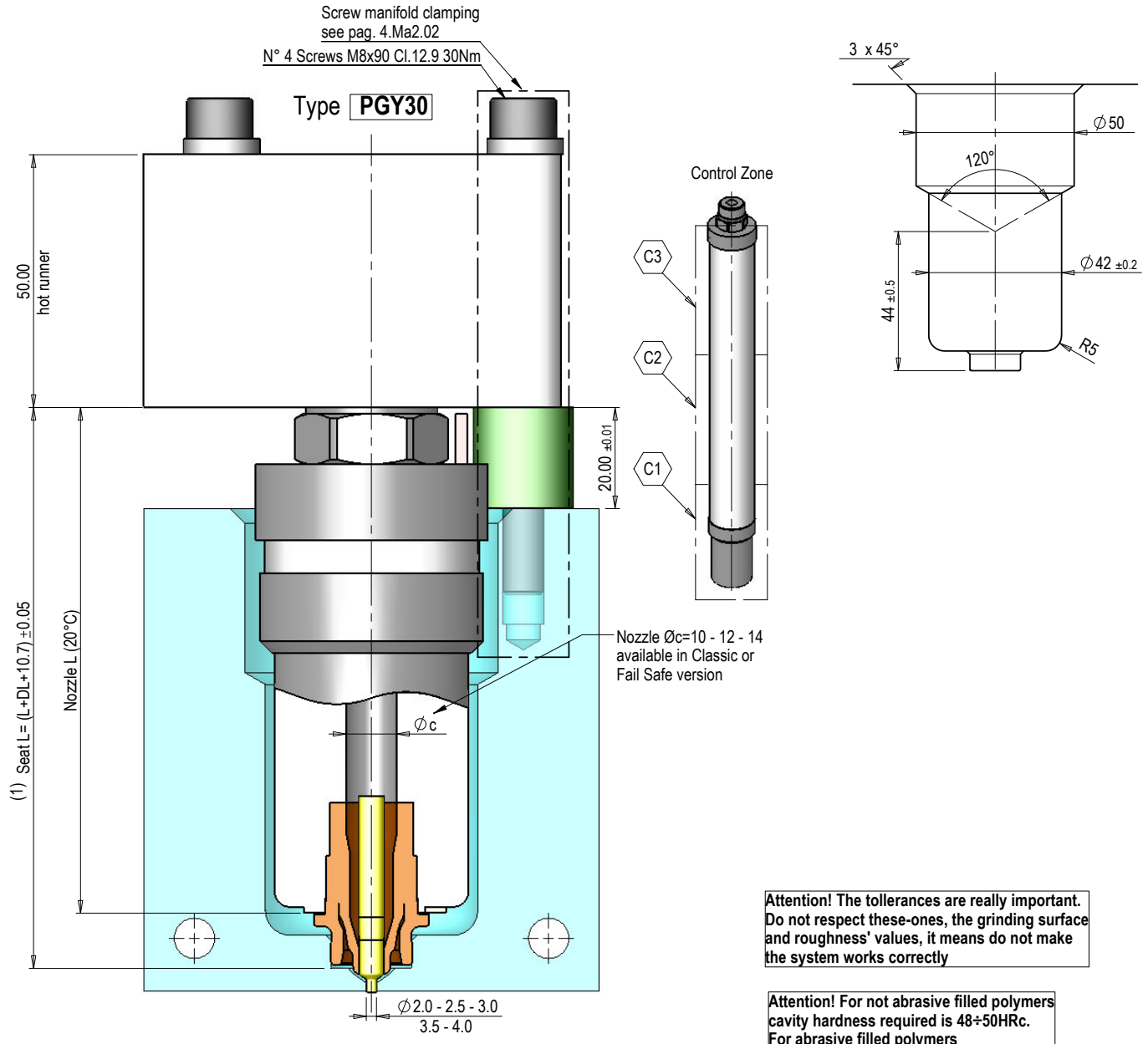
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

For all reference codes see on page 4.Ma1.11-12

(1) For "Seat L" calculation see pag. 4.Ma1.17a table B

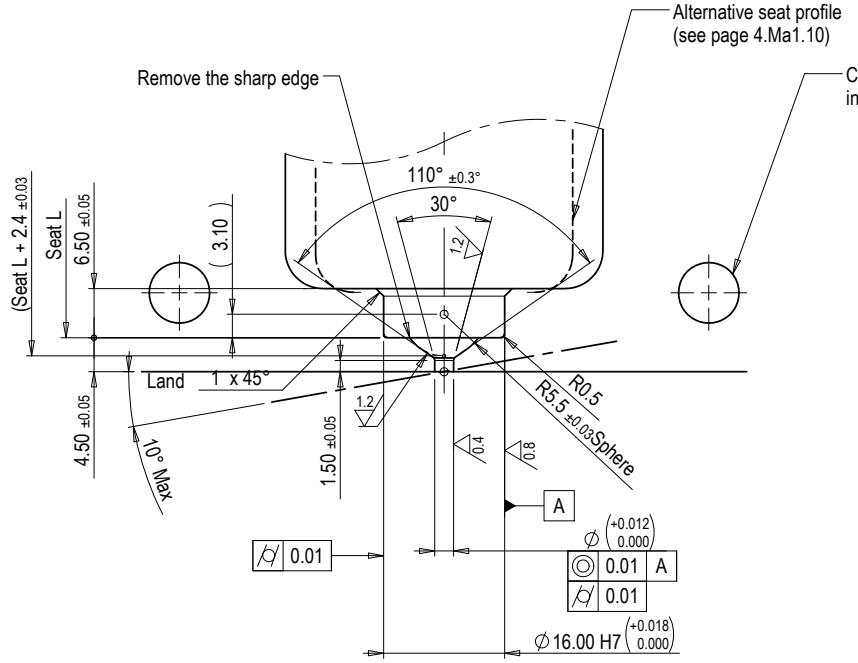
NOZZLE *L*
75
100
125
150
175
200
225
250
275
300
325
350
375
400

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Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

Attention! For not abrasive filled polymers cavity hardness required is 48÷50HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.



For all reference codes see on page 4.Ma1.11-12

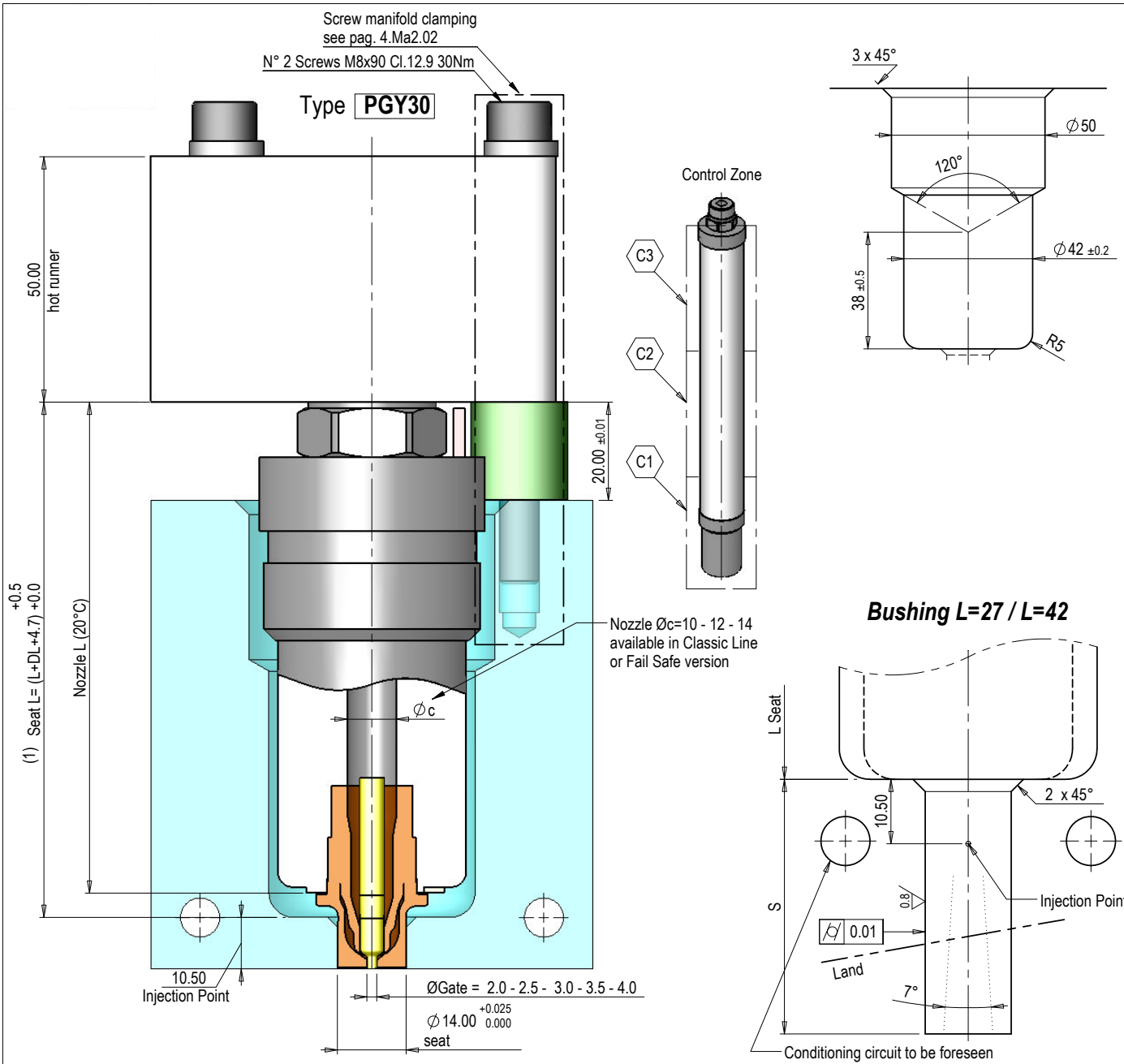
(1) For "Seat L" calculation see pag. 4.Ma1.17b table D

NOZZLE *L*
75
100
125
150
175
200
225
250
275
300
325
350
375
400

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Screwed-in nozzle CYLINDRICAL VALVE GATING with bushing trough the cavity

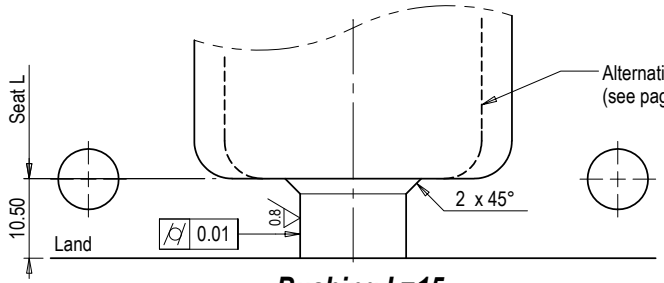
oerlikon hrsflow



Bushing L=27 / L=42

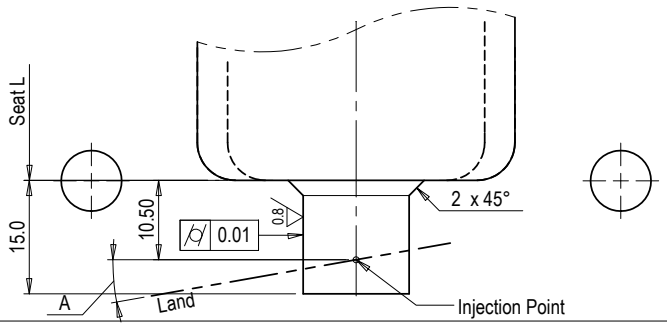
	S
L=27	26.5
L=42	41.5

Bushing L=11

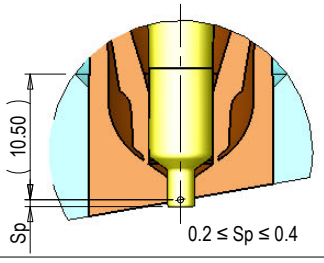


Bushing L=15

A = 0° ÷ 10° max



ATTENTION! In this configuration there is a protrusion "Sp" of the Pin from the bushing.
HRS recommends not to remove this protrusion.
The "Sp" dimension is function of Ø Gate and "A" angle

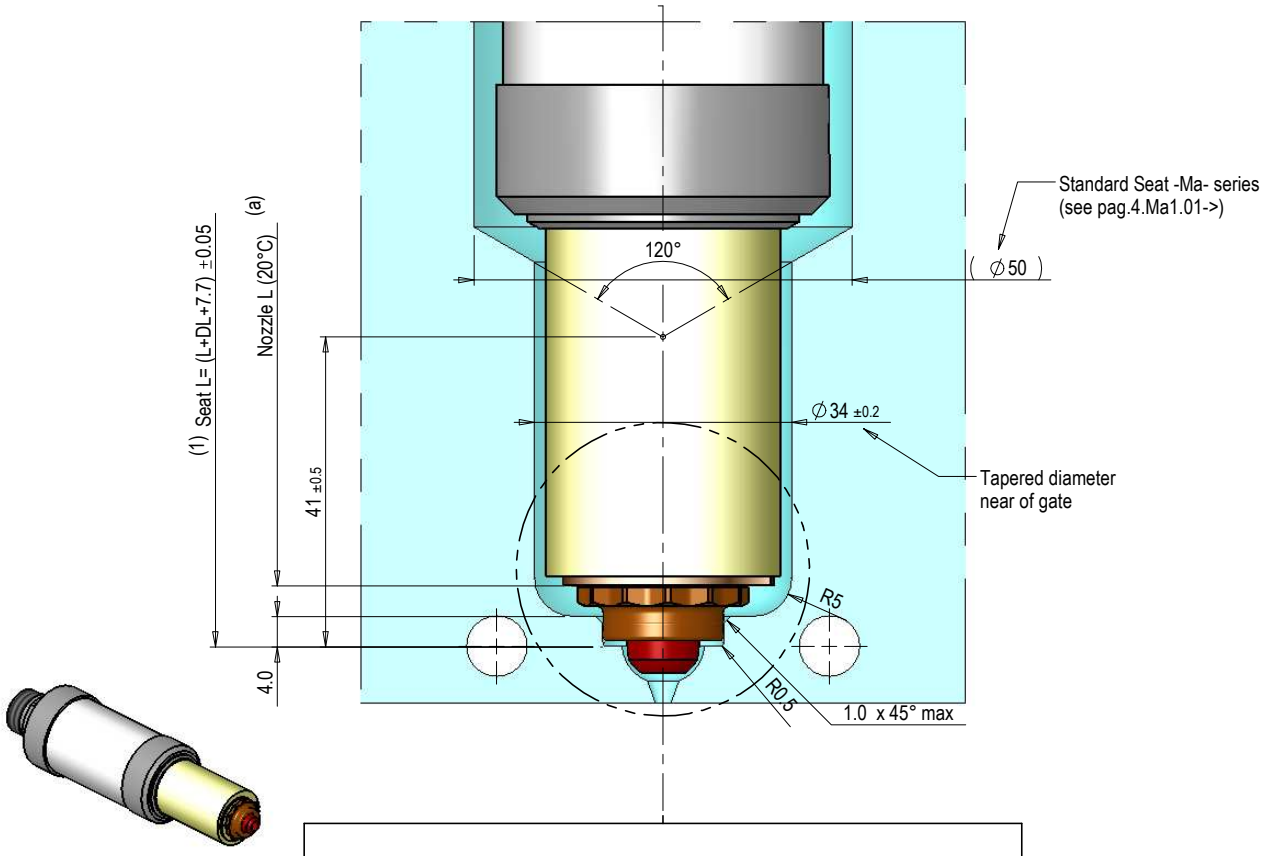


For all reference codes see on page 4.Ma1.11-12
(1) For "Seat L" calculation see pag. 4.Ma1.17a table A

NOZZLE L
75
100
125
150
175
200
225
250
275
300
325
350
375
400

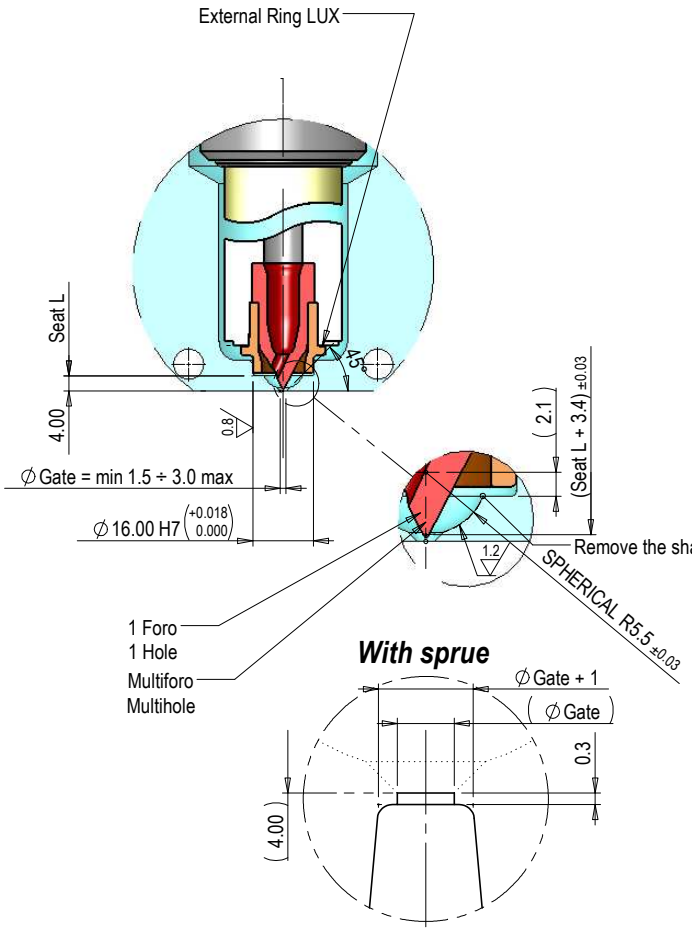
index

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Torpedo

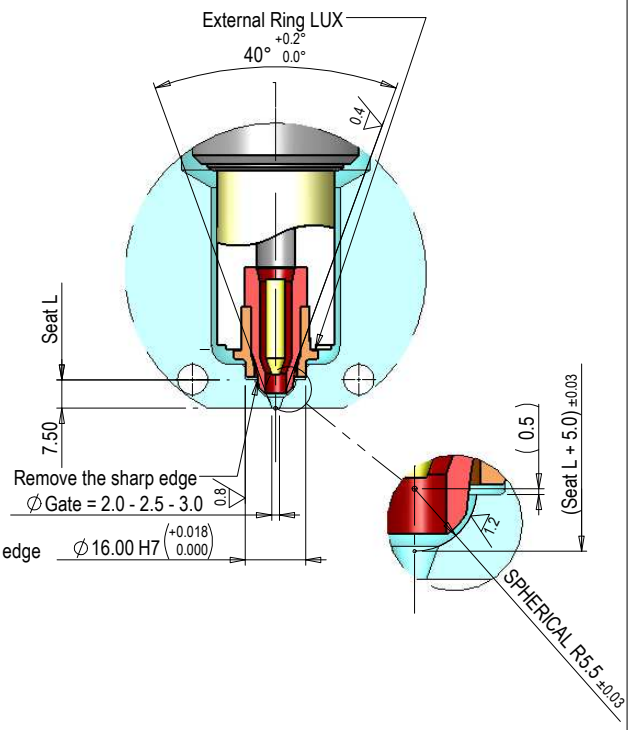
Type **PGT30**



With sprue

Conic valve gating

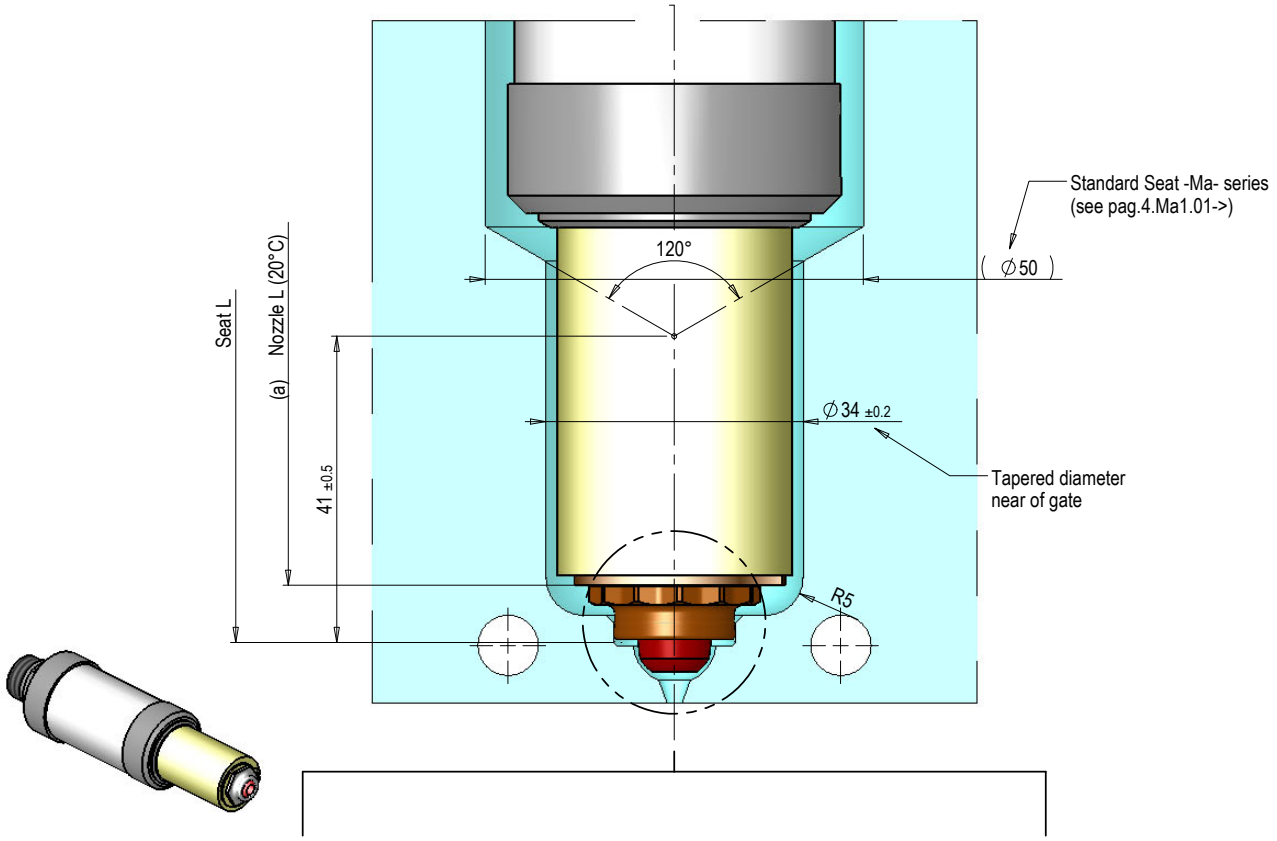
Type **PGC30**



Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

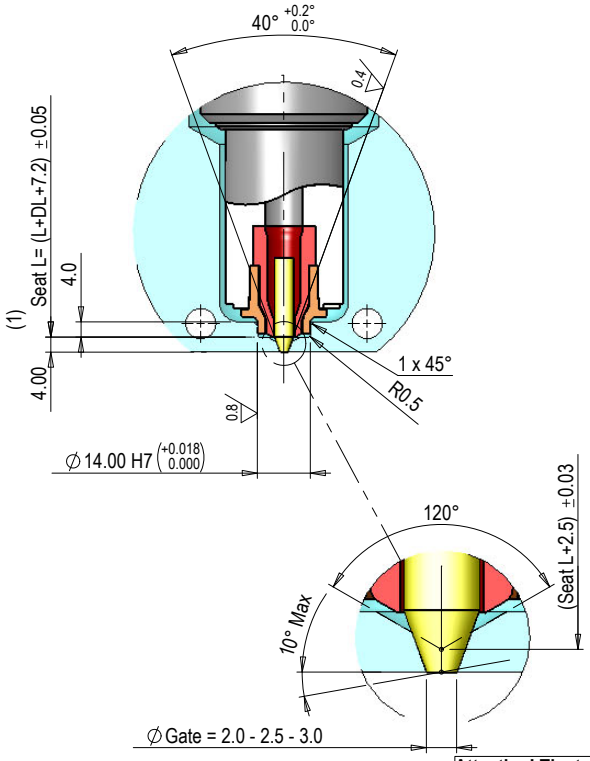
(a) L Nozzle = min 075 ÷ 300 mm max
(1) For "Seat L" calculation see pag. 4.Ma1.17b table A

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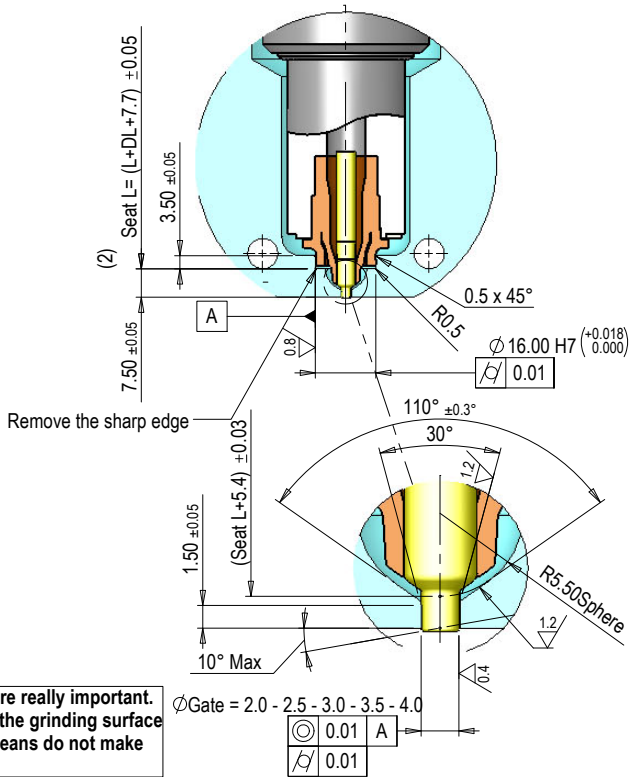
Conic valve gating

Type **PGC20**



Cylindrical valve gating

Type **PGY30**



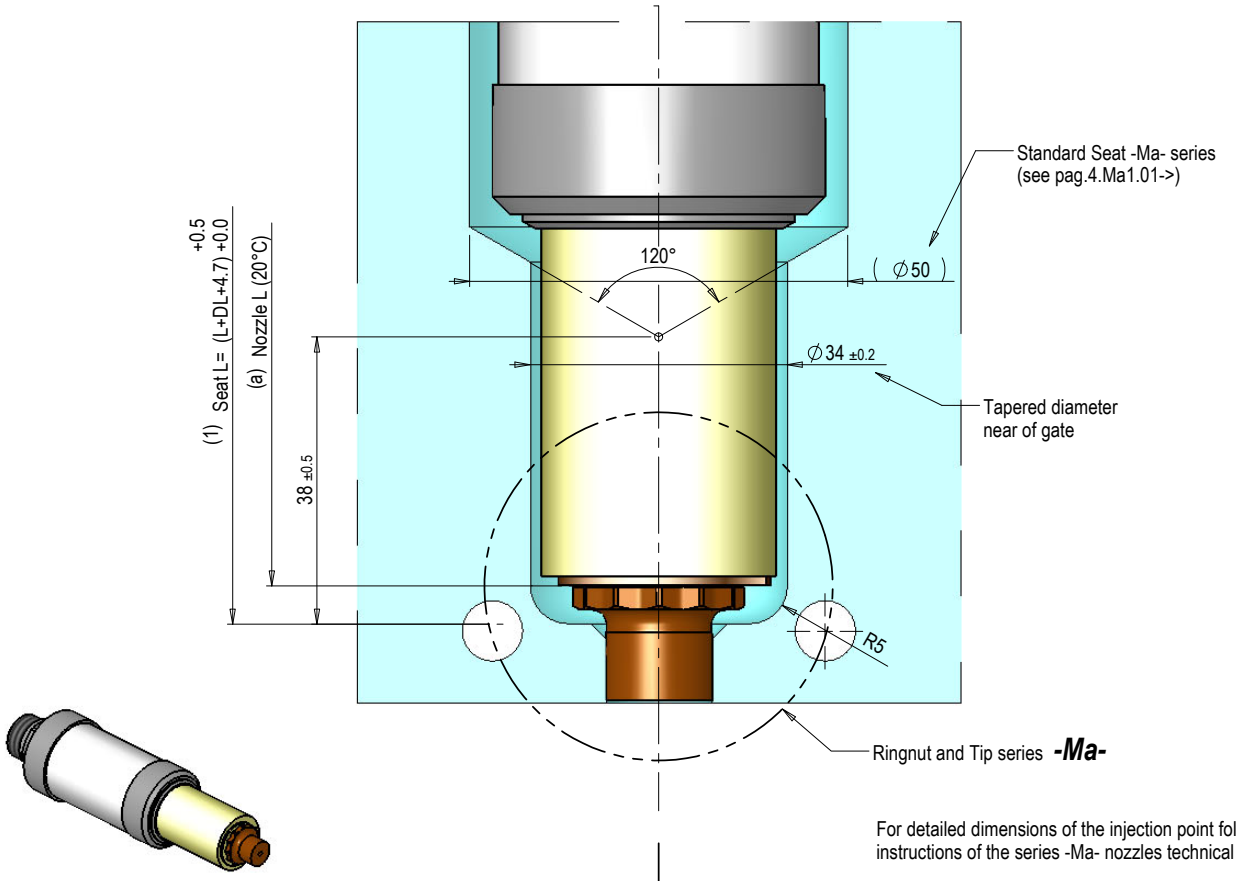
Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

(a) L Nozzle = min 075 ÷ 300 mm max
(1) For "Seat L" calculation see pag. 4.Ma1.17d table C
(2) For "Seat L" calculation see pag. 4.Ma1.17d table D

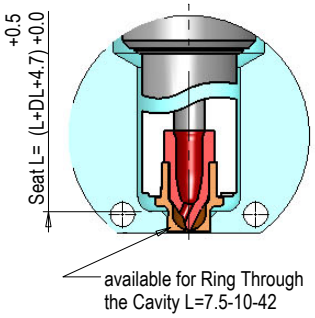
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-Ma- NOZZLE "LUX"
Bushing through the cavity version

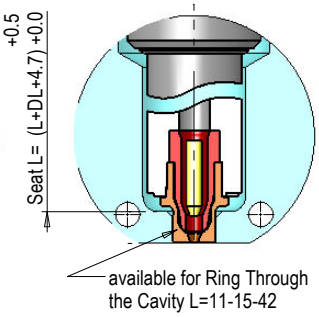


For detailed dimensions of the injection point follow the instructions of the series -Ma- nozzles technical sheet below

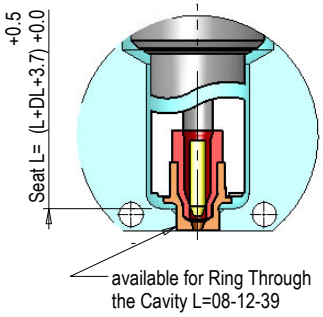
Type **PGT30**
pag. 4.Ma1.03



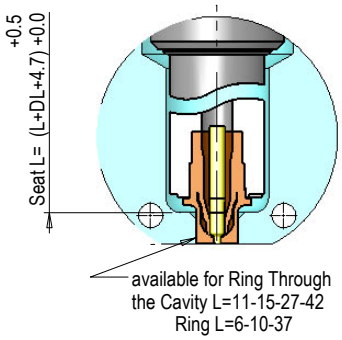
Type **PGC30**
pag. 4.Ma1.05



Type **PGC20**
pag. 4.Ma1.25



Type **PGY30**
pag. 4.Ma1.08-09

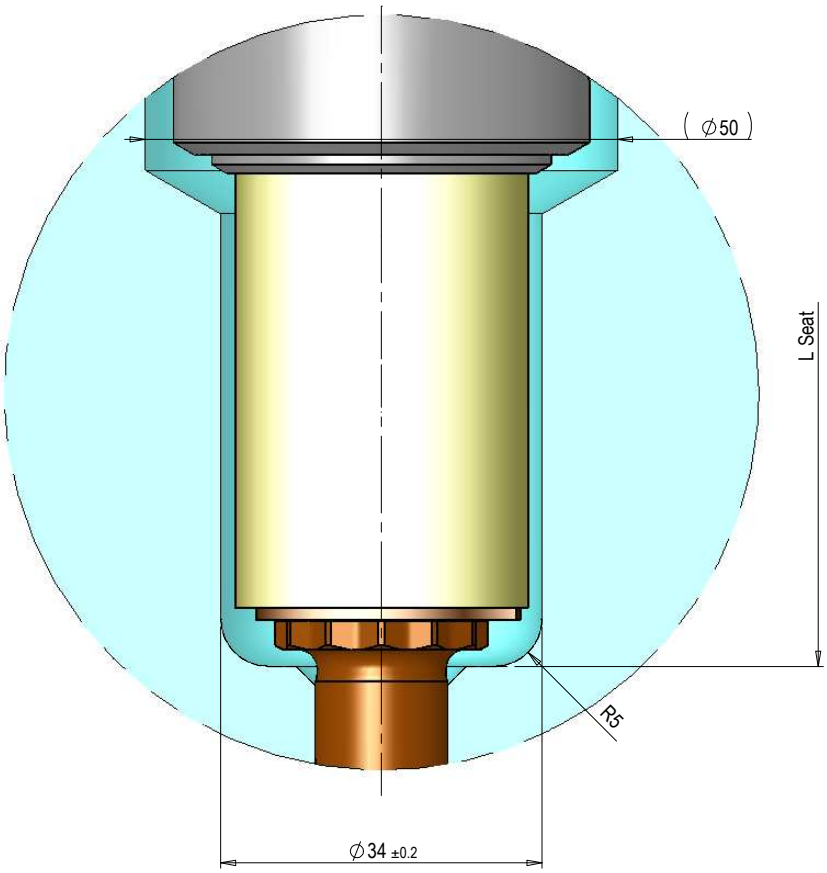


(a) "L Nozzle" = min 075 ÷ 500 mm max
(1) For "Seat L" calculation see pag. 4.Ma1.17

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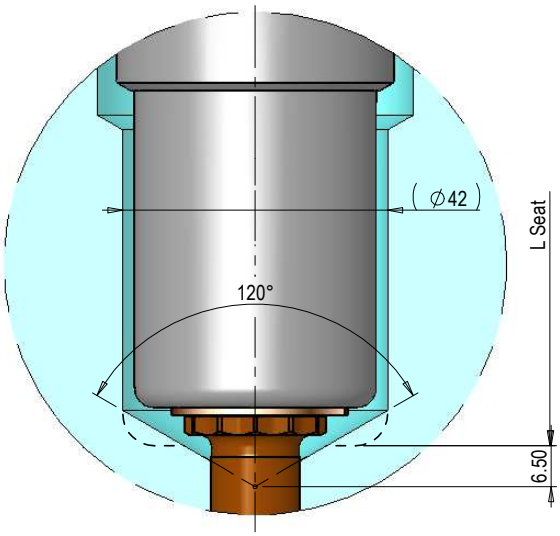
Compact Seat

Nozzles series -Ma- with BUSHING THROUGH CAVITY/EXTERNAL RING
Alternative seat profile to the standard of this catalogue
(reduction of overall dimensions near the injection point)

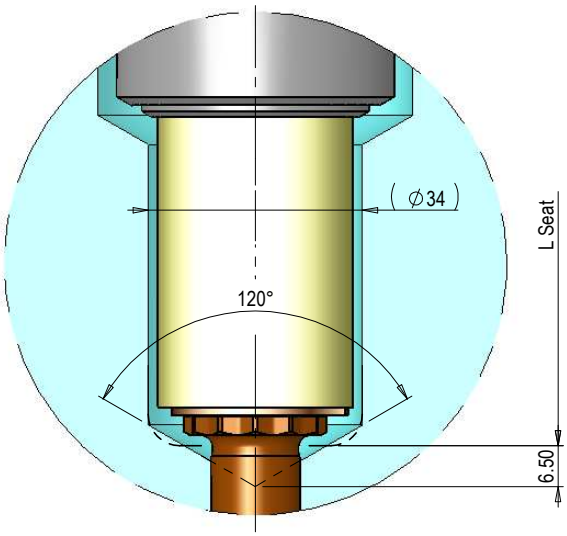


Seat made with 120° tip (*)

Application on STANDARD seat



Application on COMPACT seat



(*) Available for all nozzle models having only BUSHING THROUGH CAVITY

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NOZZLE L (*)	NOZZLE CODE Øc=10		POWER (230V)				
	= Classic L.	= Fail Safe			C1	C2	C3
75	0011-02074	0011-02088	1x	2x	225	-	-
100	0011-02075	0011-02089	1x	2x	225	-	-
125	0011-02076	0011-02090	1x	2x	330	-	-
150	0011-02077	0011-02091	1x	2x	330	-	-
175	0011-02078	0011-02092	1x	2x	225	200	-
200	0011-02079	0011-02093	1x	2x	225	200	-
225	0011-02080	0011-02094	1x	2x	225	200	-
250	0011-02081	0011-02095	1x	2x	225	300	-
275	0011-02082	0011-02096	1x	2x	225	300	-
300	0011-02083	0011-02097	1x	2x	225	300	-
325	0011-02084	0011-02098	1x	2x	225	375	-
350	0011-02085	0011-02099	1x	2x	225	375	-
375	0011-02086	0011-02100	1x	2x	225	375	-
400	0011-02087	0011-02101	1x	2x	225	330	200

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

(*) You can order nozzles with "L" different from the standard (min 75 - max 500 mm) and manifold Øc=12

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TIP CODE			BUSHING CODE				ANTISTAGNATION RING CODE (*)
FREE FLOW							
PGF30			***External end ring***				
	0012-00583			***Ø16 (LUX)***	0013-00955		
	0012-00584	*for high resistance*					
PGF20			***Bushing through the cavity***				
Ø0.9	0012-00387	*(to be used with bushing Ø1.2)*	*gate*	***PGF30***	***PGF20***	***PGF10***	
Ø1.2	0012-00388	*(to be used with bushing Ø1.5)*	***Ø1.2***	-	0013-00597	-	
Ø1.5	0012-00389	*(to be used with bushing Ø1.8)*	***Ø1.5***	0013-00915	0013-00598	0013-00928	
PGF10			***Ø1.8***	-	0013-00598	-	
	0012-00597	*for high resistance*	***Ø2.0***	0013-00916	-	0013-00929	
			Ø2.5	0013-00917	-	0013-00930	
TORPEDO							
PGT30 Monohole			***External end ring***				
	0012-00268			***Ø16 (LUX)***	0013-00955		
	0012-00269	*for high resistance*		Ø16	0013-02110	for engineering polymers	
	0012-00331	*for high conductibility*	***PGT30 Boushing through the cavity***				
PGT30 Multihole			*gate*	***L=7.5***	***L=10***	***L=42***	
	0012-00270		***Ø1.5***	0013-00431	0013-00434	0013-00437	
	0012-00271	*for high resistance*	***Ø2.0***	0013-00432	0013-00435	0013-00438	
	0012-00328	*for high conductibility*	***Ø2.5***	0013-00433	0013-00436	0013-00439	
	0012-01002	*for engineering polymers*					
PGT30 for Rubber			***Ø3.0***	0013-00545	0013-00546	0013-00547	
		for high conductibility					
Ø0.45	0012-00390	0012-00393	***PGT30 Bushing through the cavity for rubber***				
Ø0.60	0012-00391	0012-00394	*gate*				
Ø0.75	0012-00392	0012-00395	***Ø0.9***	0013-00602	*(to be used with tip Ø0.45)*		
PGT30 Torpedo for Rubber			***Ø1.2***	0013-00604	*(to be used with tip Ø0.60)*		
		for high conductibility	***Ø1.5***	0013-00604	*(to be used with tip Ø0.75)*		
Ø0.45	0012-00396	0012-00399					
Ø0.60	0012-00397	0012-00400					
Ø0.75	0012-00398	0012-00401					
CONICAL VALVE GATING							
PGC30			***PGC30 External end ring***				
	0012-00273						
	0012-00533	*For high conductibility with End Ring*		***Ø16 (LUX)***	0013-00955		
	0012-00324	*For high conductibility with Bushing th.cavity*					
	0012-00427	*for high resistance*	***PGC30 Bushing through the cavity***				
			gate	**L=11**	**L=15**	**L=42**	
PGC30 Antiristagno			***Ø2.0***	0013-00990	0013-00991	0013-00992	
	0012-00770	*For high conductibility with End Ring*	***Ø2.5***	0013-00440	0013-00442	0013-00444	
	0012-00771	*For high conductibility with Bushing th.cavity*	***Ø3.0***	0013-00441	0013-00443	0013-00445	0262-00055 { *for External ring nut* / *for Bushings through cavity*
	0012-00805	*for high resistance*					
PGC20			***PGC20 External end ring***				
	0012-00808			***Ø14***	0013-01310		
	0012-00810	*for high resistance*	***PGC20 Bushing through the cavity***				
			gate	L=8	L=12	L=39	
PGC20 Antistagnation			***Ø2.0***	0013-01312	0013-01315	0013-01319	
	0012-00809		***Ø2.5***	0013-01313	0013-01316	0013-01320	0262-00060
	0012-00811	*for high resistance*	***Ø3.0***	0013-01314	0013-01317	0013-01321	
CYLINDRICAL VALVE GATING							
			PGY30 External end ring				
				Ø16	0013-01622		(Long Contact)
				Ø16	0013-01623	*Antistagnation*	(Long Contact)
				Ø16 (LUX)	0013-01624		(Short Contact)
				Ø16 (LUX)	0013-01625	*Antistagnation*	(Short Contact)
			PGY30 Bushing through the cavity				
			gate	**L=11**	**L=15**	**L=27**	**L=42**
			Ø2.0	0013-01626	0013-01631	0013-01636	0013-01641
			Ø2.5	0013-01627	0013-01632	0013-01637	0013-01642
			Ø3.0	0013-01628	0013-01633	0013-01638	0013-01643
			Ø3.5	0013-01629	0013-01634	0013-01639	0013-01644
			Ø4.0	0013-01630	0013-01635	0013-01640	0013-01645

(*) Antistagnation Seal available only some polymers. For further information see sheet pag. 2.01.43

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	DL = (L * ΔT * λ)										
75	0.09	0.11	0.13	0.14	0.16	0.18	0.20	0.22	0.23	0.25	0.27
100	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36
125	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	Seat L = L + DL + 4.7										
75	79.79	79.81	79.83	79.84	79.86	79.88	79.90	79.92	79.93	79.95	79.97
100	104.82	104.84	104.87	104.89	104.92	104.94	104.96	104.99	105.01	105.04	105.06
125	129.85	129.88	129.91	129.94	129.97	130.00	130.03	130.06	130.09	130.12	130.15
150	154.88	154.92	154.95	154.99	155.02	155.06	155.10	155.13	155.17	155.20	155.24
175	179.91	179.95	179.99	180.04	180.08	180.12	180.16	180.20	180.25	180.29	180.33
200	204.94	204.99	205.04	205.08	205.13	205.18	205.23	205.28	205.32	205.37	205.42
225	229.97	230.02	230.08	230.13	230.19	230.24	230.29	230.35	230.40	230.46	230.51
250	255.00	255.06	255.12	255.18	255.24	255.30	255.36	255.42	255.48	255.54	255.60
275	280.03	280.10	280.16	280.23	280.29	280.36	280.43	280.49	280.56	280.62	280.69
300	305.06	305.13	305.20	305.28	305.35	305.42	305.49	305.56	305.64	305.71	305.78
325	330.09	330.17	330.25	330.32	330.40	330.48	330.56	330.64	330.71	330.79	330.87
350	355.12	355.20	355.29	355.37	355.46	355.54	355.62	355.71	355.79	355.88	355.96
375	380.15	380.24	380.33	380.42	380.51	380.60	380.69	380.78	380.87	380.96	381.05
400	405.18	405.28	405.37	405.47	405.56	405.66	405.76	405.85	405.95	406.04	406.14

Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	Seat L = L + DL + 10.4										
75	85.49	85.51	85.53	85.54	85.56	85.58	85.60	85.62	85.63	85.65	85.67
100	110.52	110.54	110.57	110.59	110.62	110.64	110.66	110.69	110.71	110.74	110.76
125	135.55	135.58	135.61	135.64	135.67	135.70	135.73	135.76	135.79	135.82	135.85
150	160.58	160.62	160.65	160.69	160.72	160.76	160.80	160.83	160.87	160.90	160.94
175	185.61	185.65	185.69	185.74	185.78	185.82	185.86	185.90	185.95	185.99	186.03
200	210.64	210.69	210.74	210.78	210.83	210.88	210.93	210.98	211.02	211.07	211.12
225	235.67	235.72	235.78	235.83	235.89	235.94	235.99	236.05	236.10	236.16	236.21
250	260.70	260.76	260.82	260.88	260.94	261.00	261.06	261.12	261.18	261.24	261.30
275	285.73	285.80	285.86	285.93	285.99	286.06	286.13	286.19	286.26	286.32	286.39
300	310.76	310.83	310.90	310.98	311.05	311.12	311.19	311.26	311.34	311.41	311.48
325	335.79	335.87	335.95	336.02	336.10	336.18	336.26	336.34	336.41	336.49	336.57
350	360.82	360.90	360.99	361.07	361.16	361.24	361.32	361.41	361.49	361.58	361.66
375	385.85	385.94	386.03	386.12	386.21	386.30	386.39	386.48	386.57	386.66	386.75
400	410.88	410.98	411.07	411.17	411.26	411.36	411.46	411.55	411.65	411.74	411.84

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

Tab. C - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	Seat L = L + DL + 3.7										
75	78.79	78.81	78.83	78.84	78.86	78.88	78.90	78.92	78.93	78.95	78.97
100	103.82	103.84	103.87	103.89	103.92	103.94	103.96	103.99	104.01	104.04	104.06
125	128.85	128.88	128.91	128.94	128.97	129.00	129.03	129.06	129.09	129.12	129.15
150	153.88	153.92	153.95	153.99	154.02	154.06	154.10	154.13	154.17	154.20	154.24
175	178.91	178.95	178.99	179.04	179.08	179.12	179.16	179.20	179.25	179.29	179.33
200	203.94	203.99	204.04	204.08	204.13	204.18	204.23	204.28	204.32	204.37	204.42
225	228.97	229.02	229.08	229.13	229.19	229.24	229.29	229.35	229.40	229.46	229.51
250	254.00	254.06	254.12	254.18	254.24	254.30	254.36	254.42	254.48	254.54	254.60
275	279.03	279.10	279.16	279.23	279.29	279.36	279.43	279.49	279.56	279.62	279.69
300	304.06	304.13	304.20	304.28	304.35	304.42	304.49	304.56	304.64	304.71	304.78
325	329.09	329.17	329.25	329.32	329.40	329.48	329.56	329.64	329.71	329.79	329.87
350	354.12	354.20	354.29	354.37	354.46	354.54	354.62	354.71	354.79	354.88	354.96
375	379.15	379.24	379.33	379.42	379.51	379.60	379.69	379.78	379.87	379.96	380.05
400	404.18	404.28	404.37	404.47	404.56	404.66	404.76	404.85	404.95	405.04	405.14

Tab. D - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	= L + DL + 10.7										
75	85.79	85.81	85.83	85.84	85.86	85.88	85.90	85.92	85.93	85.95	85.97
100	110.82	110.84	110.87	110.89	110.92	110.94	110.96	110.99	111.01	111.04	111.06
125	135.85	135.88	135.91	135.94	135.97	136.00	136.03	136.06	136.09	136.12	136.15
150	160.88	160.92	160.95	160.99	161.02	161.06	161.10	161.13	161.17	161.20	161.24
175	185.91	185.95	185.99	186.04	186.08	186.12	186.16	186.20	186.25	186.29	186.33
200	210.94	210.99	211.04	211.08	211.13	211.18	211.23	211.28	211.32	211.37	211.42
225	235.97	236.02	236.08	236.13	236.19	236.24	236.29	236.35	236.40	236.46	236.51
250	261.00	261.06	261.12	261.18	261.24	261.30	261.36	261.42	261.48	261.54	261.60
275	286.03	286.10	286.16	286.23	286.29	286.36	286.43	286.49	286.56	286.62	286.69
300	311.06	311.13	311.20	311.28	311.35	311.42	311.49	311.56	311.64	311.71	311.78
325	336.09	336.17	336.25	336.32	336.40	336.48	336.56	336.64	336.71	336.79	336.87
350	361.12	361.20	361.29	361.37	361.46	361.54	361.62	361.71	361.79	361.88	361.96
375	386.15	386.24	386.33	386.42	386.51	386.60	386.69	386.78	386.87	386.96	387.05
400	411.18	411.28	411.37	411.47	411.56	411.66	411.76	411.85	411.95	412.04	412.14

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ?T * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	0.09	0.11	0.13	0.14	0.16	0.18	0.20	0.22	0.23	0.25	0.27
100	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36
125	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 7.7										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	82.79	82.81	82.83	82.84	82.86	82.88	82.90	82.92	82.93	82.95	82.97
100	107.82	107.84	107.87	107.89	107.92	107.94	107.96	107.99	108.01	108.04	108.06
125	132.85	132.88	132.91	132.94	132.97	133.00	133.03	133.06	133.09	133.12	133.15
150	157.88	157.92	157.95	157.99	158.02	158.06	158.10	158.13	158.17	158.20	158.24
175	182.91	182.95	182.99	183.04	183.08	183.12	183.16	183.20	183.25	183.29	183.33
200	207.94	207.99	208.04	208.08	208.13	208.18	208.23	208.28	208.32	208.37	208.42
225	232.97	233.02	233.08	233.13	233.19	233.24	233.29	233.35	233.40	233.46	233.51
250	258.00	258.06	258.12	258.18	258.24	258.30	258.36	258.42	258.48	258.54	258.60
275	283.03	283.10	283.16	283.23	283.29	283.36	283.43	283.49	283.56	283.62	283.69
300	308.06	308.13	308.20	308.28	308.35	308.42	308.49	308.56	308.64	308.71	308.78

Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 10.4										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	85.49	85.51	85.53	85.54	85.56	85.58	85.60	85.62	85.63	85.65	85.67
100	110.52	110.54	110.57	110.59	110.62	110.64	110.66	110.69	110.71	110.74	110.76
125	135.55	135.58	135.61	135.64	135.67	135.70	135.73	135.76	135.79	135.82	135.85
150	160.58	160.62	160.65	160.69	160.72	160.76	160.80	160.83	160.87	160.90	160.94
175	185.61	185.65	185.69	185.74	185.78	185.82	185.86	185.90	185.95	185.99	186.03
200	210.64	210.69	210.74	210.78	210.83	210.88	210.93	210.98	211.02	211.07	211.12
225	235.67	235.72	235.78	235.83	235.89	235.94	235.99	236.05	236.10	236.16	236.21
250	260.70	260.76	260.82	260.88	260.94	261.00	261.06	261.12	261.18	261.24	261.30
275	285.73	285.80	285.86	285.93	285.99	286.06	286.13	286.19	286.26	286.32	286.39
300	310.76	310.83	310.90	310.98	311.05	311.12	311.19	311.26	311.34	311.41	311.48
325	335.79	335.87	335.95	336.02	336.10	336.18	336.26	336.34	336.41	336.49	336.57
350	360.82	360.90	360.99	361.07	361.16	361.24	361.32	361.41	361.49	361.58	361.66
375	385.85	385.94	386.03	386.12	386.21	386.30	386.39	386.48	386.57	386.66	386.75
400	410.88	410.98	411.07	411.17	411.26	411.36	411.46	411.55	411.65	411.74	411.84

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

Tab. C - "Seat L" Calculation

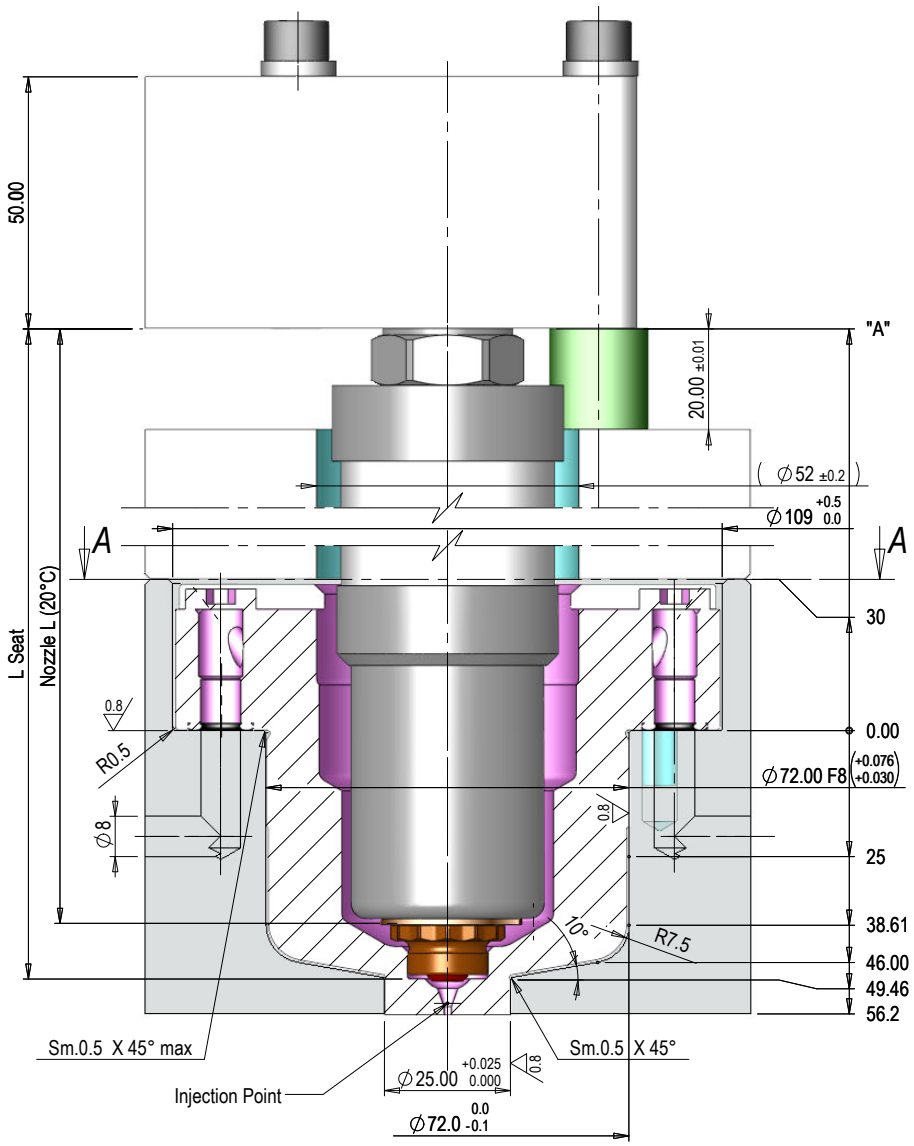
L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 7.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	82.29	82.31	82.33	82.34	82.36	82.38	82.40	82.42	82.43	82.45	82.47
100	107.32	107.34	107.37	107.39	107.42	107.44	107.46	107.49	107.51	107.54	107.56
125	132.35	132.38	132.41	132.44	132.47	132.50	132.53	132.56	132.59	132.62	132.65
150	157.38	157.42	157.45	157.49	157.52	157.56	157.60	157.63	157.67	157.70	157.74
175	182.41	182.45	182.49	182.54	182.58	182.62	182.66	182.70	182.75	182.79	182.83
200	207.44	207.49	207.54	207.58	207.63	207.68	207.73	207.78	207.82	207.87	207.92
225	232.47	232.52	232.58	232.63	232.69	232.74	232.79	232.85	232.90	232.96	233.01
250	257.50	257.56	257.62	257.68	257.74	257.80	257.86	257.92	257.98	258.04	258.10
275	282.53	282.60	282.66	282.73	282.79	282.86	282.93	282.99	283.06	283.12	283.19
300	307.56	307.63	307.70	307.78	307.85	307.92	307.99	308.06	308.14	308.21	308.28

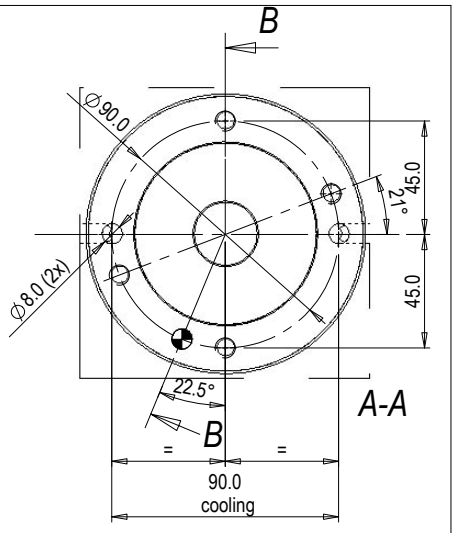
Tab. D - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	= L + DL + 7.7										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	82.70	82.70	82.70	82.70	82.70	82.70	82.70	82.70	82.70	82.70	82.70
100	107.70	107.70	107.70	107.70	107.70	107.70	107.70	107.70	107.70	107.70	107.70
125	132.70	132.70	132.70	132.70	132.70	132.70	132.70	132.70	132.70	132.70	132.70
150	157.70	157.70	157.70	157.70	157.70	157.70	157.70	157.70	157.70	157.70	157.70
175	182.70	182.70	182.70	182.70	182.70	182.70	182.70	182.70	182.70	182.70	182.70
200	207.70	207.70	207.70	207.70	207.70	207.70	207.70	207.70	207.70	207.70	207.70
225	232.70	232.70	232.70	232.70	232.70	232.70	232.70	232.70	232.70	232.70	232.70
250	257.70	257.70	257.70	257.70	257.70	257.70	257.70	257.70	257.70	257.70	257.70
275	282.70	282.70	282.70	282.70	282.70	282.70	282.70	282.70	282.70	282.70	282.70
300	307.70	307.70	307.70	307.70	307.70	307.70	307.70	307.70	307.70	307.70	307.70

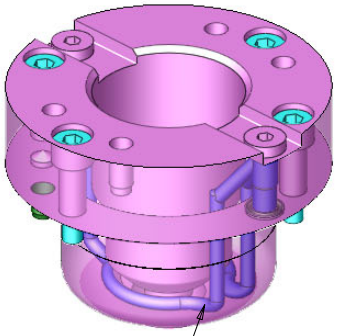
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SLM COOLING BUSHING
STANDARD Version

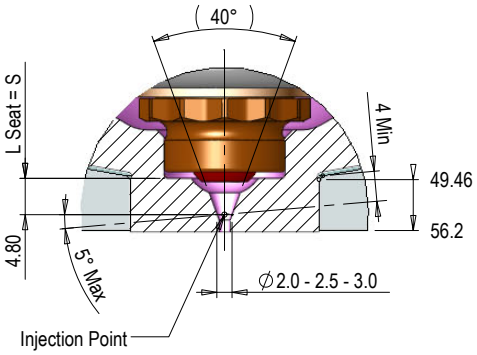




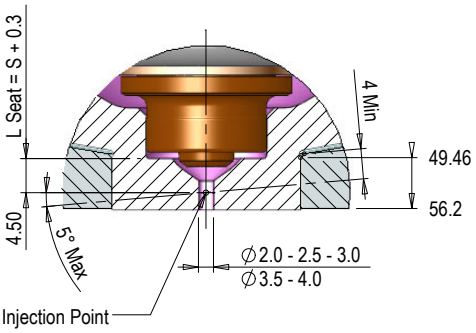
STANDARD Version



Conic valve gating



Cylindrical valve gating

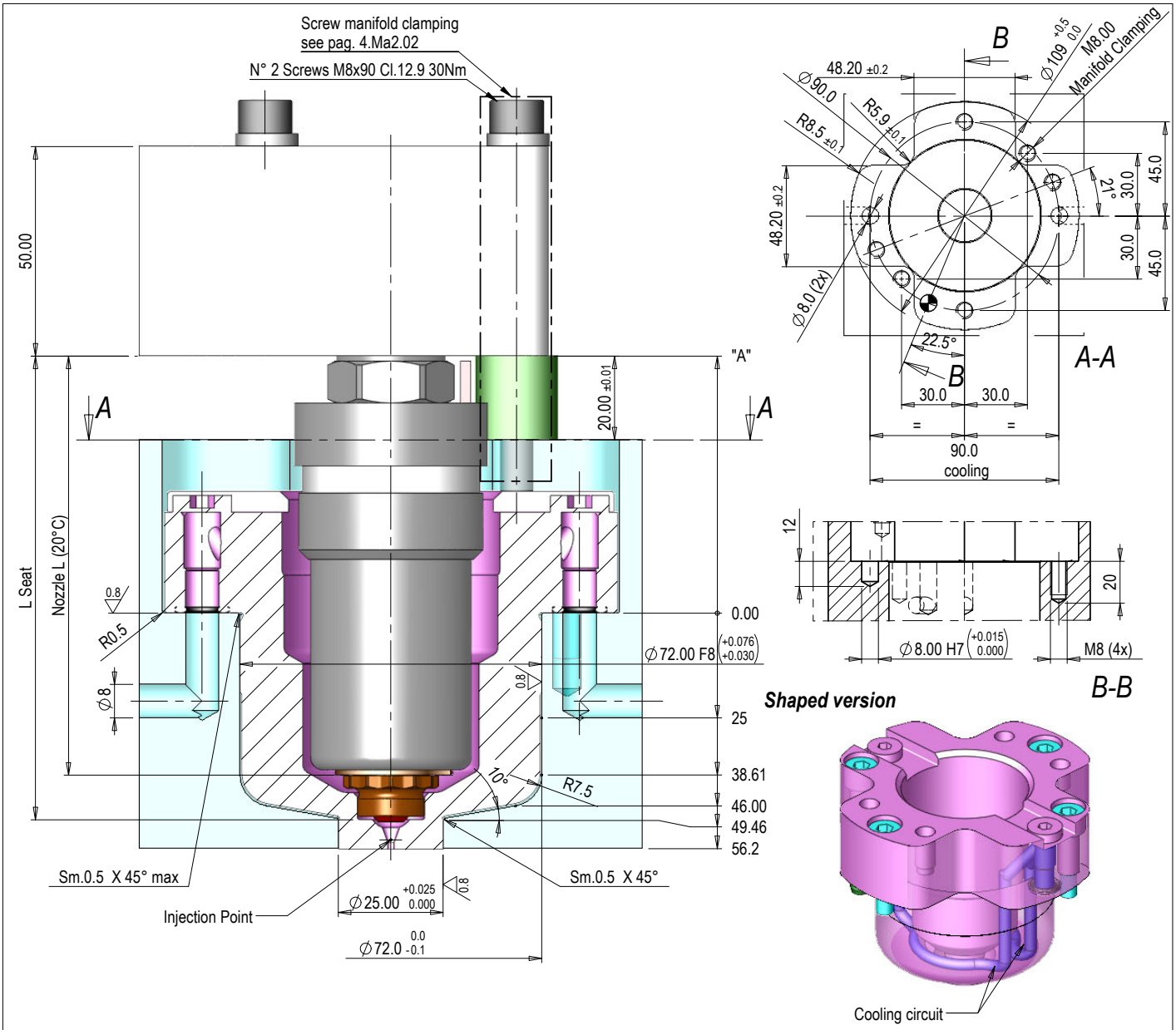


Cooling bushing STANDARD to be used with "L Nozzle" ≥ 125. For version with "L Nozzle" < 125 see pag. 4.Ma1.14

NOZZLE L	DL 200°C	S	A	NOZZLE L	DL 200°C	S	A	COOLING BUSHING
125	0.30	135.70	86.40	325	0.78	336.18	286.88	***Conic valve gating***
150	0.36	160.76	111.46	350	0.84	361.24	311.94	Ø2.0 - 0002-00116
175	0.42	185.82	136.52	375	0.90	386.30	337.00	Ø2.5 - 0002-00117
200	0.48	210.88	161.58	400	0.96	411.36	362.06	Ø3.0 - 0002-00118
225	0.54	235.94	186.64					***Cylindrical valve gating***
250	0.60	261.00	211.70					Ø2.0 - 0002-00350 | Ø2.5 - 0002-00351 | Ø3.0 - 0002-00352
275	0.66	286.06	236.76					Ø3.5 - 0002-00353 | Ø4.0 - 0002-00354
300	0.72	311.12	261.82					

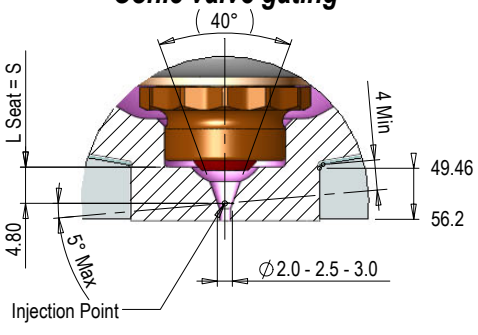
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SLM COOLING BUSHING
SHAPED Version

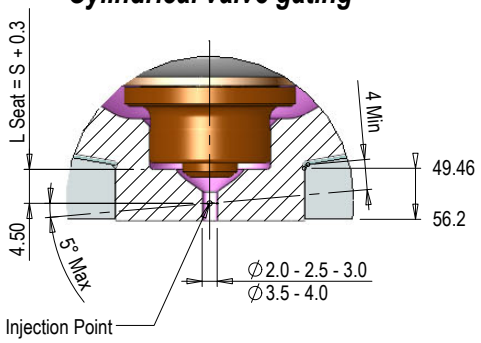


Shaped version

Conic valve gating



Cylindrical valve gating



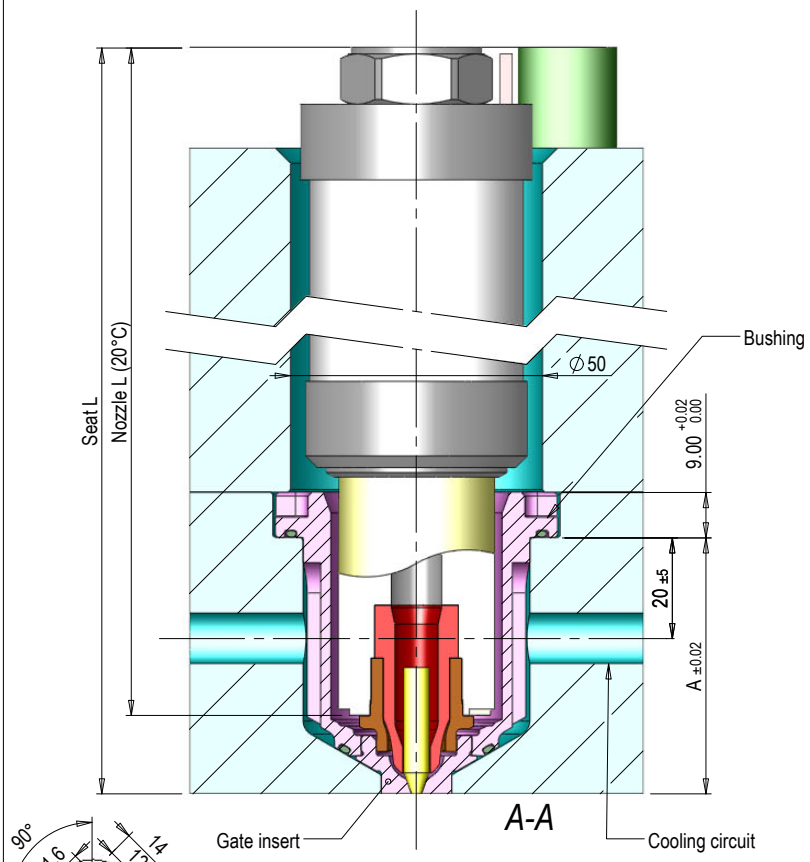
SHAPED Cooling bushing to be used with "L Nozzle" 88 ≤ L < 125 mm (*). For version with "L Nozzle" ≥ 125 see pag. 4.Ma1.13

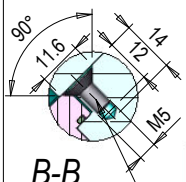
NOZZLE L	DL 200°C	S	A	COOLING BUSHING	
88 (*)	0.21	98.61	49.31	Conic valve gating	Cylindrical valve gating
100	0.24	110.64	61.34	Ø2.0 - 0002-00119 Ø2.5 - 0002-00120 Ø3.0 - 0002-00121	Ø2.0 - 0002-00355 | Ø2.5 - 0002-00356 | Ø3.0 - 0002-00357 Ø3.5 - 0002-00358 | Ø4.0 - 0002-00359

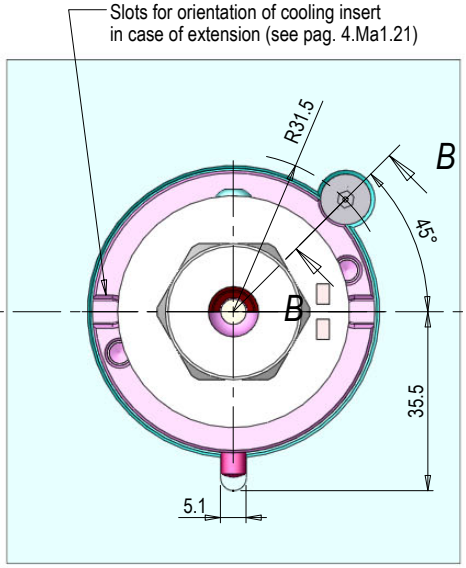
(*) The Shaped cooling bushing can't be used with "L Nozzle" = 75 standard. "L Nozzle" = 88: minimun limit standard out (only on request)

Index

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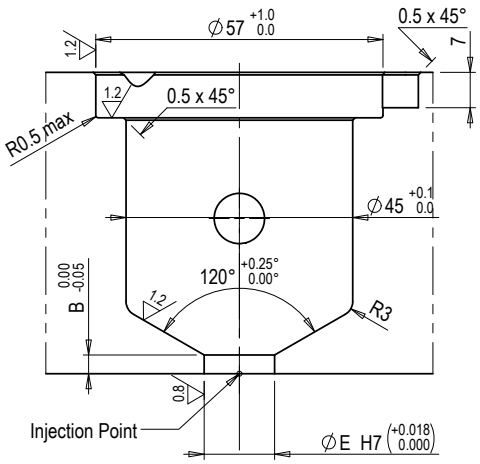




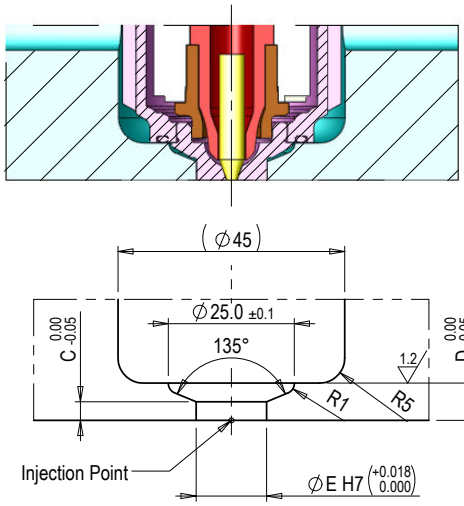


1) Cooling note: suggested hole Ø10 to cool max 4 bushings with only 1 circuit (range 4÷6 Bar)

Standard Seat



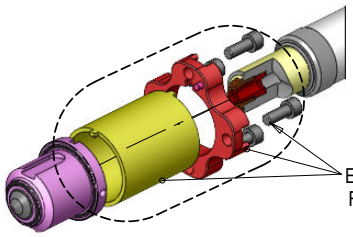
On plane OR Seat





for Ø gate and codes check page 4.Ma1.28

COOLING INSERT Extension



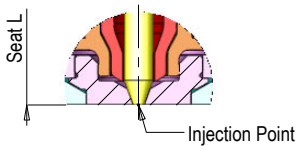
Extension components
For further details see
pag. 4.Ma1.30

	Seat L	A	B	C	D	E
PGC20	L+DL+11.2	47.80	1.85	2.00	4.40	18
PGC30 / PGY30	L+DL+15.2	50.80	3.70	3.70	7.40	14

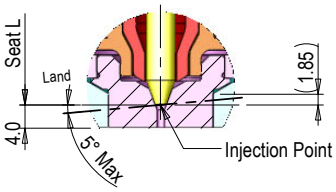
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Type **PGC20**

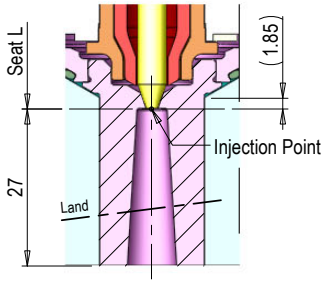
Version L=08



Version L=12

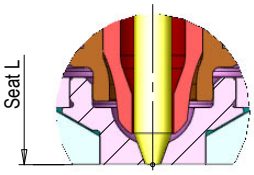


Version L=39

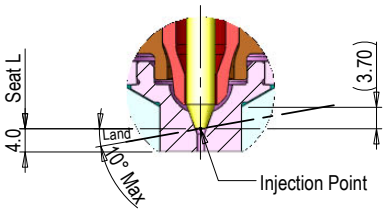


Type **PGC30**

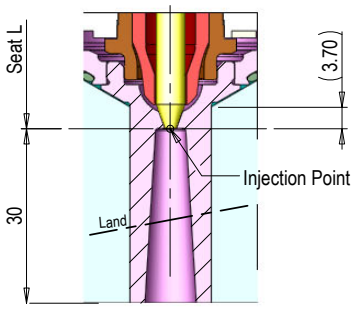
Version L=11



Version L=15

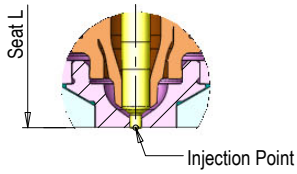


Version L=42

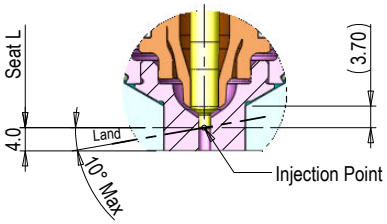


Type **PGY30**

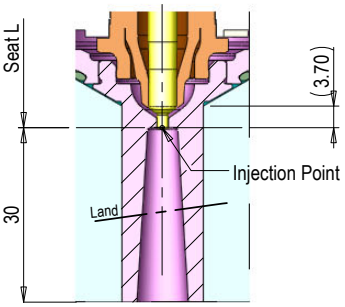
Version L=11



Version L=15



Version L=42

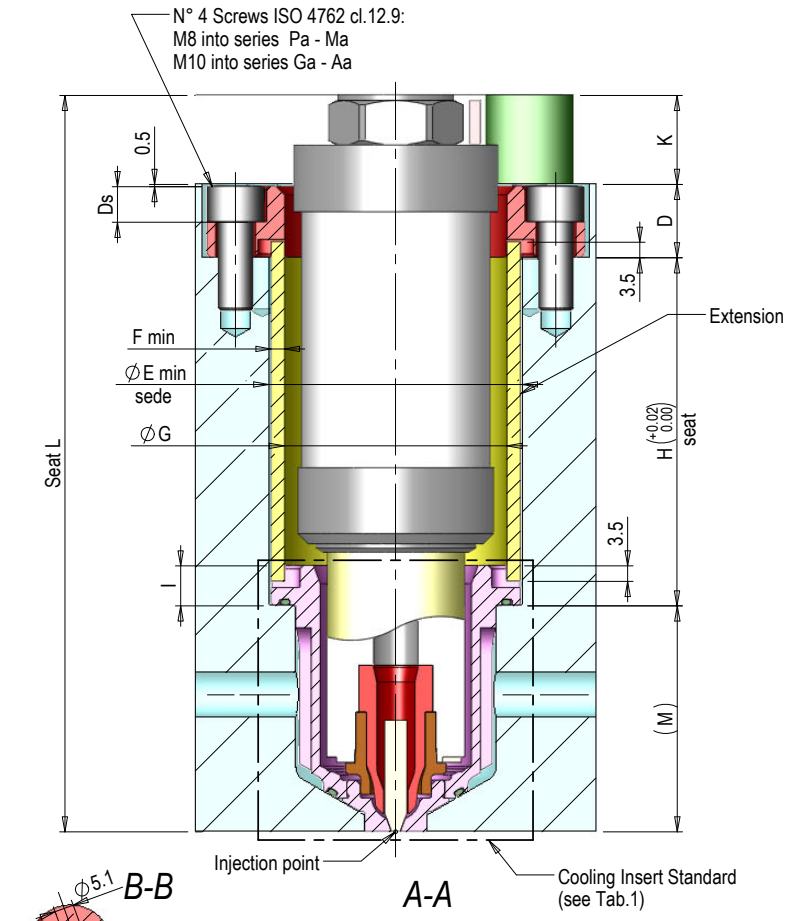


For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

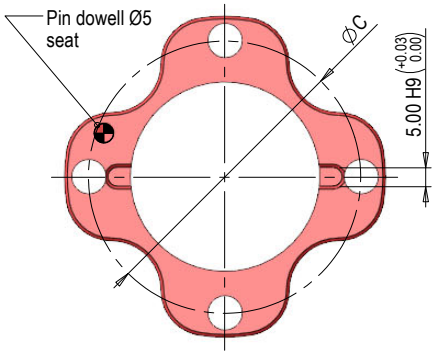
GATE INSERT			
	Version L=08	***Version L=12***	***Version L=39***
PGC20	Gate Ø2.0 - 0335-00019 Ø2.5 - 0335-00020 Ø3.0 - 0335-00021	Gate Ø2.0 - 0335-00024 Ø2.5 - 0335-00025 Ø3.0 - 0335-00026	Gate Ø2.0 - 0335-00029 Ø2.5 - 0335-00030 Ø3.0 - 0335-00031
	Version L=11	***Version L=15***	***Version L=42***
PGC30	Gate Ø2.0 - 0335-00034 Ø2.5 - 0335-00035 Ø3.0 - 0335-00036	Gate Ø2.0 - 0335-00039 Ø2.5 - 0335-00040 Ø3.0 - 0335-00041	Gate Ø2.0 - 0335-00044 Ø2.5 - 0335-00045 Ø3.0 - 0335-00046
PGY30	Gate Ø2.0 - 0335-00049 Ø2.5 - 0335-00050 Ø3.0 - 0335-00051 Ø3.5 - 0335-00052 Ø4.0 - 0335-00053	Gate Ø2.0 - 0335-00054 Ø2.5 - 0335-00055 Ø3.0 - 0335-00056 Ø3.5 - 0335-00057 Ø4.0 - 0335-00058	Gate Ø2.0 - 0335-00059 Ø2.5 - 0335-00060 Ø3.0 - 0335-00061 Ø3.5 - 0335-00062 Ø4.0 - 0335-00063

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COOLING INSERT EXTENSION
(customer's care)

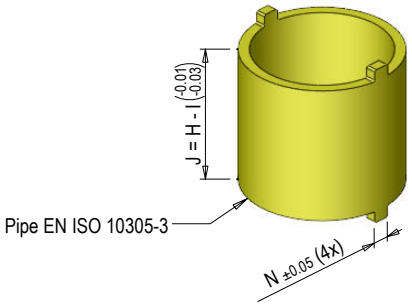


Part. Flange - rear view
(manufacturing by customer



*Flange shape at discretion customer based on the manifold screws position.

Part. Extension
(manufacturing by customer)



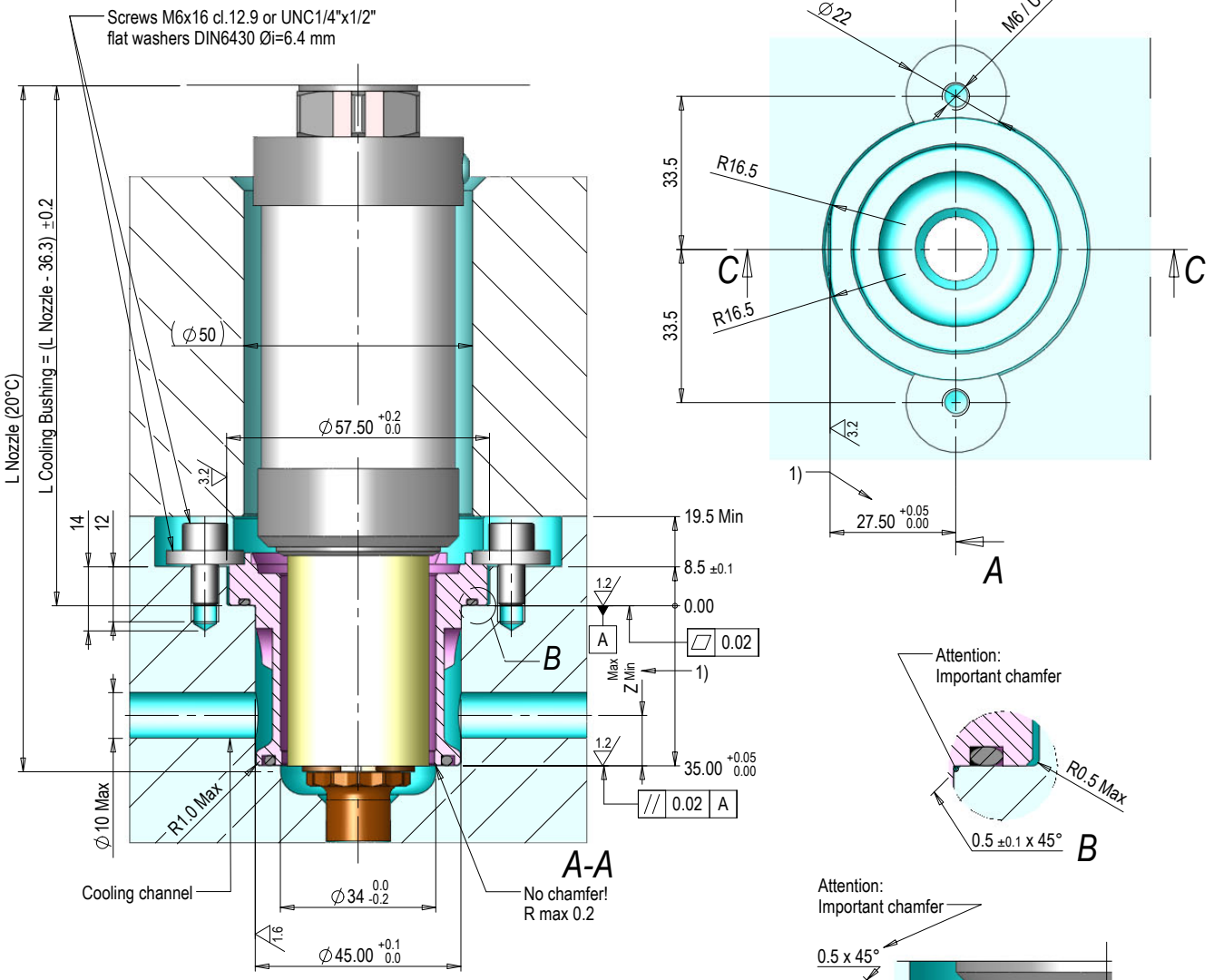
Tab.1

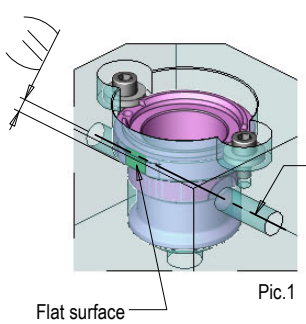
Series	Type	Ref. Page for standard code
Pa	TTC	4.Pa1.23
	CTC	4.Pa1.25
Ma	TTC	4.Ma1.27
	CTC	4.Ma1.29
Ga	TTC	4.Ga1.25
	CTC	4.Ga1.27
Aa	TTC	4.Aa1.22

Manufacturing dimensions (cooling insert and flange):

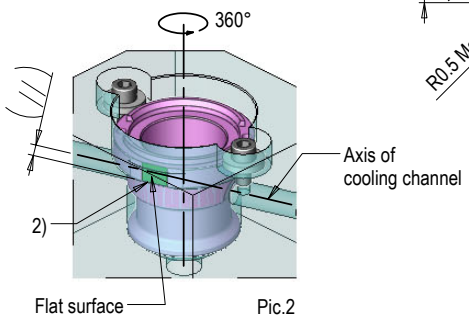
		Series			
Dim.	Description	Pa	Ma	Ga	Aa
A	Manifold clamping distance	60		80	
ØB	Flange Size	77	87	102	112
ØC	Counterbore position & thread screws ISO4762	62	72	84	94
D	Depth seat of flange	16.5		19.5	
Ds	Counterbore depth	8		10	
ØE	Minimun diameter of seat extension	46	57	67	78
F	Tickness of extension (min)	3			
ØG	Internal diameter of extension	39	50	60	70
H	Pocket of extension pipe	= Seat L - 63.25 [PGC/Y30]	= Seat L - 84.3 [PGC20] = Seat L - 83.7 [PGC/Y30]	= Seat L - 101.7 [PGC20] = Seat L - 105.5 [PGC/Y30]	= Seat L - 101.3 [PGC20] = Seat L - 103.5 [PGC/Y30]
I	Collar tickness of extension	9		9.5	
J	Height of extension	J = H - I			
K	Height of manifold Thrust block	10.00	20.00	20.00	
M	Support surface height of the cooling insert	36.75 [PGC30-PGY30]	47.80 [PGC20] 50.80 [PGC30-PGY30]	62.20 [PGC20] 66.00 [PGC30-PGY30]	61.80 [PGC20] 64.00 [PGC30-PGY30]
N	Centering pin	3.9	4.9		
R Typ	Radius for flange seat	10	12	14	

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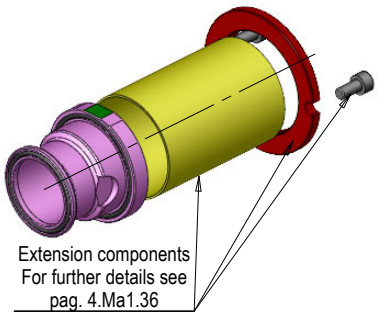


Pic.1



Pic.2

COOLING INSERT Extension

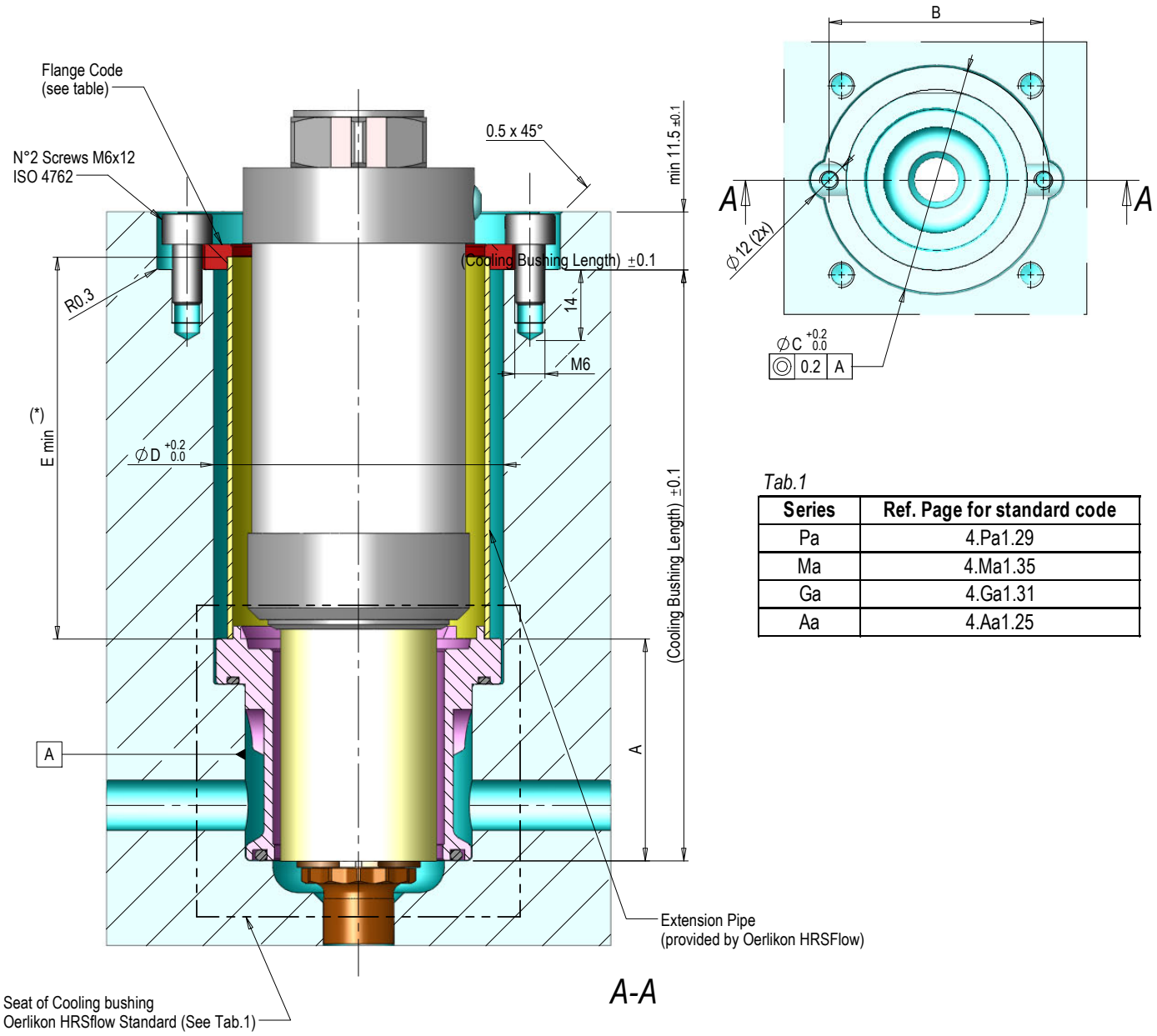


COOLING BUSHING(*)			
Code	***Z***	***Z Min***	***Z Max***
0121-00495	12	7	19.5

(*) Applicable to all type Nozzles Compact type

1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
2) For all cases with "Z Max" > 18, then the positioning face can be located at any angle around the axis of the bushing and with respect to the fixing screws, in order to correctly intercept the customer cooling channels (Fig.2). For more details, please contact the Oerlikon HRSflow technical department.

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Tab.1

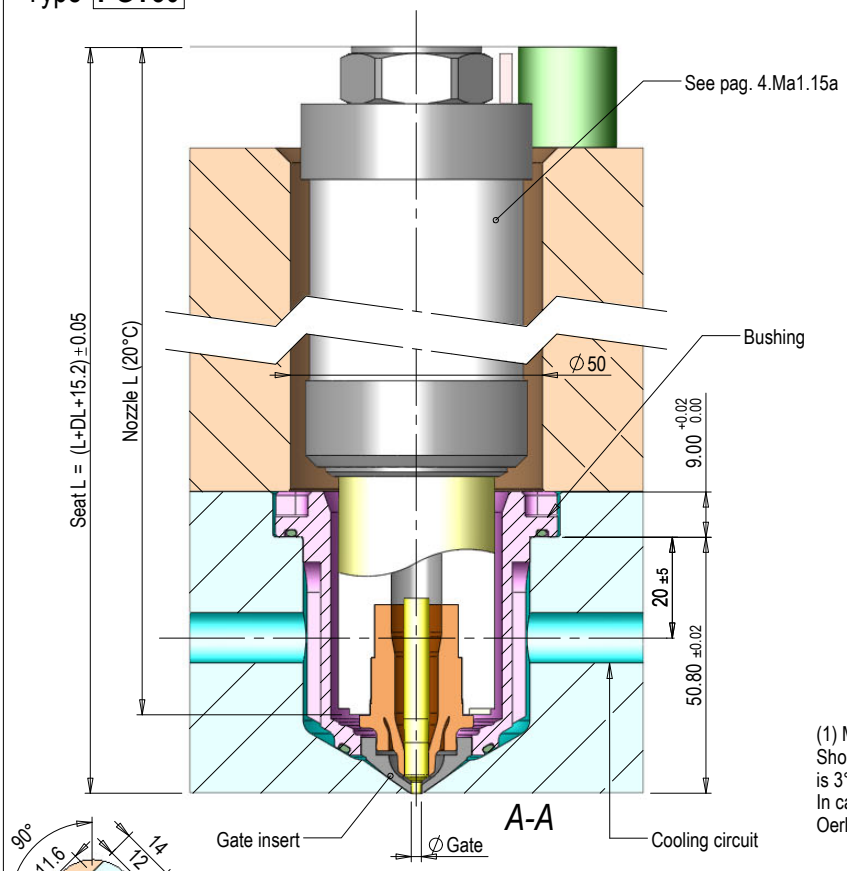
Series	Ref. Page for standard code
Pa	4.Pa1.29
Ma	4.Ma1.35
Ga	4.Ga1.31
Aa	4.Aa1.25

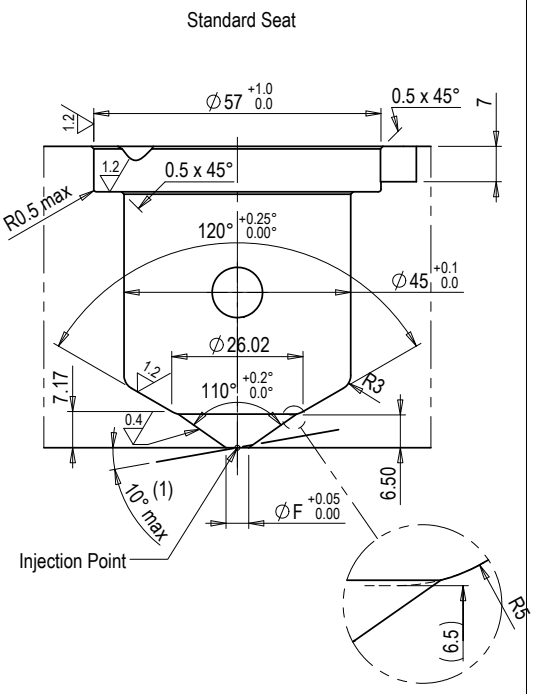
		Dimensions				
Series	**Flange Code**	**A**	**B**	**ØC**	**ØD**	**E (*)**
Pa	0213-00138	39.5	55	59.0	47	50 min
Ma	0213-00135	44	68	72.0	57.5	
Ga	0213-00136	49.5	78	82.0	67.5	
Aa	0213-00137	51.5	89	93.0	78.5	

(*) Dim. "E": minimun lenght request to be able to use the extensions

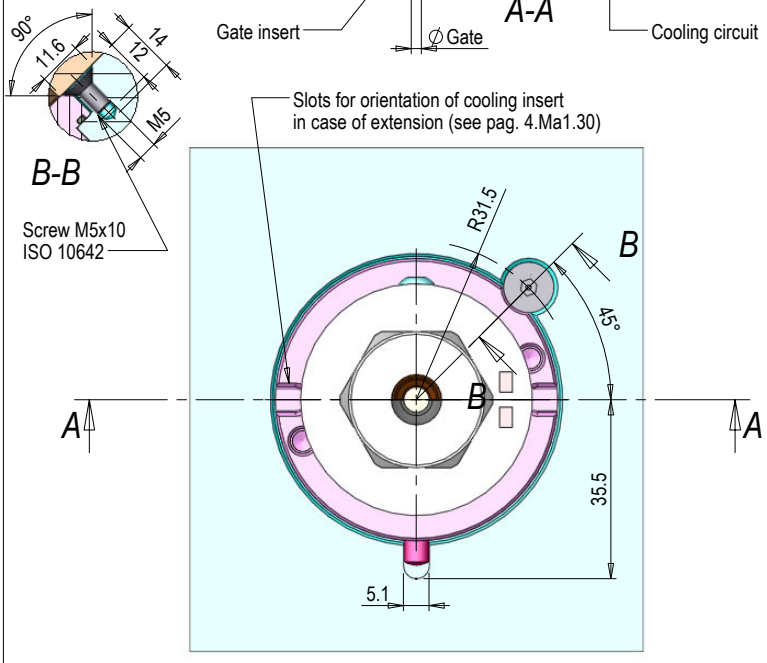
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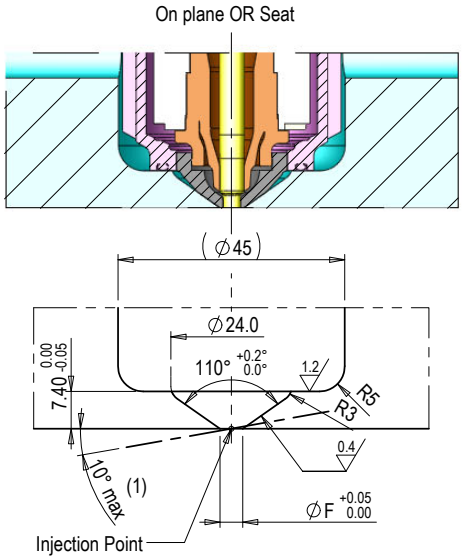
Type **PGY30**





(1) Max angle allowed to the normal to the surface is 10°.
Should gates be placed on cosmetic surfaces/portions, the max angle allowed is 3° instead.
In case of any questions, please contact your technical reference within Oerlikon HRSflow.





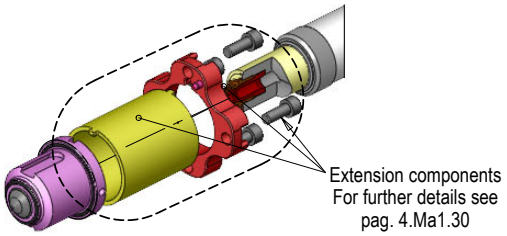
1) Cooling note: suggested hole Ø10 to cool max 4 bushings with only 1 circuit (range 4÷6 Bar)



GATE INSERT		
Code	***Ø Gate***	***Ø F***
0335-00167	2.0	2.6
0335-00168	2.5	3.3
0335-00169	3.0	3.9
0335-00170	3.5	4.5
0335-00171	4.0	5.1

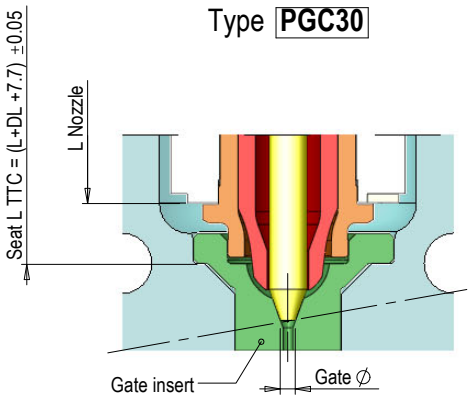
Installation KIT cod: 0283-00648

COOLING INSERT Extension



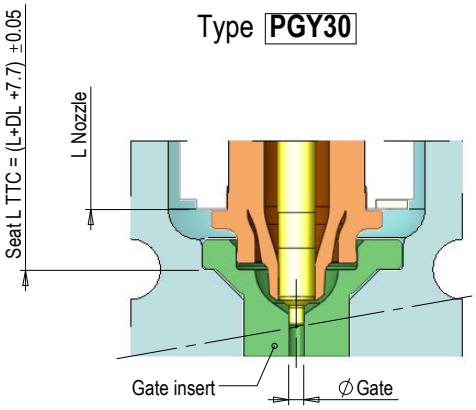
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Type **PGC30**

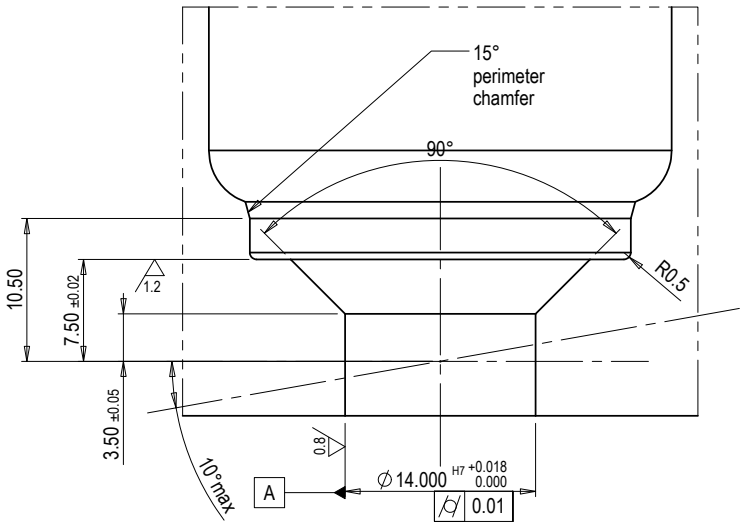


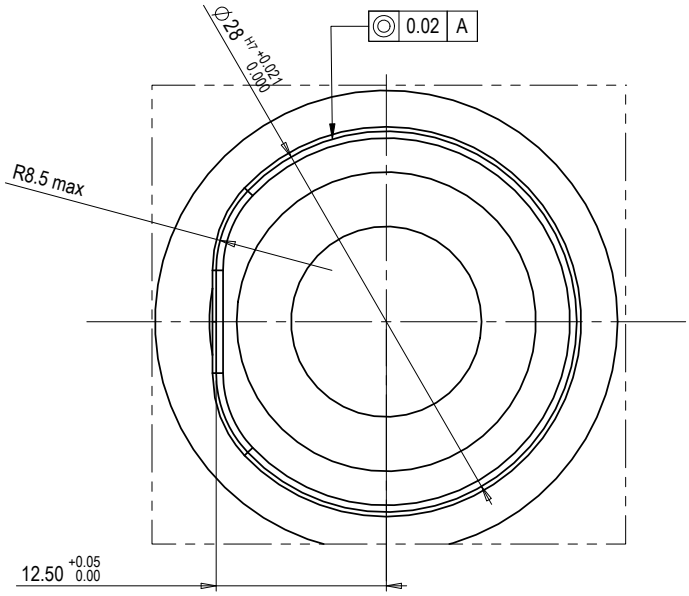
for missing nozzle dimensions check PGC30 config. in the previous pages

Type **PGY30**



for missing nozzle dimensions check PGY30 config. in the previous pages





For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

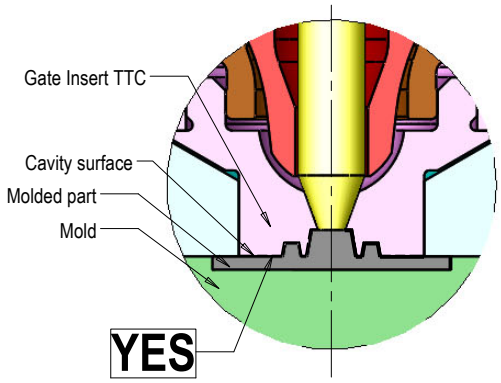
ØGate	PGC30	PGY30
2.0	0335-00182	0335-00187
2.5	0335-00183	0335-00188
3.0	0335-00184	0335-00189
3.5	-	0335-00190
4.00	-	0335-00191

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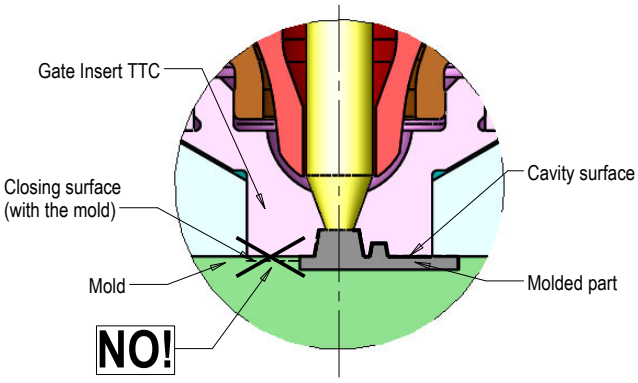
The Gate Insert TTC solution (ex. page 4.Ma1.31) or Cooling Insert TTC (ex. Page 4.Ma1.28) are suitable for any standard Injection process. However, there are some precautions to keep in mind during the designing to use the component properly:

1) The cavity surface of the Gate Insert TTC, in the standard applications, must be totally in contact with the molded part (see Pic.1):

WARNING: is not allowed any closing surface with the mold (see Pic.2)! Oerlikon HRSflow decline any liability for inappropriate operation arising from the Gate Insert TTC reworking that usually is cured by mold maker.



Pic.1



Pic.2

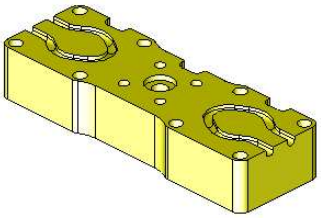
2) The method about the fixing Gate Insert TTC, for the cavity surface reworking phase, is by the customer.

3) Gate Insert TTC is not suitable for Injection-Compression molds or in presence of polymers with expanding additives.

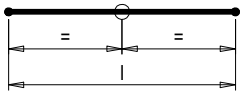
4) For more details about the Gate Insert TTC applicability please contact the Oerlikon HRSflow Technical Office

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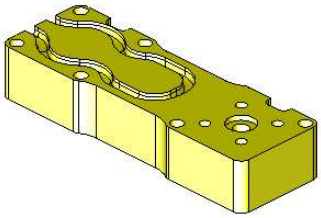
-HL-



Standard
l=150-200-250-300-350-400-450 mm



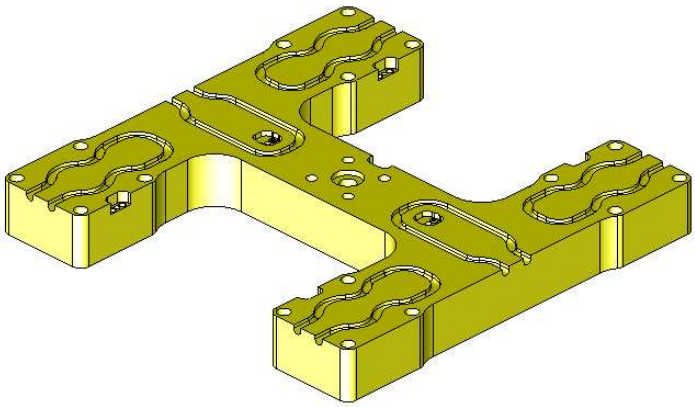
-HD-

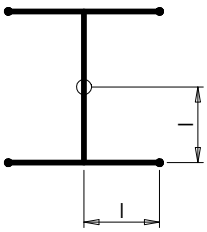


Standard
l=75-100-125-150-175-200-225 mm



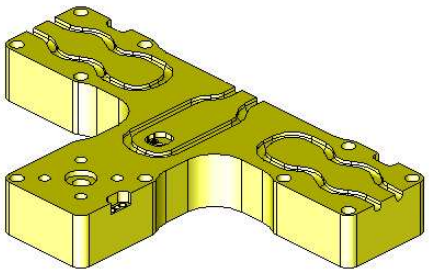
-HH-

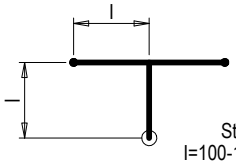




Standard
l=100-125-150 mm

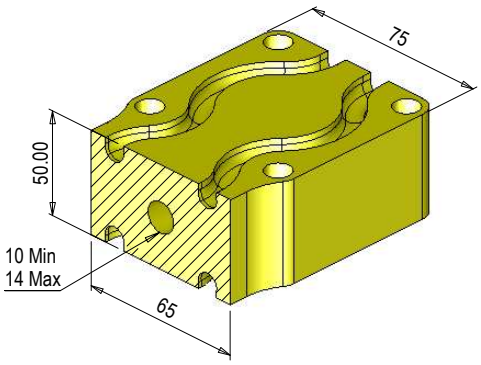
-HT-





Standard
l=100-125-150 mm

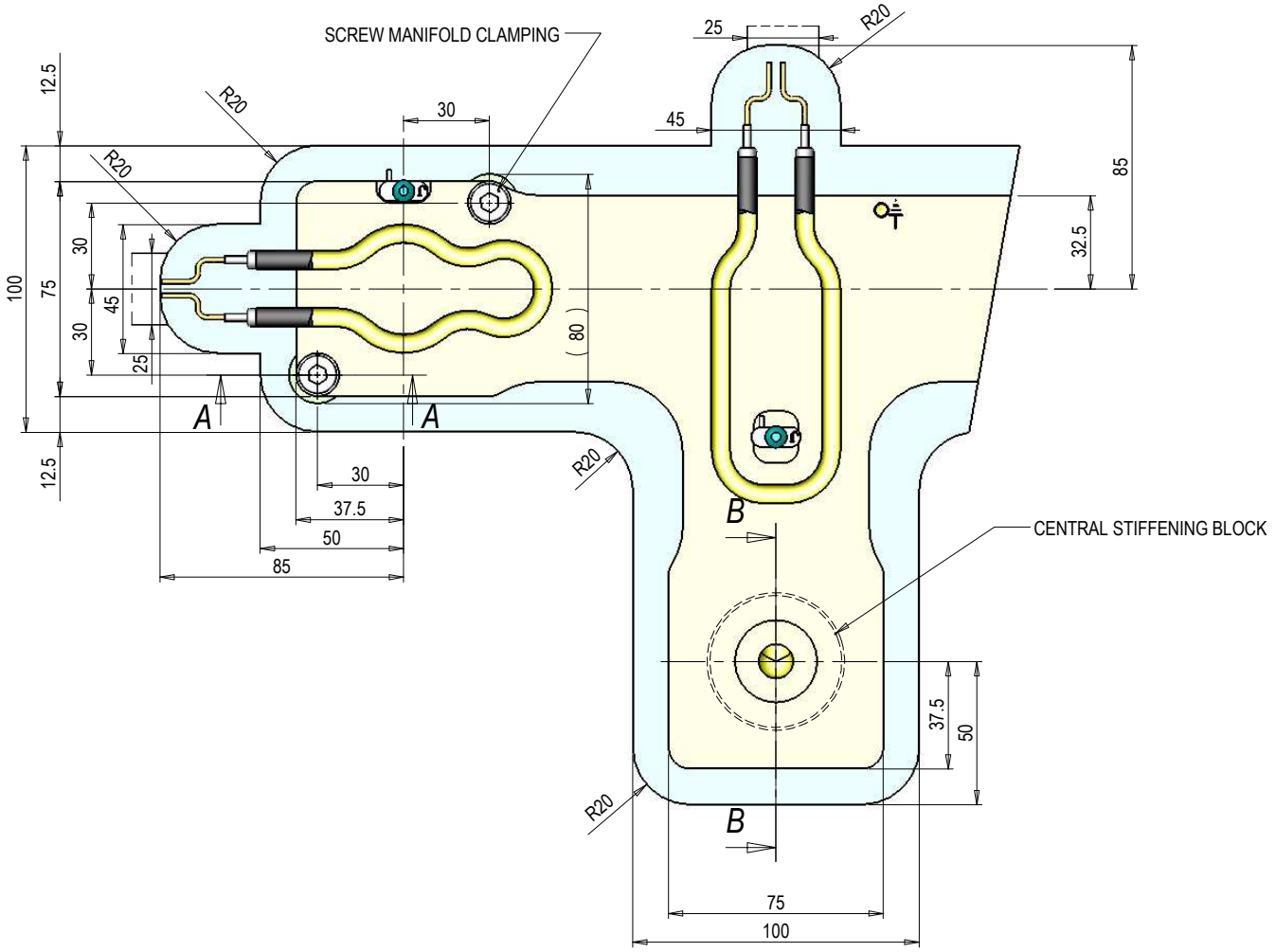
Ma series



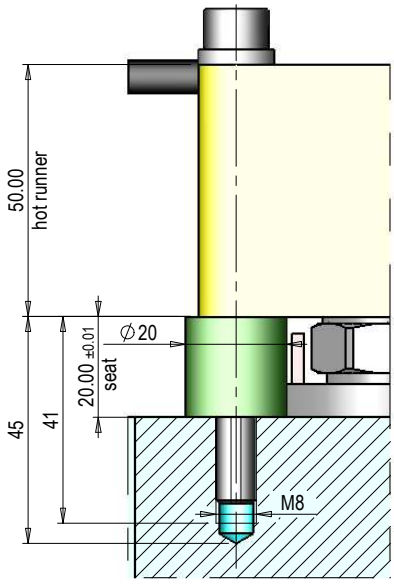
Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

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The following profile is the typical one for
the standard not wired hot runner pocket
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)

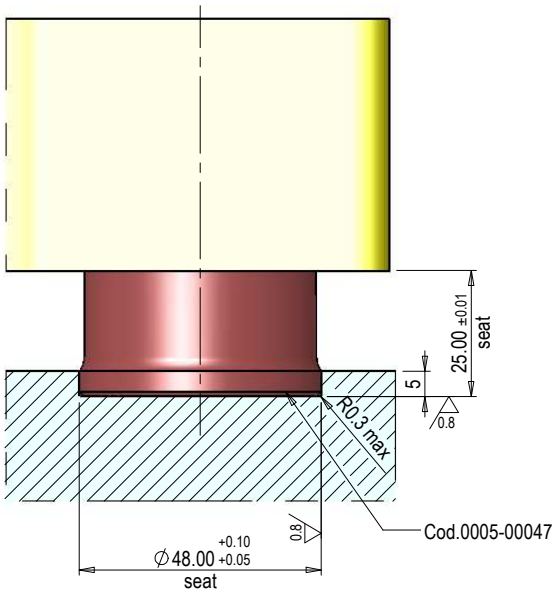


Screw manifold clamping
Screw M8x90 cl.12.9 30 Nm



A-A

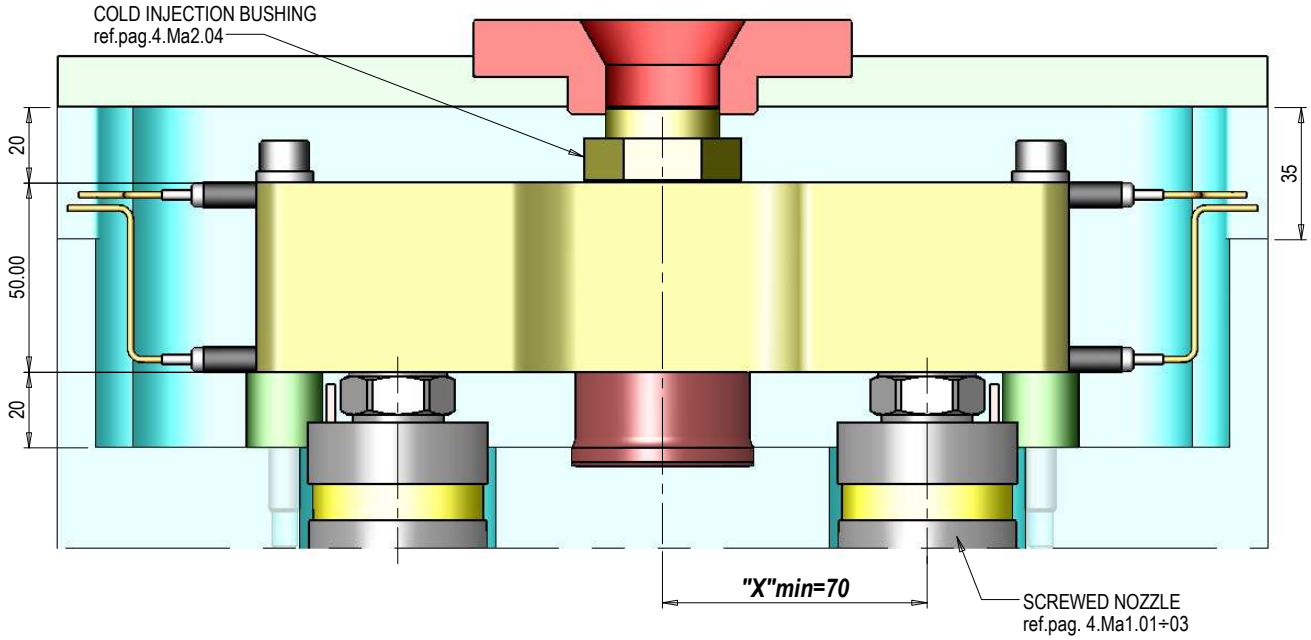
Pocket
central stiffening block



B-B

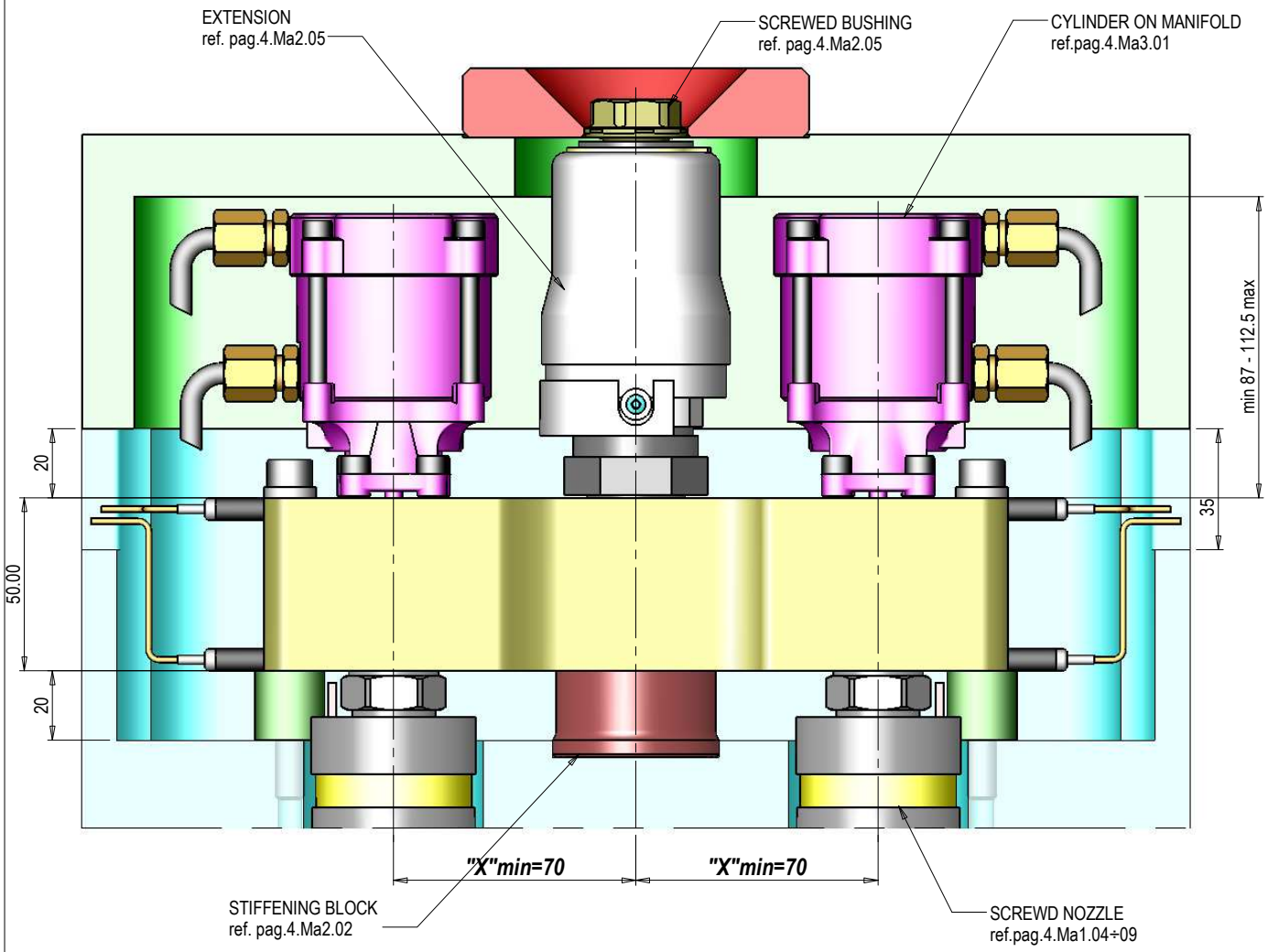
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Structure for TORPEDO or FREE FLOW systems

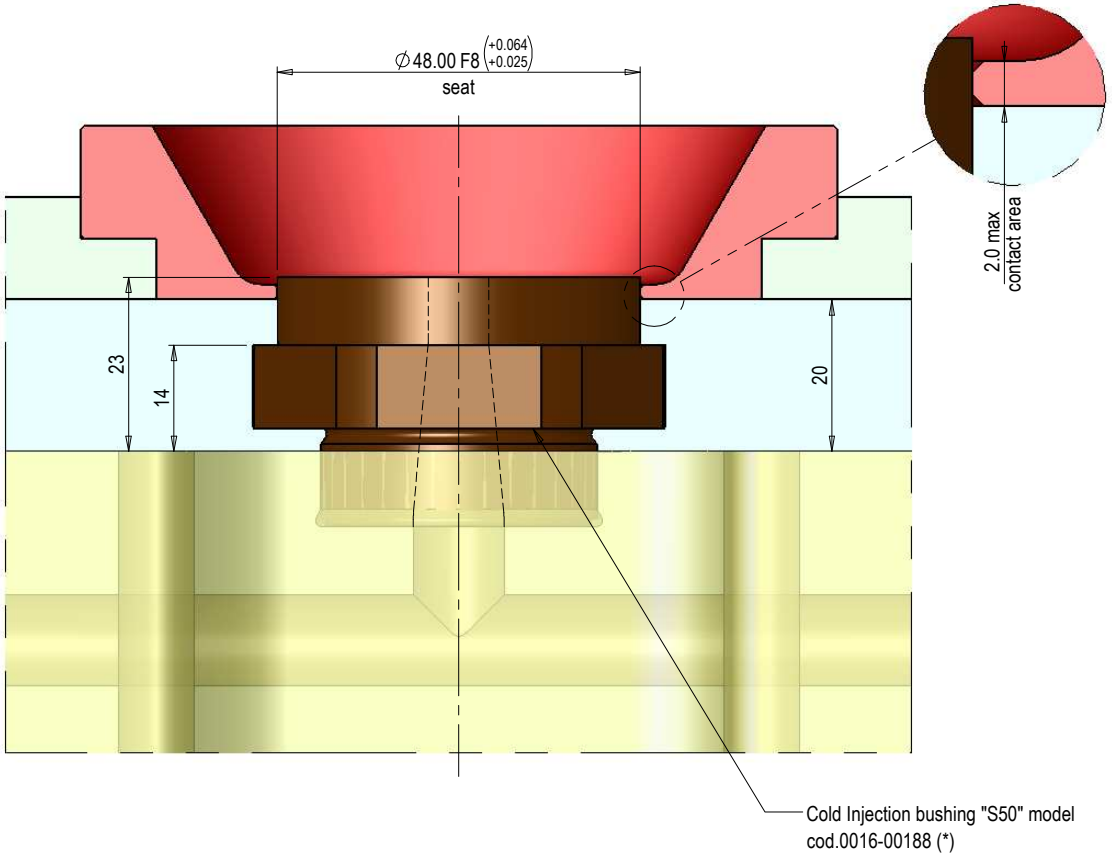


Xmin= min centre distance between injection bushing and nozzle for non standard systems

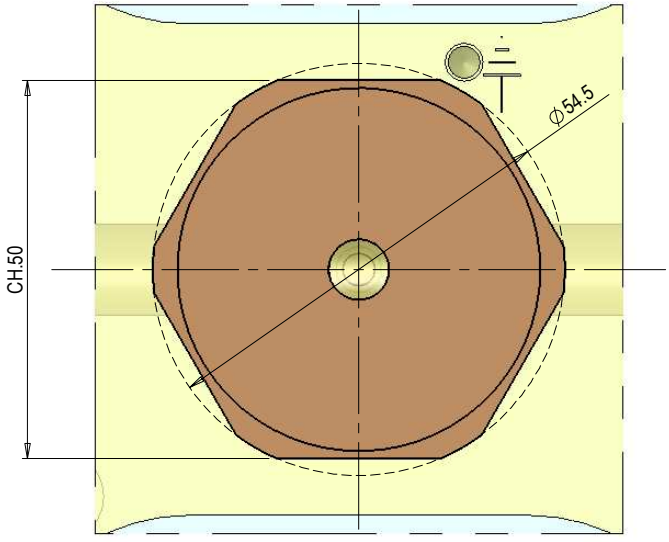
Structure for VALVE GATING systems



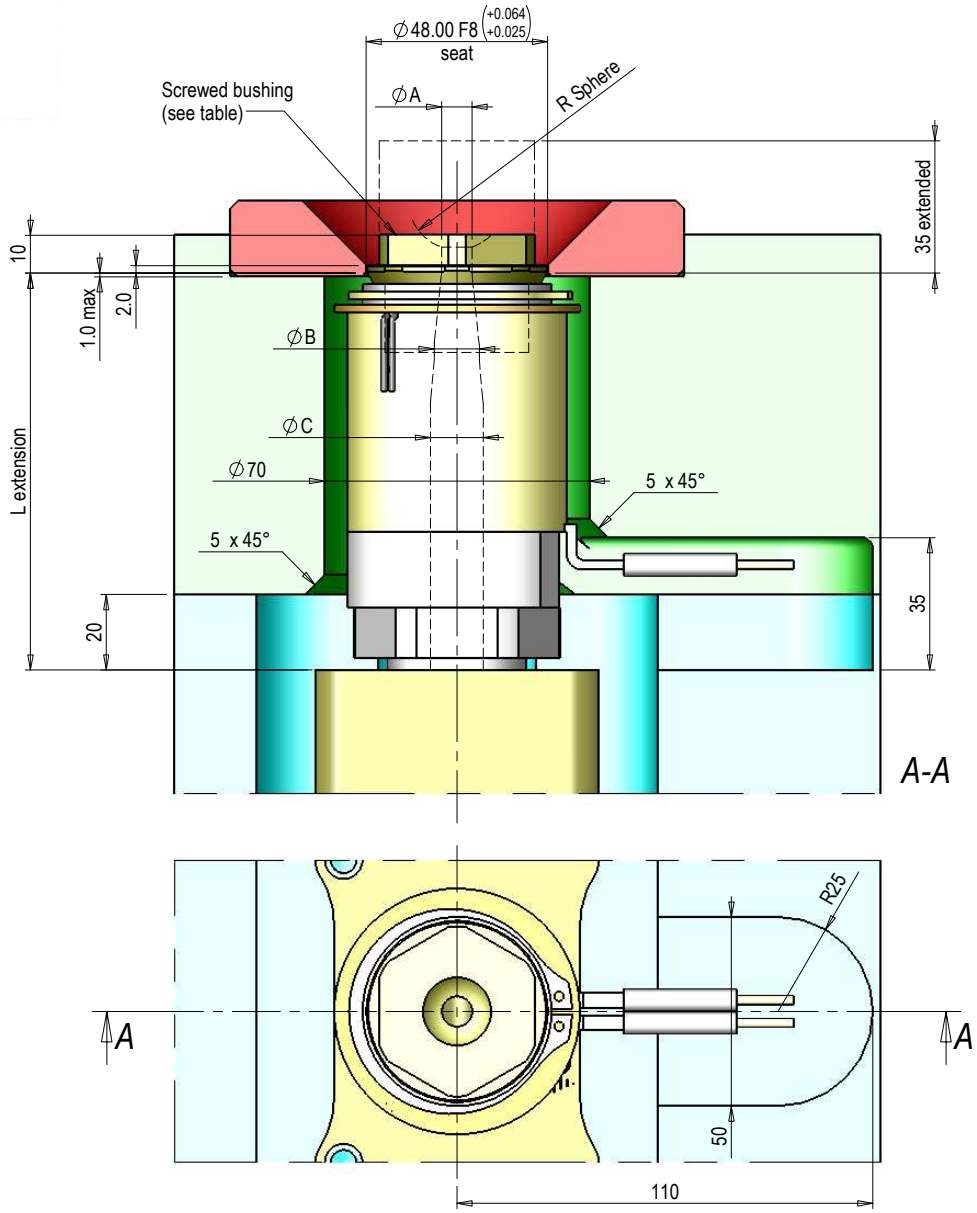
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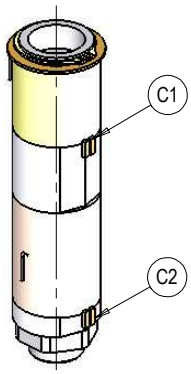
(*)Standard code with R sphere=0. Others R sphere sizes to be required.



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Control Zone



"L" (*)	*MAXIMUN N° OF ZONES*
040.00 ÷ 210.69	1 [C1]
210.70 ÷ 309.99	2 [C1 + C2]

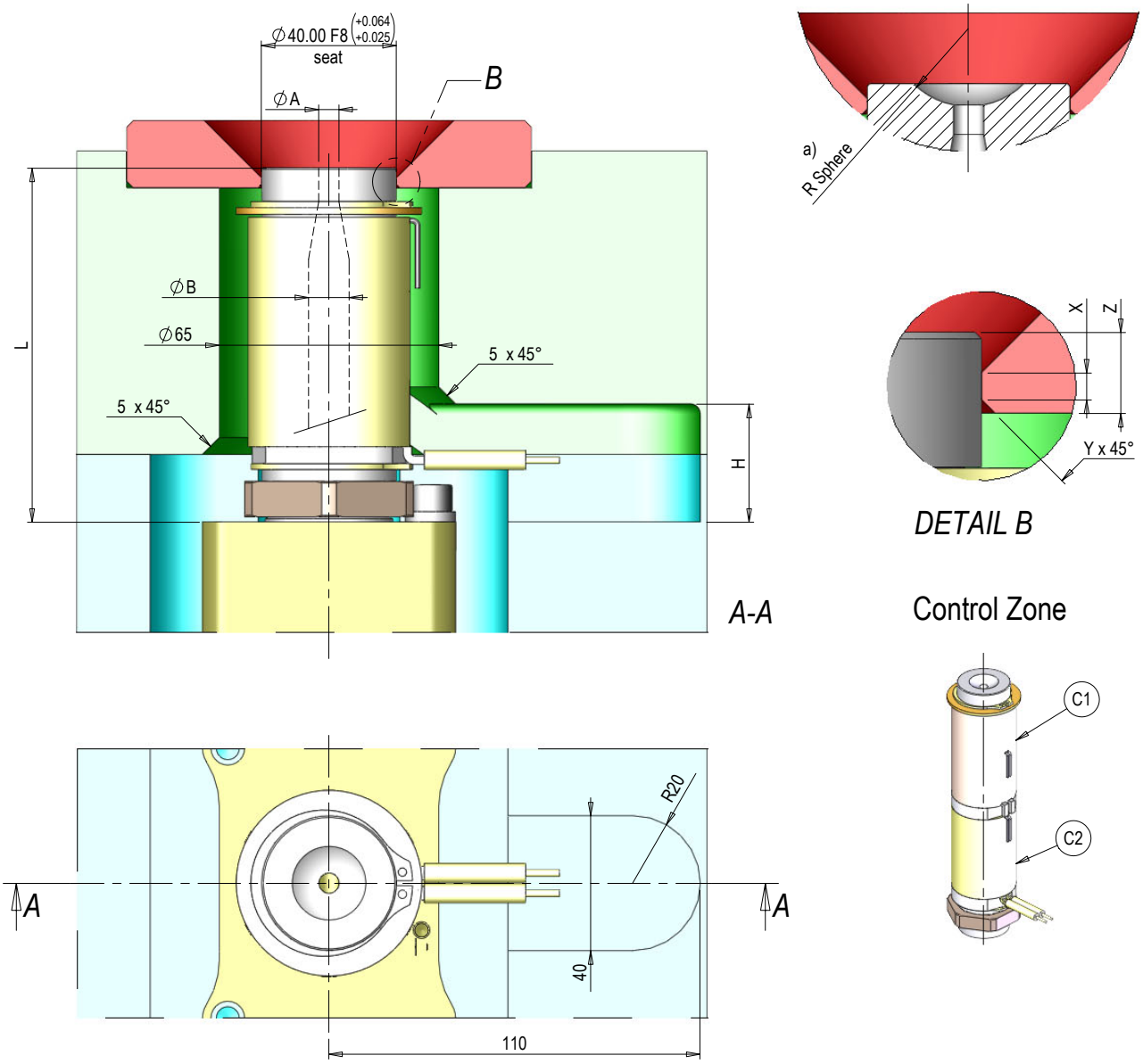
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)

ØB	ØC
10	10
12	14
	16
	18

(*) L = min 040.00 ÷ 309.99 mm max
(**) Available also ØB=ØC=8,14,16,18 mm
(***) Re-workable according to the needs of the customer (by HRS)

STANDARD SCREWED BUSHING CODE	*SPHERE RADIUS*	*ØA*	*ØB*
0015-00468	R 0	6	10
0015-00450	R 12.7		
0015-00451	R 15.5		
0015-00452	R 19.1		
0015-00507	R 20		
0015-00453	R 25		
0015-00454	R40		
0015-00447	R 0	8	12
0015-00456	R 12.7		
0015-00457	R 15.5		
0015-00458	R 19.1		
0015-00508	R 20		
0015-00459	R 25		
0015-00460	R40		
Extended 0015-00449 (***)	R 0	4	4

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a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

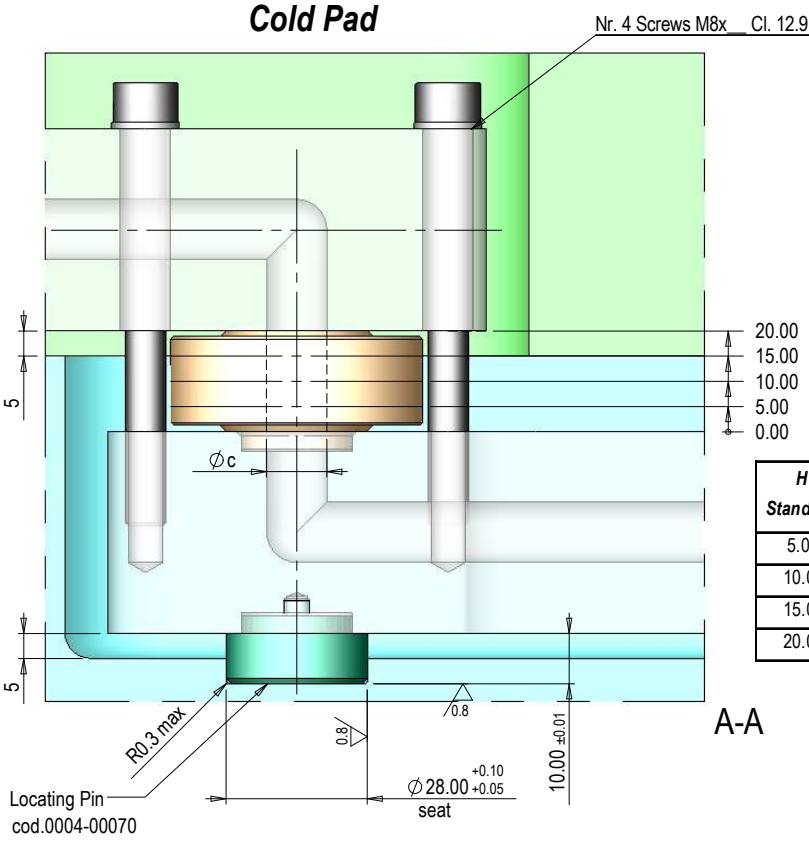
"L" (*)	*MAXIMUN N° OF ZONES*	STANDARD DIAMETERS OF EXTENSIONS DUCT	
		ØA	**ØB**
030.00 ÷ 199.99	1 [C1]	4	8 - 10 - 12
200.00 ÷ 450.00	2 [C1 + C2]	4.5	8 - 10 - 12
(*) L = min 30.00 ÷ 450.00 mm max		5	8 - 10 - 12
		5.5	8 - 10 - 12
		6	8 - 10 - 12 - 14
		6.5	8 - 10 - 12 - 14
		7	8 - 10 - 12 - 14
		7.5	8 - 10 - 12 - 14
		8	8 - 10 - 12 - 14 - 16 - 18 - 20 -
		8.5	10 - 12 - 14 - 16 - 18 - 20
		9	10 - 12 - 14 - 16 - 18 - 20
		10	10 - 12 - 14 - 16 - 18 - 20
		11	12 - 14 - 16 - 18 - 20
		12	12 - 14 - 16 - 18 - 20
		13	14 - 16 - 18 - 20
		14	14 - 16 - 18 - 20

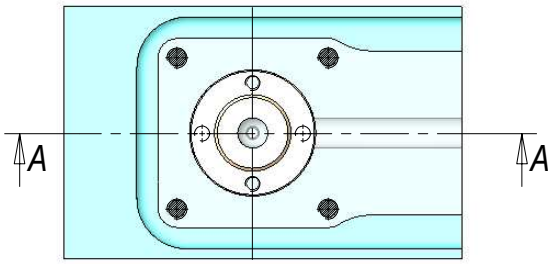
H	***with***
20	30.00 ≤ L ≤ 44.99
35	L ≥ 45.00

X	**Y**	**Z**	***with***
1.8min	0.5max	2.8max	L ≤ 54.99
2	1	4	L ≥ 55.00

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Cold Pad

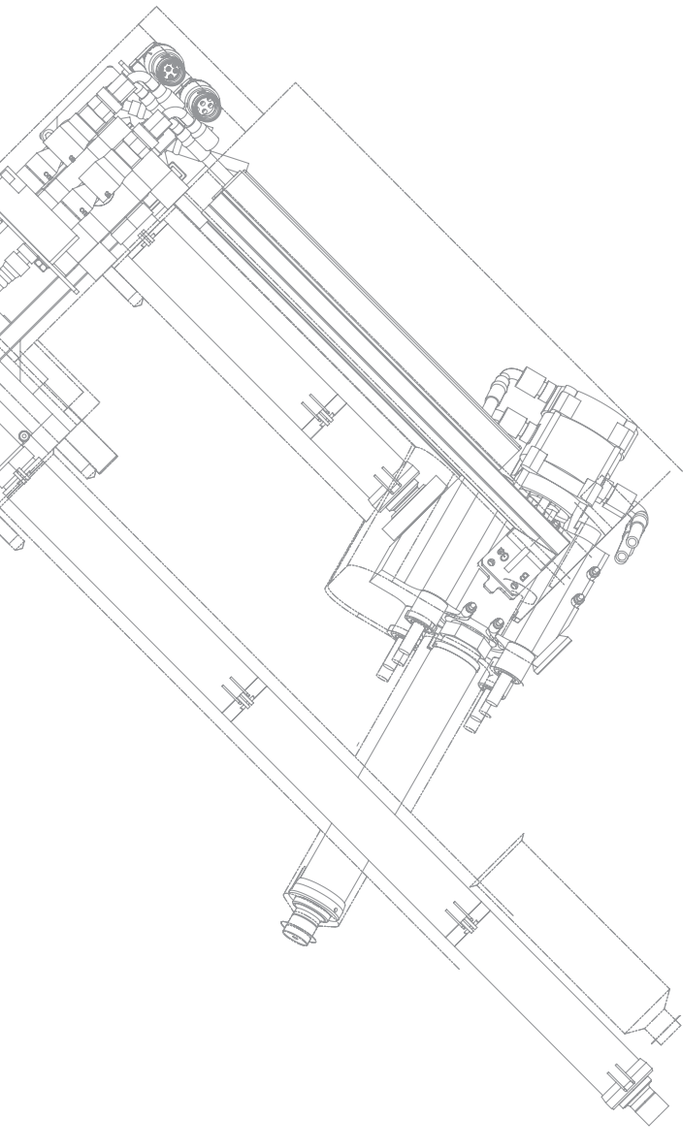




H Standard	Øc=8	Øc=10	Øc=12	Øc=14
5.00	0009-00379	0009-00383	0009-00387	0009-00391
10.00	0009-00380	0009-00384	0009-00388	0009-00392
15.00	0009-00381	0009-00385	0009-00389	0009-00393
20.00	0009-00382	0009-00386	0009-00390	0009-00394

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oerlikon
hrsflow



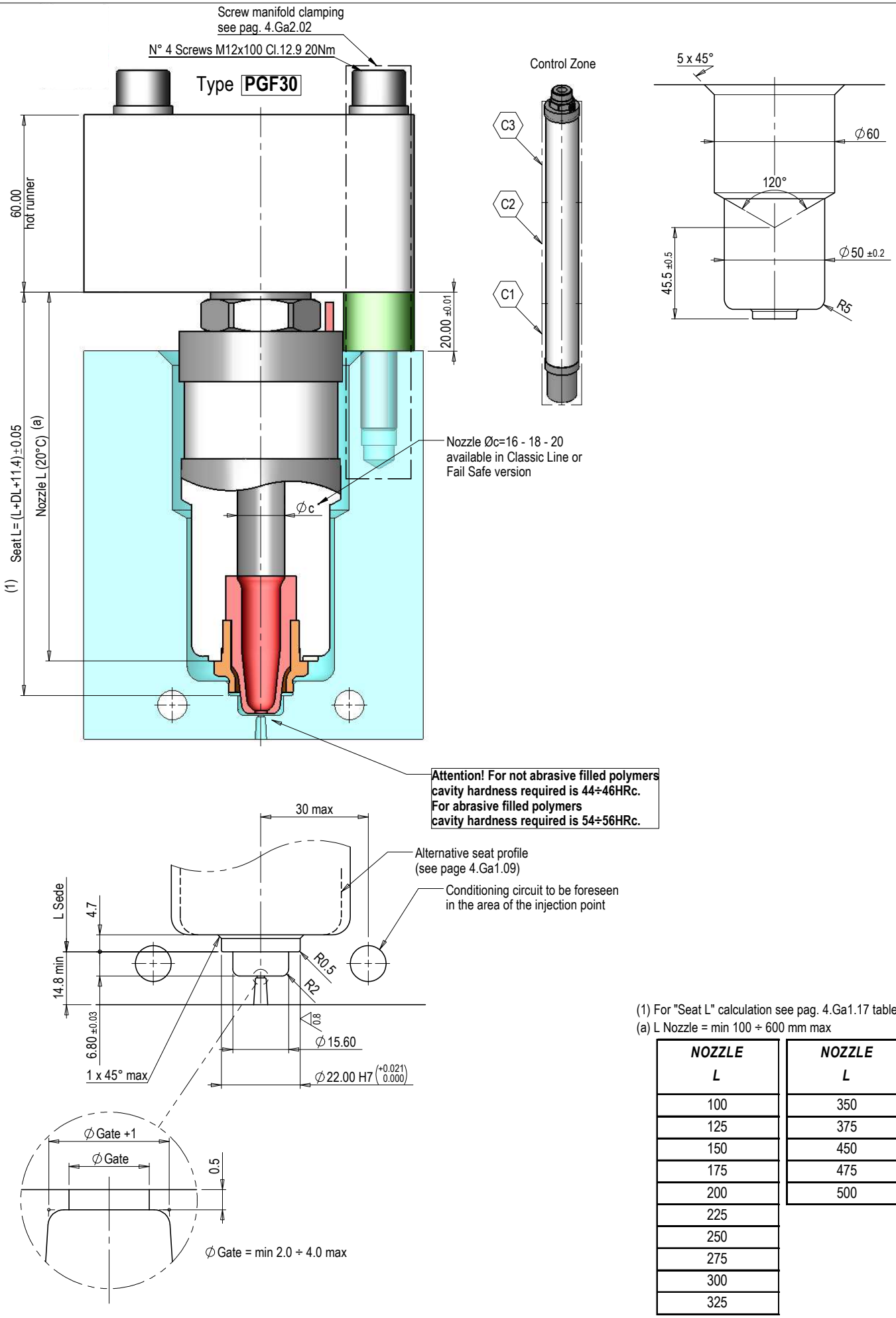
Ga

Ga Series 100÷1225 cm³/s

Serie Ga
Ga Serie
Ga Série
Ga Serie
Ga Série

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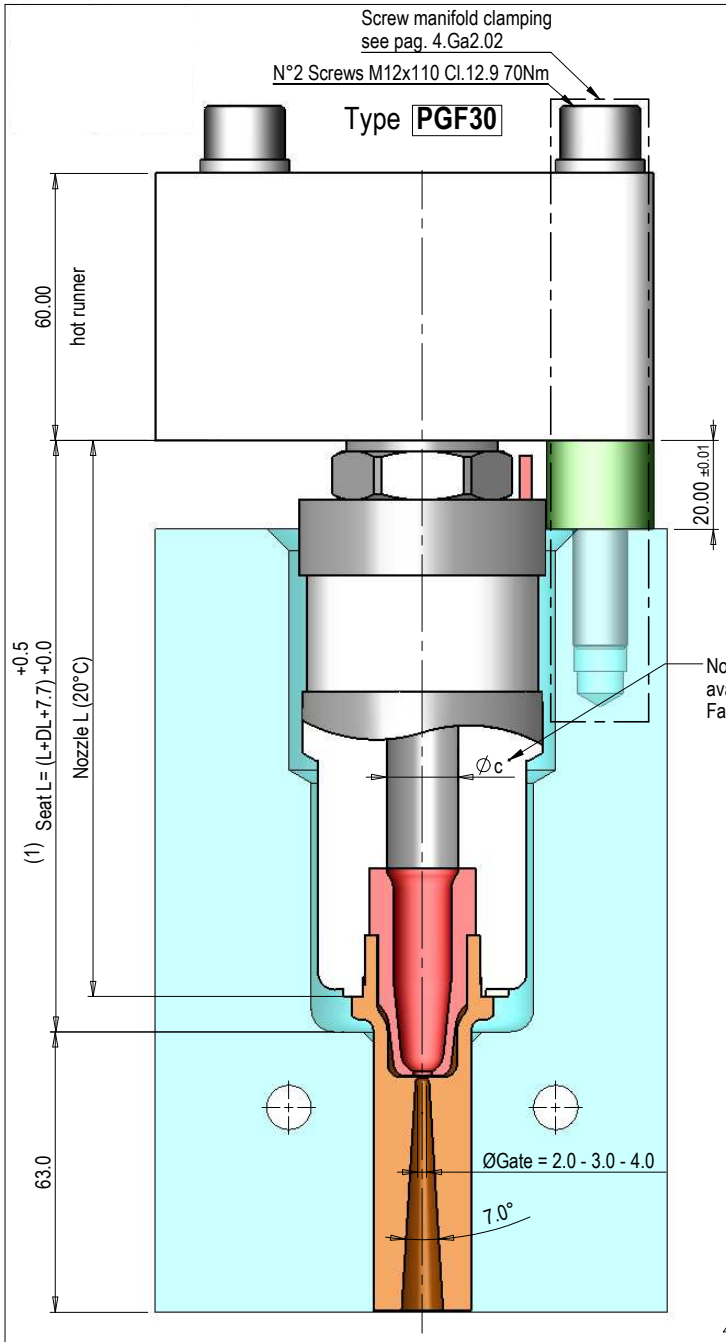
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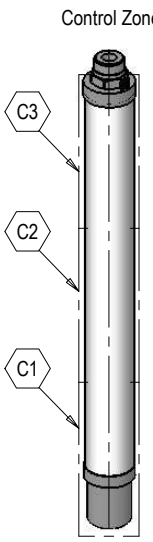


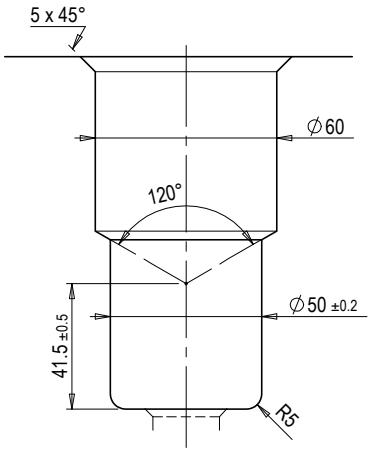
(1) For "Seat L" calculation see pag. 4.Ga1.17 table A
(a) L Nozzle = min 100 ÷ 600 mm max

NOZZLE L	NOZZLE L
100	350
125	375
150	450
175	475
200	500
225	
250	
275	
300	
325	

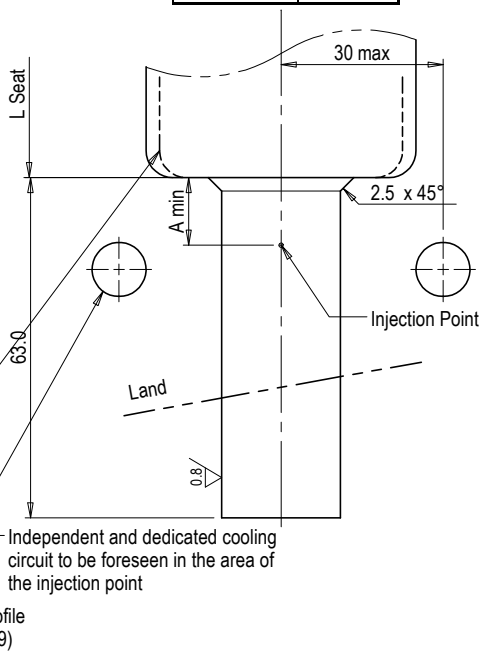
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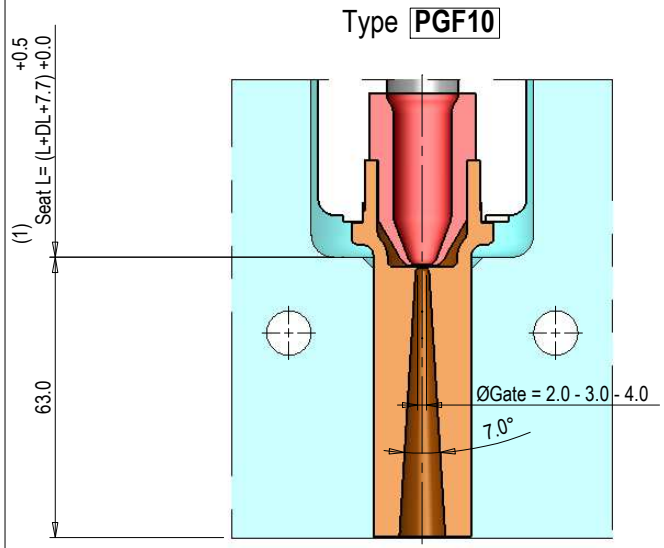






TYPE	A [mm]
PGF30	18.5
PGF10	12.5



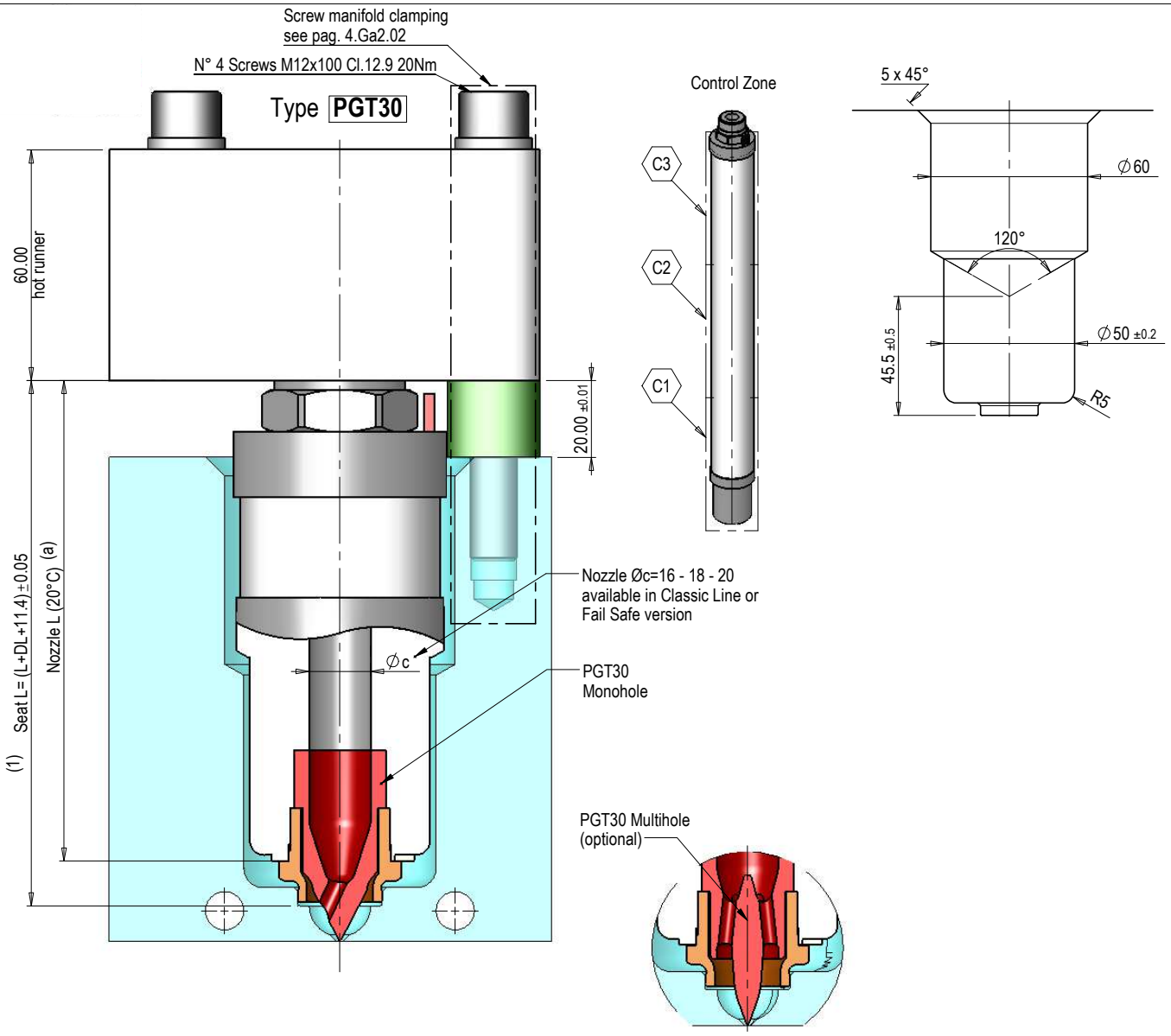


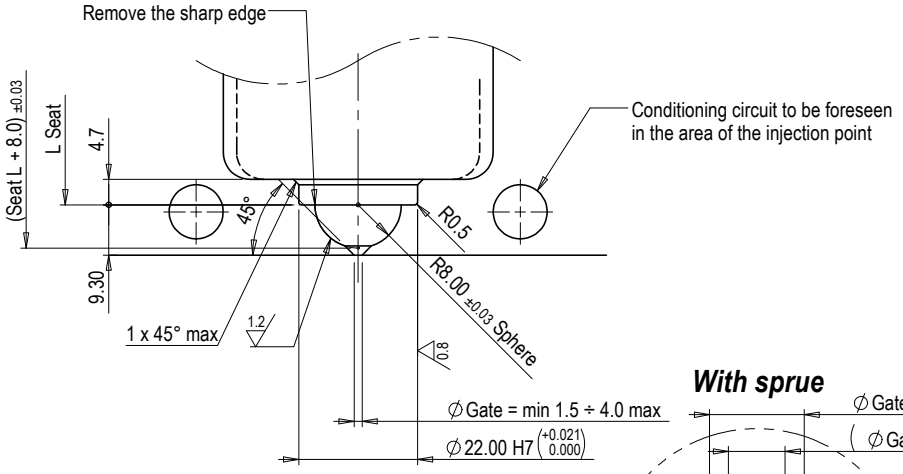
For all reference codes see on page 4.Ga1.10-11

(1) For "Seat L" calculation see pag. 4.Ga1.16 table A

NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

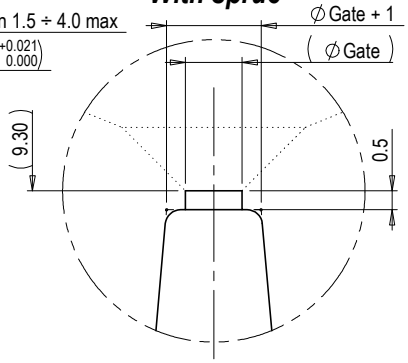
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Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.

With sprue

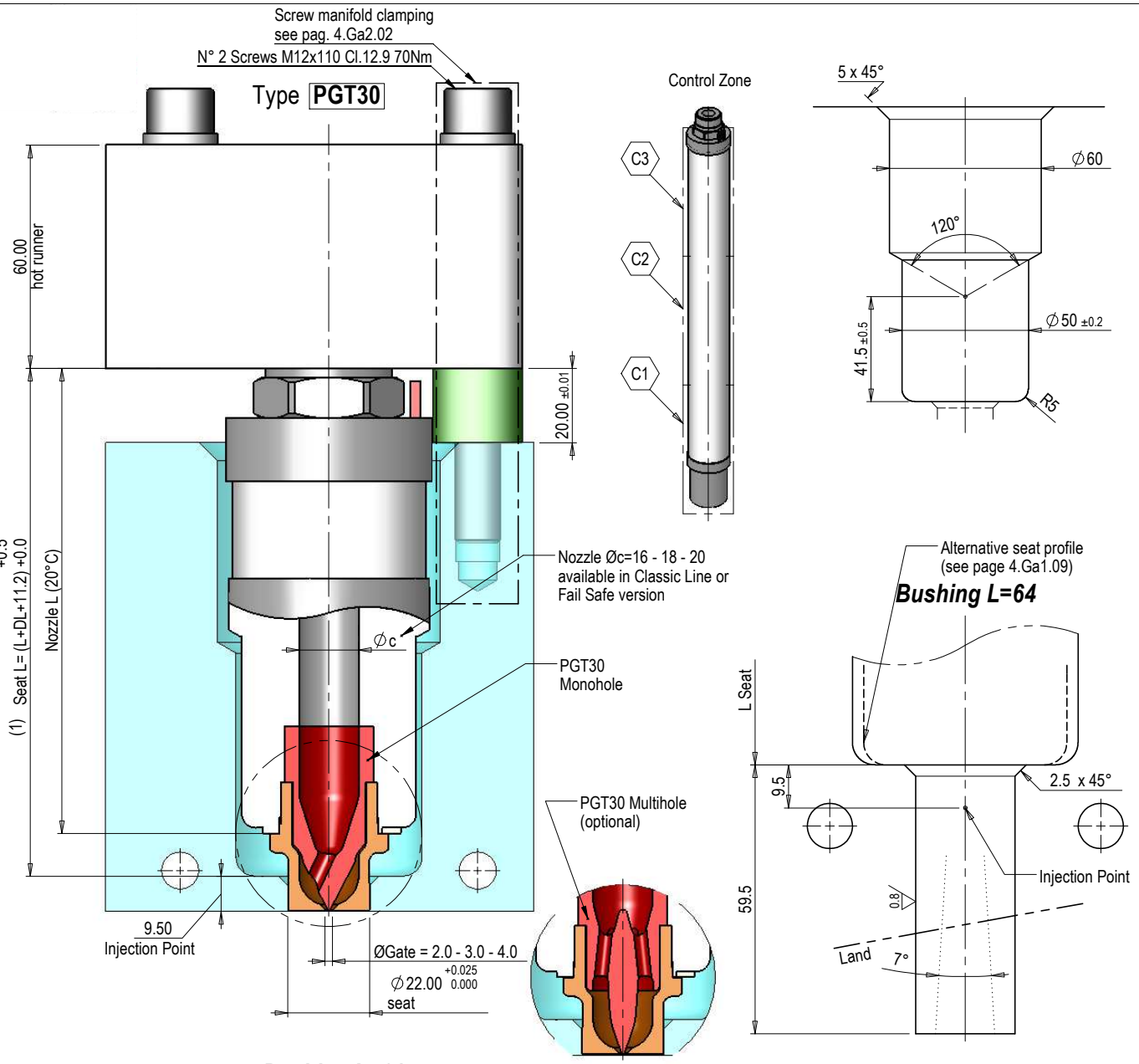


(1) For "Seat L" calculation see pag. 4.Ga1.17 table A
(a) L Nozzle = min 100 ÷ 500 mm max

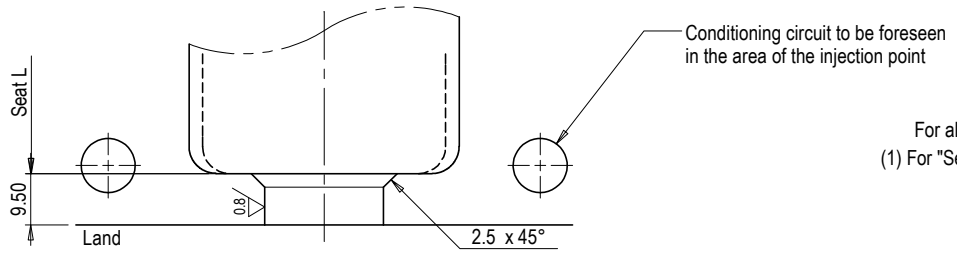
NOZZLE L	*NOZZLE L*
100	350
125	375
150	450
175	475
200	500
225	
250	
275	
300	
325	

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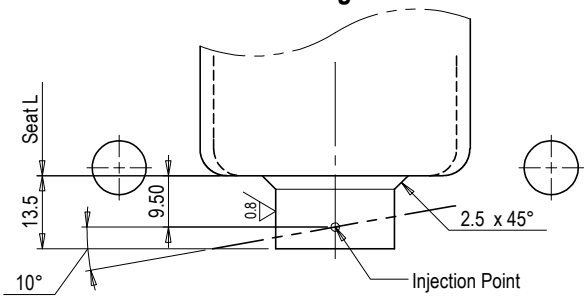
Screwed-in nozzle TORPEDO with bushing through the cavity



Bushing L=14



Bushing L=18



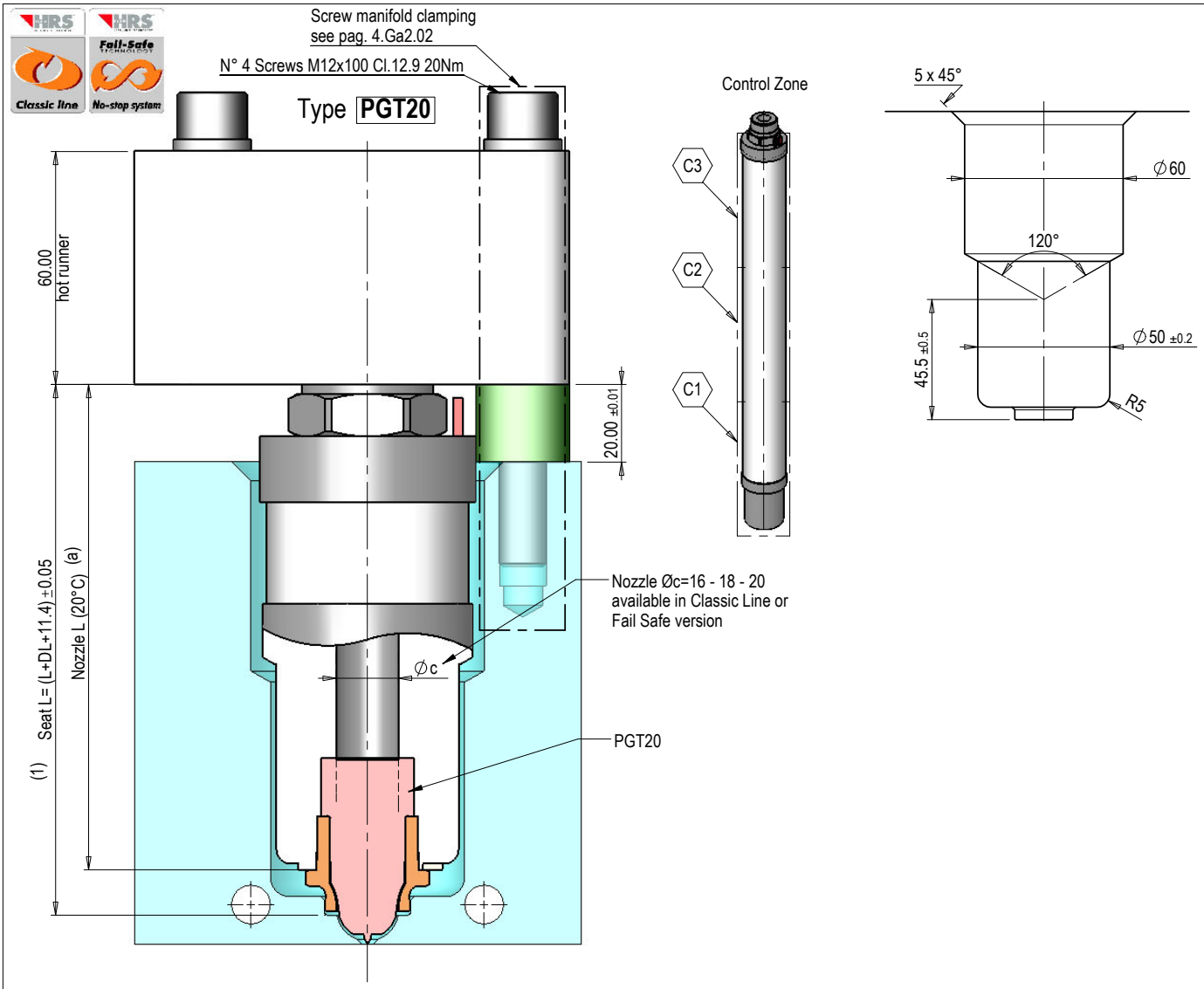
For all reference codes see on page 4.Ga1.10-11

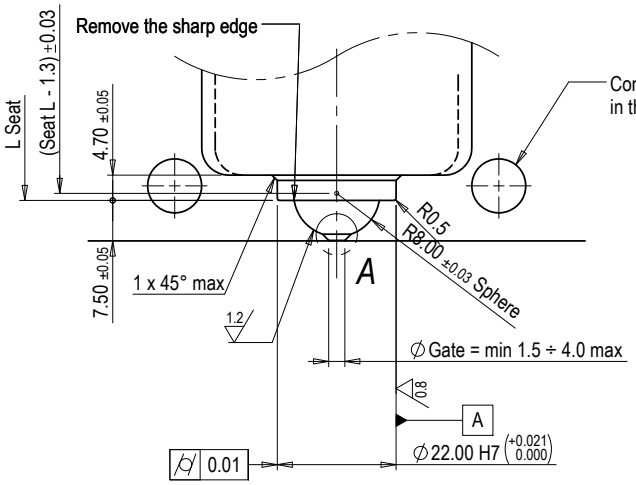
(1) For "Seat L" calculation see pag. 4.Ga1.16a table B

NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

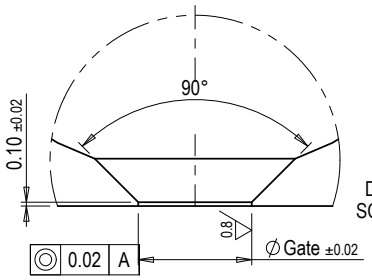
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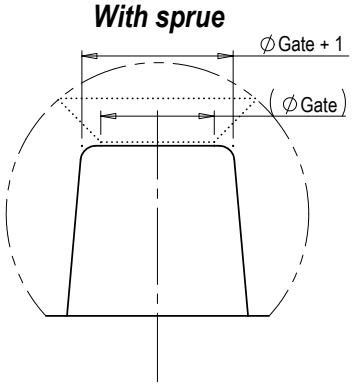
Screwed-in nozzle TORPEDO with external ring for engineering polymers





Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

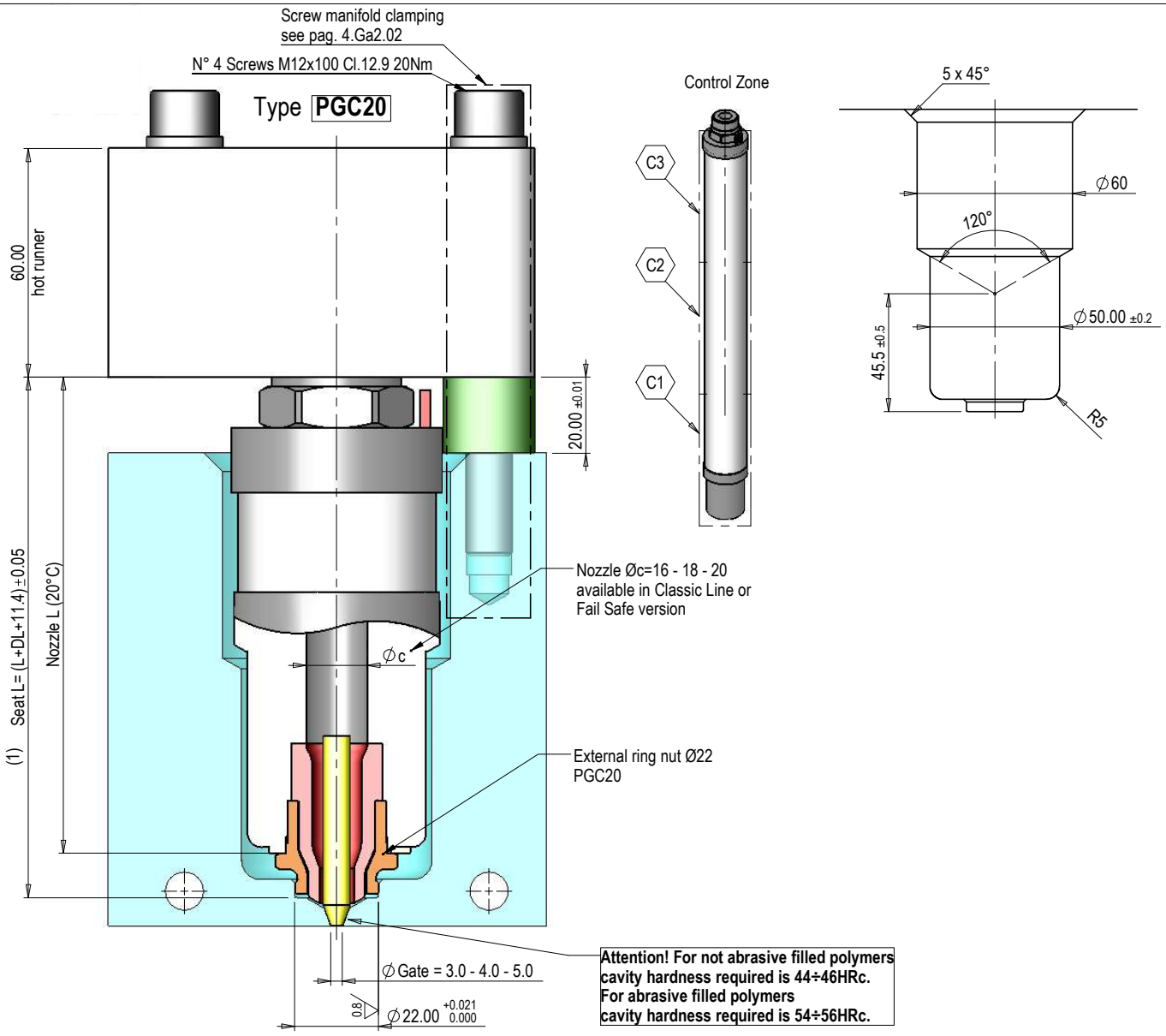


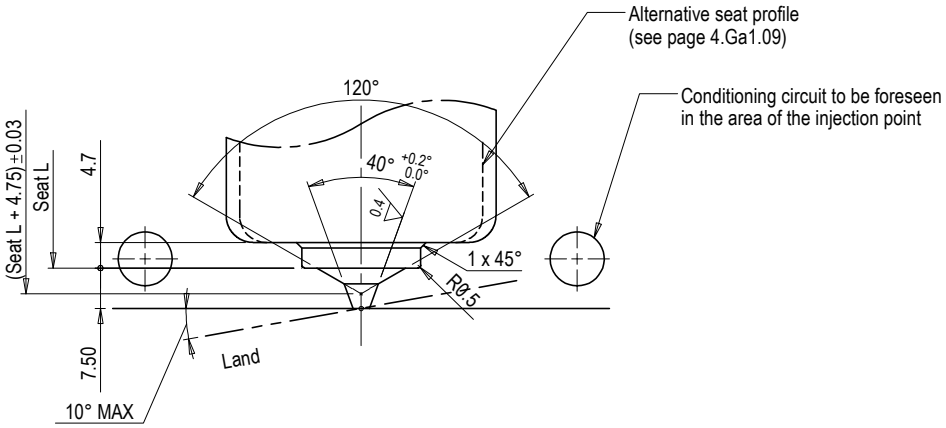


(1) For "Seat L" calculation see pag. 4.Ga1.17 table A
(a) L Nozzle = min 100 ÷ 500 mm max

NOZZLE L	NOZZLE L
100	350
125	375
150	450
175	475
200	500
225	
250	
275	
300	
325	

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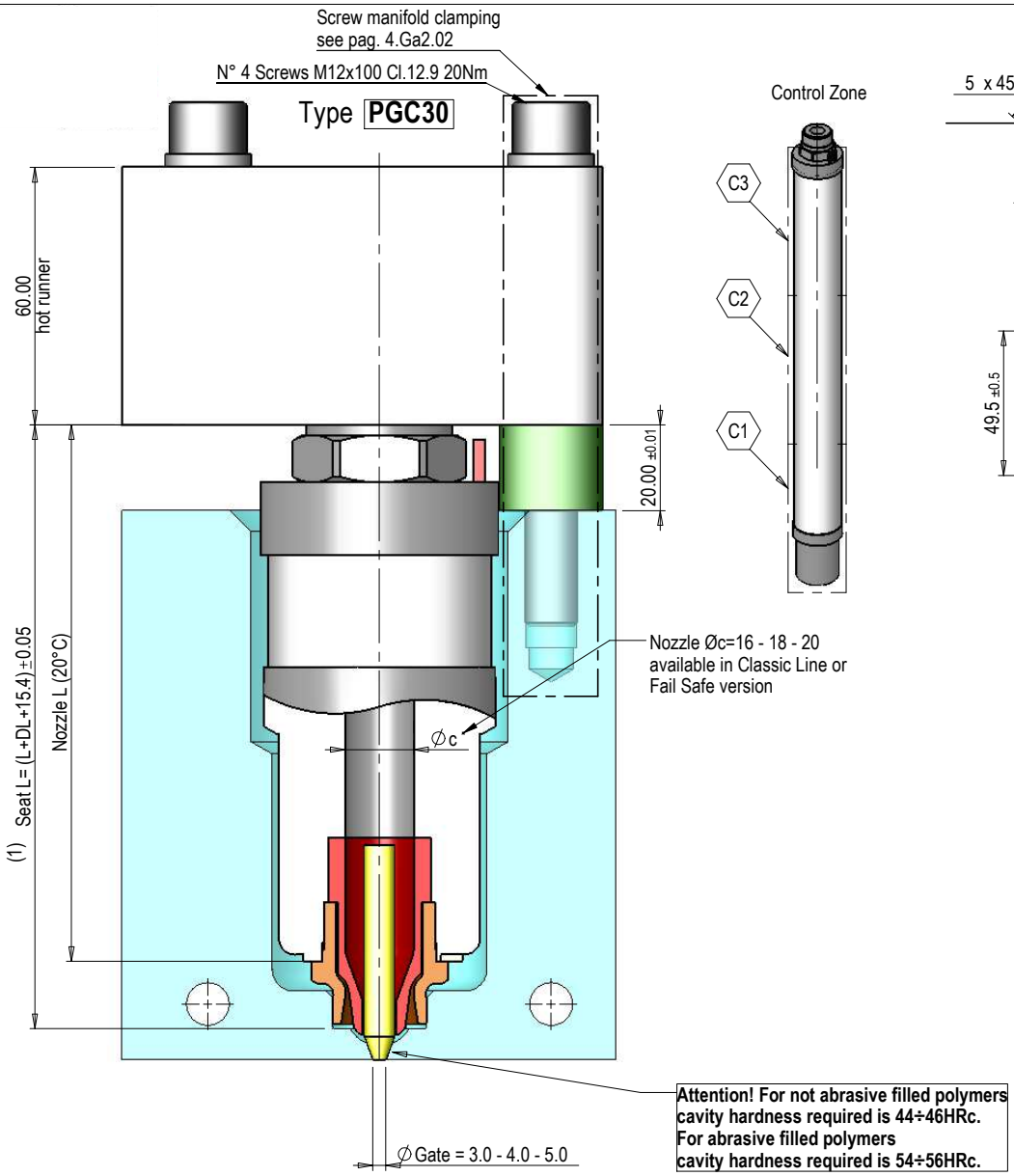
For all reference codes see on page 4.Ga1.10-11

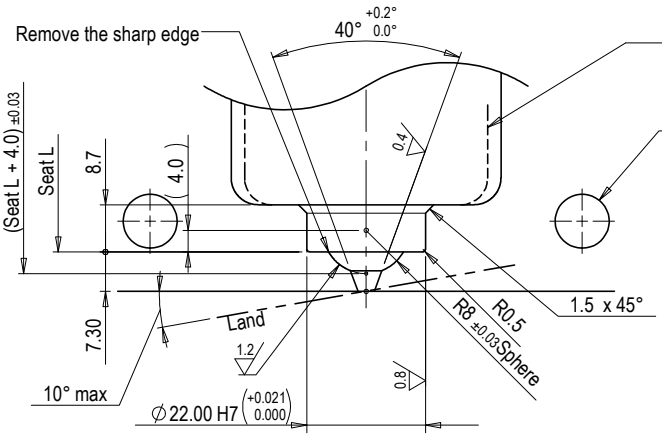
(1) For "DL" calculation see pag. 4.Ga1.17 table A

NOZZLE L	NOZZLE L
100	475
125	500
150	
175	
200	
225	
250	
275	
300	
325	
350	
375	
400	
425	
450	

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Screwed-in nozzle CONICAL VALVE GATING with external ring





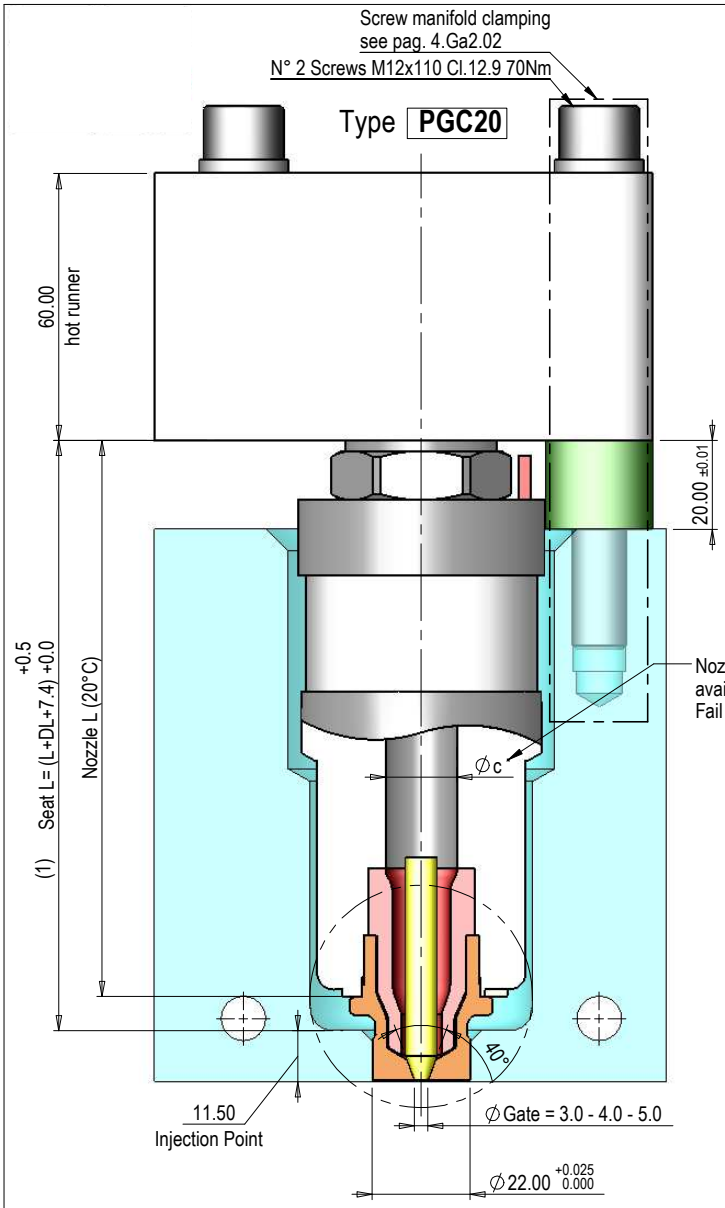
For all reference codes see on page 4.Ga1.10-11

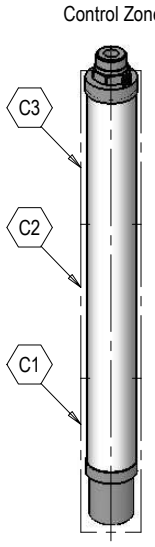
(1) For "Seat L" calculation see pag. 4.Ga1.16a table C

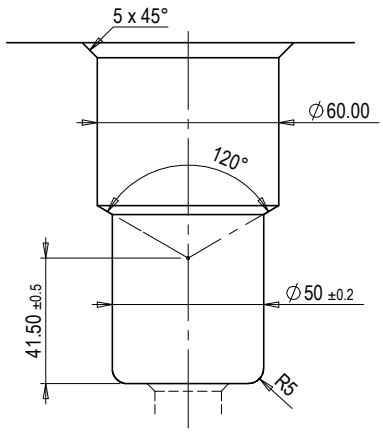
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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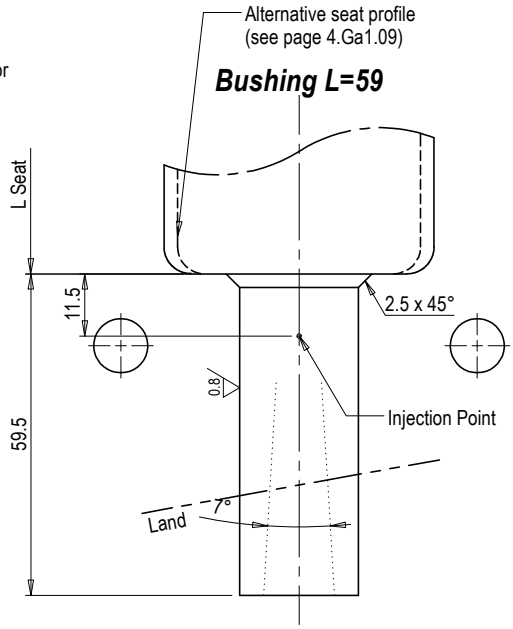
Screwed-in nozzle CONICAL VALVE GATING with bushing through the cavity



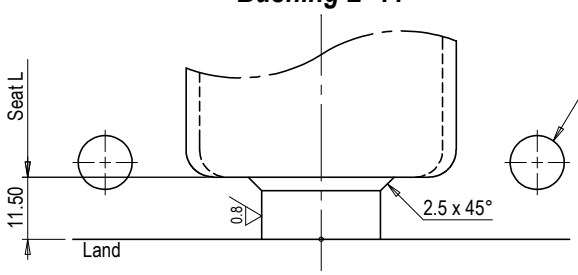




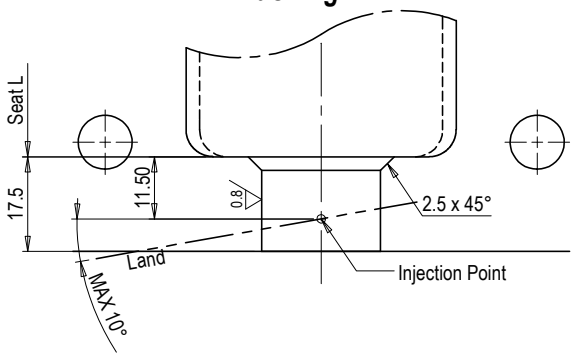
Bushing L=59



Bushing L=11



Bushing L=17



For all reference codes see on page 4.Ga1.10-11

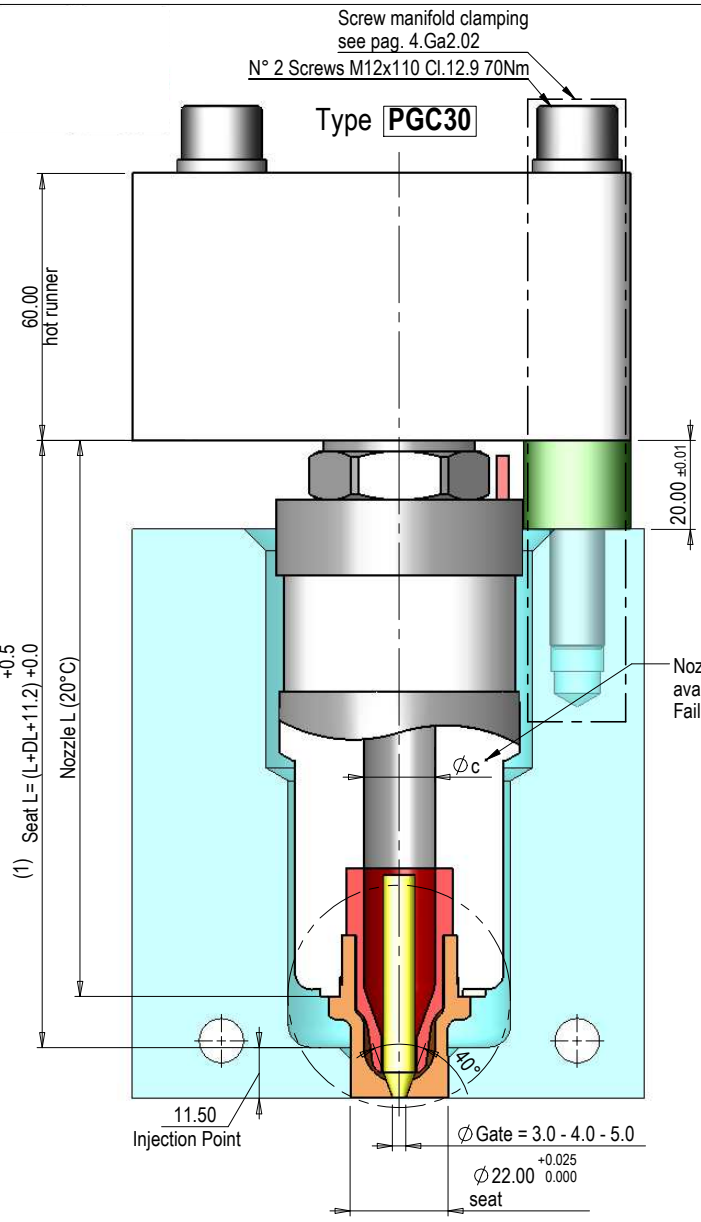
(1) For "DL" calculation see pag. 4.Ga1.16b table D

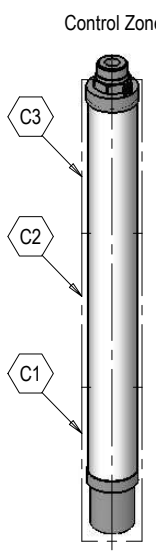
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

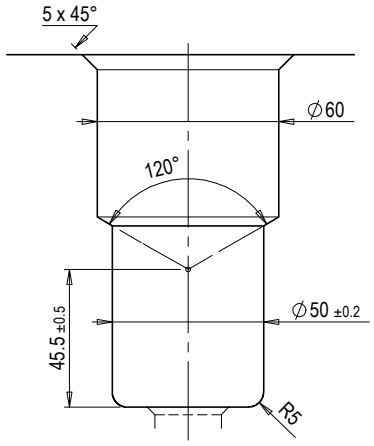
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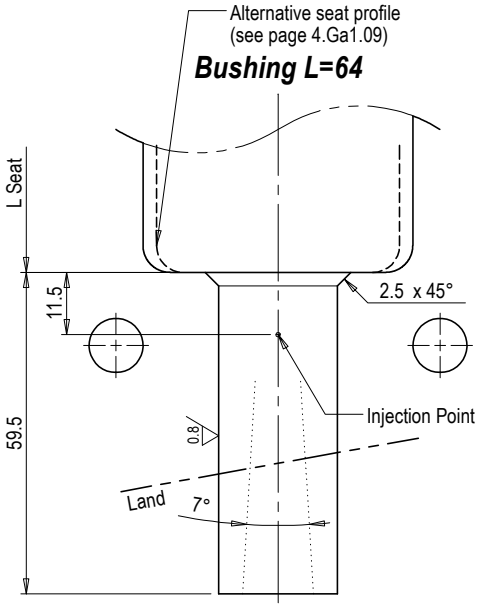
Screwed-in nozzle CONICAL VALVE GATING with bushing through the cavity

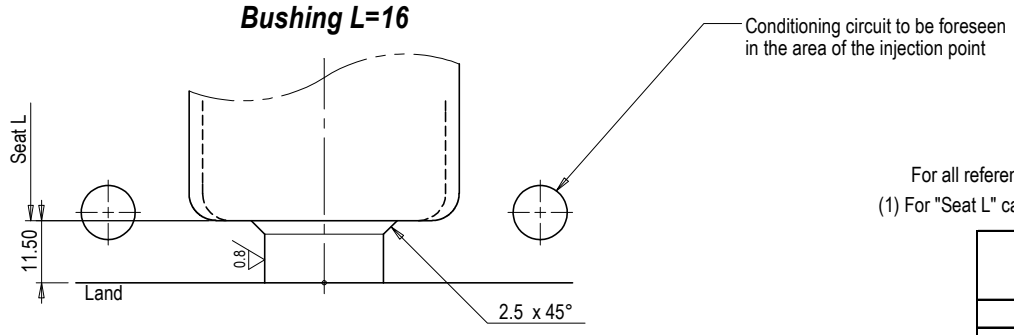
oerlikon hrsflow



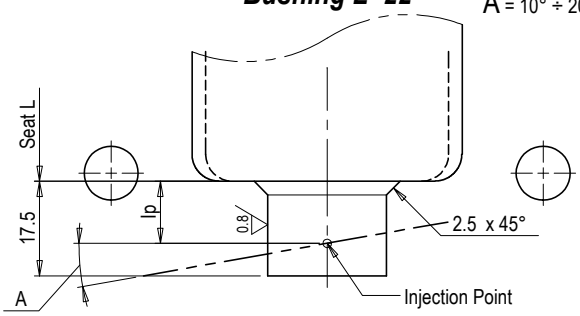








A = 0° ÷ 10° Ip=11.50 mm
A = 10° ÷ 20° Ip=11.90 mm

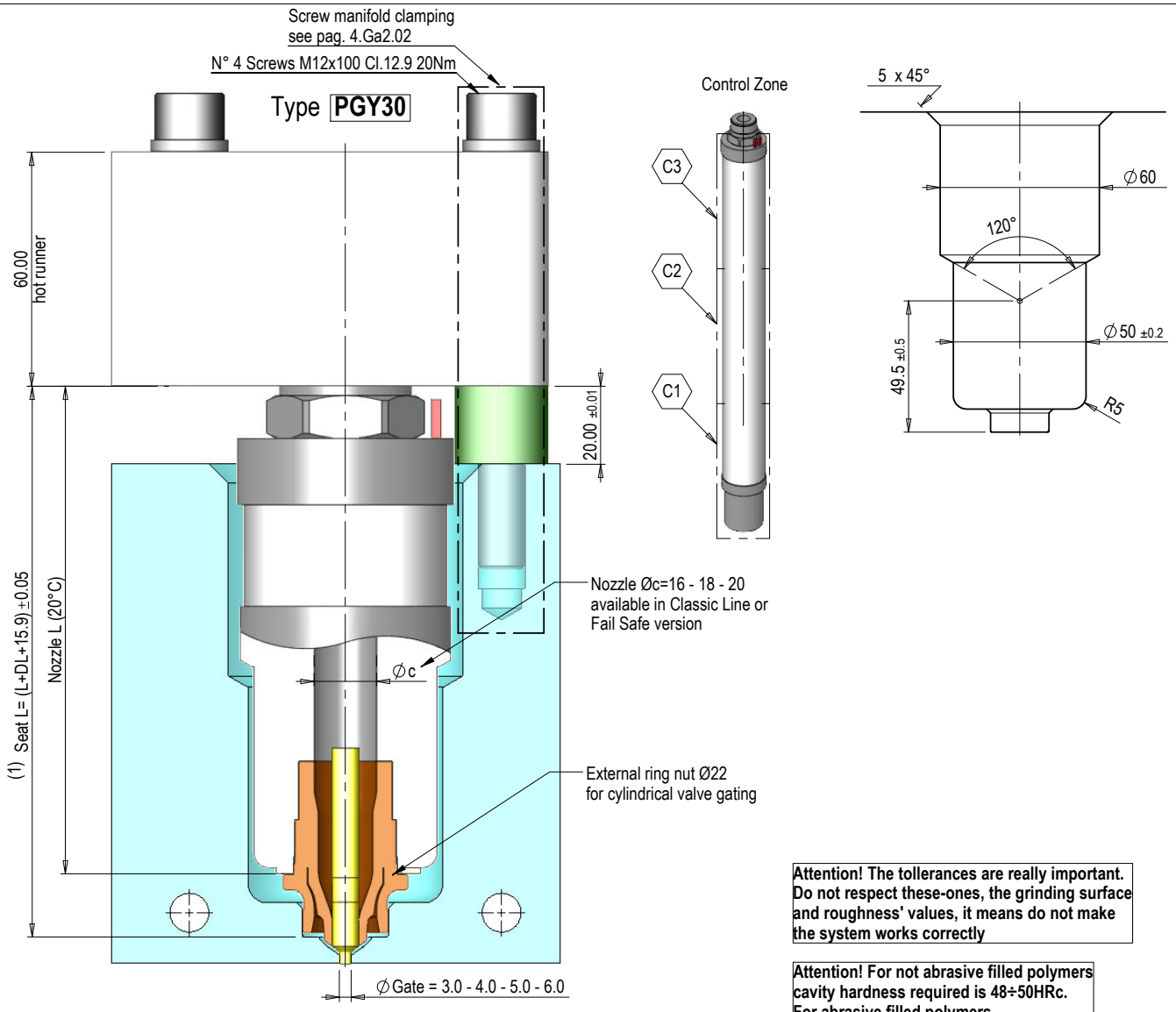


For all reference codes see on page 4.Ga1.10-11

(1) For "Seat L" calculation see pag. 4.Ga1.16a table B

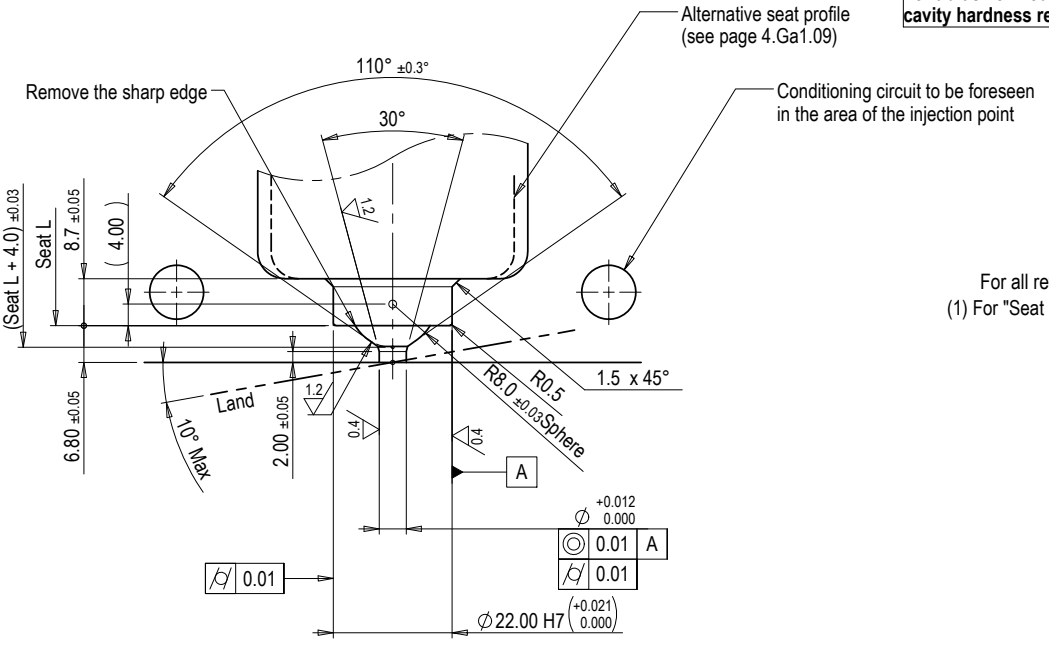
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

Attention! For not abrasive filled polymers cavity hardness required is 48÷50HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

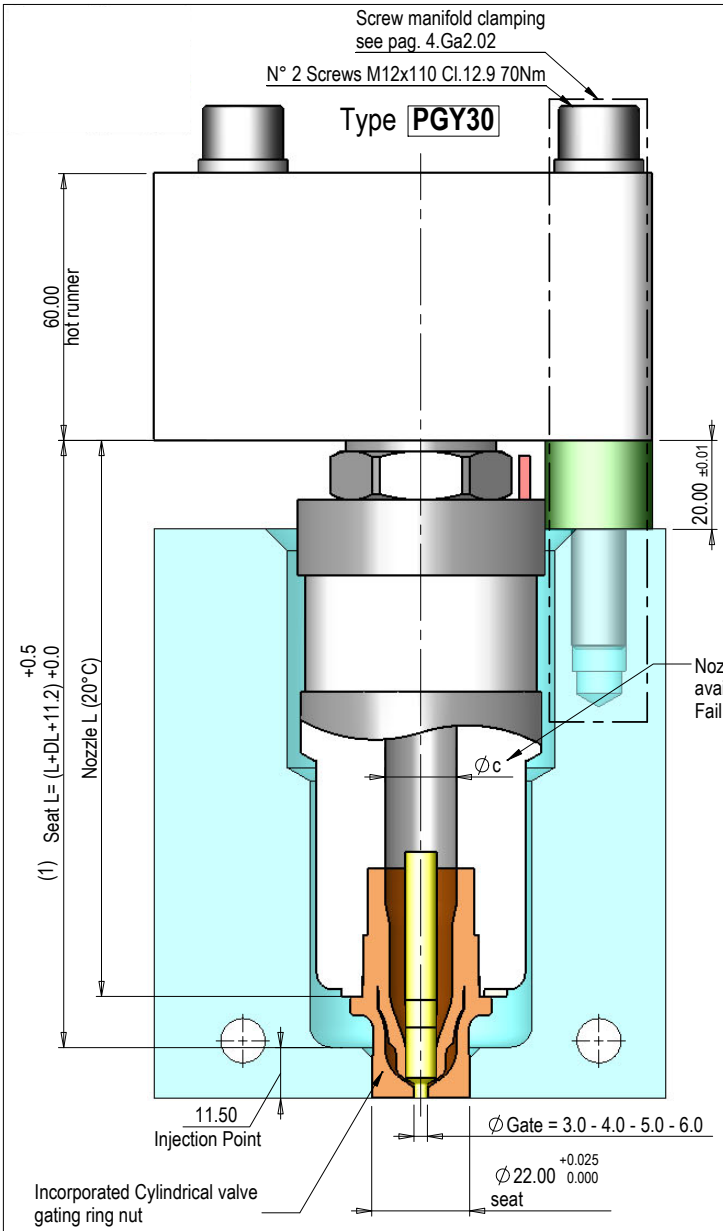


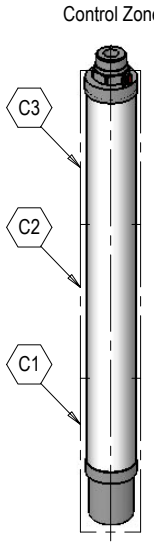
For all reference codes see on page 4.Ga1.10-11
(1) For "Seat L" calculation see pag. 4.Ga1.16b table E

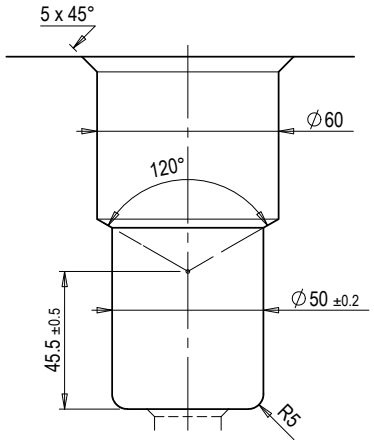
NOZZLE L	*NOZZLE L*
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

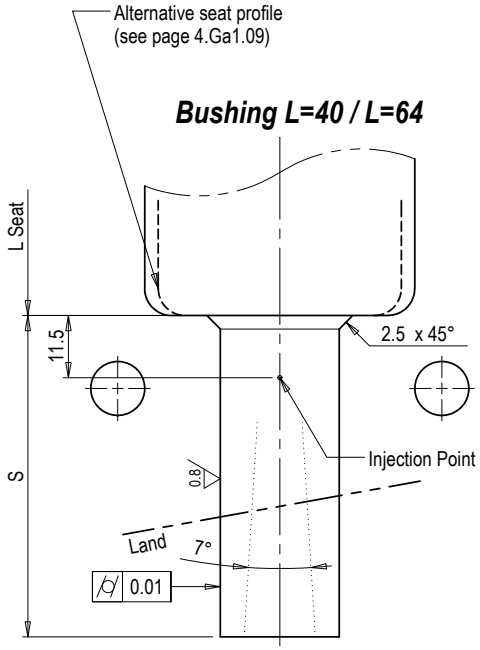
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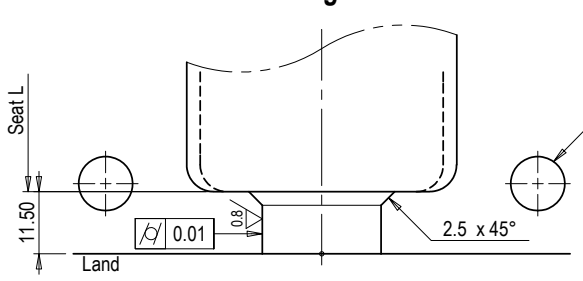
Screwed-in nozzle CYLINDRICAL VALVE GATING with bushing trough the cavity



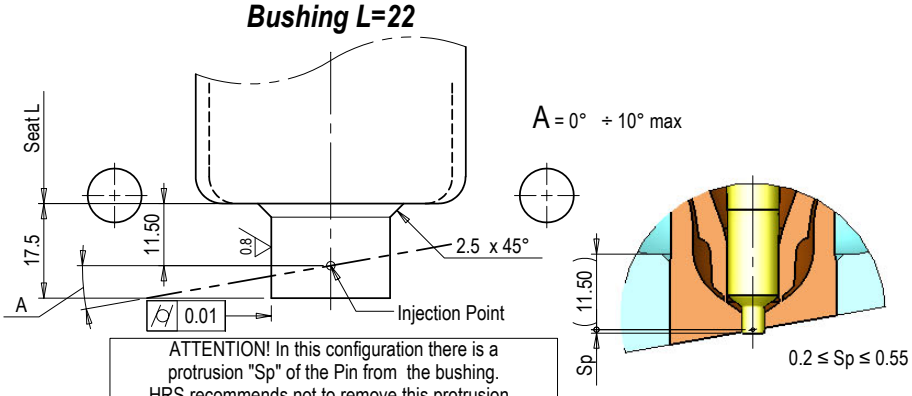








	S
L=40	35.5
L=64	59.5



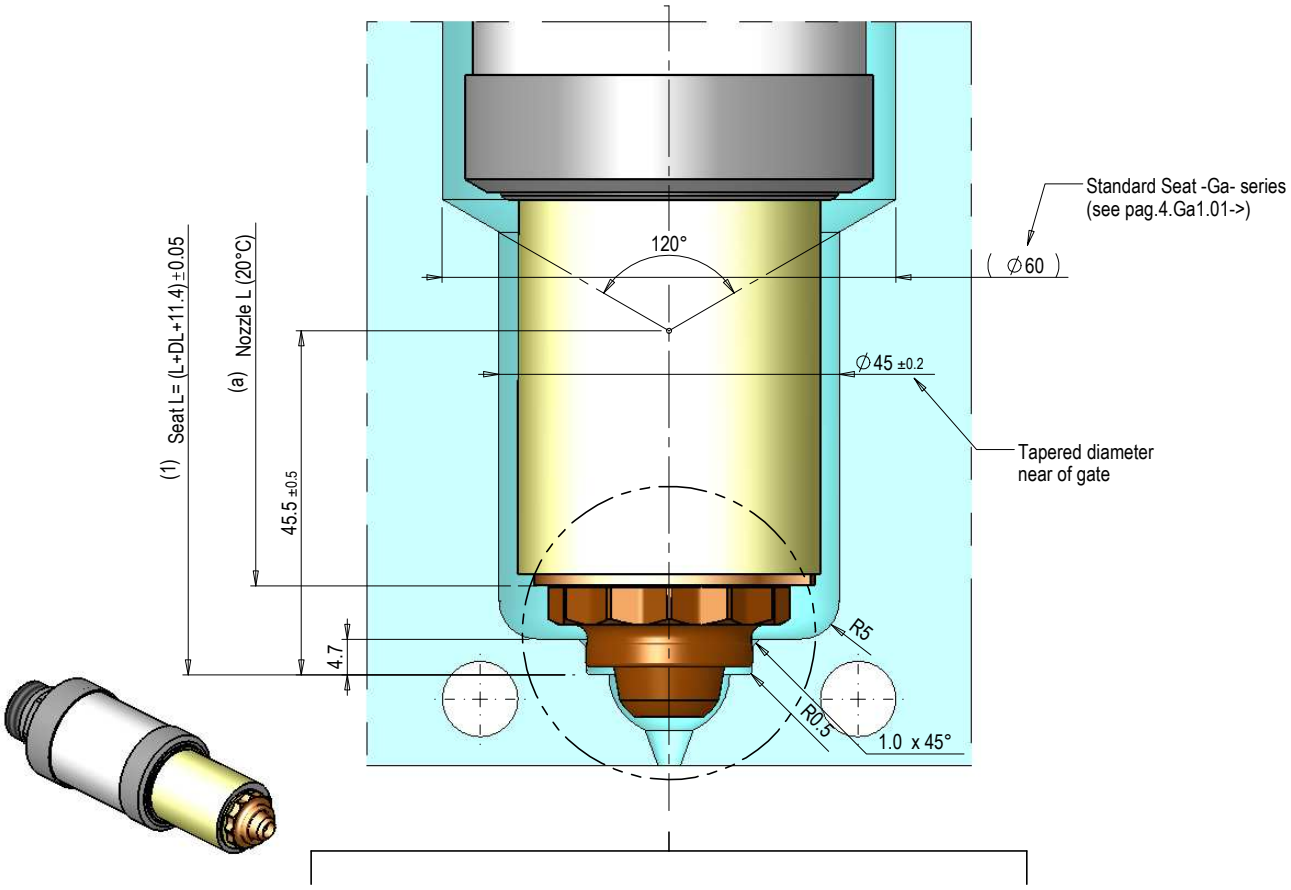
ATTENTION! In this configuration there is a protrusion "Sp" of the Pin from the bushing.
HRS recommends not to remove this protrusion.
The "Sp" dimension is function of Ø Gate and "A" angle

For all reference codes see on page 4.Ga1.10-11

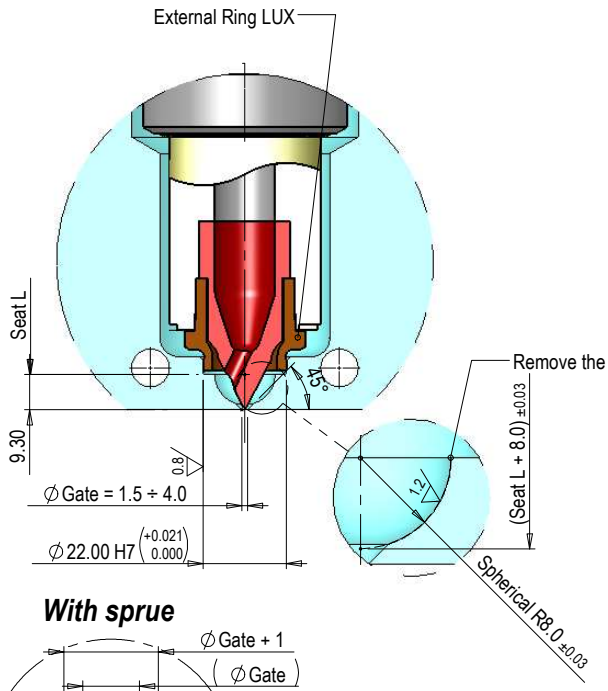
(1) For "Seat L" calculation see pag. 4.Ga1.16a table B

NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

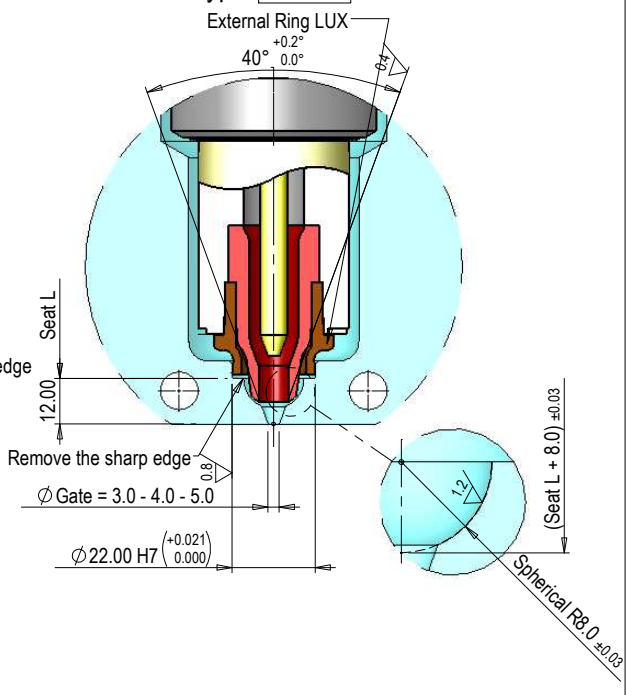
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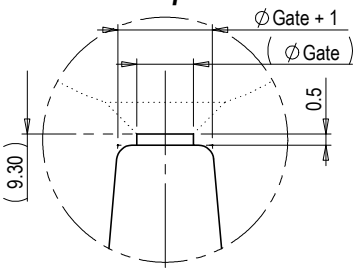
Torpedo
Type **PGT30**



Conic valve gating
Type **PGC30**



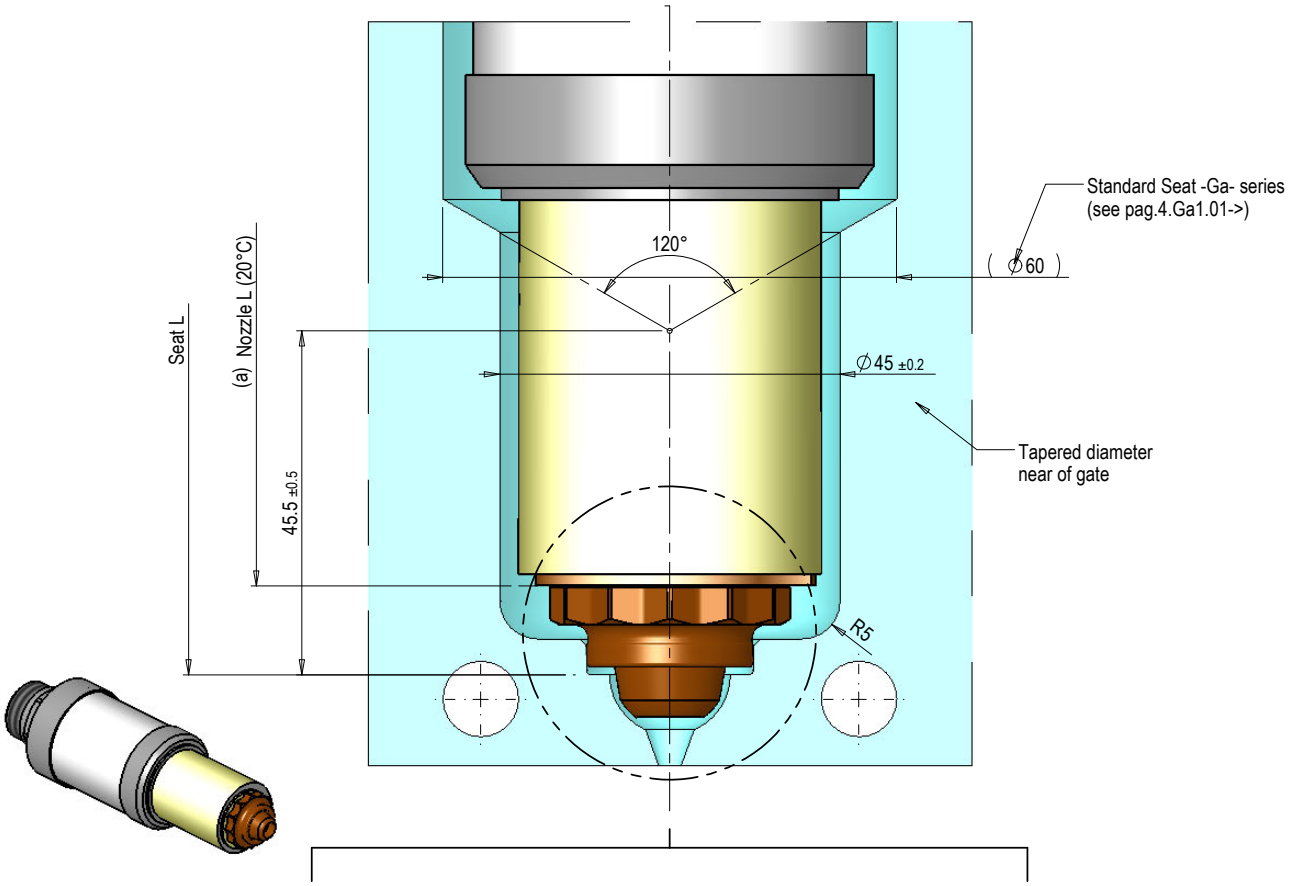
With sprue



Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

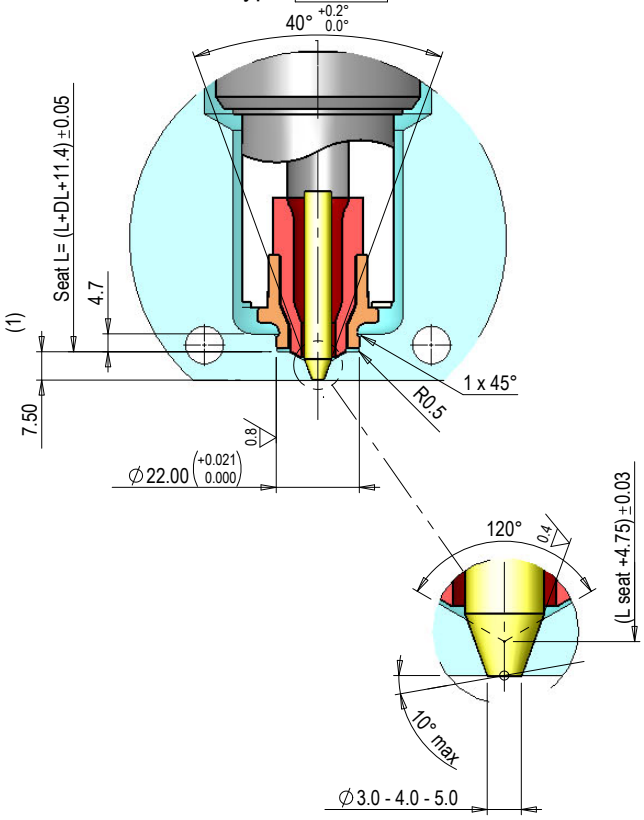
(a) L Nozzle = min 100 ÷ 500 mm max. Standard Length in according to pag.4.Ga1.10
(1) For "Seat L" calculation see pag. 4.Ga1.17 table A

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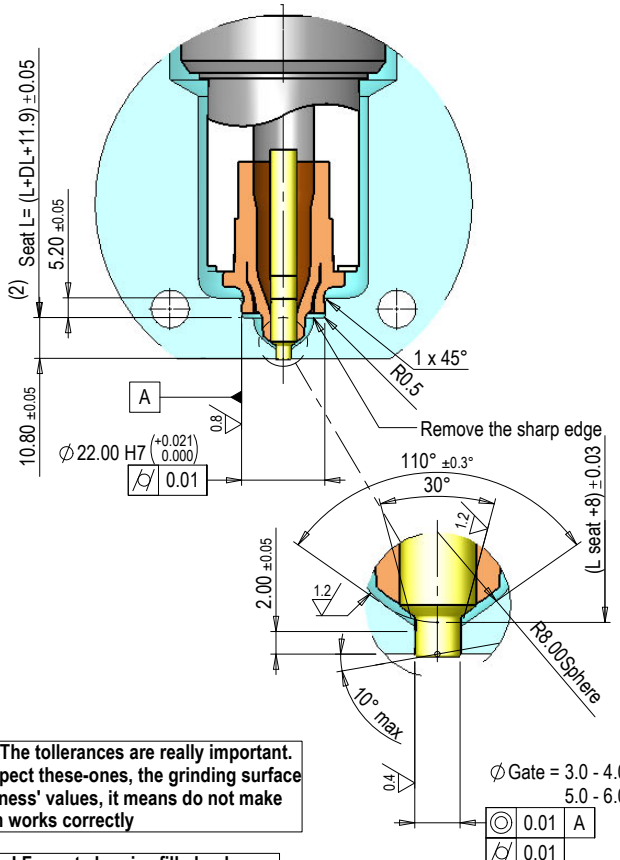
Conic valve gating

Type **PGC20**



Cylindrical valve gating

Type **PGY30**

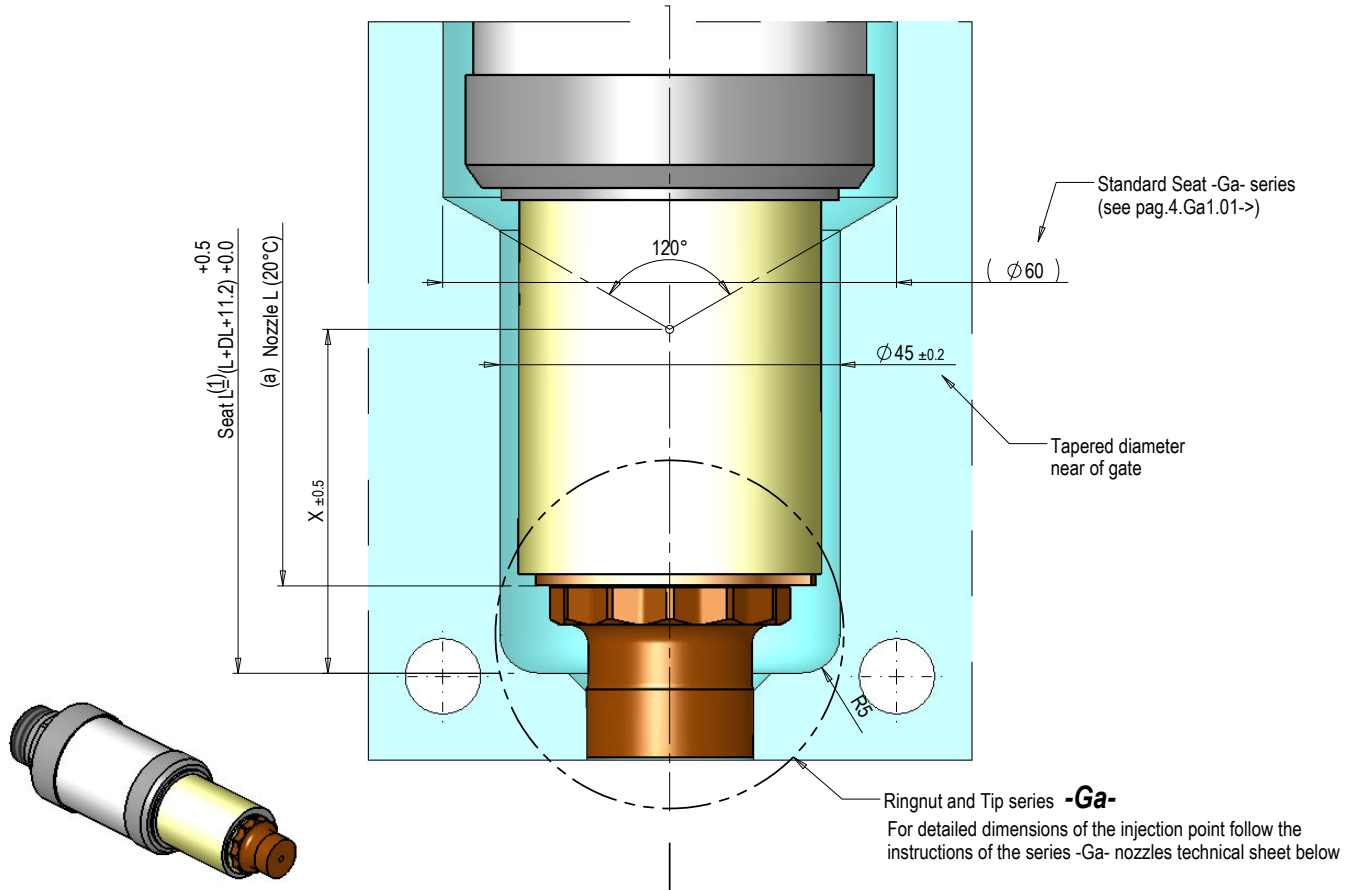


Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

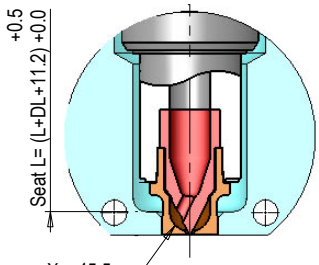
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

(a) L Nozzle = min 100 ÷ 500 mm max. Standard Length in according to pag.4.Ga1.10
(1) For "Seat L" calculation see pag. 4.Ga1.17 table A
(2) For "Seat L" calculation see pag. 4.Ga1.17a table C

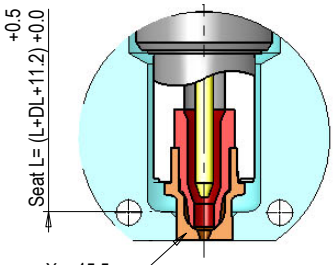
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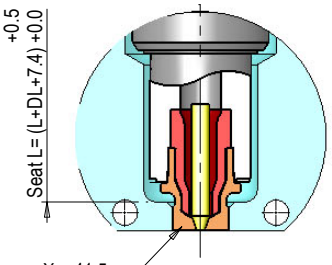
Type **PGT30**
pag. 4.Ga1.03



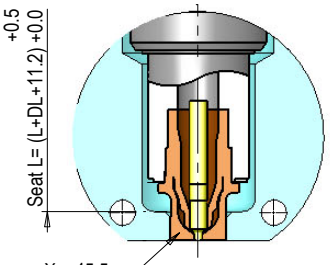
Type **PGC30**
pag. 4.Ga1.05



Type **PGC20**
pag. 4.Ga1.05



Type **PGY30**
pag. 4.Ga1.08

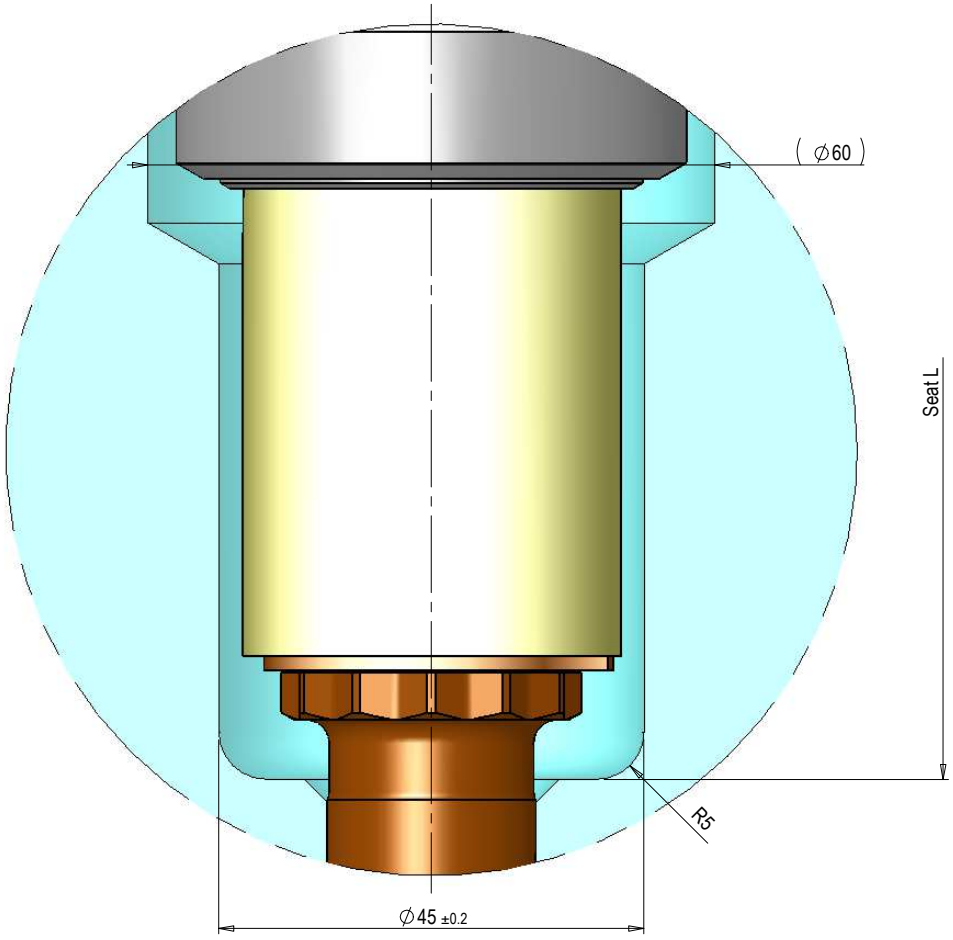


(a) "L Nozzle" = min 100 ÷ 800 mm max. Standard Length in according to pag.4.Ga1.10
(1) For "Seat L" calculation see pag. 4.Ga1.17a table B

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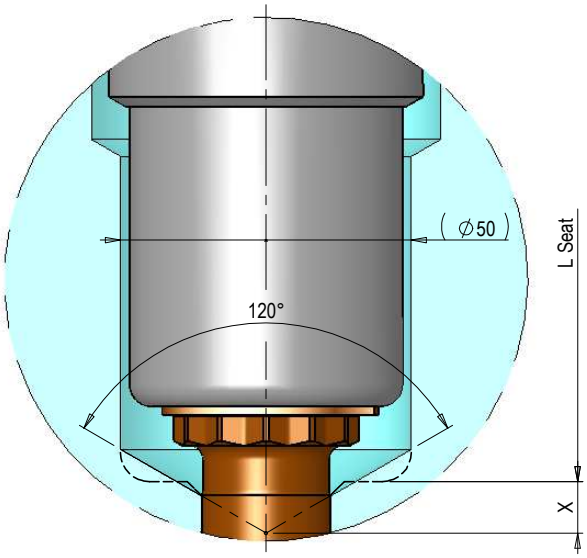
Compact Seat

Nozzles series -Ga- with BUSHING THROUGH CAVITY/EXTERNAL RING
Alternative seat profile to the standard of this catalogue
(reduction of overall dimensions near the injection point)

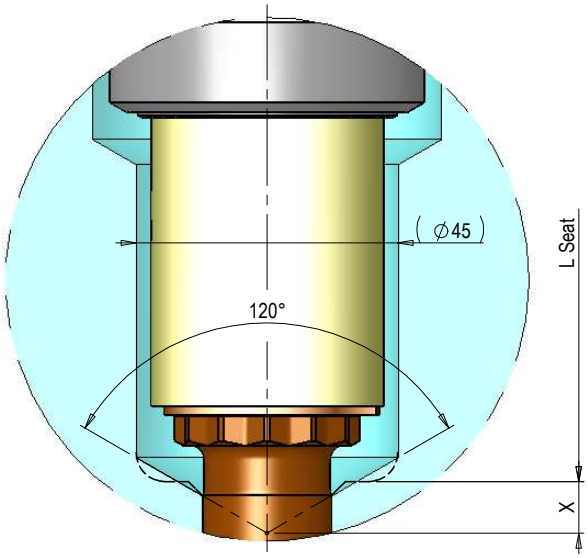


Seat made with 120° tip (*)

Application on STANDARD seat



Application on COMPACT seat



X=8.85 for all configurations, exept for **PGC20** configuration whose value it's **9.0**
(*) Available for all nozzle models having only BUSHING THROUGH CAVITY

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NOZZLE (*) L	NOZZLE CODE Øc=16		POWER (230V)				
	= Classic L.	= Fail Safe			C1	C2	C3
100	0011-01961	0011-01990	1x	2x	330	-	-
125	0011-01962	0011-01991	1x	2x	330	-	-
150	0011-01963	0011-01992	1x	2x	330	-	-
175	0011-01964	0011-01993	1x	2x	330	-	-
200	0011-01965	0011-01994	1x	2x	330	-	-
225	0011-01966	0011-01995	1x	2x	330	225	-
250	0011-01967	0011-01996	1x	2x	330	225	-
275	0011-01968	0011-01997	1x	2x	330	330	-
300	0011-01969	0011-01998	1x	2x	330	330	-
325	0011-01970	0011-01999	1x	2x	330	330	-
350	0011-01971	0011-02000	1x	2x	330	500	-
375	0011-01972	0011-02001	1x	2x	330	500	-
400	0011-01973	0011-02002	1x	2x	330	225	330
425	0011-01974	0011-02003	1x	2x	330	225	330
450	0011-01975	0011-02004	1x	2x	330	225	330
475	0011-01976	0011-02005	1x	2x	330	225	500
500	0011-01977	0011-02006	1x	2x	330	225	500
525	0011-01978	0011-02007	1x	2x	330	225	500
550	0011-01979	0011-02008	1x	2x	330	500	330
575	0011-01980	0011-02009	1x	2x	330	500	330
600	0011-01981	0011-02010	1x	2x	330	500	330
625	0011-01982	0011-02011	1x	2x	330	500	500
650	0011-01983	0011-02012	1x	2x	330	500	500
675	0011-01984	0011-02013	1x	2x	330	500	500
700	0011-01985	0011-02014	1x	2x	330	500	500
725	0011-01986	0011-02015	1x	2x	330	500	500
750	0011-01987	0011-02016	1x	2x	330	500	500
775	0011-01988	0011-02017	1x	2x	330	500	500
800	0011-01989	0011-02018	1x	2x	330	500	500

(*) You can order nozzles with "L" different from the standard (min 100 - max 800 mm) and manifold Øc=18

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30 0012-00586 0012-00584 *for high resistance* **PGF10** 0012-00599 *for high resistance*	***External end ring*** ***Ø22 (LUX)*** 0013-00964 ***Bushing through the cavity*** Øgate ***PGF30*** ***PGF10*** ***Ø2.0*** 0013-00918 0013-00931 ***Ø3.0*** 0013-00919 0013-00932 ***Ø4.0*** 0013-00920 0013-00933	
TORPEDO		
PGT30 Monohole 0012-00281 0012-00282 *for high resistance* 0012-00333 *for high conductibility* 0012-01008 *for engineering polymers* ***PGT30 Multihole*** 0012-00283 0012-00284 *for high resistance* 0012-00334 *for high conductibility*	***External end ring*** ***Ø22 (LUX)*** 0013-00964 Ø22 0013-02112 for engineering polymers ***PGT30 Boushing through the cavity*** Øgate ***L=14*** ***L=18*** ***L=64*** ***Ø2.0*** 0013-00454 0013-00457 0013-00460 ***Ø3.0*** 0013-00455 0013-00458 0013-00461 ***Ø4.0*** 0013-00456 0013-00459 0013-00462	
CONICAL VALVE GATING		
PGC30 0012-00281 0012-00535 *For high conductibility with End Ring* 0012-00326 *For high conductibility with Bushing th.cavity* 0012-00431 *for high resistance* ***PGC30 Antistagnation*** 0012-00772 *For high conductibility with End Ring* 0012-00773 *For high conductibility with Bushing th.cavity* 0012-00806 *for high resistance*	***PGC30 External end ring*** ***Ø22*** 0013-00658 ***Ø22 LUX*** 0013-00964 ***PGC30 Bushing through the cavity*** Øgate **L=16** **L=22** **L=64** ***Ø3.0*** 0013-00501 0013-00502 0013-00701 ***Ø4.0*** 0013-00463 0013-00465 0013-00467 ***Ø5.0*** 0013-00464 0013-00466 0013-00468	0262-00056 { *for External end ring* *for Bushings through ca*
PGC20 0012-00812 0012-00814 *for high resistance* ***PGC20 Antistagnation*** 0012-00813 0012-00815 *for high resistance*	***PGC20 External end ring*** ***Ø22*** 0013-01345 ***PGC20 Bushing through the cavity*** Øgate **L=11** **L=17** **L=59** ***Ø3.0*** 0013-01348 0013-01360 0013-01375 ***Ø4.0*** 0013-01350 0013-01362 0013-01377 ***Ø5.0*** 0013-01352 0013-01364 0013-01379	0262-00061
CYLINDRICAL VALVE GATING		
	PGY30 External end ring ***Ø22*** 0013-01703 (Long Contact) ***Ø22*** 0013-01704 *Antistagnation* (Long Contact) ***Ø22 (LUX)*** 0013-01705 (Short Contact) ***Ø22 (LUX)*** 0017-01706 *Antistagnation* (Short Contact) ***PGY30 Bushing through the cavity*** *gate* **L=16** **L=22** **L=40** **L=64** ***Ø3.0*** 0013-01707 0013-01711 0013-01715 0013-01719 ***Ø4.0*** 0013-01708 0013-01712 0013-01716 0013-01720 ***Ø5.0*** 0013-01709 0013-01713 0013-01717 0013-01721 ***Ø6.0*** 0013-01710 0013-01714 0013-01718 0013-01722	

(*) Antistagnation Seal available only some polymers. For further information see sheet pag. 2.01.43

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36
125	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
425	0.51	0.61	0.71	0.82	0.92	1.02	1.12	1.22	1.33	1.43	1.53
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
475	0.57	0.68	0.80	0.91	1.03	1.14	1.25	1.37	1.48	1.60	1.71
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80
525	0.63	0.76	0.88	1.01	1.13	1.26	1.39	1.51	1.64	1.76	1.89
550	0.66	0.79	0.92	1.06	1.19	1.32	1.45	1.58	1.72	1.85	1.98
575	0.69	0.83	0.97	1.10	1.24	1.38	1.52	1.66	1.79	1.93	2.07
600	0.72	0.86	1.01	1.15	1.30	1.44	1.58	1.73	1.87	2.02	2.16
625	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
650	0.78	0.94	1.09	1.25	1.40	1.56	1.72	1.87	2.03	2.18	2.34
675	0.81	0.97	1.13	1.30	1.46	1.62	1.78	1.94	2.11	2.27	2.43
700	0.84	1.01	1.18	1.34	1.51	1.68	1.85	2.02	2.18	2.35	2.52
725	0.87	1.04	1.22	1.39	1.57	1.74	1.91	2.09	2.26	2.44	2.61
750	0.90	1.08	1.26	1.44	1.62	1.80	1.98	2.16	2.34	2.52	2.70
775	0.93	1.12	1.30	1.49	1.67	1.86	2.05	2.23	2.42	2.60	2.79
800	0.96	1.15	1.34	1.54	1.73	1.92	2.11	2.30	2.50	2.69	2.88

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 7.7										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	107.82	107.84	107.87	107.89	107.92	107.94	107.96	107.99	108.01	108.04	108.06
125	132.85	132.88	132.91	132.94	132.97	133.00	133.03	133.06	133.09	133.12	133.15
150	157.88	157.92	157.95	157.99	158.02	158.06	158.10	158.13	158.17	158.20	158.24
175	182.91	182.95	182.99	183.04	183.08	183.12	183.16	183.20	183.25	183.29	183.33
200	207.94	207.99	208.04	208.08	208.13	208.18	208.23	208.28	208.32	208.37	208.42
225	232.97	233.02	233.08	233.13	233.19	233.24	233.29	233.35	233.40	233.46	233.51
250	258.00	258.06	258.12	258.18	258.24	258.30	258.36	258.42	258.48	258.54	258.60
275	283.03	283.10	283.16	283.23	283.29	283.36	283.43	283.49	283.56	283.62	283.69
300	308.06	308.13	308.20	308.28	308.35	308.42	308.49	308.56	308.64	308.71	308.78
325	333.09	333.17	333.25	333.32	333.40	333.48	333.56	333.64	333.71	333.79	333.87
350	358.12	358.20	358.29	358.37	358.46	358.54	358.62	358.71	358.79	358.88	358.96
375	383.15	383.24	383.33	383.42	383.51	383.60	383.69	383.78	383.87	383.96	384.05
400	408.18	408.28	408.37	408.47	408.56	408.66	408.76	408.85	408.95	409.04	409.14
425	433.21	433.31	433.41	433.52	433.62	433.72	433.82	433.92	434.03	434.13	434.23
450	458.24	458.35	458.46	458.56	458.67	458.78	458.89	459.00	459.10	459.21	459.32
475	483.27	483.38	483.50	483.61	483.73	483.84	483.95	484.07	484.18	484.30	484.41
500	508.30	508.42	508.54	508.66	508.78	508.90	509.02	509.14	509.26	509.38	509.50
525	533.33	533.46	533.58	533.71	533.83	533.96	534.09	534.21	534.34	534.46	534.59
550	558.36	558.49	558.62	558.76	558.89	559.02	559.15	559.28	559.42	559.55	559.68
575	583.39	583.53	583.67	583.80	583.94	584.08	584.22	584.36	584.49	584.63	584.77
600	608.42	608.56	608.71	608.85	609.00	609.14	609.28	609.43	609.57	609.72	609.86
625	633.45	633.60	633.75	633.90	634.05	634.20	634.35	634.50	634.65	634.80	634.95
650	658.48	658.64	658.79	658.95	659.10	659.26	659.42	659.57	659.73	659.88	660.04
675	683.51	683.67	683.83	684.00	684.16	684.32	684.48	684.64	684.81	684.97	685.13
700	708.54	708.71	708.88	709.04	709.21	709.38	709.55	709.72	709.88	710.05	710.22
725	733.57	733.74	733.92	734.09	734.27	734.44	734.61	734.79	734.96	735.14	735.31
750	758.60	758.78	758.96	759.14	759.32	759.50	759.68	759.86	760.04	760.22	760.40
775	783.63	783.82	784.00	784.19	784.37	784.56	784.75	784.93	785.12	785.30	785.49
800	808.66	808.85	809.04	809.24	809.43	809.62	809.81	810.00	810.20	810.39	810.58

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Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 11.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	111.32	111.34	111.37	111.39	111.42	111.44	111.46	111.49	111.51	111.54	111.56
125	136.35	136.38	136.41	136.44	136.47	136.50	136.53	136.56	136.59	136.62	136.65
150	161.38	161.42	161.45	161.49	161.52	161.56	161.60	161.63	161.67	161.70	161.74
175	186.41	186.45	186.49	186.54	186.58	186.62	186.66	186.70	186.75	186.79	186.83
200	211.44	211.49	211.54	211.58	211.63	211.68	211.73	211.78	211.82	211.87	211.92
225	236.47	236.52	236.58	236.63	236.69	236.74	236.79	236.85	236.90	236.96	237.01
250	261.50	261.56	261.62	261.68	261.74	261.80	261.86	261.92	261.98	262.04	262.10
275	286.53	286.60	286.66	286.73	286.79	286.86	286.93	286.99	287.06	287.12	287.19
300	311.56	311.63	311.70	311.78	311.85	311.92	311.99	312.06	312.14	312.21	312.28
325	336.59	336.67	336.75	336.82	336.90	336.98	337.06	337.14	337.21	337.29	337.37
350	361.62	361.70	361.79	361.87	361.96	362.04	362.12	362.21	362.29	362.38	362.46
375	386.65	386.74	386.83	386.92	387.01	387.10	387.19	387.28	387.37	387.46	387.55
400	411.68	411.78	411.87	411.97	412.06	412.16	412.26	412.35	412.45	412.54	412.64
425	436.71	436.81	436.91	437.02	437.12	437.22	437.32	437.42	437.53	437.63	437.73
450	461.74	461.85	461.96	462.06	462.17	462.28	462.39	462.50	462.60	462.71	462.82
475	486.77	486.88	487.00	487.11	487.23	487.34	487.45	487.57	487.68	487.80	487.91
500	511.80	511.92	512.04	512.16	512.28	512.40	512.52	512.64	512.76	512.88	513.00
525	536.83	536.96	537.08	537.21	537.33	537.46	537.59	537.71	537.84	537.96	538.09
550	561.86	561.99	562.12	562.26	562.39	562.52	562.65	562.78	562.92	563.05	563.18
575	586.89	587.03	587.17	587.30	587.44	587.58	587.72	587.86	587.99	588.13	588.27
600	611.92	612.06	612.21	612.35	612.50	612.64	612.78	612.93	613.07	613.22	613.36
625	636.95	637.10	637.25	637.40	637.55	637.70	637.85	638.00	638.15	638.30	638.45
650	661.98	662.14	662.29	662.45	662.60	662.76	662.92	663.07	663.23	663.38	663.54
675	687.01	687.17	687.33	687.50	687.66	687.82	687.98	688.14	688.31	688.47	688.63
700	712.04	712.21	712.38	712.54	712.71	712.88	713.05	713.22	713.38	713.55	713.72
725	737.07	737.24	737.42	737.59	737.77	737.94	738.11	738.29	738.46	738.64	738.81
750	762.10	762.28	762.46	762.64	762.82	763.00	763.18	763.36	763.54	763.72	763.90
775	787.13	787.32	787.50	787.69	787.87	788.06	788.25	788.43	788.62	788.80	788.99
800	812.16	812.35	812.54	812.74	812.93	813.12	813.31	813.50	813.70	813.89	814.08

Tab. C - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 15.4										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	115.52	115.54	115.57	115.59	115.62	115.64	115.66	115.69	115.71	115.74	115.76
125	140.55	140.58	140.61	140.64	140.67	140.70	140.73	140.76	140.79	140.82	140.85
150	165.58	165.62	165.65	165.69	165.72	165.76	165.80	165.83	165.87	165.90	165.94
175	190.61	190.65	190.69	190.74	190.78	190.82	190.86	190.90	190.95	190.99	191.03
200	215.64	215.69	215.74	215.78	215.83	215.88	215.93	215.98	216.02	216.07	216.12
225	240.67	240.72	240.78	240.83	240.89	240.94	240.99	241.05	241.10	241.16	241.21
250	265.70	265.76	265.82	265.88	265.94	266.00	266.06	266.12	266.18	266.24	266.30
275	290.73	290.80	290.86	290.93	290.99	291.06	291.13	291.19	291.26	291.32	291.39
300	315.76	315.83	315.90	315.98	316.05	316.12	316.19	316.26	316.34	316.41	316.48
325	340.79	340.87	340.95	341.02	341.10	341.18	341.26	341.34	341.41	341.49	341.57
350	365.82	365.90	365.99	366.07	366.16	366.24	366.32	366.41	366.49	366.58	366.66
375	390.85	390.94	391.03	391.12	391.21	391.30	391.39	391.48	391.57	391.66	391.75
400	415.88	415.98	416.07	416.17	416.26	416.36	416.46	416.55	416.65	416.74	416.84
425	440.91	441.01	441.11	441.22	441.32	441.42	441.52	441.62	441.73	441.83	441.93
450	465.94	466.05	466.16	466.26	466.37	466.48	466.59	466.70	466.80	466.91	467.02
475	490.97	491.08	491.20	491.31	491.43	491.54	491.65	491.77	491.88	492.00	492.11
500	516.00	516.12	516.24	516.36	516.48	516.60	516.72	516.84	516.96	517.08	517.20
525	541.03	541.16	541.28	541.41	541.53	541.66	541.79	541.91	542.04	542.16	542.29
550	566.06	566.19	566.32	566.46	566.59	566.72	566.85	566.98	567.12	567.25	567.38
575	591.09	591.23	591.37	591.50	591.64	591.78	591.92	592.06	592.19	592.33	592.47
600	616.12	616.26	616.41	616.55	616.70	616.84	616.98	617.13	617.27	617.42	617.56
625	641.15	641.30	641.45	641.60	641.75	641.90	642.05	642.20	642.35	642.50	642.65
650	666.18	666.34	666.49	666.65	666.80	666.96	667.12	667.27	667.43	667.58	667.74
675	691.21	691.37	691.53	691.70	691.86	692.02	692.18	692.34	692.51	692.67	692.83
700	716.24	716.41	716.58	716.74	716.91	717.08	717.25	717.42	717.58	717.75	717.92
725	741.27	741.44	741.62	741.79	741.97	742.14	742.31	742.49	742.66	742.84	743.01
750	766.30	766.48	766.66	766.84	767.02	767.20	767.38	767.56	767.74	767.92	768.10
775	791.33	791.52	791.70	791.89	792.07	792.26	792.45	792.63	792.82	793.00	793.19
800	816.36	816.55	816.74	816.94	817.13	817.32	817.51	817.70	817.90	818.09	818.28

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Tab. D - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	Seat L = L + DL + 7.4										
100	107.52	107.54	107.57	107.59	107.62	107.64	107.66	107.69	107.71	107.74	107.76
125	132.55	132.58	132.61	132.64	132.67	132.70	132.73	132.76	132.79	132.82	132.85
150	157.58	157.62	157.65	157.69	157.72	157.76	157.80	157.83	157.87	157.90	157.94
175	182.61	182.65	182.69	182.74	182.78	182.82	182.86	182.90	182.95	182.99	183.03
200	207.64	207.69	207.74	207.78	207.83	207.88	207.93	207.98	208.02	208.07	208.12
225	232.67	232.72	232.78	232.83	232.89	232.94	232.99	233.05	233.10	233.16	233.21
250	257.70	257.76	257.82	257.88	257.94	258.00	258.06	258.12	258.18	258.24	258.30
275	282.73	282.80	282.86	282.93	282.99	283.06	283.13	283.19	283.26	283.32	283.39
300	307.76	307.83	307.90	307.98	308.05	308.12	308.19	308.26	308.34	308.41	308.48
325	332.79	332.87	332.95	333.02	333.10	333.18	333.26	333.34	333.41	333.49	333.57
350	357.82	357.90	357.99	358.07	358.16	358.24	358.32	358.41	358.49	358.58	358.66
375	382.85	382.94	383.03	383.12	383.21	383.30	383.39	383.48	383.57	383.66	383.75
400	407.88	407.98	408.07	408.17	408.26	408.36	408.46	408.55	408.65	408.74	408.84
425	432.91	433.01	433.11	433.22	433.32	433.42	433.52	433.62	433.73	433.83	433.93
450	457.94	458.05	458.16	458.26	458.37	458.48	458.59	458.70	458.80	458.91	459.02
475	482.97	483.08	483.20	483.31	483.43	483.54	483.65	483.77	483.88	484.00	484.11
500	508.00	508.12	508.24	508.36	508.48	508.60	508.72	508.84	508.96	509.08	509.20
525	533.03	533.16	533.28	533.41	533.53	533.66	533.79	533.91	534.04	534.16	534.29
550	558.06	558.19	558.32	558.46	558.59	558.72	558.85	558.98	559.12	559.25	559.38
575	583.09	583.23	583.37	583.50	583.64	583.78	583.92	584.06	584.19	584.33	584.47
600	608.12	608.26	608.41	608.55	608.70	608.84	608.98	609.13	609.27	609.42	609.56
625	633.15	633.30	633.45	633.60	633.75	633.90	634.05	634.20	634.35	634.50	634.65
650	658.18	658.34	658.49	658.65	658.80	658.96	659.12	659.27	659.43	659.58	659.74
675	683.21	683.37	683.53	683.70	683.86	684.02	684.18	684.34	684.51	684.67	684.83
700	708.24	708.41	708.58	708.74	708.91	709.08	709.25	709.42	709.58	709.75	709.92
725	733.27	733.44	733.62	733.79	733.97	734.14	734.31	734.49	734.66	734.84	735.01
750	758.30	758.48	758.66	758.84	759.02	759.20	759.38	759.56	759.74	759.92	760.10
775	783.33	783.52	783.70	783.89	784.07	784.26	784.45	784.63	784.82	785.00	785.19
800	808.36	808.55	808.74	808.94	809.13	809.32	809.51	809.70	809.90	810.09	810.28

Tab. E - "Seat L" Calculation

0 [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	= L + DL + 15.9										
100	116.02	116.04	116.07	116.09	116.12	116.14	116.16	116.19	116.21	116.24	116.26
125	141.05	141.08	141.11	141.14	141.17	141.20	141.23	141.26	141.29	141.32	141.35
150	166.08	166.12	166.15	166.19	166.22	166.26	166.30	166.33	166.37	166.40	166.44
175	191.11	191.15	191.19	191.24	191.28	191.32	191.36	191.40	191.45	191.49	191.53
200	216.14	216.19	216.24	216.28	216.33	216.38	216.43	216.48	216.52	216.57	216.62
225	241.17	241.22	241.28	241.33	241.39	241.44	241.49	241.55	241.60	241.66	241.71
250	266.20	266.26	266.32	266.38	266.44	266.50	266.56	266.62	266.68	266.74	266.80
275	291.23	291.30	291.36	291.43	291.49	291.56	291.63	291.69	291.76	291.82	291.89
300	316.26	316.33	316.40	316.48	316.55	316.62	316.69	316.76	316.84	316.91	316.98
325	341.29	341.37	341.45	341.52	341.60	341.68	341.76	341.84	341.91	341.99	342.07
350	366.32	366.40	366.49	366.57	366.66	366.74	366.82	366.91	366.99	367.08	367.16
375	391.35	391.44	391.53	391.62	391.71	391.80	391.89	391.98	392.07	392.16	392.25
400	416.38	416.48	416.57	416.67	416.76	416.86	416.96	417.05	417.15	417.24	417.34
425	441.41	441.51	441.61	441.72	441.82	441.92	442.02	442.12	442.23	442.33	442.43
450	466.44	466.55	466.66	466.76	466.87	466.98	467.09	467.20	467.30	467.41	467.52
475	491.47	491.58	491.70	491.81	491.93	492.04	492.15	492.27	492.38	492.50	492.61
500	516.50	516.62	516.74	516.86	516.98	517.10	517.22	517.34	517.46	517.58	517.70
525	541.53	541.66	541.78	541.91	542.03	542.16	542.29	542.41	542.54	542.66	542.79
550	566.56	566.69	566.82	566.96	567.09	567.22	567.35	567.48	567.62	567.75	567.88
575	591.59	591.73	591.87	592.00	592.14	592.28	592.42	592.56	592.69	592.83	592.97
600	616.62	616.76	616.91	617.05	617.20	617.34	617.48	617.63	617.77	617.92	618.06
625	641.65	641.80	641.95	642.10	642.25	642.40	642.55	642.70	642.85	643.00	643.15
650	666.68	666.84	666.99	667.15	667.30	667.46	667.62	667.77	667.93	668.08	668.24
675	691.71	691.87	692.03	692.20	692.36	692.52	692.68	692.84	693.01	693.17	693.33
700	716.74	716.91	717.08	717.24	717.41	717.58	717.75	717.92	718.08	718.25	718.42
725	741.77	741.94	742.12	742.29	742.47	742.64	742.81	742.99	743.16	743.34	743.51
750	766.80	766.98	767.16	767.34	767.52	767.70	767.88	768.06	768.24	768.42	768.60

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36
125	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
425	0.51	0.61	0.71	0.82	0.92	1.02	1.12	1.22	1.33	1.43	1.53
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
475	0.57	0.68	0.80	0.91	1.03	1.14	1.25	1.37	1.48	1.60	1.71
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80
525	0.63	0.76	0.88	1.01	1.13	1.26	1.39	1.51	1.64	1.76	1.89
550	0.66	0.79	0.92	1.06	1.19	1.32	1.45	1.58	1.72	1.85	1.98
575	0.69	0.83	0.97	1.10	1.24	1.38	1.52	1.66	1.79	1.93	2.07
600	0.72	0.86	1.01	1.15	1.30	1.44	1.58	1.73	1.87	2.02	2.16
625	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
650	0.78	0.94	1.09	1.25	1.40	1.56	1.72	1.87	2.03	2.18	2.34
675	0.81	0.97	1.13	1.30	1.46	1.62	1.78	1.94	2.11	2.27	2.43
700	0.84	1.01	1.18	1.34	1.51	1.68	1.85	2.02	2.18	2.35	2.52
725	0.87	1.04	1.22	1.39	1.57	1.74	1.91	2.09	2.26	2.44	2.61
750	0.90	1.08	1.26	1.44	1.62	1.80	1.98	2.16	2.34	2.52	2.70
775	0.93	1.12	1.30	1.49	1.67	1.86	2.05	2.23	2.42	2.60	2.79
800	0.96	1.15	1.34	1.54	1.73	1.92	2.11	2.30	2.50	2.69	2.88

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 11.4										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	111.52	111.54	111.57	111.59	111.62	111.64	111.66	111.69	111.71	111.74	111.76
125	136.55	136.58	136.61	136.64	136.67	136.70	136.73	136.76	136.79	136.82	136.85
150	161.58	161.62	161.65	161.69	161.72	161.76	161.80	161.83	161.87	161.90	161.94
175	186.61	186.65	186.69	186.74	186.78	186.82	186.86	186.90	186.95	186.99	187.03
200	211.64	211.69	211.74	211.78	211.83	211.88	211.93	211.98	212.02	212.07	212.12
225	236.67	236.72	236.78	236.83	236.89	236.94	236.99	237.05	237.10	237.16	237.21
250	261.70	261.76	261.82	261.88	261.94	262.00	262.06	262.12	262.18	262.24	262.30
275	286.73	286.80	286.86	286.93	286.99	287.06	287.13	287.19	287.26	287.32	287.39
300	311.76	311.83	311.90	311.98	312.05	312.12	312.19	312.26	312.34	312.41	312.48
325	336.79	336.87	336.95	337.02	337.10	337.18	337.26	337.34	337.41	337.49	337.57
350	361.82	361.90	361.99	362.07	362.16	362.24	362.32	362.41	362.49	362.58	362.66
375	386.85	386.94	387.03	387.12	387.21	387.30	387.39	387.48	387.57	387.66	387.75
400	411.88	411.98	412.07	412.17	412.26	412.36	412.46	412.55	412.65	412.74	412.84
425	436.91	437.01	437.11	437.22	437.32	437.42	437.52	437.62	437.73	437.83	437.93
450	461.94	462.05	462.16	462.26	462.37	462.48	462.59	462.70	462.80	462.91	463.02
475	486.97	487.08	487.20	487.31	487.43	487.54	487.65	487.77	487.88	488.00	488.11
500	512.00	512.12	512.24	512.36	512.48	512.60	512.72	512.84	512.96	513.08	513.20
525	537.03	537.16	537.28	537.41	537.53	537.66	537.79	537.91	538.04	538.16	538.29
550	562.06	562.19	562.32	562.46	562.59	562.72	562.85	562.98	563.12	563.25	563.38
575	587.09	587.23	587.37	587.50	587.64	587.78	587.92	588.06	588.19	588.33	588.47
600	612.12	612.26	612.41	612.55	612.70	612.84	612.98	613.13	613.27	613.42	613.56

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Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 11.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	111.32	111.34	111.37	111.39	111.42	111.44	111.46	111.49	111.51	111.54	111.56
125	136.35	136.38	136.41	136.44	136.47	136.50	136.53	136.56	136.59	136.62	136.65
150	161.38	161.42	161.45	161.49	161.52	161.56	161.60	161.63	161.67	161.70	161.74
175	186.41	186.45	186.49	186.54	186.58	186.62	186.66	186.70	186.75	186.79	186.83
200	211.44	211.49	211.54	211.58	211.63	211.68	211.73	211.78	211.82	211.87	211.92
225	236.47	236.52	236.58	236.63	236.69	236.74	236.79	236.85	236.90	236.96	237.01
250	261.50	261.56	261.62	261.68	261.74	261.80	261.86	261.92	261.98	262.04	262.10
275	286.53	286.60	286.66	286.73	286.79	286.86	286.93	286.99	287.06	287.12	287.19
300	311.56	311.63	311.70	311.78	311.85	311.92	311.99	312.06	312.14	312.21	312.28
325	336.59	336.67	336.75	336.82	336.90	336.98	337.06	337.14	337.21	337.29	337.37
350	361.62	361.70	361.79	361.87	361.96	362.04	362.12	362.21	362.29	362.38	362.46
375	386.65	386.74	386.83	386.92	387.01	387.10	387.19	387.28	387.37	387.46	387.55
400	411.68	411.78	411.87	411.97	412.06	412.16	412.26	412.35	412.45	412.54	412.64
425	436.71	436.81	436.91	437.02	437.12	437.22	437.32	437.42	437.53	437.63	437.73
450	461.74	461.85	461.96	462.06	462.17	462.28	462.39	462.50	462.60	462.71	462.82
475	486.77	486.88	487.00	487.11	487.23	487.34	487.45	487.57	487.68	487.80	487.91
500	511.80	511.92	512.04	512.16	512.28	512.40	512.52	512.64	512.76	512.88	513.00
525	536.83	536.96	537.08	537.21	537.33	537.46	537.59	537.71	537.84	537.96	538.09
550	561.86	561.99	562.12	562.26	562.39	562.52	562.65	562.78	562.92	563.05	563.18
575	586.89	587.03	587.17	587.30	587.44	587.58	587.72	587.86	587.99	588.13	588.27
600	611.92	612.06	612.21	612.35	612.50	612.64	612.78	612.93	613.07	613.22	613.36
625	636.95	637.10	637.25	637.40	637.55	637.70	637.85	638.00	638.15	638.30	638.45
650	661.98	662.14	662.29	662.45	662.60	662.76	662.92	663.07	663.23	663.38	663.54
675	687.01	687.17	687.33	687.50	687.66	687.82	687.98	688.14	688.31	688.47	688.63
700	712.04	712.21	712.38	712.54	712.71	712.88	713.05	713.22	713.38	713.55	713.72
725	737.07	737.24	737.42	737.59	737.77	737.94	738.11	738.29	738.46	738.64	738.81
750	762.10	762.28	762.46	762.64	762.82	763.00	763.18	763.36	763.54	763.72	763.90
775	787.13	787.32	787.50	787.69	787.87	788.06	788.25	788.43	788.62	788.80	788.99
800	812.16	812.35	812.54	812.74	812.93	813.12	813.31	813.50	813.70	813.89	814.08

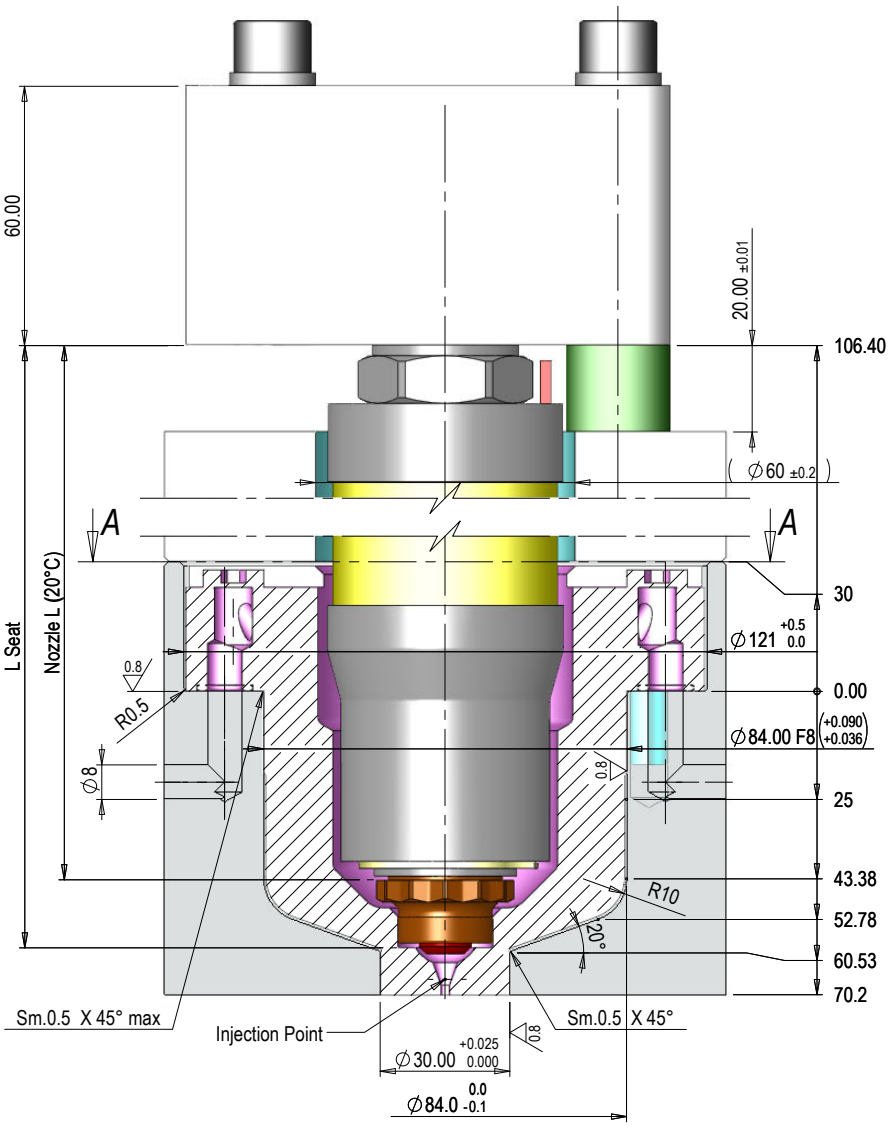
Tab. C - "Seat L" Calculation

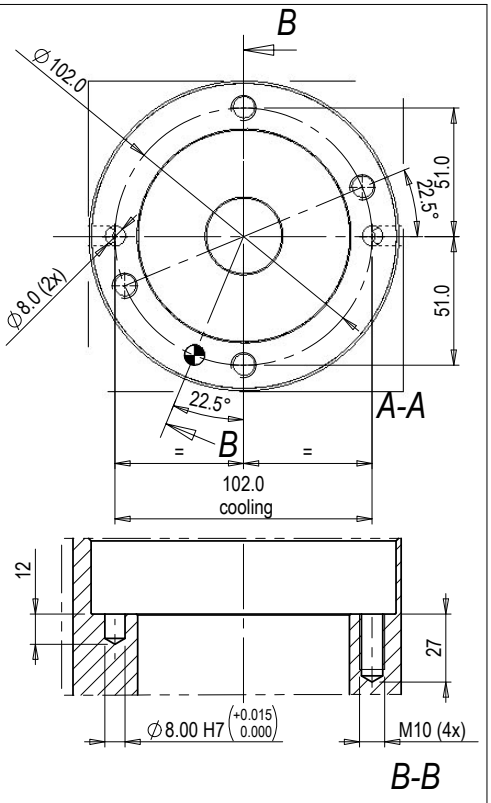
0 [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	= L + DL + 11.9										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	112.02	112.04	112.07	112.09	112.12	112.14	112.16	112.19	112.21	112.24	112.26
125	137.05	137.08	137.11	137.14	137.17	137.20	137.23	137.26	137.29	137.32	137.35
150	162.08	162.12	162.15	162.19	162.22	162.26	162.30	162.33	162.37	162.40	162.44
175	187.11	187.15	187.19	187.24	187.28	187.32	187.36	187.40	187.45	187.49	187.53
200	212.14	212.19	212.24	212.28	212.33	212.38	212.43	212.48	212.52	212.57	212.62
225	237.17	237.22	237.28	237.33	237.39	237.44	237.49	237.55	237.60	237.66	237.71
250	262.20	262.26	262.32	262.38	262.44	262.50	262.56	262.62	262.68	262.74	262.80
275	287.23	287.30	287.36	287.43	287.49	287.56	287.63	287.69	287.76	287.82	287.89
300	312.26	312.33	312.40	312.48	312.55	312.62	312.69	312.76	312.84	312.91	312.98
325	337.29	337.37	337.45	337.52	337.60	337.68	337.76	337.84	337.91	337.99	338.07
350	362.32	362.40	362.49	362.57	362.66	362.74	362.82	362.91	362.99	363.08	363.16
375	387.35	387.44	387.53	387.62	387.71	387.80	387.89	387.98	388.07	388.16	388.25
400	412.38	412.48	412.57	412.67	412.76	412.86	412.96	413.05	413.15	413.24	413.34
425	437.41	437.51	437.61	437.72	437.82	437.92	438.02	438.12	438.23	438.33	438.43
450	462.44	462.55	462.66	462.76	462.87	462.98	463.09	463.20	463.30	463.41	463.52
475	487.47	487.58	487.70	487.81	487.93	488.04	488.15	488.27	488.38	488.50	488.61
500	512.50	512.62	512.74	512.86	512.98	513.10	513.22	513.34	513.46	513.58	513.70

index

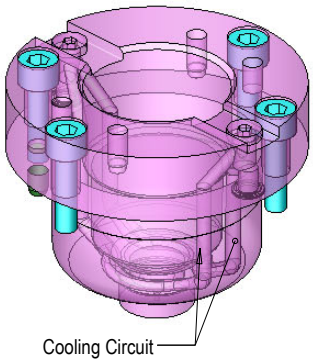
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SLM COOLING BUSHING
STANDARD Version

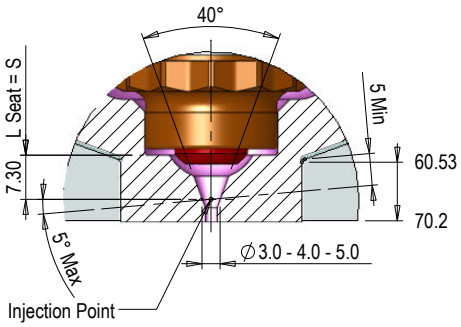




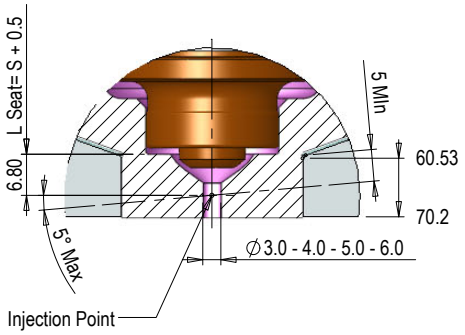
Standard version



Conic valve gating



Cylindrical valve gating



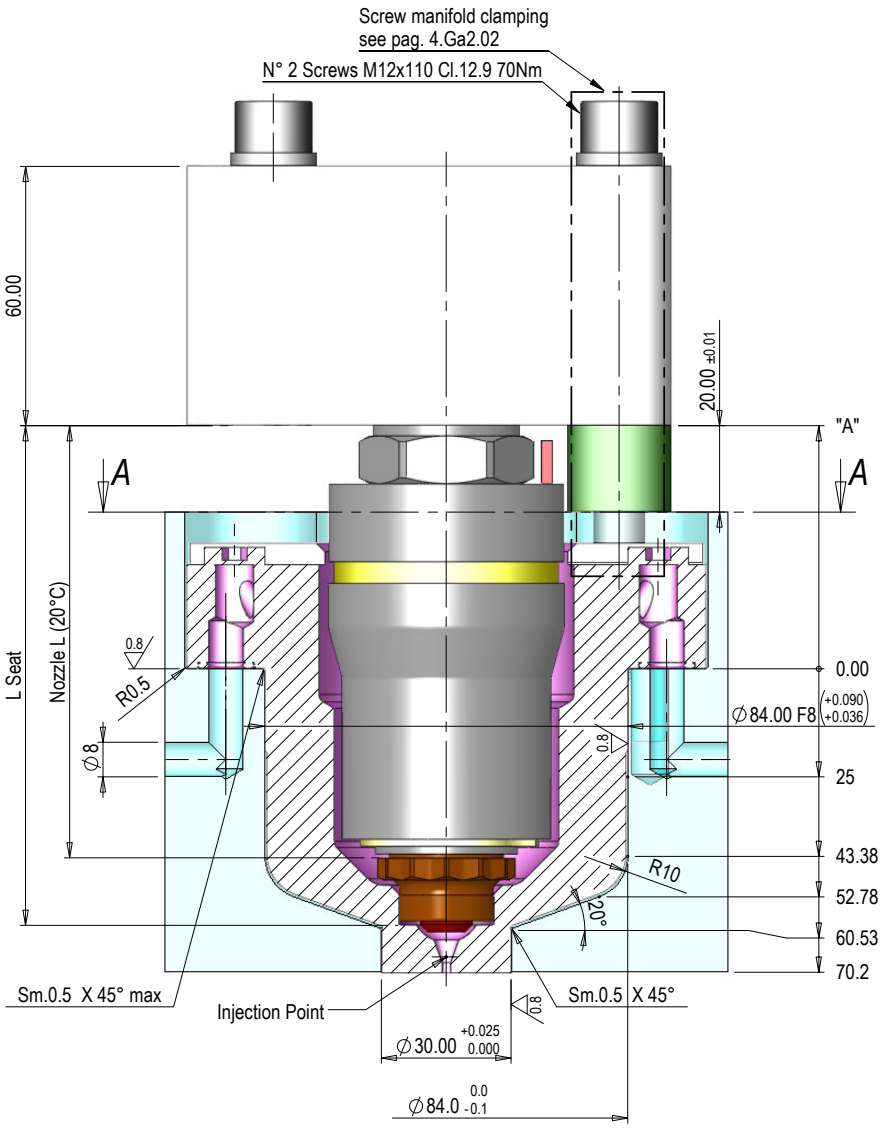
Cooling bushing STANDARD to be used with "L Nozzle" ≥ 150. For version with "L Nozzle" < 150 see pag. 4.Ga1.13

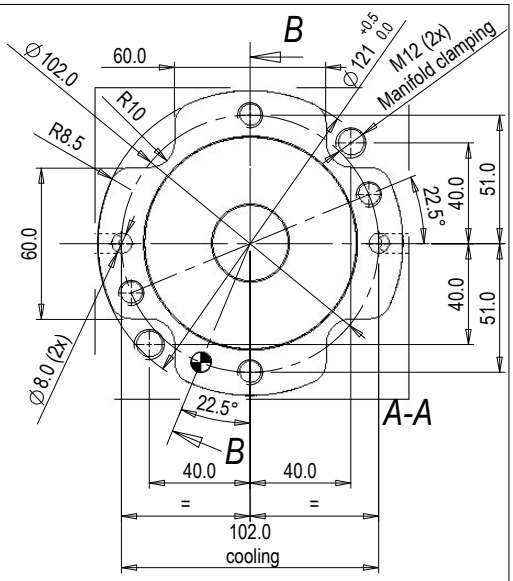
NOZZLE L	DL 200°C	S	A	NOZZLE L	DL 200°C	S	A	NOZZLE L	DL 200°C	S	A	COOLING BUSHING
150	0.36	165.76	106.40	375.00	0.90	391.30	331.94	600	1.44	616.84	557.48	***Conic valve gating***
175	0.42	190.82	131.46	400.00	0.96	416.36	357.00	625	1.50	641.90	582.54	Ø3.0 - 0002-00128
200	0.48	215.88	156.52	425.00	1.02	441.42	382.06	650	1.56	666.96	607.60	Ø4.0 - 0002-00129
225	0.54	240.94	181.58	450.00	1.08	466.48	407.12	675	1.62	692.02	632.66	Ø5.0 - 0002-00130
250	0.60	266.00	206.64	475.00	1.14	491.54	432.18	700	1.68	717.08	657.72	***Cylindrical valve gating***
275	0.66	291.06	231.70	500.00	1.20	516.60	457.24	725	1.74	742.14	682.78	Ø3.0 - 0002-00360
300	0.72	316.12	256.76	525.00	1.26	541.66	482.30	750	1.80	767.20	707.84	Ø4.0 - 0002-00361
325	0.78	341.18	281.82	550.00	1.32	566.72	507.36	775	1.86	792.26	732.90	Ø5.0 - 0002-00362
350	0.84	366.24	306.88	575.00	1.38	591.78	532.42	800	1.92	817.32	757.96	Ø6.0 - 0002-00363

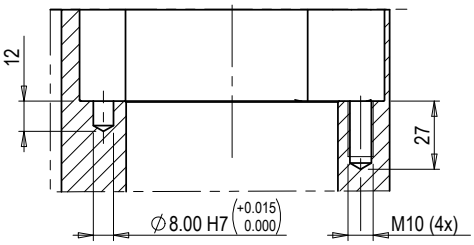
Index

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SLM COOLING BUSHING
SHAPED Version

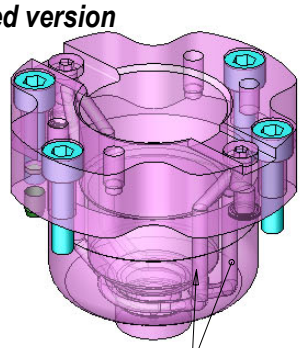




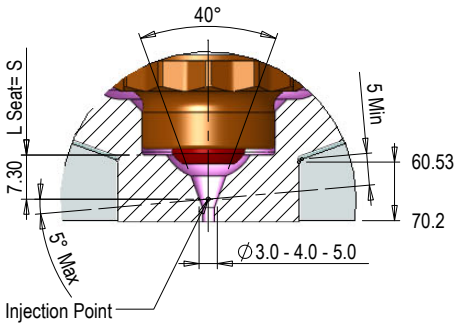


Shaped version

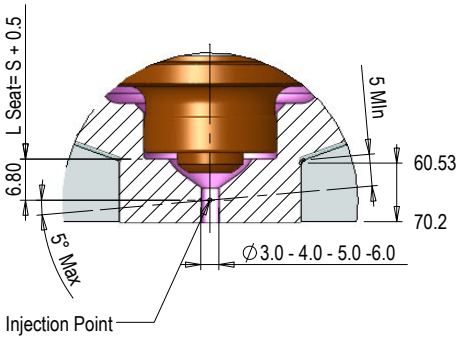
B-B



Conic valve gating



Cylindrical valve gating

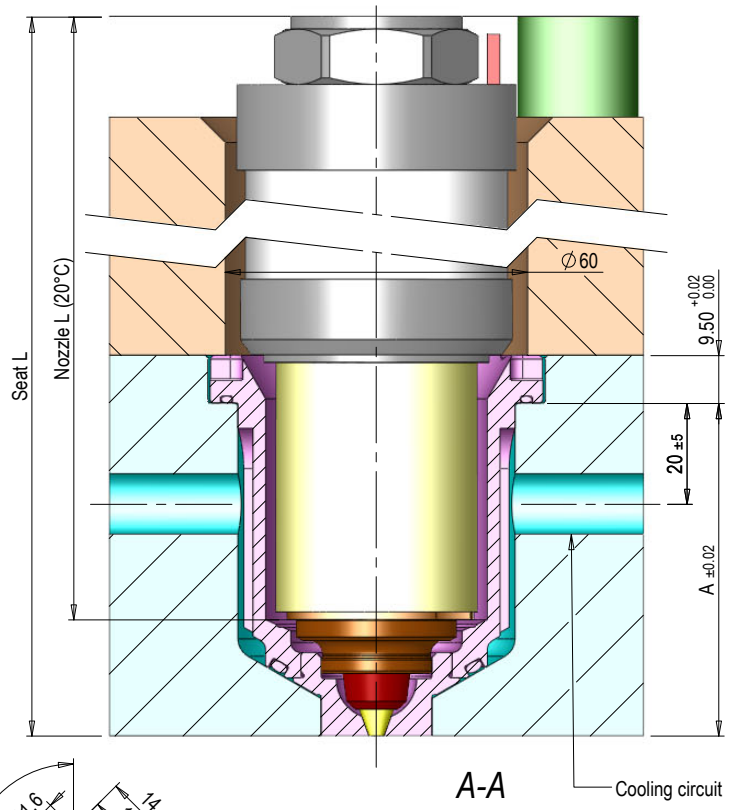


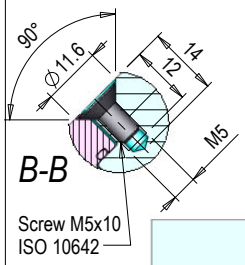
SHAPED Cooling bushing to be used with "L Nozzle" < 150 mm. For version with "L Nozzle" ≥ 150 see pag. 4.Ga1.12

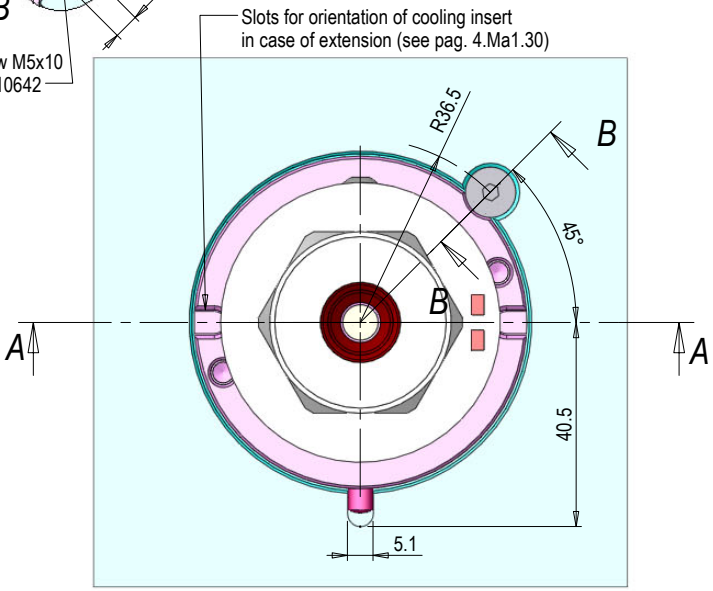
L INIETTORE	DL 200°C	S	A	BUSSOLA DI RAFFREDDAMENTO	
100	0.24	115.64	56.28	Otturazione Conica	Otturazione Cilindrica
125	0.30	140.70	81.34	Ø3.0 - 0002-00131	Ø3.0 - 0002-00364
				Ø4.0 - 0002-00132	Ø4.0 - 0002-00365
				Ø5.0 - 0002-00133	Ø5.0 - 0002-00366
					Ø6.0 - 0002-00367

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COOLING INSERT
TTC

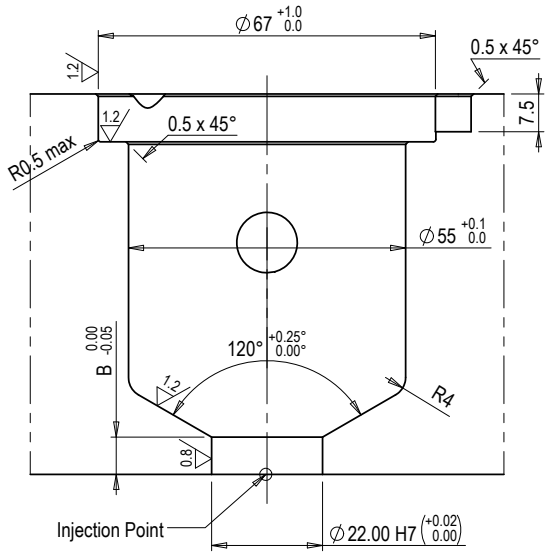




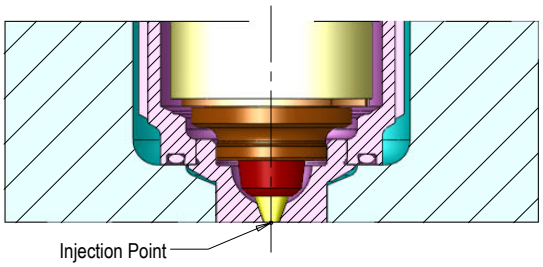


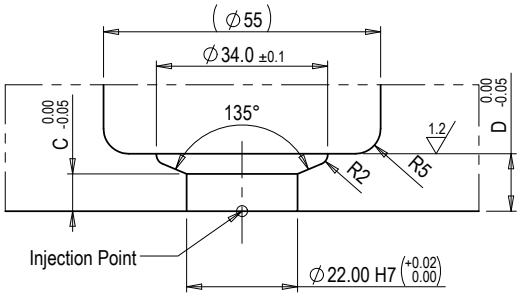
1) Cooling note: suggested hole Ø12 to cool max 4 bushings with only 1 circuit (range 4÷6 Bar)

Standard Seat



On plane OR Seat

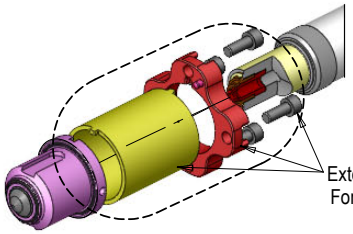






for Ø gate and codes check page 4.Ga1.26

COOLING INSERT Extension

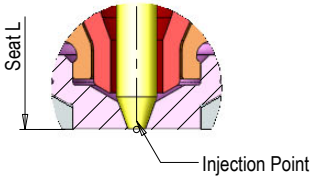


	Seat L	A	B	C	D
PGC20	L+DL+18.9	62.20	3.60	3.50	7.60
PGC30 / PGY30	L+DL+22.7	66.00	7.40	7.40	11.40

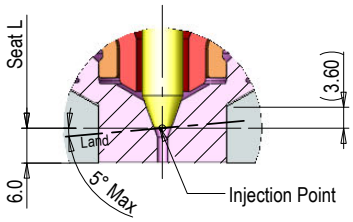
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Type **PGC20**

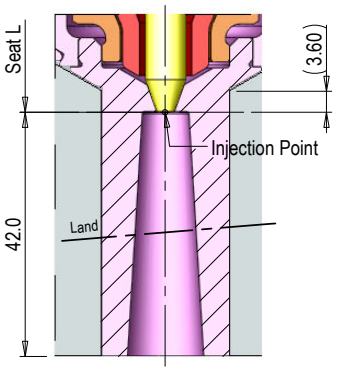
Version L=11



Version L=17

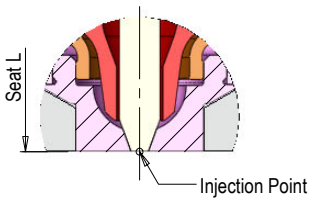


Version L=59

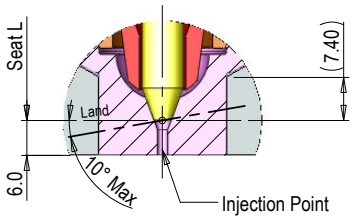


Type **PGC30**

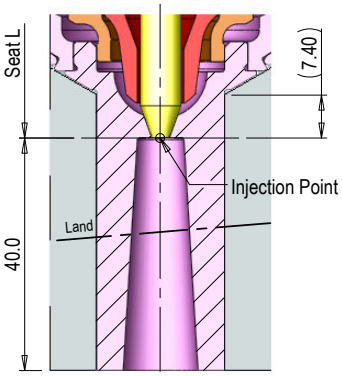
Version L=16



Version L=22

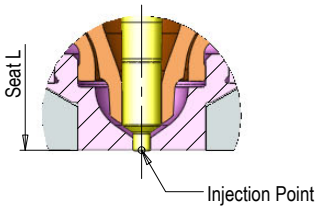


Version L=59

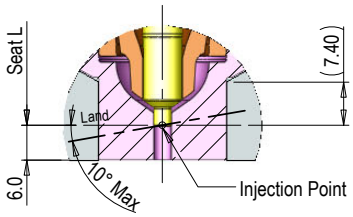


Type **PGY30**

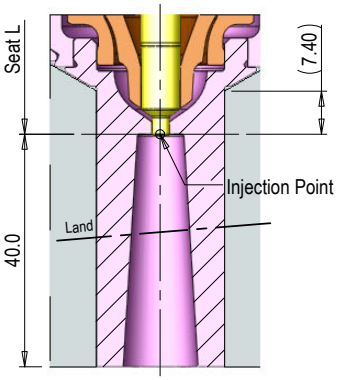
Version L=16



Version L=22



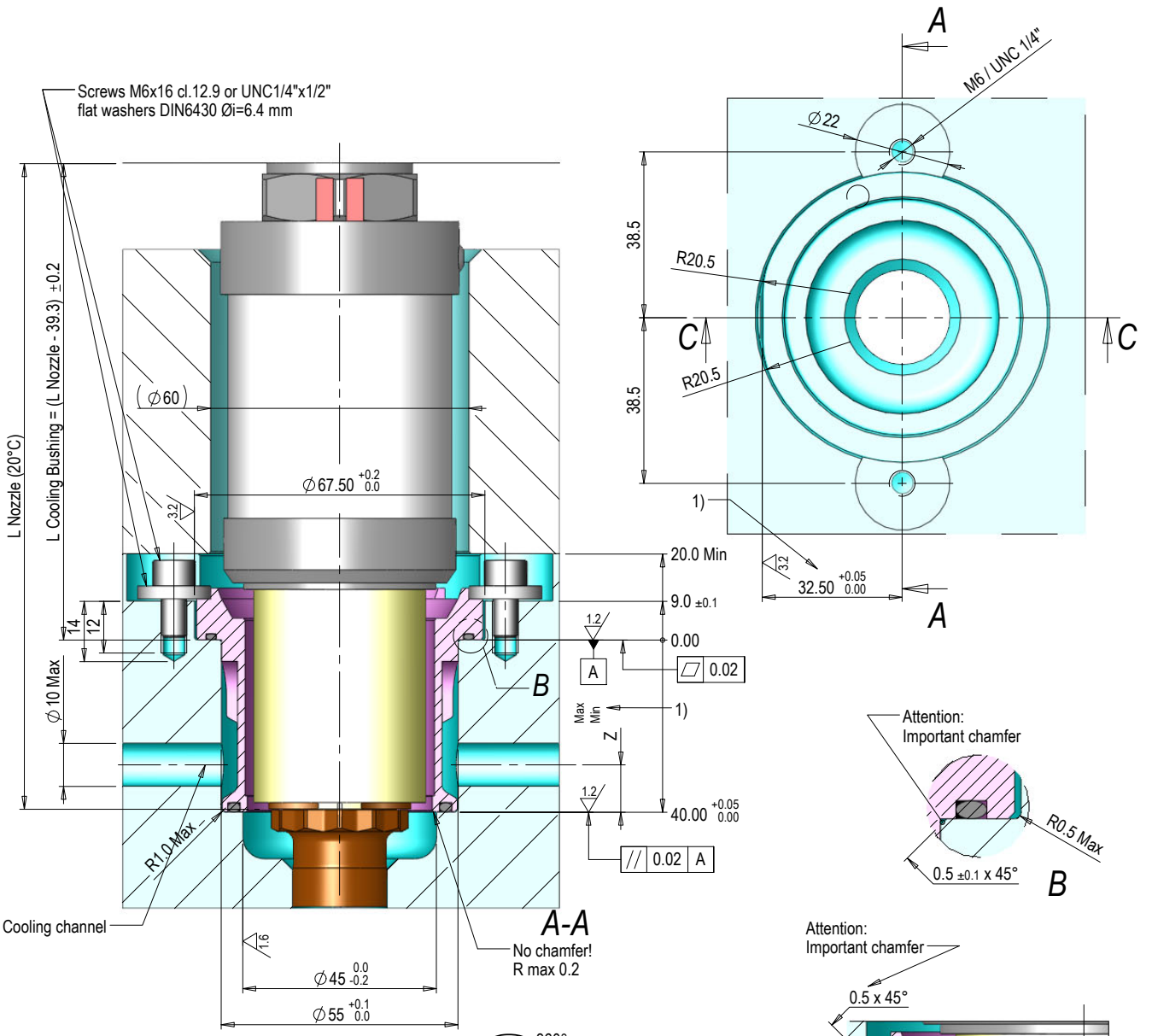
Version L=59



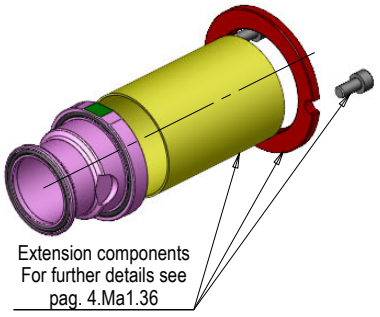
For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

	GATE INSERT		
	Version L=11	***Version L=17***	***Version L=59***
PGC20	Gate Ø3.0 - 0335-00064 Ø3.5 - 0335-00065 Ø4.0 - 0335-00066 Ø4.5 - 0335-00067 Ø5.0 - 0335-00068	Gate Ø3.0 - 0335-00071 Ø3.5 - 0335-00072 Ø4.0 - 0335-00073 Ø4.5 - 0335-00074 Ø5.0 - 0335-00075	Gate Ø3.0 - 0335-00078 Ø3.5 - 0335-00079 Ø4.0 - 0335-00080 Ø4.5 - 0335-00081 Ø5.0 - 0335-00082
	Version L=16	***Version L=22***	***Version L=64***
PGC30	Gate Ø3.0 - 0335-00085 Ø3.5 - 0335-00086 Ø4.0 - 0335-00087 Ø4.5 - 0335-00088 Ø5.0 - 0335-00089	Gate Ø3.0 - 0335-00092 Ø3.5 - 0335-00093 Ø4.0 - 0335-00094 Ø4.5 - 0335-00095 Ø5.0 - 0335-00096	Gate Ø3.0 - 0335-00099 Ø3.5 - 0335-00100 Ø4.0 - 0335-00101 Ø4.5 - 0335-00102 Ø5.0 - 0335-00103
PGY30	Gate Ø3.0 - 0335-00106 Ø4.0 - 0335-00107 Ø5.0 - 0335-00108 Ø6.0 - 0335-00109	Gate Ø3.0 - 0335-00110 Ø4.0 - 0335-00111 Ø5.0 - 0335-00112 Ø6.0 - 0335-00113	Gate Ø3.0 - 0335-00114 Ø4.0 - 0335-00115 Ø5.0 - 0335-00116 Ø6.0 - 0335-00117

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COOLING INSERT Extension



Extension components
For further details see
pag. 4.Ma1.36

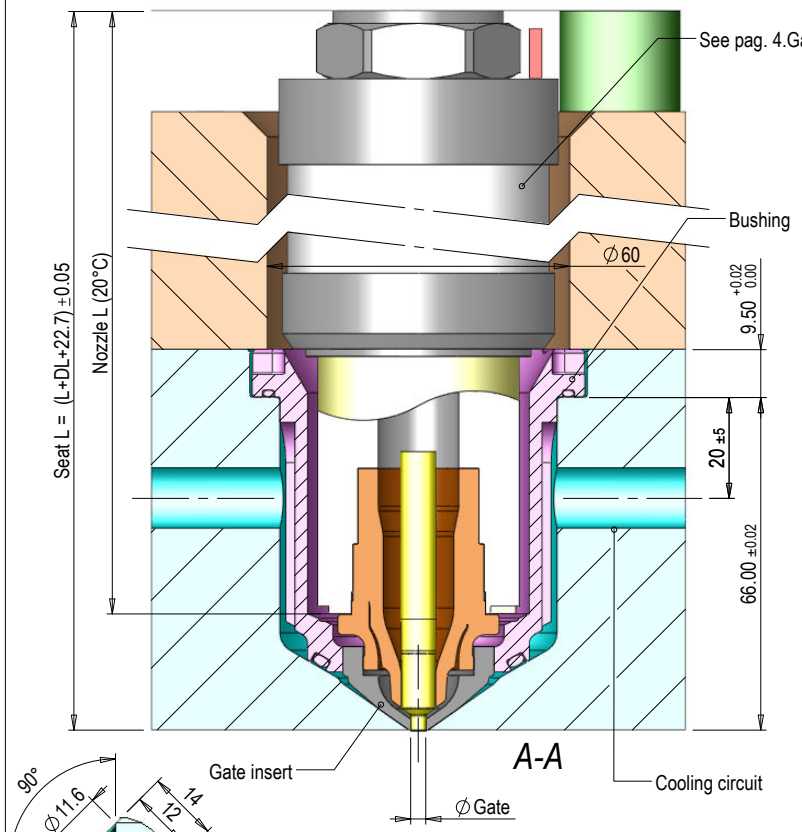
COOLING BUSHING(*)			
Code	**Z**	**Z Min**	**Z Max**
0121-00496	12	7	25.0

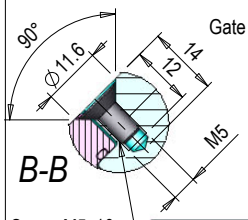
(*) Applicable to all type Nozzles Compact type

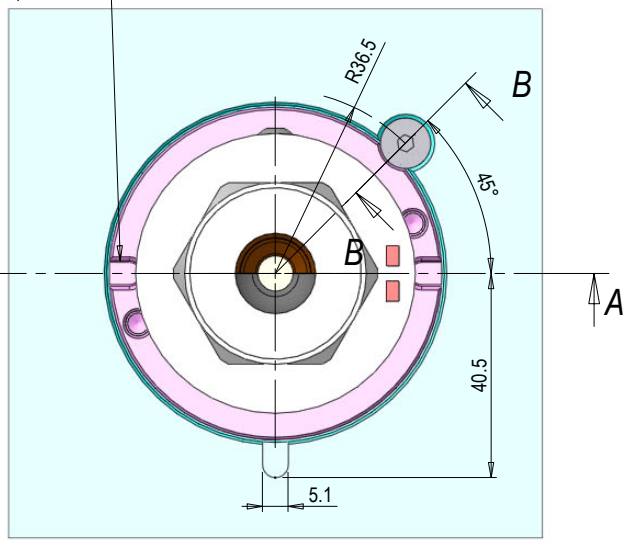
1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
2) For all cases with "Z Max" > 18, then the positioning face can be located at any angle around the axis of the bushing and with respect to the fixing screws, in order to correctly intercept the customer cooling channels (Fig.2). For more details, please contact the Oerlikon HRSflow technical department.

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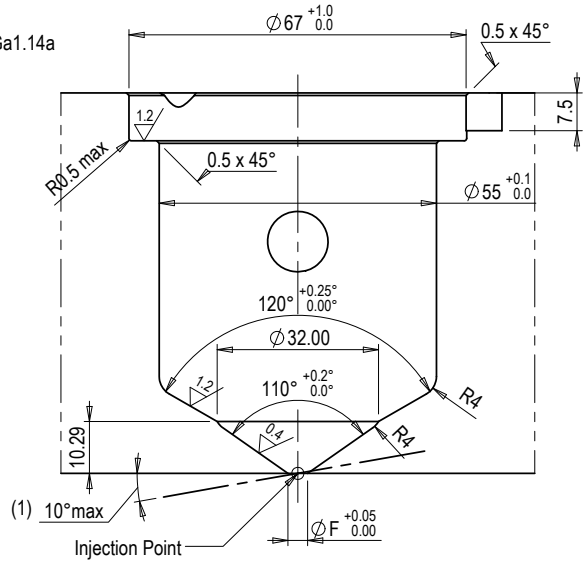
Type **PGY30**





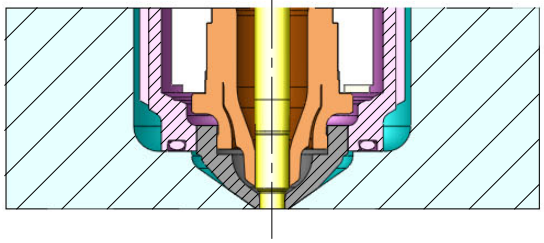


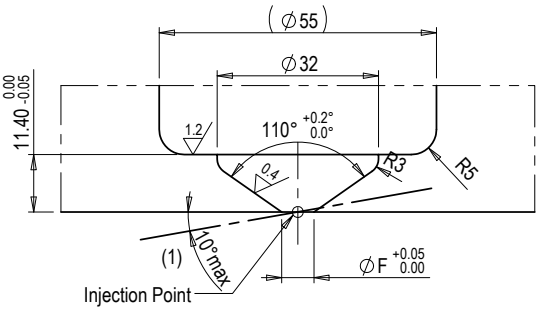
Standard Seat

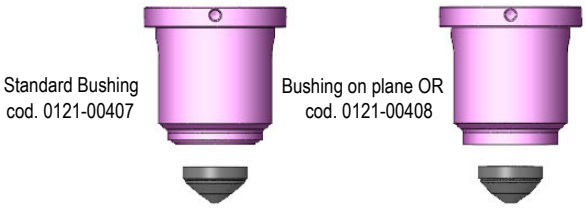


(1) Max angle allowed to the normal to the surface is 10°.
Should gates be placed on cosmetic surfaces/portions, the max angle allowed is 3° instead.
In case of any questions, please contact your technical reference within Oerlikon HRSflow.

On plane OR Seat





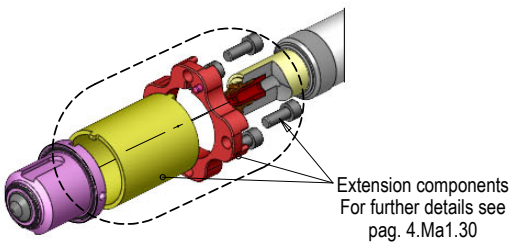


1) Cooling note: suggested hole Ø10 to cool max 4 bushings with only 1 circuit (range 4÷6 Bar)

GATE INSERT		
Code	***Ø Gate***	***Ø F***
0335-00172	3.0	3.9
0335-00173	4.0	5.1
0335-00174	5.0	6.4
0335-00175	6.0	7.6

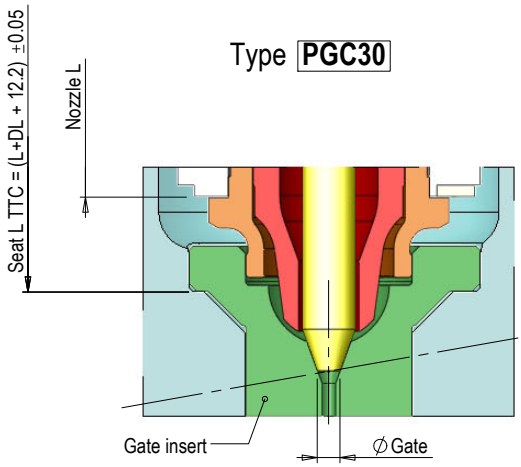
Installation KIT cod: 0283-00649

COOLING INSERT Extension



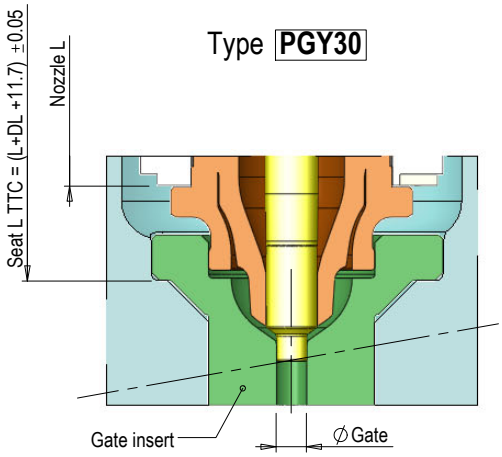
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Type **PGC30**

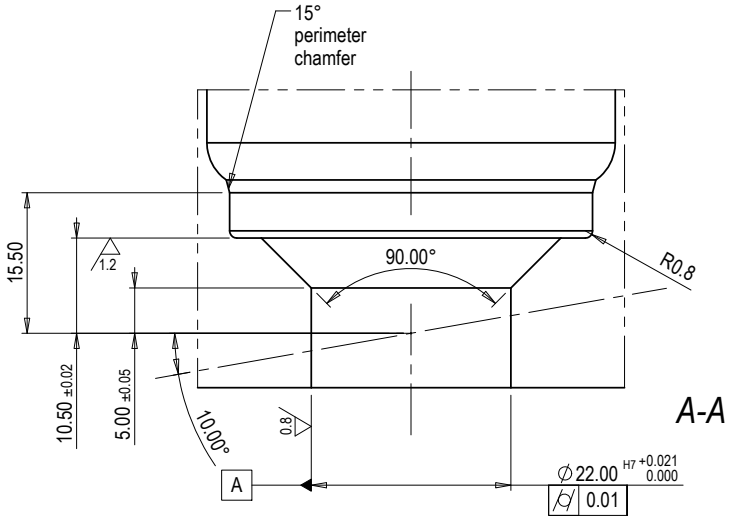


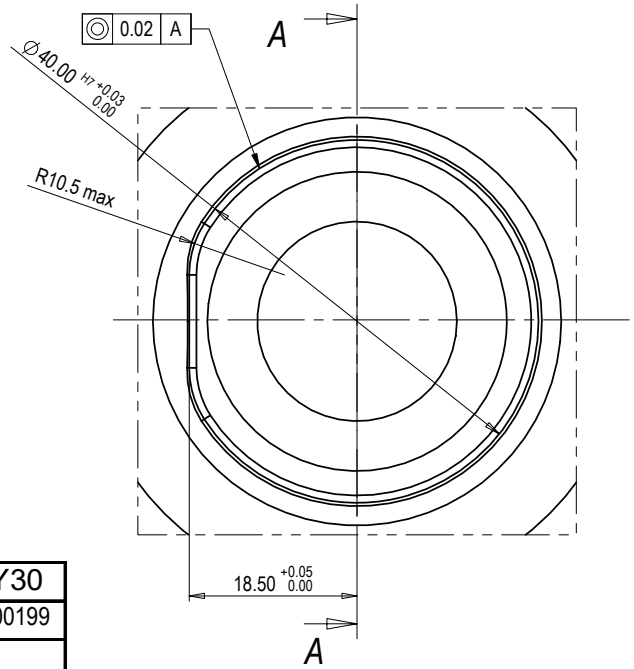
for missing nozzle dimensions check PGC30 config. in the previous pages

Type **PGY30**



for missing nozzle dimensions check PGY30 config. in the previous pages



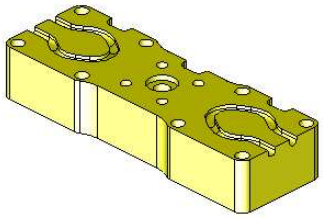


ØGate	PGC30	PGY30
3.0	0335-00192	0335-00199
3.5	0335-00193	-
4.0	0335-00194	0335-00200
4.5	0335-00195	-
5.0	0335-00196	0335-00201
6.0	-	0335-00202

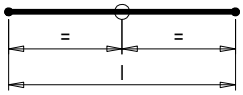
For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

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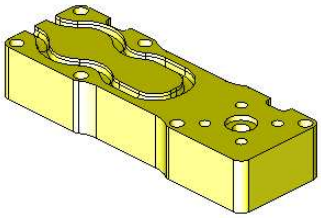
-HL-



Standard
l=150-200-250-300-350-400-450 mm



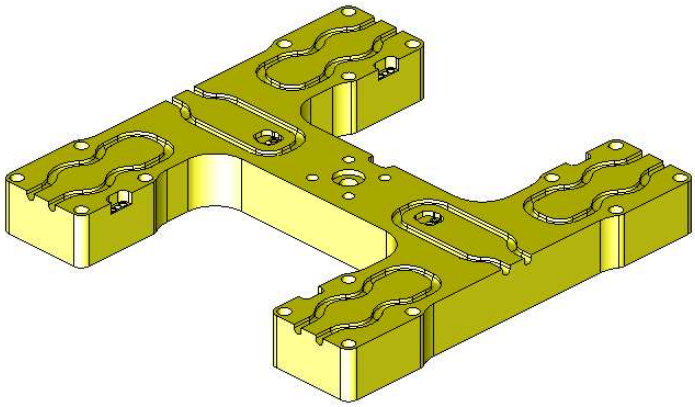
-HD-

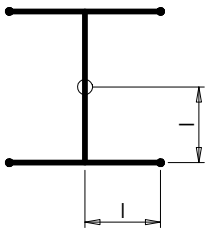


Standard
l=75-100-125-150-175-200-225 mm



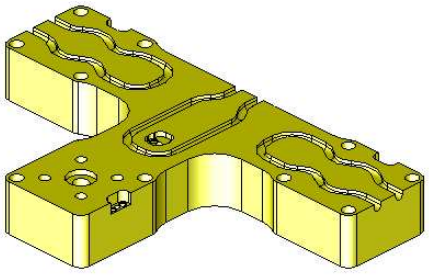
-HH-

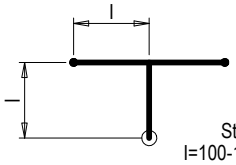




Standard
l=100-125-150 mm

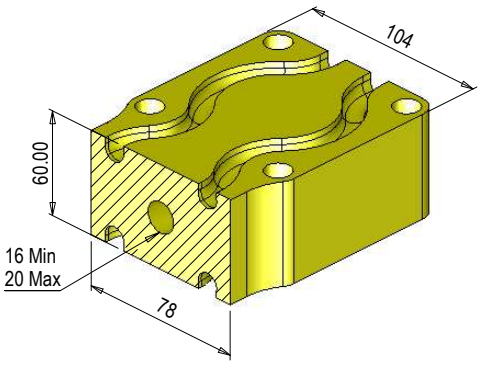
-HT-





Standard
l=100-125-150 mm

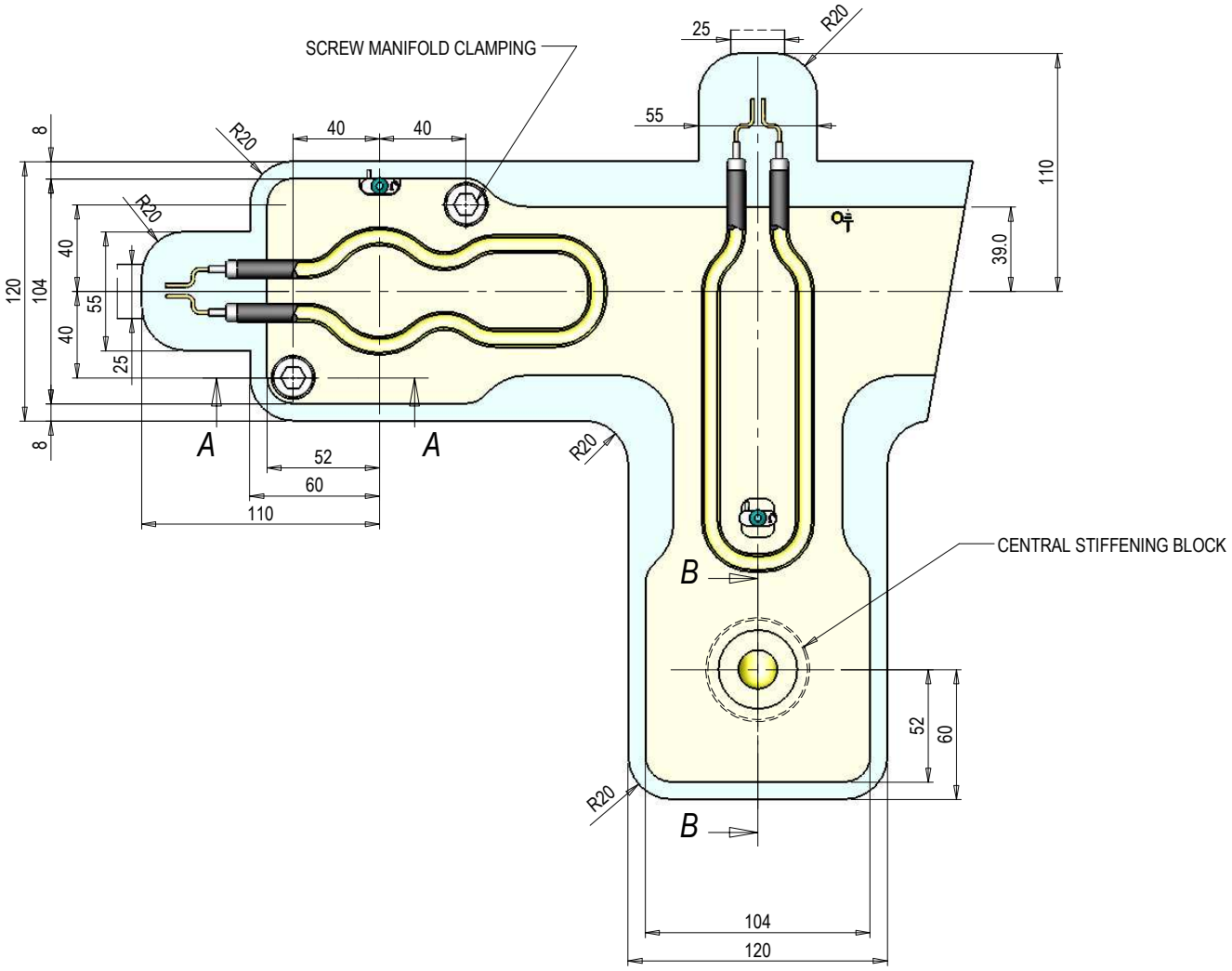
Ga series



Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

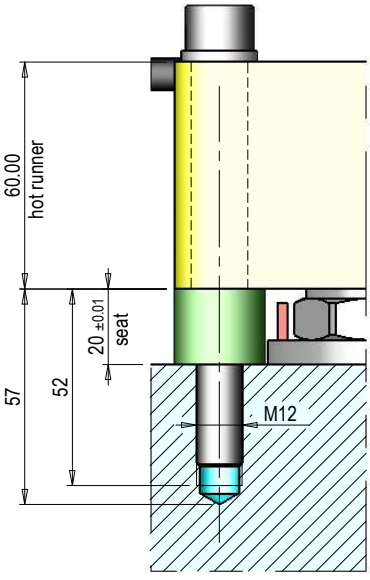
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The following profile is the typical one for
the standard not wired hot runner pocket
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)



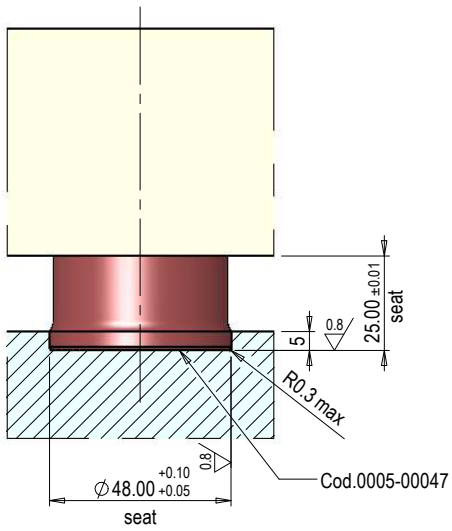
Screw manifold clamping

Screw M12x110 cl.12.9 70 Nm



A-A

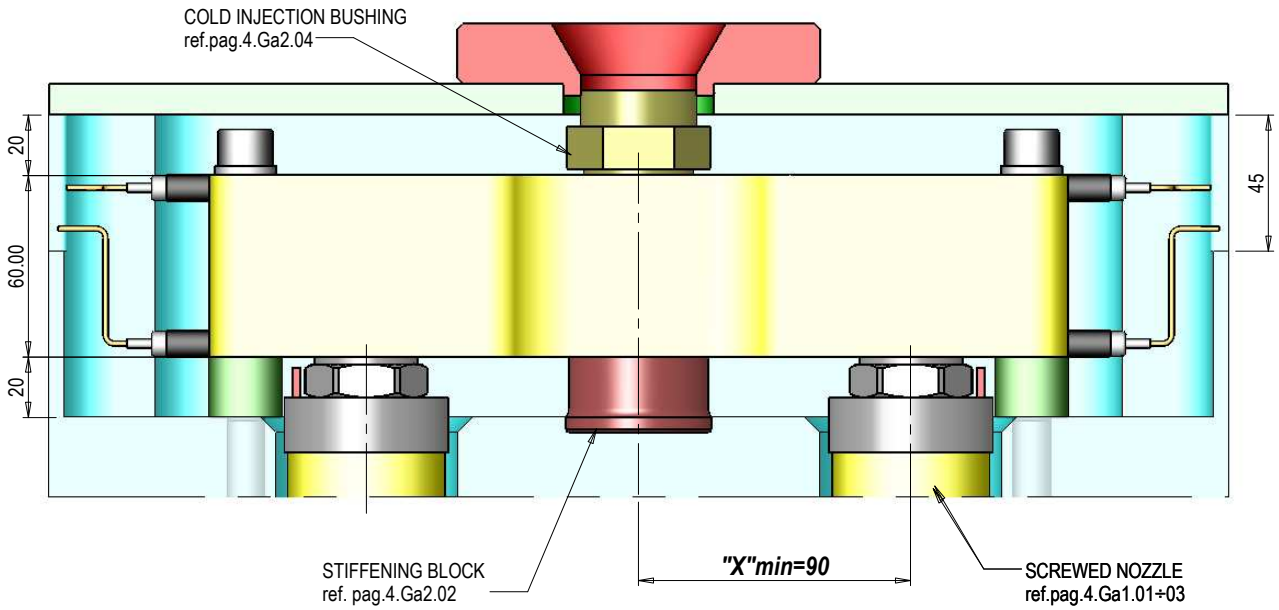
Pocket central stiffening block



B-B

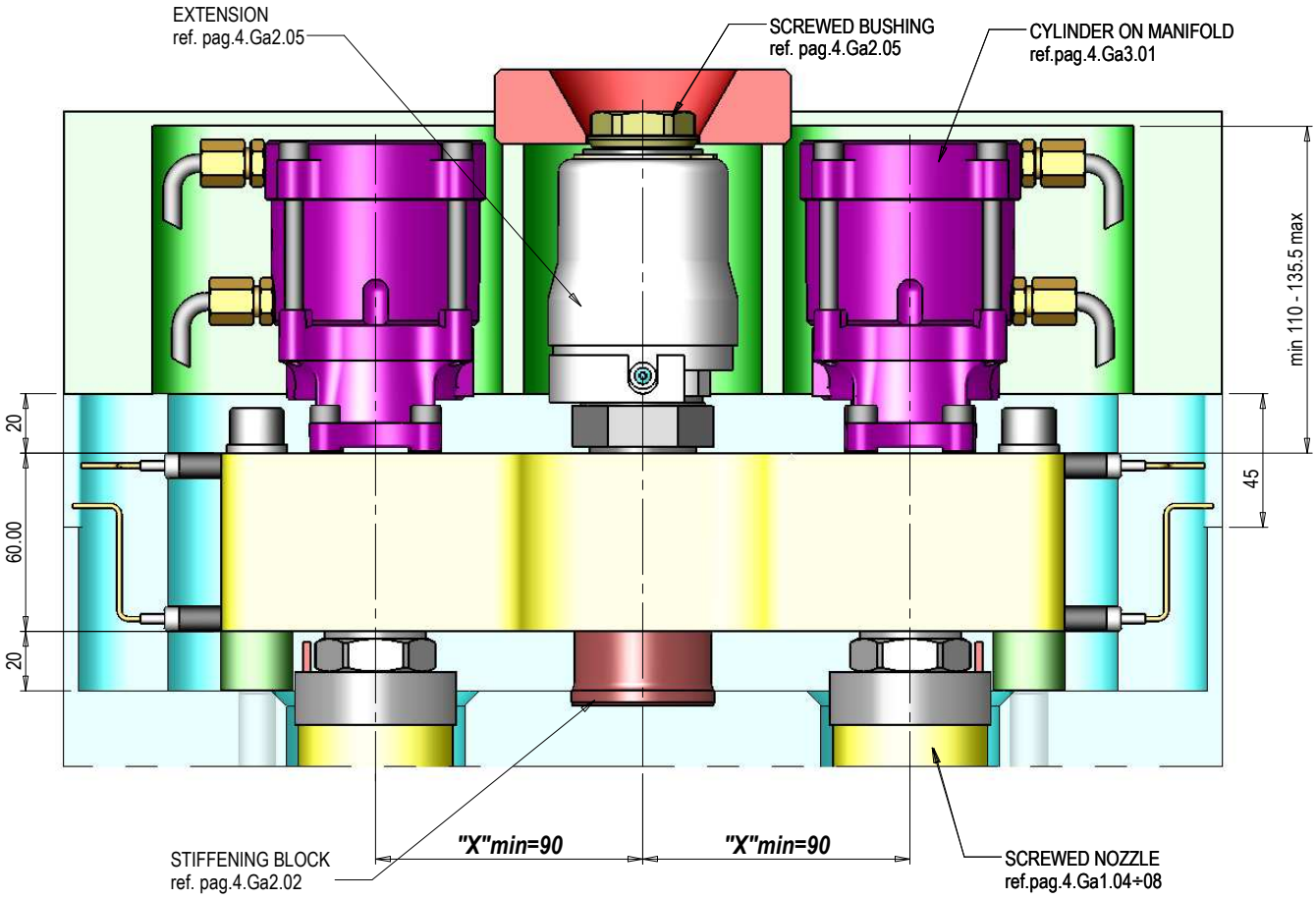
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Structure for TORPEDO or FREE FLOW systems

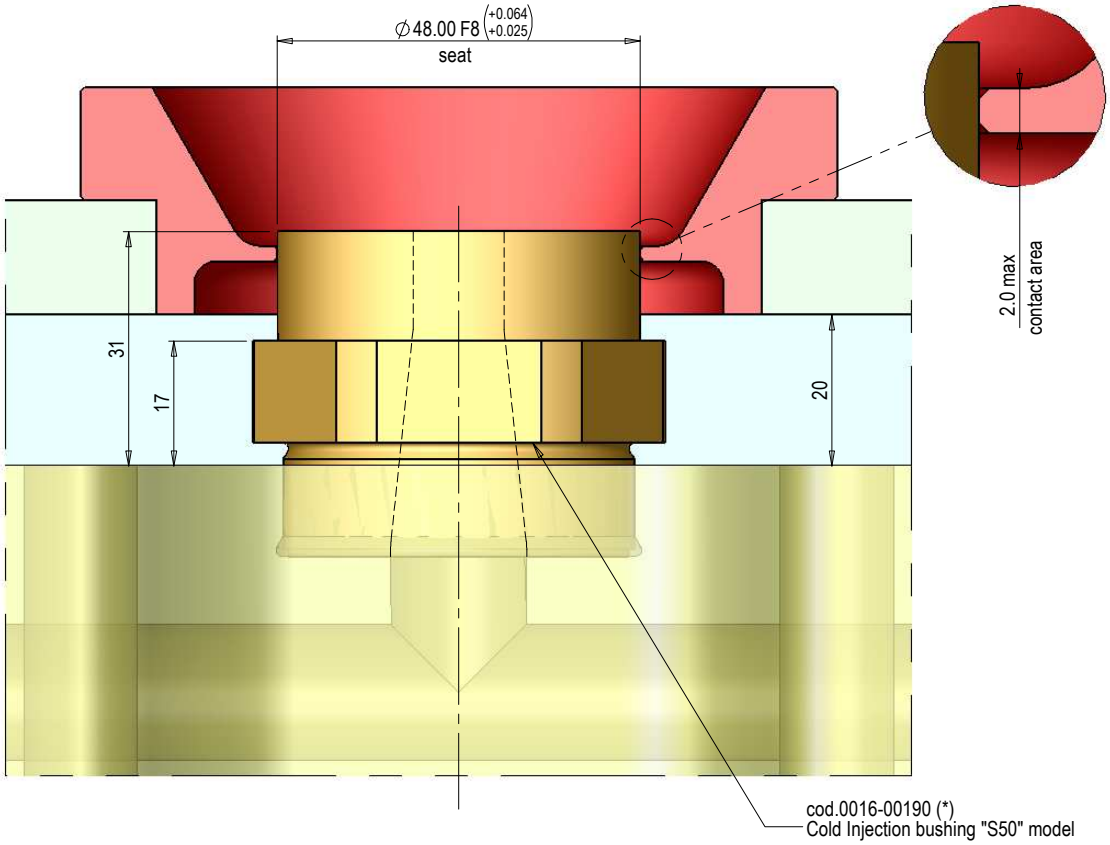


Xmin= min centre distance between injection bushing and nozzle for non standard systems

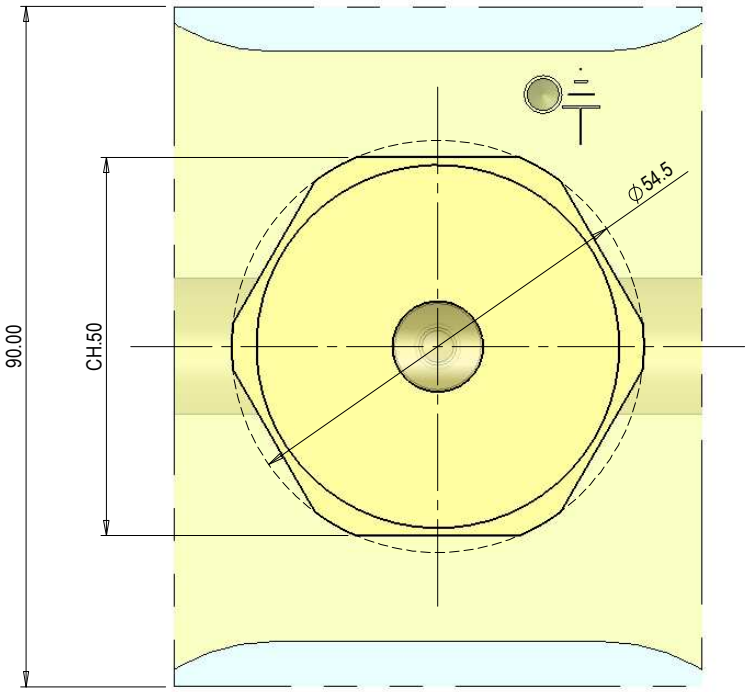
Structure for VALVE GATING systems



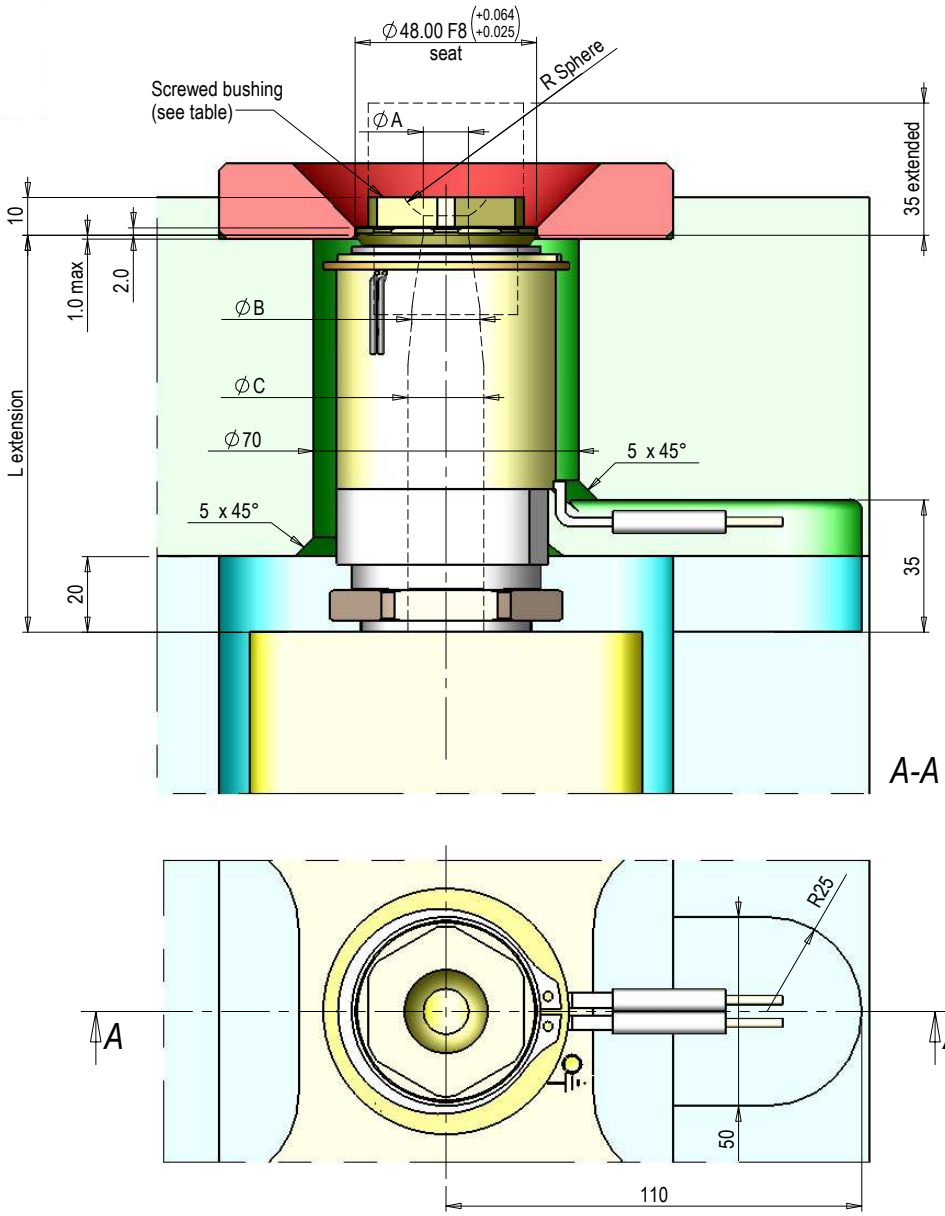
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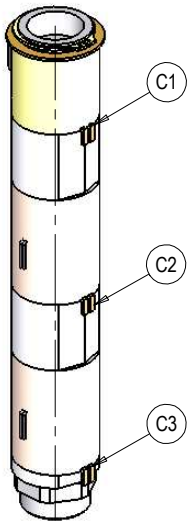
(*)Standard code with R sphere=0. Others R sphere sizes to be required.



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Control Zone



"L" (*)	MAXIMUN N° OF ZONES
040.00 ÷ 205.69	1 [C1]
205.70 ÷ 356.39	2 [C1 + C2]
356.40 ÷ 520.00	3 [C1 + C2 + C3]

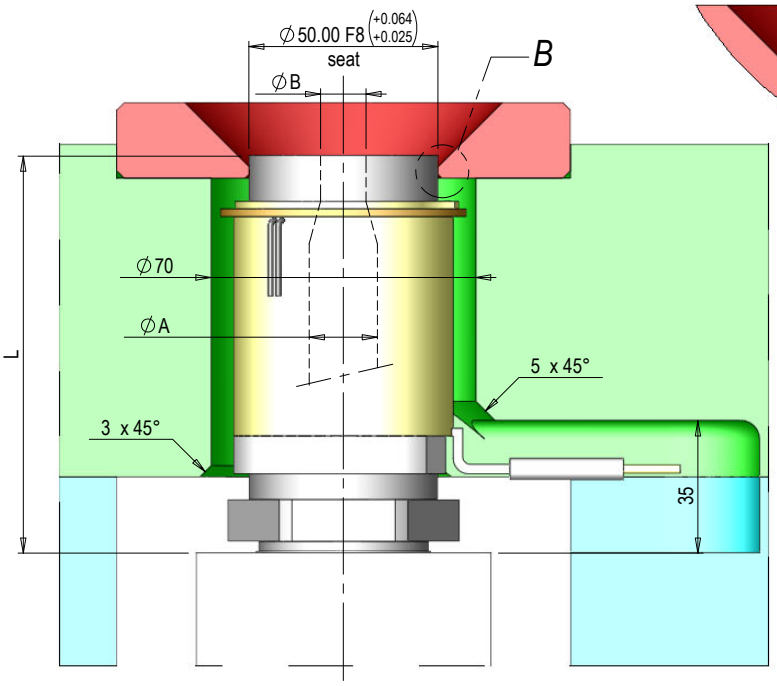
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)

ØB	ØC
18	18
	20
	22
	24

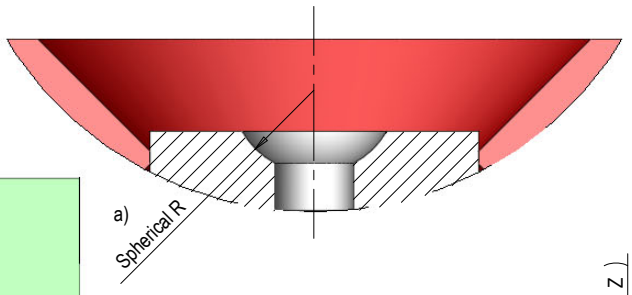
(*) L = min 040.00 ÷ 520.00 mm max
(**) Available also ØB=ØC=16,22 mm
(***) Re-workable according to the needs of the customer (by HRS)

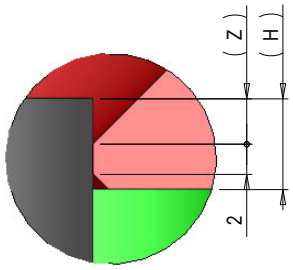
STANDARD SCREWED BUSHING CODE	SPHERE RADIUS	ØA	ØB
0015-00448	R 0	12	18
0015-00462	R 12.7		
0015-00463	R 15.5		
0015-00464	R 19.1		
0015-00509	R 20		
0015-00465	R 25		
0015-00466	R40		
Extended 0015-00449 (***)	R 0	4	4

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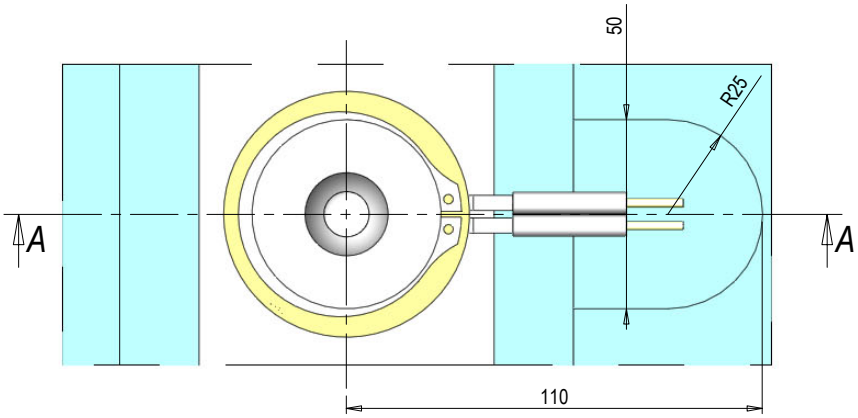
A-A



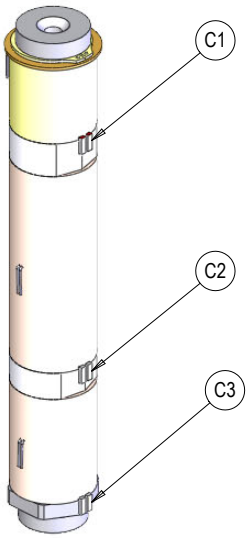


DETAIL B

L	H	Z
35.00-54.99	3.50	1.0
55.00-555.00	max 9.0	min 3.0



Control Zone

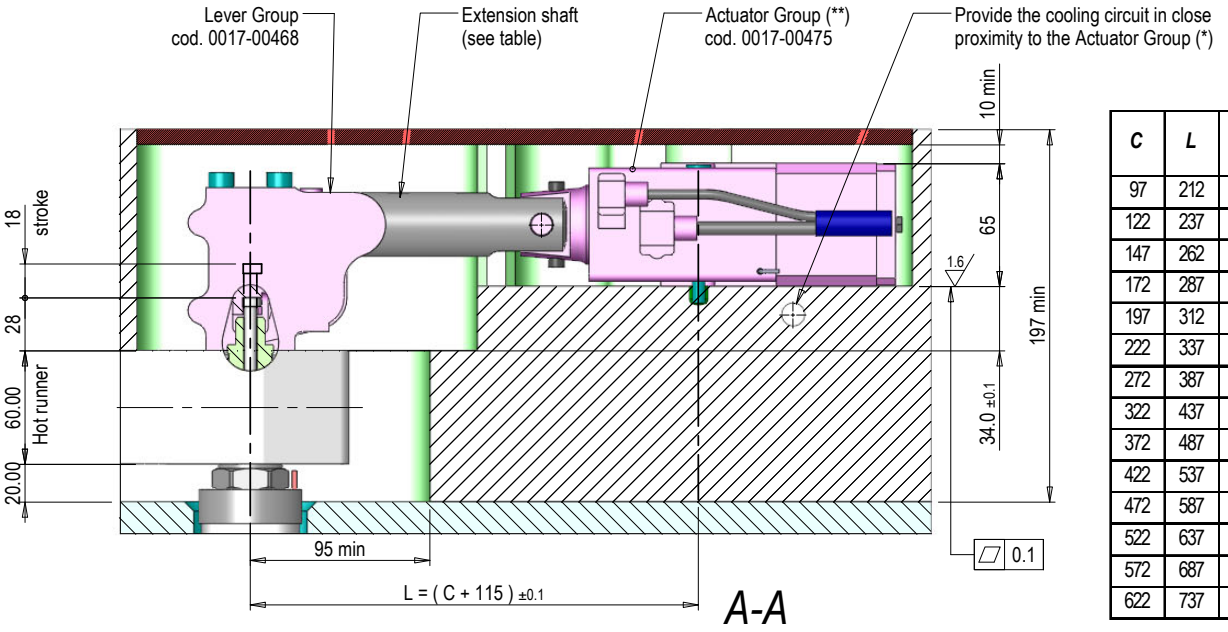


a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

"L" (*)	*MAXIMUN N° OF ZONES*	STANDARD DIAMETERS OF EXTENSIONS DUCT	
		ØA	ØB
035.00 ÷ 212.89	1 [C1]	8	8
212.90 ÷ 363.19	2 [C1 + C2]	10	8 - 8.5 - 10
363.20 ÷ 555.00	3 [C1 + C2 + C3]	12	8 - 10 - 12
(*) L = min 055.00 ÷ 555.00 mm max		14	8 - 8.5 - 10 - 12 - 14
		16	8 - 10 - 12 - 14 - 16
		18	10 - 12 - 14 - 16 - 18
		20	8 - 9 - 10 - 12 - 14 - 15.5 - 16 - 18
		22	8 - 8.5 - 9 - 10 - 12 - 13 - 14 - 16 - 18
		24	10 - 12 - 12.5 - 14 - 16 - 18 - 19

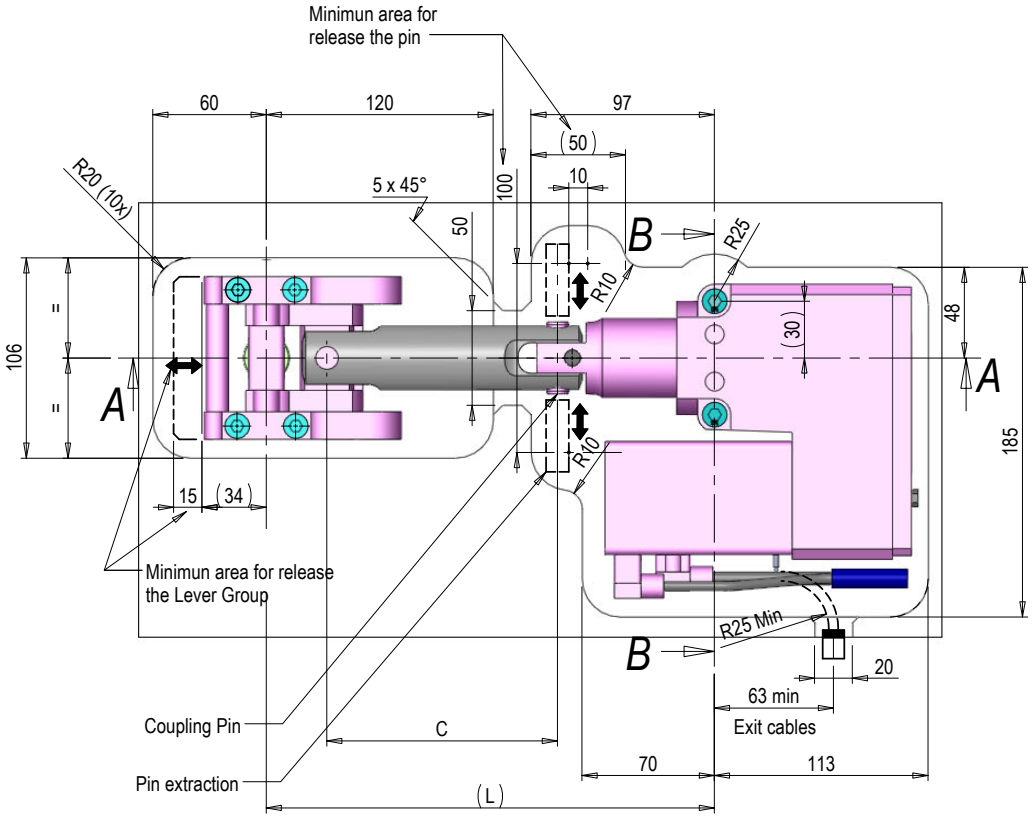
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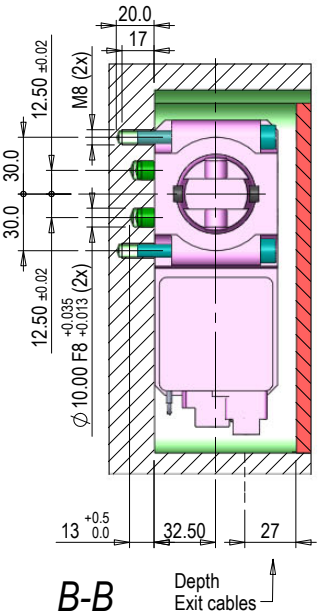
POCKET and DIMENSIONS standard



C	L	EXTENSION CODE
97	212	0214-00125
122	237	0214-00126
147	262	0214-00127
172	287	0214-00128
197	312	0214-00129
222	337	0214-00130
272	387	0214-00131
322	437	0214-00132
372	487	0214-00133
422	537	0214-00134
472	587	0214-00135
522	637	0214-00136
572	687	0214-00137
622	737	0214-00138

(*) For more information see section "General rules for the cooling of plate" page 4.Ga3.05a
(**) Cod. 0017-00475 for the applications "FLEXflow". For the applications "FLEXflow One" is available the Actuator group cod. 0017-00472.



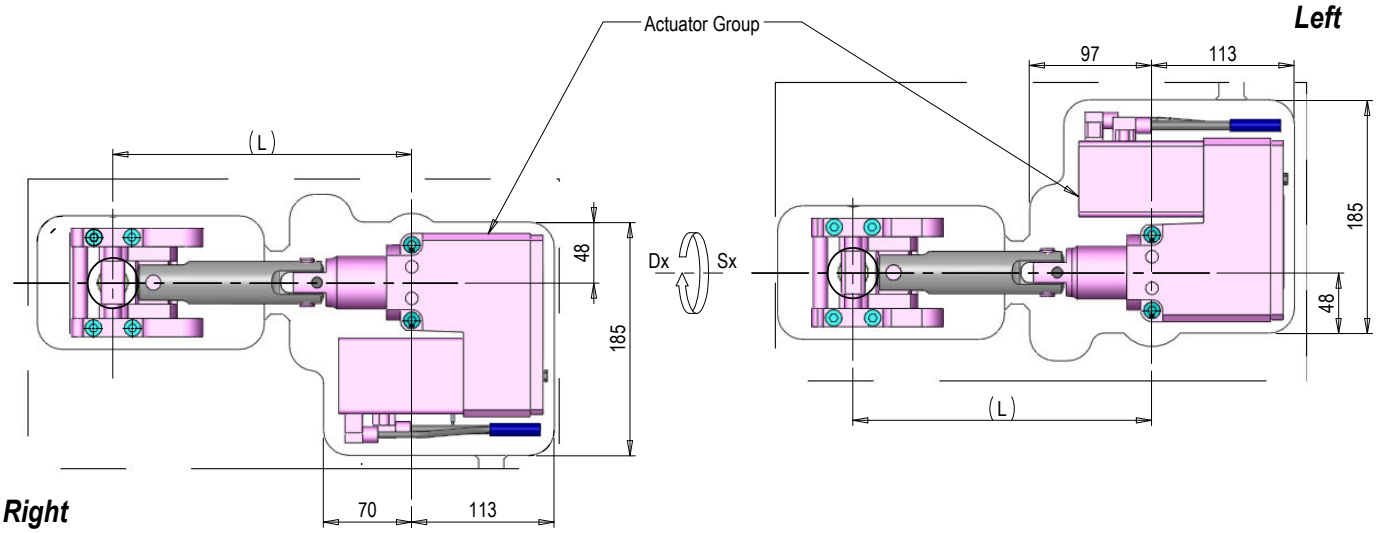


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POSSIBLE CONFIGURATIONS

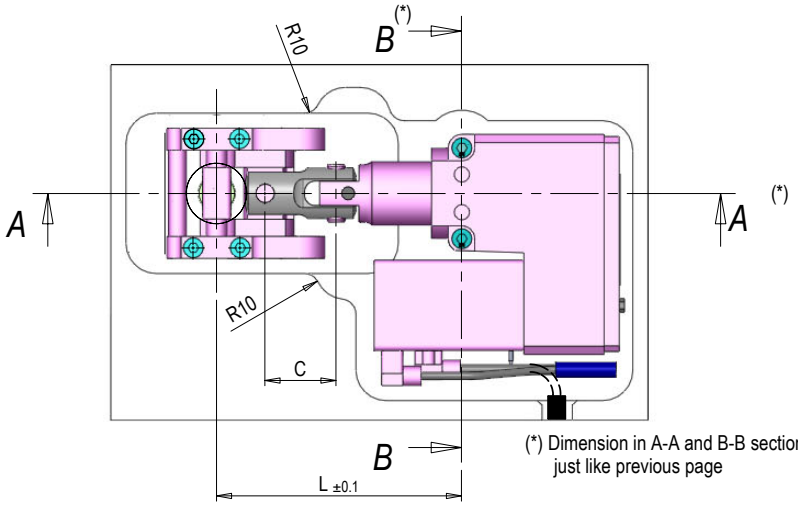
1- Right or Left Configuration

The Right or Left configuration of the electrical cylinder is obtained turning the actuator group and its pocket by 180° on the longitudinal axis



2- Configuration without Extension shaft

On limit conditions the actuator can be further approached on leverage hooking using specific extension shafts with small lenghts C=47 or 72 mm.
It is possible to use this configuration only after HRS feasabilty evaluation and in exceptional cases only, that is when the system layout does not permit to place the standard extension shaft shown in previous page.

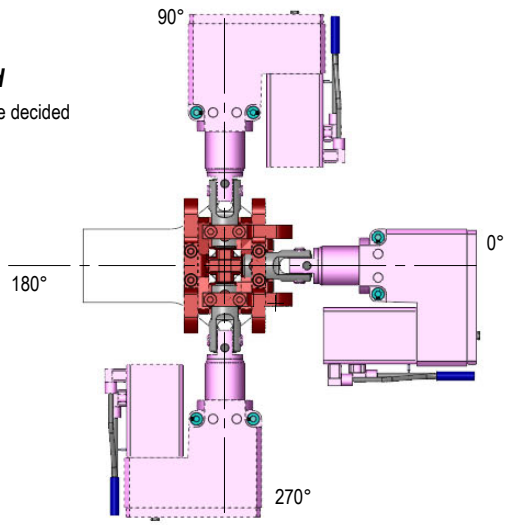


C	L	EXTENSION CODE
47	162	0214-00123
72	187	0214-00124

(*) Dimension in A-A and B-B section just like previous page

3- Possible orientations Cylinder on manifold

The positioning and orientation of the actuator groups are decided by technical HRS office and indicated on the project

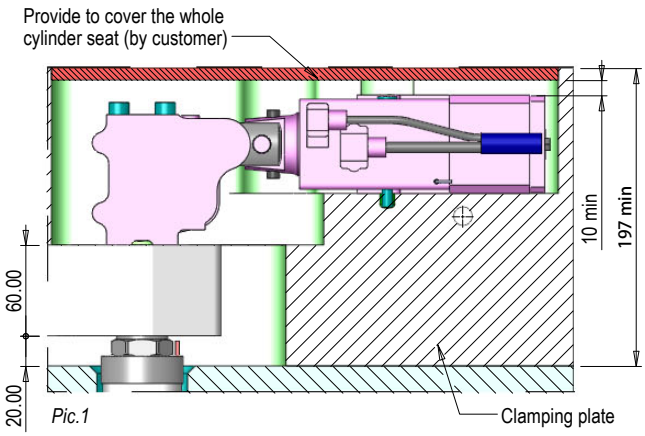


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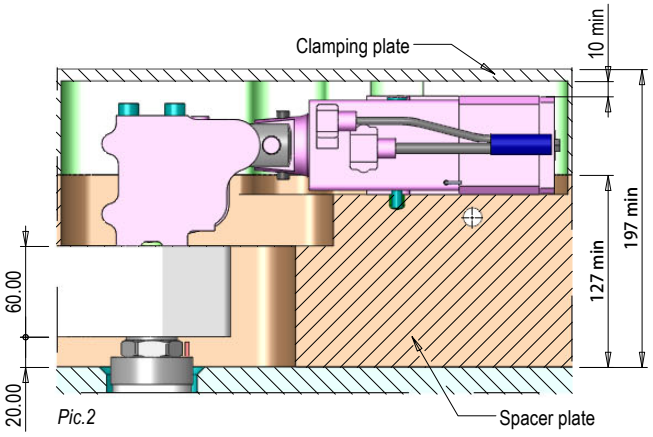
MOLD REQUIREMENTS

1- Minimum thickness of plates for cylinder positioning

In order to obtain a correct installation of the HRS hot runner system + electrical cylinder, the following minimum thicknesses of plates must be respected:



Pic.1



Pic.2

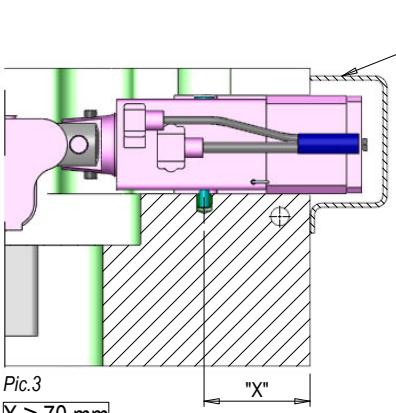
2- Cylinder protrusion from mold edge

In particular conditions, Actuator groups of electrical cylinder can be placed partially above the mold edge (Pic. 3 & 4) or completely ouside (Pic. 5). In case of Pic. 4 & 5 limit dimension "X" must be considered. For "X"<70 mm it is necessary to use a plate to complete the support of Actuator groups (Pic. 4) and in extreme cases of Actuator groups completely out of mold (Pic. 5), the plate must further have proper clamping holes (M8 screws and Ø10 pins) for Actuator groups.

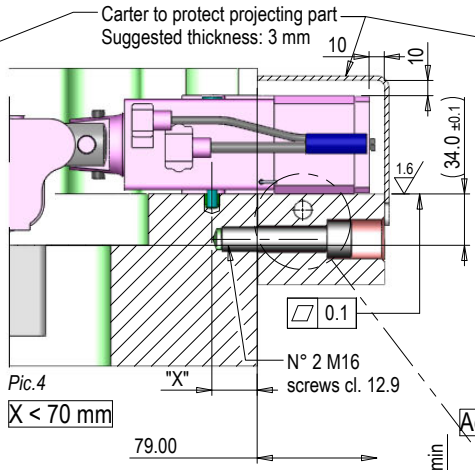
The plate, realized by customer, must further have the following requirements:

- minimum thickness 60 mm and hardness min 30 HRC;
- use N°2 M16 cl.12.9 clamping screws (Pic. 4 & 6) + N°2 cylindrical pins Ø16x40 DIN6325 (Pic. 5 & 6); in case of a single plate supporting more than one actuators in the same time it is necessary to place at least 2 M16 cl. 12.9 screws **in correspondance to every actuator;**
- provide a cooling circuit placed next to Actuator group following "General rules for plate cooling" on page 4.Ga3.05a

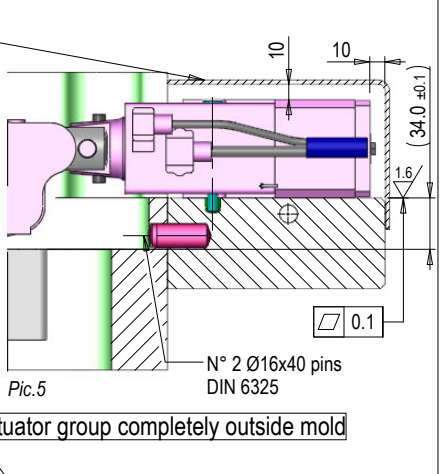
In every case (Pic. 3, 4, 5) **parts of Actuator groups which projects outside mold edge must be properly protected with carters (by customer)**.



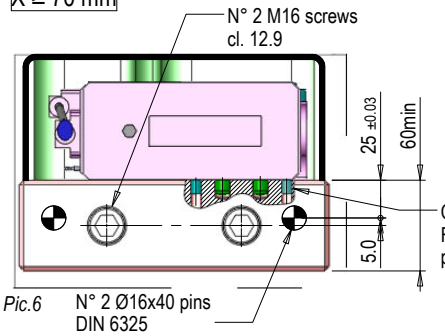
Pic.3



Pic.4



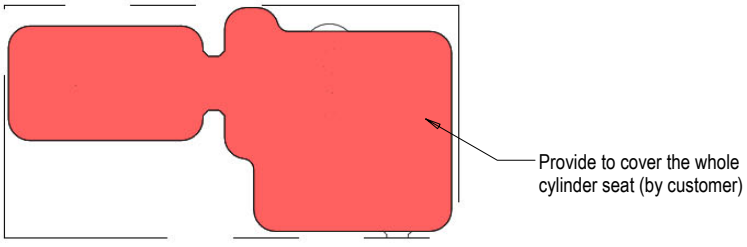
Pic.5



Pic.6

3- Carter for cylinder protection

The FLEXflow on plate must be always covered (Pic. 1 & 2). If the customer chooses FLEXflow seats completely through the clamping plate, the FLEXflow must be completely covered with teh carter, whose design is realized by customer (see Pic. 7). Suggested thickness: 3 mm



Pic.7

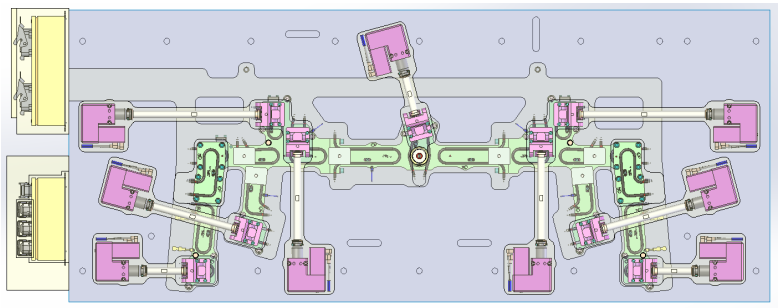
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T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximum Mold temperature
Tc (°C) = Coolant temperature

General rules for the cooling of the plate

1- Rules for which the cooling of the plate is NOT MANDATORY

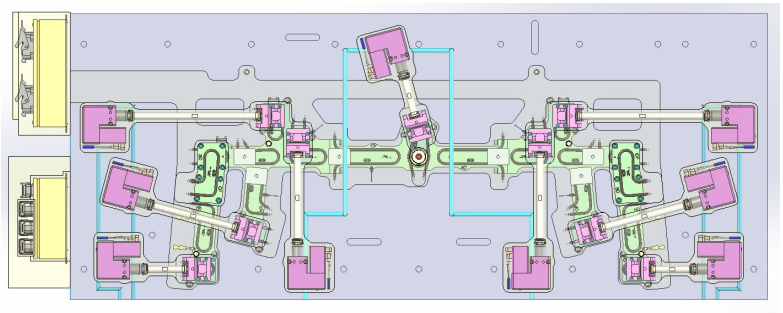
For materials with T1≤260°C [500°F] and T2≤60°C [140°F], cooling of the actuators' plate is NOT MANDATORY.
In this condition must be satisfied also the following requirements:
1a- Use of extension shafts with minimum C=97mm on each actuator group (Pic.1);
1b- Presence of AIR VENTS on the mold (see following point 3)



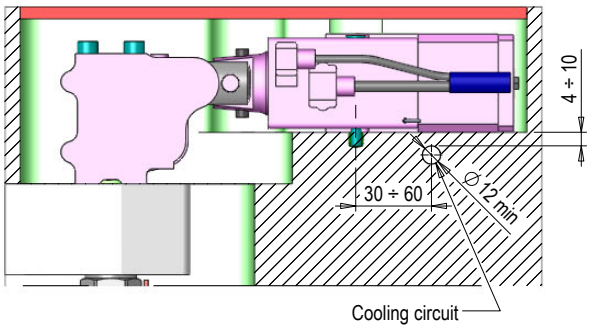
Pic.1

2- Rules for which the cooling of the plate is MANDATORY

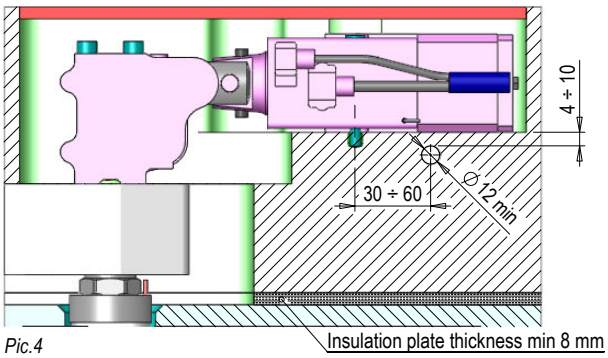
For materials with T1>260°C [500°F] or T2>60°C [140°F], cooling of the actuators' plate IS MANDATORY.
The correct cooling of the plate must be include:
2a- Maximum No. 3 actuator groups can be cooled through 1 circuit (ex. Pic.2);
2b- Cooling circuits must be positioned in the plate right below the actuator groups as illustrated in Pic.3;
2c- An insulation plate with a minimum thickness of 8mm is also necessary (ex. Pic.4);
2d- A minimum diameter Ø12mm is recommended for the circuit (minimum pressure 1.5 bar);
2e- Maximum incoming coolant temperature for the cooling of the plate Tc≤25°C [77°F].



Pic.2



Pic.3



Pic.4

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General rules for the cooling of the plate

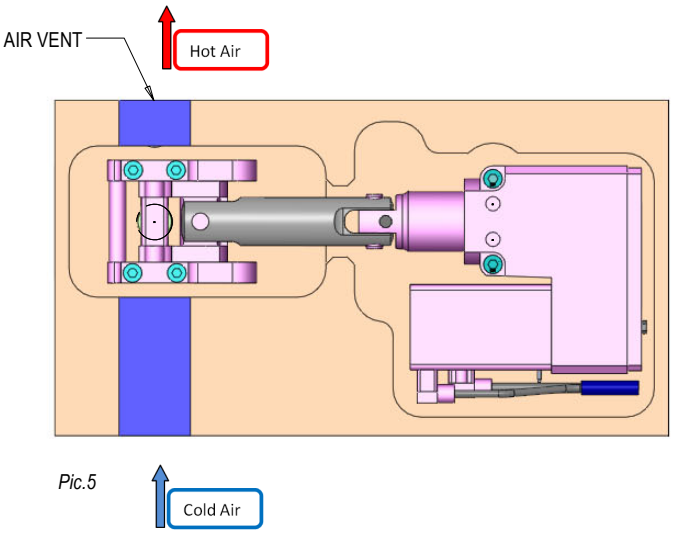
3- Air vents

It's **always** mandatory to provide air vents in the manifold plate for hot air removal.

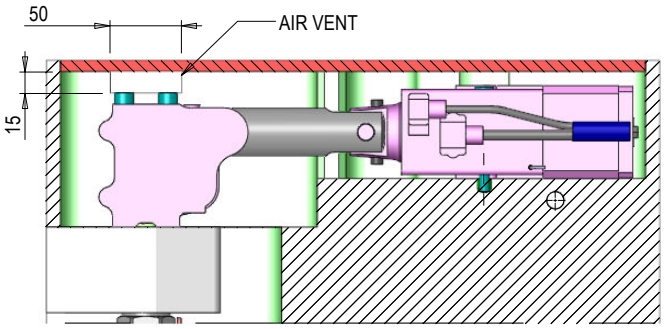
- The air vents must through the plate from bottom mold to top mold near the lever group (Pic.5/6/7)

- Avoid hot air exit from vents near electrical boxes eventually present on top mold.

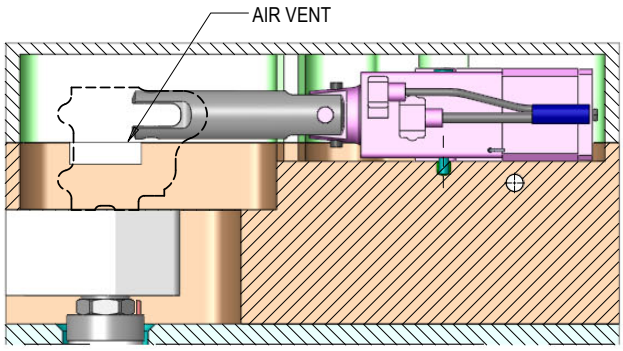
- The minimun dimensions requested for Air vents are: 50mm (width) x 15mm (depth)



Pic.5



Pic.6

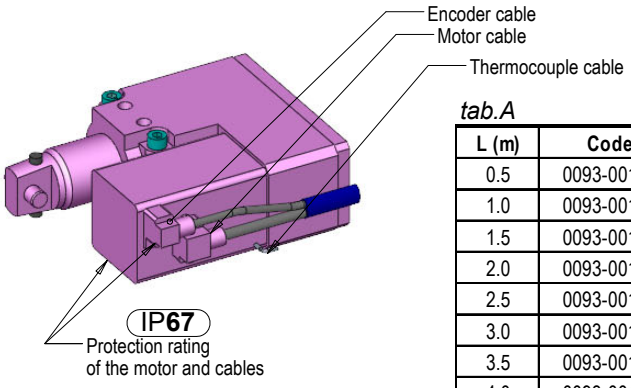


Pic. 7

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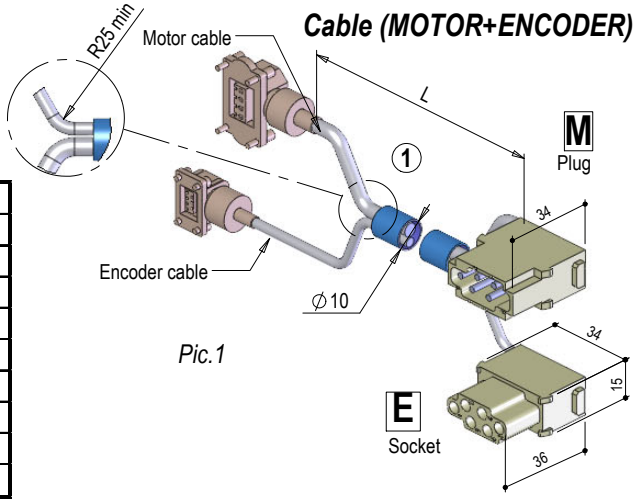
Electricals specification for FLEXflow

Every actuator group is electrically powered through a couple of cables (ENCODER+MOTOR). For cable codes with available lenghts see table "A".
The cable is supplied separated from the group; its lenght must be carefully calculated during wiring design.
The temperature of the actuator group is monitored through a ungrounded J Type thermocouple cable (supplied with actuator group).

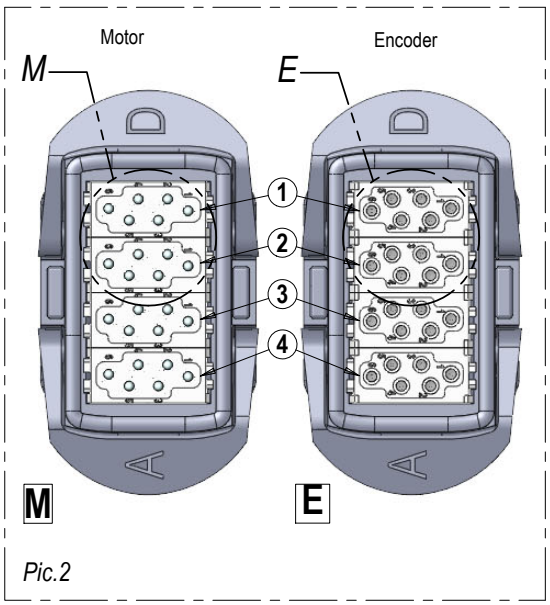


tab.A

L (m)	Code
0.5	0093-00173
1.0	0093-00174
1.5	0093-00135
2.0	0093-00136
2.5	0093-00137
3.0	0093-00138
3.5	0093-00139
4.0	0093-00140
4.5	0093-00175



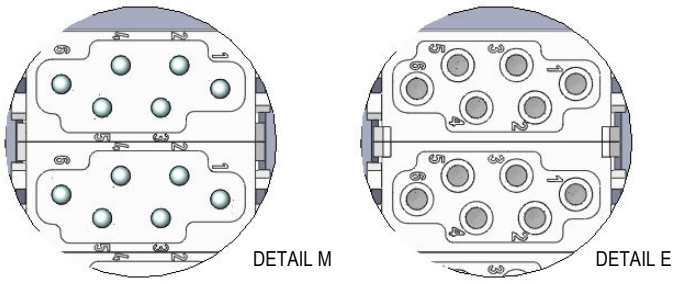
Pic.1



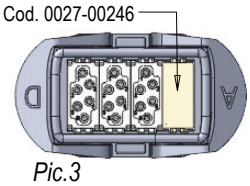
Pic.2

NOTES:

1) The Plug and Socket of the same cable must be put in their housing with the same sequence (Pic.1 & 2)

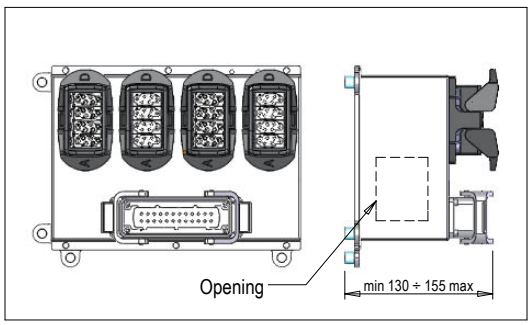


2) Always cover empty positions on the housing (Pic.3)

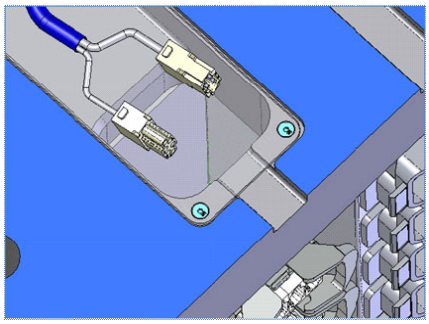


Pic.3

3) ENCODER+MOTOR cable (Pic.1) is provided yet wired. Openings on electrical box (supplied by HRS) or forced groove on the mold must take into consideration enough clearance for the connectors (see pic. 4-5)



Pic.4

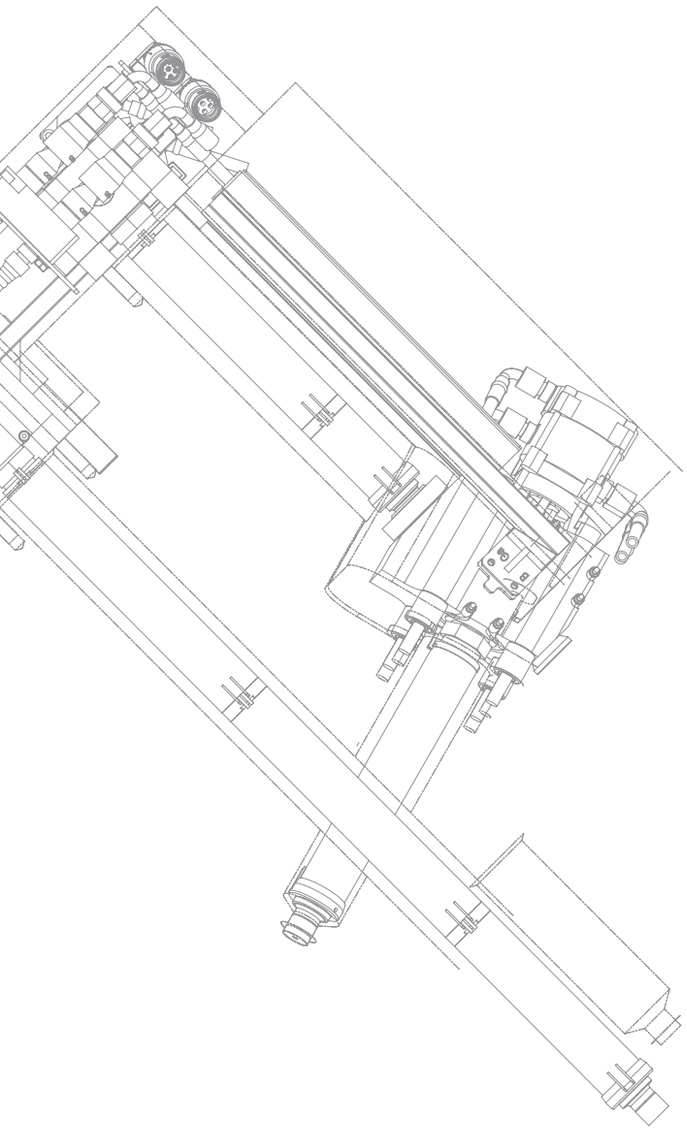


Pic.5

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oerlikon
hrsflow



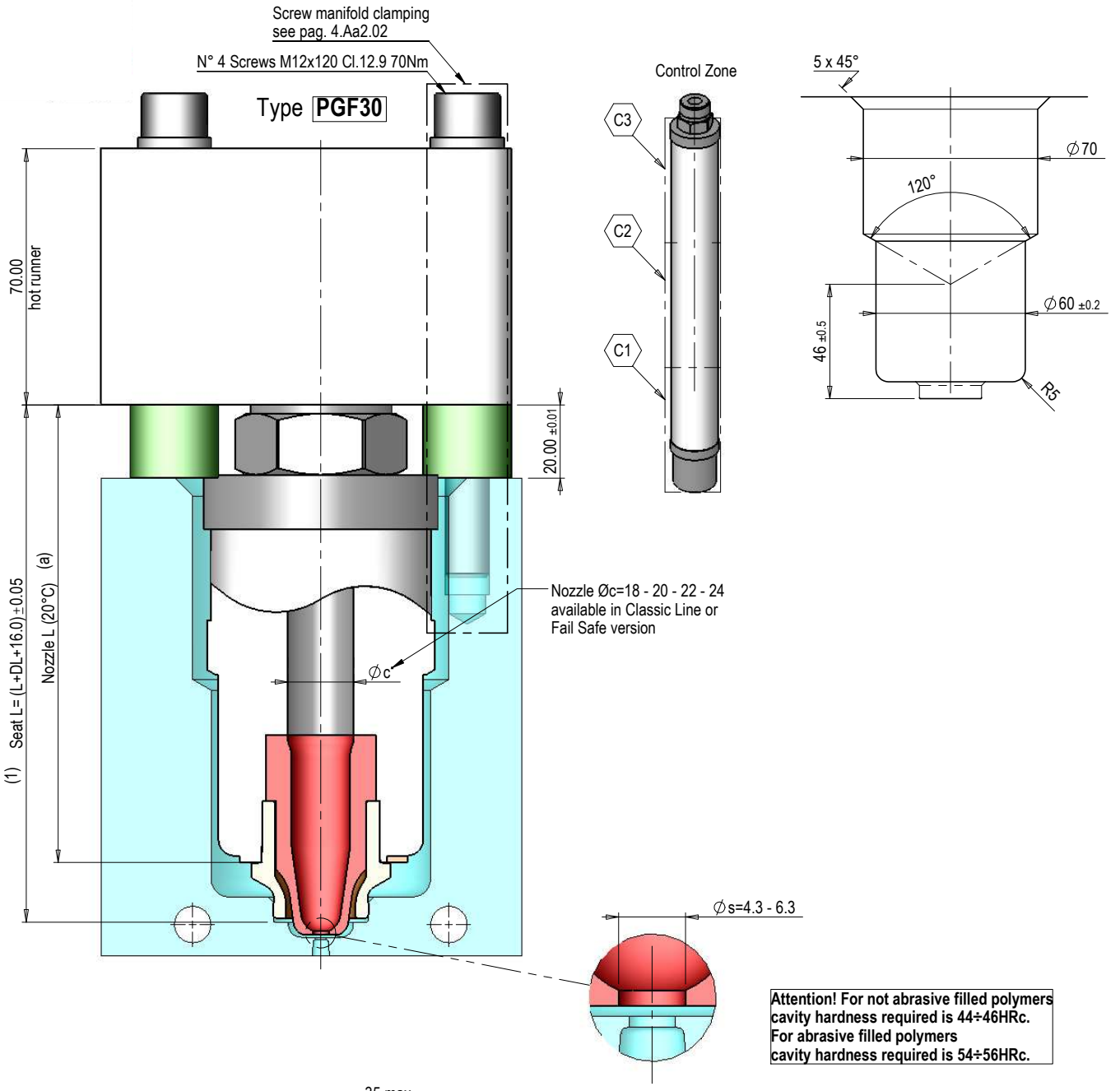
Aa

Aa Series 270÷3150 cm³/s

Serie Aa
Aa Serie
Aa Série
Aa Serie
Aa Série

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Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

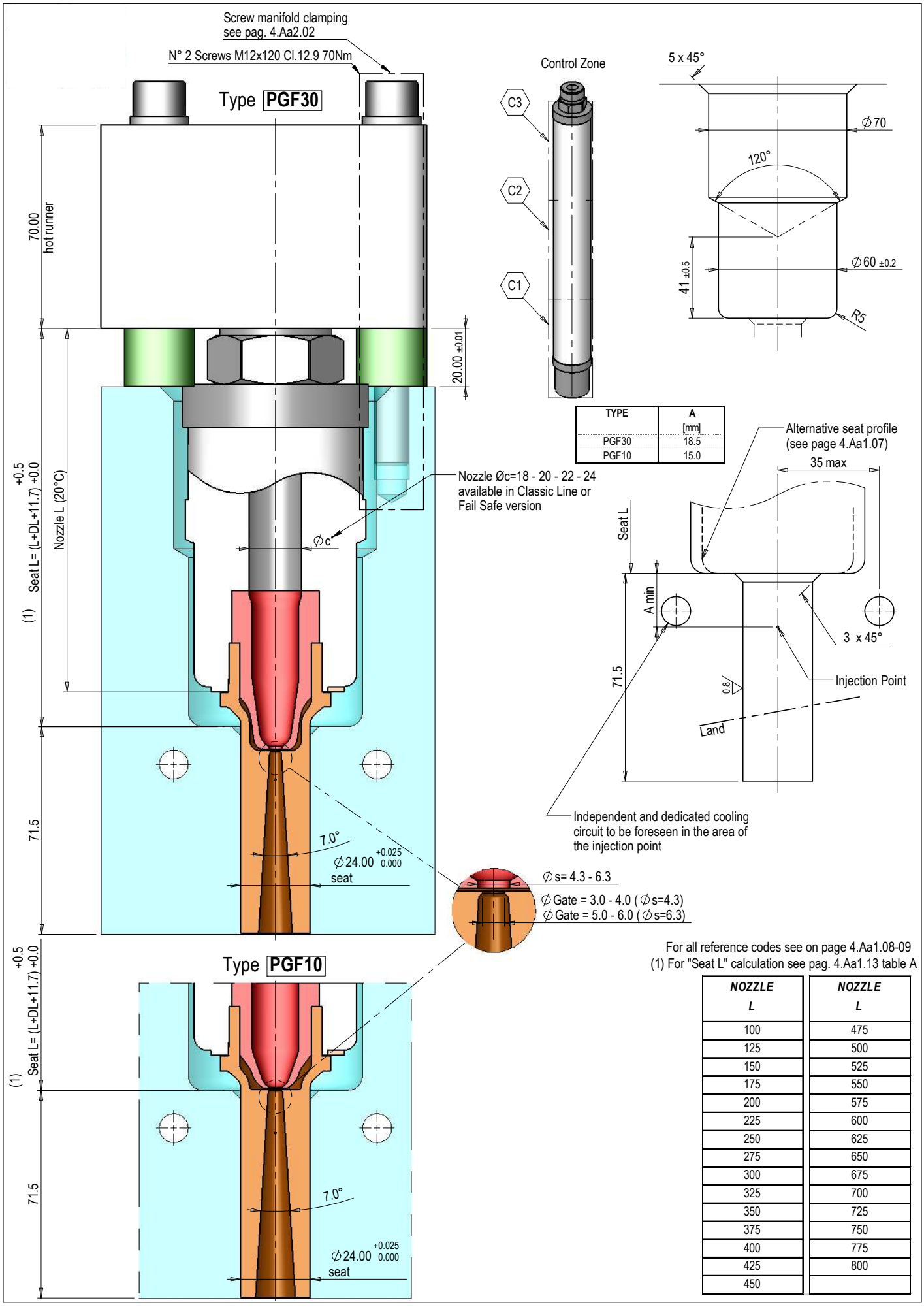
(1) For "Seat L" calculation see pag. 4.Aa1.14 table A

(a) L Nozzle = min 100 ÷ 600 mm max

NOZZLE L	NOZZLE L
100	375
125	400
150	425
175	450
200	475
225	500
250	525
275	550
300	575
325	600
350	

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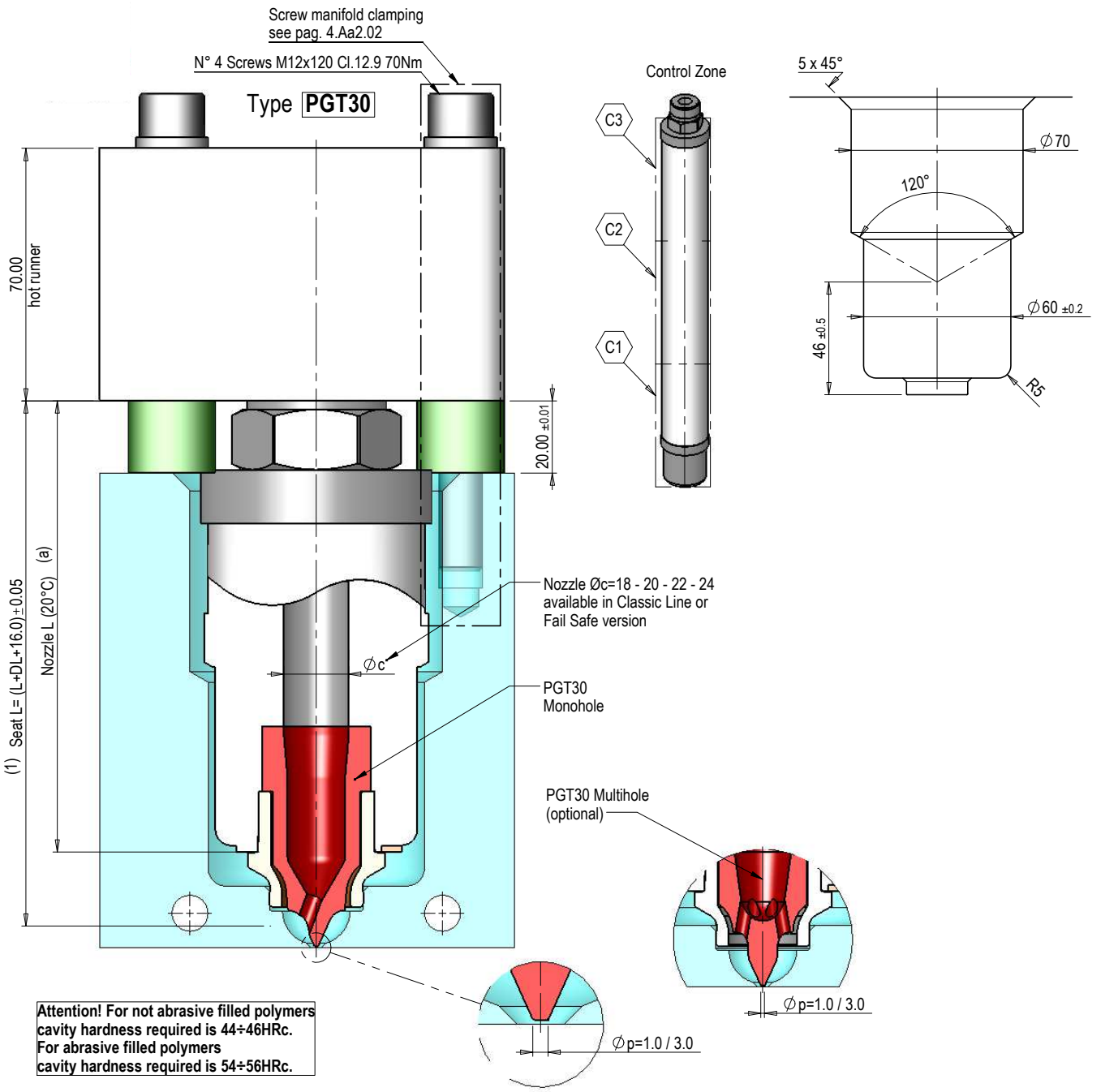
Screwed-in nozzle FREE FLOW with bushing through the cavity



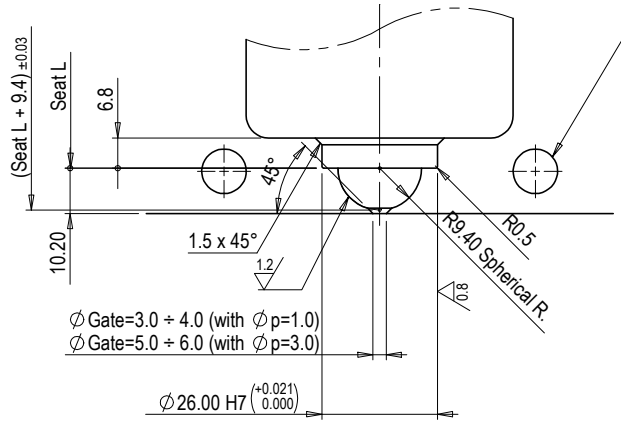
For all reference codes see on page 4.Aa1.08-09
(1) For "Seat L" calculation see pag. 4.Aa1.13 table A

NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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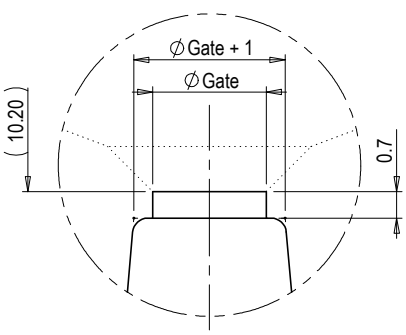


Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.



Conditioning circuit to be foreseen in the area of the injection point

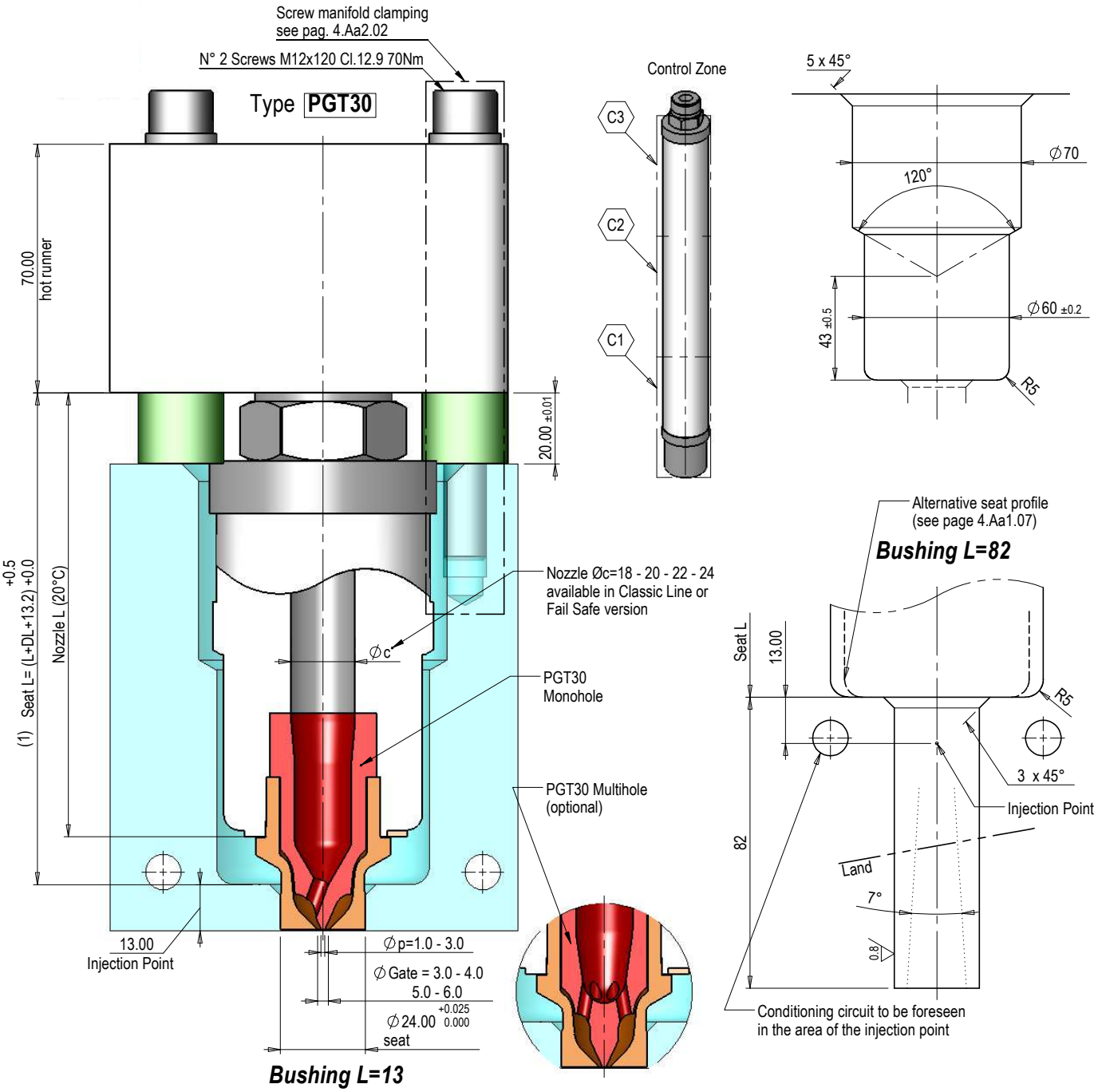
With sprue



(1) For "Seat L" calculation see pag. 4.Aa1.14 table A
(a) L Nozzle = min 100 ÷ 600 mm max

NOZZLE L	*NOZZLE L*
100	375
125	400
150	425
175	450
200	475
225	500
250	525
275	550
300	575
325	600
350	

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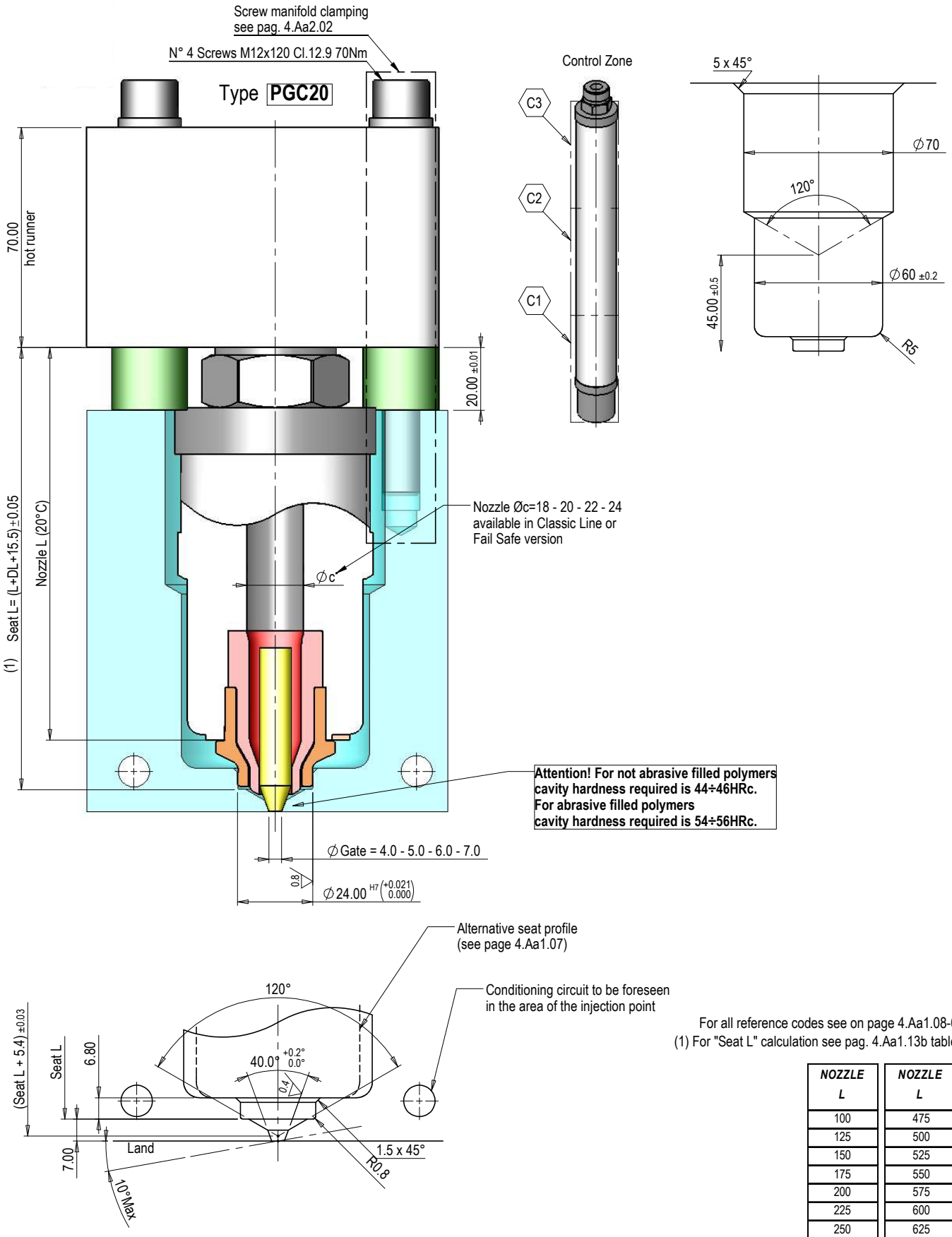
For all reference codes see on page 4.Aa1.08-09

(1) For "Seat L" calculation see pag. 4.Aa1.13a table B

NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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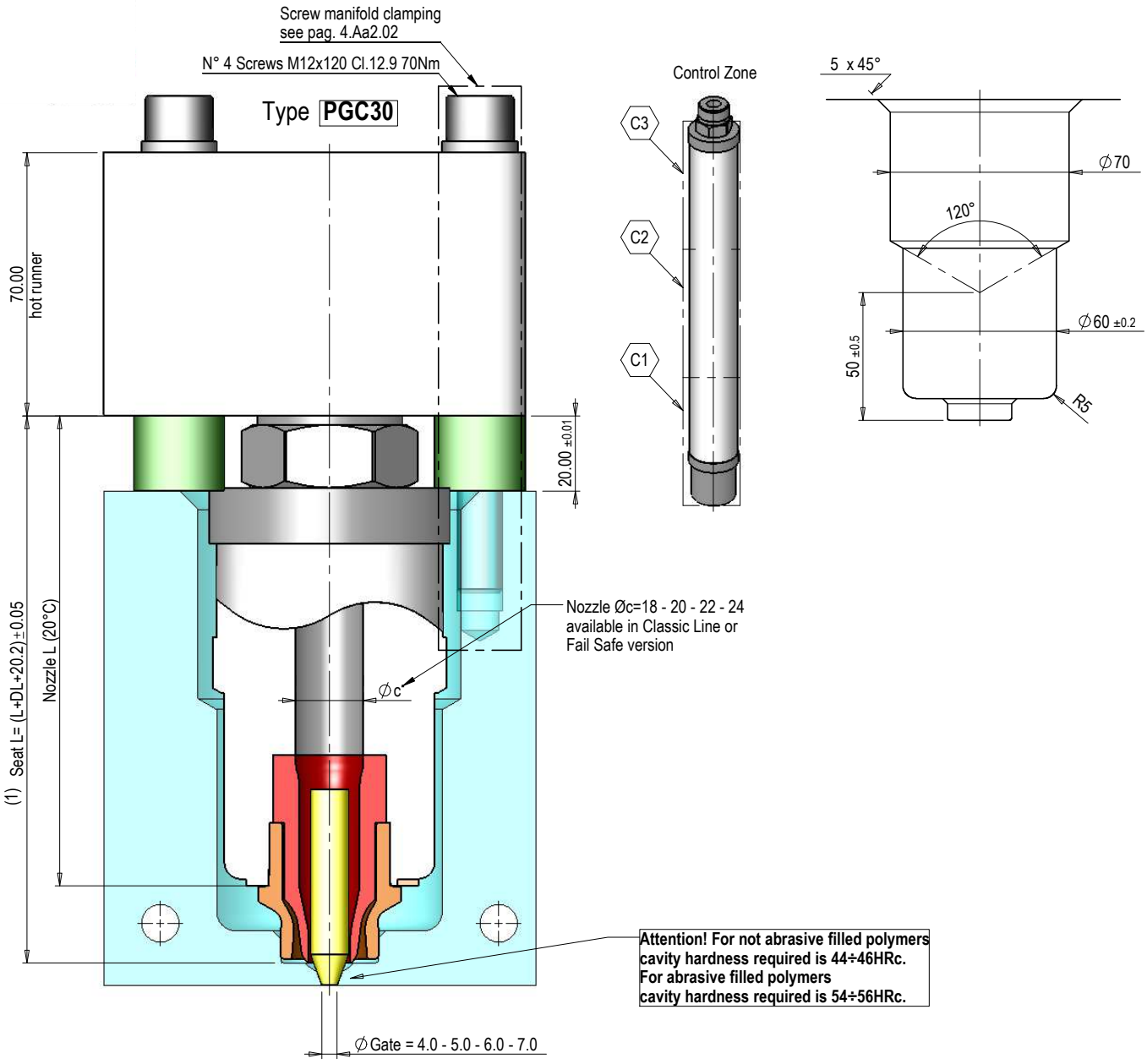
Screwed-in nozzle CONICAL VALVE GATING with external ring

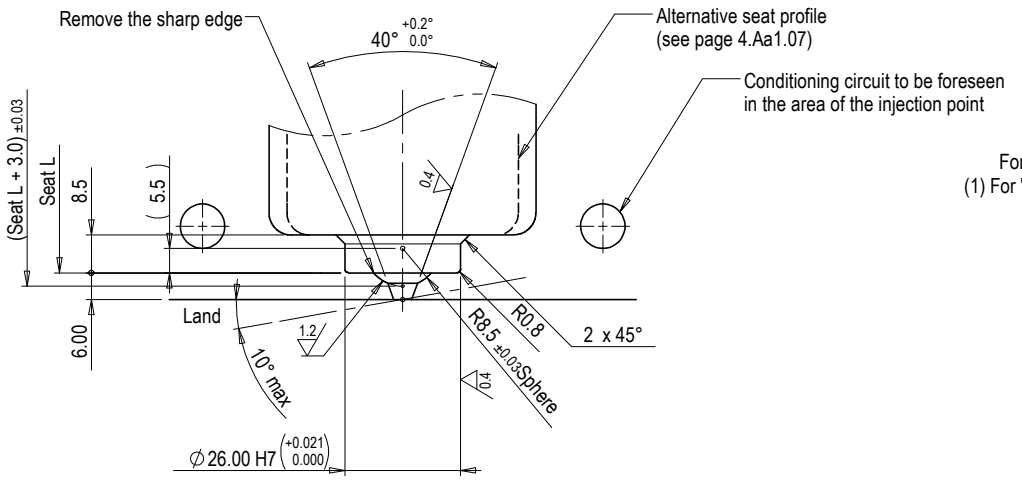


For all reference codes see on page 4.Aa1.08-09
(1) For "Seat L" calculation see pag. 4.Aa1.13b table E

NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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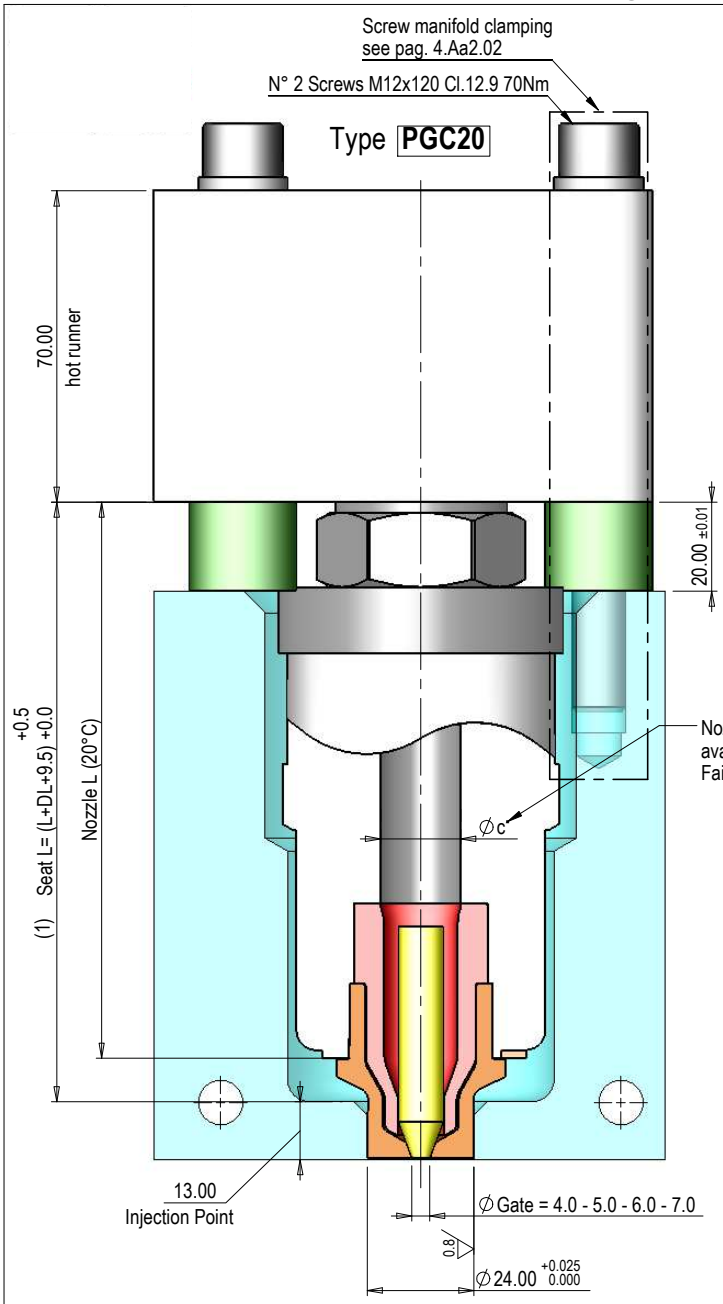


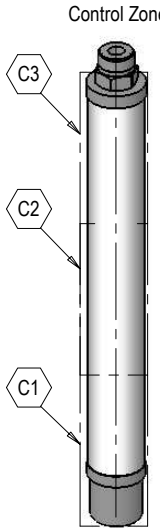
For all reference codes see on page 4.Aa1.08-09
(1) For "Seat L" calculation see pag. 4.Aa1.13a table C

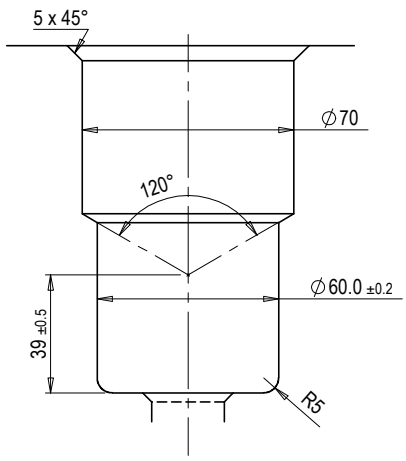
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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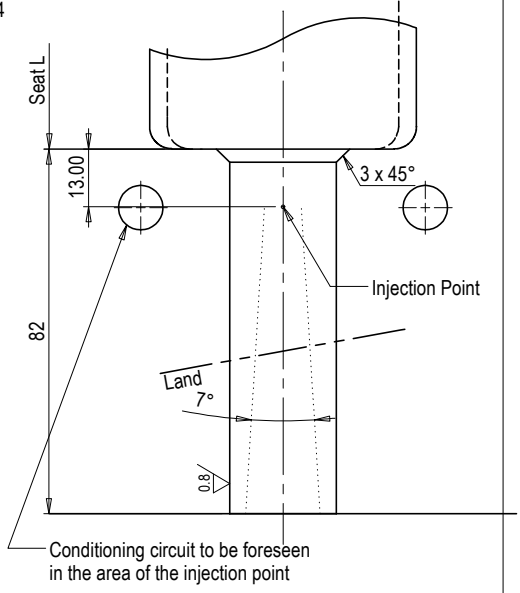
Screwed-in nozzle CONICAL VALVE GATING with bushing through the cavity



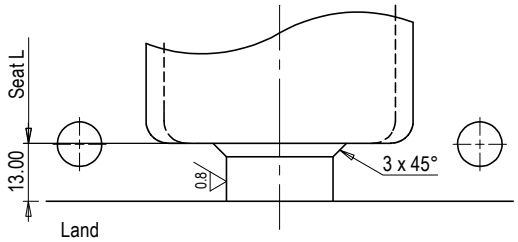




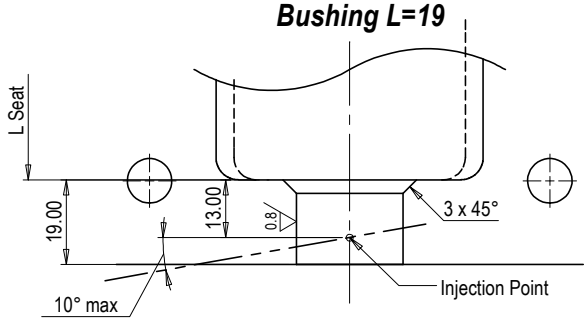
Bushing L=82



Bushing L=13



Bushing L=19



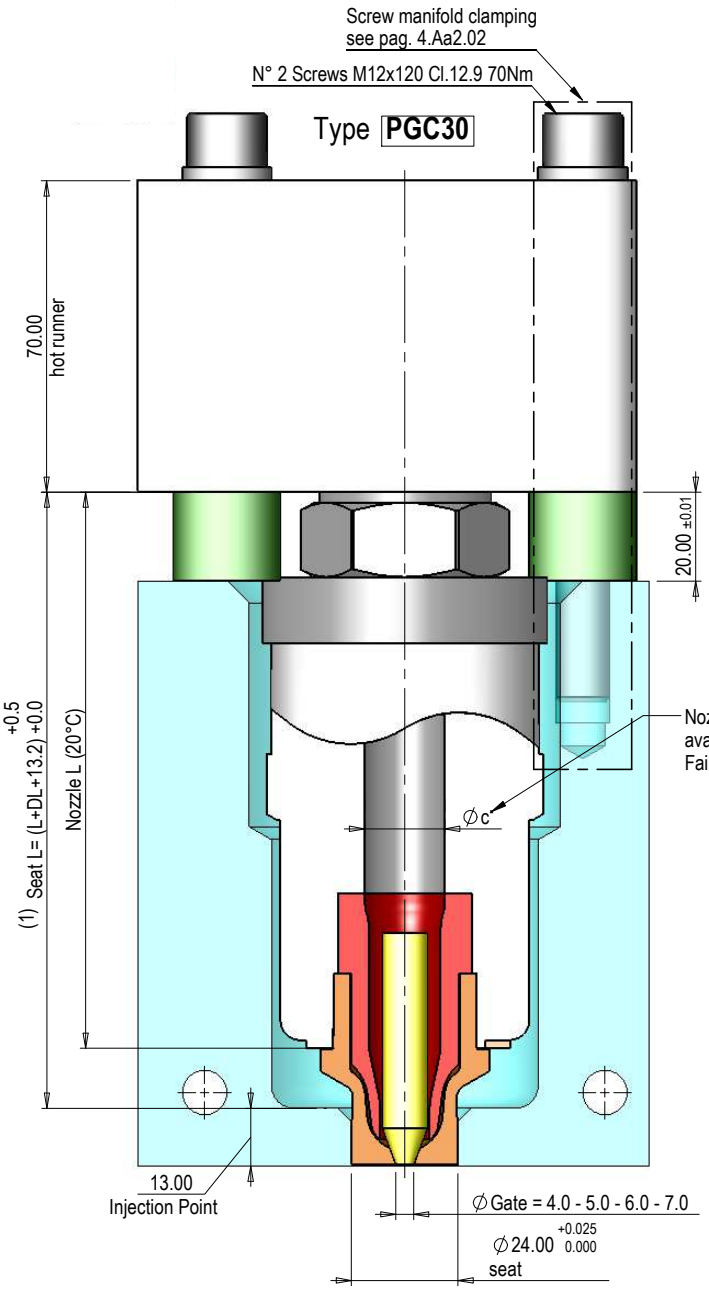
For all reference codes see on page 4.Aa1.08-09

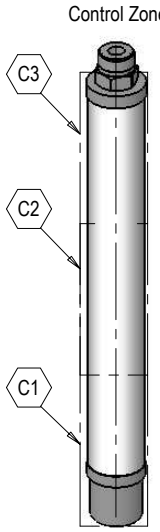
(1) For "Seat L" calculation see pag. 4.Aa1.13b table D

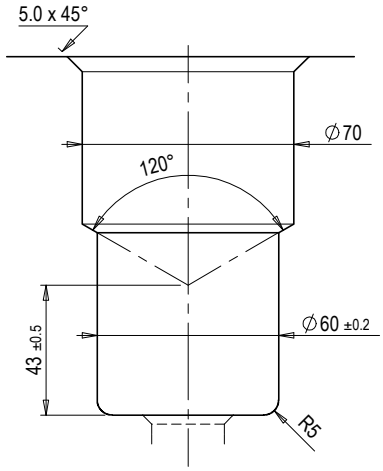
NOZZLE L	*NOZZLE L*
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

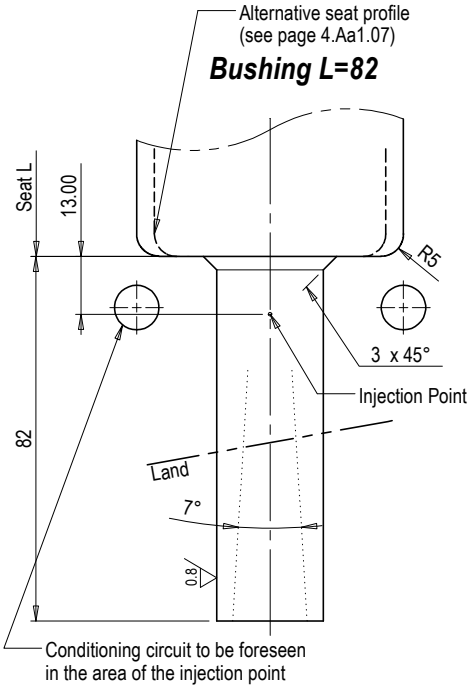
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Screwed-in nozzle CONICAL VALVE GATING with bushing through the cavity

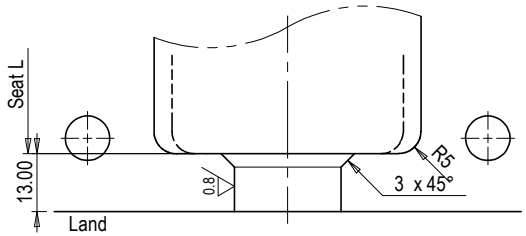




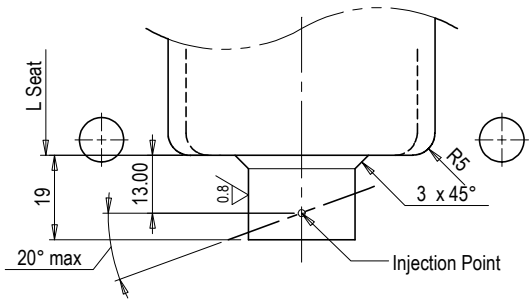




Bushing L=13



Bushing L=19

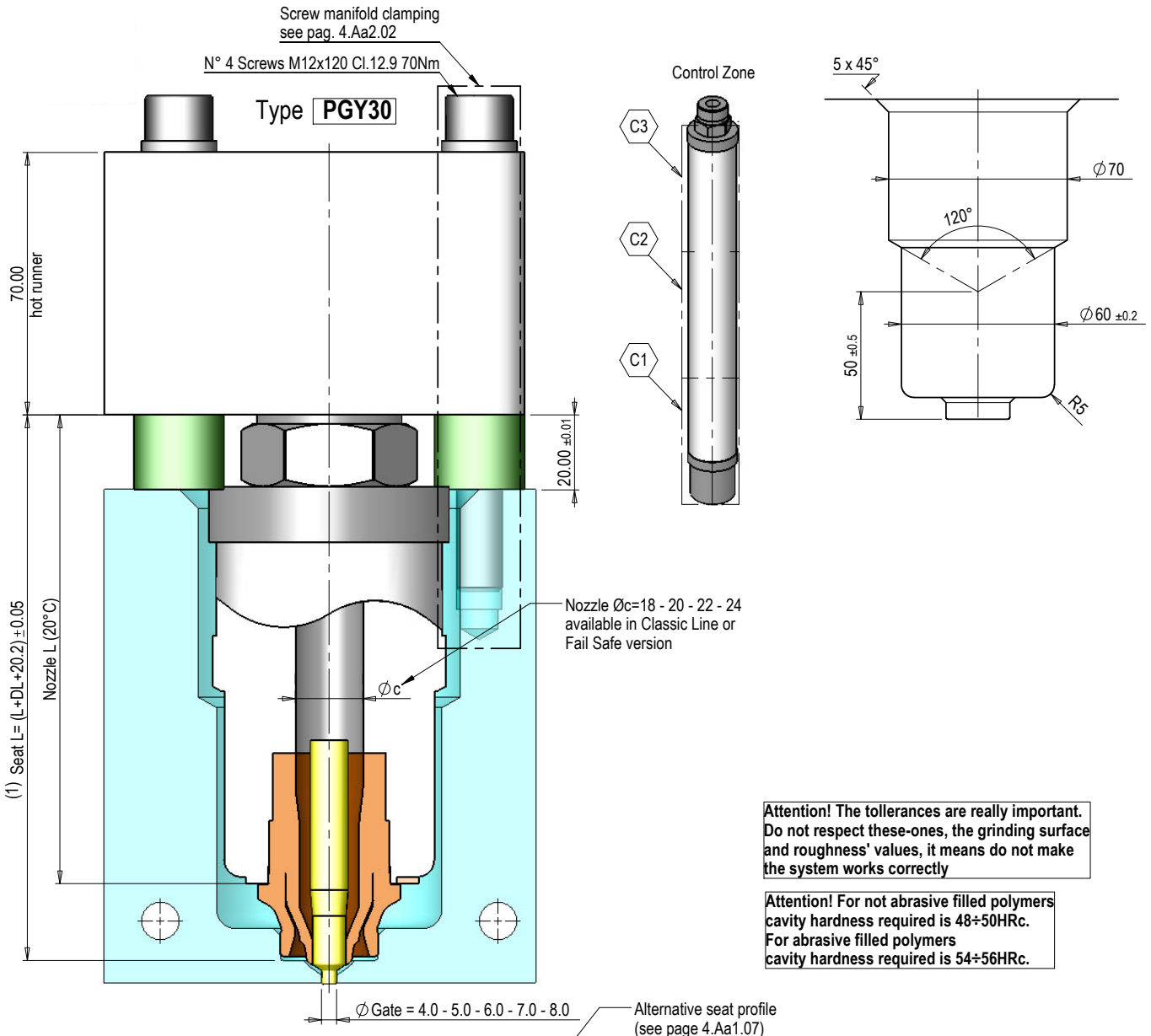


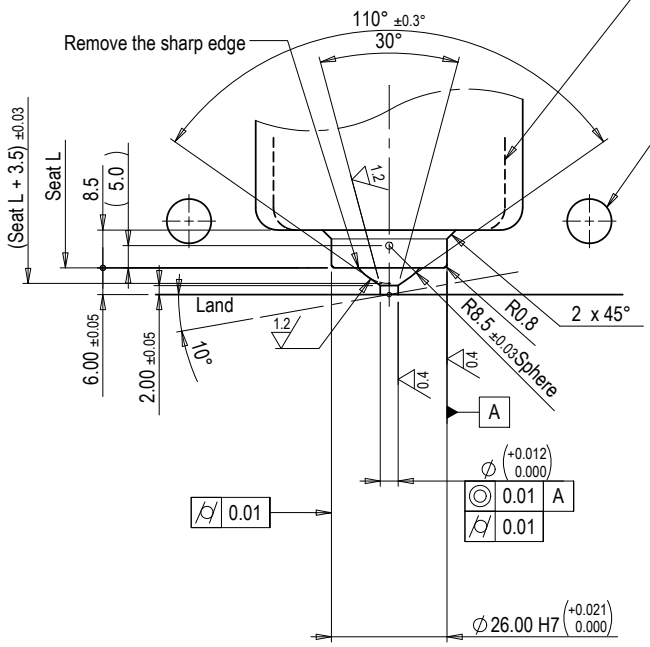
For all reference codes see on page 4.Aa1.08-09

(1) For "Seat L" calculation see pag. 4.Aa1.13a table B

NOZZLE L	*NOZZLE L*
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

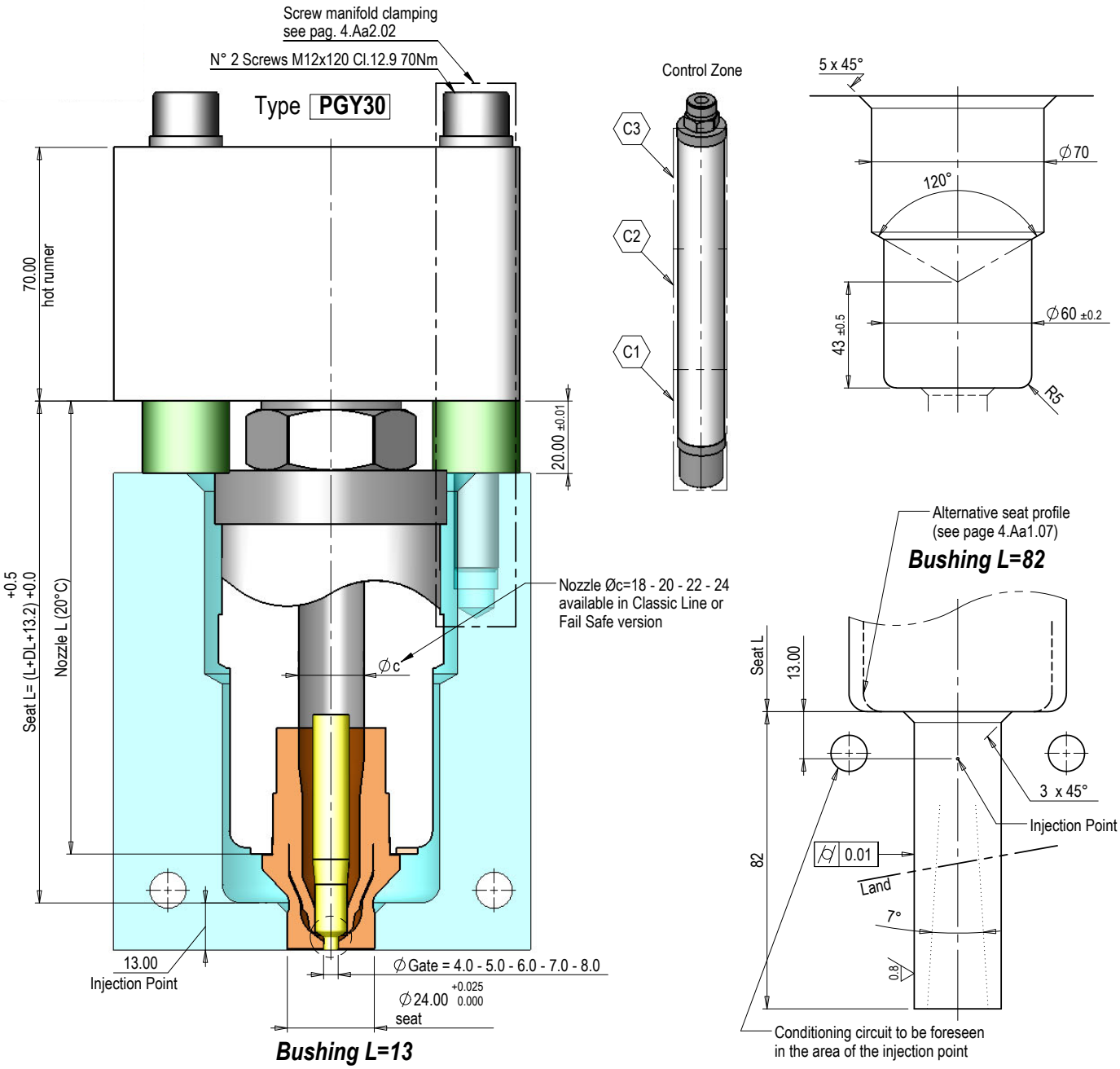
Attention! For not abrasive filled polymers cavity hardness required is 48÷50HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

For all reference codes see on page 4.Aa1.08-09

(1) For "Seat L" calculation see pag. 4.Aa1.13a table C

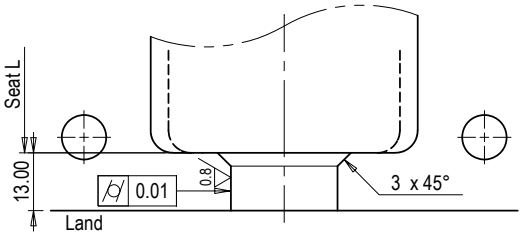
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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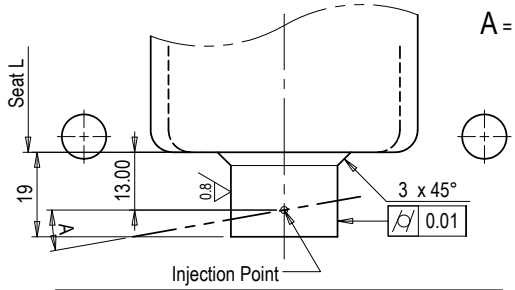


Bushing L=82

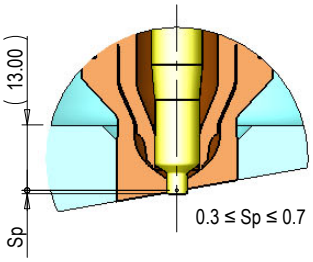
Bushing L=13



Bushing L=19



ATTENTION! In this configuration there is a protrusion "Sp" of the Pin from the bushing.
HRS recommends not to remove this protrusion.
The "Sp" dimension is function of Ø Gate and "A" angle

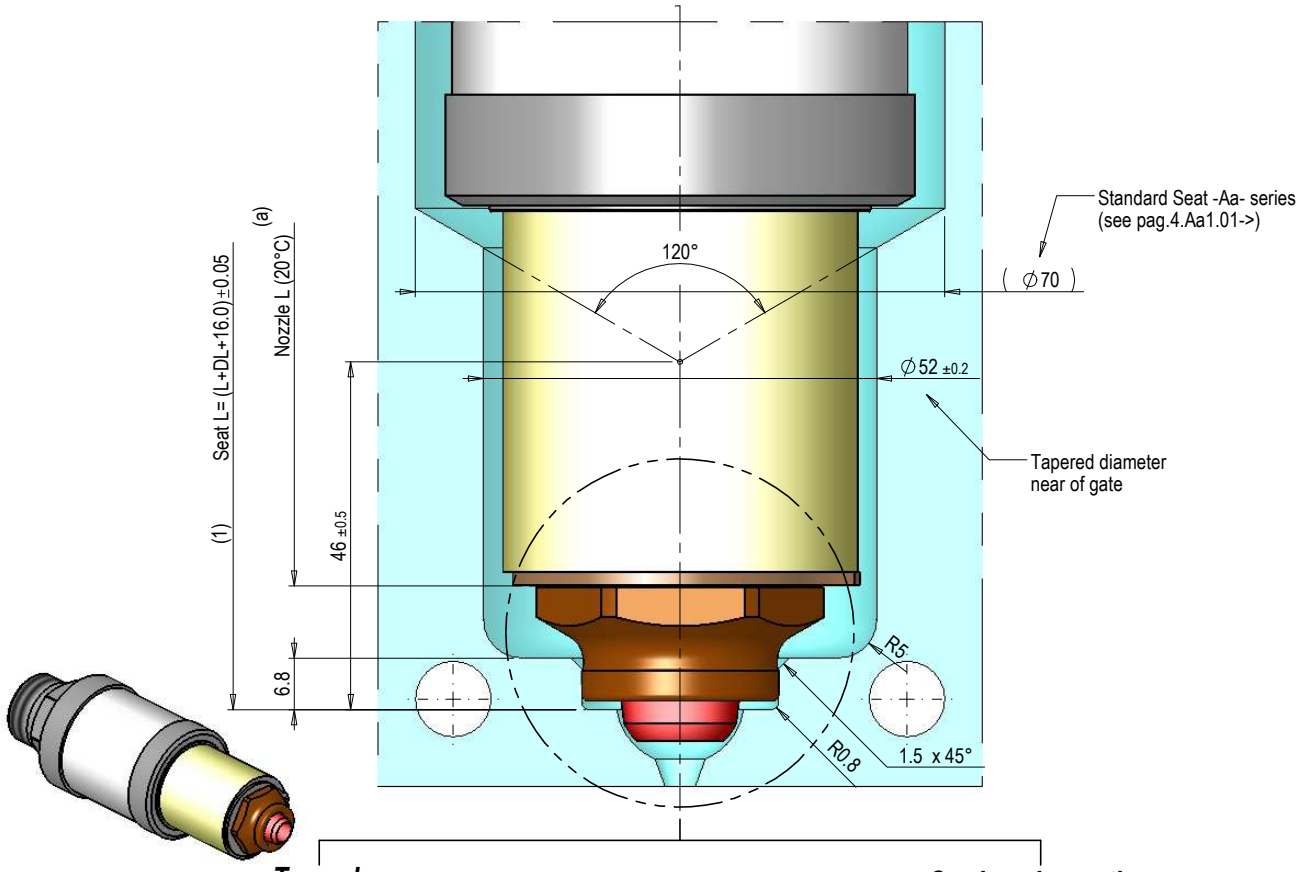


For all reference codes see on page 4.Aa1.08-09
(1) For "Seat L" calculation see pag. 4.Aa1.13a table B

NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

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-Aa- NOZZLE "LUX"
External Ring version

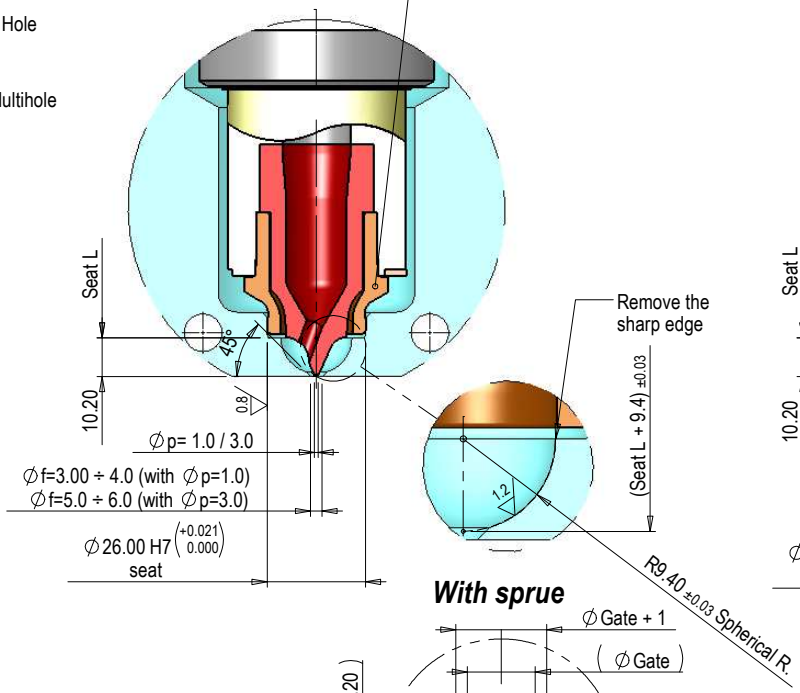


Torpedo
Type **PGT30**

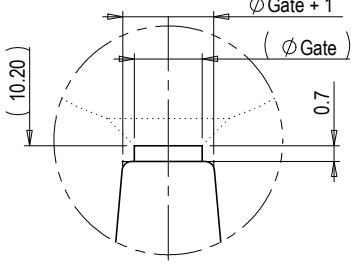
External Ring LUX

1 Hole

Multihole

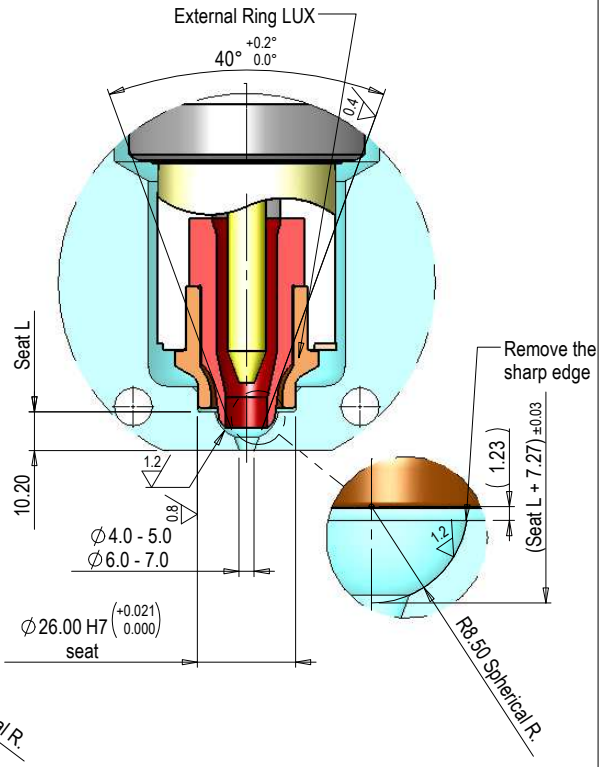


With sprue



Conic valve gating
Type **PGC30**

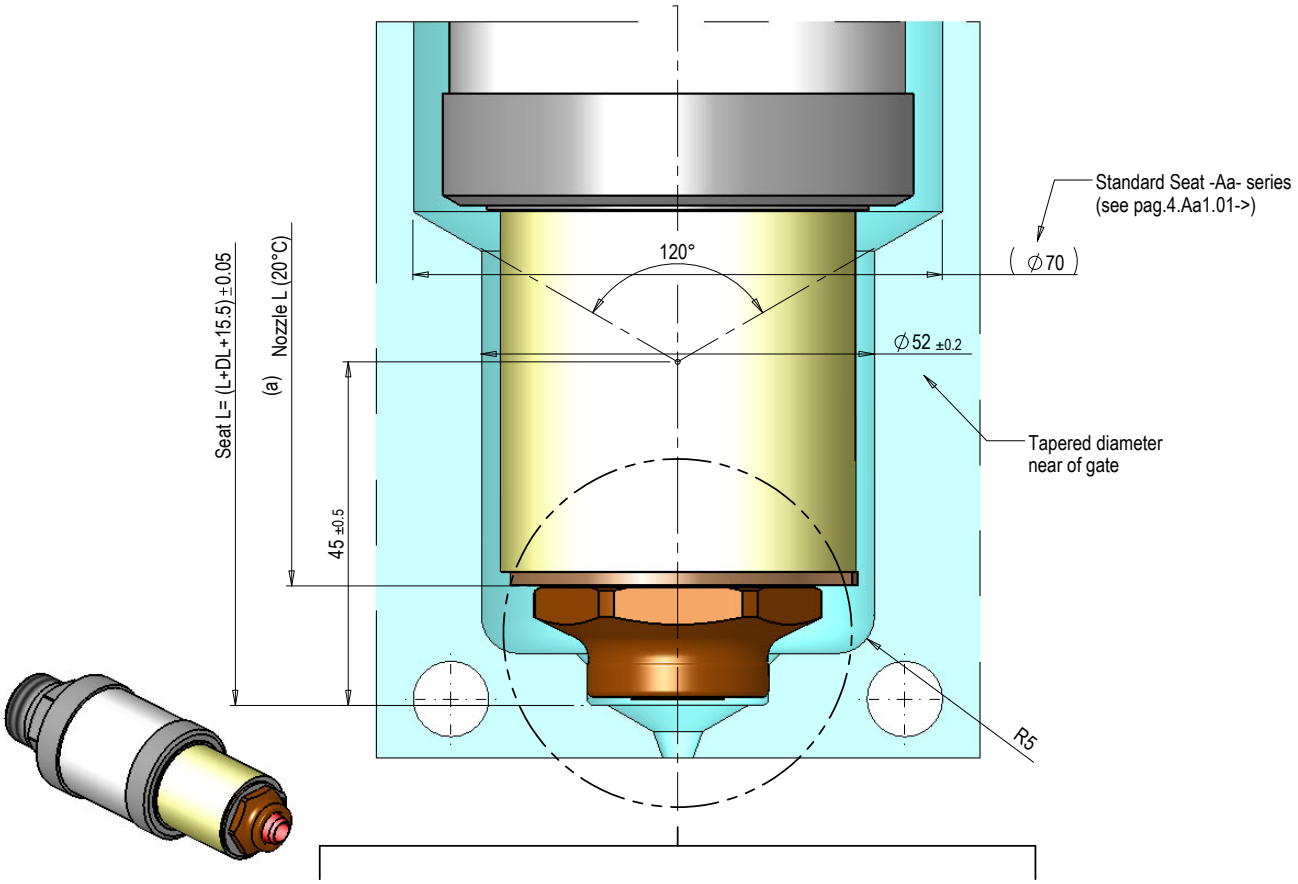
External Ring LUX



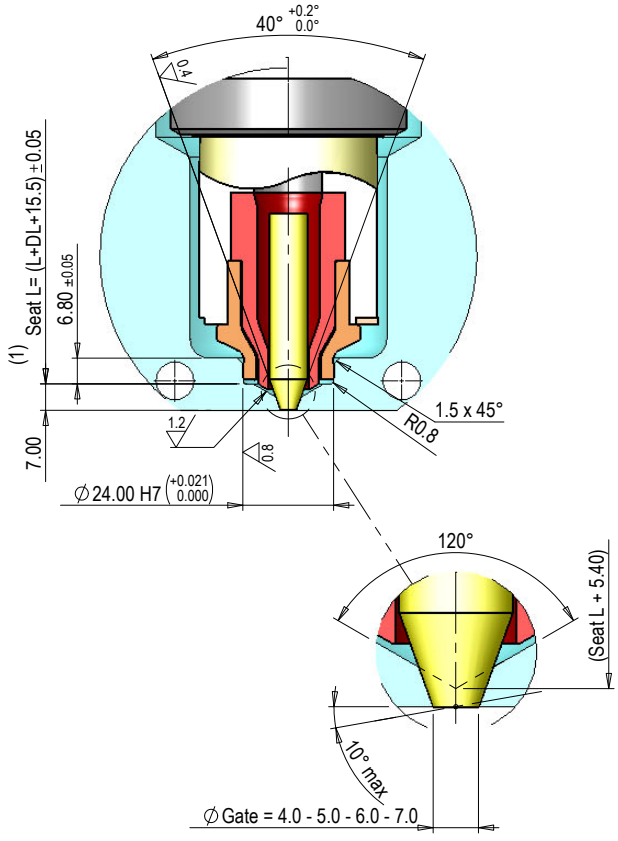
Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

(a) L Nozzle = min 100 ÷ 600 mm max. Standard Length in according to pag.4.Aa1.08
(1) For "Seat L" calculation see pag. 4.Aa1.14 table A

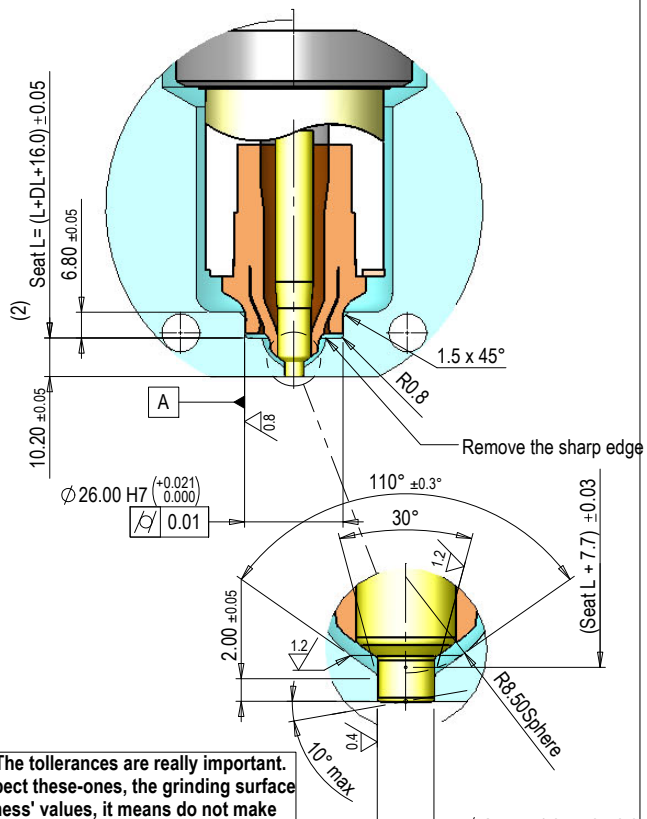
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Conic valve gating
Type **PGC20**



Cylindrical valve gating
Type **PGY30**



(a) L Nozzle = min 100 ÷ 600 mm max. Standard Length in according to pag.4.Aa1.08

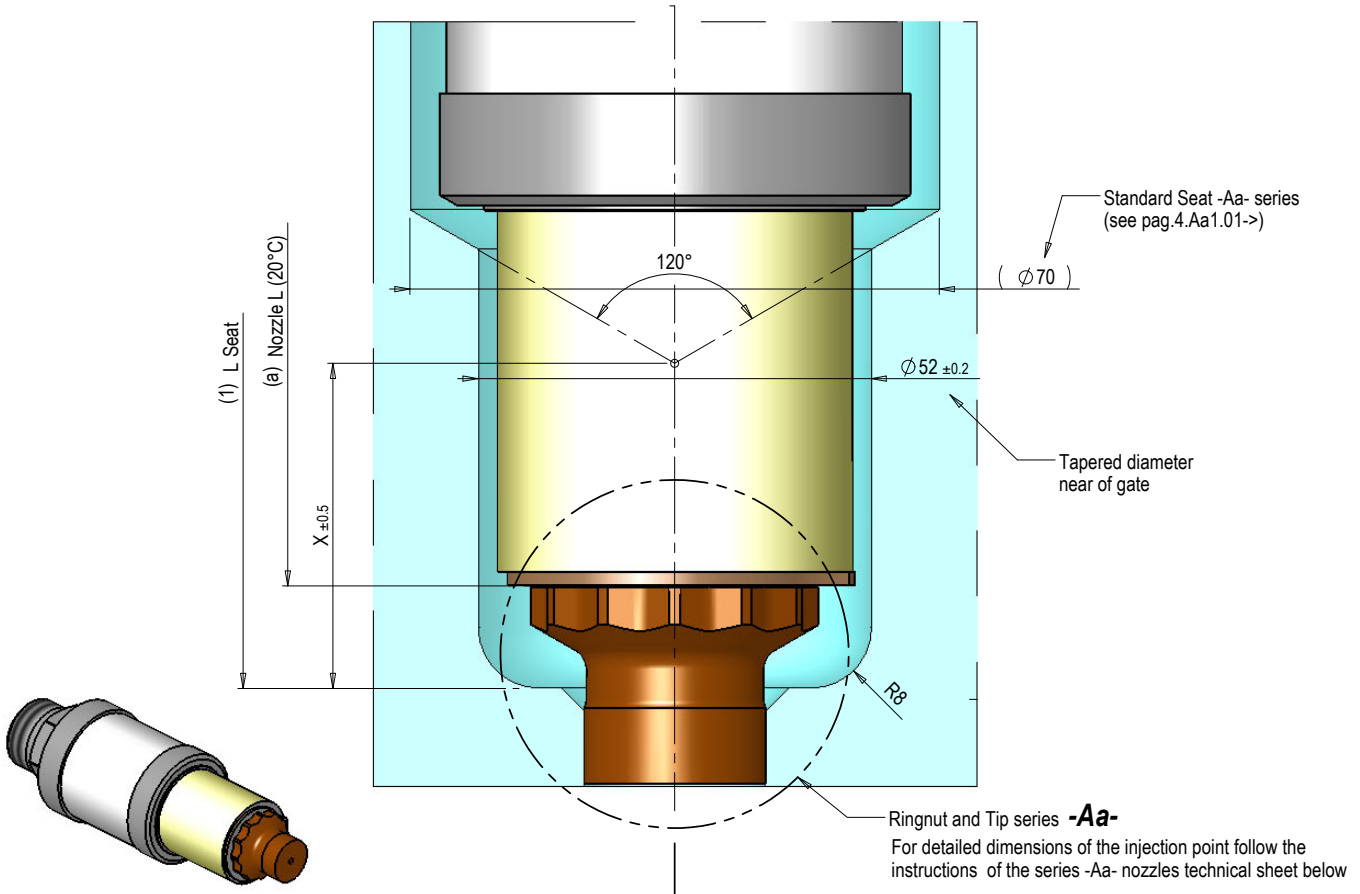
(1) For "Seat L" calculation see pag. 4.Aa1.13b table E

(2) For "Seat L" calculation see pag. 4.Aa1.14 table A

Attention! The tollerances are really important. Do not respect these-ones, the grinding surface and roughness' values, it means do not make the system works correctly

Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc. For abrasive filled polymers cavity hardness required is 54÷56HRc.

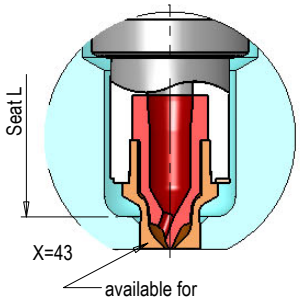
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Type **PGT30**

Torpedo

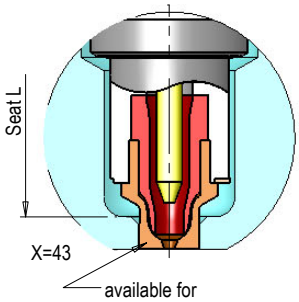
pag. 4.Aa1.02



Type **PGC30**

Conical valve gating

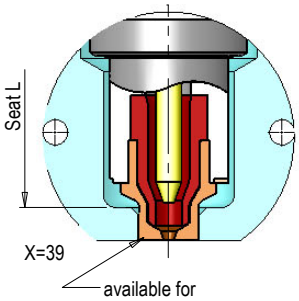
pag. 4.Aa1.04



Type **PGC20**

Conical valve gating

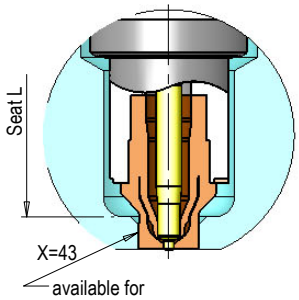
pag. 4.Aa1.20



Type **PGY30**

Cylindrical valve gating

pag. 4.Aa1.06

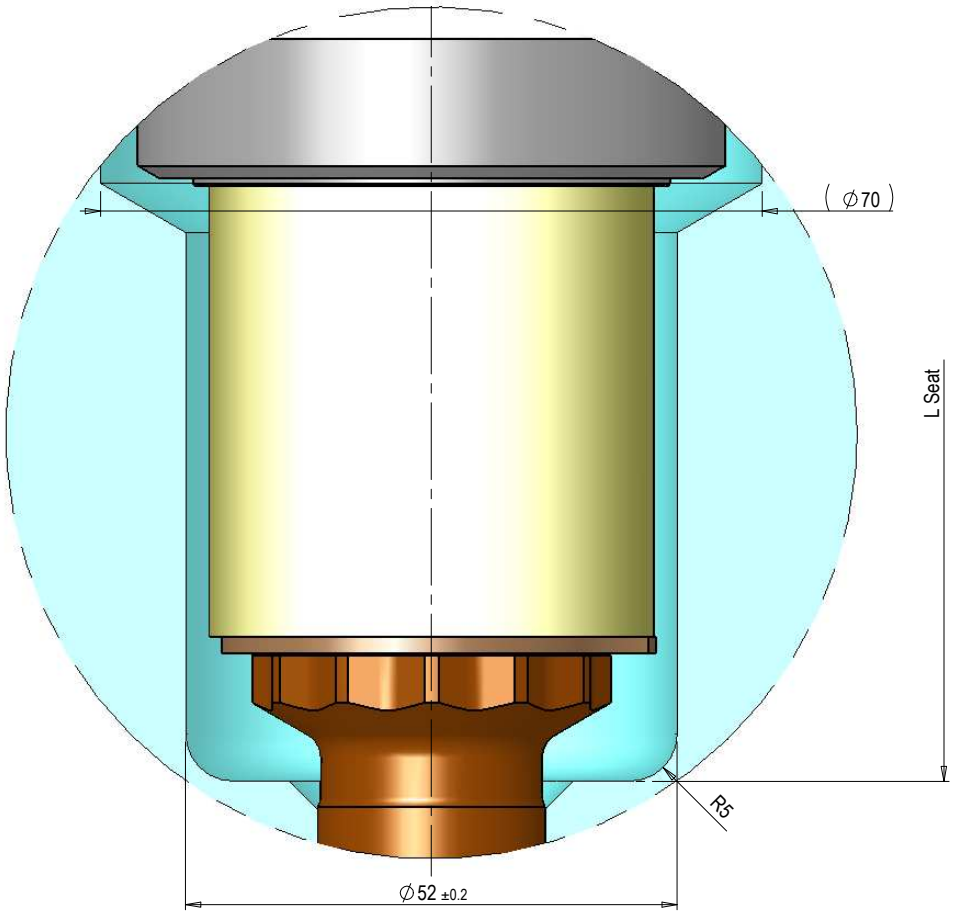


(a) "L Nozzle" = min 100 ÷ 800 mm max. Standard Length in according to pag.4.Aa1.08
(1) For "Seat L" calculation see pag. 4.Aa1.14a table B

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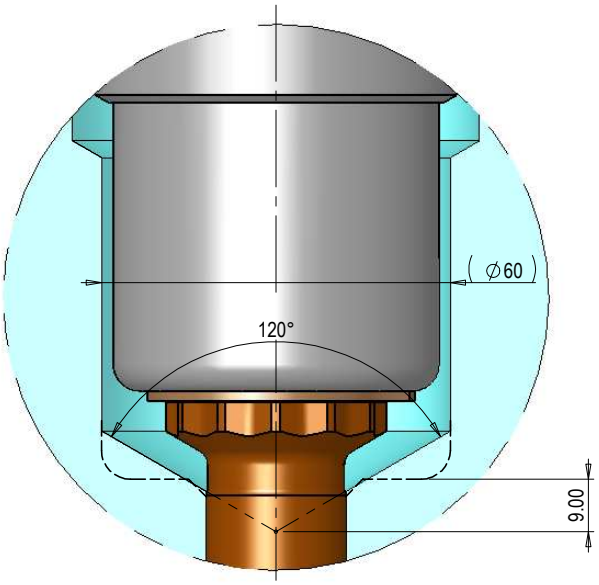
Compact Seat

Nozzles series -Aa- with BUSHING THROUGH CAVITY/EXTERNAL RING
Alternative seat profile to the standard of this catalogue
(reduction of overall dimensions near the injection point)

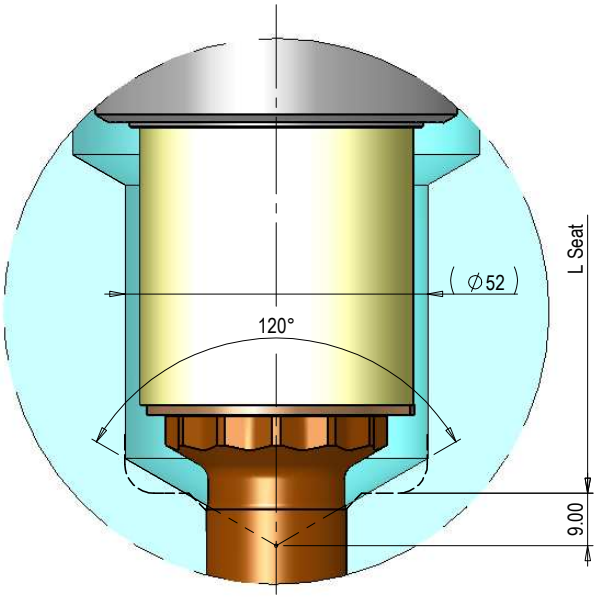


Seat made with 120° tip (*)

Application on STANDARD seat



Application on COMPACT seat



(*) Available for all nozzle models having only BUSHING THROUGH CAVITY

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NOZZLES CODES TABLE

NOZZLE (*) L	NOZZLE CODE Øc=18		POWER (230V)				
	= Classic L.	= Fail Safe			C1	C2	C3
100	0011-02102	0011-02131	1x	2x	300	-	-
125	0011-02103	0011-02132	1x	2x	300	-	-
150	0011-02104	0011-02133	1x	2x	300	-	-
175	0011-02105	0011-02134	1x	2x	300	-	-
200	0011-02106	0011-02135	1x	2x	300	-	-
225	0011-02107	0011-02136	1x	2x	300	330	-
250	0011-02108	0011-02137	1x	2x	300	330	-
275	0011-02109	0011-02138	1x	2x	300	330	-
300	0011-02110	0011-02139	1x	2x	300	330	-
325	0011-02111	0011-02140	1x	2x	300	330	-
350	0011-02112	0011-02141	1x	2x	300	500	-
375	0011-02113	0011-02142	1x	2x	300	500	-
400	0011-02114	0011-02143	1x	2x	300	330	330
425	0011-02115	0011-02144	1x	2x	300	330	330
450	0011-02116	0011-02145	1x	2x	300	330	330
475	0011-02117	0011-02146	1x	2x	300	330	500
500	0011-02118	0011-02147	1x	2x	300	330	500
525	0011-02119	0011-02148	1x	2x	300	330	500
550	0011-02120	0011-02149	1x	2x	300	500	330
575	0011-02121	0011-02150	1x	2x	300	500	330
600	0011-02122	0011-02151	1x	2x	300	500	330
625	0011-02123	0011-02152	1x	2x	300	500	330
650	0011-02124	0011-02153	1x	2x	300	500	500
675	0011-02125	0011-02154	1x	2x	300	500	500
700	0011-02126	0011-02155	1x	2x	300	500	500
725	0011-02127	0011-02156	1x	2x	300	500	500
750	0011-02128	0011-02157	1x	2x	300	500	500
775	0011-02129	0011-02158	1x	2x	300	500	500
800	0011-02130	0011-02159	1x	2x	300	500	500

(*) You can order nozzles with "L" different from the standard (min 100 - max 800 mm) and manifold Øc=20 - 22

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
Øs **PGF30** **Ø4.3** 0012-00589 **Ø6.3** 0012-00590 **Ø4.3** 0012-00591 *for high resistance* **Ø6.3** 0012-00592 *for high resistance* Øs **PGF10** **Ø4.3** 0012-00601 *for high resistance* **Ø6.3** 0012-00602 *for high resistance*	***External end ring*** **Ø26 (LUX)** 0013-01297 ***Bushing through the cavity*** gate **PGF30** **PGF10** **Ø3.0** (*) 0013-00921 0013-00924 **Ø4.0** (*) 0013-00922 0013-00935 **Ø5.0** (**) 0013-00923 0013-00936 **Ø6.0** (**) 0013-00924 0013-00937 (*) to be used with tip Øs=4.3 (**) to be used with tip Øs=6.3	
TORPEDO		
Øp **PGT30 Monohole** **Ø1.0** 0012-00344 **Ø3.0** 0012-00345 **Ø1.0** 0012-00346 *for high resistance* **Ø3.0** 0012-00347 *for high resistance* Øp **PGT30 Multihole** **Ø1.0** 0012-00348 **Ø3.0** 0012-00349 **Ø1.0** 0012-00350 *for high resistance* **Ø3.0** 0012-00351 *for high resistance*	***External end ring*** **Ø26 (LUX)** 0013-01297 ***PGT30 Boushing through the cavity*** gate **L=13** **L=19** **L=82** **Ø3.0** (*) 0013-00554 0013-00558 0013-00562 **Ø4.0** (*) 0013-00555 0013-00559 0013-00563 **Ø5.0** (**) 0013-00556 0013-00560 0013-00564 **Ø6.0** (**) 0013-00557 0013-00561 0013-00565 (*) to be used with tip Øp=1.0 (**) to be used with tip Øp=3.0	
CONICAL VALVE GATING		
PGC30 0012-00788 *For high conductibility with End Ring* 0012-00790 *For high conductibility with Bushing th.cavity* 0012-00792 *for high resistance* ***PGC30 Antistagnation*** 0012-00828 *For high conductibility with End Ring* 0012-00829 *For high conductibility with Bushing th.cavity* 0012-00830 *for high resistance*	***PGC30 External end ring*** **Ø26** 0013-01296 **Ø26 LUX** 0013-01297 ***PGC30 Bushing through the cavity*** gate **L=13** **L=19** **L=82** **Ø4.0** 0013-01279 0013-01285 0013-01291 **Ø5.0** 0013-01280 0013-01286 0013-01292 **Ø6.0** 0013-01281 0013-01287 0013-01293 **Ø7.0** 0013-01282 0013-01288 0013-01294	0262-00063
PGC20 0012-00832 ***PGC20 Antistagnation*** 0012-00833	***PGC20 External end ring*** **Ø24 (LUX)** 0013-01450 ***PGC20 Bushing through the cavity*** Øgate **L=13** **L=19** **L=82** **Ø4.0** 0013-01453 0013-01463 0013-01475 **Ø5.0** 0013-01454 0013-01464 0013-01476 **Ø6.0** 0013-01455 0013-01465 0013-01477 **Ø7.0** 0013-01456 0013-01466 0013-01478	0262-00064
CYLINDRICAL VALVE GATING		
	PGY30 External end ring **Ø26** 0013-01747 (Long Contact) **Ø26** 0013-01748 *Antistagnation* (Long Contact) **Ø26 (LUX)** 0013-01749 (Short Contact) **Ø26 (LUX)** 0013-01750 *Antistagnation* (Short Contact) ***PGY30 Bushing through the cavity*** gate **L=13** **L=19** **L=82** **Ø4.0** 0013-01751 0013-01756 0013-01761 **Ø5.0** 0013-01752 0013-01757 0013-01762 **Ø6.0** 0013-01753 0013-01758 0013-01763 **Ø7.0** 0013-01754 0013-01759 0013-01764 **Ø8.0** 0013-01755 0013-01760 0013-01765	

(*) Antistagnation Seal available only some polymers. For further information see sheet pag. 2.01.43

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	DL = (L * ΔT * λ)										
100	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36
125	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
425	0.51	0.61	0.71	0.82	0.92	1.02	1.12	1.22	1.33	1.43	1.53
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
475	0.57	0.68	0.80	0.91	1.03	1.14	1.25	1.37	1.48	1.60	1.71
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80
525	0.63	0.76	0.88	1.01	1.13	1.26	1.39	1.51	1.64	1.76	1.89
550	0.66	0.79	0.92	1.06	1.19	1.32	1.45	1.58	1.72	1.85	1.98
575	0.69	0.83	0.97	1.10	1.24	1.38	1.52	1.66	1.79	1.93	2.07
600	0.72	0.86	1.01	1.15	1.30	1.44	1.58	1.73	1.87	2.02	2.16
625	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
650	0.78	0.94	1.09	1.25	1.40	1.56	1.72	1.87	2.03	2.18	2.34
675	0.81	0.97	1.13	1.30	1.46	1.62	1.78	1.94	2.11	2.27	2.43
700	0.84	1.01	1.18	1.34	1.51	1.68	1.85	2.02	2.18	2.35	2.52
725	0.87	1.04	1.22	1.39	1.57	1.74	1.91	2.09	2.26	2.44	2.61
750	0.90	1.08	1.26	1.44	1.62	1.80	1.98	2.16	2.34	2.52	2.70
775	0.93	1.12	1.30	1.49	1.67	1.86	2.05	2.23	2.42	2.60	2.79
800	0.96	1.15	1.34	1.54	1.73	1.92	2.11	2.30	2.50	2.69	2.88

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	Seat L = L + DL + 11.7										
100	111.82	111.84	111.87	111.89	111.92	111.94	111.96	111.99	112.01	112.04	112.06
125	136.85	136.88	136.91	136.94	136.97	137.00	137.03	137.06	137.09	137.12	137.15
150	161.88	161.92	161.95	161.99	162.02	162.06	162.10	162.13	162.17	162.20	162.24
175	186.91	186.95	186.99	187.04	187.08	187.12	187.16	187.20	187.25	187.29	187.33
200	211.94	211.99	212.04	212.08	212.13	212.18	212.23	212.28	212.32	212.37	212.42
225	236.97	237.02	237.08	237.13	237.19	237.24	237.29	237.35	237.40	237.46	237.51
250	262.00	262.06	262.12	262.18	262.24	262.30	262.36	262.42	262.48	262.54	262.60
275	287.03	287.10	287.16	287.23	287.29	287.36	287.43	287.49	287.56	287.62	287.69
300	312.06	312.13	312.20	312.28	312.35	312.42	312.49	312.56	312.64	312.71	312.78
325	337.09	337.17	337.25	337.32	337.40	337.48	337.56	337.64	337.71	337.79	337.87
350	362.12	362.20	362.29	362.37	362.46	362.54	362.62	362.71	362.79	362.88	362.96
375	387.15	387.24	387.33	387.42	387.51	387.60	387.69	387.78	387.87	387.96	388.05
400	412.18	412.28	412.37	412.47	412.56	412.66	412.76	412.85	412.95	413.04	413.14
425	437.21	437.31	437.41	437.52	437.62	437.72	437.82	437.92	438.03	438.13	438.23
450	462.24	462.35	462.46	462.56	462.67	462.78	462.89	463.00	463.10	463.21	463.32
475	487.27	487.38	487.50	487.61	487.73	487.84	487.95	488.07	488.18	488.30	488.41
500	512.30	512.42	512.54	512.66	512.78	512.90	513.02	513.14	513.26	513.38	513.50
525	537.33	537.46	537.58	537.71	537.83	537.96	538.09	538.21	538.34	538.46	538.59
550	562.36	562.49	562.62	562.76	562.89	563.02	563.15	563.28	563.42	563.55	563.68
575	587.39	587.53	587.67	587.80	587.94	588.08	588.22	588.36	588.49	588.63	588.77
600	612.42	612.56	612.71	612.85	613.00	613.14	613.28	613.43	613.57	613.72	613.86
625	637.45	637.60	637.75	637.90	638.05	638.20	638.35	638.50	638.65	638.80	638.95
650	662.48	662.64	662.79	662.95	663.10	663.26	663.42	663.57	663.73	663.88	664.04
675	687.51	687.67	687.83	688.00	688.16	688.32	688.48	688.64	688.81	688.97	689.13
700	712.54	712.71	712.88	713.04	713.21	713.38	713.55	713.72	713.88	714.05	714.22
725	737.57	737.74	737.92	738.09	738.27	738.44	738.61	738.79	738.96	739.14	739.31
750	762.60	762.78	762.96	763.14	763.32	763.50	763.68	763.86	764.04	764.22	764.40
775	787.63	787.82	788.00	788.19	788.37	788.56	788.75	788.93	789.12	789.30	789.49
800	812.66	812.85	813.04	813.24	813.43	813.62	813.81	814.00	814.20	814.39	814.58

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Tab. B - Calcolo "L Sede"

L (INIETTORE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Sede = L + DL + 13.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	113.32	113.34	113.37	113.39	113.42	113.44	113.46	113.49	113.51	113.54	113.56
125	138.35	138.38	138.41	138.44	138.47	138.50	138.53	138.56	138.59	138.62	138.65
150	163.38	163.42	163.45	163.49	163.52	163.56	163.60	163.63	163.67	163.70	163.74
175	188.41	188.45	188.49	188.54	188.58	188.62	188.66	188.70	188.75	188.79	188.83
200	213.44	213.49	213.54	213.58	213.63	213.68	213.73	213.78	213.82	213.87	213.92
225	238.47	238.52	238.58	238.63	238.69	238.74	238.79	238.85	238.90	238.96	239.01
250	263.50	263.56	263.62	263.68	263.74	263.80	263.86	263.92	263.98	264.04	264.10
275	288.53	288.60	288.66	288.73	288.79	288.86	288.93	288.99	289.06	289.12	289.19
300	313.56	313.63	313.70	313.78	313.85	313.92	313.99	314.06	314.14	314.21	314.28
325	338.59	338.67	338.75	338.82	338.90	338.98	339.06	339.14	339.21	339.29	339.37
350	363.62	363.70	363.79	363.87	363.96	364.04	364.12	364.21	364.29	364.38	364.46
375	388.65	388.74	388.83	388.92	389.01	389.10	389.19	389.28	389.37	389.46	389.55
400	413.68	413.78	413.87	413.97	414.06	414.16	414.26	414.35	414.45	414.54	414.64
425	438.71	438.81	438.91	439.02	439.12	439.22	439.32	439.42	439.53	439.63	439.73
450	463.74	463.85	463.96	464.06	464.17	464.28	464.39	464.50	464.60	464.71	464.82
475	488.77	488.88	489.00	489.11	489.23	489.34	489.45	489.57	489.68	489.80	489.91
500	513.80	513.92	514.04	514.16	514.28	514.40	514.52	514.64	514.76	514.88	515.00
525	538.83	538.96	539.08	539.21	539.33	539.46	539.59	539.71	539.84	539.96	540.09
550	563.86	563.99	564.12	564.26	564.39	564.52	564.65	564.78	564.92	565.05	565.18
575	588.89	589.03	589.17	589.30	589.44	589.58	589.72	589.86	589.99	590.13	590.27
600	613.92	614.06	614.21	614.35	614.50	614.64	614.78	614.93	615.07	615.22	615.36
625	638.95	639.10	639.25	639.40	639.55	639.70	639.85	640.00	640.15	640.30	640.45
650	663.98	664.14	664.29	664.45	664.60	664.76	664.92	665.07	665.23	665.38	665.54
675	689.01	689.17	689.33	689.50	689.66	689.82	689.98	690.14	690.31	690.47	690.63
700	714.04	714.21	714.38	714.54	714.71	714.88	715.05	715.22	715.38	715.55	715.72
725	739.07	739.24	739.42	739.59	739.77	739.94	740.11	740.29	740.46	740.64	740.81
750	764.10	764.28	764.46	764.64	764.82	765.00	765.18	765.36	765.54	765.72	765.90
775	789.13	789.32	789.50	789.69	789.87	790.06	790.25	790.43	790.62	790.80	790.99
800	814.16	814.35	814.54	814.74	814.93	815.12	815.31	815.50	815.70	815.89	816.08

Tab. C - Calcolo "L Sede"

L (INIETTORE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Sede = L + DL + 20.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	120.32	120.34	120.37	120.39	120.42	120.44	120.46	120.49	120.51	120.54	120.56
125	145.35	145.38	145.41	145.44	145.47	145.50	145.53	145.56	145.59	145.62	145.65
150	170.38	170.42	170.45	170.49	170.52	170.56	170.60	170.63	170.67	170.70	170.74
175	195.41	195.45	195.49	195.54	195.58	195.62	195.66	195.70	195.75	195.79	195.83
200	220.44	220.49	220.54	220.58	220.63	220.68	220.73	220.78	220.82	220.87	220.92
225	245.47	245.52	245.58	245.63	245.69	245.74	245.79	245.85	245.90	245.96	246.01
250	270.50	270.56	270.62	270.68	270.74	270.80	270.86	270.92	270.98	271.04	271.10
275	295.53	295.60	295.66	295.73	295.79	295.86	295.93	295.99	296.06	296.12	296.19
300	320.56	320.63	320.70	320.78	320.85	320.92	320.99	321.06	321.14	321.21	321.28
325	345.59	345.67	345.75	345.82	345.90	345.98	346.06	346.14	346.21	346.29	346.37
350	370.62	370.70	370.79	370.87	370.96	371.04	371.12	371.21	371.29	371.38	371.46
375	395.65	395.74	395.83	395.92	396.01	396.10	396.19	396.28	396.37	396.46	396.55
400	420.68	420.78	420.87	420.97	421.06	421.16	421.26	421.35	421.45	421.54	421.64
425	445.71	445.81	445.91	446.02	446.12	446.22	446.32	446.42	446.53	446.63	446.73
450	470.74	470.85	470.96	471.06	471.17	471.28	471.39	471.50	471.60	471.71	471.82
475	495.77	495.88	496.00	496.11	496.23	496.34	496.45	496.57	496.68	496.80	496.91
500	520.80	520.92	521.04	521.16	521.28	521.40	521.52	521.64	521.76	521.88	522.00
525	545.83	545.96	546.08	546.21	546.33	546.46	546.59	546.71	546.84	546.96	547.09
550	570.86	570.99	571.12	571.26	571.39	571.52	571.65	571.78	571.92	572.05	572.18
575	595.89	596.03	596.17	596.30	596.44	596.58	596.72	596.86	596.99	597.13	597.27
600	620.92	621.06	621.21	621.35	621.50	621.64	621.78	621.93	622.07	622.22	622.36
625	645.95	646.10	646.25	646.40	646.55	646.70	646.85	647.00	647.15	647.30	647.45
650	670.98	671.14	671.29	671.45	671.60	671.76	671.92	672.07	672.23	672.38	672.54
675	696.01	696.17	696.33	696.50	696.66	696.82	696.98	697.14	697.31	697.47	697.63
700	721.04	721.21	721.38	721.54	721.71	721.88	722.05	722.22	722.38	722.55	722.72
725	746.07	746.24	746.42	746.59	746.77	746.94	747.11	747.29	747.46	747.64	747.81
750	771.10	771.28	771.46	771.64	771.82	772.00	772.18	772.36	772.54	772.72	772.90
775	796.13	796.32	796.50	796.69	796.87	797.06	797.25	797.43	797.62	797.80	797.99
800	821.16	821.35	821.54	821.74	821.93	822.12	822.31	822.50	822.70	822.89	823.08

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Tab. D - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 9.5										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	109.62	109.64	109.67	109.69	109.72	109.74	109.76	109.79	109.81	109.84	109.86
125	134.65	134.68	134.71	134.74	134.77	134.80	134.83	134.86	134.89	134.92	134.95
150	159.68	159.72	159.75	159.79	159.82	159.86	159.90	159.93	159.97	160.00	160.04
175	184.71	184.75	184.79	184.84	184.88	184.92	184.96	185.00	185.05	185.09	185.13
200	209.74	209.79	209.84	209.88	209.93	209.98	210.03	210.08	210.12	210.17	210.22
225	234.77	234.82	234.88	234.93	234.99	235.04	235.09	235.15	235.20	235.26	235.31
250	259.80	259.86	259.92	259.98	260.04	260.10	260.16	260.22	260.28	260.34	260.40
275	284.83	284.90	284.96	285.03	285.09	285.16	285.23	285.29	285.36	285.42	285.49
300	309.86	309.93	310.00	310.08	310.15	310.22	310.29	310.36	310.44	310.51	310.58
325	334.89	334.97	335.05	335.12	335.20	335.28	335.36	335.44	335.51	335.59	335.67
350	359.92	360.00	360.09	360.17	360.26	360.34	360.42	360.51	360.59	360.68	360.76
375	384.95	385.04	385.13	385.22	385.31	385.40	385.49	385.58	385.67	385.76	385.85
400	409.98	410.08	410.17	410.27	410.36	410.46	410.56	410.65	410.75	410.84	410.94
425	435.01	435.11	435.21	435.32	435.42	435.52	435.62	435.72	435.83	435.93	436.03
450	460.04	460.15	460.26	460.36	460.47	460.58	460.69	460.80	460.90	461.01	461.12
475	485.07	485.18	485.30	485.41	485.53	485.64	485.75	485.87	485.98	486.10	486.21
500	510.10	510.22	510.34	510.46	510.58	510.70	510.82	510.94	511.06	511.18	511.30
525	535.13	535.26	535.38	535.51	535.63	535.76	535.89	536.01	536.14	536.26	536.39
550	560.16	560.29	560.42	560.56	560.69	560.82	560.95	561.08	561.22	561.35	561.48
575	585.19	585.33	585.47	585.60	585.74	585.88	586.02	586.16	586.29	586.43	586.57
600	610.22	610.36	610.51	610.65	610.80	610.94	611.08	611.23	611.37	611.52	611.66
625	635.25	635.40	635.55	635.70	635.85	636.00	636.15	636.30	636.45	636.60	636.75
650	660.28	660.44	660.59	660.75	660.90	661.06	661.22	661.37	661.53	661.68	661.84
675	685.31	685.47	685.63	685.80	685.96	686.12	686.28	686.44	686.61	686.77	686.93
700	710.34	710.51	710.68	710.84	711.01	711.18	711.35	711.52	711.68	711.85	712.02
725	735.37	735.54	735.72	735.89	736.07	736.24	736.41	736.59	736.76	736.94	737.11
750	760.40	760.58	760.76	760.94	761.12	761.30	761.48	761.66	761.84	762.02	762.20
775	785.43	785.62	785.80	785.99	786.17	786.36	786.55	786.73	786.92	787.10	787.29
800	810.46	810.65	810.84	811.04	811.23	811.42	811.61	811.80	812.00	812.19	812.38

Tab. E - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 15.5										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	115.62	115.64	115.67	115.69	115.72	115.74	115.76	115.79	115.81	115.84	115.86
125	140.65	140.68	140.71	140.74	140.77	140.80	140.83	140.86	140.89	140.92	140.95
150	165.68	165.72	165.75	165.79	165.82	165.86	165.90	165.93	165.97	166.00	166.04
175	190.71	190.75	190.79	190.84	190.88	190.92	190.96	191.00	191.05	191.09	191.13
200	215.74	215.79	215.84	215.88	215.93	215.98	216.03	216.08	216.12	216.17	216.22
225	240.77	240.82	240.88	240.93	240.99	241.04	241.09	241.15	241.20	241.26	241.31
250	265.80	265.86	265.92	265.98	266.04	266.10	266.16	266.22	266.28	266.34	266.40
275	290.83	290.90	290.96	291.03	291.09	291.16	291.23	291.29	291.36	291.42	291.49
300	315.86	315.93	316.00	316.08	316.15	316.22	316.29	316.36	316.44	316.51	316.58
325	340.89	340.97	341.05	341.12	341.20	341.28	341.36	341.44	341.51	341.59	341.67
350	365.92	366.00	366.09	366.17	366.26	366.34	366.42	366.51	366.59	366.68	366.76
375	390.95	391.04	391.13	391.22	391.31	391.40	391.49	391.58	391.67	391.76	391.85
400	415.98	416.08	416.17	416.27	416.36	416.46	416.56	416.65	416.75	416.84	416.94
425	441.01	441.11	441.21	441.32	441.42	441.52	441.62	441.72	441.83	441.93	442.03
450	466.04	466.15	466.26	466.36	466.47	466.58	466.69	466.80	466.90	467.01	467.12
475	491.07	491.18	491.30	491.41	491.53	491.64	491.75	491.87	491.98	492.10	492.21
500	516.10	516.22	516.34	516.46	516.58	516.70	516.82	516.94	517.06	517.18	517.30
525	541.13	541.26	541.38	541.51	541.63	541.76	541.89	542.01	542.14	542.26	542.39
550	566.16	566.29	566.42	566.56	566.69	566.82	566.95	567.08	567.22	567.35	567.48
575	591.19	591.33	591.47	591.60	591.74	591.88	592.02	592.16	592.29	592.43	592.57
600	616.22	616.36	616.51	616.65	616.80	616.94	617.08	617.23	617.37	617.52	617.66
625	641.25	641.40	641.55	641.70	641.85	642.00	642.15	642.30	642.45	642.60	642.75
650	666.28	666.44	666.59	666.75	666.90	667.06	667.22	667.37	667.53	667.68	667.84
675	691.31	691.47	691.63	691.80	691.96	692.12	692.28	692.44	692.61	692.77	692.93
700	716.34	716.51	716.68	716.84	717.01	717.18	717.35	717.52	717.68	717.85	718.02
725	741.37	741.54	741.72	741.89	742.07	742.24	742.41	742.59	742.76	742.94	743.11
750	766.40	766.58	766.76	766.94	767.12	767.30	767.48	767.66	767.84	768.02	768.20
775	791.43	791.62	791.80	791.99	792.17	792.36	792.55	792.73	792.92	793.10	793.29
800	816.46	816.65	816.84	817.04	817.23	817.42	817.61	817.80	818.00	818.19	818.38

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36
125	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
425	0.51	0.61	0.71	0.82	0.92	1.02	1.12	1.22	1.33	1.43	1.53
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
475	0.57	0.68	0.80	0.91	1.03	1.14	1.25	1.37	1.48	1.60	1.71
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80
525	0.63	0.76	0.88	1.01	1.13	1.26	1.39	1.51	1.64	1.76	1.89
550	0.66	0.79	0.92	1.06	1.19	1.32	1.45	1.58	1.72	1.85	1.98
575	0.69	0.83	0.97	1.10	1.24	1.38	1.52	1.66	1.79	1.93	2.07
600	0.72	0.86	1.01	1.15	1.30	1.44	1.58	1.73	1.87	2.02	2.16
625	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
650	0.78	0.94	1.09	1.25	1.40	1.56	1.72	1.87	2.03	2.18	2.34
675	0.81	0.97	1.13	1.30	1.46	1.62	1.78	1.94	2.11	2.27	2.43
700	0.84	1.01	1.18	1.34	1.51	1.68	1.85	2.02	2.18	2.35	2.52
725	0.87	1.04	1.22	1.39	1.57	1.74	1.91	2.09	2.26	2.44	2.61
750	0.90	1.08	1.26	1.44	1.62	1.80	1.98	2.16	2.34	2.52	2.70
775	0.93	1.12	1.30	1.49	1.67	1.86	2.05	2.23	2.42	2.60	2.79
800	0.96	1.15	1.34	1.54	1.73	1.92	2.11	2.30	2.50	2.69	2.88

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL +16.0										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	116.12	116.14	116.17	116.19	116.22	116.24	116.26	116.29	116.31	116.34	116.36
125	141.15	141.18	141.21	141.24	141.27	141.30	141.33	141.36	141.39	141.42	141.45
150	166.18	166.22	166.25	166.29	166.32	166.36	166.40	166.43	166.47	166.50	166.54
175	191.21	191.25	191.29	191.34	191.38	191.42	191.46	191.50	191.55	191.59	191.63
200	216.24	216.29	216.34	216.38	216.43	216.48	216.53	216.58	216.62	216.67	216.72
225	241.27	241.32	241.38	241.43	241.49	241.54	241.59	241.65	241.70	241.76	241.81
250	266.30	266.36	266.42	266.48	266.54	266.60	266.66	266.72	266.78	266.84	266.90
275	291.33	291.40	291.46	291.53	291.59	291.66	291.73	291.79	291.86	291.92	291.99
300	316.36	316.43	316.50	316.58	316.65	316.72	316.79	316.86	316.94	317.01	317.08
325	341.39	341.47	341.55	341.62	341.70	341.78	341.86	341.94	342.01	342.09	342.17
350	366.42	366.50	366.59	366.67	366.76	366.84	366.92	367.01	367.09	367.18	367.26
375	391.45	391.54	391.63	391.72	391.81	391.90	391.99	392.08	392.17	392.26	392.35
400	416.48	416.58	416.67	416.77	416.86	416.96	417.06	417.15	417.25	417.34	417.44
425	441.51	441.61	441.71	441.82	441.92	442.02	442.12	442.22	442.33	442.43	442.53
450	466.54	466.65	466.76	466.86	466.97	467.08	467.19	467.30	467.40	467.51	467.62
475	491.57	491.68	491.80	491.91	492.03	492.14	492.25	492.37	492.48	492.60	492.71
500	516.60	516.72	516.84	516.96	517.08	517.20	517.32	517.44	517.56	517.68	517.80
525	541.63	541.76	541.88	542.01	542.13	542.26	542.39	542.51	542.64	542.76	542.89
550	566.66	566.79	566.92	567.06	567.19	567.32	567.45	567.58	567.72	567.85	567.98
575	591.69	591.83	591.97	592.10	592.24	592.38	592.52	592.66	592.79	592.93	593.07
600	616.72	616.86	617.01	617.15	617.30	617.44	617.58	617.73	617.87	618.02	618.16
625	641.75	641.90	642.05	642.20	642.35	642.50	642.65	642.80	642.95	643.10	643.25
650	666.78	666.94	667.09	667.25	667.40	667.56	667.72	667.87	668.03	668.18	668.34
675	691.81	691.97	692.13	692.30	692.46	692.62	692.78	692.94	693.11	693.27	693.43
700	716.84	717.01	717.18	717.34	717.51	717.68	717.85	718.02	718.18	718.35	718.52
725	741.87	742.04	742.22	742.39	742.57	742.74	742.91	743.09	743.26	743.44	743.61
750	766.90	767.08	767.26	767.44	767.62	767.80	767.98	768.16	768.34	768.52	768.70
775	791.93	792.12	792.30	792.49	792.67	792.86	793.05	793.23	793.42	793.60	793.79
800	816.96	817.15	817.34	817.54	817.73	817.92	818.11	818.30	818.50	818.69	818.88

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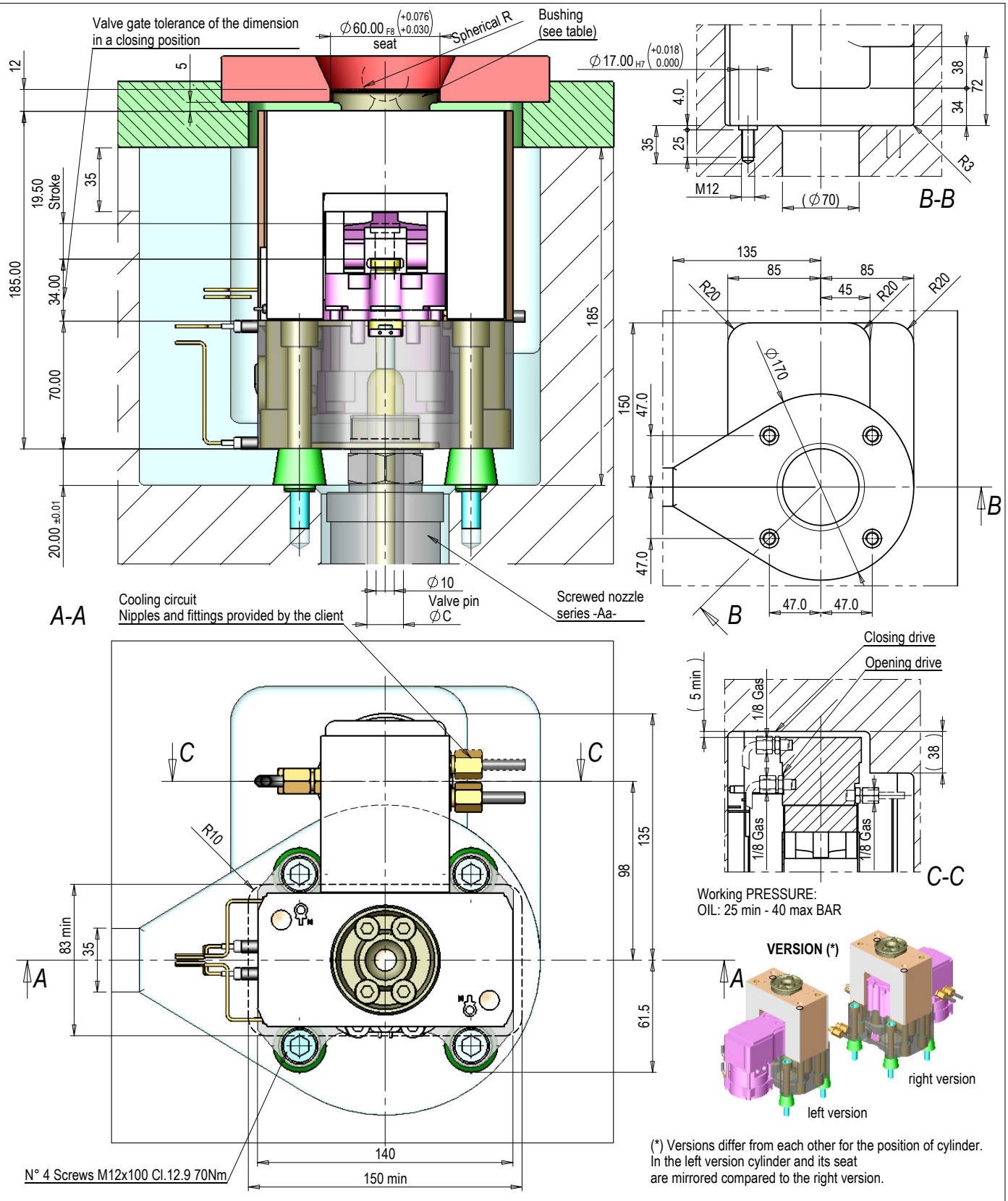
Tab. B - Calcolo "L Sede"

L (INIETTORE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Sede = L + DL + 13.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	113.32	113.34	113.37	113.39	113.42	113.44	113.46	113.49	113.51	113.54	113.56
125	138.35	138.38	138.41	138.44	138.47	138.50	138.53	138.56	138.59	138.62	138.65
150	163.38	163.42	163.45	163.49	163.52	163.56	163.60	163.63	163.67	163.70	163.74
175	188.41	188.45	188.49	188.54	188.58	188.62	188.66	188.70	188.75	188.79	188.83
200	213.44	213.49	213.54	213.58	213.63	213.68	213.73	213.78	213.82	213.87	213.92
225	238.47	238.52	238.58	238.63	238.69	238.74	238.79	238.85	238.90	238.96	239.01
250	263.50	263.56	263.62	263.68	263.74	263.80	263.86	263.92	263.98	264.04	264.10
275	288.53	288.60	288.66	288.73	288.79	288.86	288.93	288.99	289.06	289.12	289.19
300	313.56	313.63	313.70	313.78	313.85	313.92	313.99	314.06	314.14	314.21	314.28
325	338.59	338.67	338.75	338.82	338.90	338.98	339.06	339.14	339.21	339.29	339.37
350	363.62	363.70	363.79	363.87	363.96	364.04	364.12	364.21	364.29	364.38	364.46
375	388.65	388.74	388.83	388.92	389.01	389.10	389.19	389.28	389.37	389.46	389.55
400	413.68	413.78	413.87	413.97	414.06	414.16	414.26	414.35	414.45	414.54	414.64
425	438.71	438.81	438.91	439.02	439.12	439.22	439.32	439.42	439.53	439.63	439.73
450	463.74	463.85	463.96	464.06	464.17	464.28	464.39	464.50	464.60	464.71	464.82
475	488.77	488.88	489.00	489.11	489.23	489.34	489.45	489.57	489.68	489.80	489.91
500	513.80	513.92	514.04	514.16	514.28	514.40	514.52	514.64	514.76	514.88	515.00
525	538.83	538.96	539.08	539.21	539.33	539.46	539.59	539.71	539.84	539.96	540.09
550	563.86	563.99	564.12	564.26	564.39	564.52	564.65	564.78	564.92	565.05	565.18
575	588.89	589.03	589.17	589.30	589.44	589.58	589.72	589.86	589.99	590.13	590.27
600	613.92	614.06	614.21	614.35	614.50	614.64	614.78	614.93	615.07	615.22	615.36
625	638.95	639.10	639.25	639.40	639.55	639.70	639.85	640.00	640.15	640.30	640.45
650	663.98	664.14	664.29	664.45	664.60	664.76	664.92	665.07	665.23	665.38	665.54
675	689.01	689.17	689.33	689.50	689.66	689.82	689.98	690.14	690.31	690.47	690.63
700	714.04	714.21	714.38	714.54	714.71	714.88	715.05	715.22	715.38	715.55	715.72
725	739.07	739.24	739.42	739.59	739.77	739.94	740.11	740.29	740.46	740.64	740.81
750	764.10	764.28	764.46	764.64	764.82	765.00	765.18	765.36	765.54	765.72	765.90
775	789.13	789.32	789.50	789.69	789.87	790.06	790.25	790.43	790.62	790.80	790.99
800	814.16	814.35	814.54	814.74	814.93	815.12	815.31	815.50	815.70	815.89	816.08

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HYDRAULIC VALVE GATING GROUP SINGLE NOZZLE WITH COOLING

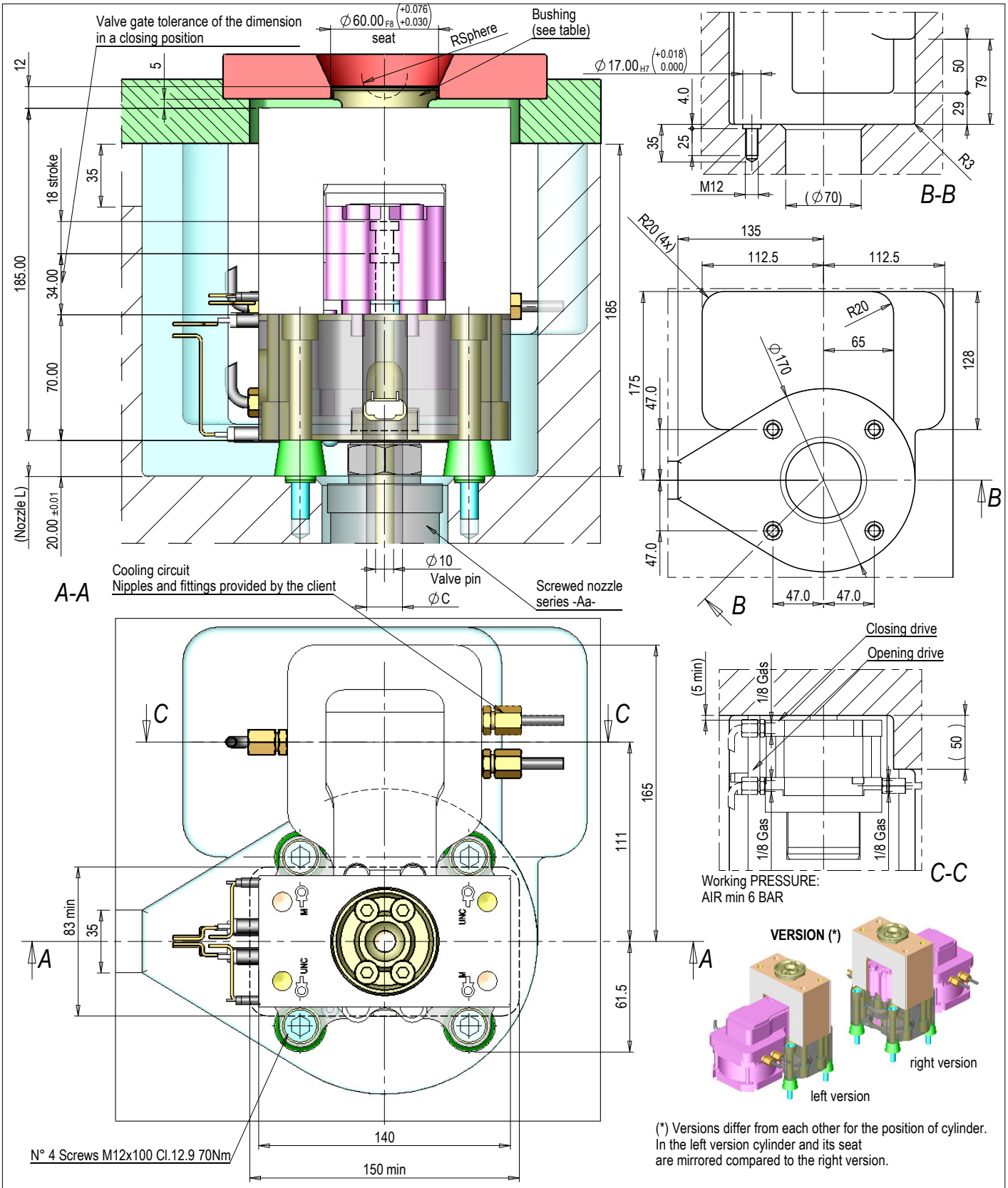


(*) Versions differ from each other for the position of cylinder. In the left version cylinder and its seat are mirrored compared to the right version.

VALVE GATING GROUP CODE	BUSHING CODE	R SPHERE	VALVE PIN CODE		SPARE PARTS KIT
for nozzles Øc=20	0016-00154	R 0	**(Nozzle L)**	**Valve pin**	**Cylinder OR**
0152-00047 right version	0016-00155	R 12.7	100 ÷300	0018-00043	0038-00063
0152-00049 left version	0016-00156	R 15.5	(301) ÷800	0018-00044	
for nozzles Øc=22	0016-00157	R 19.1			
0152-00048 right version	0016-00158	R 25			
0152-00050 left version	0016-00159	R 40			

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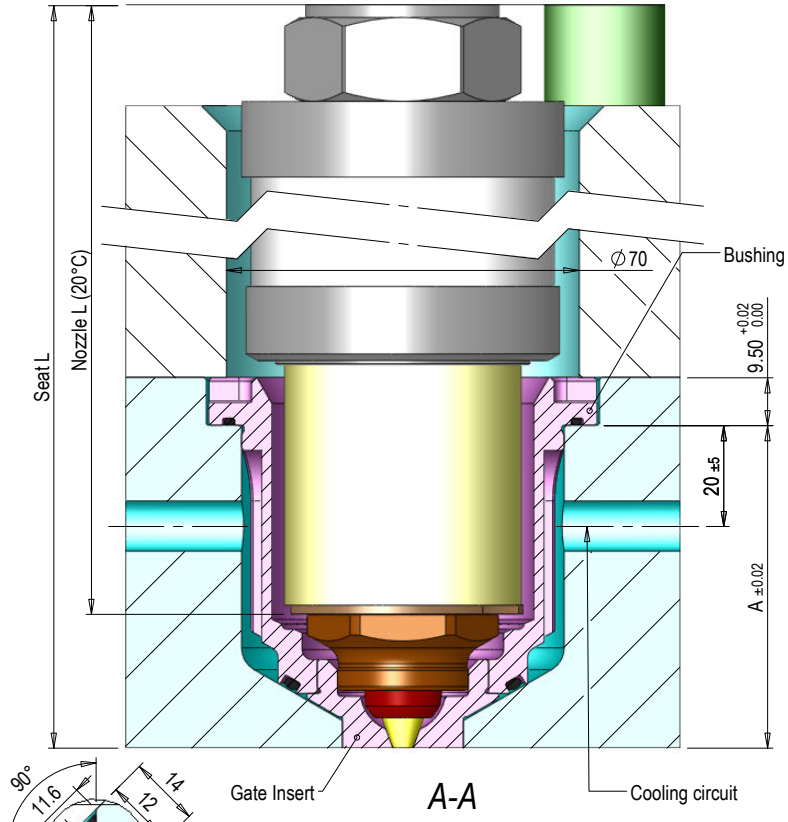
PNEUMATIC VALVE GATING GROUP SINGLE NOZZLE WITH COOLING

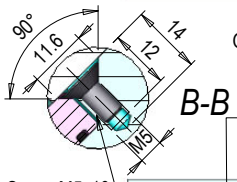


(*) Versions differ from each other for the position of cylinder. In the left version cylinder and its seat are mirrored compared to the right version.

VALVE GATING GROUP CODE	BUSHING CODE	R SPHERE	VALVE PIN CODE		SPARE PARTS KIT
for nozzles Øc=20	0016-00154	R 0	**(Nozzle L)**	**Valve pin**	**Cylinder OR**
0152-00079 right version	0016-00155	R 12.7	100 ÷300	0018-00043	0038-00044
0152-00081 left version	0016-00156	R 15.5	(301) ÷800	0018-00044	
for nozzles Øc=22	0016-00157	R 19.1			
0152-00080 right version	0016-00158	R 25			
0152-00082 left version	0016-00159	R 40			

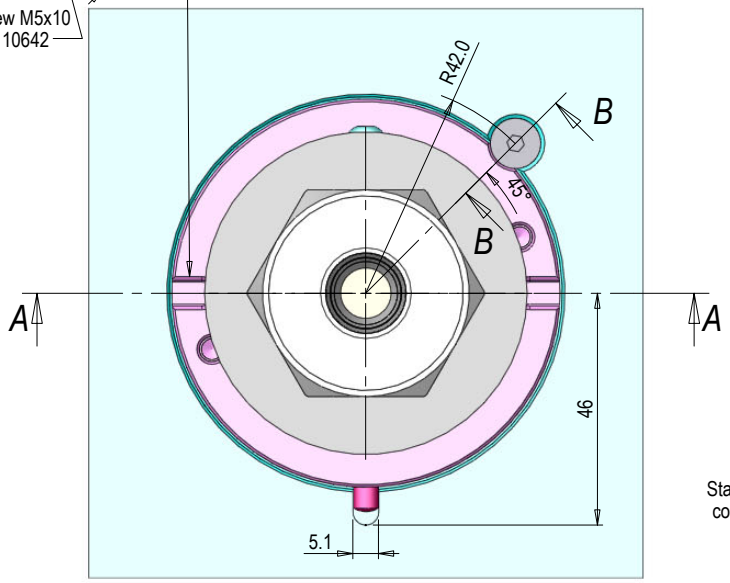
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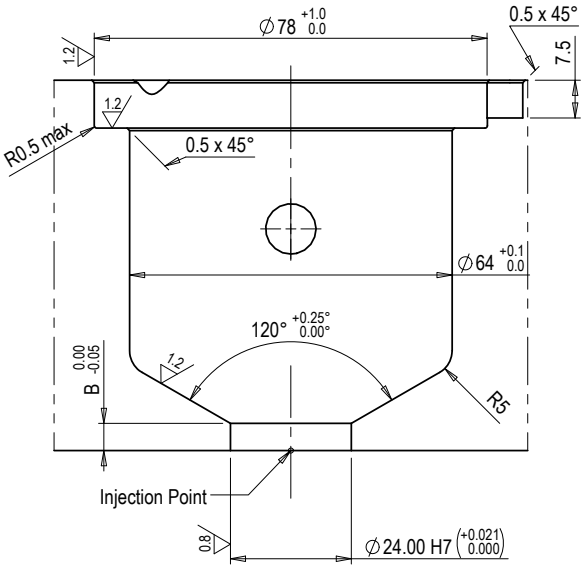
Screw M5x10
ISO 10642

Slots for orientation of cooling insert
in case of extension (see pag. 4.Ma1.30)

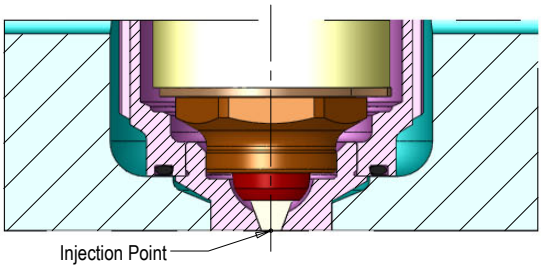


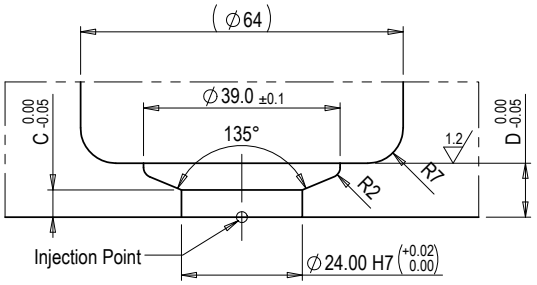
1) Cooling note: suggested hole Ø14 to cool max 4 bushings
with only 1 circuit (range 4÷6 Bar)

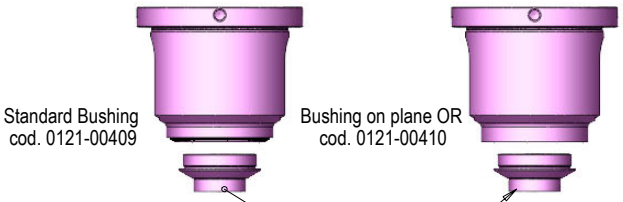
Standard Seat



On plane OR Seat

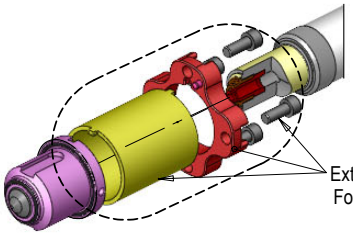






for Ø gate and codes check page 4.Aa1.23

COOLING INSERT Extension



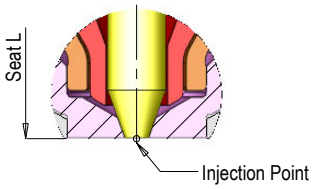
Extension components
For further details see
pag. 4.Ma1.30

	Seat L	*A*	*B*	*C*	*D*
PGC20	L+DL+22.5	61.80	3.20	3.20	8.50
PGC30 / PGY30	L+DL+26.2	64.00	5.40	5.40	10.70

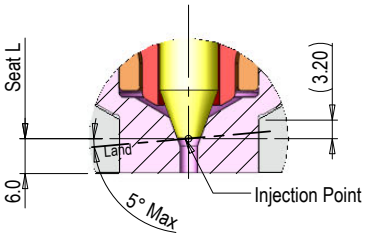
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Type **PGC20**

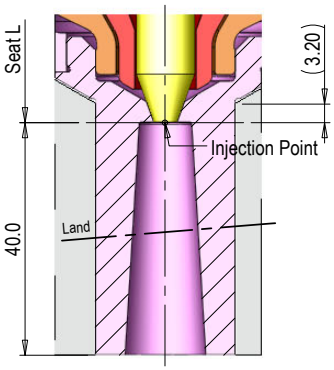
Version L=13



Version L=19

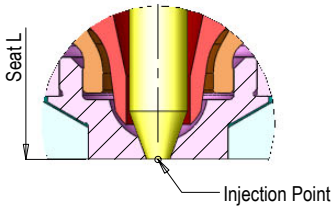


Version L=82

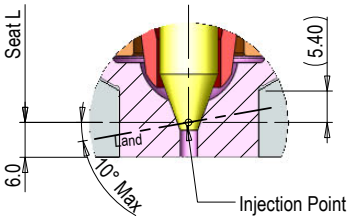


Type **PGC30**

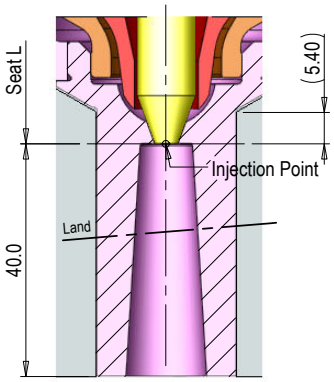
Version L=13



Version L=19

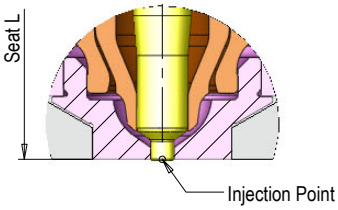


Version L=82

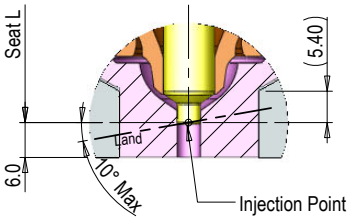


Type **PGY30**

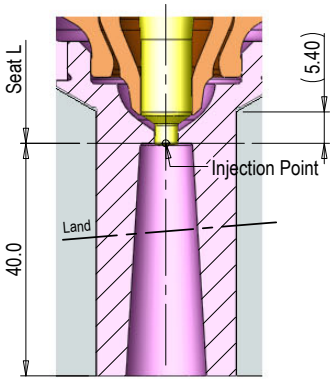
Version L=13



Version L=19



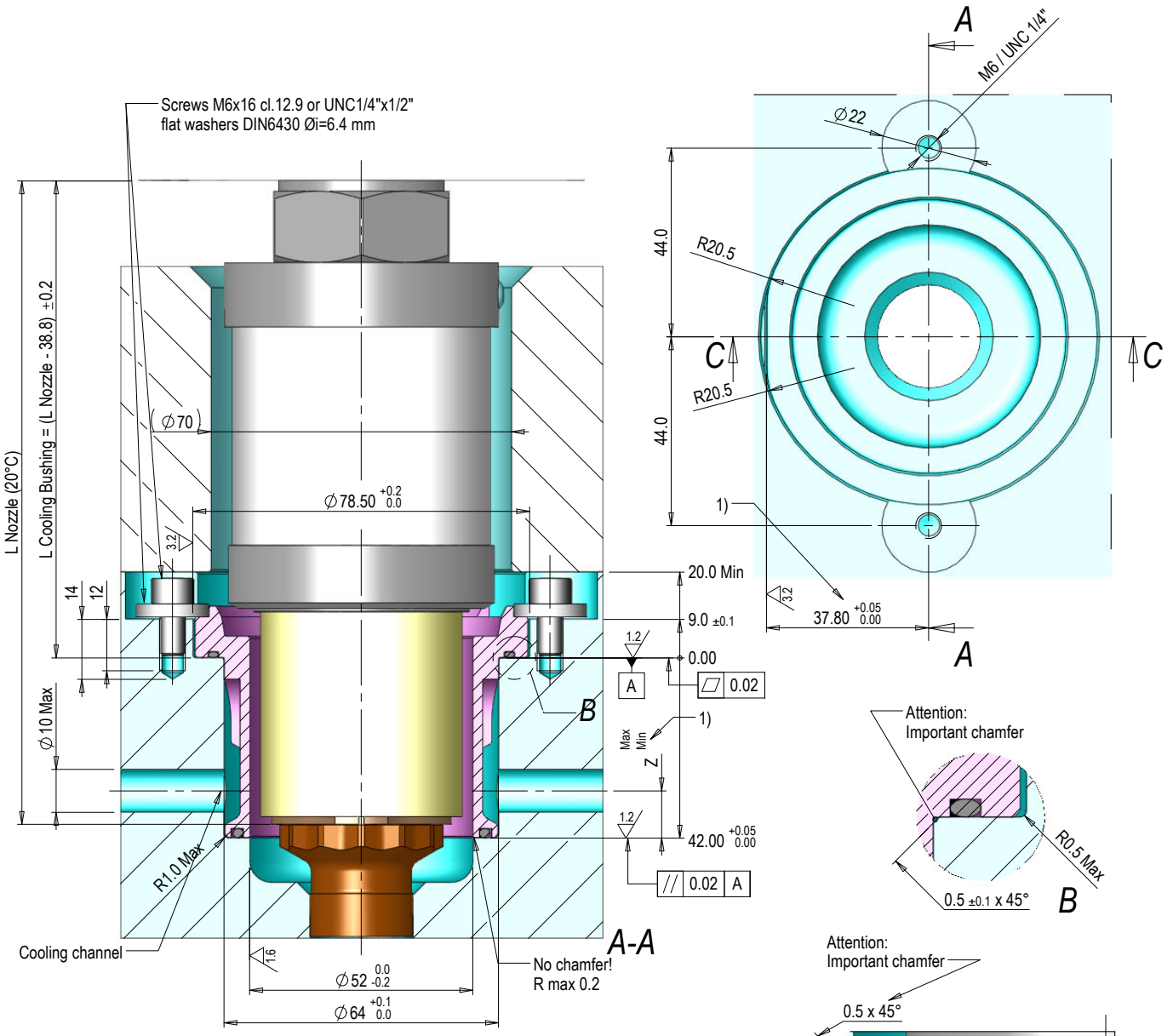
Version L=82



For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

	GATE INSERT		
	Version L=13	***Version L=19***	***Version L=82***
PGC20	Gate Ø4.0 - 0335-00118 Ø5.0 - 0335-00119 Ø6.0 - 0335-00120 Ø7.0 - 0335-00121	Gate Ø4.0 - 0335-00123 Ø5.0 - 0335-00124 Ø6.0 - 0335-00125 Ø7.0 - 0335-00126	Gate Ø4.0 - 0335-00128 Ø5.0 - 0335-00129 Ø6.0 - 0335-00130 Ø7.0 - 0335-00131
PGC30	Gate Ø4.0 - 0335-00133 Ø5.0 - 0335-00134 Ø6.0 - 0335-00135 Ø7.0 - 0335-00136	Gate Ø4.0 - 0335-00138 Ø5.0 - 0335-00139 Ø6.0 - 0335-00140 Ø7.0 - 0335-00141	Gate Ø4.0 - 0335-00143 Ø5.0 - 0335-00144 Ø6.0 - 0335-00145 Ø7.0 - 0335-00146
PGY30	Gate Ø4.0 - 0335-00148 Ø5.0 - 0335-00149 Ø6.0 - 0335-00150 Ø7.0 - 0335-00151 Ø8.0 - 0335-00152	Gate Ø4.0 - 0335-00153 Ø5.0 - 0335-00154 Ø6.0 - 0335-00155 Ø7.0 - 0335-00156 Ø8.0 - 0335-00157	Gate Ø4.0 - 0335-00158 Ø5.0 - 0335-00159 Ø6.0 - 0335-00160 Ø7.0 - 0335-00161 Ø8.0 - 0335-00162

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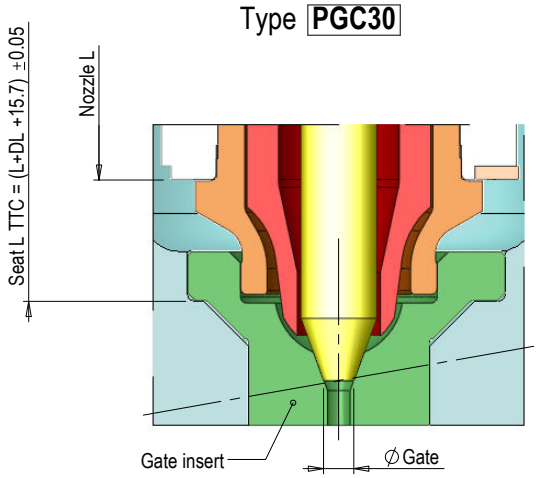
COOLING BUSHING(*)			
Code	***Z***	***Z Min***	***Z Max***
0121-00497	12	7	27.0

(*) Applicable to all type Nozzles Compact type

1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
2) For all cases with "Z Max" > 18, then the positioning face can be located at any angle around the axis of the bushing and with respect to the fixing screws, in order to correctly intercept the customer cooling channels (Fig.2). For more details, please contact the Oerlikon HRSflow technical department.

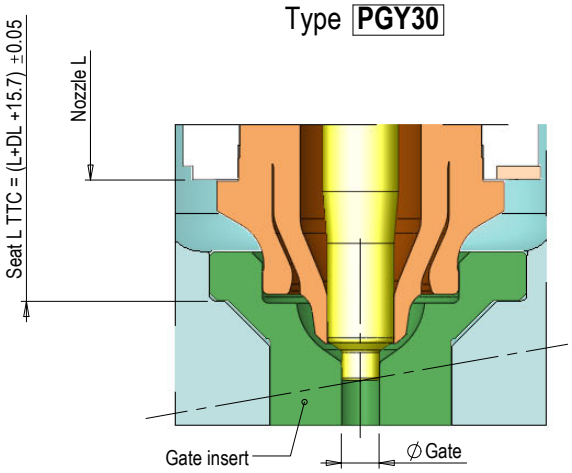
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Type **PGC30**

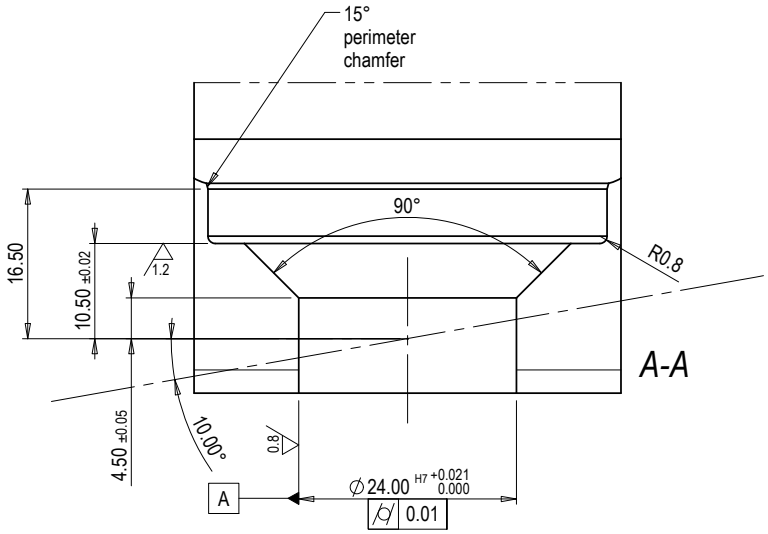


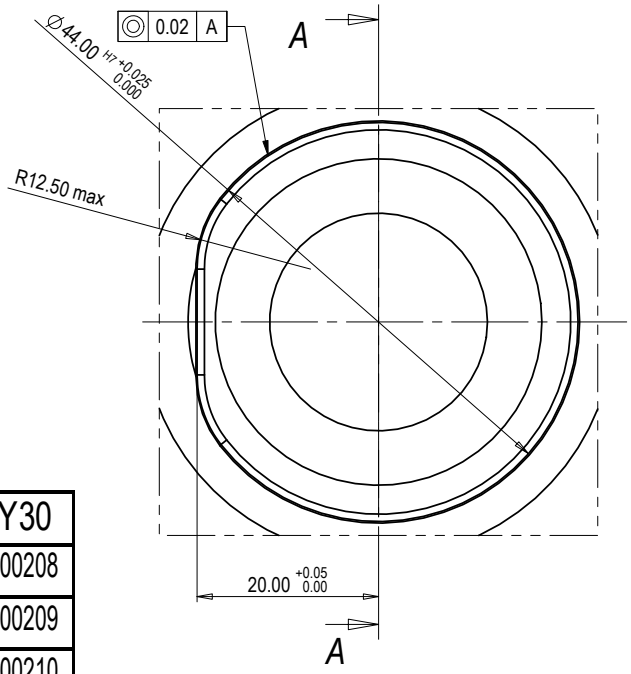
for missing nozzle dimensions check PGC30 config. in the previous pages

Type **PGY30**



for missing nozzle dimensions check PGY30 config. in the previous pages



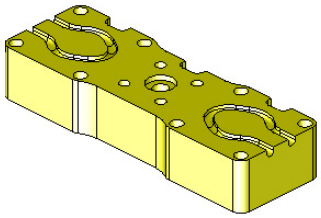


ØGate	PGC30	PGY30
4.0	0335-00203	0335-00208
5.0	0335-00204	0335-00209
6.0	0335-00205	0335-00210
7.0	0335-00206	0335-00211
8.0	-	0335-00212

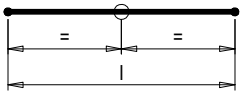
For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

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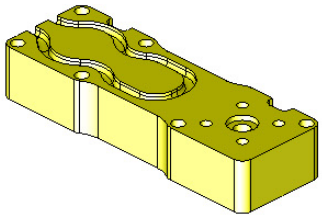
-HL-



Standard
l=150-200-250-300-350-400-450 mm



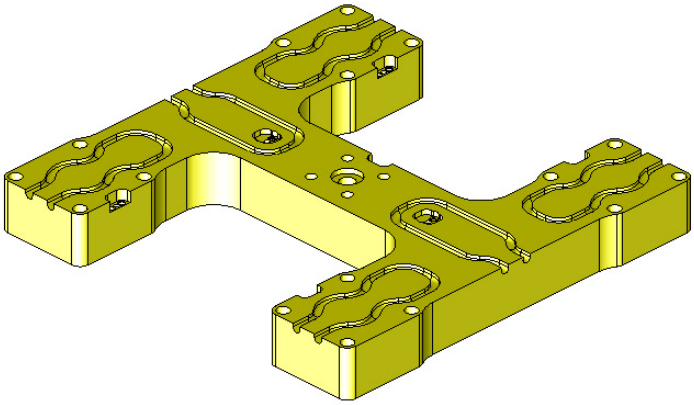
-HD-

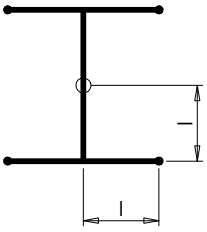


Standard
l=75-100-125-150-175-200-225 mm



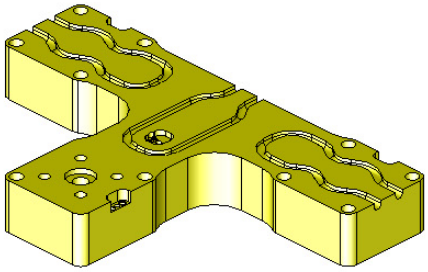
-HH-

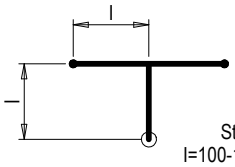




Standard
l=100-125-150 mm

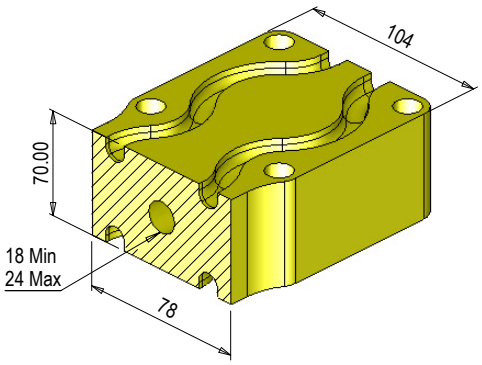
-HT-





Standard
l=100-125-150 mm

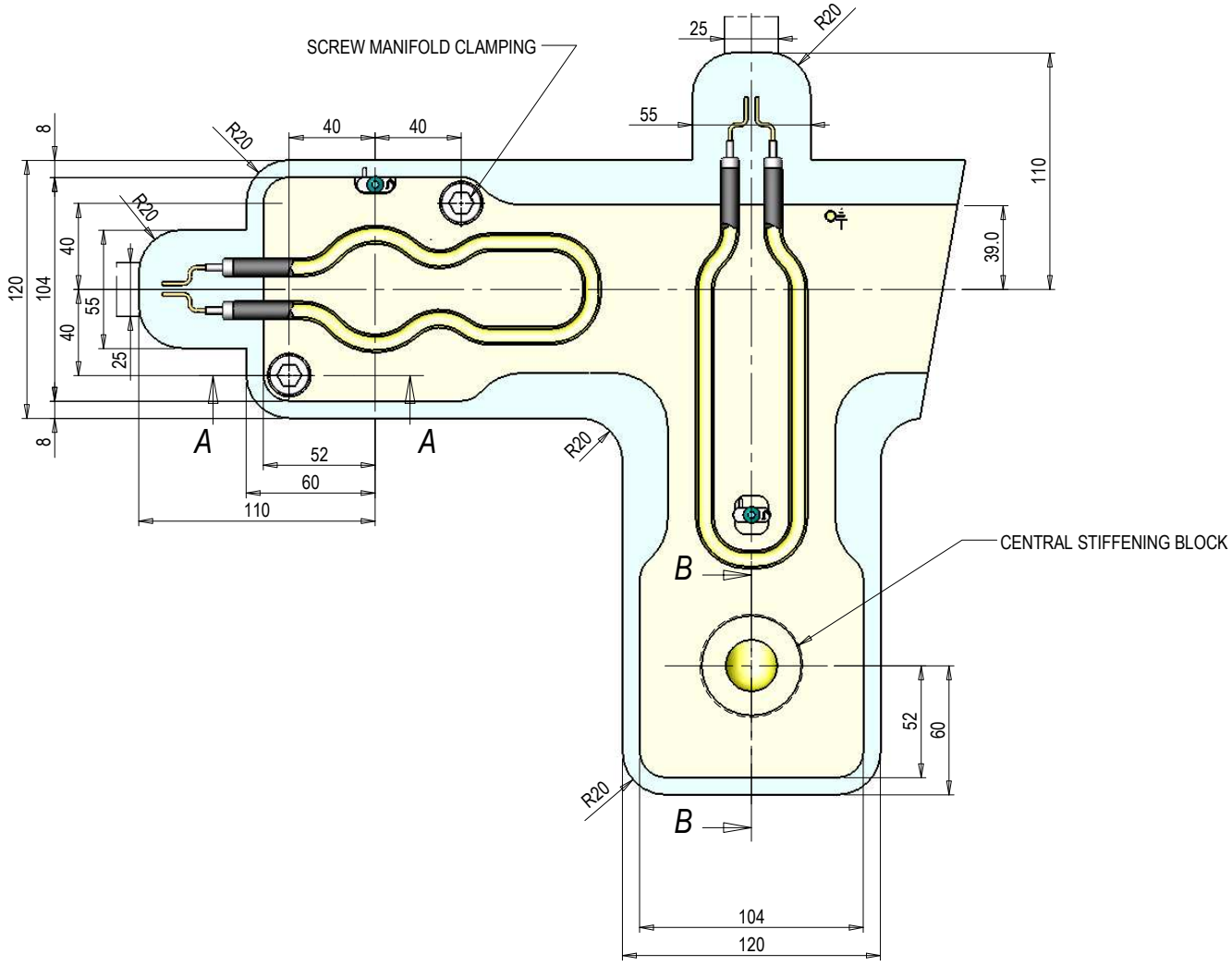
Aa series



Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

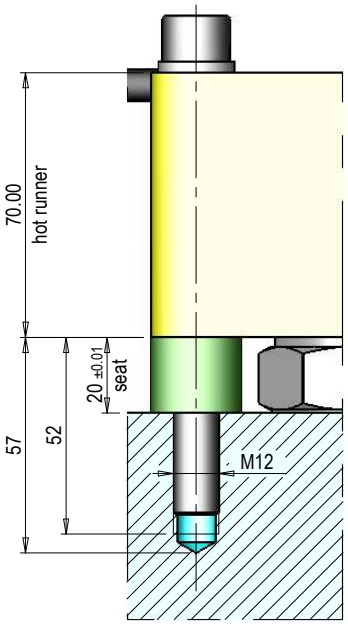
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The following profile is the typical one for
the standard not wired hot runner pocket
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)



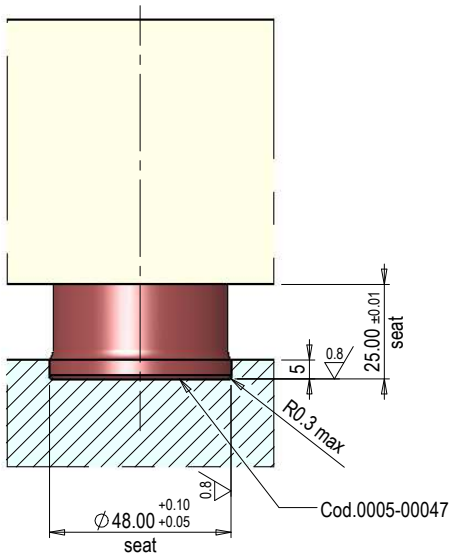
Screw manifold clamping

Screw M12x120 cl.12.9 70 Nm



A-A

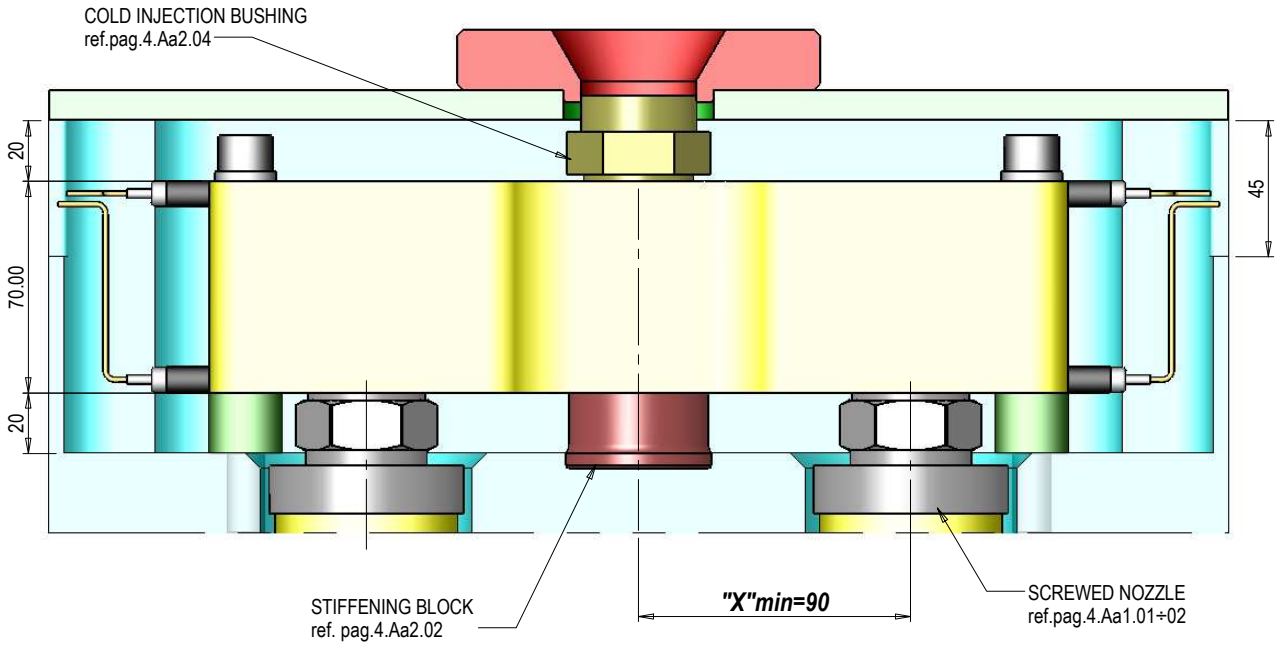
Pocket central stiffening block



B-B

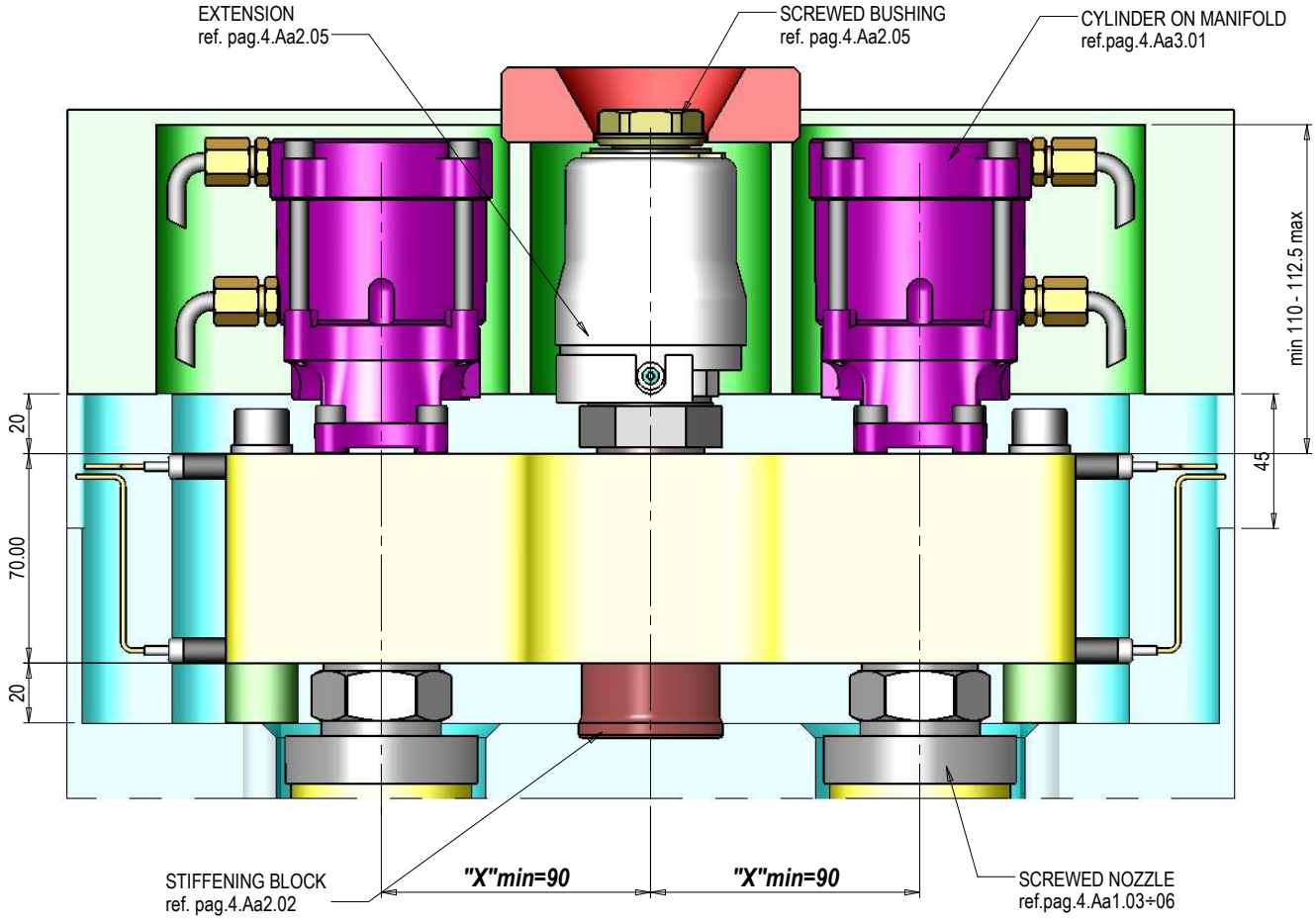
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Structure for TORPEDO or FREE FLOW systems

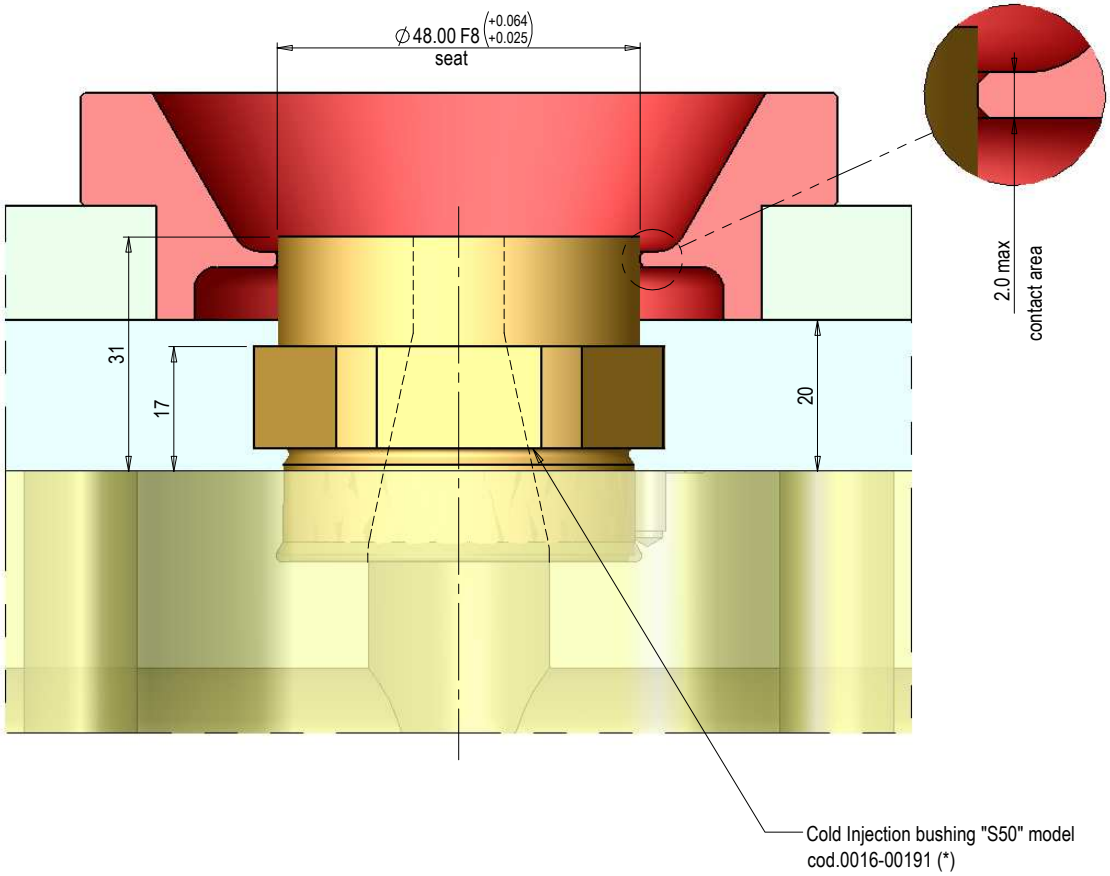


Xmin= min centre distance between injection bushing and nozzle for non standard systems

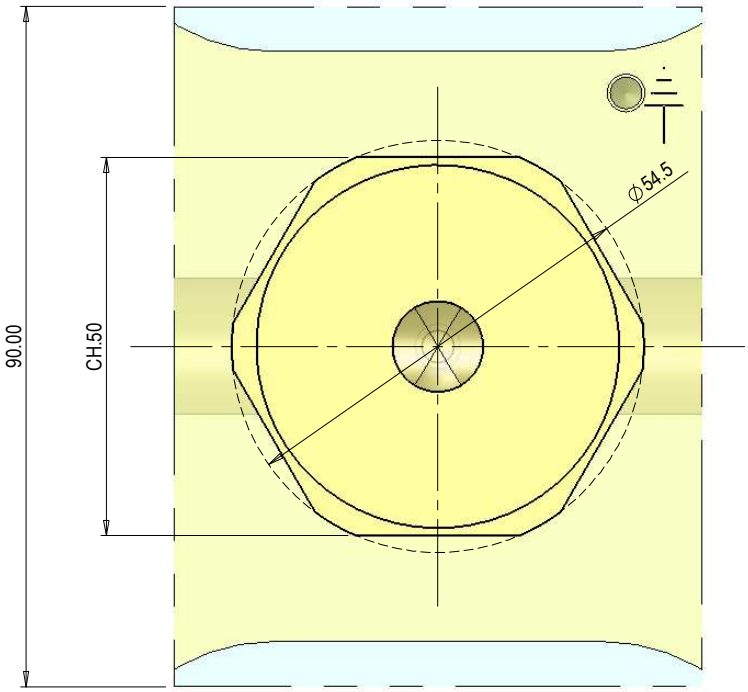
Structure for VALVE GATING systems



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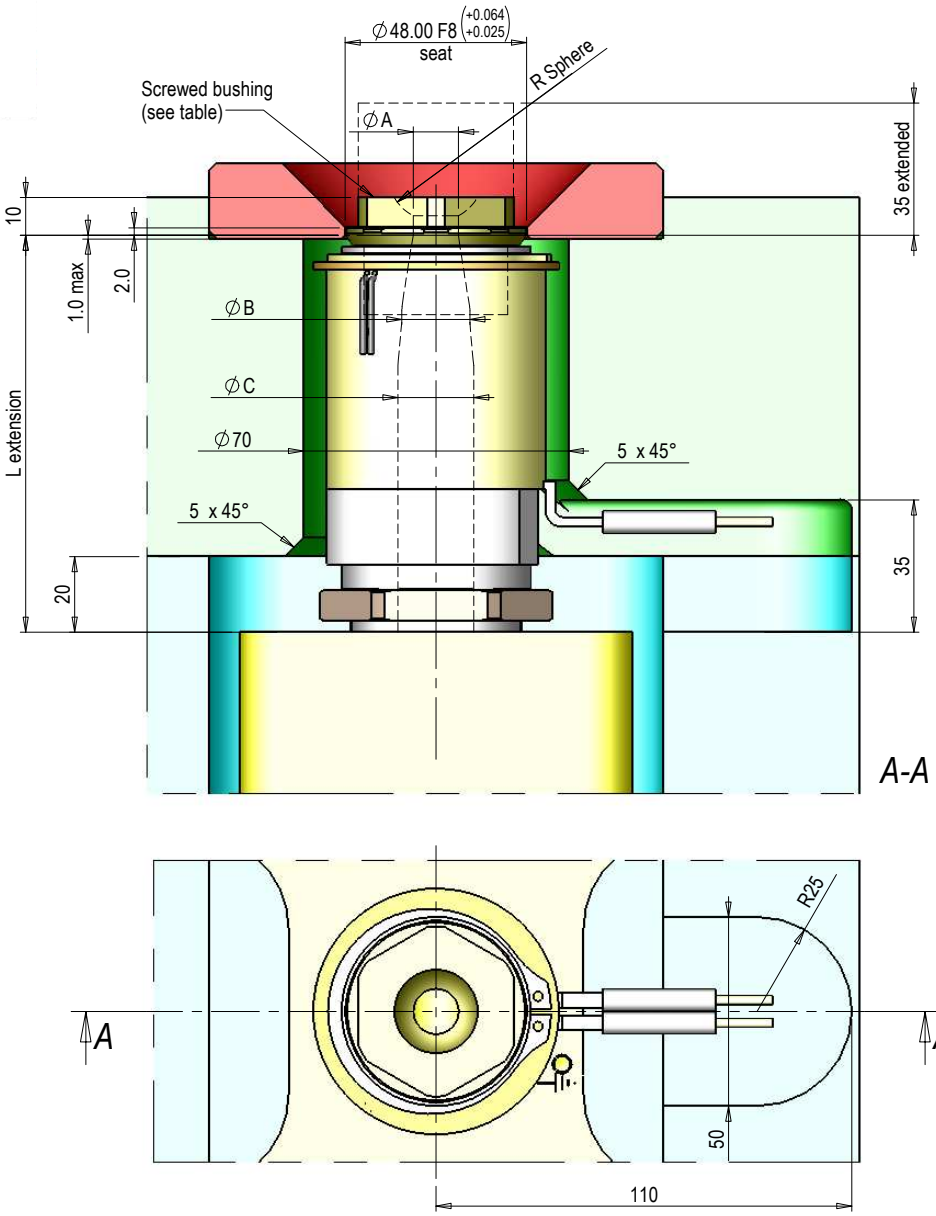


(*)Standard code with R sphere=0. Others R sphere sizes to be required.

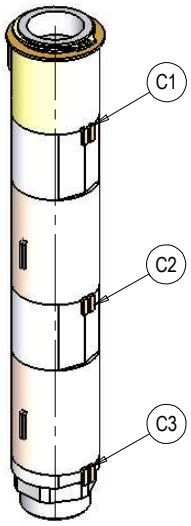


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SCREWED EXTENSION -Ga-
application on -Aa- manifold series



Control Zone



"L" (*)	*MAXIMUN N° OF ZONES*
040.00 ÷ 205.69	1 [C1]
205.70 ÷ 356.39	2 [C1 + C2]
356.40 ÷ 520.00	3 [C1 + C2 + C3]

STANDARD DIAMETERS OF EXTENSIONS DUCT (**)

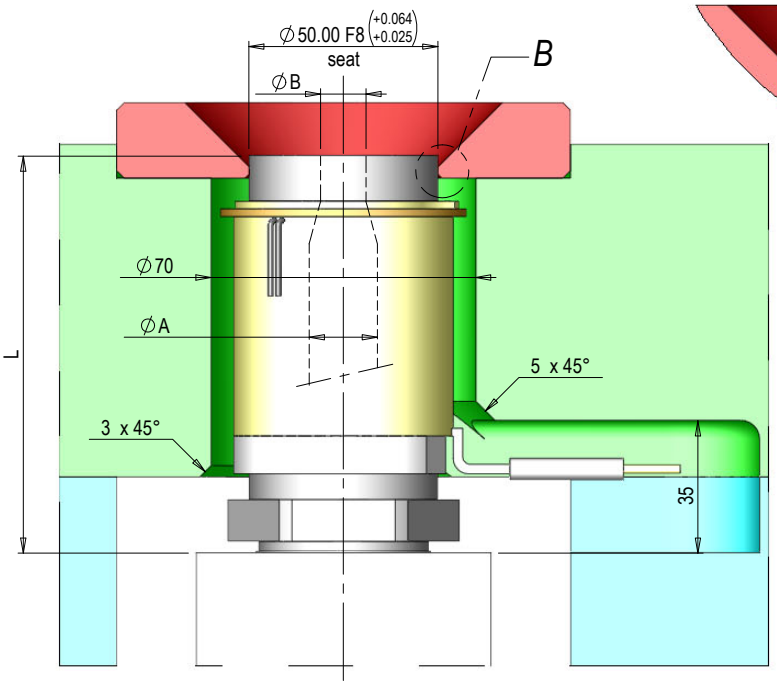
ØB	ØC
18	18 20 22 24

(*) L = min 040.00 ÷ 520.00 mm max
(**) Available also ØB=ØC=16,22 mm
(***) Re-workable according to the needs of the customer (by HRS)

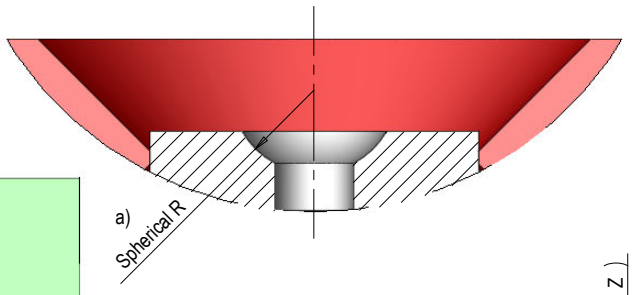
STANDARD SCREWED BUSHING CODE	*SPHERE RADIUS*	*ØA*	*ØB*
0015-00448	R 0	12	18
0015-00462	R 12.7		
0015-00463	R 15.5		
0015-00464	R 19.1		
0015-00509	R 20		
0015-00465	R 25		
0015-00466	R40		
Extended 0015-00449 (***)	R 0	4	4

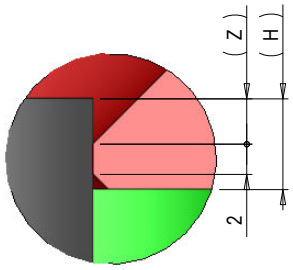
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MONOCOMPONENT SCREWED EXTENSION -Ga-
application on -Aa- manifold series



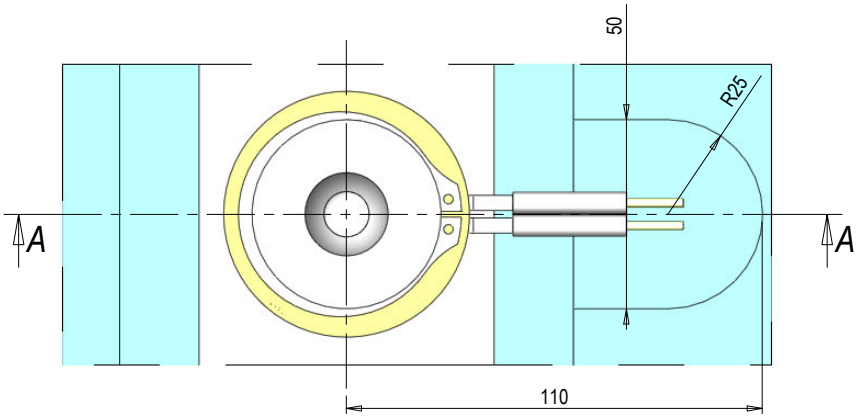
A-A



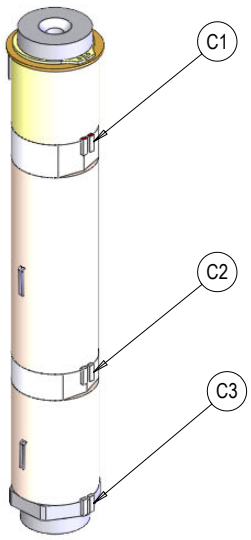


DETAIL B

L	H	Z
35.00-54.99	3.50	1.0
55.00-555.00	max 9.0	min 3.0



Control Zone

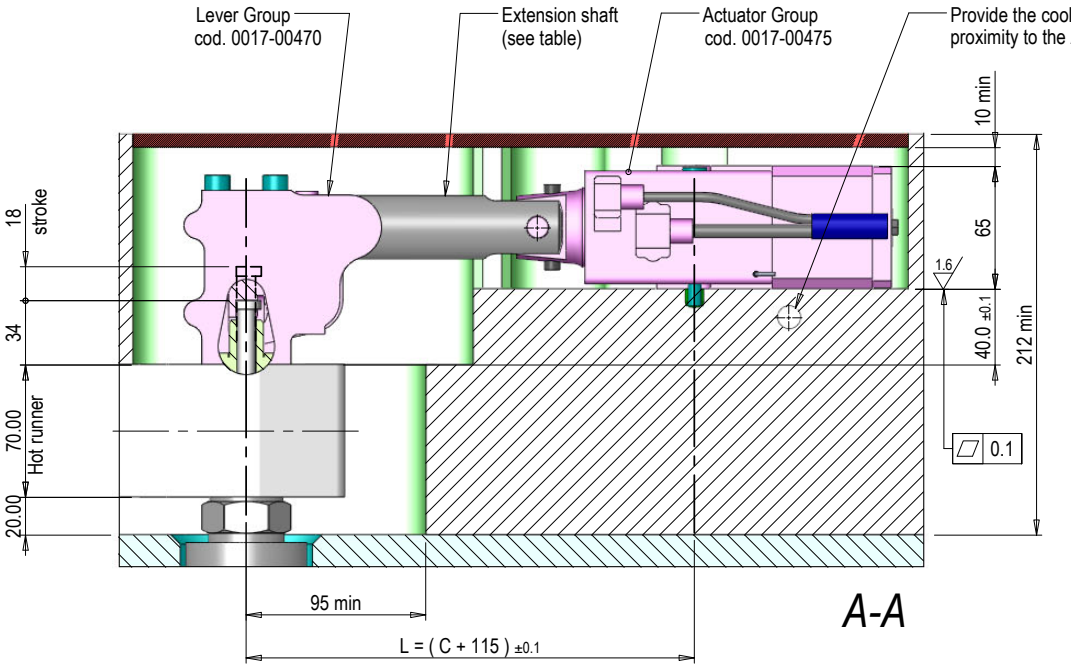


a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

"L" (*)	*MAXIMUN N° OF ZONES*	STANDARD DIAMETERS OF EXTENSIONS DUCT	
		ØA	ØB
035.00 ÷ 212.89	1 [C1]	8	8
212.90 ÷ 363.19	2 [C1 + C2]	10	8 - 8.5 - 10
363.20 ÷ 555.00	3 [C1 + C2 + C3]	12	8 - 10 - 12
(*) L = min 055.00 ÷ 555.00 mm max		14	8 - 8.5 - 10 - 12 - 14
		16	8 - 10 - 12 - 14 - 16
		18	10 - 12 - 14 - 16 - 18
		20	8 - 9 - 10 - 12 - 14 - 15.5 - 16 - 18
		22	8 - 8.5 - 9 - 10 - 12 - 13 - 14 - 16 - 18
		24	10 - 12 - 12.5 - 14 - 16 - 18 - 19

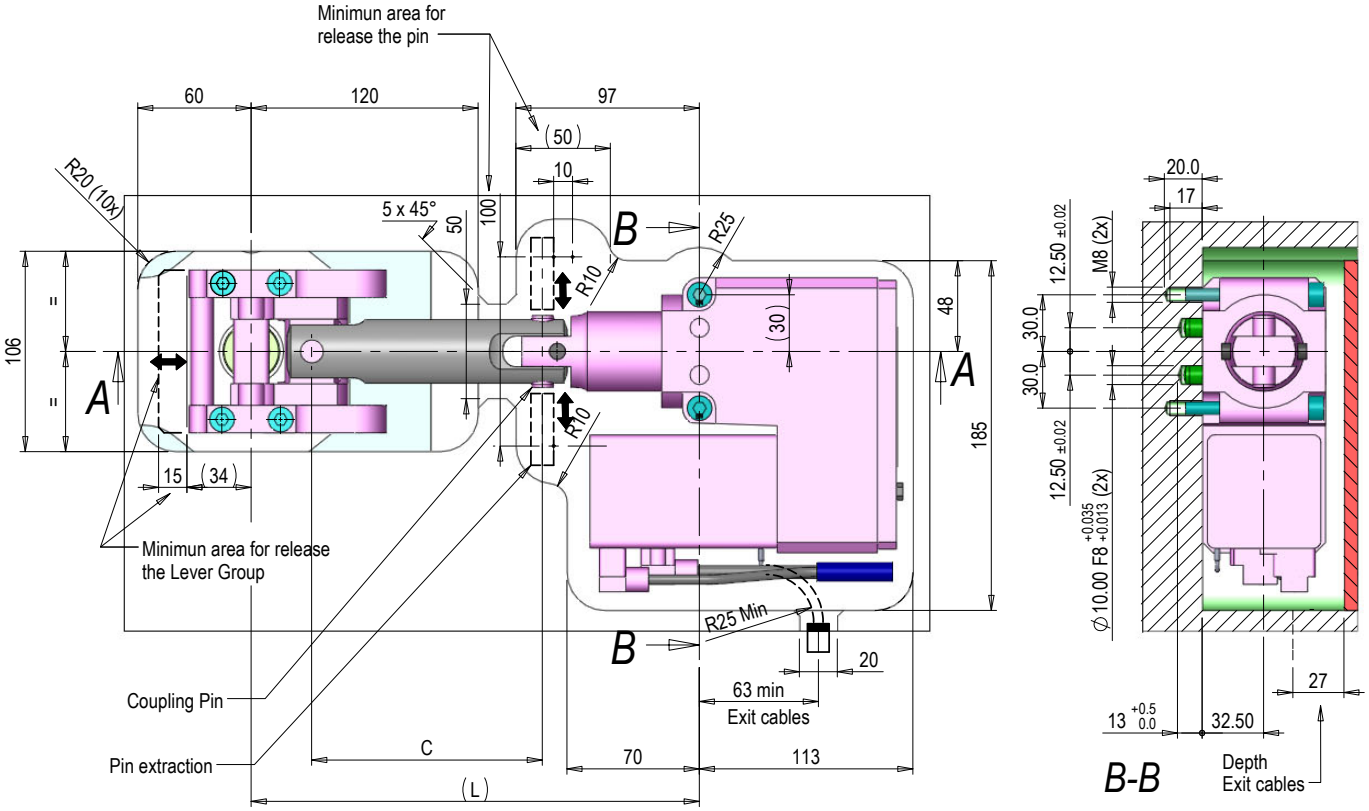
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POCKET and DIMENSIONS standard



C	L	EXTENSION CODE
97	212	0214-00125
122	237	0214-00126
147	262	0214-00127
172	287	0214-00128
197	312	0214-00129
222	337	0214-00130
272	387	0214-00131
322	437	0214-00132
372	487	0214-00133
422	537	0214-00134
472	587	0214-00135
522	637	0214-00136
572	687	0214-00137
622	737	0214-00138

(*) For more information see section "General rules for the cooling of plate" page 4.Ga3.05a
(**) Cod. 0017-00475 for the applications "Flex Flow". For the applications "FLEXflow One" is available the Actuator group cod. 0017-00472.

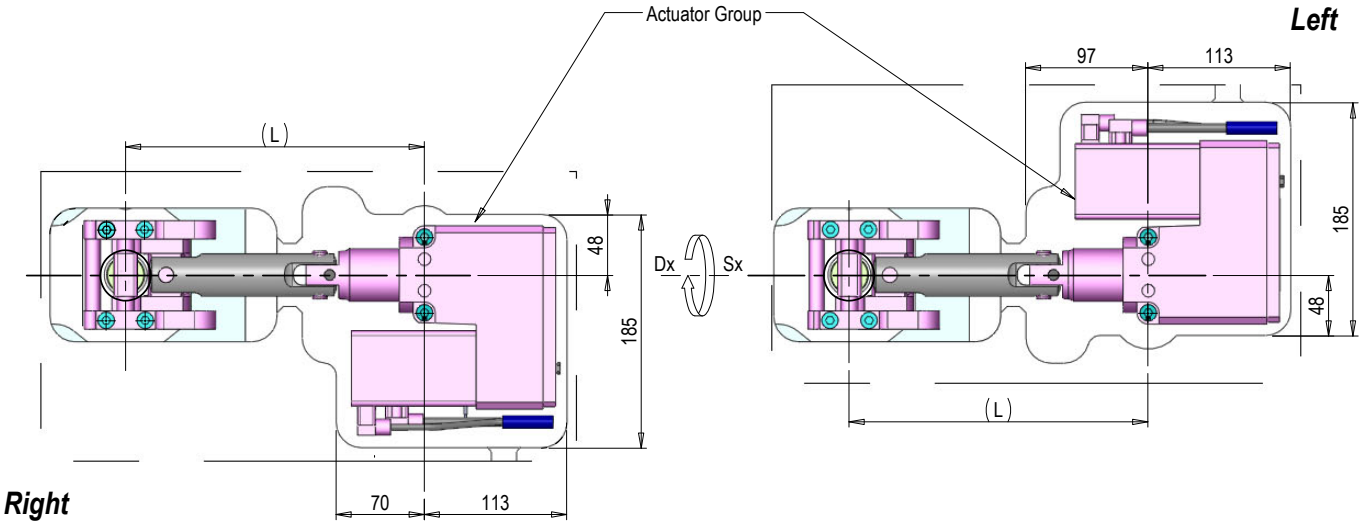


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POSSIBLE CONFIGURATIONS

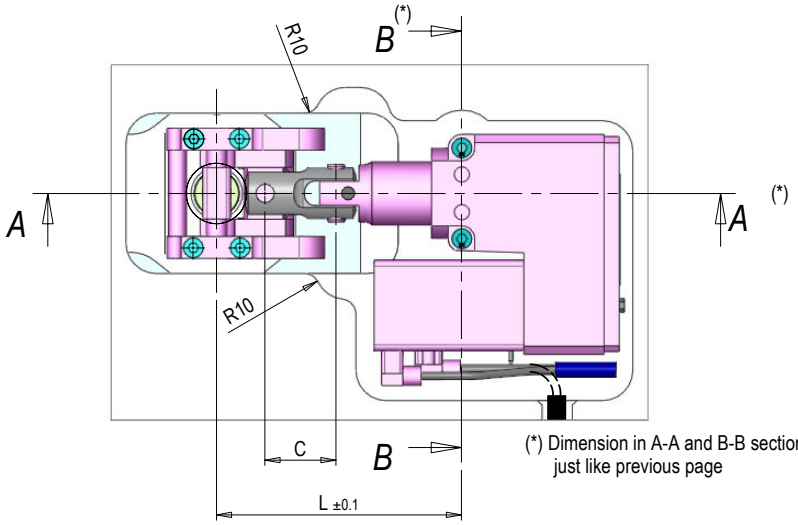
1- Right or Left Configuration

The Right or Left configuration of the electrical cylinder is obtained turning the actuator group and its pocket by 180° on the longitudinal axis



2- Configuration without Extension shaft

On limit conditions the actuator can be further approached on leverage hooking using specific extension shafts with small lenghts C=47 or 72 mm.
It is possible to use this configuration only after HRS feasabilty evaluation and in exceptional cases only, that is when the system layout does not permit to place the standard extension shaft shown in previous page.

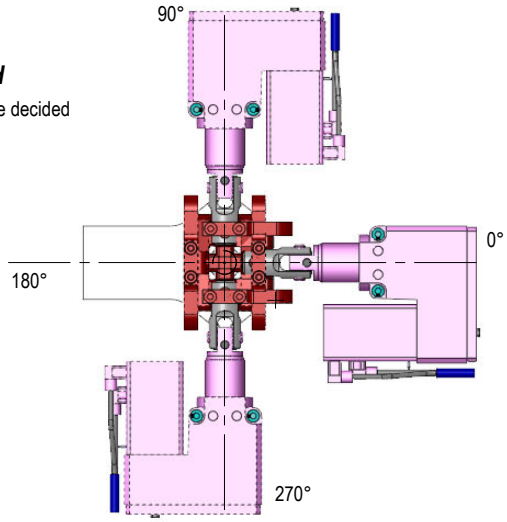


(*) Dimension in A-A and B-B section just like previous page

C	L	EXTENSION CODE
47	162	0214-00123
72	187	0214-00124

3- Possible orientations Cylinder on manifold

The positioning and orientation of the actuator groups are decided by technical HRS office and indicated on the project

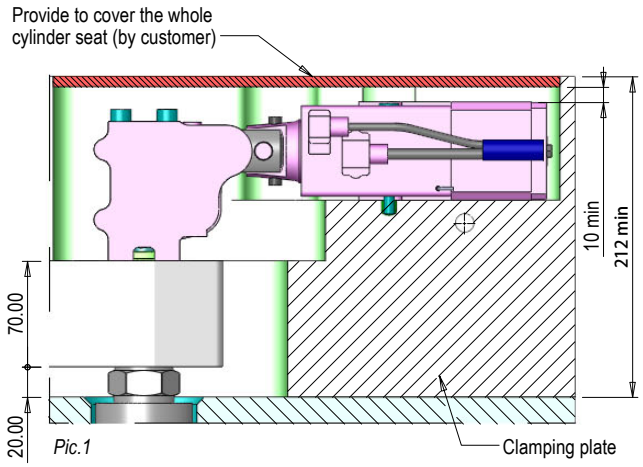


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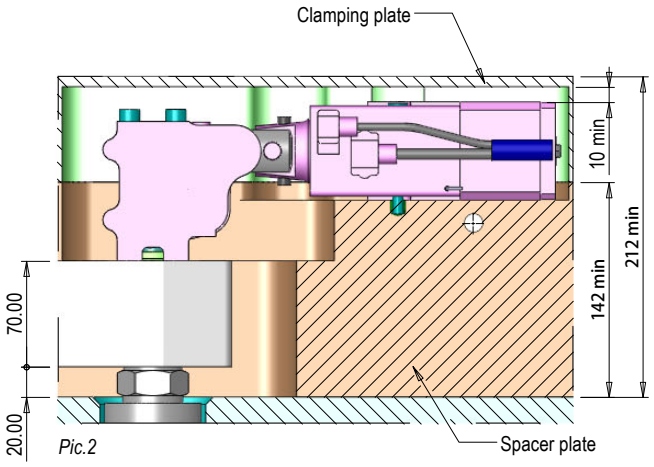
MOLD REQUIREMENTS

1- Minimum thickness of plates for cylinder positioning

In order to obtain a correct installation of the HRS hot runner system + electrical cylinder, the following minimum thicknesses of plates must be respected:



Pic.1



Pic.2

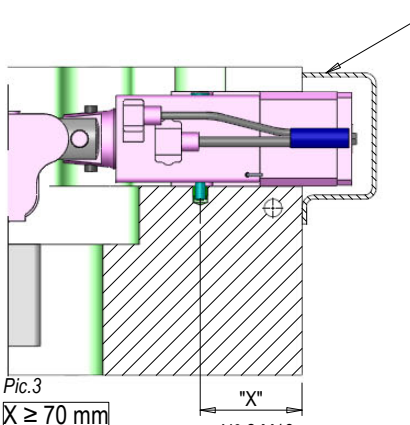
2- Cylinder protrusion from mold edge

In particular conditions, Actuator groups of electrical cylinder can be placed partially above the mold edge (Pic. 3 & 4) or completely ouside (Pic. 5). In case of Pic. 4 & 5 limit dimension "X" must be considered. For "X"<70 mm it is necessary to use a plate to complete the support of Actuator groups (Pic. 4) and in extreme cases of Actuator groups completely out of mold (Pic. 5), the plate must further have proper clamping holes (M8 screws and Ø10 pins) for Actuator groups.

The plate, realized by customer, must further have the following requirements:

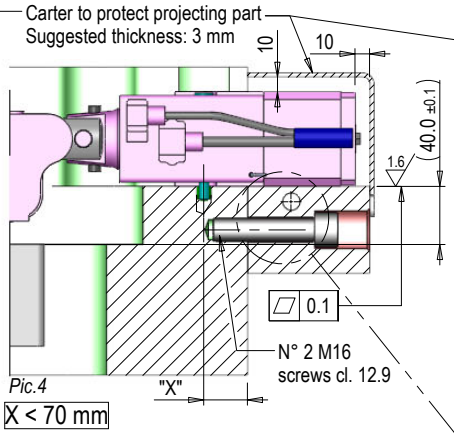
- minimum thickness 60 mm and hardness min 30 HRC;
- use N°2 M16 cl.12.9 clamping screws (Pic. 4 & 6) + N°2 cylindrical pins Ø16x40 DIN6325 (Pic. 5 & 6); in case of a single plate supporting more than one actuators in the same time it is necessary to place at least 2 M16 cl. 12.9 screws **in correspondance to every actuator;**
- provide a cooling circuit placed next to Actuator group following "General rules for plate cooling" on page 4.Ga3.05a

In every case (Pic. 3, 4, 5) **parts of Actuator groups which projects outside mold edge must be properly protected with carters (by customer)**.



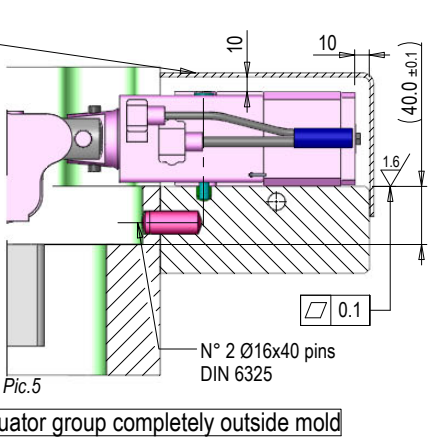
Pic.3

X ≥ 70 mm



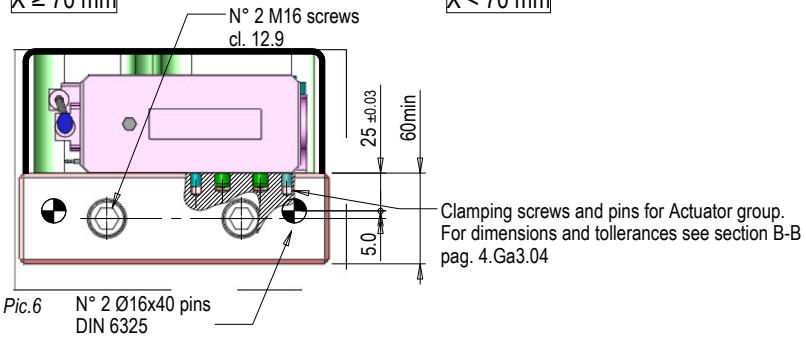
Pic.4

X < 70 mm

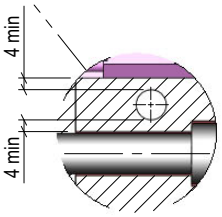


Pic.5

Actuator group completely outside mold

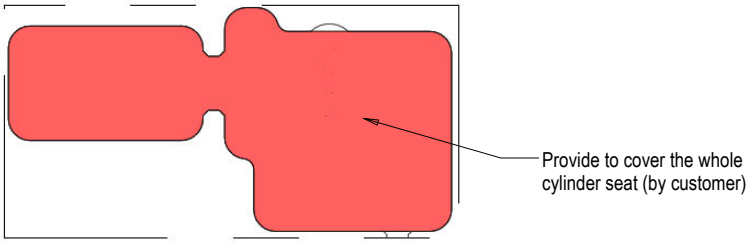


Pic.6



3- Carter for cylinder protection

The FLEXflow on plate must be always covered (Pic. 1 & 2). If the customer chooses FLEXflow seats completely through the clamping plate, the FLEXflow must be completely covered with teh carter, whose design is realized by customer (see Pic. 7). Suggested thickness: 3 mm



Pic.7

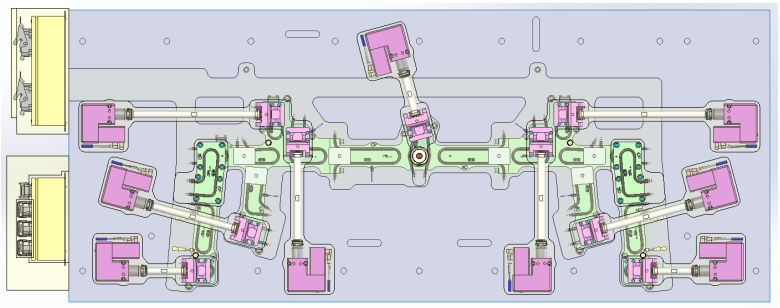
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T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximun Mold temperature
Tc (°C) = Coolant temperature

General rules for the cooling of the plate

1- Rules for which the cooling of the plate is NOT MANDATORY

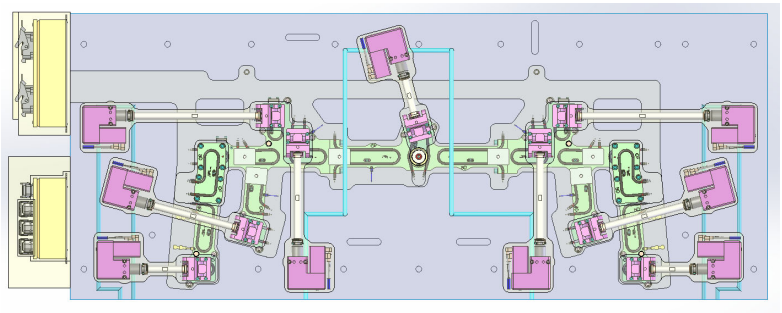
For materials with T1≤260°C [500°F] and T2≤60°C [140°F], cooling of the actuators' plate is NOT MANDATORY.
In this condition must be satisfied also the following requirements:
1a- Use of extension shafts with minimum C=97mm on each actuator group (Pic.1);
1b- Presence of AIR VENTS on the mold (see following point 3)



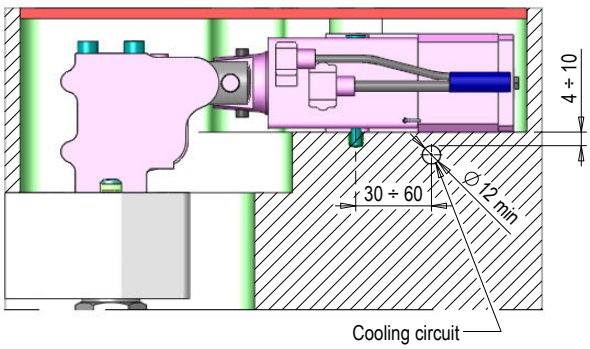
Pic.1

2- Rules for which the cooling of the plate is MANDATORY

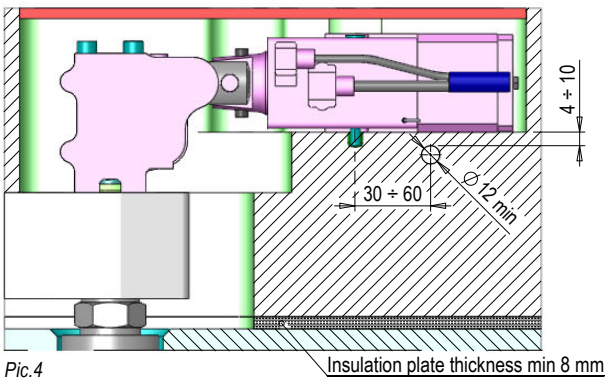
For materials with T1>260°C [500°F] or T2>60°C [140°F], cooling of the actuators' plate IS MANDATORY.
The correct cooling of the plate must be include:
2a- Maximum No. 3 actuator groups can be cooled through 1 circuit (ex. Pic.2);
2b- Cooling circuits must be positioned in the plate right below the actuator groups as illustrated in Pic.3;
2c- An insulation plate with a minimum thickness of 8mm is also necessary (ex. Pic.4);
2d- A minimum diameter Ø12mm is recommended for the circuit (minimum pressure 1.5 bar);
2e- Maximum incoming coolant temperature for the cooling of the plate Tc≤25°C [77°F].



Pic.2



Pic.3



Pic.4

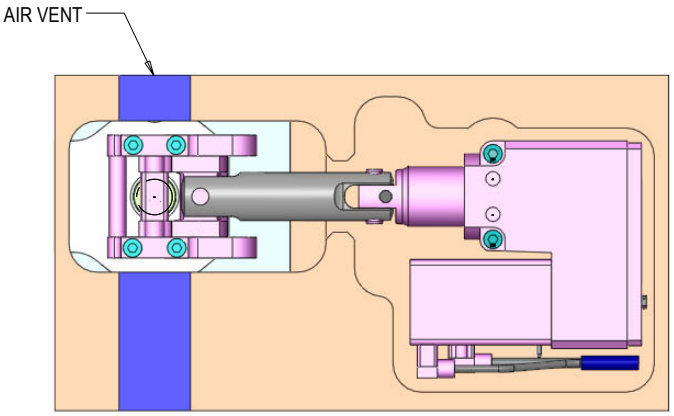
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General rules for the cooling of the plate

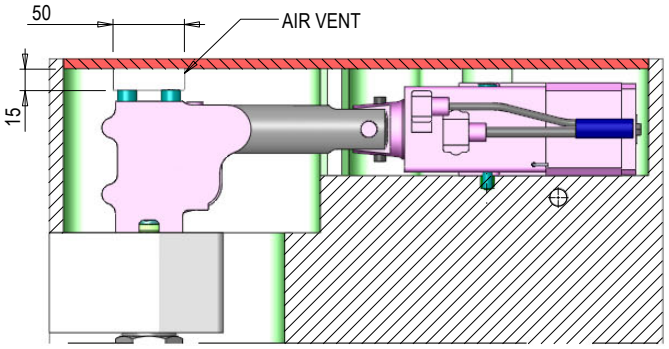
3- Air vents

It's **always** mandatory to provide air vents in the manifold plate for hot air removal.

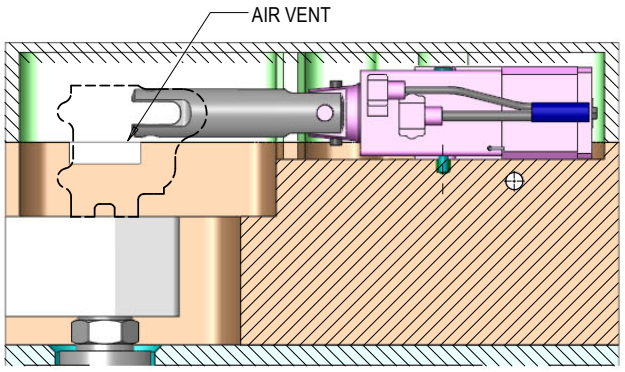
- The air vents must through the plate from bottom mold to top mold near the lever group (Pic.5/6/7)
- Avoid hot air exit from vents near electrical boxes eventually present on top mold.
- The minimun dimensions requested for Air vents are: 50mm (width) x 15mm (depth)



Pic.5



Pic.6

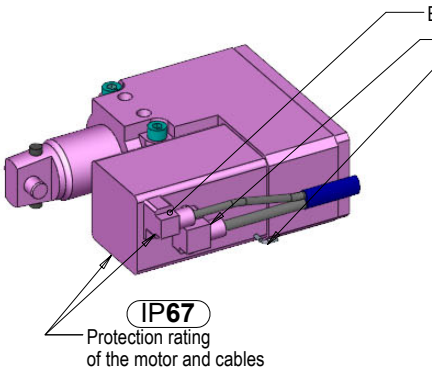


Pic. 7

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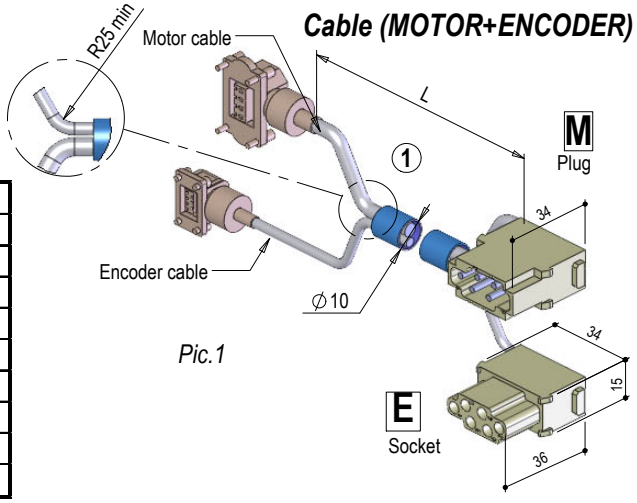
Electricals specification for FLEXflow

Every actuator group is electrically powered through a couple of cables (ENCODER+MOTOR). For cable codes with available lenghts see table "A".
The cable is supplied separated from the group; its lenght must be carefully calculated during wiring design.
The temperature of the actuator group is monitored through a ungrounded J Type thermocouple cable (supplied with actuator group).

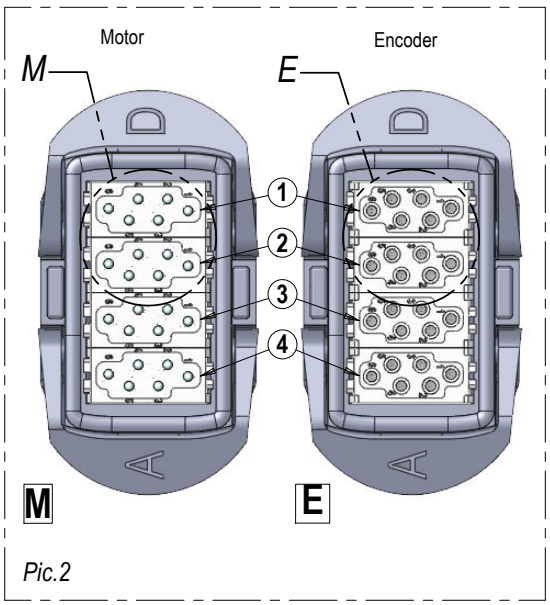


tab.A

L (m)	Code
0.5	0093-00173
1.0	0093-00174
1.5	0093-00135
2.0	0093-00136
2.5	0093-00137
3.0	0093-00138
3.5	0093-00139
4.0	0093-00140
4.5	0093-00175



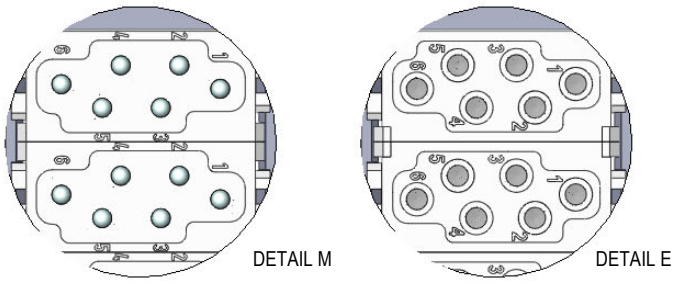
Pic.1



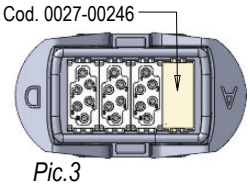
Pic.2

NOTES:

1) The Plug and Socket of the same cable must be put in their housing with the same sequence (Pic.1 & 2)

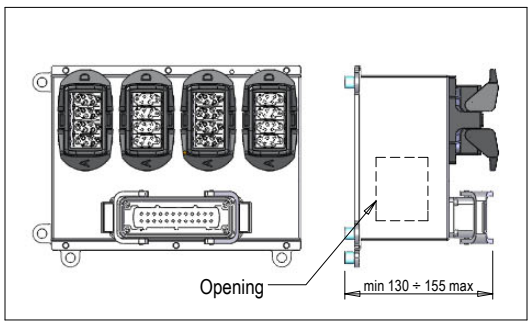


2) Always cover empty positions on the housing (Pic.3)

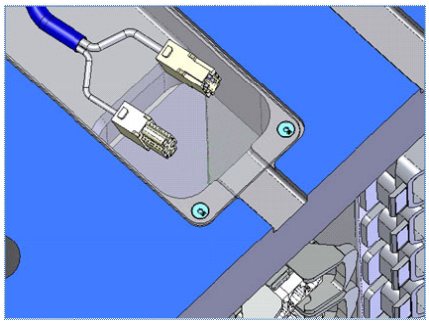


Pic.3

3) ENCODER+MOTOR cable (Pic.1) is provided yet wired. Openings on electrical box (supplied by HRS) or forced groove on the mold must take into consideration enough clearance for the connectors (see pic. 4-5)



Pic.4



Pic.5

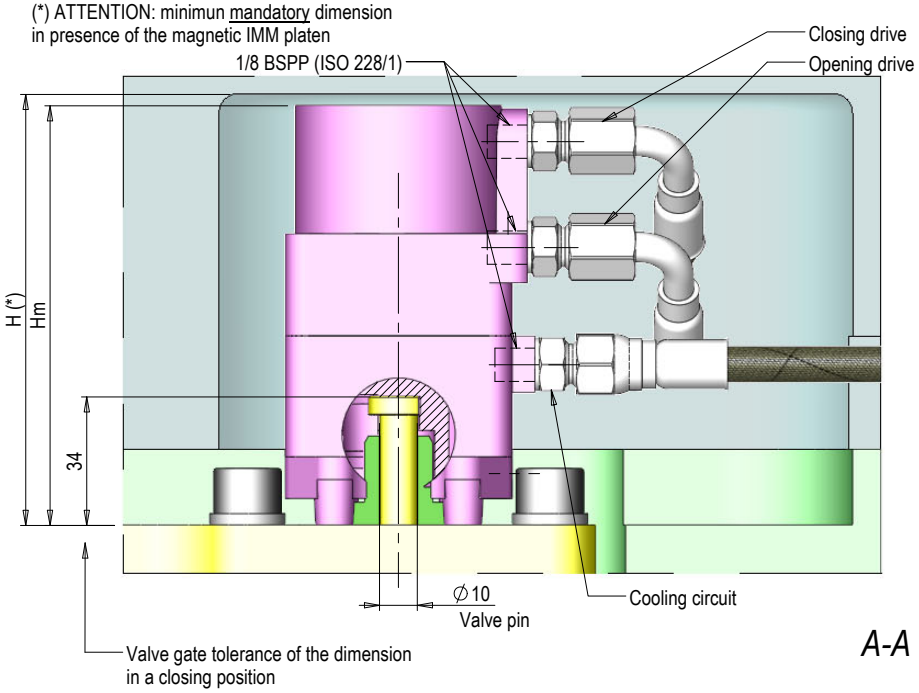
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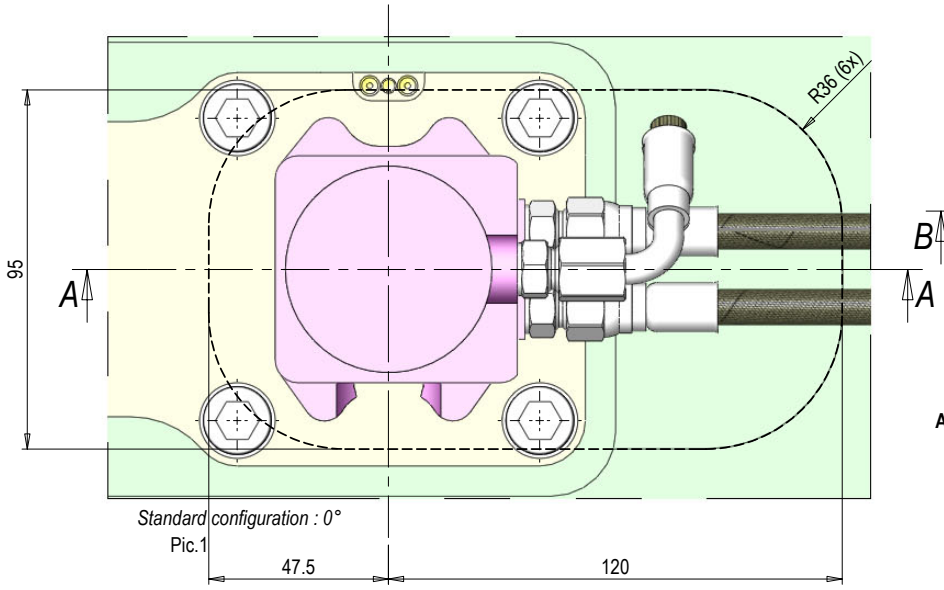
HYDRAULIC CYLINDER ON MANIFOLD
3rd VERSION

Hydraulic Cylinder: bore 42 mm - stroke 18 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

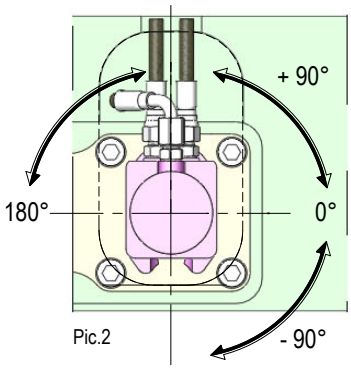
(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen





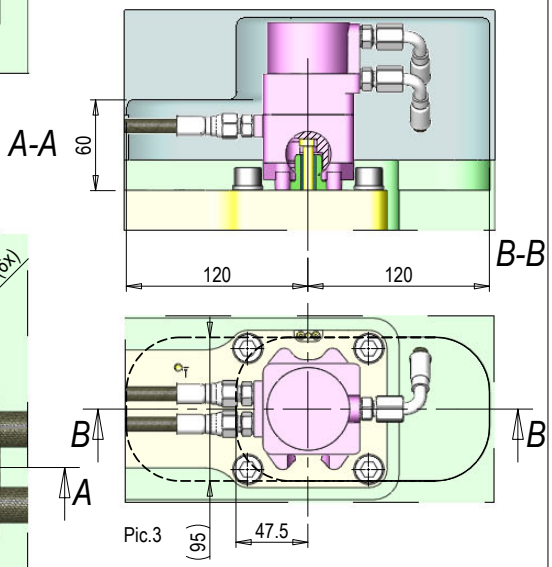
Pic.1

b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



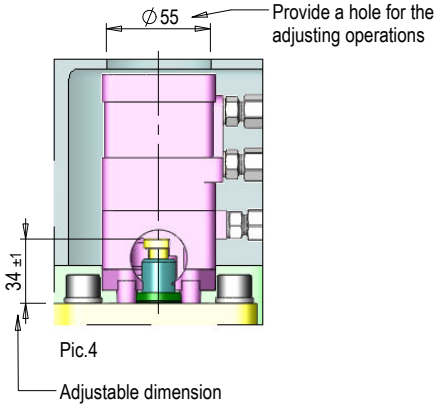
Pic.2

ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



Pic.3

ADJUSTABLE CYLINDER



Pic.4

CODE	*VERSION*	COMPLETE GASKET SET	*Hm*	H
0017-01119	(standard)	0038-00102	111	114
0017-01125	DAMPENED	0038-00103	111	114
0017-00569	ADJUSTABLE	0038-00102	121	124
0017-01121	WITH 1 END OF STROKE	0038-00107	131	134
0017-01123	WITH DOUBLE END OF STROKE	0038-00107	136	139

NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

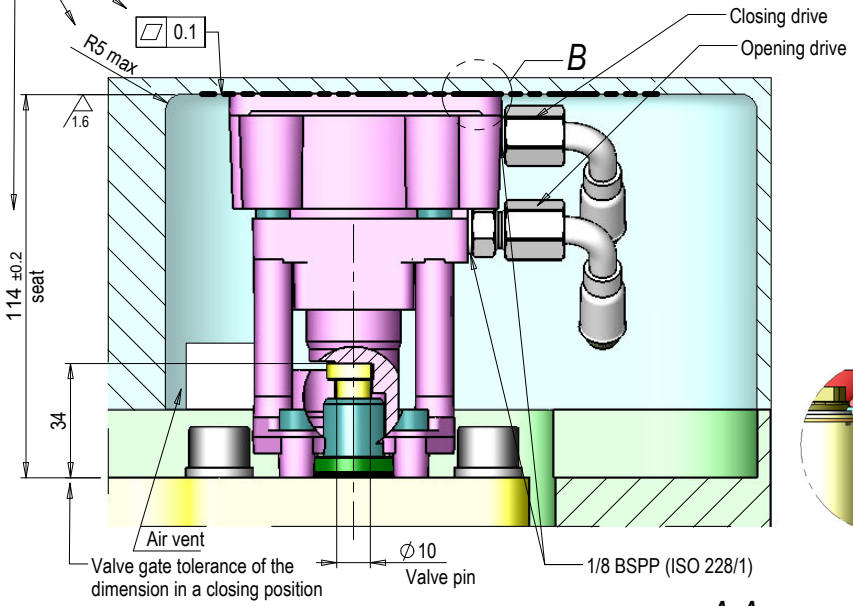
NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

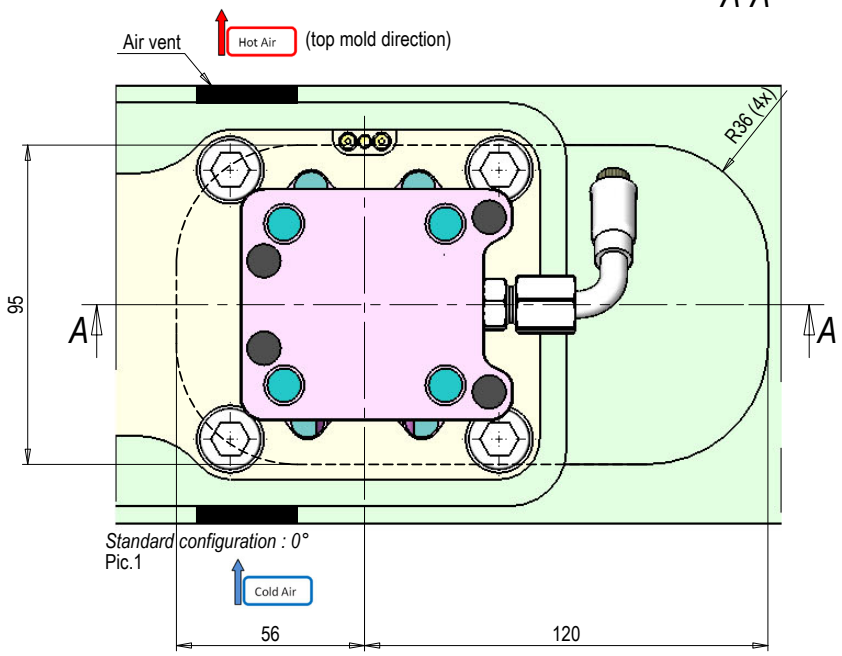
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Hydraulic Cylinder: bore 42 mm - stroke 18 mm - passive cooling (HRS COOL)

Cylinder's upper surface **totally in contact** with the lower surface of the seat obtained on the clamping plate. The contact surface **must be one and continuos**. The seat's tolerances must be respected!



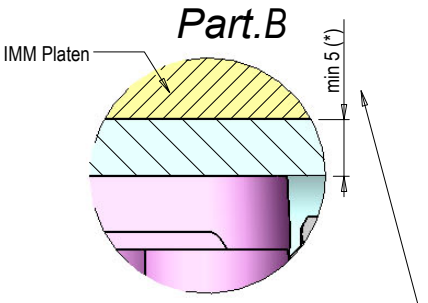
A-A



Standard configuration : 0°
Pic.1

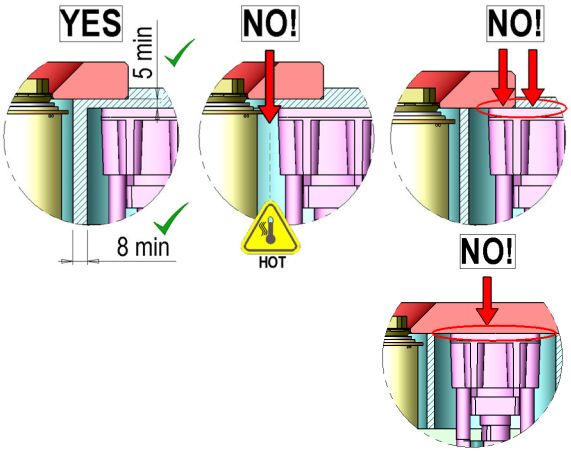
a) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1

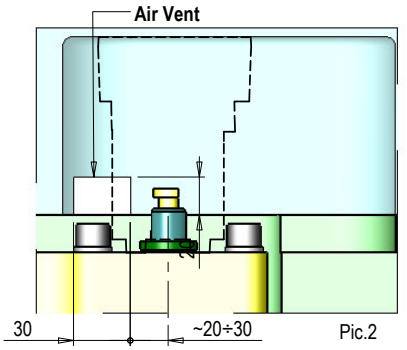
CODE	*VERSION*	COMPLETE GASKET SET
0017-00563	*(standard)*	0038-00102
0017-00564	DAMPENED	0038-00103



(*) ATTENTION: 5 mm minimum mandatory dimension. In presence of the magnetic IMM Platen increase dimension to "minimum 30 mm".

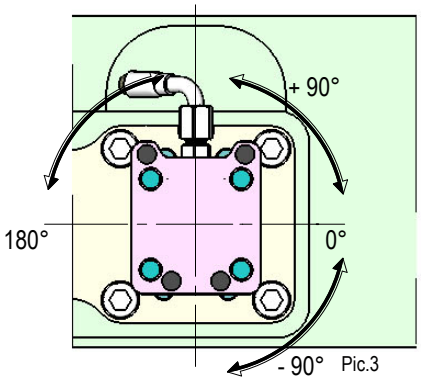
WARNINGS FOR THE SEAT CONSTRUCTION





Pic.2

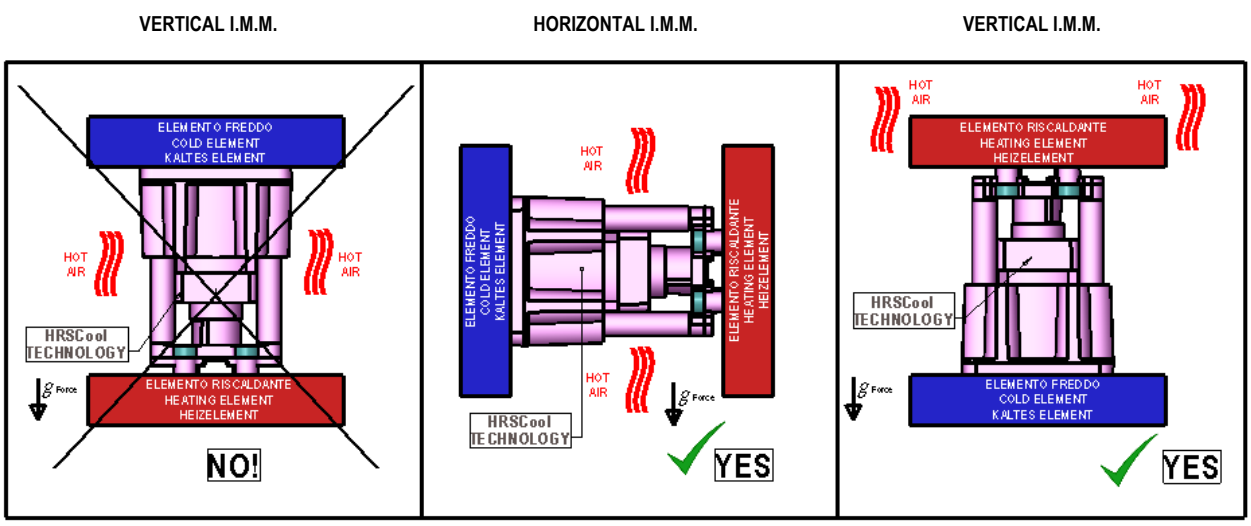
a) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



Pic.3

follow

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Pic.4

System requirements (**):

1- Maximum temperature allowed: T hot runner manifold: max 280°C [536°F] - T mold: max 60°C [140°F].
2- In case of cylinder plate temperature is higher than 60°C [140°F], it is mandatory to cool it at the temperature ≤ 60°C [140°F].
3- Working PRESSURE: HYDRAULIC max 80 BAR (absolute value).
The working pressure is only for reference: for the correct value of the maximum allowed working pressure, please refer to the specific steel plate provided for each HRSFlow job.
4- Air vents in the cylinder plate is highly recommended to evacuate hot air:
- The air vents must pass through the plate from bottom to top mold in proximity of the cylinders. Distance from the air vent to the valve pin axis: 20÷30mm (Pic.1 & Pic.2);
- Due to hot air, avoid the exit of the air vents in proximity of electrical boxes eventually present on top mold;
- The minimum dimensions requested for the air vents are: 30mm (width) x 20mm (depth).
5- The HRSCOOL technology is permitted in the vertical injection moulding machine but only if the heating elements (i.e.: the manifold) are placed in an upwards position in respect to the cylinders and to the cold elements (i.e.: mould plate). It's necessary to avoid the cylinder heated by the hot air coming from hot elements (Pic.4).
6- The minimum distance from cylinder to HRS extension "Xmin" must be respected: see notes pag. 4.Aa2.03. For special cases, please contact the HRS Technical Office.

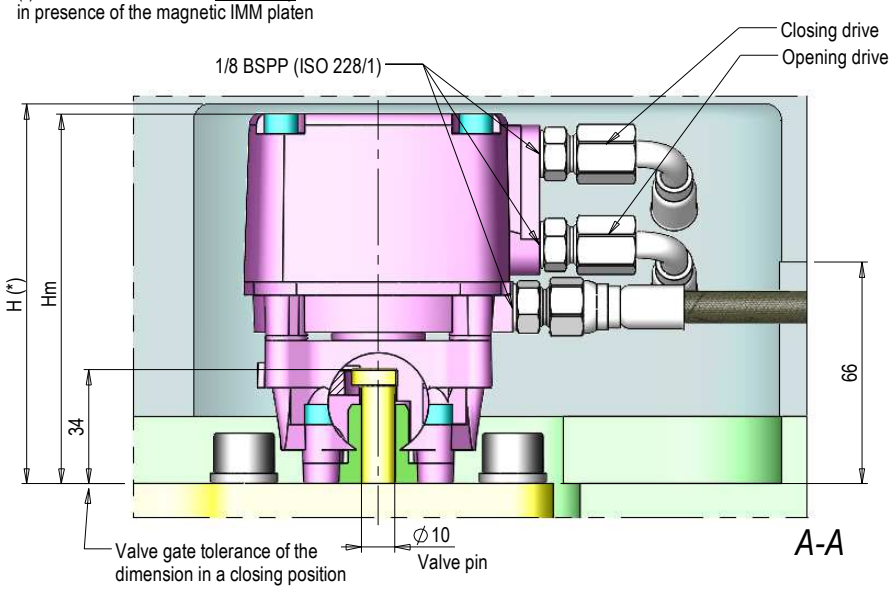
(**) ATTENTION: in particular conditions of the system, the seat of the cylinder ''HRS COOL'' might be modified. In this case the HRS Technical Office will provide the necessary documentation.

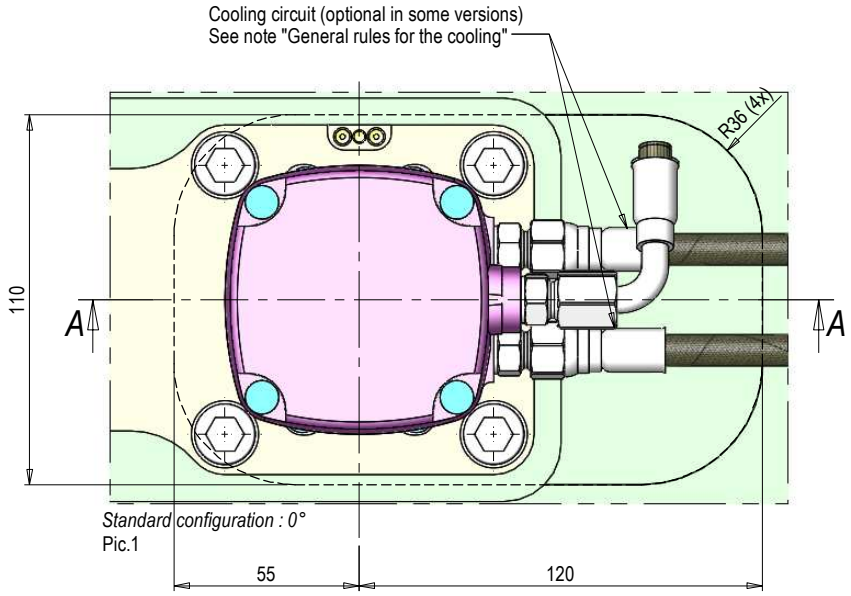
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Pneumatic Cylinder: bore 70 mm - stroke 18 mm

a) Working PRESSURE: AIR max 12 BAR

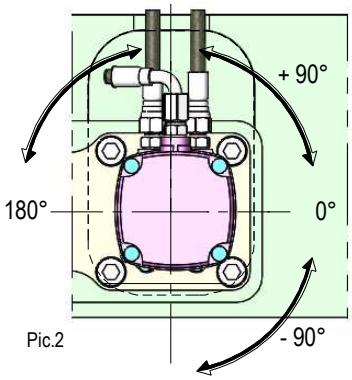
(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen





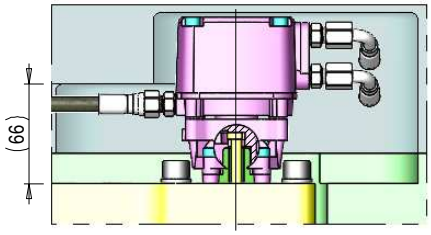
Standard configuration : 0°
Pic.1

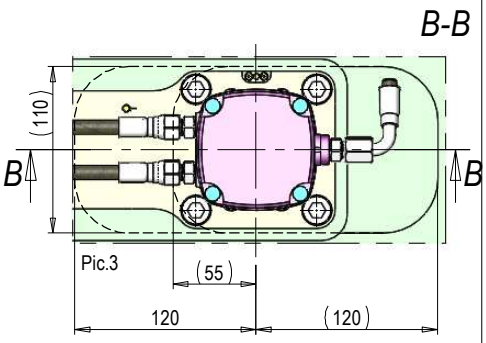
b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



Pic.2

ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT





Pic.3

CODE	VERSION	COOLED	DAMPENED	COMPLETE GASKET SET	Hm	H
0017-00961	(standard)	✓	×	0038-00133	110	113
0017-00962		×	×			
0017-00964		✓	✓	0038-00134		
0017-00965		×	✓			
0017-00967	WITH 1 END OF STROKE	✓	×	0038-00135	130.5	133.5
0017-00971		✓	✓	0038-00136		
0017-00969	WITH DOUBLE END OF STROKE	✓	×	0038-00135	135.5	138.5
0017-00973		✓	✓	0038-00136		
0017-00975	PREARRANGED FOR TRANSDUCER	✓	×	0038-00137	123	126
0017-00976		×	×			
0017-01200	ADJUSTABLE	✓	×	0038-00133	118.5	121.5
0017-01201		×	×			

T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximum Mold temperature

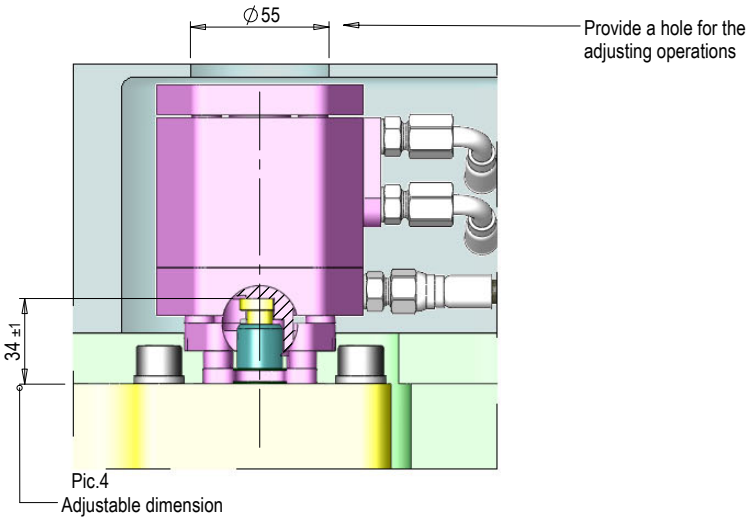
GENERAL RULES FOR THE COOLING
- Versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of T1 ≤280°C [536°F] and T2 ≤80°C [176°F]
- Versions with end of stroke: cooling ALWAYS MANDATORYwith T1≥200°C [392°F] also after shut off of the mold/hot runner systems. During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
  - 100°C [212°F] Temperature of the mold
  - 300°C [572°F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

a) The working pressure is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

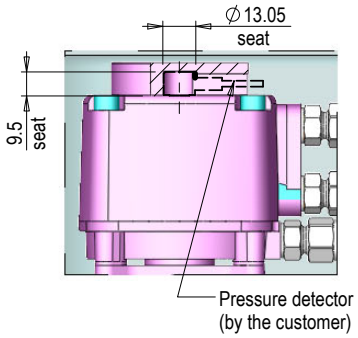
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ADJUSTABLE CYLINDER



Pic.4
Adjustable dimension

VERSION PREARRANGED FOR TRANSDUCER



NOTE FOR THE ADJUSTABLE CYLINDER
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting of the cylinder by the customer.

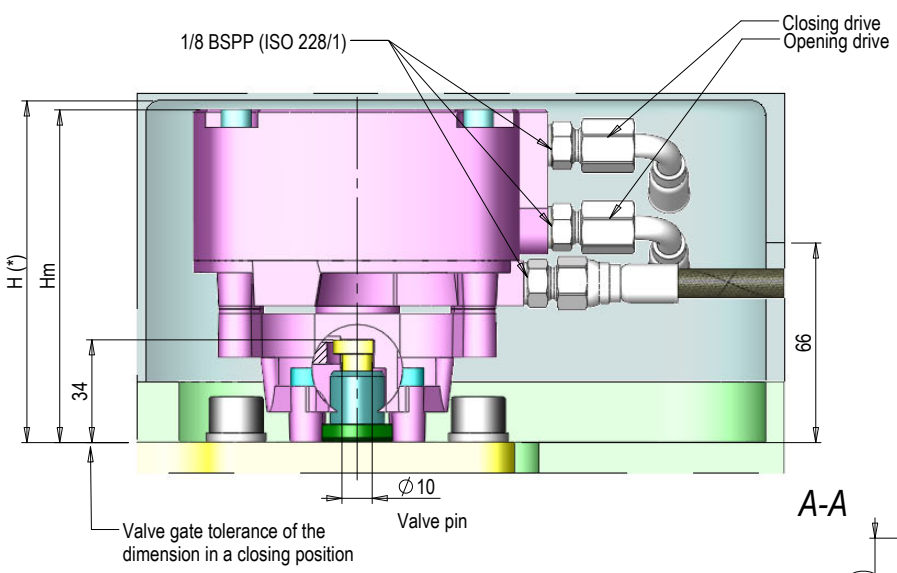
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PNEUMATIC CYLINDER ON MANIFOLD Ø100
2nd VERSION

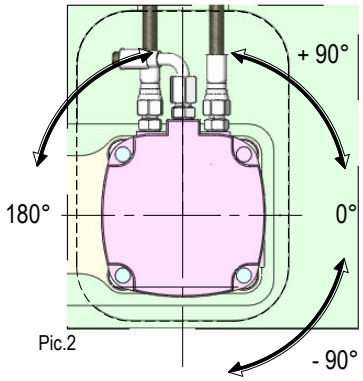
Pneumatic Cylinder: bore 100 mm - stroke 18 mm

a) Working PRESSURE: AIR max 12 BAR

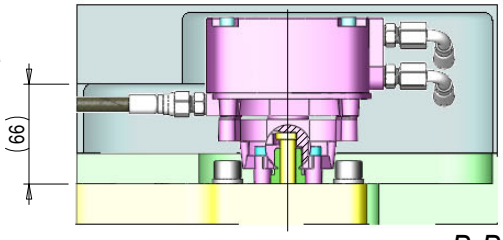
(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen

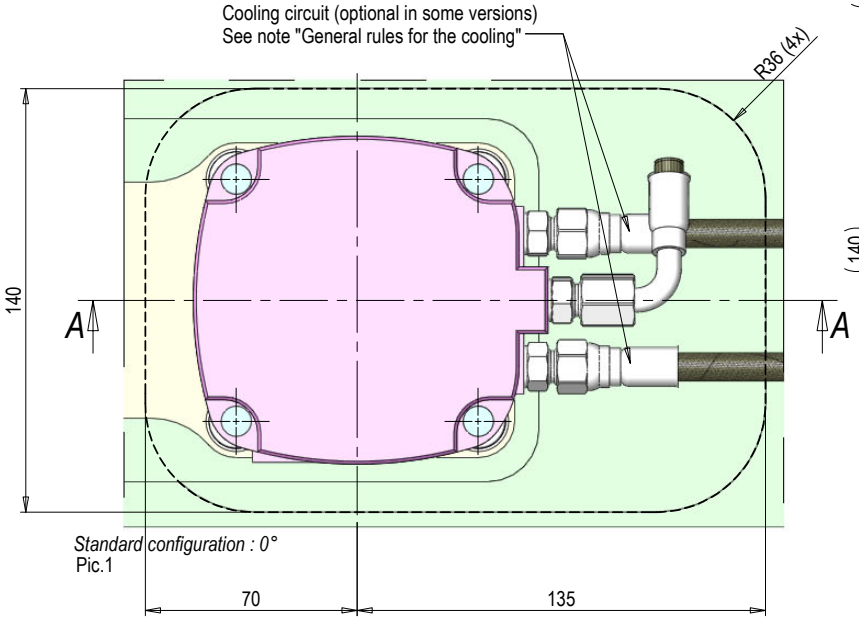


b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



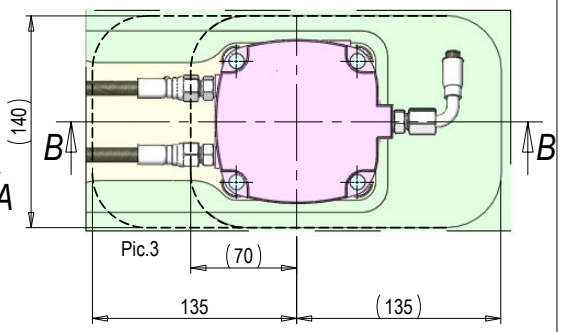
ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



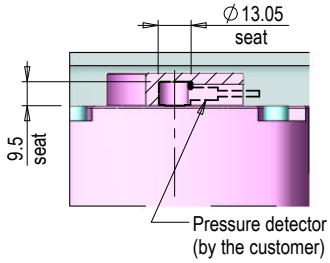


A-A

B-B



VERSION PREARRANGED FOR TRANSDUCER



CODE	VERSION	COOLED	DAMPENED	COMPLETE GASKET SET	Hm	H
0017-00770	(standard)	✓	×	0038-00123	110	113
0017-00771		×	×			
0017-00773		✓	✓	038-00124		
0017-00774		×	✓			
0017-00776	CON 1 FINECORSA	✓	×	0038-00125	130.5	133.5
0017-00780		✓	✓	0038-00126		
0017-00778	CON DOPPIO FINECORSA	✓	×	0038-00125	135.5	138.5
0017-00782		✓	✓	0038-00126		
0017-00784	PREDISP. PER RILEVATORE	✓	×	0038-00127	123	126
0017-00785		×	×			

T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximum Mold temperature

GENERAL RULES FOR THE COOLING
- Versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of T1 ≤280°C [536°F] and T2 ≤80°C [176°F]
- Versions with end of stroke: cooling ALWAYS MANDATORY with T1≥200°C [392°F].
- During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
  - 100°C [212°F] Temperature of the mold
  - 300°C [572°F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

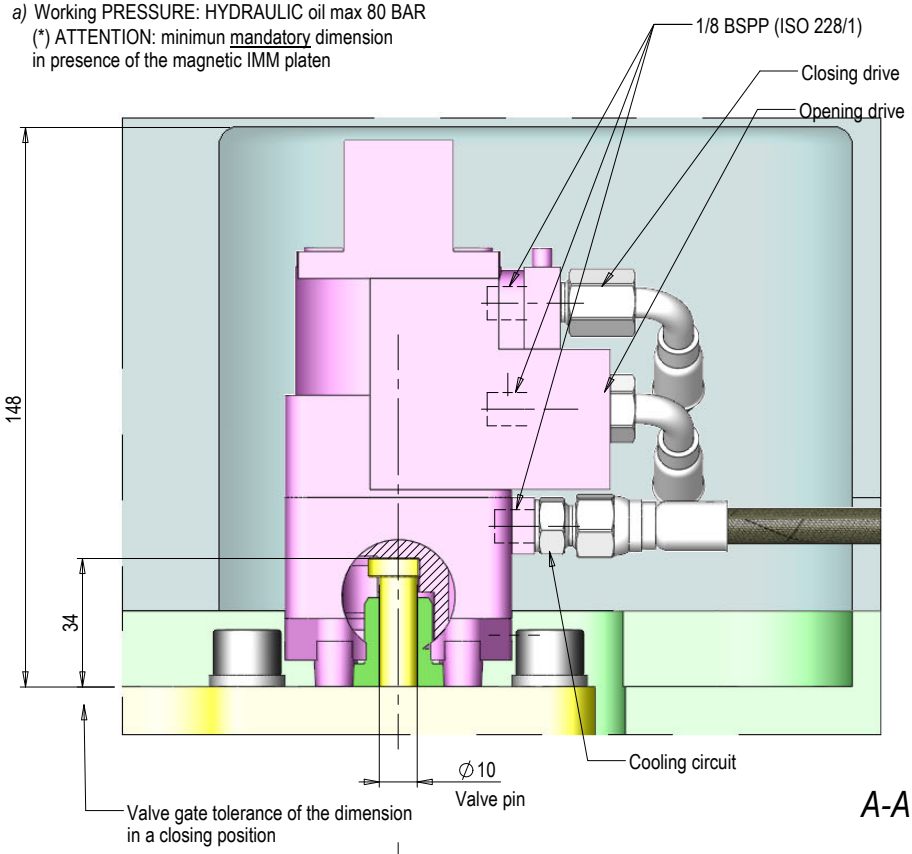
a) The working pressure is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

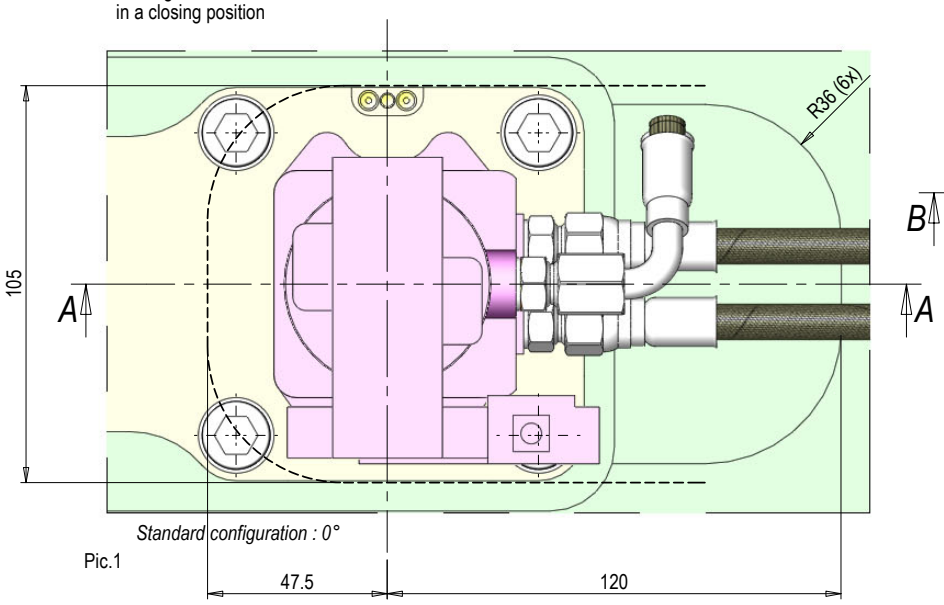
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HYDRAULIC CYLINDER ON MANIFOLD
HYFLOW

Hydraulic Cylinder: bore 42 mm - stroke 18 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR
(*) ATTENTION: minimun mandatory dimension
in presence of the magnetic IMM platen

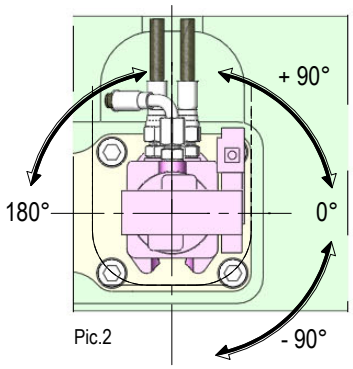




Standard configuration : 0°

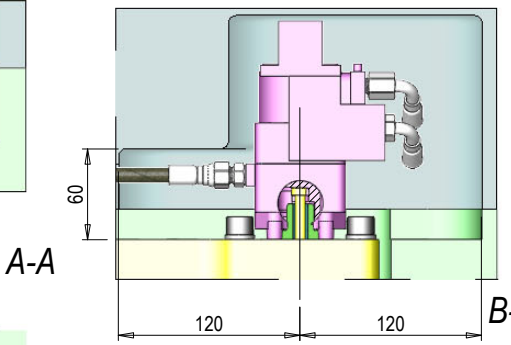
Pic.1

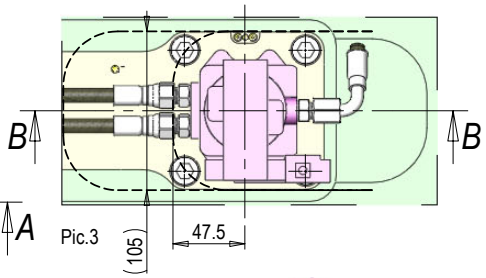
b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



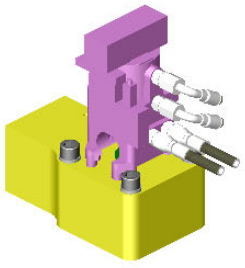
Pic.2

ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT

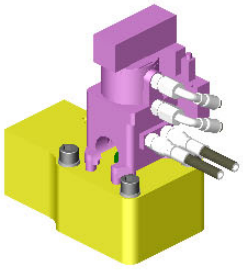




Pic.3



LEFT SENSOR VERSION



RIGHT SENSOR VERSION

CODE	VERSION	COMPLETE GASKET SET
0017-01129	LEFT SENSOR VERSION	0038-00107
0017-01131	WITH DOUBLE END OF STROKE	
0017-01133	RIGHT SENSOR VERSION	
0017-01135	WITH DOUBLE END OF STROKE	

NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system
Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

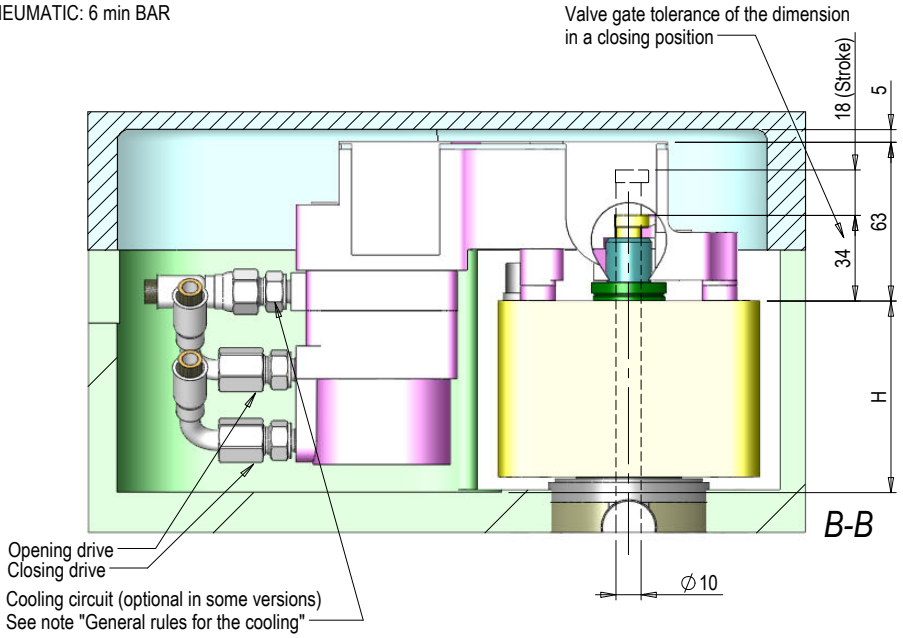
a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

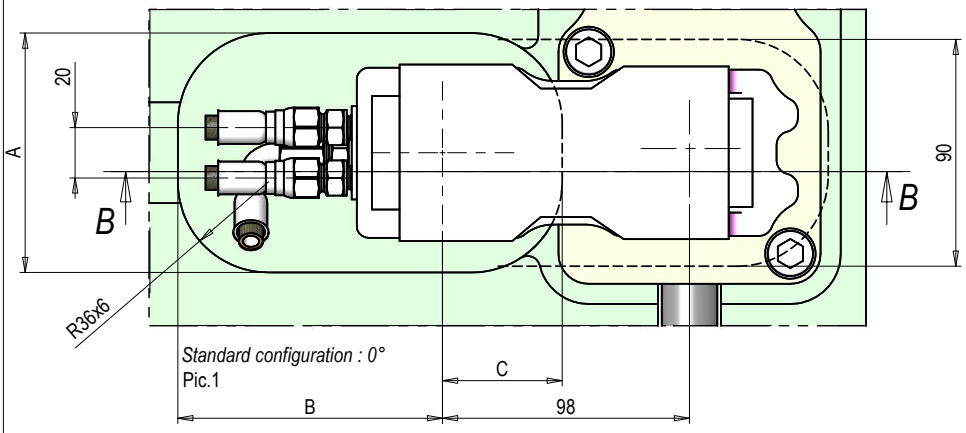
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Oil cylinder: bore 42 mm - stroke 18 mm
Air cylinder: bore 70 mm - stroke 18 mm

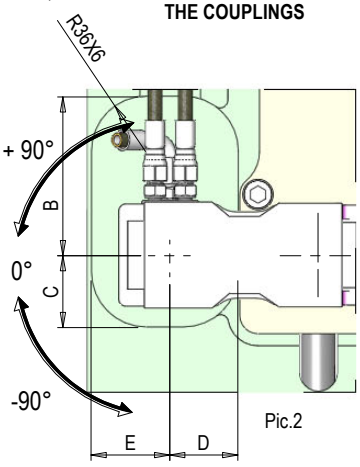
Working PRESSURE:
OIL: 40 max BAR
PNEUMATIC: 6 min BAR

(*) ATTENTION: minimun mandatory dimension in presence of the magnetic IMM platen



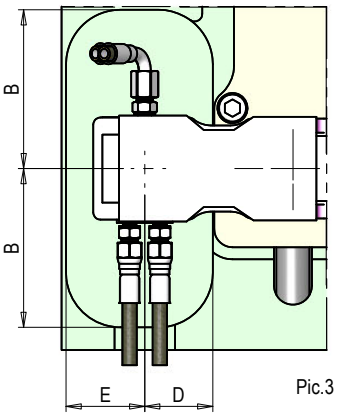


b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



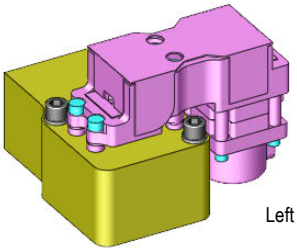
Pic.2

ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT

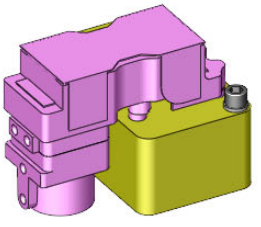


Pic.3

POSSIBILE ORIENTATIONS CYLINDER ON MANIFOLD



Left



Right

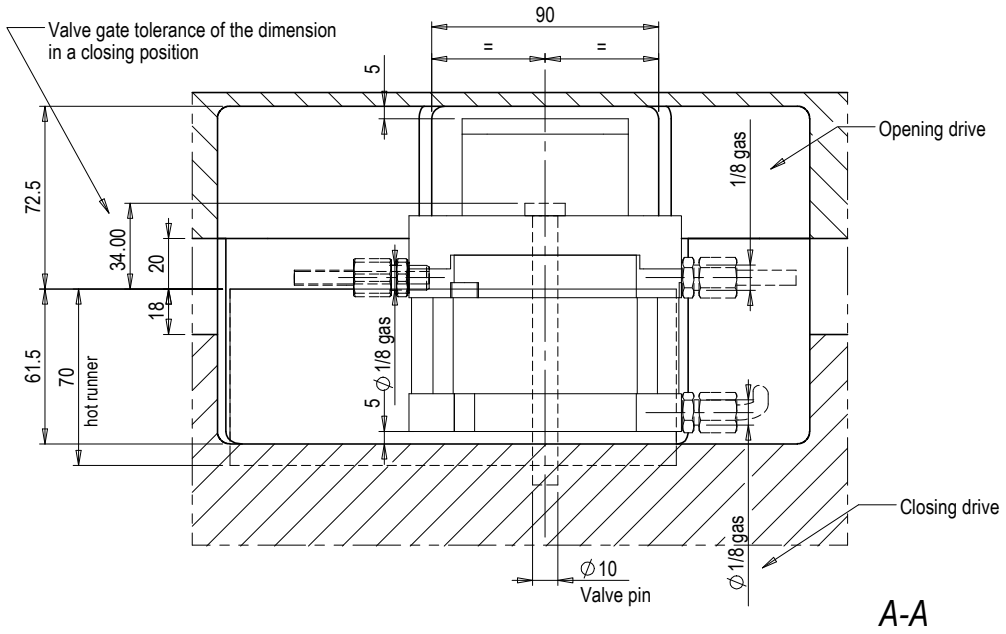
CODE	WORKING	DESCRIPTION	COOLED	COMPLETE GASKET SET	SEAT					
					A	B	C	D	E	H
0017-01152	OIL	(standard)	✓	0038-00102	95	105	47.5	45	52	70
0017-01154		WITH 1 END OF STROKE	✓	0038-00107						90
0017-01156		WITH DOUBLE END OF STROKE	✓							95
0017-00869	AIR	(standard)	✓	0038-00133	110	120	55	55	55	59
0017-00870			×							
0017-00871		WITH 1 END OF STROKE	✓	0038-00135						79.5
0017-00872			×							
0017-00873		WITH DOUBLE END OF STROKE	✓							84.5
0017-00874			×							

GENERAL RULES FOR THE COOLING
- Pneaumatic versions with optional cooling: is NOT MANDATORY to cooling the cylinderin presence of T1 ≤280°C [536°F] and T2 ≤80°C [176°F]
- Versions with end of stroke: cooling ALWAYS MANDATORY with T1≥200°C [392°F] also after shut off of the mold/hot runner systems.
- During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
  - HYDRAULIC => 60°C [140°F] Temperature of the mold - 280°C [536°F] Temperature of the hot runner system
  - PNEUMATIC => 100°C [212°F] Temperature of the mold - 300°C [572°F] Temperature of the hot runner system

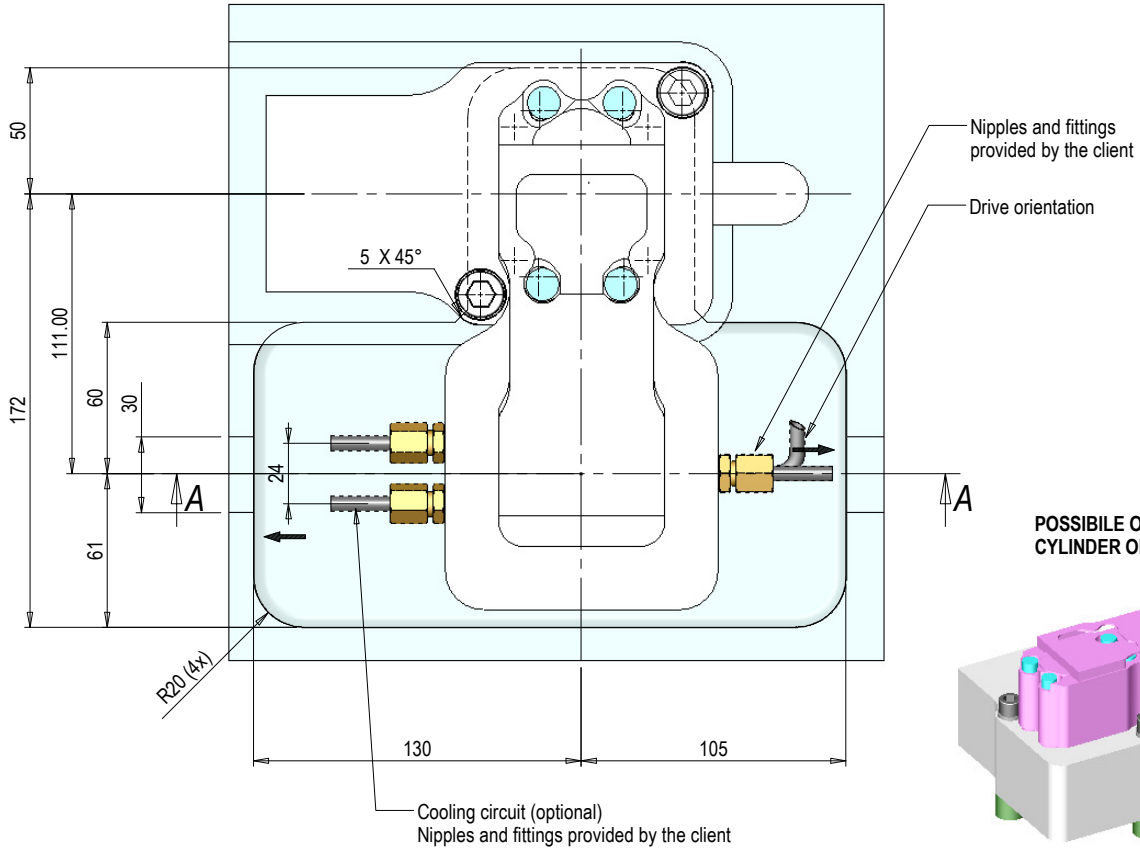
Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1.

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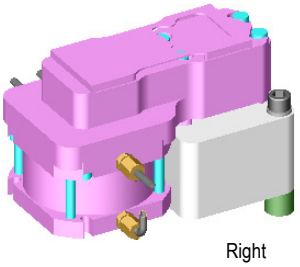


A-A



POSSIBILE ORIENTATIONS CYLINDER ON MANIFOLD

Left



Right

The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job

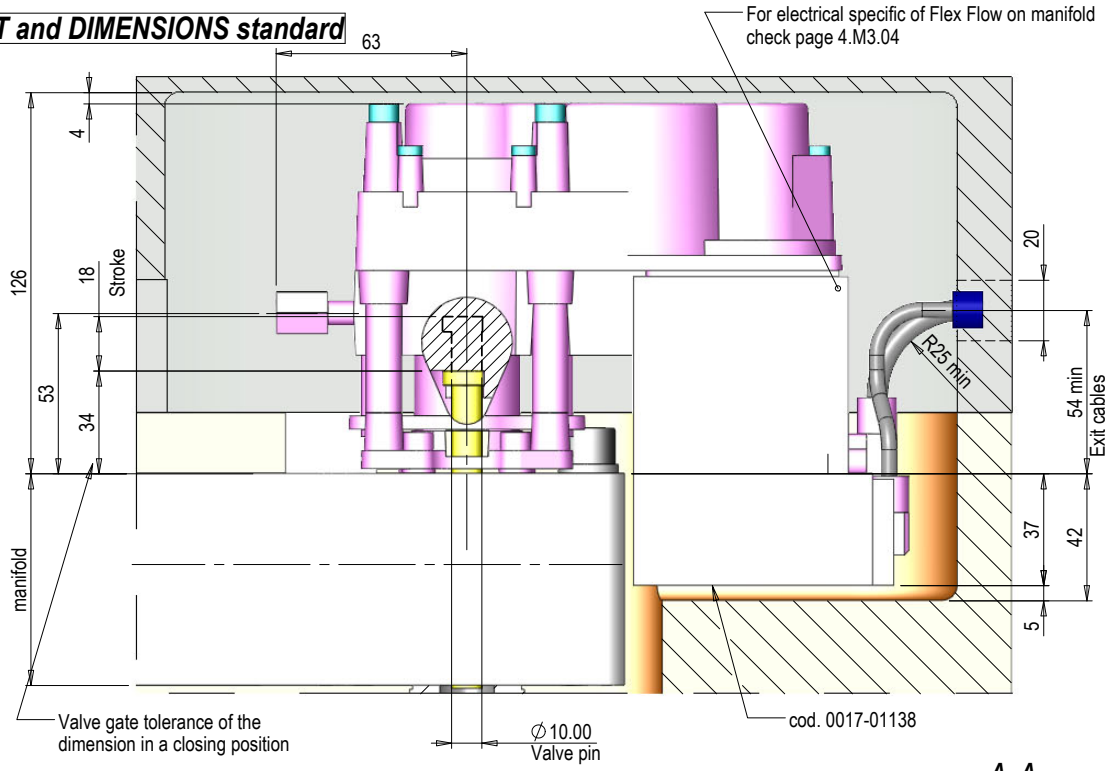
Working PRESSURE:
AIR: 6 min BAR

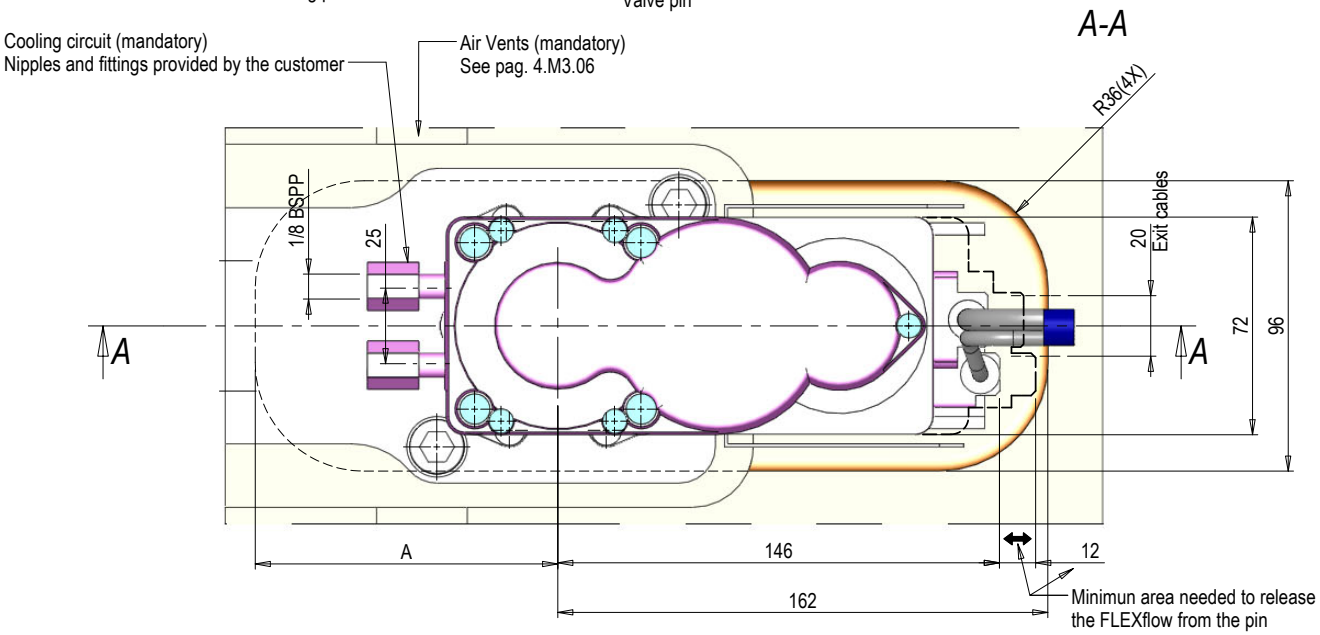
NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system
Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

Cooled air cylinder cod. 0017-00484: bore 100 mm - stroke 18 mm
Complete gasket set: 0038-00044

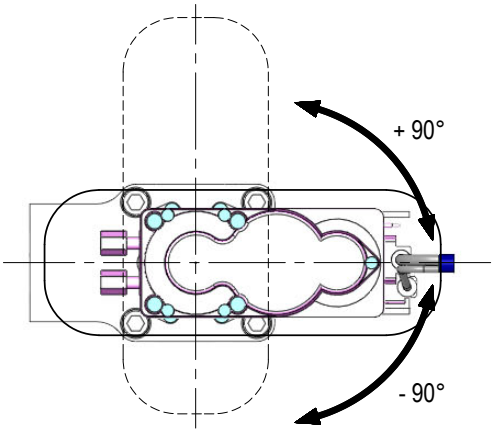
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POCKET and DIMENSIONS standard





POSSIBLE ORIENTATIONS FLEX FLOW ON MANIFOLD



The configuration +/-90° is obtained turning the Flex Flow on the manifold axis, together with its standard seat

General rules for the cooling of the FLEXflow on manifold

T1 (°C) = Max molding temperature of polymer
Tc (°C) = Coolant temperature

1) Maximum N° of actuators per single cooling circuit:

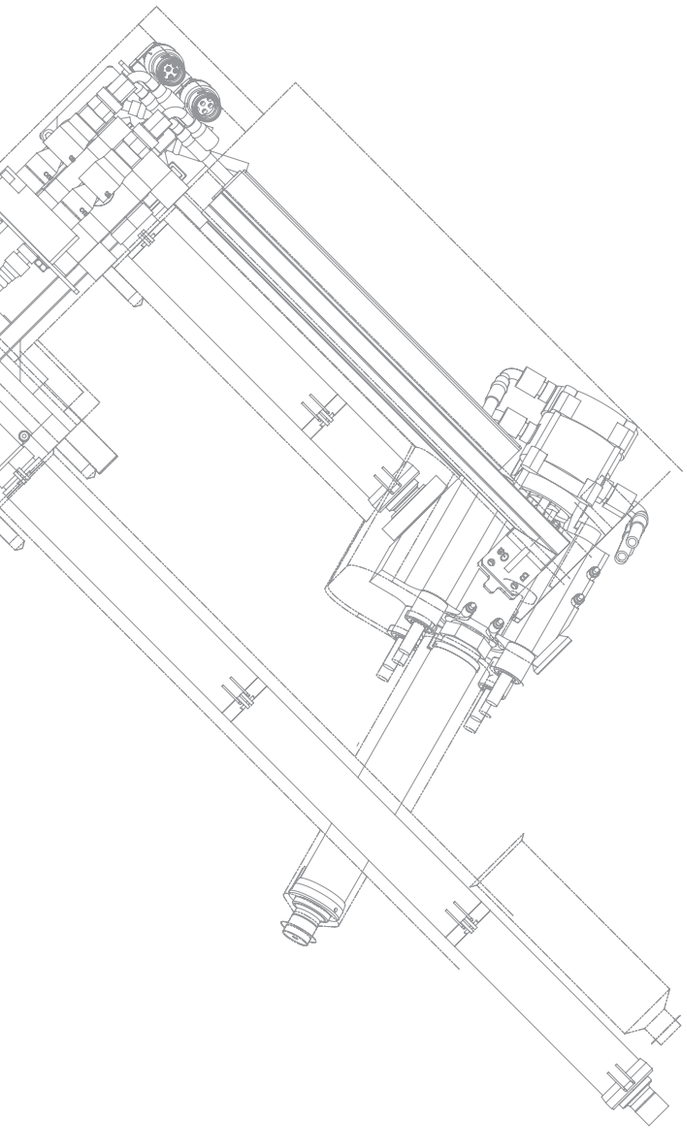
n°3 ==>	T1 ≤ 270°C [518°F]
n°2 ==>	[518°F] 270°C < T1 < 320°C [608°F]
n°1 ==>	T1 ≥ 320°C [608°F]

2) Maximum incoming coolant temperature Tc ≤ 25°C [77°F]

3) Minimum flow rate for each cooling circuit: 3 l/min

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oerlikon
hrsflow



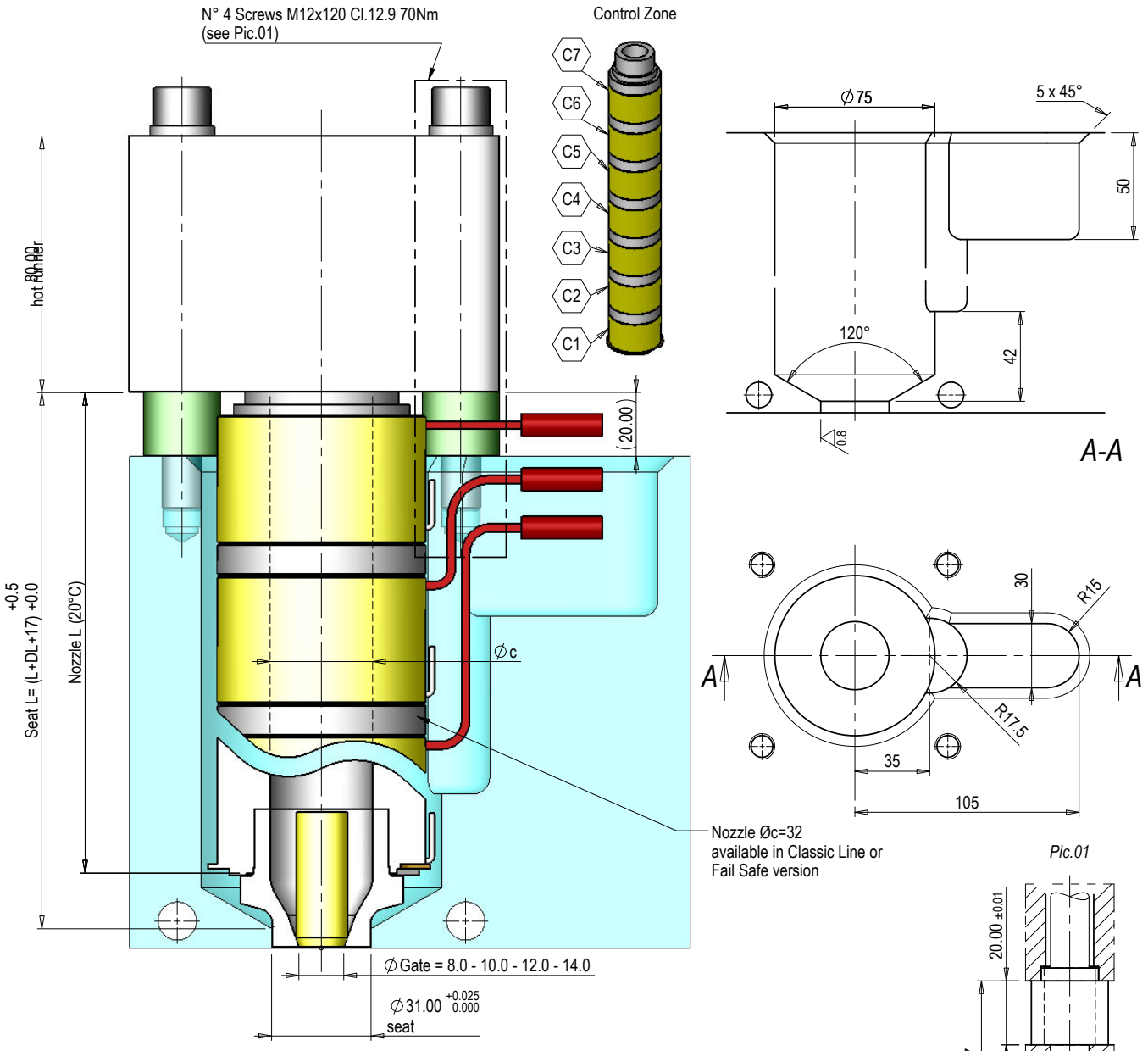
Wa

Wa Series 400 – 4700 cm3/s

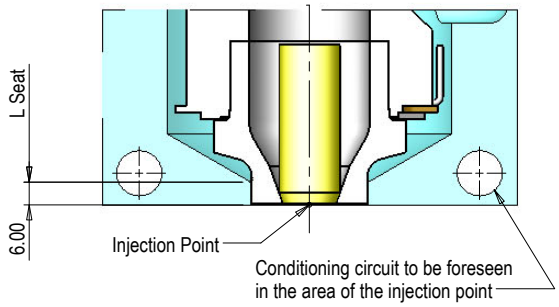
Serie Wa
Wa Serie
Wa Série
Wa Serie
Wa Série

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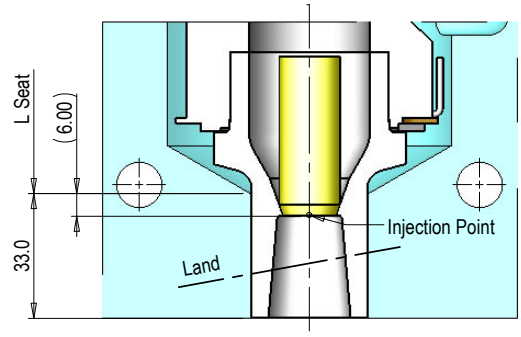
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Bushing L=6



Bushing L=33



(1) For "Seat L" calculation see pag. 4.Wa1.02 table A

ØGate	CODE L6	CODE L33
8.0	0013-02117A	0013-02121A
10.0	0013-02118A	0013-02122A
12.0	0013-02119A	0013-02123A
14.0	0013-02120A	0013-02124A

L INIETTORE	*L INIETTORE*
150	300
175	325
200	350
225	375
250	400
275	

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T1 (°C) = Spritztemperatur
T2 (°C) = Formtemperatur

ΔT = T1 - T2
λ= 0.000012 (1/°C)

Tab. DÜSE AUSDEHNUNG

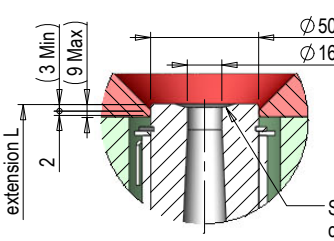
L (DÜSE)	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
[20°C]	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44

Tab. A – „L Sitz“ Kalkulieren

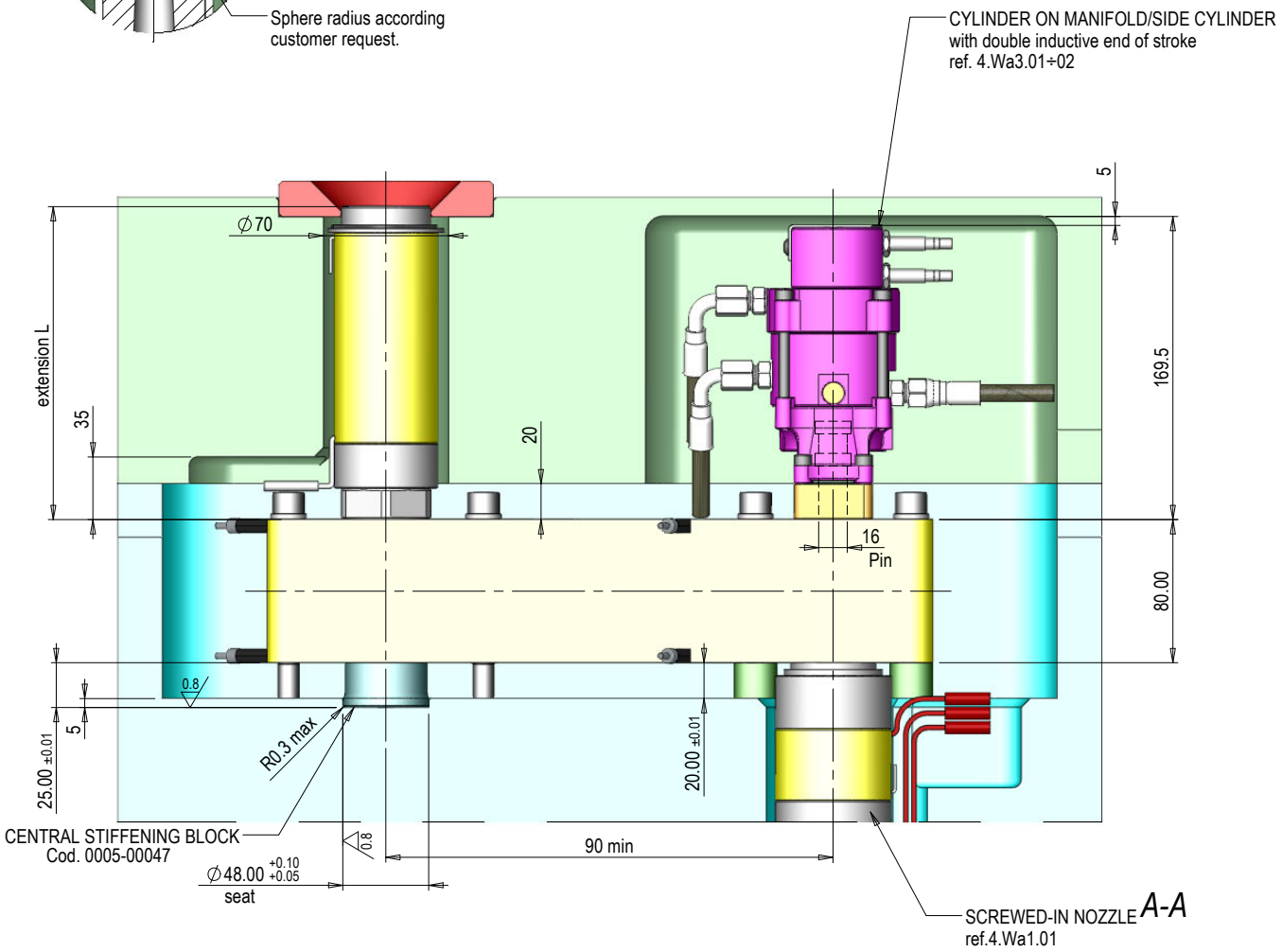
L (DÜSE)	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Sitz = L + DL + 17.6										
[20°C]	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
150	167.78	167.82	167.85	167.89	167.92	167.96	168.00	168.03	168.07	168.10	168.14
175	192.81	192.85	192.89	192.94	192.98	193.02	193.06	193.10	193.15	193.19	193.23
200	217.84	217.89	217.94	217.98	218.03	218.08	218.13	218.18	218.22	218.27	218.32
225	242.87	242.92	242.98	243.03	243.09	243.14	243.19	243.25	243.30	243.36	243.41
250	267.90	267.96	268.02	268.08	268.14	268.20	268.26	268.32	268.38	268.44	268.50
275	292.93	293.00	293.06	293.13	293.19	293.26	293.33	293.39	293.46	293.52	293.59
300	317.96	318.03	318.10	318.18	318.25	318.32	318.39	318.46	318.54	318.61	318.68
325	342.99	343.07	343.15	343.22	343.30	343.38	343.46	343.54	343.61	343.69	343.77
350	368.02	368.10	368.19	368.27	368.36	368.44	368.52	368.61	368.69	368.78	368.86
375	393.05	393.14	393.23	393.32	393.41	393.50	393.59	393.68	393.77	393.86	393.95
400	418.08	418.18	418.27	418.37	418.46	418.56	418.66	418.75	418.85	418.94	419.04

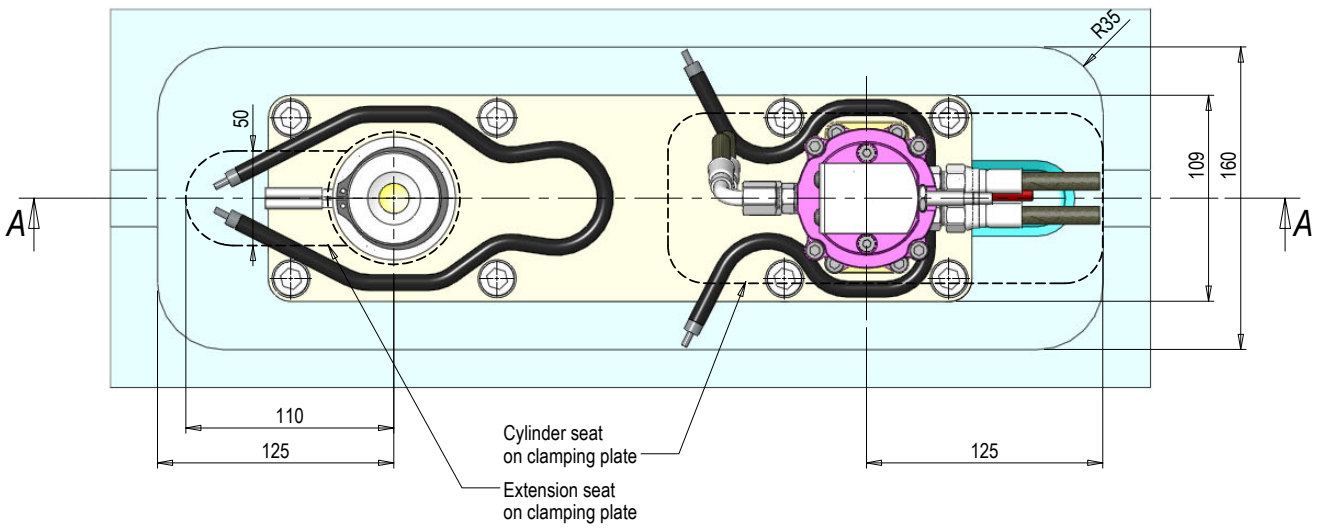
0	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	= L + DL + 17										
[20°C]	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
150	167.18	167.22	167.25	167.29	167.32	167.36	167.40	167.43	167.47	167.50	167.54
175	192.21	192.25	192.29	192.34	192.38	192.42	192.46	192.50	192.55	192.59	192.63
200	217.24	217.29	217.34	217.38	217.43	217.48	217.53	217.58	217.62	217.67	217.72
225	242.27	242.32	242.38	242.43	242.49	242.54	242.59	242.65	242.70	242.76	242.81
250	267.30	267.36	267.42	267.48	267.54	267.60	267.66	267.72	267.78	267.84	267.90
275	292.33	292.40	292.46	292.53	292.59	292.66	292.73	292.79	292.86	292.92	292.99
300	317.36	317.43	317.50	317.58	317.65	317.72	317.79	317.86	317.94	318.01	318.08
325	342.39	342.47	342.55	342.62	342.70	342.78	342.86	342.94	343.01	343.09	343.17
350	367.42	367.50	367.59	367.67	367.76	367.84	367.92	368.01	368.09	368.18	368.26
375	392.45	392.54	392.63	392.72	392.81	392.90	392.99	393.08	393.17	393.26	393.35
400	417.48	417.58	417.67	417.77	417.86	417.96	418.06	418.15	418.25	418.34	418.44

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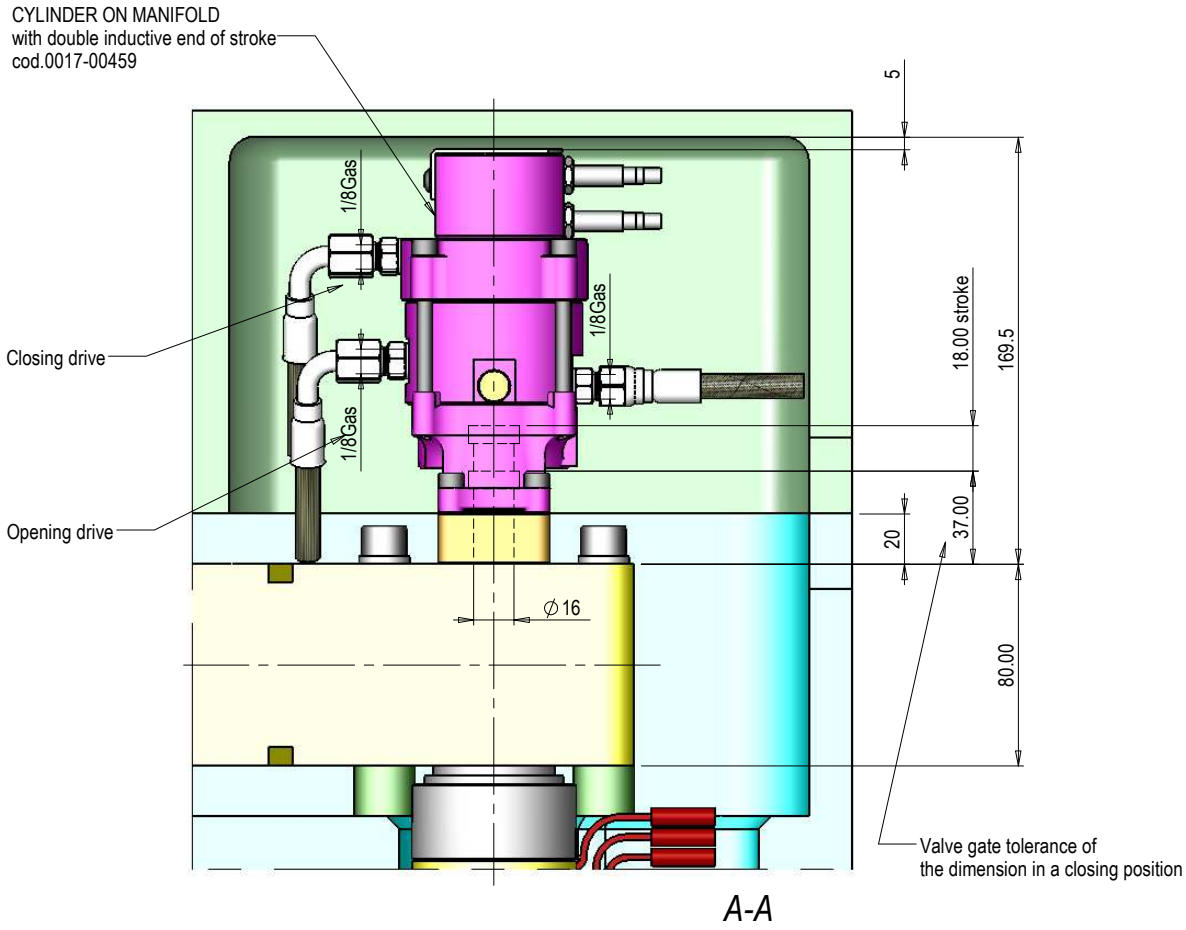


L EXTENSION	CODE
90	0014-00995
175	0014-00996





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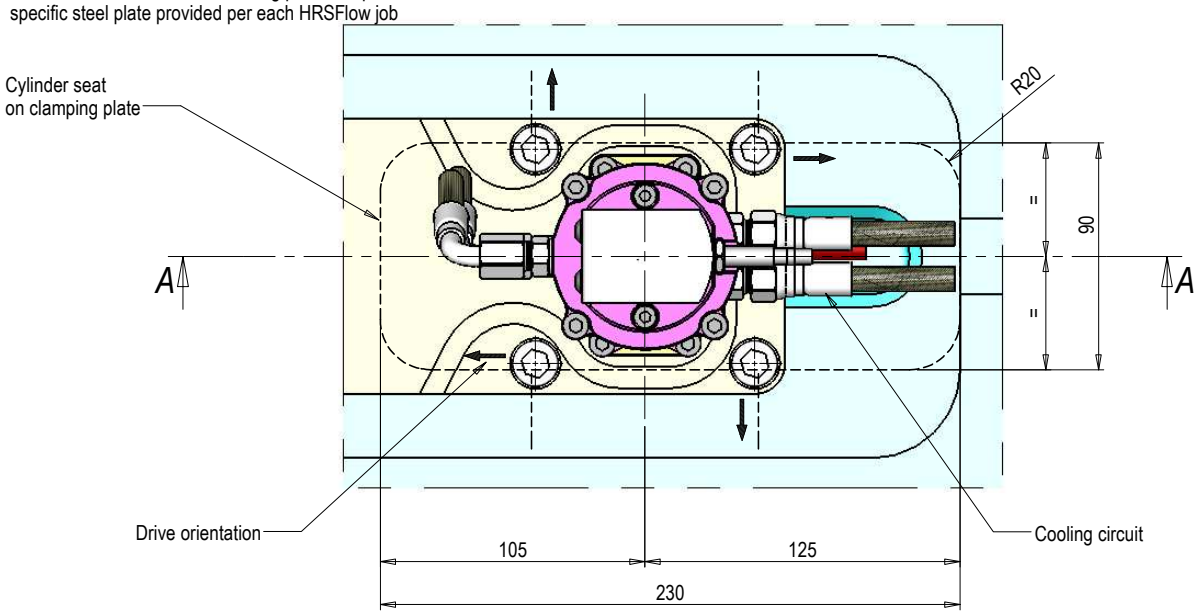


NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

Working PRESSURE:
OIL: 80 max BAR

The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job



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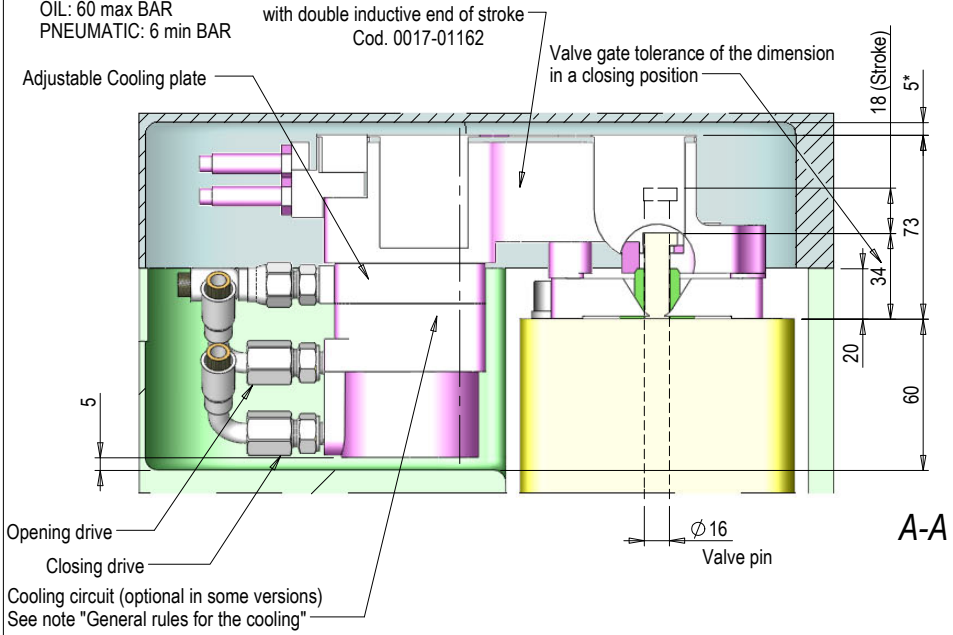
SIDE CYLINDER

Oil cylinder: bore 42 mm - stroke 18 mm
Air cylinder: bore 70 mm - stroke 18 mm

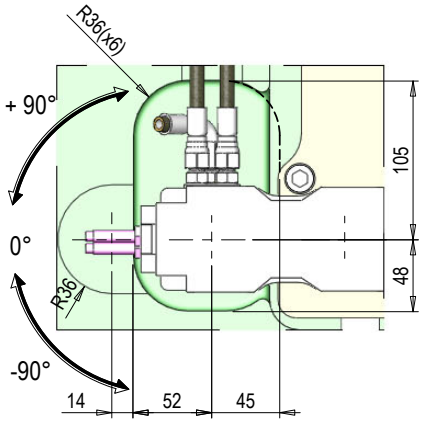
(*) ATTENTION: minimun mandatory dimension
in presence of the magnetic IMM platen

a) Working PRESSURE:
OIL: 60 max BAR
PNEUMATIC: 6 min BAR

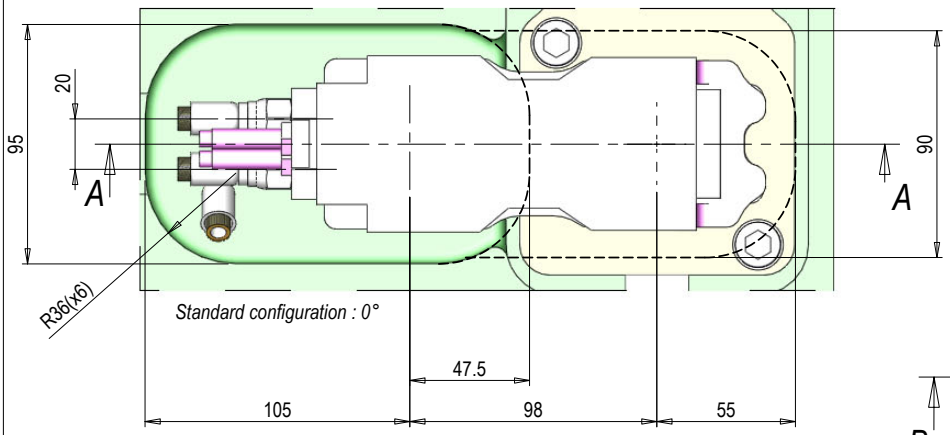
SIDE CYLINDER
with double inductive end of stroke
Cod. 0017-01162

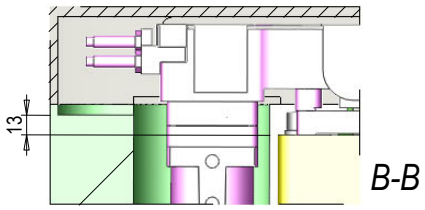


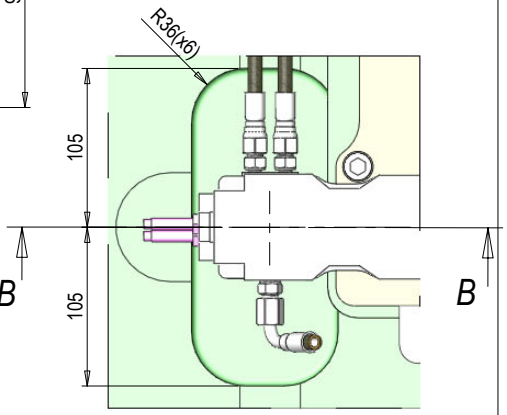
b) **POSSIBILE ORIENTATIONS OF THE COUPLINGS**



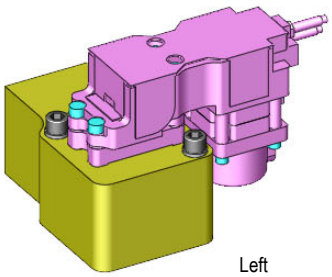
c) **ALTERNATIVE POSITIONS OF THE COOLING PLATE**



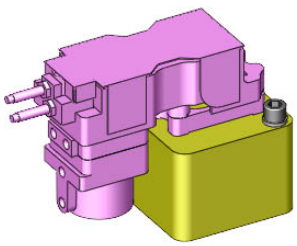




POSSIBILE ORIENTATIONS CYLINDER ON MANIFOLD



Left



Right

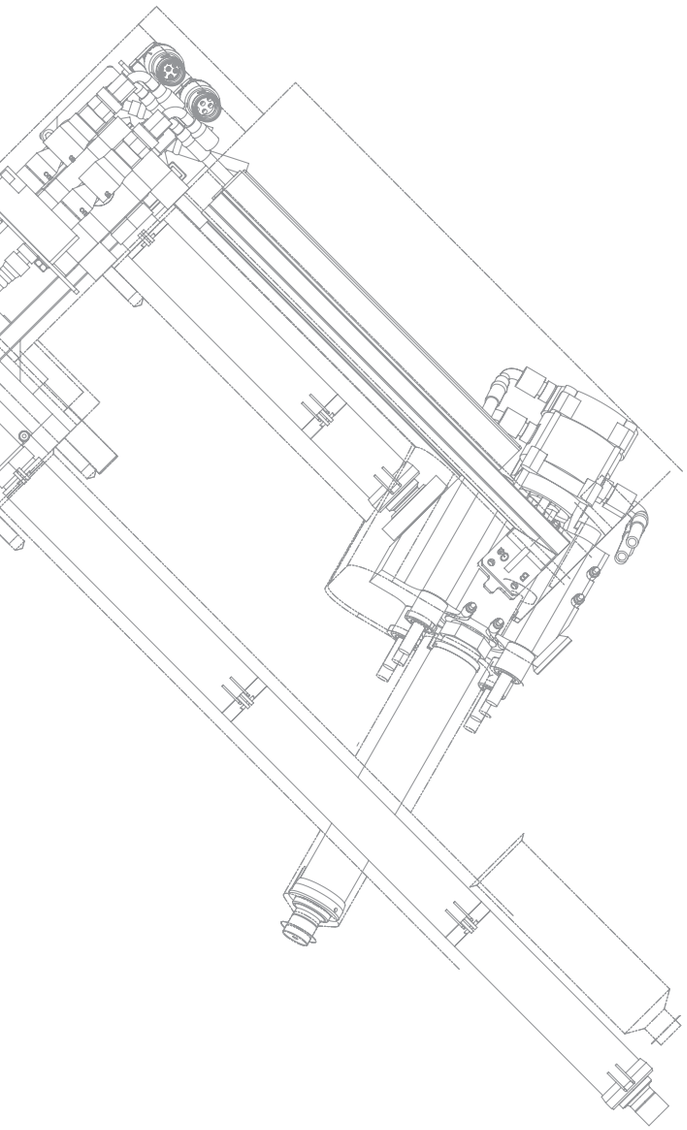
NOTE FOR THE CYLINDERS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system
Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

a) The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Altenative positions of the couplings than the STANDARD configuration shown in Pic.1;
c) In alternative, the cooling plate wiht his couplings can be oriented on the opposite side of the hydraulic connections.

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hrsflow



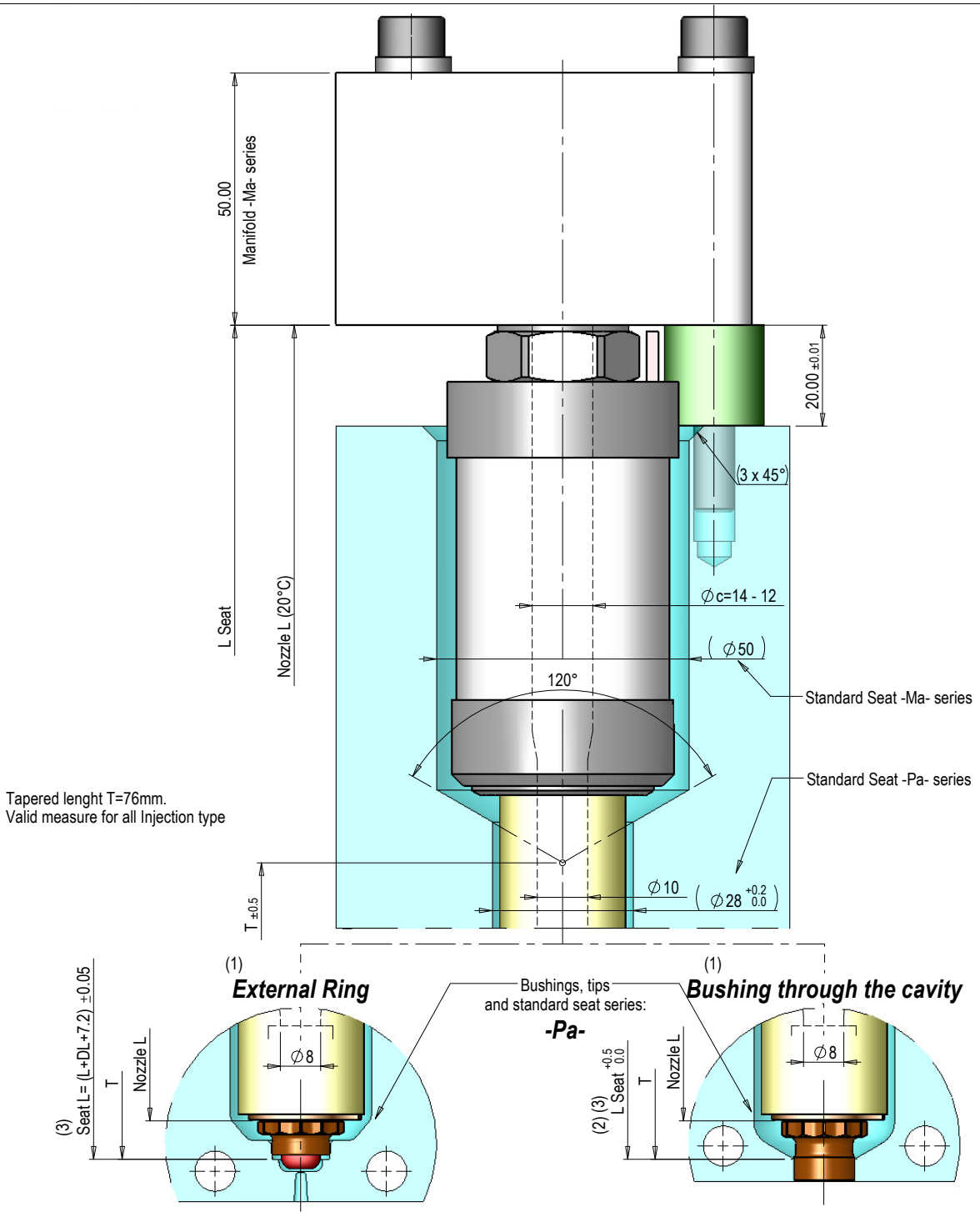
Ja

Ja Series 2÷70 cm³/s

Serie Ja
Ja Serie
Ja Série
Ja Serie
Ja Série

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Tapered lenght T=76mm.
Valid measure for all Injection type

(1) For detailed dimensions of the injection point follow the instructions on each series -Pa- nozzles series sheet (Pag.4.Pa1.01 ->)

(2) "L Seat" calculation with bushing through the cavity according to the specifications of Injection type:

Seat L = L + DL + 6.2 ==> Free Flow
Seat L = L + DL + 7.2 ==> Torpedo - Valve Gate PGC30
Seat L = L + DL + 4.7 ==> Valve Gate PGC20

(3) For values of "Seat L" and "DL" refer to table pag. 4.Ja1.02/03 (table A,B,C)

For Tips and Ring nuts reference codes see page 4.Pa1.11

Nozzle L	*External Ring (*)*	*Bushing through the cavity*
180	☑	☑
200	☑	☑
225	☑	☑
250	☑	☑
275	☑	☑
300	☑	☑
325	☑	☑
350	☑	☑
375	*not available*	☑
400	*not available*	☑
425	*not available*	☑
450	*not available*	☑
475	*not available*	☑
500	*not available*	☑
525	*not available*	☑
550	*not available*	☑

☑ = Available nozzle lenght

(*) External ring nut not allowed with PGC20

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
180	0.22	0.26	0.30	0.35	0.39	0.43	0.48	0.52	0.56	0.60	0.65
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
425	0.51	0.61	0.71	0.82	0.92	1.02	1.12	1.22	1.33	1.43	1.53
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
475	0.57	0.68	0.80	0.91	1.03	1.14	1.25	1.37	1.48	1.60	1.71
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80
525	0.63	0.76	0.88	1.01	1.13	1.26	1.39	1.51	1.64	1.76	1.89
550	0.66	0.79	0.92	1.06	1.19	1.32	1.45	1.58	1.72	1.85	1.98

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Seat = L + DL + 7.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
180	187.42	187.46	187.50	187.55	187.59	187.63	187.68	187.72	187.76	187.80	187.85
200	207.44	207.49	207.54	207.58	207.63	207.68	207.73	207.78	207.82	207.87	207.92
225	232.47	232.52	232.58	232.63	232.69	232.74	232.79	232.85	232.90	232.96	233.01
250	257.50	257.56	257.62	257.68	257.74	257.80	257.86	257.92	257.98	258.04	258.10
275	282.53	282.60	282.66	282.73	282.79	282.86	282.93	282.99	283.06	283.12	283.19
300	307.56	307.63	307.70	307.78	307.85	307.92	307.99	308.06	308.14	308.21	308.28
325	332.59	332.67	332.75	332.82	332.90	332.98	333.06	333.14	333.21	333.29	333.37
350	357.62	357.70	357.79	357.87	357.96	358.04	358.12	358.21	358.29	358.38	358.46
375	382.65	382.74	382.83	382.92	383.01	383.10	383.19	383.28	383.37	383.46	383.55
400	407.68	407.78	407.87	407.97	408.06	408.16	408.26	408.35	408.45	408.54	408.64
425	432.71	432.81	432.91	433.02	433.12	433.22	433.32	433.42	433.53	433.63	433.73
450	457.74	457.85	457.96	458.06	458.17	458.28	458.39	458.50	458.60	458.71	458.82
475	482.77	482.88	483.00	483.11	483.23	483.34	483.45	483.57	483.68	483.80	483.91
500	507.80	507.92	508.04	508.16	508.28	508.40	508.52	508.64	508.76	508.88	509.00
525	532.83	532.96	533.08	533.21	533.33	533.46	533.59	533.71	533.84	533.96	534.09
550	557.86	557.99	558.12	558.26	558.39	558.52	558.65	558.78	558.92	559.05	559.18

Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Seat = L + DL + 6.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
180	186.42	186.46	186.50	186.55	186.59	186.63	186.68	186.72	186.76	186.80	186.85
200	206.44	206.49	206.54	206.58	206.63	206.68	206.73	206.78	206.82	206.87	206.92
225	231.47	231.52	231.58	231.63	231.69	231.74	231.79	231.85	231.90	231.96	232.01
250	256.50	256.56	256.62	256.68	256.74	256.80	256.86	256.92	256.98	257.04	257.10
275	281.53	281.60	281.66	281.73	281.79	281.86	281.93	281.99	282.06	282.12	282.19
300	306.56	306.63	306.70	306.78	306.85	306.92	306.99	307.06	307.14	307.21	307.28
325	331.59	331.67	331.75	331.82	331.90	331.98	332.06	332.14	332.21	332.29	332.37
350	356.62	356.70	356.79	356.87	356.96	357.04	357.12	357.21	357.29	357.38	357.46
375	381.65	381.74	381.83	381.92	382.01	382.10	382.19	382.28	382.37	382.46	382.55
400	406.68	406.78	406.87	406.97	407.06	407.16	407.26	407.35	407.45	407.54	407.64
425	431.71	431.81	431.91	432.02	432.12	432.22	432.32	432.42	432.53	432.63	432.73
450	456.74	456.85	456.96	457.06	457.17	457.28	457.39	457.50	457.60	457.71	457.82
475	481.77	481.88	482.00	482.11	482.23	482.34	482.45	482.57	482.68	482.80	482.91
500	506.80	506.92	507.04	507.16	507.28	507.40	507.52	507.64	507.76	507.88	508.00
525	531.83	531.96	532.08	532.21	532.33	532.46	532.59	532.71	532.84	532.96	533.09
550	556.86	556.99	557.12	557.26	557.39	557.52	557.65	557.78	557.92	558.05	558.18

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Tab. C - "Seat L" Calculation

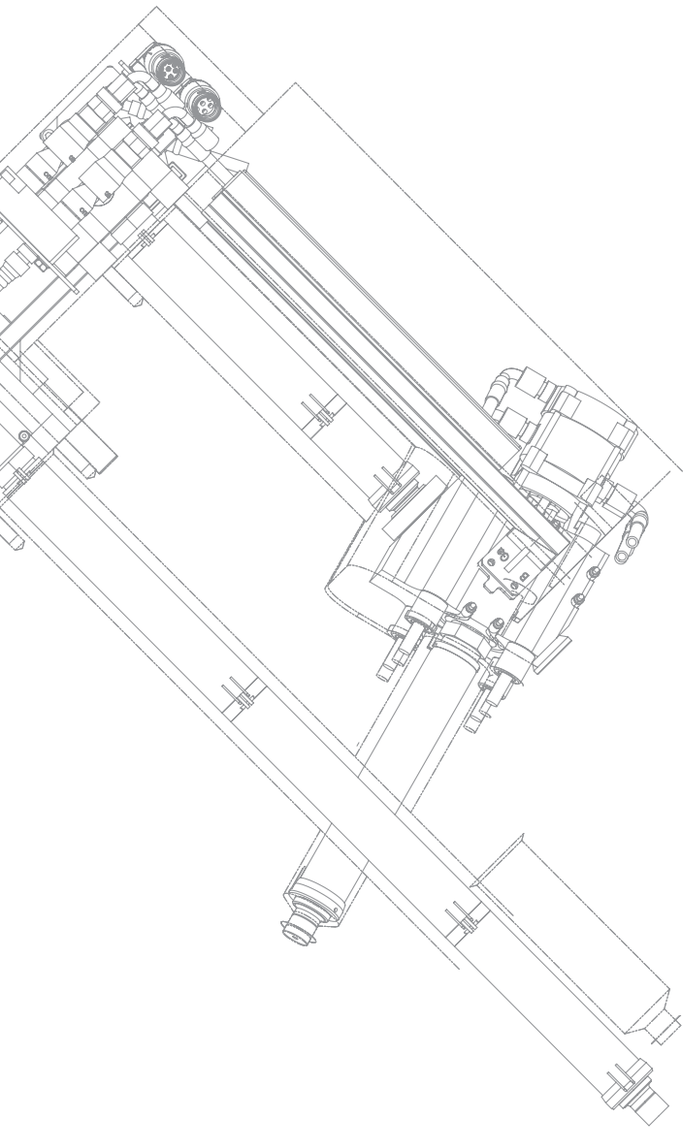
L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	L Seat = L + DL + 4.7										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
180	184.92	184.96	185.00	185.05	185.09	185.13	185.18	185.22	185.26	185.30	185.35
200	204.94	204.99	205.04	205.08	205.13	205.18	205.23	205.28	205.32	205.37	205.42
225	229.97	230.02	230.08	230.13	230.19	230.24	230.29	230.35	230.40	230.46	230.51
250	255.00	255.06	255.12	255.18	255.24	255.30	255.36	255.42	255.48	255.54	255.60
275	280.03	280.10	280.16	280.23	280.29	280.36	280.43	280.49	280.56	280.62	280.69
300	305.06	305.13	305.20	305.28	305.35	305.42	305.49	305.56	305.64	305.71	305.78
325	330.09	330.17	330.25	330.32	330.40	330.48	330.56	330.64	330.71	330.79	330.87
350	355.12	355.20	355.29	355.37	355.46	355.54	355.62	355.71	355.79	355.88	355.96
375	380.15	380.24	380.33	380.42	380.51	380.60	380.69	380.78	380.87	380.96	381.05
400	405.18	405.28	405.37	405.47	405.56	405.66	405.76	405.85	405.95	406.04	406.14
425	430.21	430.31	430.41	430.52	430.62	430.72	430.82	430.92	431.03	431.13	431.23
450	455.24	455.35	455.46	455.56	455.67	455.78	455.89	456.00	456.10	456.21	456.32
475	480.27	480.38	480.50	480.61	480.73	480.84	480.95	481.07	481.18	481.30	481.41
500	505.30	505.42	505.54	505.66	505.78	505.90	506.02	506.14	506.26	506.38	506.50
525	530.33	530.46	530.58	530.71	530.83	530.96	531.09	531.21	531.34	531.46	531.59
550	555.36	555.49	555.62	555.76	555.89	556.02	556.15	556.28	556.42	556.55	556.68

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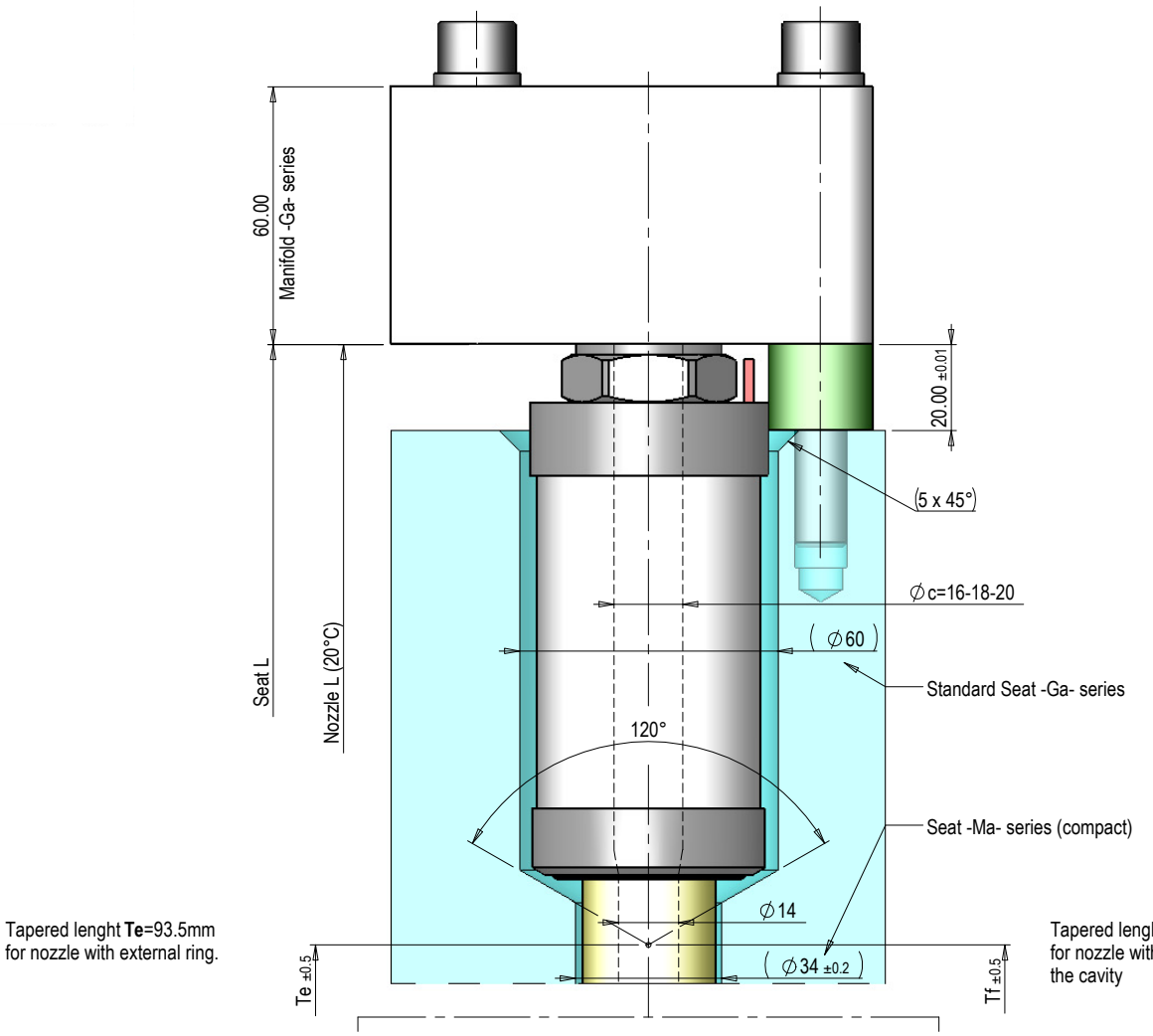
Ha

Ha Series 10÷265 cm³/s

Serie Ha
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Ha Série
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Ha Série

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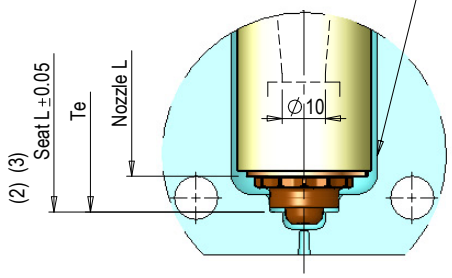


Tapered lenght **Te**=93.5mm
for nozzle with external ring.

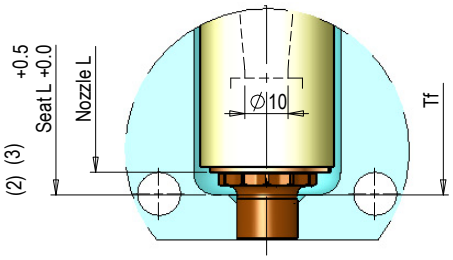
Tapered lenght **Tf**=90mm
for nozzle with bushing through the cavity

Bushings, tips and seat series:
-Ma-

(1) ***External Ring***



Bushing through the cavity (1)



Nozzle L	External Ring		Bushing through the cavity
	PGF30 - PGT30 - PGC20	PGC30 - PGY30	
225	☑	☑	☑
250	☑	☑	☑
275	☑	☑	☑
300	☑	☑	☑
325	☑	☑	☑
350	☑	☑	☑
375	*not available*	☑	☑
400	*not available*	☑	☑
425	*not available*	☑	☑
450	*not available*	☑	☑
475	*not available*	☑	☑
500	*not available*	☑	☑
525	*not available*	☑	☑
550	*not available*	☑	☑
575	*not available*	☑	☑
600	*not available*	☑	☑
625	*not available*	☑	☑
650	*not available*	☑	☑
675	*not available*	☑	☑
700	*not available*	☑	☑
725	*not available*	☑	☑

☑ = Available nozzle lenght

(1) For detailed dimensions of the injection point follow the instructions on each -Ma- nozzles series sheet (Pag.4.Ma1.01 ->)

(2) "Seat L" calculation with external ring according to the specifications of Injection type:

Seat L = L + DL + 7.7 ==> PGF30, PGT30
Seat L = L + DL + 10.4 ==> PGC30, PGY30
Seat L = L + DL + 7.2 ==> PGC20

"Seat L" calculation with Bushing through the cavity according to the specifications of Injection type:

Seat L = L + DL + 4.7 ==> Bushing through the cavity
Seat L = L + DL + 3.7 ==> PGC20

(3) For values of "Seat L" and "DL" refer to table pag. 4.Ha1.02÷03 (tables A,B,C)

For Tips and Ring nuts reference codes see page 4.Ma1.12

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NOZZLE EXPANSION Table - "SEAT L" dimension

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
425	0.51	0.61	0.71	0.82	0.92	1.02	1.12	1.22	1.33	1.43	1.53
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
475	0.57	0.68	0.80	0.91	1.03	1.14	1.25	1.37	1.48	1.60	1.71
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80
525	0.63	0.76	0.88	1.01	1.13	1.26	1.39	1.51	1.64	1.76	1.89
550	0.66	0.79	0.92	1.06	1.19	1.32	1.45	1.58	1.72	1.85	1.98
575	0.69	0.83	0.97	1.10	1.24	1.38	1.52	1.66	1.79	1.93	2.07
600	0.72	0.86	1.01	1.15	1.30	1.44	1.58	1.73	1.87	2.02	2.16
625	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
650	0.78	0.94	1.09	1.25	1.40	1.56	1.72	1.87	2.03	2.18	2.34
675	0.81	0.97	1.13	1.30	1.46	1.62	1.78	1.94	2.11	2.27	2.43
700	0.84	1.01	1.18	1.34	1.51	1.68	1.85	2.02	2.18	2.35	2.52
725	0.87	1.04	1.22	1.39	1.57	1.74	1.91	2.09	2.26	2.44	2.61

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 7.7										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
225	232.97	233.02	233.08	233.13	233.19	233.24	233.29	233.35	233.40	233.46	233.51
250	258.00	258.06	258.12	258.18	258.24	258.30	258.36	258.42	258.48	258.54	258.60
275	283.03	283.10	283.16	283.23	283.29	283.36	283.43	283.49	283.56	283.62	283.69
300	308.06	308.13	308.20	308.28	308.35	308.42	308.49	308.56	308.64	308.71	308.78
325	333.09	333.17	333.25	333.32	333.40	333.48	333.56	333.64	333.71	333.79	333.87
350	358.12	358.20	358.29	358.37	358.46	358.54	358.62	358.71	358.79	358.88	358.96

Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 10.4										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
225	235.67	235.72	235.78	235.83	235.89	235.94	235.99	236.05	236.10	236.16	236.21
250	260.70	260.76	260.82	260.88	260.94	261.00	261.06	261.12	261.18	261.24	261.30
275	285.73	285.80	285.86	285.93	285.99	286.06	286.13	286.19	286.26	286.32	286.39
300	310.76	310.83	310.90	310.98	311.05	311.12	311.19	311.26	311.34	311.41	311.48
325	335.79	335.87	335.95	336.02	336.10	336.18	336.26	336.34	336.41	336.49	336.57
350	360.82	360.90	360.99	361.07	361.16	361.24	361.32	361.41	361.49	361.58	361.66
375	385.85	385.94	386.03	386.12	386.21	386.30	386.39	386.48	386.57	386.66	386.75
400	410.88	410.98	411.07	411.17	411.26	411.36	411.46	411.55	411.65	411.74	411.84
425	435.91	436.01	436.11	436.22	436.32	436.42	436.52	436.62	436.73	436.83	436.93
450	460.94	461.05	461.16	461.26	461.37	461.48	461.59	461.70	461.80	461.91	462.02
475	485.97	486.08	486.20	486.31	486.43	486.54	486.65	486.77	486.88	487.00	487.11
500	511.00	511.12	511.24	511.36	511.48	511.60	511.72	511.84	511.96	512.08	512.20
525	536.03	536.16	536.28	536.41	536.53	536.66	536.79	536.91	537.04	537.16	537.29
550	561.06	561.19	561.32	561.46	561.59	561.72	561.85	561.98	562.12	562.25	562.38
575	586.09	586.23	586.37	586.50	586.64	586.78	586.92	587.06	587.19	587.33	587.47
600	611.12	611.26	611.41	611.55	611.70	611.84	611.98	612.13	612.27	612.42	612.56
625	636.15	636.30	636.45	636.60	636.75	636.90	637.05	637.20	637.35	637.50	637.65
650	661.18	661.34	661.49	661.65	661.80	661.96	662.12	662.27	662.43	662.58	662.74
675	686.21	686.37	686.53	686.70	686.86	687.02	687.18	687.34	687.51	687.67	687.83
700	711.24	711.41	711.58	711.74	711.91	712.08	712.25	712.42	712.58	712.75	712.92
725	736.27	736.44	736.62	736.79	736.97	737.14	737.31	737.49	737.66	737.84	738.01

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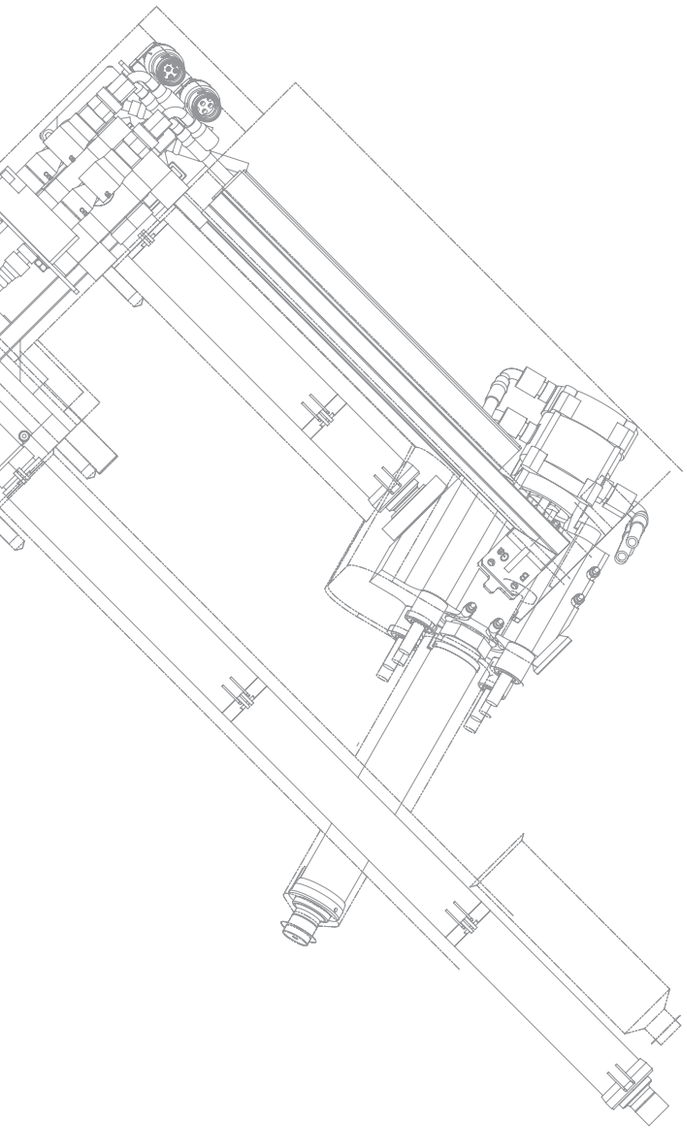
Tab. C - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	Seat L = L + DL + 4.7										
225	229.97	230.02	230.08	230.13	230.19	230.24	230.29	230.35	230.40	230.46	230.51
250	255.00	255.06	255.12	255.18	255.24	255.30	255.36	255.42	255.48	255.54	255.60
275	280.03	280.10	280.16	280.23	280.29	280.36	280.43	280.49	280.56	280.62	280.69
300	305.06	305.13	305.20	305.28	305.35	305.42	305.49	305.56	305.64	305.71	305.78
325	330.09	330.17	330.25	330.32	330.40	330.48	330.56	330.64	330.71	330.79	330.87
350	355.12	355.20	355.29	355.37	355.46	355.54	355.62	355.71	355.79	355.88	355.96
375	380.15	380.24	380.33	380.42	380.51	380.60	380.69	380.78	380.87	380.96	381.05
400	405.18	405.28	405.37	405.47	405.56	405.66	405.76	405.85	405.95	406.04	406.14
425	430.21	430.31	430.41	430.52	430.62	430.72	430.82	430.92	431.03	431.13	431.23
450	455.24	455.35	455.46	455.56	455.67	455.78	455.89	456.00	456.10	456.21	456.32
475	480.27	480.38	480.50	480.61	480.73	480.84	480.95	481.07	481.18	481.30	481.41
500	505.30	505.42	505.54	505.66	505.78	505.90	506.02	506.14	506.26	506.38	506.50
525	530.33	530.46	530.58	530.71	530.83	530.96	531.09	531.21	531.34	531.46	531.59
550	555.36	555.49	555.62	555.76	555.89	556.02	556.15	556.28	556.42	556.55	556.68
575	580.39	580.53	580.67	580.80	580.94	581.08	581.22	581.36	581.49	581.63	581.77
600	605.42	605.56	605.71	605.85	606.00	606.14	606.28	606.43	606.57	606.72	606.86
625	630.45	630.60	630.75	630.90	631.05	631.20	631.35	631.50	631.65	631.80	631.95
650	655.48	655.64	655.79	655.95	656.10	656.26	656.42	656.57	656.73	656.88	657.04
675	680.51	680.67	680.83	681.00	681.16	681.32	681.48	681.64	681.81	681.97	682.13
700	705.54	705.71	705.88	706.04	706.21	706.38	706.55	706.72	706.88	707.05	707.22
725	730.57	730.74	730.92	731.09	731.27	731.44	731.61	731.79	731.96	732.14	732.31

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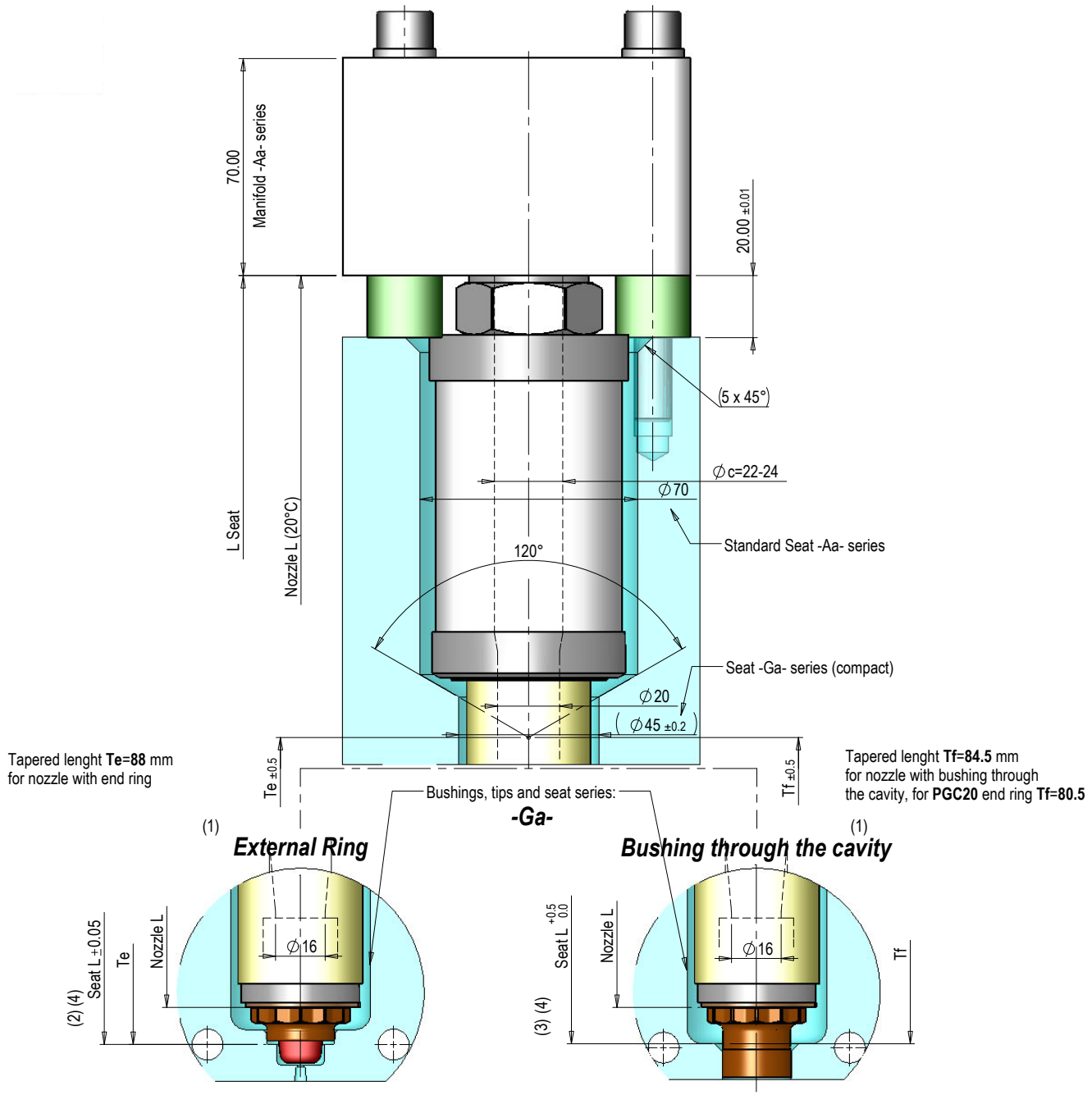
Ca

Ca Series 100÷1225 cm³/s

Serie Ca
Ca Serie
Ca Série
Ca Serie
Ca Série

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Nozzle L	*External Ring*		*Bushing through the cavity*
	PGC20 - PGF30 - PGT30	*PGC30 - PGY30*	
225	☑	☑	☑
250	☑	☑	☑
275	☑	☑	☑
300	☑	☑	☑
325	☑	☑	☑
350	☑	☑	☑
375	☑	☑	☑
400	☑	☑	☑
425	☑	☑	☑
450	☑	☑	☑
475	☑	☑	☑
500	☑	☑	☑
525	*not available*	☑	☑
550	*not available*	☑	☑
575	*not available*	☑	☑
600	*not available*	☑	☑
625	*not available*	☑	☑
650	*not available*	☑	☑
675	*not available*	☑	☑
700	*not available*	☑	☑
725	*not available*	☑	☑
750	*not available*	☑	☑
775	*not available*	☑	☑
800	*not available*	☑	☑

☑ = Available nozzle lenght

(1) For detailed dimensions of the injection point follow the instructions on each -Ga- nozzles series sheet (Pag.4.Ga1.01 ->)

(2) "Seat L" calculation with external ring according to the specifications of Injection type:

Seat L = L + DL + 11.4 ==> PGC20, PGF30, PGT30
Seat L = L + DL + 15.4 ==> PGC30, PGY30

(3) "Seat L" calculation with bushing through the cavity in according to the specifications of Injection type:

Seat L = L + DL + 7.7 ==> PGF10, PGF30
Seat L = L + DL + 11.2 ==> PGT30, PGC30, PGY30
Seat L = L + DL + 7.4 ==> PGC20

(4) For values of "Seat L" and "DL" refer to table pag. 4.Ca1.02÷04 (tables A,B,C)

For Tips and Ring nuts reference codes see page 4.Ga1.11

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NOZZLE EXPANSION Table - "SEAT L" dimension

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L *ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
425	0.51	0.61	0.71	0.82	0.92	1.02	1.12	1.22	1.33	1.43	1.53
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
475	0.57	0.68	0.80	0.91	1.03	1.14	1.25	1.37	1.48	1.60	1.71
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80
525	0.63	0.76	0.88	1.01	1.13	1.26	1.39	1.51	1.64	1.76	1.89
550	0.66	0.79	0.92	1.06	1.19	1.32	1.45	1.58	1.72	1.85	1.98
575	0.69	0.83	0.97	1.10	1.24	1.38	1.52	1.66	1.79	1.93	2.07
600	0.72	0.86	1.01	1.15	1.30	1.44	1.58	1.73	1.87	2.02	2.16
625	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
650	0.78	0.94	1.09	1.25	1.40	1.56	1.72	1.87	2.03	2.18	2.34
675	0.81	0.97	1.13	1.30	1.46	1.62	1.78	1.94	2.11	2.27	2.43
700	0.84	1.01	1.18	1.34	1.51	1.68	1.85	2.02	2.18	2.35	2.52
725	0.87	1.04	1.22	1.39	1.57	1.74	1.91	2.09	2.26	2.44	2.61
750	0.90	1.08	1.26	1.44	1.62	1.80	1.98	2.16	2.34	2.52	2.70
775	0.93	1.12	1.30	1.49	1.67	1.86	2.05	2.23	2.42	2.60	2.79
800	0.96	1.15	1.34	1.54	1.73	1.92	2.11	2.30	2.50	2.69	2.88

Tab. A - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 7.7										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
225	232.97	233.02	233.08	233.13	233.19	233.24	233.29	233.35	233.40	233.46	233.51
250	258.00	258.06	258.12	258.18	258.24	258.30	258.36	258.42	258.48	258.54	258.60
275	283.03	283.10	283.16	283.23	283.29	283.36	283.43	283.49	283.56	283.62	283.69
300	308.06	308.13	308.20	308.28	308.35	308.42	308.49	308.56	308.64	308.71	308.78
325	333.09	333.17	333.25	333.32	333.40	333.48	333.56	333.64	333.71	333.79	333.87
350	358.12	358.20	358.29	358.37	358.46	358.54	358.62	358.71	358.79	358.88	358.96
375	383.15	383.24	383.33	383.42	383.51	383.60	383.69	383.78	383.87	383.96	384.05
400	408.18	408.28	408.37	408.47	408.56	408.66	408.76	408.85	408.95	409.04	409.14
425	433.21	433.31	433.41	433.52	433.62	433.72	433.82	433.92	434.03	434.13	434.23
450	458.24	458.35	458.46	458.56	458.67	458.78	458.89	459.00	459.10	459.21	459.32
475	483.27	483.38	483.50	483.61	483.73	483.84	483.95	484.07	484.18	484.30	484.41
500	508.30	508.42	508.54	508.66	508.78	508.90	509.02	509.14	509.26	509.38	509.50
525	533.33	533.46	533.58	533.71	533.83	533.96	534.09	534.21	534.34	534.46	534.59
550	558.36	558.49	558.62	558.76	558.89	559.02	559.15	559.28	559.42	559.55	559.68
575	583.39	583.53	583.67	583.80	583.94	584.08	584.22	584.36	584.49	584.63	584.77
600	608.42	608.56	608.71	608.85	609.00	609.14	609.28	609.43	609.57	609.72	609.86
625	633.45	633.60	633.75	633.90	634.05	634.20	634.35	634.50	634.65	634.80	634.95
650	658.48	658.64	658.79	658.95	659.10	659.26	659.42	659.57	659.73	659.88	660.04
675	683.51	683.67	683.83	684.00	684.16	684.32	684.48	684.64	684.81	684.97	685.13
700	708.54	708.71	708.88	709.04	709.21	709.38	709.55	709.72	709.88	710.05	710.22
725	733.57	733.74	733.92	734.09	734.27	734.44	734.61	734.79	734.96	735.14	735.31
750	758.60	758.78	758.96	759.14	759.32	759.50	759.68	759.86	760.04	760.22	760.40
775	783.63	783.82	784.00	784.19	784.37	784.56	784.75	784.93	785.12	785.30	785.49
800	808.66	808.85	809.04	809.24	809.43	809.62	809.81	810.00	810.20	810.39	810.58

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Tab. B - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 11.2										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
225	236.47	236.52	236.58	236.63	236.69	236.74	236.79	236.85	236.90	236.96	237.01
250	261.50	261.56	261.62	261.68	261.74	261.80	261.86	261.92	261.98	262.04	262.10
275	286.53	286.60	286.66	286.73	286.79	286.86	286.93	286.99	287.06	287.12	287.19
300	311.56	311.63	311.70	311.78	311.85	311.92	311.99	312.06	312.14	312.21	312.28
325	336.59	336.67	336.75	336.82	336.90	336.98	337.06	337.14	337.21	337.29	337.37
350	361.62	361.70	361.79	361.87	361.96	362.04	362.12	362.21	362.29	362.38	362.46
375	386.65	386.74	386.83	386.92	387.01	387.10	387.19	387.28	387.37	387.46	387.55
400	411.68	411.78	411.87	411.97	412.06	412.16	412.26	412.35	412.45	412.54	412.64
425	436.71	436.81	436.91	437.02	437.12	437.22	437.32	437.42	437.53	437.63	437.73
450	461.74	461.85	461.96	462.06	462.17	462.28	462.39	462.50	462.60	462.71	462.82
475	486.77	486.88	487.00	487.11	487.23	487.34	487.45	487.57	487.68	487.80	487.91
500	511.80	511.92	512.04	512.16	512.28	512.40	512.52	512.64	512.76	512.88	513.00
525	536.83	536.96	537.08	537.21	537.33	537.46	537.59	537.71	537.84	537.96	538.09
550	561.86	561.99	562.12	562.26	562.39	562.52	562.65	562.78	562.92	563.05	563.18
575	586.89	587.03	587.17	587.30	587.44	587.58	587.72	587.86	587.99	588.13	588.27
600	611.92	612.06	612.21	612.35	612.50	612.64	612.78	612.93	613.07	613.22	613.36
625	636.95	637.10	637.25	637.40	637.55	637.70	637.85	638.00	638.15	638.30	638.45
650	661.98	662.14	662.29	662.45	662.60	662.76	662.92	663.07	663.23	663.38	663.54
675	687.01	687.17	687.33	687.50	687.66	687.82	687.98	688.14	688.31	688.47	688.63
700	712.04	712.21	712.38	712.54	712.71	712.88	713.05	713.22	713.38	713.55	713.72
725	737.07	737.24	737.42	737.59	737.77	737.94	738.11	738.29	738.46	738.64	738.81
750	762.10	762.28	762.46	762.64	762.82	763.00	763.18	763.36	763.54	763.72	763.90
775	787.13	787.32	787.50	787.69	787.87	788.06	788.25	788.43	788.62	788.80	788.99
800	812.16	812.35	812.54	812.74	812.93	813.12	813.31	813.50	813.70	813.89	814.08

Tab. C - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	Seat L = L + DL + 11.4										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
225	236.67	236.72	236.78	236.83	236.89	236.94	236.99	237.05	237.10	237.16	237.21
250	261.70	261.76	261.82	261.88	261.94	262.00	262.06	262.12	262.18	262.24	262.30
275	286.73	286.80	286.86	286.93	286.99	287.06	287.13	287.19	287.26	287.32	287.39
300	311.76	311.83	311.90	311.98	312.05	312.12	312.19	312.26	312.34	312.41	312.48
325	336.79	336.87	336.95	337.02	337.10	337.18	337.26	337.34	337.41	337.49	337.57
350	361.82	361.90	361.99	362.07	362.16	362.24	362.32	362.41	362.49	362.58	362.66
375	386.85	386.94	387.03	387.12	387.21	387.30	387.39	387.48	387.57	387.66	387.75
400	411.88	411.98	412.07	412.17	412.26	412.36	412.46	412.55	412.65	412.74	412.84
425	436.91	437.01	437.11	437.22	437.32	437.42	437.52	437.62	437.73	437.83	437.93
450	461.94	462.05	462.16	462.26	462.37	462.48	462.59	462.70	462.80	462.91	463.02
475	486.97	487.08	487.20	487.31	487.43	487.54	487.65	487.77	487.88	488.00	488.11
500	512.00	512.12	512.24	512.36	512.48	512.60	512.72	512.84	512.96	513.08	513.20

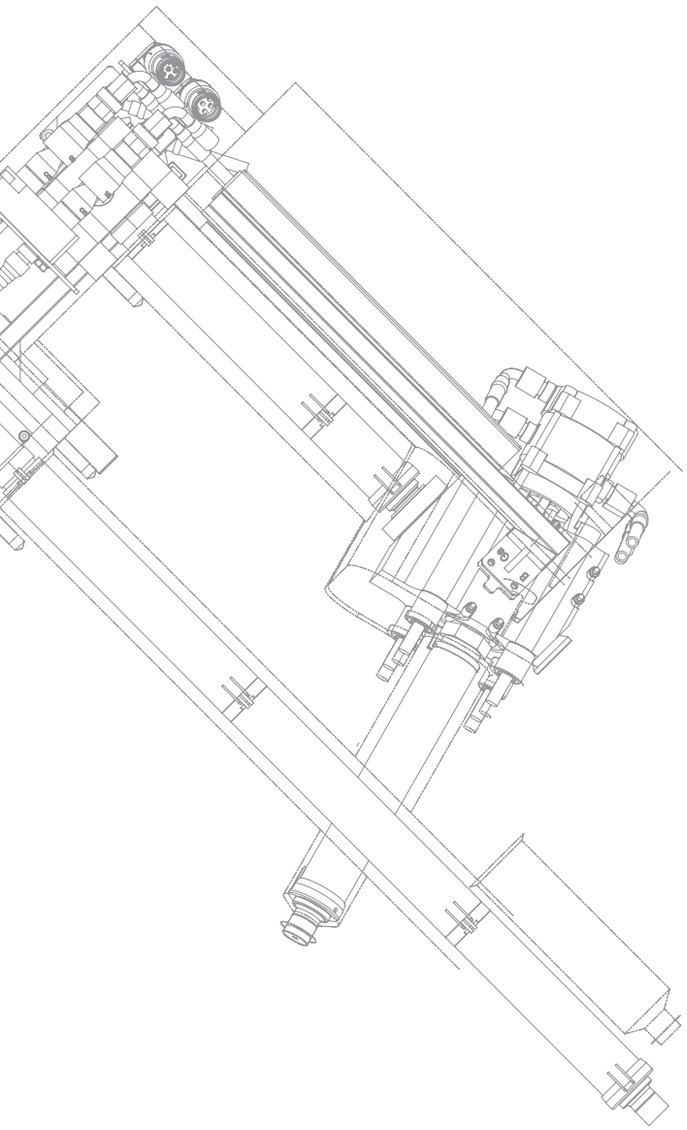
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Tab. D - "Seat L" Calculation

L (NOZZLE) [20°C]	ΔT 100÷110°C [ΔT=100°C]	111÷130°C [ΔT=120°C]	131÷150°C [ΔT=140°C]	151÷170°C [ΔT=160°C]	171÷190°C [ΔT=180°C]	191÷210°C [ΔT=200°C]	211÷230°C [ΔT=220°C]	231÷250°C [ΔT=240°C]	251÷270°C [ΔT=260°C]	271÷290°C [ΔT=280°C]	291÷300°C [ΔT=300°C]
	Seat L = L + DL + 15.4										
225	240.67	240.72	240.78	240.83	240.89	240.94	240.99	241.05	241.10	241.16	241.21
250	265.70	265.76	265.82	265.88	265.94	266.00	266.06	266.12	266.18	266.24	266.30
275	290.73	290.80	290.86	290.93	290.99	291.06	291.13	291.19	291.26	291.32	291.39
300	315.76	315.83	315.90	315.98	316.05	316.12	316.19	316.26	316.34	316.41	316.48
325	340.79	340.87	340.95	341.02	341.10	341.18	341.26	341.34	341.41	341.49	341.57
350	365.82	365.90	365.99	366.07	366.16	366.24	366.32	366.41	366.49	366.58	366.66
375	390.85	390.94	391.03	391.12	391.21	391.30	391.39	391.48	391.57	391.66	391.75
400	415.88	415.98	416.07	416.17	416.26	416.36	416.46	416.55	416.65	416.74	416.84
425	440.91	441.01	441.11	441.22	441.32	441.42	441.52	441.62	441.73	441.83	441.93
450	465.94	466.05	466.16	466.26	466.37	466.48	466.59	466.70	466.80	466.91	467.02
475	490.97	491.08	491.20	491.31	491.43	491.54	491.65	491.77	491.88	492.00	492.11
500	516.00	516.12	516.24	516.36	516.48	516.60	516.72	516.84	516.96	517.08	517.20
525	541.03	541.16	541.28	541.41	541.53	541.66	541.79	541.91	542.04	542.16	542.29
550	566.06	566.19	566.32	566.46	566.59	566.72	566.85	566.98	567.12	567.25	567.38
575	591.09	591.23	591.37	591.50	591.64	591.78	591.92	592.06	592.19	592.33	592.47
600	616.12	616.26	616.41	616.55	616.70	616.84	616.98	617.13	617.27	617.42	617.56
625	641.15	641.30	641.45	641.60	641.75	641.90	642.05	642.20	642.35	642.50	642.65
650	666.18	666.34	666.49	666.65	666.80	666.96	667.12	667.27	667.43	667.58	667.74
675	691.21	691.37	691.53	691.70	691.86	692.02	692.18	692.34	692.51	692.67	692.83
700	716.24	716.41	716.58	716.74	716.91	717.08	717.25	717.42	717.58	717.75	717.92
725	741.27	741.44	741.62	741.79	741.97	742.14	742.31	742.49	742.66	742.84	743.01
750	766.30	766.48	766.66	766.84	767.02	767.20	767.38	767.56	767.74	767.92	768.10
775	791.33	791.52	791.70	791.89	792.07	792.26	792.45	792.63	792.82	793.00	793.19
800	816.36	816.55	816.74	816.94	817.13	817.32	817.51	817.70	817.90	818.09	818.28

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hrsflow



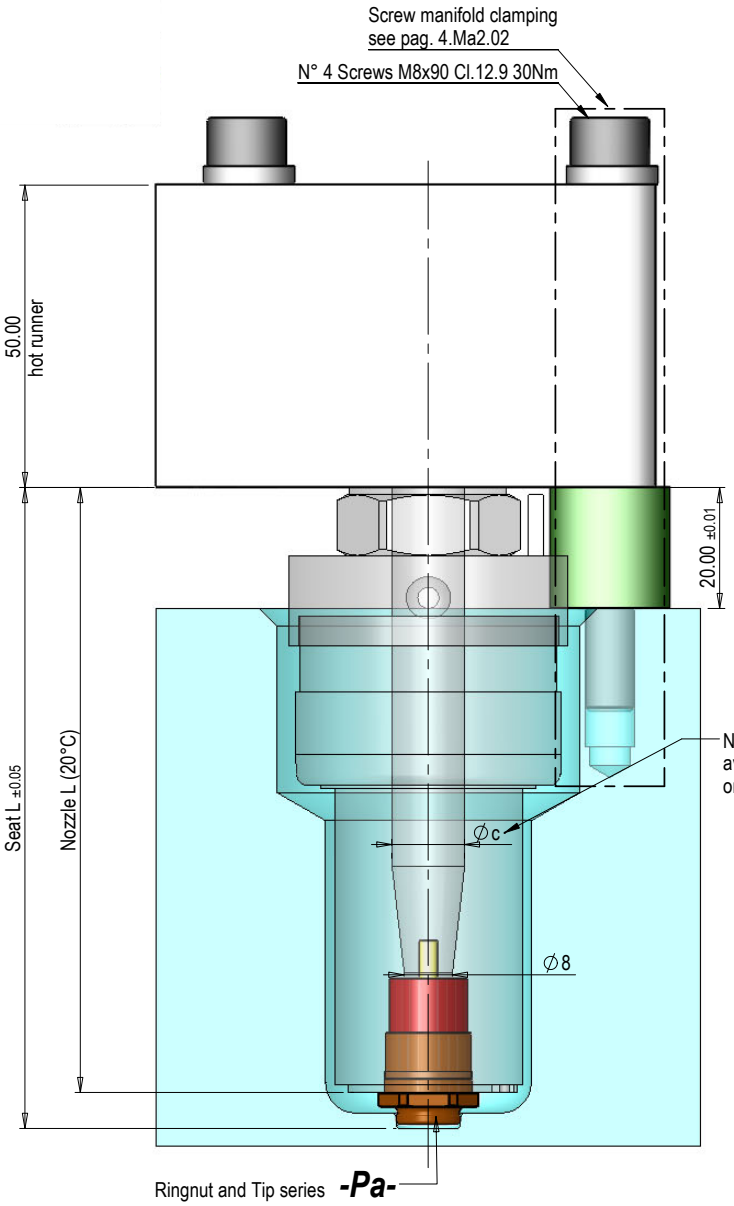
Mz series 10÷265 cm3/s

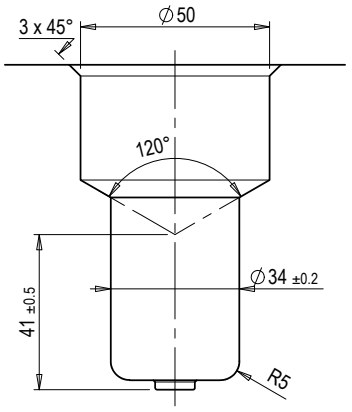
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SCREWED-IN NOZZLE (HYBRID series) with EXTERNAL ring only for VALVE GATING





For all reference codes see on page 4.Pa1.11

NOZZLE L	Available Lenght: PGC20	PGC30 PGY30
75	✓	✓
100	✓	✓
125	✓	✓
150	✓	✓
175	✓	✓
180	✓	✓
200	×	✓
225	×	✓
250	×	✓
275	×	✓
300	×	✓
325	×	✓
350	×	✓

For detailed dimensions of the injection point follow the instructions of the series -Pa- nozzles technical sheets (4.Pa1.18 ->)

(1) "L Seat" calculation with external ring nut according to the specifications of Injection type:

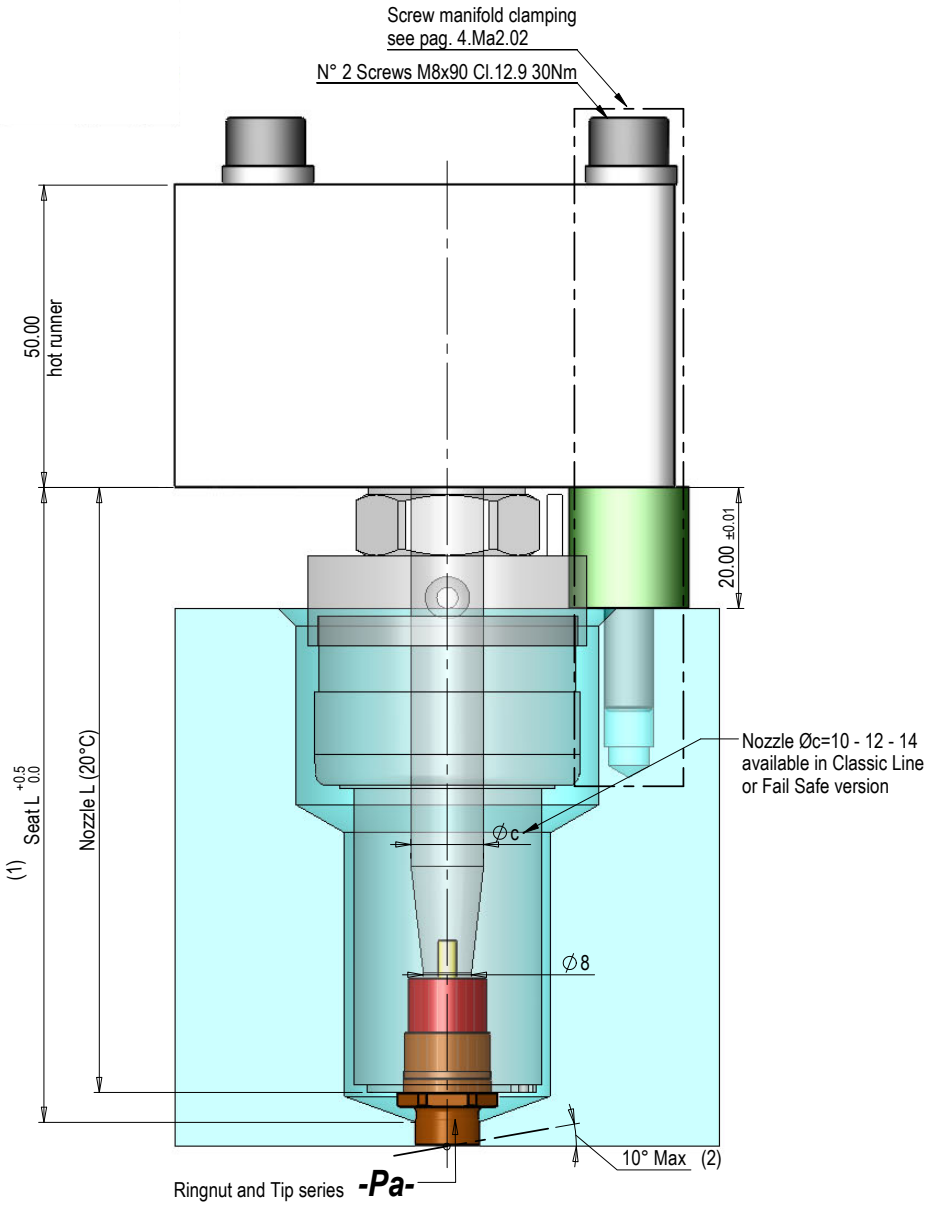
Seat L = L + DL + 5.7 => PGC20
Seat L = L + DL + 7.2 => PGC30, PGY30

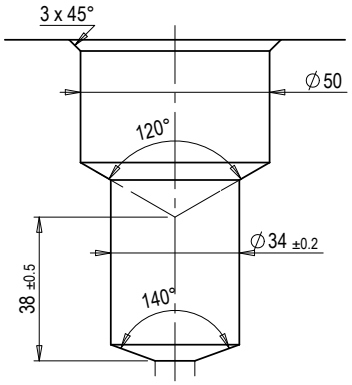
For "DL" values, see table on page 4.Mz1.02

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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SCREWED-IN NOZZLE (HYBRID series) with bushing through the cavi only for VALVE GATING





For all reference codes see on page 4.Pa1.11

L Iniettore - L Nozzle - L DÜSE
75
100
125
150
175
200
225
250
275
300
325
350
375
400
425
450
475
500

For detailed dimensions of the injection point follow the instructions of the series -Pa- nozzles technical sheets (Page 4.Pa1.19 ->)

(1) "L Seat" calculation with bushing through the cavity according to the specifications of Injection type:

Seat L = L + DL + 4.7 => PGC20
Seat L = L + DL + 7.2 => PGC30, PGY30

(2) Max angle allowed in all configurations (PGC30 included)

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

$\Delta T = T1 - T2$
$\lambda = 0.000012$ (1/°C)

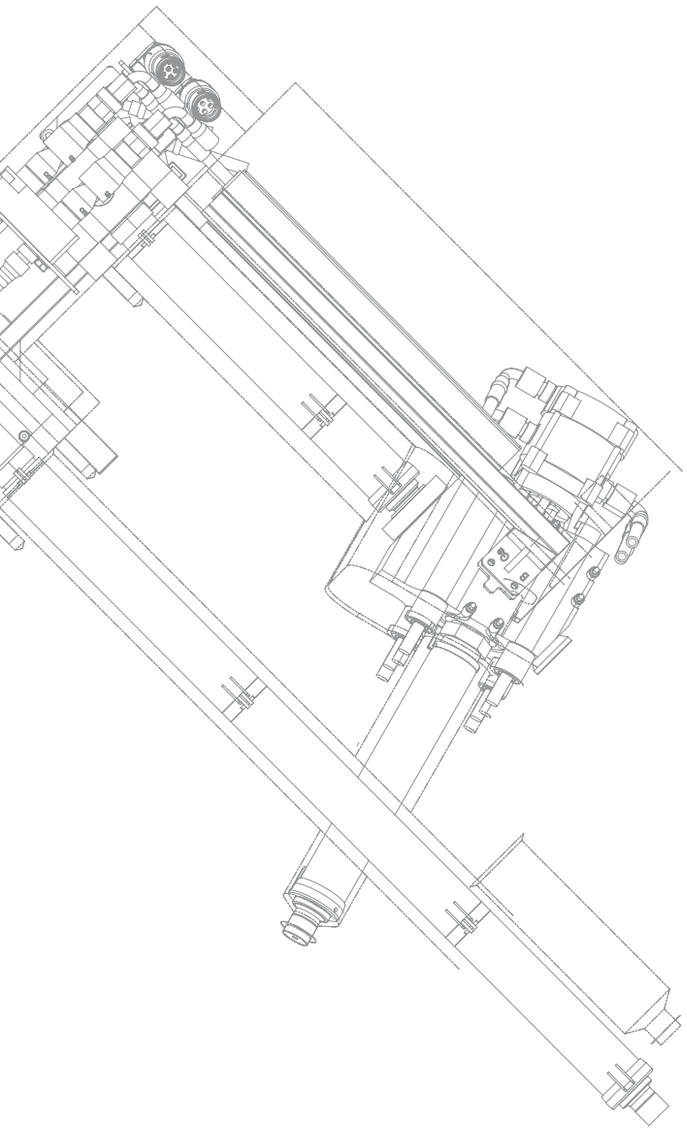
HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

NOZZLE EXPANSION Table

NOZZLE L	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
[20°C]	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	0.09	0.11	0.13	0.14	0.16	0.18	0.20	0.22	0.23	0.25	0.27
100	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36
125	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
180	0.22	0.26	0.30	0.35	0.39	0.43	0.48	0.52	0.56	0.60	0.65
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
275	0.33	0.40	0.46	0.53	0.59	0.66	0.73	0.79	0.86	0.92	0.99
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
325	0.39	0.47	0.55	0.62	0.70	0.78	0.86	0.94	1.01	1.09	1.17
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
375	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
425	0.51	0.61	0.71	0.82	0.92	1.02	1.12	1.22	1.33	1.43	1.53
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
475	0.57	0.68	0.80	0.91	1.03	1.14	1.25	1.37	1.48	1.60	1.71
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80

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Gz

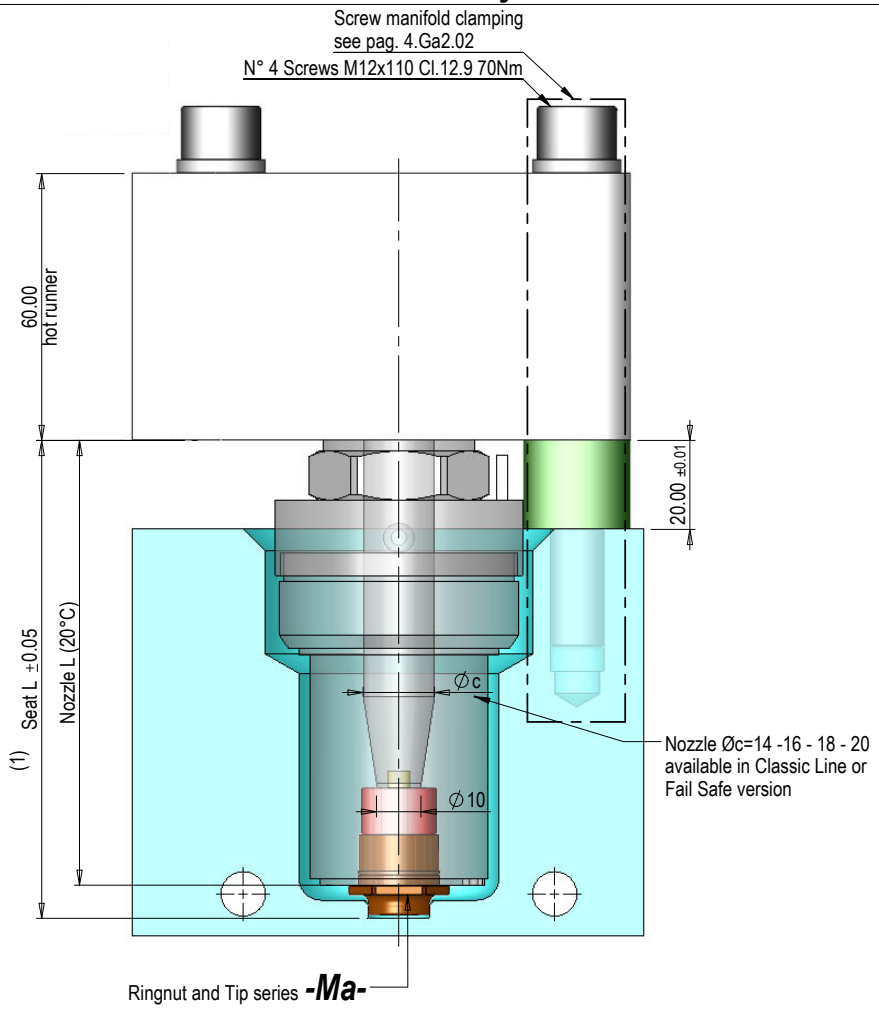
Gz series 100÷1265 cm3/s

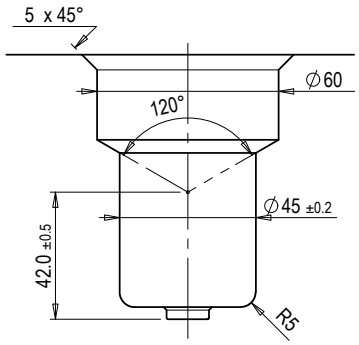
Serie Gz
Gz Serie
Gz Série
Gz Serie
Gz Série

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SCREWED-IN NOZZLE (HYBRID series) with EXTERNAL ring only for VALVE GATING





For all reference codes see on page 4.Ma1.12

NOZZLE L	Available Lenght: PGC20 - PGC30 Lux - PGY30 Lux	PGC30 PGY30
100	✓	✓
125	✓	✓
150	✓	✓
175	✓	✓
200	✓	✓
225	✓	✓
250	✓	✓
300	✓	✓
350	✓	✓
400	×	✓
450	×	✓
500	×	✓
550	×	✓
600	×	✓
650	×	✓
700	×	✓
725	×	✓

For detailed dimensions of the injection point follow the instructions of the series -Ma- nozzles technical sheets (4.Ma1.24 ->)

(1) "L Seat" calculation with external ring nut according to the specifications of Injection type:

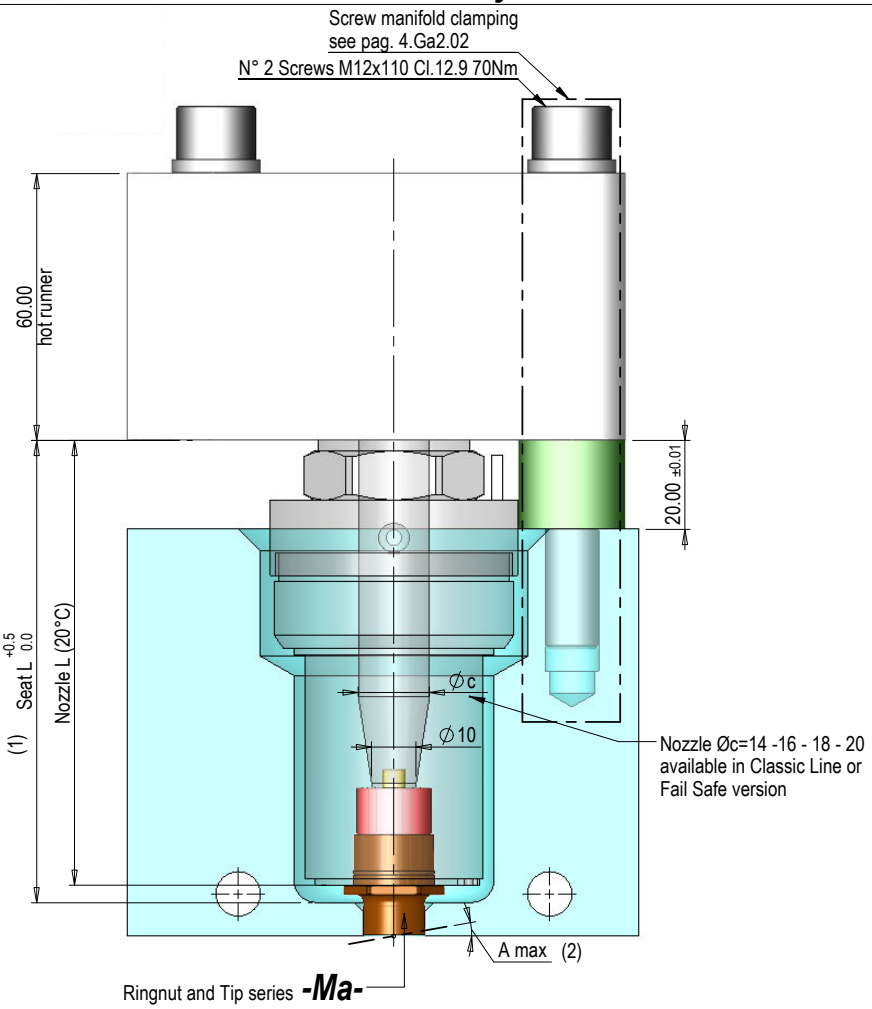
Seat L = L + DL + 7.2 => PGC20
Seat L = L + DL + 10.7 => PGC30, PGY30
Seat L = L + DL + 10.7 => PGY30
Seat L = L + DL + 7.7 => PGC30 Lux, PGY30 Lux

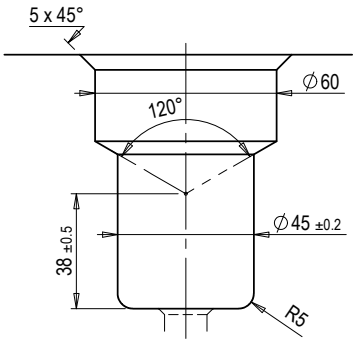
For "DL" values, see table on page 4.Gz1.02

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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SCREWED-IN NOZZLE (HYBRID series) with bushing through the cavi only for VALVE GATING





For all reference codes see on page 4.Ma1.12

L Iniettore - L Nozzle - L DÜSE
100
125
150
175
200
225
250
300
350
400
450
500
550
600
650
700
725

For detailed dimensions of the injection point follow the instructions of the series -Ma- nozzles technical sheets (4.Ma1.05 ->)

(1) "L Seat" calculation with external ring nut according to the specifications of Injection type:

Seat L = L + DL + 3.7 => PGC20
Seat L = L + DL + 4.7 => PGC30, PGY30

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

A = 0° ÷ 10 ° max => PGC20, PGY30
A = 0° ÷ 15 ° max => PGC30

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

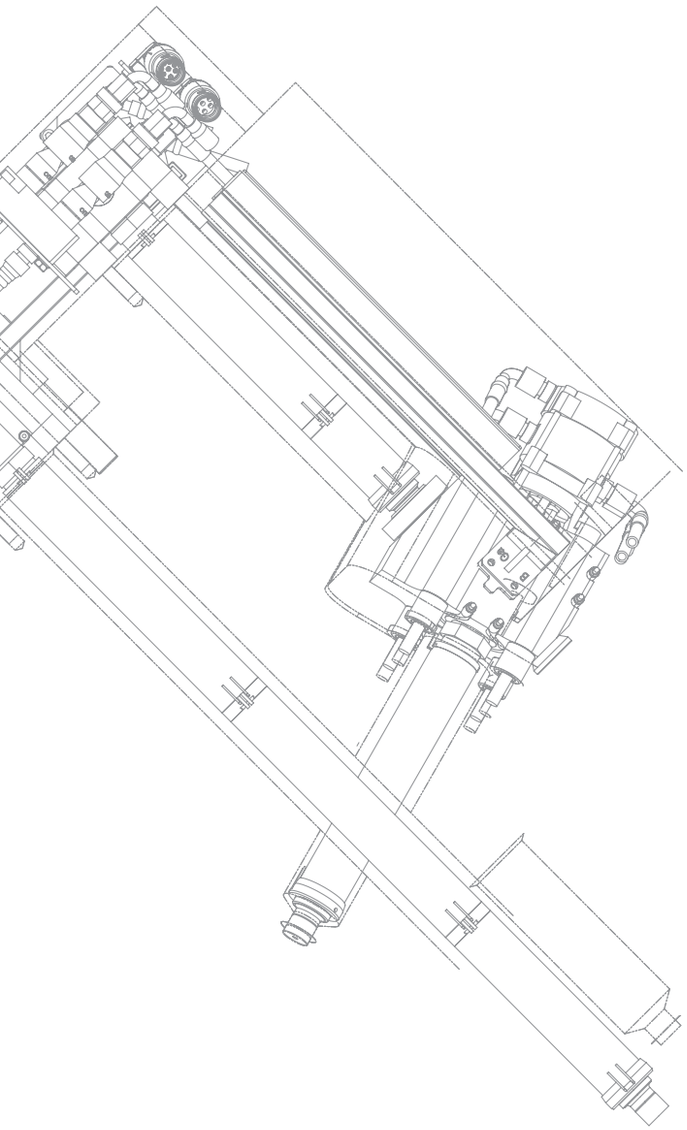
ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

NOZZLE L	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
[20°C]	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
100	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36
125	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45
150	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.43	0.47	0.50	0.54
175	0.21	0.25	0.29	0.34	0.38	0.42	0.46	0.50	0.55	0.59	0.63
200	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72
225	0.27	0.32	0.38	0.43	0.49	0.54	0.59	0.65	0.70	0.76	0.81
250	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90
300	0.36	0.43	0.50	0.58	0.65	0.72	0.79	0.86	0.94	1.01	1.08
350	0.42	0.50	0.59	0.67	0.76	0.84	0.92	1.01	1.09	1.18	1.26
400	0.48	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.25	1.34	1.44
450	0.54	0.65	0.76	0.86	0.97	1.08	1.19	1.30	1.40	1.51	1.62
500	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80
550	0.66	0.79	0.92	1.06	1.19	1.32	1.45	1.58	1.72	1.85	1.98
600	0.72	0.86	1.01	1.15	1.30	1.44	1.58	1.73	1.87	2.02	2.16
650	0.78	0.94	1.09	1.25	1.40	1.56	1.72	1.87	2.03	2.18	2.34
700	0.84	1.01	1.18	1.34	1.51	1.68	1.85	2.02	2.18	2.35	2.52
725	0.87	1.04	1.22	1.39	1.57	1.74	1.91	2.09	2.26	2.44	2.61

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Thrusted System

Serie Contrastata

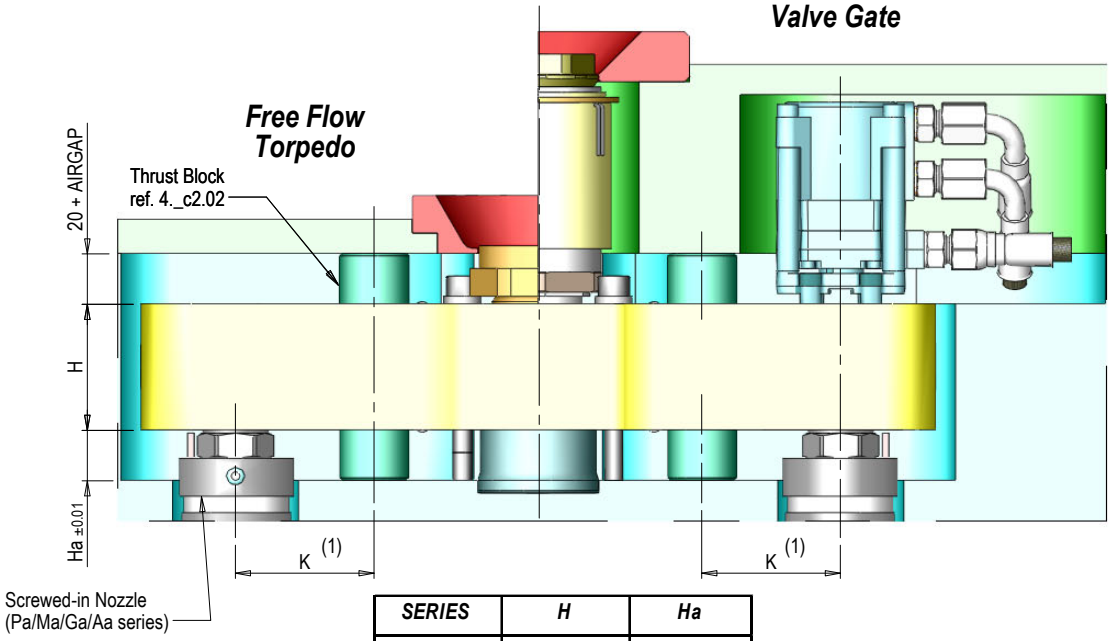
Geprüftes System

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MANIFOLD WITHOUT FIXING SCREWS
("THRUSTED" system)

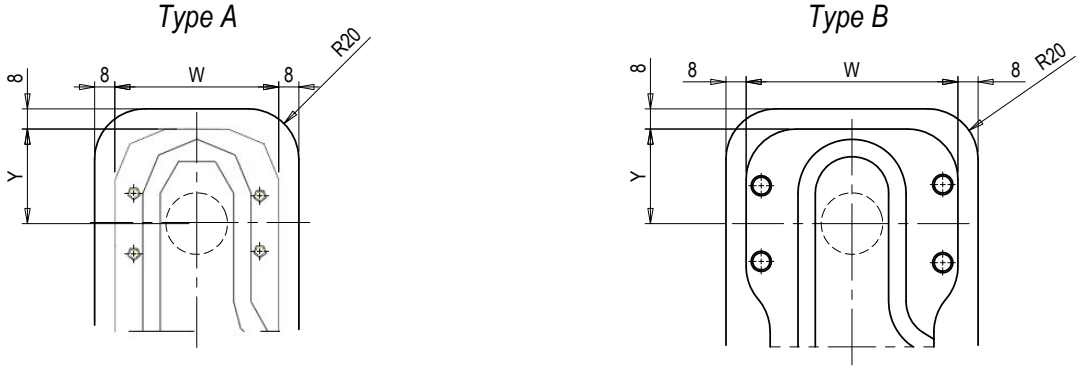
HRS combines the four screwed series (Pa, Ma, Ga, Aa) previously shown with four series named "Thrusted system": Pc, Mc, Gc, Ac. These differ from the screwed-in standard series due to the absence of the manifold fixing screws that characterize each injection point. The screws absence allows a discreet reduction of the manifold pocket. The force from the molding material is counteracted by special thrust blocks installed on both sides of the manifold placed near each injection axis which allow the positioning of the HRS system in the mold. Use of these series with Face to Face nozzles is not allowed.



SERIES	H	Ha
Pc	40.00	10.00
Mc	50.00	20.00
Gc	60.00	
Ac	70.00	

(1) The "K" value will be defined by the HRS Technical Office during the design.

Manifold Shape

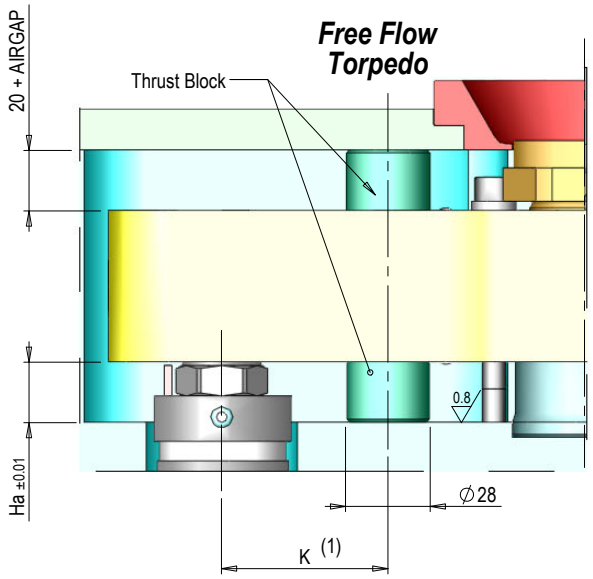


SERIES	INJECTION TYPE	CYLINDER TYPE	SHAPE	W	Y
Pc - Mc	Free Flow / Torpedo	-	Type A	65	38
	Valve Gate	on manifold pneumatic /			
	Valve Gate	Lateral / Electric	Type B	84	
Gc - Ac	Free Flow / Torpedo	-	Type A	78	52
	Valve Gate	on manifold pneumatic /			
	Valve Gate	Lateral / Electric	Type B	84	

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MANIFOLD WITHOUT FIXING SCREWS
("THRUSTED" system)

The thrust blocks are 20mm high (10 mm for Pc series). For all series the standard upper thrust block is 20mm high (editable in special cases). Upper thrust block always requires anair gap . The air gap distance is specific for each system and will be notified from the HRS Technical Office during the design.
The exact positions ot the thrust blocks ("K" value") will aslo be notified during the design.

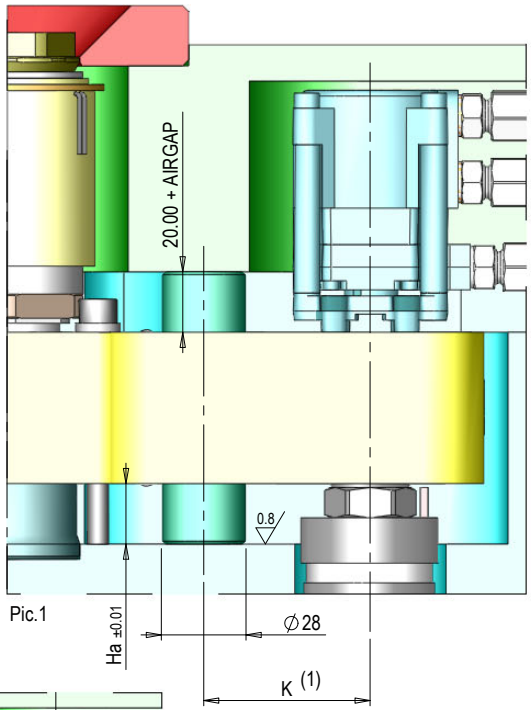


SERIES	Ha	CODE
Pc	10.00	0004-00070
Mc	20.00	0004-00072
Gc		
Ac		

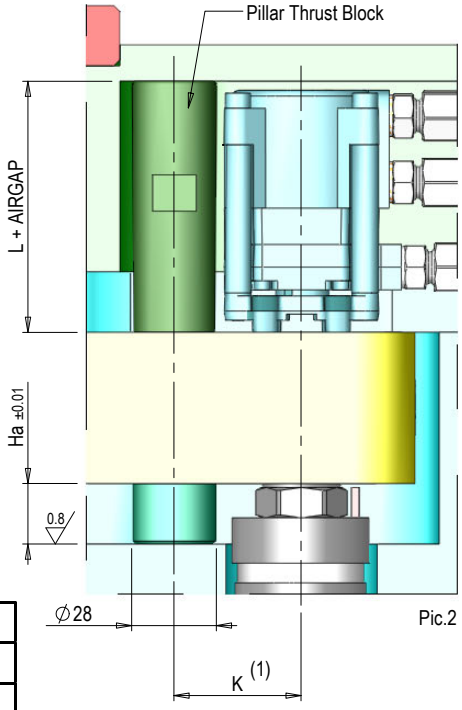
(1) The "K" value will be defined by the HRS Technical Office during the design.

Valve Gate

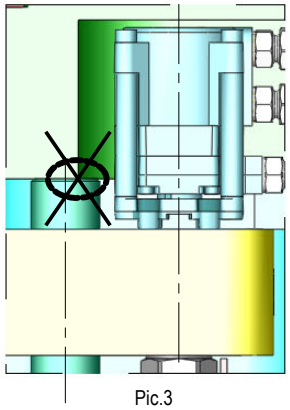
Normally the Valve Gate systems use the same thrust block of the Free Flow/Torpedo systems (Pic.1). In special situations a pillar thrust block can be used to extend the height of the cylinder pocket (Pic.2). In all cases, avoid that the annular surface of the thrust block is partially placed in contatct with the mold. (Pic.3)



Pic.1



Pic.2



Pic.3

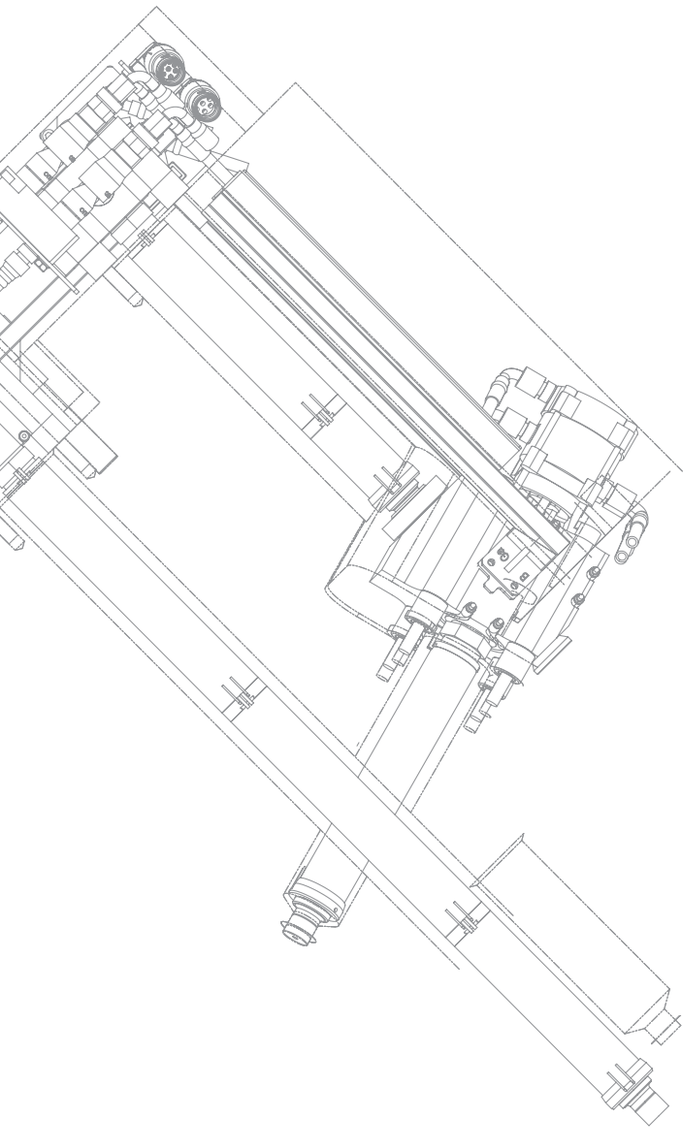
SERIES
Pc
Mc
Gc
Ac

mm 66.5 ≤ L ≤ 148 mm

(1) The "K" value will be defined by the HRS Technical Office during the design.

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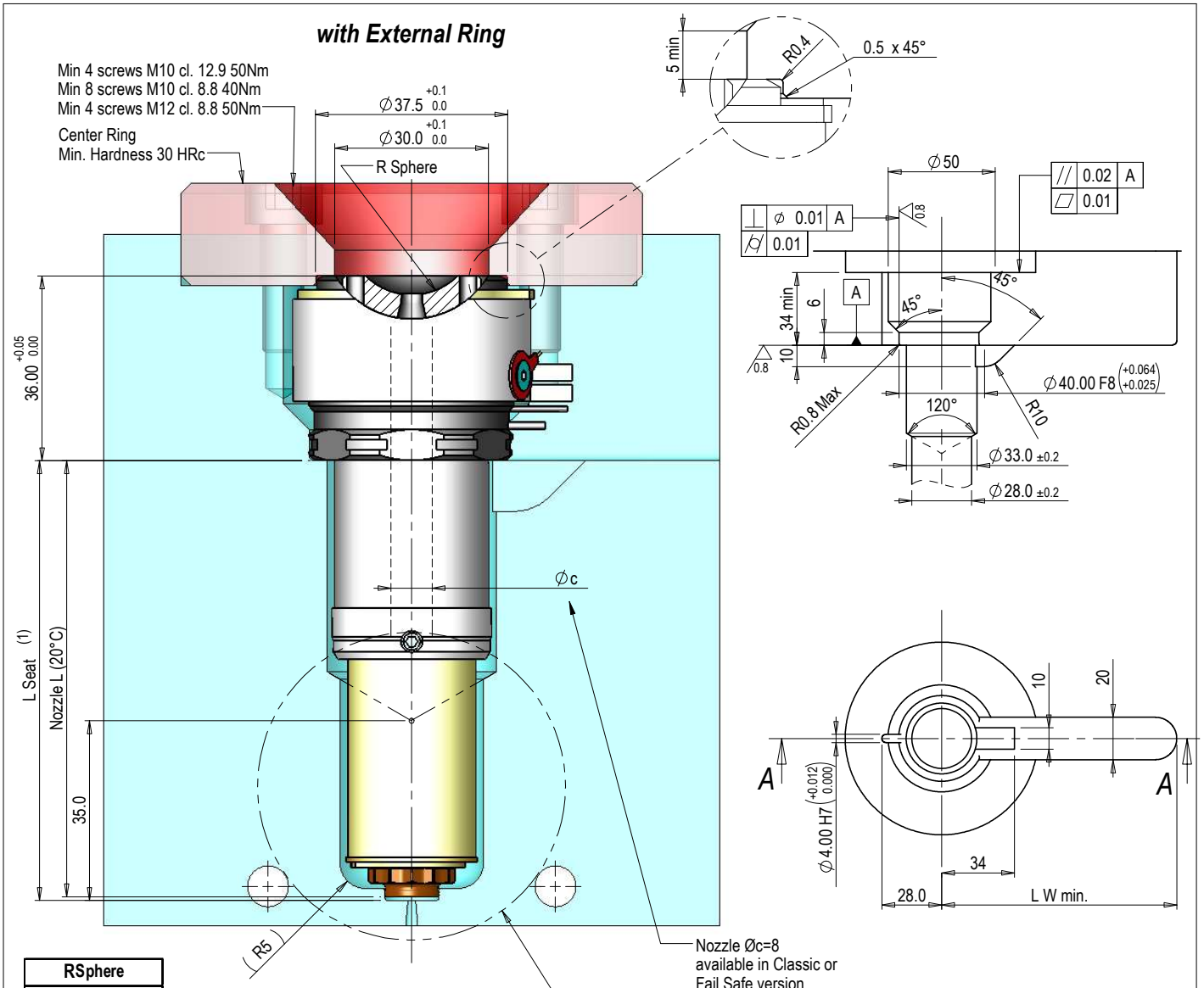
Single Nozzles Series

Serie Iniettori Singoli
Einzeldüsen Serie
Série Mono Buses
Serie Boquillas Unitárias
Série Bicos Unitários

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with External Ring

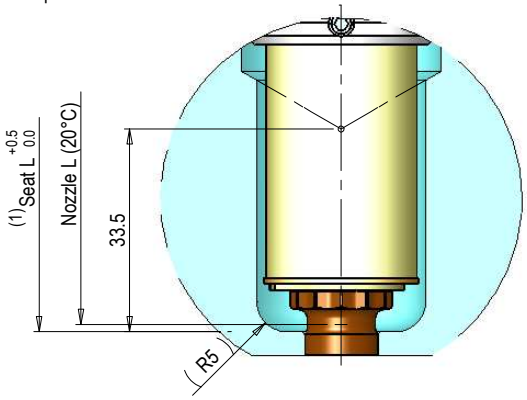


Ringnut and Tip series **-Pp-**
For detailed dimensions of the injection point follow the instructions of the series -Pp- nozzles technical sheets (Page 4.P1.02->)

RSphere	
R0 *(standard)*	
R12.7	(1/2")
R15.5	
R19.1	(3/4")
R25	(1")
R40	

"RSphere"=0 Standard.
Other sizes to be required

with Bushing through the cavity



(1) Dimension and tolerance of the "Seat L" in according to the formula showed in the -Pp- technical sheet of injection point pre-selected. For values of "Nozzle L" and "DL" refer to table pag. 4.Ps1.02.

For Tips and Ring nuts reference codes go on page 4.P1.09

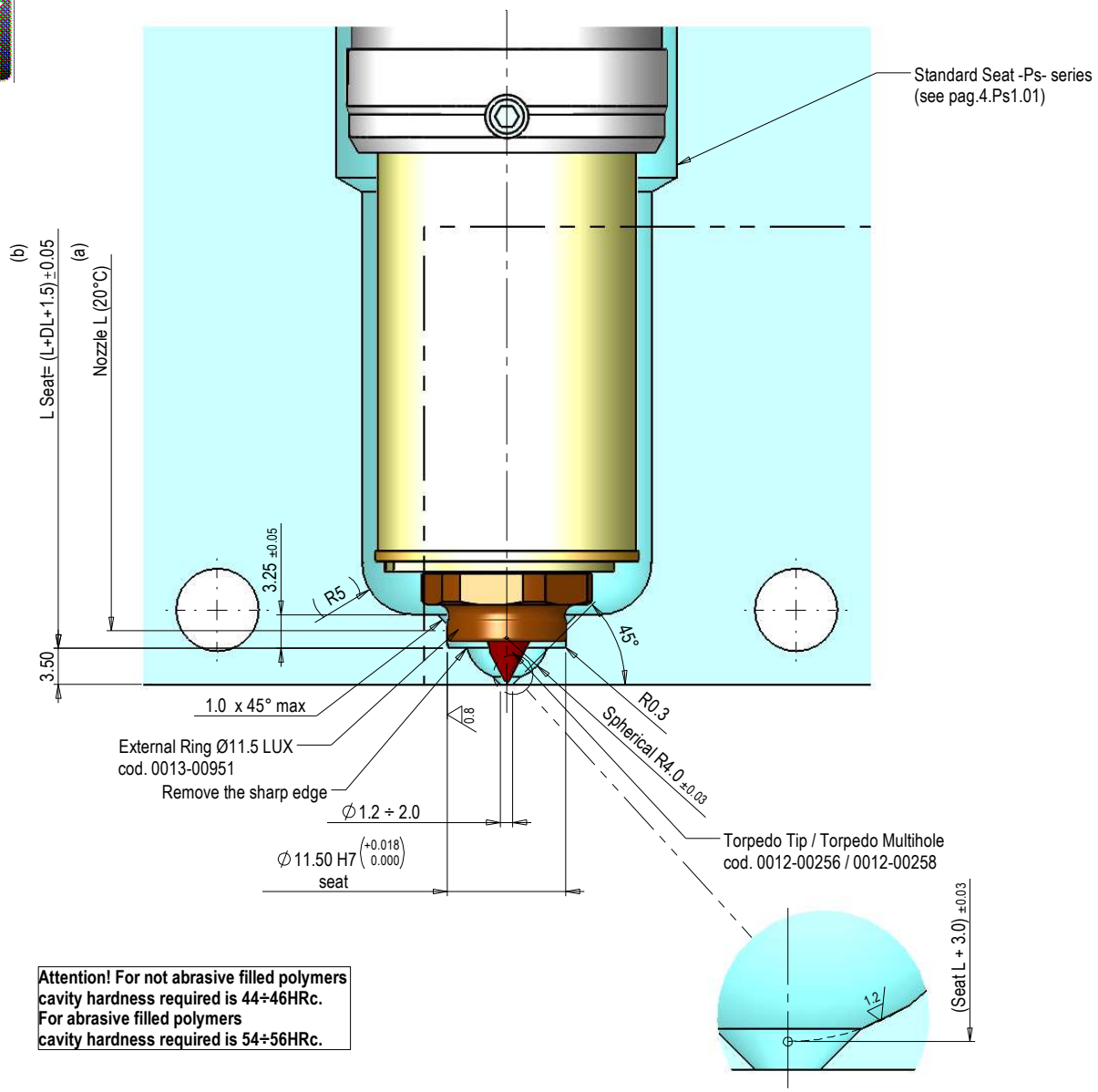
NOZZLE L	*L W min.*
45	125
60	125
85	225
110	225
135	250
160	250
185	250
210	250

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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Torpedo



Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

(a) (b) For values of "Nozzle L" and "DL" refer to below table.

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

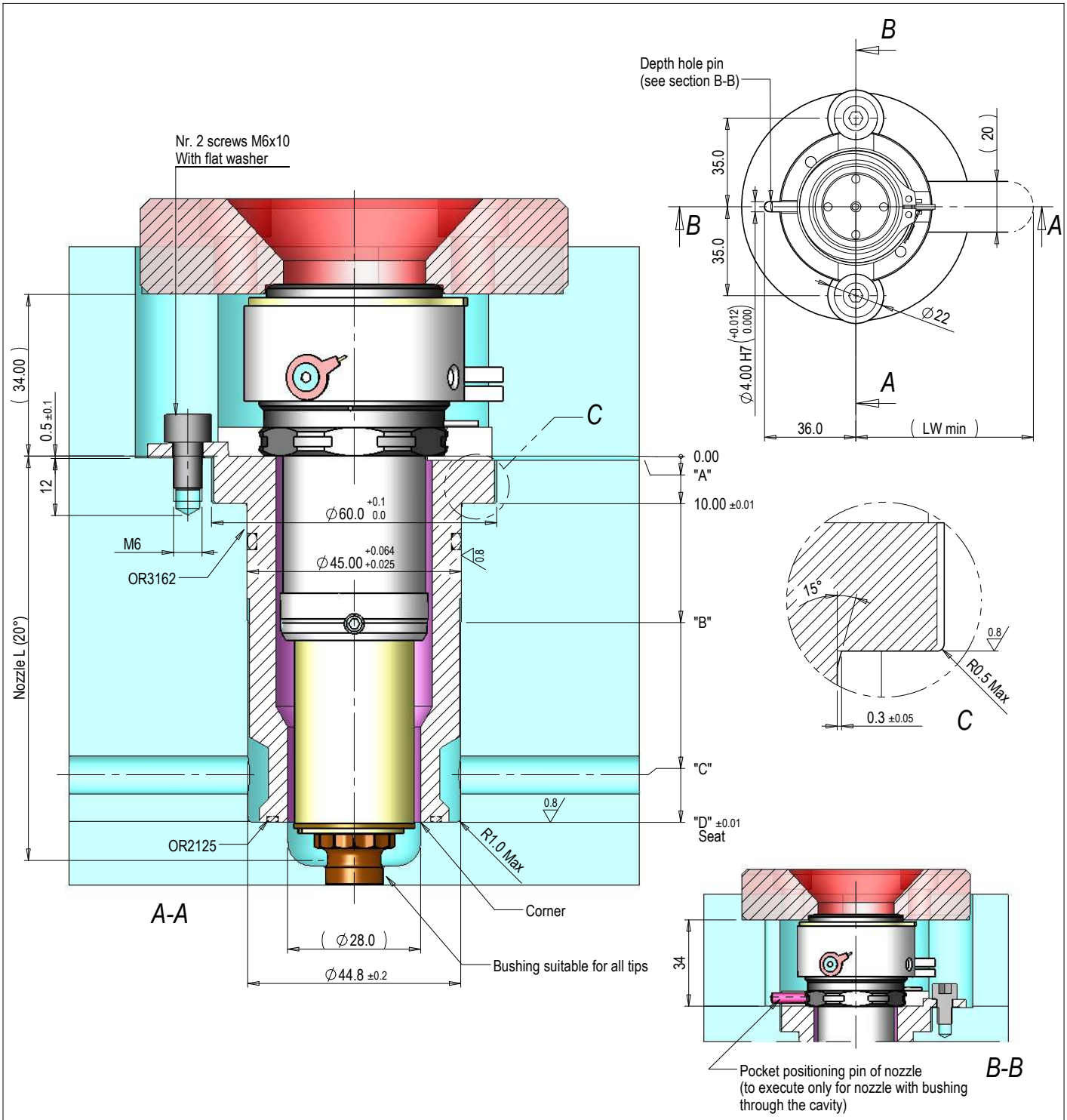
NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	*ΔT 100÷110°C*	*111÷130°C*	*131÷150°C*	*151÷170°C*	*171÷190°C*	*191÷210°C*	*211÷230°C*	*231÷250°C*	*251÷270°C*	*271÷290°C*	*291÷300°C*
	*DL = (L * ΔT * λ)*										
	[ΔT=100°C]	*[ΔT=120°C]*	*[ΔT=140°C]*	*[ΔT=160°C]*	*[ΔT=180°C]*	*[ΔT=200°C]*	*[ΔT=220°C]*	*[ΔT=240°C]*	*[ΔT=260°C]*	*[ΔT=280°C]*	*[ΔT=300°C]*
45	0.05	0.06	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16
60	0.07	0.09	0.10	0.12	0.13	0.14	0.16	0.17	0.19	0.20	0.22
85	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.27	0.29	0.31
110	0.13	0.16	0.18	0.21	0.24	0.26	0.29	0.32	0.34	0.37	0.40
135	0.16	0.19	0.23	0.26	0.29	0.32	0.36	0.39	0.42	0.45	0.49
160	0.19	0.23	0.27	0.31	0.35	0.38	0.42	0.46	0.50	0.54	0.58
185	0.22	0.27	0.31	0.36	0.40	0.44	0.49	0.53	0.58	0.62	0.67
210	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.66	0.71	0.76

index

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COOLING BUSHING



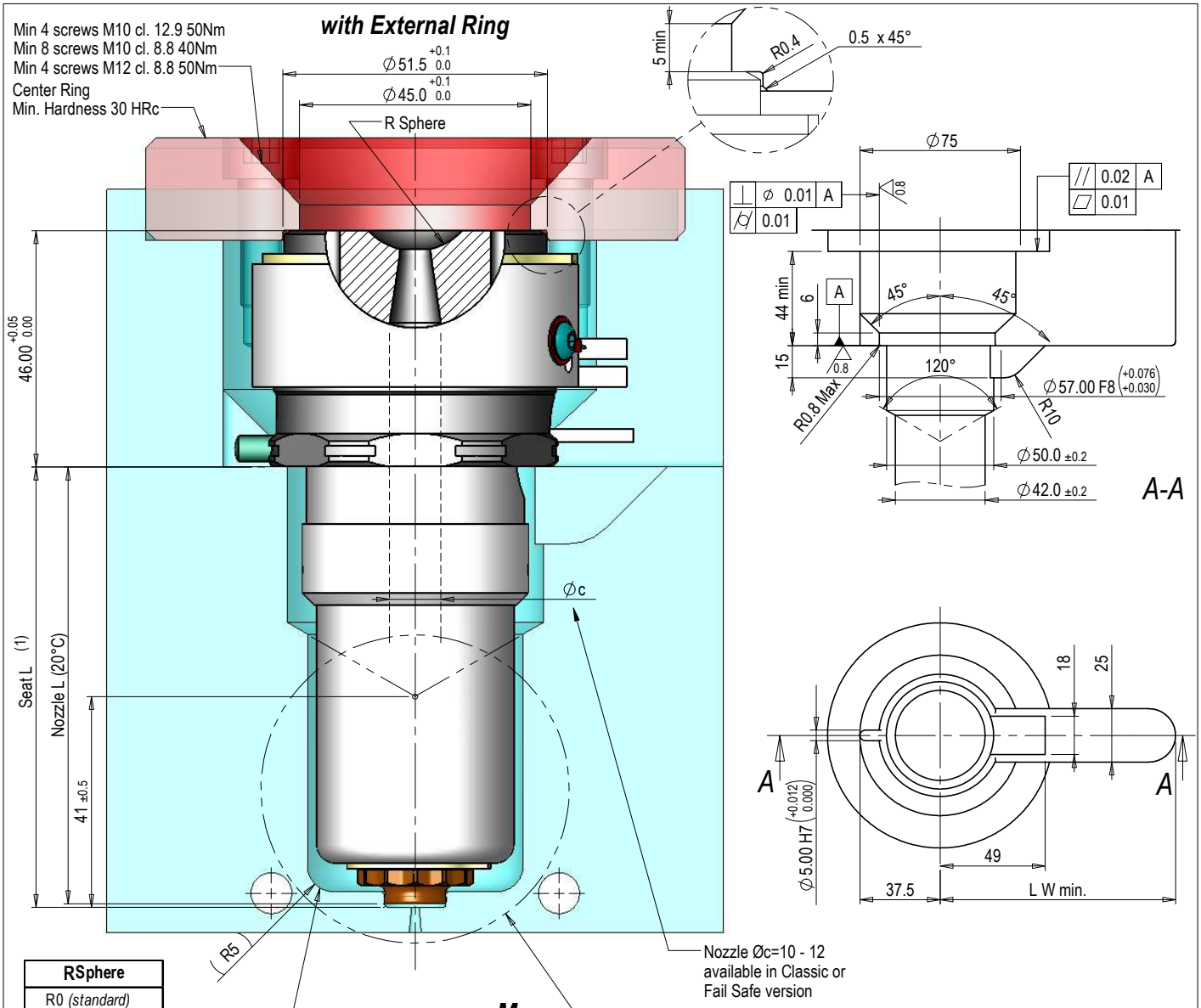
BUSHING CODE	NOZZLE L (*)	A	B	C	D	LW min.
0002-00151	45	1	25	29	37.00	125
0002-00152	60	2	35	42	52.00	125
0002-00153	85	2	35	67	77.00	225
0002-00154	110	2	35	92	102.00	225
0002-00155	135	2	35	117	127.00	250
0002-00156	160	2	35	142	152.00	250

(*) In case cooling is required on standard nozzle with L>160mm, an extension insert is needed. Its manufacturing is on customer's care.

For further manufacturing details, refer to page 4._s1.02

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with External Ring

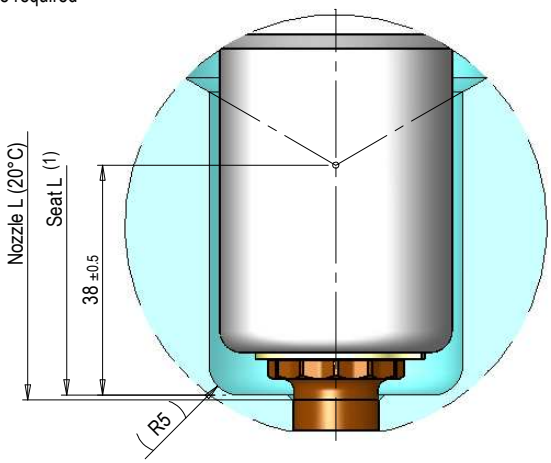


RSphere	
R0 *(standard)*	
R12.7	(1/2")
R15.5	
R19.1	(3/4")
R25	(1")
R40	

"RSphere"=0 Standard.
Other sizes to be required

(1) Dimension and tolerance of the "Seat L" in according to the formula showed in the -Mp- technical sheet of injection point pre-selected.
For values of "Nozzle L" and "DL" refer to table pag. 4.Ms1.03.
For Tips and Ring nuts reference codes go on page 4.M1.15

with Bushing through the cavity

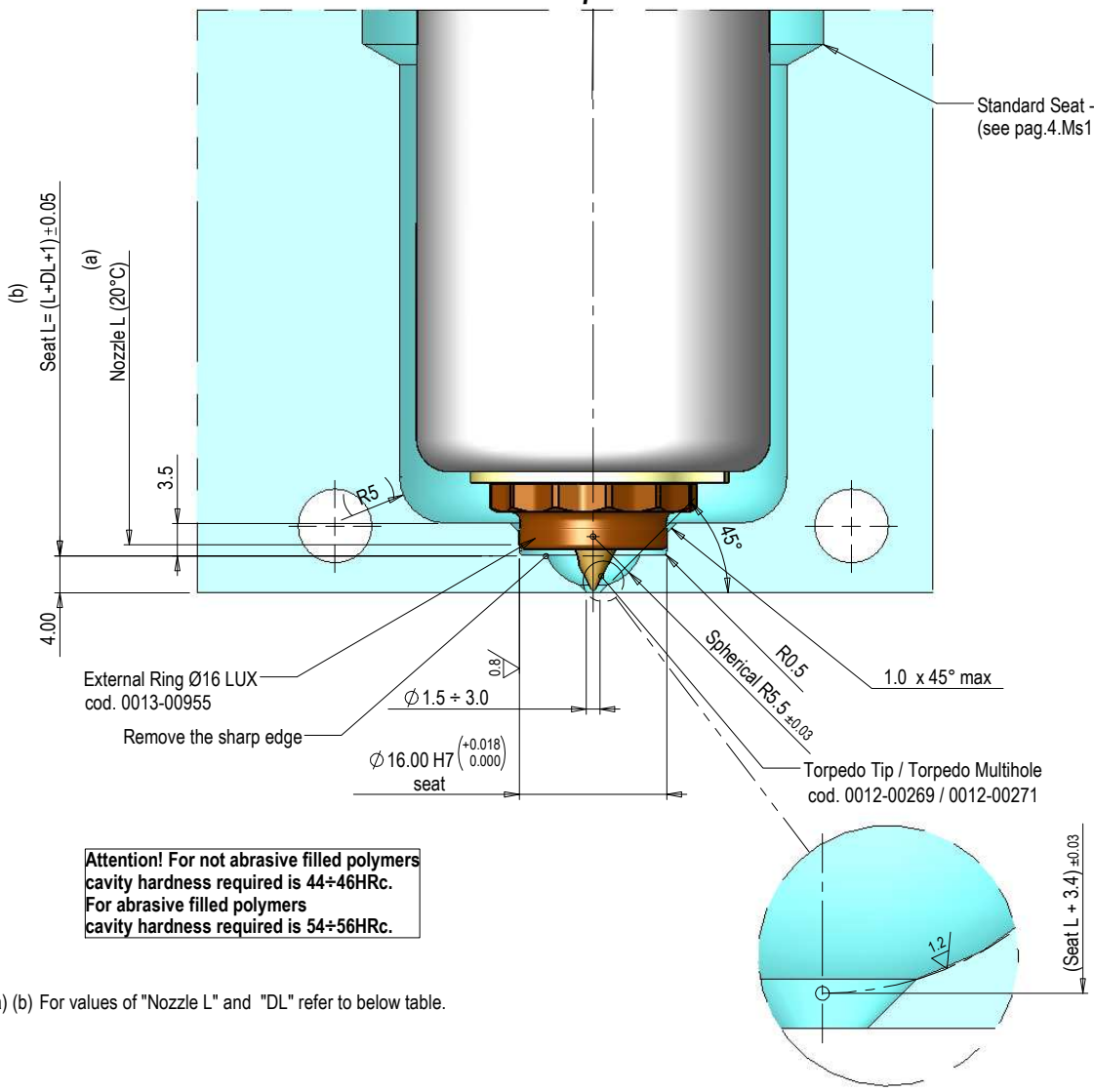


NOZZLE L *L*	*L W min.*
45	125.00
60	125.00
85	125.00
110	125.00
135	125.00
160	275.00
185	275.00
210	175.00
235	175.00
260	125.00
285	125.00
310	225.00
335	225.00
360	250.00

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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Torpedo



Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

(a) (b) For values of "Nozzle L" and "DL" refer to below table.

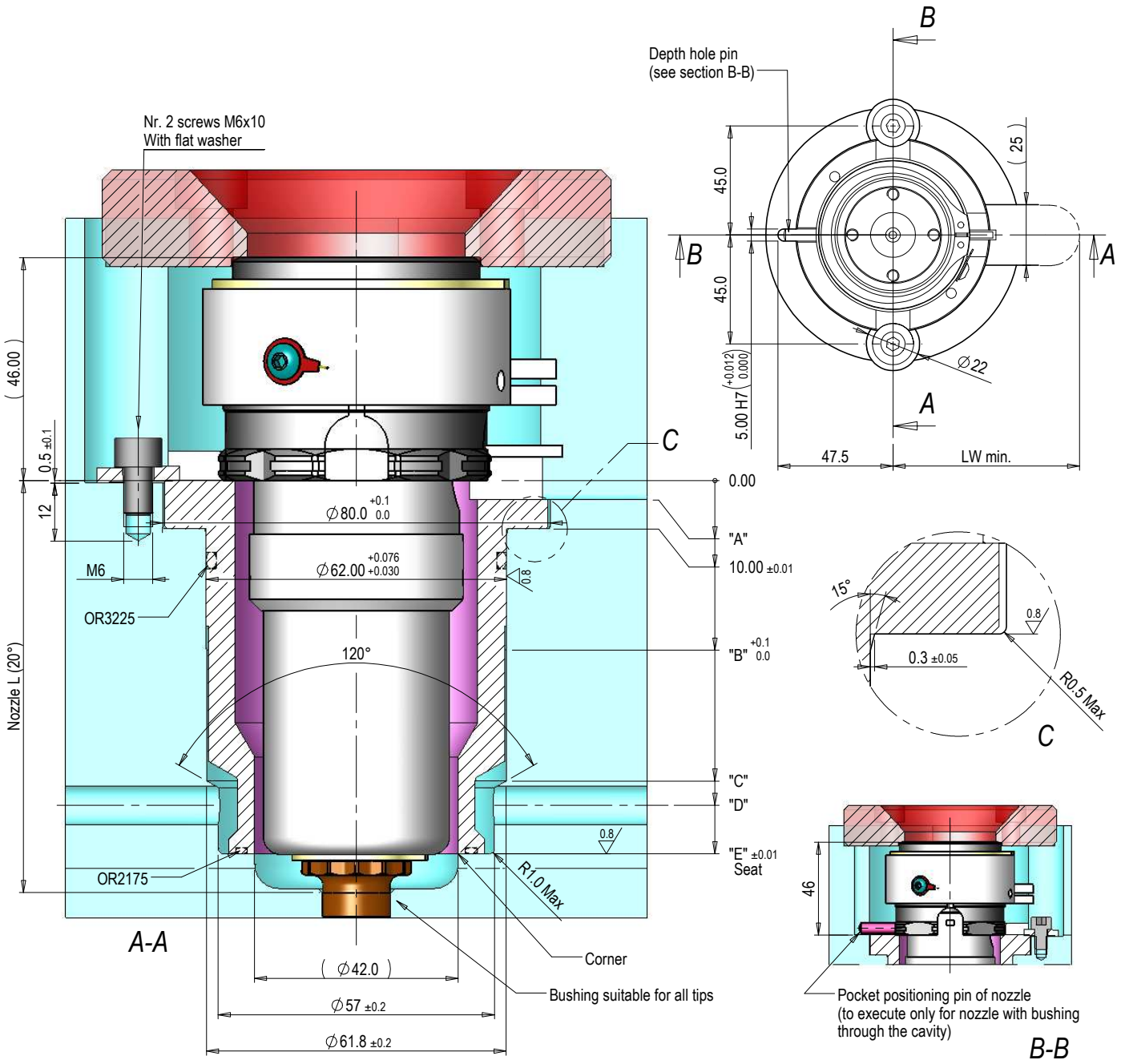
T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
45	0.05	0.06	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16
60	0.07	0.09	0.10	0.12	0.13	0.14	0.16	0.17	0.19	0.20	0.22
85	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.27	0.29	0.31
110	0.13	0.16	0.18	0.21	0.24	0.26	0.29	0.32	0.34	0.37	0.40
135	0.16	0.19	0.23	0.26	0.29	0.32	0.36	0.39	0.42	0.45	0.49
160	0.19	0.23	0.27	0.31	0.35	0.38	0.42	0.46	0.50	0.54	0.58
185	0.22	0.27	0.31	0.36	0.40	0.44	0.49	0.53	0.58	0.62	0.67
210	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.66	0.71	0.76
235	0.28	0.34	0.39	0.45	0.51	0.56	0.62	0.68	0.73	0.79	0.85
260	0.31	0.37	0.44	0.50	0.56	0.62	0.69	0.75	0.81	0.87	0.94
285	0.34	0.41	0.48	0.55	0.62	0.68	0.75	0.82	0.89	0.96	1.03
310	0.37	0.45	0.52	0.60	0.67	0.74	0.82	0.89	0.97	1.04	1.12
335	0.40	0.48	0.56	0.64	0.72	0.80	0.88	0.96	1.05	1.13	1.21
360	0.43	0.52	0.60	0.69	0.78	0.86	0.95	1.04	1.12	1.21	1.30

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BUSHING CODE	NOZZLE L (*)	A	B	C	D	E	LW min.
0002-00157	45	4	21.5	22	30	37.00	125
0002-00158	60	10	35	37	42	52.00	125
0002-00159	85	10	35	62	67	77.00	125
0002-00160	110	10	35	87	92	102.00	125
0002-00161	135	10	35	112	117	127.00	125
0002-00162	160	10	35	137	142	152.00	275
0002-00163	185	10	35	162	167	177.00	275

(*) In case cooling is required on standard nozzle with L>185mm, an extension insert is needed. Its manufacturing is on customer's care.

For further manufacturing details, refer to page 4._s1.02

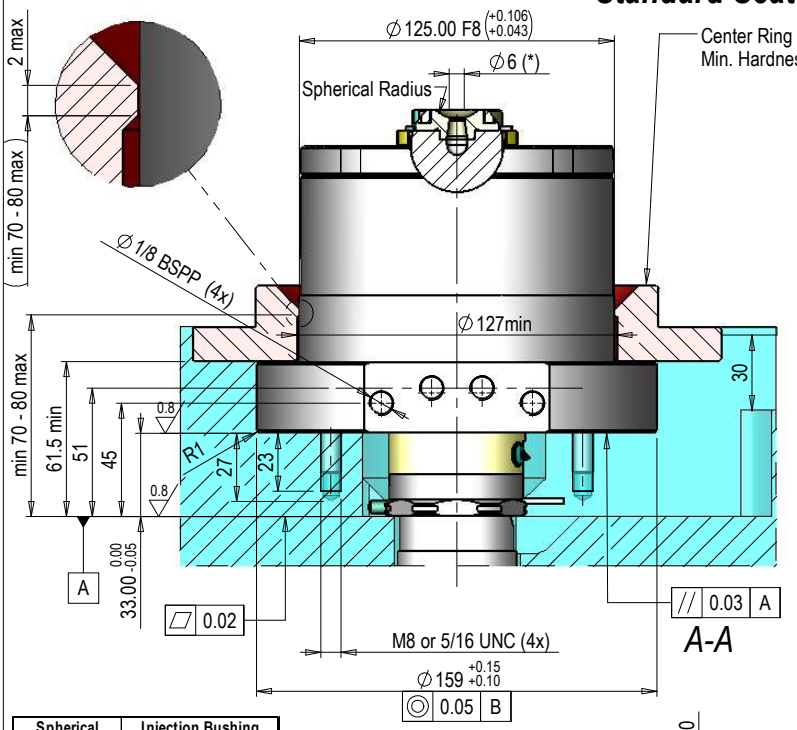
index

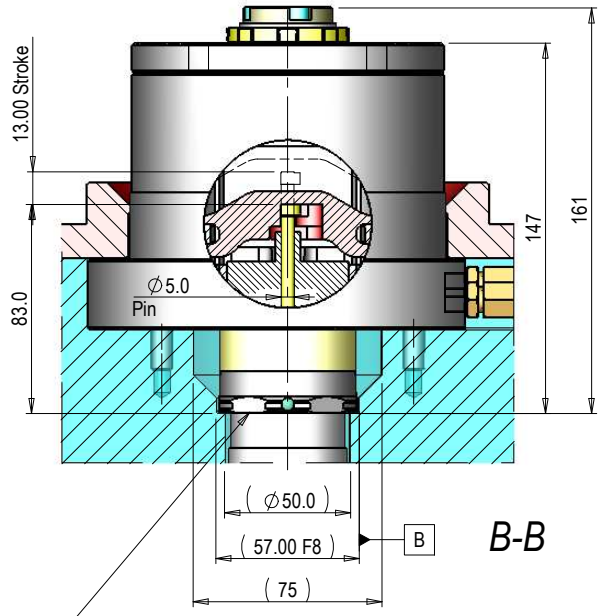
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Standard Seat

Max pressure Hydraulic: 25 bar
Max pressure Pneumatic: 15 bar

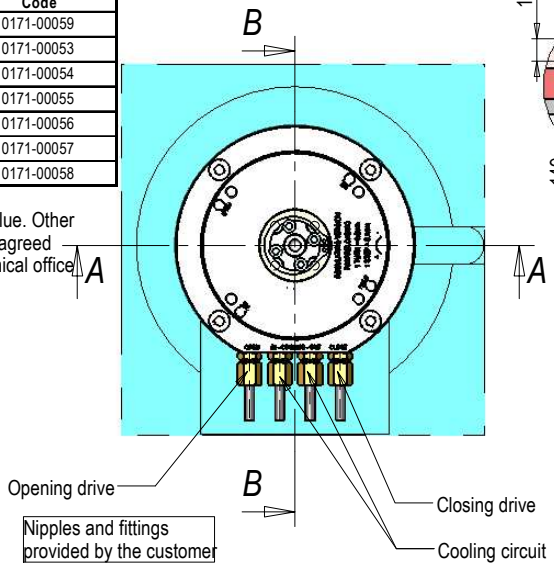
The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job

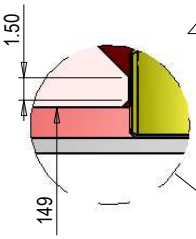




Spherical Radius	Injection Bushing Code
0	0171-00059
12.7 (1/2")	0171-00053
15.5	0171-00054
19.1 (3/4")	0171-00055
25 (1")	0171-00056
40	0171-00057
5x45°	0171-00058

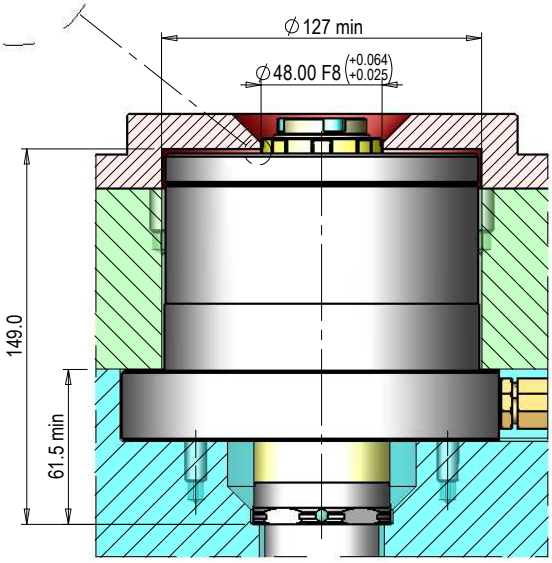
(*) Ø6 Standard value. Other values can be pre-agreed with the HRS technical office

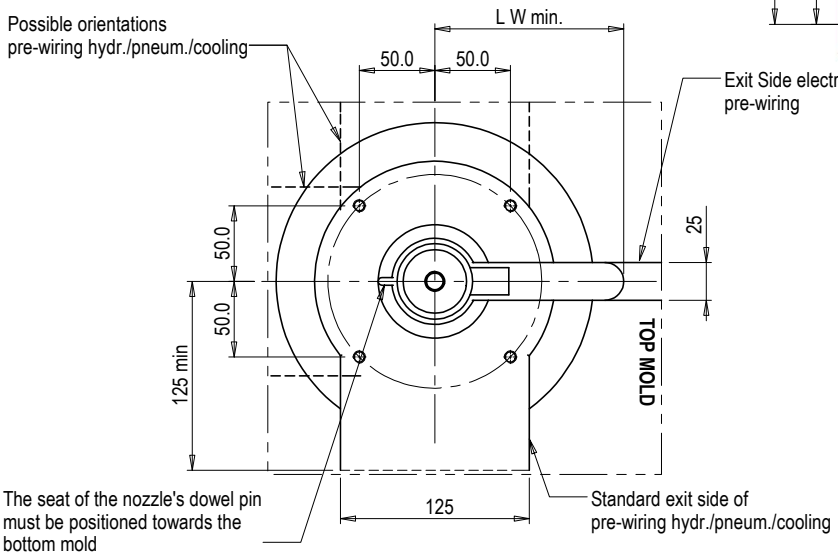




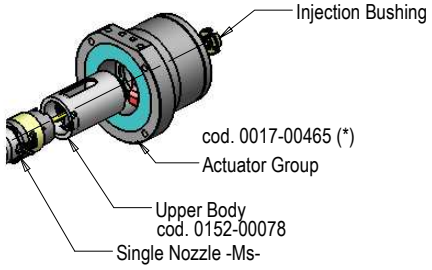
Valve Gating Nozzle -Ms-
(see seat nozzle's on pag.4 Ms1.01)

Alternative Seat with two Plates





NOTE FOR THE ACTUATORS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the actuator can be shut off at the same time as the mold/injection systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the Single Valve Gate



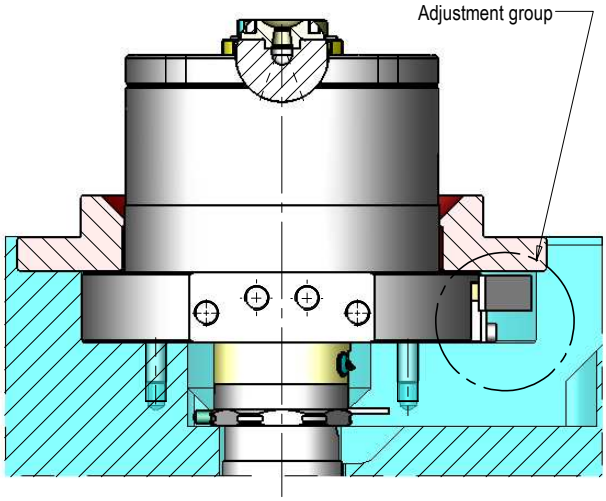
(*) O-Ring Kit code: 0038-00087

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COAXIAL SINGLE VALVE GATING GROUP
Adjustable

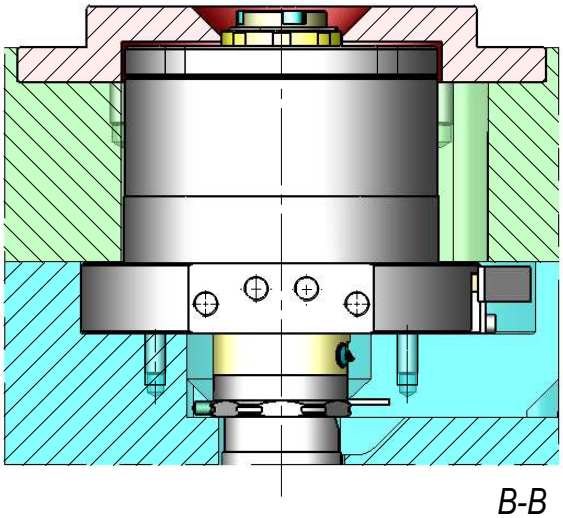
The coaxial single valve gating group in the "adjustable" version allows the stroke adjustment of ± 1.5 mm.The adjustment is realized via polygonal socket wrench CH.8.
The adjustment group requires the realization of an additional pocket on the standard seats shown in previous page.

Standard

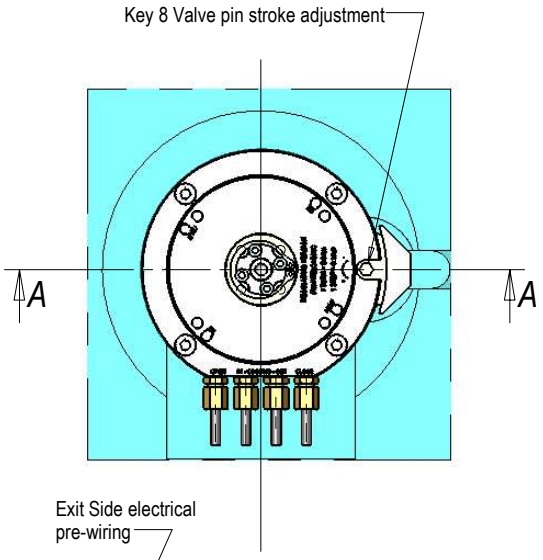


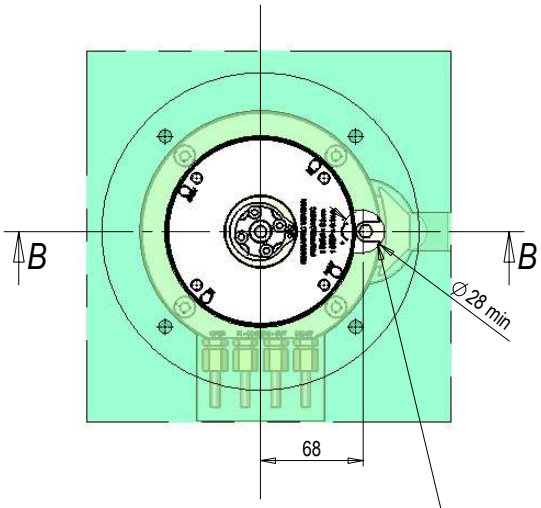
A-A

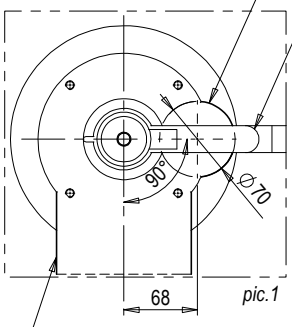
With two plates



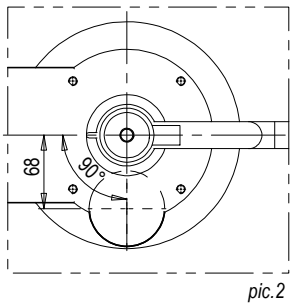
B-B



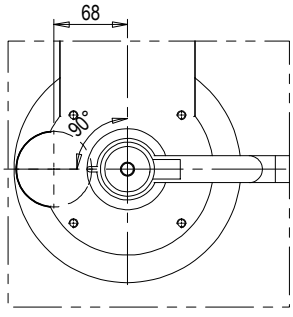




pic.1



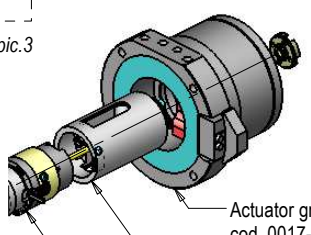
pic.2



pic.3

Exit side of
pre-wiring hydr./pneum./cooling

- The pocket of Actuator group it's positioned always at -90° from the pre-wiring hydr./pneum./cooling.
- Alternative seats as shown in the pic. 1-2-3



Actuator group adjustable
cod. 0017-00466 (*)

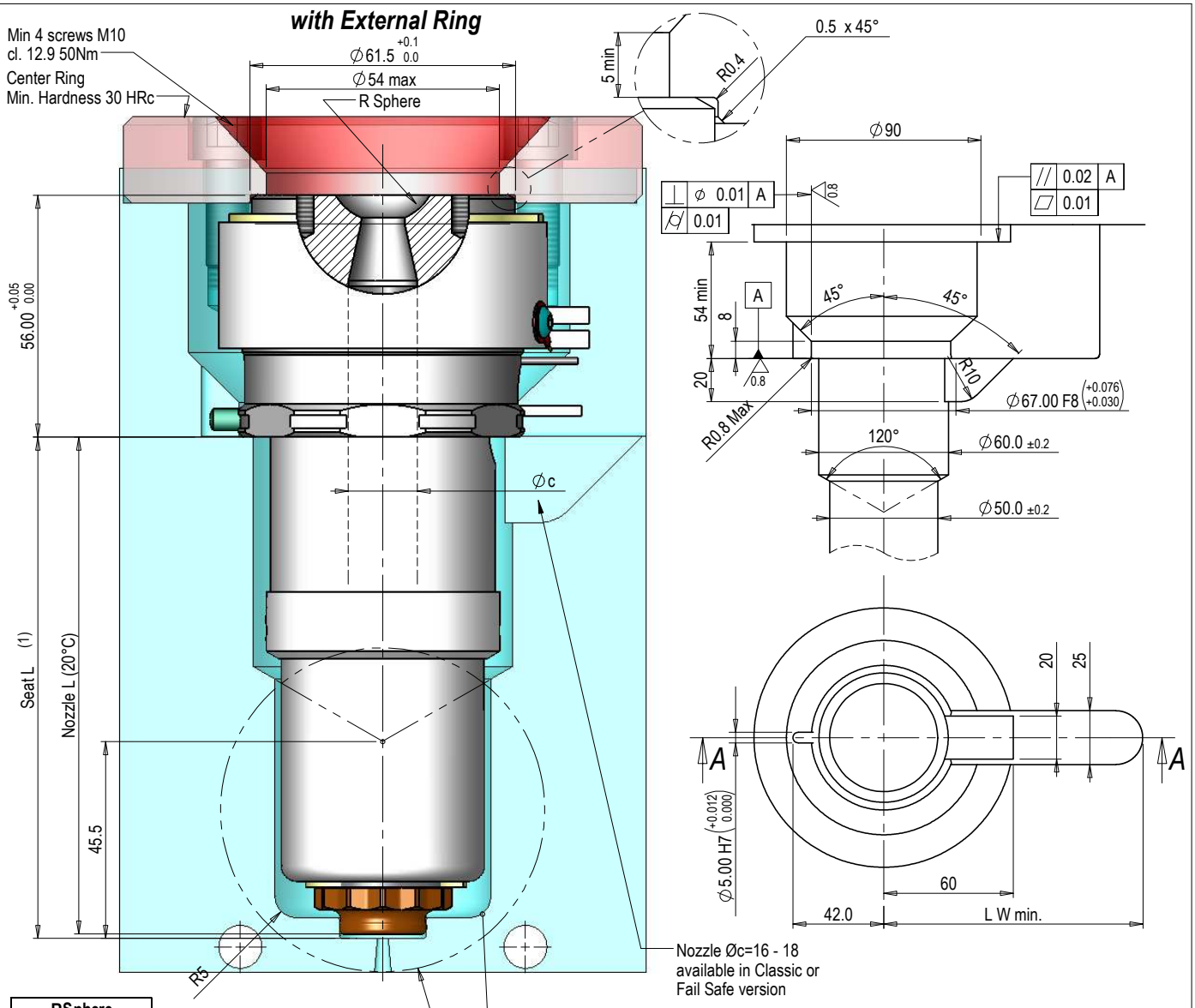
Upper Body
cod. 0152-00078

Single Nozzle -Ms-

(*) O-Ring Kit code: 0038-00087

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with External Ring



RSphere	
R0 *(standard)*	
R12.7	(1/2")
R15.5	
R19.1	(3/4")
R25	(1")
R40	

"RSphere"=0 Standard.
Other sizes to be required

Ringnut and Tip series **-Gp-**

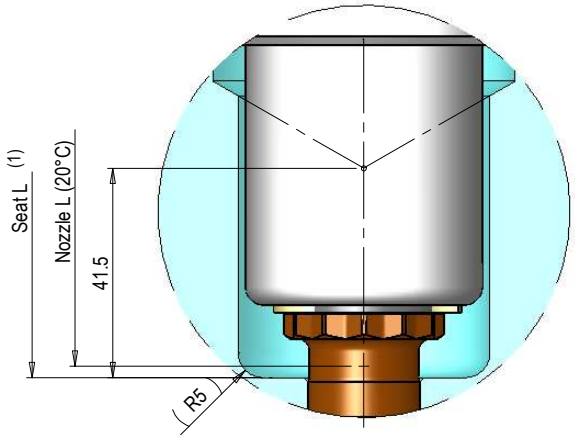
For detailed dimensions of the injection point follow the instructions of the series -Gp- nozzles technical sheets (Page 4.G1.02->)

(1) Dimension and tolerance of the "Seat L" in according to the formula showed in the -Gp- technical sheet of injection point pre-selected. For values of "Nozzle L" and "DL" refer to table pag. 4.Gs1.03.

For Tips and Ring nuts reference codes go on page 4.G1.14

NOZZLE L L	L W min.
50	125.00
65	125.00
90	125.00
115	125.00
140	125.00
165	175.00
190	175.00
215	125.00
240	275.00
265	225.00
290	225.00
315	175.00
340	175.00
365	125.00
390	125.00
415	300.00
440	275.00
465	275.00
490	225.00
515	225.00

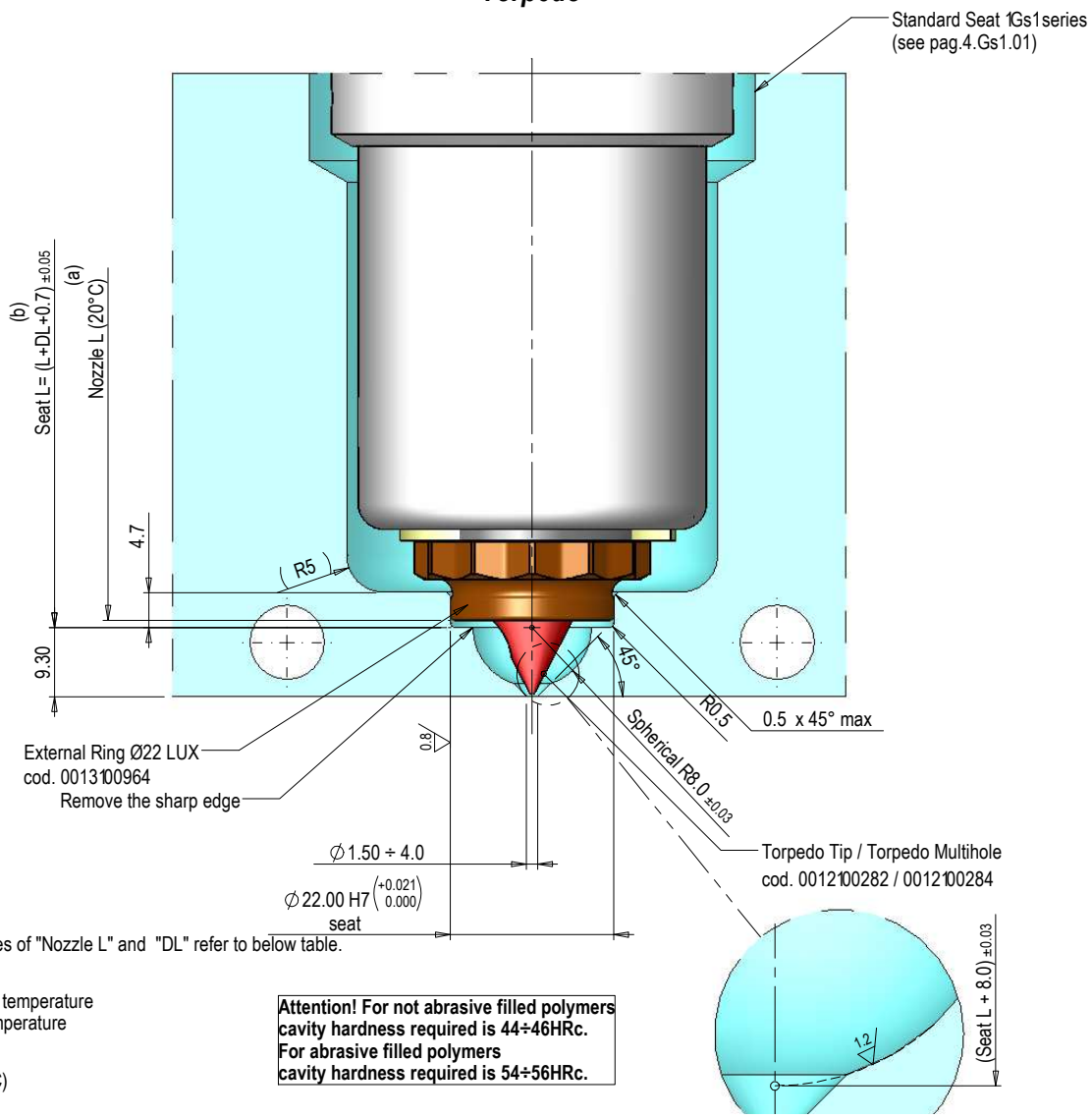
with Bushing through the cavity



HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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Torpedo



(a) (b) For values of "Nozzle L" and "DL" refer to below table.

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

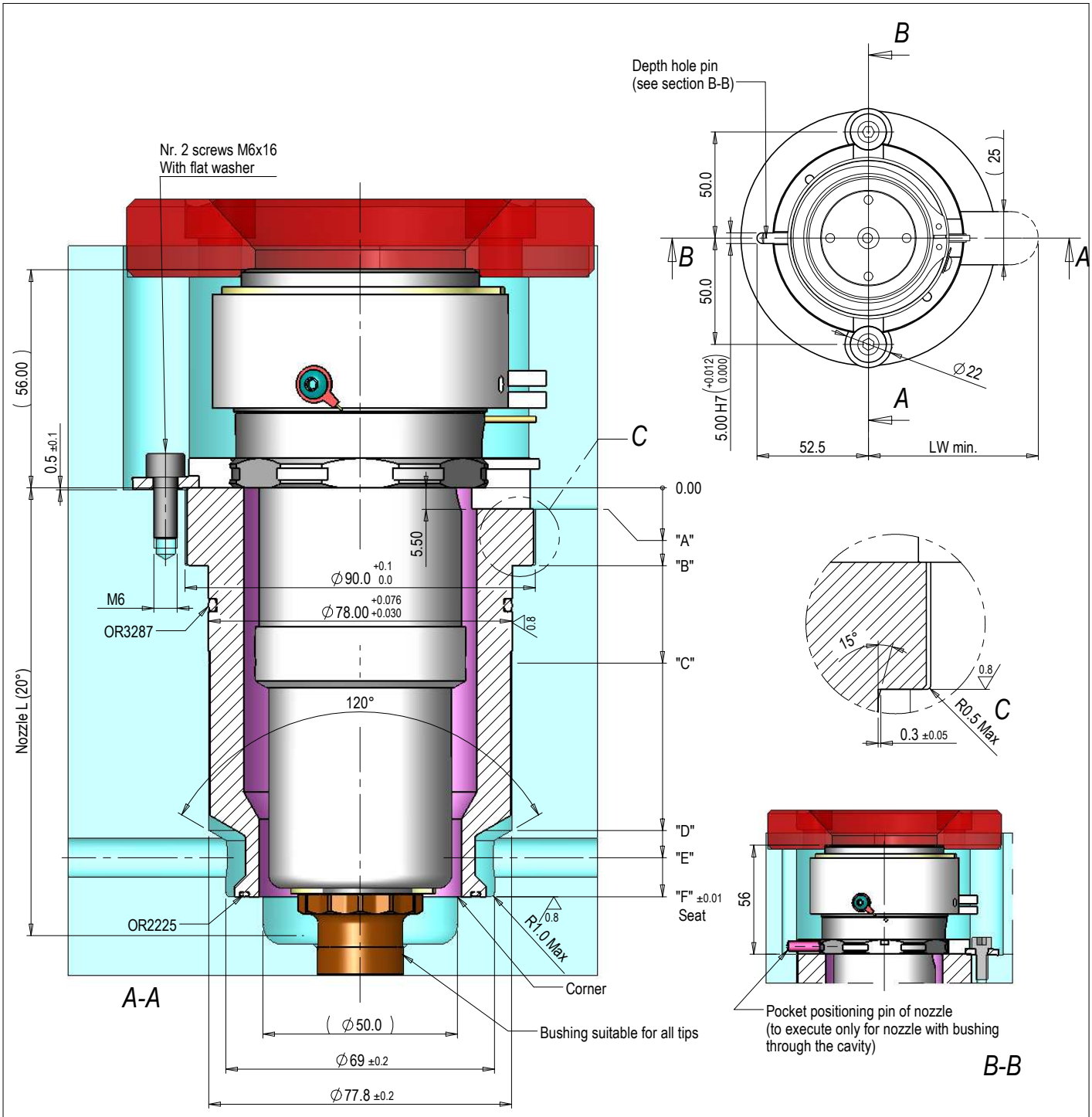
ΔT = T1 1T2
λ= 0.000012 (1/°C)

Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

Tab. DÜSE AUSDEHNUNG

L (DÜSE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
50	0.06	0.07	0.08	0.10	0.11	0.12	0.13	0.14	0.16	0.17	0.18
65	0.08	0.09	0.11	0.12	0.14	0.16	0.17	0.19	0.20	0.22	0.23
90	0.11	0.13	0.15	0.17	0.19	0.22	0.24	0.26	0.28	0.30	0.32
115	0.14	0.17	0.19	0.22	0.25	0.28	0.30	0.33	0.36	0.39	0.41
140	0.17	0.20	0.24	0.27	0.30	0.34	0.37	0.40	0.44	0.47	0.50
165	0.20	0.24	0.28	0.32	0.36	0.40	0.44	0.48	0.51	0.55	0.59
190	0.23	0.27	0.32	0.36	0.41	0.46	0.50	0.55	0.59	0.64	0.68
215	0.26	0.31	0.36	0.41	0.46	0.52	0.57	0.62	0.67	0.72	0.77
240	0.29	0.35	0.40	0.46	0.52	0.58	0.63	0.69	0.75	0.81	0.86
265	0.32	0.38	0.45	0.51	0.57	0.64	0.70	0.76	0.83	0.89	0.95
290	0.35	0.42	0.49	0.56	0.63	0.70	0.77	0.84	0.90	0.97	1.04
315	0.38	0.45	0.53	0.60	0.68	0.76	0.83	0.91	0.98	1.06	1.13
340	0.41	0.49	0.57	0.65	0.73	0.82	0.90	0.98	1.06	1.14	1.22
365	0.44	0.53	0.61	0.70	0.79	0.88	0.96	1.05	1.14	1.23	1.31
390	0.47	0.56	0.66	0.75	0.84	0.94	1.03	1.12	1.22	1.31	1.40
415	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.29	1.39	1.49
440	0.53	0.63	0.74	0.84	0.95	1.06	1.16	1.27	1.37	1.48	1.58
465	0.56	0.67	0.78	0.89	1.00	1.12	1.23	1.34	1.45	1.56	1.67
490	0.59	0.71	0.82	0.94	1.06	1.18	1.29	1.41	1.53	1.65	1.76
515	0.62	0.74	0.87	0.99	1.11	1.24	1.36	1.48	1.61	1.73	1.85

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BUSHING CODE	NOZZLE L (*)	A	B	C	D	E	F	LW min.
0002-00164	50	0	9	23	26	30	40.00	125
0002-00165	65	0	13	35	38	45	55.00	125
0002-00166	90	5.5	20	45	63	70	80.00	125
0002-00167	115	5.5	20	45	88	95	105.00	125
0002-00168	140	5.5	20	45	113	120	130.00	125
0002-00169	165	5.5	20	45	138	145	155.00	175
0002-00170	190	5.5	20	45	163	170	180.00	175

(*) In case cooling is required on standard nozzle with L>190mm, an extension insert is needed. Its manufacturing is on customer's care.

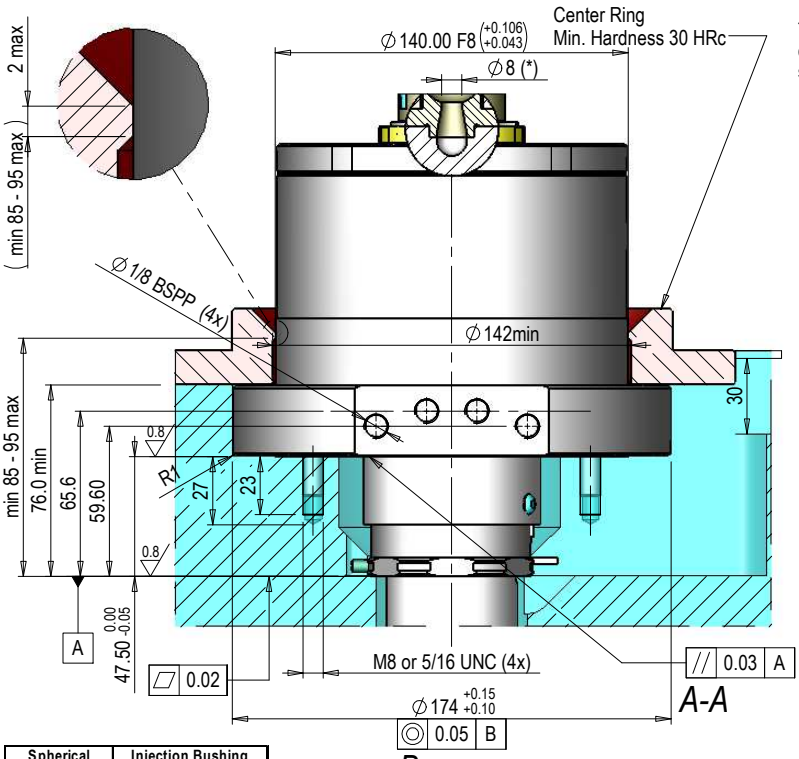
For further manufacturing details, refer to page 4._s1.02

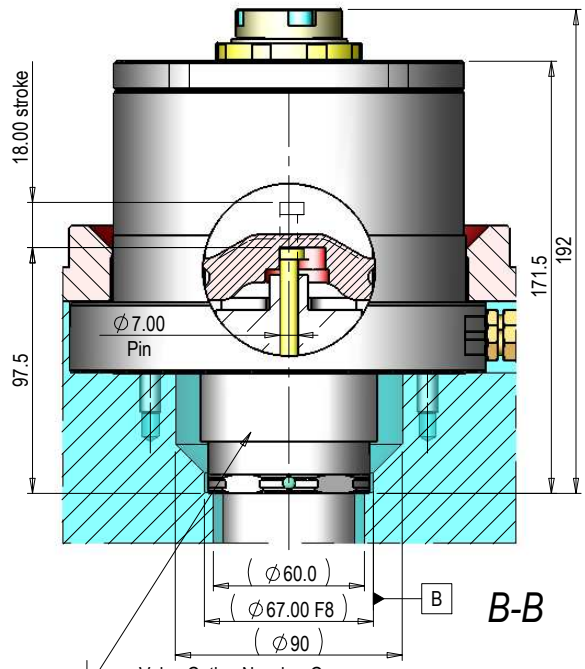
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Standard Seat

Max pressure Hydraulic: 40 bar
Max pressure Pneumatic: 15 bar

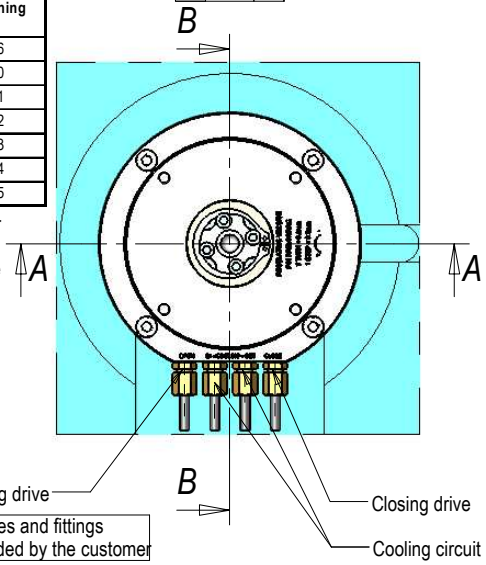
The working pressure below is only for reference: for the correct choice of maximun allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job





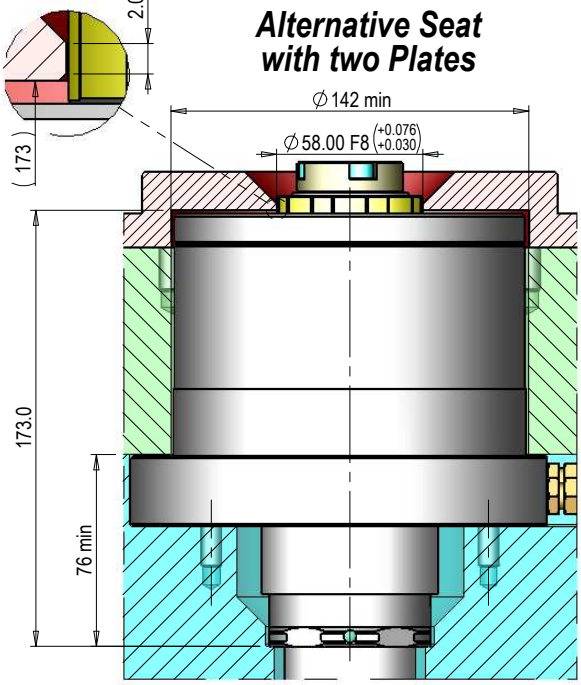
Spherical Radius	Injection Bushing Code
0	0171-00066
12.7 (1/2")	0171-00060
15.5	0171-00061
19.1 (3/4")	0171-00062
25 (1")	0171-00063
40	0171-00064
5x45°	0171-00065

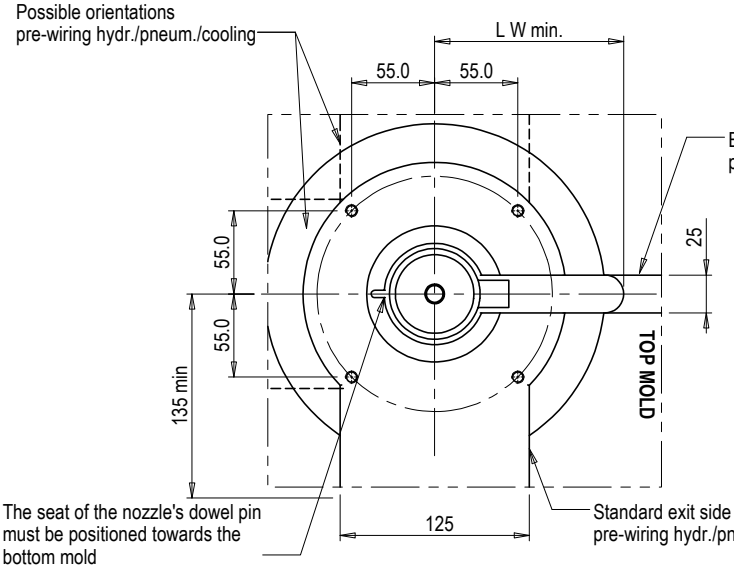
(*) Ø8 Standard value. Other values can be pre-agreed with the HRS technical office



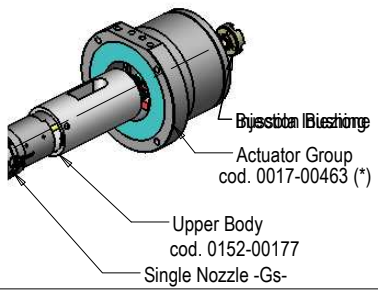
Valve Gating Nozzle -Gs-
(see seat nozzle's on pag.4.Gs1.01)

Alternative Seat with two Plates





NOTE FOR THE ACTUATORS WITH COOLING
During the shutdown phase of the HRS system, the cooling circuit of the actuator can be shut off at the same time as the mold/injection systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of Single Valve Gate



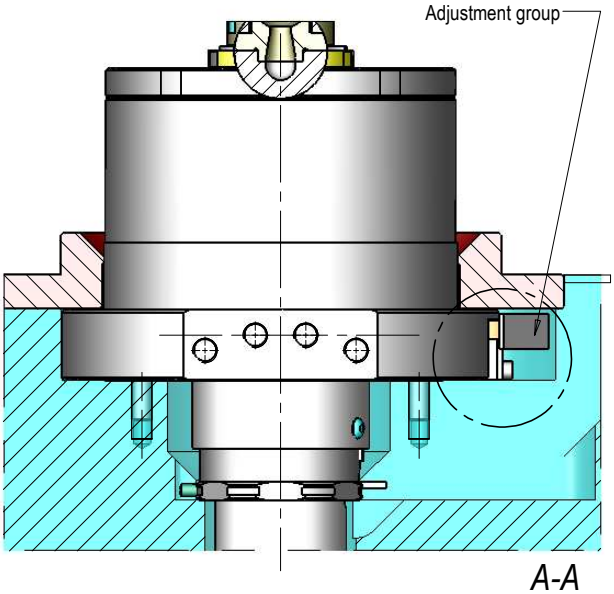
(*) O-Ring Kit code: 0038-00091

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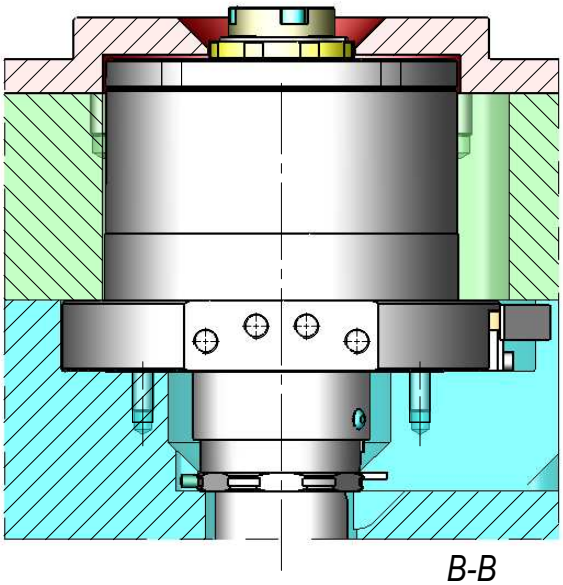
COAXIAL SINGLE VALVE GATING GROUP
Adjustable

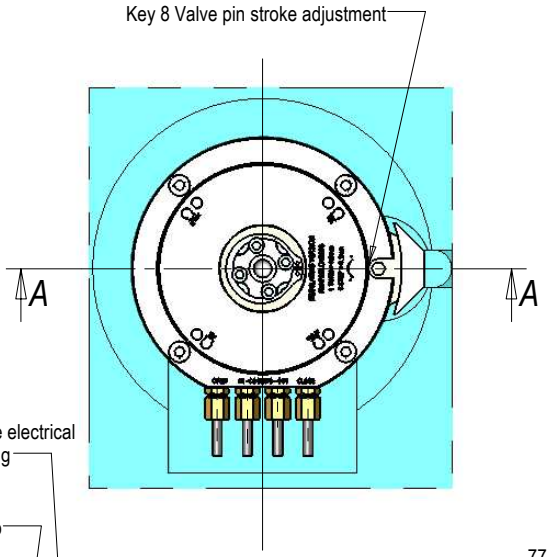
The coaxial single valve gating group in the “adjustable” version allows the stroke adjustment of ± 1.5 mm.The adjustment is realized via polygonal socket wrench CH.8.
The adjustment group requires the realization of an additional pocket on the standard seats shown in previous page.

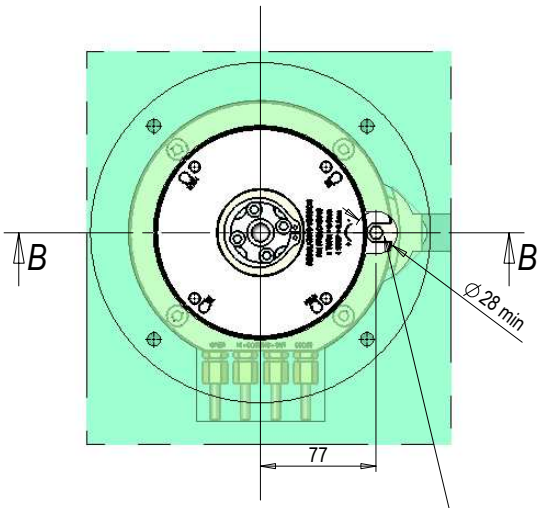
Standard

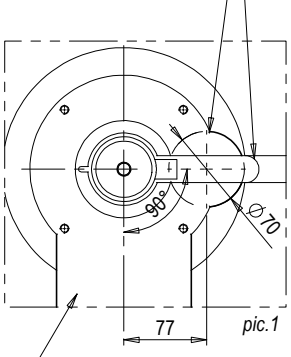


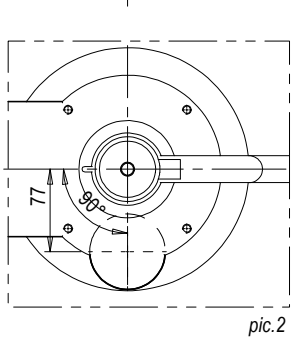
With two plates

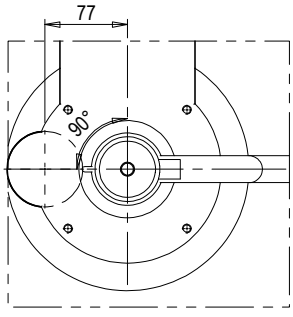


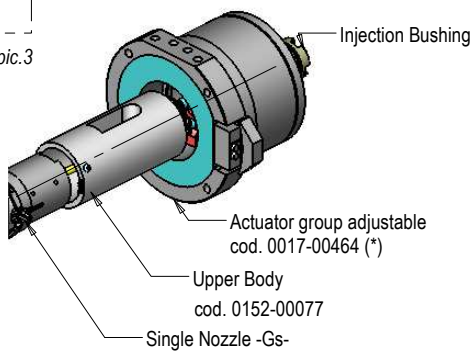










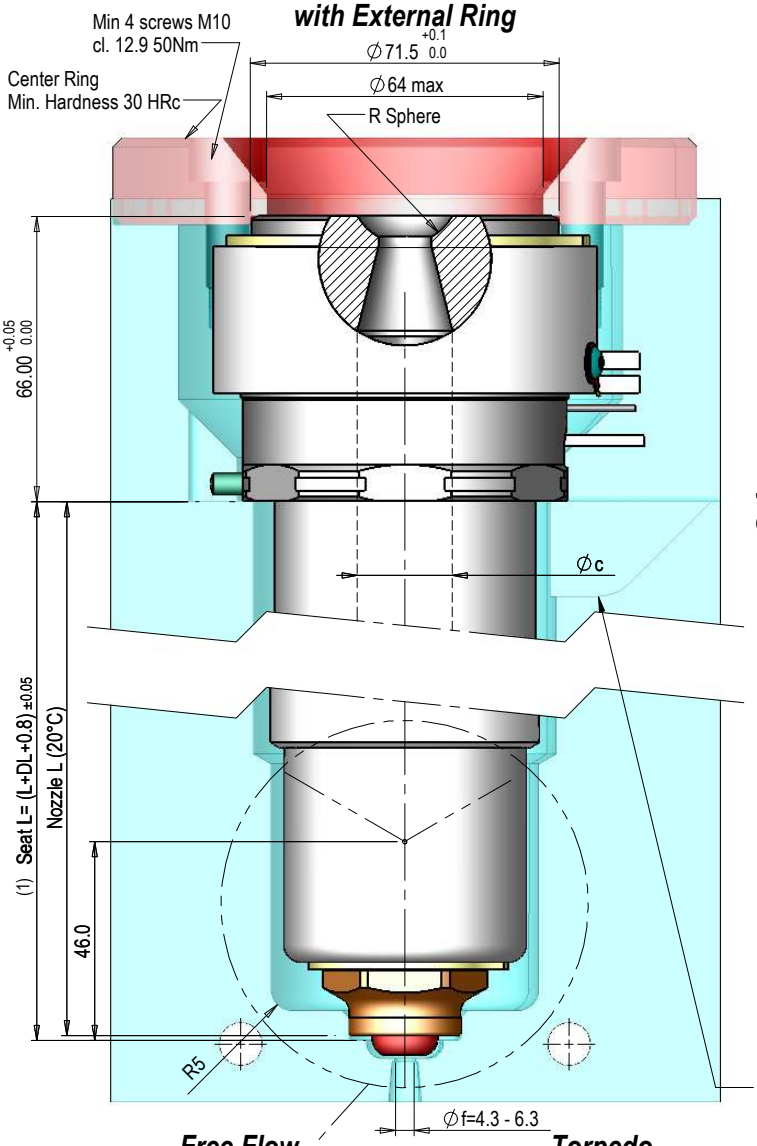


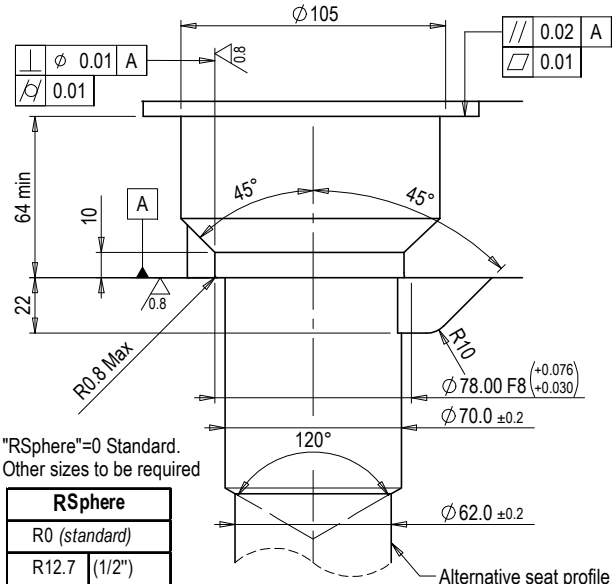
- Alternative seats as shown in the pic. 1-2-3
- The pocket of Actuator group it's positioned always at -90° from the pre-wiring hydr./pneum./cooling.

(*) O-Ring Kit code: 0038-00091

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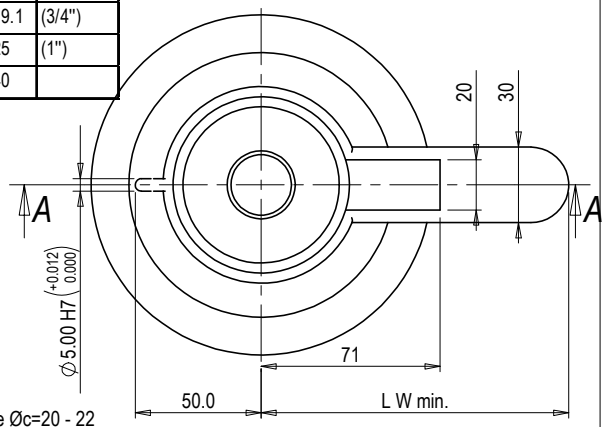
with External Ring





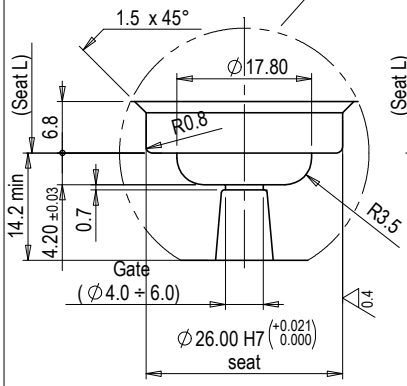
"RSphere"=0 Standard.
Other sizes to be required

RSphere	
R0 *(standard)*	
R12.7	(1/2")
R15.5	
R19.1	(3/4")
R25	(1")
R40	

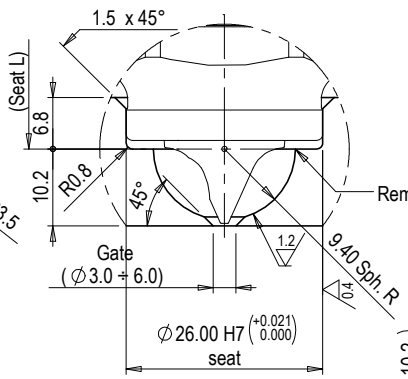


Nozzle Øc=20 - 22
available in Classic or
Fail Safe version

Free Flow



Torpedo

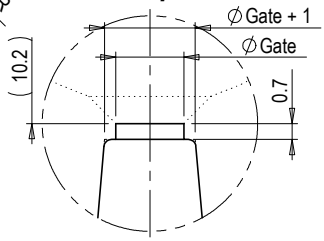


Remove the sharp edge

(1) For values of "Nozzle L" and "DL" refer to table pag. 4.As1.03.

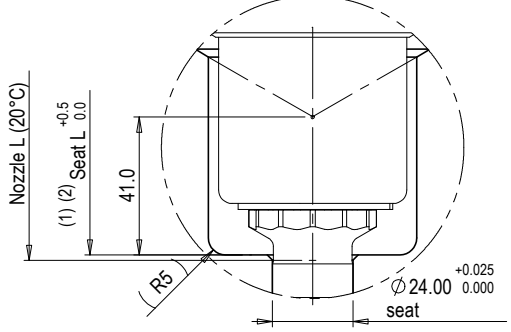
(2) "Seat L" dimension with Bushing through the cavity:
- FREE FLOW --> Seat L = (L + DL - 3.5)
- TORPEDO --> Seat L = (L + DL - 2.0)

Torpedo with Sprue



with Bushing through the cavity

See on technical sheets nozzles -Aa- page 4.Aa1.01->)

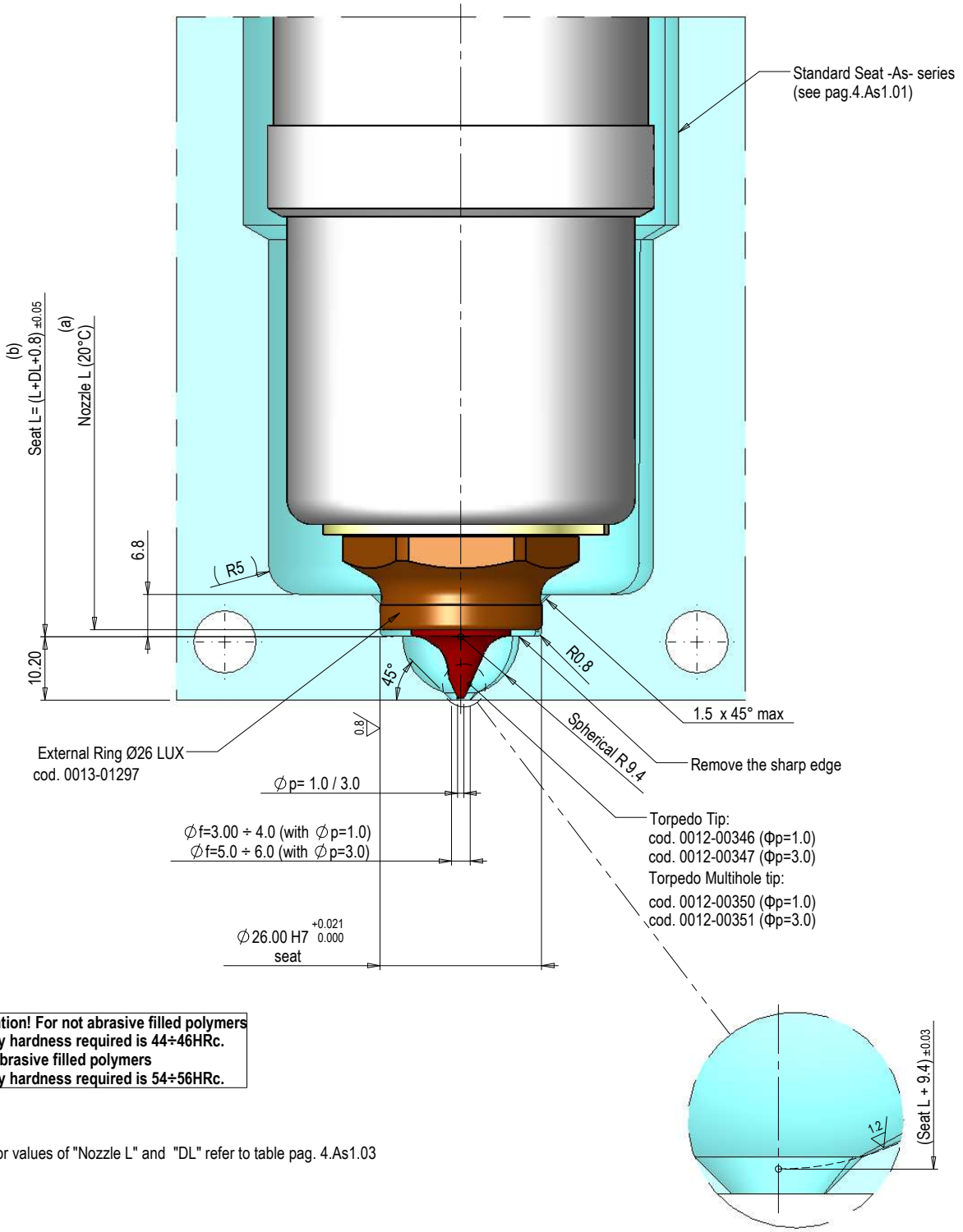


NOZZLE L L	*L W min.*
75	125.00
90	125.00
115	125.00
140	125.00
165	175.00
190	175.00
215	125.00
240	125.00
265	225.00
290	225.00
315	175.00
340	175.00
365	125.00
390	125.00
415	300.00
440	275.00
465	275.00
490	225.00
515	225.00
540	175.00
565	175.00
590	125.00
615	125.00

HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

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Torpedo



Attention! For not abrasive filled polymers cavity hardness required is 44÷46HRc.
For abrasive filled polymers cavity hardness required is 54÷56HRc.

(a) (b) For values of "Nozzle L" and "DL" refer to table pag. 4.As1.03

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T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

ΔT = T1 - T2
λ= 0.000012 (1/°C)

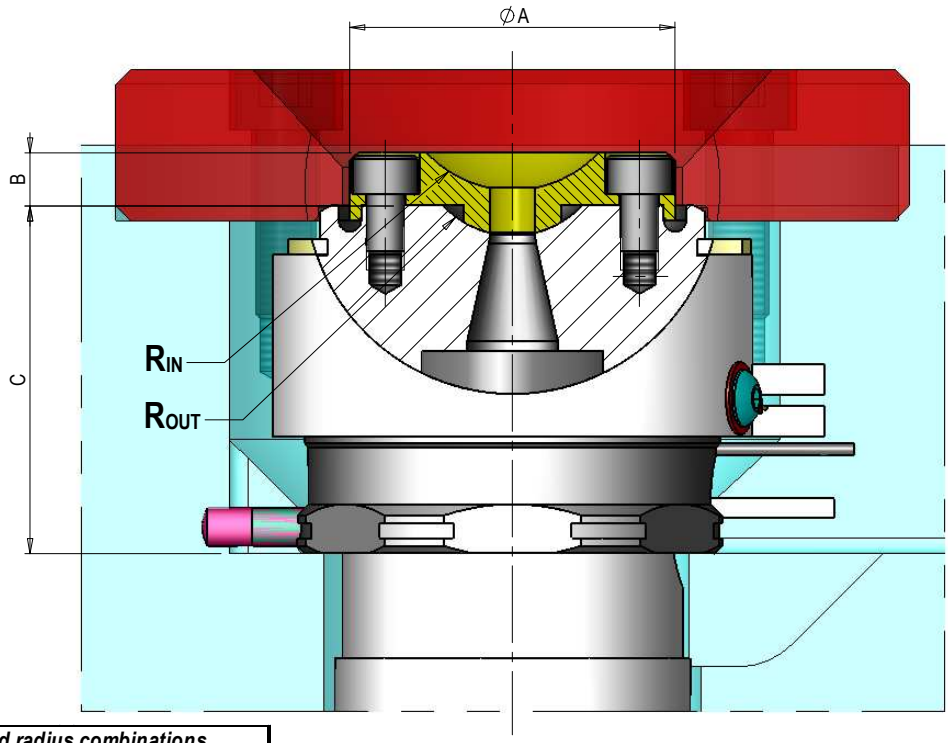
NOZZLE EXPANSION Table

L (NOZZLE) [20°C]	ΔT 100÷110°C	111÷130°C	131÷150°C	151÷170°C	171÷190°C	191÷210°C	211÷230°C	231÷250°C	251÷270°C	271÷290°C	291÷300°C
	DL = (L * ΔT * λ)										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[ΔT=240°C]	[ΔT=260°C]	[ΔT=280°C]	[ΔT=300°C]
75	0.09	0.11	0.13	0.14	0.16	0.18	0.20	0.22	0.23	0.25	0.27
90	0.11	0.13	0.15	0.17	0.19	0.22	0.24	0.26	0.28	0.30	0.32
115	0.14	0.17	0.19	0.22	0.25	0.28	0.30	0.33	0.36	0.39	0.41
140	0.17	0.20	0.24	0.27	0.30	0.34	0.37	0.40	0.44	0.47	0.50
165	0.20	0.24	0.28	0.32	0.36	0.40	0.44	0.48	0.51	0.55	0.59
190	0.23	0.27	0.32	0.36	0.41	0.46	0.50	0.55	0.59	0.64	0.68
215	0.26	0.31	0.36	0.41	0.46	0.52	0.57	0.62	0.67	0.72	0.77
240	0.29	0.35	0.40	0.46	0.52	0.58	0.63	0.69	0.75	0.81	0.86
265	0.32	0.38	0.45	0.51	0.57	0.64	0.70	0.76	0.83	0.89	0.95
290	0.35	0.42	0.49	0.56	0.63	0.70	0.77	0.84	0.90	0.97	1.04
315	0.38	0.45	0.53	0.60	0.68	0.76	0.83	0.91	0.98	1.06	1.13
340	0.41	0.49	0.57	0.65	0.73	0.82	0.90	0.98	1.06	1.14	1.22
365	0.44	0.53	0.61	0.70	0.79	0.88	0.96	1.05	1.14	1.23	1.31
390	0.47	0.56	0.66	0.75	0.84	0.94	1.03	1.12	1.22	1.31	1.40
415	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.29	1.39	1.49
440	0.53	0.63	0.74	0.84	0.95	1.06	1.16	1.27	1.37	1.48	1.58
465	0.56	0.67	0.78	0.89	1.00	1.12	1.23	1.34	1.45	1.56	1.67
490	0.59	0.71	0.82	0.94	1.06	1.18	1.29	1.41	1.53	1.65	1.76
515	0.62	0.74	0.87	0.99	1.11	1.24	1.36	1.48	1.61	1.73	1.85
540	0.65	0.78	0.91	1.04	1.17	1.30	1.43	1.56	1.68	1.81	1.94
565	0.68	0.81	0.95	1.08	1.22	1.36	1.49	1.63	1.76	1.90	2.03
590	0.71	0.85	0.99	1.13	1.27	1.42	1.56	1.70	1.84	1.98	2.12
615	0.74	0.89	1.03	1.18	1.33	1.48	1.62	1.77	1.92	2.07	2.21

index

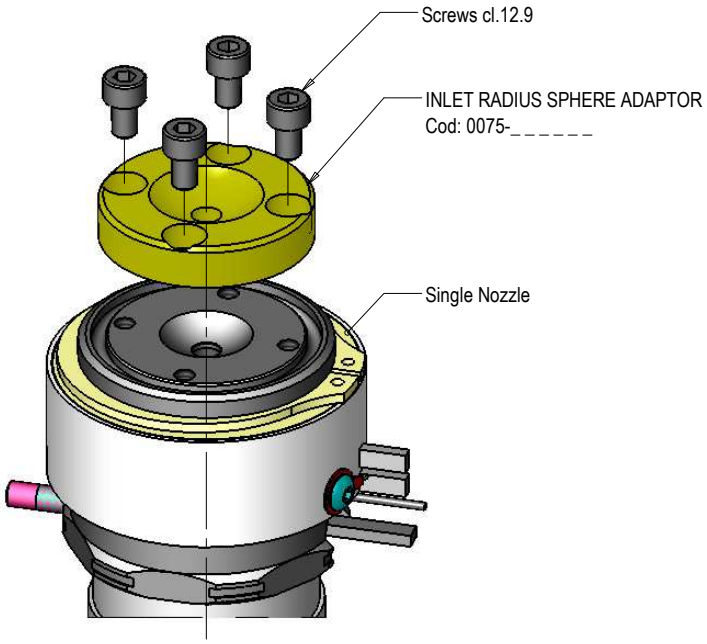
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WARNING. The following INLET ADAPTOR must be adopted only for the TRY OUT of the mold.



Standard radius combinations	
RIN	ROUT
0	12.7
12.7	15.5
15.5	19.1
19.1	25
25	40
40	

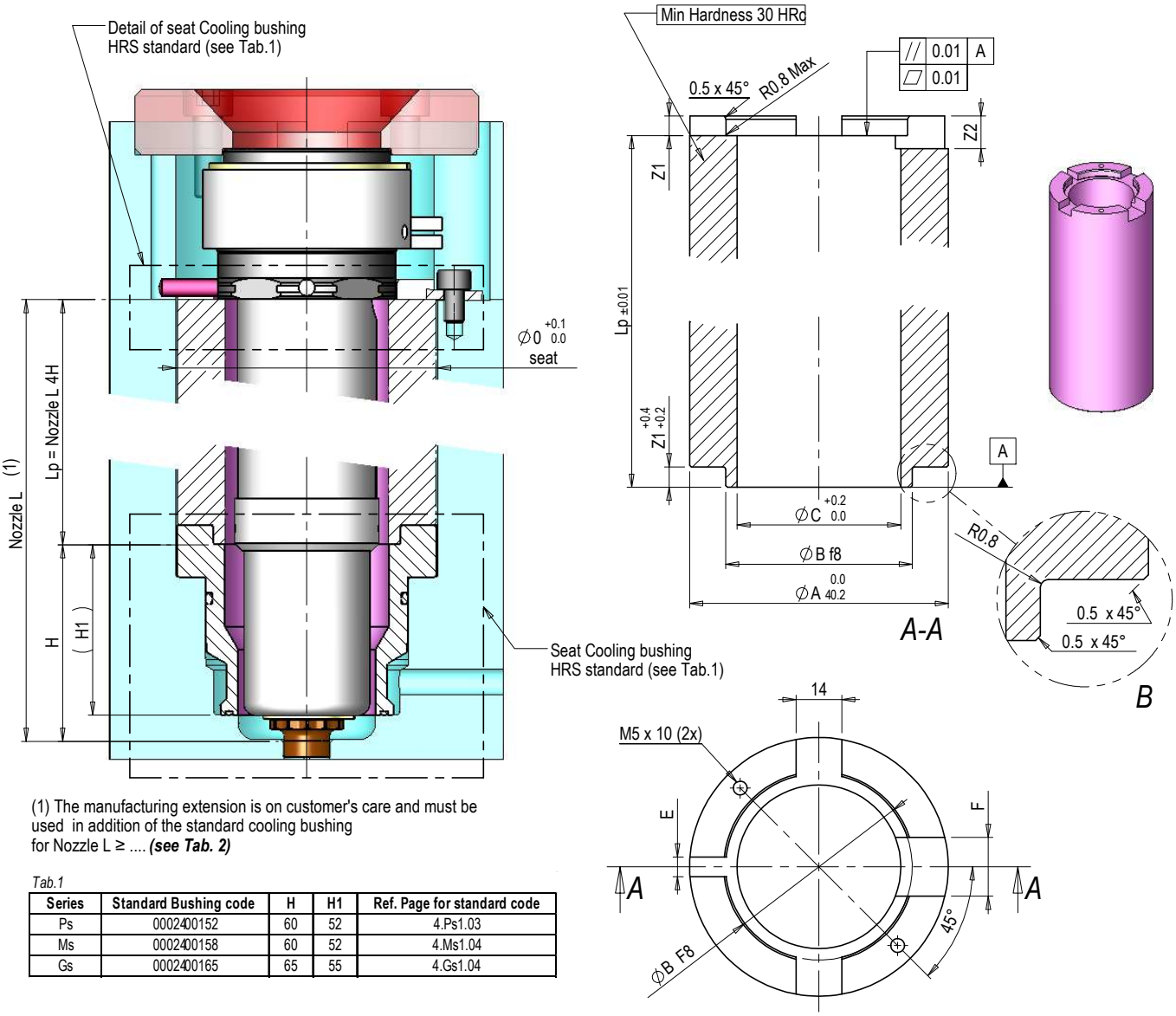
(*) Other customs radius can be required



SERIES	ØA	B	C	Screws cl.12.9
-Ps-	31	5.5	36.00	M4x8 (4Pz)
-Ms-	43	7.0	46.00	M5x8 (4Pz)
-Gs-	50	7.0	56.00	M5x8 (4Pz)
-As-	60	8.0	66.00	M6x10 (4Pz)

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COOLING BUSHING EXTENSION
(customer's care)



(1) The manufacturing extension is on customer's care and must be used in addition of the standard cooling bushing for Nozzle L ≥ .... ***(see Tab. 2)***

Tab.1

Series	Standard Bushing code	H	H1	Ref. Page for standard code
Ps	0002400152	60	52	4.Ps1.03
Ms	0002400158	60	52	4.Ms1.04
Gs	0002400165	65	55	4.Gs1.04

Tab.2

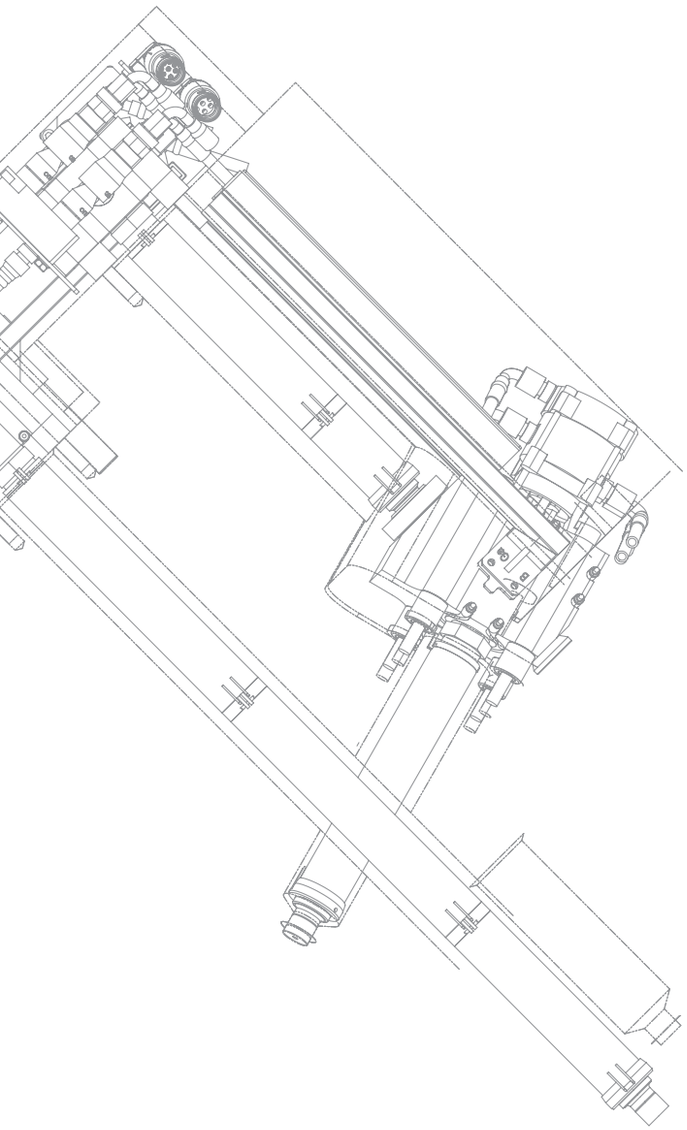
Series	Nozzle L ≥
Ps	185
Ms	210
Gs	215

Manufacturing dimensions:

Dimensions	Ps	Ms	Gs
ØA	59	79	89
ØB	40	57	67
ØC	28	50	60
ØD	60	80	90
E	5	6	6
F	12	18	18
Z1	6	6	7.5
Z2	8	10	8.5

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oerlikon
hrsflow

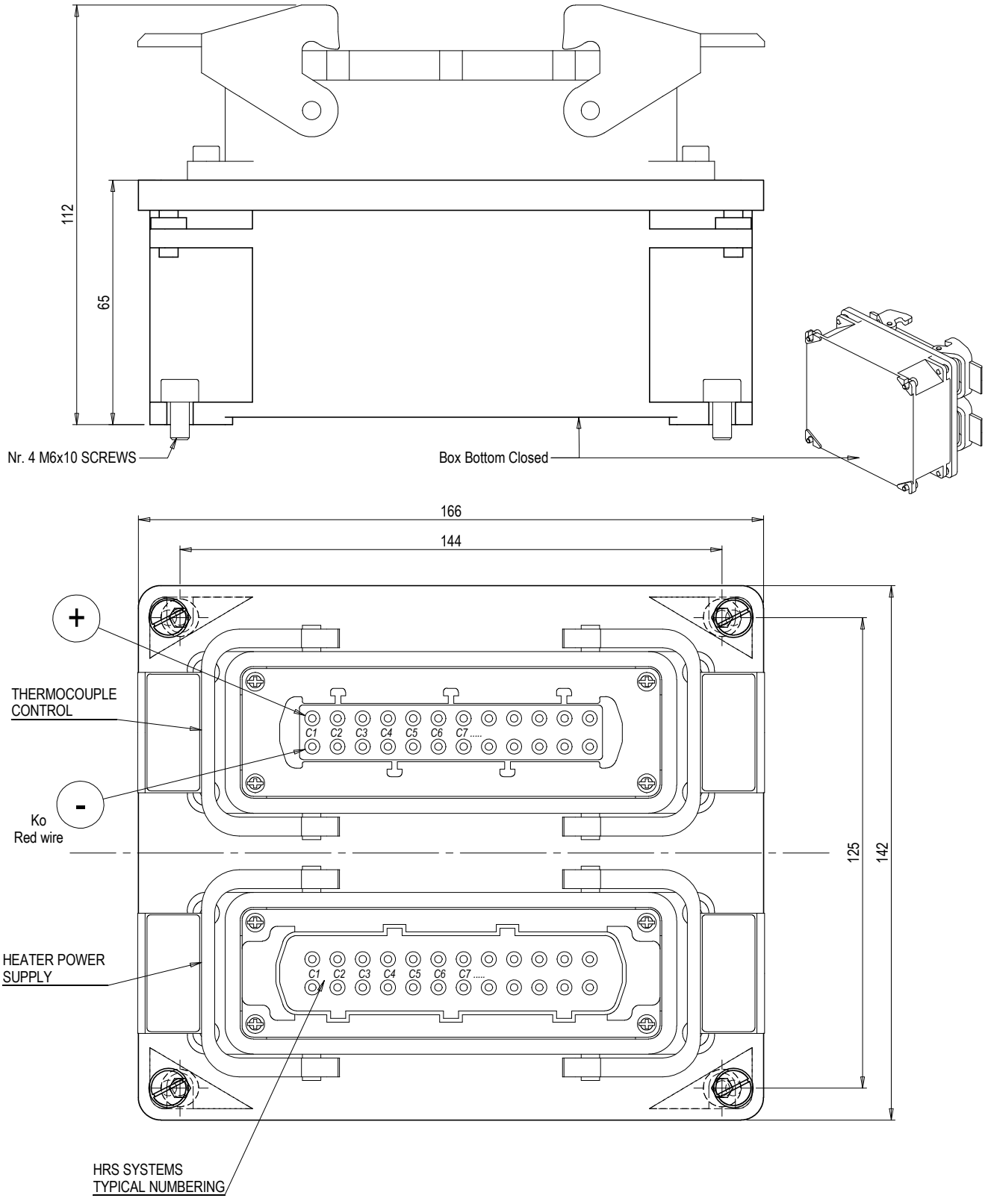


Accessories

Accessori
Zubehör
Accessoires
Accessorios
Accessórios

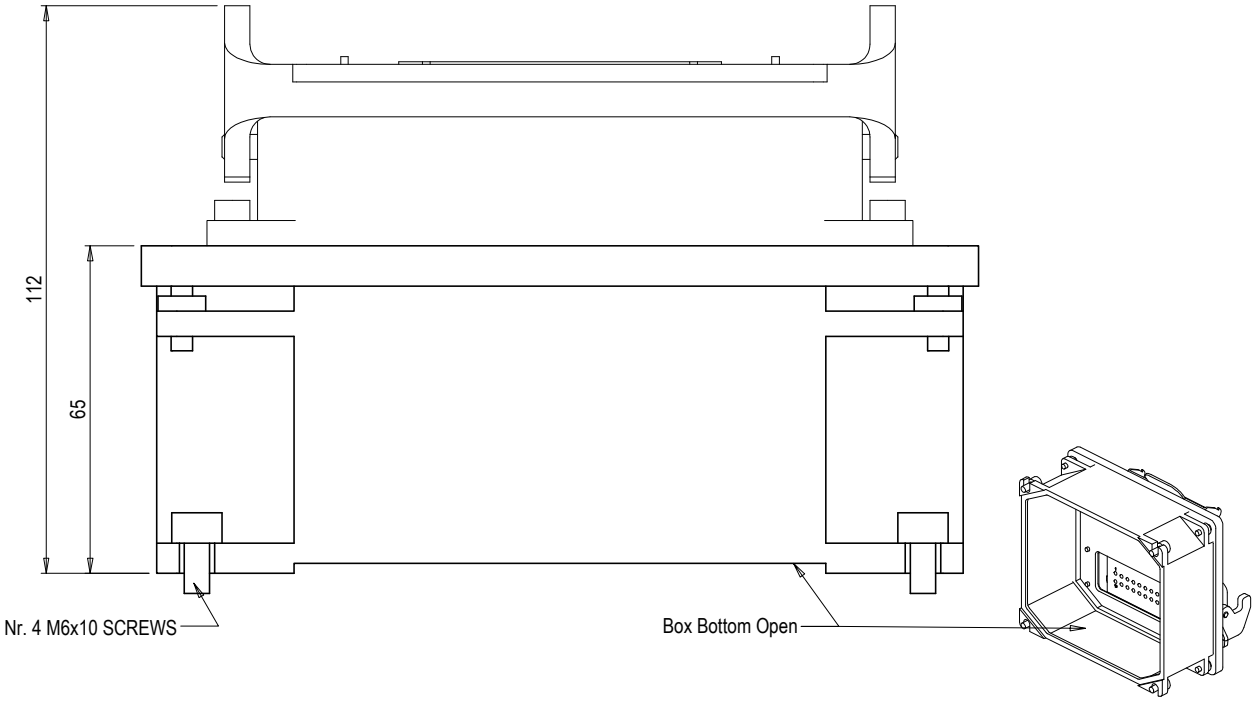
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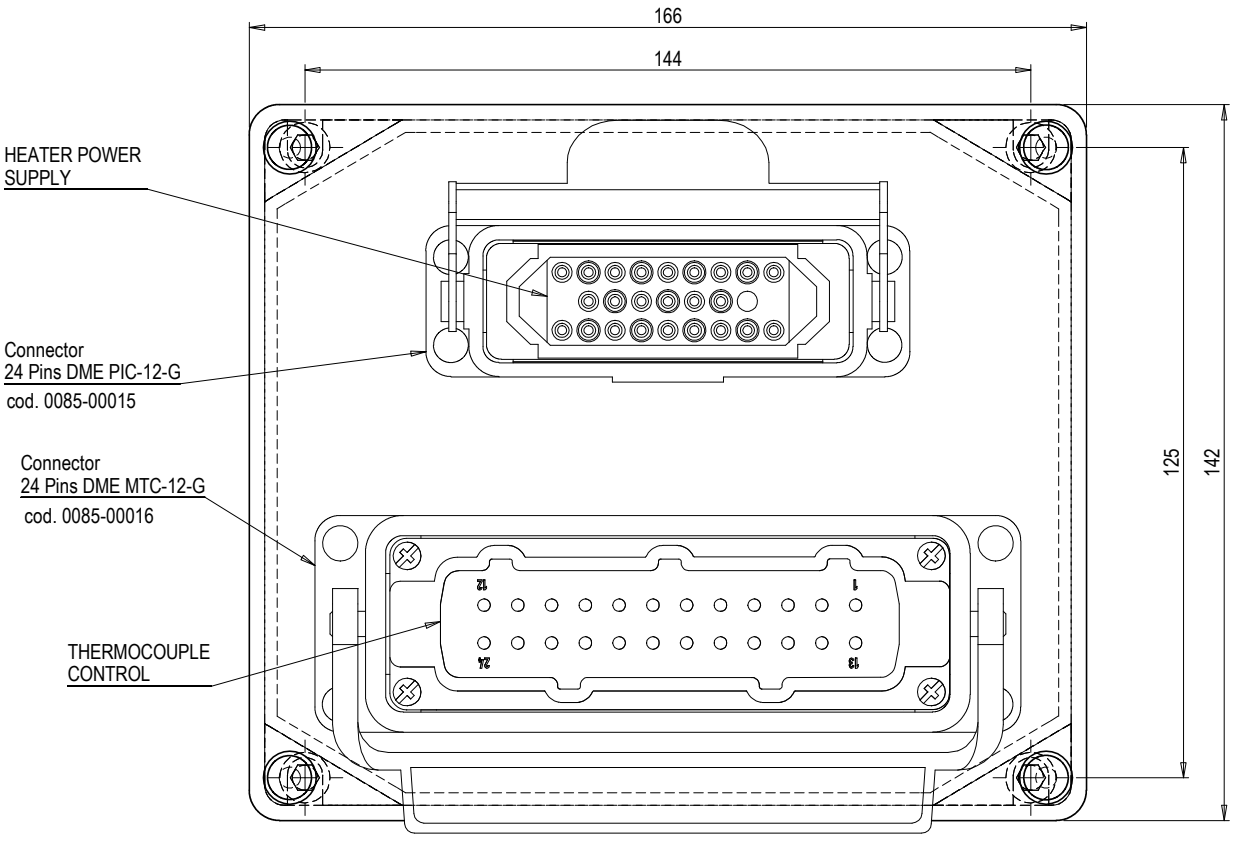
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CODE	DESCRIPTION
0028-00006	N° 2 16-PIN CONNECTORS (1 MALE + 1 FEMALE)
0028-00008	N° 2 24-PIN CONNECTORS (1 MALE + 1 FEMALE)

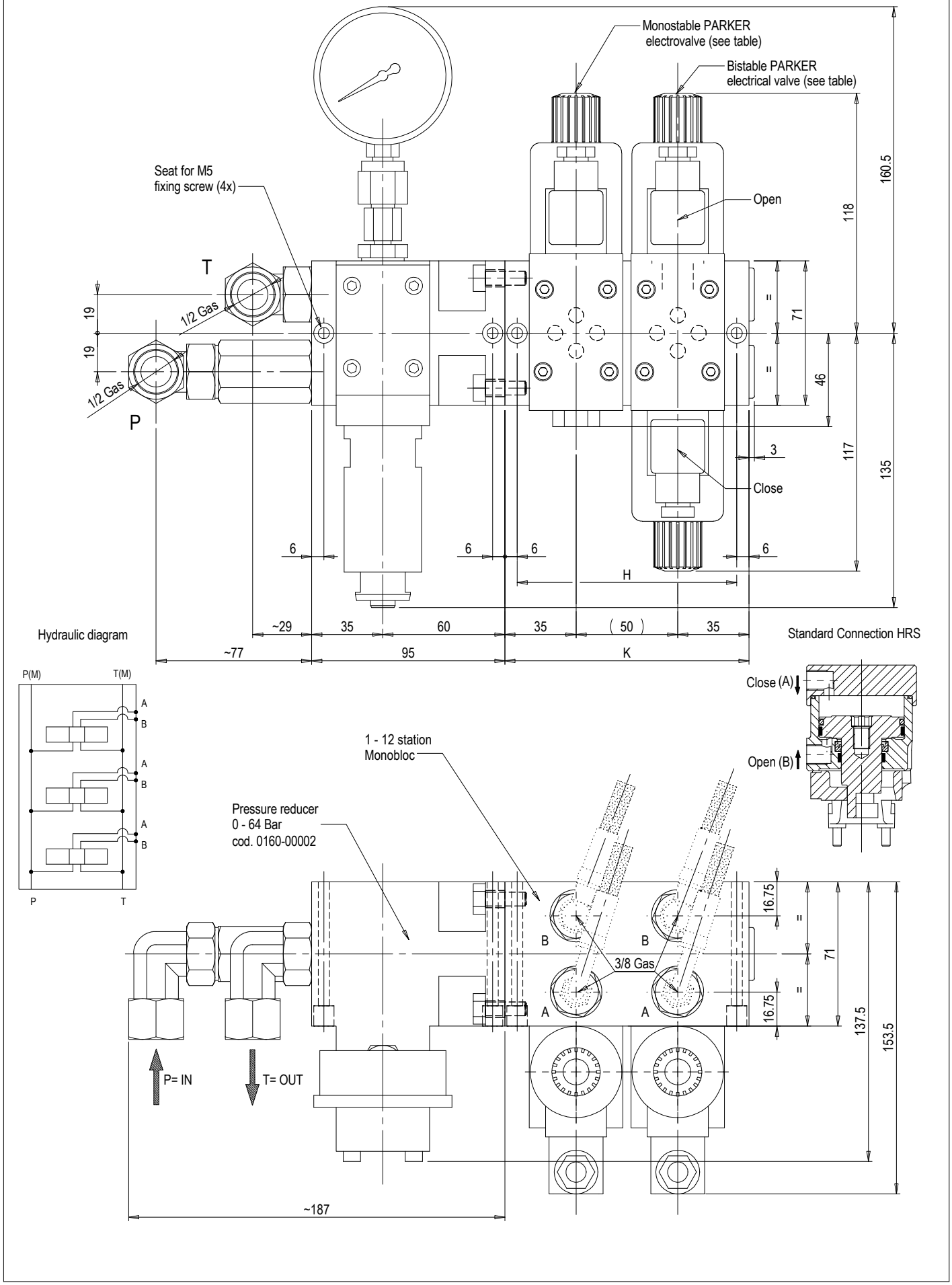
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CODICE	DESCRIZIONE
0028-00166	ASSEMBLATO CASSETTA DI COLLEGAMENTO 2X24 POLI CON CONNETTORI DME

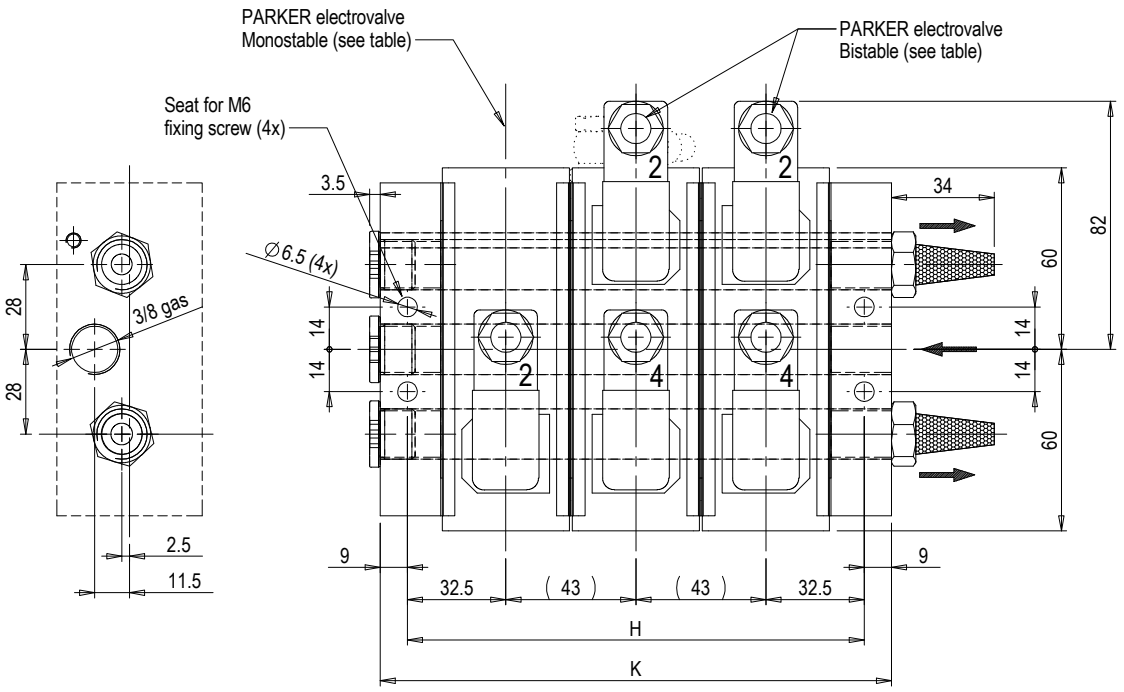
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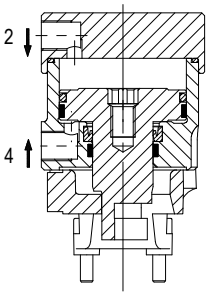
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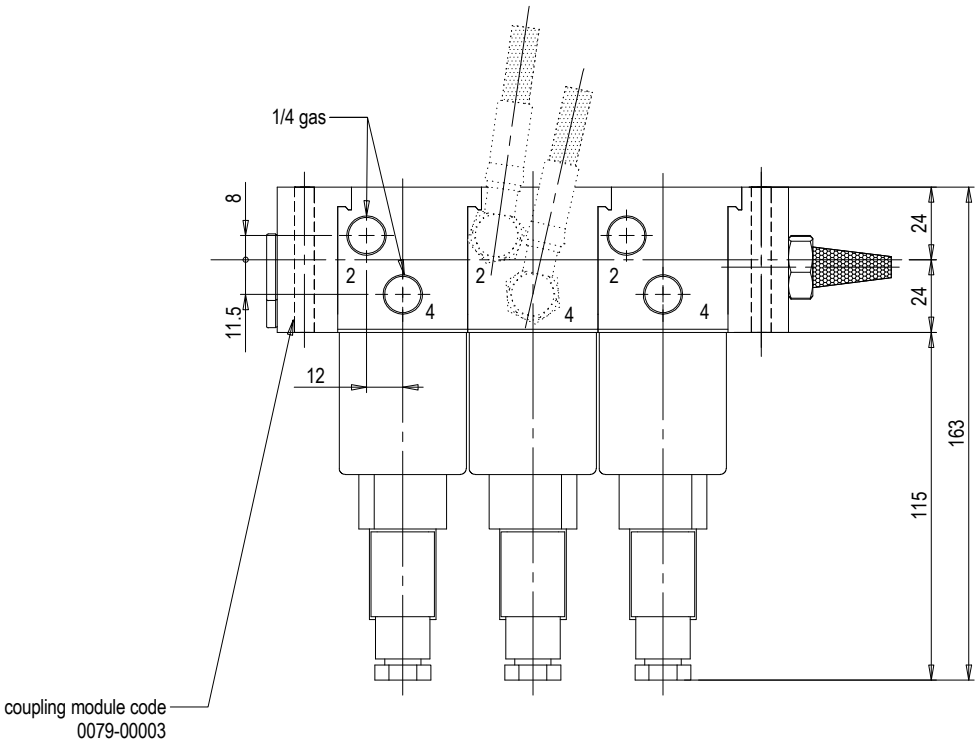
MONOBLOC				ELECTROVALVES	
CODE	STATION NO.	H	K	CODE	MODEL
0077-00011	1	58	70	0076-00004	Monostable 24V AC
0077-00012	2	108	120		
0077-00013	3	158	170	0076-00001	Monostable 24V DC
0077-00014	4	208	220		
0077-00015	5	258	270	0076-00003	Bistable 24V AC
0077-00016	6	308	320		
0077-00017	7	358	370	0076-00002	Bistable 24V DC
0077-00018	8	408	420		
0077-00019	9	458	470		
0077-00020	10	508	520		
0077-00023	11	558	570		
0077-00024	12	608	620		

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Standard connection HRS





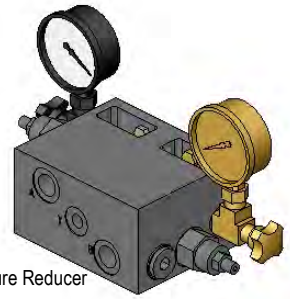
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N° STATIONS	H	K	PNEUMATIC ELECTROVALVES	
			CODE	MODEL
1	65	83	0076-00014	Monostable 24V AC
2	108	126		
3	151	169	0076-00013	Monostable 24V DC
4	194	212		
5	237	255	0076-00016	Bistable 24V AC
6	280	298		
7	323	341	0076-00015	Bistable 24V DC
8	366	384		
9	409	427		
10	452	470		
11	495	513		
12	538	556		

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The pressure reducer HRS allows the use of Hydraulic oil supplied from Injection machine to feed the HRS Hydraulic circuit.
The in-line pressure is pre-emptively reduced to the correct value foreseen for in working order of HRS system.

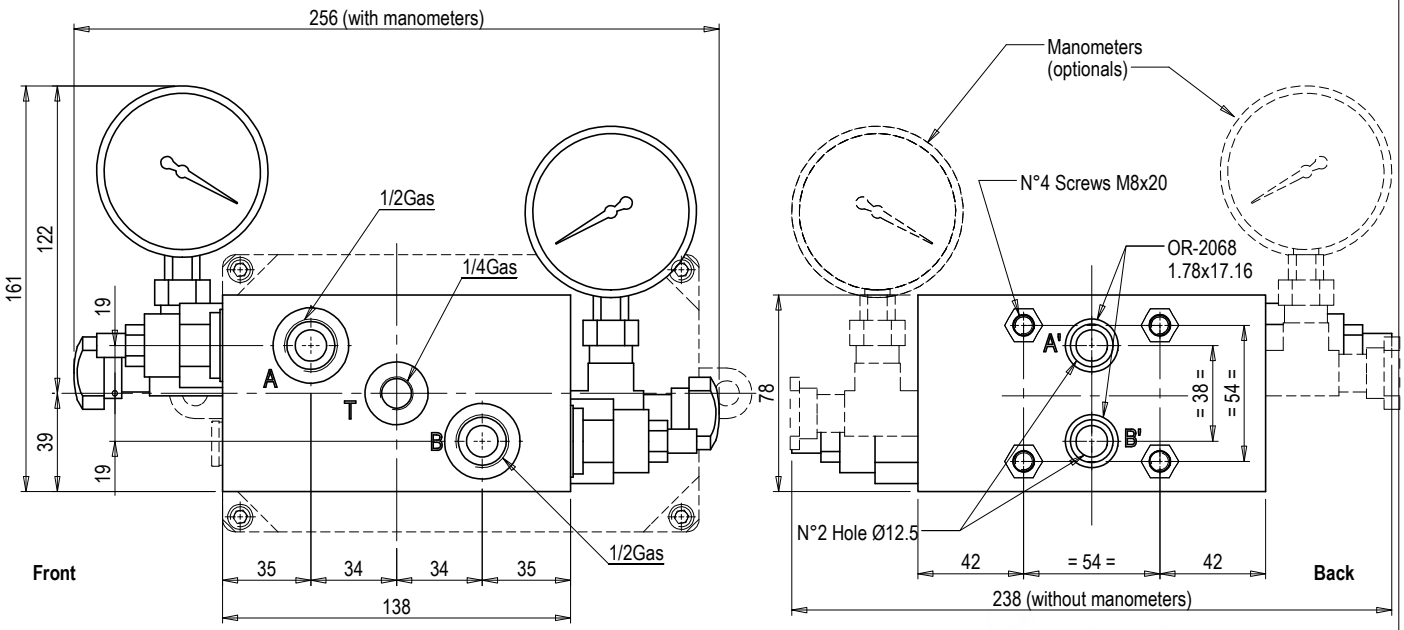
Technical features:

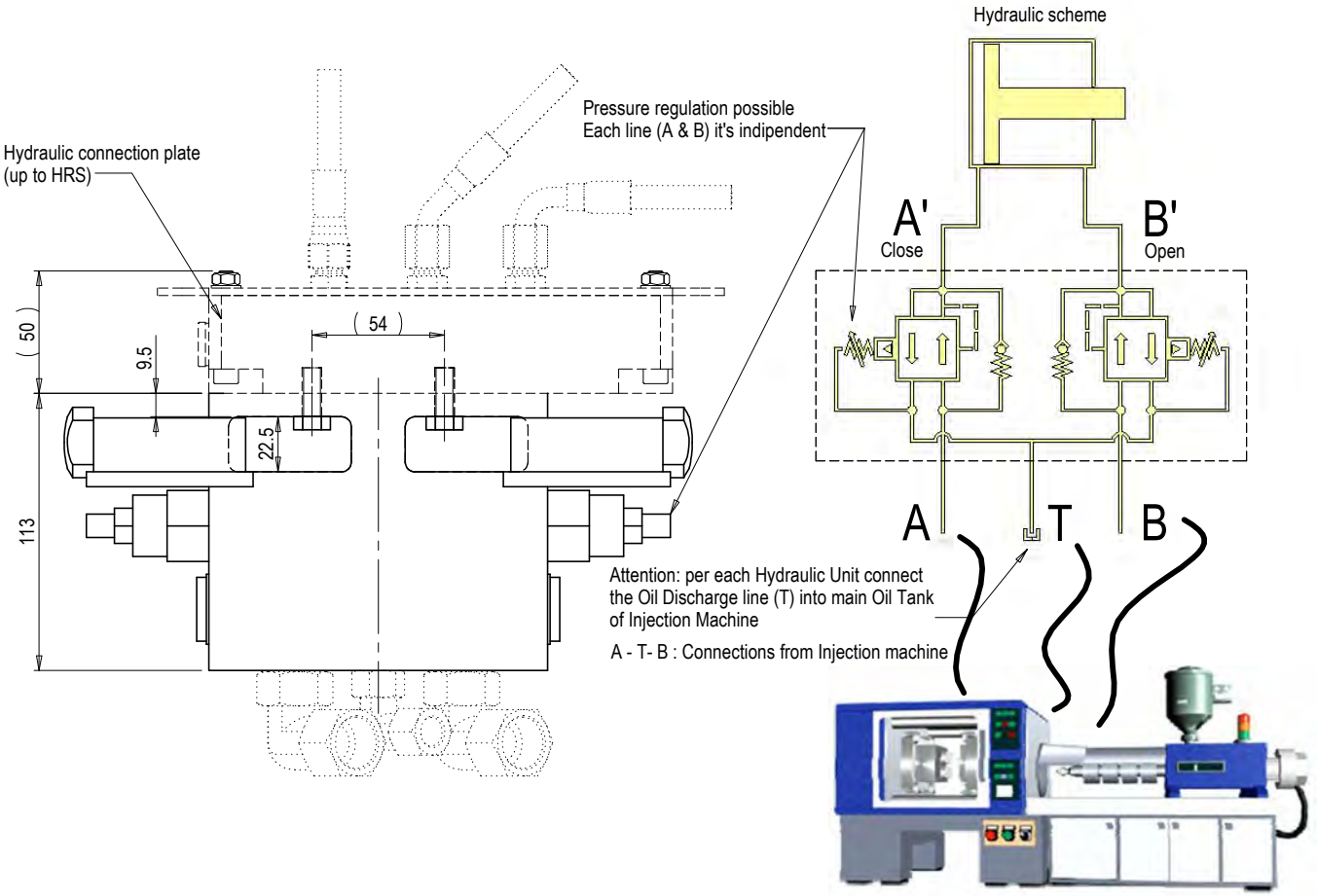


-Available in two versions:
- cod. 0160-00010 Pressure reducer supplied with double manometers (bounding box 256x161x113)
- cod.0160-00011 Pressure reducer supplied without manometer but predisposed with thread 1/4" BSPP (bounding box 238x78x113)

- Max. supplied pressure from Injection machine: 340 bar (34 MPa)
- Default set-up Exit oil pressure before assembling into Hot Runner System: 40 bar (4 MPa)
- Possible regulating Exit oil pressure: 10-100 Bar (1-10 MPa)
- Max Flow Rate : 670 cm3/s
- Max oil temperature: 120°C
- Use of most common Hydraulic Oil
- Every Hydraulic Reducer Unit can feed from 1 up to 12 HRS Flow Hydraulic Valve Units acting at same time.
- If sequential functioning of Hot Runner System is required, then each group of HRS Flow Hydraulic Valve Units will be fed by 1 single Pressure Reducer

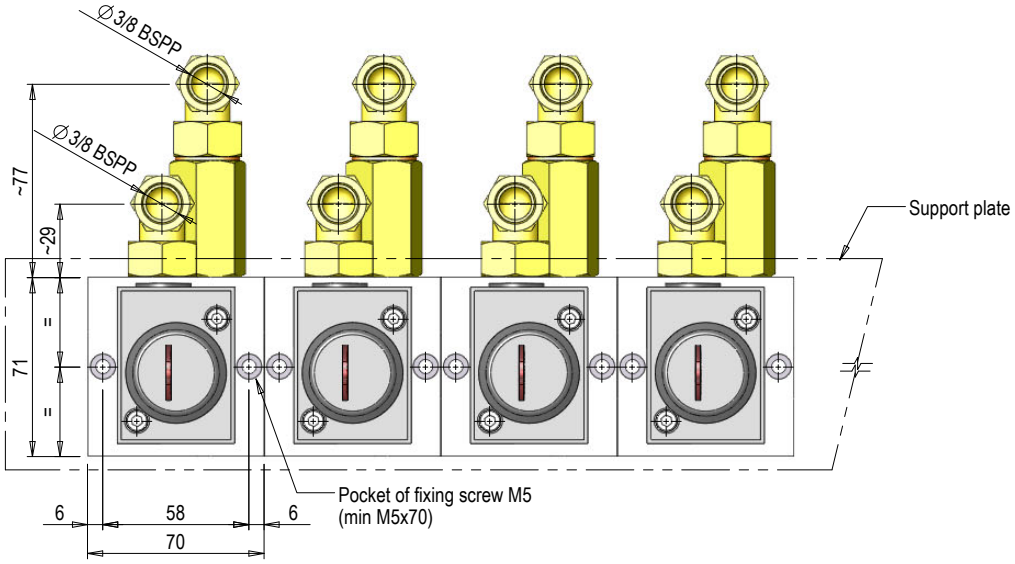
Attention: The pressure reducer cicuit provides the discharge oil "T", absolutely to be connected to oil tank of Injection machine.
The failure respect of connection, heavily damages the HRS system because the line pressure is not reduced.

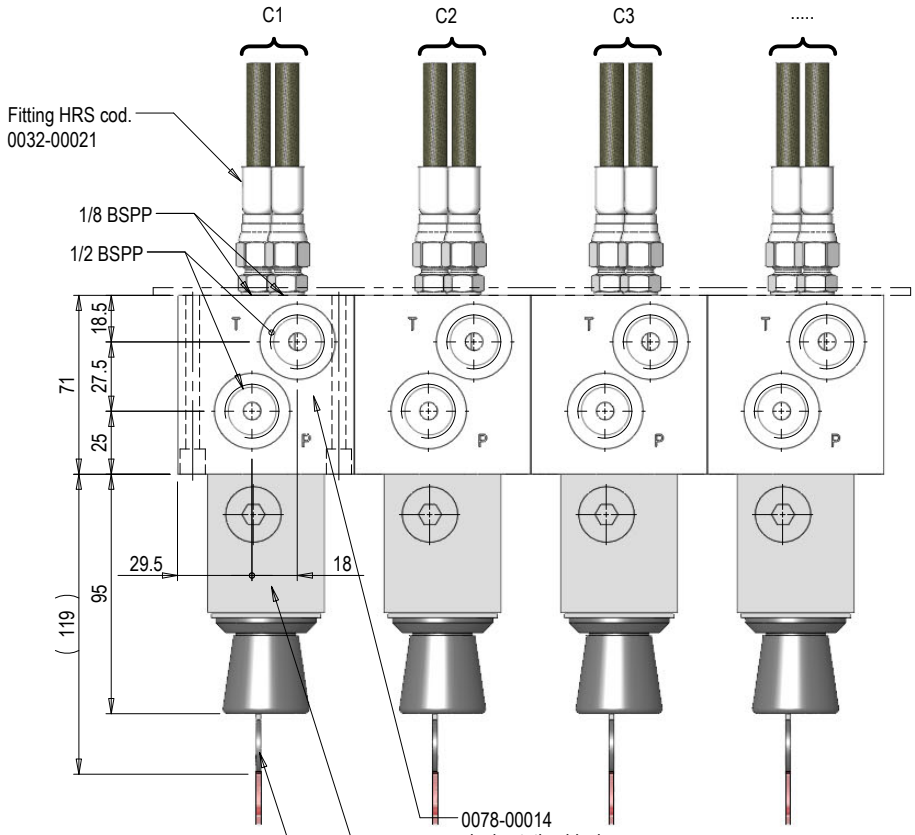




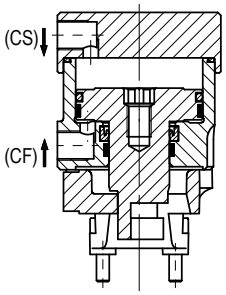
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FLEX Speed



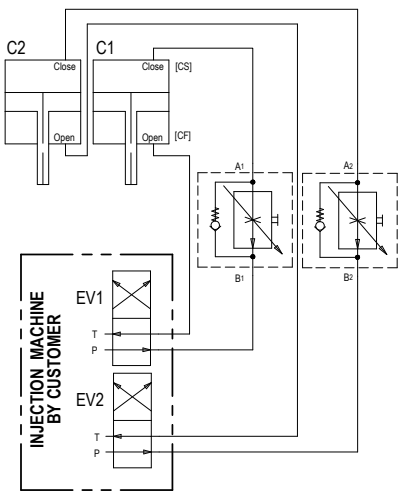


Standard Connection HRS

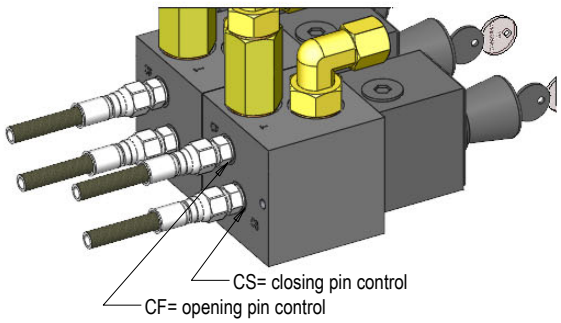


CYLINDER C1 - C2 - C3 ....

Hydraulic diagram



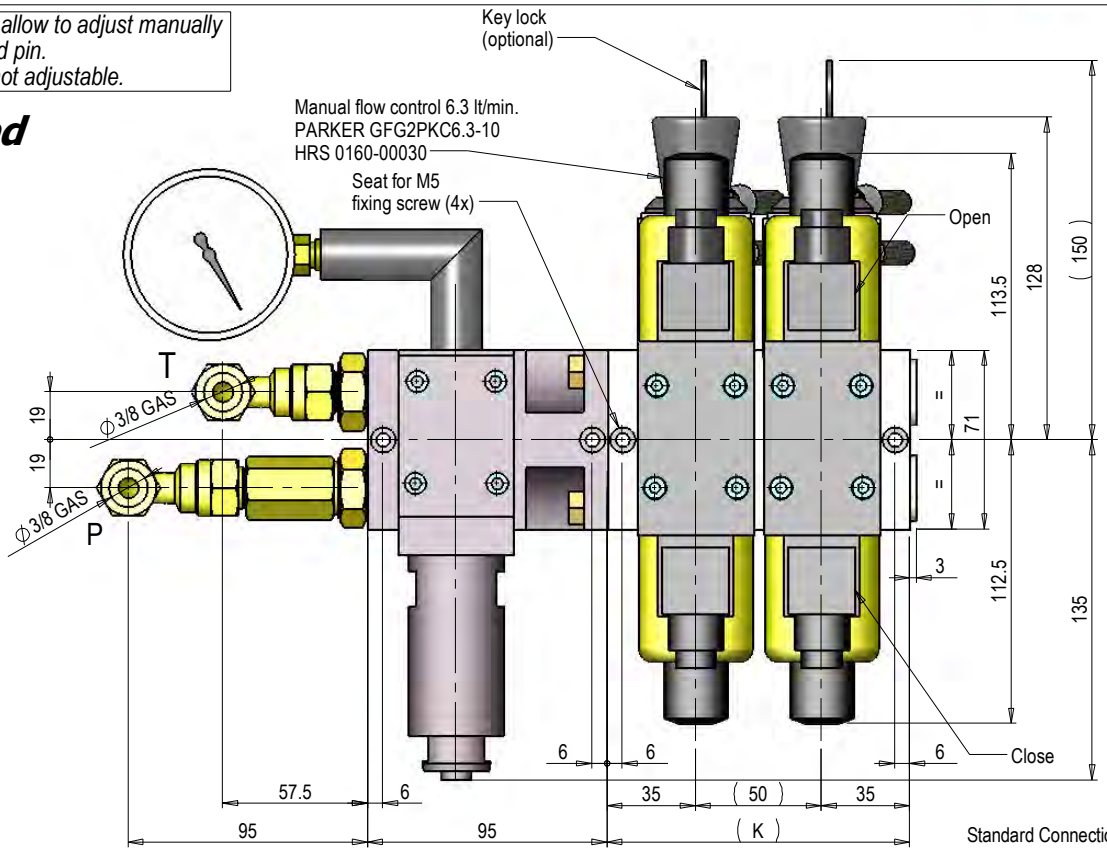
The flow control valve allow to adjust manually only the opening speed pin.
The closing speed is not adjustable.



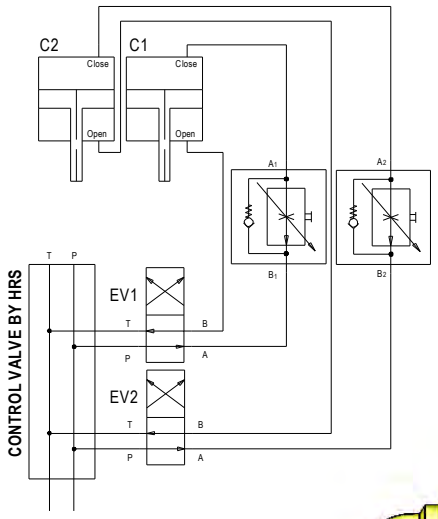
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The flow control valve allow to adjust manually only the opening speed pin.
The closing speed is not adjustable.

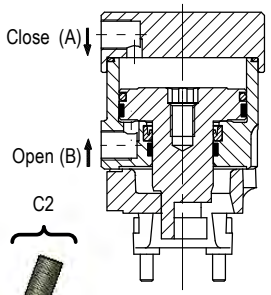
FLEX Speed



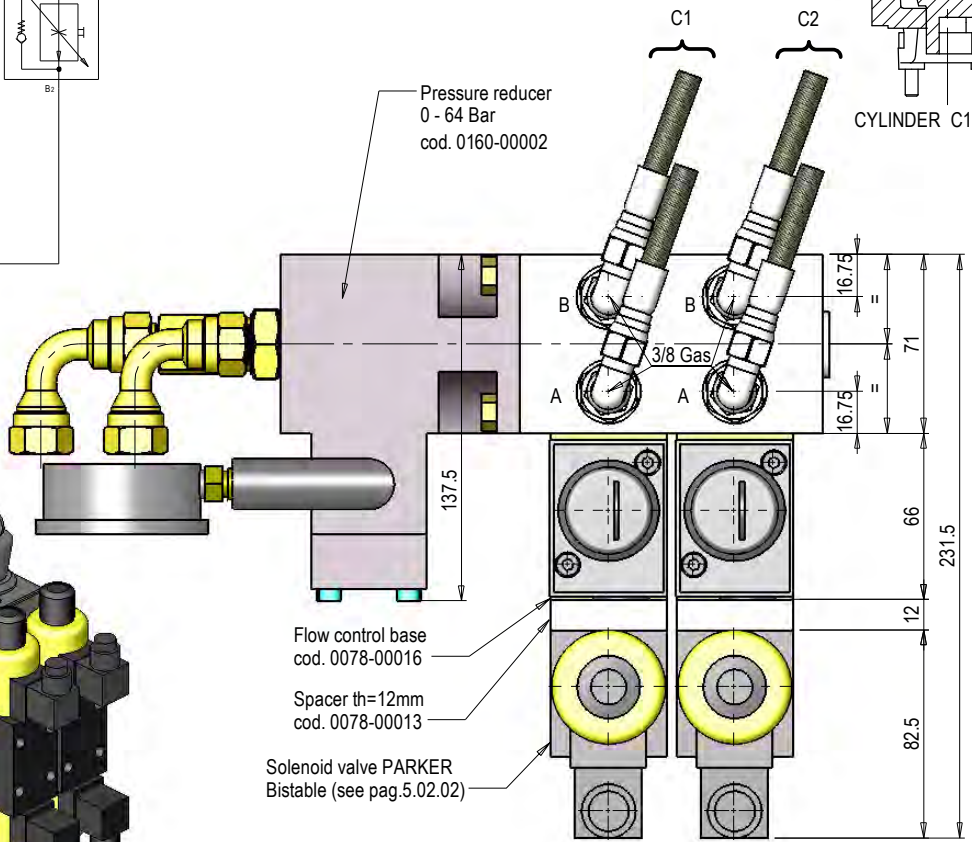
Hydraulic diagram

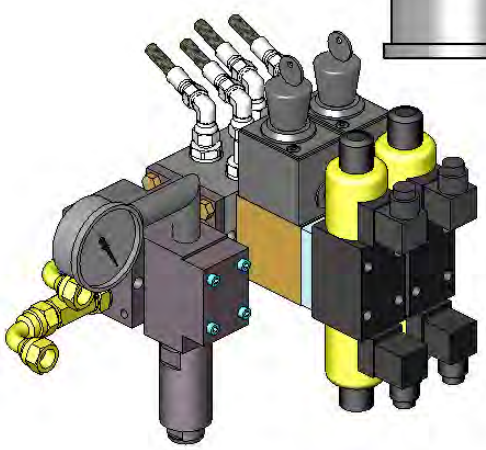


Standard Connection HRS



CYLINDER C1 - C2 - ....





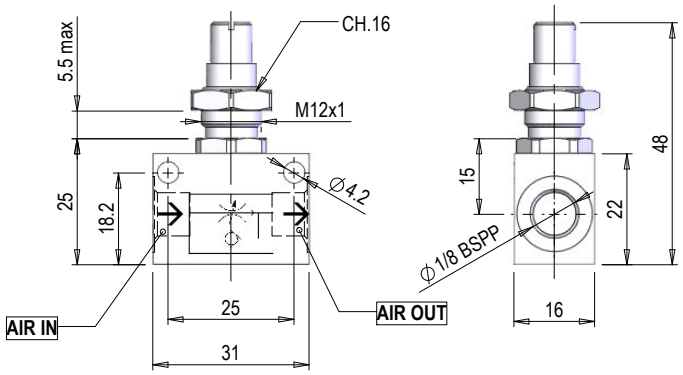
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FLEX Speed cod. 0160-00100

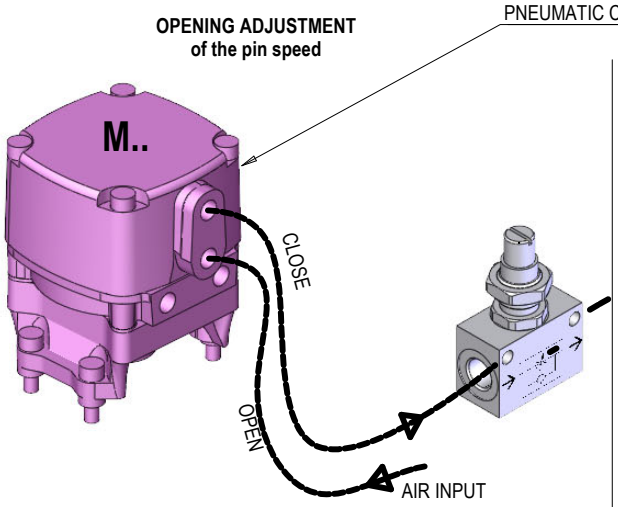
max 10 bar
max 70°C [158°F]

The FLEX Speed is a pneumatic flow control valve that allows to adjust the OPEN, CLOSE speed of the pin. In according of the adjustment's type required, follow the correct assembly as shown below.

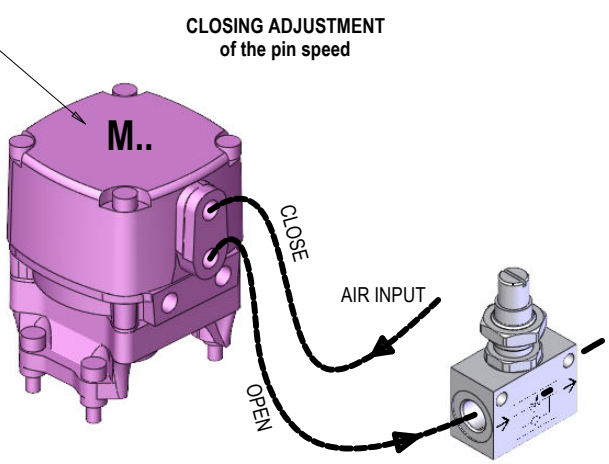
Overall Dimensions



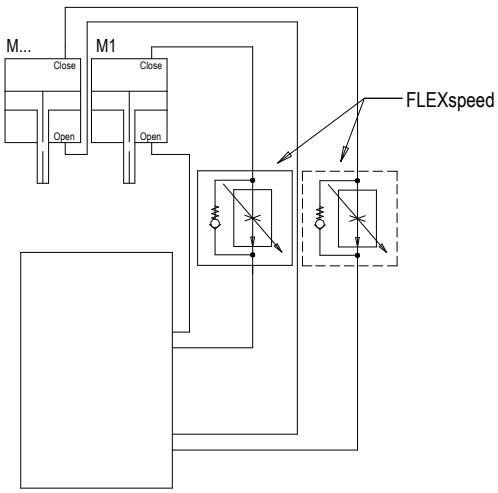
OPENING ADJUSTMENT of the pin speed



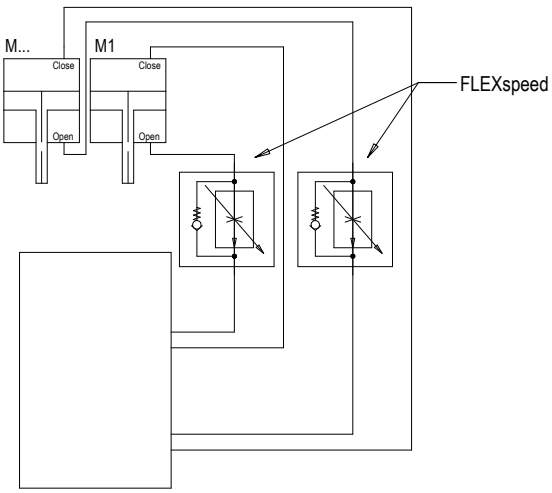
CLOSING ADJUSTMENT of the pin speed



Pneumatic diagram

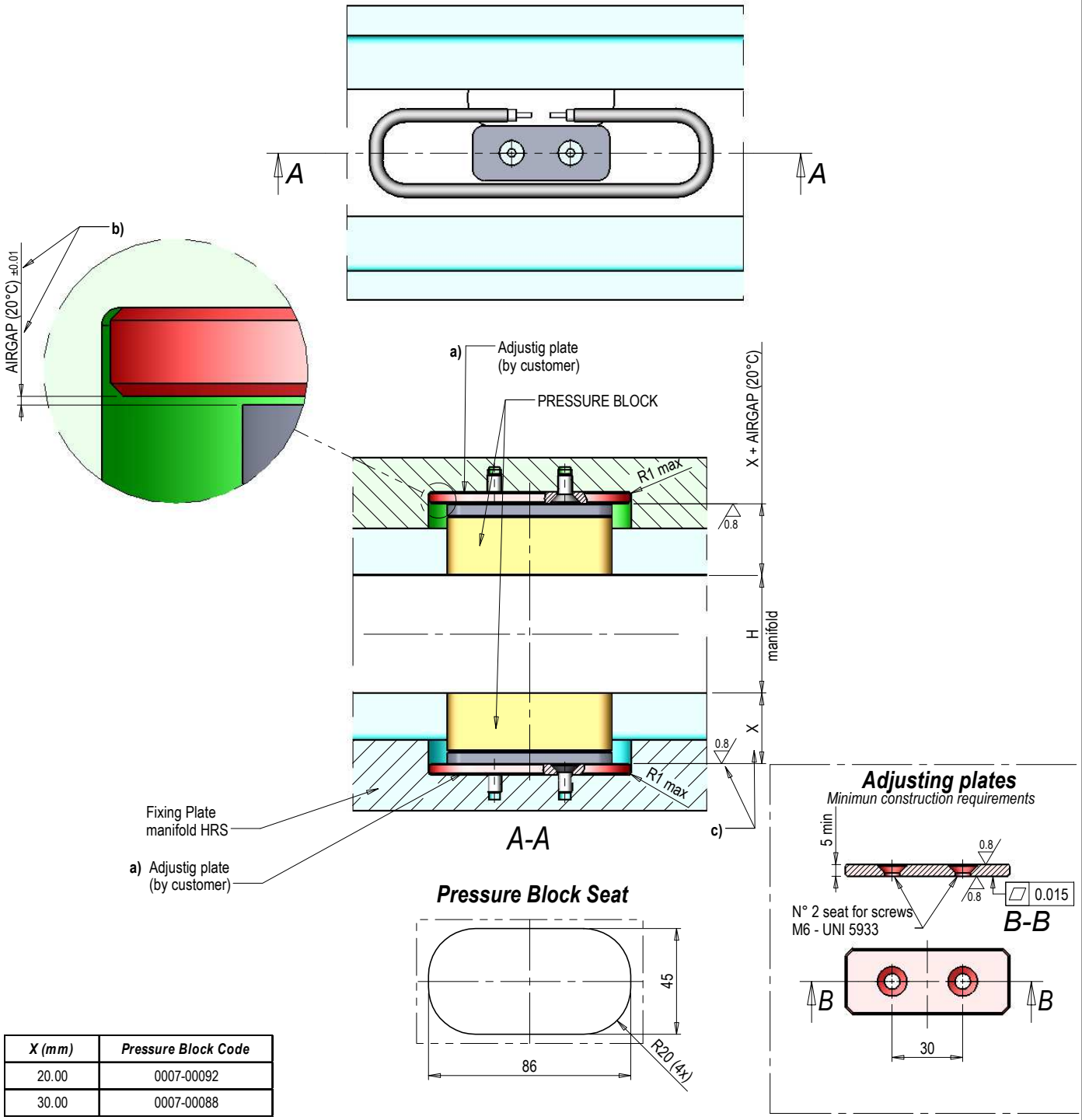


Pneumatic diagram



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The pressure block is a component exclusively providable by design of HRS technical office which manages the feasibillity, quantity and positioning on manifold.
HRS declines every responsability for improper use of Pressure Blocks indipendently installed by customer on HRS systems which originally didn't have them.
For further information please contact HRS technical office.



X (mm)	Pressure Block Code
20.00	0007-00092
30.00	0007-00088

Series	H (mm)	AIRGAP (mm)
P(*) - Pa - M(*)	40	0.10
Ma - G(*)	50	0.12
Ga	60	0.14
Aa	70	0.17

TEMPERATURE RANGE	VALUE with "X"=20 mm	VALUE with "X"=30 mm
Compressive strenght at 200°C [392°F]	450 Mpa	450 Mpa
MAX Temperature of Manifold	240°C [464°F]	300°C [570°F]
MAX Mold Temperature	50°C [122°F]	100°C [212°F]

INSTALLATION NOTES:

a) Adjusting plates (by customer): the realization is here suggested in order to obtained the correct installation of the Pressure Block as requested on the following points b) c) and d).

b) AIRGAP value and tolerance very important. Values to be obtained after fixing correctly the HRS system in the mold.

c) The precise coupling of Pressure Block with mold seat is required during installation. Properly check with BLUE scraping the surfaces of Pressure Block and all other surfaces of the manifold in contact with the mold.

d) Requirements b) and c) must be satisfied for ALL pressure blocks requaired by HRS system

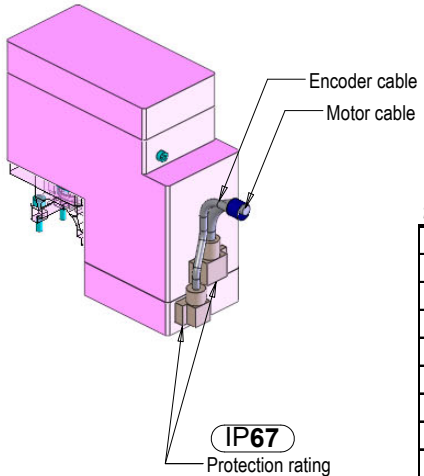
(*) In these series HRS reserves its use. The possibility to install the Pressure block on the manifold is exclusively subordinate to preliminary feasibility study by HRS technical office.

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Electricals specification for Flexflow One

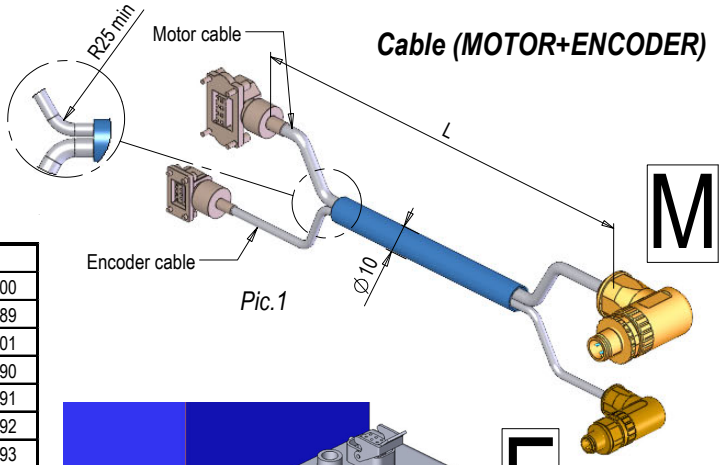
1- Flexflow One cables

Every actuator group is electrically powered through a couple of cables (ENCODER+MOTOR). For cable codes with available lenghts see table "A". The cable is supplied separated from the group; its lenght must be carefully calculated during wiring design.

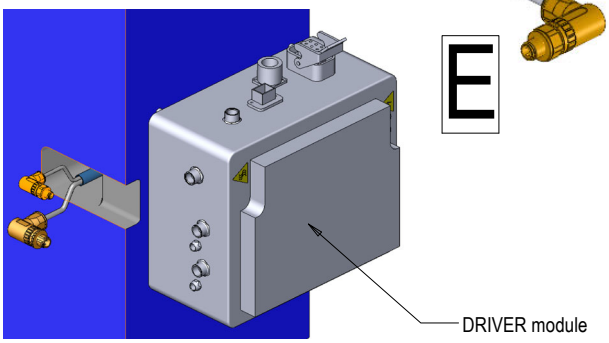


tab.A

L (m)	Code
0.25	0093-00200
0.5	0093-00189
0.75	0093-00201
1.0	0093-00190
1.5	0093-00191
2.0	0093-00192
2.5	0093-00193
3.0	0093-00194
3.5	0093-00195
4.0	0093-00196
4.5	0093-00197



Pic.1

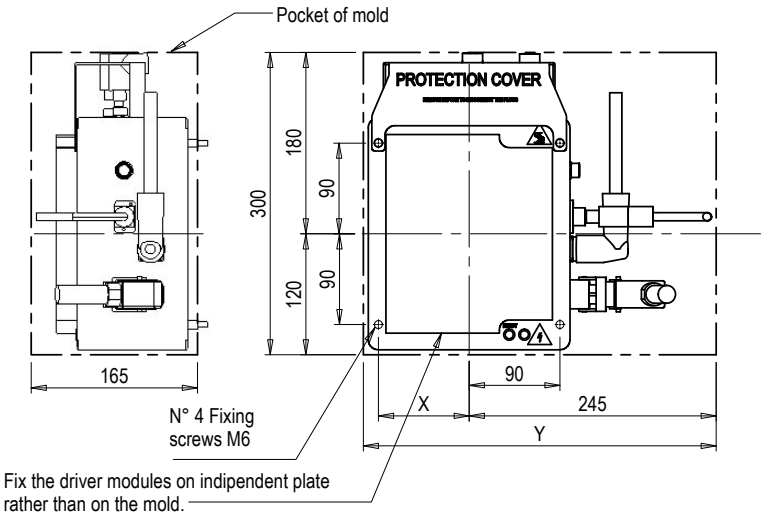


Pic.2

ENCODER+MOTOR cable (Pic.1) is provided yet wired. Openings forced groove on the mold must take into consideration enough clearance for the connectors (see pic.2)

2- DRIVER modules

The DRIVER modules are of three different sizes and thei can manage a max numbers of actuators as shown on table "B".



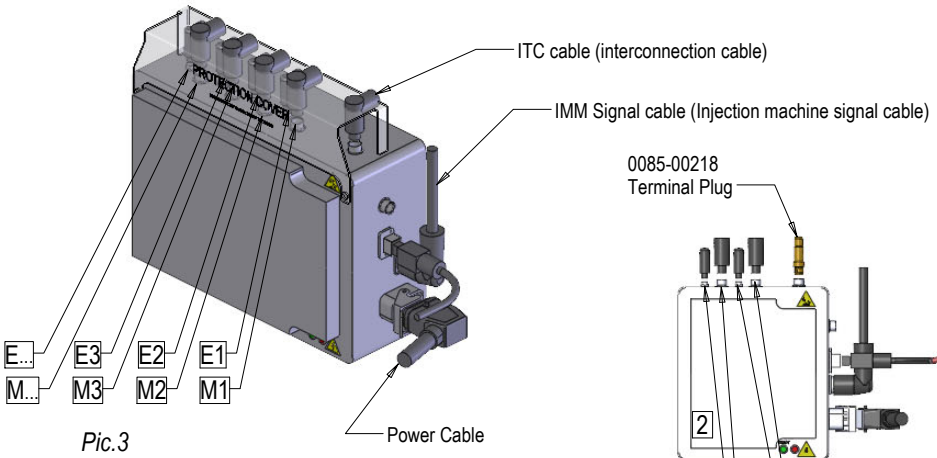
tab.B

X	Y	N° of ACTUATORS
90	350	1
		2
220	480	3
		4
490	750	5
		6
		7
		8

WARNING! Every single driver module it's specifically set for the system where it have to operate; at the customer it's not allowed to remove t his component in complete autonomy and replace him with other equal or bigger sizes modules. Please contact the customer service Oerlikon HRSflow.

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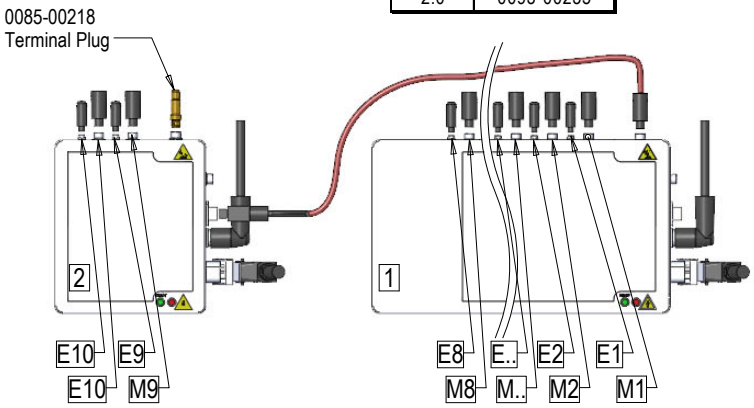
More driver module (max n°3) may be connected beetwen them, so to have the control up to max n° 24 actuators.
The interconnection is realized with the specific bridge cable ITC shown in Pic.3/4. The cable lenght "L" available are set out on table "C".



Pic.3

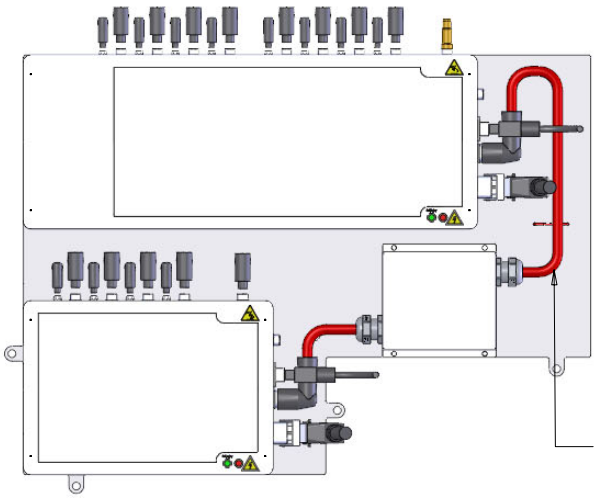
tab.C

L (m)	Code
0.5	0093-00231
0.75	0093-00232
1.0	0093-00233
1.5	0093-00234
2.0	0093-00235



Pic.4

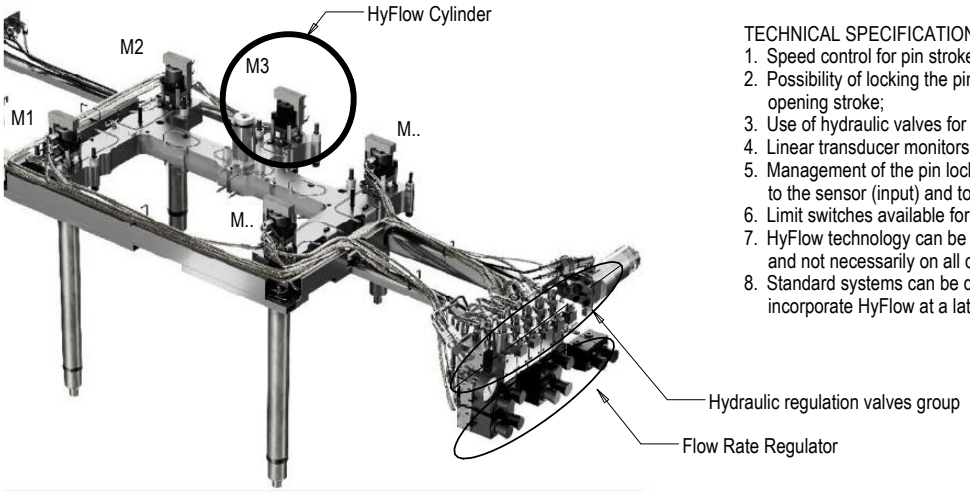
The Injection Molding Machine and the driver modul are connected with a specific cable and connector (Pic.5)



Pic.5

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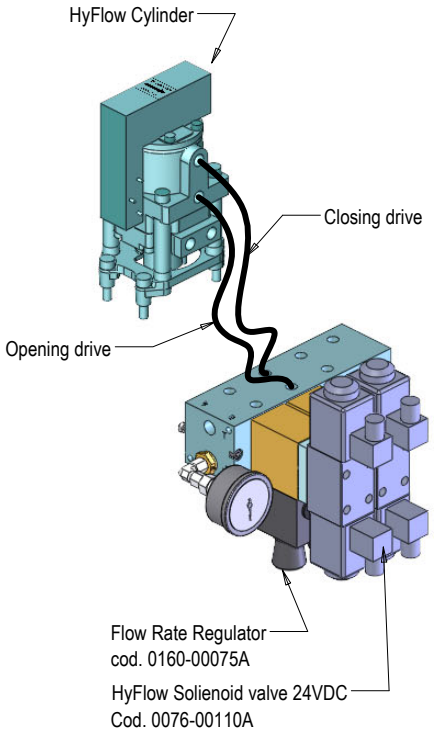
The "HyFlow" system allows speed adjustment and control of the pin opening position in HRS systems equipped with specific hydraulic cylinder named HyFlow (see page 4.G3.12 / 4.Aa3.17). Speed adjustment is possible in both directions: during opening and closing the pin.
The HRS system with HyFlow is equipped with dedicated flow regulation valves in addition to the normal directional solenoid valves.



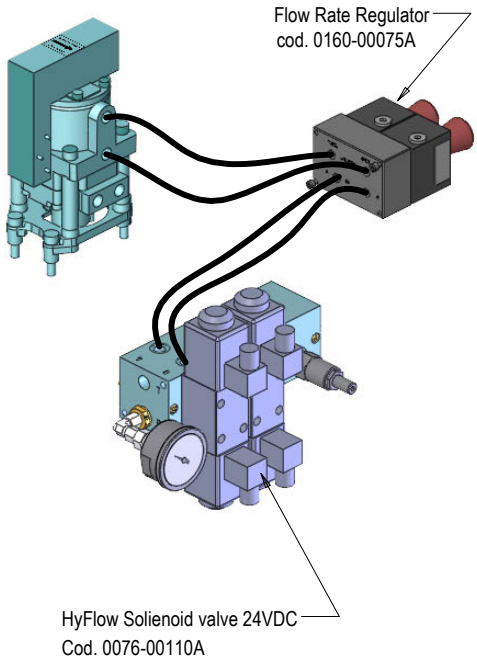
TECHNICAL SPECIFICATIONS:
1. Speed control for pin stroke (opening and closing);;
2. Possibility of locking the pin in an intermediate position of the opening stroke;
3. Use of hydraulic valves for regulation;
4. Linear transducer monitors pin position at all times;
5. Management of the pin locking position via the control unit connected to the sensor (input) and to the hydraulic blocking valve (output);
6. Limit switches available for both forward and back positions;
7. HyFlow technology can be applied only to the required drops and not necessarily on all drops (HyFlow Hybrid);
8. Standard systems can be delivered with the provisions to incorporate HyFlow at a later date (HyFlow ready).

Depending on the type of functionality required, two valve configurations are available for regulation:

1VOS
Adjust the OPENING speed
with pin stop in a intermediate position (OPENING only)

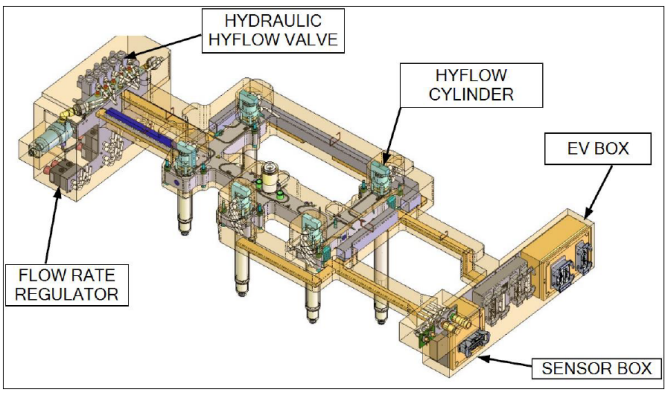


2VOS
Adjust the OPENING and CLOSING speed
with pin stop in a intermediate position (OPENING only)



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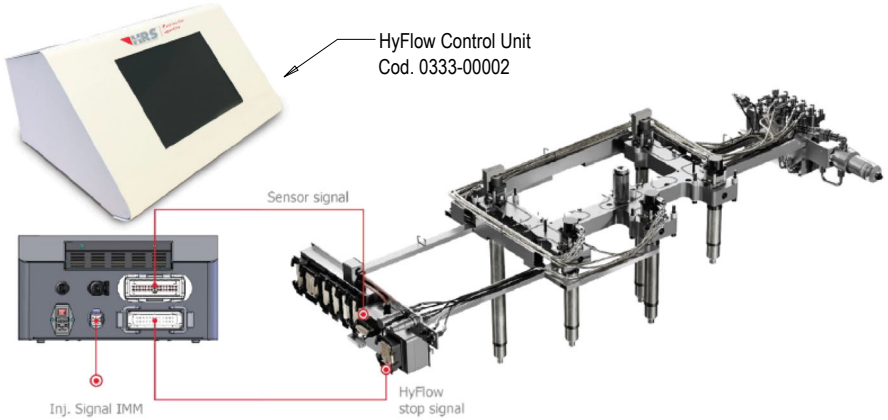
Regarding the electrical part, the "HyFlow" system is equipped with two special boxes: "EV BOX" for controlling the hydraulic valves and the "SENSOR BOX" for reading the linear sensor with which the HyFlow cylinder is equipped (see Fig. 1).
These two BOXES make the interface between the mechanical portion of the HRS system and the HyFlow Control unit



Pic.1

The HyFlow system is managed by an easy and intuitive HyFlow Control Unit that allows you to set the stroke for each pin.
It also allows you to:

- Obtain pin movement graphing;
- Store recipes;
- Control up to 16 HyFlow drops;
- Power voltage 110V & 230V;
- Includes standard 10m cables.



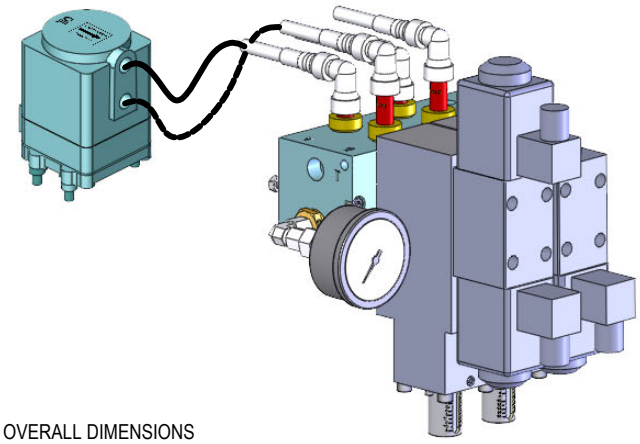
Pic.2

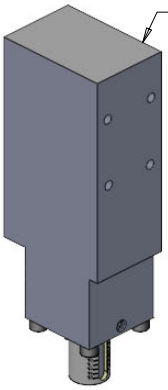
For more information about the "HyFlow" system, please contact HRS

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The MSR solution (Pic.1) allows adjustment of the position of the pin in the systems with hydraulic actuators. Managing the oil volume is possible to set different position of needle in opening phase by mean a mechanical device installed on solenoid valve block (Pic.2-3)

TECHNICAL SPECIFICATIONS:
- Valve pin opening stroke adjustment;
- Installed in EV block (Pic.3);
- Possibile to install only in required EV position;
- Possibile to install with the FLEXSpeed (optional) (Pic.4);
- Compatible with all types and series HRS hydraulic cylinder.

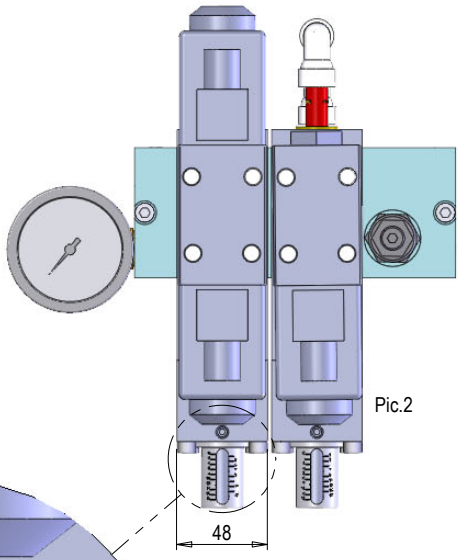




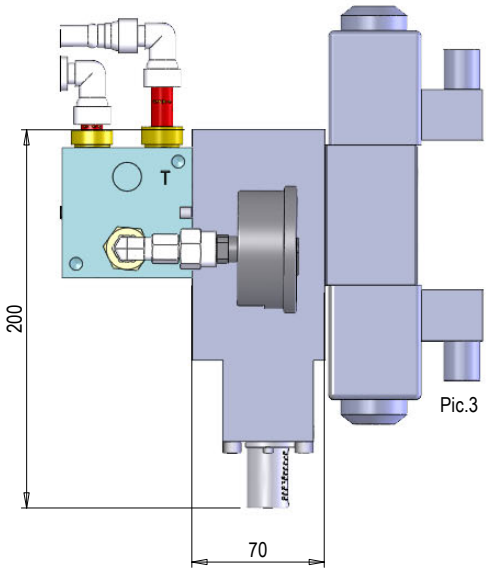
Hydraulic Unit MSR
0160-00105A stroke12
0160-00107A stroke18

Pic.1

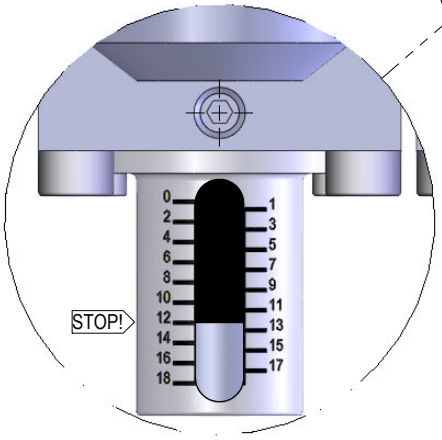
OVERALL DIMENSIONS

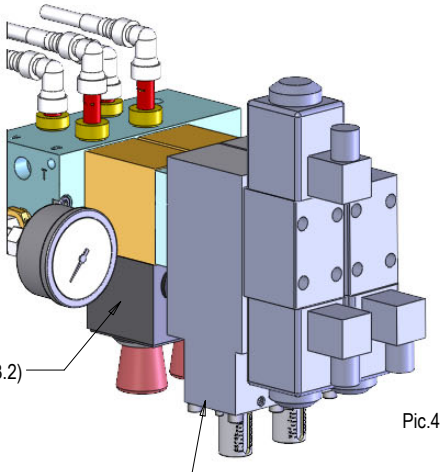


Pic.2



Pic.3





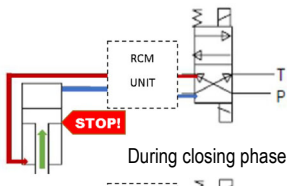
FLEXSpeed
(see pag.5.03.2)

Pic.4

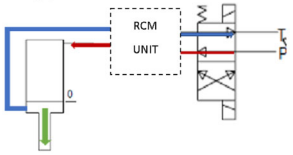
Hydraulic Unit MSR

FUNCTIONALITY

During opening phase (Stroke regulation)



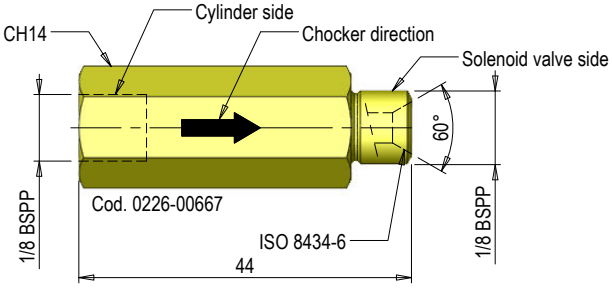
During closing phase



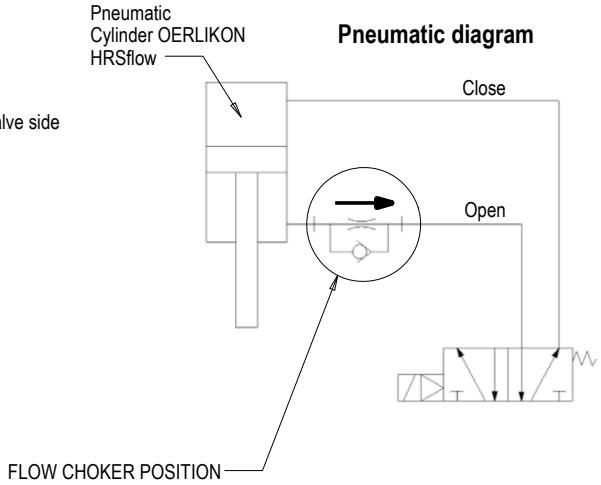
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It's a particular kind of PNEUMATIC fitting used to slow down the closing stroke of the cylinder. If the design rules require it, in case of wired systems OERLIKON HRSflow foresees it already installed by default. In case of no-wired systems, the customer will have to carry out the installation independently according to the specifications below:

Overall Dimensions



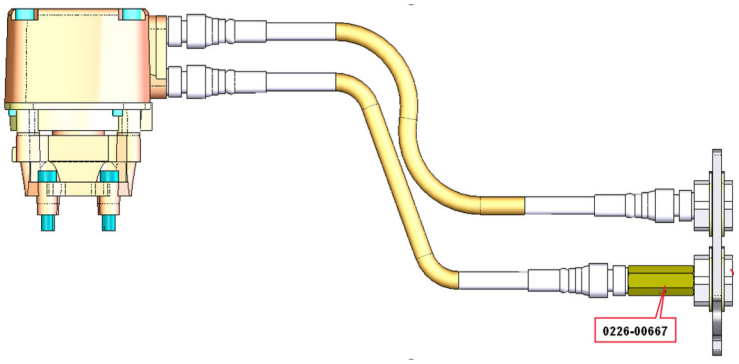
Pneumatic diagram



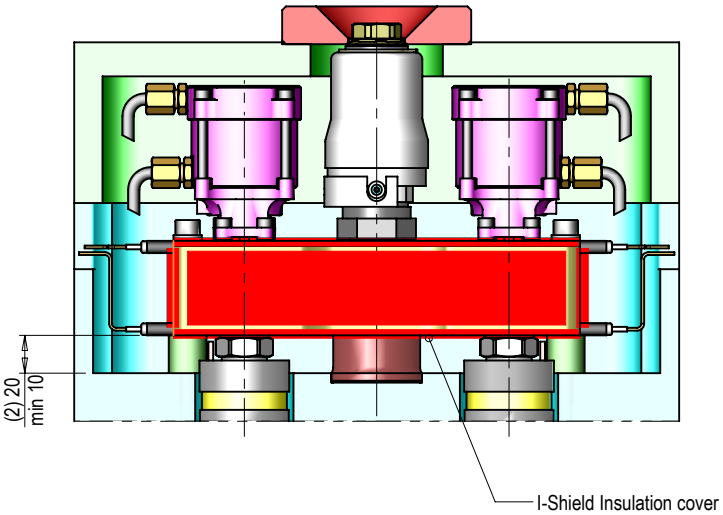
Technical data sheet		
Fluid:		Compressed Air
Max Pression:		15 bar
(*) Max working temperature :		+300°C [+572°F]
Materials:	Body	Stainless Steel
	Springs	Stainless Steel

(*) WARNING: use the fitting preferably outside the mold.
For moulding temperature greater than of the max value specified above, installation outside the mold is always MANDATORY!

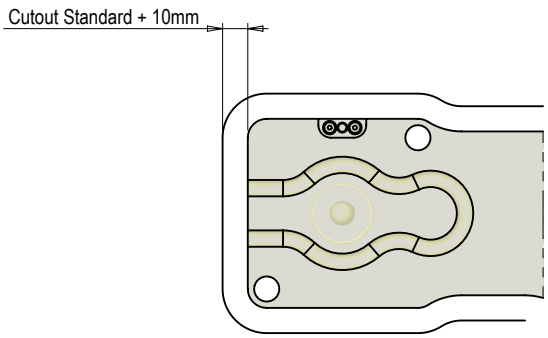
Assembly (only for example)
for more detail please contact OERLIKON HRSflow Technical Office



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- Insulating cover I-SHIELD HRS applicable to manifold only.
- Allow an extra 10mm per side on the standard cut out (see "Manifold" section of the catalogue).
- Recommended Thrust Block height 20mm, minimum height 10mm.
- Suitable for plastic materials with a maximum molding temperature of 320°C Maximum operating temperature 320°C.
- Suitable for all Screwed-in or P, M, G, A Face to Face series and hybrid. For other series contact Oerlikon HRSflow.
- For installation and repair see User Manual. For replacement and reorder insulating cover contact Oerlikon HRSflow.



Reduced the system heating time

↓

Reduction of energy consumption and greenhouse gas emissions in the heating process

Reduction of heat dissipation to the mould during the molding process

↓

Reduction of energy consumption and greenhouse gas emissions in the molding process

It helps to even out any hot and cold spots present along the manifold



Insulation material that poses no risk to health or the environment.

General Safety Dispositions:
- Ventilation: Local exhaust in accordance with general industrial hygiene practies is recommended to control dust;
- Eye Protection: Safety glasses;
- Skin Protection: Safety gloves.

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