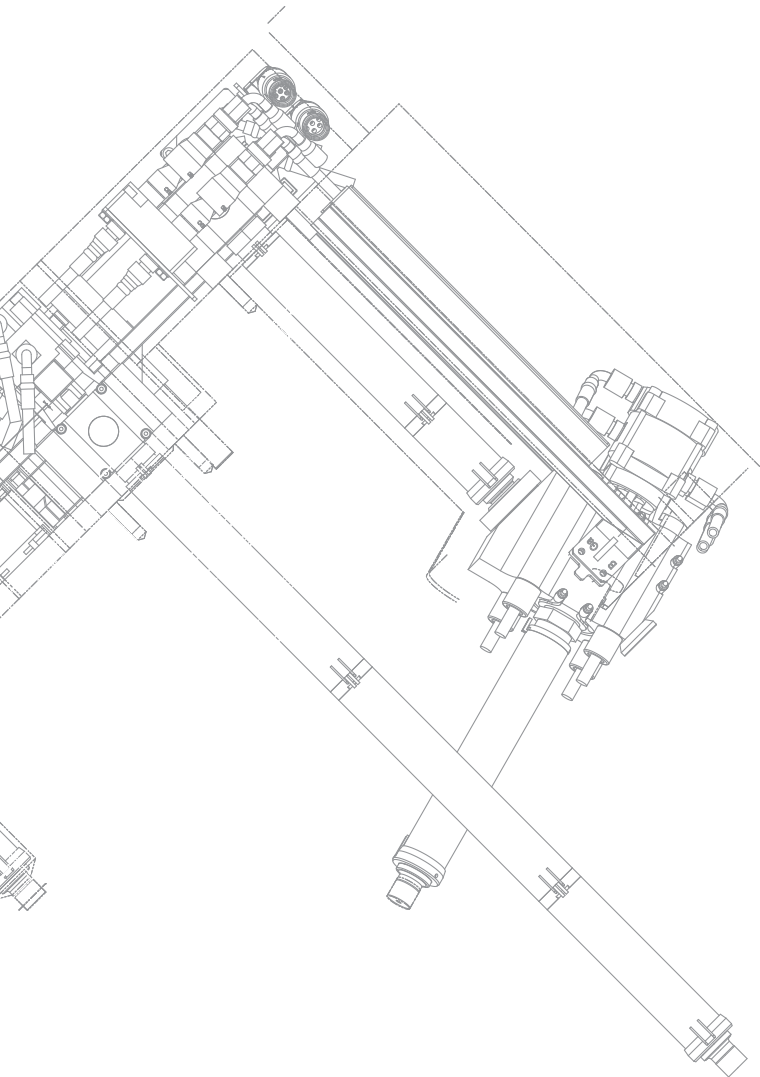


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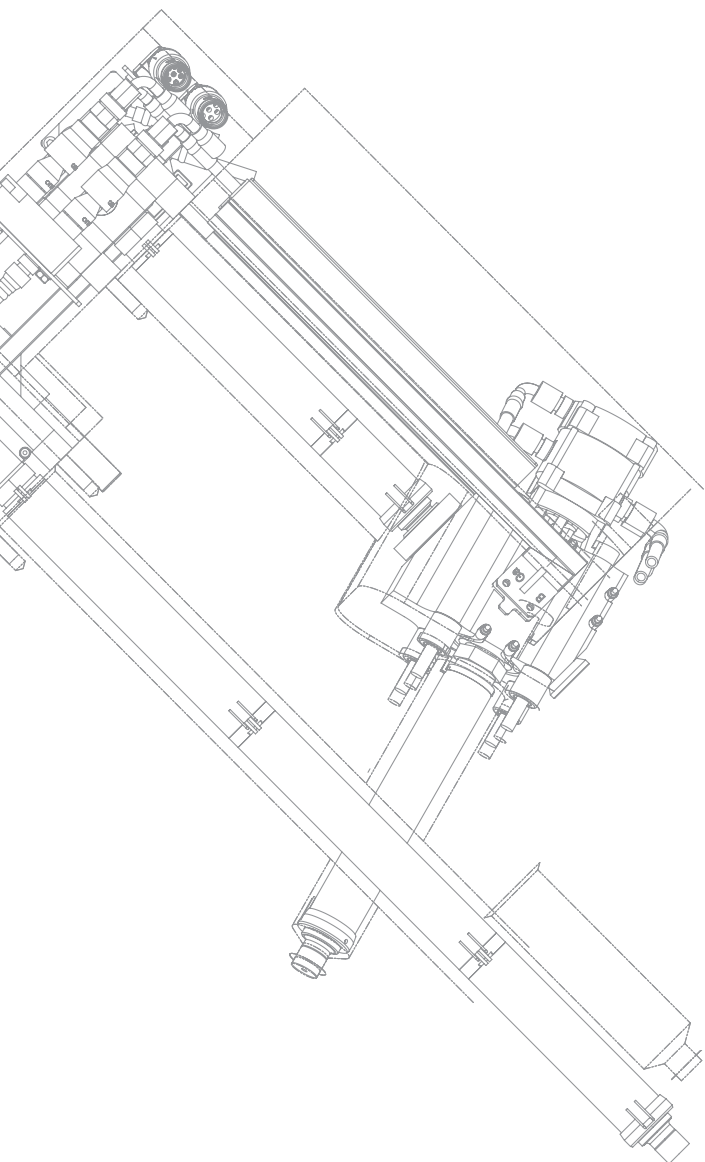


*Passion for
expertise*

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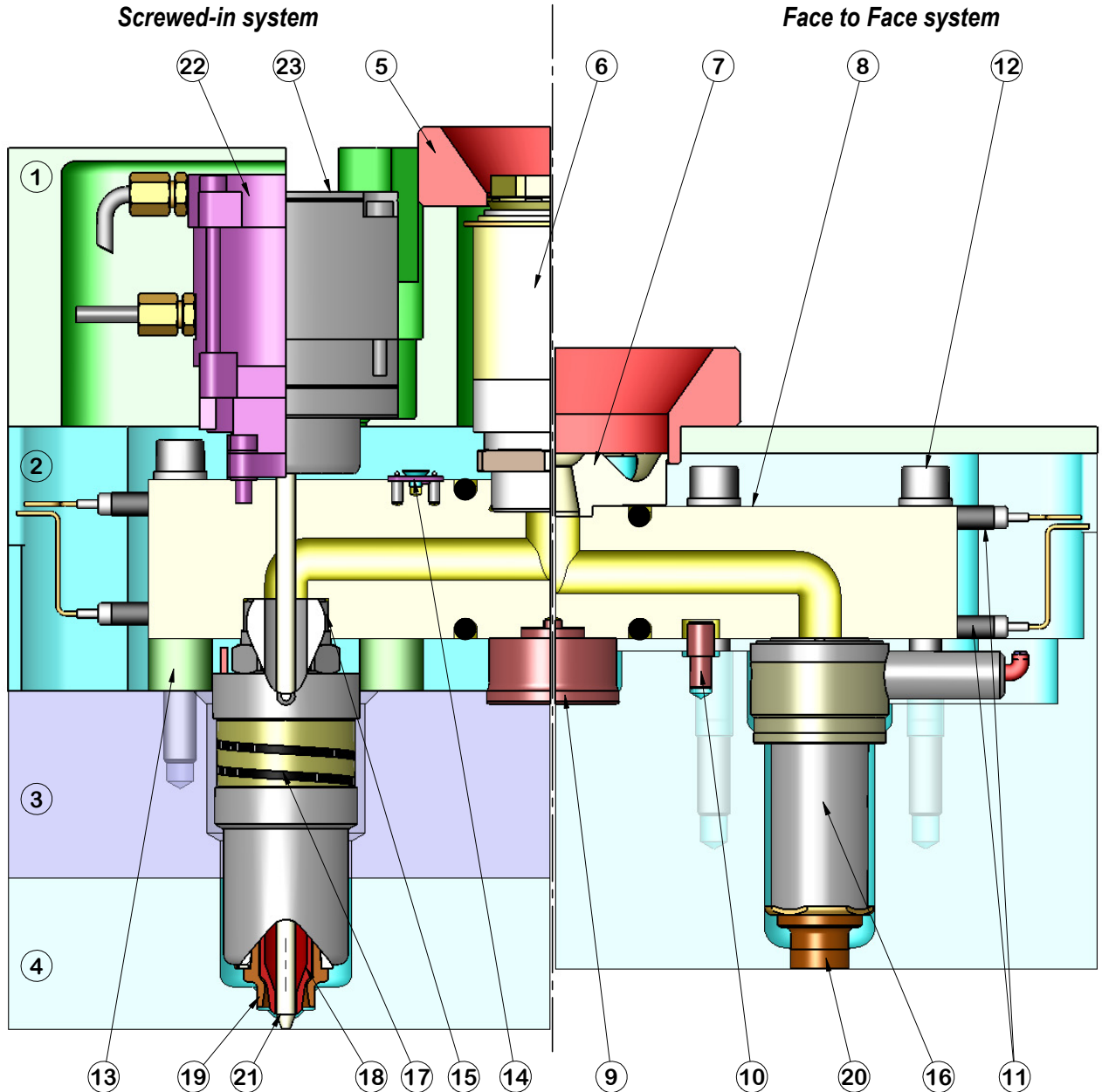
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Technical information

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Technische Informationen
Informations techniques
Informaciones técnicas
Informações técnicas

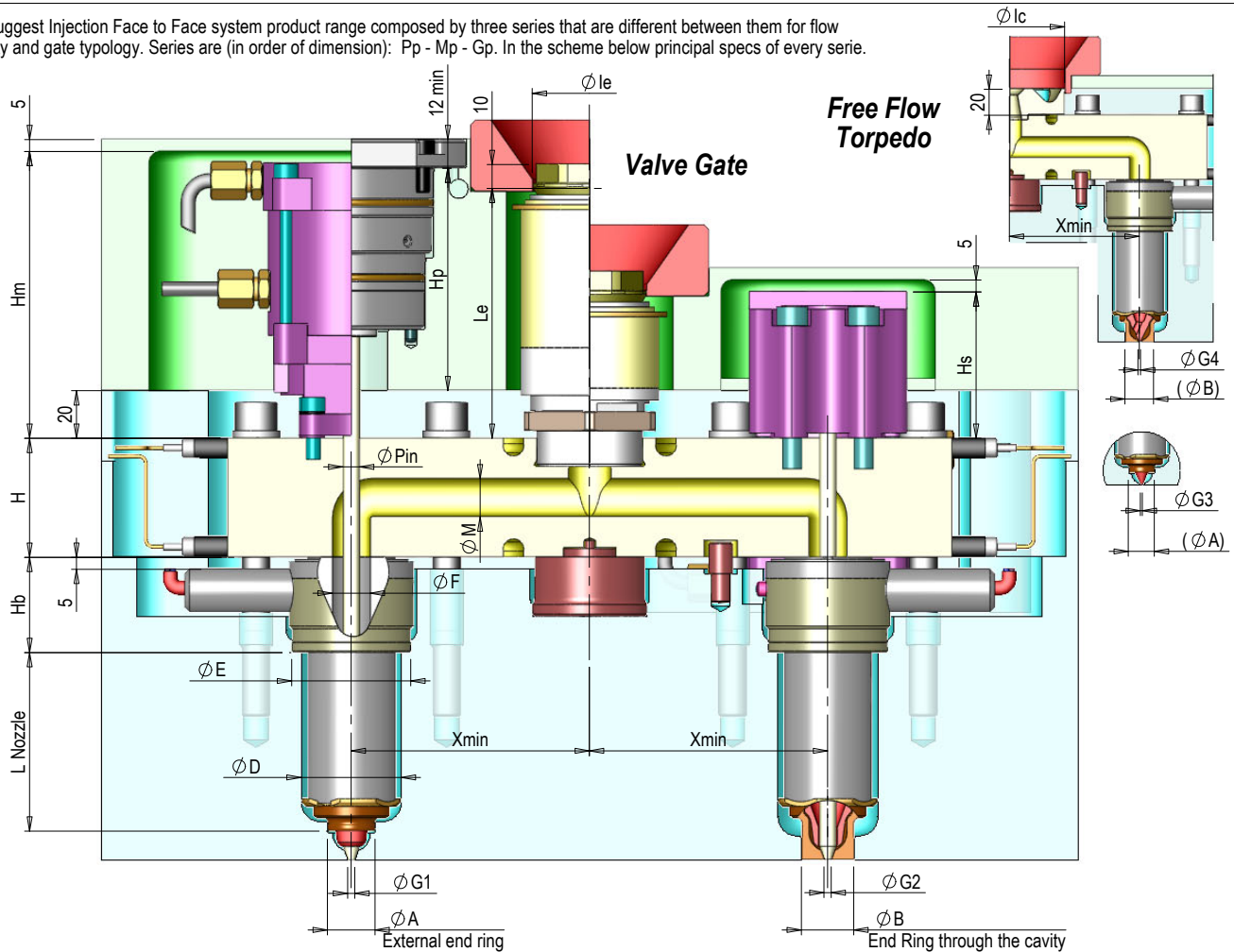


- | | | |
|---------------------------|-------------------------------|------------------------|
| ① Clamping Plate | ⑪ Manifold Heater | ⑳ Valve Pin |
| ② Spacer Plate | ⑫ Manifold clamping screw | ㉑ Cylinder on manifold |
| ③ Holder Plate | ⑬ Thrust block | ㉒ Cylinder on plate |
| ④ Cavity Plate | 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 | ㉓ External End Ring | |
| ⑩ Locating Pin | ㉔ End Ring through the cavity | |

STANDARD PRODUCT RANGE

Face to Face systems

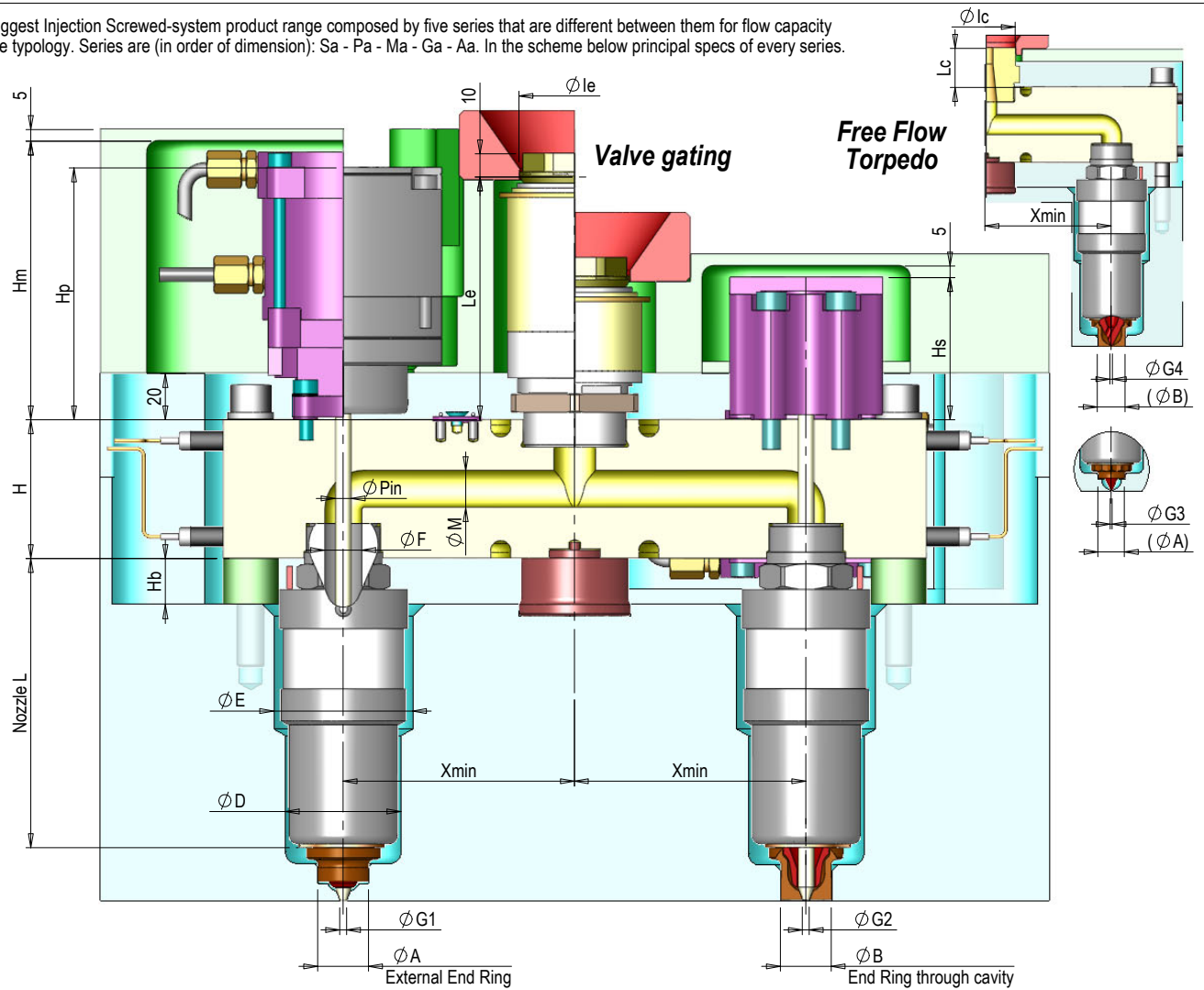
HRS suggest Injection Face to Face system product range composed by three series that are different between them for flow capacity and gate typology. Series are (in order of dimension): Pp - Mp - Gp. In the scheme below principal specs of every serie.



	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 <i>Free Flow / Torpedo</i>	10.5	12 - 14	20
ØB <i>Valve gating</i>	12	12 - 14	20 - 22
ØB <i>Free Flow / Torpedo</i>	10.5 - 12	14	22
ØB <i>Valve gating</i>			
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 <i>Free Flow</i>	Min 0.9 - 2.0 Max	Min 0.9 - 2.0 Max	Min 2.0 - 4.0 Max
ØG3 <i>Torpedo</i>	Min 1.2 - 2.0 Max	Min 1.5 - 3.0 Max	Min 1.5 - 4.0 Max
ØG4 <i>Free Flow</i>	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
ØG4 <i>Torpedo</i>	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
Ølc	65	65	85
Øle	30	48	48
Xmin	70	70	90

STANDARD PRODUCT RANGE SCREWED-IN systems

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.



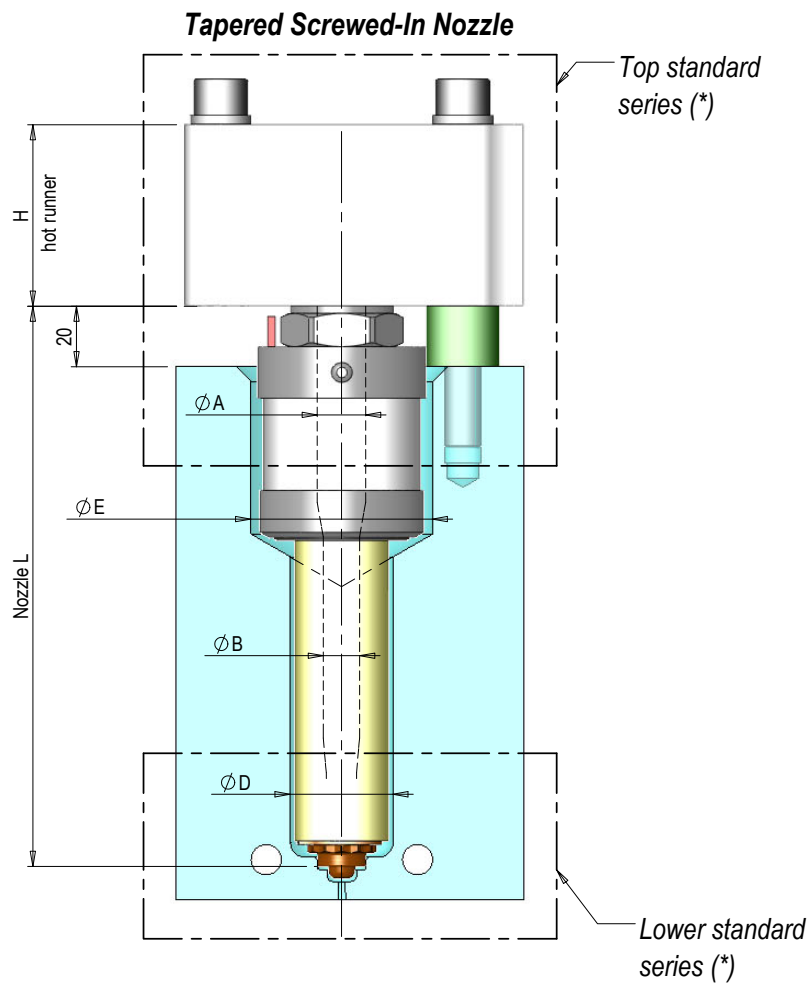
Series					
	Sa	Pa	Ma	Ga	Aa
Max flow capacity per nozzle [cm³/s]	15 Max	Min 2 - 70 Max	Min 10 - 265 Max	Min 100 - 1265 Max	Min 270 - 3150 Max
Max part weight	15g Max	200g Max	500g Max	2500g Max	5000g Max
Nozzle L	with External End Ring	Min 50 - 160 Max	Min 75 - 345 Max	Min 100 - 500 Max	Min 100 - 800 Max
	with End Ring through the	Min 50 - 195 Max	Min 75 - 360 Max	Min 100 - 800 Max	Min 100 - 800 Max
ØA	Free Flow / Torpedo	8	11.5	16	22
	Valve gating	10.5 - 11.5	14 - 16	22	26
ØB	Free Flow / Torpedo	8	12	14	22
	Valve gating	10.5 - 12	14	22	24
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	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	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
Ølc	30	30	48	48	48
Øle	30	30	48	48 - 50	48 - 50
Xmin	70	70	70	90	90

STANDARD PRODUCT RANGE Systems with Tapered nozzles

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 series to those of a smaller one.

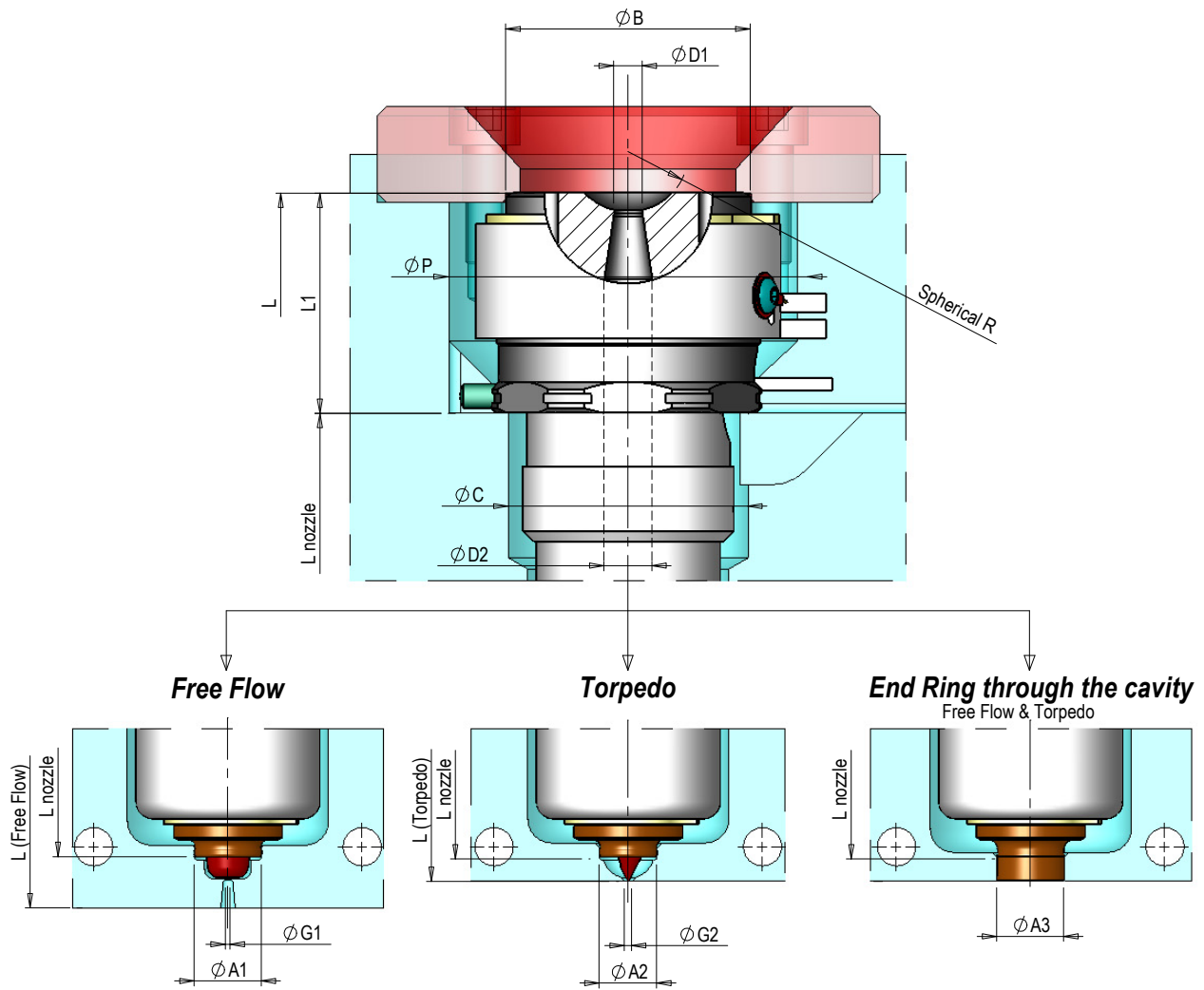
Tapered nozzles are available for screwed-in systems accordingly with the following scheme:

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



		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

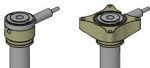
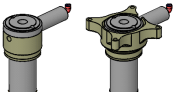
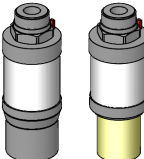
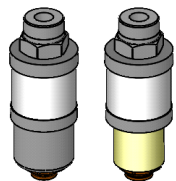
(*) for all the other dimensions not written in the table (endrings/manifold/cylinders etc..) please refer to the standard dimensions reported in the form 2.02.01 and 2.02.02



	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
	Torpedo	Min 1.2 - 2.0 Max	Min 1.5 - 3.0 Max	Min 1.5 - 4.0 Max
Spherical R	R0 - R12.7 - R15.5 - R19.1 - R25 - R40			

NOZZLE SPECIFICATIONS

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

Series	Nozzles (with indicating diameters available)	Plus (p) Scheme Face To Face	Screwed-in (a) Scheme	Max Molding Weight
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			
	Mp - Np Mh - Nh			
	Ø(8)-10-12-14			
	Ma - Malux Mz			
G	Ø(8)-10-12-14			2500g
	Ha			
	Ø16-18-20			
	Gp - Ep Gh - Eh			
	Ø16-18-20			
A	Ga - Galux Gz	Not available		5000g
	Ø14-16-18-20			
	Ca			
	Ø22-24			
A	Aa - Aalux	Not available		5000g
	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 configurations (Tip & End Ring) of the series just below.

MAX NOZZLE FLOW TABLE

The maximum 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.

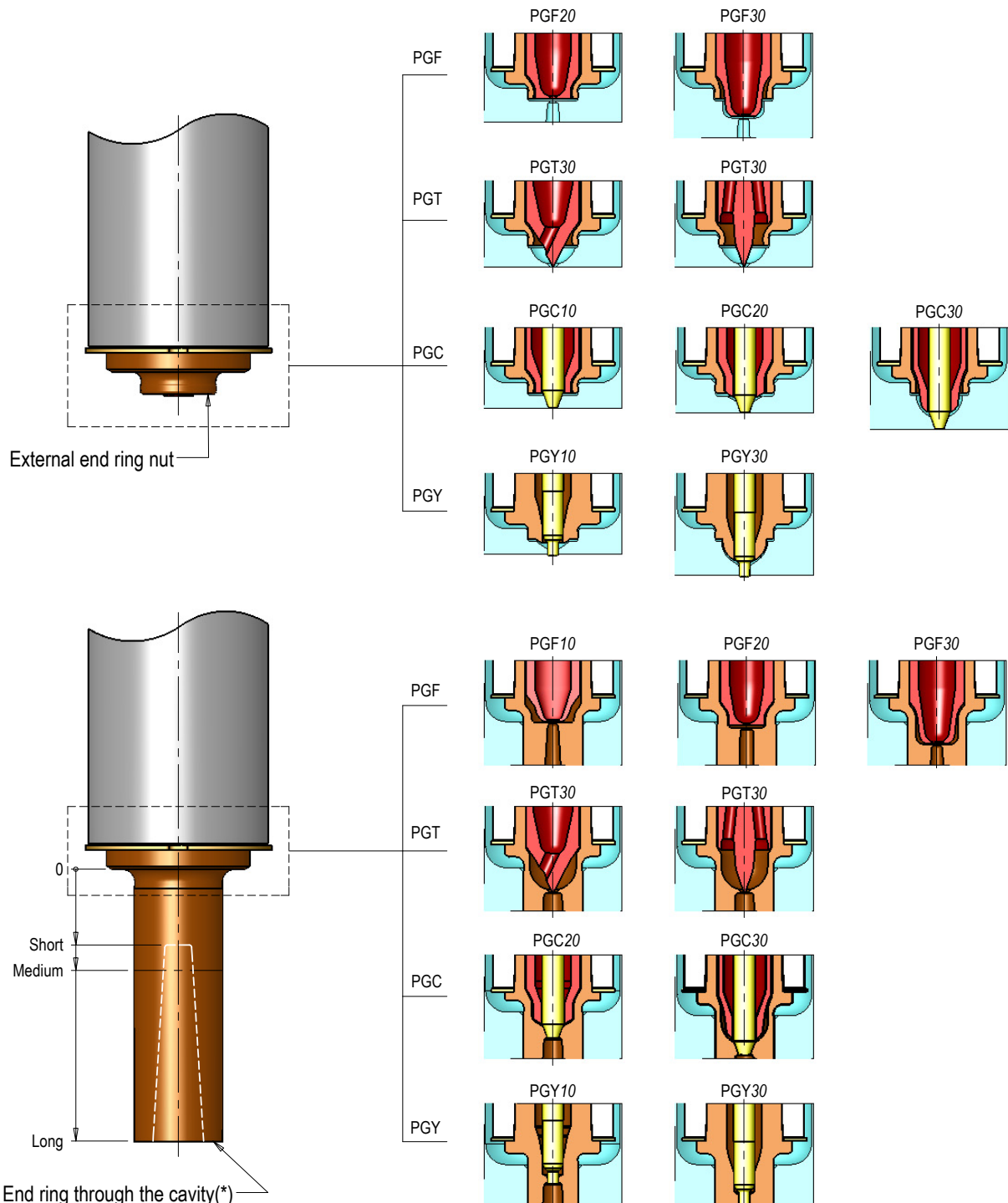
HRSflow is available to support you in order to find the most suitable solution based on the specific plastic material to be injected.

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	10
	Multihole	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



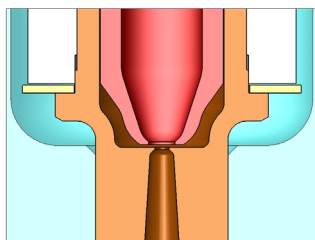
(*) Available by three lenght: "Short", "Medium", "Long"

FREE FLOW

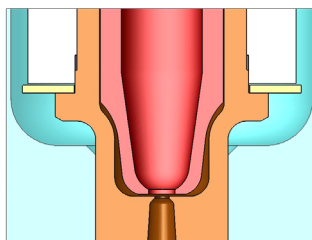
Free flow is characterized by the presence of a small sprue connected to the molded component or connected to the cold channel. The sprue is solidified during the cooling phase and serves to prevent the drooling of molten plastic from the gate. If the freezing of the sprue is achieved too much fast, 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



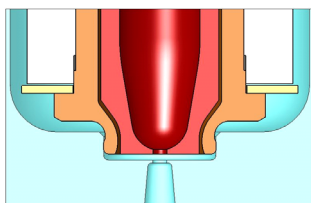
PGF10/30 - FREE FLOW WITH END RING THROUGH THE CAVITY

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 recommended for materials with wide 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 drooling problems.

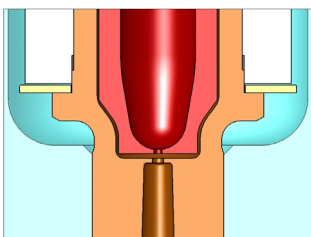
PGF20



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.

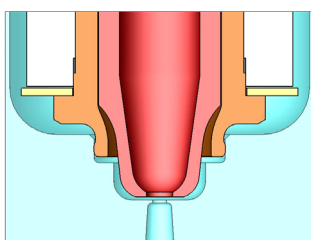
PGF20



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.

TORPEDO

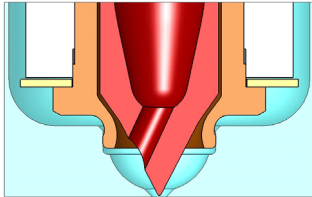
The torpedo tip injection type is recommended when a high quality finish at injection point is a main requirement.

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 independent cooling circuit around the gate.

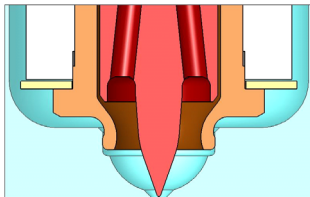
PGT30



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.

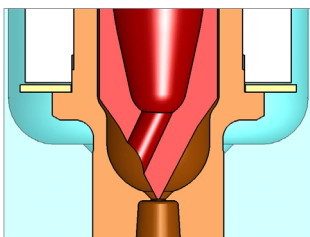
PGT30



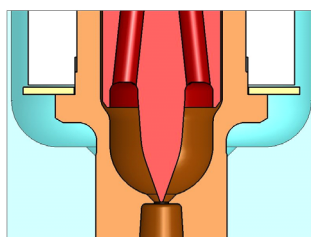
PGT30 - MULTIHOLE TORPEDO WITH EXTERNAL RING NUT

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 multi-hole torpedo tip type is recommended if it is necessary to inject into cold channels.

VALVE GATING

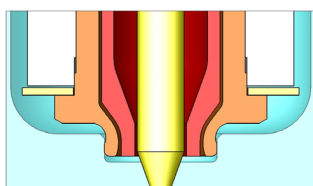
In the hot runner systems that apply this kind of gate (with conical or cylindrical valve gate) it is not required to wait long time for the gate solidification, because the gate is closed by a mechanism, so there is no concern for drooling or stringing.

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.

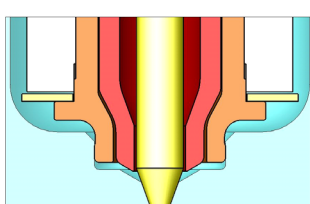
The aesthetic finishing at the injection point is also better than the one obtained from a free flow or torpedo tip system.

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



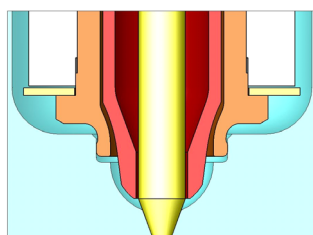
PGC20



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.

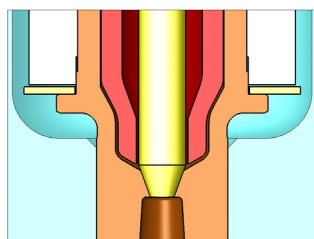
PGC30



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.

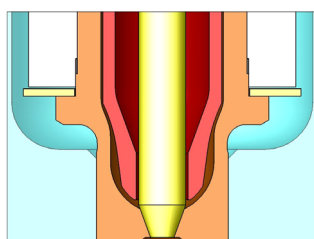
PGC20



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.

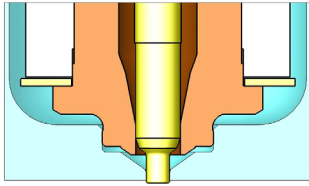
PGC30



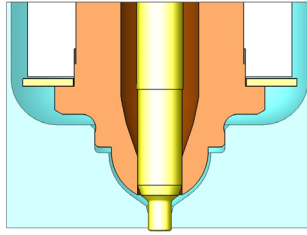
PGC30 - EXTENDED CONICAL V. GATING WITH END RING THROUGH THE CAVITY

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.

PGY10



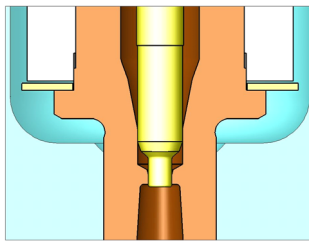
PGY30



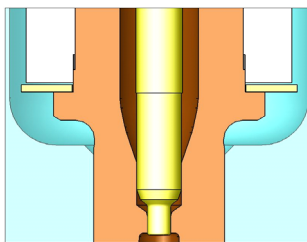
PGY10-PGY30 - CYLINDRICAL V. GATING WITH EXTERNAL END RING NUT

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



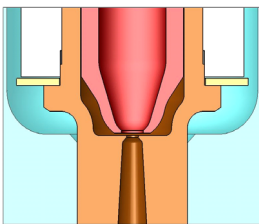
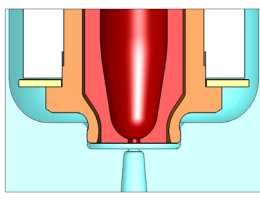
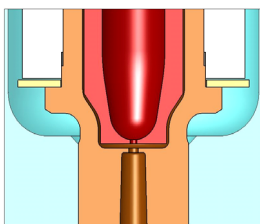
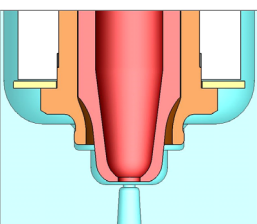
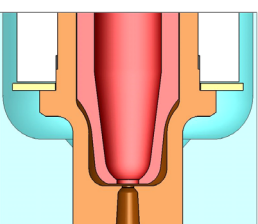
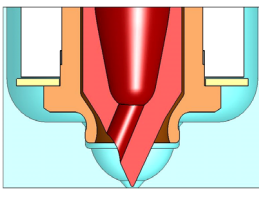
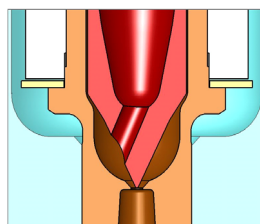
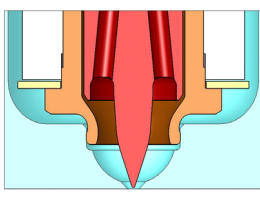
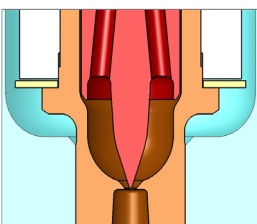
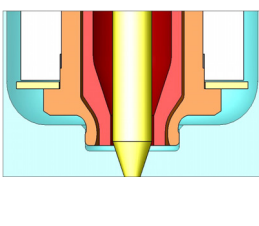
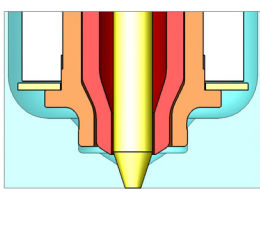
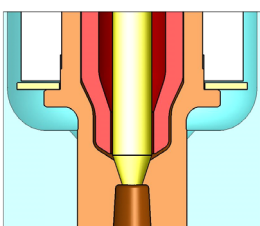
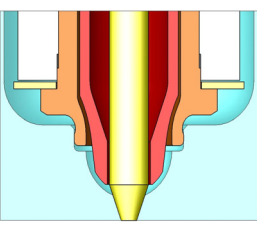
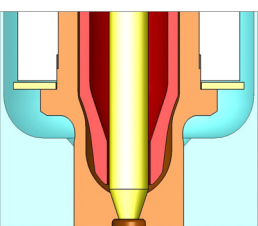
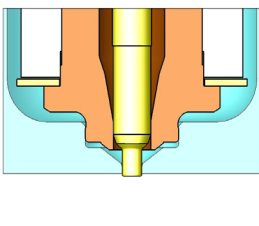
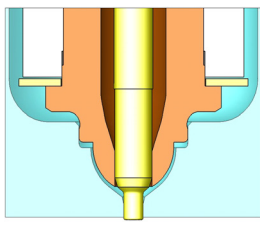
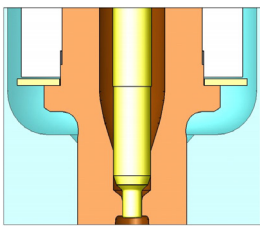
PGY30



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.

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		

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

TOLERANCES

Following the general tolerances applying to the present catalogue

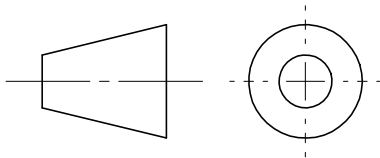
Metric system used for quoting

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 
0.03 MAX	0.03 MAX	0.2 MAX	0.3x45° MAX	 4h	 4H	HARDNESS ±1 HRc

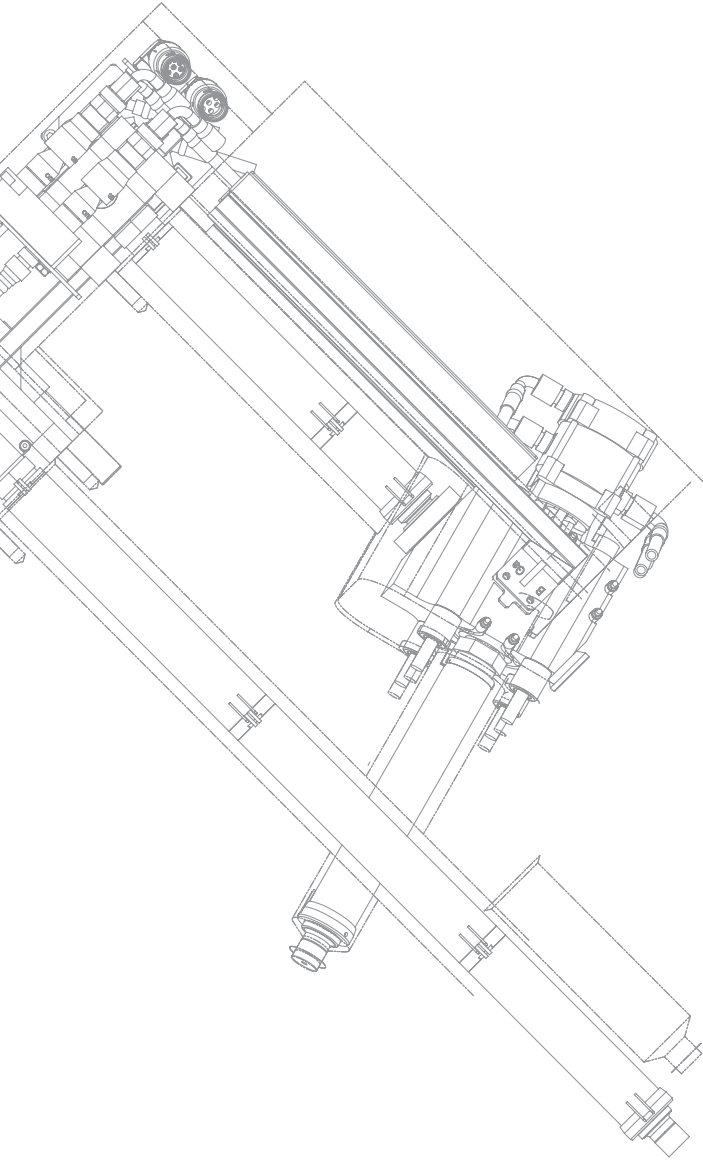
PROJECTION

European projection system used for graphic displaying

**DIMENSION CONVERSION TABLE**

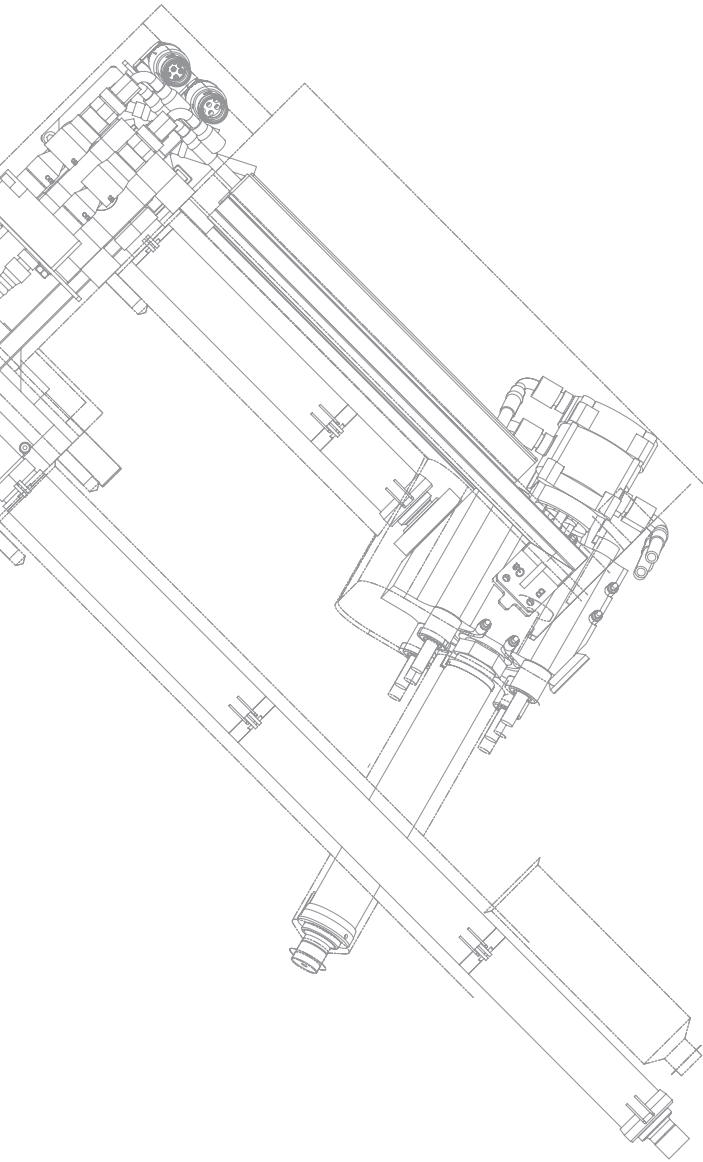
The following table allows translation of specific dimensions according to the International Unit System (SI)

DIMENSION	To achieve corresponding value in;	(SI) Multiply number of:	
LENGTH	Inches	mm (millimetres)	x 0.03937008
VOLUME	Inches ³	cm ³ (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 (New ton meter)	x 0.7375621
POWER	Btu (Int. Table/hour)	W (Watt)	x 3.412141
PRESSURE	pound/inch ²	bar	x 14.50377



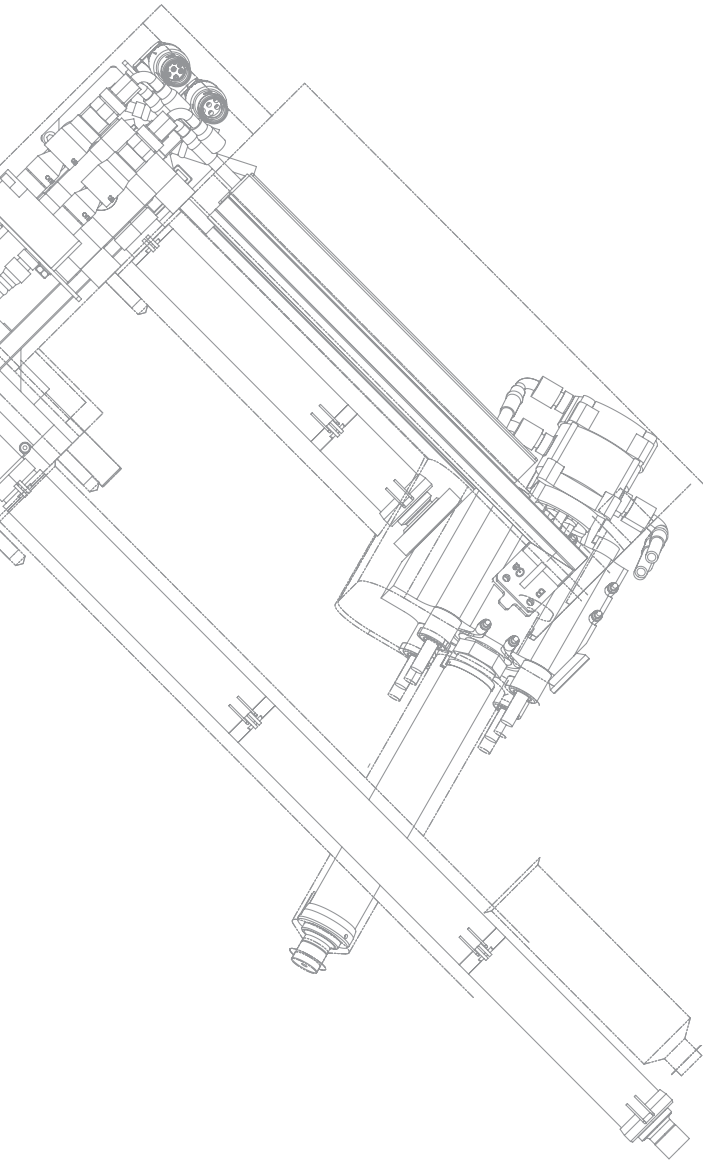
Nozzles and hot runners

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



Plus Series

Serie Plus
Plus Serie
Plus Série
Plus Serie
Plus Série



P Series 2÷70 cm³/s

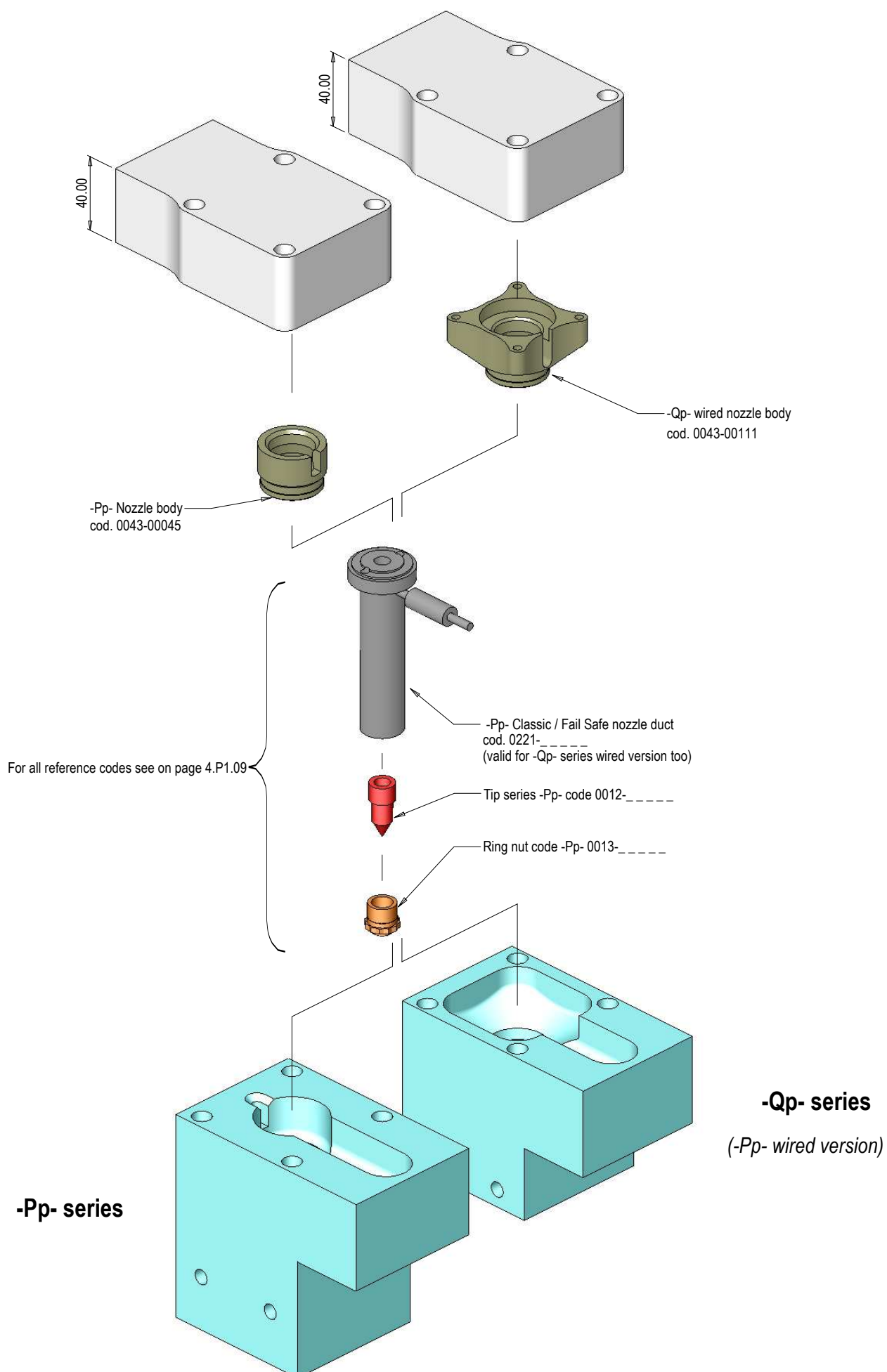
Serie P

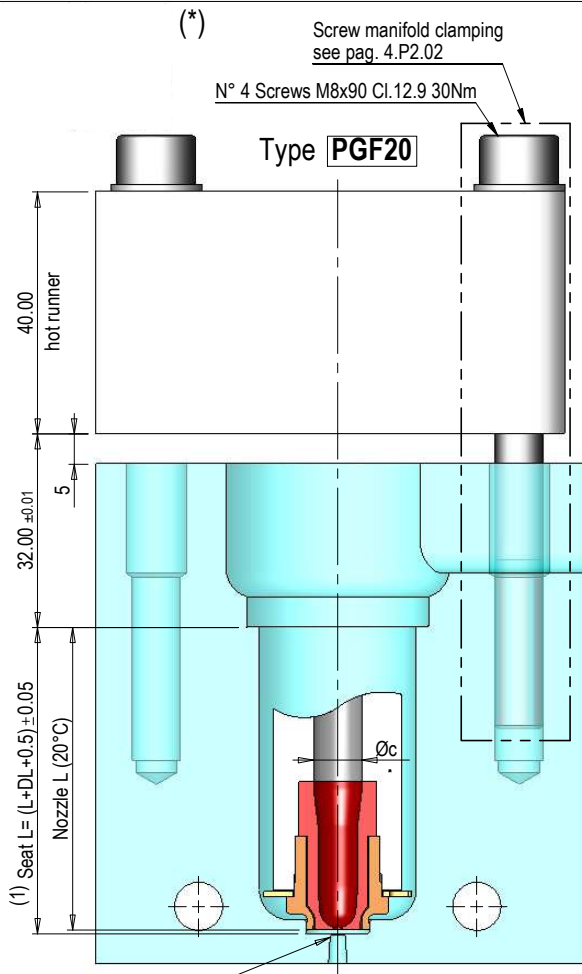
P Serie

P Série

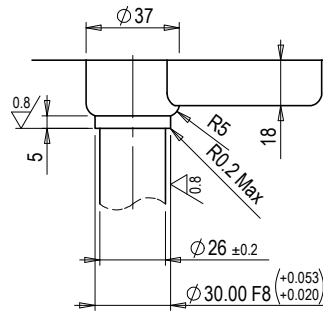
P Serie

P Série

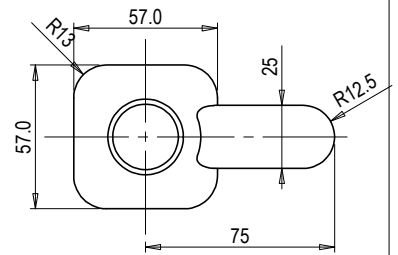
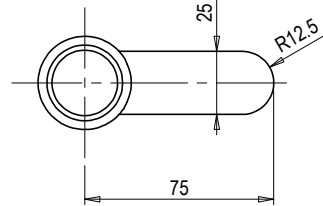
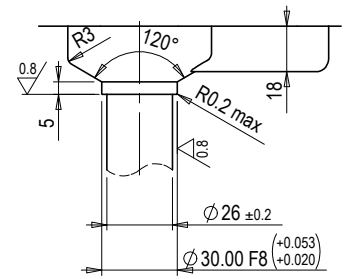




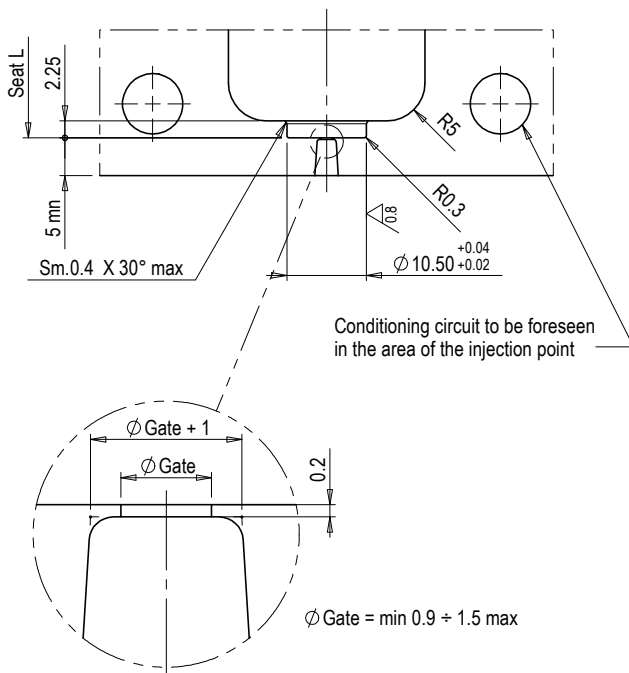
-Pp- series



-Qp- series
(-Pp- wired version)

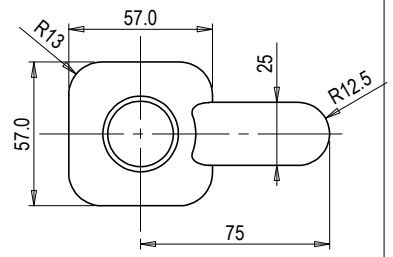
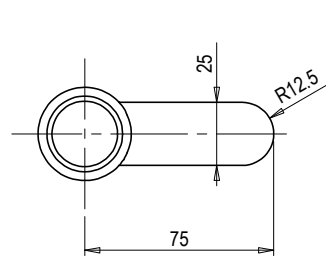
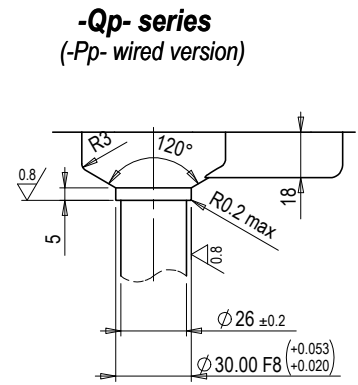
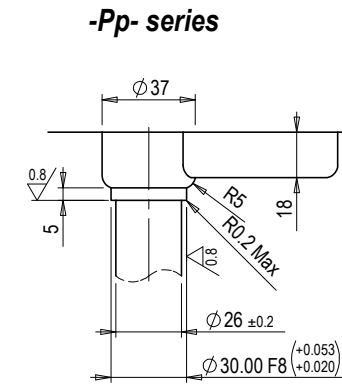
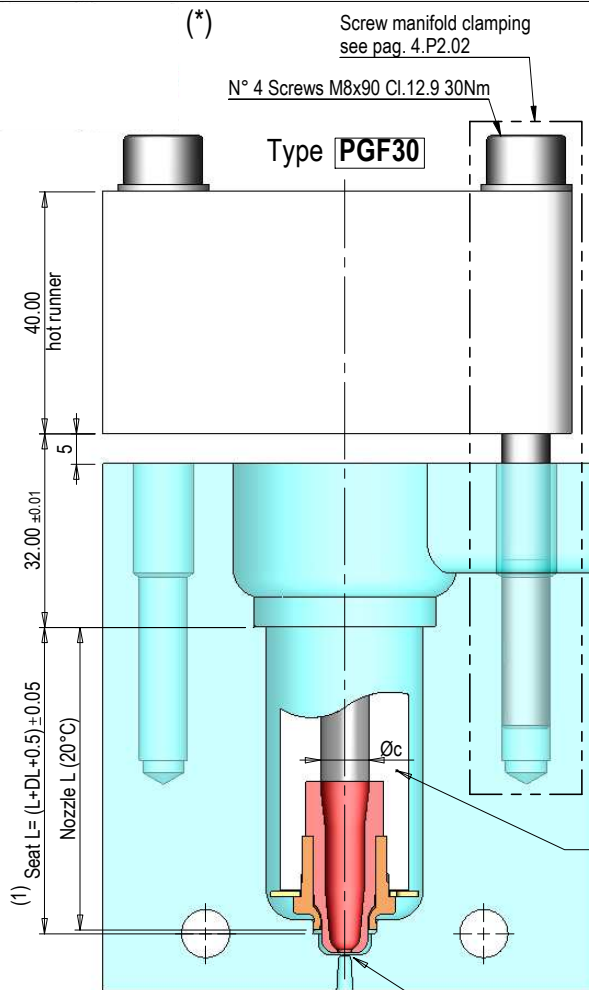


**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRC.
For abrasive filled polymers
cavity hardness required is 54÷56HRC.**



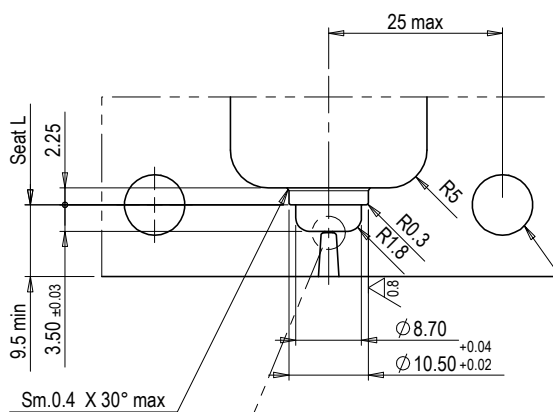
For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09b table A

NOZZLE L
35
50
65
80
95
125
155

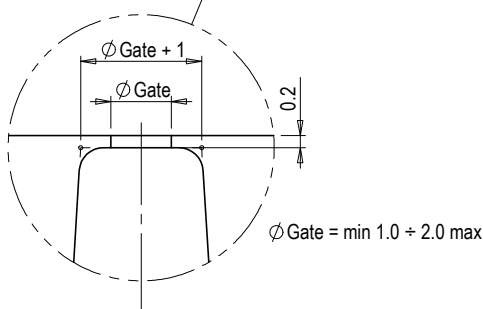


Nozzle $\varnothing c=8 - 10$
available in Classic or
Fail Safe version

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

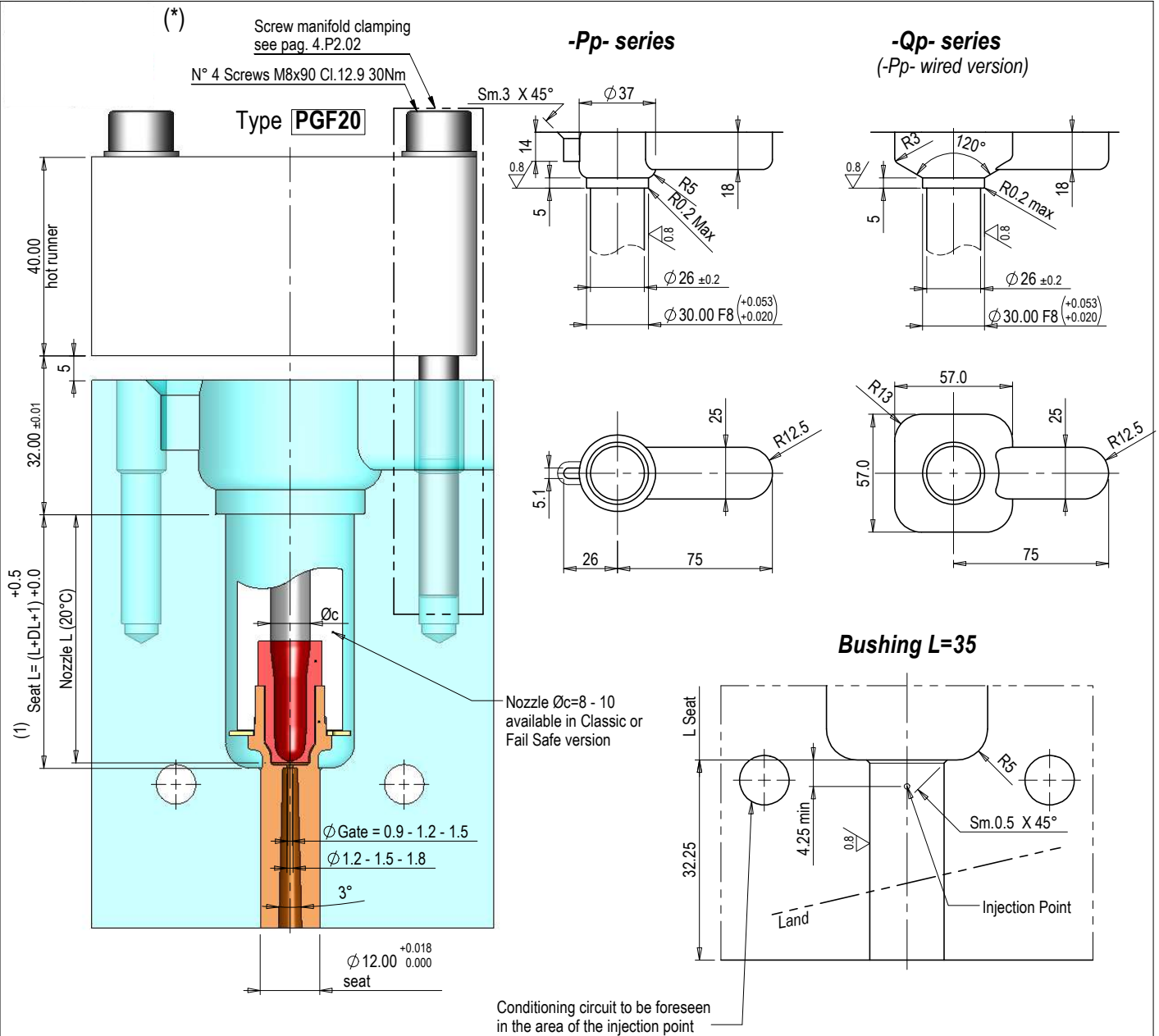


Independent and dedicated cooling
circuit to be foreseen in the area of
the injection point



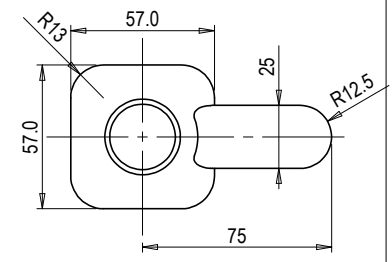
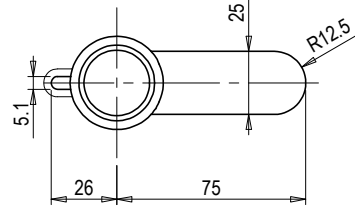
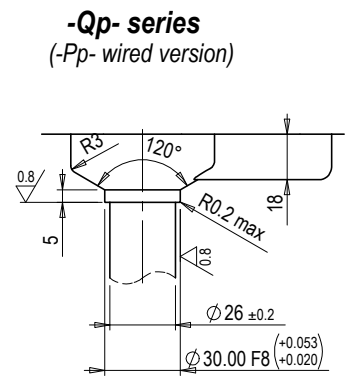
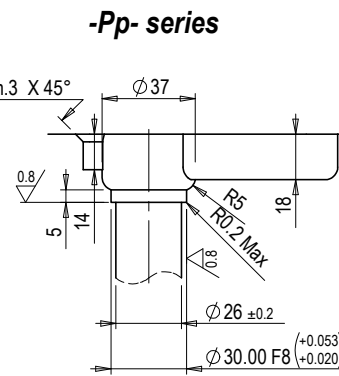
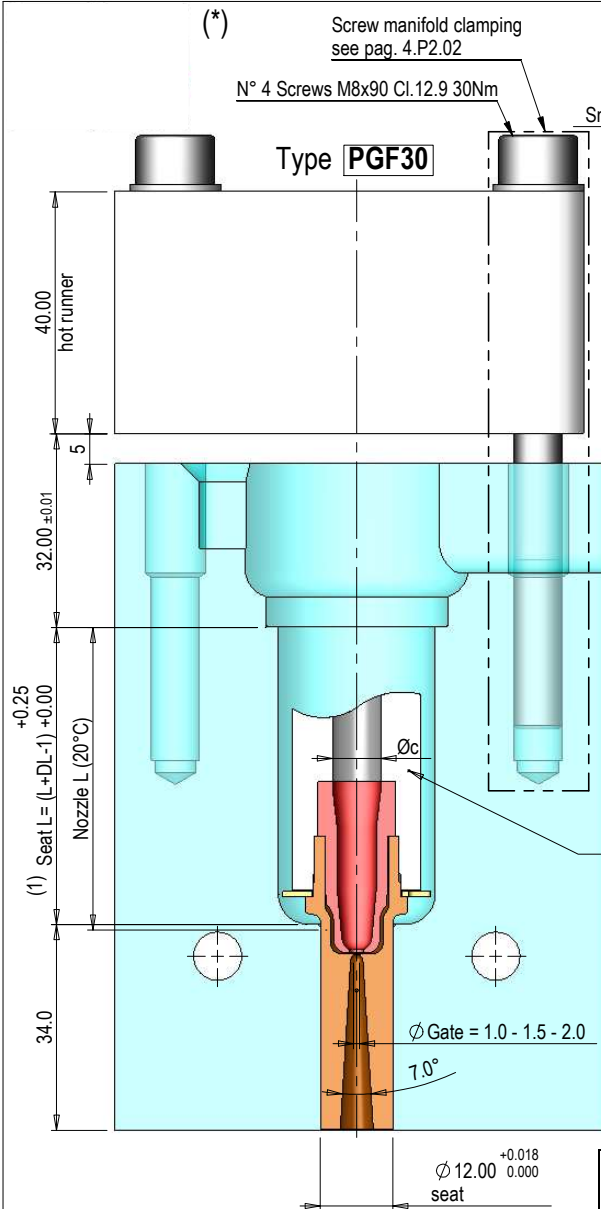
For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09b table A

NOZZLE L
35
50
65
80
95
125
155



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

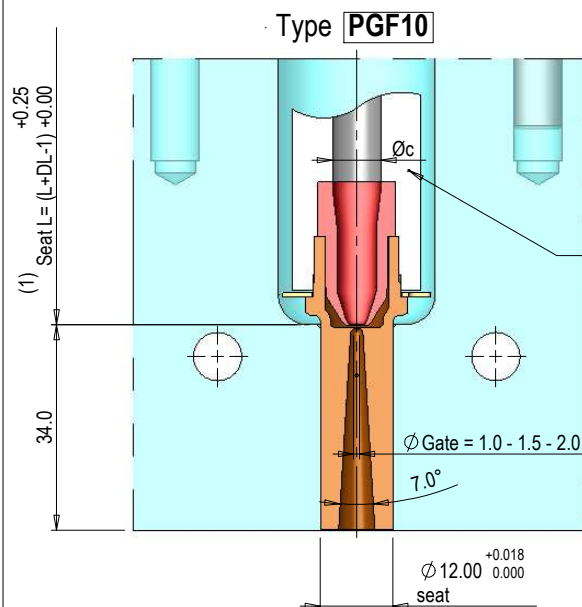
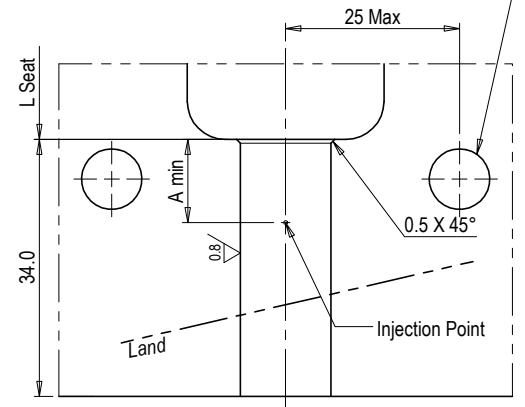
NOZZLE L
35
50
65
80
95
125
155



Nozzle Øc=8 - 10
available in Classic or
Fail Safe version

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

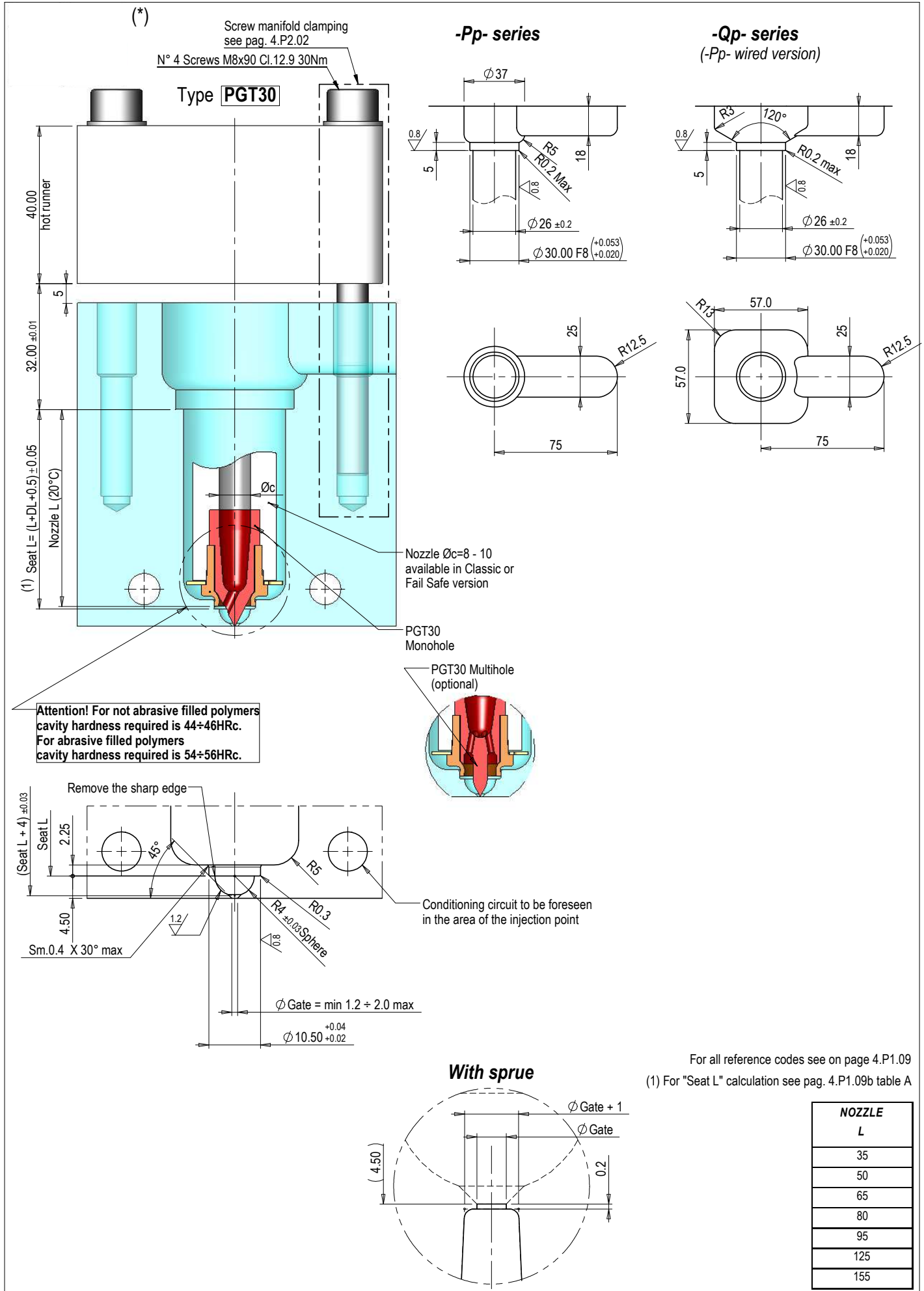
TYPE	A [mm]
PGF30	11.0
PGF10	8.5

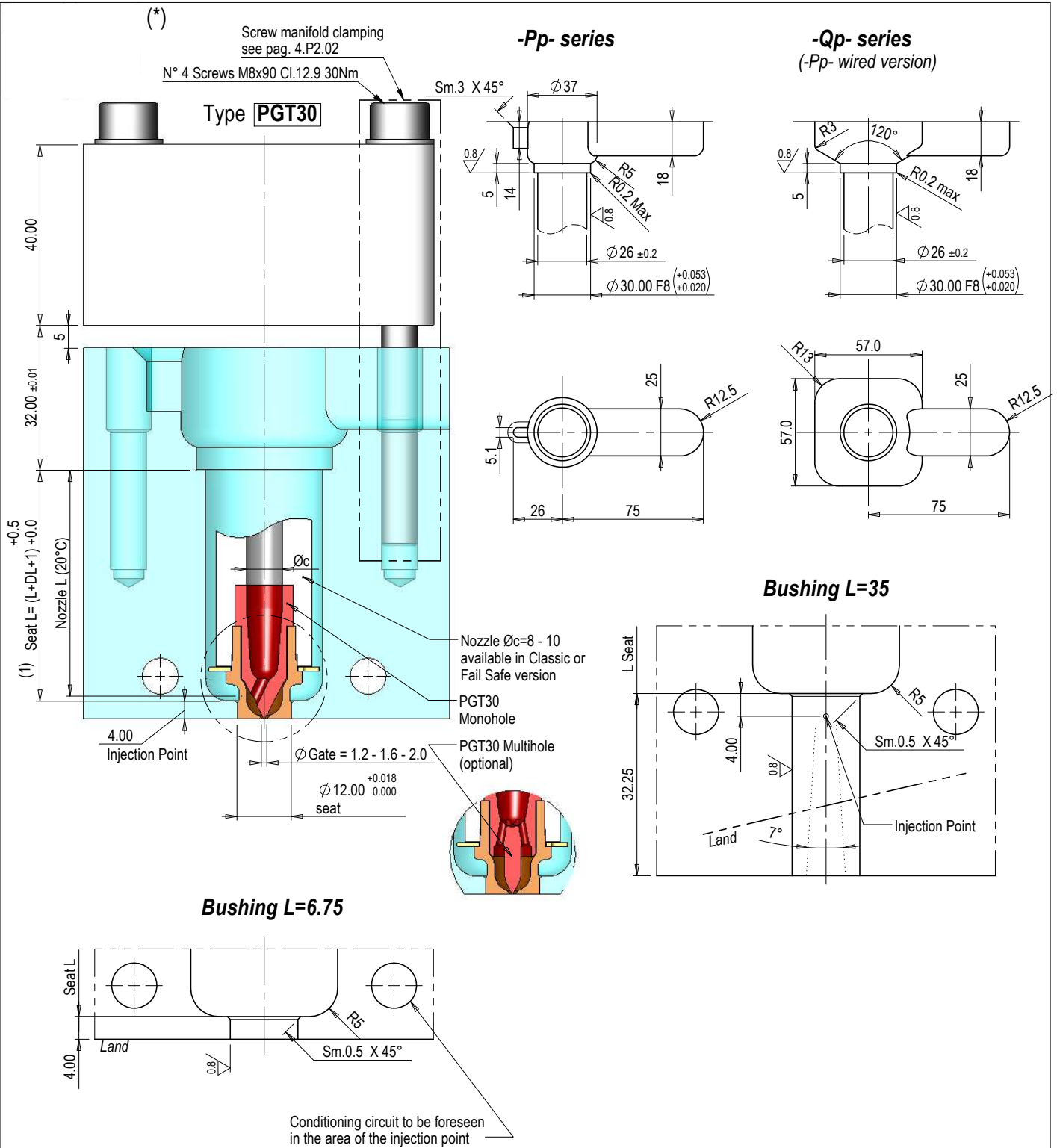


Nozzle Øc=8 - 10
available in Classic or
Fail Safe version

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

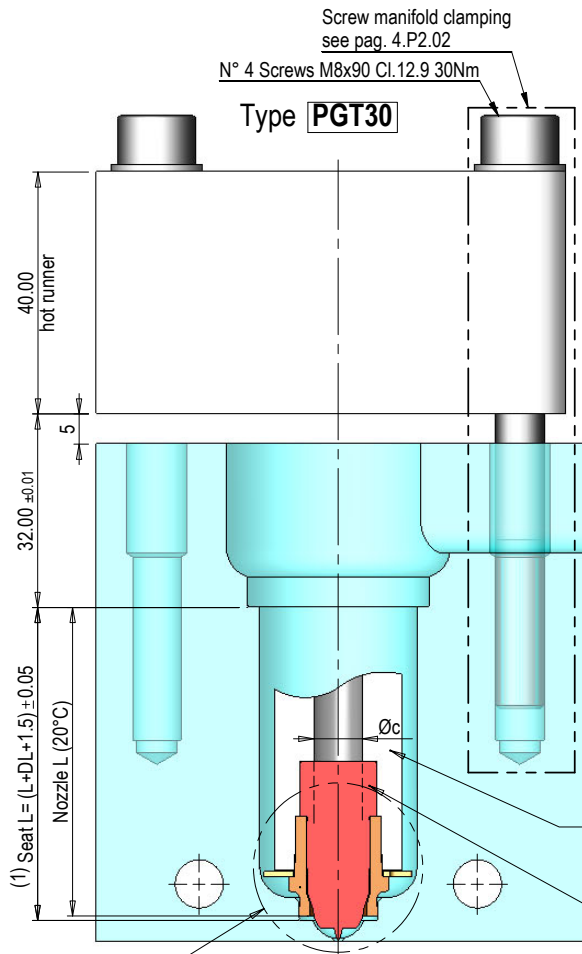
NOZZLE L
35
50
65
80
95
125
155



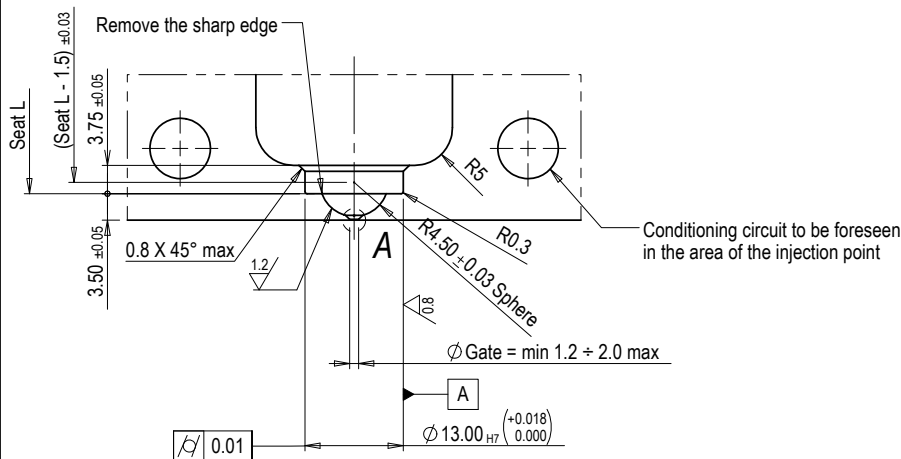


For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09b table B

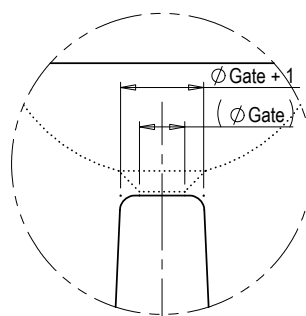
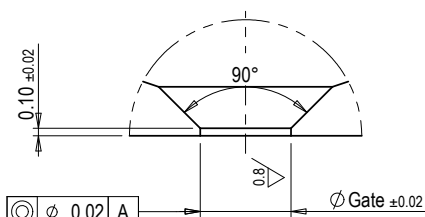
NOZZLE L
35
50
65
80
95
125
155



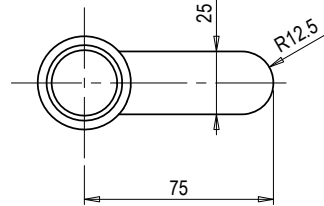
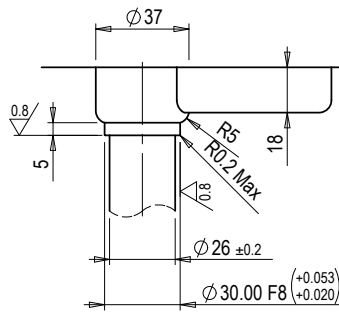
**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**



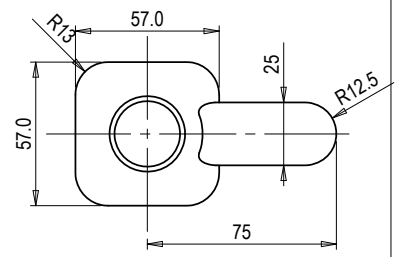
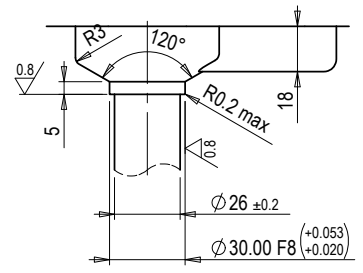
With sprue



-Pp- series



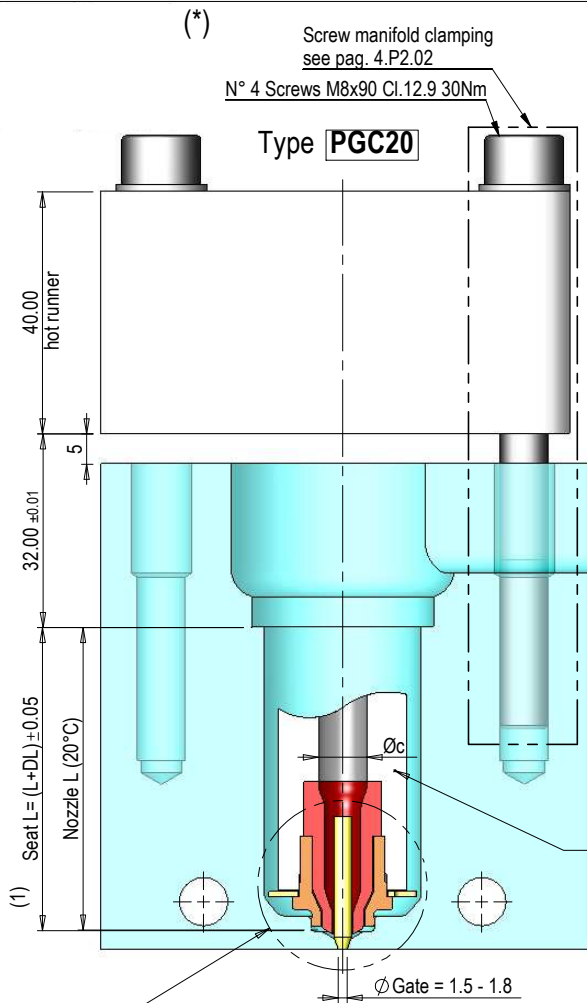
**-Qp- series
(-Pp- wired version)**



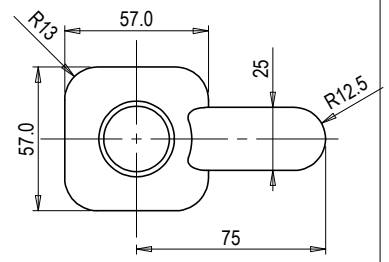
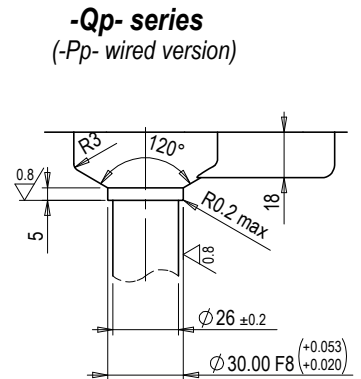
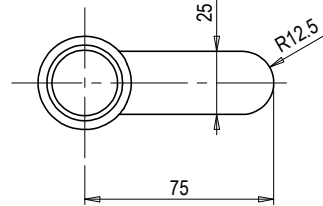
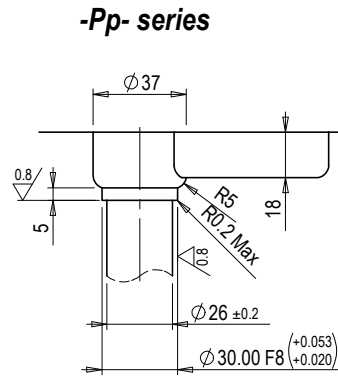
For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09b table A

NOZZLE L	
35	
50	
65	
80	
95	
125	
155	

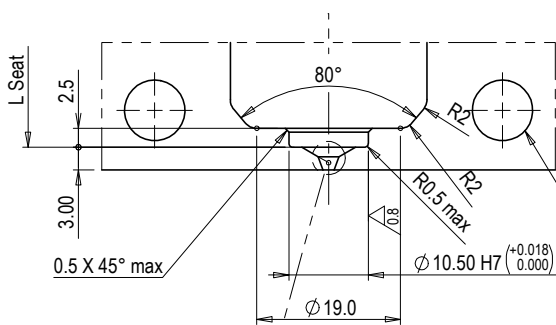
DETAIL A
SCALE 10 : 1



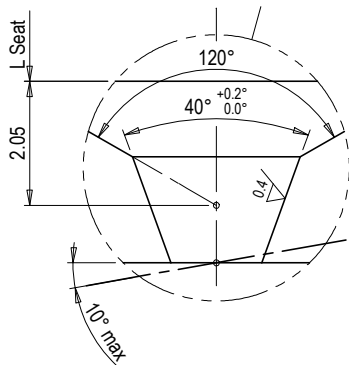
**Attention! For not abrasive filled polymers
cavity hardness required is 44+46HRc.
For abrasive filled polymers
cavity hardness required is 54+56HRc.**



Nozzle Øc=8 - 10
available in Classic or
Fail Safe version

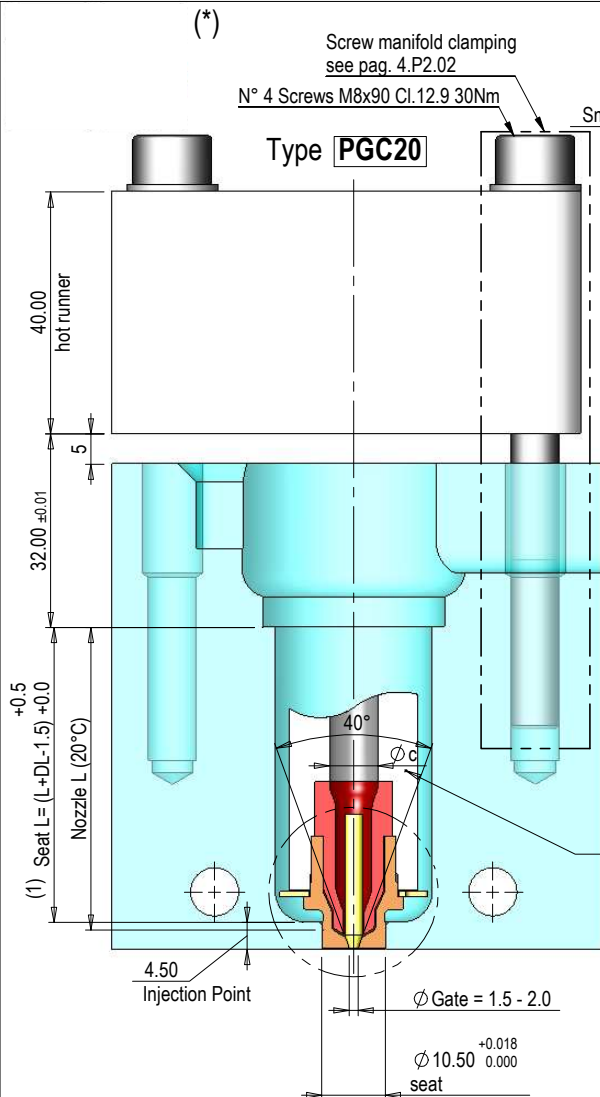


Conditioning circuit to be foreseen
in the area of the injection point

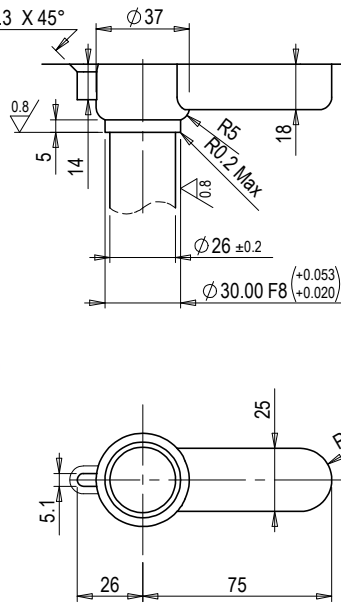


For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09c table D

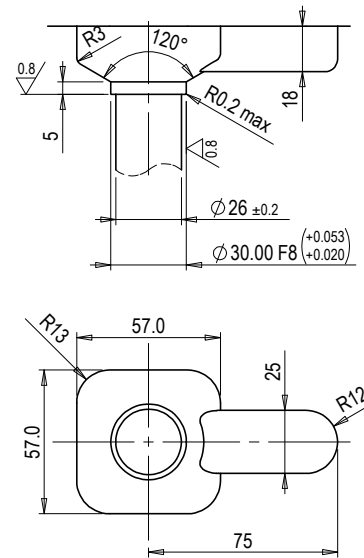
NOZZLE L
35
50
65
80
95
125
155



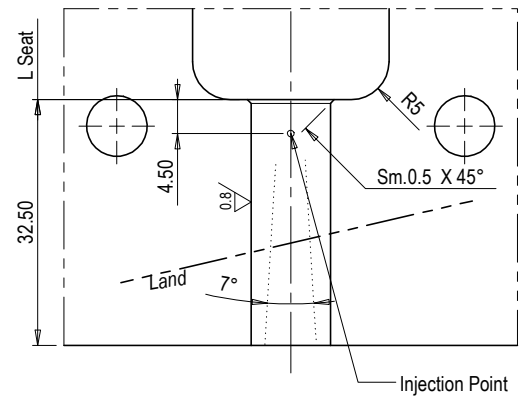
-Pp- series



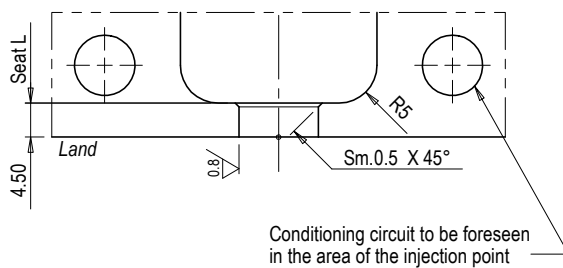
-Qp- series
(-Pp- wired version)



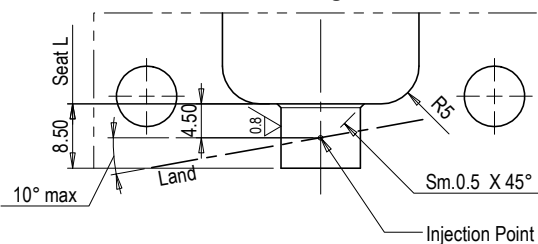
Bushing L=33



Bushing L=5.5

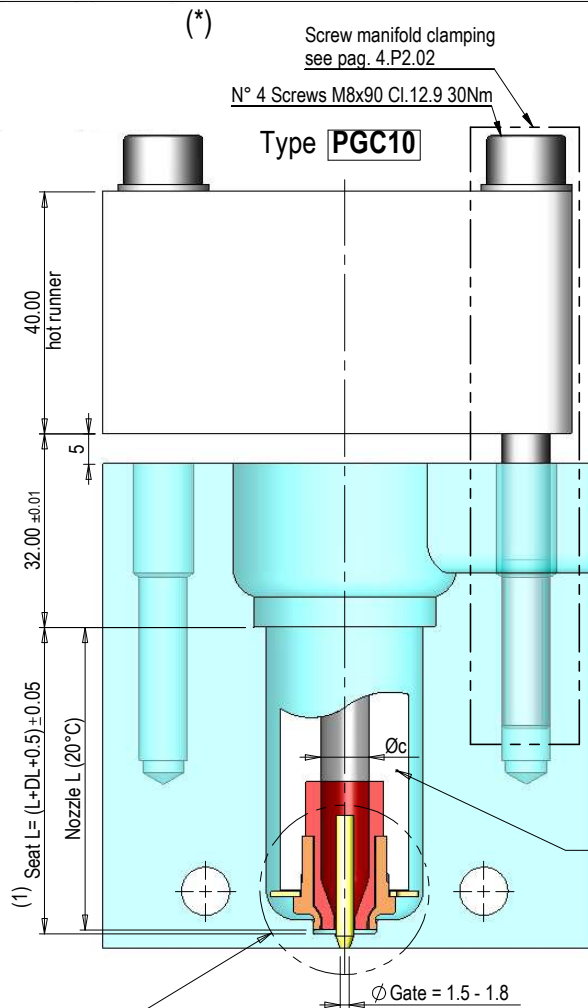


Bushing L=9



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

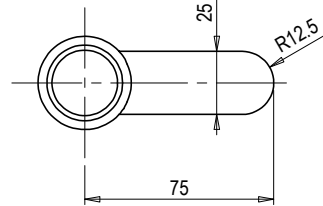
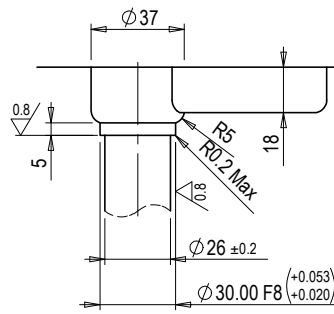
NOZZLE L
35
50
65
80
95
125
155



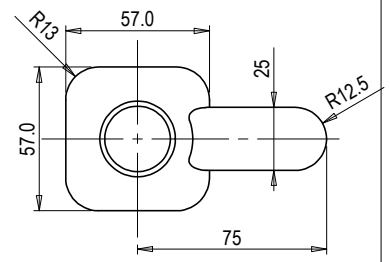
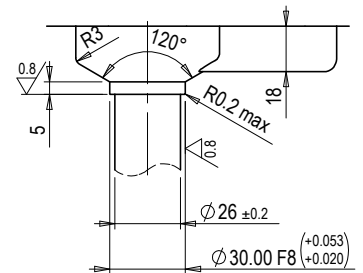
**Attention! For not abrasive filled polymers
cavity hardness required is 44±46HRC.
For abrasive filled polymers
cavity hardness required is 54±56HRC.**

Nozzle Øc=8 - 10
available in Classic or
Fail Safe version

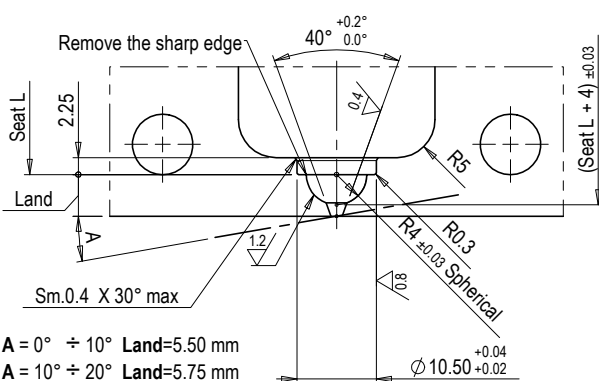
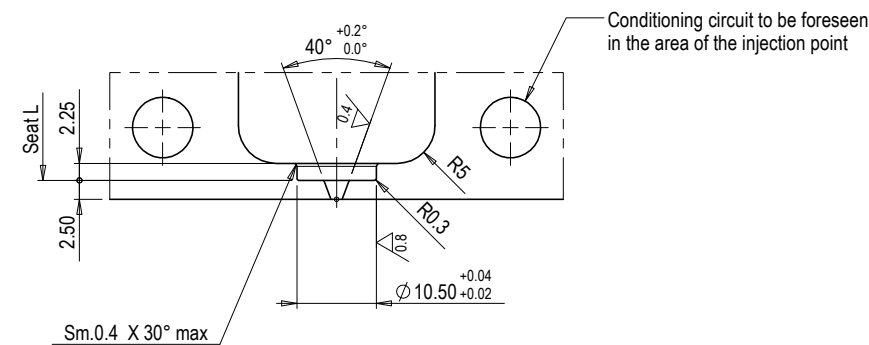
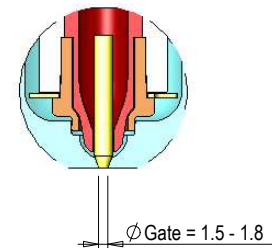
-Pp- series



-Qp- series
(-Pp- wired version)

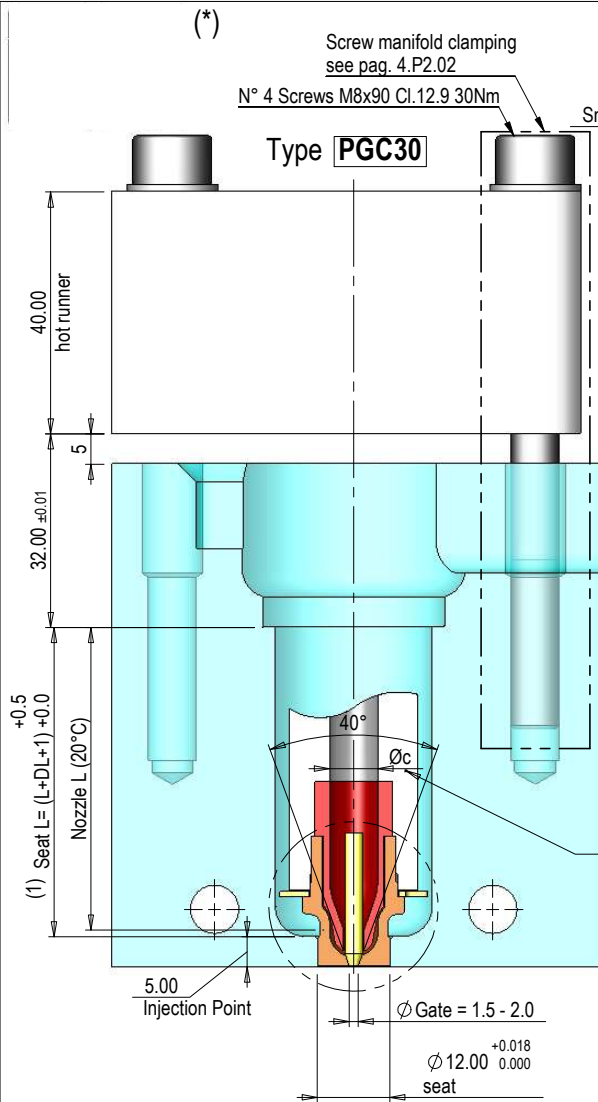


Type **PGC30**

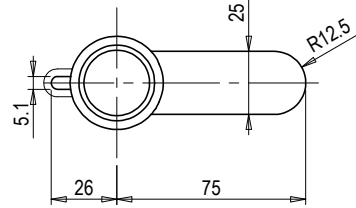
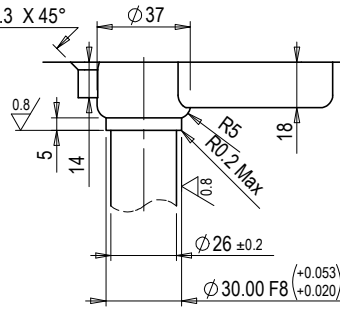


For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09b table A

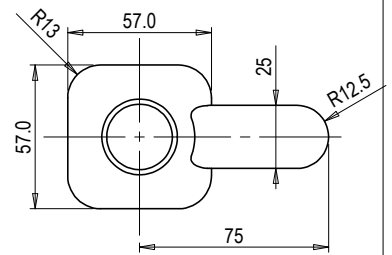
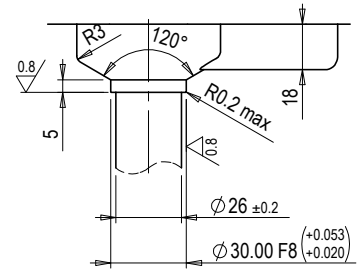
NOZZLE L
35
50
65
80
95
125
155



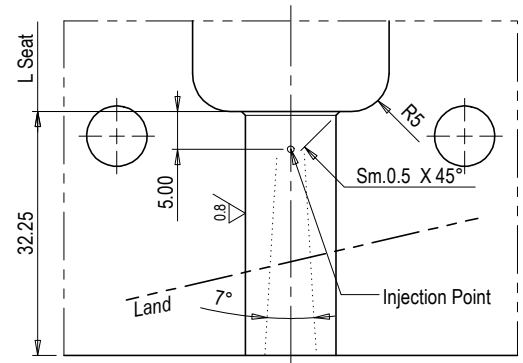
-Pp- series



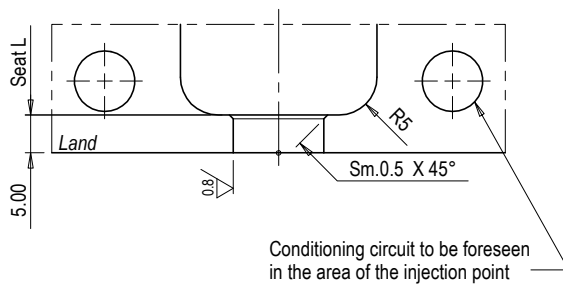
-Qp- series
(-Pp- wired version)



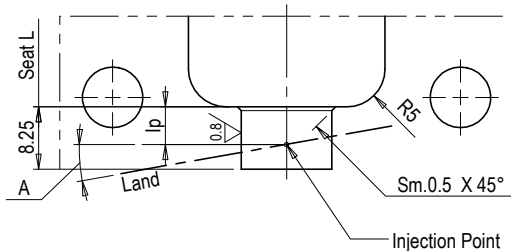
Bushing L=35



Bushing L=7.75



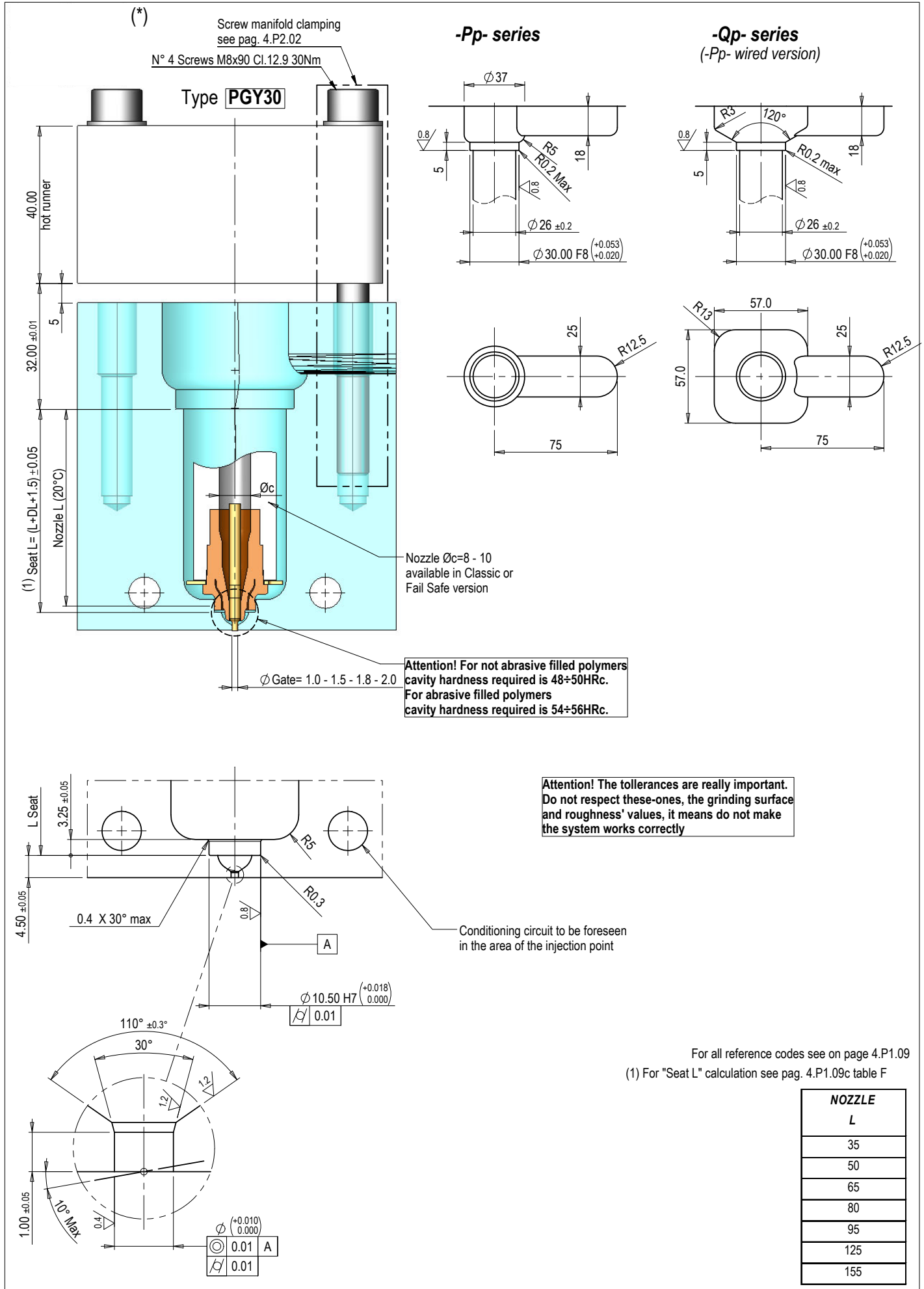
Bushing L=11

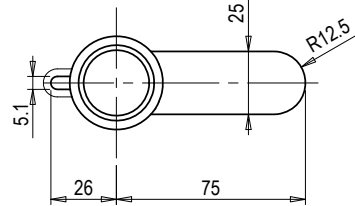
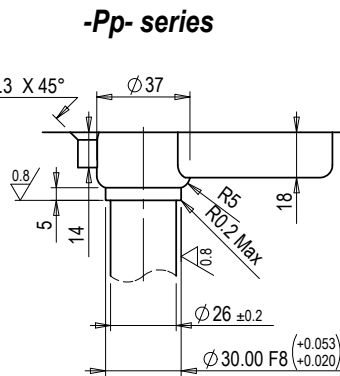
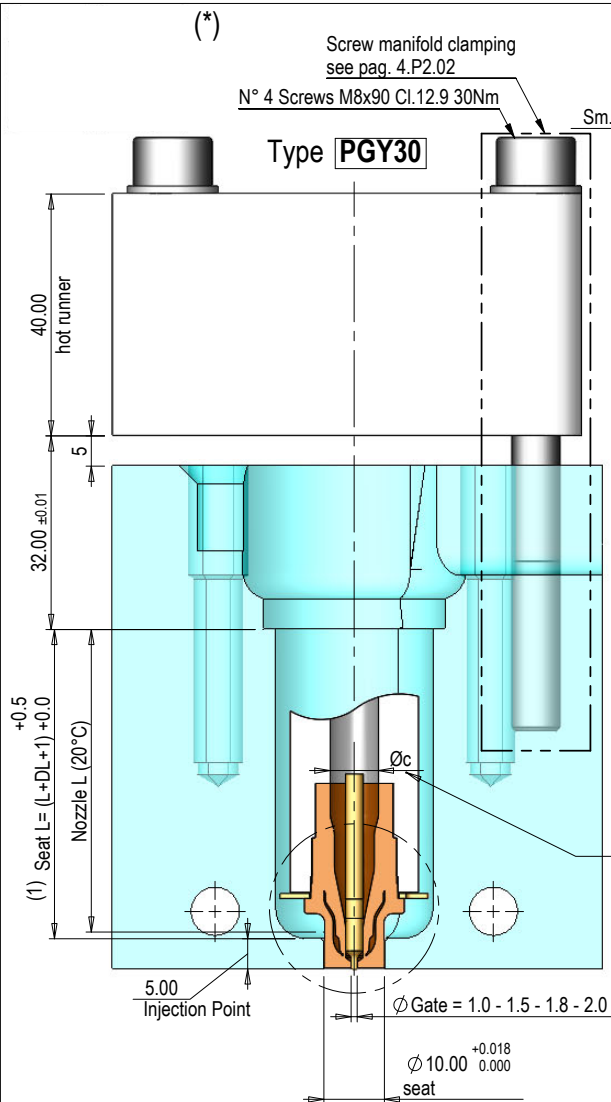


A = 0° + 10° Ip=5.00 mm
A = 10° + 20° Ip=5.20 mm

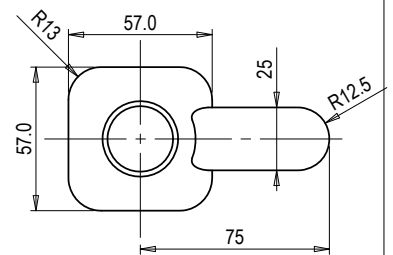
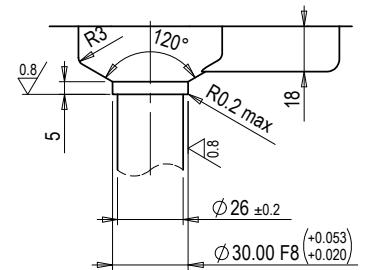
For all reference codes see on page 4.P1.09
(1) For "Seat L" calculation see pag. 4.P1.09b table B

NOZZLE L
35
50
65
80
95
125
155

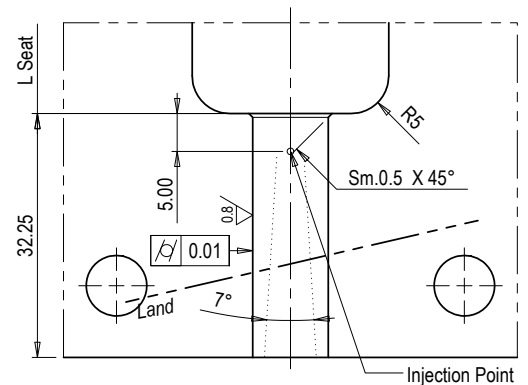




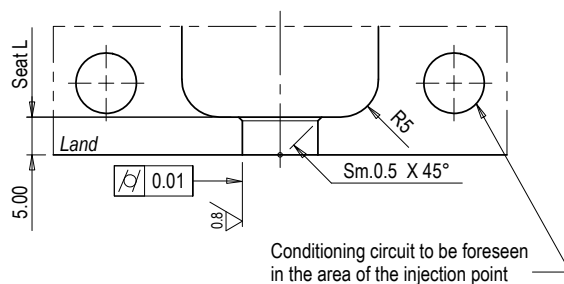
-Qp- series
(-Pp- wired version)



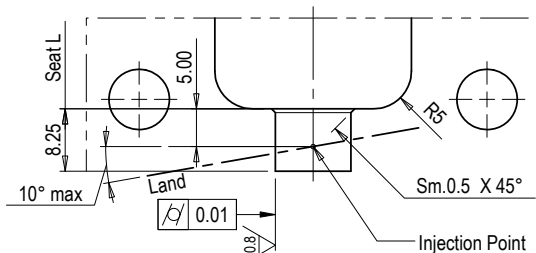
Bushing L=35



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

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.

TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30 0012-00580 0012-00581 for high resistance	External end ring nut Ø10.5 0013-00412	
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	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	External end ring nut Ø10.5 0013-00412 Ø13.0 0013-02108 for engineering polymers	
PGT30 Torpedo 0012-00257 0012-00258 for high resistance 0012-00990 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 for Rubber for high conductivity 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 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)	
PGT30 Multihole for Rubber for high conductivity Ø0.45 0012-00381 0012-00384 Ø0.60 0012-00382 0012-00385 Ø0.75 0012-00383 0012-00386		
CONICAL VALVE GATING		
PGC10 0012-00259 0012-00554 For high conductivity with End Ring 0012-00299 for high resistance	External end ring nut Ø10.5 0013-00412 Ø10.5 0013-00904 for high conductivity	
PGC20 0012-00816	PGC20 External end ring nut Ø10.5 0013-01387	
PGC20 Antistagnation 0012-00817	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 conductivity with End Ring PGC30 Antistagnation 0012-00769 for high conductivity	External end ring nut Ø10.5 0013-00412 Ø10.5 0013-00904 for high conductivity 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.

T1 (°C) = Injection temperature

T2 (°C) = Mold temperature

 $\Delta T = T1 - T2$ $\lambda = 0.000012 \text{ (1/°C)}$ $k = (\Delta T * 0.0008) - 0.04$

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
	$DL = (L * \Delta T * \lambda) + k$										
	[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

Tab. D - "Seat L" Calculation

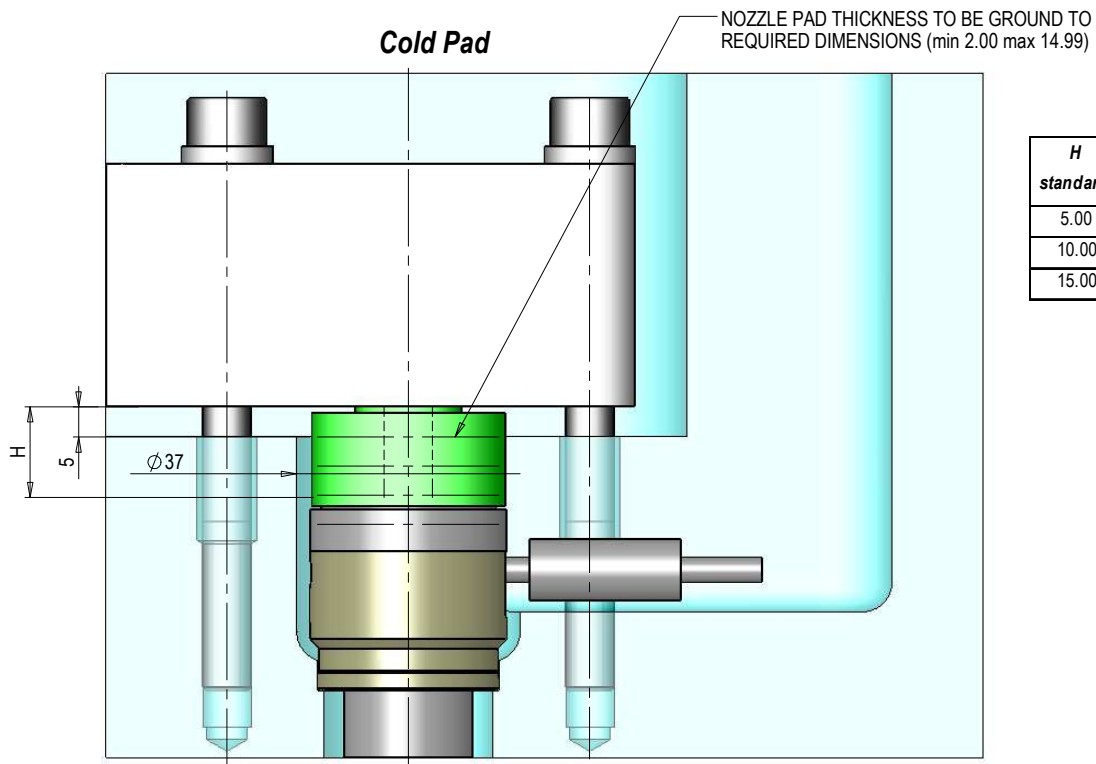
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	Seat L = L + DL										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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

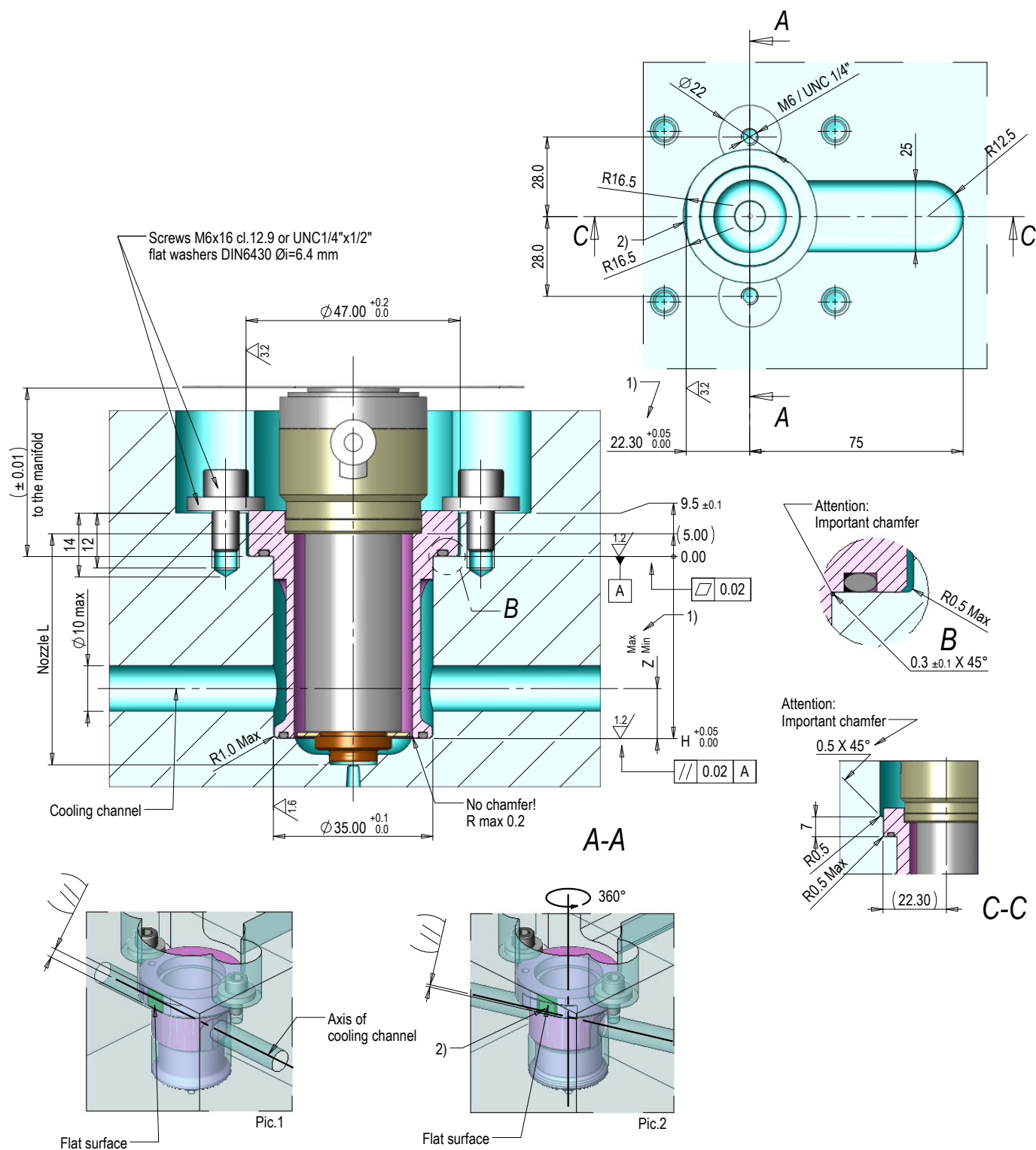
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	Seat L = L + DL - 1.5										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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



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

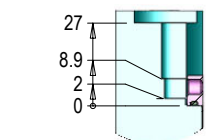
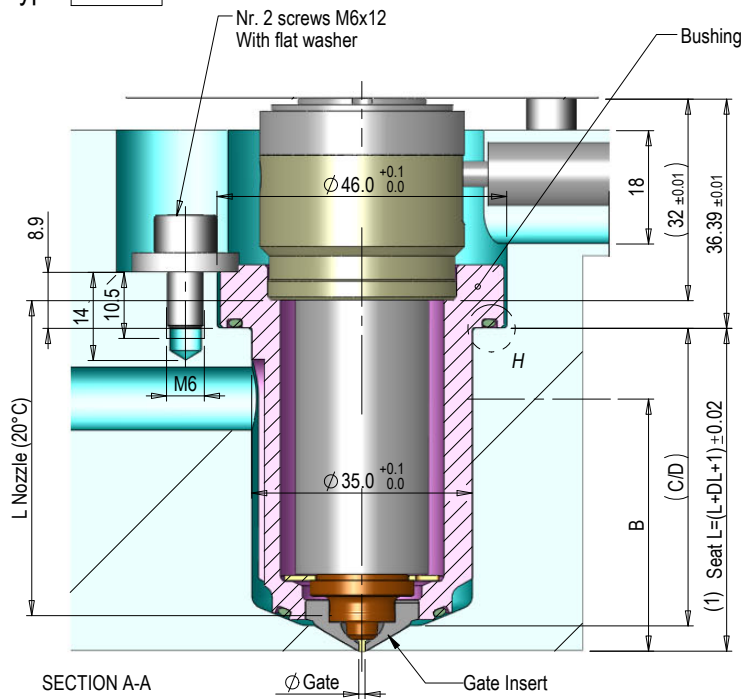


- 1) Attention: for cooling channels drilled with "Z Max" > 16 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
- 2) For all cases with "Z Max" > 16, then the positioning face can be located 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.

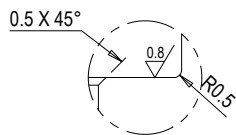
<i>BUSHING CODE</i>	<i>NOZZLE L</i>	<i>H</i>	<i>Z</i>	<i>Z Min</i>	<i>Z Max</i>	<i>BUSHING CODE</i>	<i>NOZZLE L</i>	<i>H</i>	<i>Z</i>	<i>Z Min</i>	<i>Z Max</i>
0121-00463	35	25.00	10	7	10.5	0121-00467	95	85.00	11	7	70.5
0121-00464	50	40.00	11	7	25.5	0121-00468	125	115.00	11	7	100.5
0121-00465	65	55.00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

Type **PGY30**

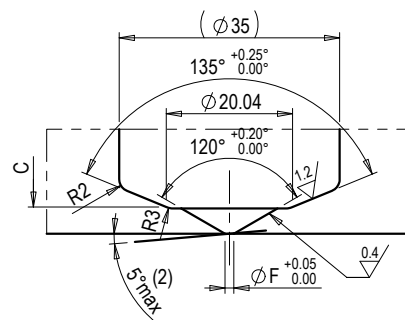
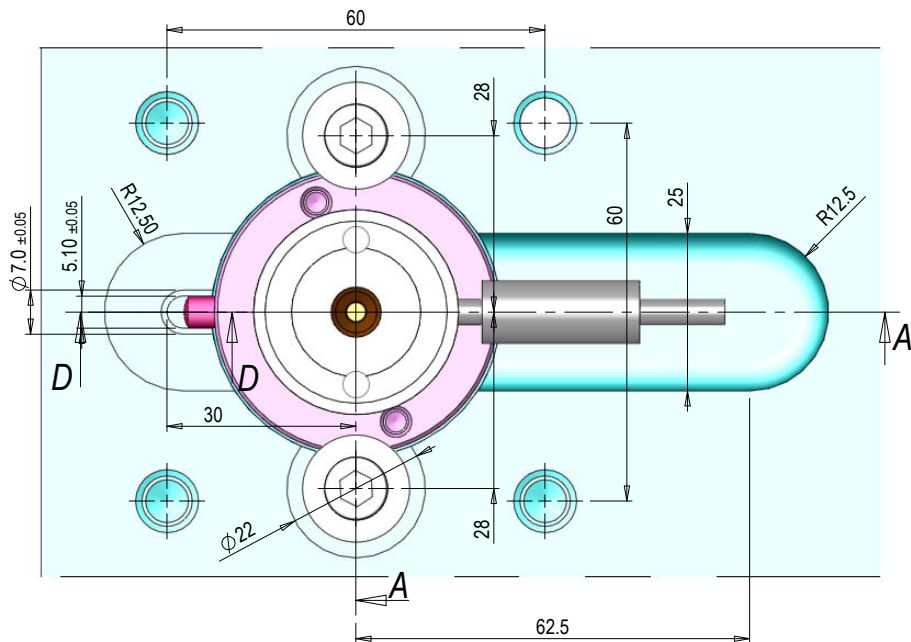
Standard Seat



SECTION D-D

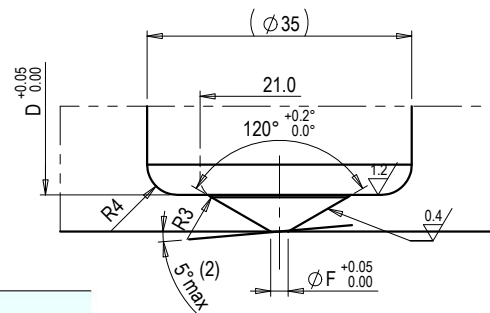
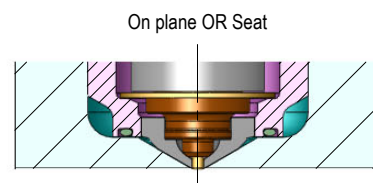


DETAIL H



(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.



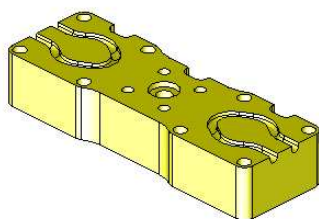
GATE INSERT		
Code	ØGate	ØF
0335-00163	1.0	1.4
0335-00164	1.5	1.9
0335-00165	1.8	2.3
0335-00166	2.00	2.5

Installation KIT cod: 0283-00647

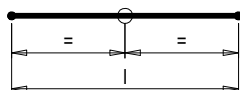
(1) For "Seat L" calculation see pag. 4.P1.09b table B

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							

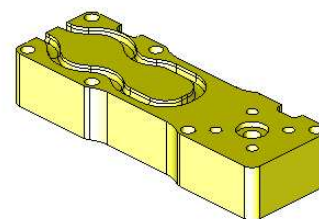
-HL-



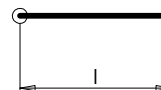
Standard
l=150-200-250-300-350-400-450 mm



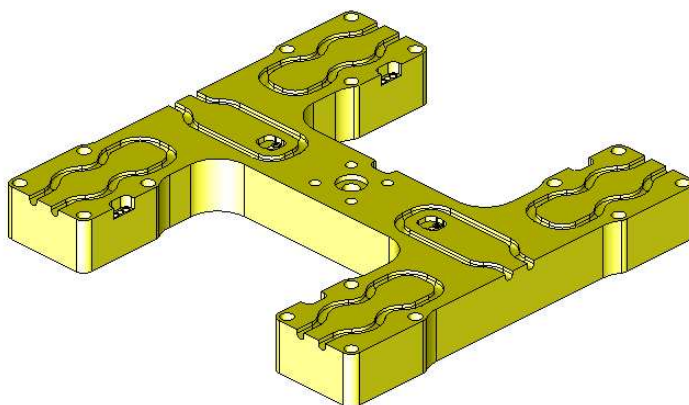
-HD-



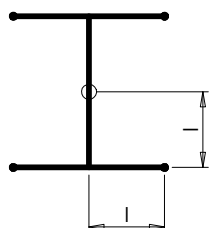
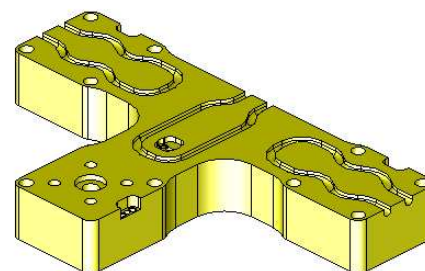
Standard
l=75-100-125-150-175-200-225 mm



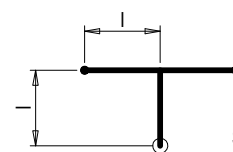
-HH-



-HT-

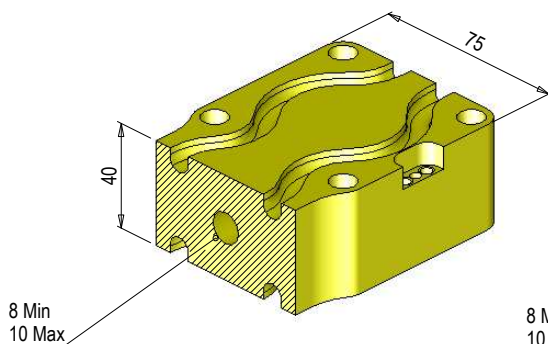


Standard
l=100-125-150 mm

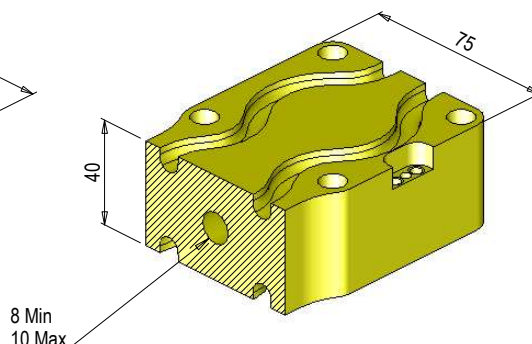


Standard
l=100-125-150 mm

P series



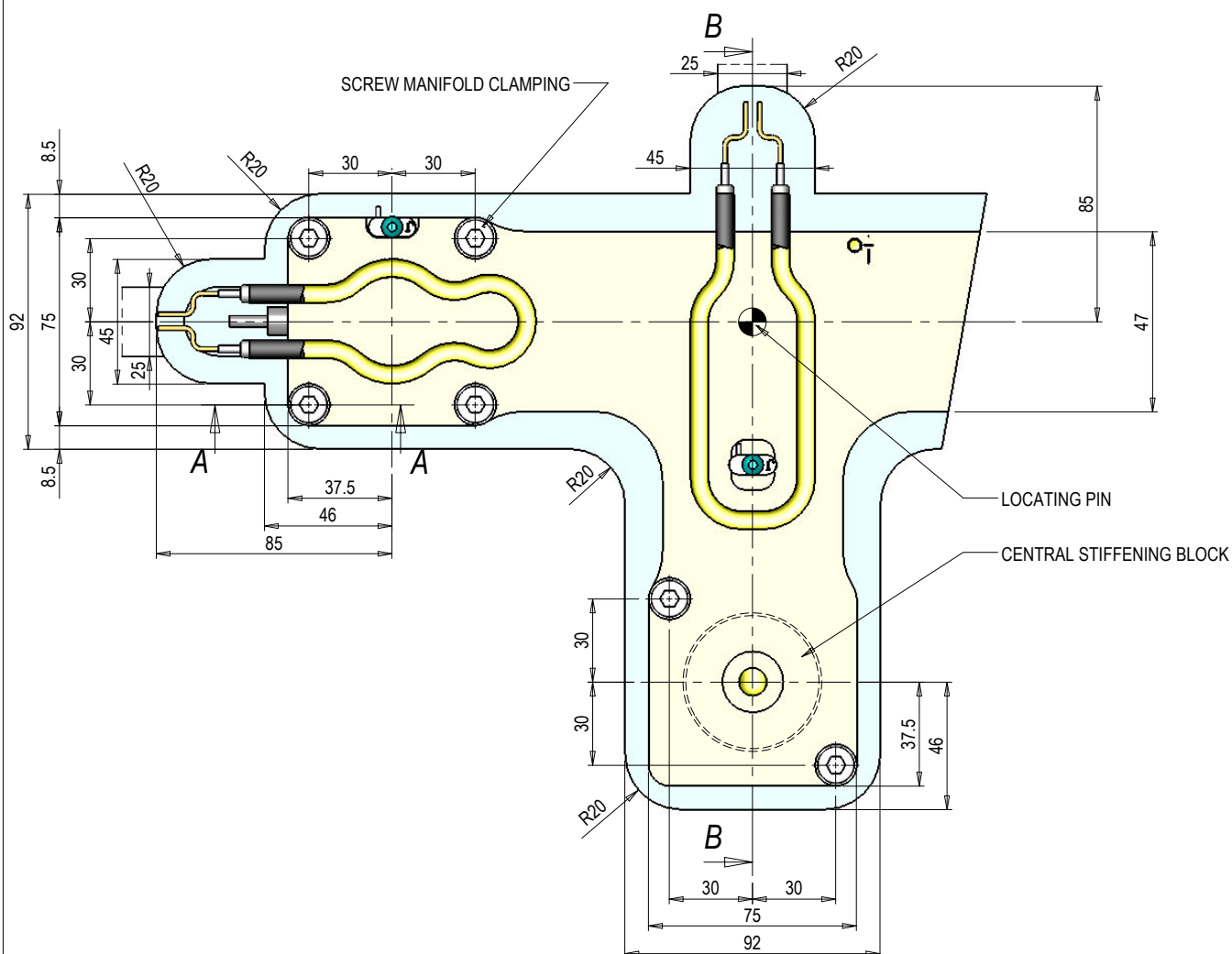
Q series



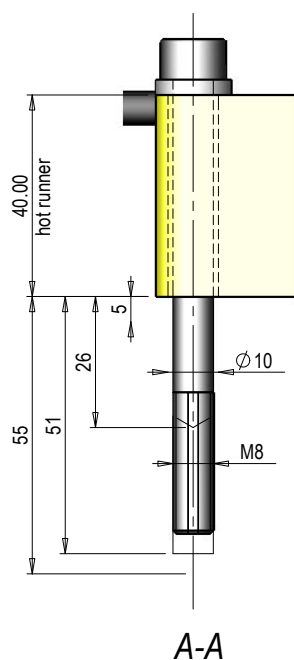
Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

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

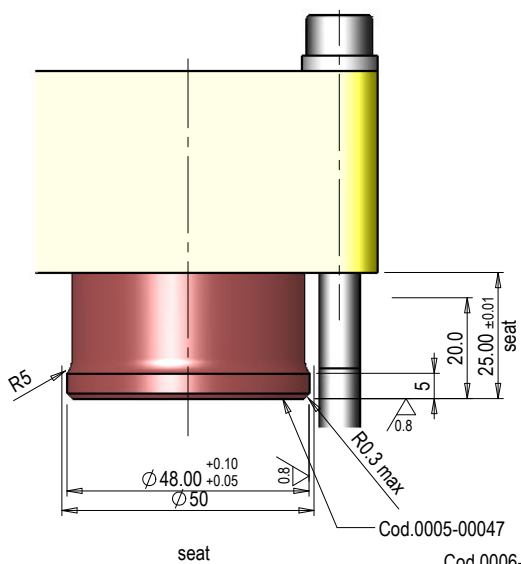
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)



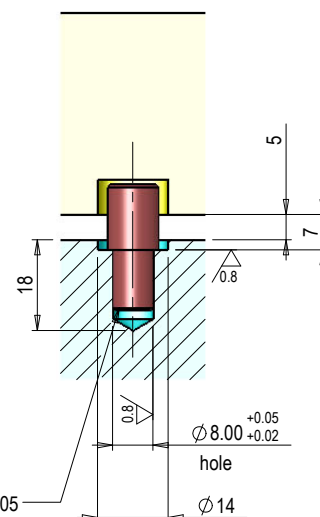
Screw manifold clamping
Screw M8x90 cl.12.9 30 Nm



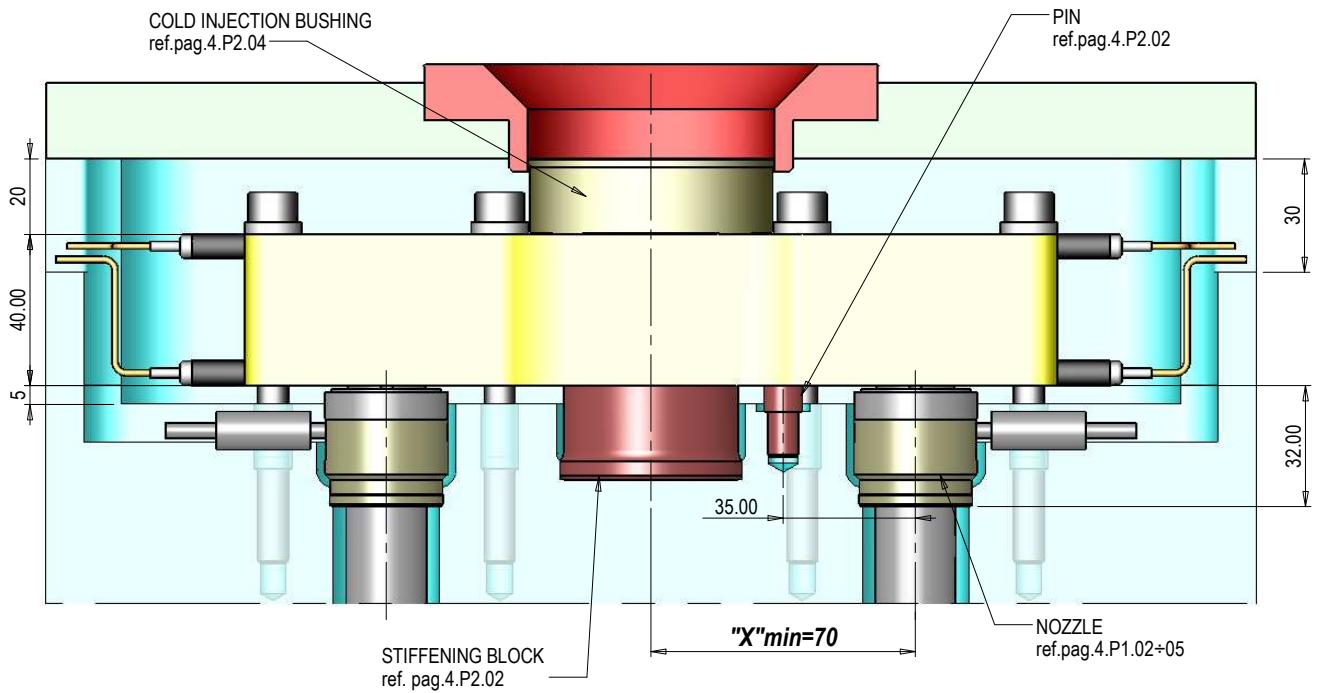
***Pocket
central stiffening block***



**Pocket for
locating pin**

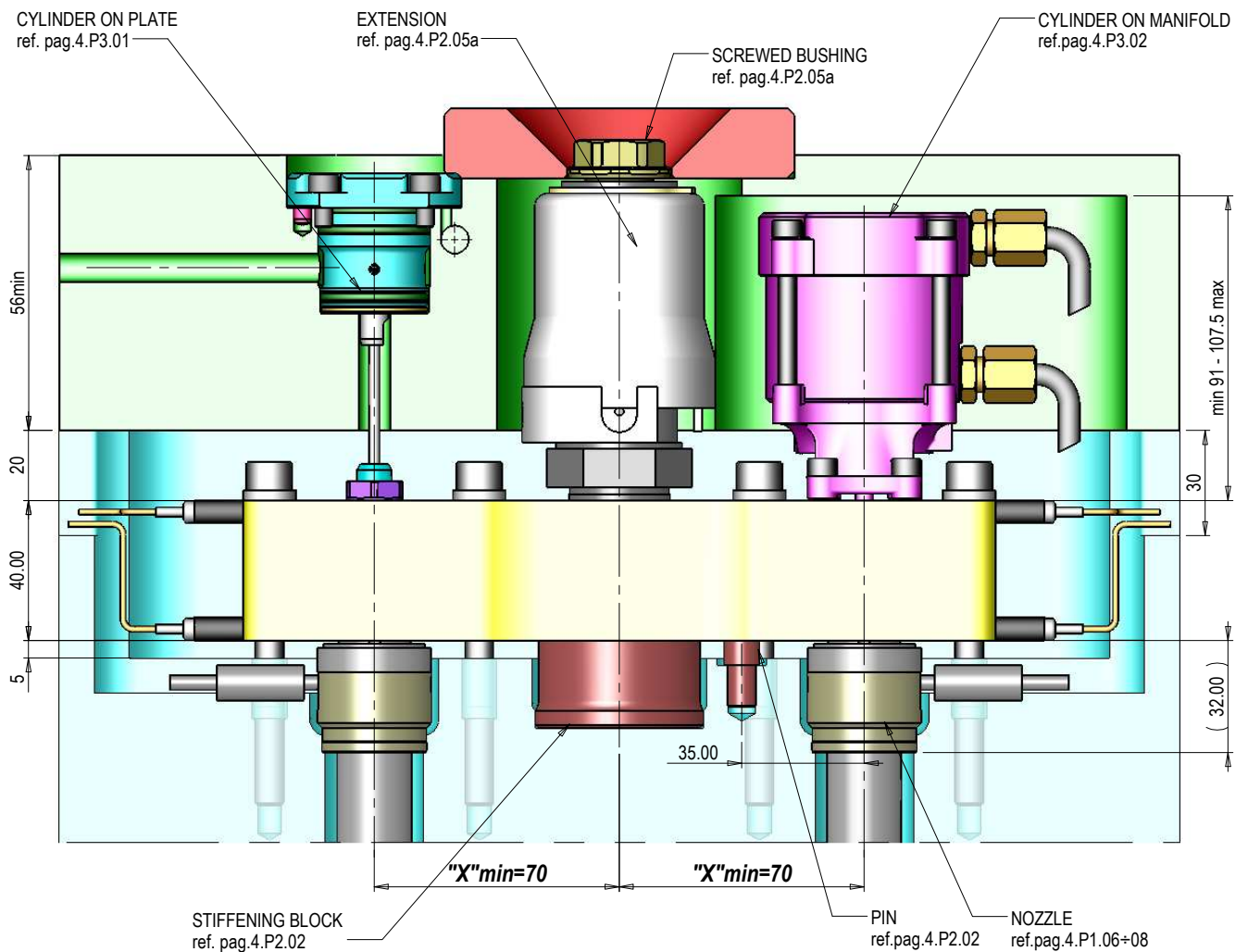


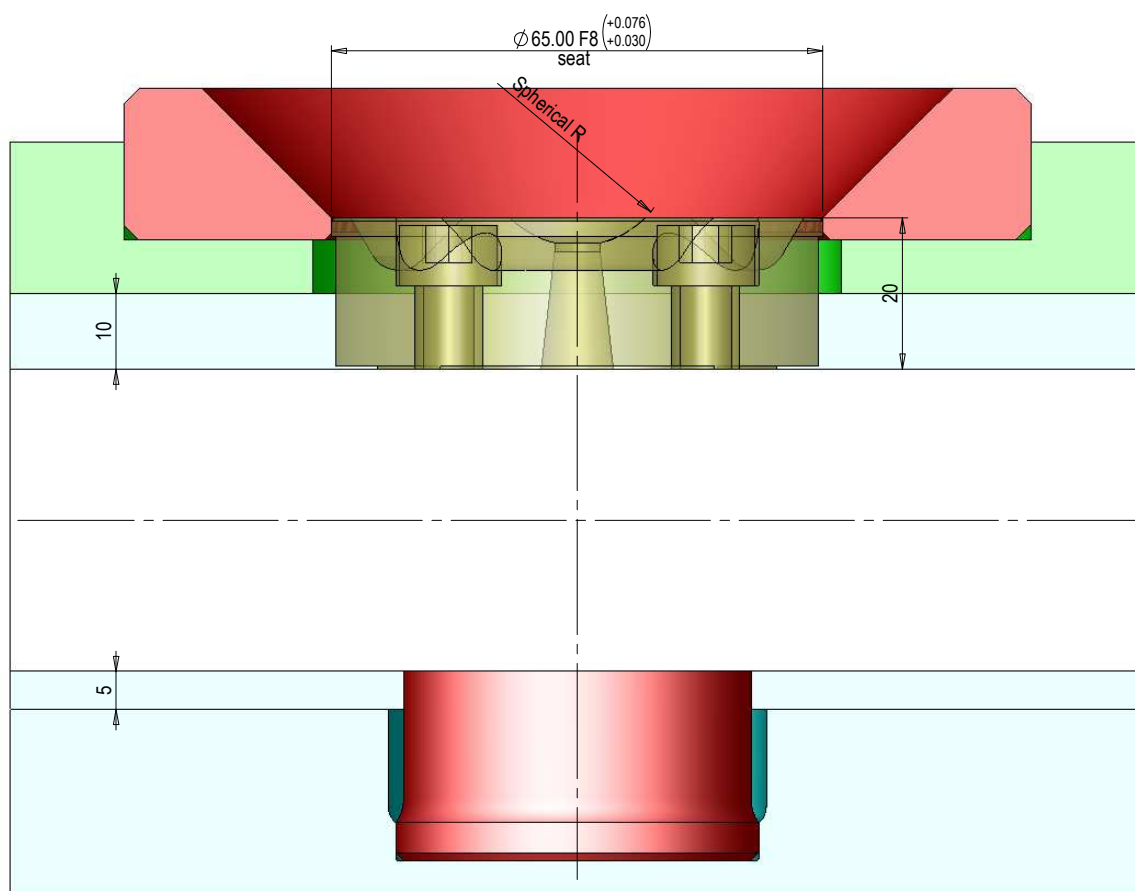
Structure for TORPEDO or FREE FLOW systems



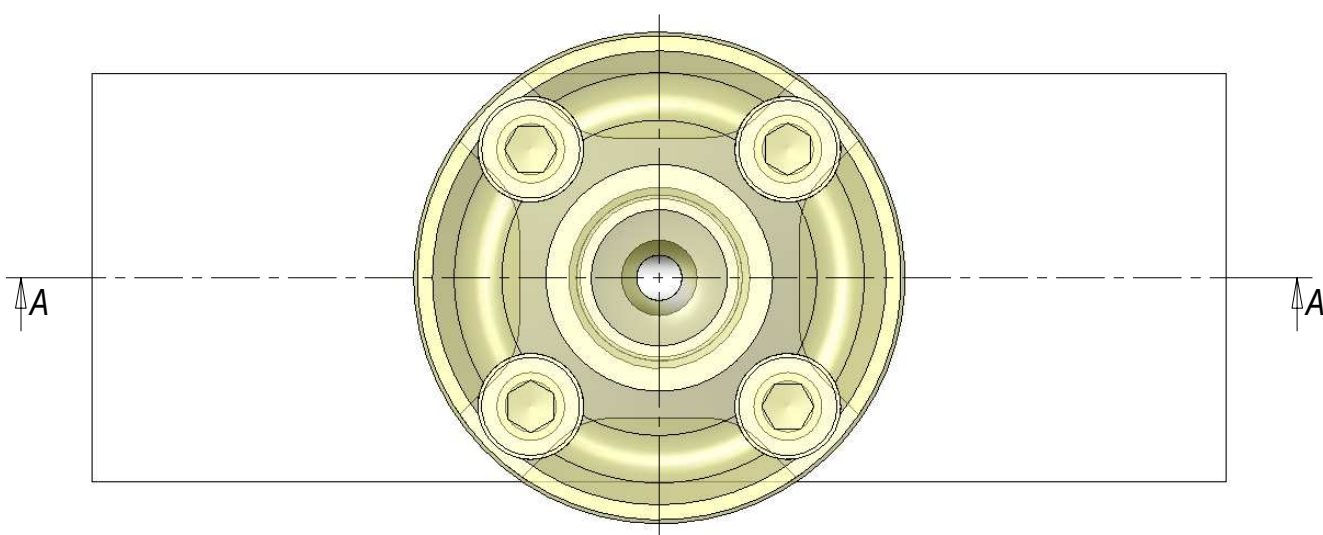
Xmin= min centre distance between injection bushing and nozzle for non standard systems

Structure for VALVE GATING systems

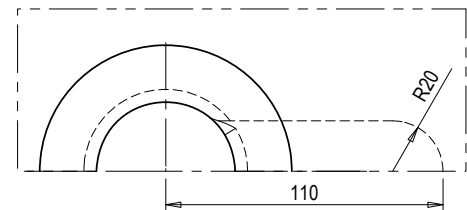
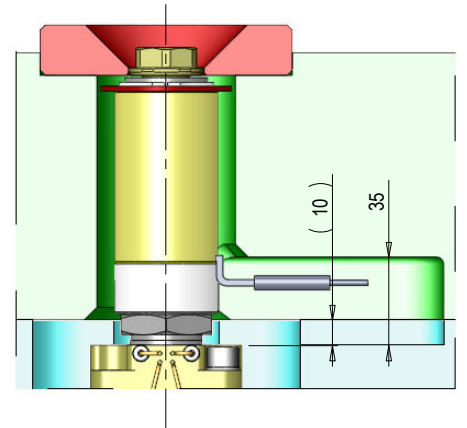
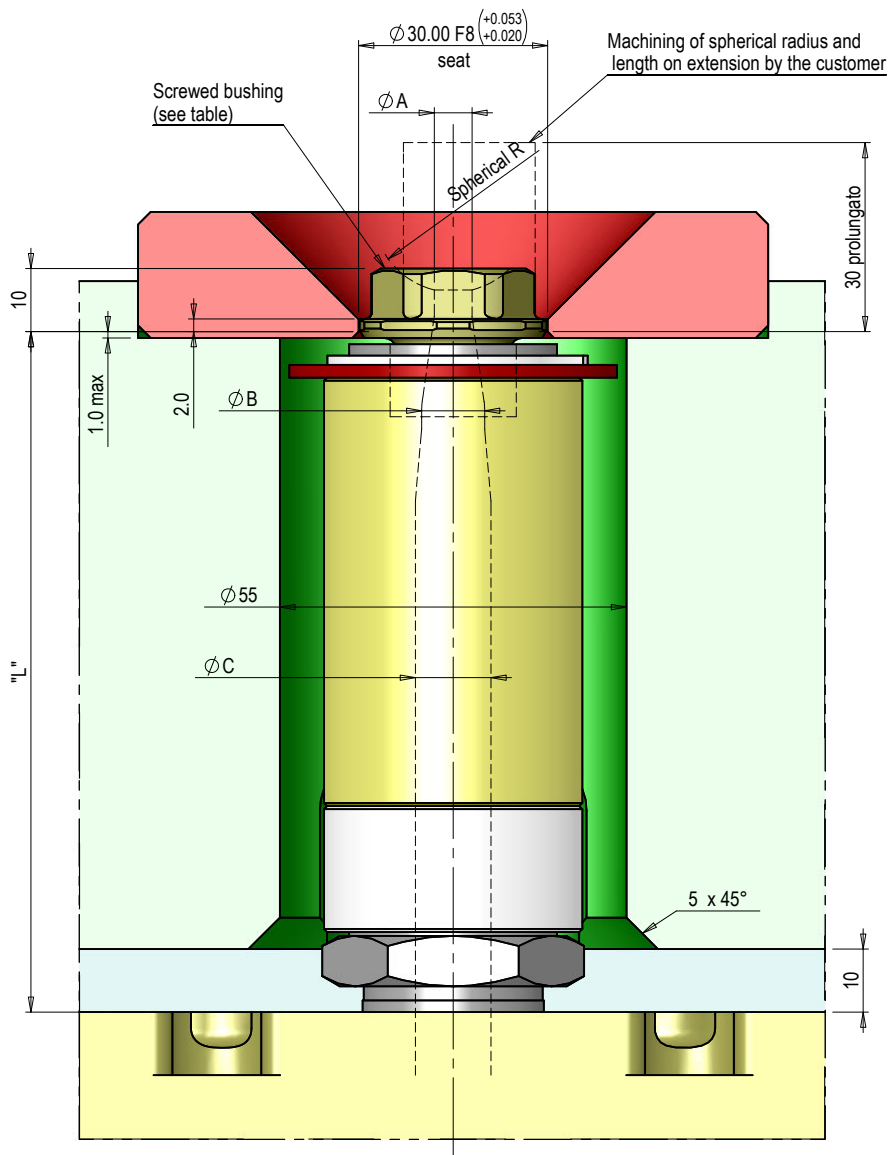




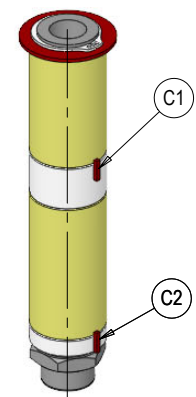
A-A



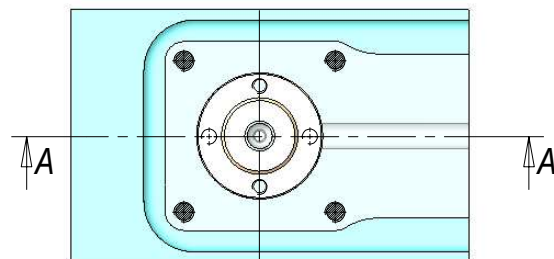
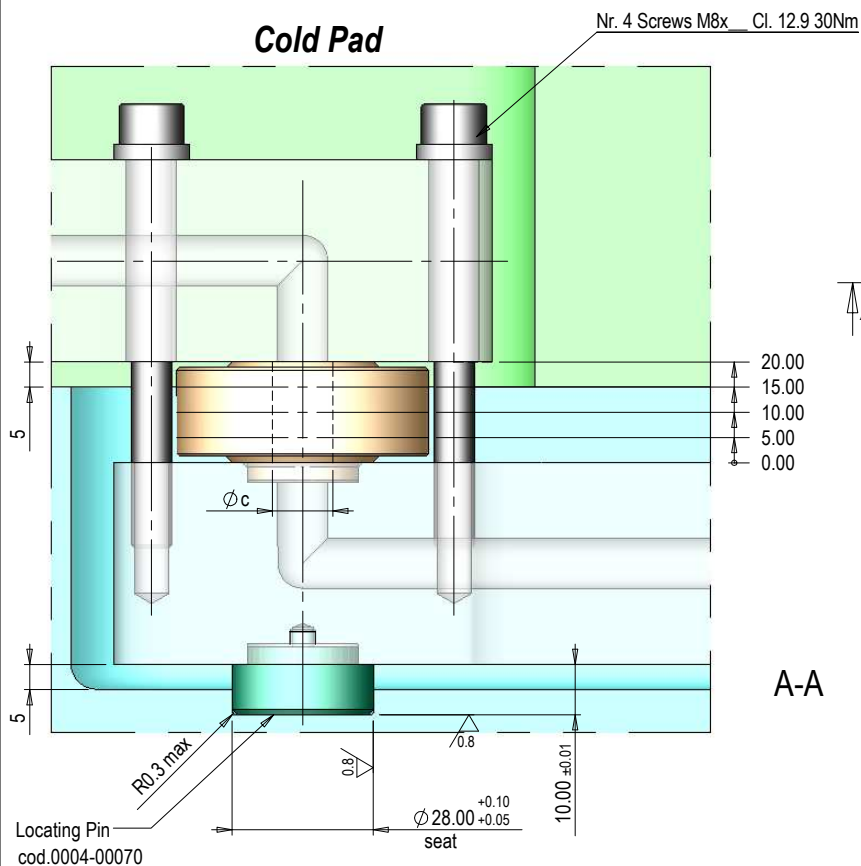
CODE	SPHERICAL R
0016-00165	R 0
0016-00166	R 12.7
0016-00167	R 15.5
0016-00168	R 19.1
0016-00169	R25
0016-00170	R 40



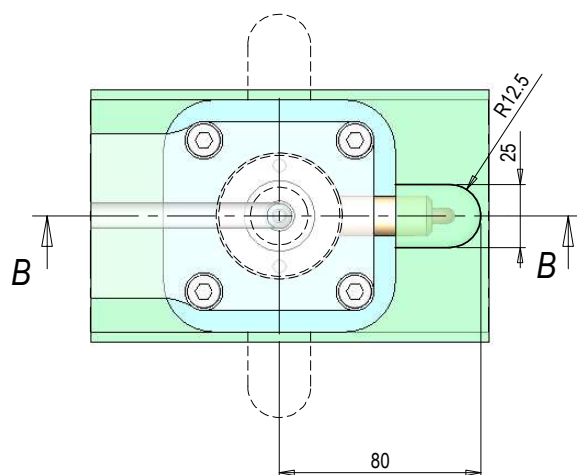
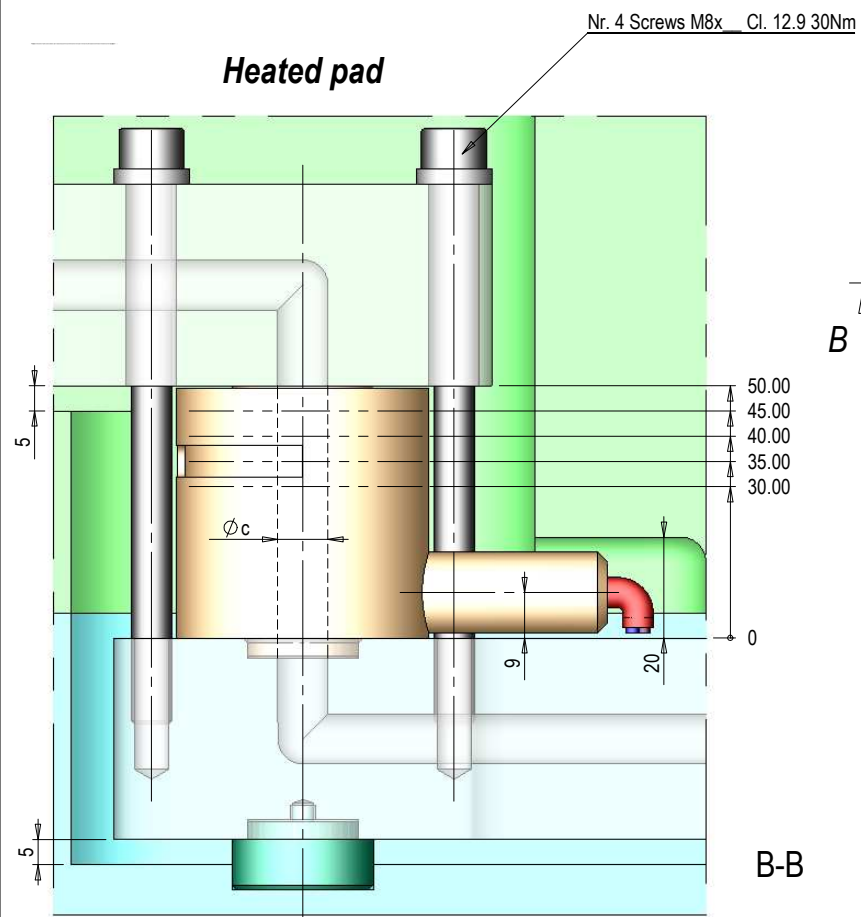
Control Zones



"L" (*)	MAXIMUN N° OF ZONES	SPHERE RADIUS	STANDARD SCREWED BUSHING CODE	
			ØA=6 ØB=8	ØA=6 ØB=10
050.00 ÷ 204.89	1 [C1]	Extension R0	0015-00439	0015-00405
204.90 ÷ 305.09	2 [C1 + C2]	R0	0015-00440	0015-00406
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)		R 12.7	0015-00441	0015-00411
		R 15.5	0015-00442	0015-00412
ØB	ØC	R 19.1	0015-00443	0015-00413
8	10	R 20	0015-00505	0015-00503
10	12	R 25	0015-00444	0015-00414
	14	R40	0015-00445	0015-00415
(*) L = min 050.00 ÷ 305.09 mm max				
(**) Disponibili anche ØB=ØC=8,10 mm				

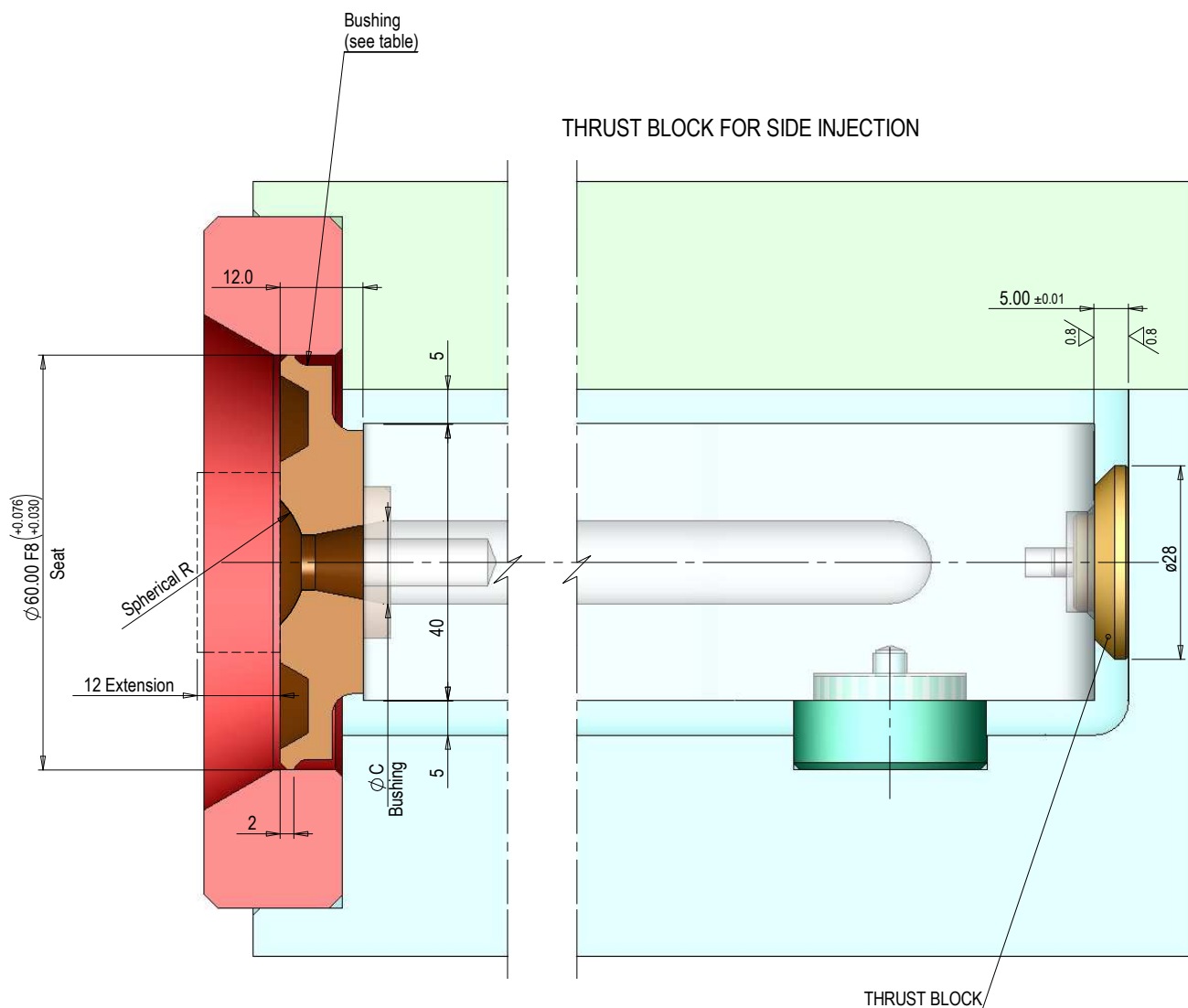


H Standard	$\phi_c=8$	$\phi_c=10$	$\phi_c=12$
5.00	0009-00379	0009-00383	0009-00387
10.00	0009-00380	0009-00384	0009-00388
15.00	0009-00381	0009-00385	0009-00389
20.00	0009-00382	0009-00386	0009-00390

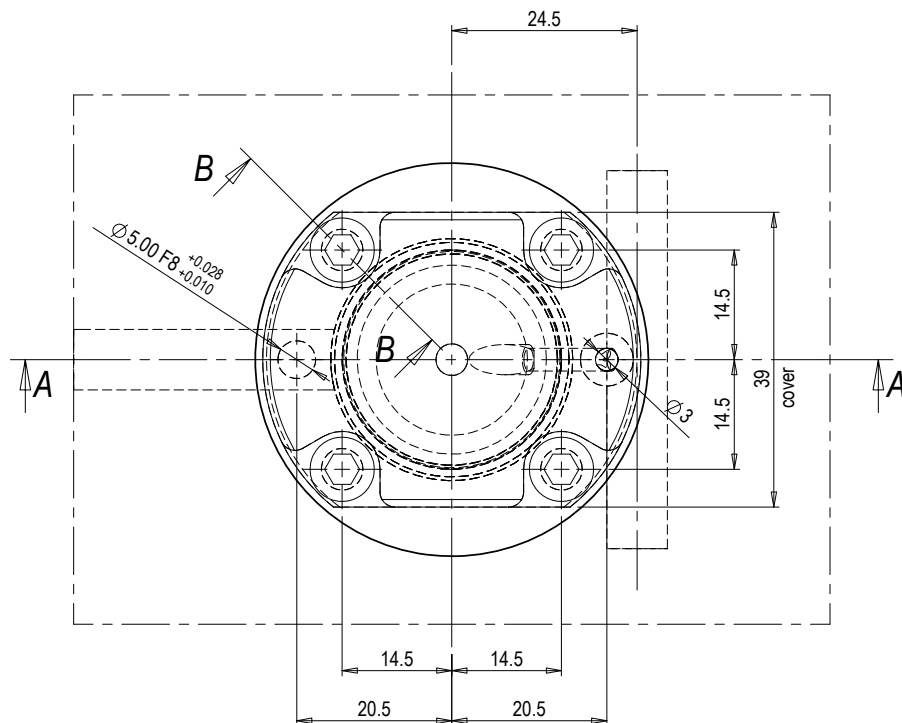


H Standard	$\phi_c=8$ [*]	$\phi_c=12$ [*]	W (230V)
30.00	0009-00441	0009-00446	2x210
35.00	0009-00442	0009-00447	2x210
40.00	0009-00443	0009-00448	2x360
45.00	0009-00444	0009-00449	2x360
50.00	0009-00445	0009-00450	2x360

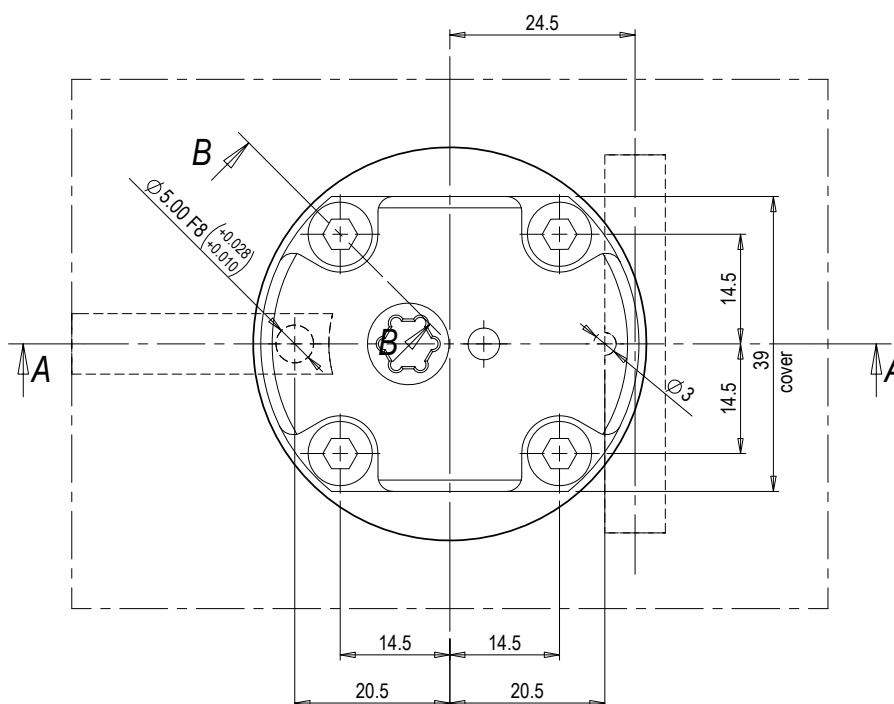
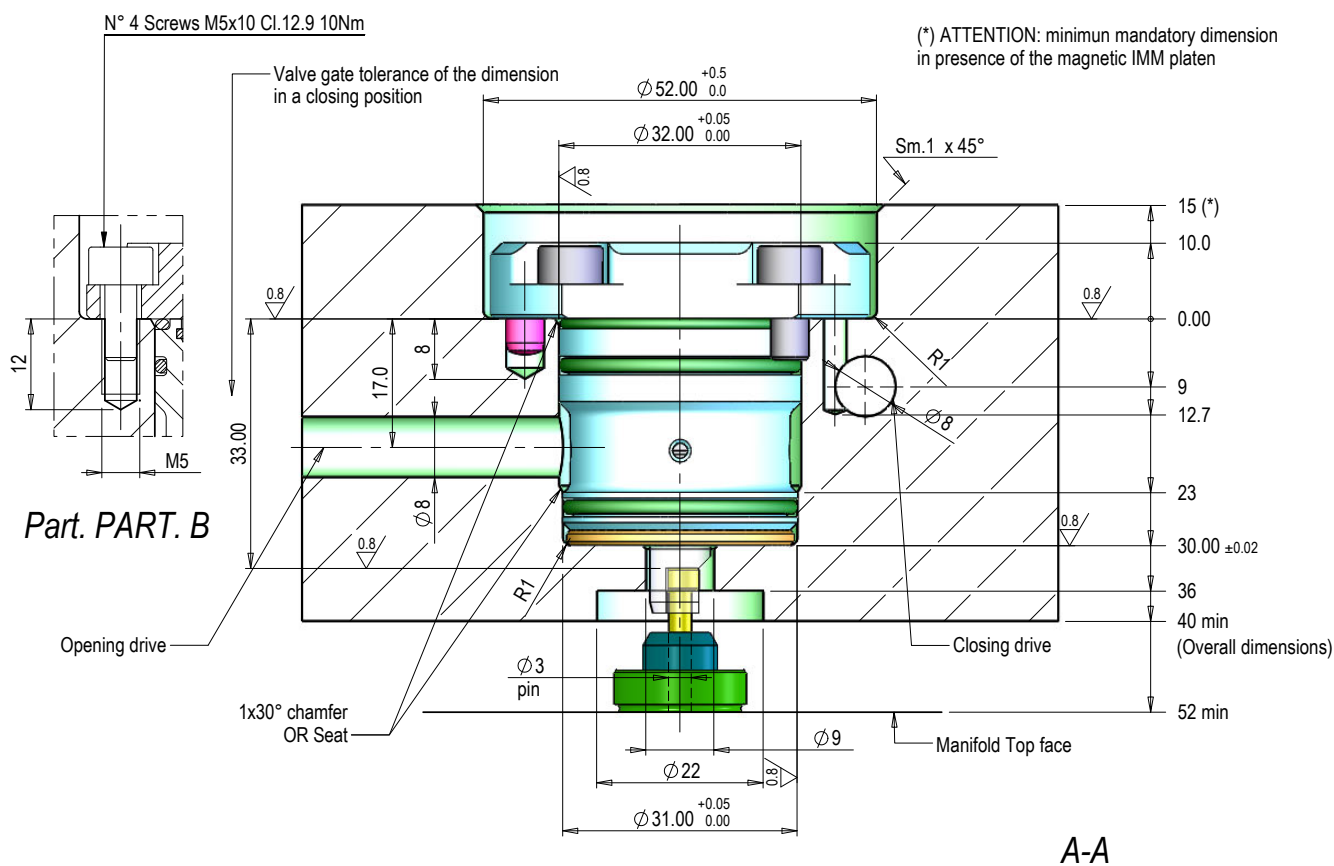
[*] $\phi_c=10$ mm upon request



THRUST BLOCK CODE	BUSHING CODE		SPHERICAL RADIUS
	$\varnothing_c = 12$	$\varnothing_c = 14$	
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 Ex tension	0016-00145 Ex tension	R0



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



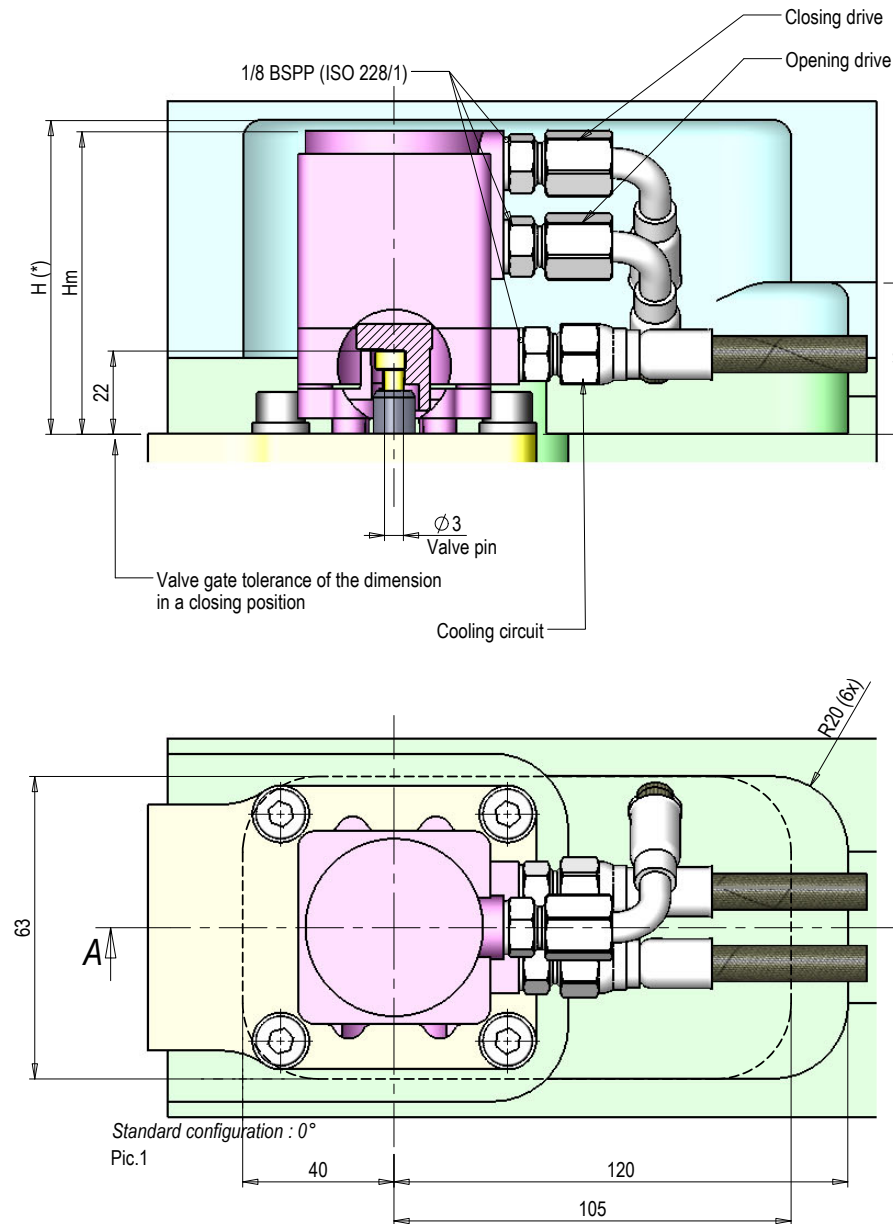
The working pressure below is only for reference: for the correct choice of maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job

<i>CODE</i>	<i>BORE</i>	<i>STROKE</i>	<i>WORKING</i>		<i>COMPLETE GASKET SET</i>
0017-00106	24	7	AIR / OIL	P _{min-max} = 6 - 80 BAR	0038-00069

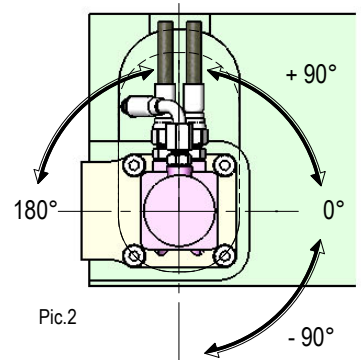
Hydraulic Cylinder: bore 30 mm - stroke 12 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

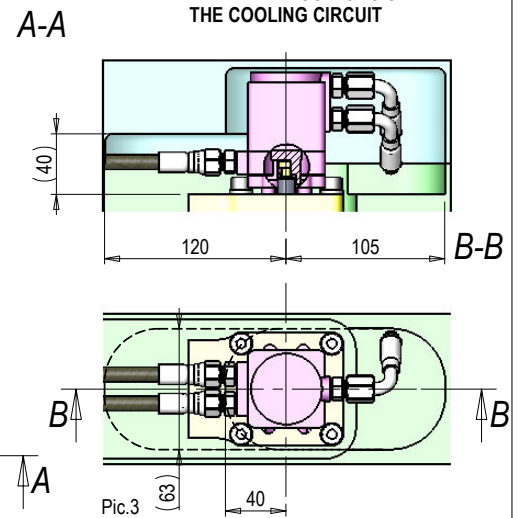
(*) ATTENTION: minimum mandatory dimension in presence of the magnetic IMM platen



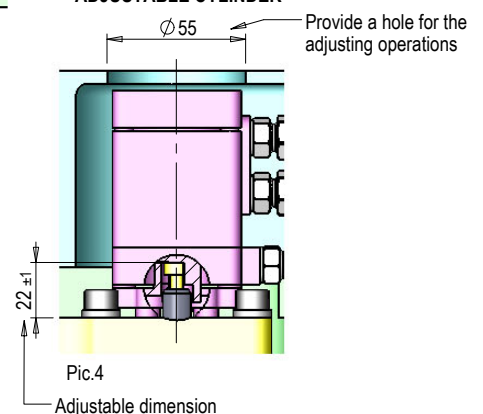
b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



ADJUSTABLE CYLINDER



CODE	VERSION	COMPLETE GASKET SET	Hm	H
0017-01450	(standard)	0038-00104	80	83
0017-01453	DAMPENED	0038-00105	80	83
0017-01457	ADJUSTABLE	0038-00141	90	93
0017-01451	WITH 1 END OF STROKE	0038-00106	99	102
0017-01452	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

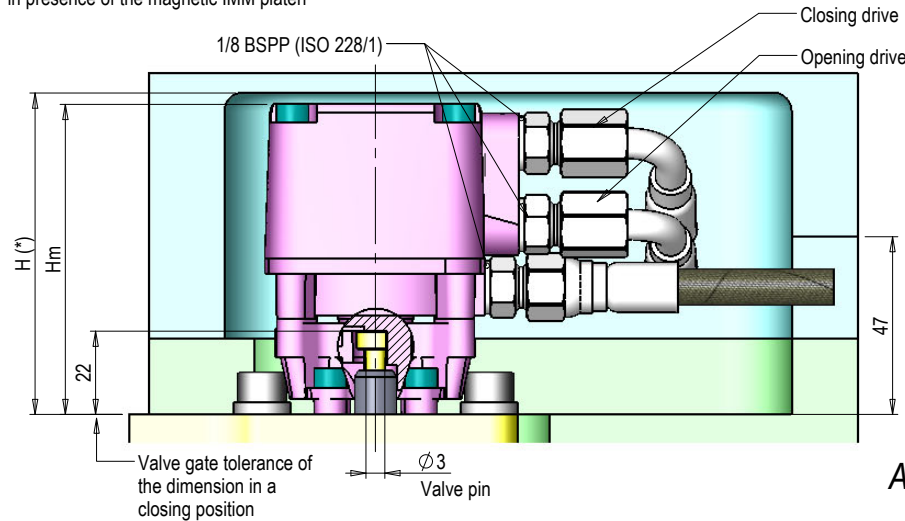
This version of cylinder allows ±1 mm adjustment of pin's closure position on PGY-type gate configurations (cylindrical valve g.).
 In case of use the version with PGC-type gate configuration (conical valve g.), HRS declines any responsibility for damage of the gate arising from the improper adjusting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

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

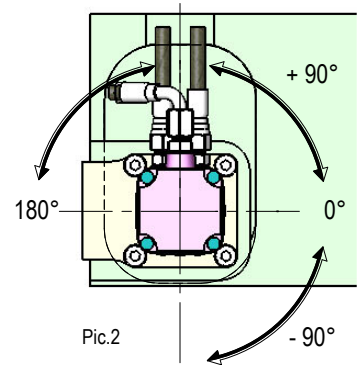
Pneumatic Cylinder: bore 50 mm - stroke 12 mm

a) Working PRESSURE: AIR max 12 BAR

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

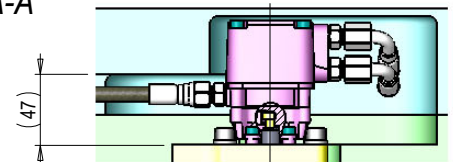


b) POSSIBLE ORIENTATIONS OF THE COUPLINGS

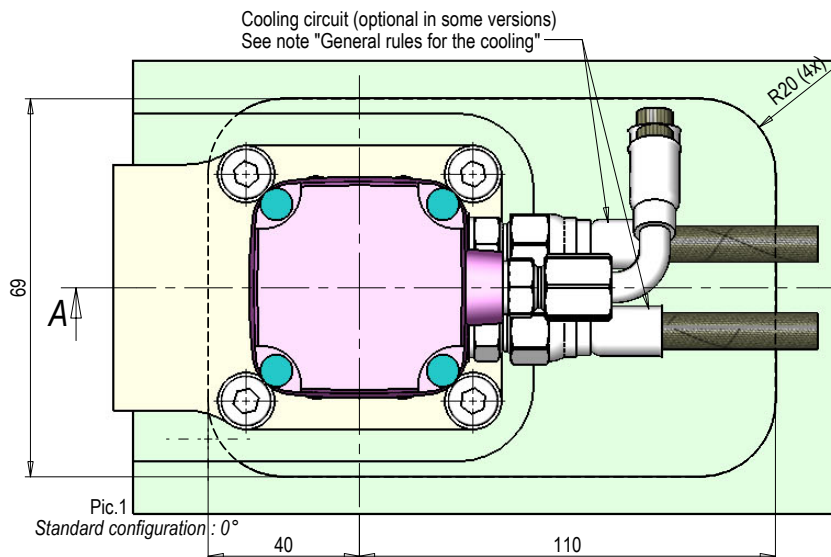
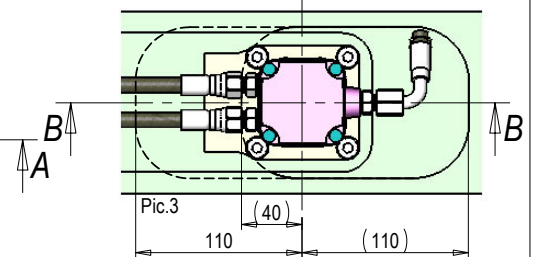


c) ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT

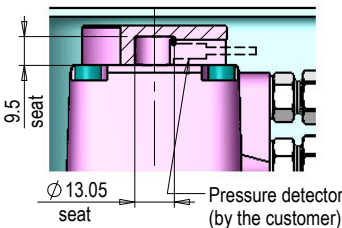
A-A



B-B



VERSION
PREARRANGED FOR TRANSDUCER

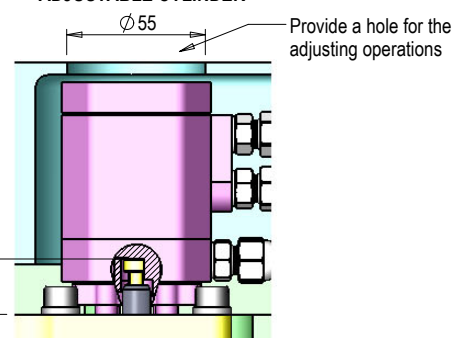


NOTE FOR THE ADJUSTABLE CYLINDER

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 dimension

ADJUSTABLE CYLINDER



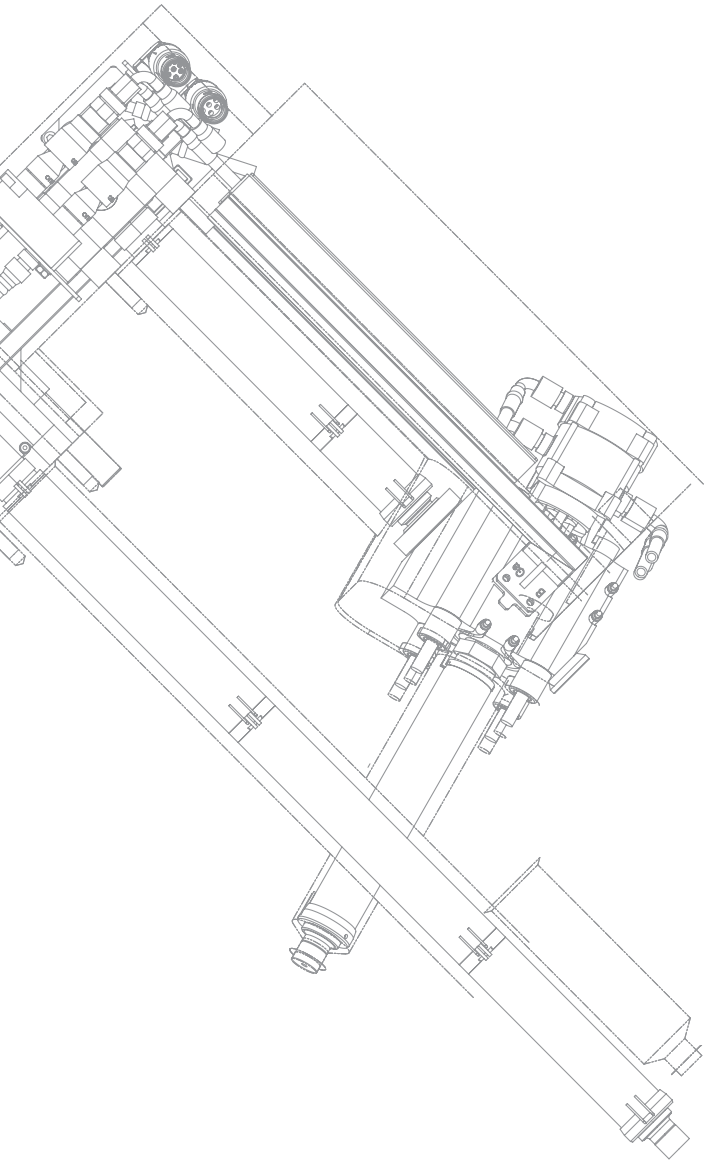
CODE	VERSION	COOLED	DAMPENED	COMPLETE GASKET	Hm	H
0017-01460	(standard)	✓	✗	0038-00128	82	85
0017-01461		✗	✗			
0017-01464		✓	✓	0038-00129		
0017-01465		✗	✓			
0017-01462	WITH 1 END OF STROKE	✓	✗	0038-00130	101.5	104.5
0017-01466		✓	✓	0038-00131		
0017-01463	WITH DOUBLE END OF STROKE	✓	✗	0038-00130	95	98
0017-01467		✓	✓	0038-00115		
0017-01472		✓	✗			
0017-01473	PREARRANGED FOR TRANSDUCER	✗	✗	0038-00131	92	95
0017-01470	ADJUSTABLE	✓	✗			
0017-01471		✗	✗	0038-00128		

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 $\leq 280^{\circ}\text{C}$ [536°F] and T2 $\leq 80^{\circ}\text{C}$ [176°F]
 - Versions with end of stroke: cooling ALWAYS MANDATORY with T1 $\geq 200^{\circ}\text{C}$ [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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1;



M Series 10÷265 cm³/s

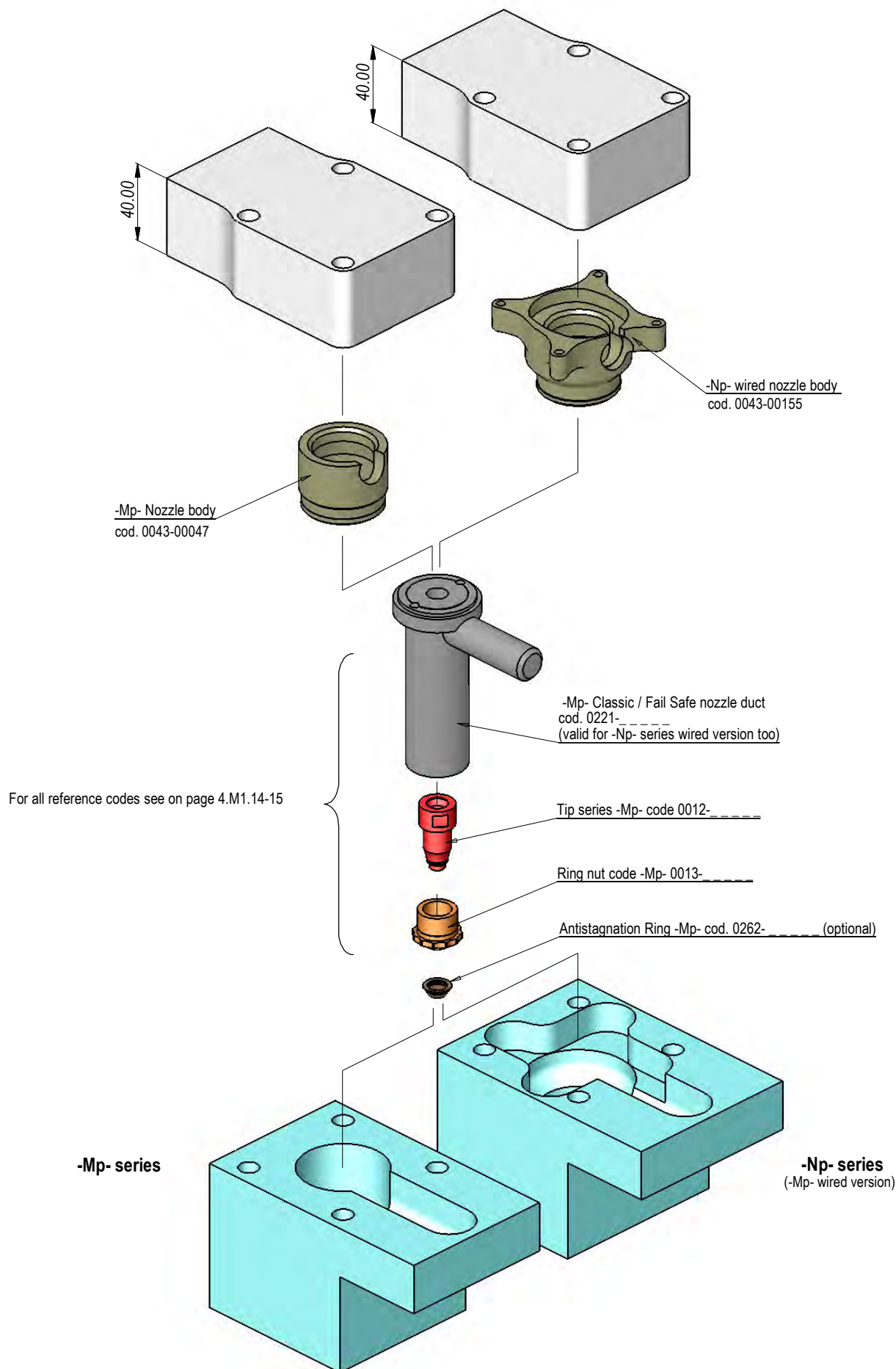
Serie M

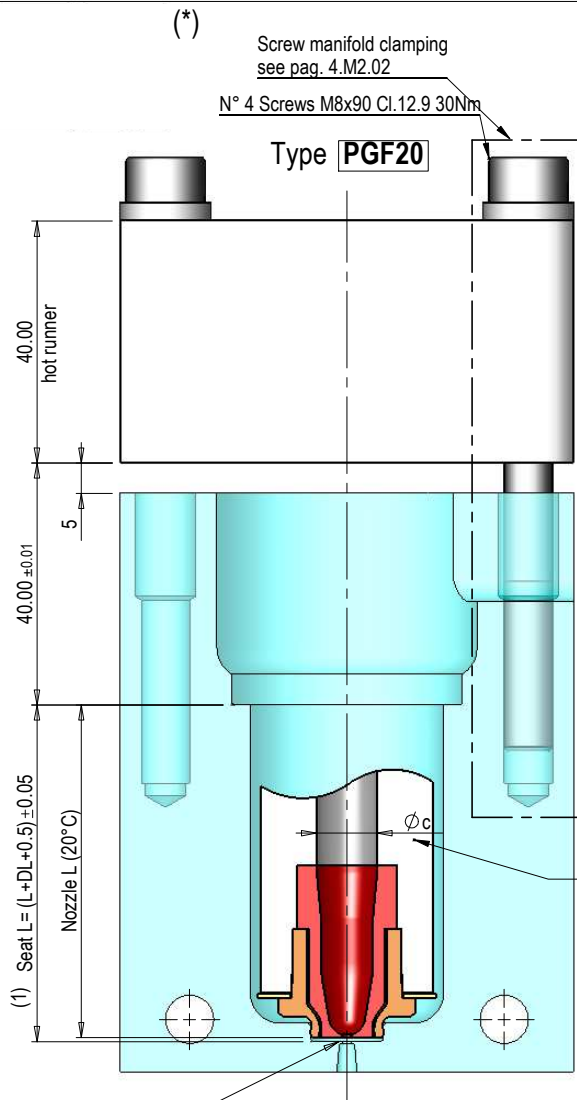
M Serie

M Série

M Serie

M Série

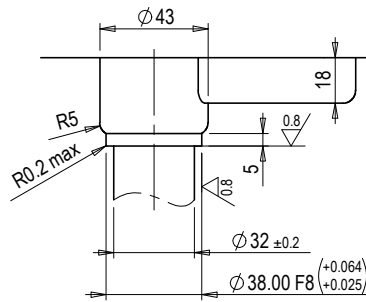




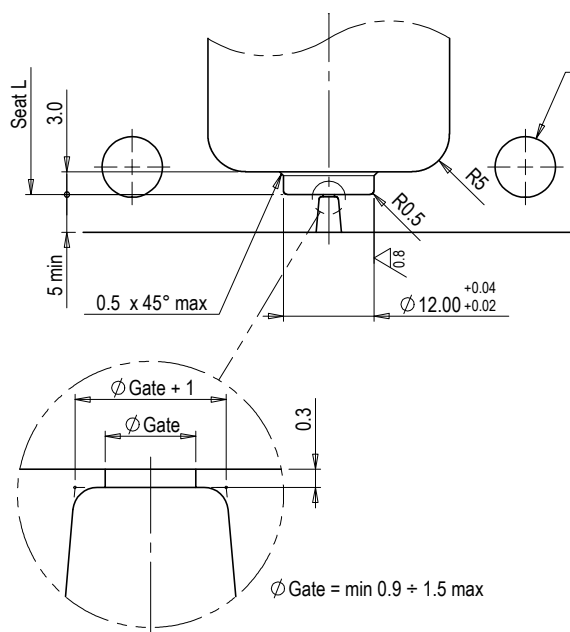
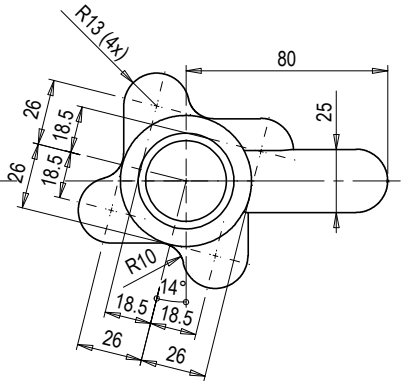
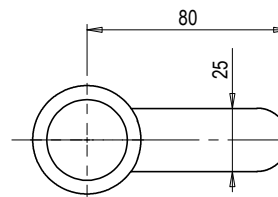
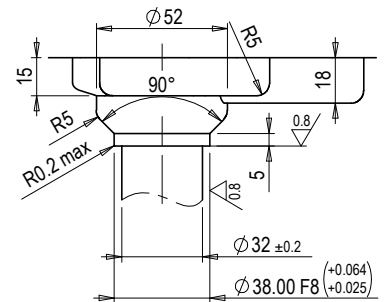
**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**

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

-Mp- series

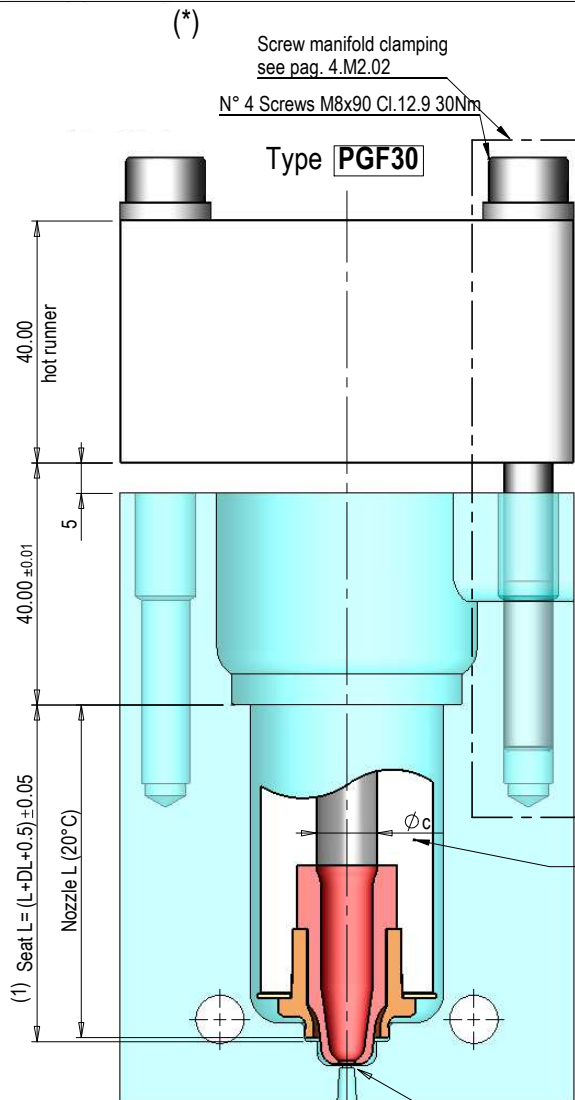


-Np- series
(-Mp- wired version)

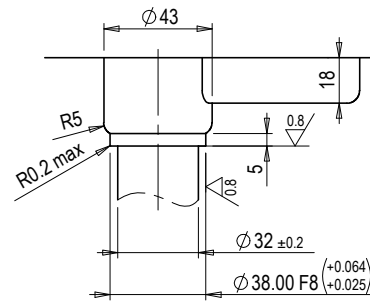


For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table A

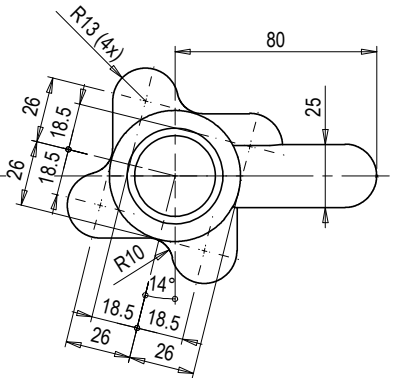
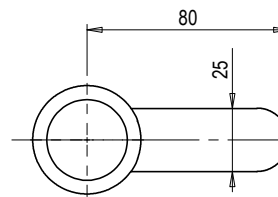
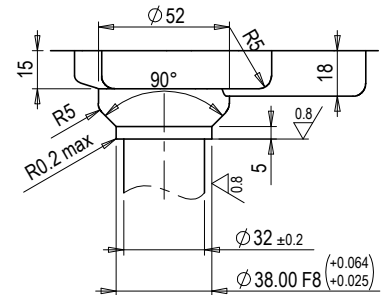
NOZZLE L
35
55
75
95
115
135
155
195
235
275
315



-Mp- series

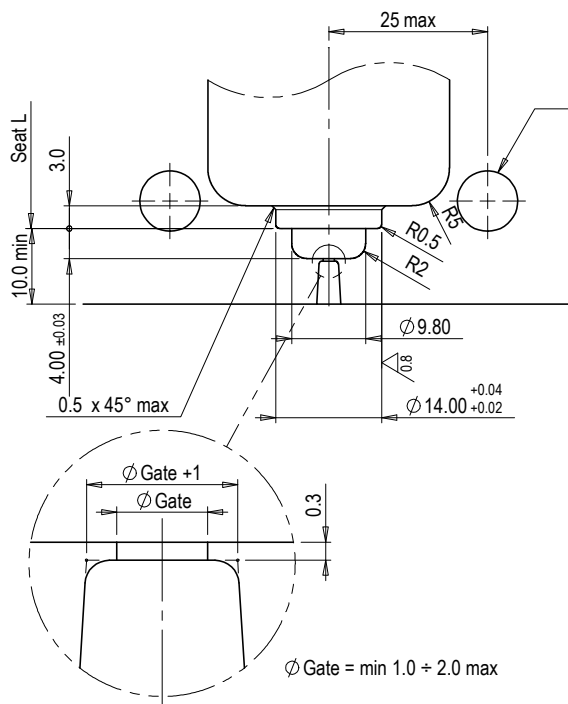


-Np- series
(-Mp- wired version)



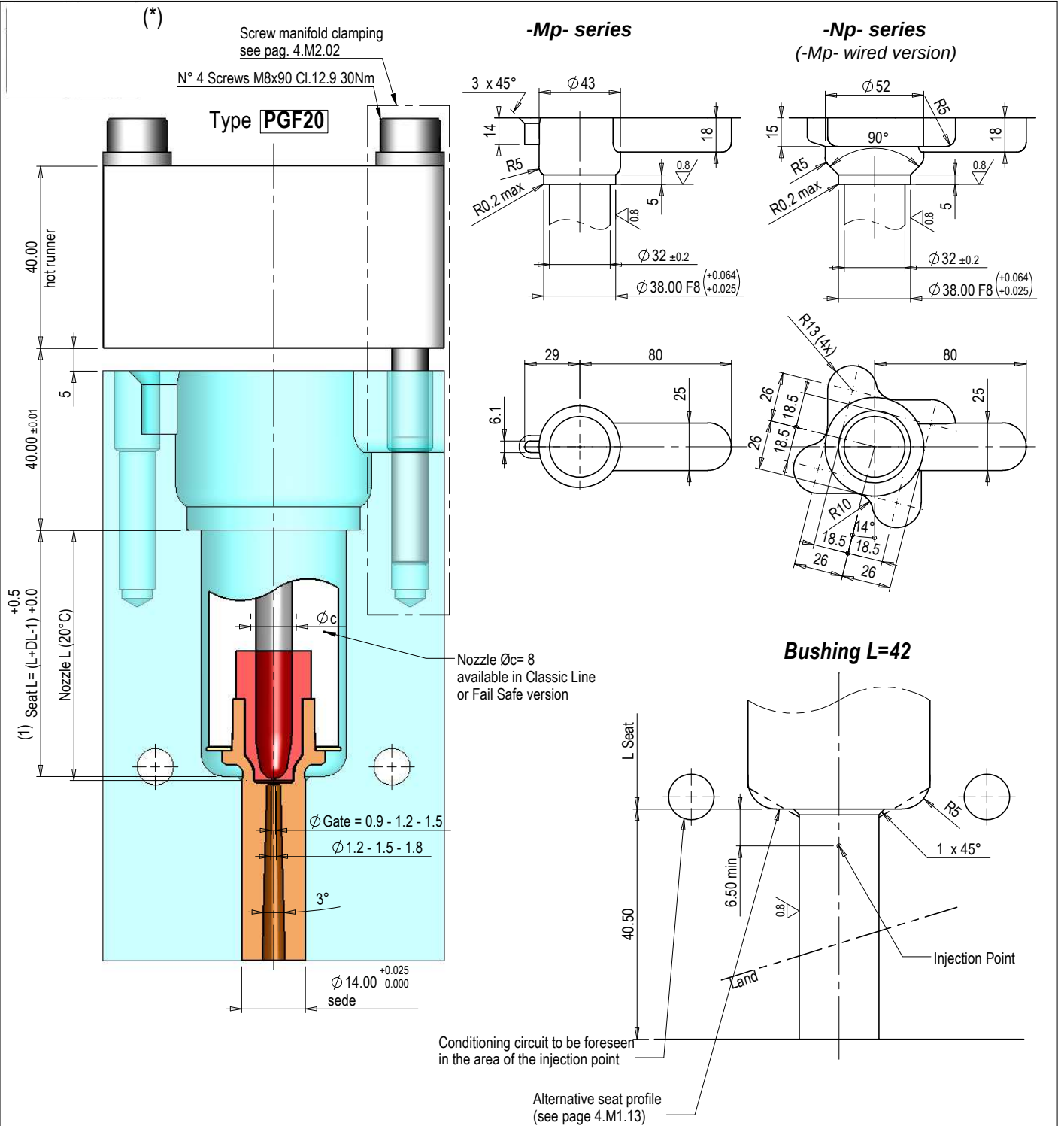
Nozzle Øc=10 - 12 - 14
available in Classic Line
or Fail Safe version

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



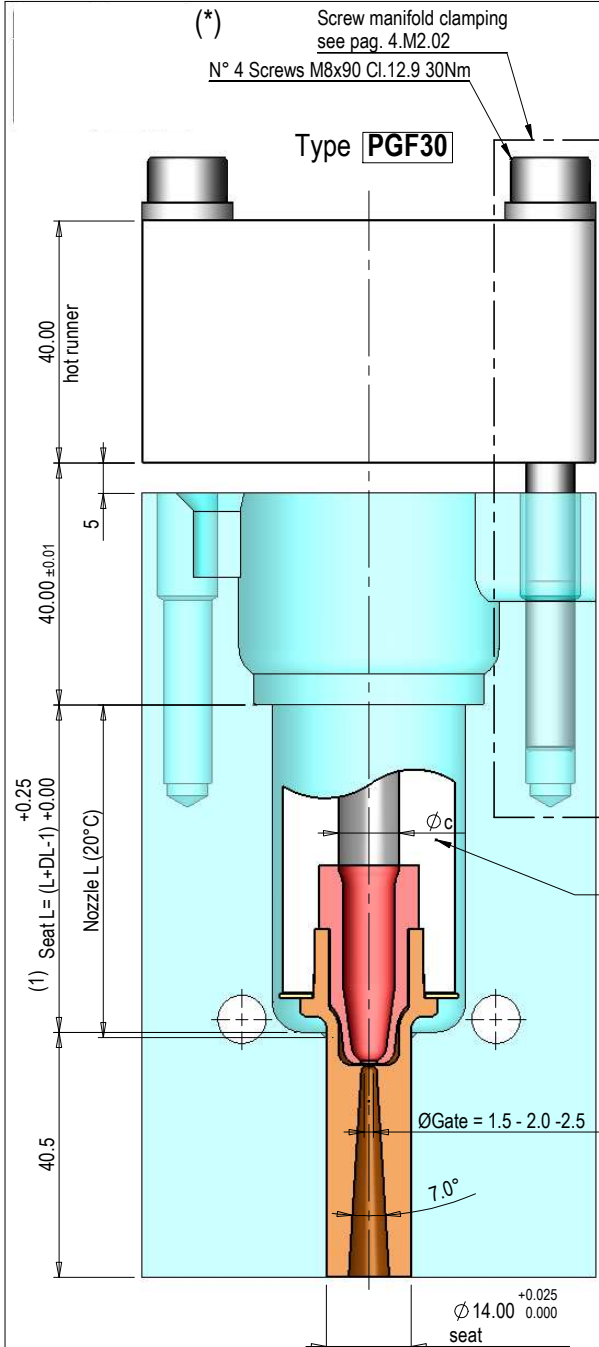
For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table A

NOZZLE L
35
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75
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115
135
155
195
235
275
315

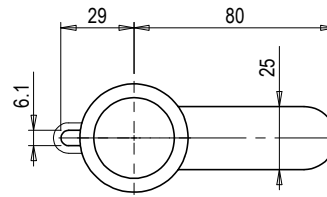
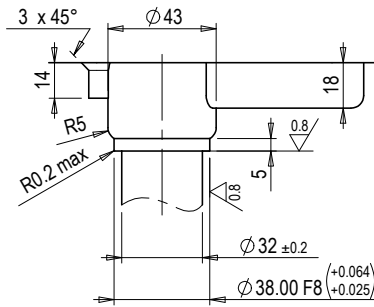


For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table B

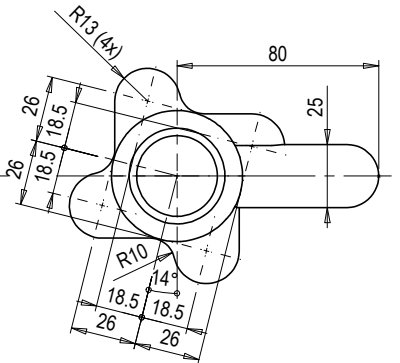
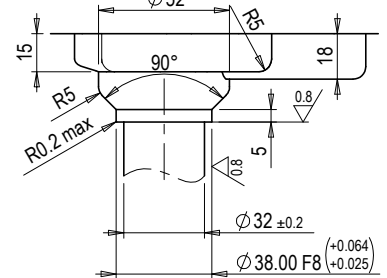
NOZZLE L
35
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275
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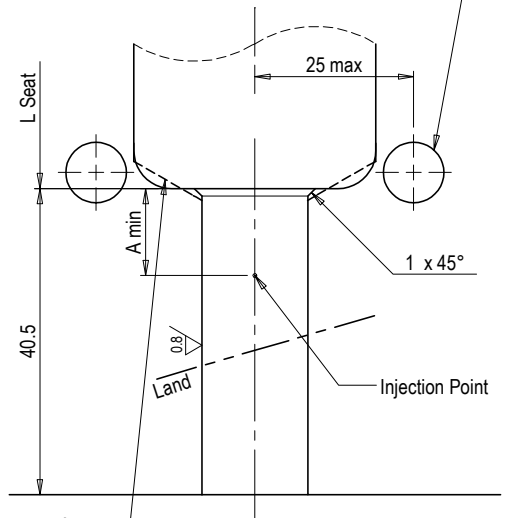
-Mp- series



-Np- series
(-Mp- wired version)



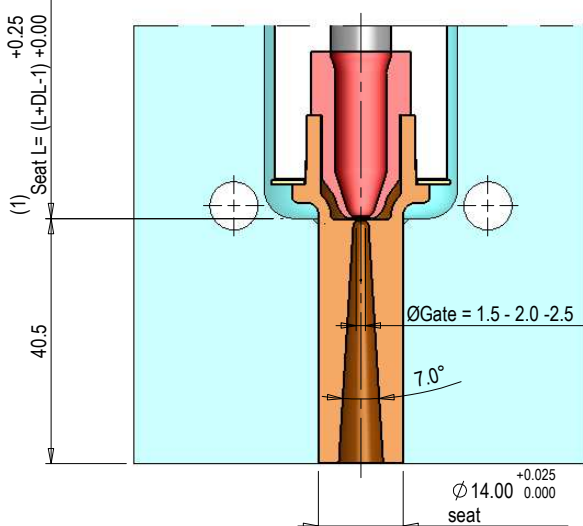
Independent and dedicated cooling circuit to be foreseen in the area of the injection point



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

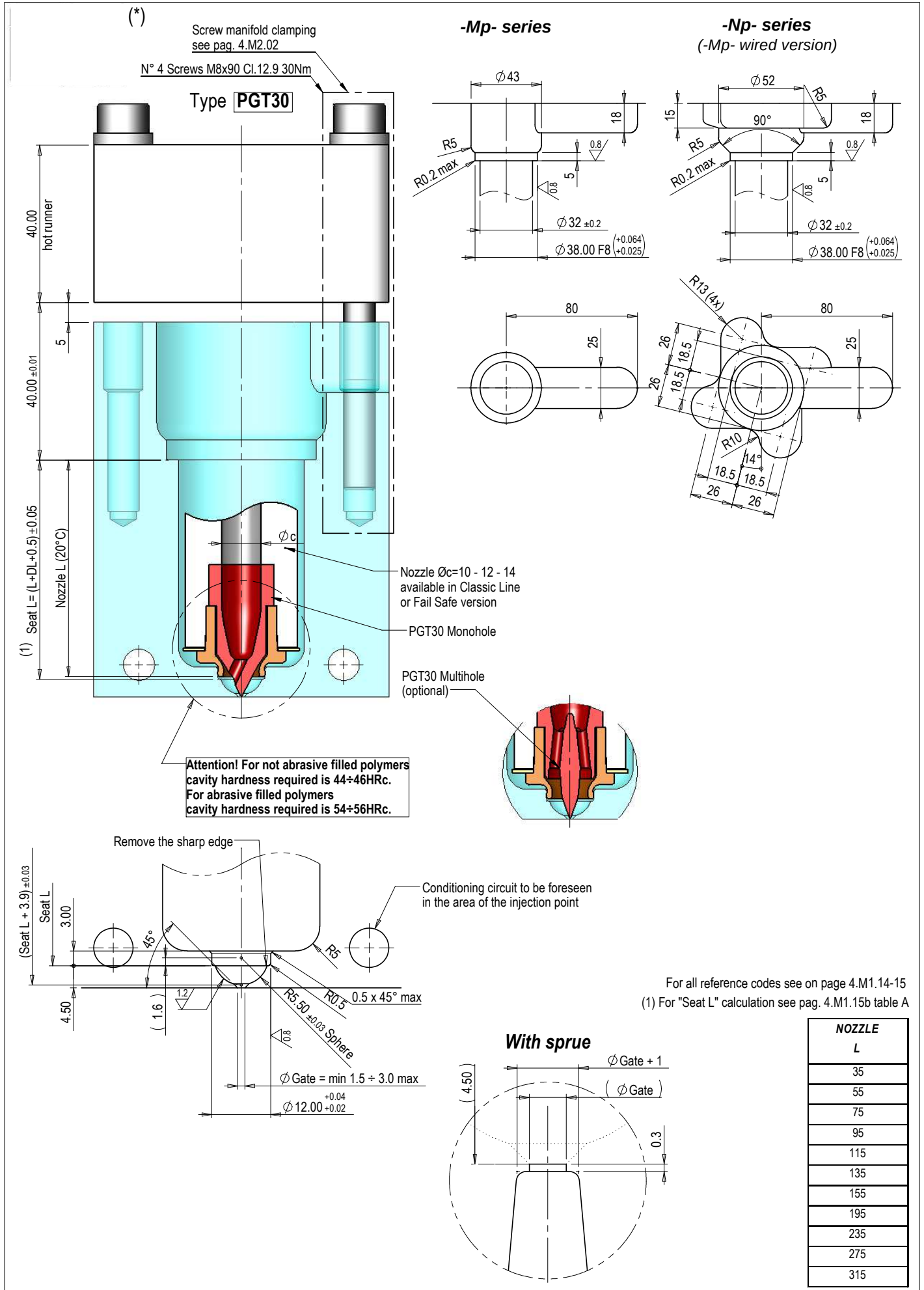
TYPE	A [mm]
PGF30	11.5
PGF10	10.3

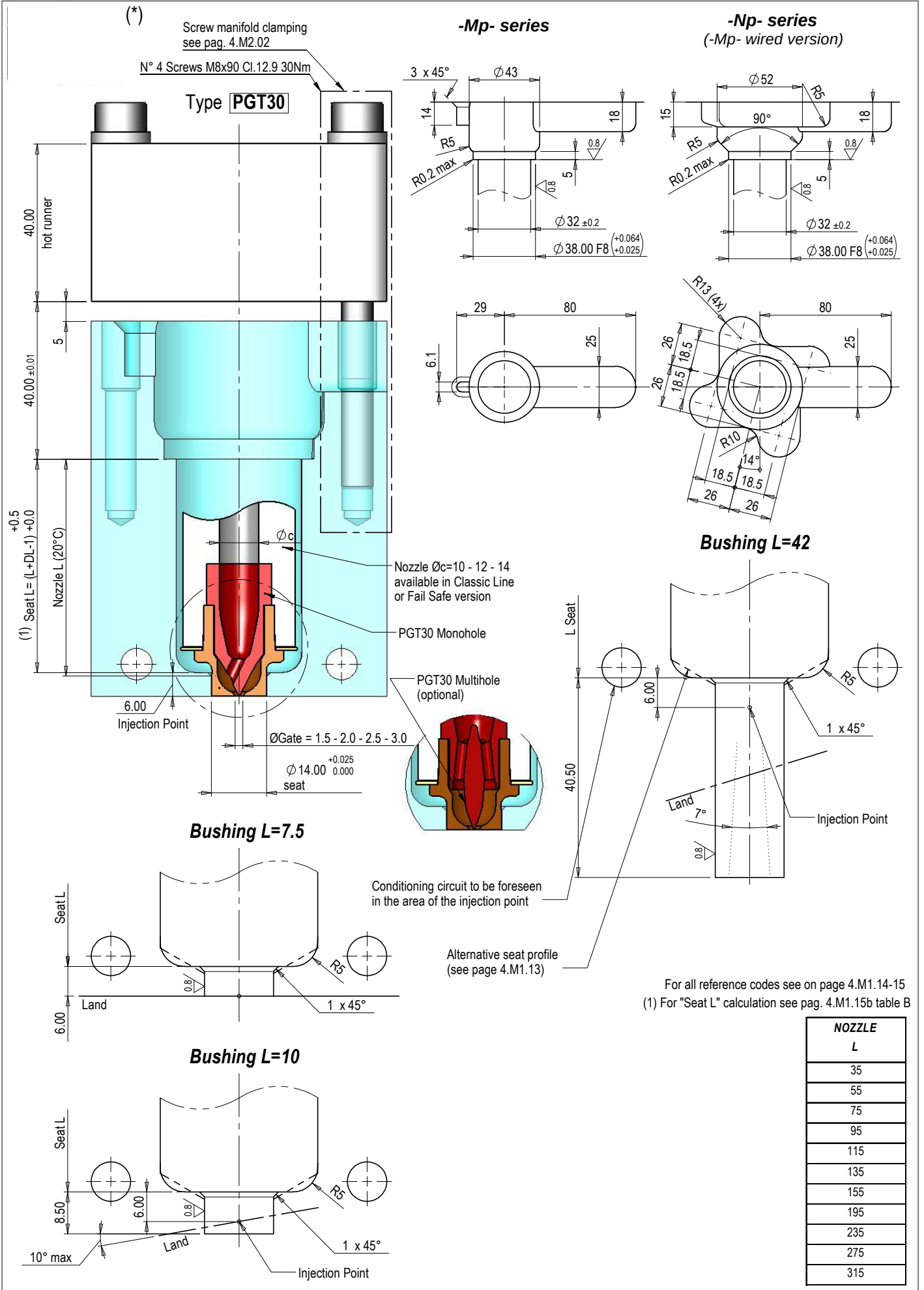
Type **PGF10**

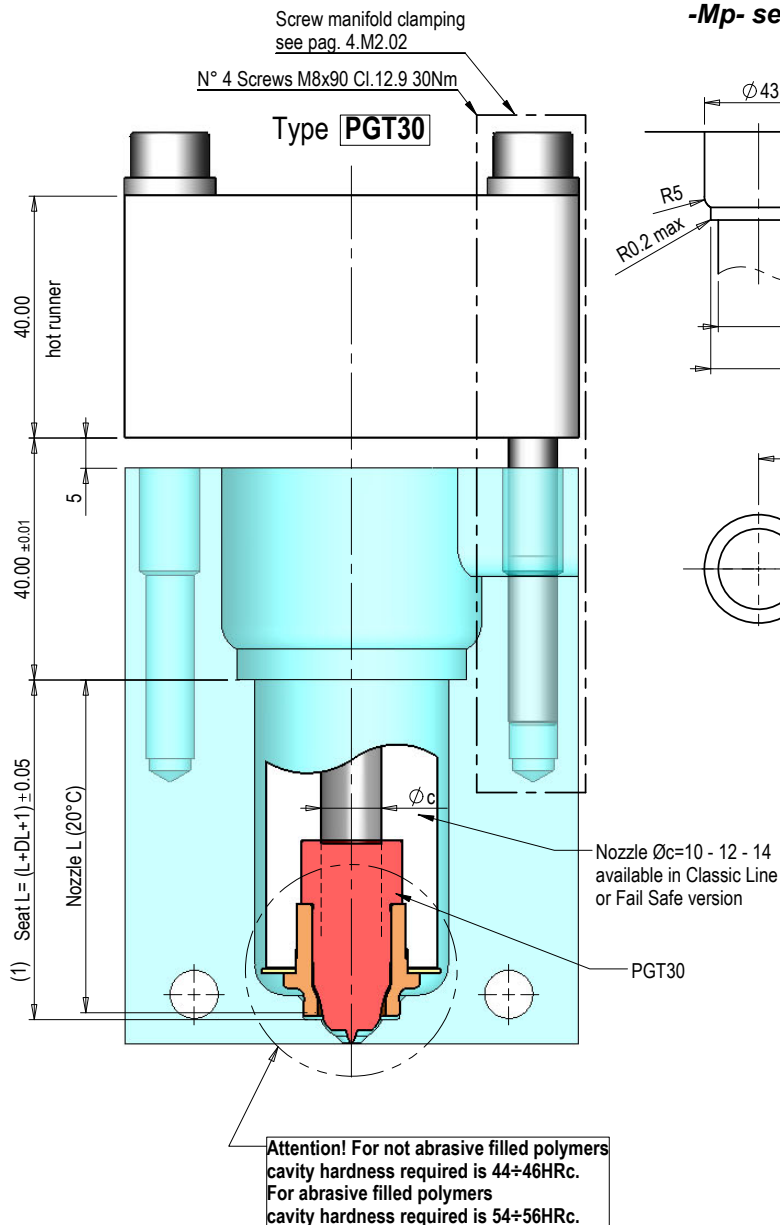


For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table B

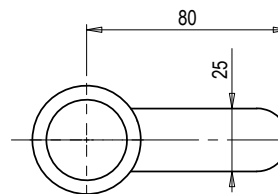
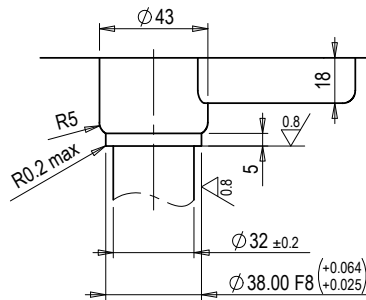
NOZZLE L
35
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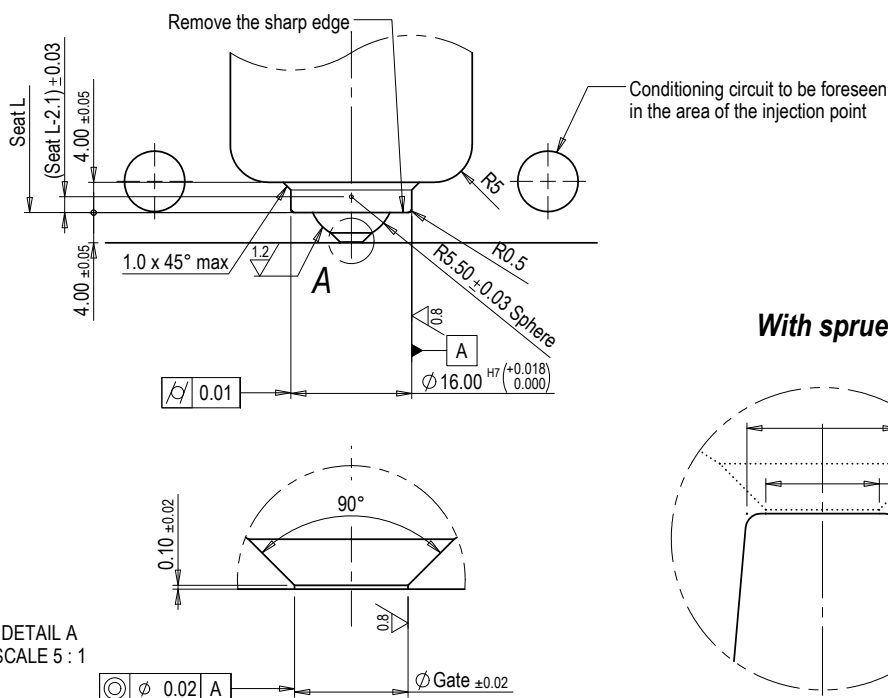
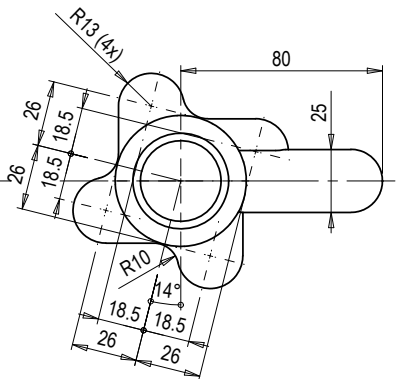
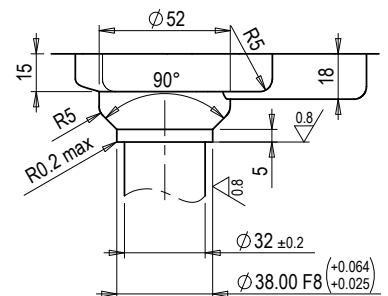


-Mp- series

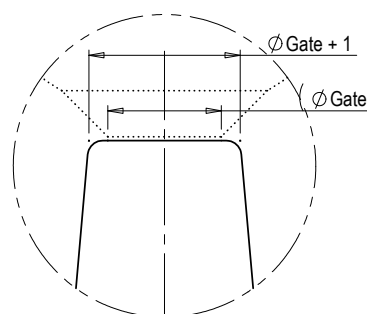


-Np- series

(-Mp- wired version)

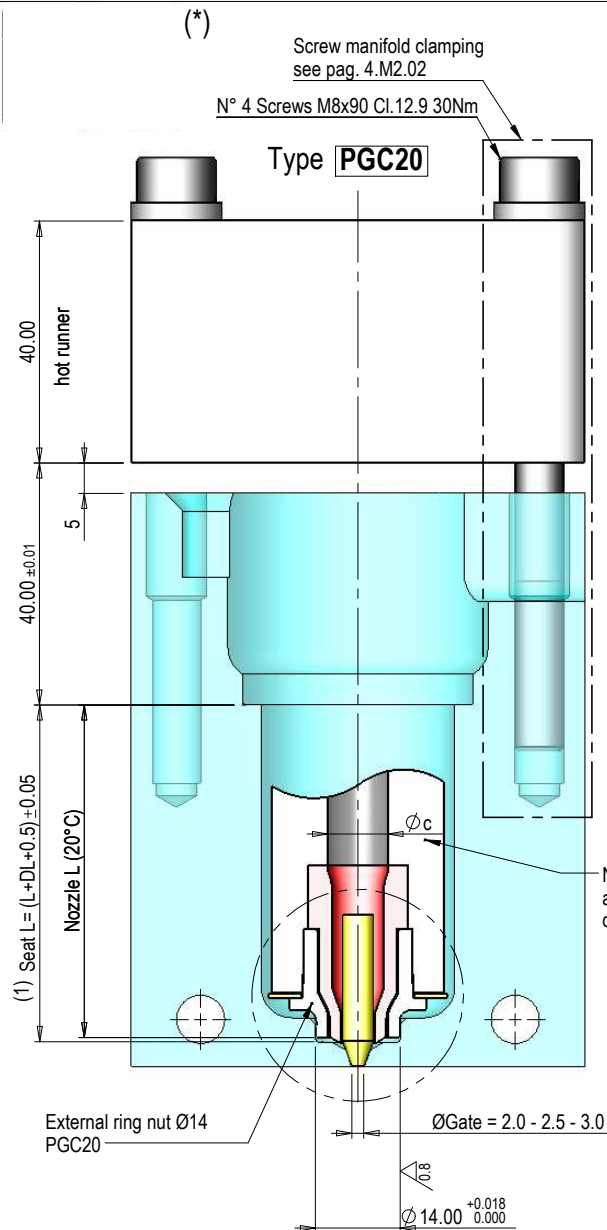


With sprue

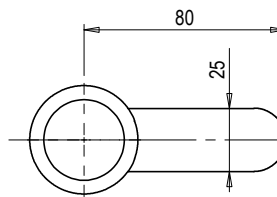
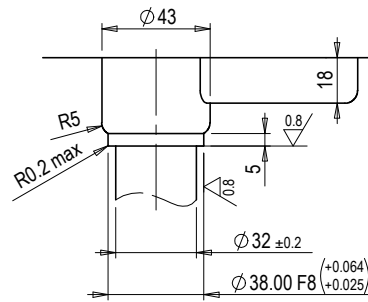


For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table A

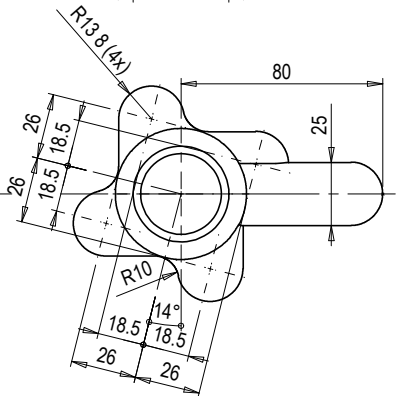
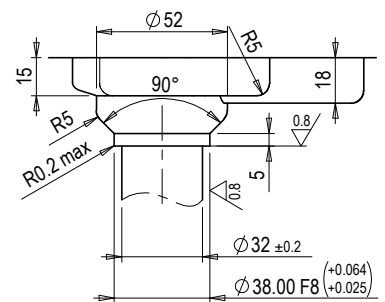
NOZZLE L
35
55
75
95
115
135
155
195
235
275
315



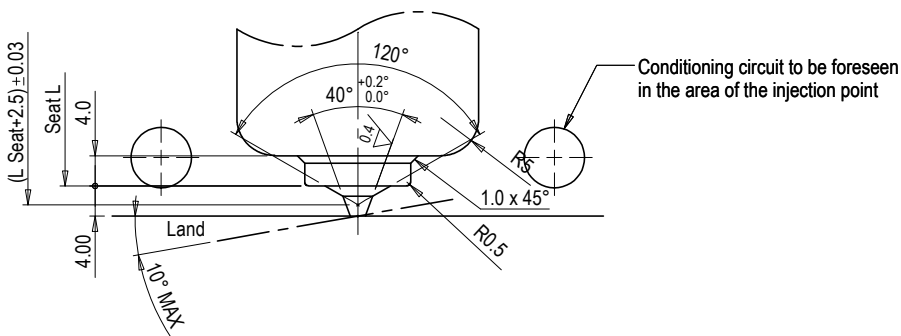
-Mp- series



-Np- series
(-Mp- wired version)

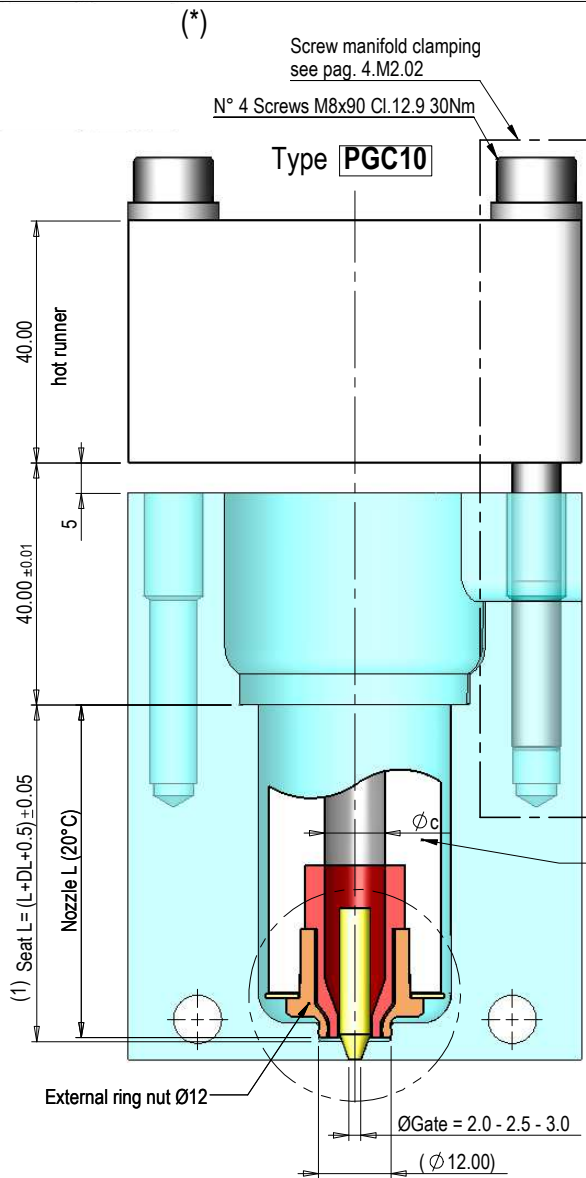


**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**

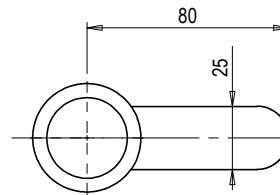
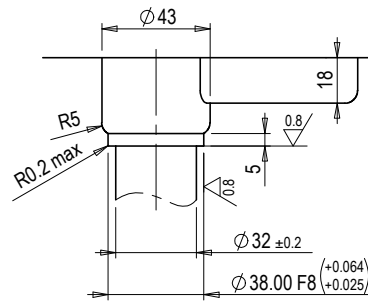


For all reference codes see on page 4.M1.14-15
(1) For "DL" calculation see pag. 4.M1.15b table A

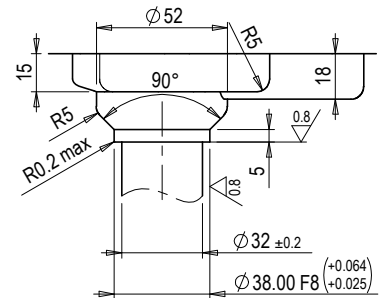
NOZZLE L
35
55
75
95
115
135
155
195
235
275
315



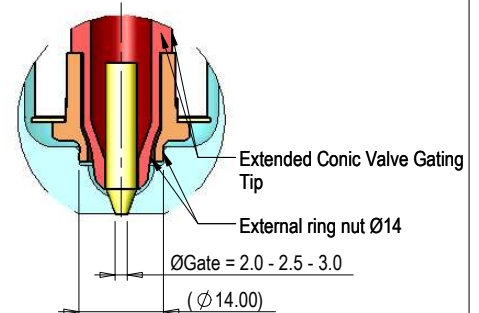
-Mp- series



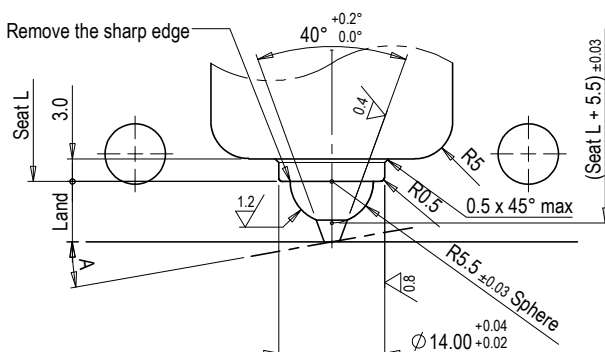
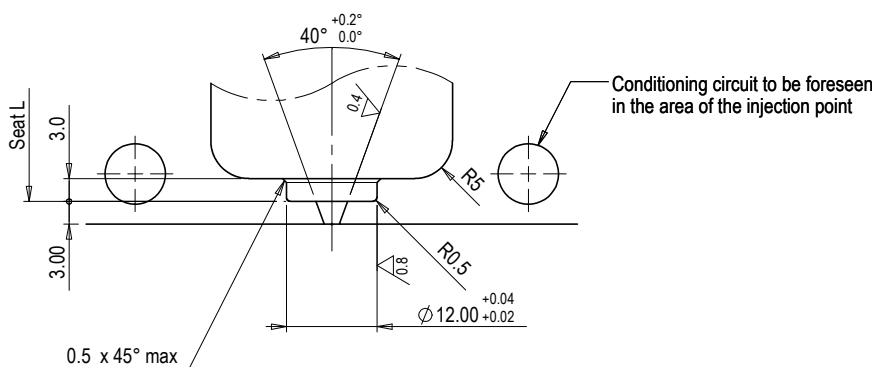
-Np- series
(-Mp- wired version)



Type **PGC30**



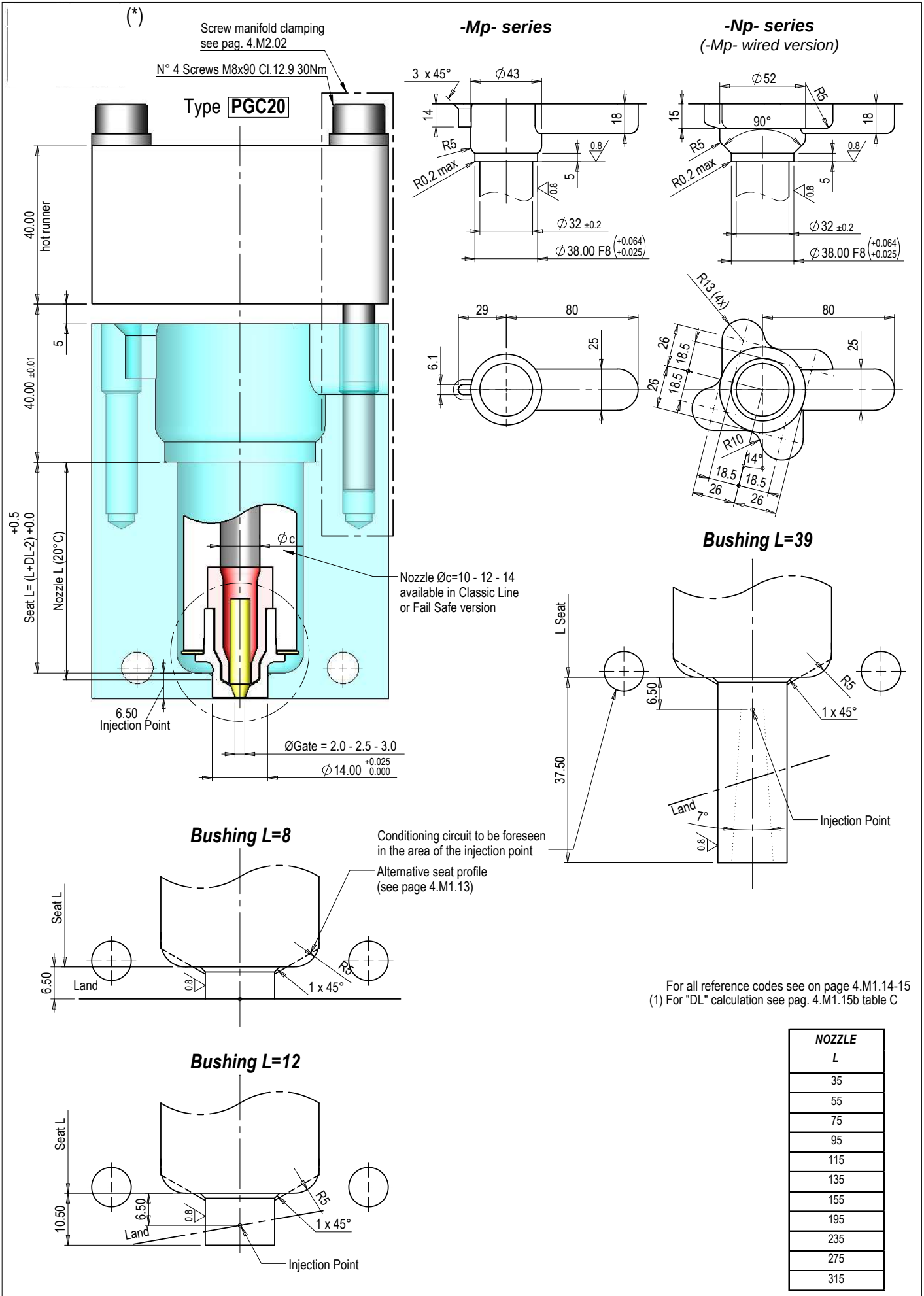
**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**

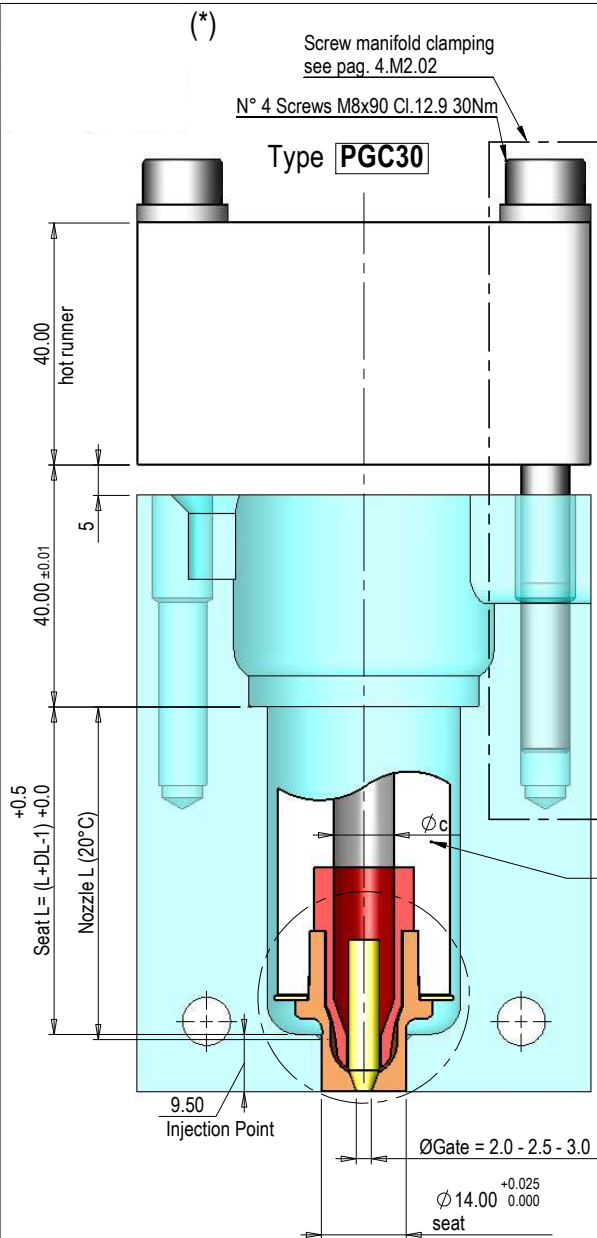


A = 0° + 10° Land=8.00 mm
A = 10° + 20° Land=8.50 mm

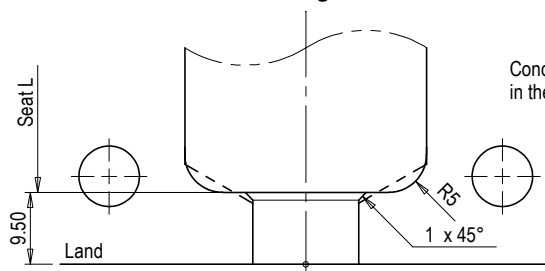
For all reference codes see on page 4.M1.14-15
(1) For "Seat L" calculation see pag. 4.M1.15b table A

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

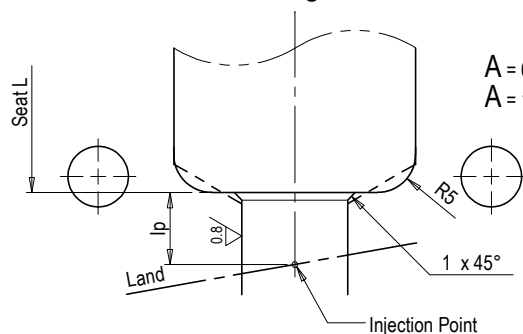




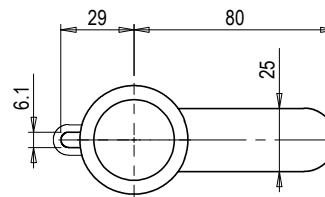
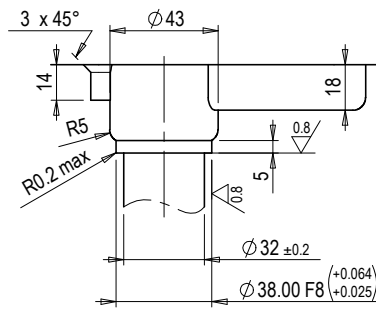
Bushing L=11



Bushing L=15

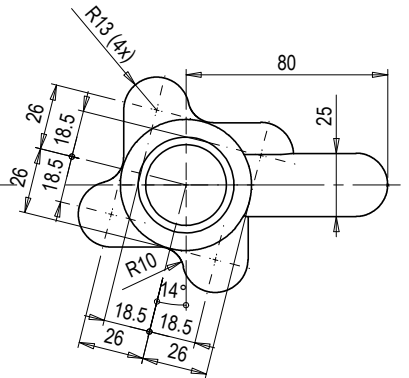
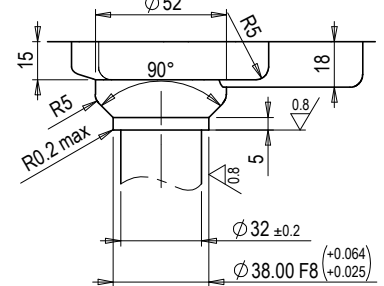


-Mp- series

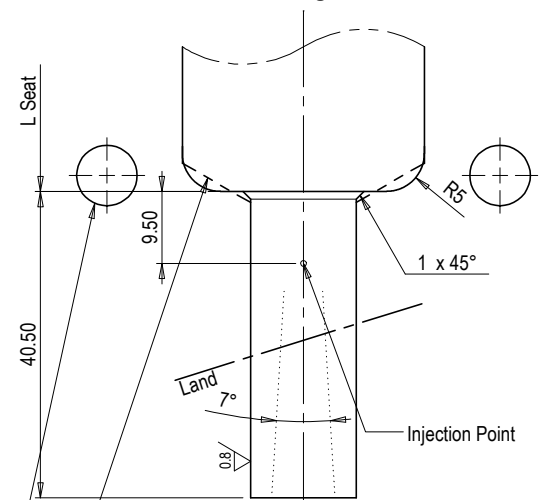


-Np- series

(-Mp- wired version)



Bushing L=42

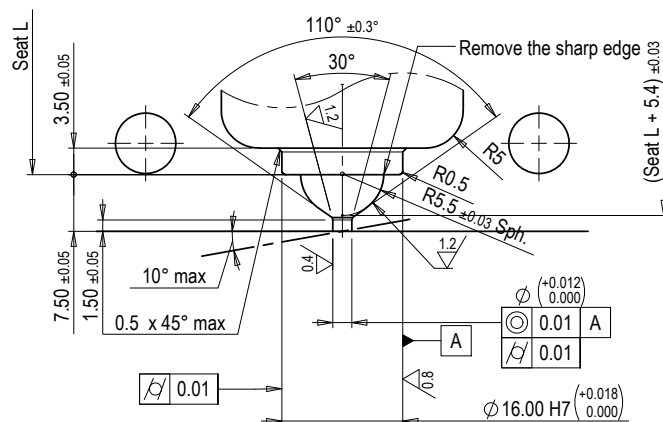
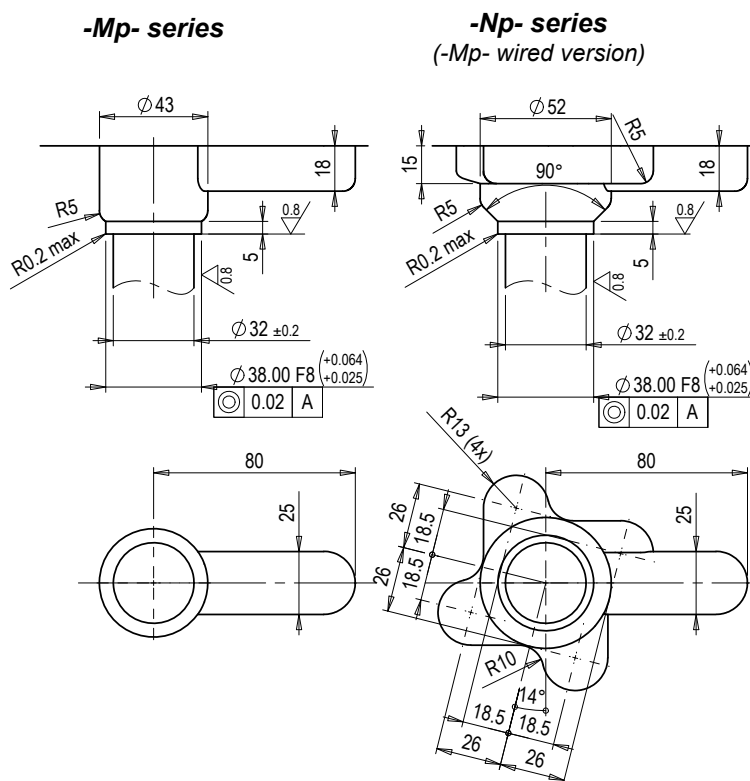
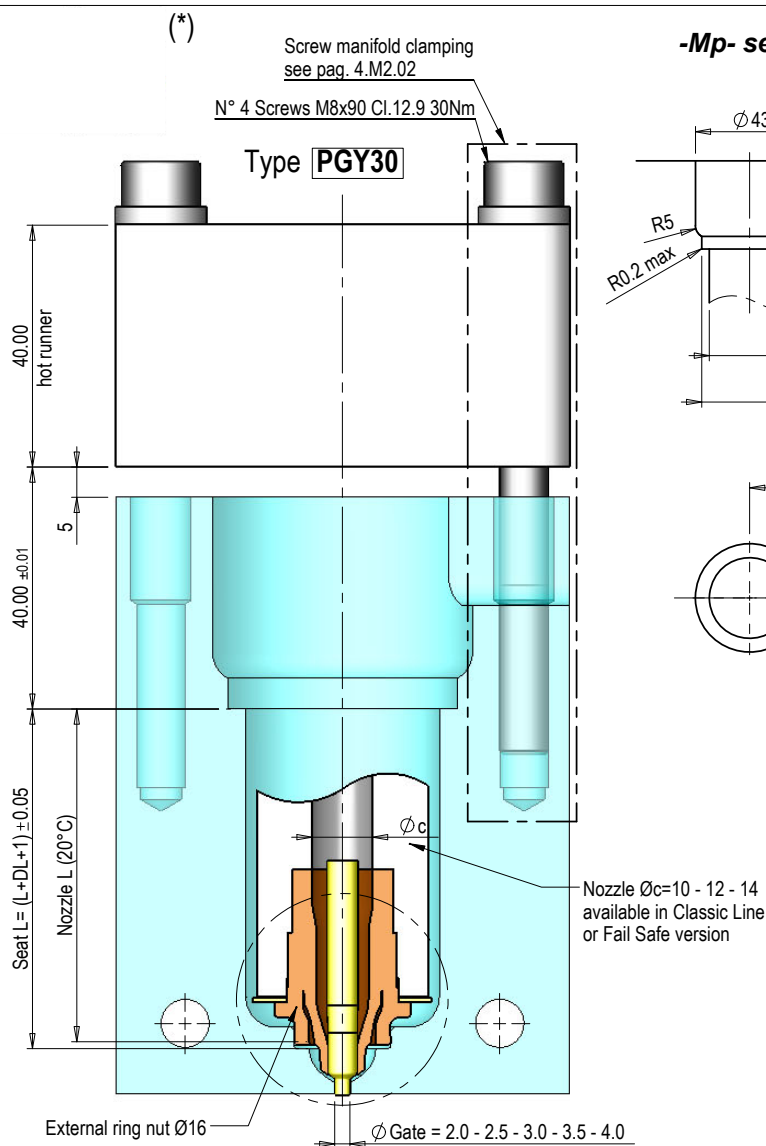


Conditioning circuit to be foreseen
in the area of the injection point

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
55
75
95
115
135
155
195
235
275
315

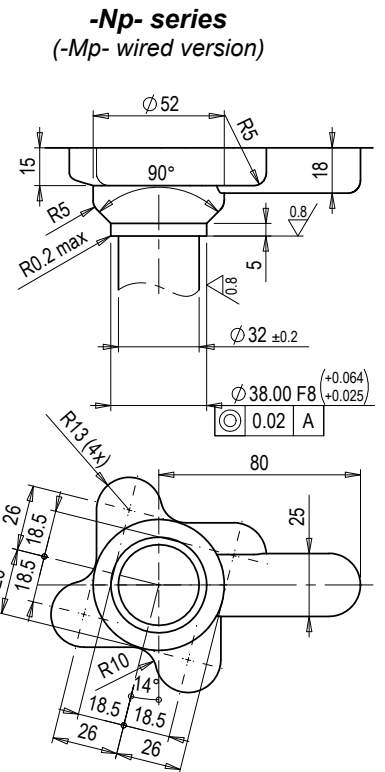
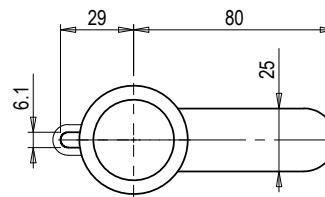
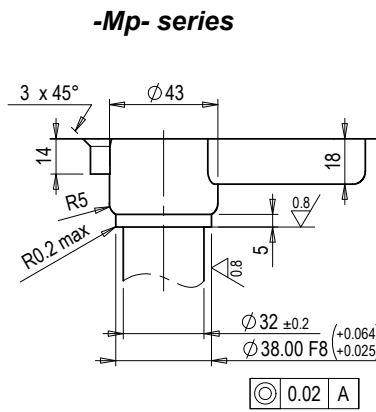
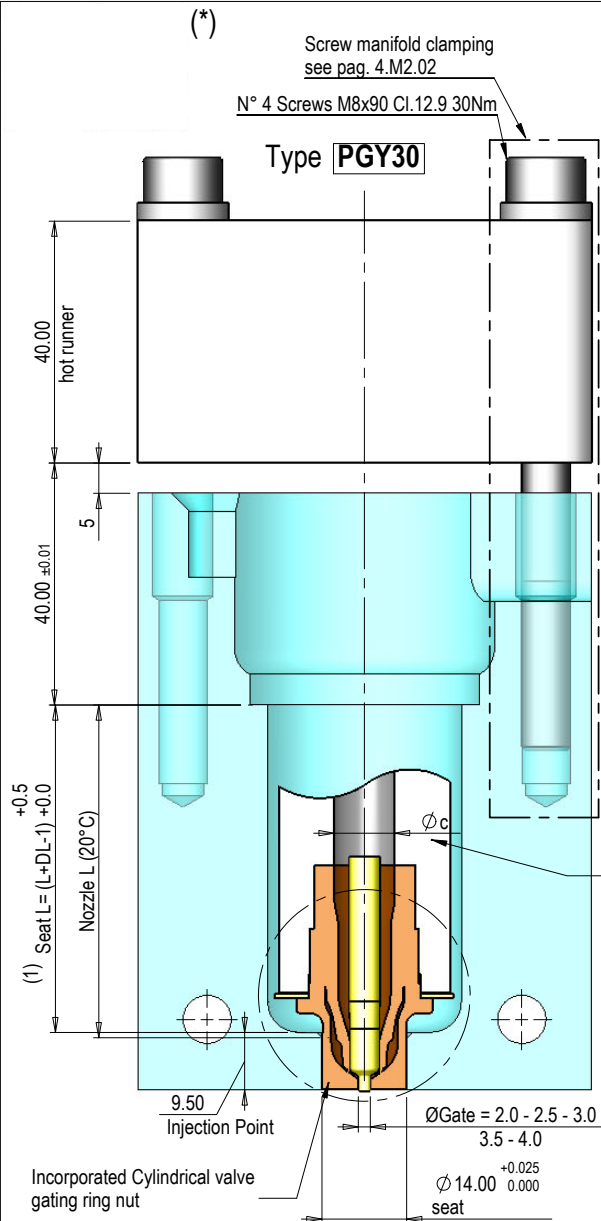


Attention! The tolerances are really important. Do not respect these ones, the grinding surface and roughness' values, it means do not make the system works correctly

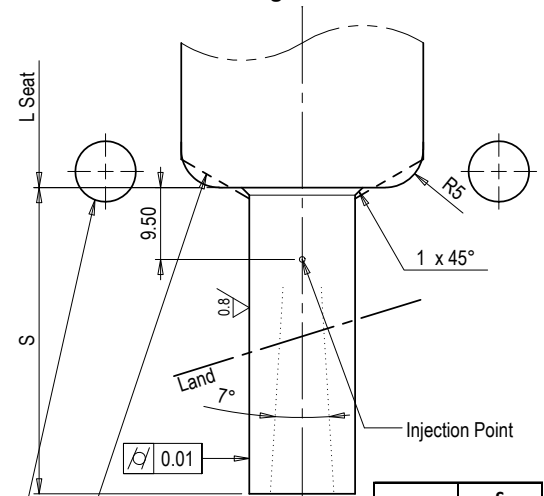
**Attention! For not abrasive filled polymers
cavity hardness required is 48÷50HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**

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



Bushing L=27 / L=42

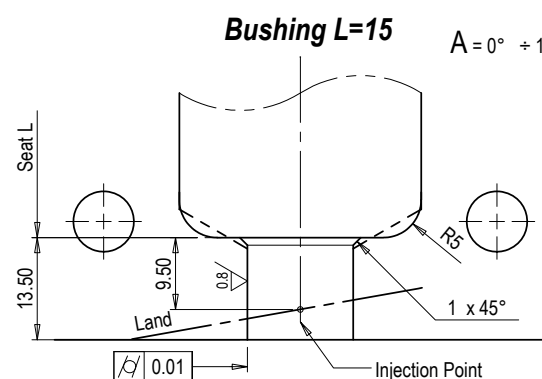
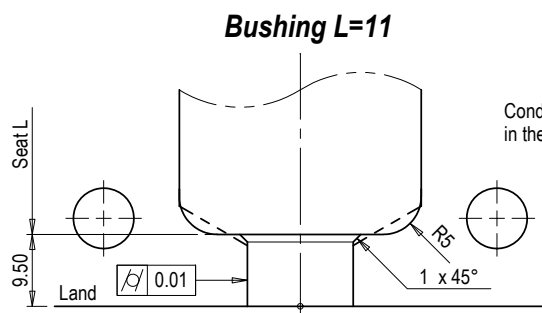


	S
L=27	26.5
L=42	41.5

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

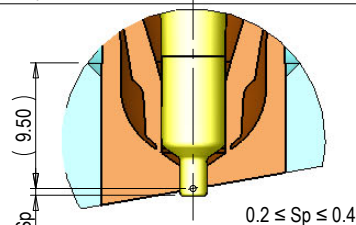
Alternative seat profile
(see page 4.M1.13)

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



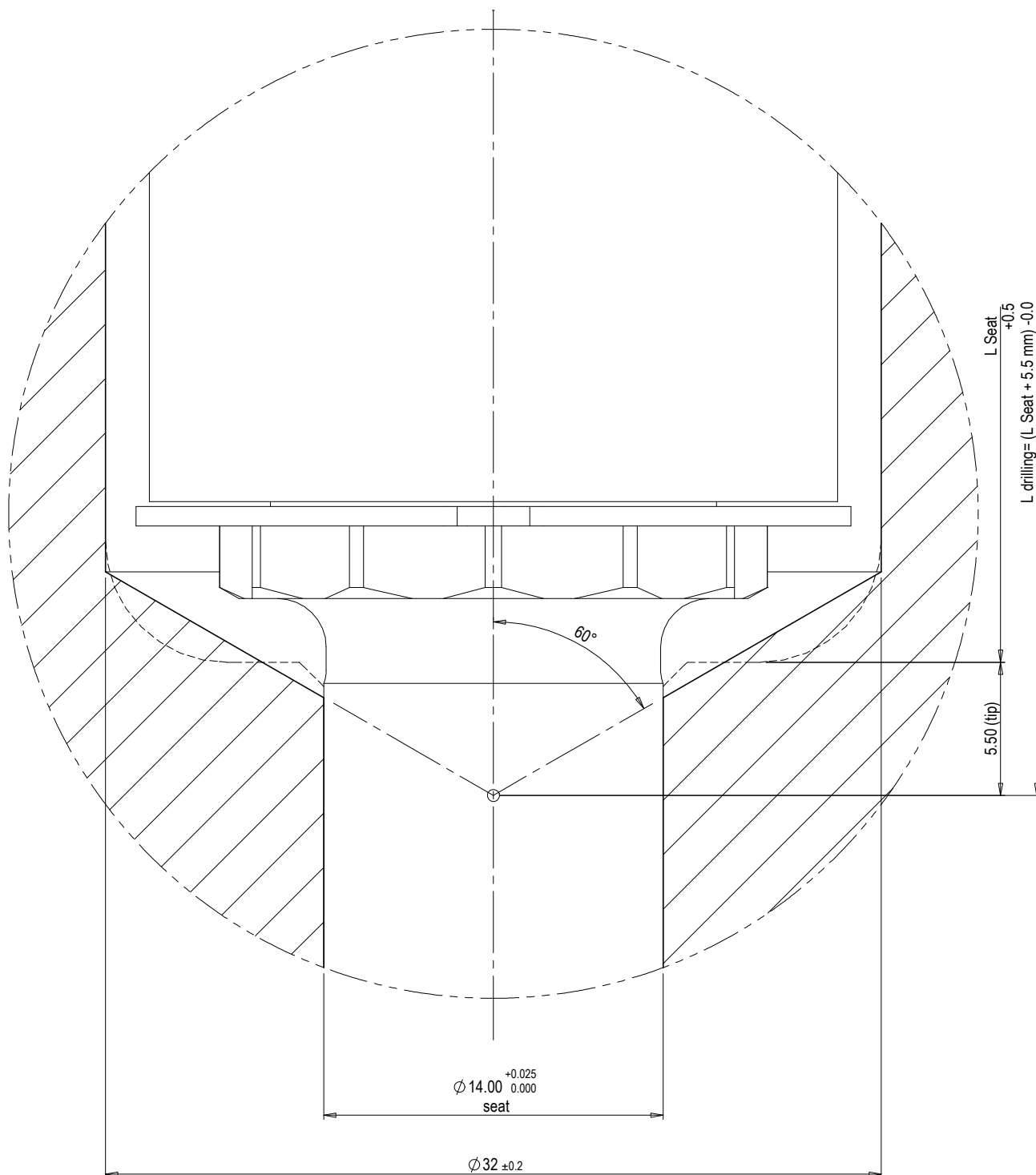
A = 0° + 10° max

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 ϕ_{Gate} and "A" angle



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

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)



NOZZLE L	NOZZLE DUCT CODE		W (230V)
35	Øc=10 Classic	0221-00261	1x 400
	Øc=12 Classic	0221-00283	
	Øc=10 Fail Safe	0221-00272	2x 400
	Øc=12 Fail Safe	0221-00294	
55	Øc=10 Classic	0221-00262	1x 400
	Øc=12 Classic	0221-00284	
	Øc=10 Fail Safe	0221-00273	2x 400
	Øc=12 Fail Safe	0221-00295	
75	Øc=10 Classic	0221-00263	1x 400
	Øc=12 Classic	0221-00285	
	Øc=10 Fail Safe	0221-00274	2x 400
	Øc=12 Fail Safe	0221-00296	
95	Øc=10 Classic	0021-00264	1x 450
	Øc=12 Classic	0221-00286	
	Øc=10 Fail Safe	0221-00275	2x 450
	Øc=12 Fail Safe	0221-00297	
115	Øc=10 Classic	0221-00265	1x 500
	Øc=12 Classic	0221-00287	
	Øc=10 Fail Safe	0221-00276	2x 500
	Øc=12 Fail Safe	0221-00298	
135	Øc=10 Classic	0221-00266	1x 550
	Øc=12 Classic	0221-00288	
	Øc=10 Fail Safe	0221-00277	2x 550
	Øc=12 Fail Safe	0221-00299	
155	Øc=10 Classic	0221-00267	1x 650
	Øc=12 Classic	0221-00289	
	Øc=10 Fail Safe	0221-00278	2x 650
	Øc=12 Fail Safe	0221-00300	
195	Øc=10 Classic	0221-00268	1x 650
	Øc=12 Classic	0221-00290	
	Øc=10 Fail Safe	0221-00279	2x 650
	Øc=12 Fail Safe	0221-00301	
235	Øc=10 Classic	0221-00269	F
	Øc=12 Classic	0221-00291	
	Øc=10 Fail Safe	0221-00280	2x 750
	Øc=12 Fail Safe	0221-00302	
275	Øc=10 Classic	0221-00270	1x 850
	Øc=12 Classic	0221-00292	
	Øc=10 Fail Safe	0221-00281	2x 850
	Øc=12 Fail Safe	0221-00303	
315	Øc=10 Classic	0221-00271	1x 850
	Øc=12 Classic	0221-00293	
	Øc=10 Fail Safe	0221-00282	2x 850
	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.

TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30 0012-00583 0012-00584 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 -	
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		
TORPEDO		
PGT30 Monohole 0012-00268 0012-00269 for high resistance 0012-00331 for high conductivity PGT30 Torpedo 0012-00270 0012-00271 for high resistance 0012-00328 for high conductivity 0012-01002 for engineering polymers PGT30 for Rubber for high conductivity Ø0.45 0012-00390 0012-00393 Ø0.60 0012-00391 0012-00394 Ø0.75 0012-00392 0012-00395 PGT30 Multihole for Rubber for high conductivity 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 conductivity with End Ring 0012-00324 For high conductivity with Bushing th.cavity 0012-00427 for high resistance PGC30 Antistagnation 0012-00770 For high conductivity with End Ring 0012-00771 For high conductivity 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	
PGC10 0012-00272 0012-00532 For high conductivity 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

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature
 $\Delta T = T1 - T2$
 $\lambda = 0.000012 (1/^\circ\text{C})$
 $k = (\Delta T * 0.0008) - 0.04$

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
	$DL = (L * \Delta T * \lambda) + k$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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
	$\text{Seat } L = L + DL + 0.5$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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
	$\text{Seat } L = L + DL - 1$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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
	$\text{Seat } L = L + DL - 2$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

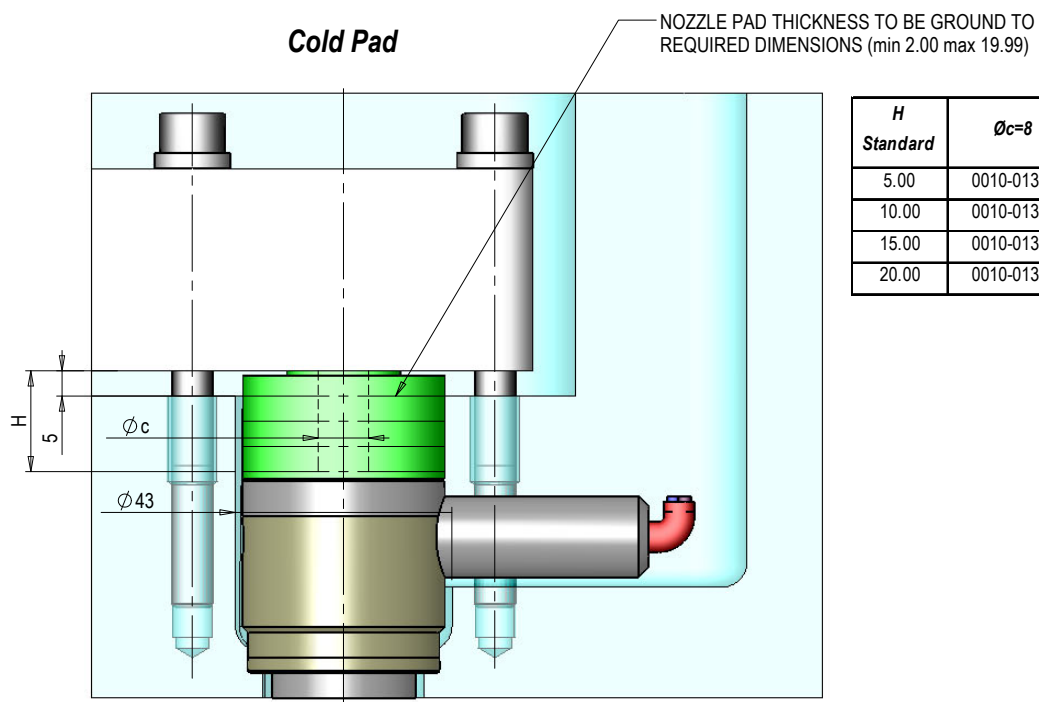
T1 (°C) = Injection temperature
T2 (°C) = Mold temperature
 $\Delta T = T1 - T2$
 $\lambda = 0.000012 \text{ (1/°C)}$
 $k = (\Delta T * 0.0008) - 0.04$

Tab. D - "Seat L" Calculation

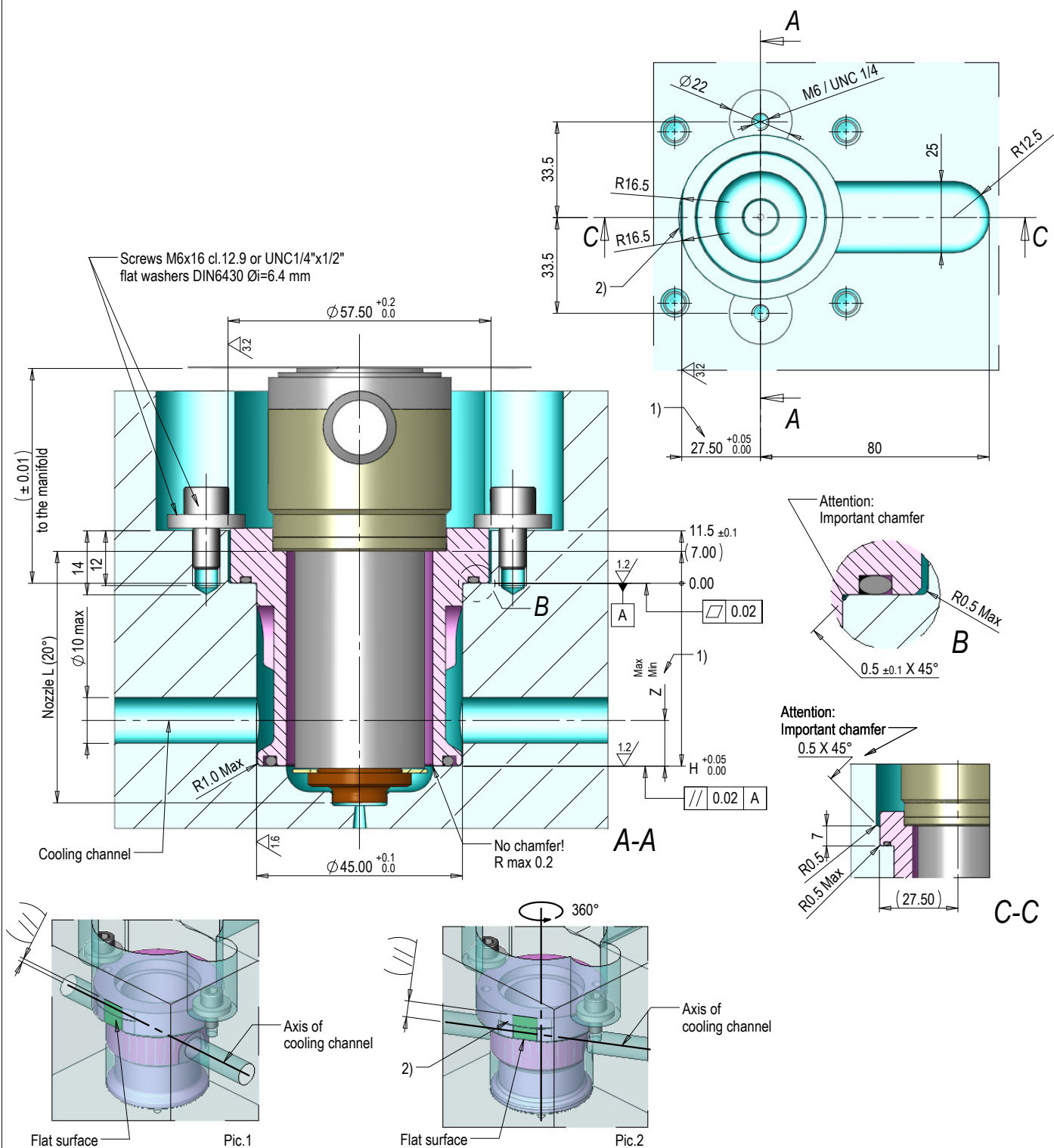
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	Seat L = L + DL + 1										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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	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										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

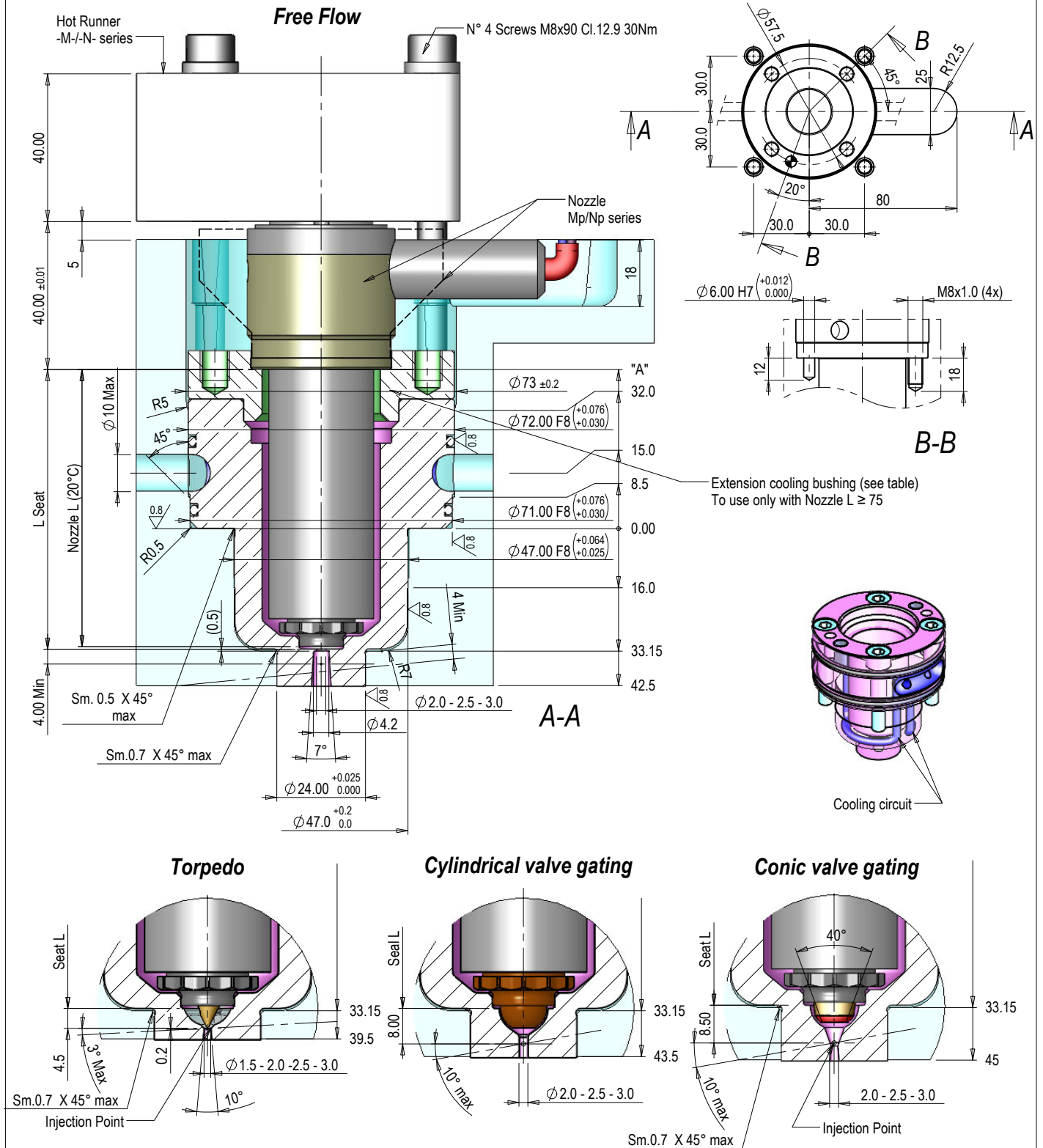


H Standard	Øc=8	Øc=10	Øc=12
5.00	0010-01329	0010-01333	0010-01337
10.00	0010-01330	0010-01334	0010-01338
15.00	0010-01331	0010-01335	0010-01339
20.00	0010-01332	0010-01336	0010-01340

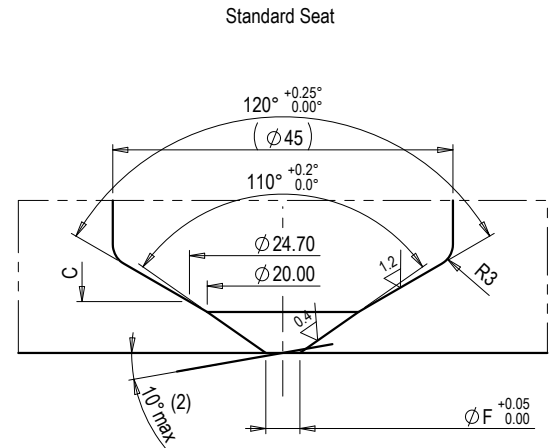
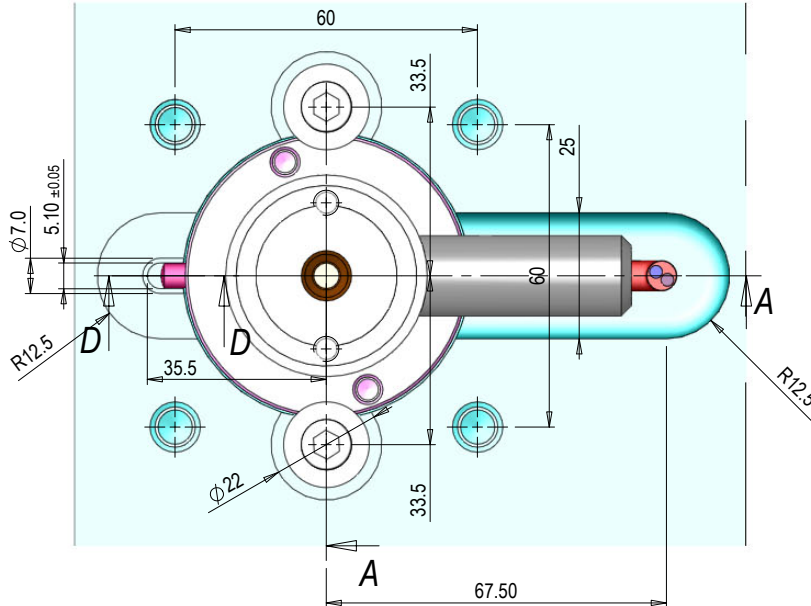
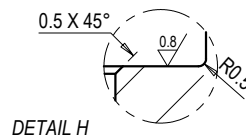
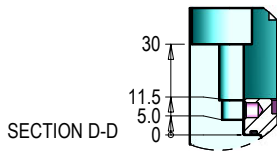
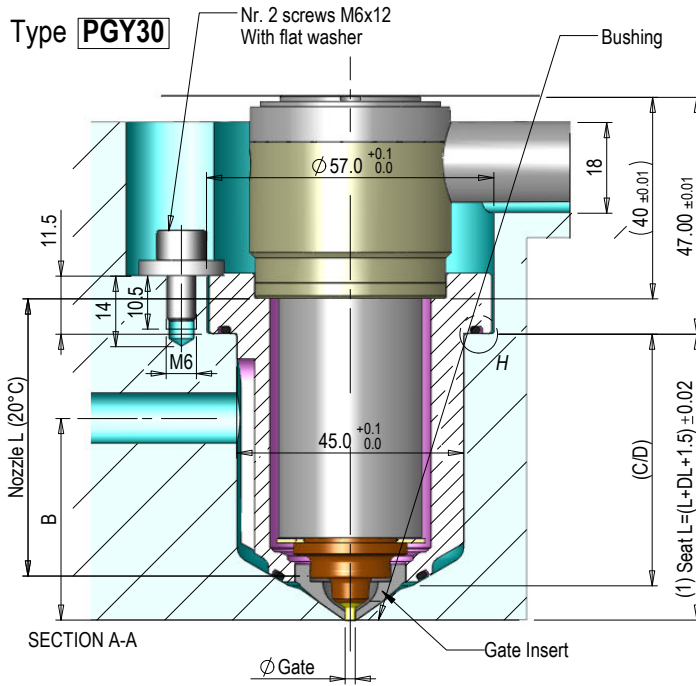


- 1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
- 2) For all cases with "Z Max" > 18, then the positioning face can be located 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.

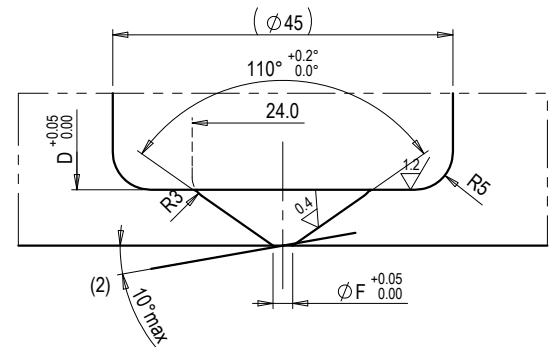
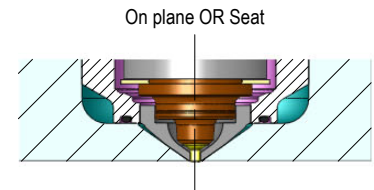
<i>BUSHING CODE</i>	<i>NOZZLE L</i>	<i>H</i>	<i>Z</i>	<i>Z Min</i>	<i>Z Max</i>	<i>BUSHING CODE</i>	<i>NOZZLE L</i>	<i>H</i>	<i>Z</i>	<i>Z Min</i>	<i>Z Max</i>
0121-00470	35	20.00	7	7	7	0121-00477	175	160.00	12	7	103
0121-00471	55	40.00	12	7	27.5	0121-00478	195	180.00	12	7	103
0121-00472	75	60.00	12	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						



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			
195	0.48	195.98	163.34	0250-00018			
235	0.58	236.08	203.44	0250-00019			



(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.



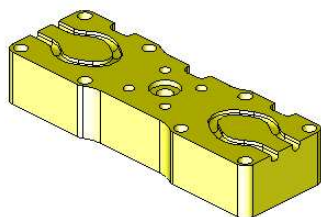
GATE INSERT		
Code	ϕ Gate	ϕF
0335-00167	2.0	2.6
0335-00168	2.5	3.3
0335-00169	3.0	3.9
0335-00170	3.5	4.5
0335-00171	4.0	5.1

Installation KIT cod: 0283-00648

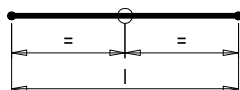
(1) For "Seat L" calculation see pag. 4.M1.15c table E

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

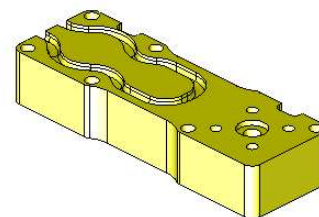
-HL-



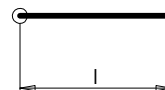
Standard
l=150-200-250-300-350-400-450 mm



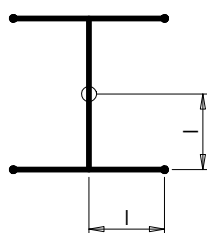
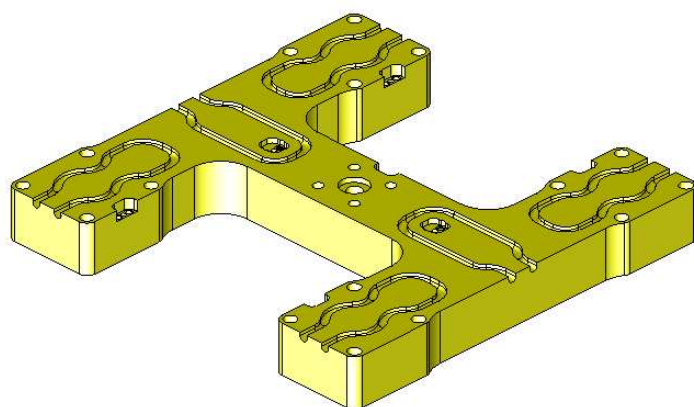
-HD-



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

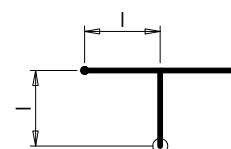
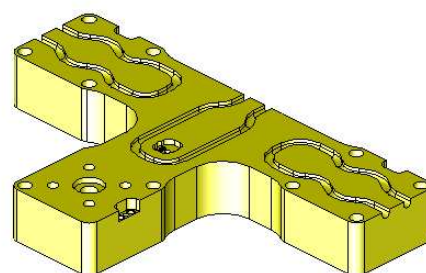


-HH-



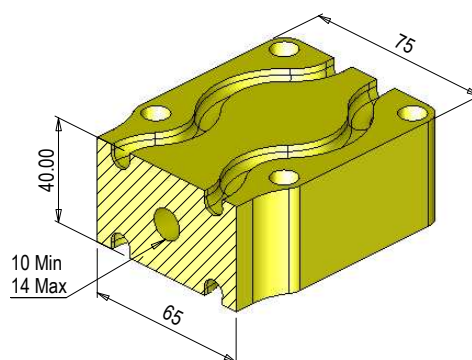
Standard
l=100-125-150 mm

-HT-



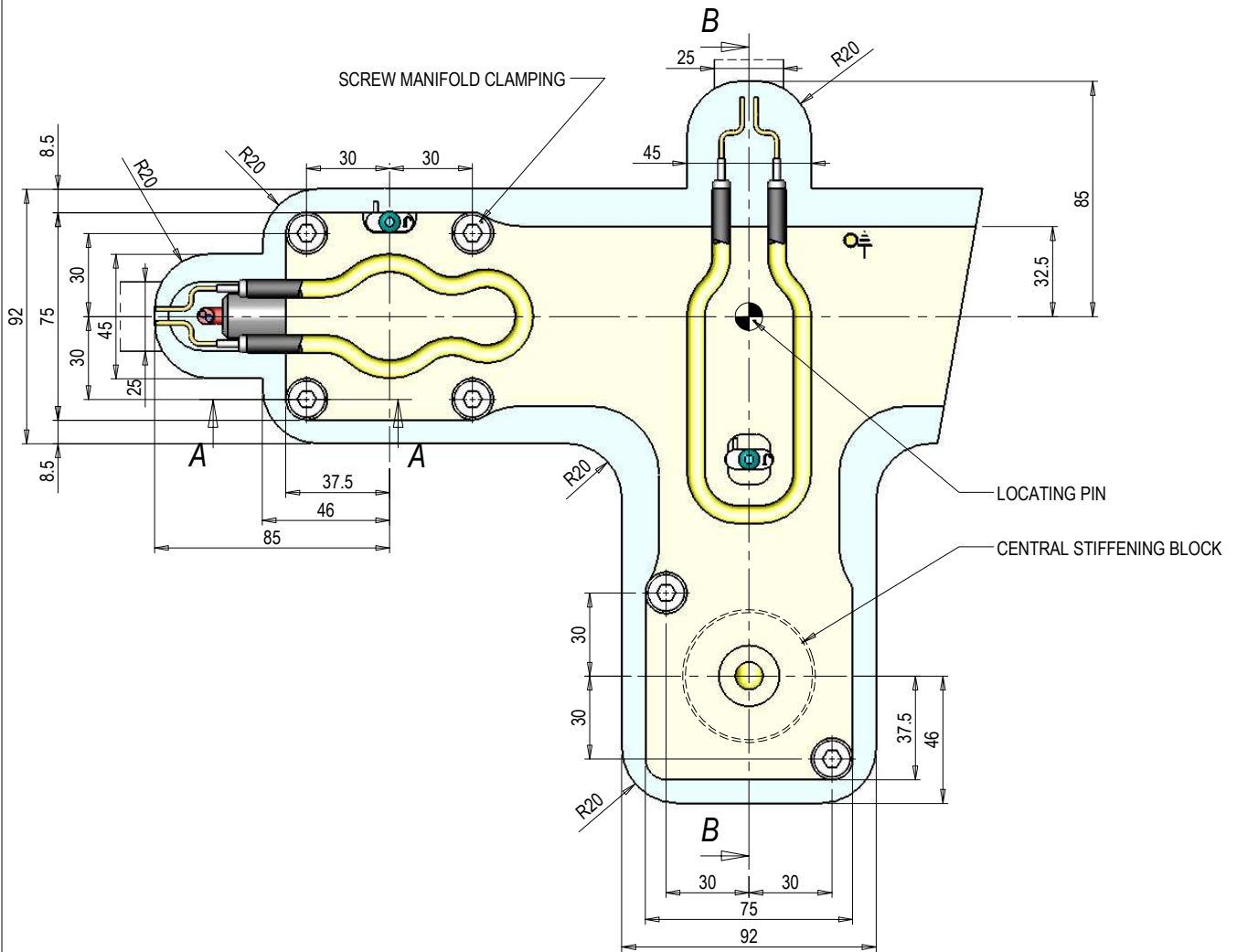
Standard
l=100-125-150 mm

M - N (wired version) series

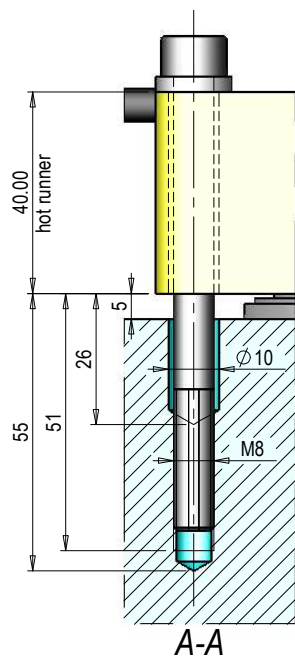


Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

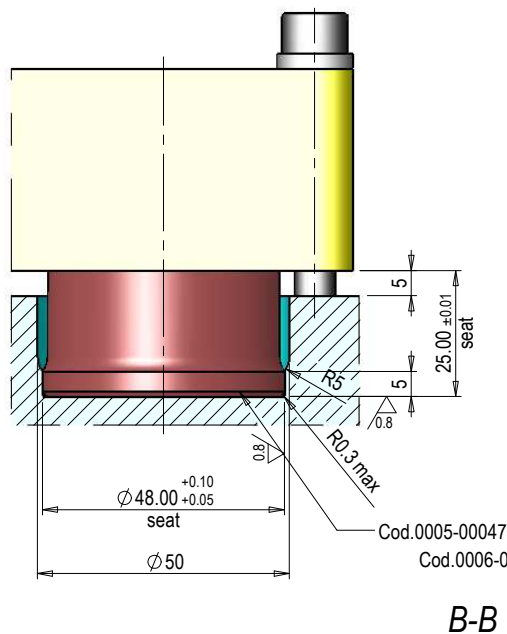
The following profile is the typical one for
the standard not wired hot runner pocket
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)



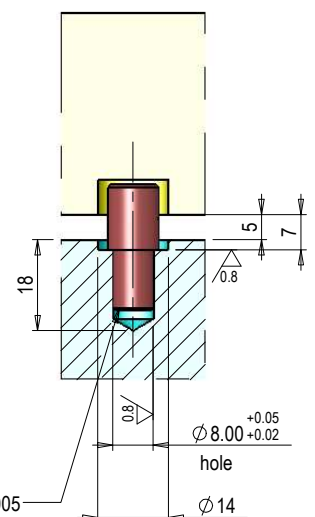
Screw manifold clamping
Screw M8x90 cl.12.9 30 Nm



**Pocket
central stiffening block**

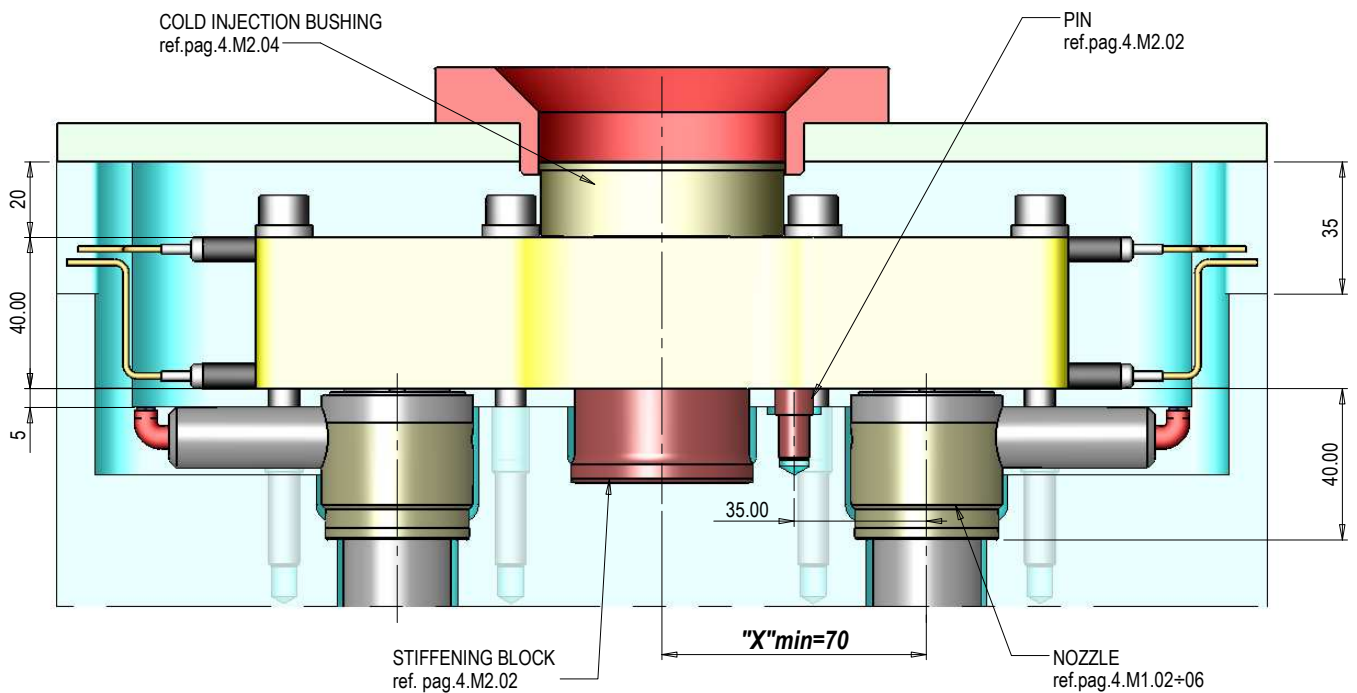


**Pocket for
locating pin**



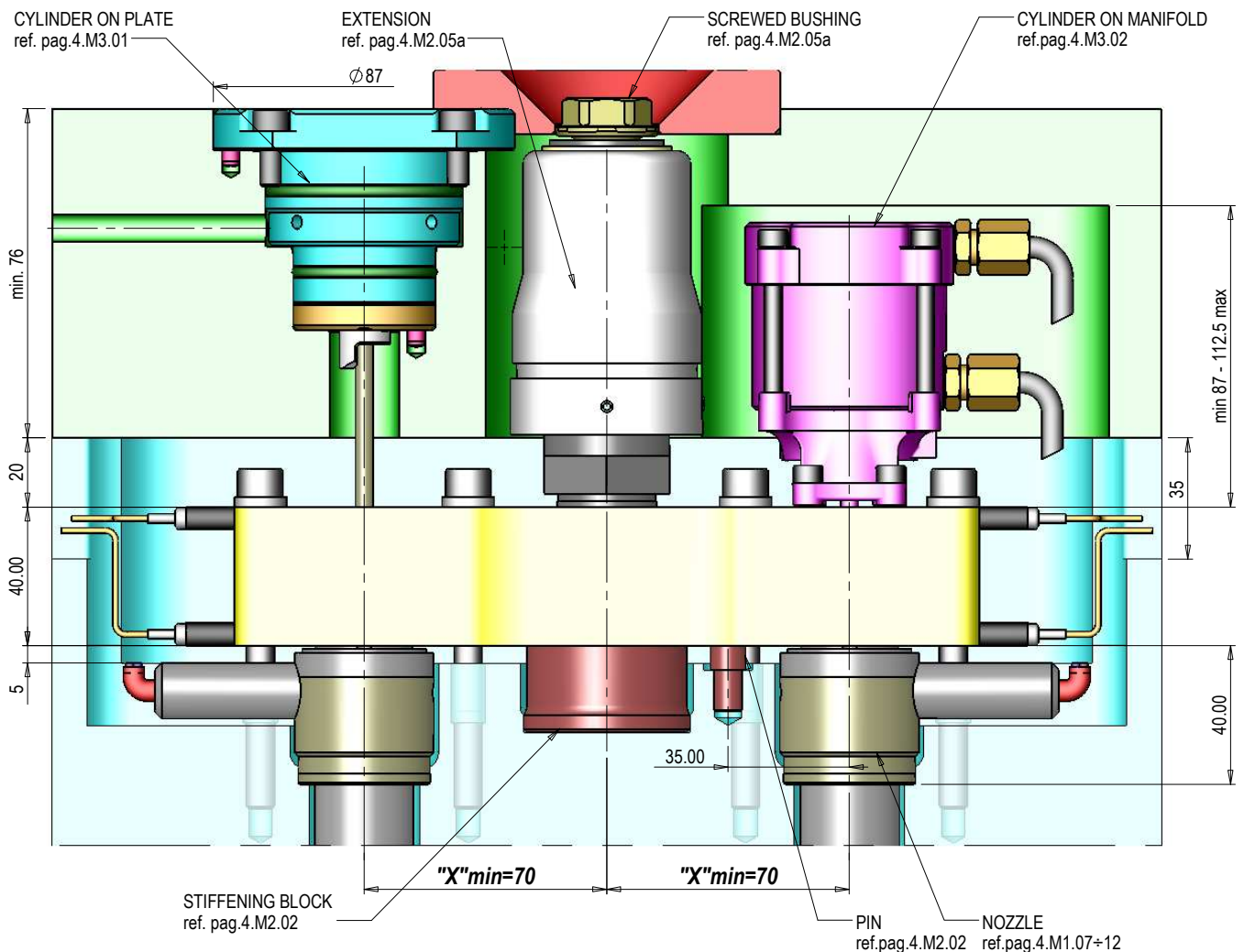
B-B

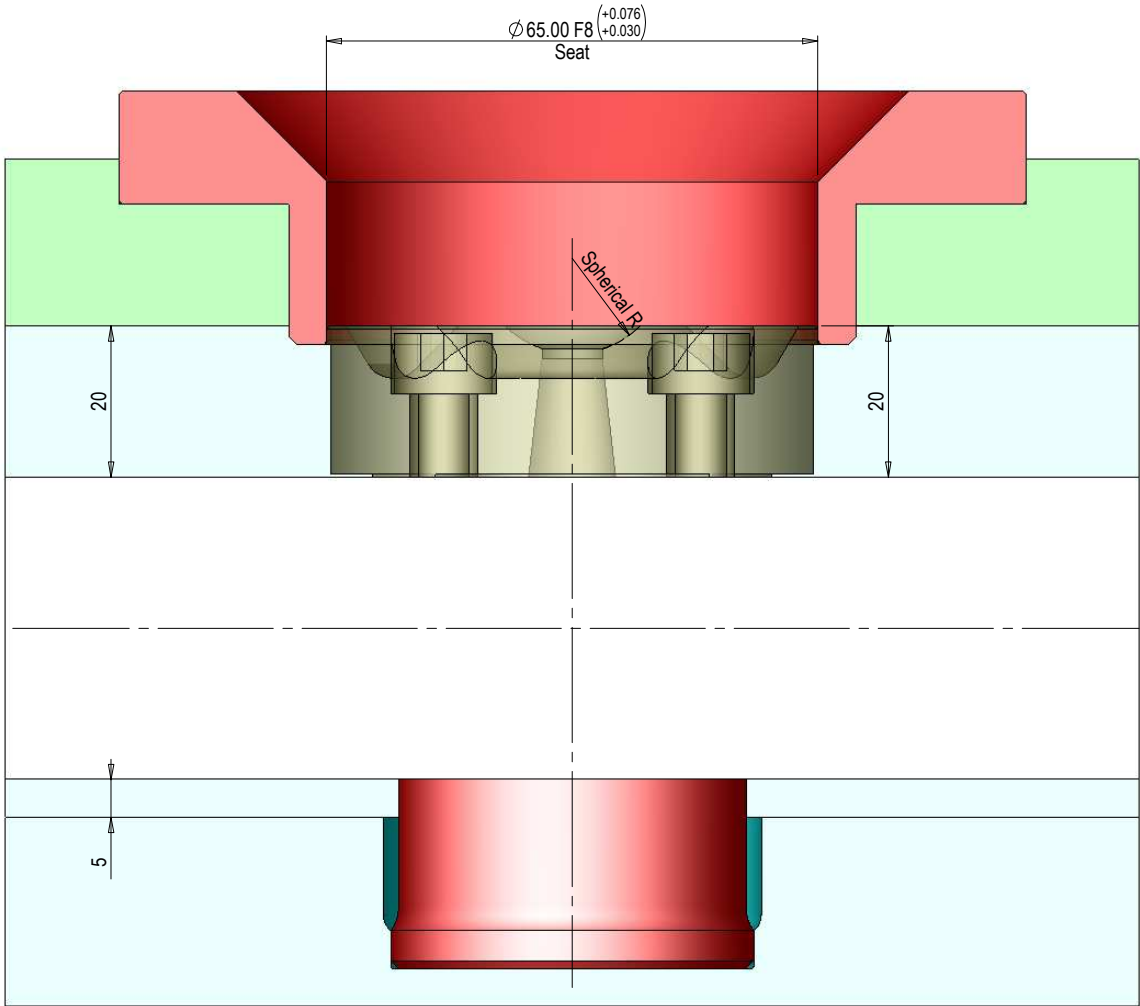
Structure for TORPEDO or FREE FLOW systems



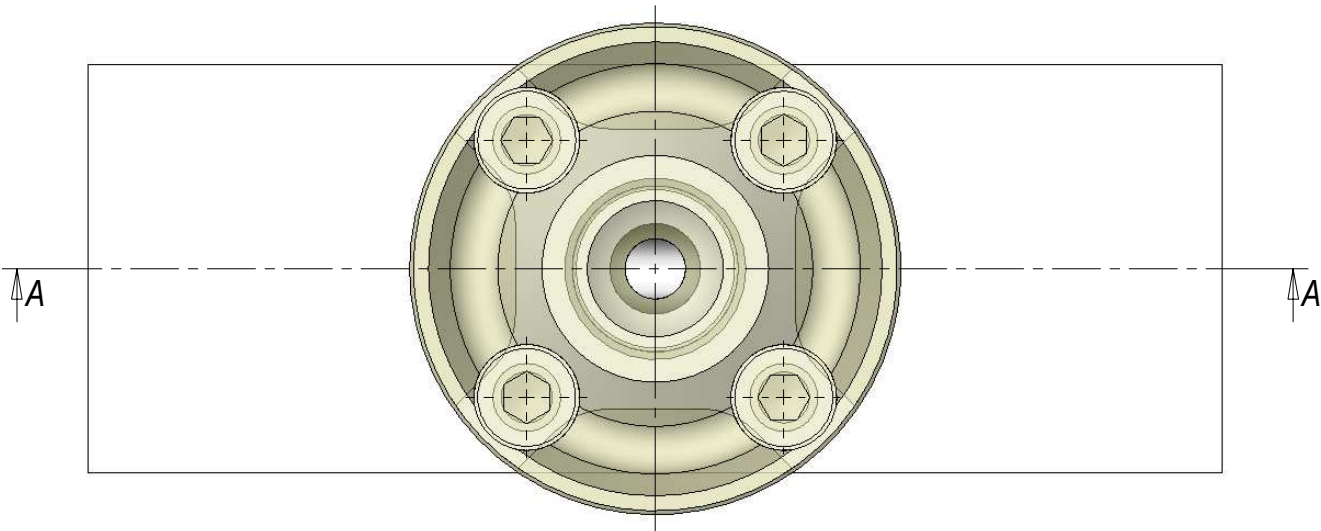
Xmin= min centre distance between injection bushing and nozzle for non standard systems

Structure for VALVE GATING systems

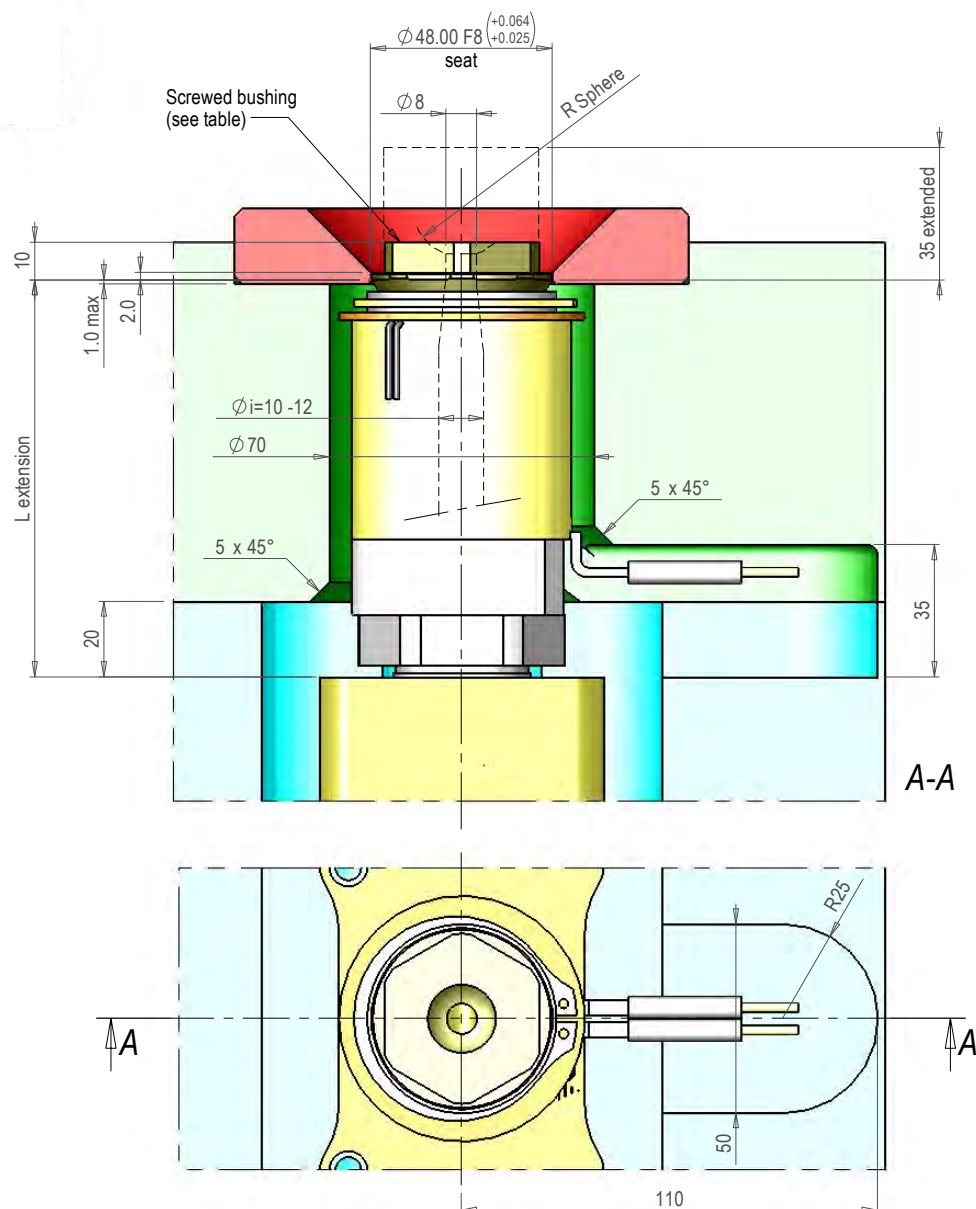




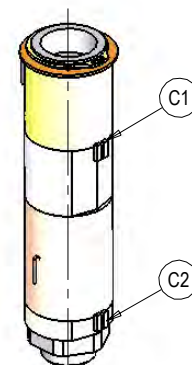
A-A



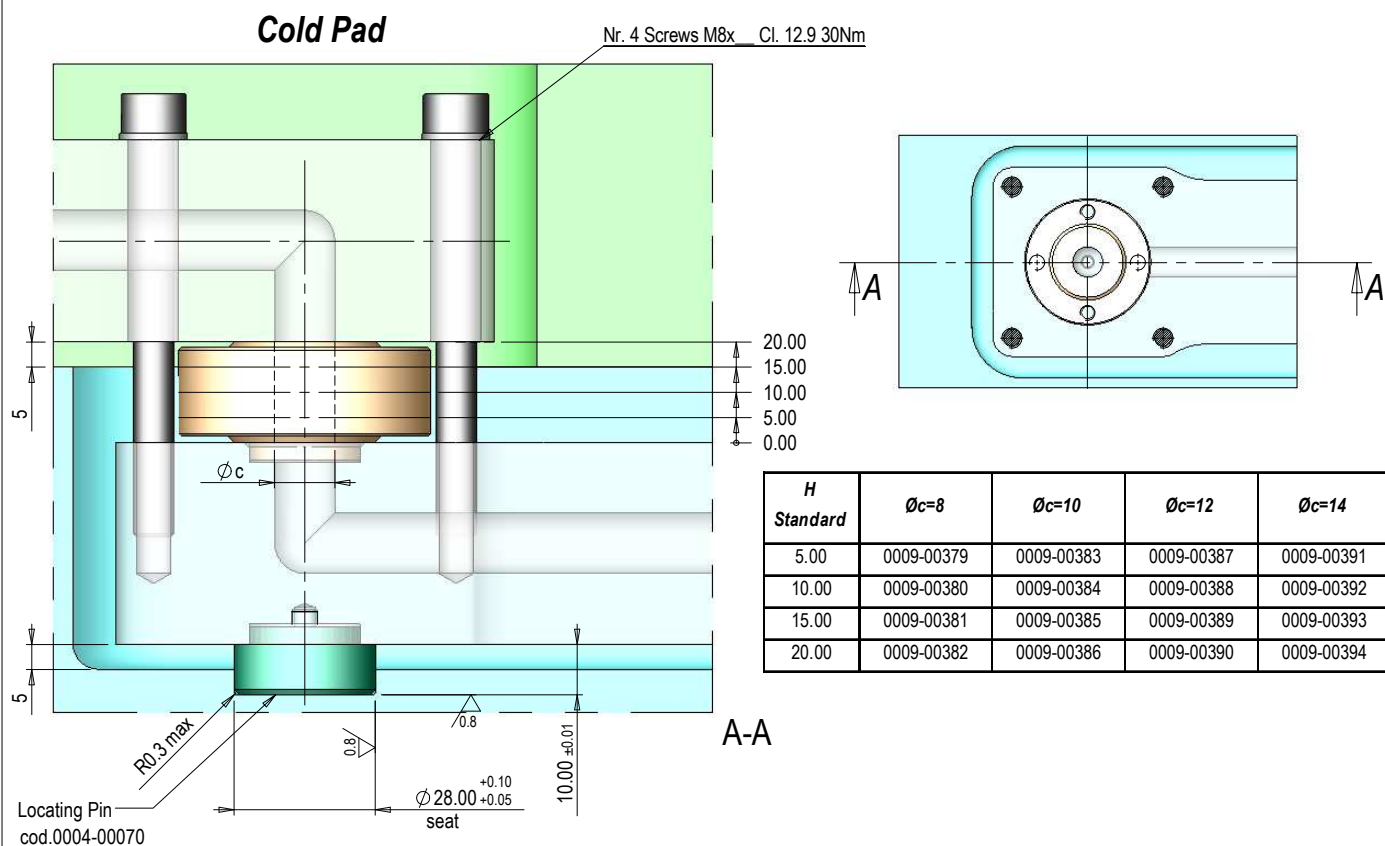
CODE	SPHERICAL R
0016-00001	R 0
0016-00002	R 12.7
0016-00003	R 15.5
0016-00004	R 19.1
0016-00048	R25
0016-00005	R 40



Control Zone

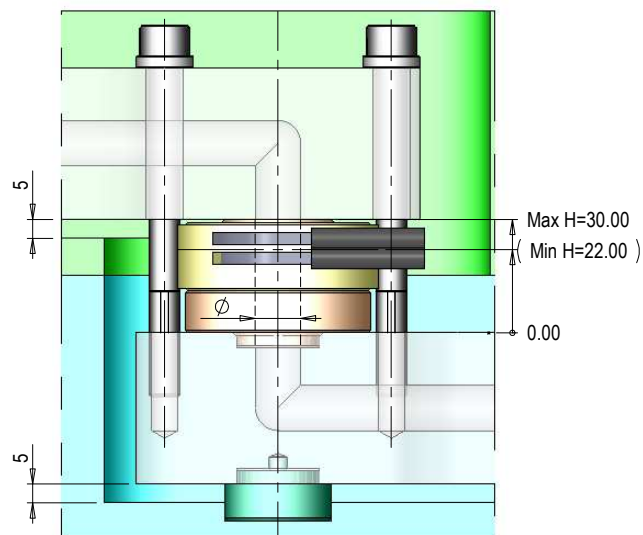


"L "	EXTENSION CODE Øi=12		POWER (230V)		SCREWED BUSHING CODE	SPHERE RADIUS
	 = Classic Line	 Fail Safe System	C1	C2		
50	0014-00735	0014-00746	2x 225 W		0015-00447 0015-00456 0015-00457 0015-00458 0015-00459 0015-00460 Ex tended 0015-00449	R 0
80	0014-00736	0014-00747	2x 225 W			R 12.7
105	0014-00737	0014-00748	2x 330 W			R 15.5
130	0014-00738	0014-00749	2x 330 W			R 19.1
155	0014-00739	0014-00750	2x 500 W			R 25
180	0014-00740	0014-00751	2x 500 W			R40
205	0014-00741	0014-00752	2x 330 W	2x 330 W		R 0
230	0014-00742	0014-00753	2x 330 W	2x 330 W		
255	0014-00743	0014-00754	2x 330 W	2x 330 W		
280	0014-00744	0014-00755	2x 330 W	2x 330 W		
305	0014-00745	0014-00756	2x 330 W	2x 330 W		



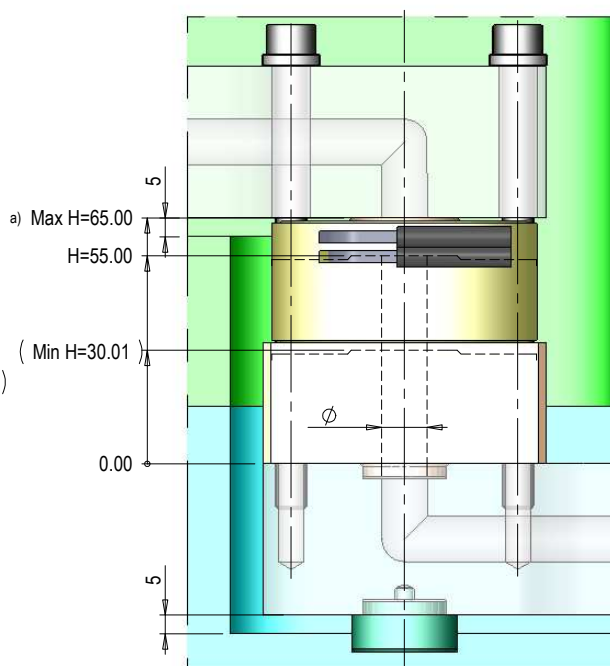
"Round" version

cod. 0009300515 (1)

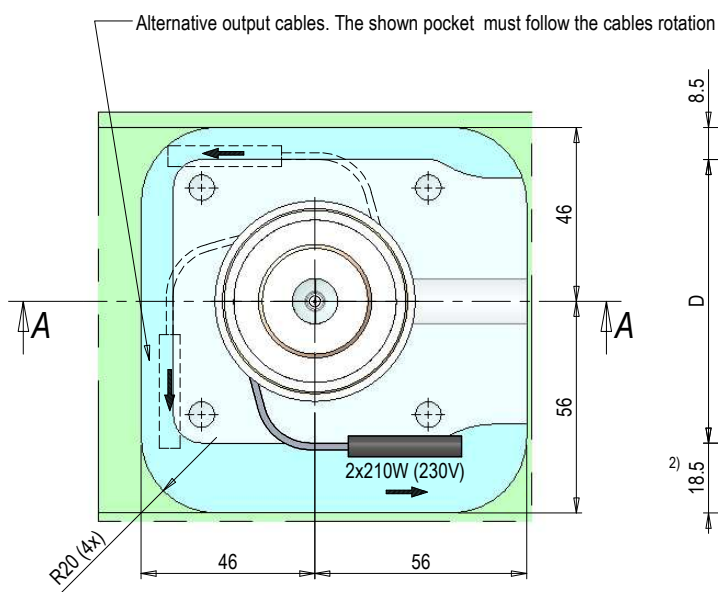


A-A

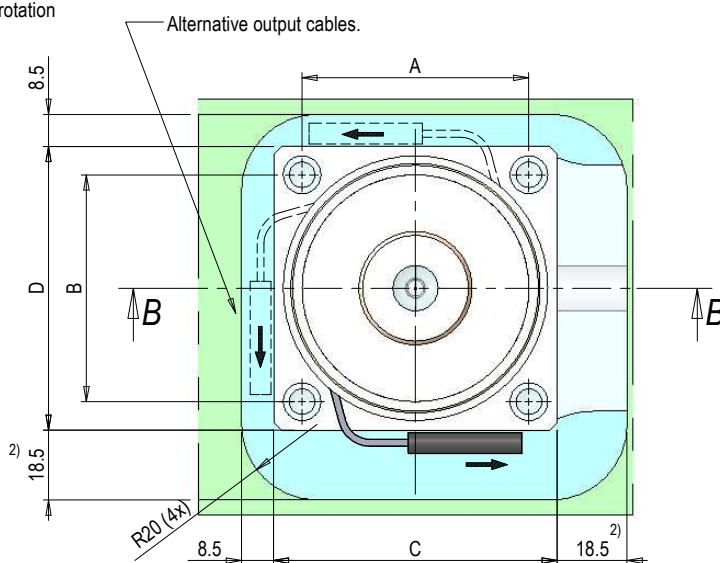
"Square Flange" version



B-B



(1) Standard reference for thickness $H=30\text{mm}$ machinable until $H=22\text{mm}$
Available with holes: $\min 8 \leq \varnothing \leq 14 \text{ max}$

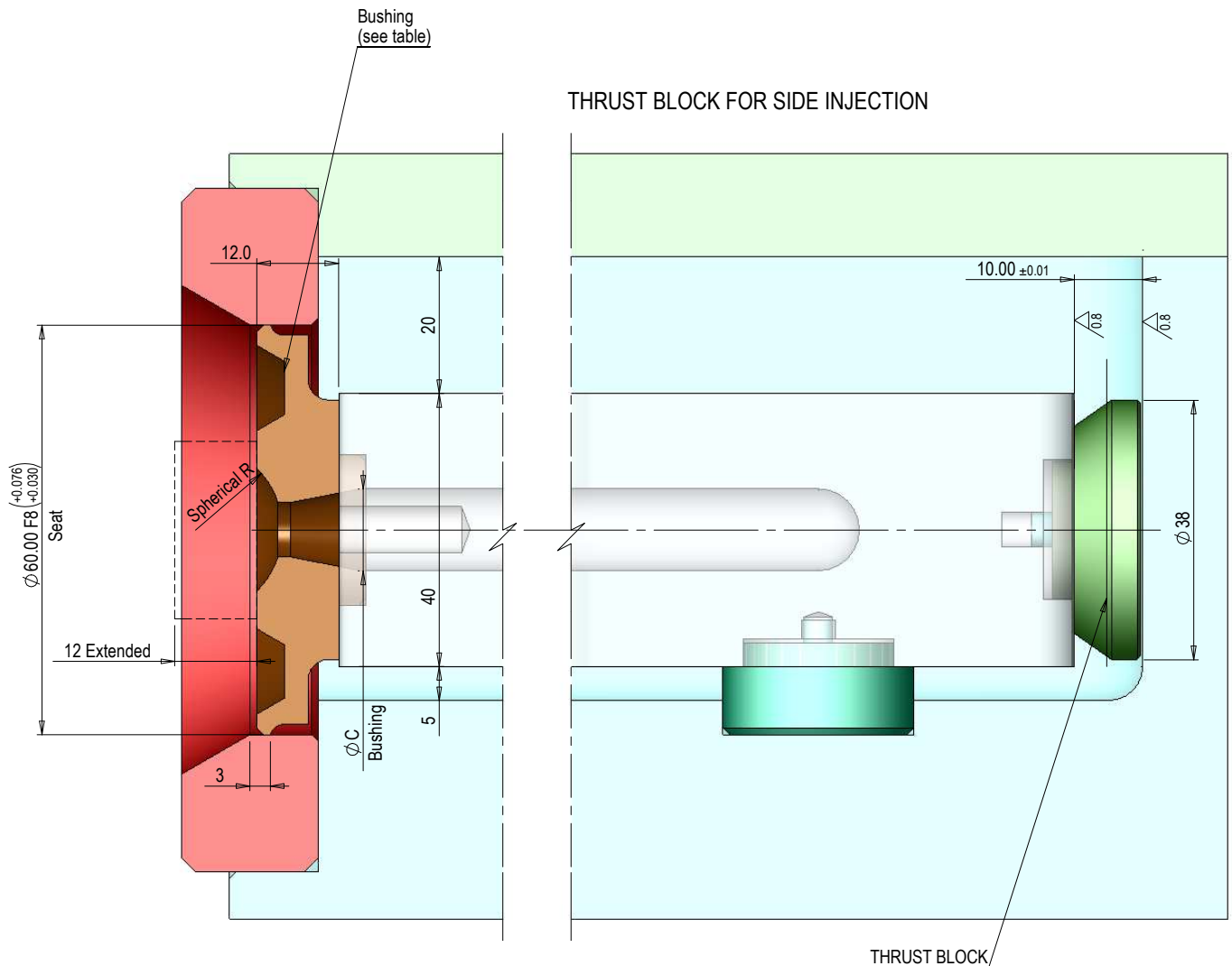


(2) Minimum distance from thickness wall in the corner of output cables
(valid dimension for all version "AxB" and in all possible rotations)

VERSION A x B	CODE	H		POWER (230V) W	C x D
		Min	Max		
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: $\min 8 \leq \varnothing \leq 14 \text{ max}$

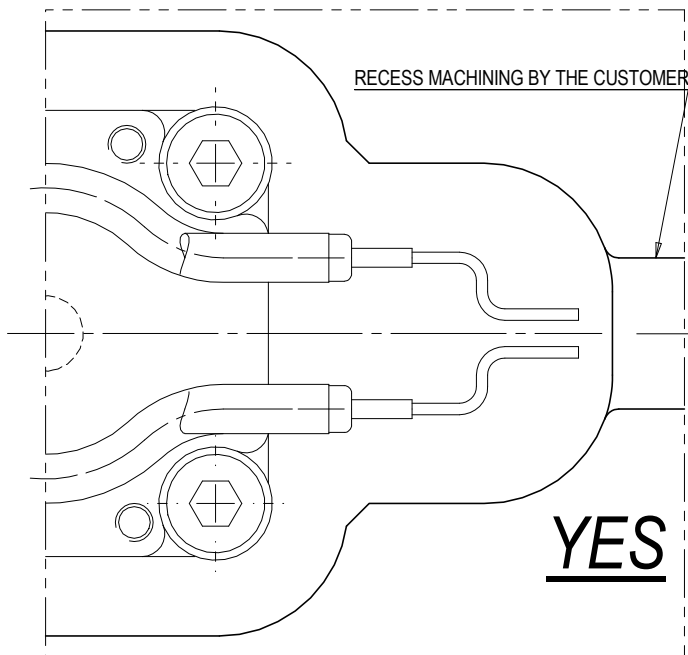
(a) In particular cases, the dim. "H" can be extended over the 65.00mm with the pocket's modification appropriate. The out of range thickness require the prior approval of the HRS technical office



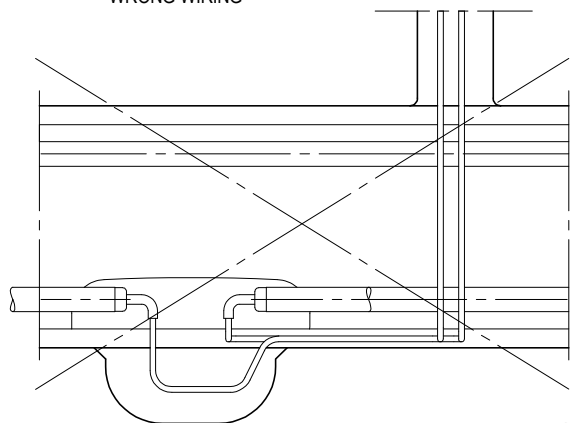
THRUST BLOCK CODE	BUSHING CODE		SPHERICAL RADIUS
	$\varnothing c = 12$	$\varnothing c = 14$	
0007-00058	0016-00128	0016-00134	R 0
	0016-00129	0016-00135	R 12.7
	0016-00130	0016-00136	R 15.5
	0016-00131	0016-00137	R 19.1
	0016-00132	0016-00138	R 25
	0016-00133	0016-00139	R40
	0016-00144 Extension	0016-00145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

Available for all series HRS

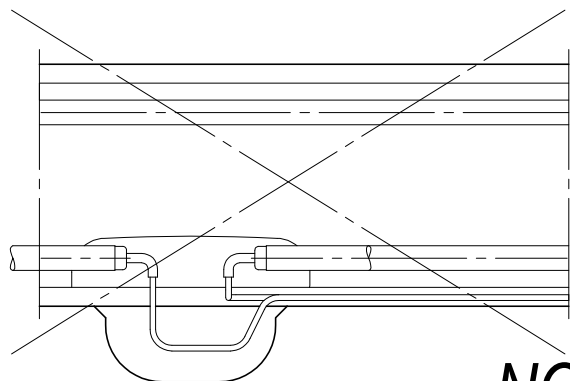
CORRECT WIRING



WRONG WIRING



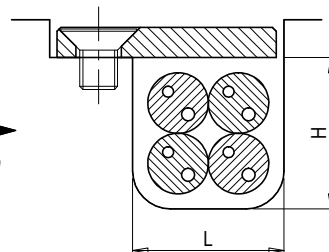
Wrong situation: the cables are not supposed to run over the hot runner



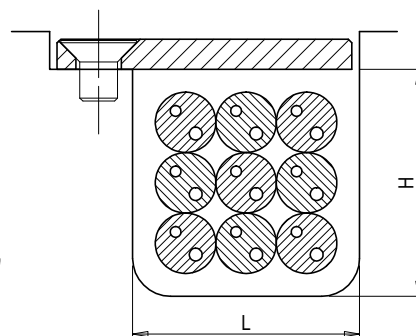
Wrong situation: the cables are not supposed to run at the side of the hot runner

ADVISED CABLE PASSAGE SECTIONS:

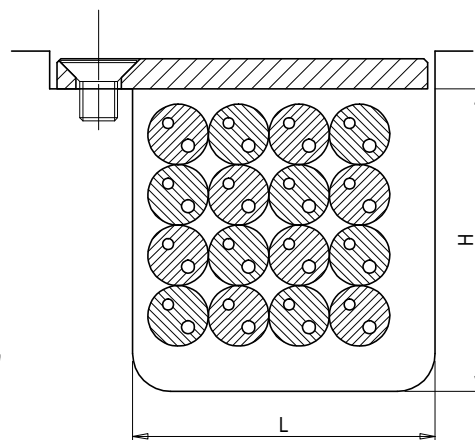
Dim. "A"



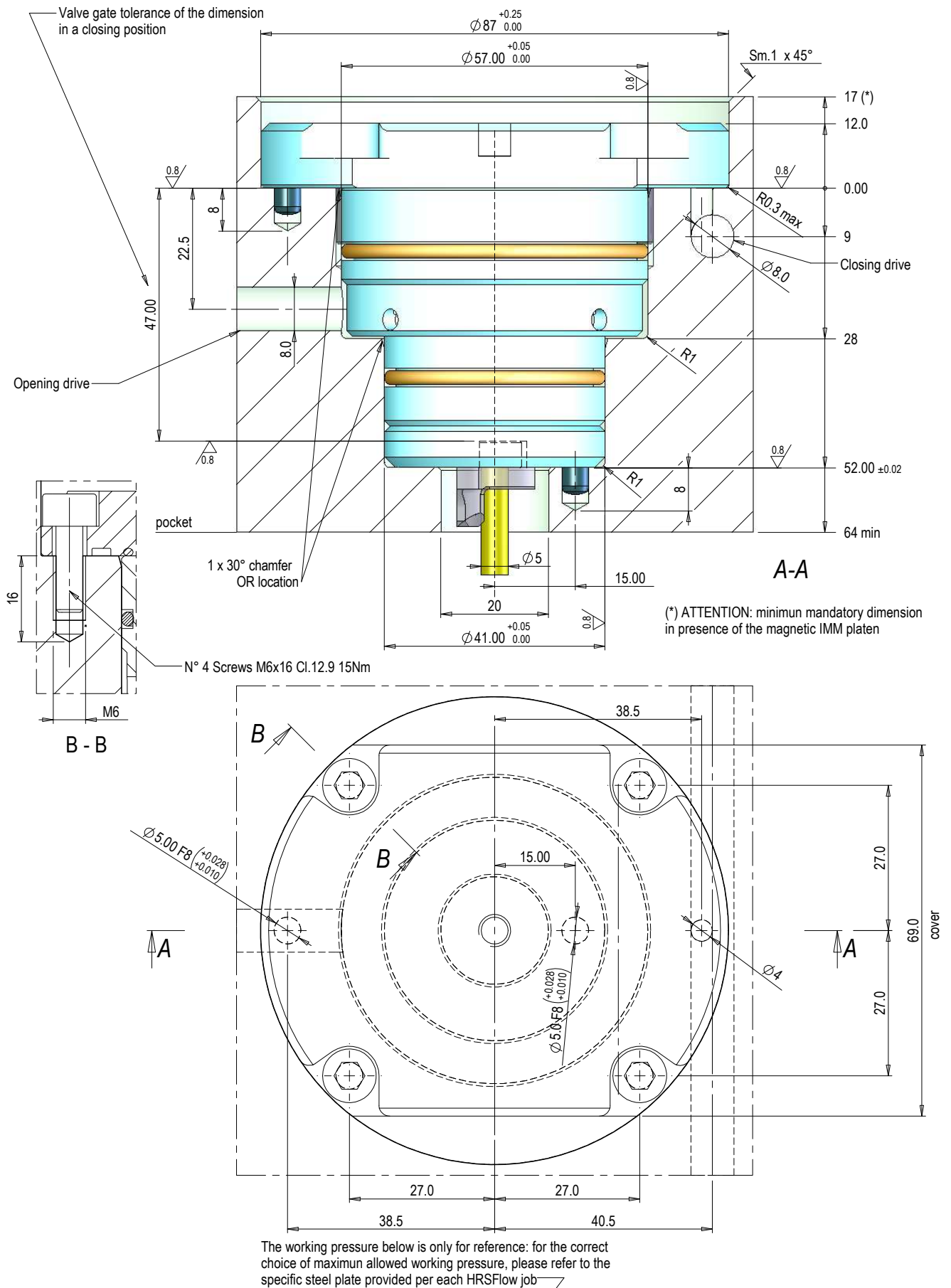
Dim. "B"



Dim. "C"



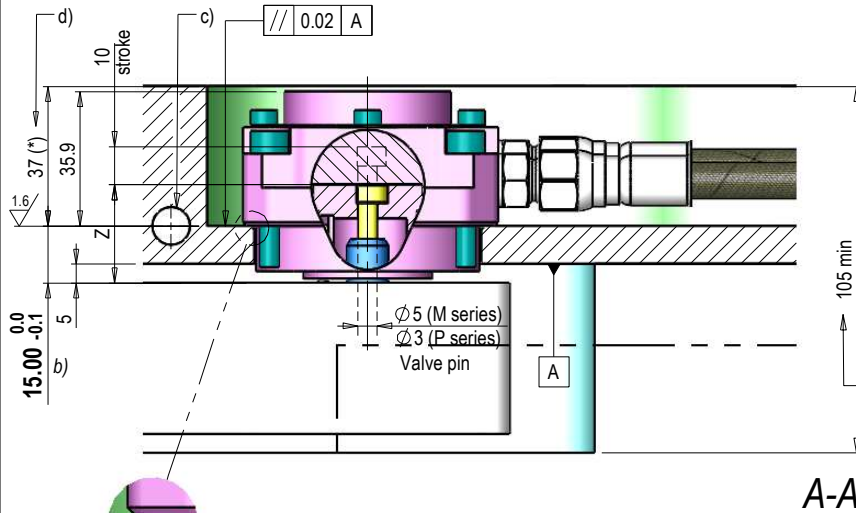
	L	H
Dim. "A"	25	30
Dim. "B"	30	30
Dim. "C"	40	40



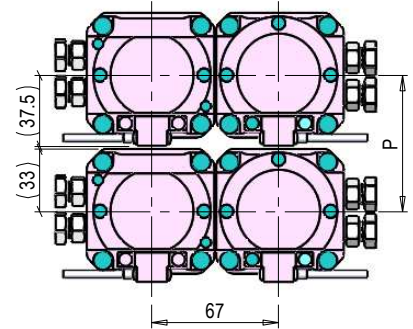
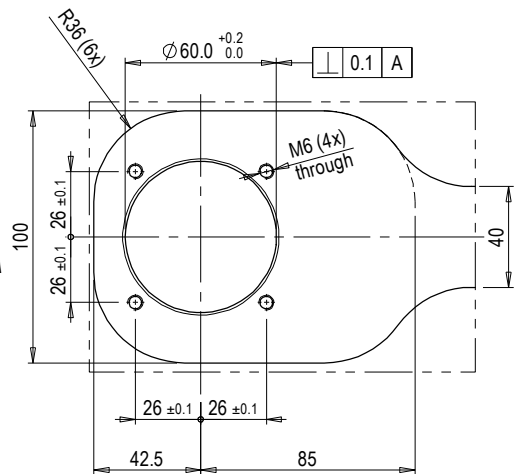
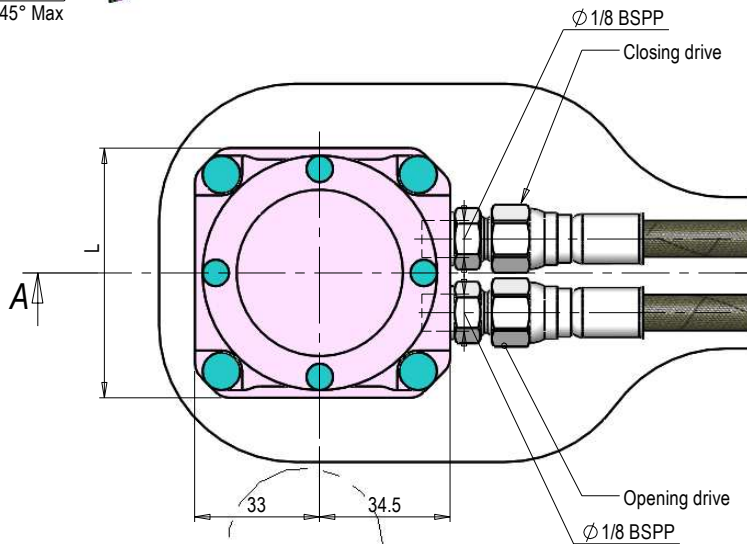
CODE	BORE	STROKE	WORKING		COMPLETE GASKET SET
0017-00091	50	12	AIR	P _{min} = 6 BAR	0038-00032
0017-00099	30	10	OIL	P _{max} = 80 BAR	0038-00062

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

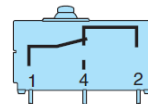
CODE	VERSION (*)	ADJUSTABLE (*)	COMPLETE GASKET SET	L	P	Z
0017-01034	(standard)	✗	0038-00140	66	67	26
0017-01038		✓				25 ±1
0017-01036	LIMIT SWITCH DOUBLE SIGNAL OPEN/CLOSE (**)	✗		75	72	26
0017-01040		✓				25 ±1

(*) 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.

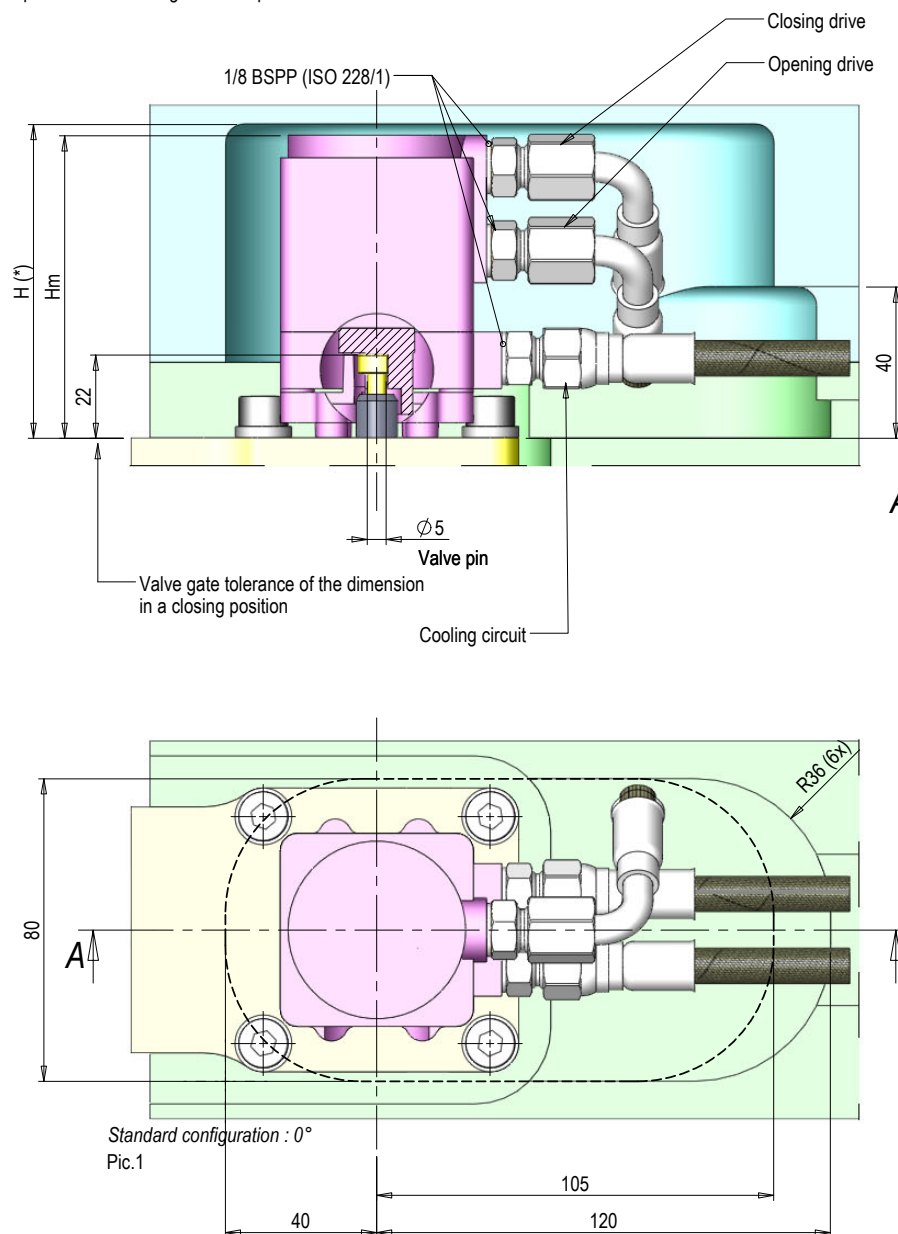
(**) Only one limit switch is provided for two functions:
single and double and of stroke.
- Wiring 1-4: OPEN position detected
- Wirings 1-2 & 1-4: OPEN (1-4) position detected
CLOSE (1-2) position detected



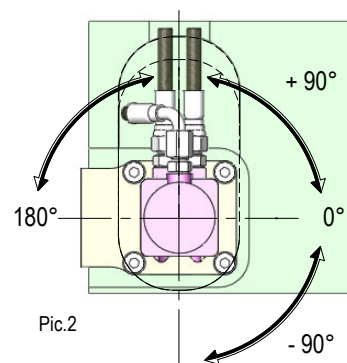
- a) The working pressure below is only for reference: for the correct choice of maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Very important dimension. Any derogations to the indicated value must be agreed before with the technical office 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.

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

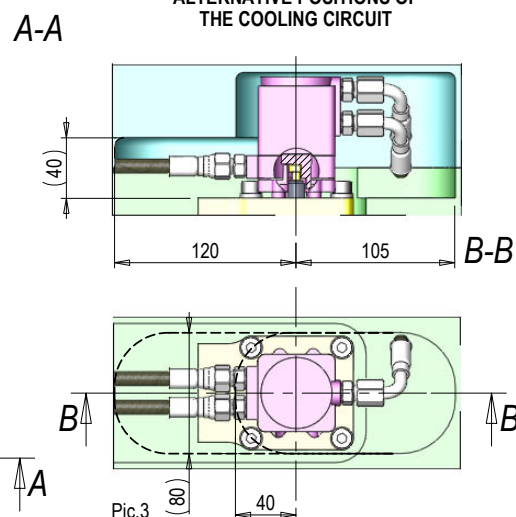
a) Working PRESSURE: HYDRAULIC oil max 80 BAR

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

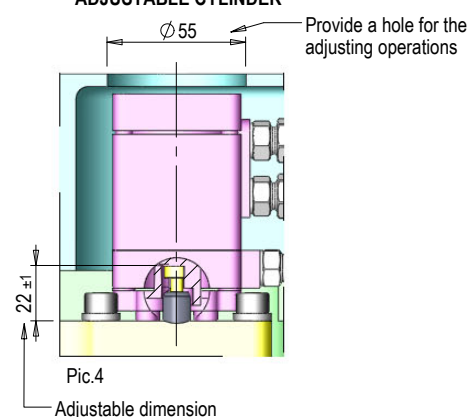
b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



ADJUSTABLE CYLINDER



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:

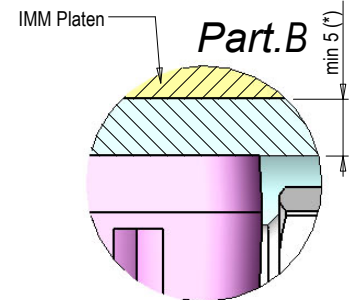
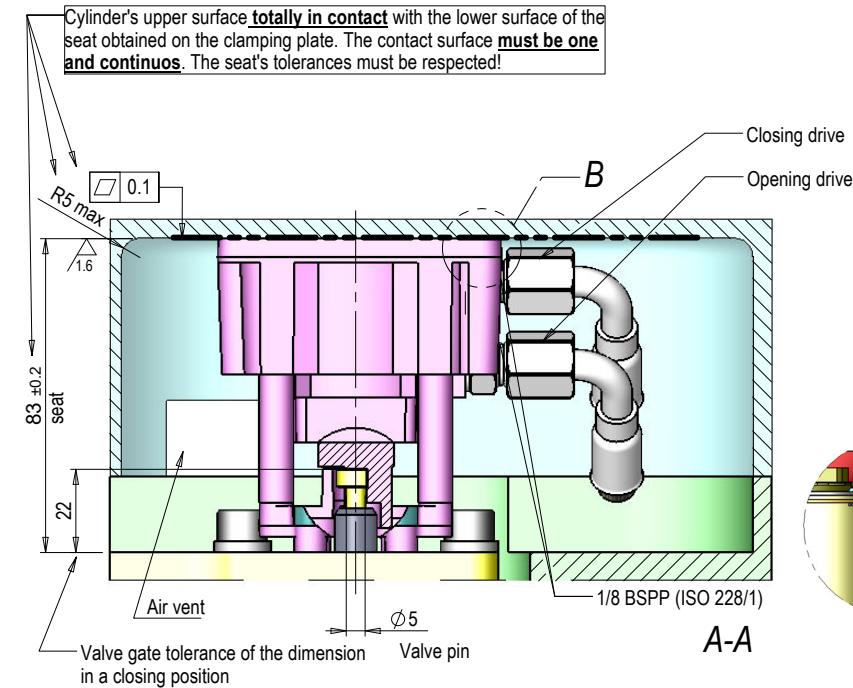
- 60° C [140° F] Temperature of the mold
 - 280° C [536° F] Temperature of the hot runner system
- Therefore, the HRS standard cooled cylinders don't require further technical devices for a fast system shutdown.

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.

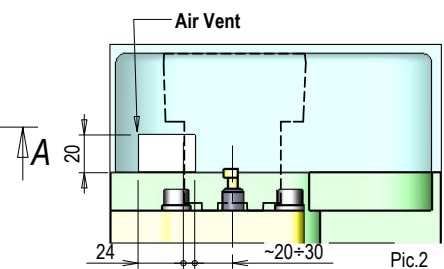
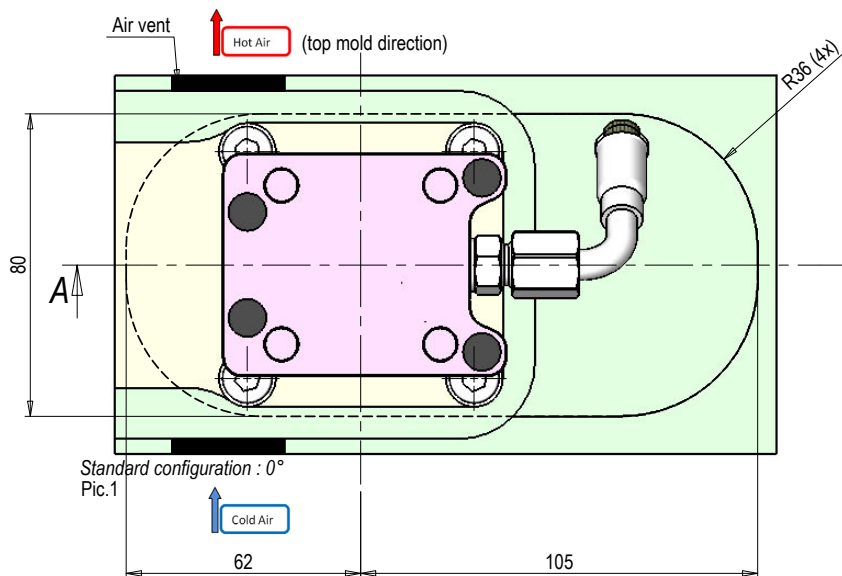
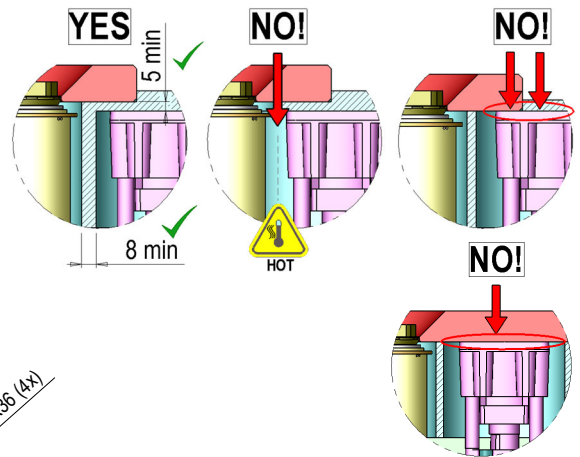
- a) The working pressure below is only for reference: for the correct choice of maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
- b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1;

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



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

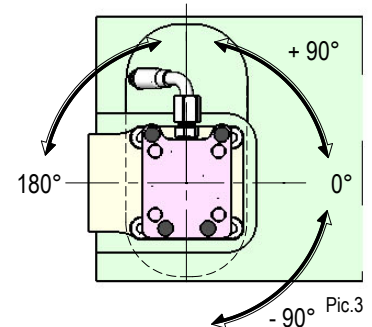
WARNINGS FOR THE SEAT REALIZATION



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

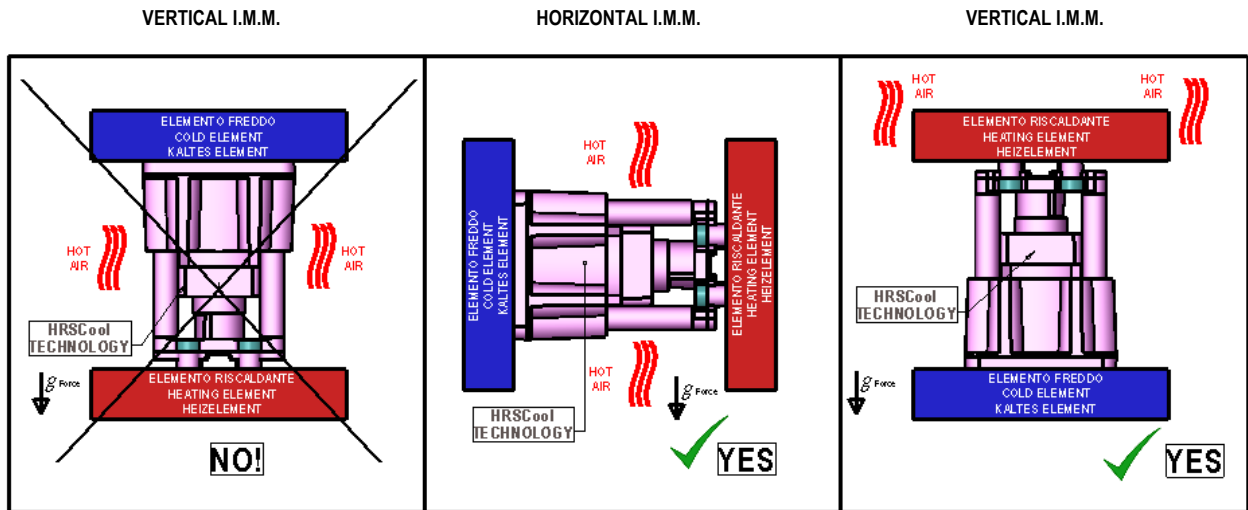
CODE	VERSION	COMPLETE GASKET SET
0017-00542	(standard)	0038-00104
0017-00543	DAMPENED	0038-00105

a) POSSIBLE ORIENTATIONS OF THE COUPLINGS



follow





Pic.4

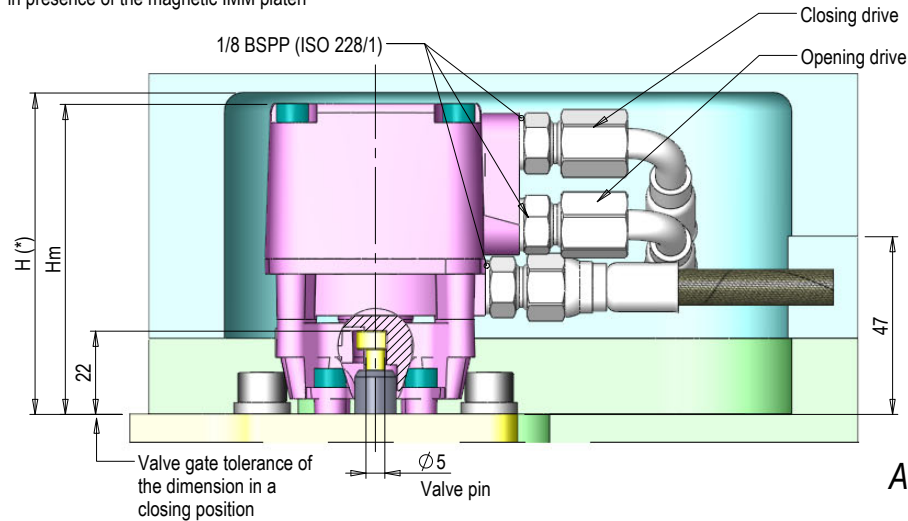
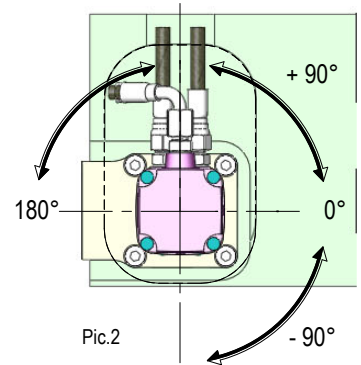
System requirements ():**

- 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.

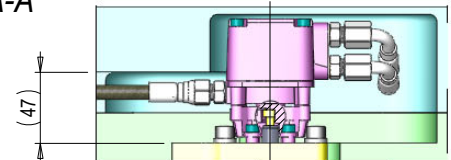
() ATTENTION:** in particular conditions of the system, the seat of the cylinder "HRS COOL" might be modified. In this case the HRS Technical Office will provide the necessary documentation.

Pneumatic Cylinder: bore 50 mm - stroke 12 mm

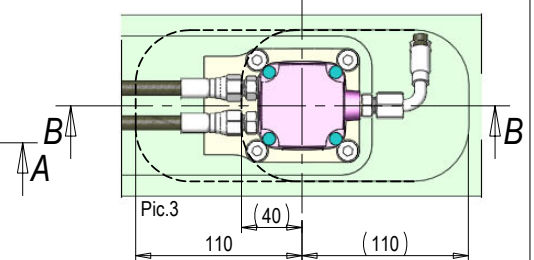
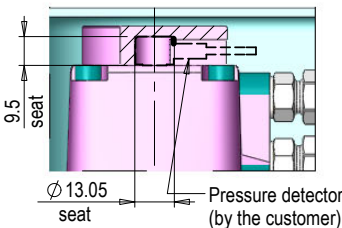
a) Working PRESSURE: AIR max 12 BAR

(*) ATTENTION: minimum mandatory dimension
in presence of the magnetic IMM platenb) POSSIBLE ORIENTATIONS OF
THE COUPLINGSc) ALTERNATIVE POSITIONS OF
THE COOLING CIRCUIT

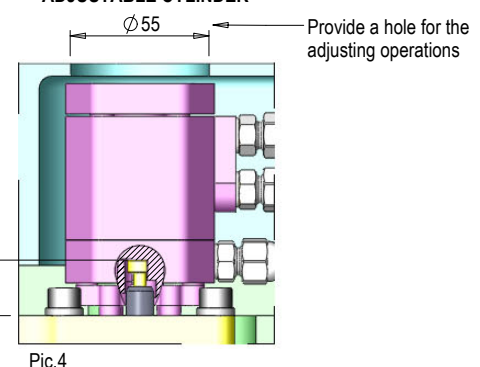
A-A



B-B

**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

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

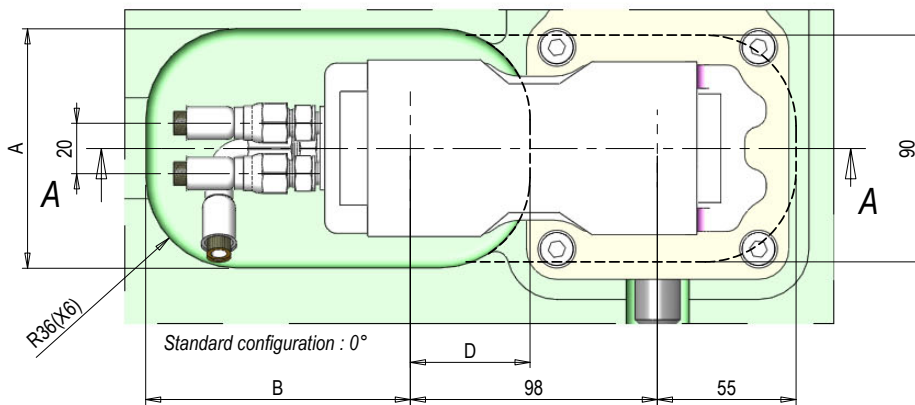
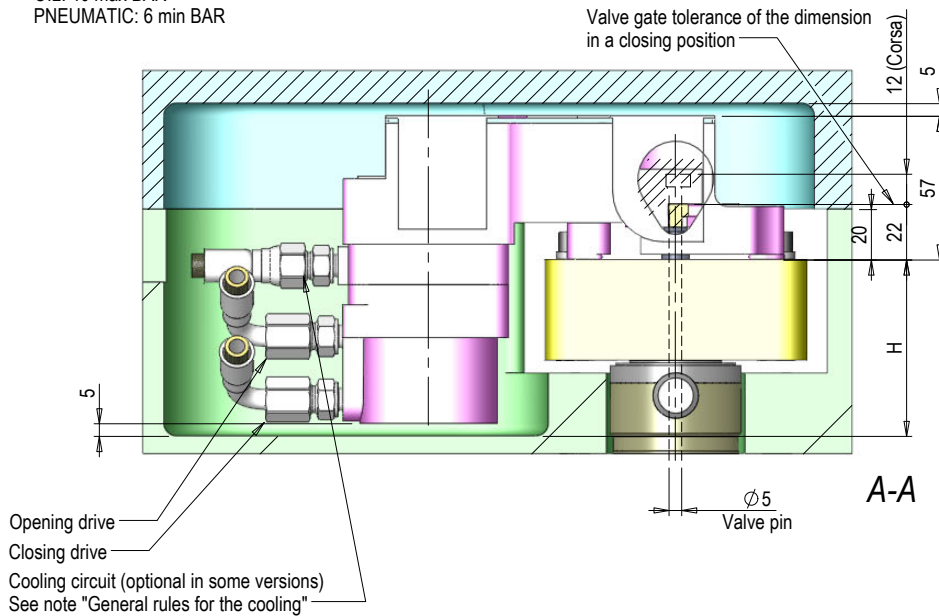
- Versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of T1 $\leq 280^{\circ}\text{C}$ [536°F] and T2 $\leq 80^{\circ}\text{C}$ [176°F]
 - Versions with end of stroke: cooling ALWAYS MANDATORY with T1 $\geq 200^{\circ}\text{C}$ [392°F] also after shut off of the mold/hot 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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1;

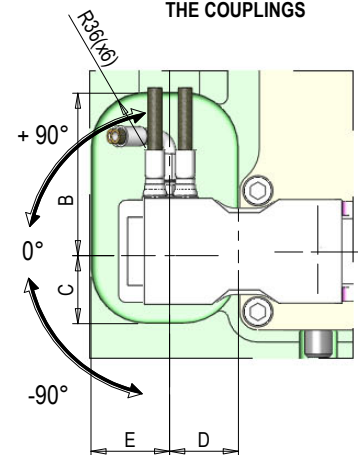
Oil cylinder: bore 42 mm - stroke 12 mm
Air cylinder: bore 70 mm - stroke 12 mm

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

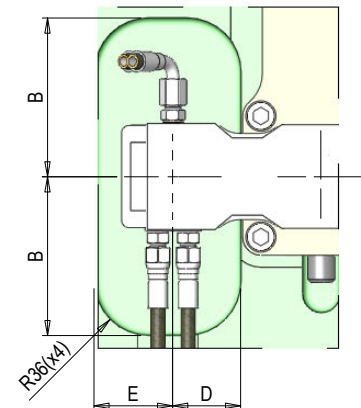
a) Working PRESSURE:
OIL: 40 max BAR
PNEUMATIC: 6 min BAR



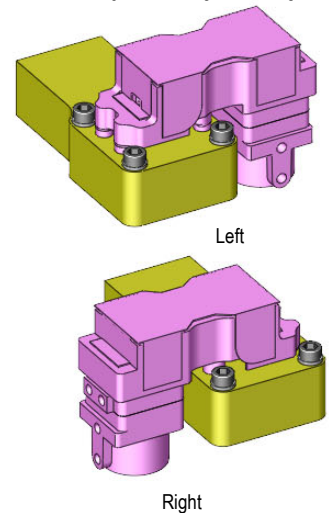
b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



POSSIBLE ORIENTATIONS CYLINDER ON MANIFOLD

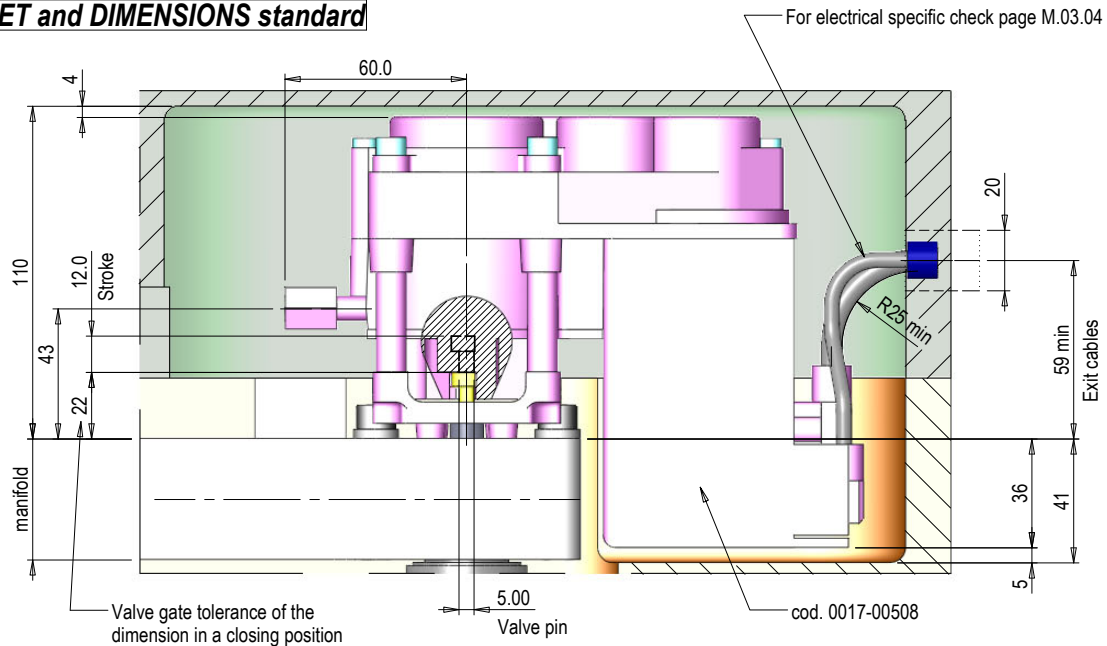
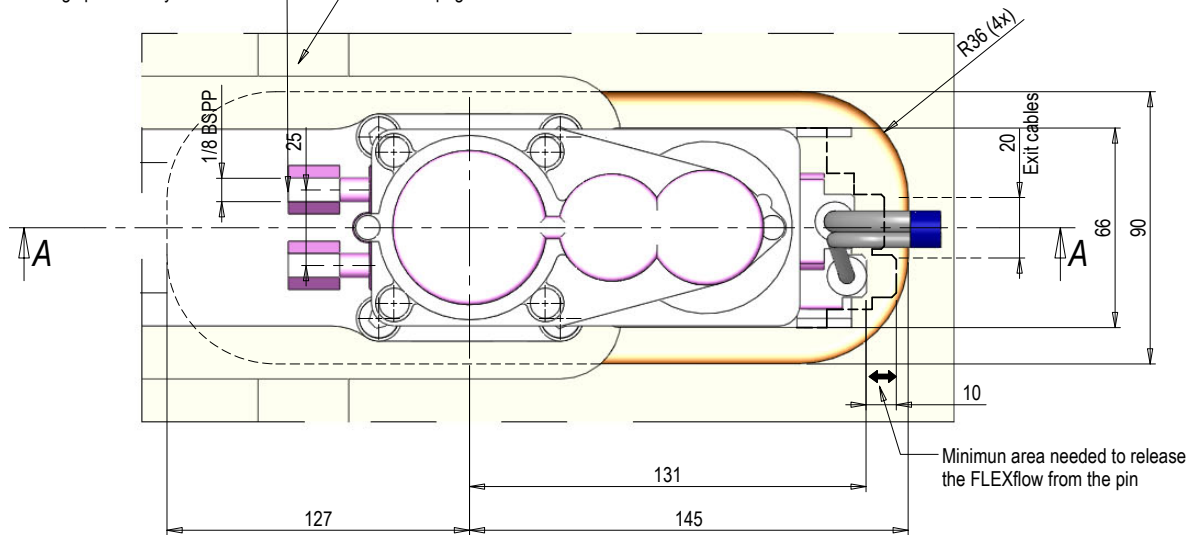
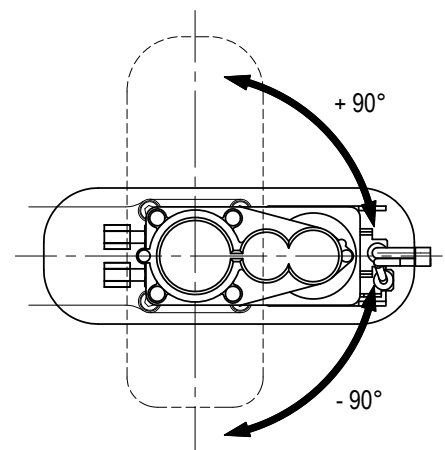


CODE	WORKING	DESCRIPTION	COOLED	COMPLETE GASKET SET	SEAT						
					A	B	C	D	E	H	
0017-01146A	OIL	(standard)	✓	0038-00102	95	105	47.5	45	52	70	
0017-00858A	AIR	(standard)	✓	0038-00133	110	120	55	55	55	59	

GENERAL RULES FOR THE COOLING

- Pneumatic versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of $T_1 \leq 280^\circ\text{C}$ [536°F] and $T_2 \leq 80^\circ\text{C}$ [176°F]
 - Versions with end of stroke: cooling ALWAYS MANDATORY with $T_1 \geq 200^\circ\text{C}$ [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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1;

POCKET and DIMENSIONS standard**A-A**Cooling circuit (mandatory)
Nipples and fittings provided by the clientAir Vents (mandatory)
See pag. 4.M3.06**POSSIBLE ORIENTATIONS ON MANIFOLD****General rules for the cooling of the FLEXflow on manifold**

T_1 (°C) = Max molding temperature of polymer

T_c (°C) = Coolant temperature

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

$n^{\circ}3 \Rightarrow$	$T_1 \leq 270^{\circ}\text{C}$ [518°F]
$n^{\circ}2 \Rightarrow$	[518°F] $270^{\circ}\text{C} < T_1 \leq 300^{\circ}\text{C}$ [572°F]
$n^{\circ}1 \Rightarrow$	[572°F] $300^{\circ}\text{C} < T_1 \leq 320^{\circ}\text{C}$ [608°F]

2) Maximum incoming coolant temperature $T_c \leq 25^{\circ}\text{C}$ [77°F]

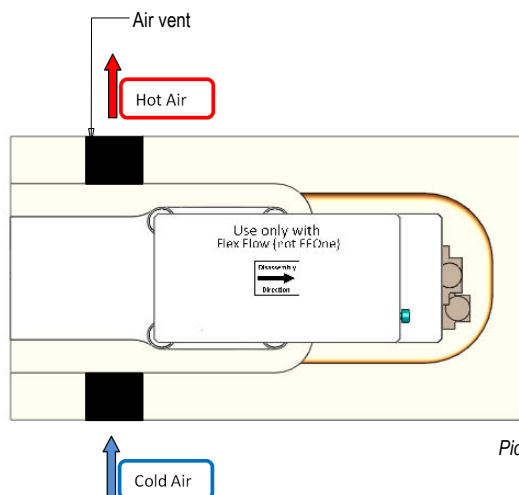
3) Minimum flow rate for each cooling circuit: 3 l/min

The configuration $\pm 90^{\circ}$ is obtained turning the FLEXflow on manifold on the hot runner axis, together with its standard seat

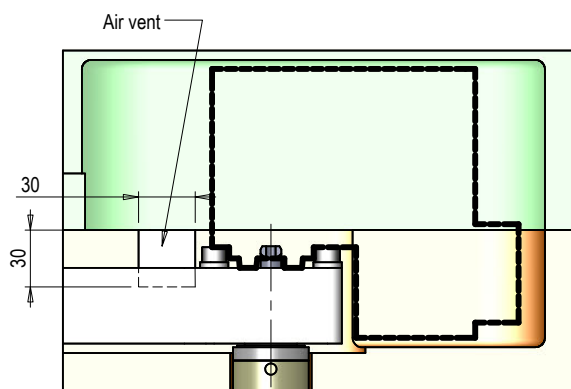
General rules for the cooling of the FLEXflow on manifold**Air vents**

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

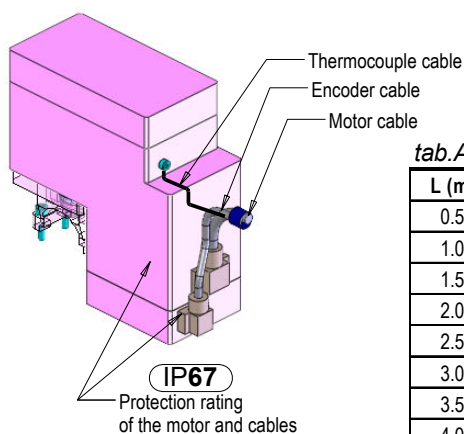


Pic.2

Electricals specification for FLEXflow

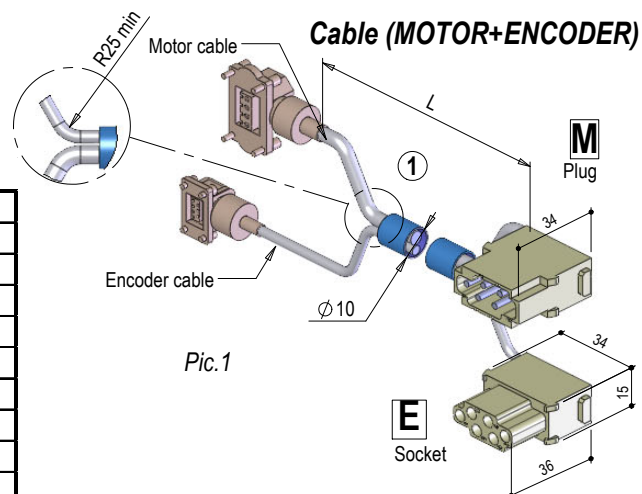
Every actuator group is electrically powered through a couple of cables (ENCODER+MOTOR). For cable codes with available lengths see table "A". The cable is supplied separated from the group; its length must be carefully calculated during wiring design.

The temperature of the actuator group is monitored through a ungrounded J Type thermocouple cable (supplied with actuator group).

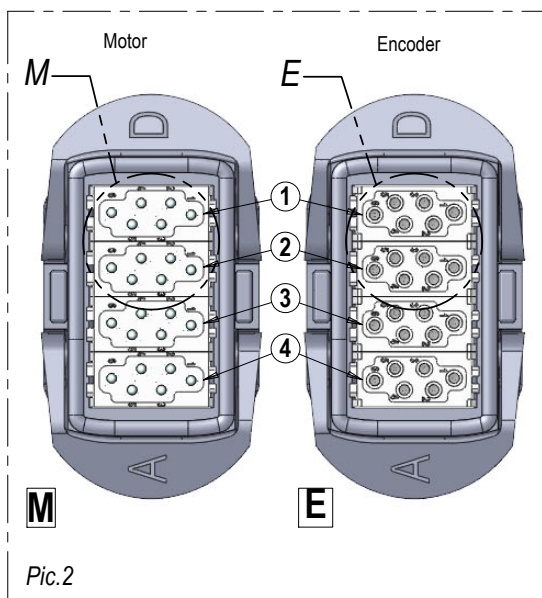


tab.A

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



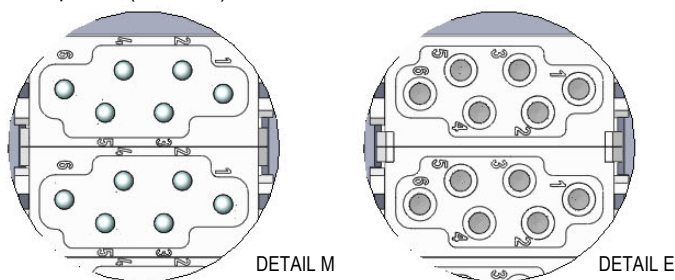
Pic.1



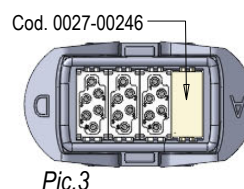
Pic.2

NOTES:

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

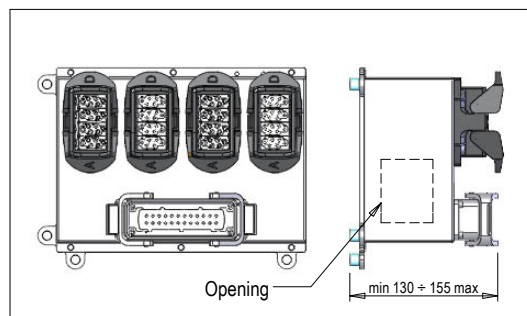


- 2) Always cover empty positions on the housing (Pic.3)

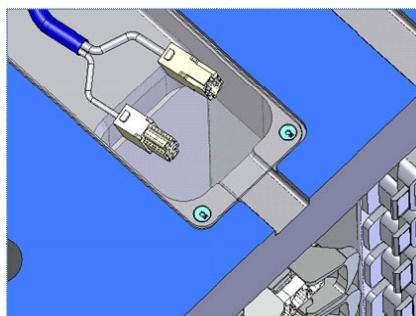


Pic.3

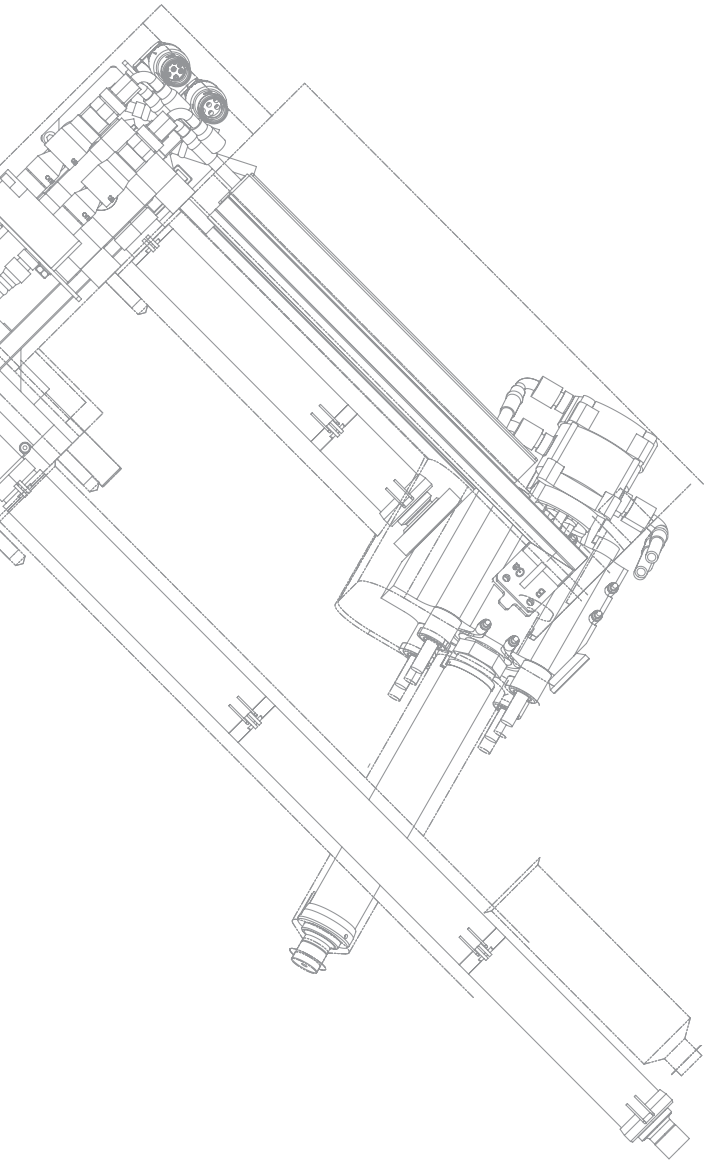
- 3) ENCODER+MOTOR cable (Pic.1) is provided yet wired. Openings on electrical box (supplied by HRS) or forced groove on the mold must take into consideration enough clearance for the connectors (see pic. 4-5)



Pic.4



Pic.5



G

G Series 100÷1225 cm³/s

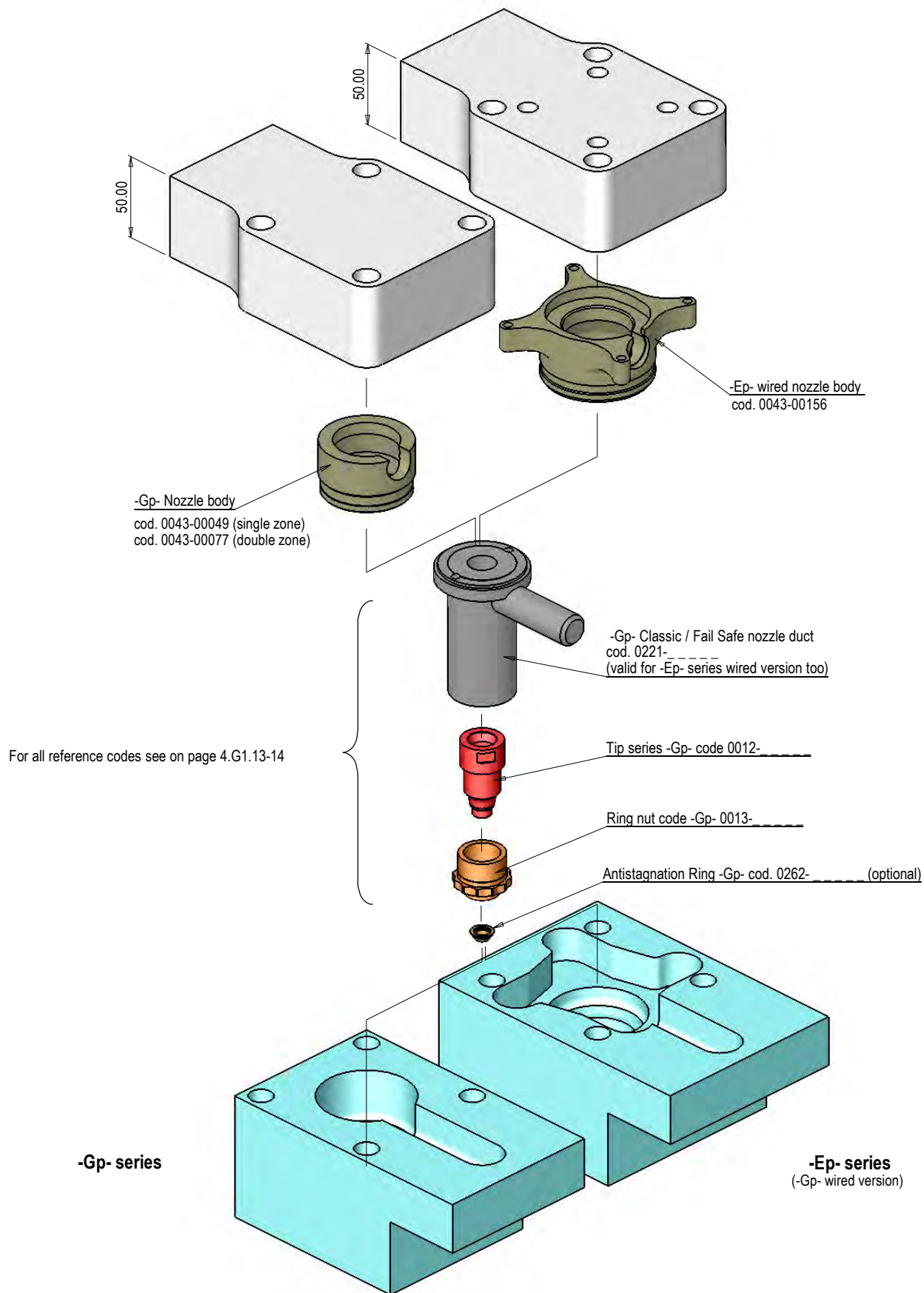
Serie G

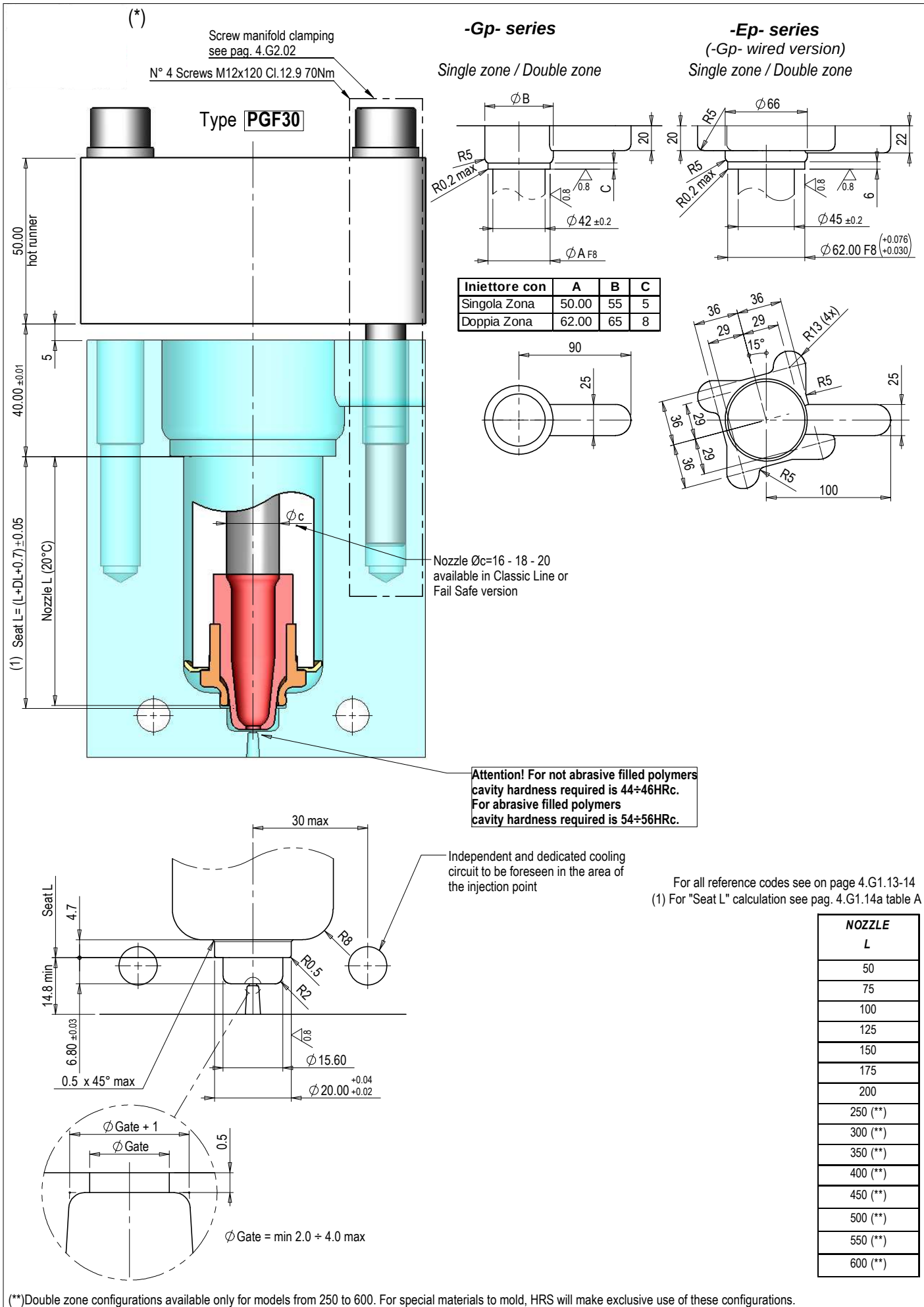
G Serie

G Série

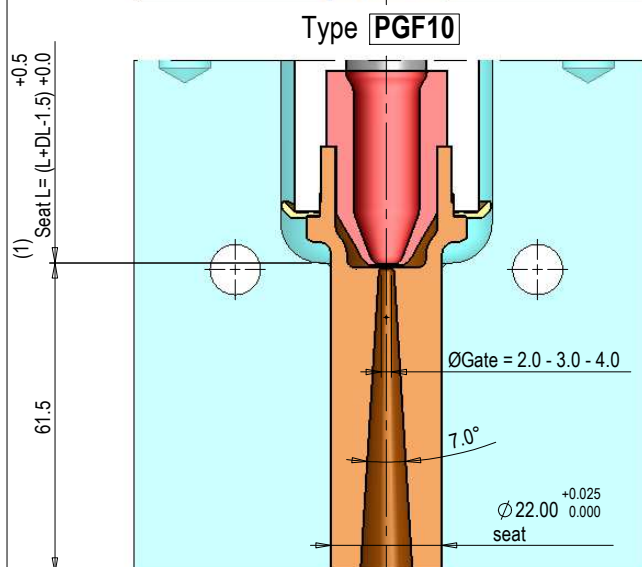
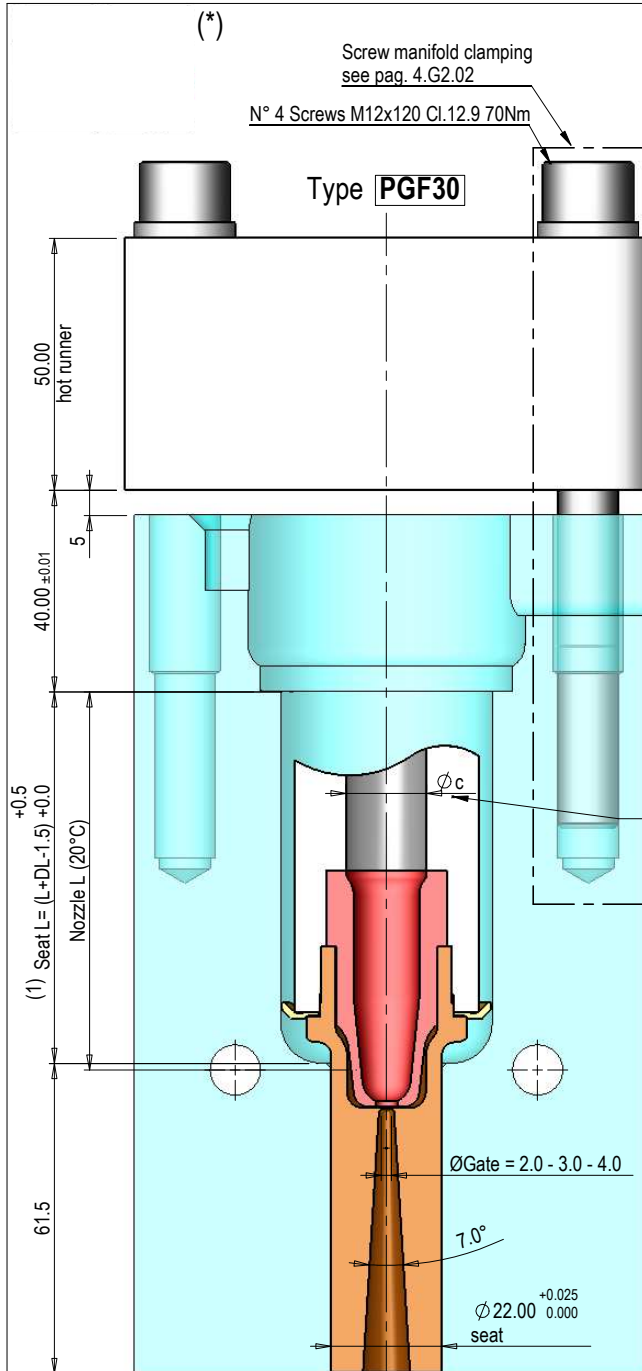
G Serie

G Série



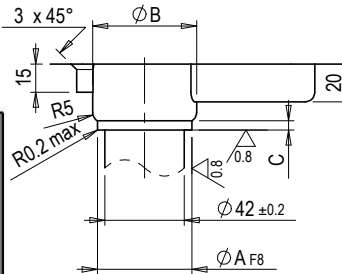


(**)Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

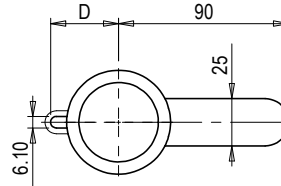


-Gp- series

Single zone / Double zone



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



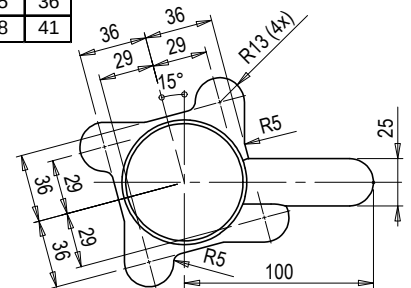
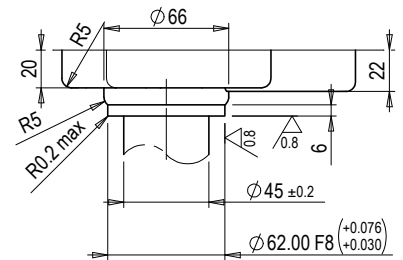
Nozzle Øc=16 - 18
available in Classic Line or
Fail Safe version

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

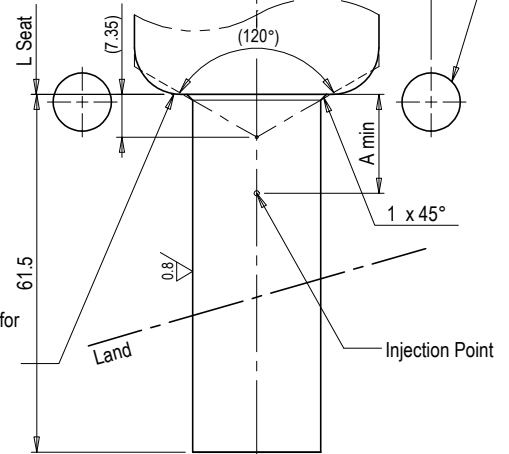
TYPE	A [mm]
PGF30	17
PGF10	11

-Ep- series

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



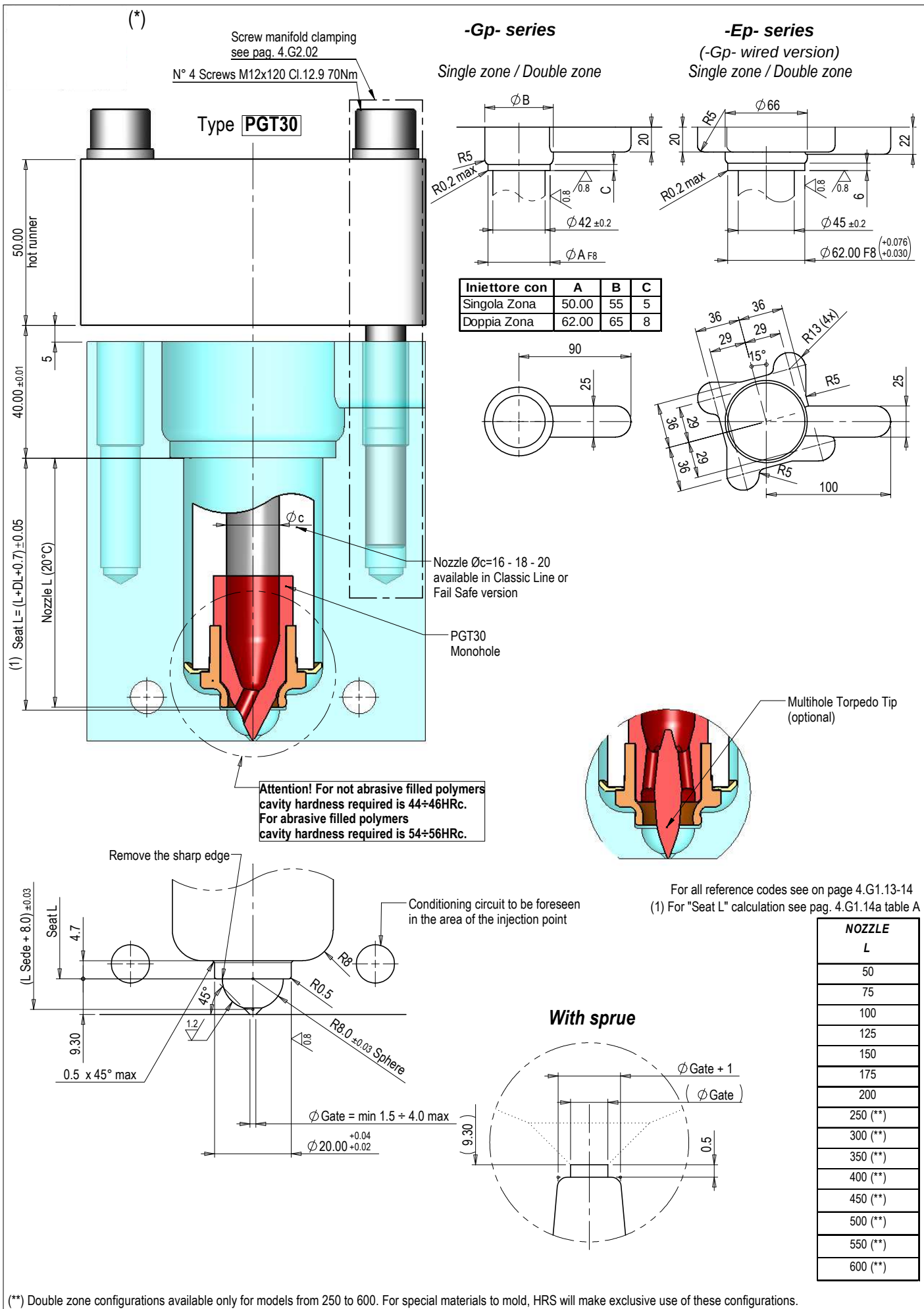
Independent and dedicated cooling
circuit to be foreseen in the area of
the injection point



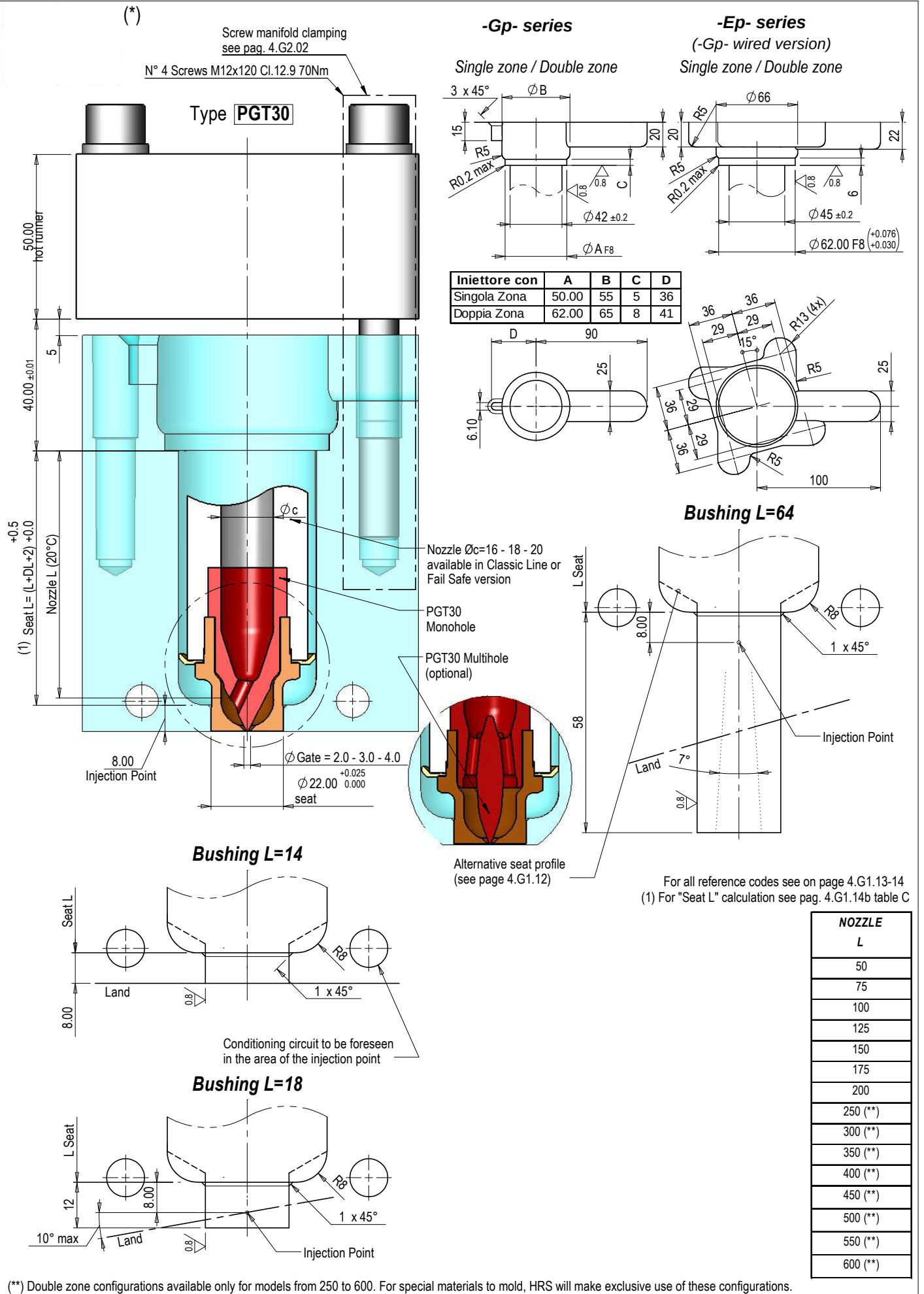
For all reference codes see on page 4.G1.13-14
(1) For "Seat L" calculation see pag. 4.G1.14a table B

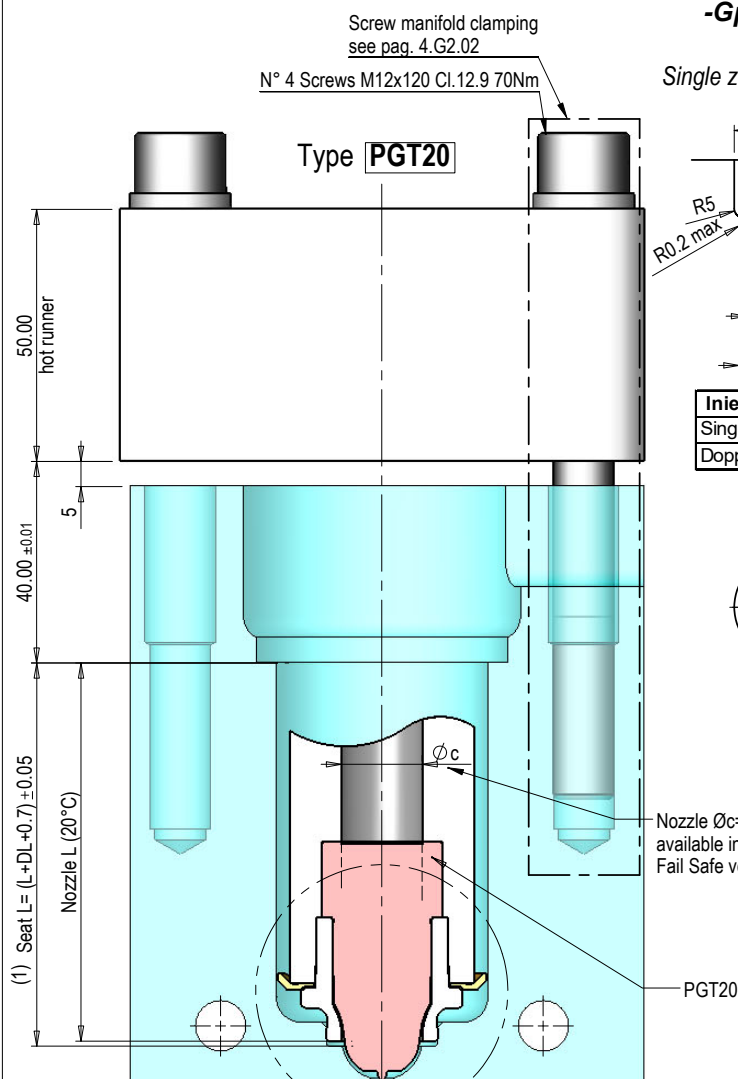
NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

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



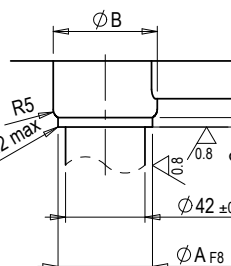
(**) Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.



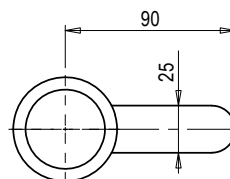


-Gp- series

Single zone / Double zone

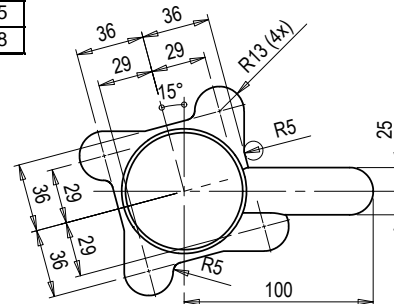
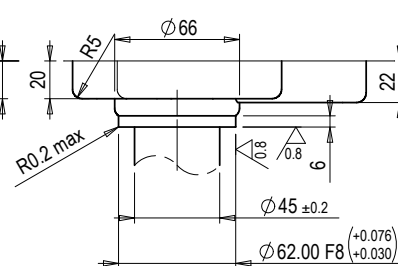


Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8

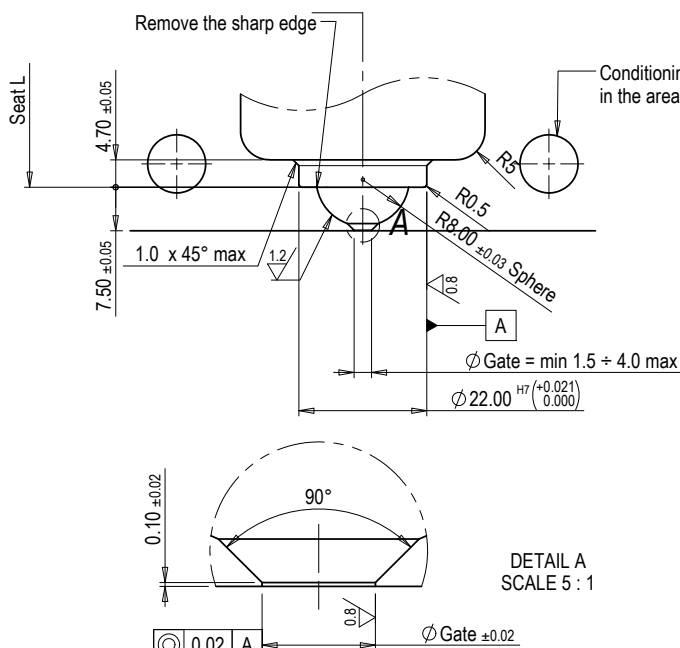


-Ep- series

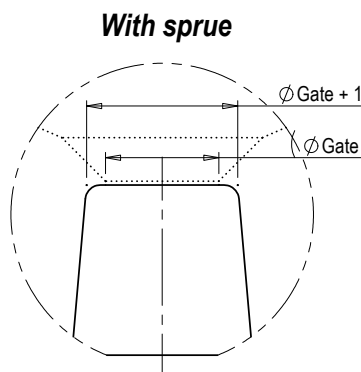
(-Gp- wired version)
Single zone / Double zone



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

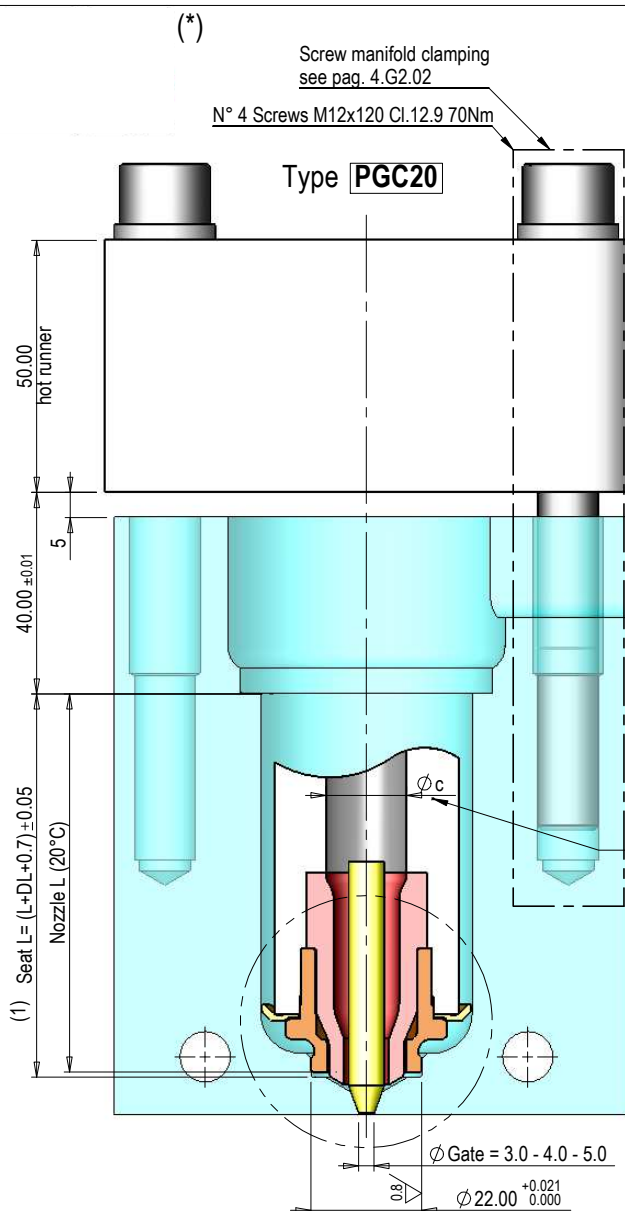


For all reference codes see on page 4.G1.13-14
(1) For "Seat L" calculation see pag. 4.G1.14a table A



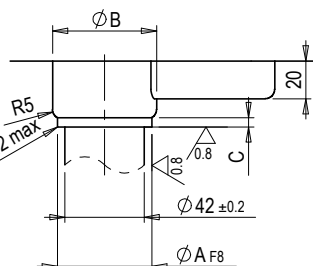
NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

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

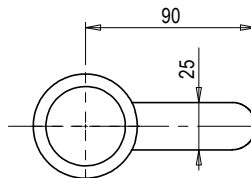


-Gp- series

Single zone / Double zone



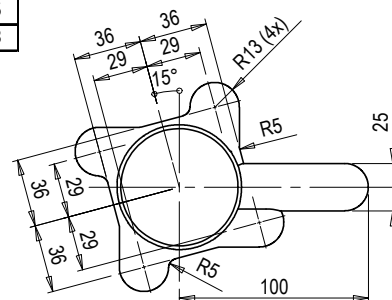
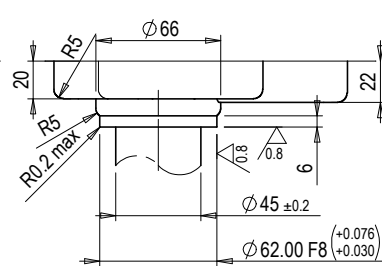
Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8



-Ep- series

(-Gp- wired version)

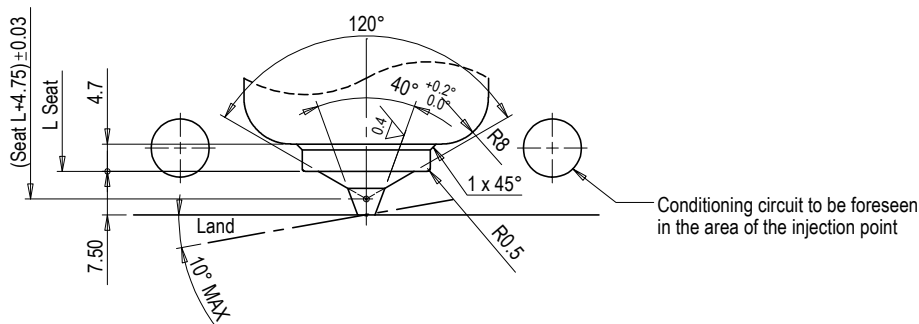
Single zone / Double zone



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

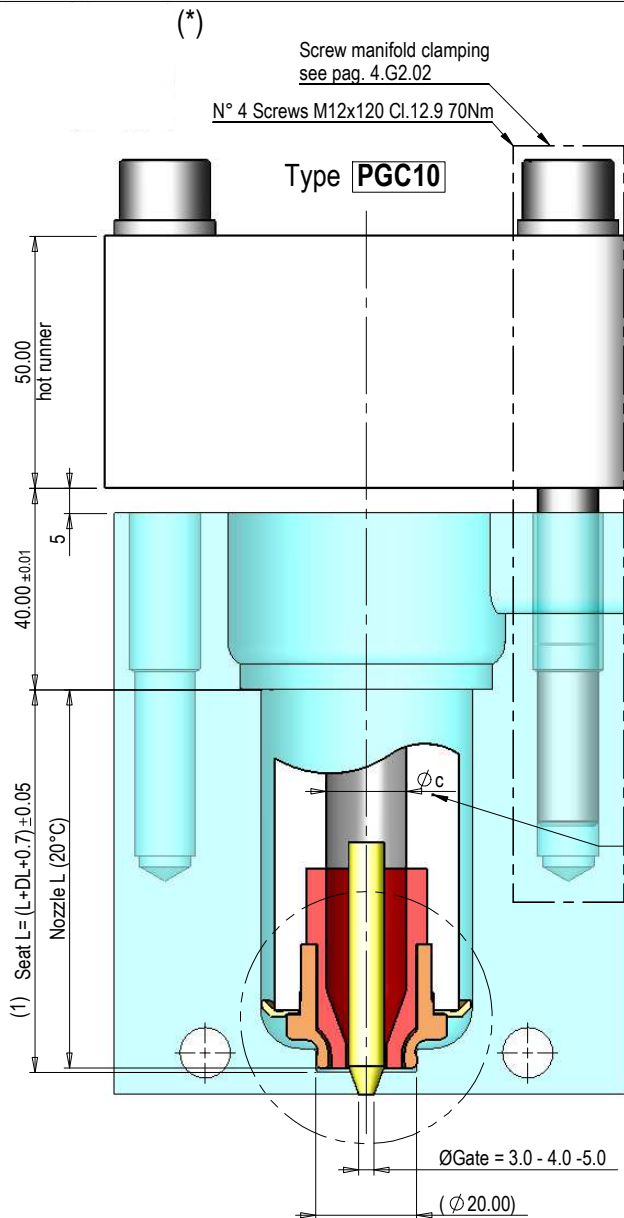
For all reference codes see on page 4.G1.13-14

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



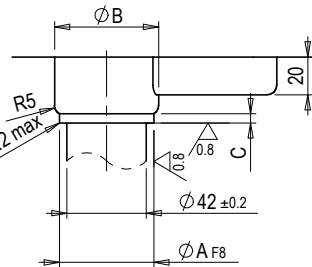
NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

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

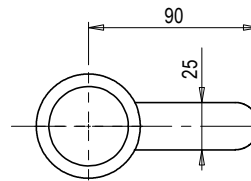


-Gp- series

Single zone / Double zone



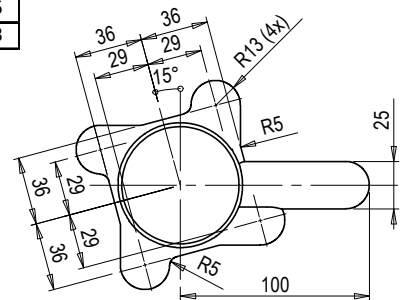
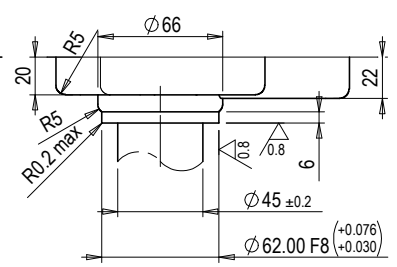
Iniettore con	A	B	C
Singola Zona	50.00	55	5
Doppia Zona	62.00	65	8



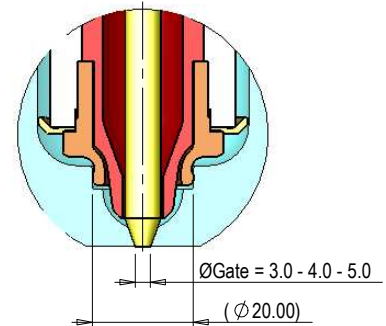
-Ep- series

(-Gp- wired version)

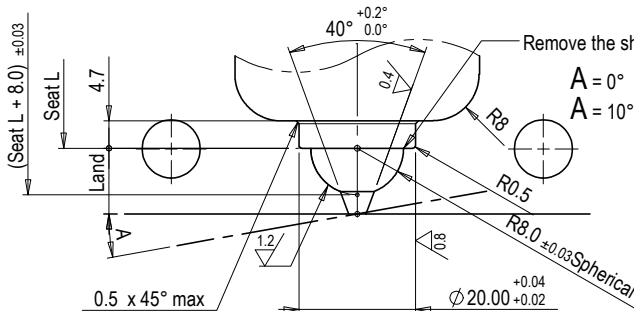
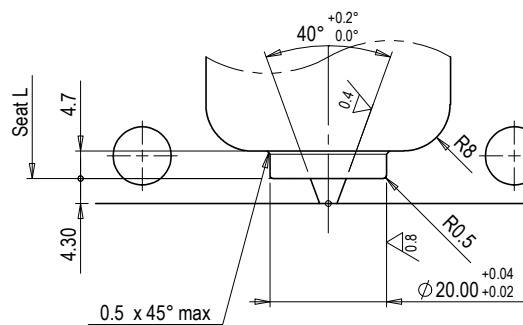
Single zone / Double zone



Type **PGC30**



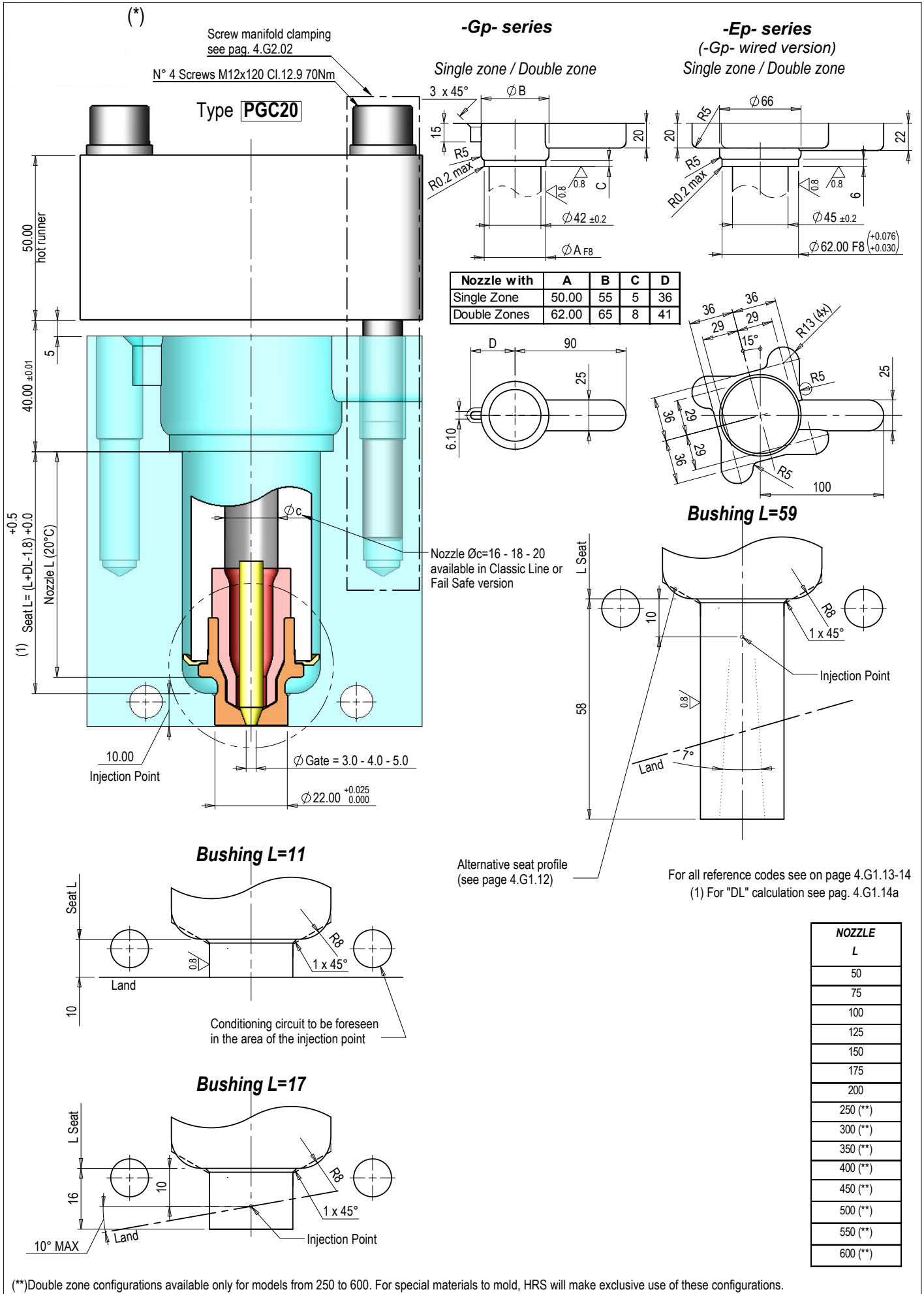
**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**

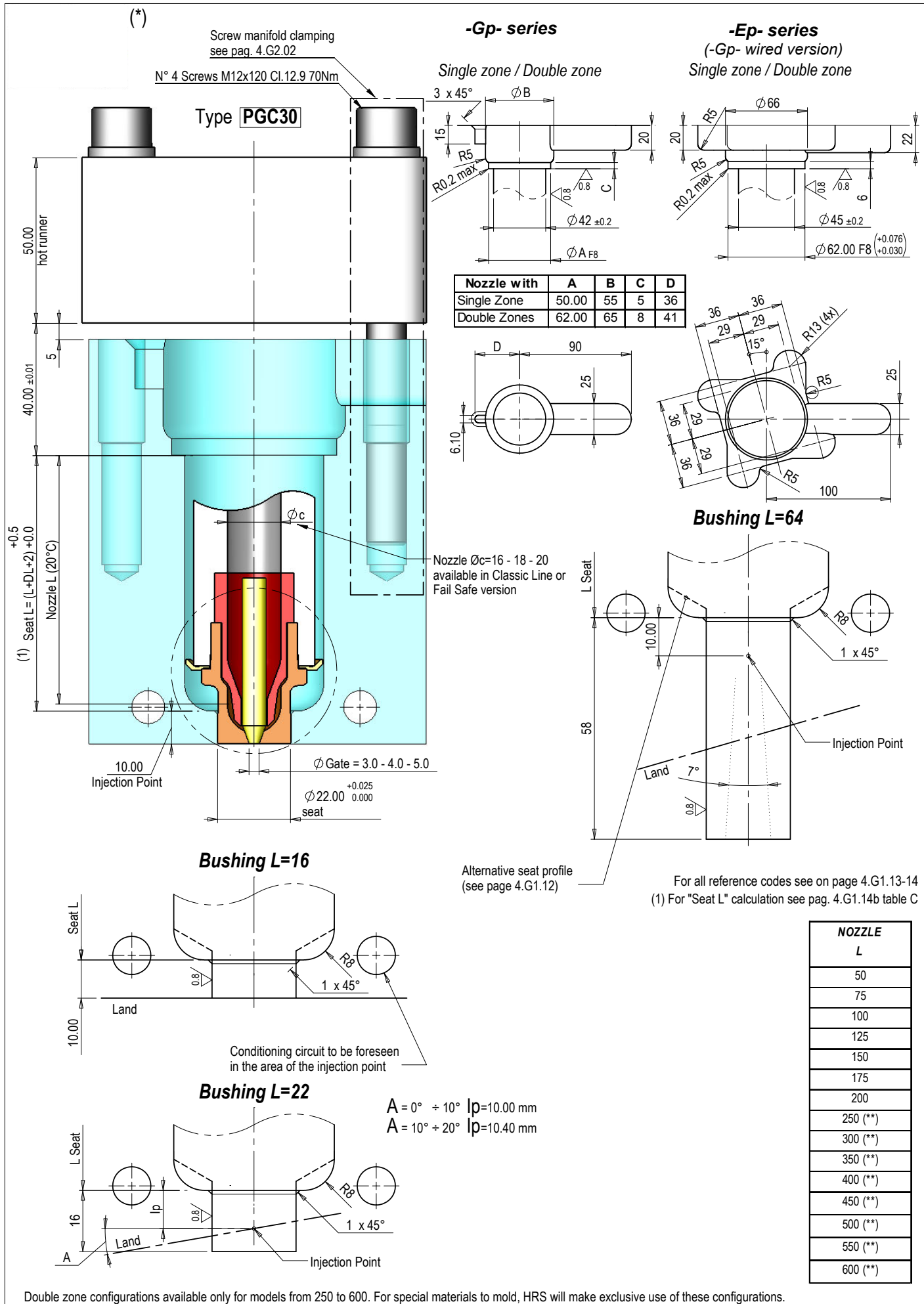


For all reference codes see on page 4.G1.13-14
(1) For "Seat L" calculation see pag. 4.G1.14a table A

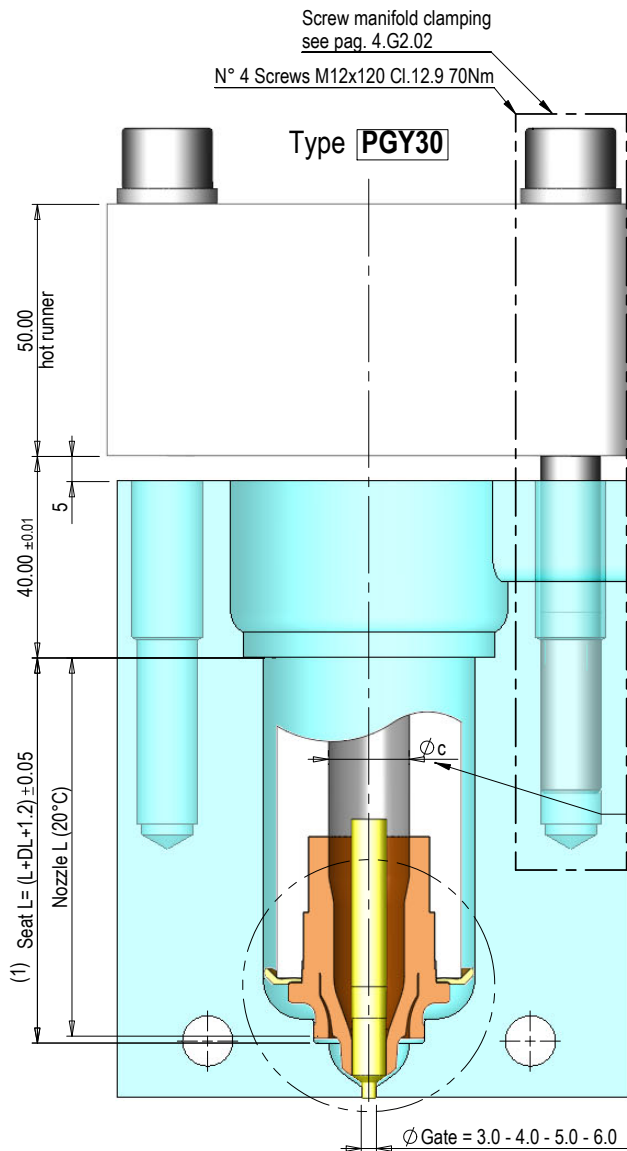
NOZZLE L
50
75
100
125
150
175
200
250 (**)
300 (**)
350 (**)
400 (**)
450 (**)
500 (**)
550 (**)
600 (**)

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



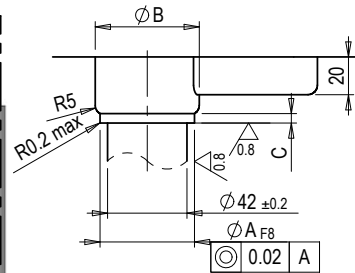


Double zone configurations available only for models from 250 to 600. For special materials to mold, HRS will make exclusive use of these configurations.

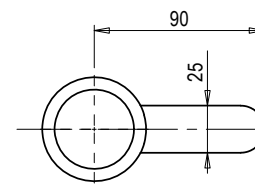


-Gp- series

Single zone / Double zone



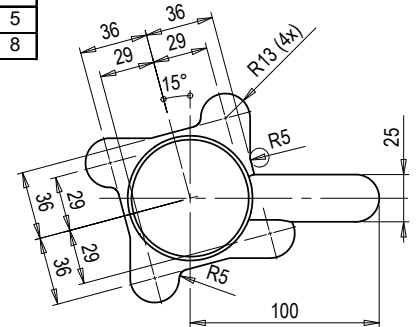
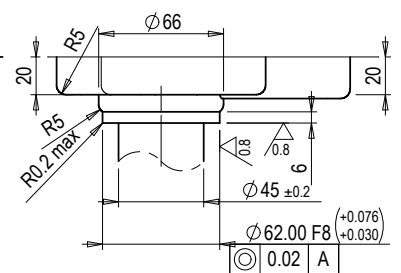
Nozzle with	A	B	C
Single Zone	50.00	55	5
Double Zones	62.00	65	8



-Ep- series

(-Gp- wired version)

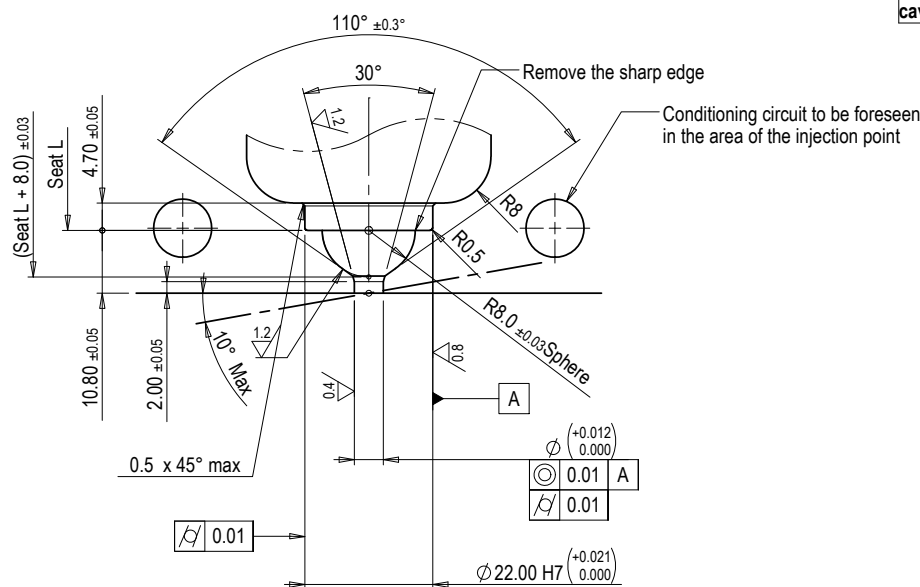
Single zone / Double zone



Nozzle $\phi_c = 16 - 18 - 20$
available in Classic Line or
Fail Safe version

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

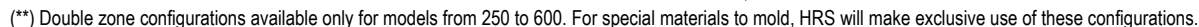
Attention! For not abrasive filled polymers
cavity hardness required is 48±50HRC.
For abrasive filled polymers
cavity hardness required is 54±56HRC.



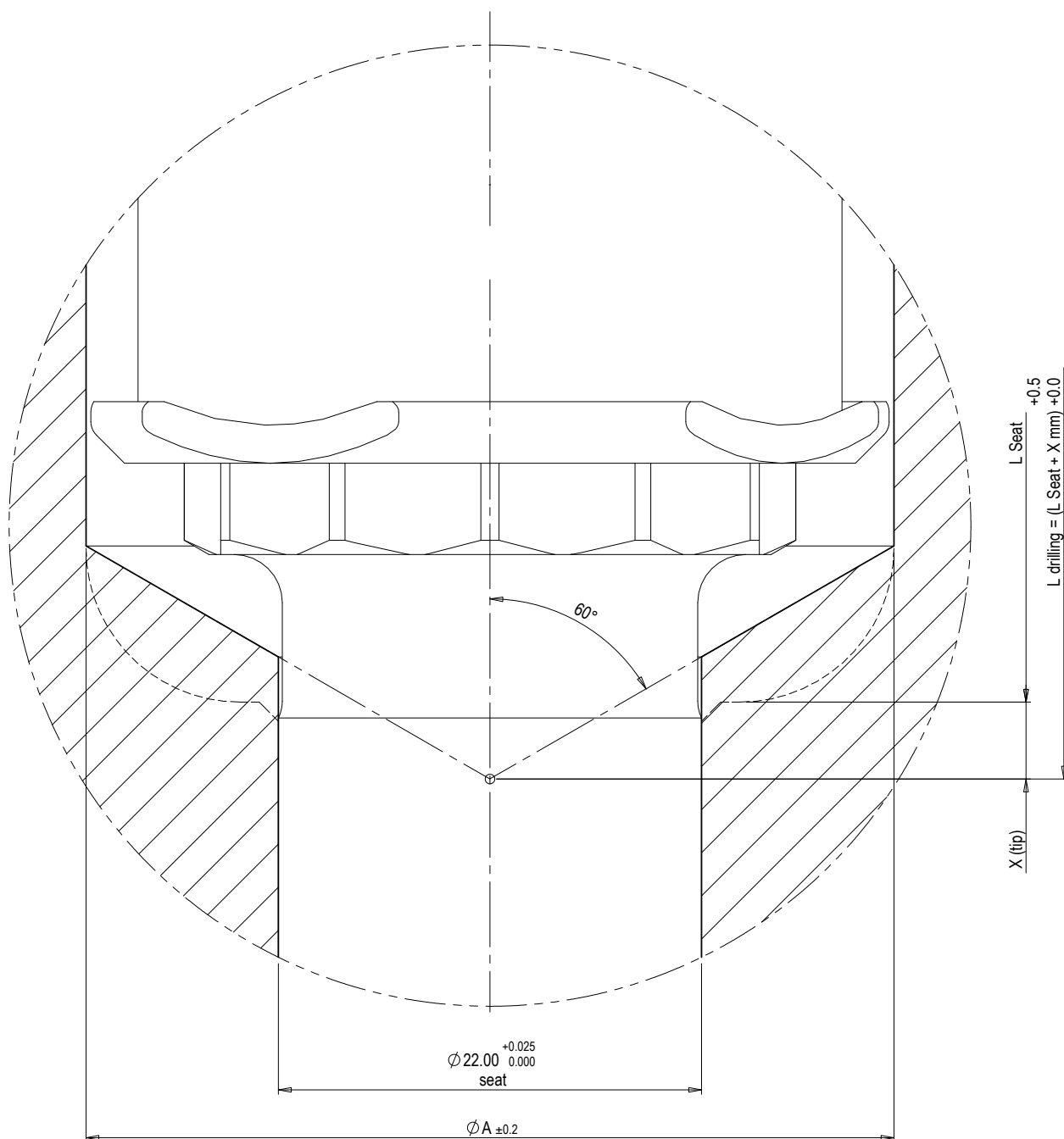
For all reference codes see on page 4.G1.13-14
(1) For "Seat L" calculation see pag. 4.G1.14b table E

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.

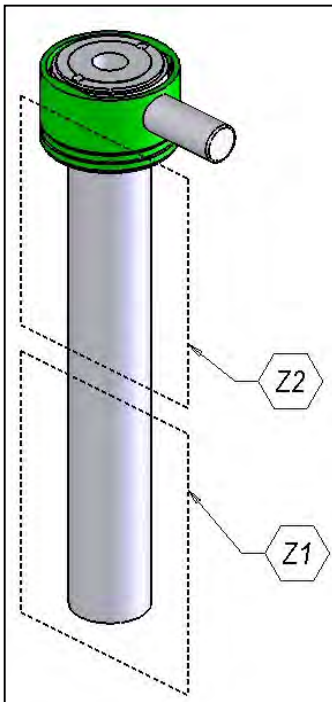


Nozzles series -Gp- -Ep- with BUSHING THROUGH CAVITY
Alternative seat contour 120°
(120° tips seat is easier to manufacture than the
standard seat but more difficult to measure)



ØA	Series
42	Gp
45	Ep

X=4.0 mm for all configurations, except $\left\{ \begin{array}{l} \text{PGF10} \Rightarrow X = 7.35 \text{ mm} \\ \text{PGF30} \Rightarrow X = 7.35 \text{ mm} \\ \text{PGC20} \Rightarrow X = 7.50 \text{ mm} \end{array} \right.$

NOZZLE L	NOZZLE DUCT CODE		W	NOZZLE DUCT CODE		Z1 [W]	Z2 [W]
	Single Zone		230V	Double Zone		230V	230V
50	Øc=16 Classic	0221-00179	1x 400	- available for models from 250 to 600 - 			
	Øc=18 Classic	0221-00209					
	Øc=16 Fail Safe	0221-00194	2x 400				
	Øc=18 Fail Safe	0221-00224					
75	Øc=16 Classic	0221-00180	1x 470				
	Øc=18 Classic	0221-00210					
	Øc=16 Fail Safe	0221-00195	2x 470				
	Øc=18 Fail Safe	0221-00225					
100	Øc=16 Classic	0221-00181	1x 470				
	Øc=18 Classic	0221-00211					
	Øc=16 Fail Safe	0221-00196	2x 470				
	Øc=18 Fail Safe	0221-00226					
125	Øc=16 Classic	0221-00182	1x 550				
	Øc=18 Classic	0221-00212					
	Øc=16 Fail Safe	0221-00197	2x 550				
	Øc=18 Fail Safe	0221-00227					
150	Øc=16 Classic	0221-00183	1x 620				
	Øc=18 Classic	0221-00213					
	Øc=16 Fail Safe	0221-00198	2x 620				
	Øc=18 Fail Safe	0221-00228					
175	Øc=16 Classic	0221-00184	1x 620				
	Øc=18 Classic	0221-00214					
	Øc=16 Fail Safe	0221-00199	2x 620				
	Øc=18 Fail Safe	0221-00229					
200	Øc=16 Classic	0221-00185	1x 620				
	Øc=18 Classic	0221-00215					
	Øc=16 Fail Safe	0221-00200	2x 620				
	Øc=18 Fail Safe	0221-00230					
250				Øc=16 Classic	0221-00493	1x 300	1x 450
				Øc=18 Classic	0221-00501		
				Øc=16 Fail Safe	0221-00509	2x 300	2x 450
				Øc=18 Fail Safe	0221-00517		
300				Øc=16 Classic	0221-00494	1x 300	1x 550
				Øc=18 Classic	0221-00502		
				Øc=16 Fail Safe	0221-00510	2x 300	2x 550
				Øc=18 Fail Safe	0221-00518		
350				Øc=16 Classic	0221-00495	1x 300	1x 550
				Øc=18 Classic	0221-00503		
				Øc=16 Fail Safe	0221-00511	2x 300	2x 550
				Øc=18 Fail Safe	0221-00519		
400				Øc=16 Classic	0221-00496	1x 300	1x 550
				Øc=18 Classic	0221-00504		
				Øc=16 Fail Safe	0221-00512	2x 300	2x 550
				Øc=18 Fail Safe	0221-00520		
450				Øc=16 Classic	0221-00497	1x 300	1x 750
				Øc=18 Classic	0221-00505		
				Øc=16 Fail Safe	0221-00513	2x 300	2x 750
				Øc=18 Fail Safe	0221-00521		
500				Øc=16 Classic	0221-00498	1x 300	1x 750
				Øc=18 Classic	0221-00506		
				Øc=16 Fail Safe	0221-00514	2x 300	2x 750
				Øc=18 Fail Safe	0221-00522		
550				Øc=16 Classic	0221-00499	1x 300	1x 950
				Øc=18 Classic	0221-00507		
				Øc=16 Fail Safe	0221-00515	2x 300	2x 950
				Øc=18 Fail Safe	0221-00523		
600				Øc=16 Classic	0221-00500	1x 300	1x 950
				Øc=18 Classic	0221-00508		
				Øc=16 Fail Safe	0221-00516	2x 300	2x 950
				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.

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 conductivity 0012-01008 for engineering polymers PGT30 Torpedo 0012-00283 0012-00284 for high resistance 0012-00334 for high conductivity	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 conductivity with End Ring 0012-00326 For high conductivity with Bushing th.cavity 0012-00431 for high resistance PGC30 Antistagnation 0012-00772 For high conductivity with End Ring 0012-00773 For high conductivity 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 conductivity 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

T1 (°C) = Injection temperature

T2 (°C) = Mold temperature

 $\Delta T = T1 - T2$ $\lambda = 0.000012 \text{ (1/°C)}$ $k = (\Delta T * 0.0008) * 0.03$ **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
	$DL = (L * \Delta T * \lambda) + k$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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
	$\text{Seat L} = L + DL + 0.7$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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
	$\text{Seat L} = L + DL - 1.5$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

Tab. C - "Seat L" Calculation

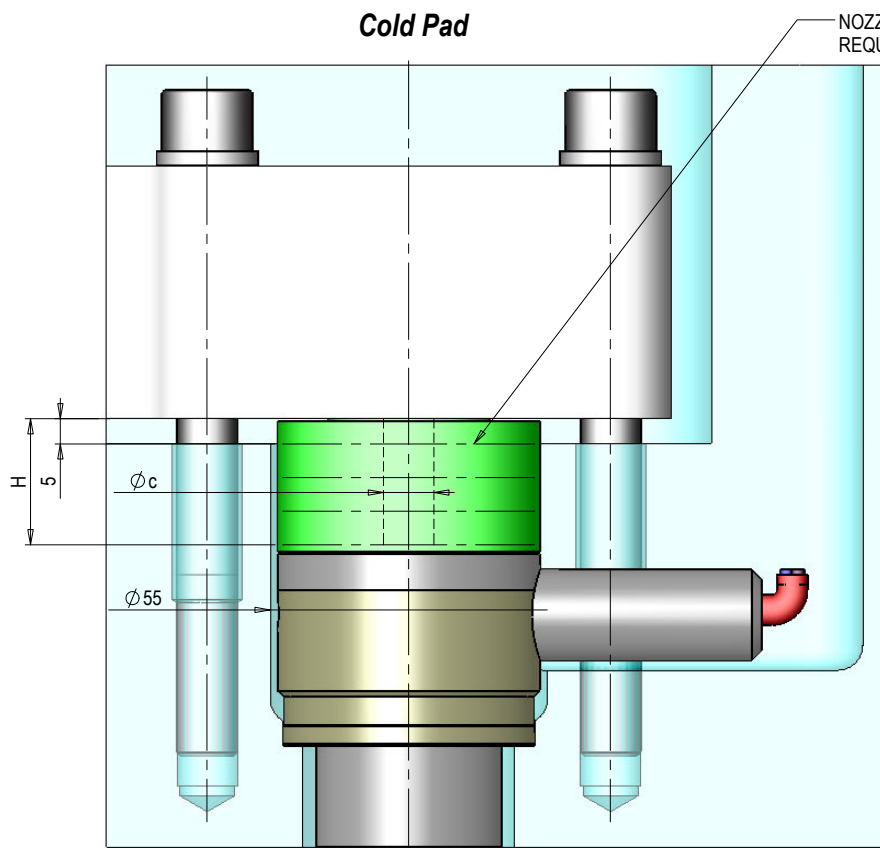
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	Seat L = L + DL + 2										
	$[\Delta T=100^{\circ}\text{C}]$	$[\Delta T=120^{\circ}\text{C}]$	$[\Delta T=140^{\circ}\text{C}]$	$[\Delta T=160^{\circ}\text{C}]$	$[\Delta T=180^{\circ}\text{C}]$	$[\Delta T=200^{\circ}\text{C}]$	$[\Delta T=220^{\circ}\text{C}]$	$[\Delta T=240^{\circ}\text{C}]$	$[\Delta T=260^{\circ}\text{C}]$	$[\Delta T=280^{\circ}\text{C}]$	$[\Delta T=300^{\circ}\text{C}]$
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

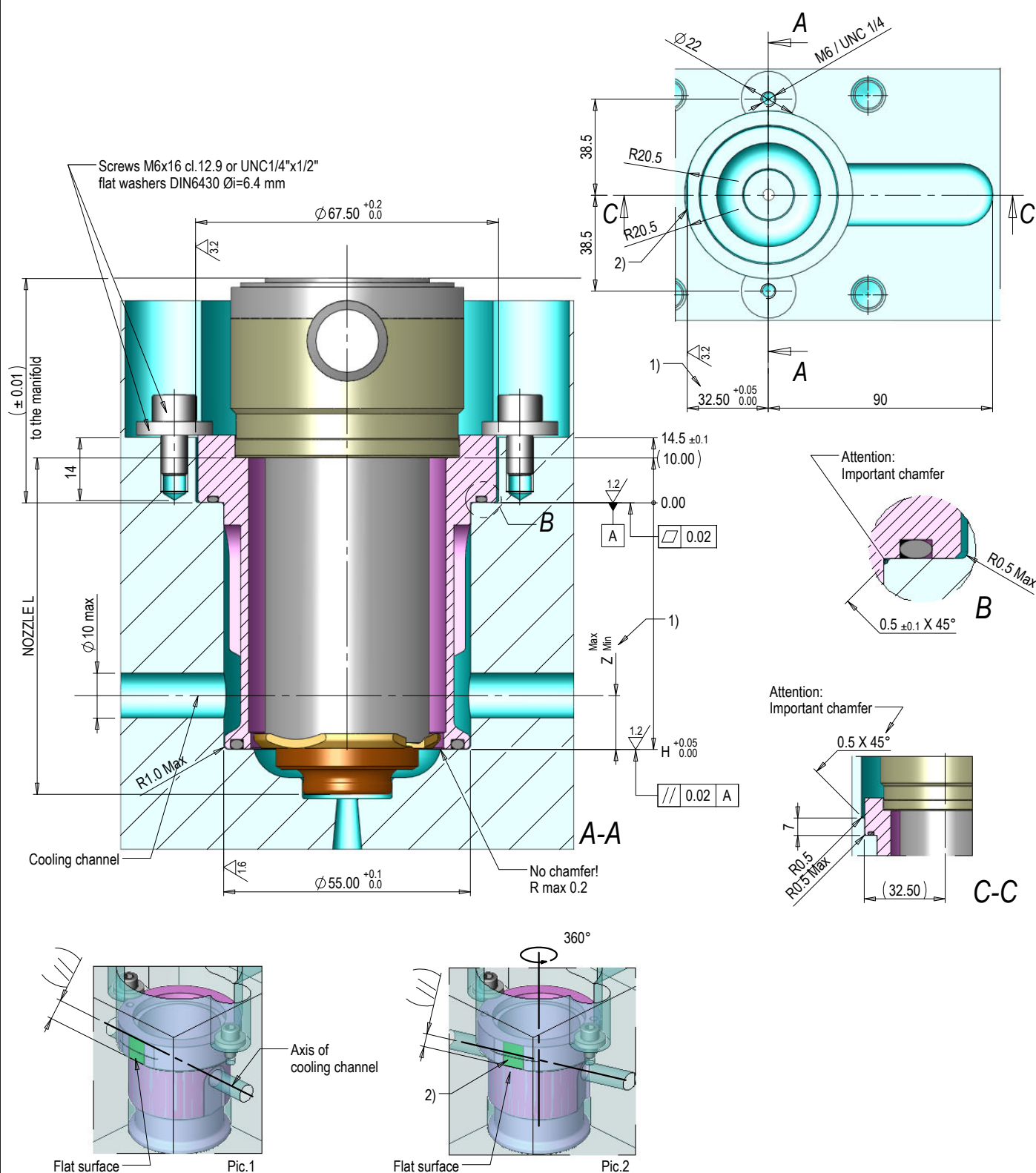
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	Seat L = L + DL - 1.8										
	$[\Delta T=100^{\circ}\text{C}]$	$[\Delta T=120^{\circ}\text{C}]$	$[\Delta T=140^{\circ}\text{C}]$	$[\Delta T=160^{\circ}\text{C}]$	$[\Delta T=180^{\circ}\text{C}]$	$[\Delta T=200^{\circ}\text{C}]$	$[\Delta T=220^{\circ}\text{C}]$	$[\Delta T=240^{\circ}\text{C}]$	$[\Delta T=260^{\circ}\text{C}]$	$[\Delta T=280^{\circ}\text{C}]$	$[\Delta T=300^{\circ}\text{C}]$
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										
	$[\Delta T=100^{\circ}\text{C}]$	$[\Delta T=120^{\circ}\text{C}]$	$[\Delta T=140^{\circ}\text{C}]$	$[\Delta T=160^{\circ}\text{C}]$	$[\Delta T=180^{\circ}\text{C}]$	$[\Delta T=200^{\circ}\text{C}]$	$[\Delta T=220^{\circ}\text{C}]$	$[\Delta T=240^{\circ}\text{C}]$	$[\Delta T=260^{\circ}\text{C}]$	$[\Delta T=280^{\circ}\text{C}]$	$[\Delta T=300^{\circ}\text{C}]$
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

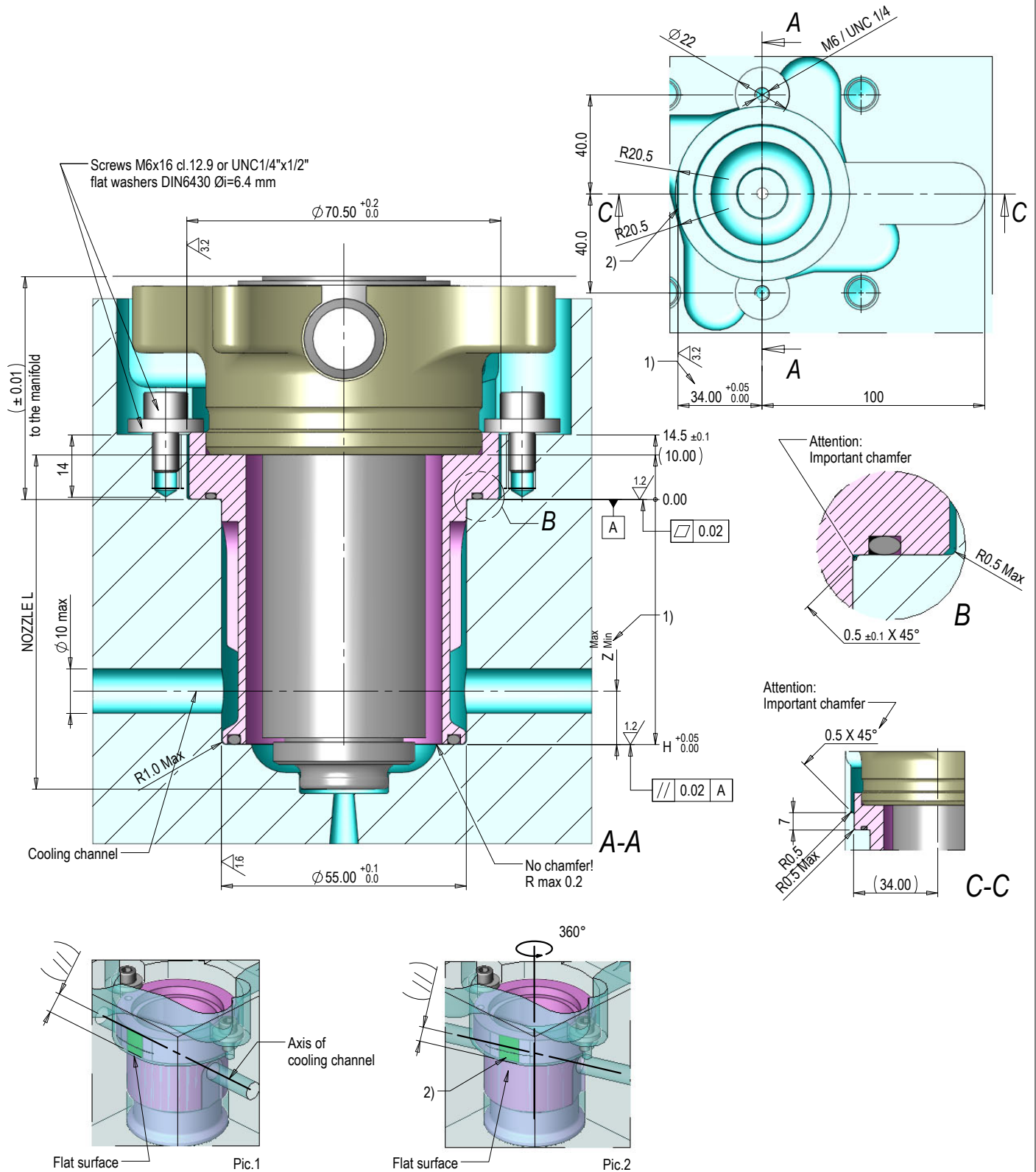


H standard	$\varnothing c=16$	$\varnothing c=18$
5.00	0010-01364	0013-01369
10.00	0010-01365	0013-01370
15.00	0010-01366	0013-01371
20.00	0010-01367	0013-01372
25.00	0010-01368	0013-01373



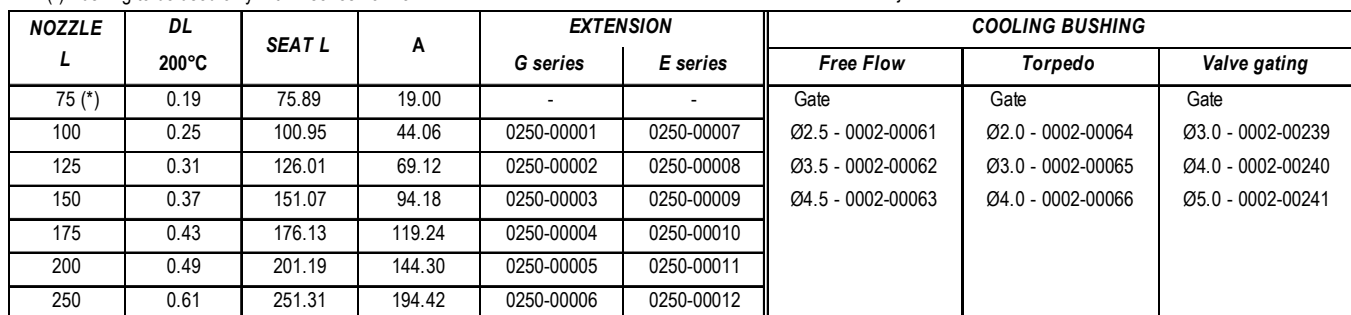
- 1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
- 2) For all cases with "Z Max" > 18, then the positioning face can be located 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

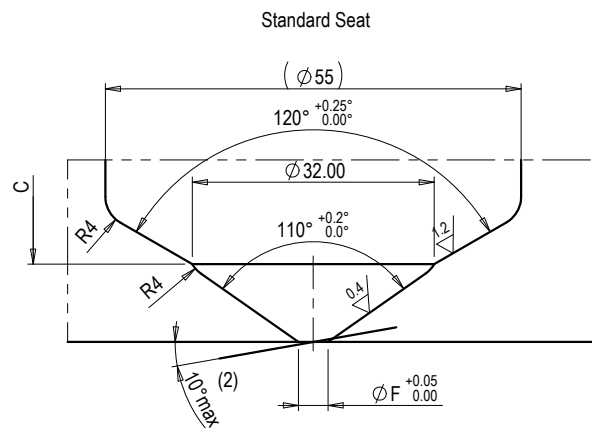
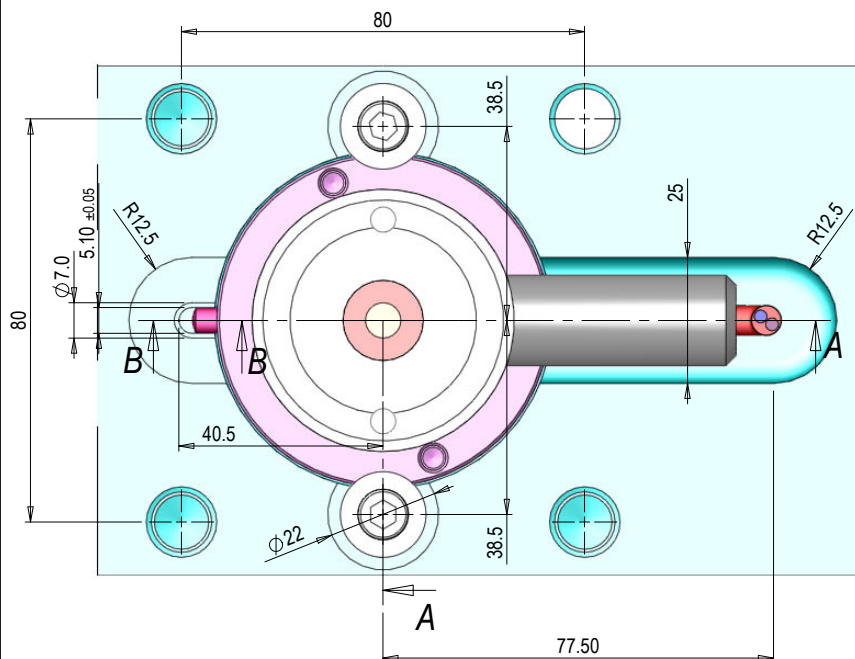
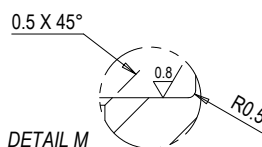
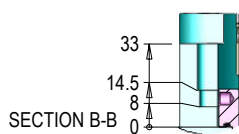
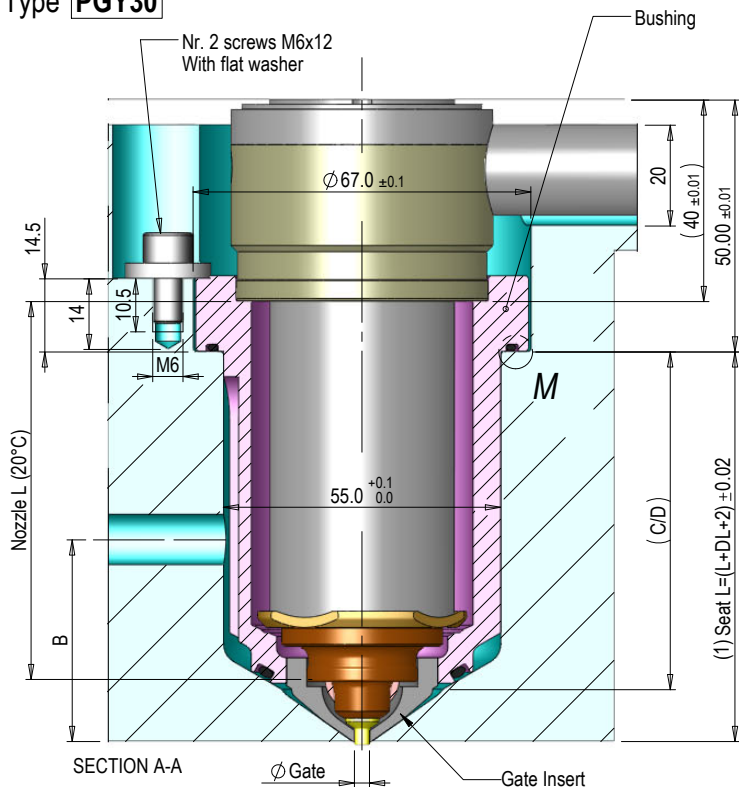


- 1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
- 2) For all cases with "Z Max" > 18, then the positioning face can be located 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.

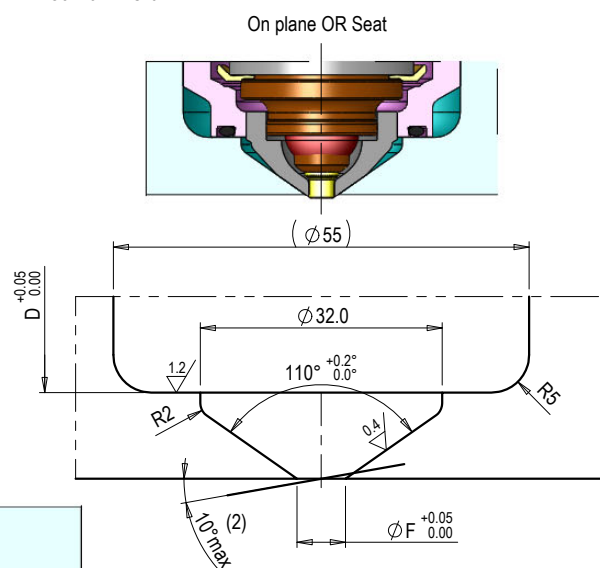
BUSHING CODE	NOZZLE L	H	Z	Z Min	Z Max	BUSHING CODE	NOZZLE L	H	Z	Z Min	Z Max
0121-00501	50	30.00	12	7	20	0121-00507	200	180.00	12	7	103
0121-00502	75	55.00	12	7	43	0121-00508	225	205.00	12	7	103
0121-00503	100	80.00	12	7	68	0121-00509	250	230.00	12	7	103
0121-00504	125	105.00	12	7	93	0121-00510	275	255.00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



Type **PGY30**



(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.



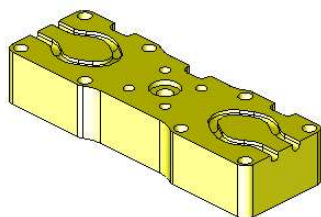
GATE INSERT		
Code	ØGate	ØF
0335-00172	3.0	3.9
0335-00173	4.0	5.1
0335-00174	5.0	6.4
0335-00175	6.0	7.6

Installation KIT cod: 0283-00649

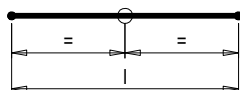
(1) For "Seat L" calculation see pag. 4.G1.14b table C

BUSHING CODE		NOZZLE L	C	D	B		BUSHING CODE	ON PLANE OR	NOZZLE L	C	D	B	
STANDARD	ON PLANE OR				min	max	STANDARD					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							

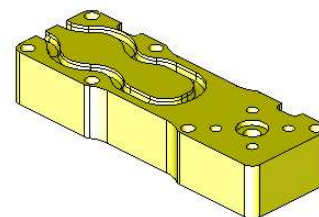
-HL-



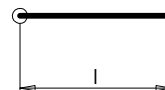
Standard
l=150-200-250-300-350-400-450 mm



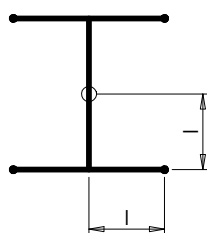
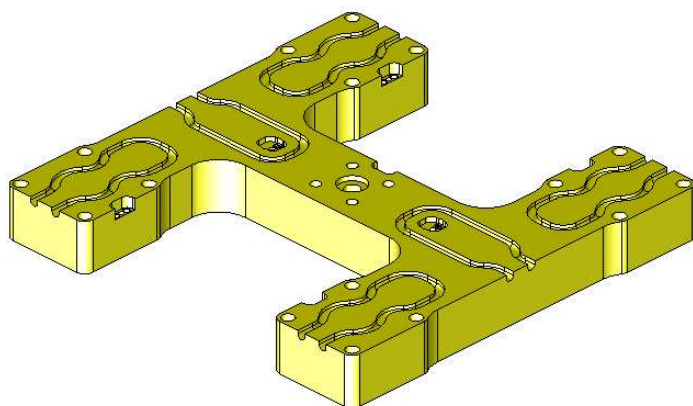
-HD-



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

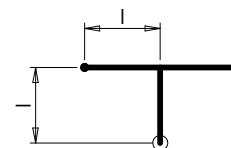
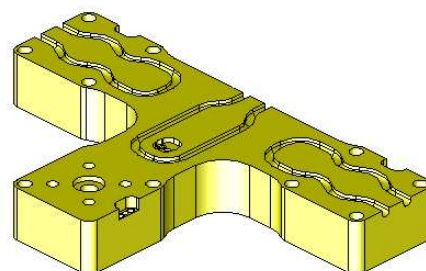


-HH-



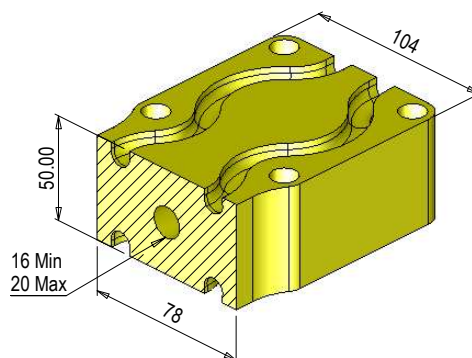
Standard
l=100-125-150 mm

-HT-



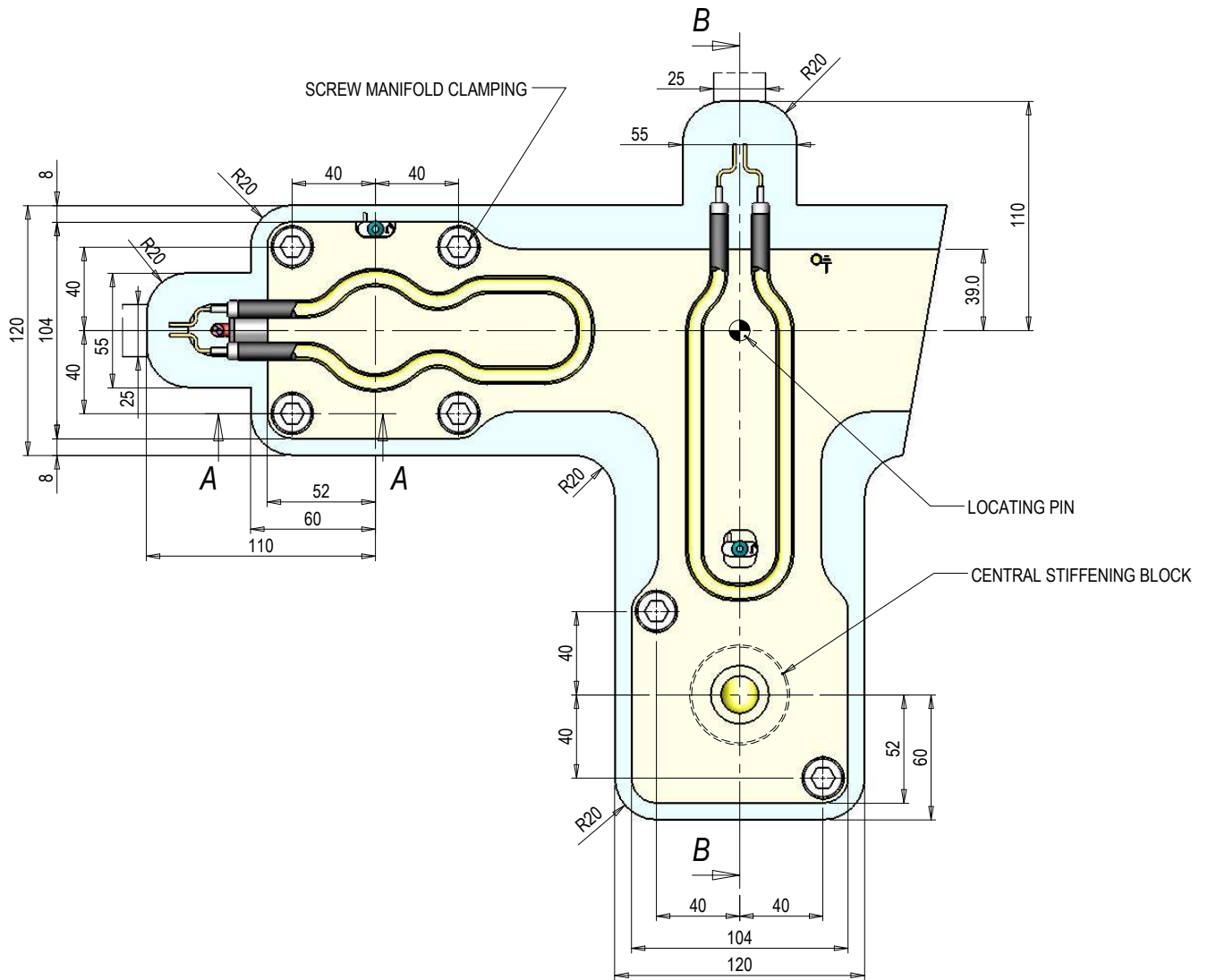
Standard
l=100-125-150 mm

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

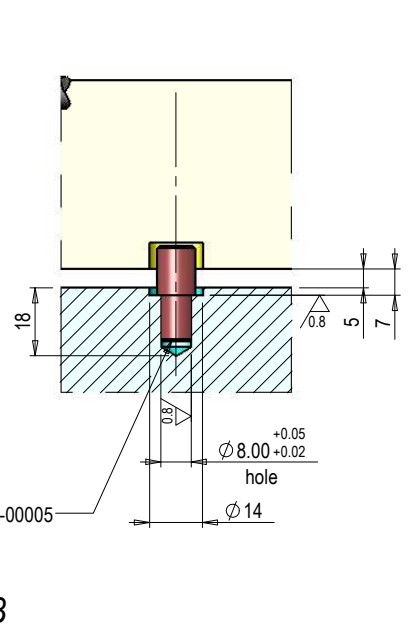
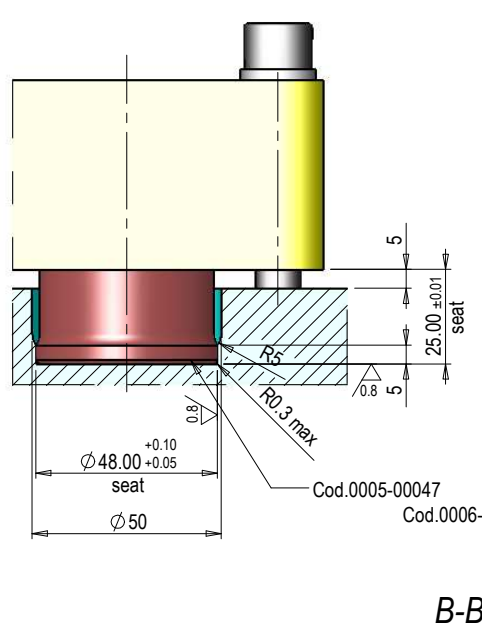
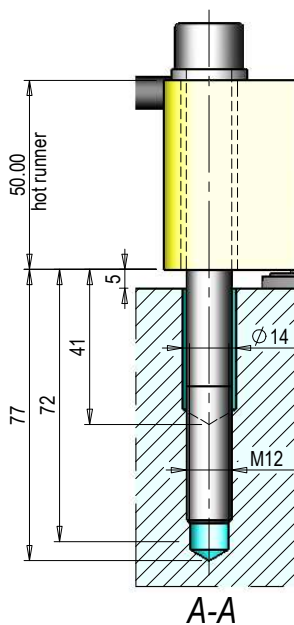
The following profile is the typical one for the standard not wired hot runner pocket
(all pockets for standard typologies can be downloaded from our web site www.hrsflow.com in 2D and 3D formats)



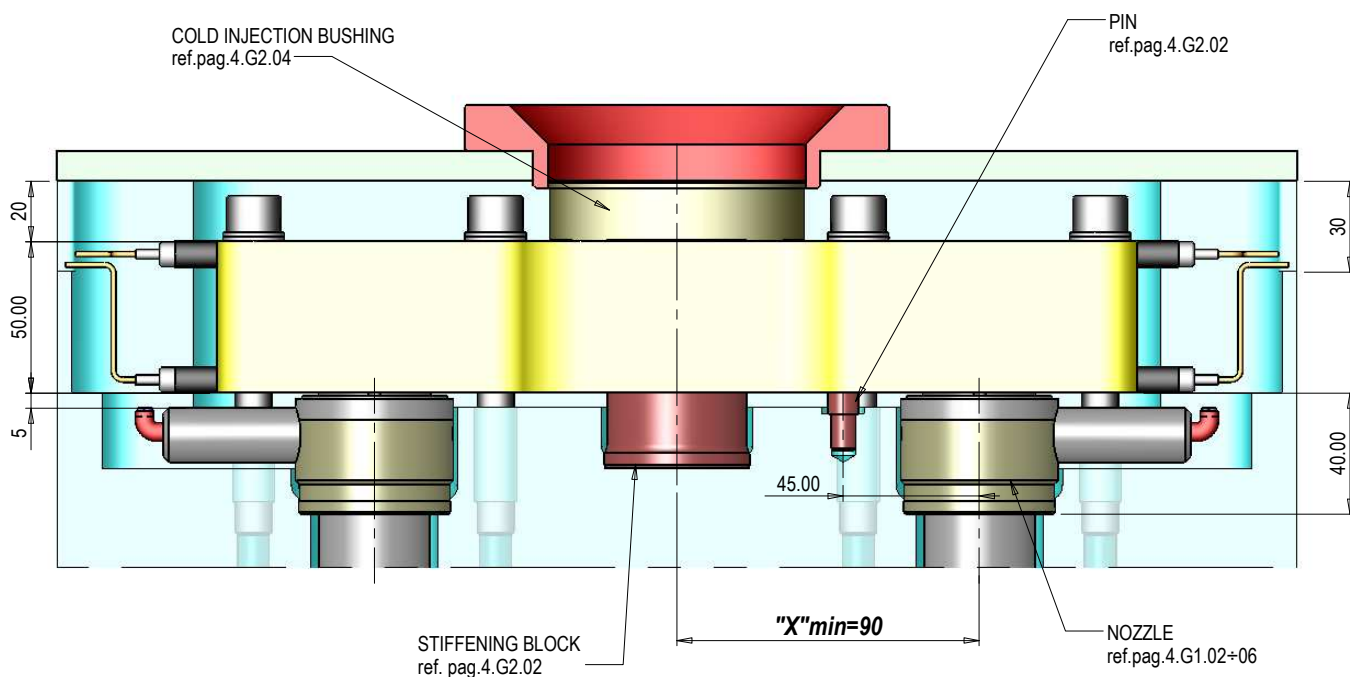
Screw manifold clamping
Screw M12x120 cl.12.9 70 Nm

Pocket central stiffening block

Pocket for locating pin

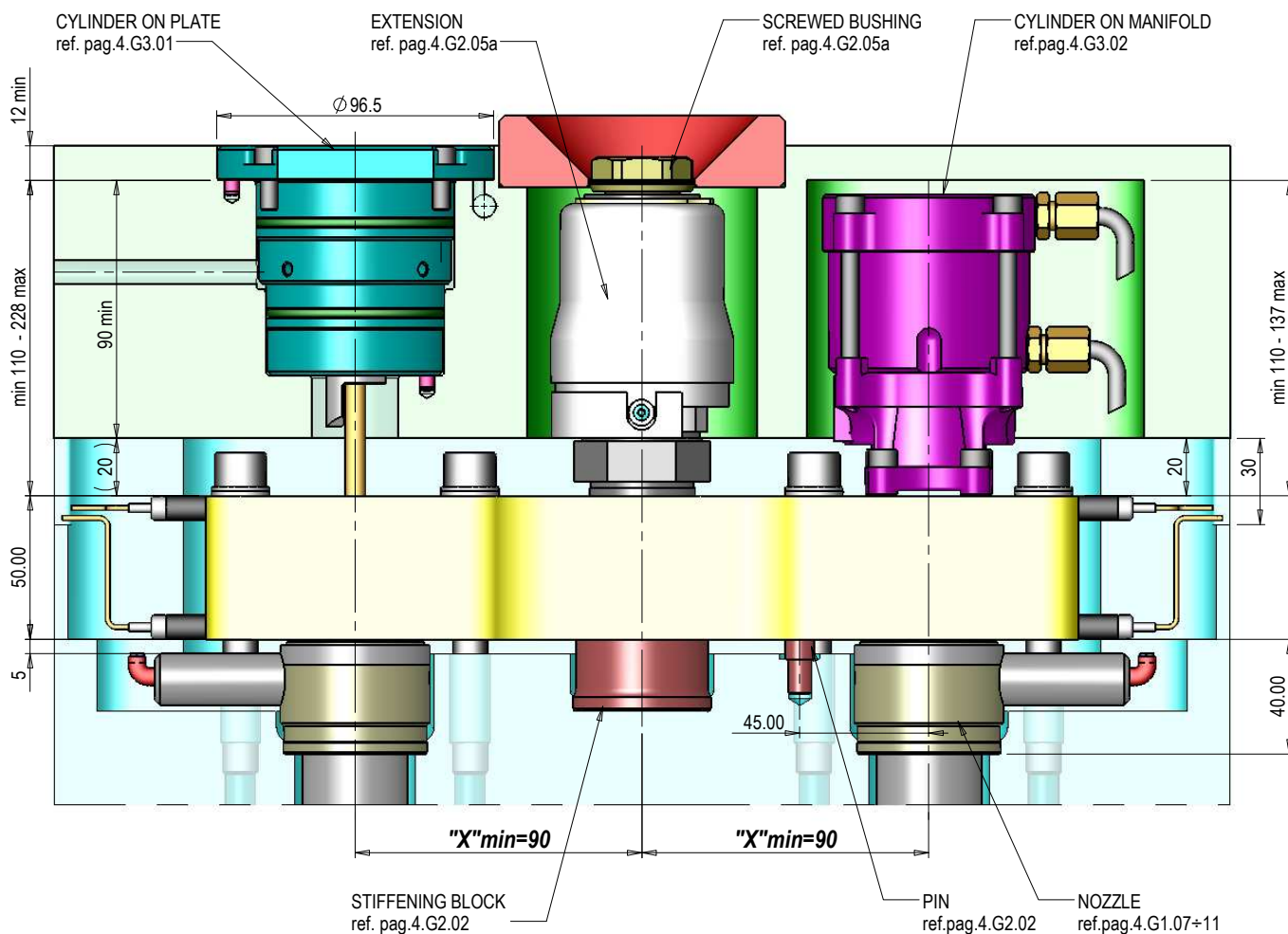


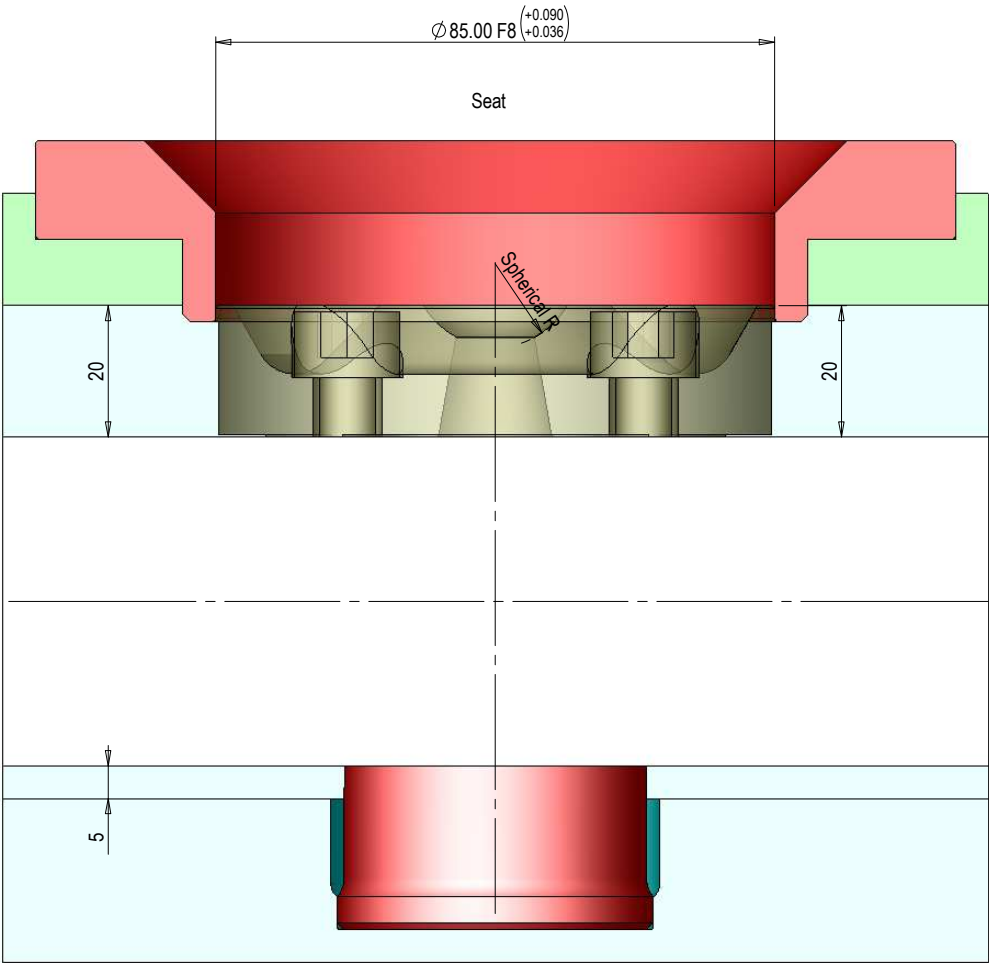
Structure for TORPEDO or FREE FLOW systems



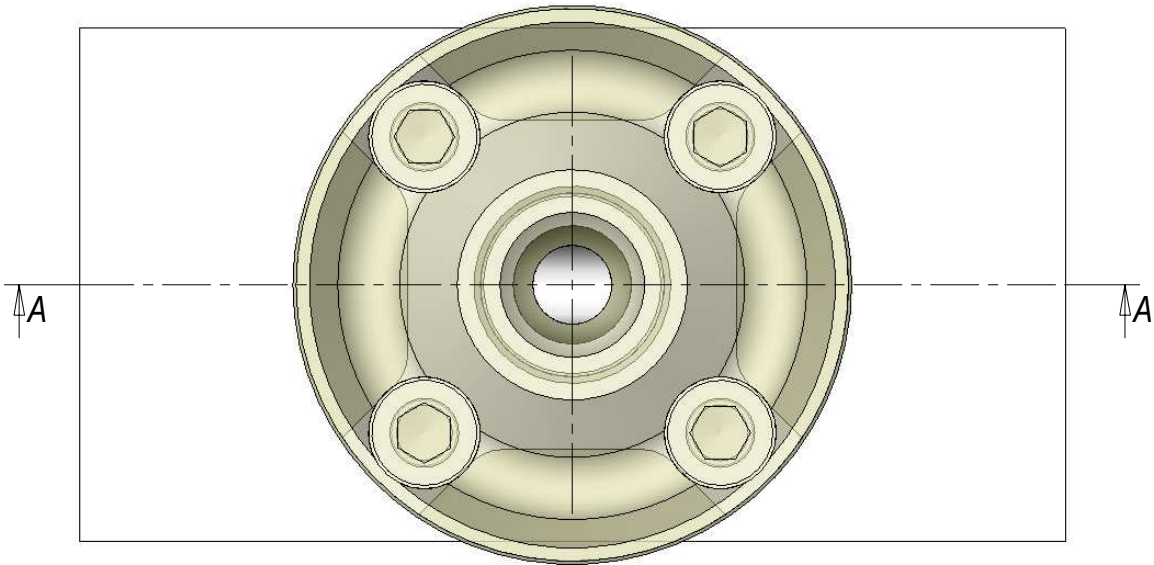
Xmin= min centre distance between injection bushing and nozzle for non standard systems

Structure for VALVE GATING systems

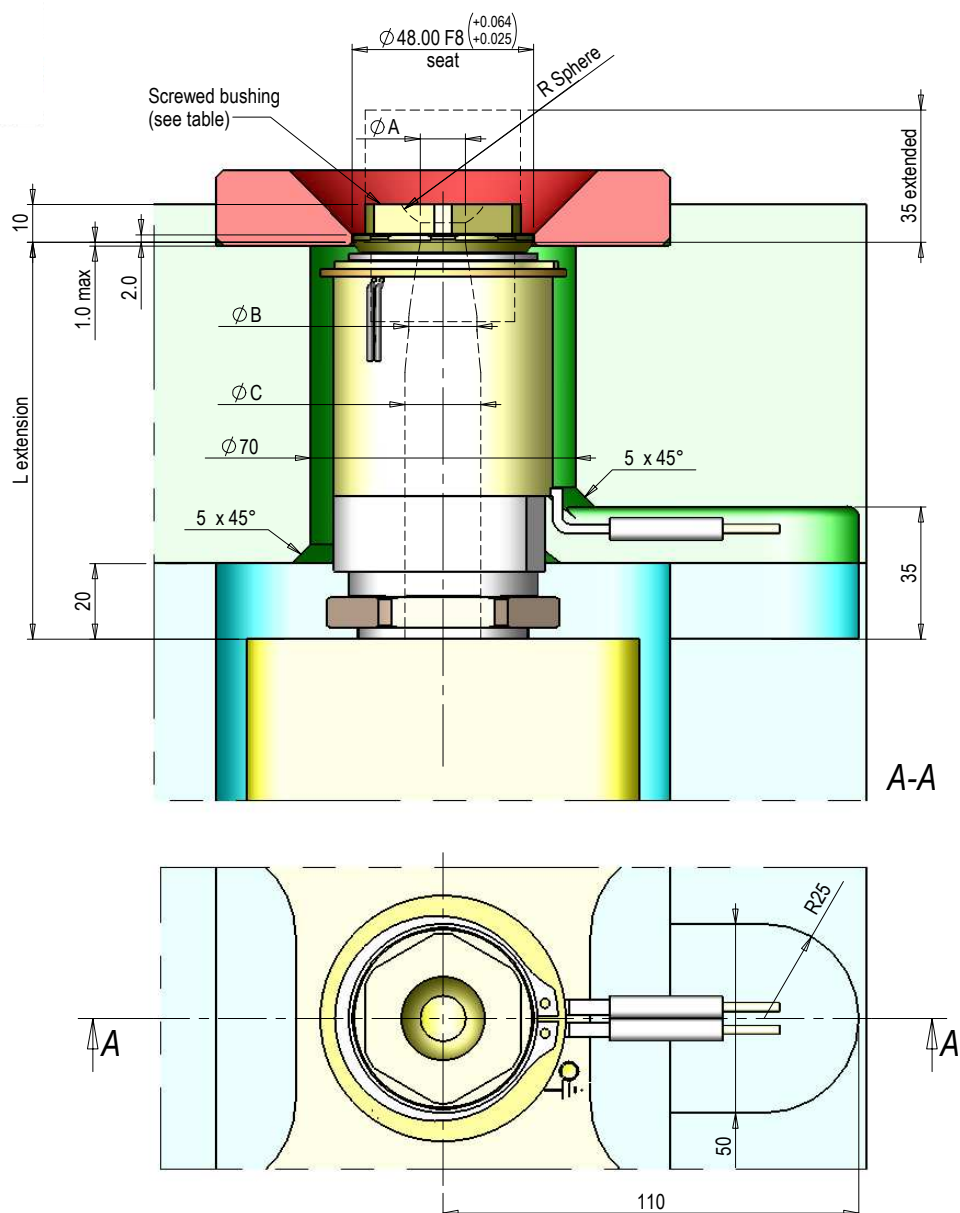
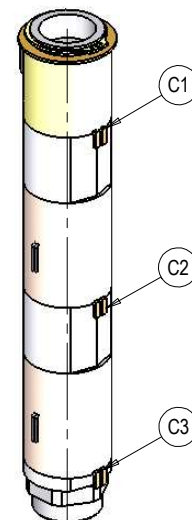




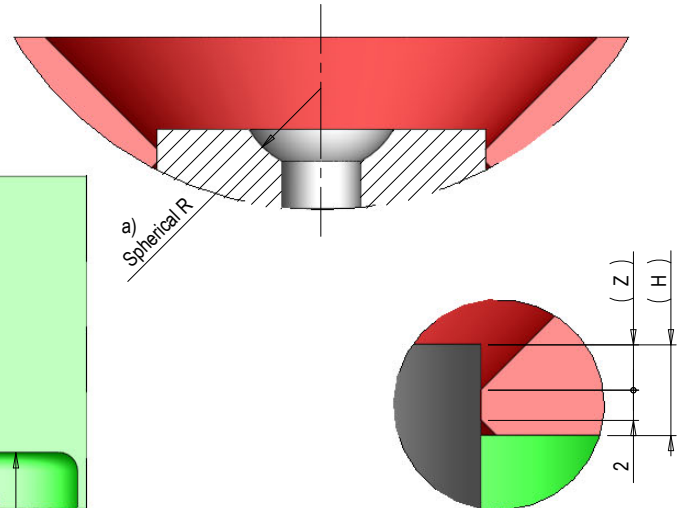
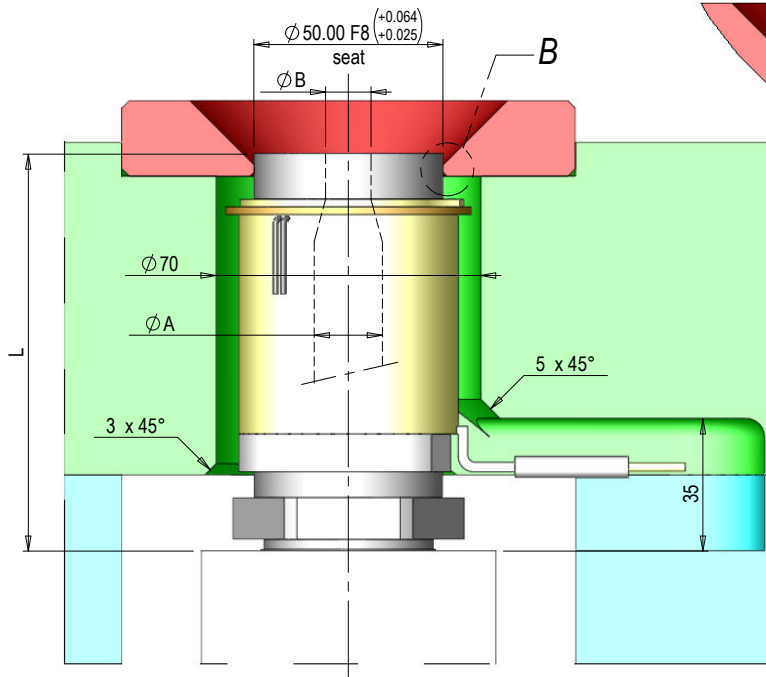
A-A



CODE	SPHERICAL R
0016-00011	R 0
0016-00012	R 12.7
0016-00013	R 15.5
0016-00014	R 19.1
0016-00050	R25
0016-00015	R 40

**Control Zone**

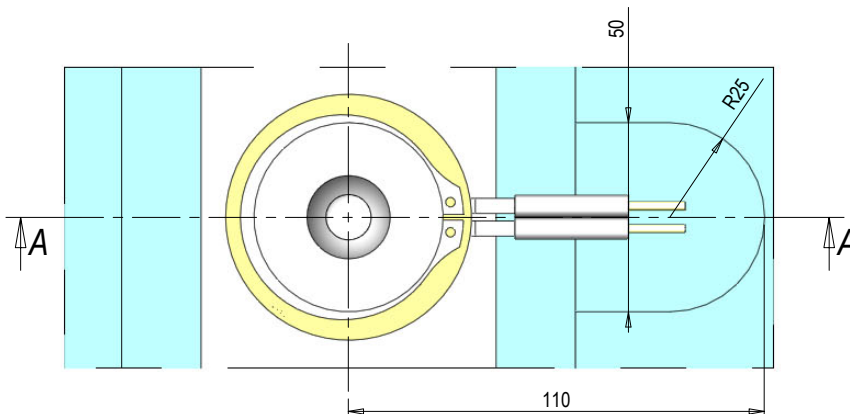
"L " (*)	MAXIMUN N° OF ZONES	STANDARD SCREWED BUSHING CODE	SPHERE RADIUS	ØA	ØB
040.00 ÷ 205.69	1 [C1]	0015-00448	R 0	12	18
205.70 ÷ 356.39	2 [C1 + C2]	0015-00462	R 12.7		
356.40 ÷ 520.00	3 [C1 + C2 + C3]	0015-00463	R 15.5		
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)		0015-00464	R 19.1		
ØB	ØC	0015-00509	R 20		
18	18	0015-00465	R 25		
	20	0015-00466	R40		
	22	Extended 0015-00449 (***)	R 0	4	4
	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)					



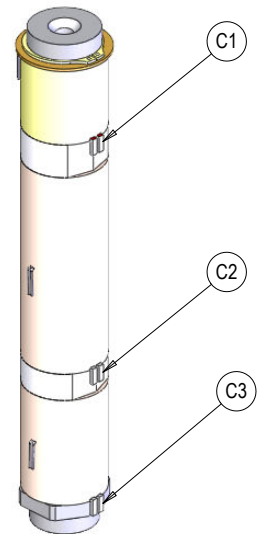
DETAIL B

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

A-A

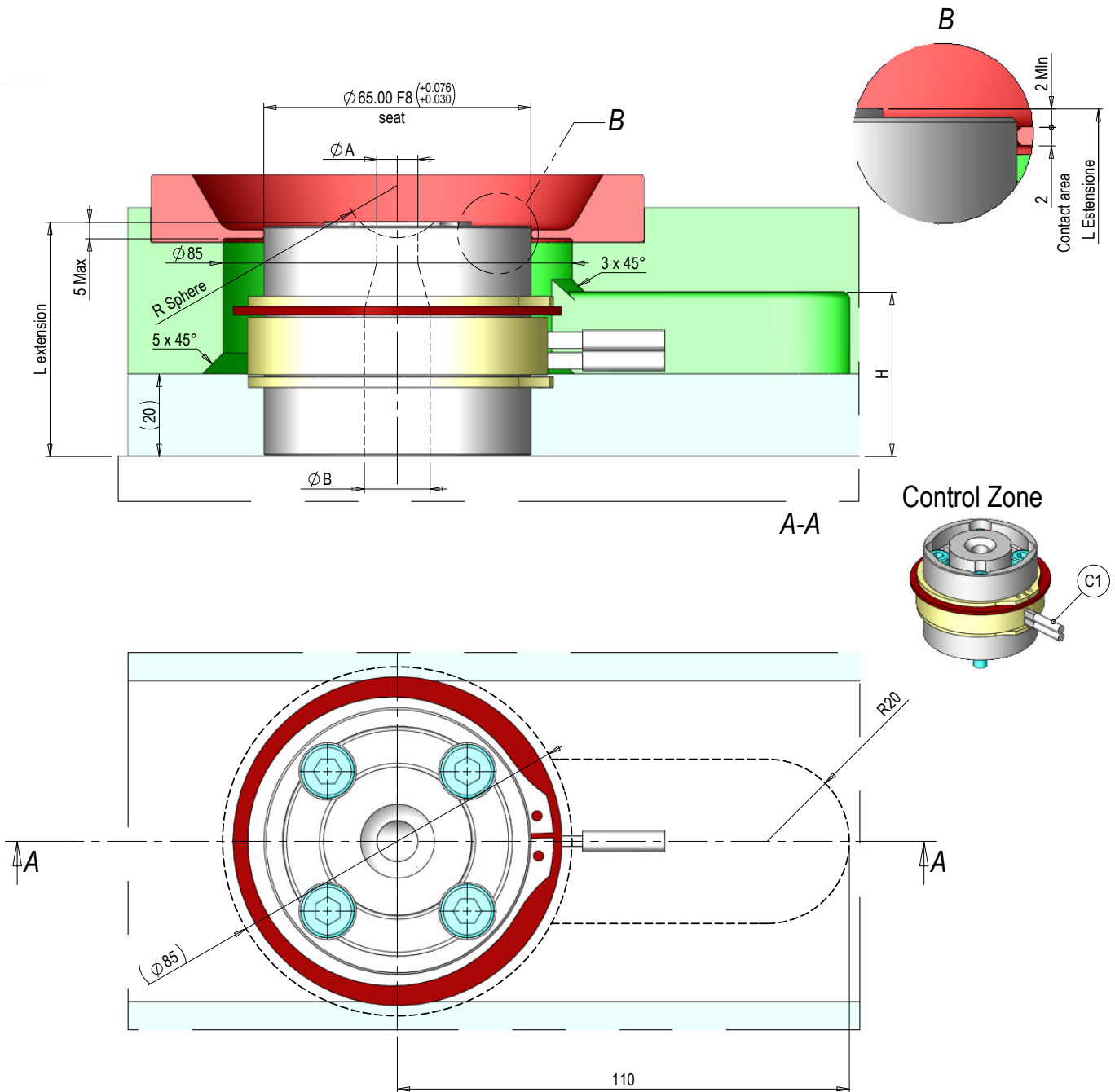


Control Zone



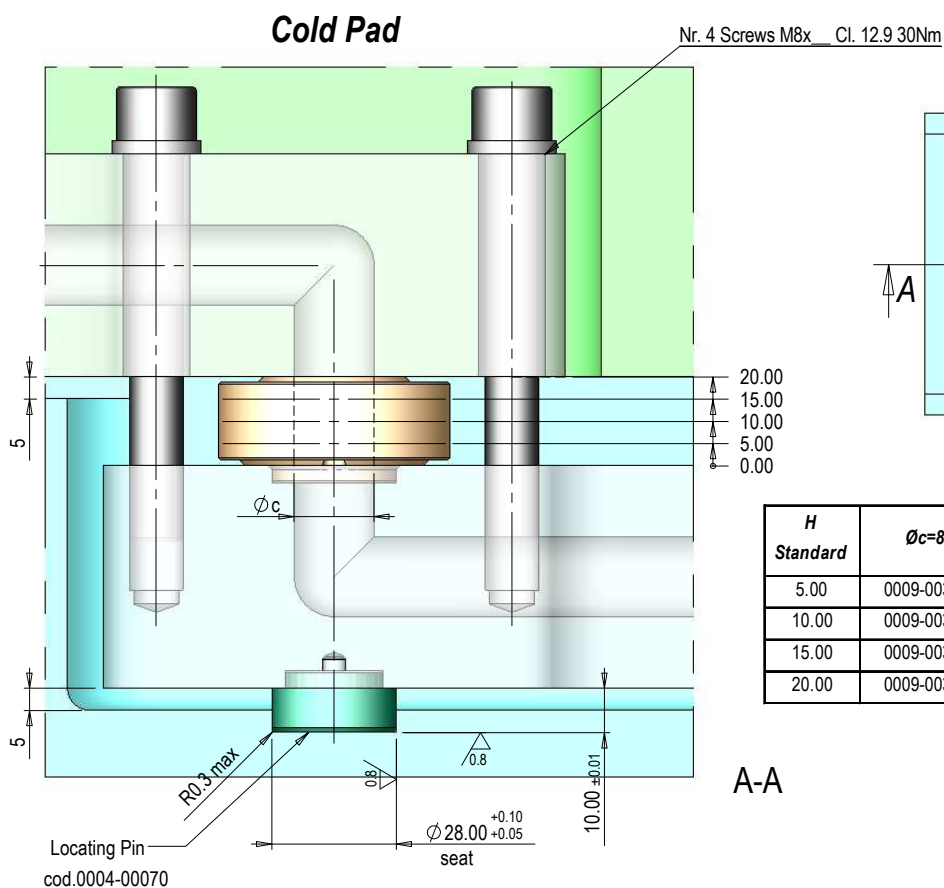
a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

"L" (*)	MAXIMUM 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

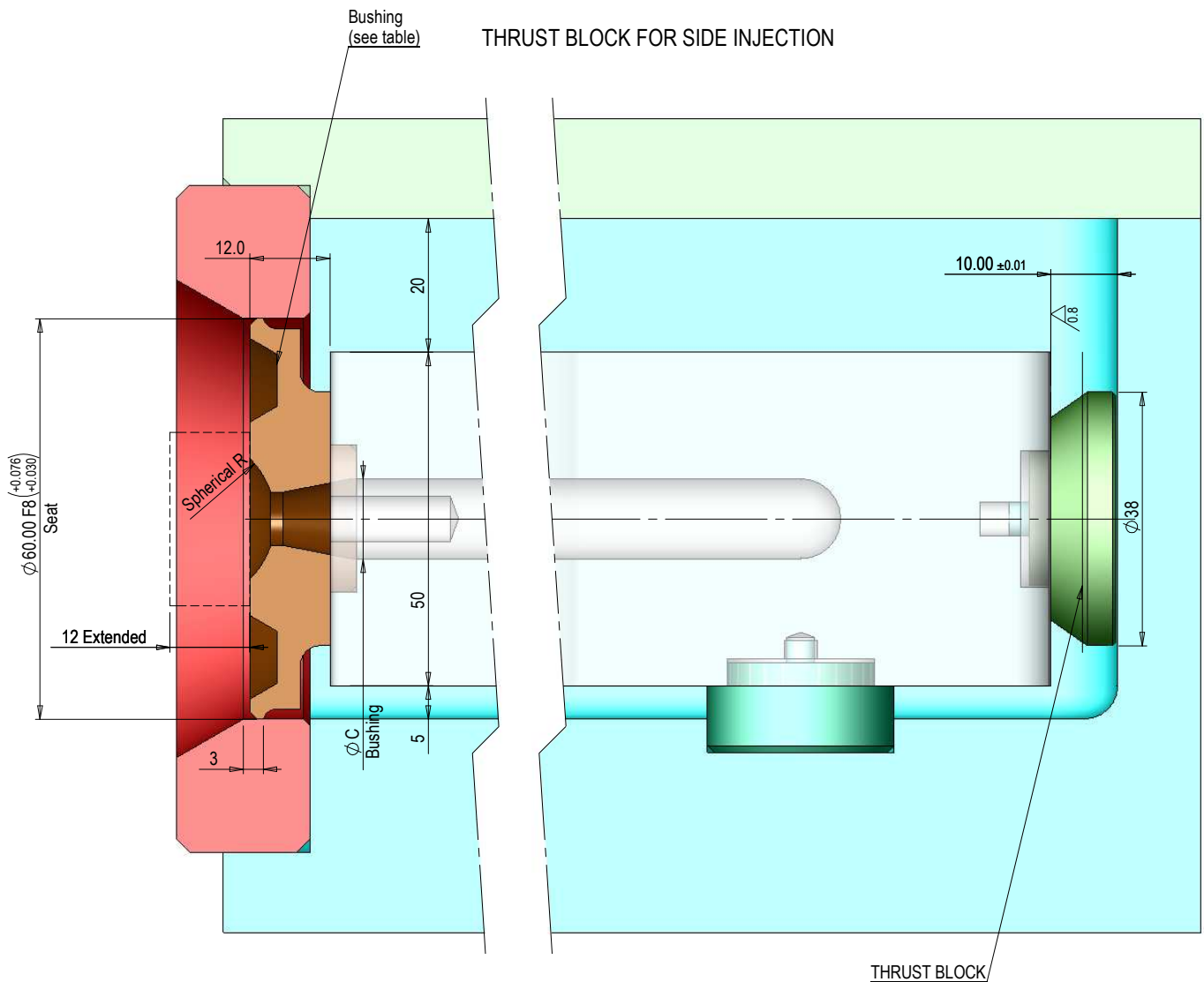


a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

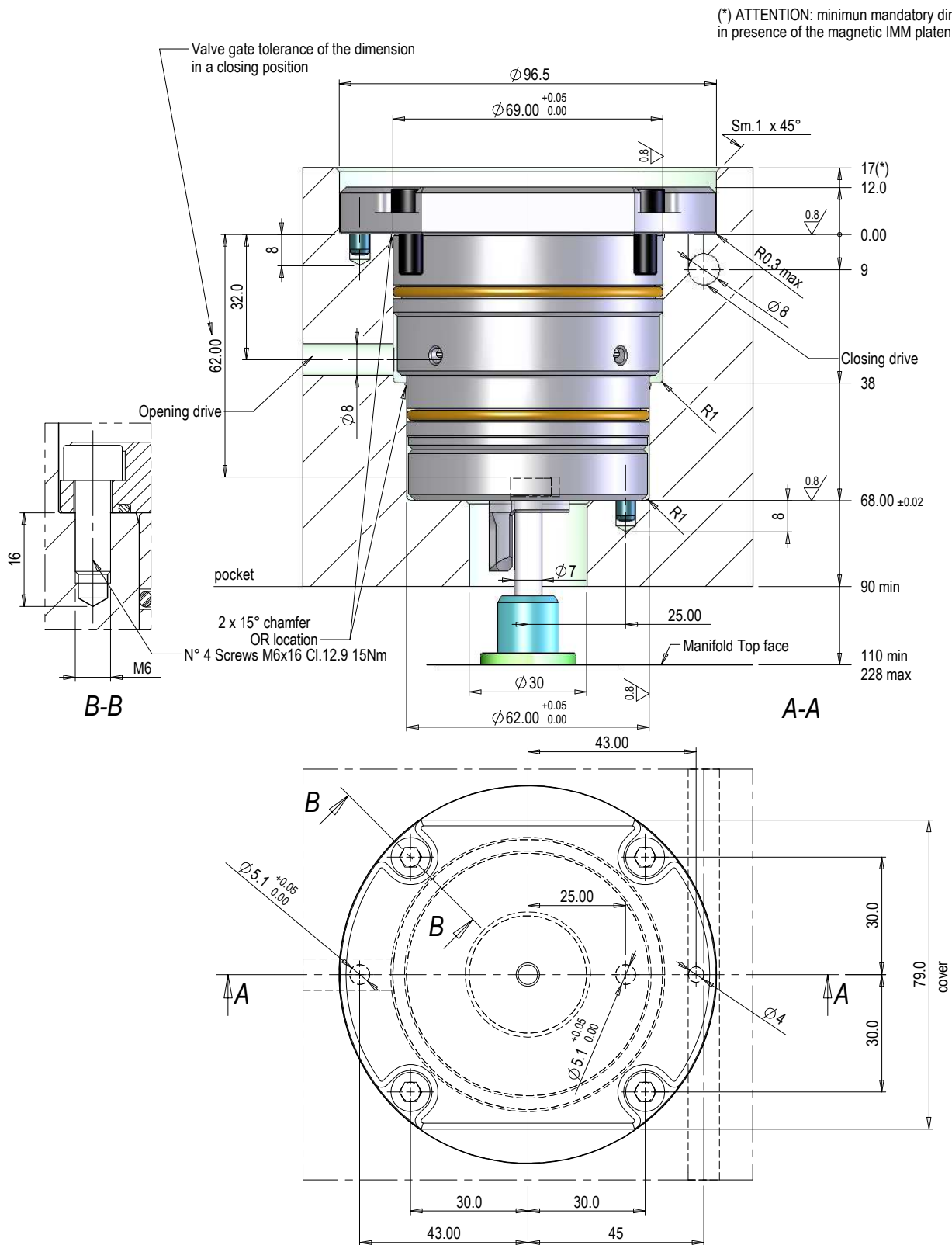
"L" (*)	H	SERIES	STANDARD DIAMETERS OF EXTENSIONS DUCT	
			ØA	ØB
31.50 ÷ 37.00	20	M	8	8
37.01 ÷ 42.00	25		10	8 - 8.5 - 10
42.01 ÷ 47.00	30		12	8 - 10 - 12
47.01 ÷ 52.00	35		14	8 - 8.5 - 10 - 12 - 14
52.01 ÷ 57.00	40	G	16	8 - 10 - 12 - 14 - 16
(*) L = min 31.50 ÷ 57.00 mm max Max n° of zone for all configurations: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



[*] $\phi_c=10-14\text{mm}$ upon request



THRUST BLOCK CODE	BUSHING CODE		SPHERICAL RADIUS
	$\varnothing c = 18$	$\varnothing c = 20$	
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



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

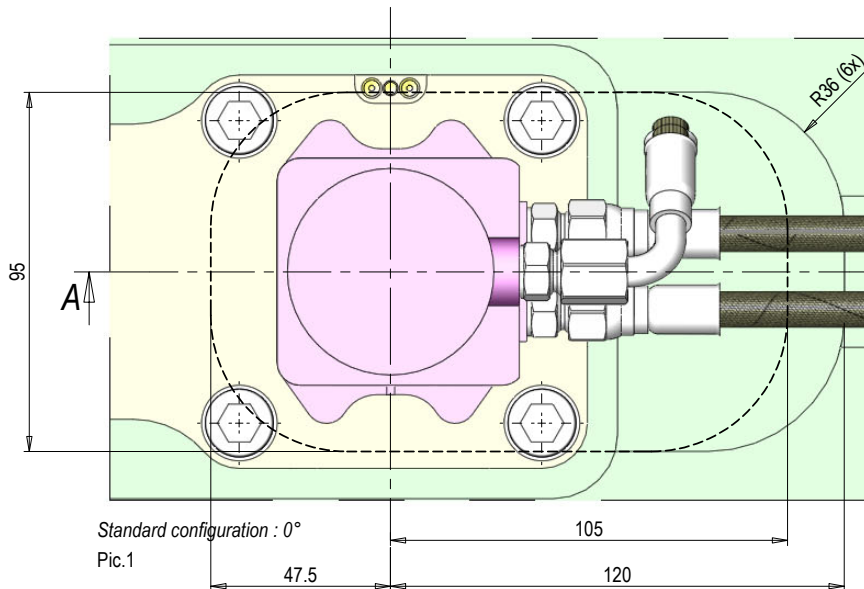
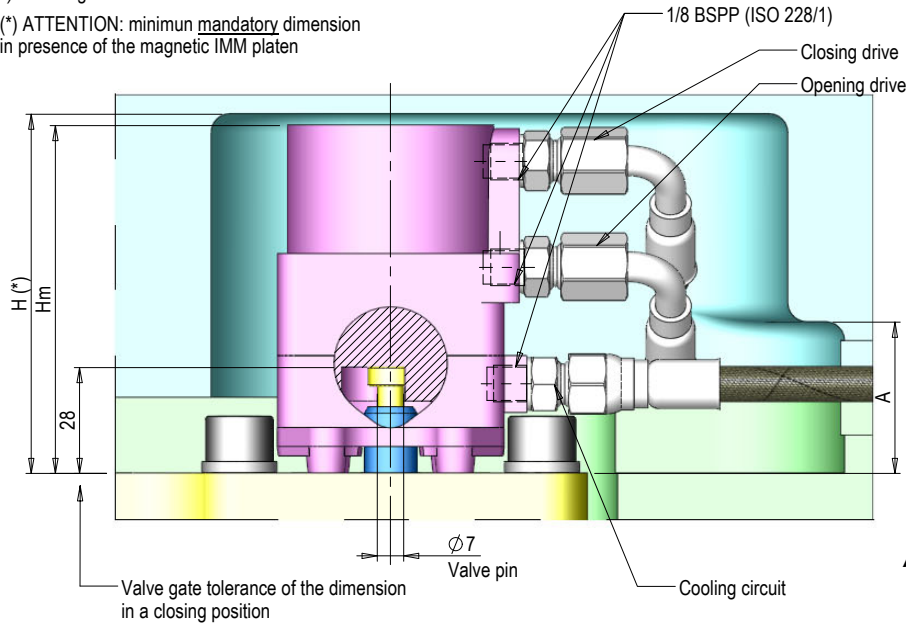
CODE	BORE	STROKE	WORKING		COMPLETE GASKET SET
0017-00078	62	18	AIR	$P_{min} = 6 \text{ BAR}$	0038-00010
0017-00079	42	18	OIL	$P_{max} = 80 \text{ BAR}$	0038-00067

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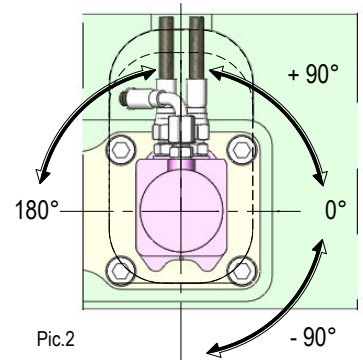
Hydraulic Cylinder: bore 42 mm - stroke 12 or 18 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

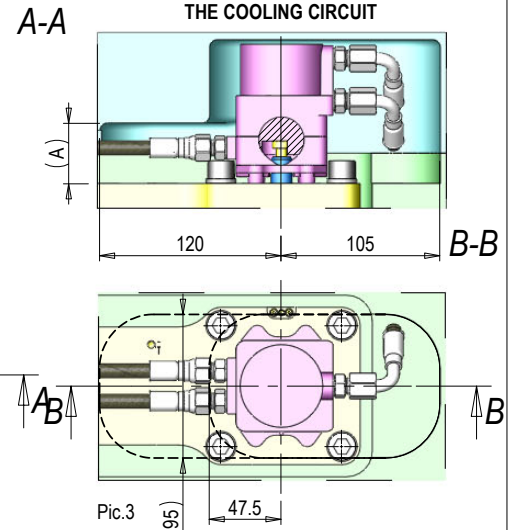
(*) ATTENTION: minimum mandatory dimension in presence of the magnetic IMM platen



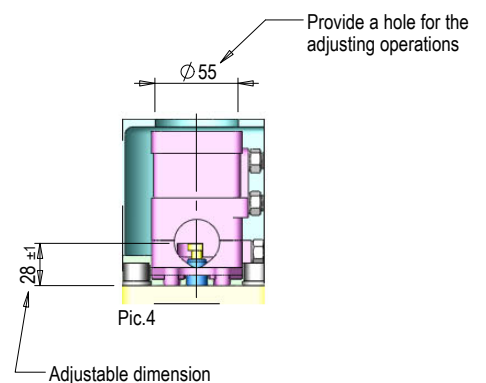
b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



ADJUSTABLE CYLINDER



CODE	CODE	VERSION	COMPLETE GASKET SET	Hm	H	Hm	H	A
stroke=18	stroke=12			stroke=18	stroke=12			
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

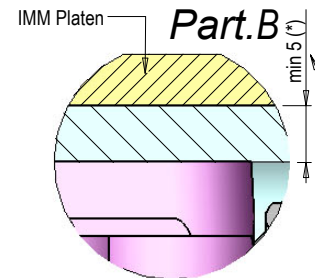
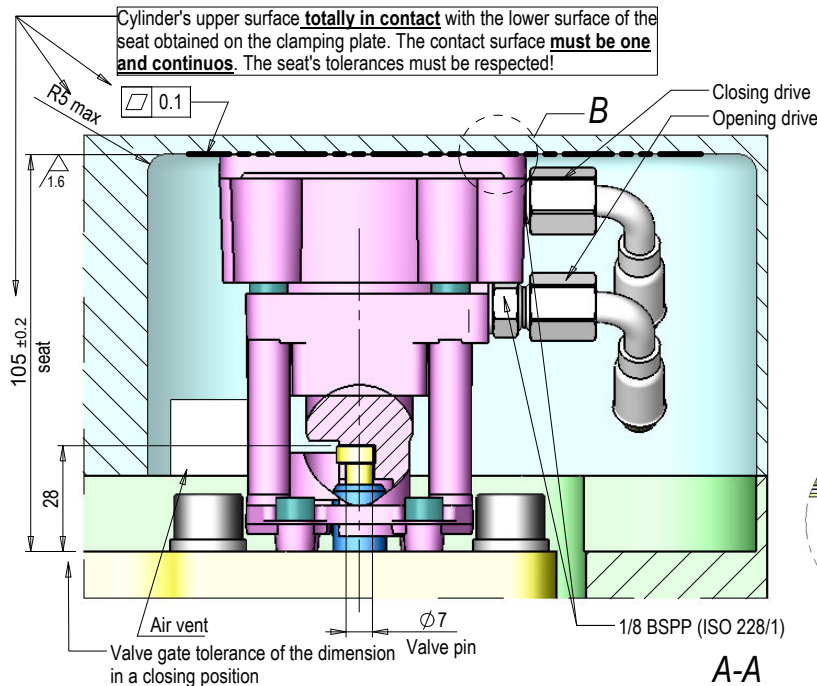
During the shutdown phase of the HRS system, the cooling circuit of the cylinder can be shut off at the same time as the mold/hot runner systems shut down for working temperatures up to:
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system
Therefore, the HRS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

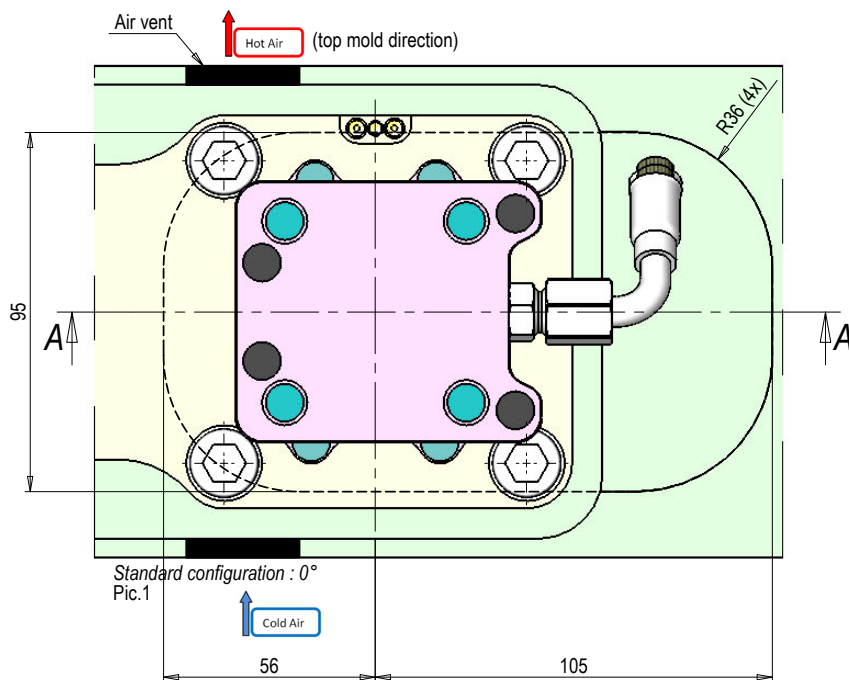
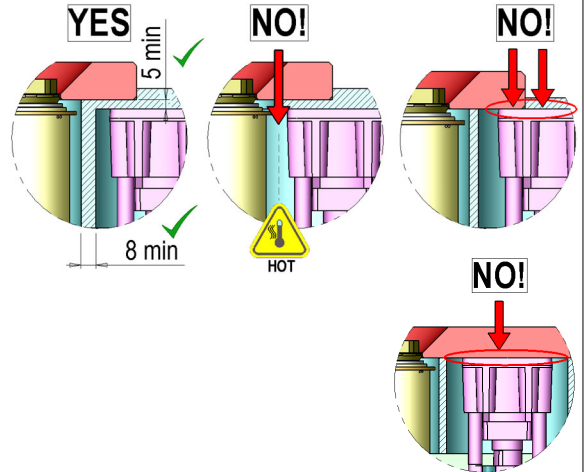
- a) The working pressure below is only for reference: for the correct choice of maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1;

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



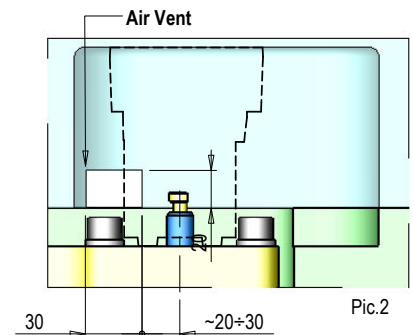
(*) ATTENTION: 5 mm minimum mandatory dimension. In presence of the magnetic IMM Platen increase dimension to "minimum 30 mm".

WARNINGS FOR THE SEAT CONSTRUCTION

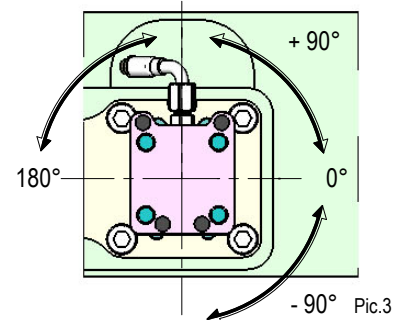


a) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1

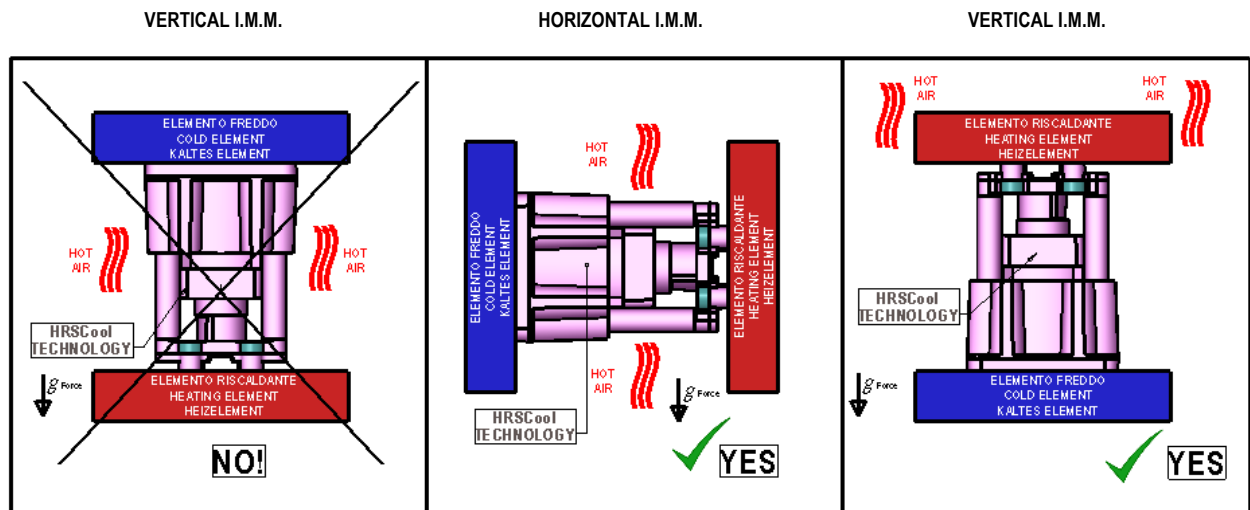
CODE	CODE	VERSION	COMPLETE GASKET SET	H	H
stroke = 18	stroke = 12			stroke = 18	stroke = 12
0017-00544	0017-00880A	(standard)	0038-00102	105	99
0017-00545	0017-00885A	DAMPENED	0038-00103		



a) POSSIBLE ORIENTATIONS OF THE COUPLINGS



follow
➔



Pic.4

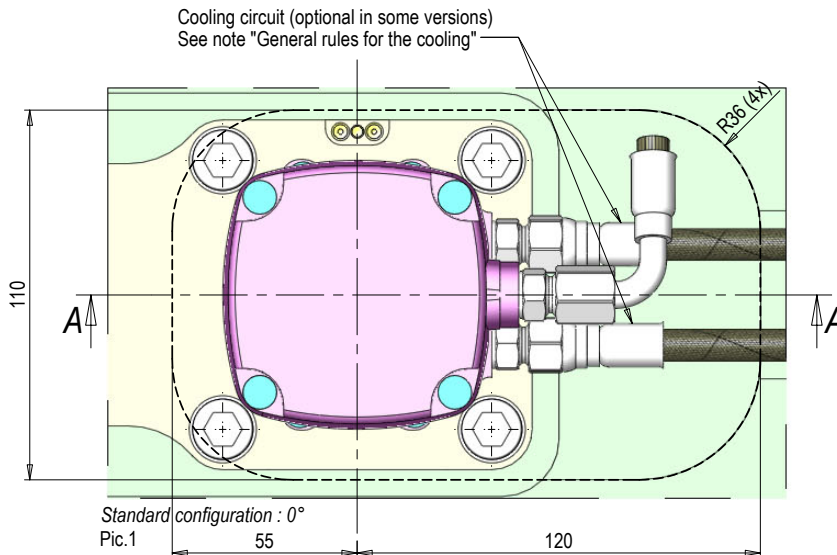
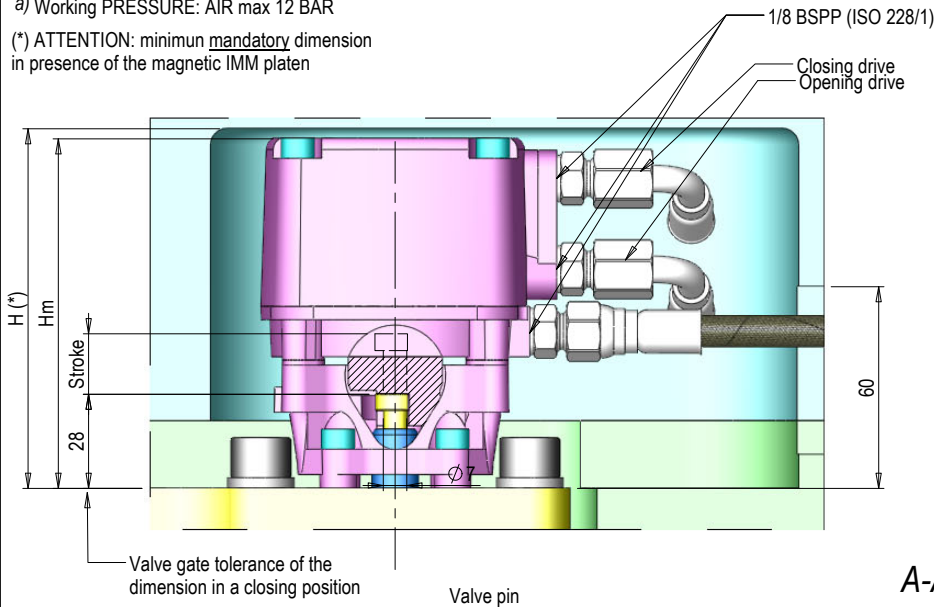
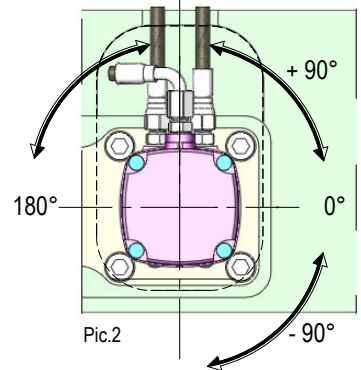
System requirements ():**

- 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.

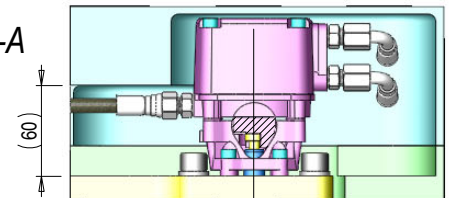
() ATTENTION: in particular conditions of the system, the seat of the cylinder "HRS COOL" might be modified. In this case the HRS Technical Office will provide the necessary documentation.**

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

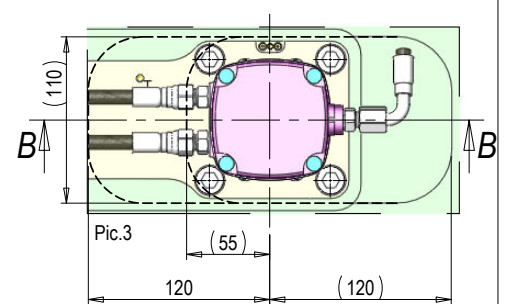
a) Working PRESSURE: AIR max 12 BAR

(*) ATTENTION: minimum mandatory dimension
in presence of the magnetic IMM platenb) POSSIBLE ORIENTATIONS OF
THE COUPLINGSALTERNATIVE POSITIONS OF
THE COOLING CIRCUIT

A-A



B-B



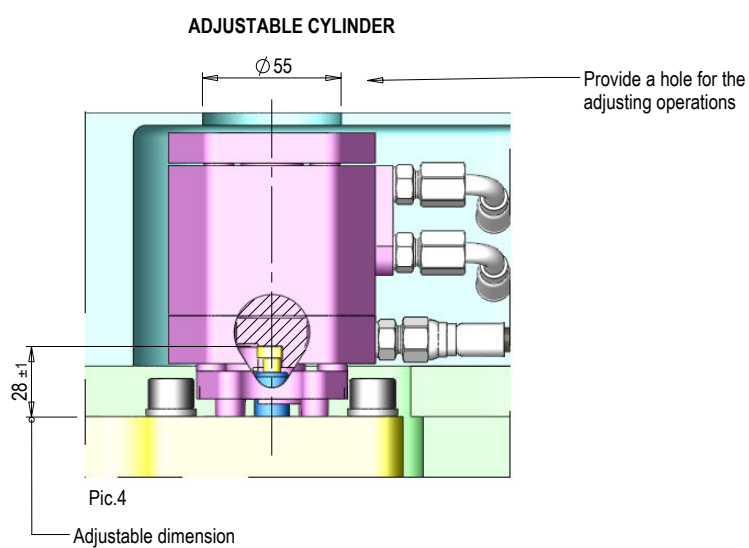
CODE	CODE	VERSION	COOLED	DAMPENED	COMPLETE GASKET SET	Hm	H	Hm	H
Stroke = 18 mm	Stroke = 12 mm					Stroke = 18 mm		Stroke = 12 mm	
0017-00916	0017-00940	(standard)	✓	✗	0038-00133	104	107	98	101
0017-00917	0017-00941		✗	✗					
0017-00919	0017-00943		✓	✓	0038-00134				
0017-00920	0017-00944		✗	✓					
0017-00922	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	-		✗	✗					

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.

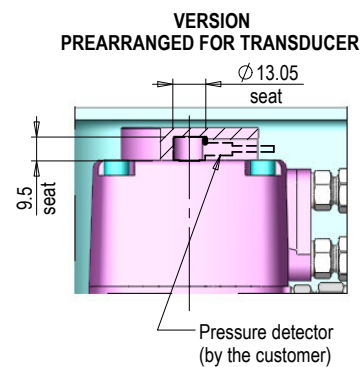
T1 (°C) = Maximum Molding temperature
of polymer
T2 (°C) = Maximum Mold temperature

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



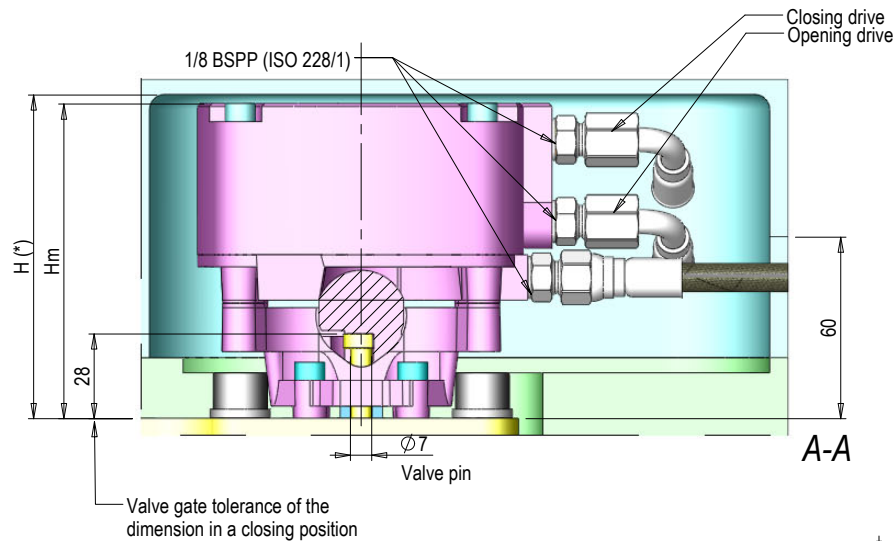
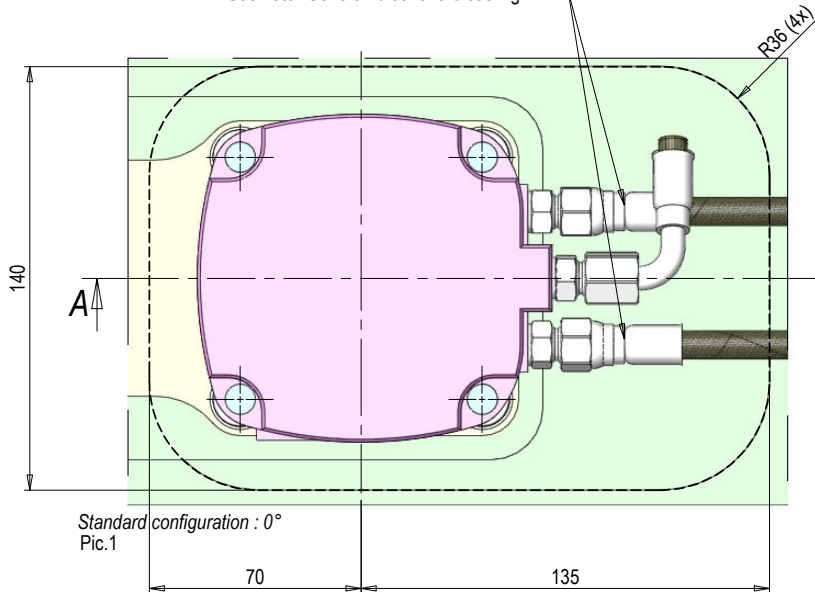
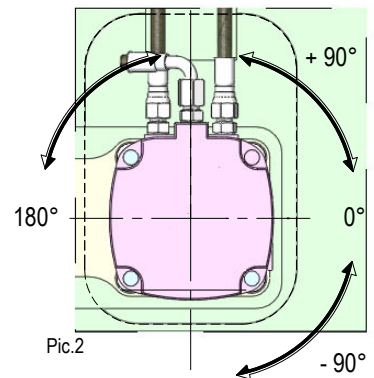
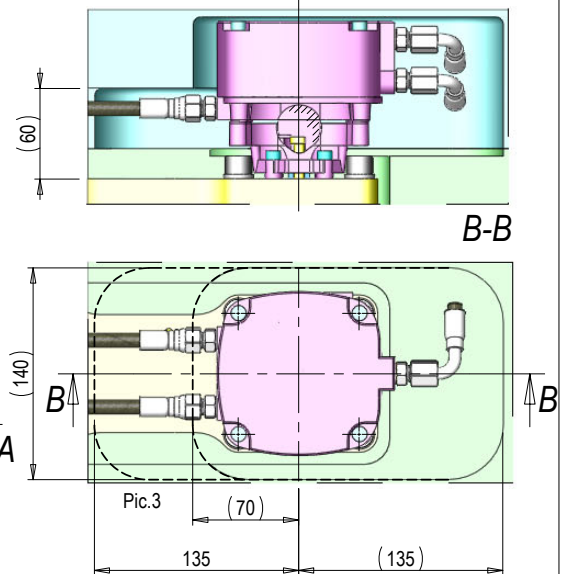
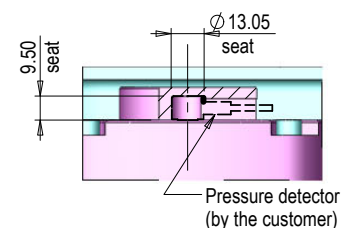
NOTE FOR THE ADJUSTABLE CYLINDER

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.



Pneumatic Cylinder: bore 100 mm - stroke 18 mm

a) Working PRESSURE: AIR max 12 BAR

(*) ATTENTION: minimum mandatory dimension
in presence of the magnetic IMM platenCooling circuit (optional in some versions)
See note "General rules for the cooling"b) POSSIBLE ORIENTATIONS OF
THE COUPLINGSALTERNATIVE POSITIONS OF
THE COOLING CIRCUITVERSION
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

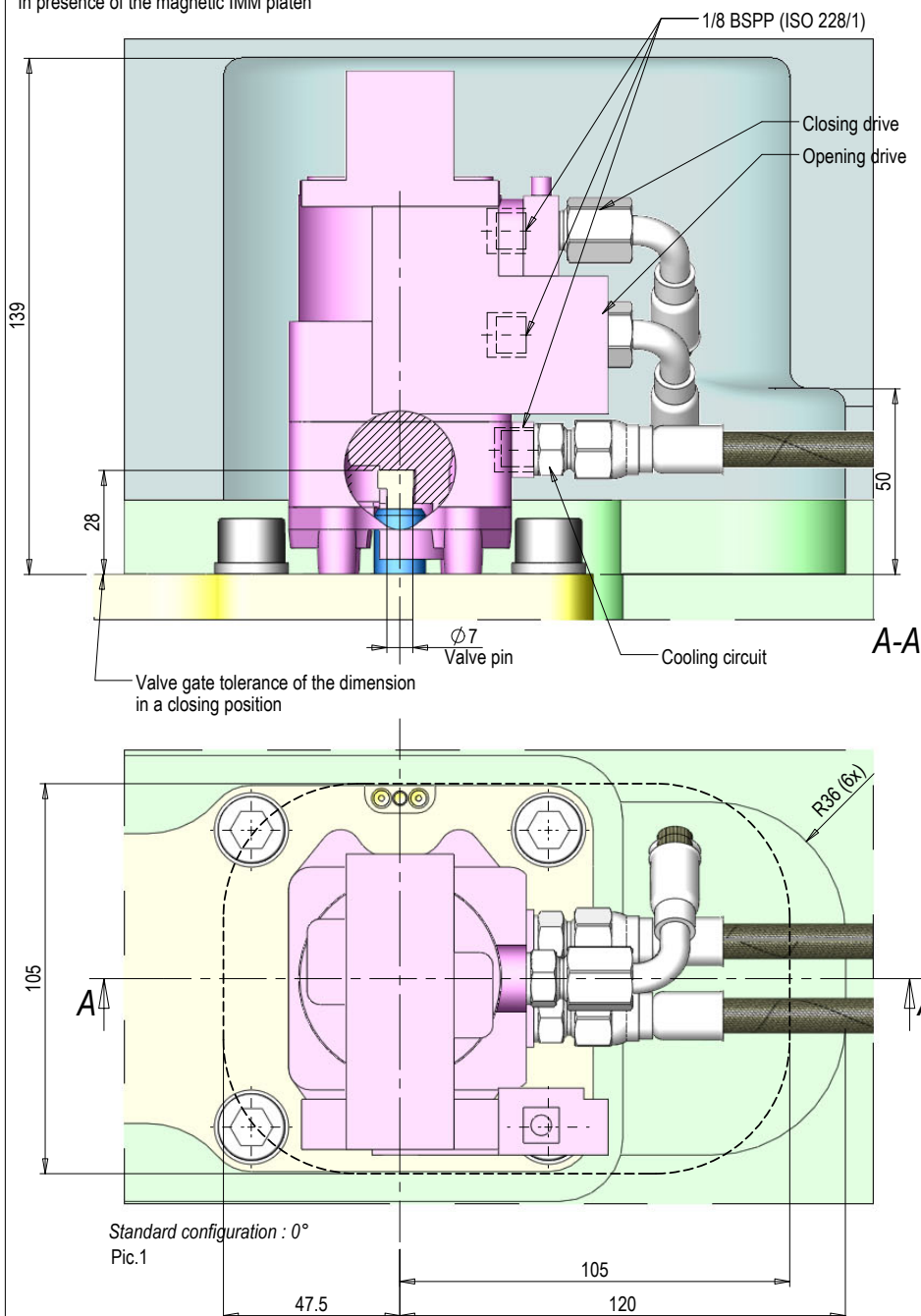
- Versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of T1 ≤ 280°C [536°F] and T2 ≤ 80°C [176°F]
 - Versions with end of stroke: cooling ALWAYS MANDATORY with T1 ≥ 200°C [392°F].
 - During the shutdown phase of the HRS system, the cooling circuit of the cylinder can 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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
- b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1.

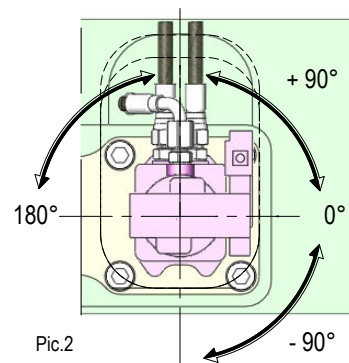
Hydraulic Cylinder: bore 42 mm - stroke 18 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

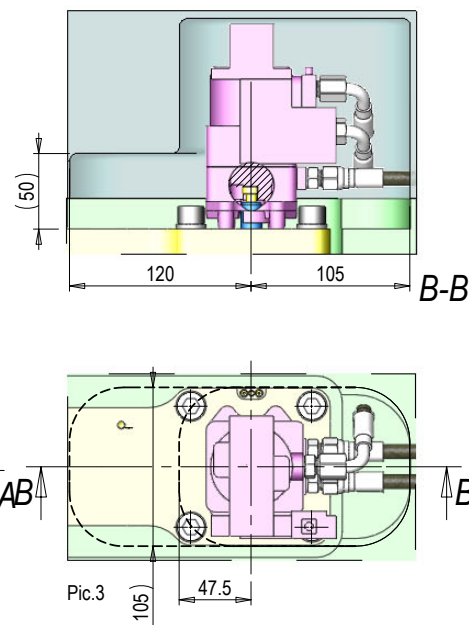
(*) ATTENTION: minimum mandatory dimension
in presence of the magnetic IMM platen



b) POSSIBLE ORIENTATIONS OF
THE COUPLINGS



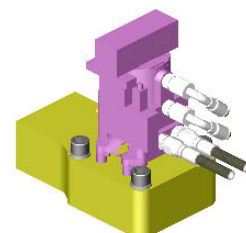
ALTERNATIVE POSITIONS OF
THE COOLING CIRCUIT



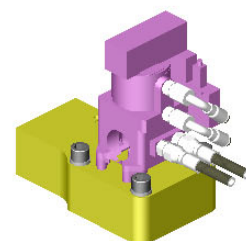
CODE	VERSION	COMPLETE
0017-01099	LEFT SENSOR VERSION	0038-00107
0017-01101	WITH DOUBLE END OF STROKE	
0017-01103	RIGHT SENSOR VERSION	
0017-01105	WITH DOUBLE END OF STROKE	

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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1.



LEFT SENSOR VERSION

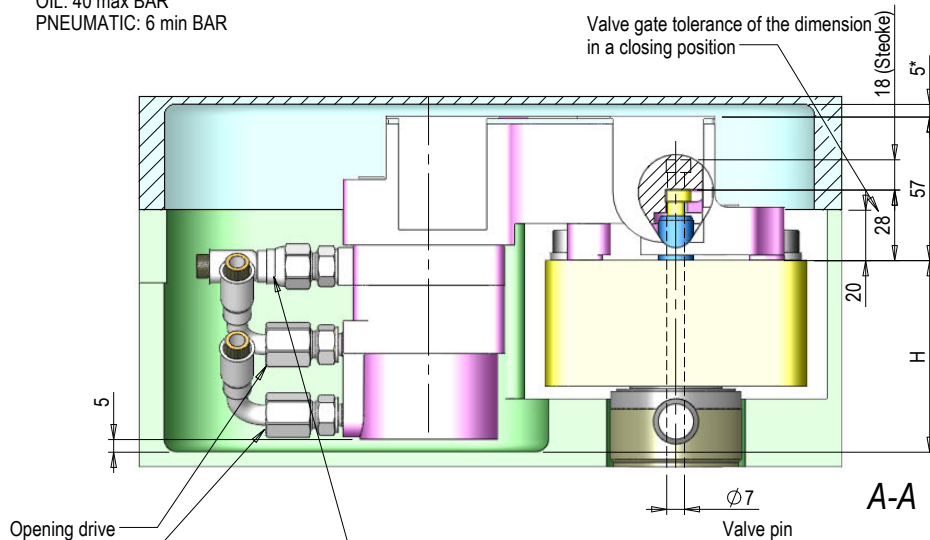


RIGHT SENSOR VERSION

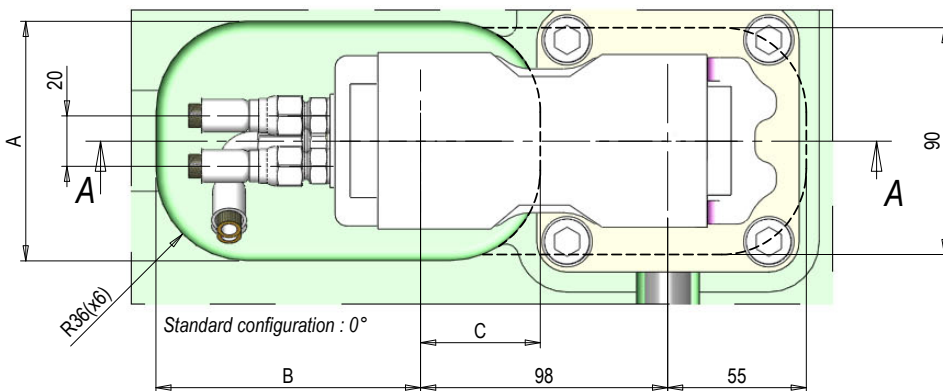
Oil cylinder: bore 42 mm - stroke 18 mm
Air cylinder: bore 70 mm - stroke 18 mm

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

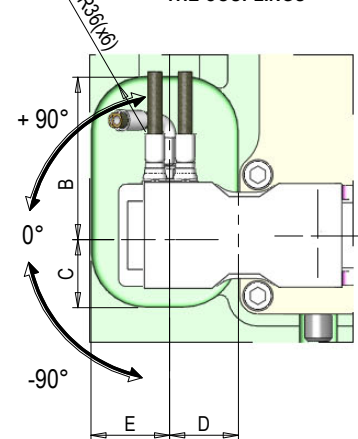
a) Working PRESSURE:
OIL: 40 max BAR
PNEUMATIC: 6 min BAR



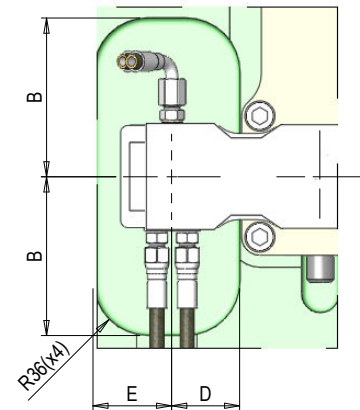
Opening drive
Closing drive
Cooling circuit (optional in some versions)
See note "General rules for the cooling"



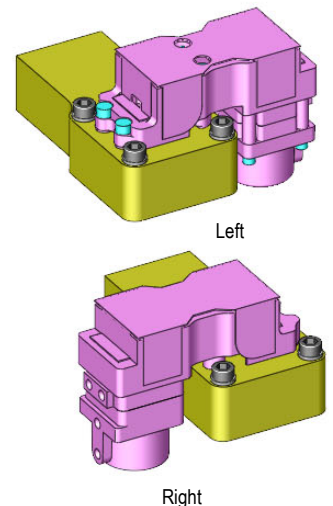
b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



POSSIBLE ORIENTATIONS CYLINDER ON MANIFOLD



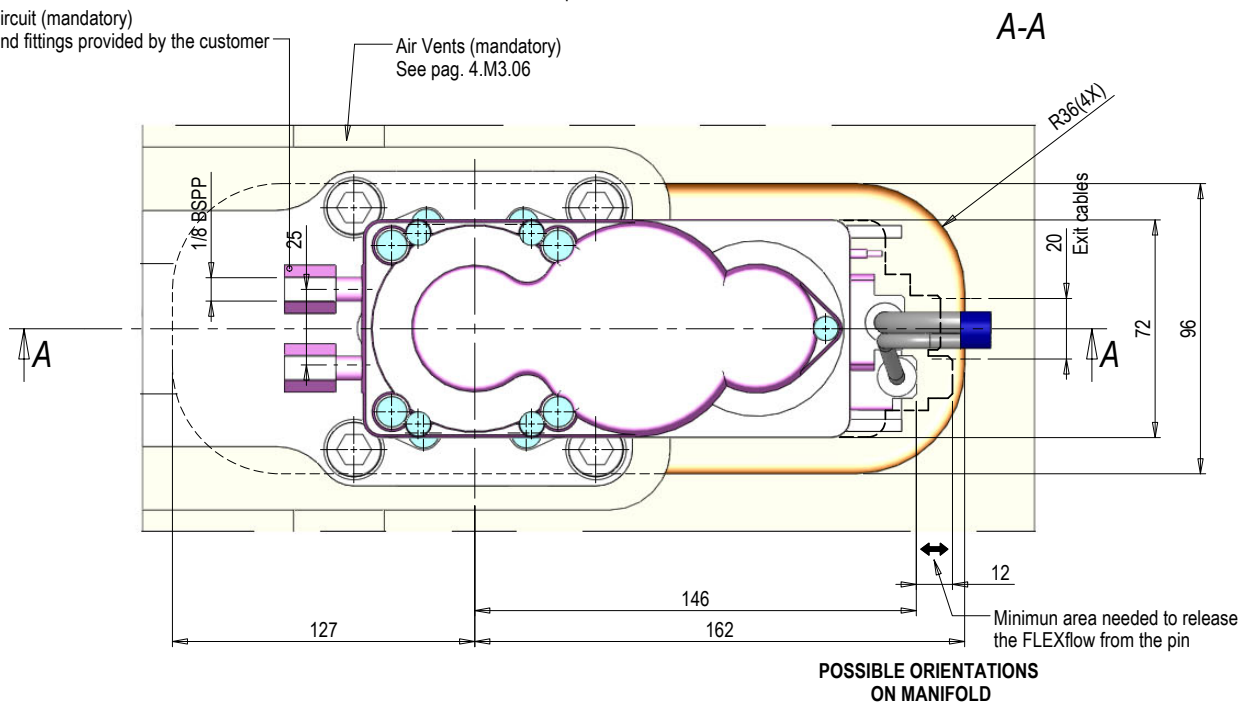
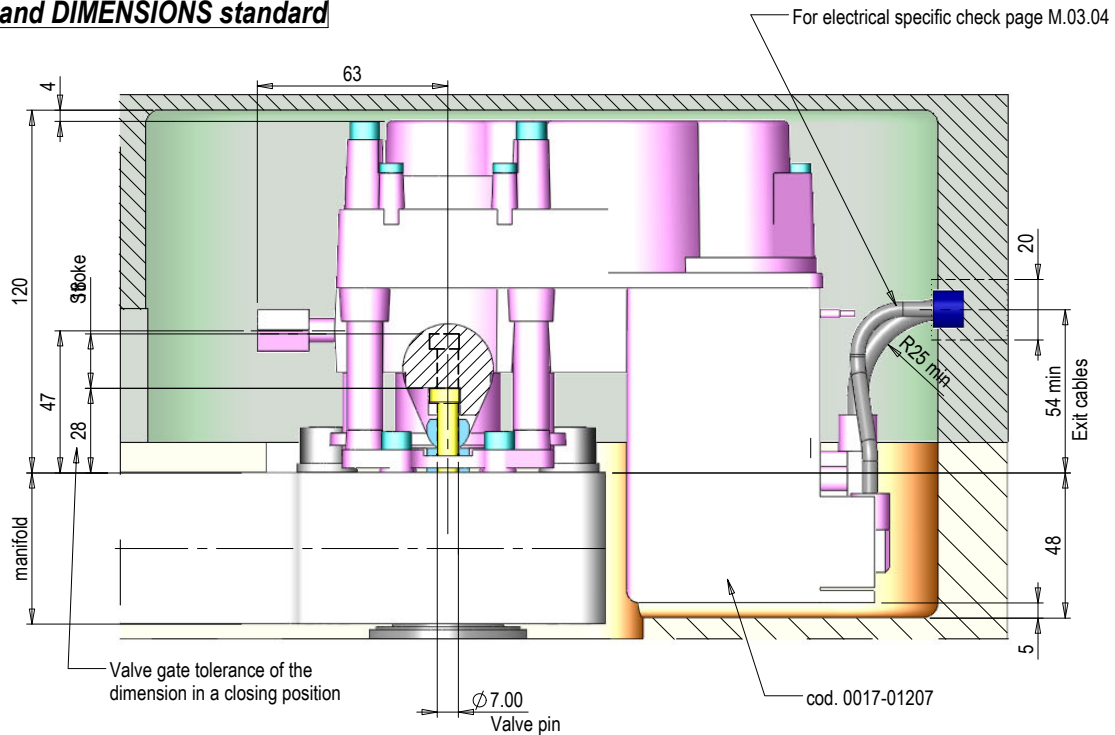
CODE	WORKING	DESCRIPTION	COOLED	COMPLETE GASKET SET	SEAT					
					A	B	C	D	E	H
0017-01147	OIL	(standard)	✓	0038-00102	95	105	47.5	45	52	76
0017-01148		WITH 1 END OF STROKE	✓	0038-00107						96
0017-01149		WITH DOUBLE END OF STROKE	✓							101
0017-00847	AIR	(standard)	✓	0038-00133	110	120	55	55	55	65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

GENERAL RULES FOR THE COOLING

- Pneumatic versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of $T_1 \leq 280^\circ\text{C}$ [536°F] and $T_2 \leq 80^\circ\text{C}$ [176°F]
 - Versions with end of stroke: cooling ALWAYS MANDATORY with $T_1 \geq 200^\circ\text{C}$ [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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1.

POCKET and DIMENSIONS standard



General rules for the cooling of the FLEXflow on manifold

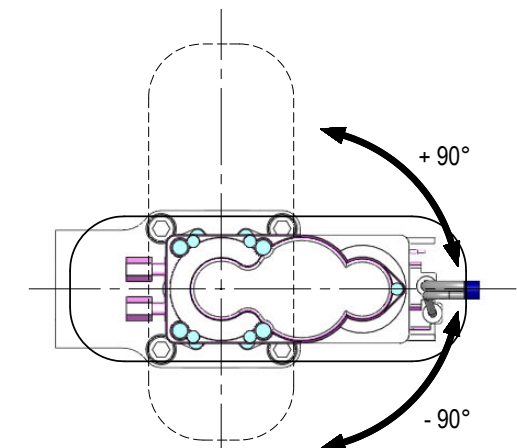
T1 (°C) = Max molding temperature of polymer
Tc (°C) = Coolant temperature

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

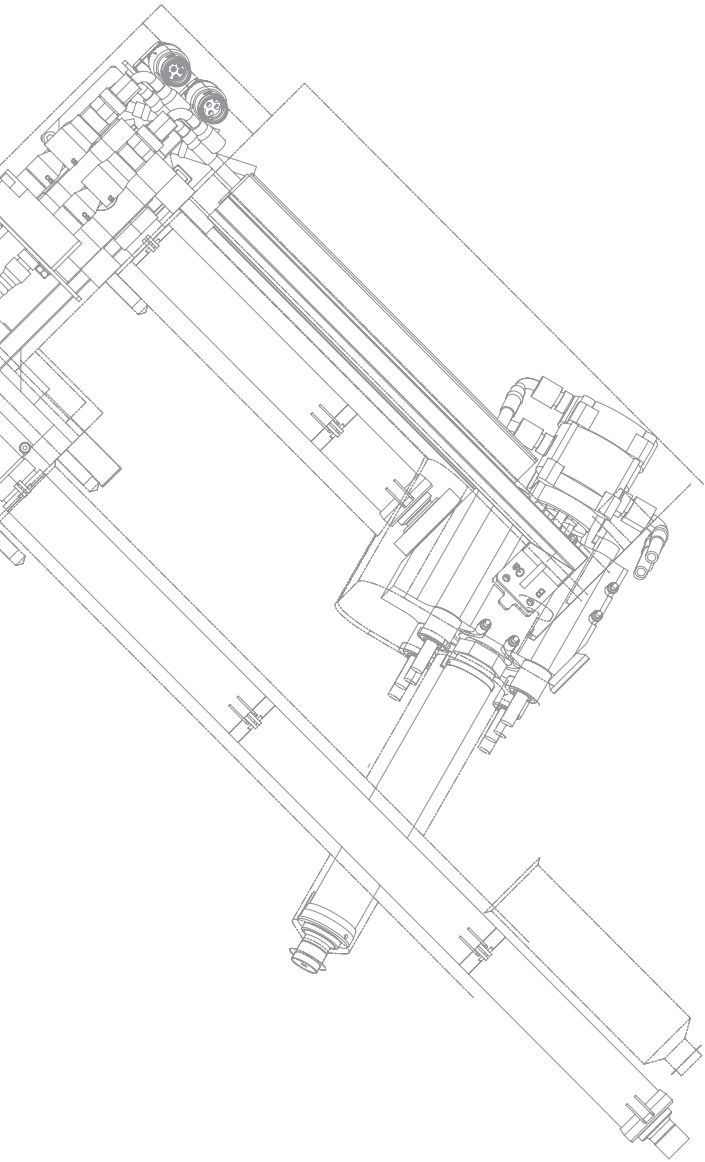
n°3 ==> T1 ≤ 270°C [518°F]
n°2 ==> [518°F] 270°C < T1 ≤ 300°C [572°F]
n°1 ==> [572°F] 300°C < T1 ≤ 320°C [608°F]

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

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



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



Mh series 10÷265 cm³/s

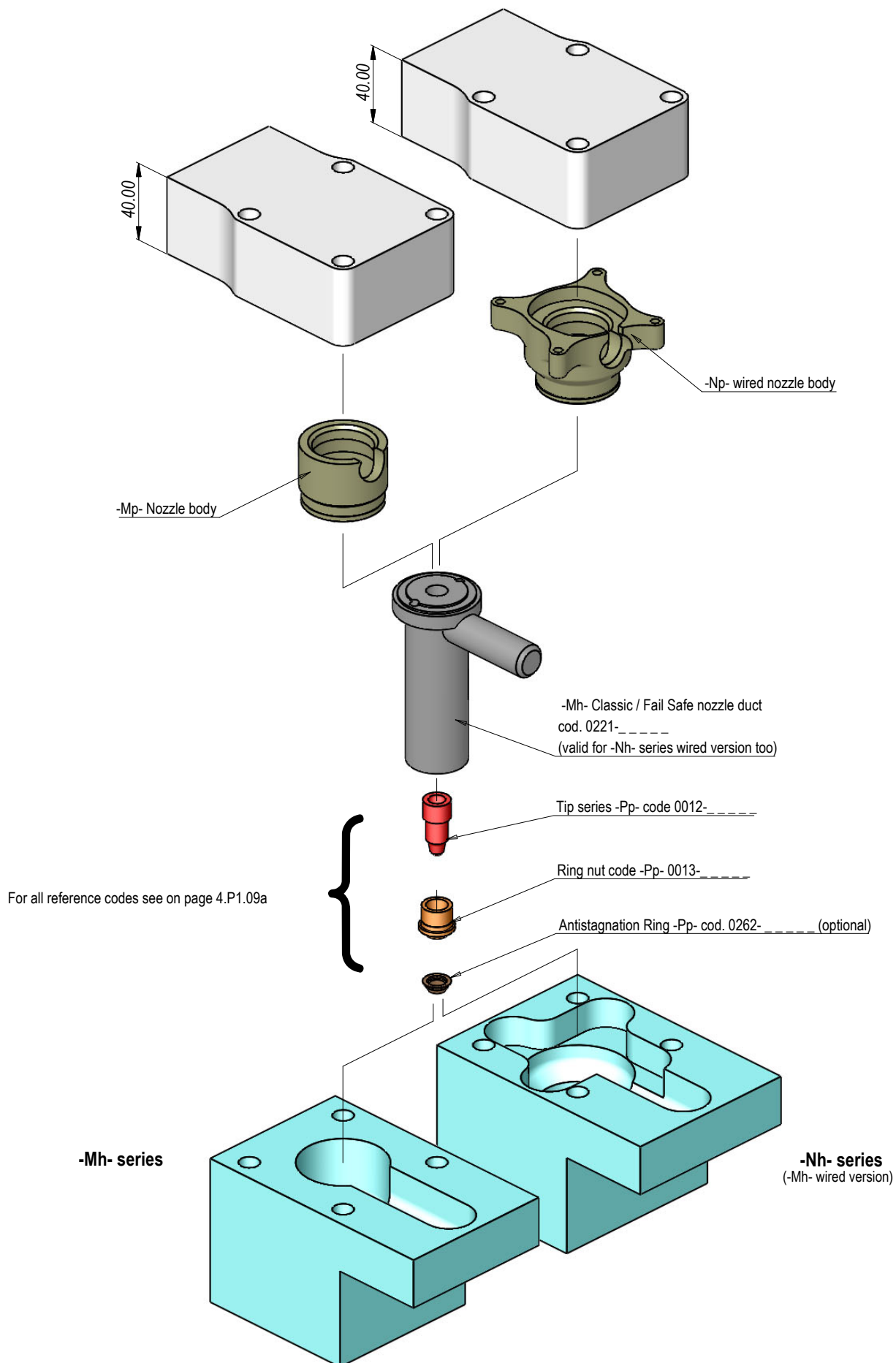
Serie Mh

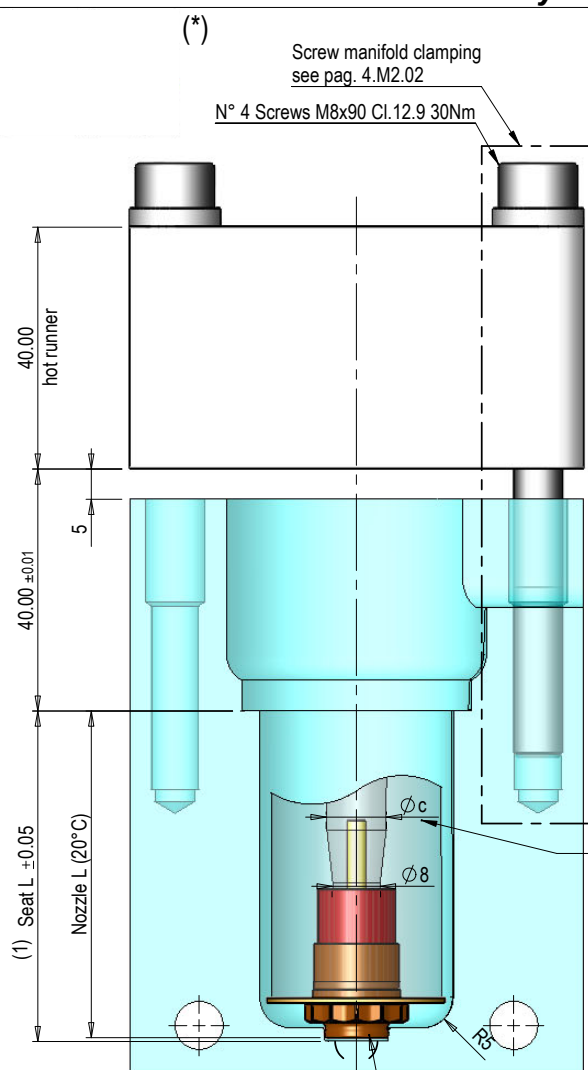
Mh Serie

Mh Série

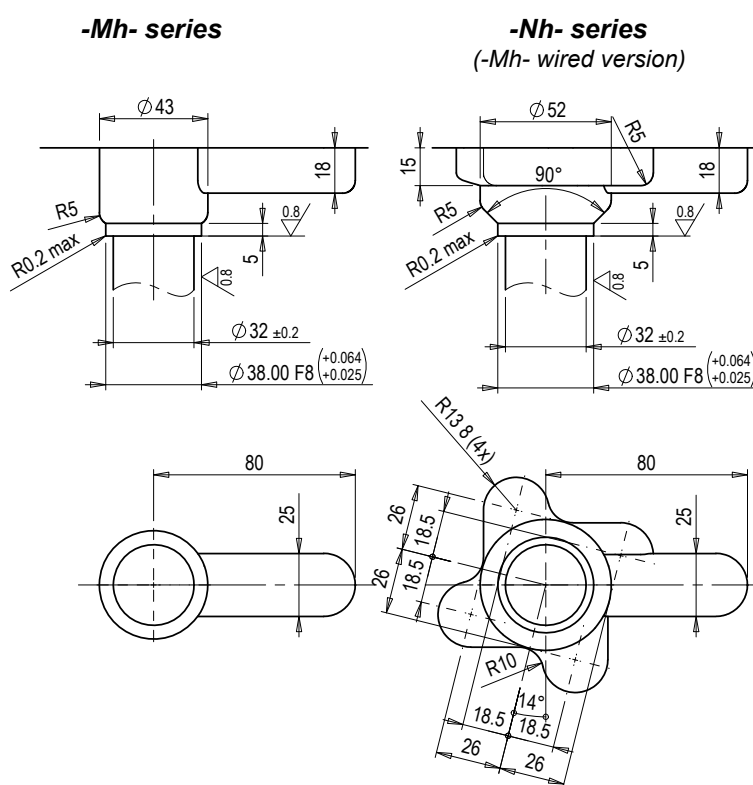
Mh Serie

Mh Série





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

Ringnut and Tip series **-Pp-**

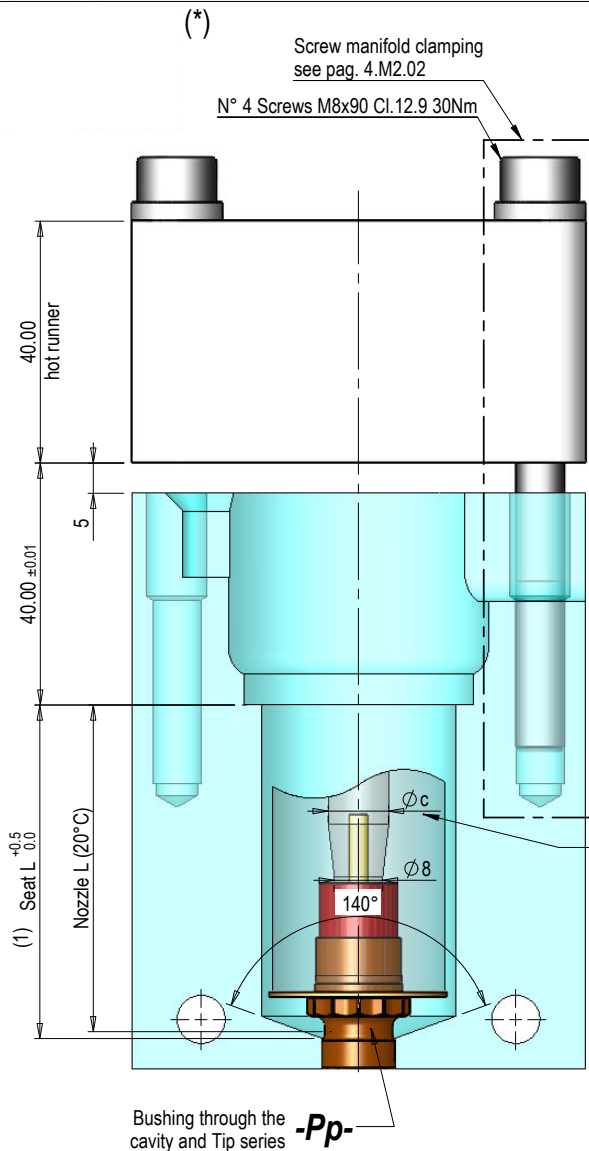
For detailed dimensions of the injection point follow the instructions of the series -Pp- nozzles technical sheets (Page 4.P1.12 ->)

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

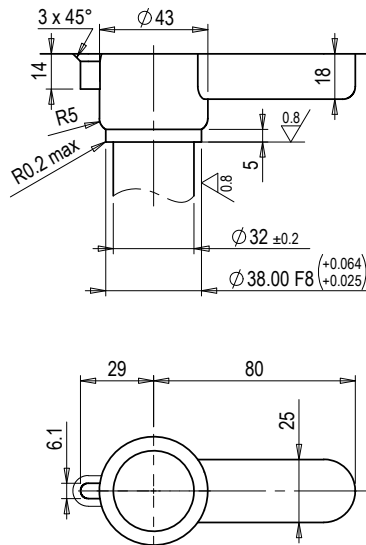
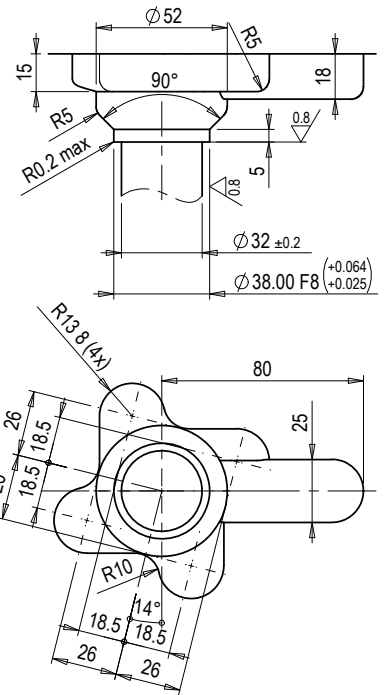
Seat L = L + DL	=> PGC20
Seat L = L + DL + 0.5	=> PGC10, PGC30
Seat L = L + DL + 1.5	=> PGY30

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.



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

-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

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

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

$$\text{Seat L} = L + DL - 1.5 \Rightarrow \text{PGC20}$$

$$\text{Seat L} = L + DL + 1.0 \Rightarrow \text{PGC30, PGY30}$$

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

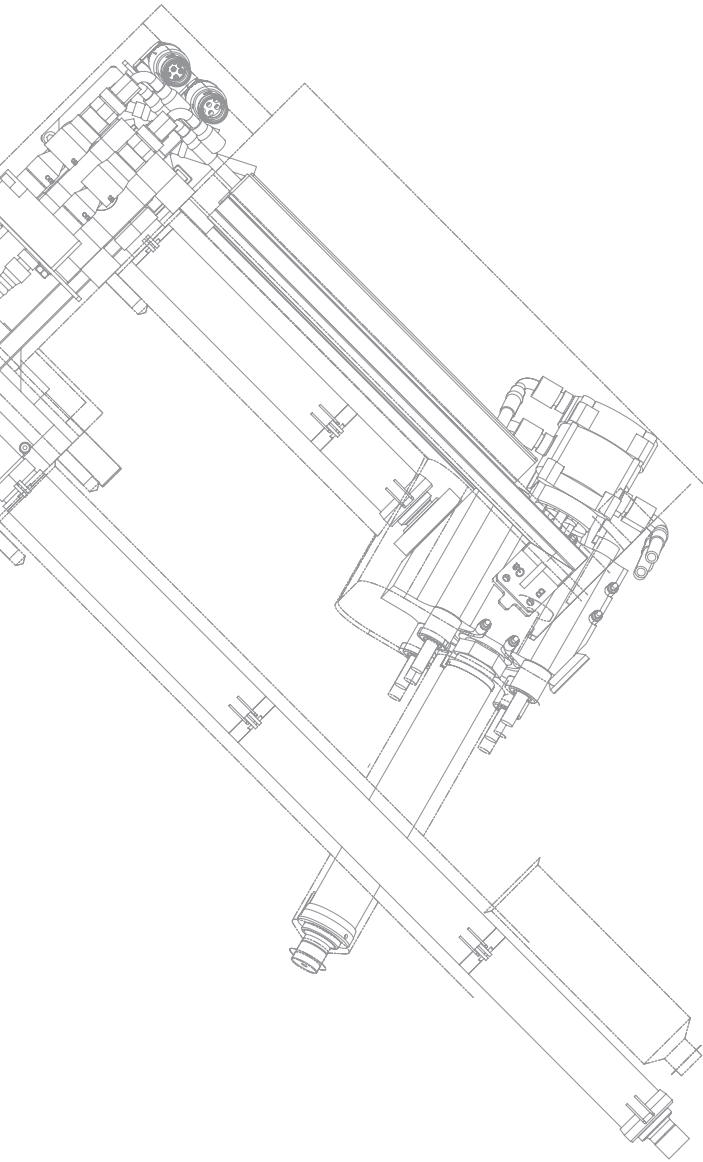
$$\Delta T = T1 - T2$$

$$\lambda = 0.000012 \text{ (1/°C)}$$

$$k = (\Delta T * 0.0008) - 0.04$$

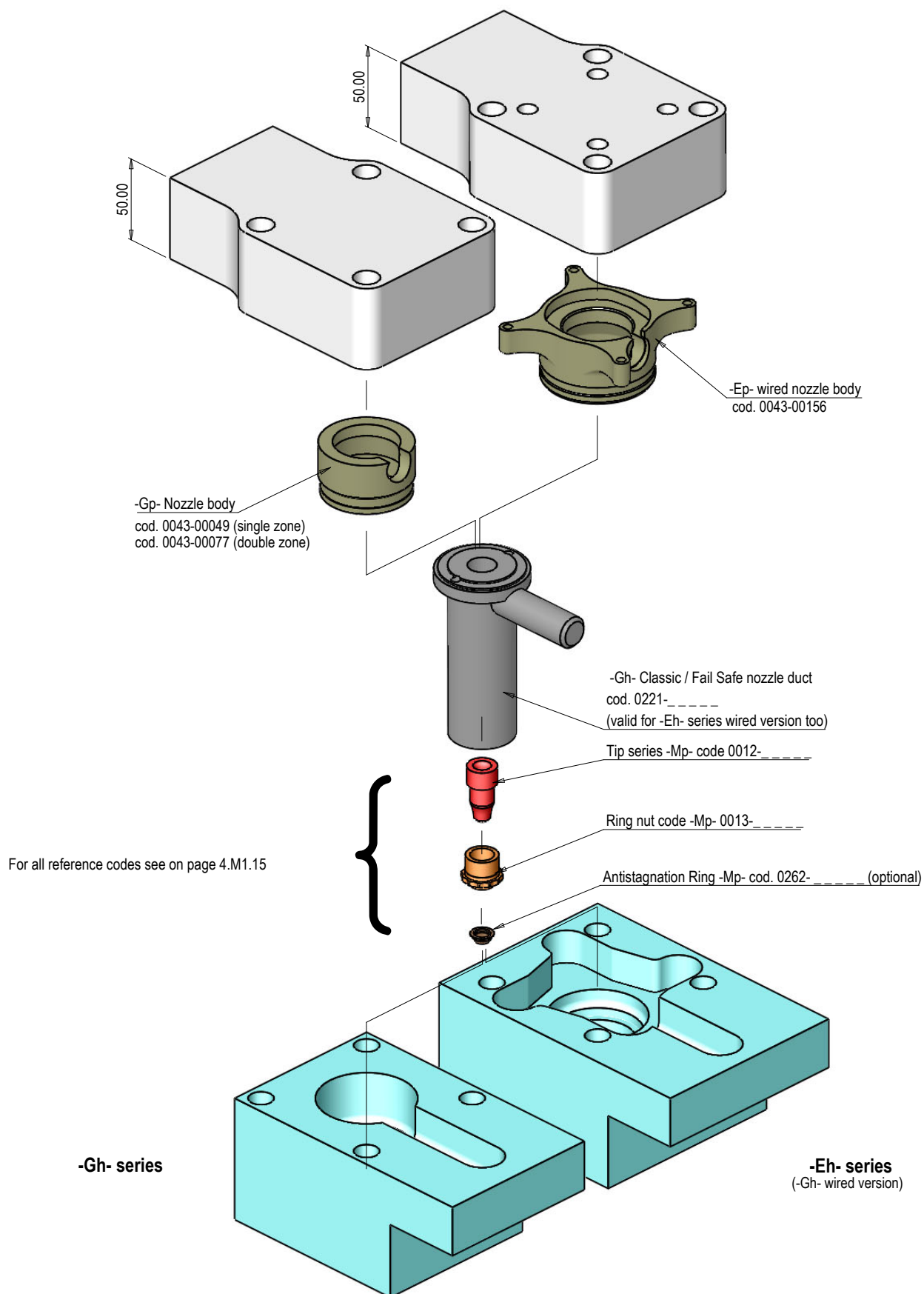
L Inietttore - Nozzle - Duse [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$DL = (L * \Delta T * \lambda) + k$										
	[ΔT=100°C]	[ΔT=120°C]	[ΔT=140°C]	[ΔT=160°C]	[ΔT=180°C]	[ΔT=200°C]	[ΔT=220°C]	[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

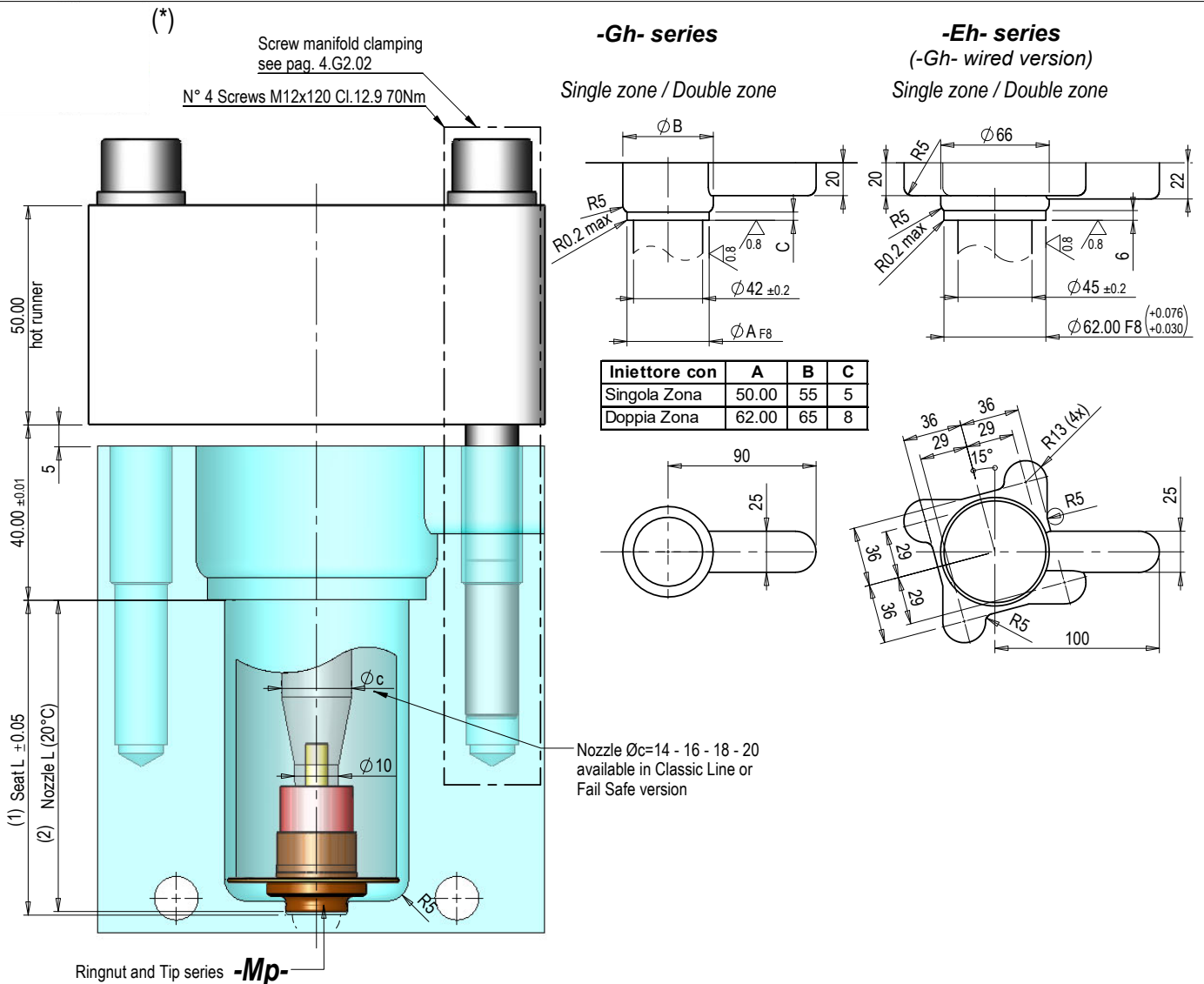
HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.



Gh series 100÷1265 cm³/s

Serie Gh
Gh Serie
Gh Série
Gh Serie
Gh Série





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 Lenght allowed: L=346 mm

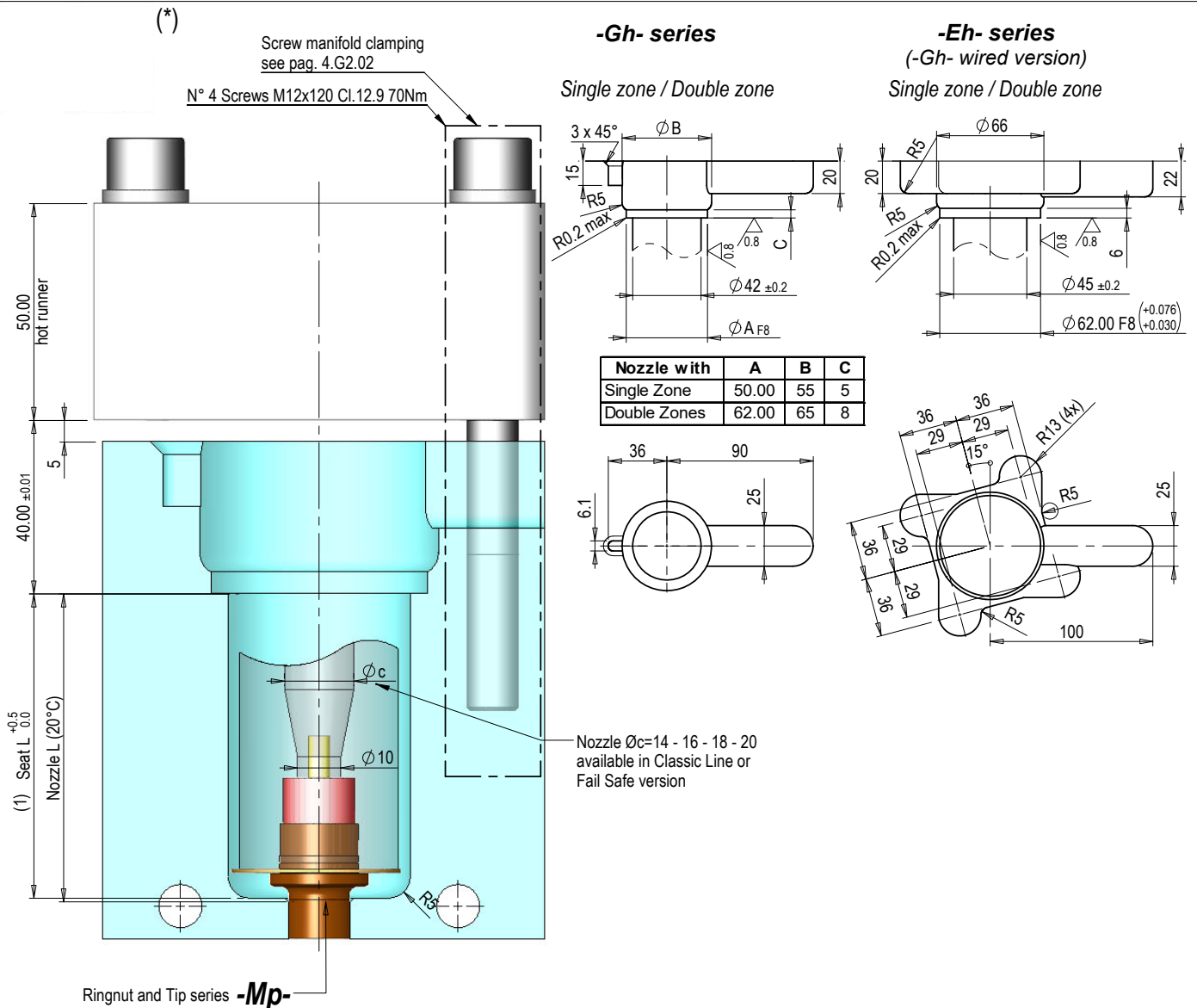
For Tips and Ring nuts reference codes go on page 4.M1.15

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	1x 400	2x 400
071	0221-01038	0221-01070	0221-01046	0221-01078	0221-01054	0221-01086	0221-01062	0221-01094	1x 470	2x 470
096	0221-01039	0221-01071	0221-01047	0221-01079	0221-01055	0221-01087	0221-01063	0221-01095	1x 470	2x 470
121	0221-01040	0221-01072	0221-01048	0221-01080	0221-01056	0221-01088	0221-01064	0221-01096	1x 550	2x 550
146	0221-01041	0221-01073	0221-01049	0221-01081	0221-01057	0221-01089	0221-01065	0221-01097	1x 620	2x 620
171	0221-01042	0221-01074	0221-01050	0221-01082	0221-01058	0221-01090	0221-01066	0221-01098	1x 620	2x 620
196	0221-01043	0221-01075	0221-01051	0221-01083	0221-01059	0221-01091	0221-01067	0221-01099	1x 620	2x 620
221	0221-01044	0221-01076	0221-01052	0221-01084	0221-01060	0221-01092	0221-01068	0221-01100	1x 620	2x 620
246 (**)	0221-01101	0221-01121	0221-01106	0221-01126	0221-01111	0221-01131	0221-01116	0221-01136	1x 300+1x 450	2x 300+2x 450
271 (**)	0221-01102	0221-01122	0221-01107	0221-01127	0221-01112	0221-01132	0221-01117	0221-01137	1x 300+1x 450	2x 300+2x 450
296 (**)	0221-01103	0221-01123	0221-01108	0221-01128	0221-01113	0221-01133	0221-01118	0221-01138	1x 300+1x 500	2x 300+2x 500
346 (**)	0221-01104	0221-01124	0221-01109	0221-01129	0221-01114	0221-01134	0221-01119	0221-01139	1x 300+1x 650	2x 300+2x 650
396 (**)	0221-01105	0221-01125	0221-01110	0221-01130	0221-01115	0221-01135	0221-01120	0221-01140	1x 300+1x 650	2x 300+2x 650

(**) 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

4.Gh1.02



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

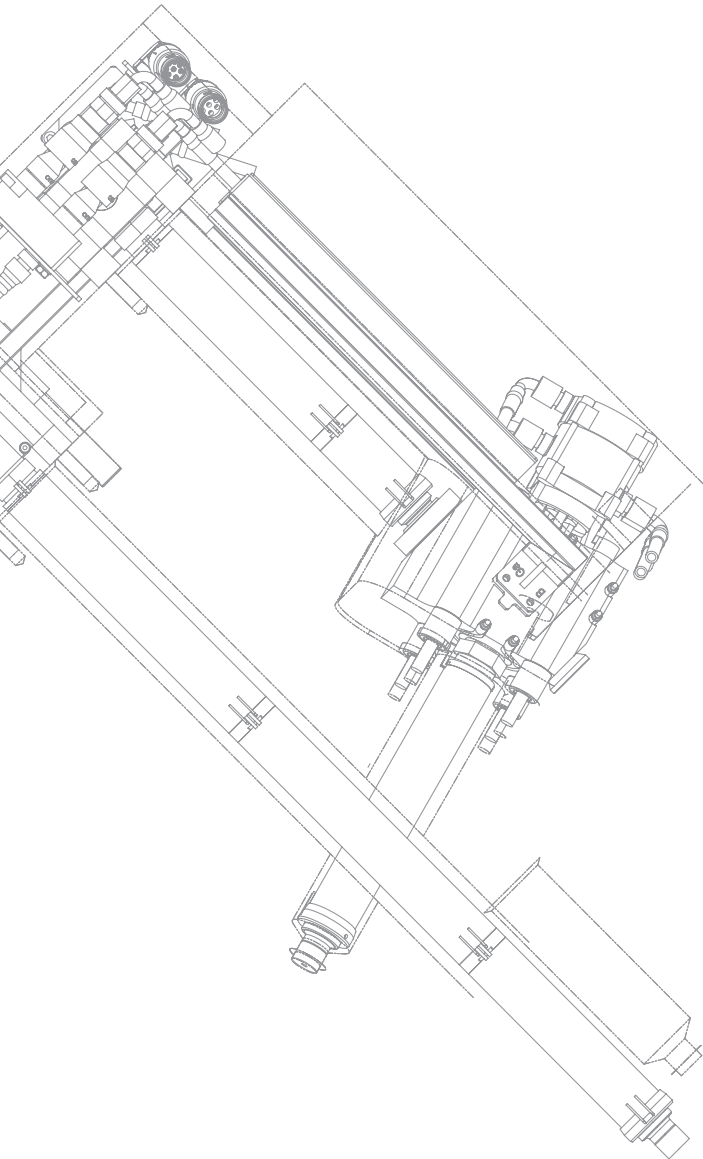
T1 (°C) = Injection temperature
T2 (°C) = Mold temperature
 $\Delta T = T1 - T2$
 $\lambda = 0.000012 (1/°C)$
 $k = (\Delta T * 0.0008) - 0.03$

L Iniettore - Nozzle - Duse	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
	$DL = (L * \Delta T * \lambda) + k$										
[20°C]	[$\Delta T=100°C$]	[$\Delta T=120°C$]	[$\Delta T=140°C$]	[$\Delta T=160°C$]	[$\Delta T=180°C$]	[$\Delta T=200°C$]	[$\Delta T=220°C$]	[$\Delta T=240°C$]	[$\Delta T=260°C$]	[$\Delta T=280°C$]	[$\Delta T=300°C$]
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.

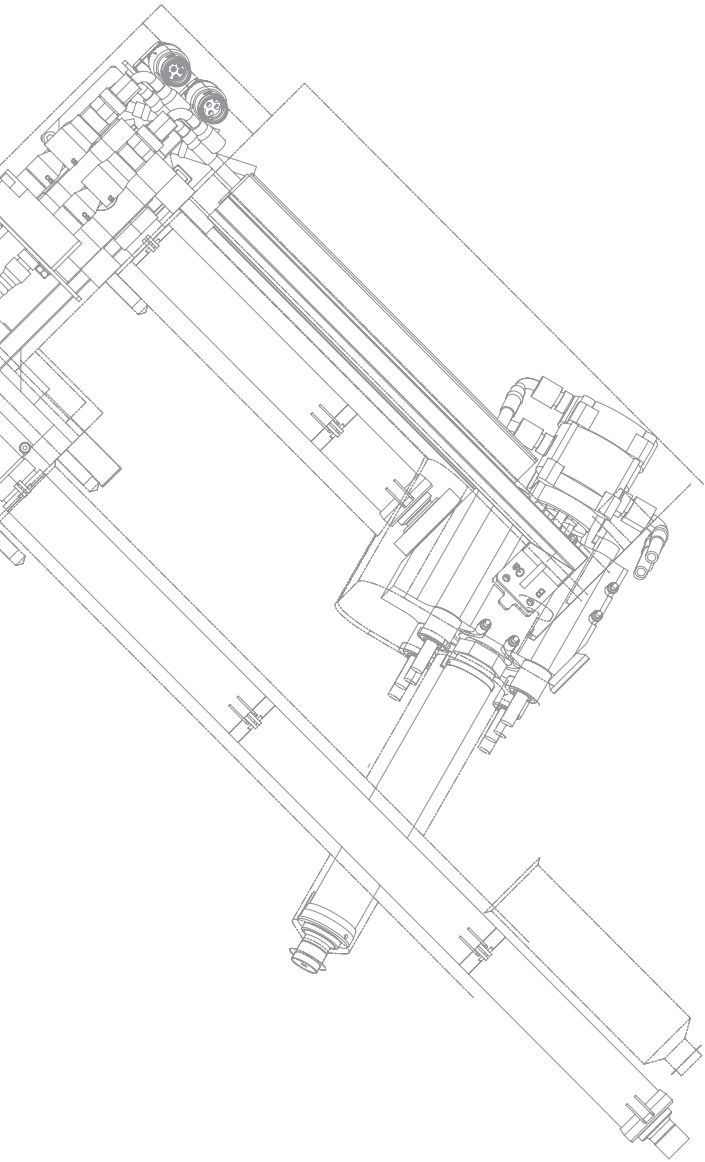
(*) Fail Safe not available for U.S. and Canadian markets

4.Gh1.03



Screwed in Series

Serie Avvitata
Geschraubte Serie
Série Visse
Serie Roscada
Série Roscada



Sa Series

Serie Sa

Sa Serie

Sa Série

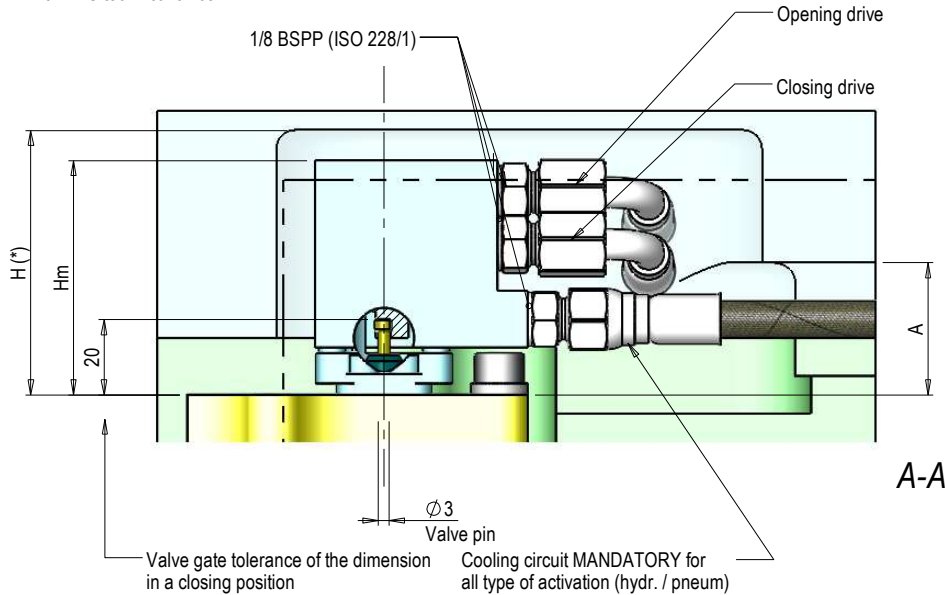
Sa Serie

Sa Série

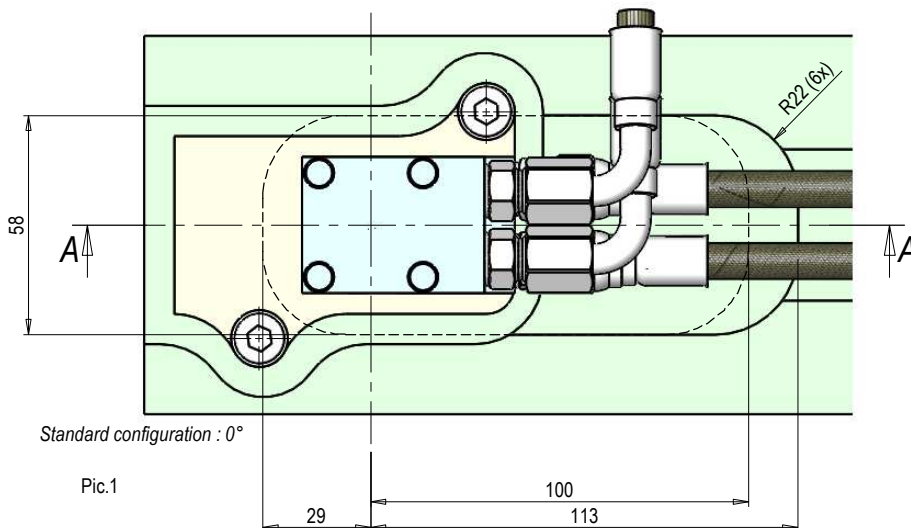
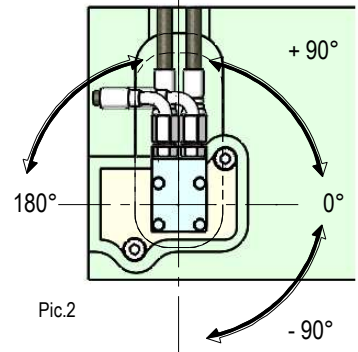
Cylinder: bore 24 mm - stroke 10 mm - COOLED

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

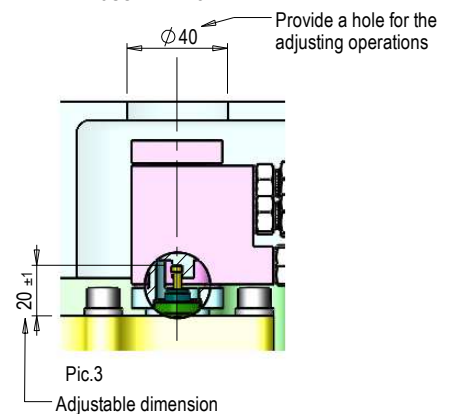
(*) Dimension reduction only after checking
with HRS technical office.



- b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ADJUSTABLE CYLINDER



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

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:

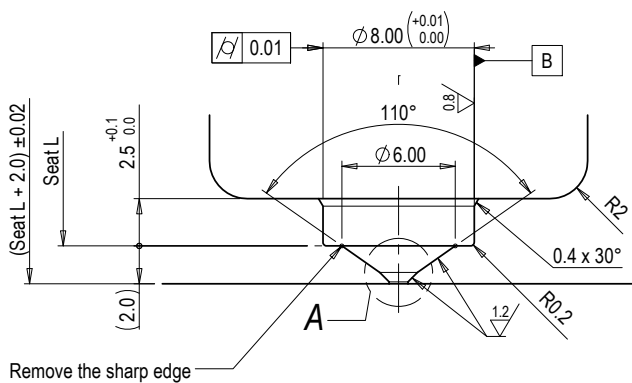
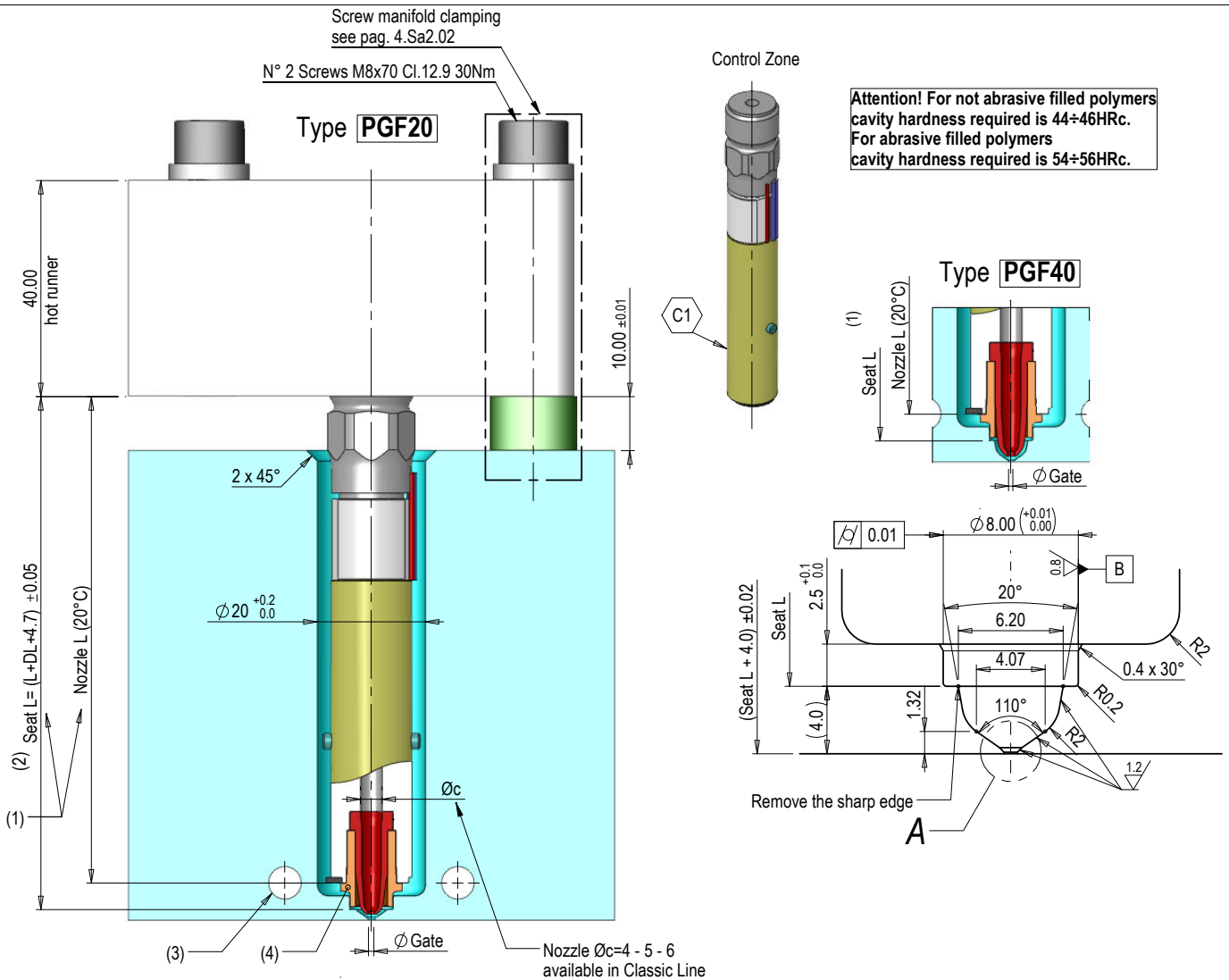
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1;

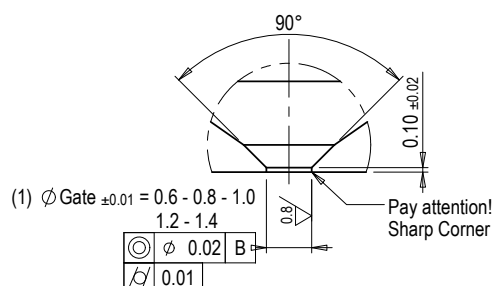


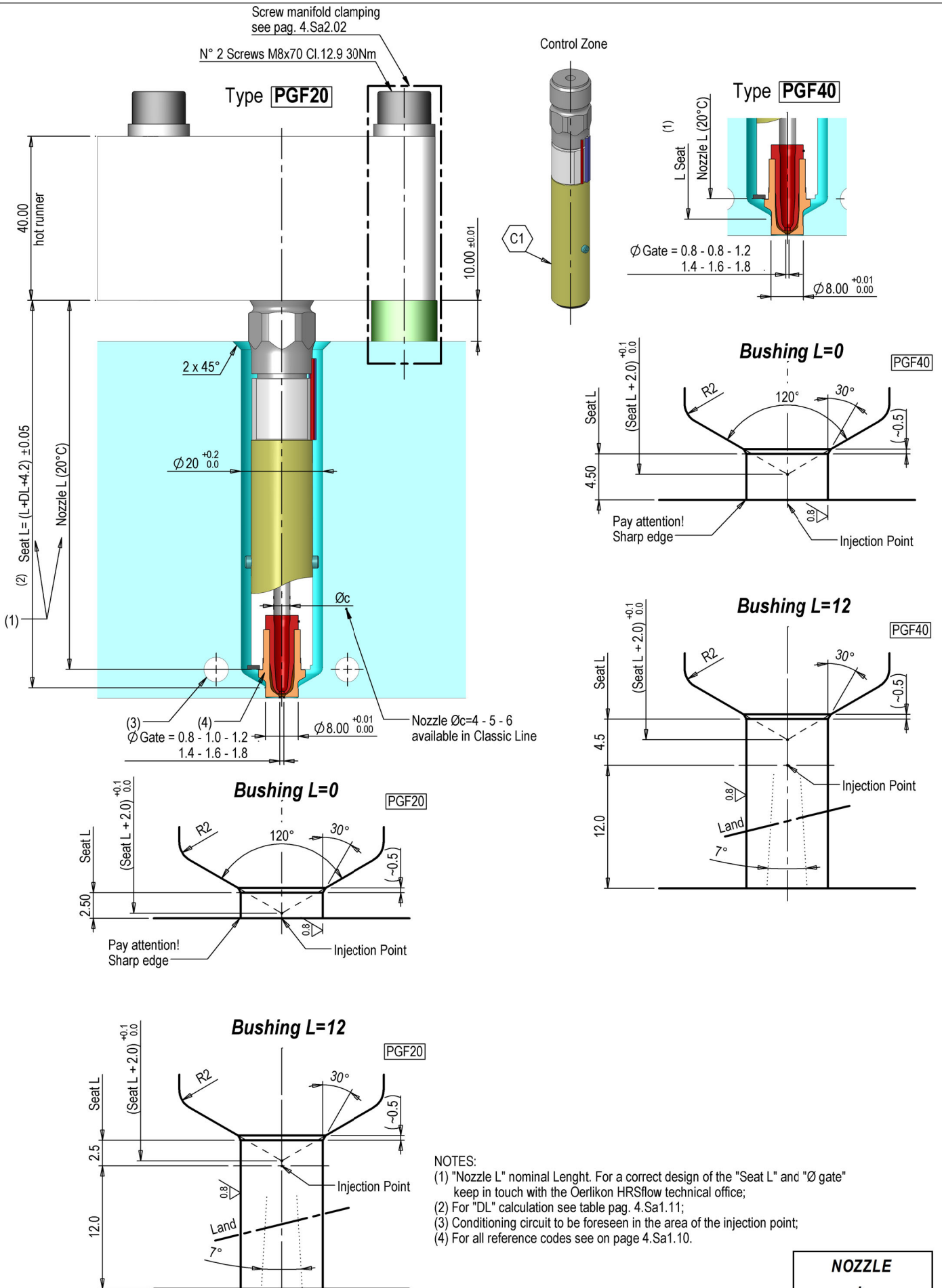
NOTES:

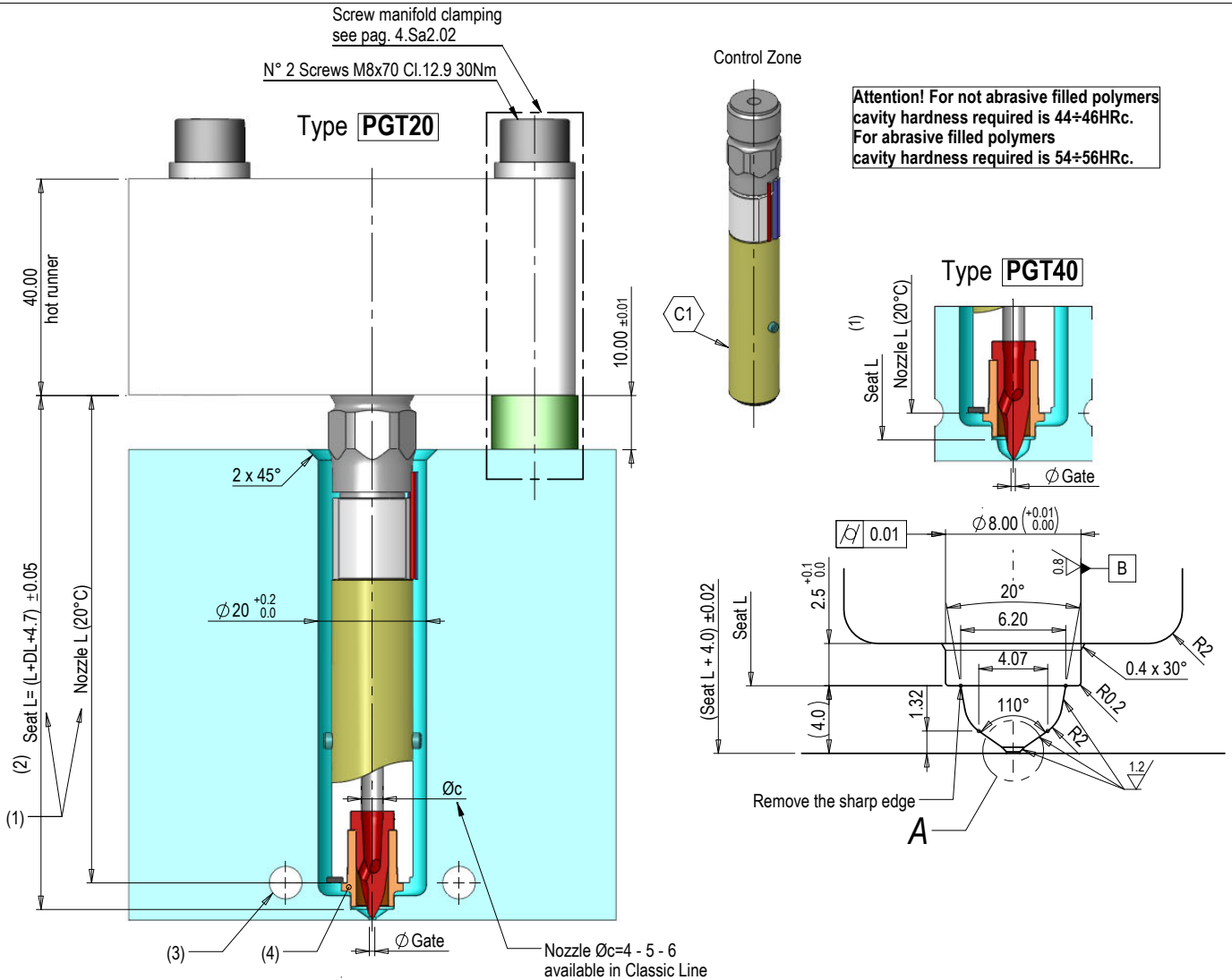
- (1) "Nozzle L" nominal Length. For a correct design of the "Seat L" and "Ø gate" keep in touch with the Oerlikon HRSflow technical office;
- (2) For "DL" calculation see table pag. 4.Sa1.11;
- (3) Conditioning circuit to be foreseen in the area of the injection point;
- (4) For all reference codes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

NOZZLE
L
50 ÷ 195

DETAIL A



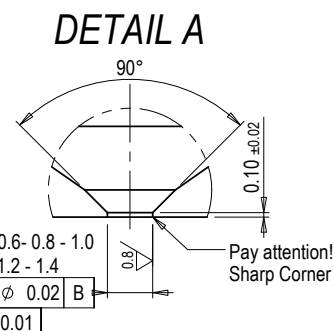


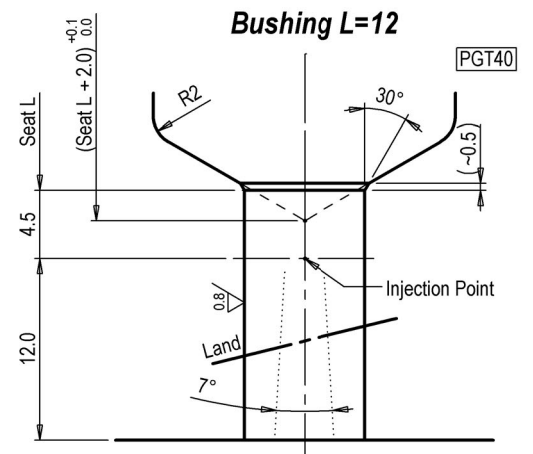
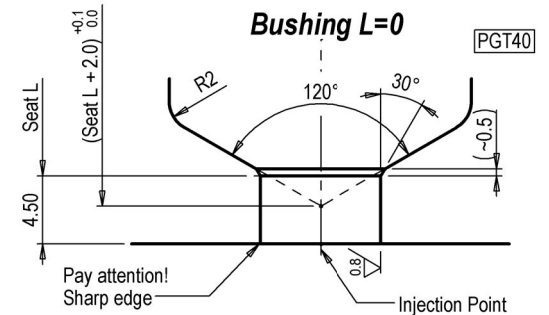
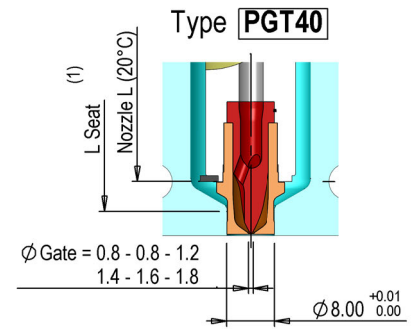
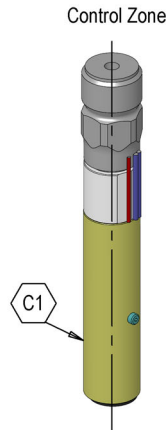
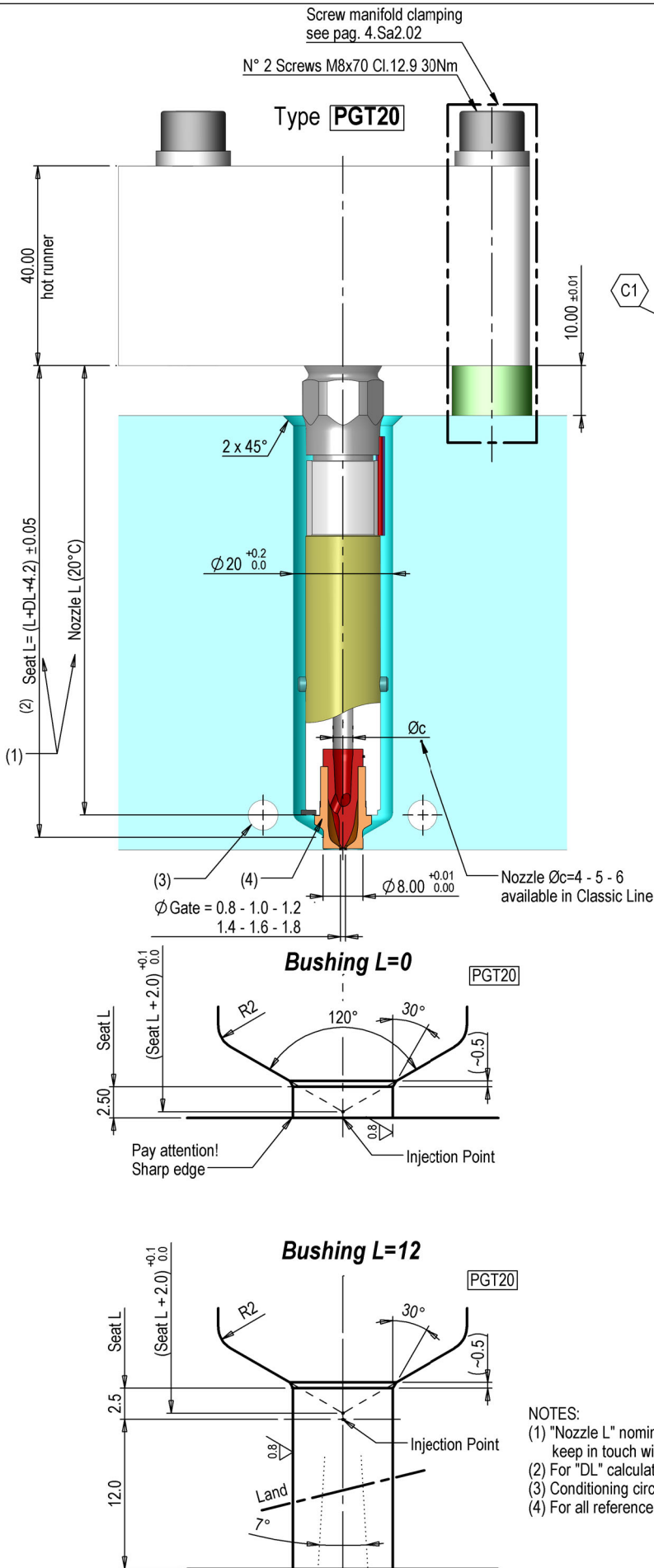


NOTES:

- (1) "Nozzle L" nominal Length. 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.

NOZZLE
L
50 ÷ 195





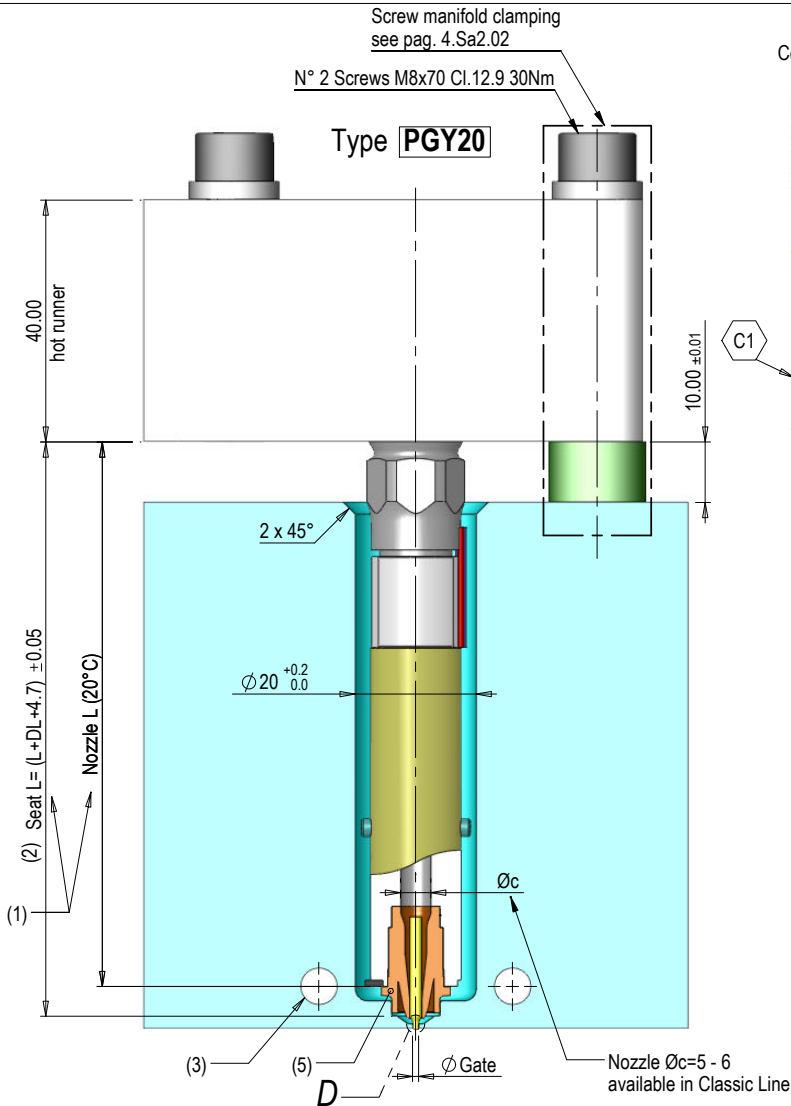
NOTES:

- (1) "Nozzle L" nominal Length. 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.

NOZZLE

L

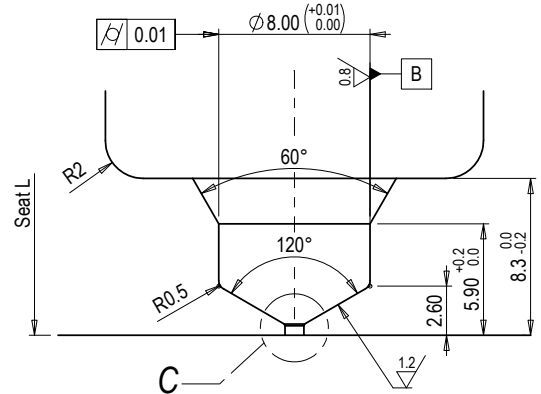
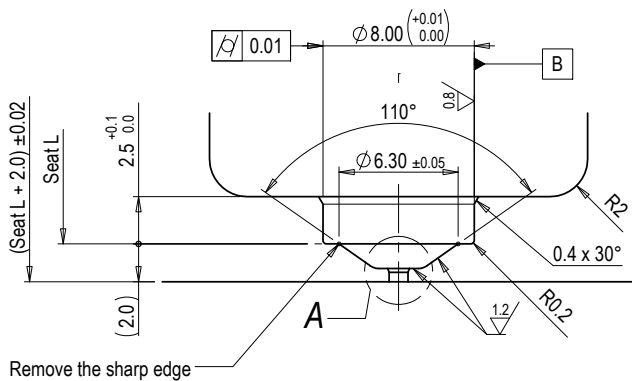
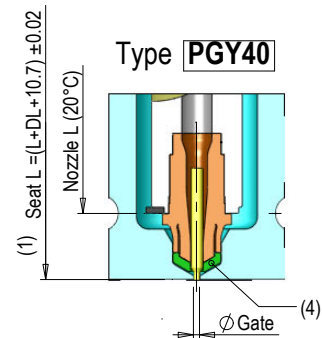
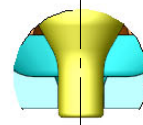
50 ÷ 195



Control Zone

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

DETAIL D
VALVE PIN:
STROKE 10.0mm



NOTES:

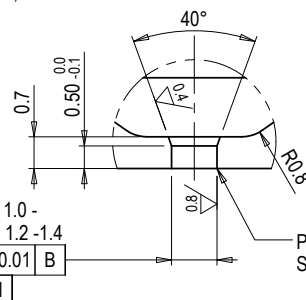
- (1) "Nozzle L" nominal Length. For a correct design of the "Seat L" and "Ø gate" keep in touch with the Oerlikon HRSflow technical office;
- (2) For "DL" calculation see table pag. 4.Sa1.11;
- (3) Conditioning circuit to be foreseen in the area of the injection point;
- (4) Bushing for change color 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

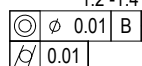
L

50 ÷ 195

DETAIL A

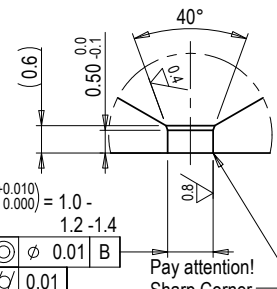


(1) Ø Gate H7 $\left(\begin{smallmatrix} +0.010 \\ 0.000 \end{smallmatrix}\right) = 1.0 - 1.2 - 1.4$

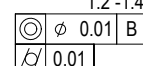


Pay attention!
Sharp Corner

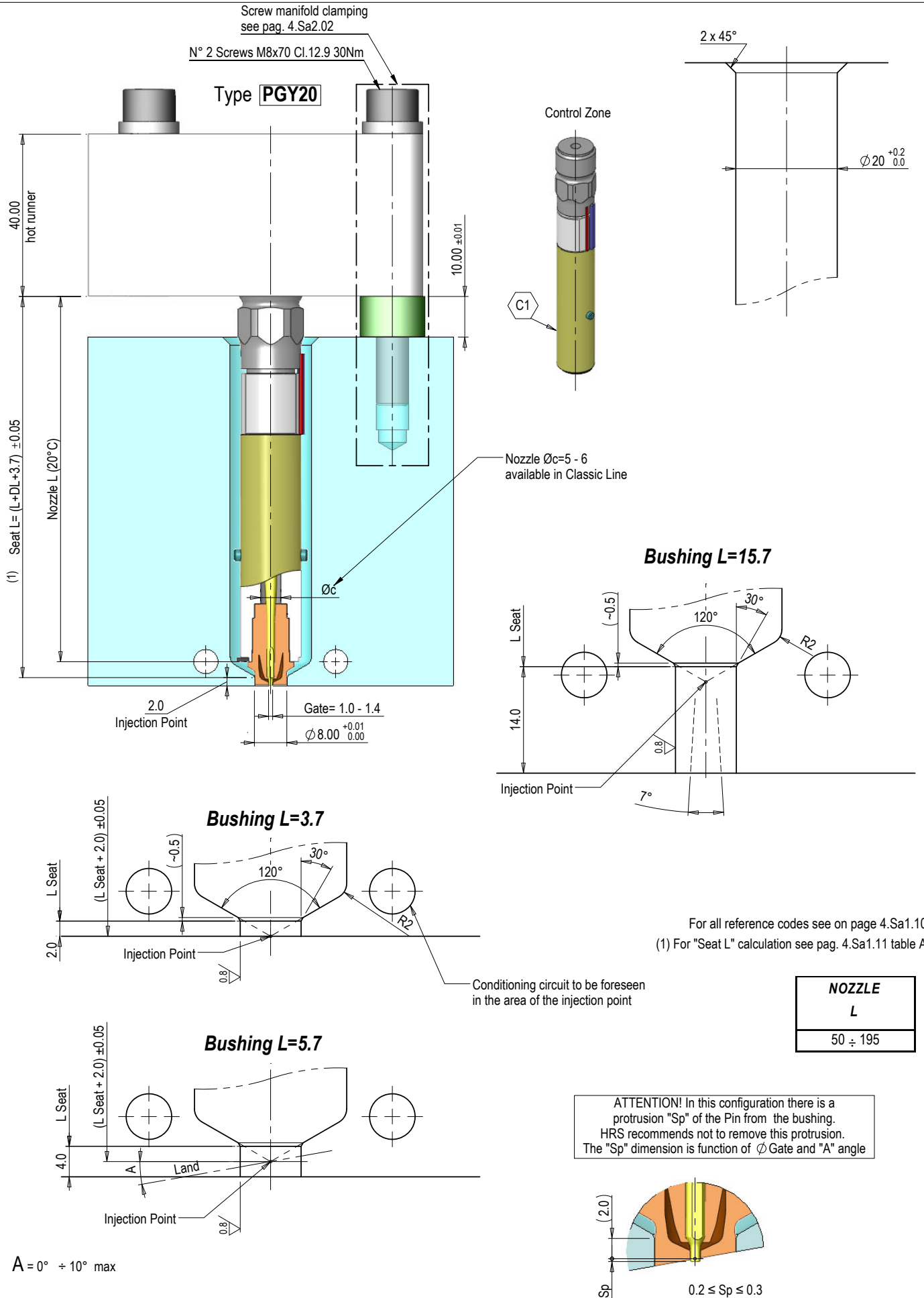
DETAIL C



(1) Ø Gate H7 $\left(\begin{smallmatrix} +0.010 \\ 0.000 \end{smallmatrix}\right) = 1.0 - 1.2 - 1.4$



Pay attention!
Sharp Corner



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 <table><tr><td colspan="2">PGF20</td><td colspan="2">PGF40</td></tr><tr><td>Gate</td><td>L=0</td><td>L=12</td><td>L=0</td><td>L=12</td></tr><tr><td>Ø.8</td><td>0013-02088</td><td>0013-02094</td><td>0013-02091</td><td>0013-02097</td></tr><tr><td>Ø1.0</td><td>0013-02089</td><td>0013-02095</td><td>0013-02092</td><td>0013-02098</td></tr><tr><td>Ø1.2</td><td>0013-02157</td><td>0013-02158</td><td>0013-02159</td><td>0013-02160</td></tr><tr><td>Ø1.4</td><td>0013-02090</td><td>0013-02096</td><td>0013-02093</td><td>0013-02099</td></tr><tr><td>Ø1.6</td><td>0013-02182</td><td>0013-02184</td><td>0013-02186</td><td>0013-02188</td></tr><tr><td>Ø1.8</td><td>0013-02183</td><td>0013-02185</td><td>0013-02187</td><td>0013-02189</td></tr></table>					PGF20		PGF40		Gate	L=0	L=12	L=0	L=12	Ø.8	0013-02088	0013-02094	0013-02091	0013-02097	Ø1.0	0013-02089	0013-02095	0013-02092	0013-02098	Ø1.2	0013-02157	0013-02158	0013-02159	0013-02160	Ø1.4	0013-02090	0013-02096	0013-02093	0013-02099	Ø1.6	0013-02182	0013-02184	0013-02186	0013-02188	Ø1.8	0013-02183	0013-02185	0013-02187	0013-02189
PGF20		PGF40																																										
Gate	L=0	L=12	L=0	L=12																																								
Ø.8	0013-02088	0013-02094	0013-02091	0013-02097																																								
Ø1.0	0013-02089	0013-02095	0013-02092	0013-02098																																								
Ø1.2	0013-02157	0013-02158	0013-02159	0013-02160																																								
Ø1.4	0013-02090	0013-02096	0013-02093	0013-02099																																								
Ø1.6	0013-02182	0013-02184	0013-02186	0013-02188																																								
Ø1.8	0013-02183	0013-02185	0013-02187	0013-02189																																								
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 PGT40 0012-00982 0012-00983 for high resistance	End Ring through the cavity <table><tr><td colspan="2">PGF20</td><td colspan="2">PGF40</td></tr><tr><td>Gate</td><td>L=0</td><td>L=12</td><td>L=0</td><td>L=12</td></tr><tr><td>Ø.8</td><td>0013-02088</td><td>0013-02094</td><td>0013-02091</td><td>0013-02097</td></tr><tr><td>Ø1.0</td><td>0013-02089</td><td>0013-02095</td><td>0013-02092</td><td>0013-02098</td></tr><tr><td>Ø1.2</td><td>0013-02157</td><td>0013-02158</td><td>0013-02159</td><td>0013-02160</td></tr><tr><td>Ø1.4</td><td>0013-02090</td><td>0013-02096</td><td>0013-02093</td><td>0013-02099</td></tr><tr><td>Ø1.6</td><td>0013-02182</td><td>0013-02184</td><td>0013-02186</td><td>0013-02188</td></tr><tr><td>Ø1.8</td><td>0013-02183</td><td>0013-02185</td><td>0013-02187</td><td>0013-02189</td></tr></table>					PGF20		PGF40		Gate	L=0	L=12	L=0	L=12	Ø.8	0013-02088	0013-02094	0013-02091	0013-02097	Ø1.0	0013-02089	0013-02095	0013-02092	0013-02098	Ø1.2	0013-02157	0013-02158	0013-02159	0013-02160	Ø1.4	0013-02090	0013-02096	0013-02093	0013-02099	Ø1.6	0013-02182	0013-02184	0013-02186	0013-02188	Ø1.8	0013-02183	0013-02185	0013-02187	0013-02189
PGF20		PGF40																																										
Gate	L=0	L=12	L=0	L=12																																								
Ø.8	0013-02088	0013-02094	0013-02091	0013-02097																																								
Ø1.0	0013-02089	0013-02095	0013-02092	0013-02098																																								
Ø1.2	0013-02157	0013-02158	0013-02159	0013-02160																																								
Ø1.4	0013-02090	0013-02096	0013-02093	0013-02099																																								
Ø1.6	0013-02182	0013-02184	0013-02186	0013-02188																																								
Ø1.8	0013-02183	0013-02185	0013-02187	0013-02189																																								
CYLINDRICAL VALVE GATING																																												
	External End Ring PGY20 0013-02156 PGY40 0013-02082 End Ring through the cavity PGY20 <table><tr><td>Gate</td><td>L=0</td><td>L=12</td></tr><tr><td>Ø1.0</td><td>0013-01515</td><td>0013-01527</td></tr><tr><td>Ø1.4</td><td>0013-01516</td><td>0013-01528</td></tr></table>					Gate	L=0	L=12	Ø1.0	0013-01515	0013-01527	Ø1.4	0013-01516	0013-01528																														
Gate	L=0	L=12																																										
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.

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature
 $\Delta T = T1 - T2$
 $\lambda = 0.000012$ (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
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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

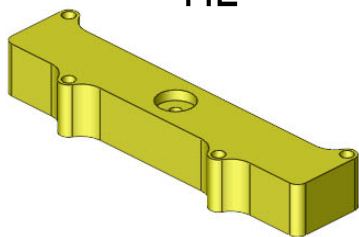
L (*) (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$L_{Seat} = L + DL + 3.7$										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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:

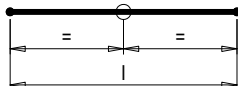
(*) You can order nozzles with "L" different from the standard within the indicated limits (min 50 - max 195 mm).

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

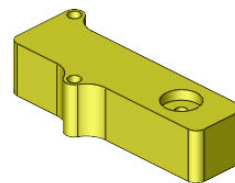
-HL-



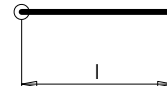
Standard
l=150-200-250-300-350-400-450 mm



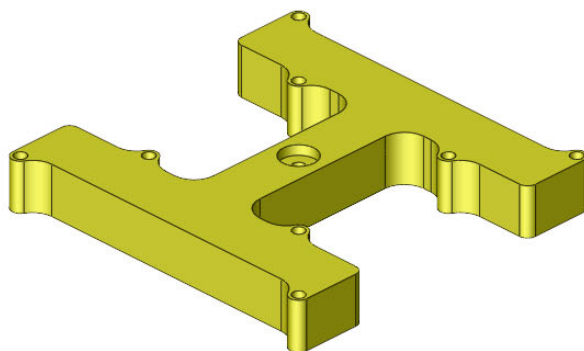
-HD-



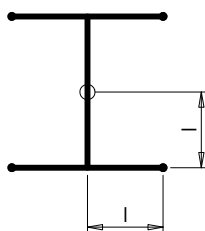
Standard
l=75-100-125-150-175-200-225 mm



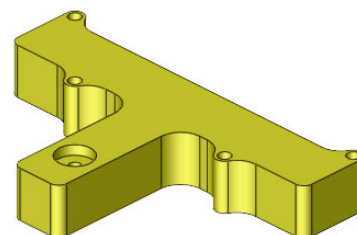
-HH-



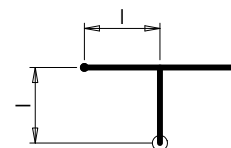
Standard
l=100-125-150 mm



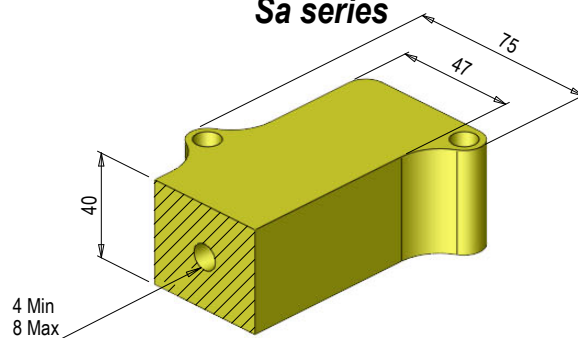
-HT-



Standard
l=100-125-150 mm

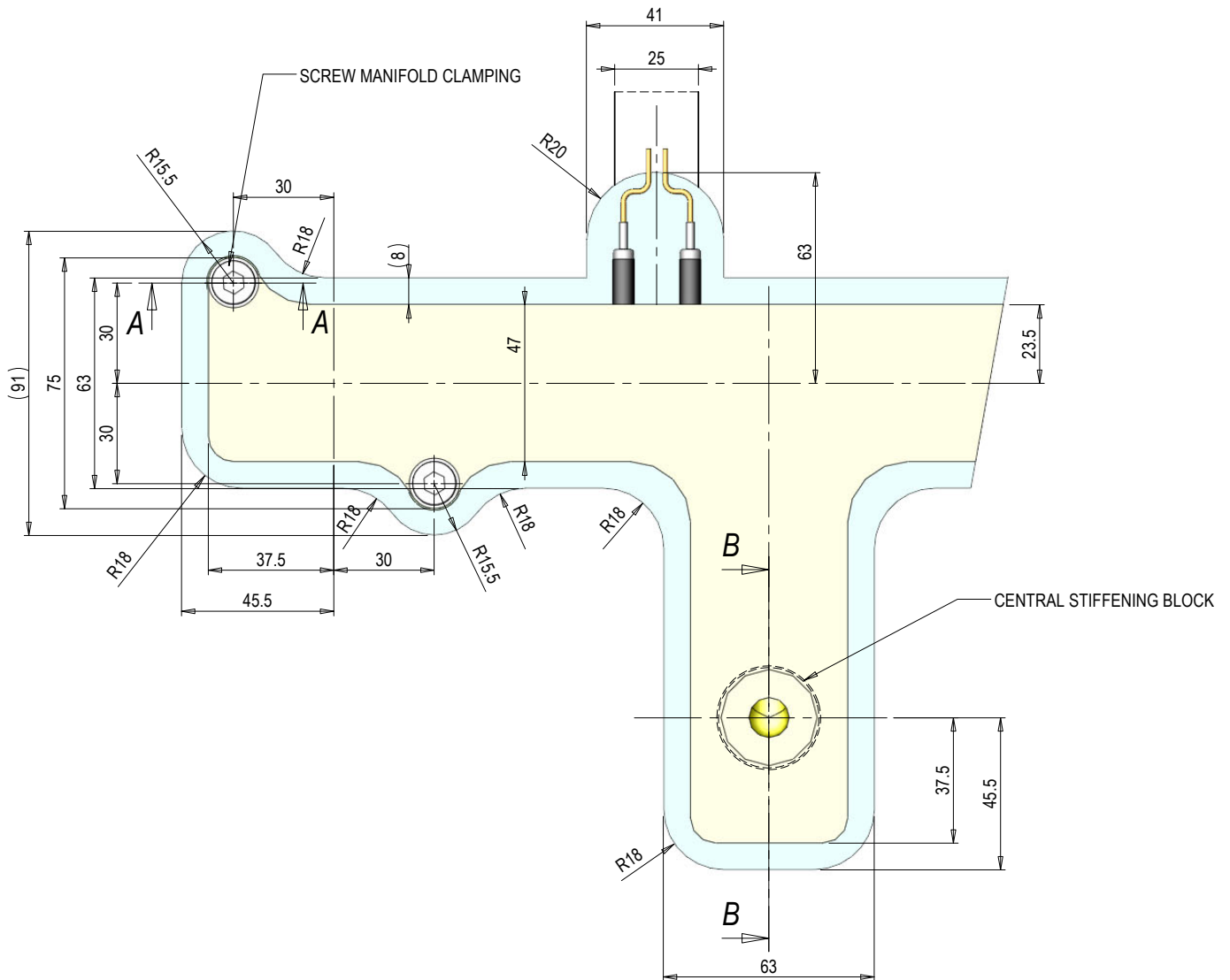


Sa series



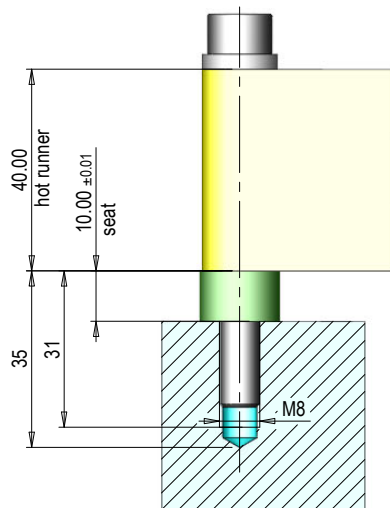
Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

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)

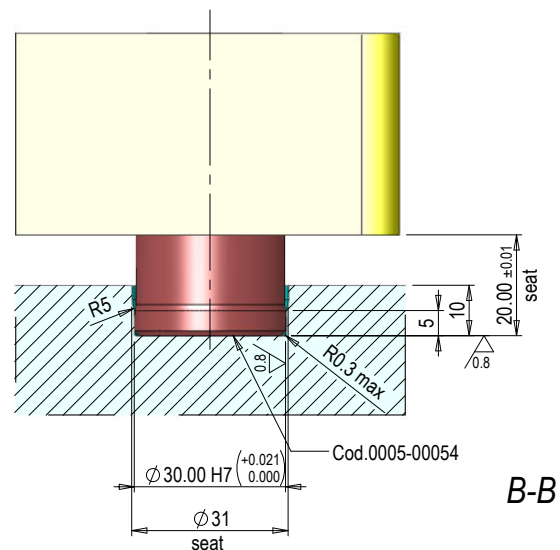


Screw manifold clamping

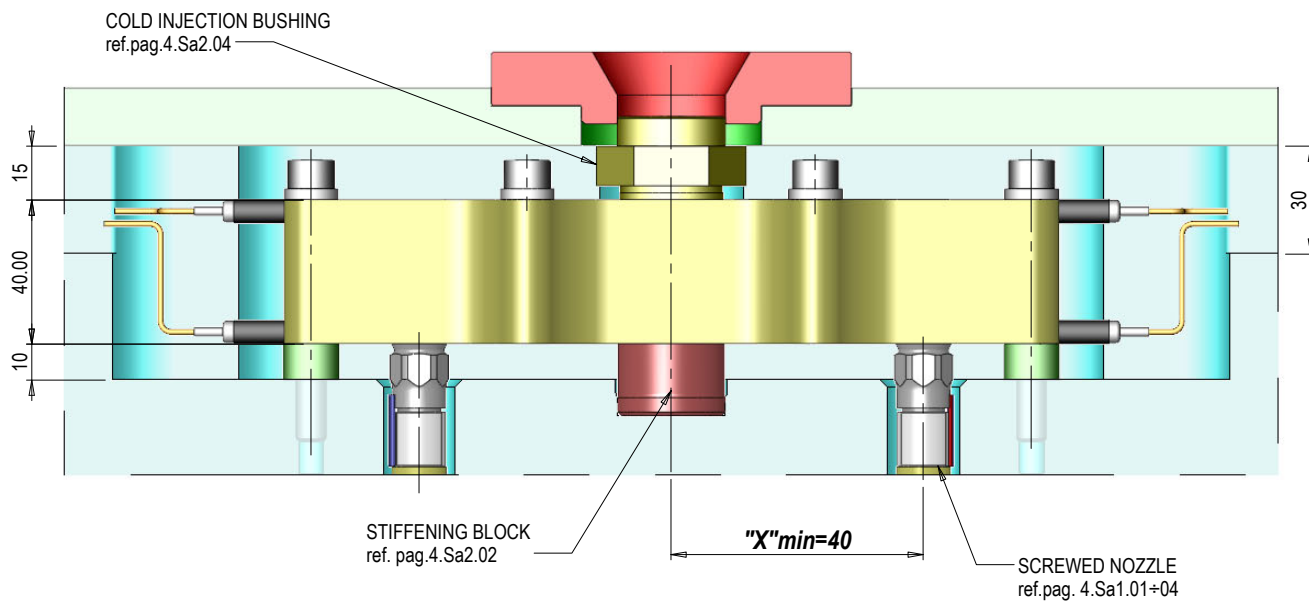
Screw M8x70 cl.12.9 30 Nm



**Pocket
central stiffening block**

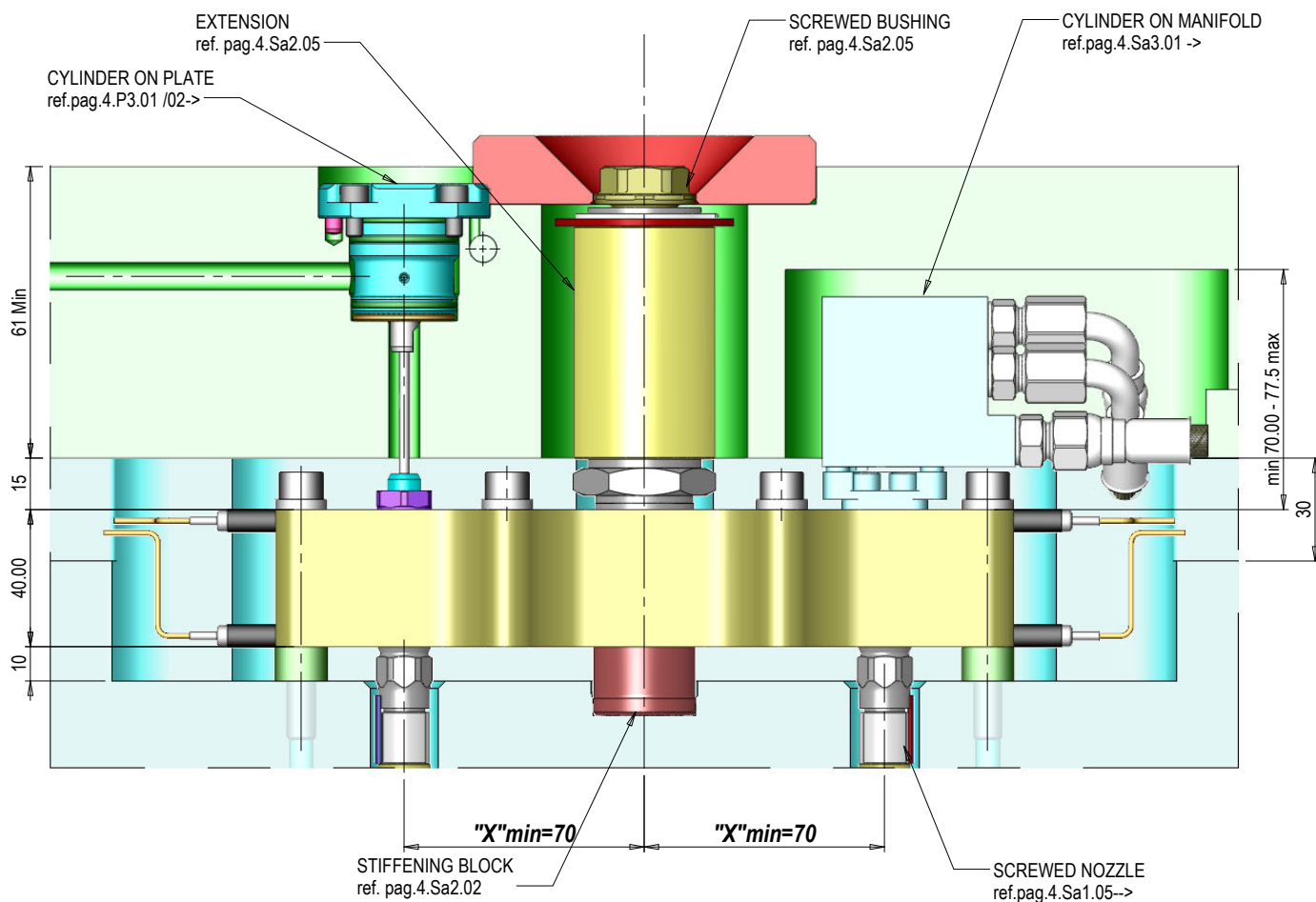


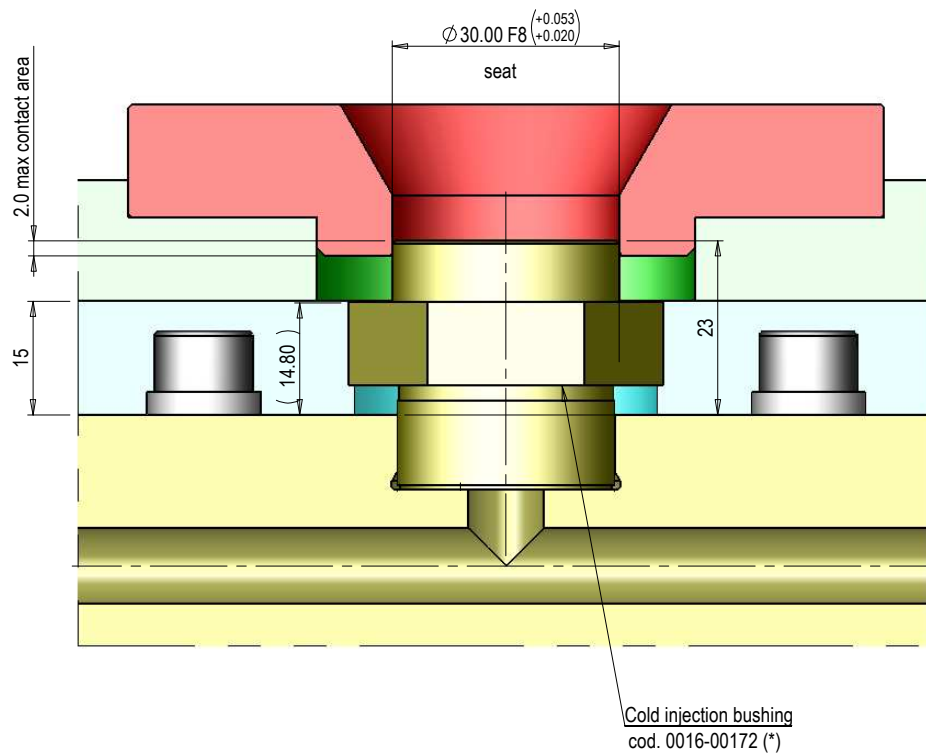
Structure for TORPEDO or FREE FLOW systems



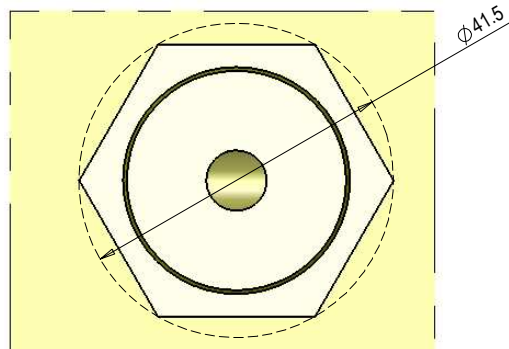
Xmin= min centre distance between injection bushing and nozzle for non standard systems

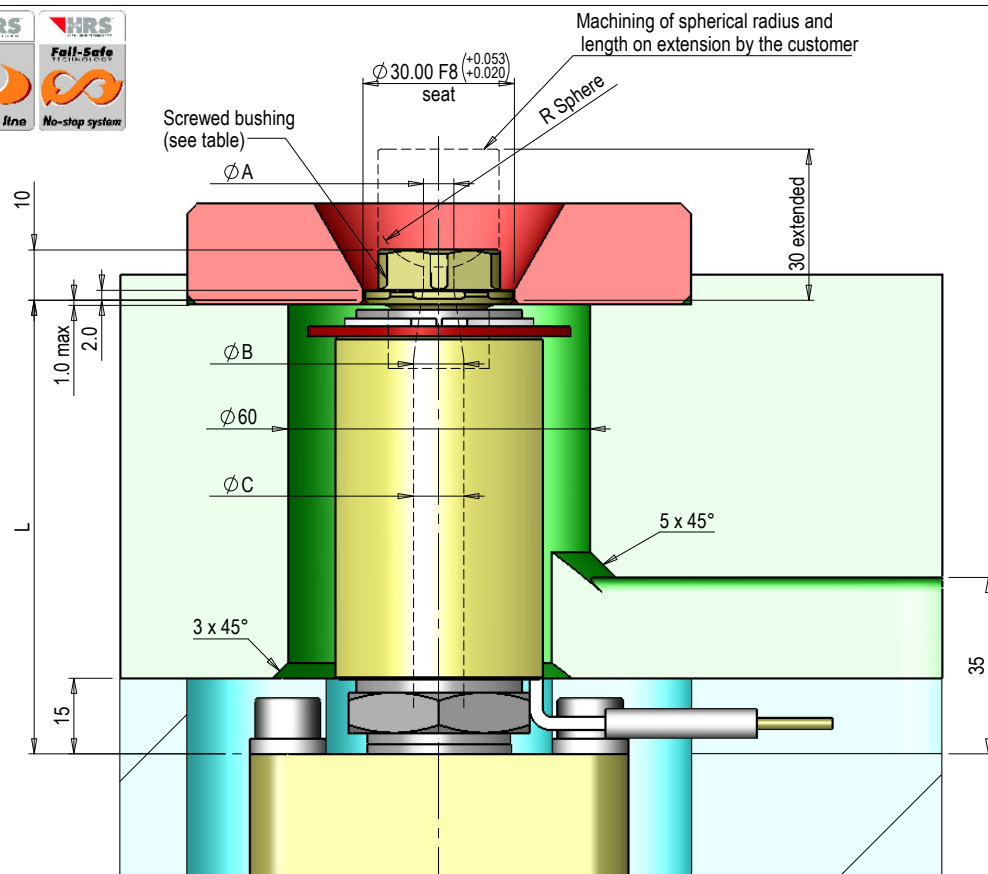
Structure for VALVE GATING systems





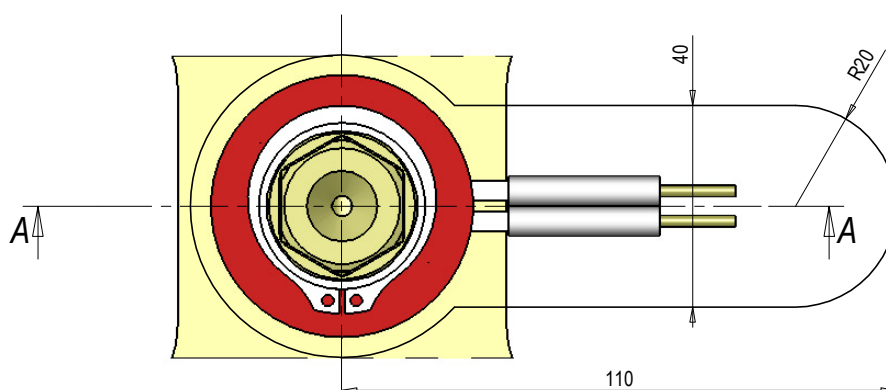
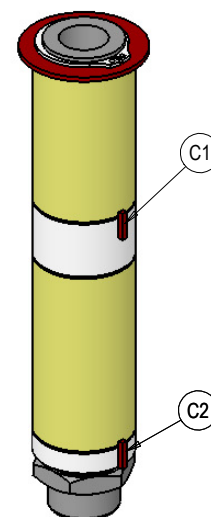
(*)Standard code with R sphere=0. Others R sphere sizes to be required.





A-A

Control Zones

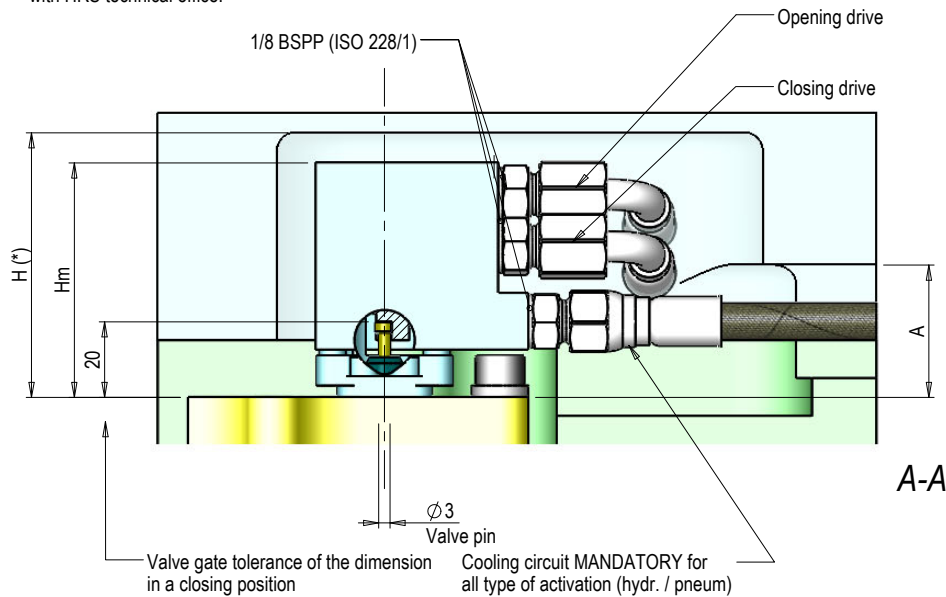


"L" (*)	MAXIMUN N° OF ZONES	SPHERE RADIUS	STANDARD SCREWED BUSHING CODE	
050.00 ÷ 204.89	1 [C1]	Extension R0 R0 R 12.7 R 15.5 R 19.1 R 20 R 25 R40	ØA = ØB =4	ØA=4 ØB=5
204.90 ÷ 305.09	2 [C1 + C2]		0015-00525	0015-00534
STANDARD DIAMETERS OF EXTENSIONS DUCT	ØC		0015-00526	0015-00535
			0015-00527	0015-00536
			0015-00528	0015-00537
			0015-00529	0015-00538
			0015-00530	0015-00539
4			0015-00531	0015-00540
5		0015-00532	0015-00541	
6		ØA=4 ØB=6	ØA=4 ØB=8	
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

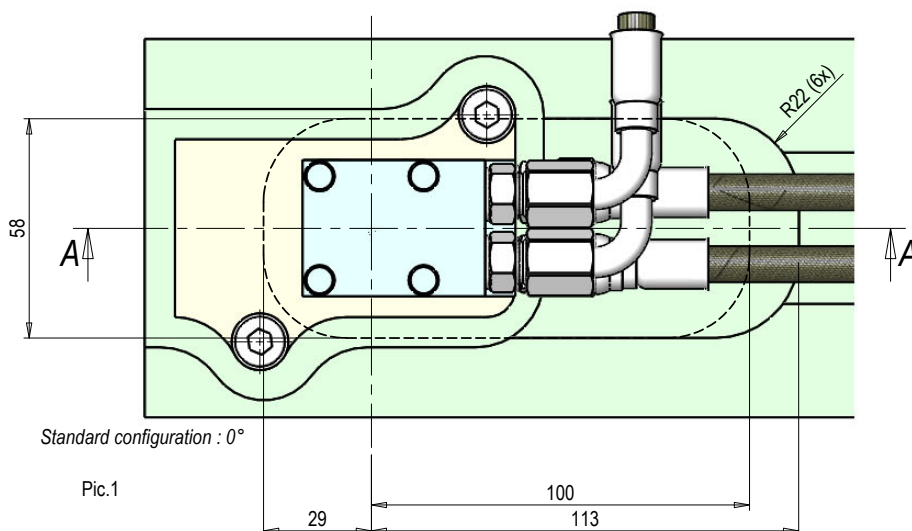
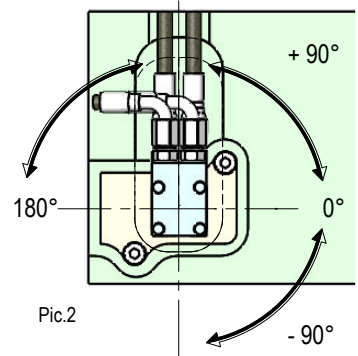
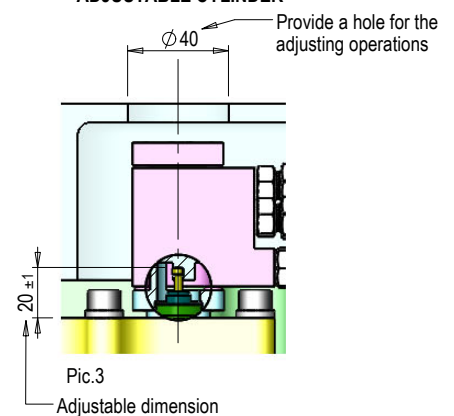
Cylinder: bore 24 mm - stroke 10 mm - COOLED

- 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) POSSIBLE ORIENTATIONS OF THE COUPLINGS

**ADJUSTABLE CYLINDER**

CODE	VERSION	ACTIVATION	DAMPENED	COMPLETE GASKET	Hm	H	A
0017-01021	(standard)	HYDR.	×	0038-00139	62	65	35
0017-01107		PNEUM.	✓	0038-00144	70	73	42
0017-01067	WITH 1 END OF STROKE	HYDR.	×	0038-00147	62	65	35
0017-01175		PNEUM.	✓	0038-00148	89	92	42
0017-01179	WITH DOUBLE END OF STROKE	HYDR.	×	0038-00147	89	92	42
0017-01183		PNEUM.	✓	0038-00148	89	92	42
0017-01177	ADJUSTABLE	HYDR.	×	0038-00139	69.5	72.5	35
0017-01203		PNEUM.	×	0038-00144	69.5	72.5	35

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:

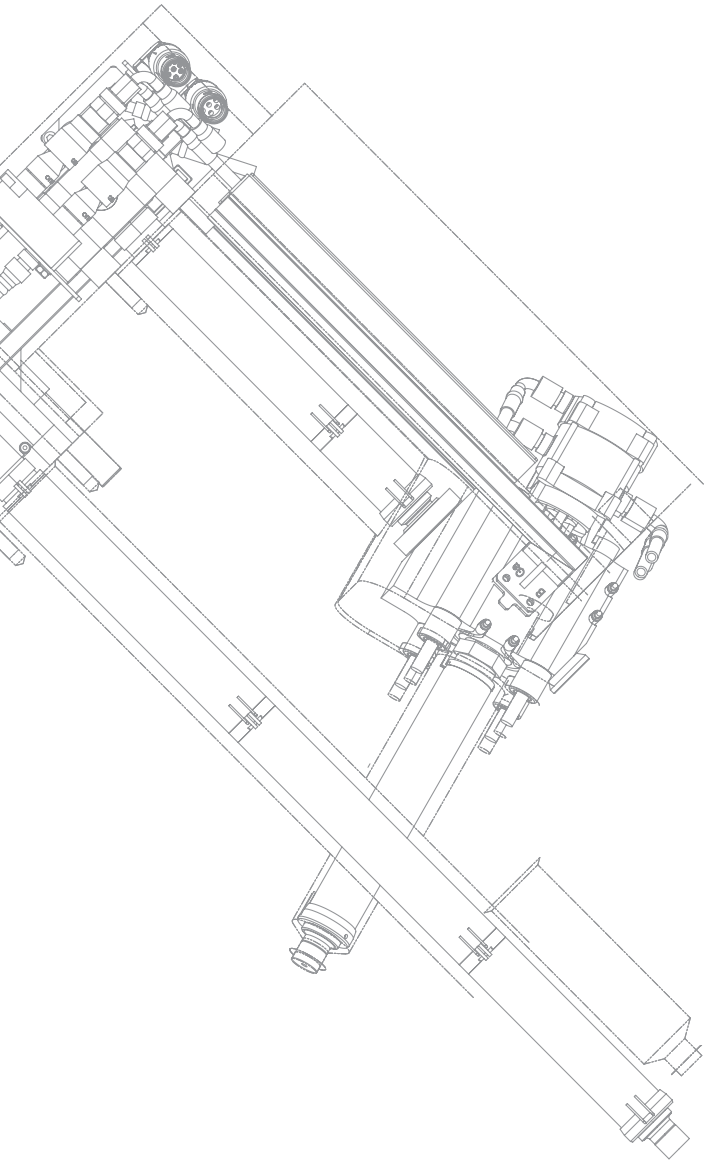
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1;



Pa Series

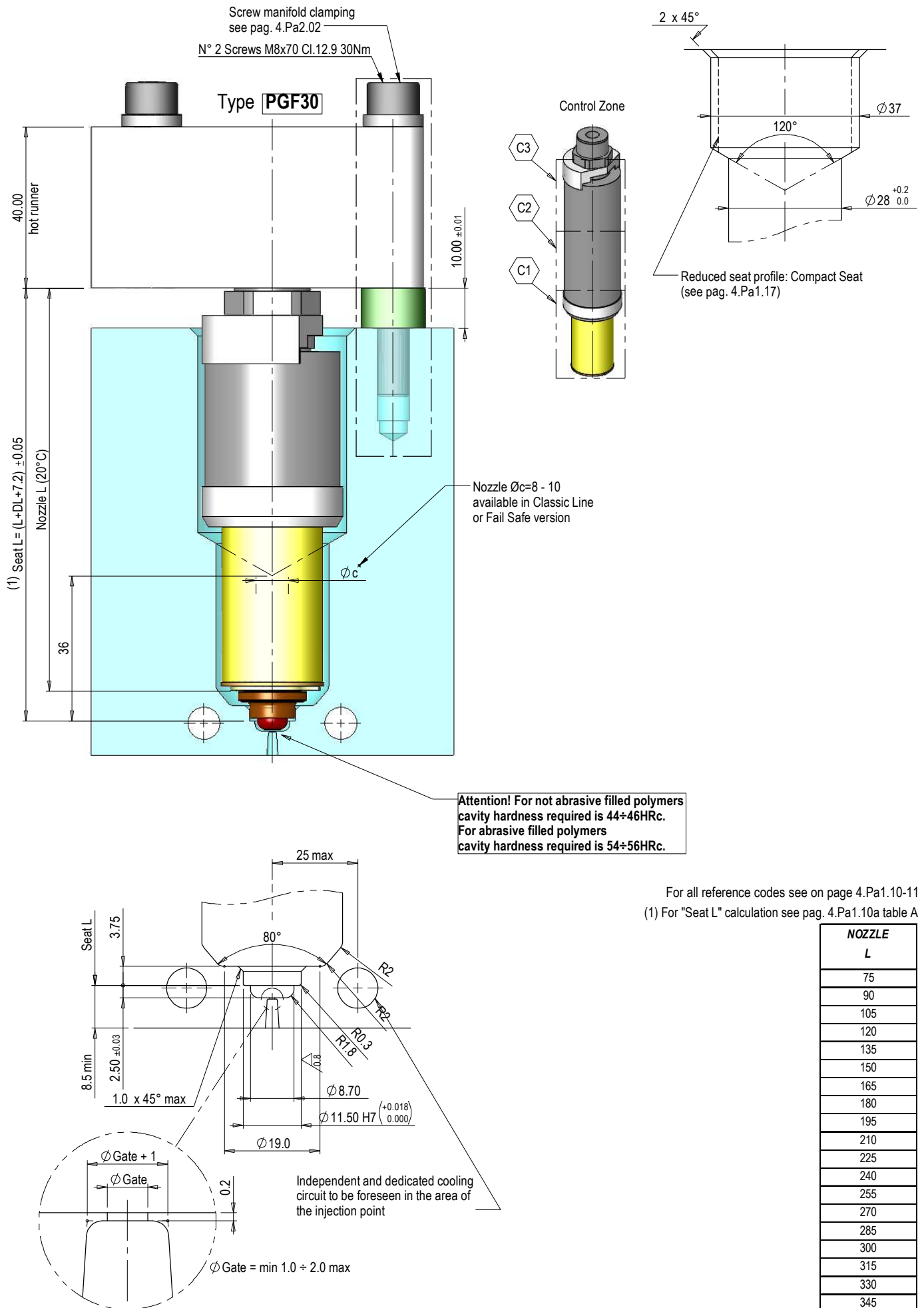
Serie Pa

Pa Serie

Pa Série

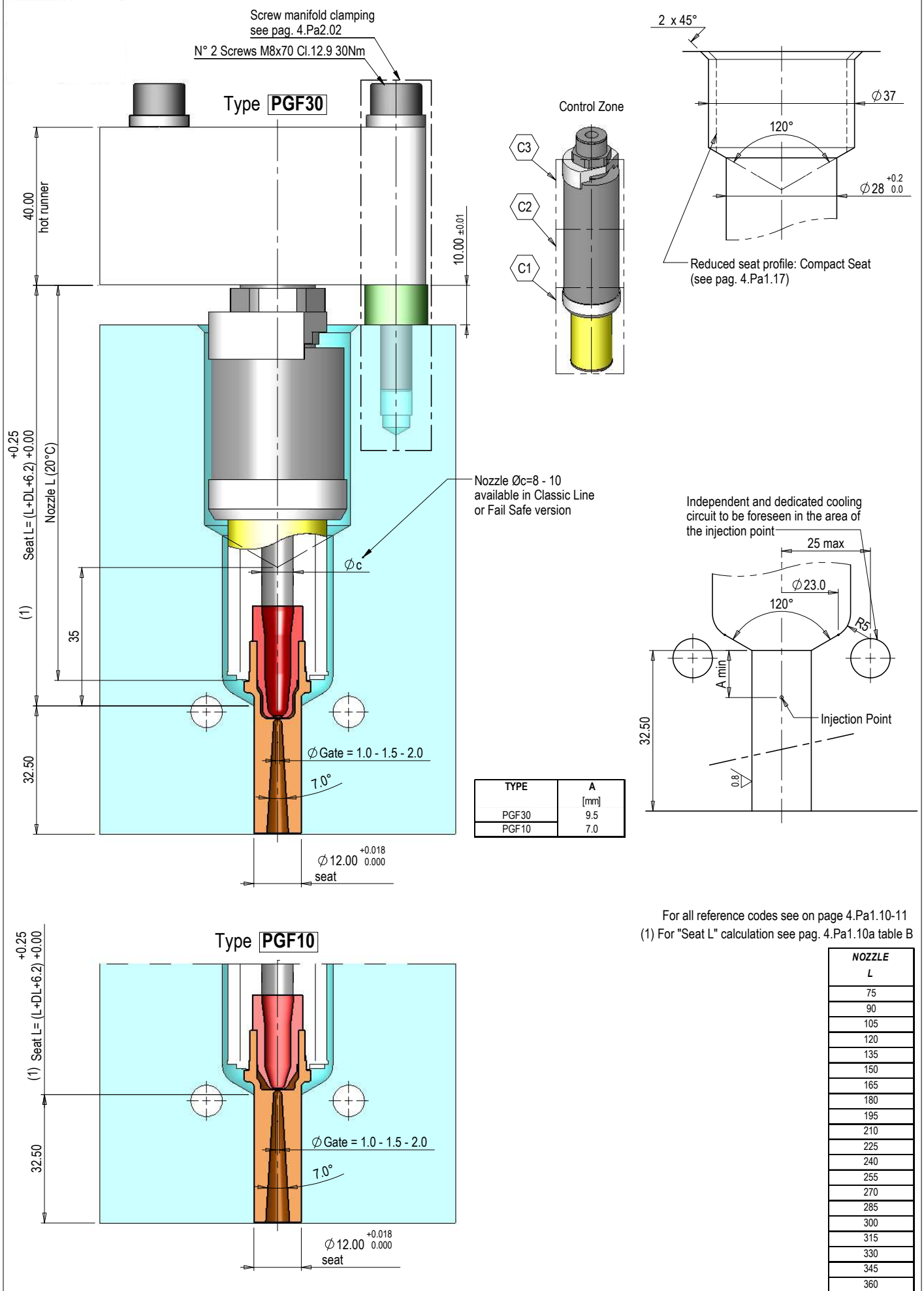
Pa Serie

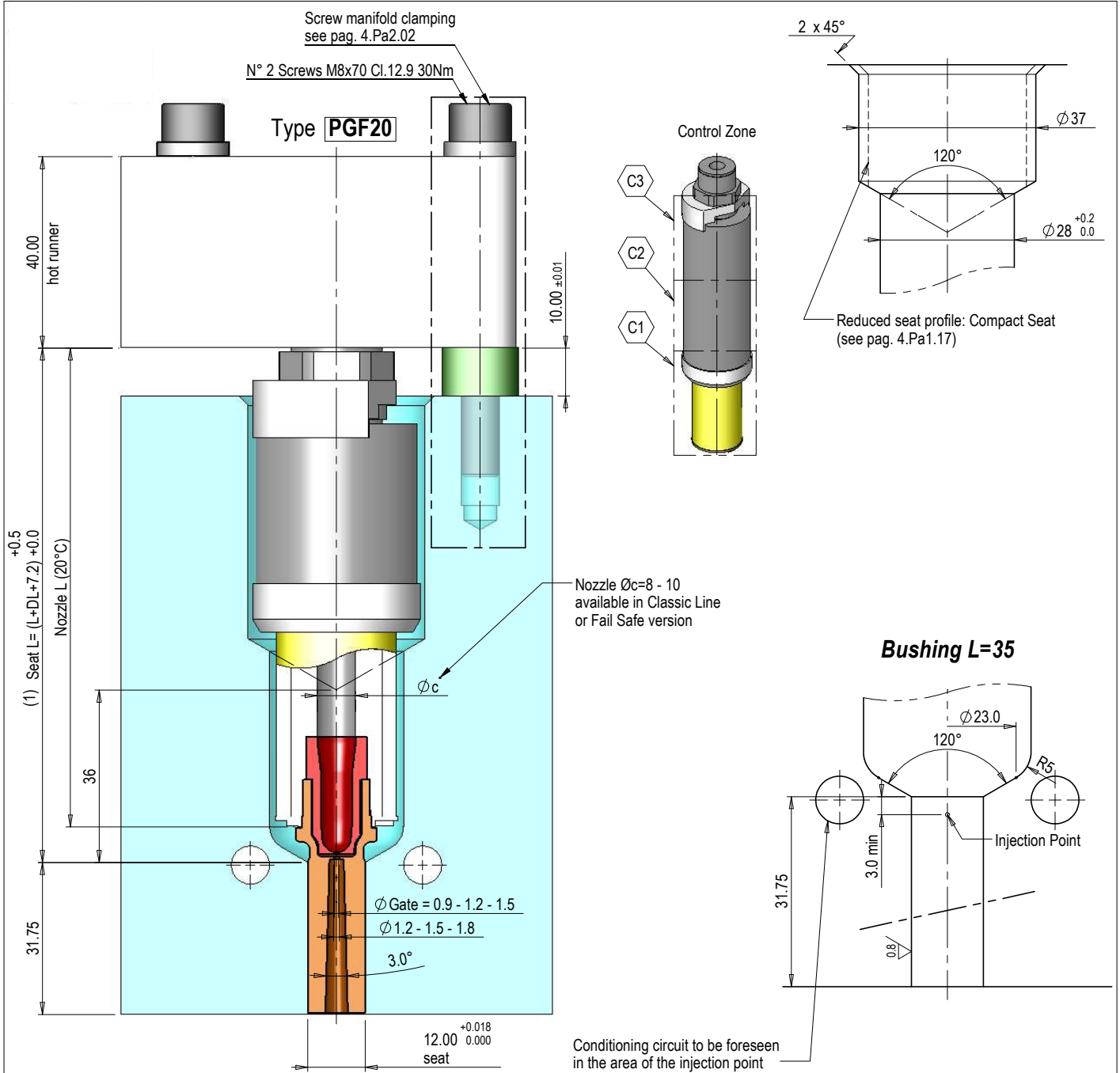
Pa Série



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

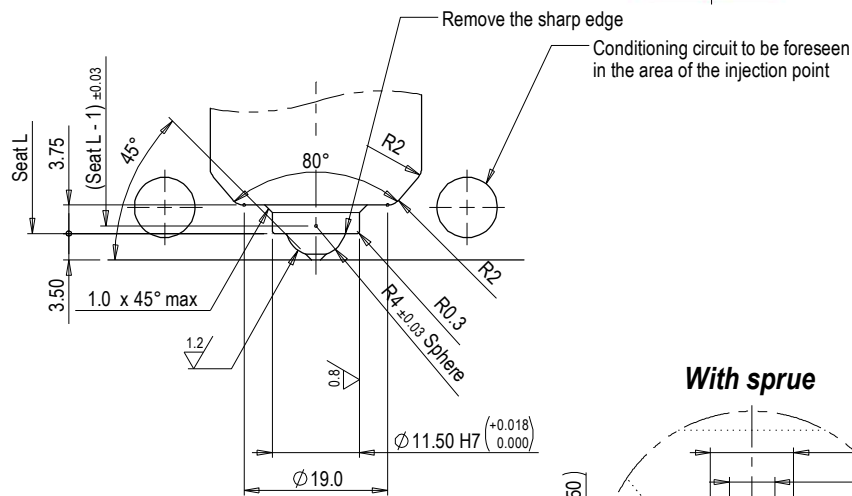
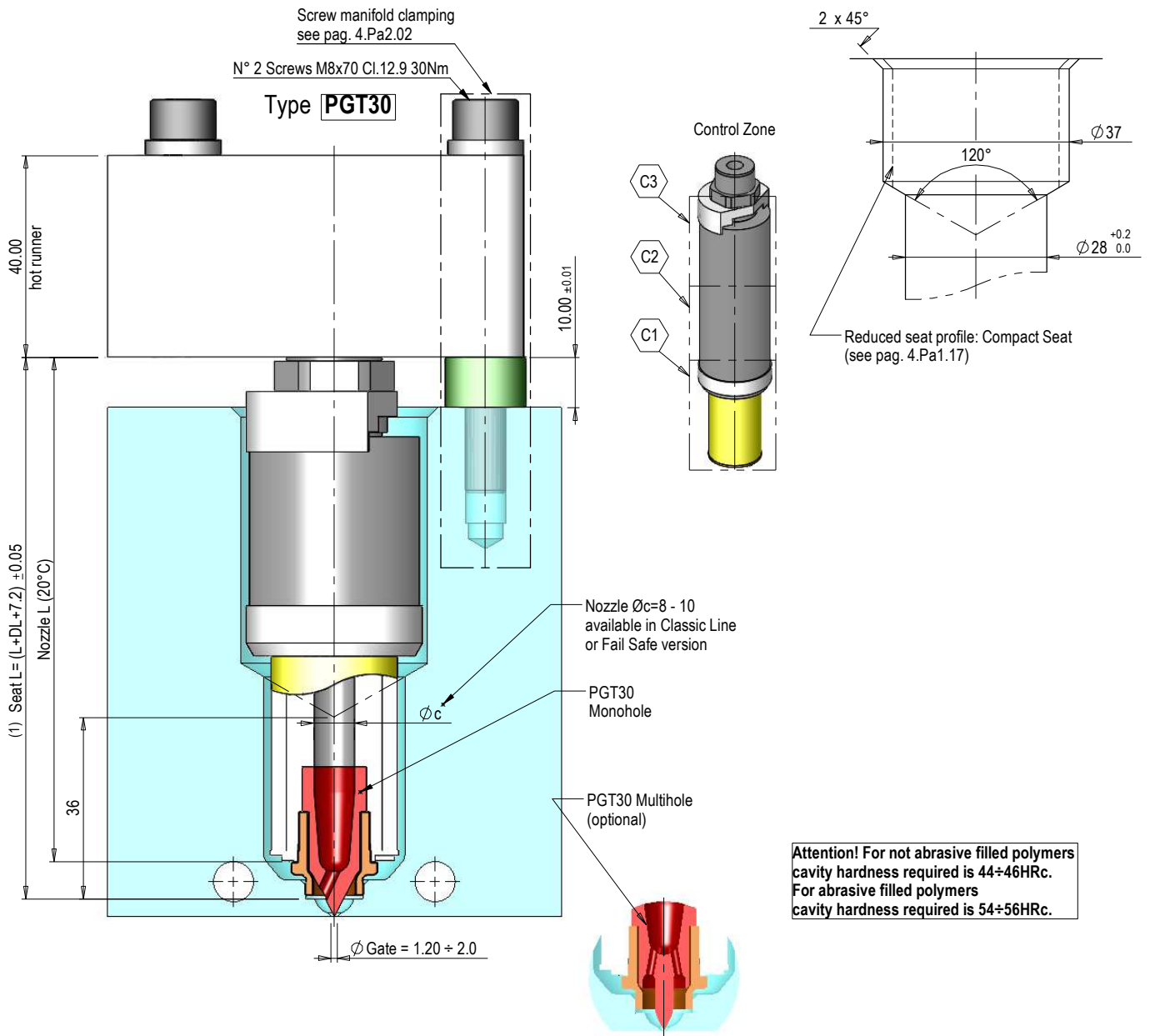
NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345



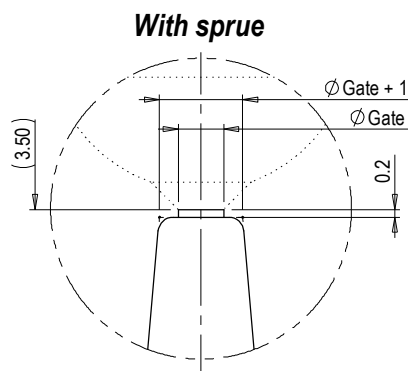


For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

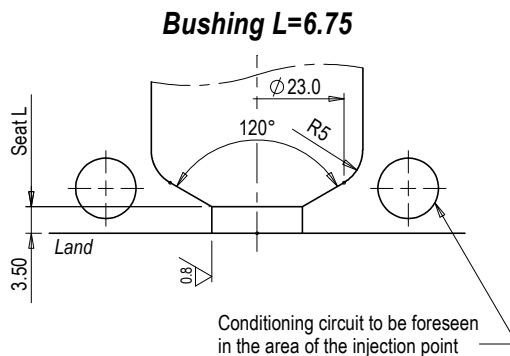
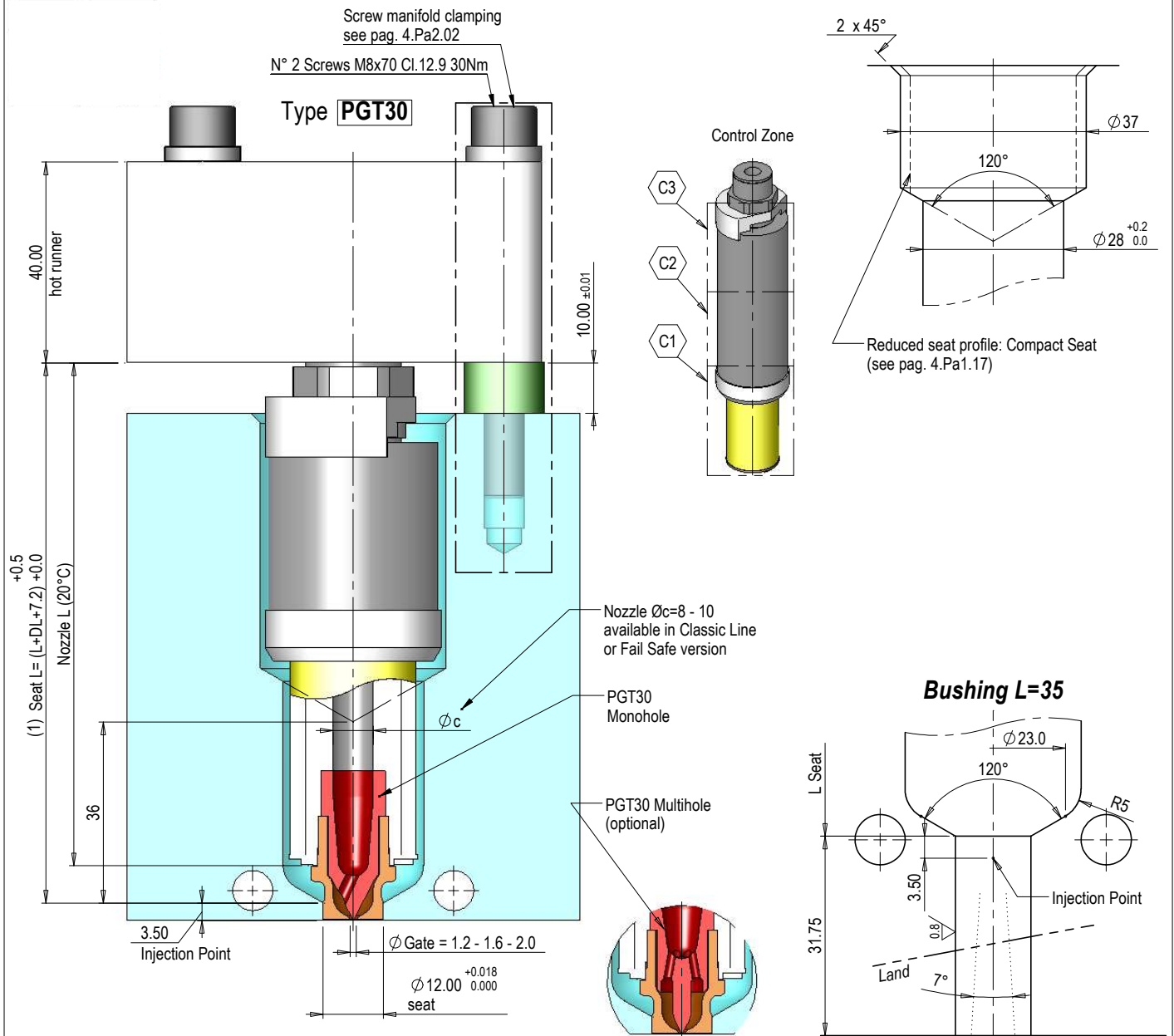
NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
360



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

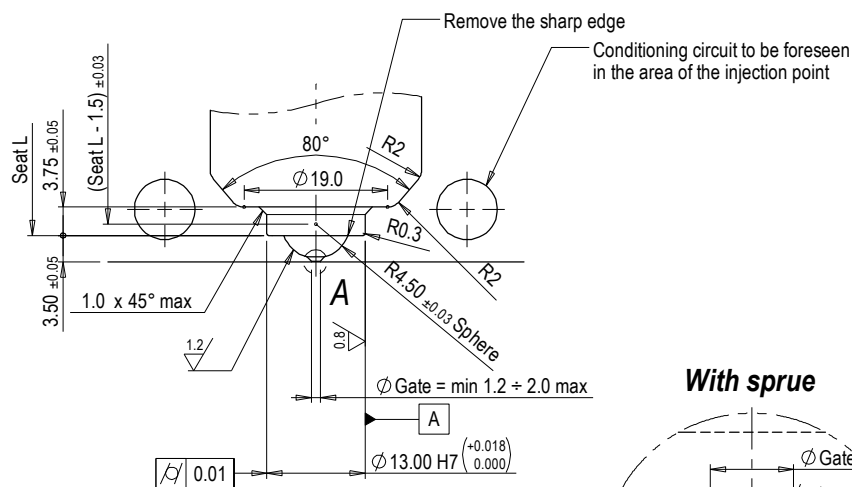
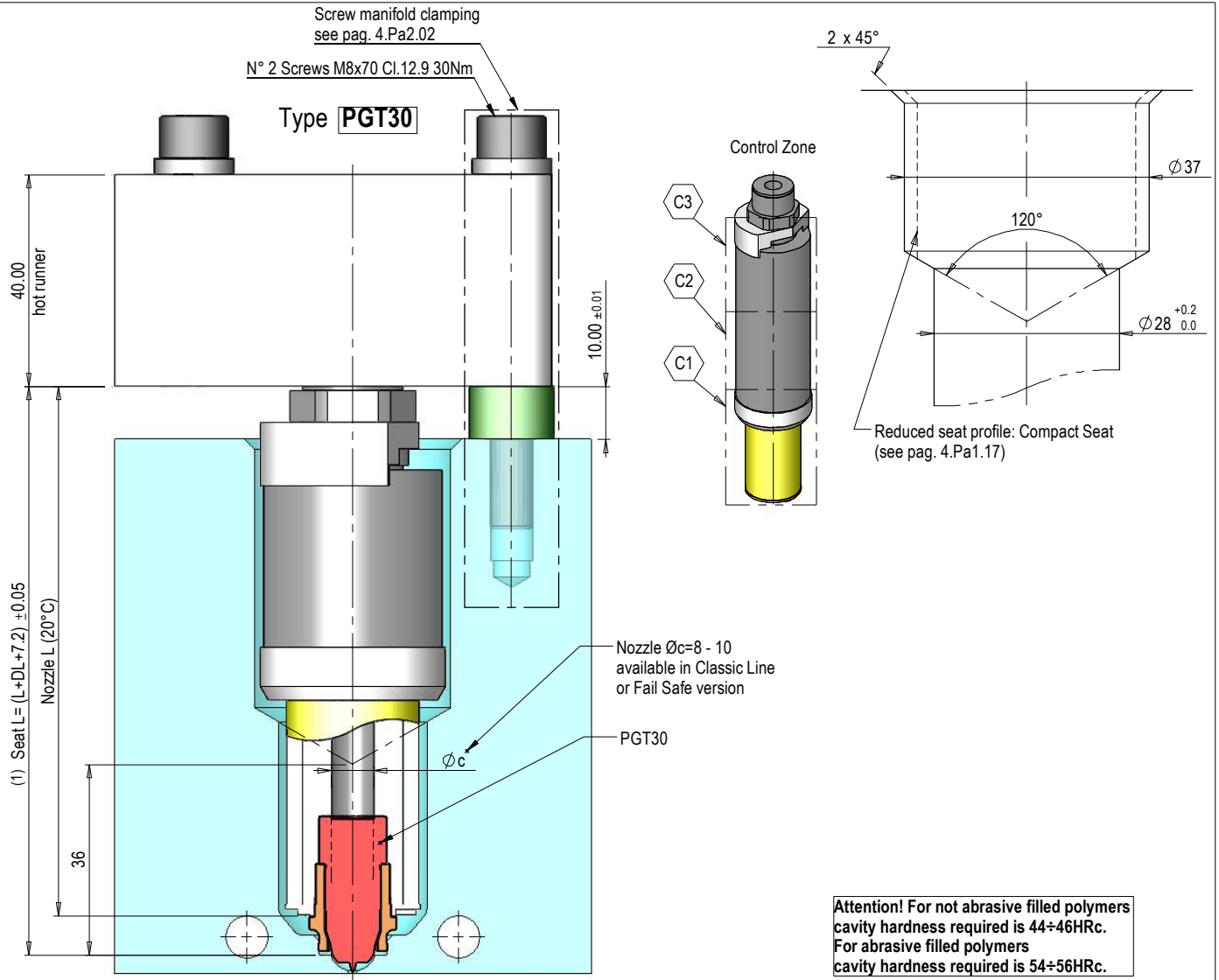


NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345



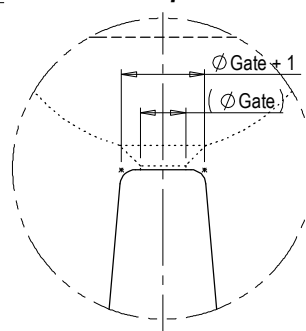
For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

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



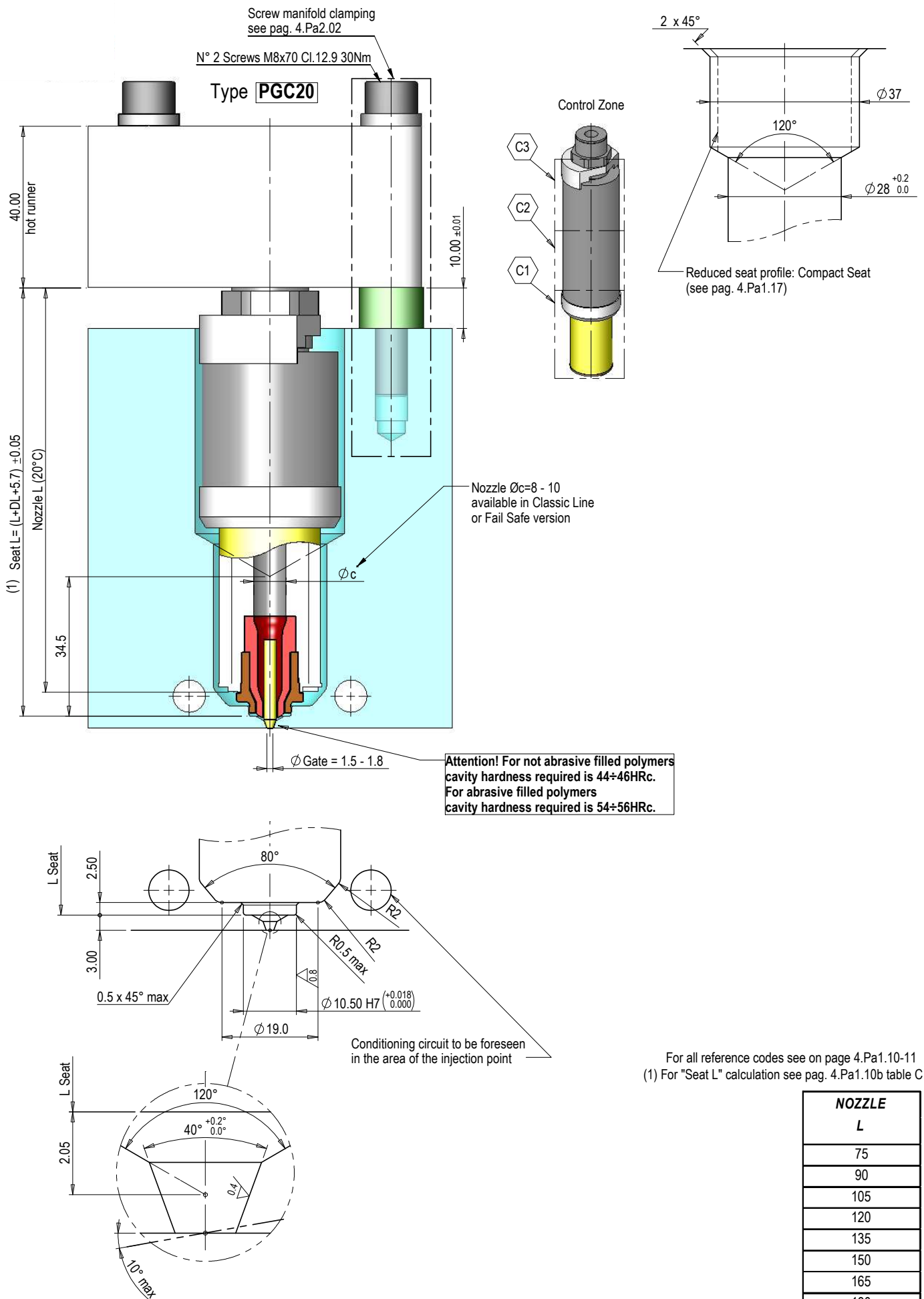
For all reference codes see on page 4.Pa1.10-11
(1) For "Seat L" calculation see pag. 4.Pa1.10a table A

With sprue

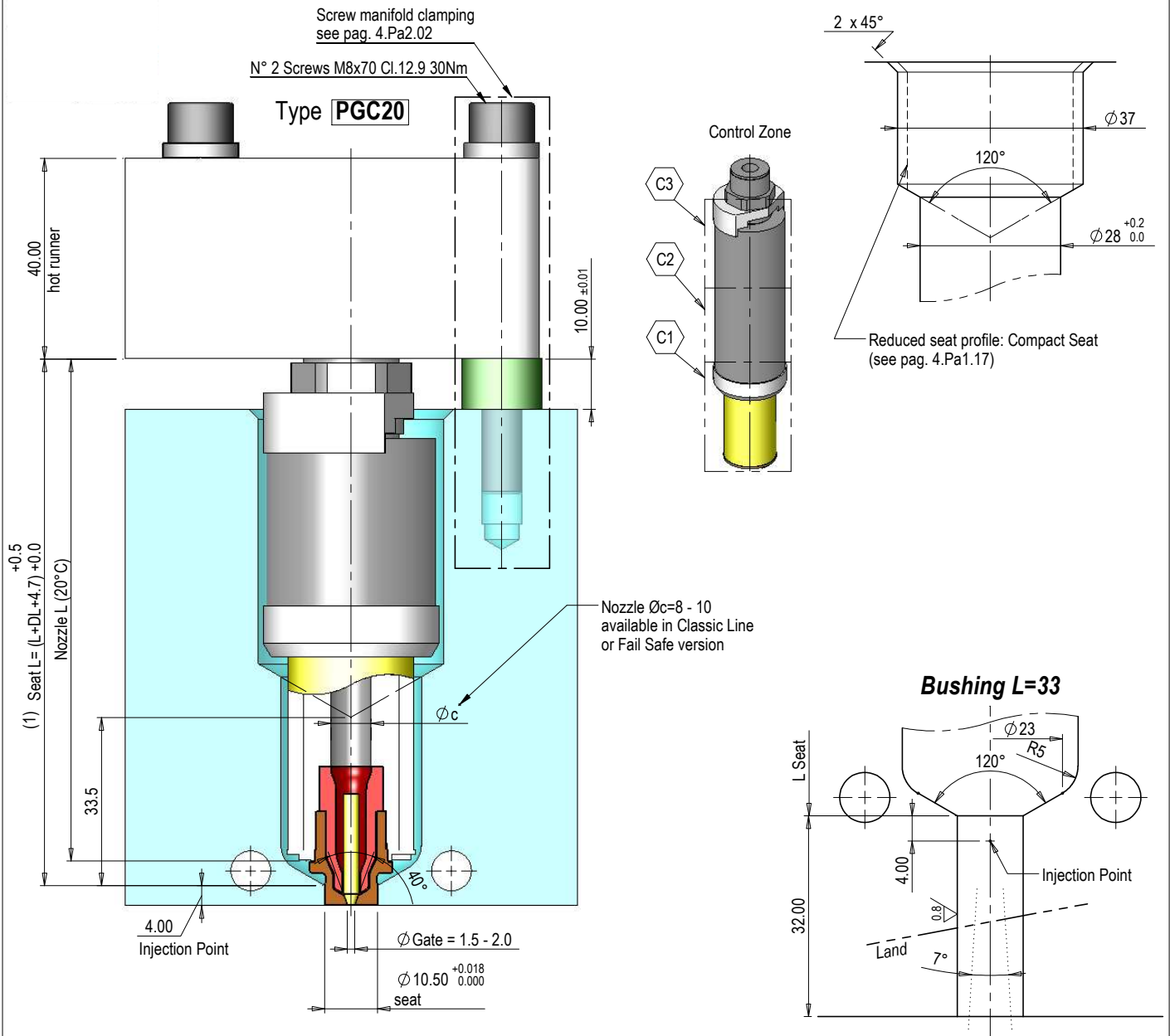


NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345

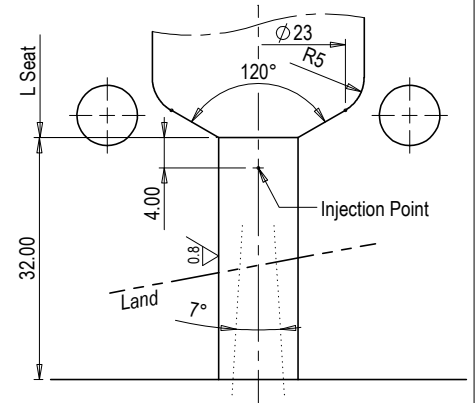
DETAIL A
SCALE 10 : 1



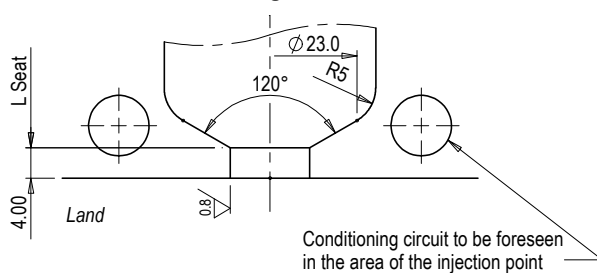
NOZZLE L
75
90
105
120
135
150
165
180



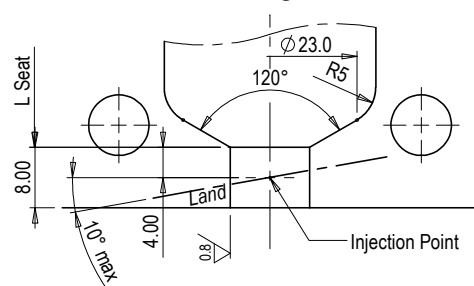
Bushing L=33



Bushing L=5.5

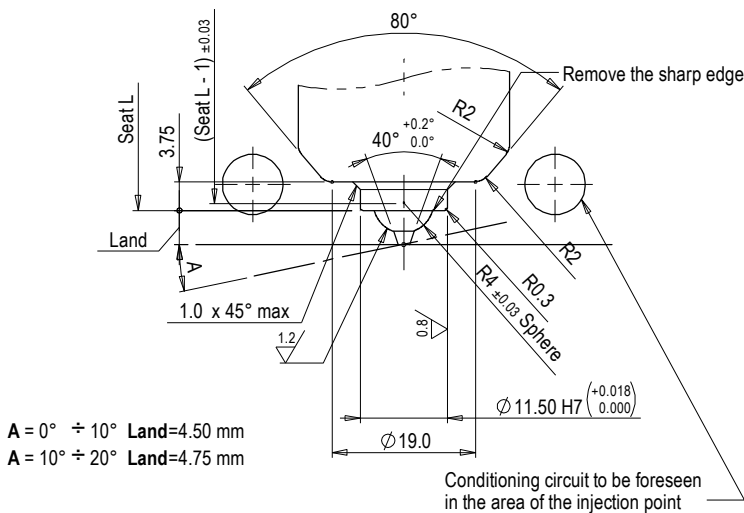
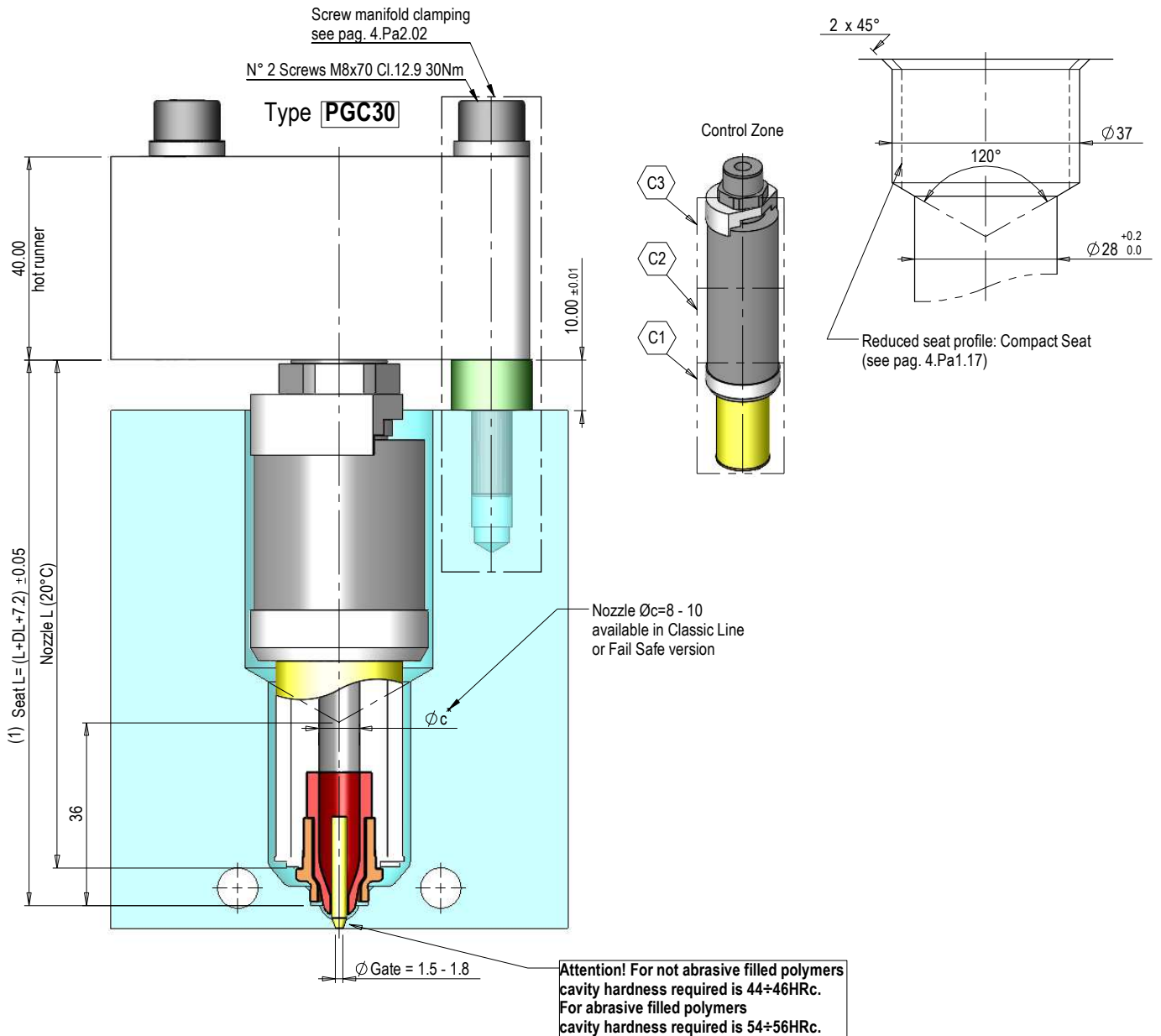


Bushing L=9



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

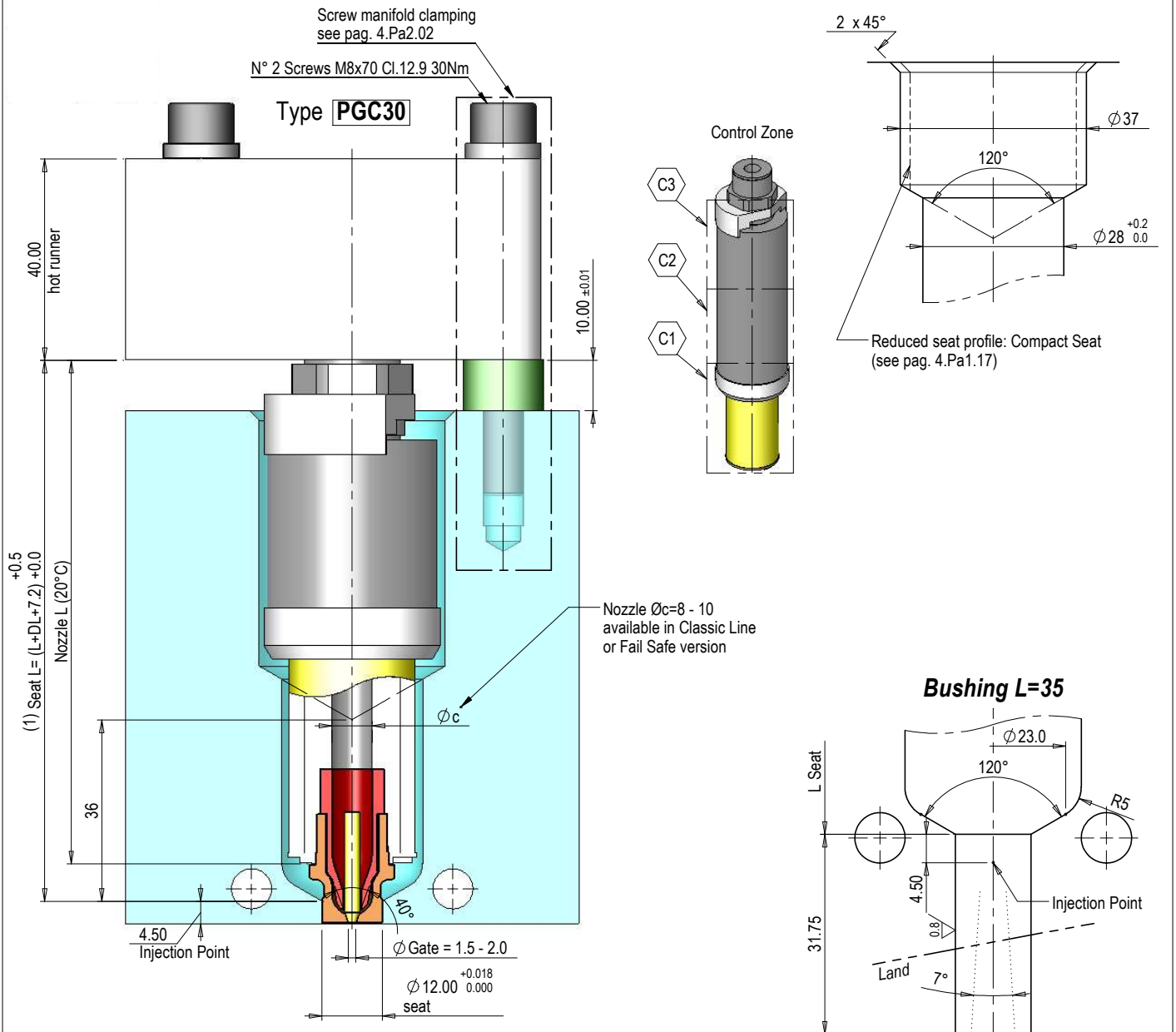
NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
360



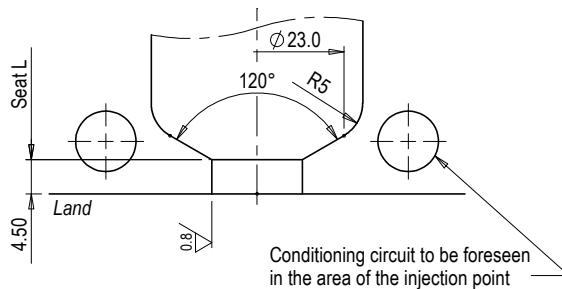
A = 0° ÷ 10° Land=4.50 mm
A = 10° ÷ 20° Land=4.75 mm

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

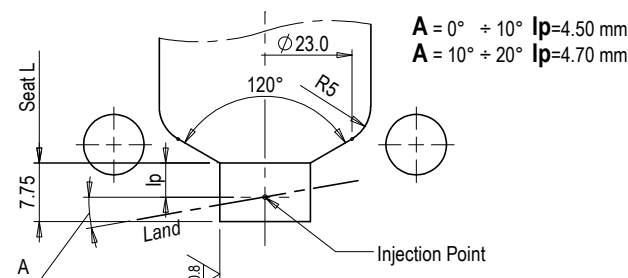
NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345



Bushing L=7.75

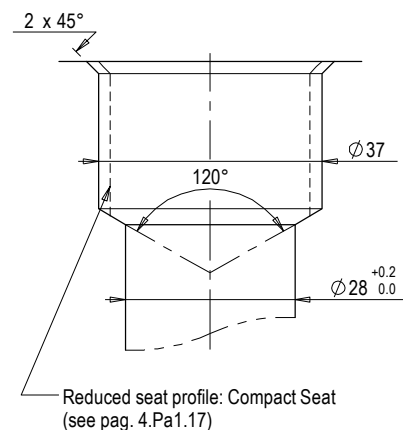
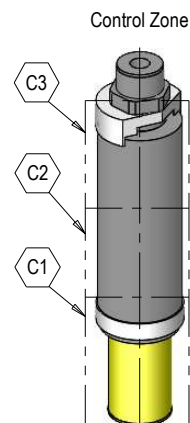
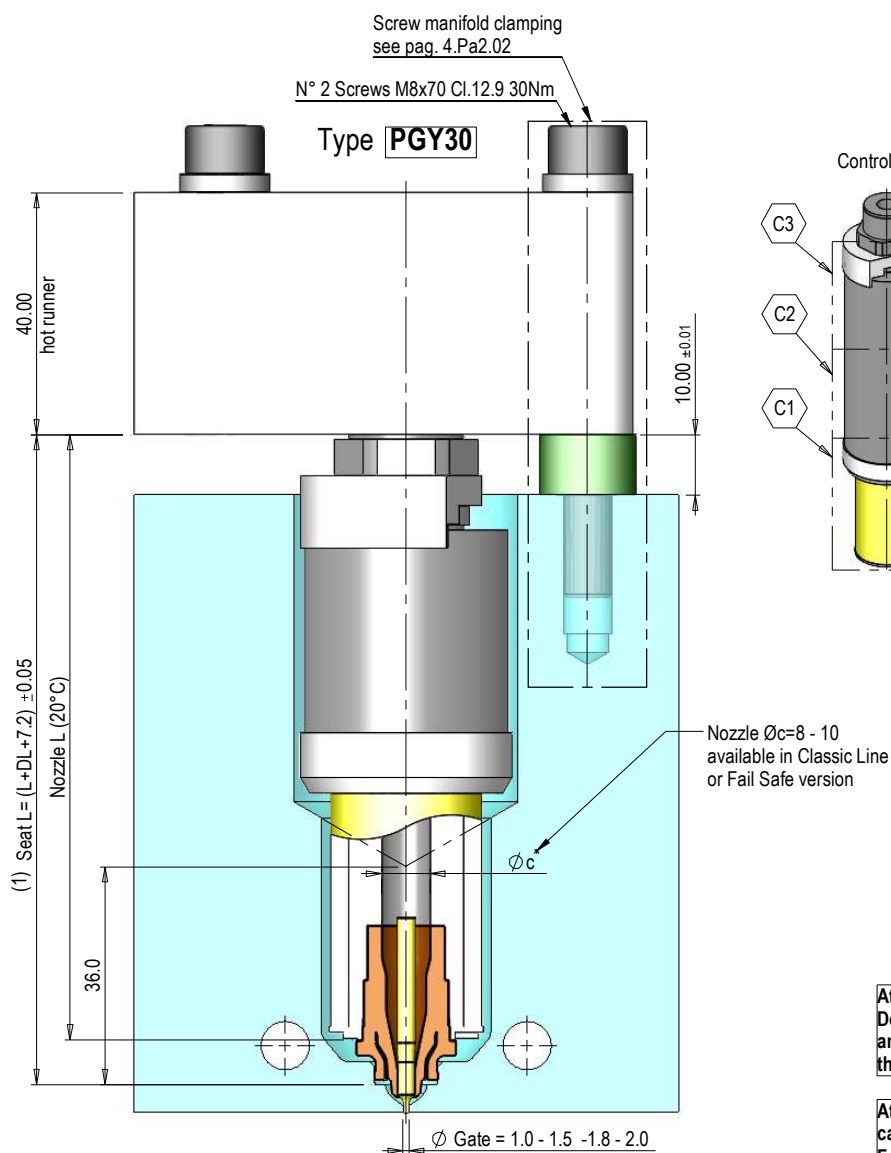


Bushing L=11



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

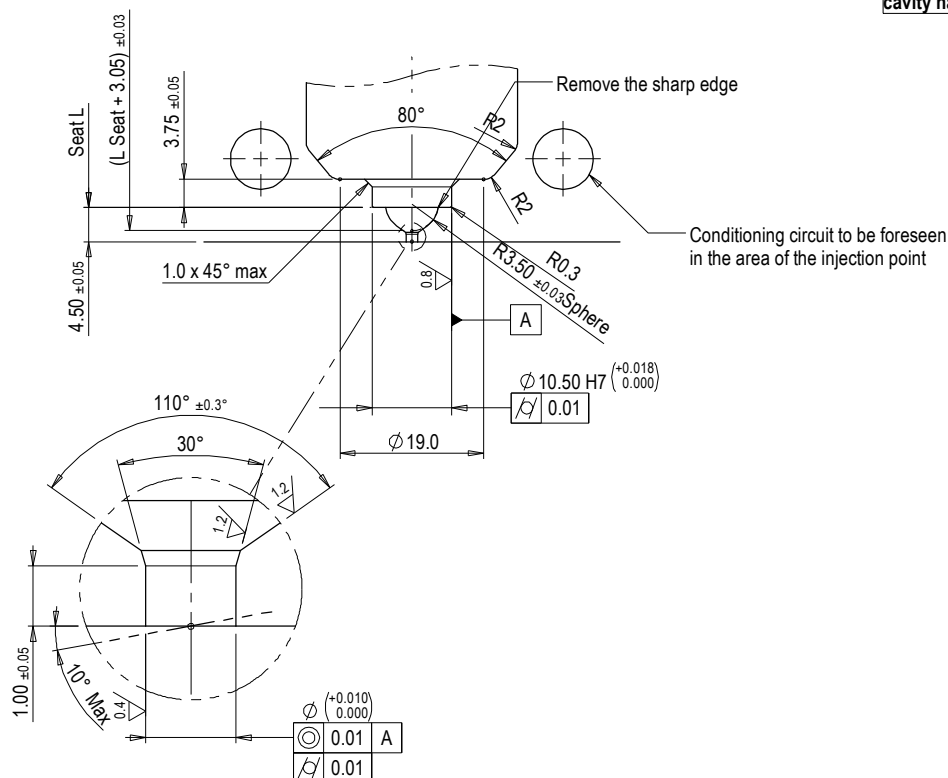
NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
360



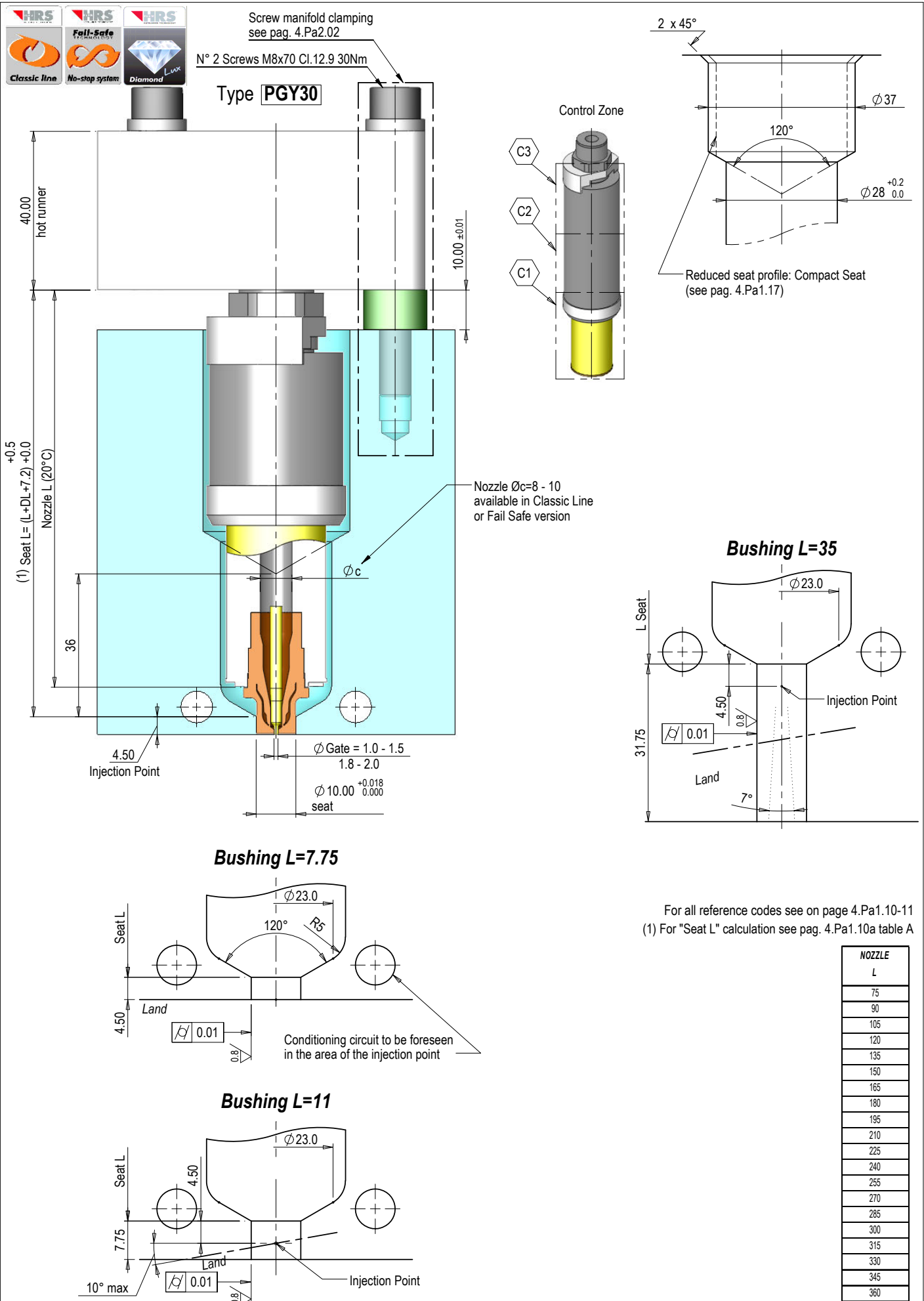
Attention! The tolerances are really important. Do not respect these ones, the grinding surface and roughness' values, it means do not make the system works correctly

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

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



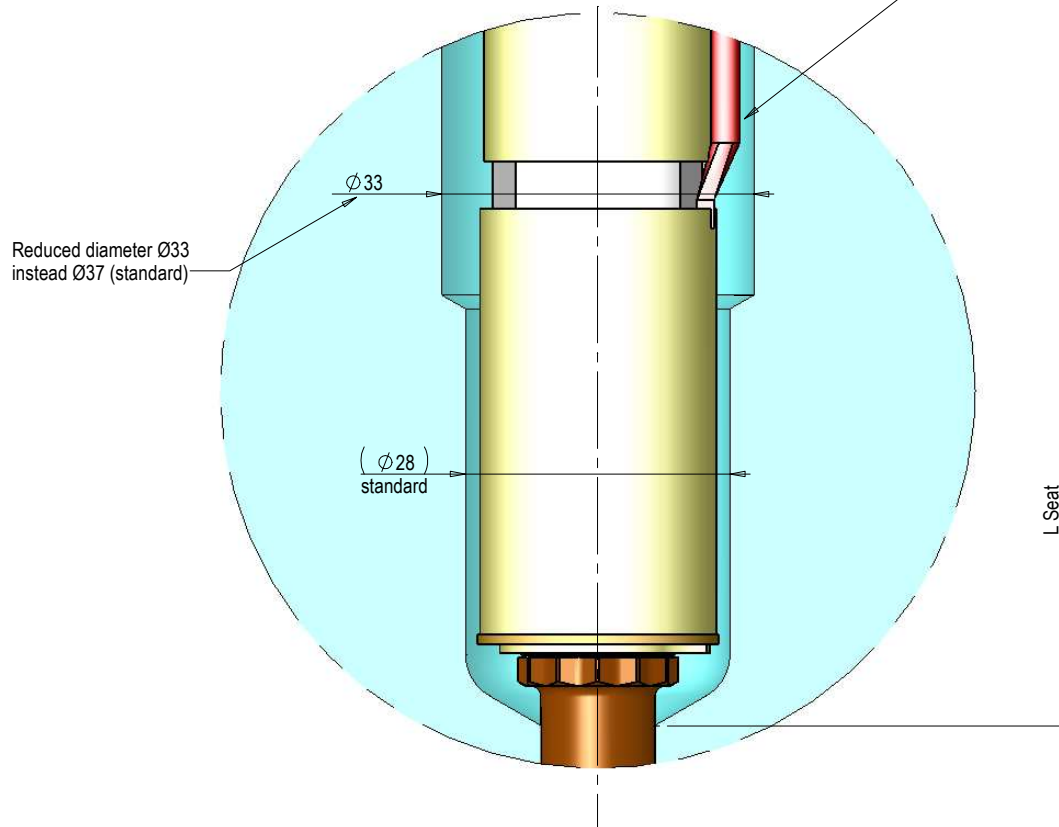
NOZZLE L
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345



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 responsibility about the possible damage of nozzle components arising from the placement on pocket.



NOZZLE L	NOZZLE CODE Øc=8		POWER (230V)				
	 = 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

TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30 0012-00580 0012-00581 for high resistance PGF20 00.9 0012-00372 (to be used with bushing Ø1.2) 01.2 0012-00373 (to be used with bushing Ø1.5) 01.5 0012-00374 (to be used with bushing Ø1.8) PGF10 0012-00595 for high resistance	External end ring Ø11.5 (LUX) 0013-01232 Free Flow 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 conductivity 00.45 0012-00375 0012-00378 00.60 0012-00376 0012-00379 00.75 0012-00377 0012-00380 PGT30 Multihole for Rubber for high conductivity 00.45 0012-00381 0012-00384 00.60 0012-00382 0012-00385 00.75 0012-00383 0012-00386	External end ring Ø11.5 (LUX) 0013-01232 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		
PGC20 0012-00816 PGC20 Antistagnation 0012-00817	PGC20 External end ring 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 end ring for Bushings through cavity
PGC30 0012-00260 0012-00556 for high conductivity PGC30 Antistagnation 0012-00557 For high conductivity with End Ring	External end ring Ø11.5 (LUX) 0013-01232 Ø11.5 (LUX) 0013-01233 for high conductivity 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 0013-00441 0013-00423	0262-00054 { for External end ring 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 end ring

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

T1 (°C) = Injection temperature
T2 (°C) = Mold temperature
 $\Delta T = T1 - T2$
 $\lambda = 0.000012$ (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
	$DL = (L \cdot \Delta T \cdot \lambda)$										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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
	$L_{Seat} = L + DL + 7.2$										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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

Tab. B - "Seat L" Calculation

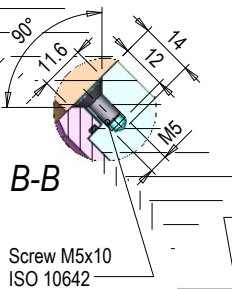
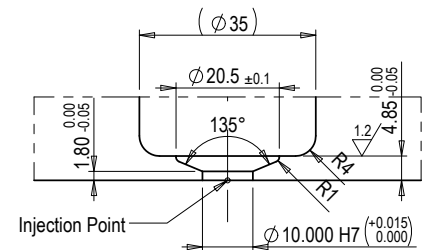
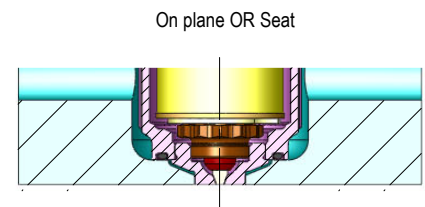
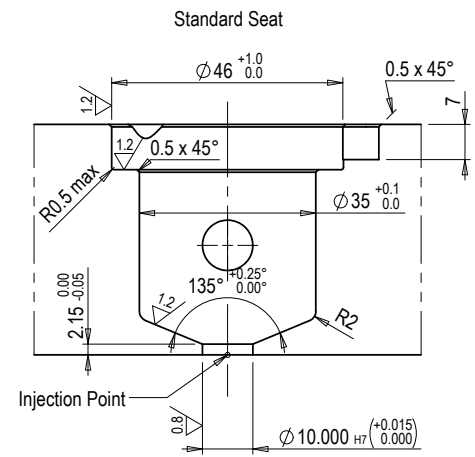
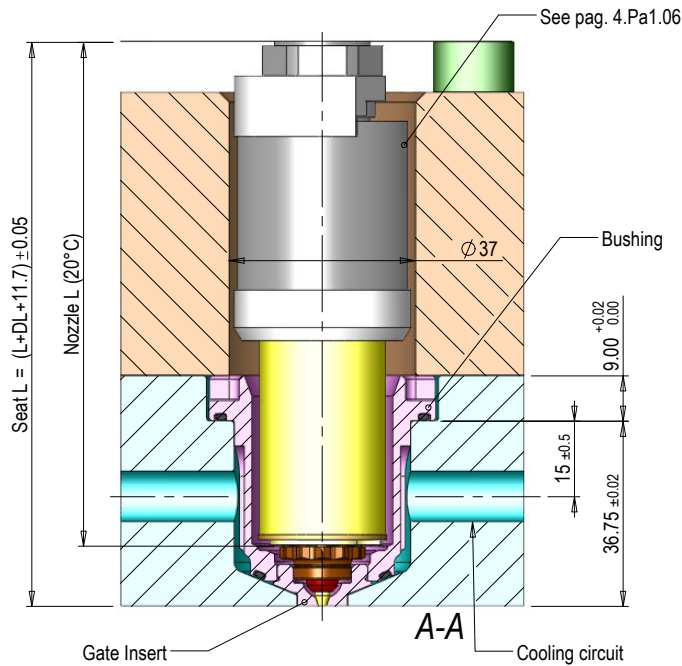
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$L_{\text{Seat}} = L + DL + 6.2$										
	$[\Delta T=100^\circ\text{C}]$	$[\Delta T=120^\circ\text{C}]$	$[\Delta T=140^\circ\text{C}]$	$[\Delta T=160^\circ\text{C}]$	$[\Delta T=180^\circ\text{C}]$	$[\Delta T=200^\circ\text{C}]$	$[\Delta T=220^\circ\text{C}]$	$[\Delta T=240^\circ\text{C}]$	$[\Delta T=260^\circ\text{C}]$	$[\Delta T=280^\circ\text{C}]$	$[\Delta T=300^\circ\text{C}]$
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

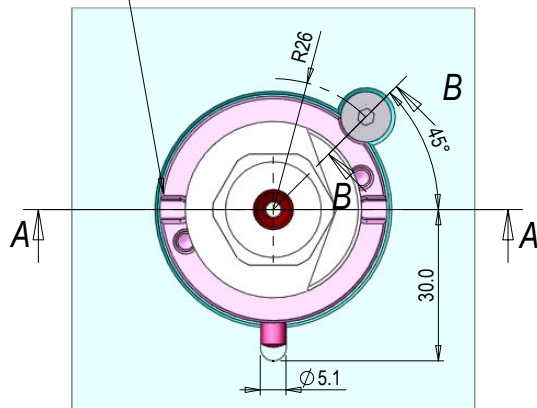
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$L_{\text{Seat}} = L + DL + 5.7$										
	$[\Delta T=100^\circ\text{C}]$	$[\Delta T=120^\circ\text{C}]$	$[\Delta T=140^\circ\text{C}]$	$[\Delta T=160^\circ\text{C}]$	$[\Delta T=180^\circ\text{C}]$	$[\Delta T=200^\circ\text{C}]$	$[\Delta T=220^\circ\text{C}]$	$[\Delta T=240^\circ\text{C}]$	$[\Delta T=260^\circ\text{C}]$	$[\Delta T=280^\circ\text{C}]$	$[\Delta T=300^\circ\text{C}]$
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

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 Seat = L + DL + 4.7										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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

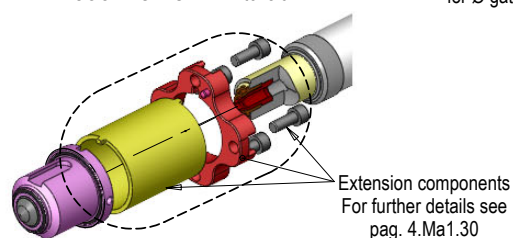


Slots for orientation of cooling insert
in case of extension (see pag. 4.Ma1.30)



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

COOLING INSERT Extension



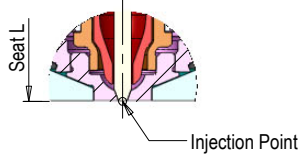
Standard Bushing
cod. 0121-00403

Bushing on plane OR
cod. 0121-00404

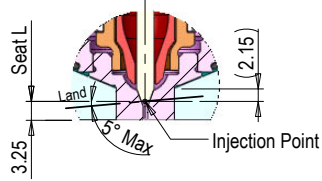
for Ø gate and codes check page 4.Pa1.24

Type **PGC30**

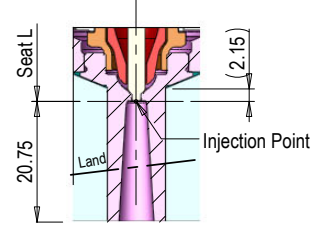
Version L=7.75



Version L=11

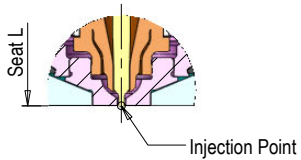


Version L=35

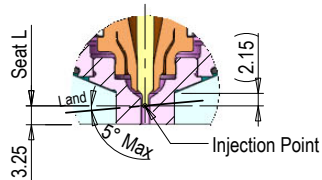


Type **PGY30**

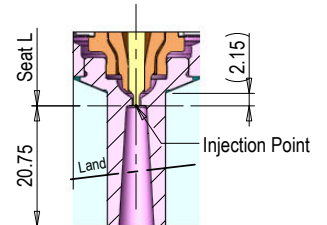
Version L=7.75



Version L=11

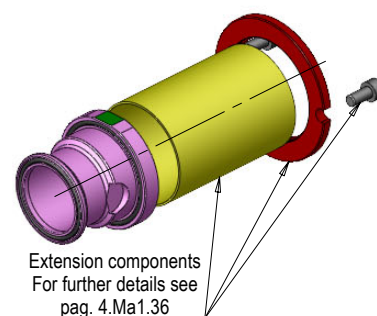


Version L=35



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

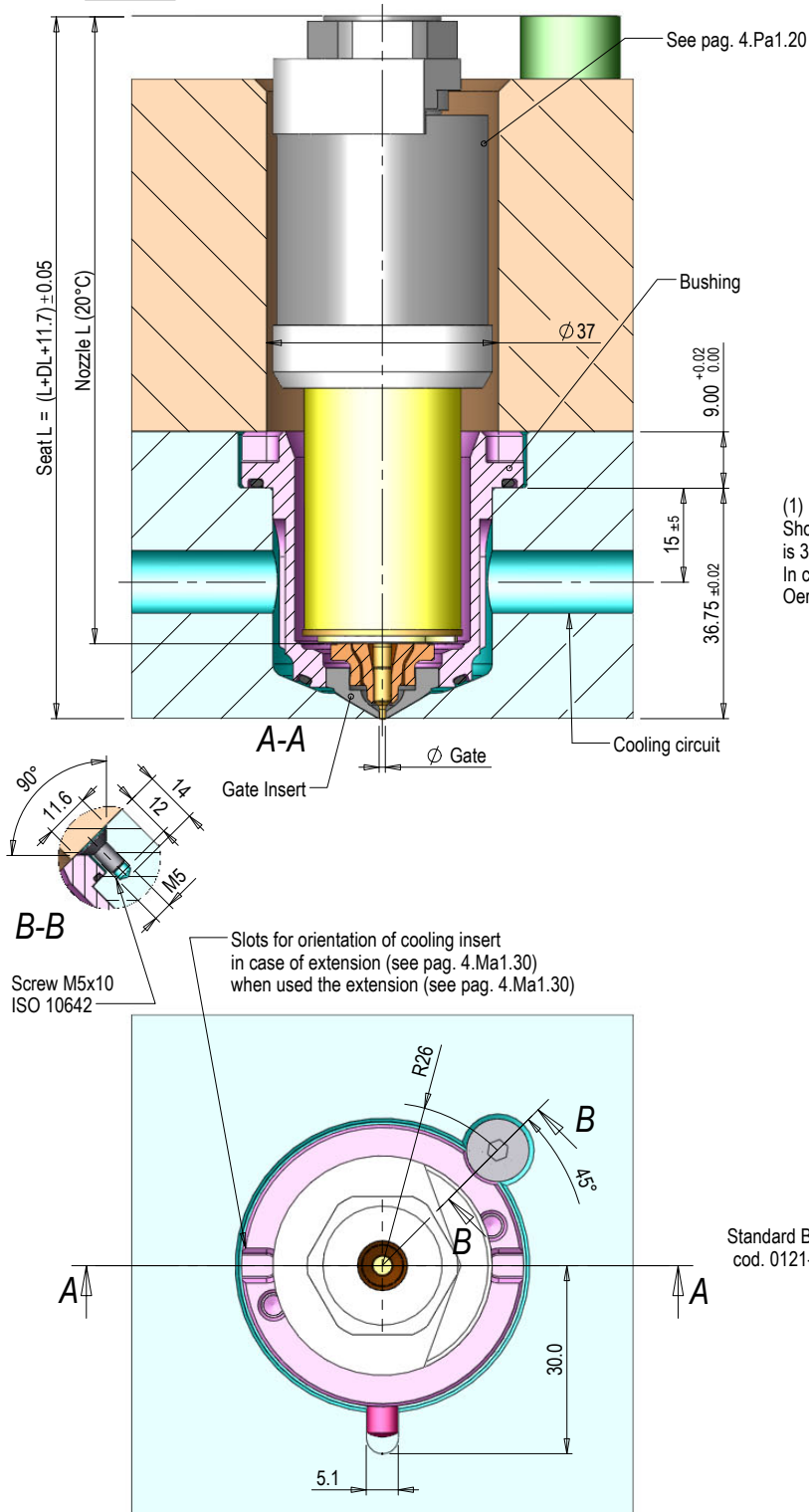
GATE INSERT			
	Version L=7.75	Version L=11	Version L=35
PGC30	Gate	Gate	Gate
	Ø1.5 - 0335-00001	Ø1.5 - 0335-00003	Ø1.5 - 0335-00005
	Ø2.0 - 0335-00002	Ø2.0 - 0335-00004	Ø2.0 - 0335-00006
PGY30	Gate	Gate	Gate
	Ø1.0 - 0335-00007	Ø1.0 - 0335-00011	Ø1.0 - 0335-00015
	Ø1.5 - 0335-00008	Ø1.5 - 0335-00012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



(*) Applicable to all type Nozzles Compact type

- 

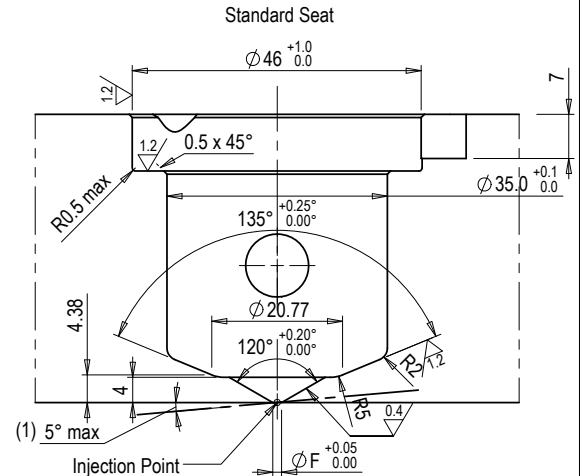
Type **PGY30**



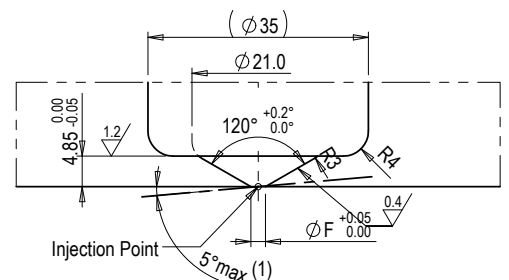
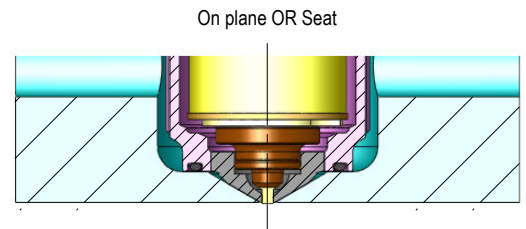
1) Cooling note: suggested hole Ø10 to cool max 4 bushings with only 1 circuit (range 4÷6 Bar)

GATE INSERT		
Code	Ø Gate	Ø F
0335-00163	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



(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.



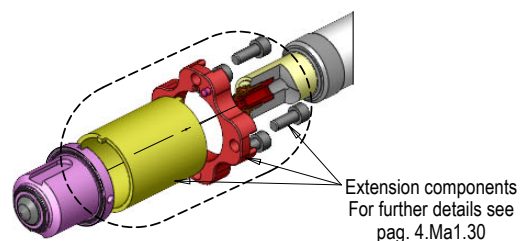
Standard Bushing
cod. 0121-00403

Bushing on plane OR
cod. 0121-00404

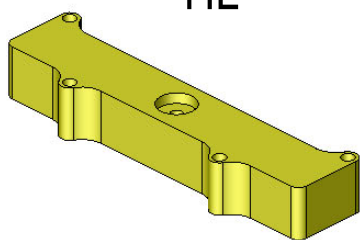
Gate Insert

Gate Insert

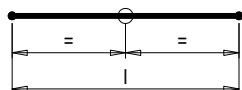
COOLING INSERT Extension



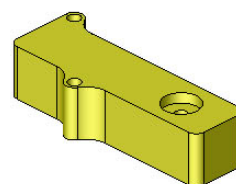
-HL-



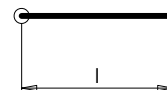
Standard
l=150-200-250-300-350-400-450 mm



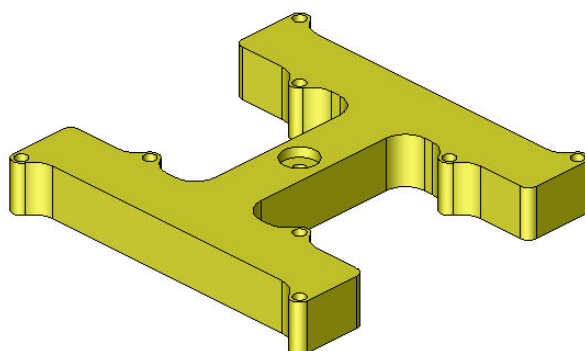
-HD-



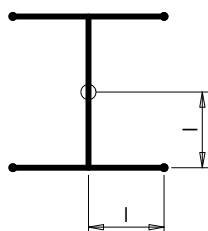
Standard
l=75-100-125-150-175-200-225 mm



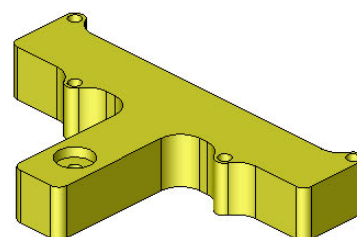
-HH-



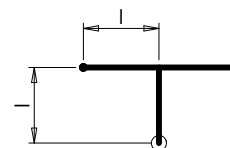
Standard
l=100-125-150 mm



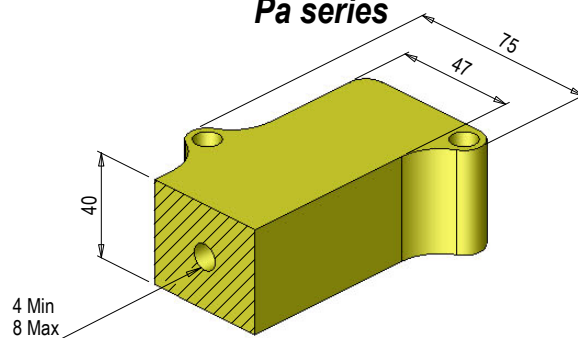
-HT-



Standard
l=100-125-150 mm



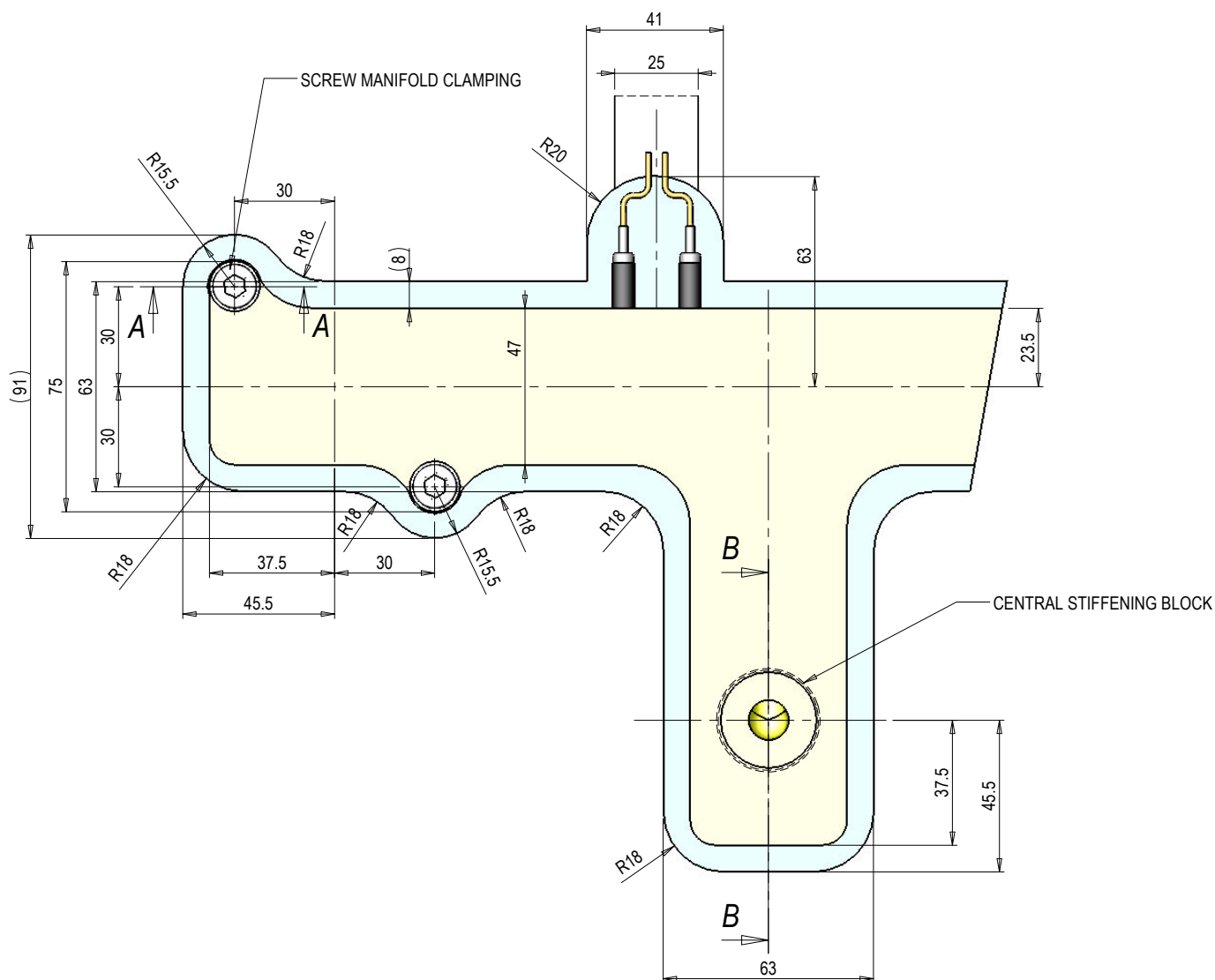
Pa series



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

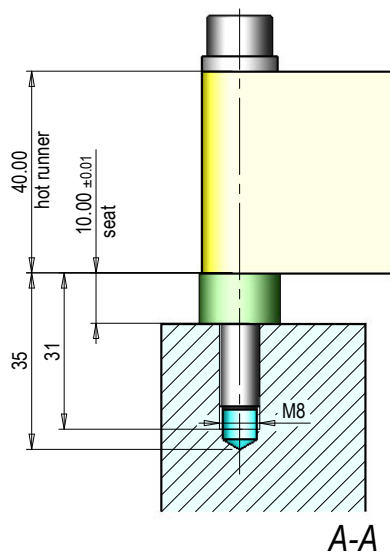
The following profile is the typical one for the standard not wired hot runner pocket

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



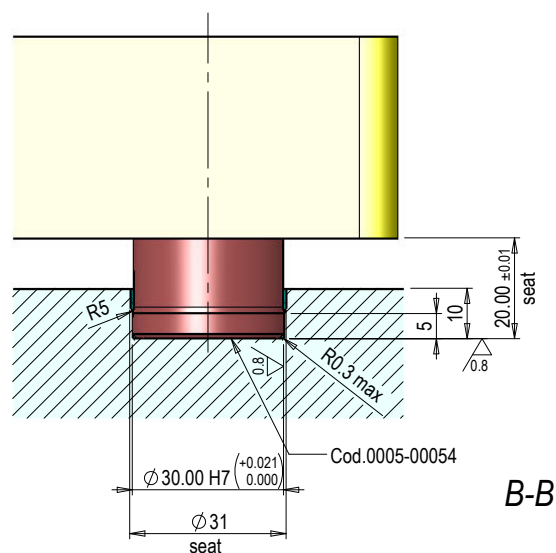
Screw manifold clamping

Screw M8x70 cl.12.9 30 Nm



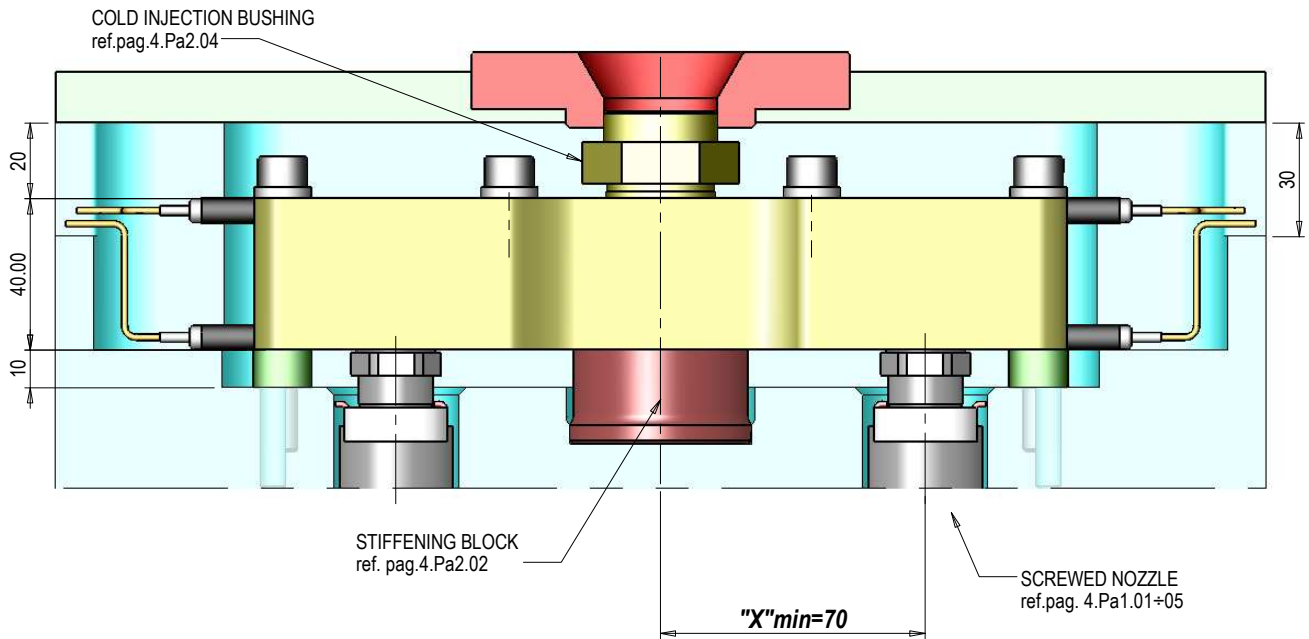
A-A

***Pocket
central stiffening block***



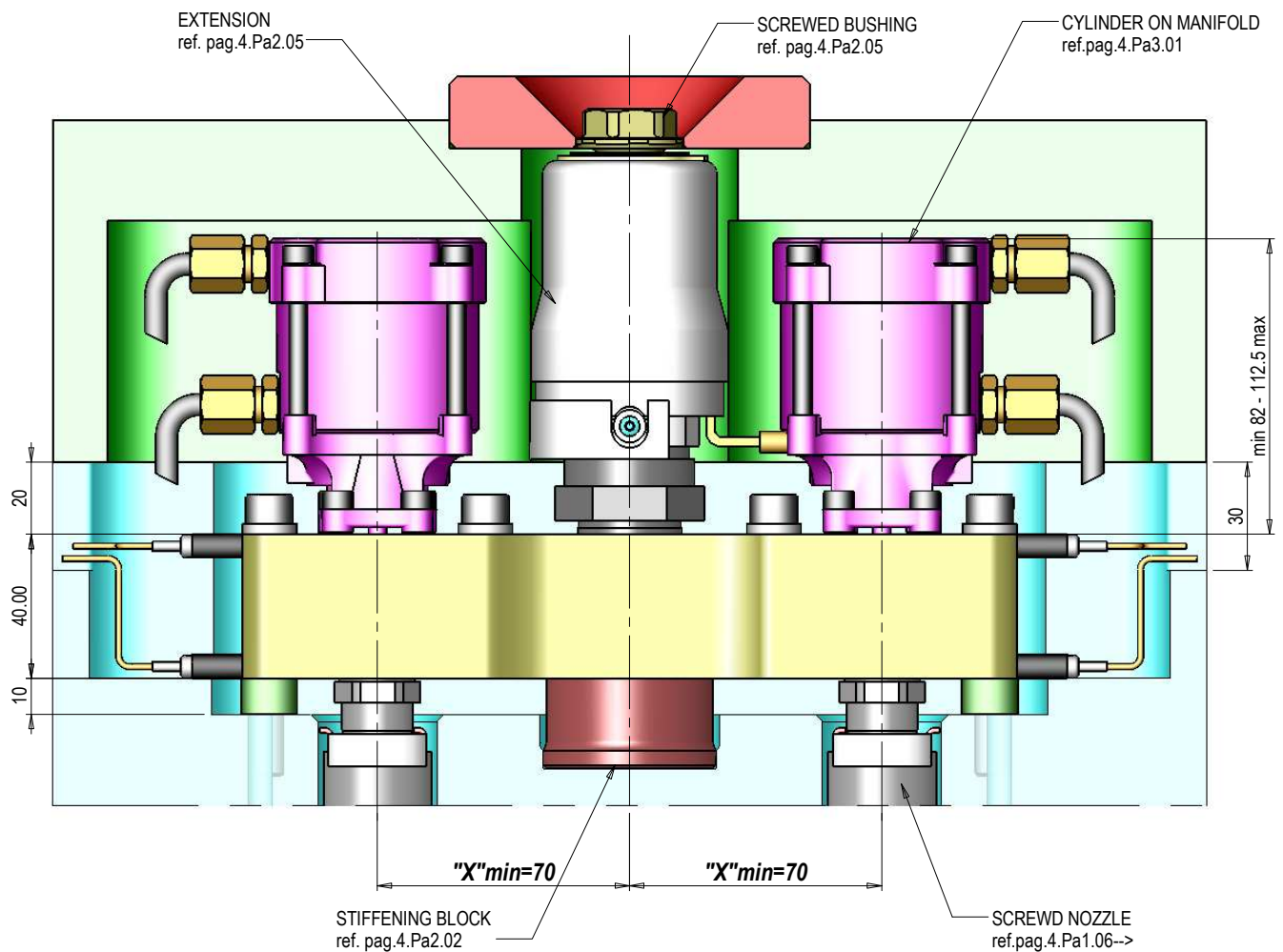
B-B

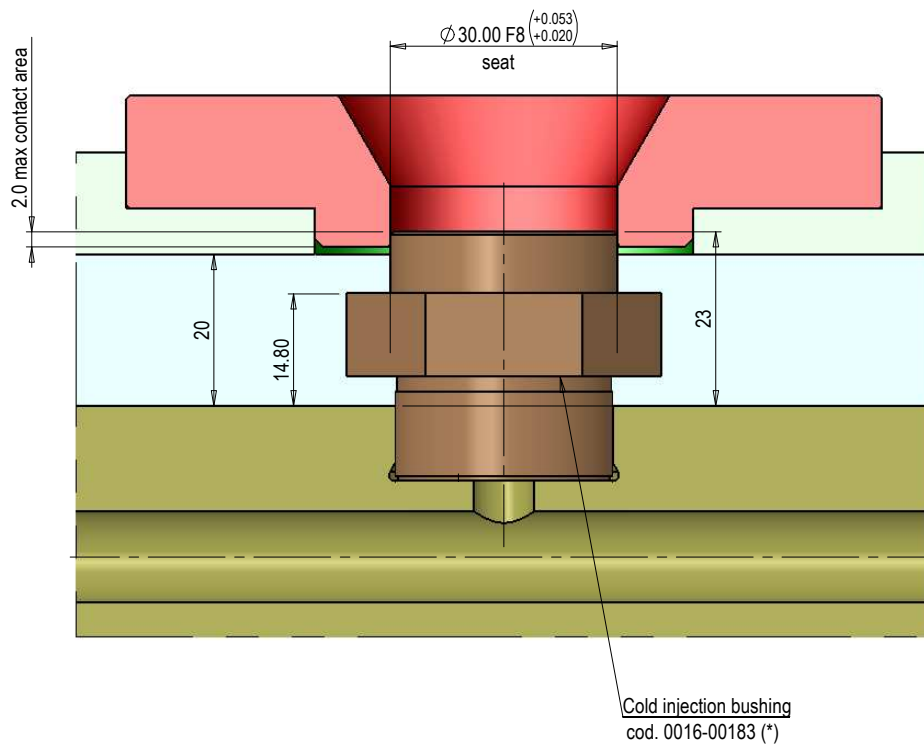
Structure for TORPEDO or FREE FLOW systems



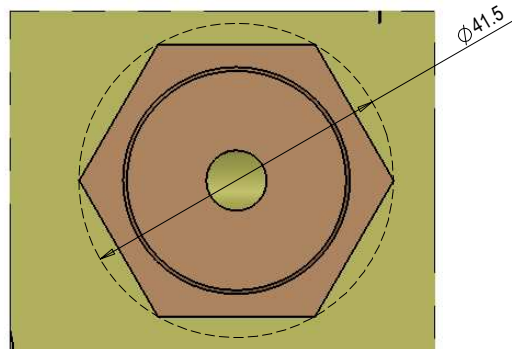
Xmin= min centre distance between injection bushing and nozzle for non standard systems

Structure for VALVE GATING systems

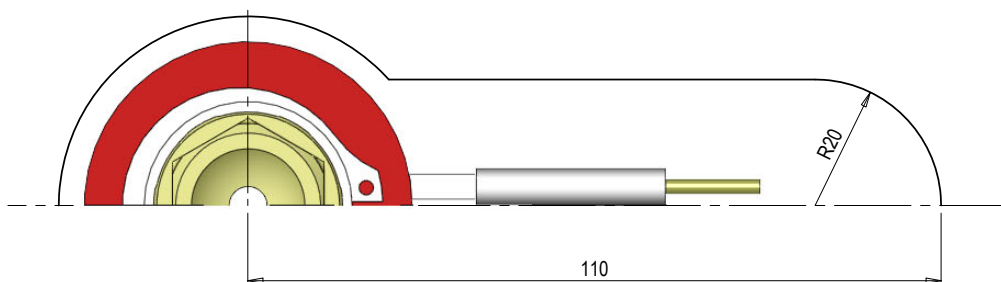
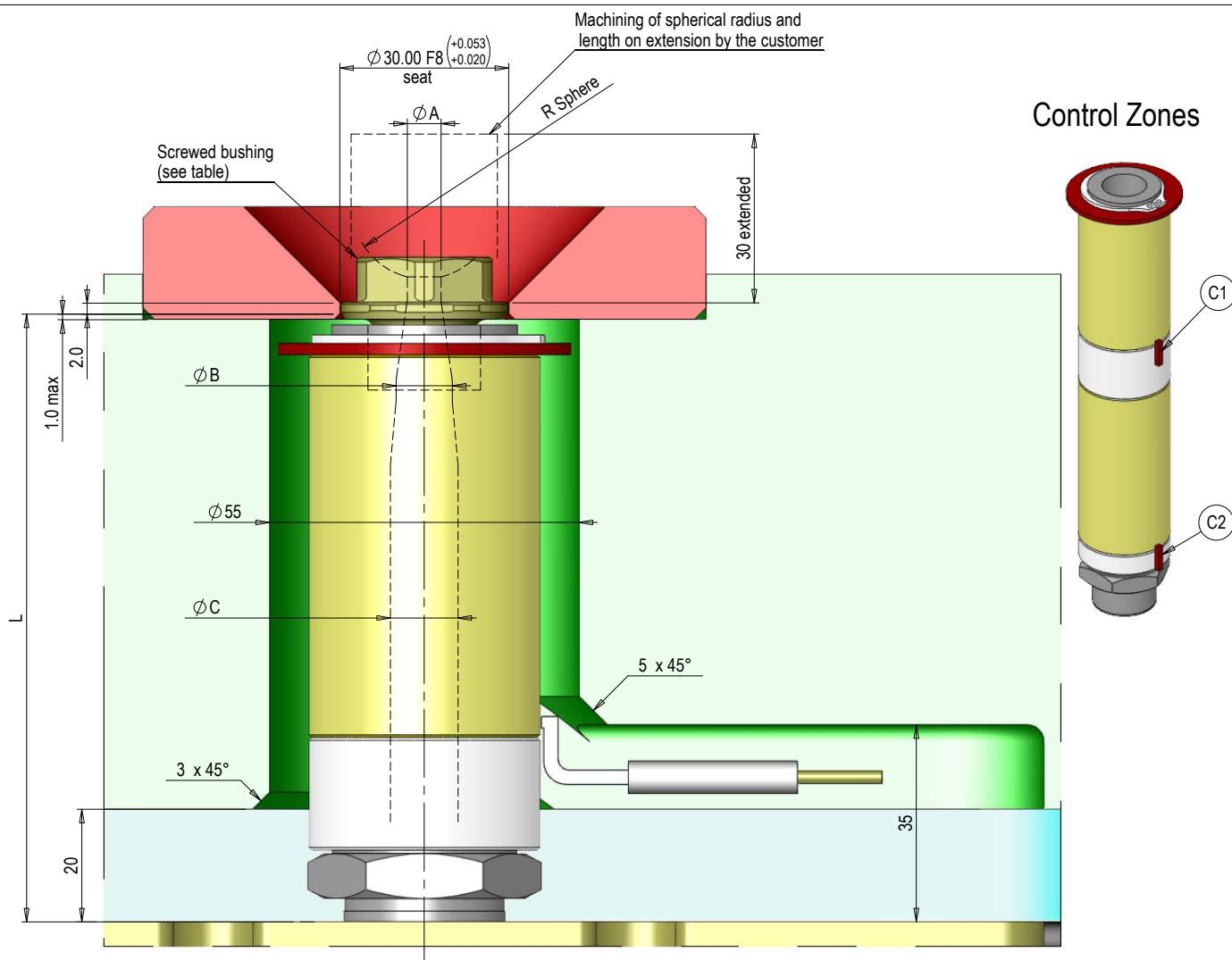




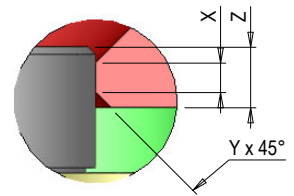
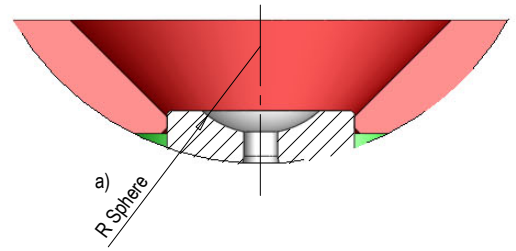
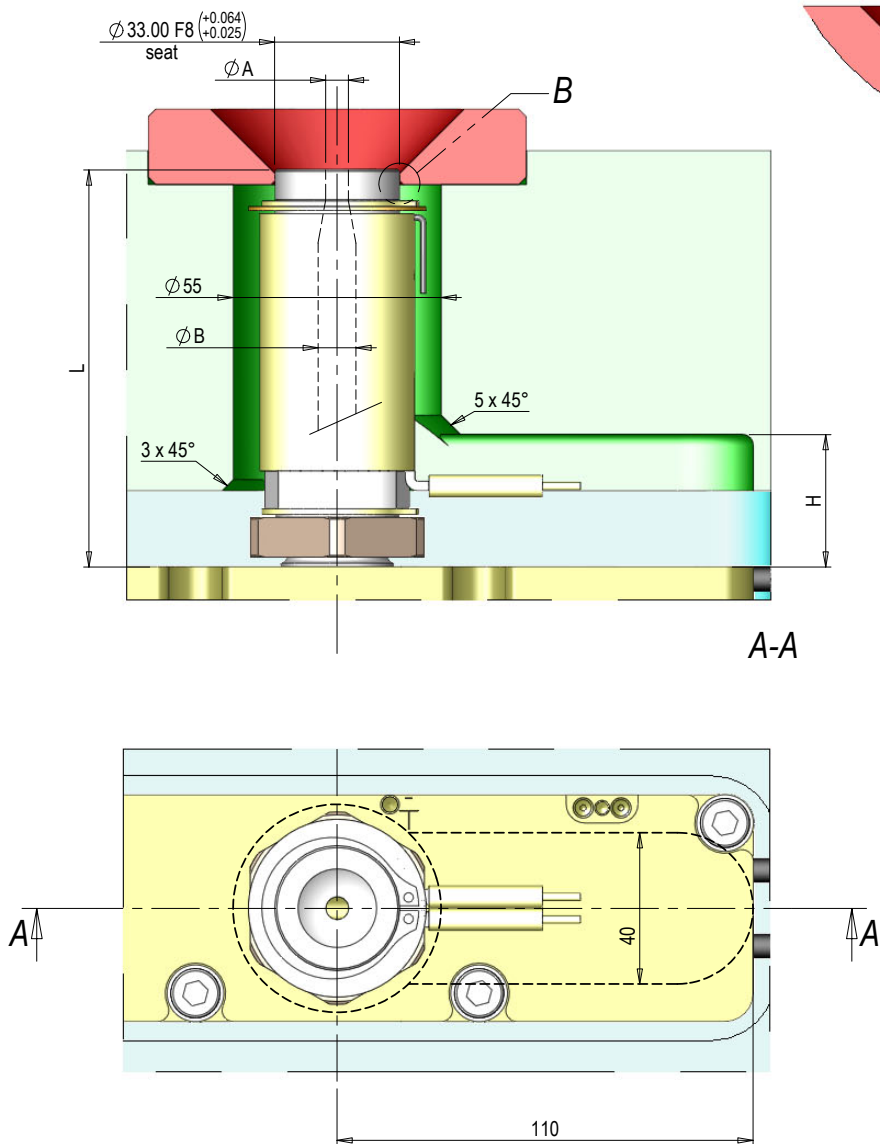
(*)Standard code with R sphere=0. Others R sphere sizes to be required.



Control Zones

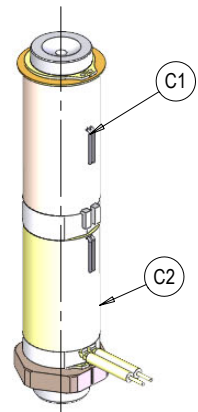


"L" (*)	MAXIMUN N° OF ZONES	SPHERE RADIUS	STANDARD SCREWED BUSHING CODE	
			ØA=6 ØB=8	ØA=6 ØB=10
050.00 ÷ 204.89	1 [C1]	Extension R0	0015-00439	0015-00405
204.90 ÷ 305.09	2 [C1 + C2]	R0	0015-00440	0015-00406
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)		R 12.7	0015-00441	0015-00411
		R 15.5	0015-00442	0015-00412
ØB	ØC	R 19.1	0015-00443	0015-00413
	10	R 20	0015-00505	0015-00503
10	12	R 25	0015-00444	0015-00414
	14	R40	0015-00445	0015-00415
(*) L = min 050.00 ÷ 305.09 mm max				
(**) Disponibili anche ØB=ØC=8,10 mm				



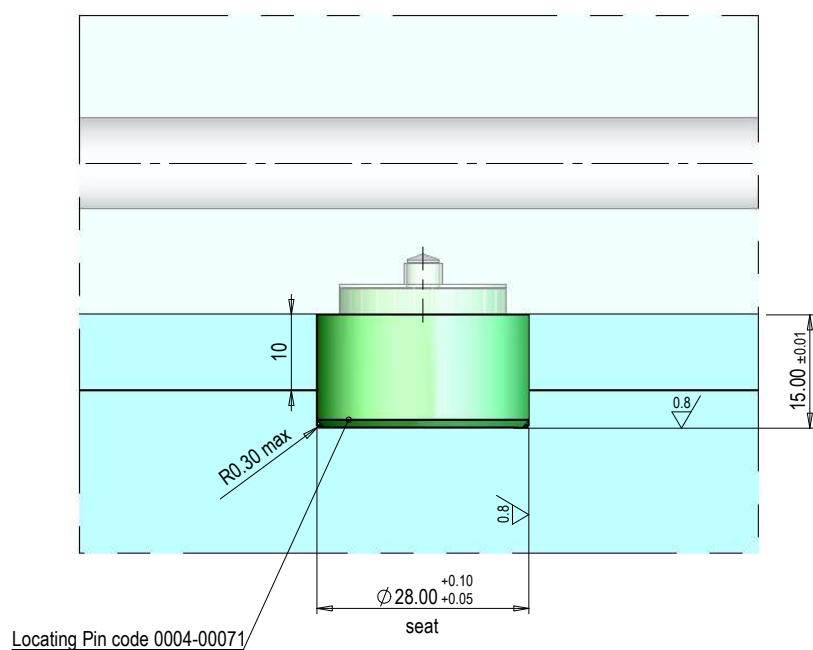
DETAIL B

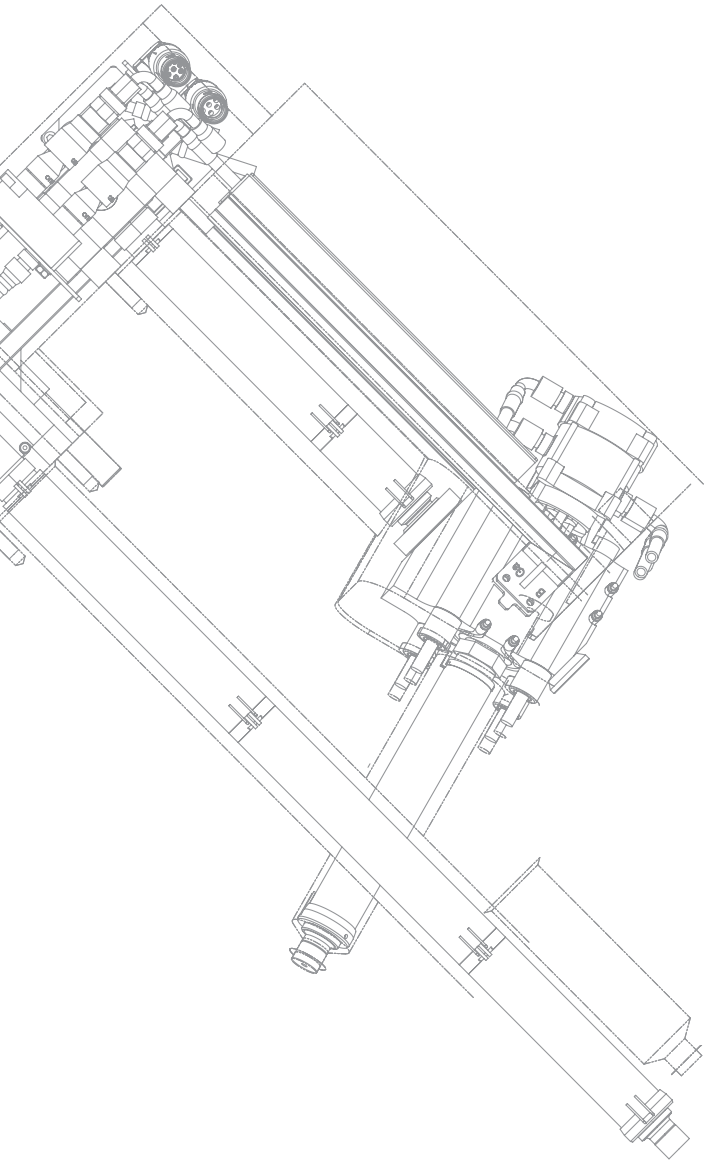
Control Zone



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

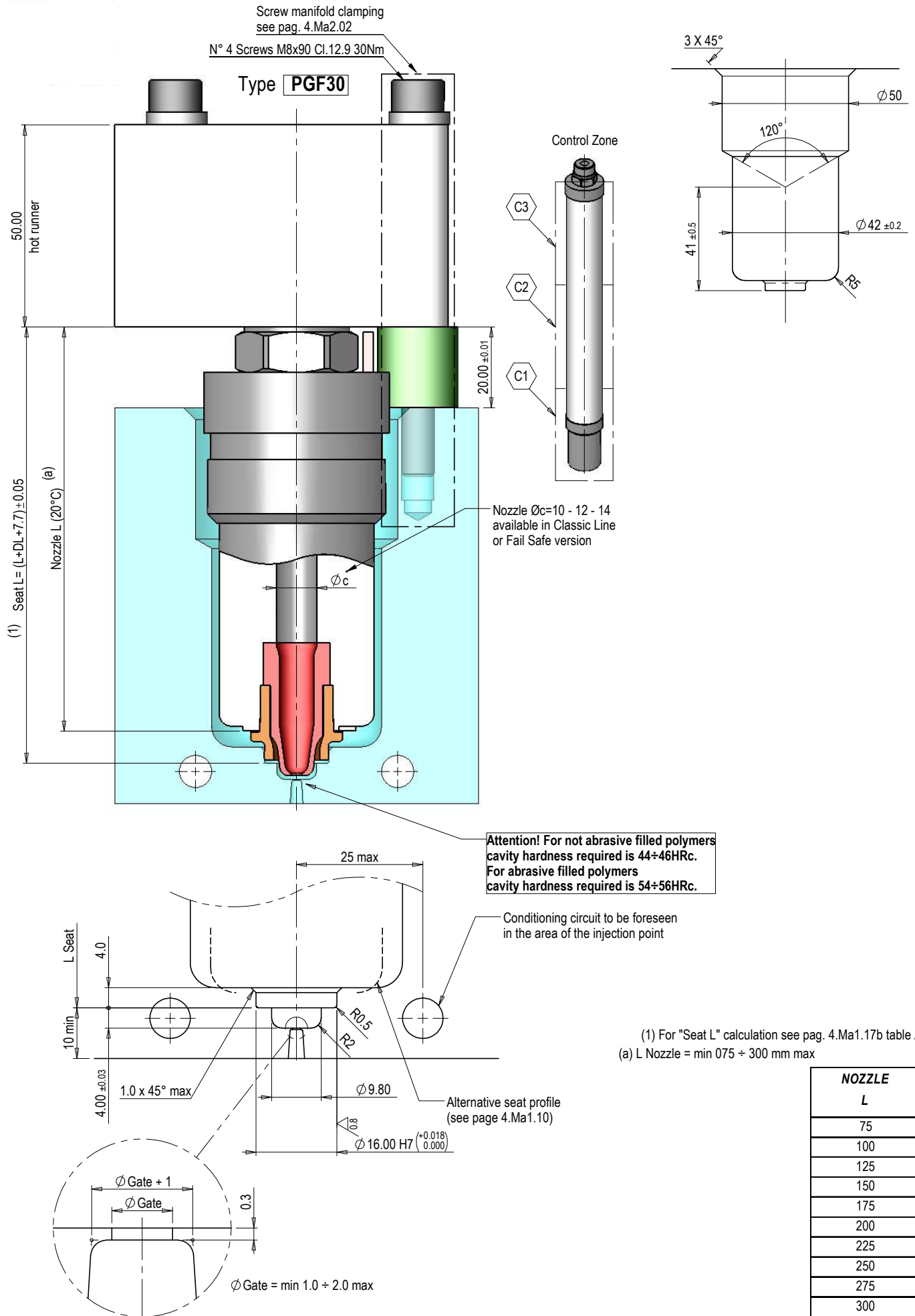
"L" (*)		MAXIMUM N° OF ZONES		STANDARD DIAMETERS OF EXTENSIONS DUCT	
				ØA	ØB
030.00 ÷ 199.99		1 [C1]		4	8 - 10 - 12
200.00 ÷ 450.00		2 [C1 + C2]		4.5	8 - 10 - 12
(*) L = min 30.00 ÷ 450.00 mm max				5	8 - 10 - 12
				5.5	8 - 10 - 12
				6	8 - 10 - 12 - 14
				6.5	8 - 10 - 12 - 14
H		with 20 30.00 ≤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

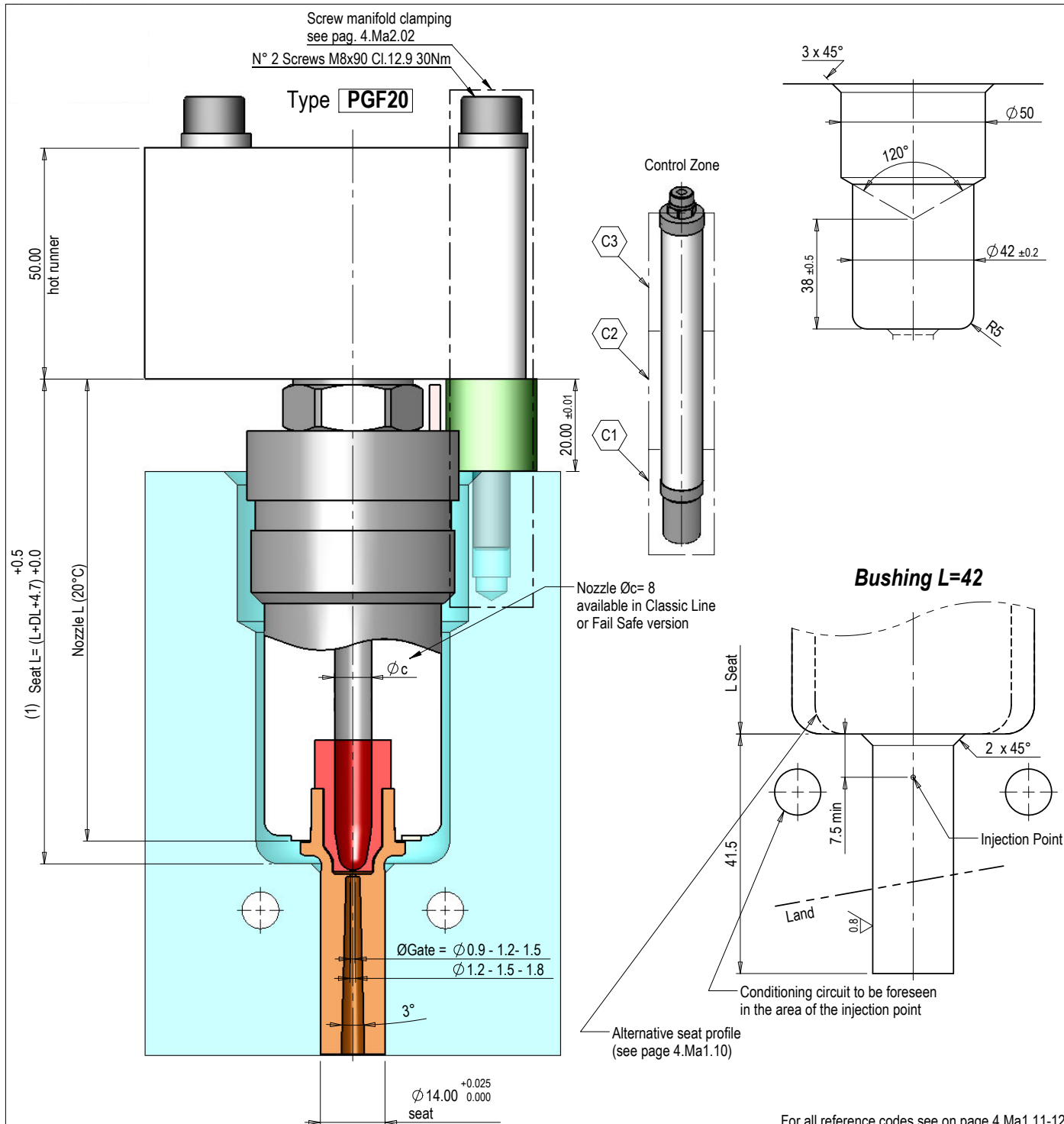




Ma Series 10÷265 cm³/s

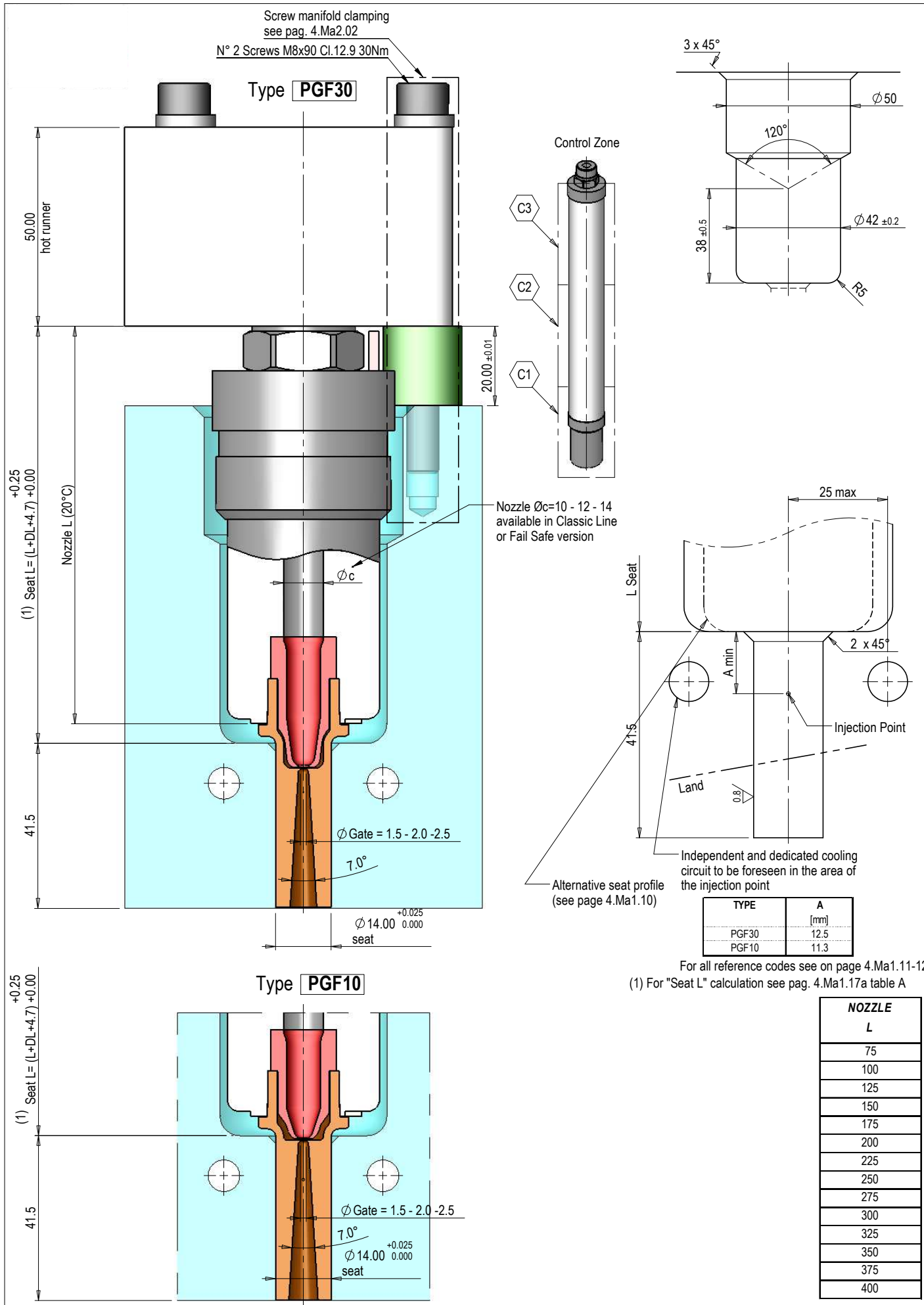
Serie Ma
Ma Serie
Ma Série
Ma Serie
Ma Série

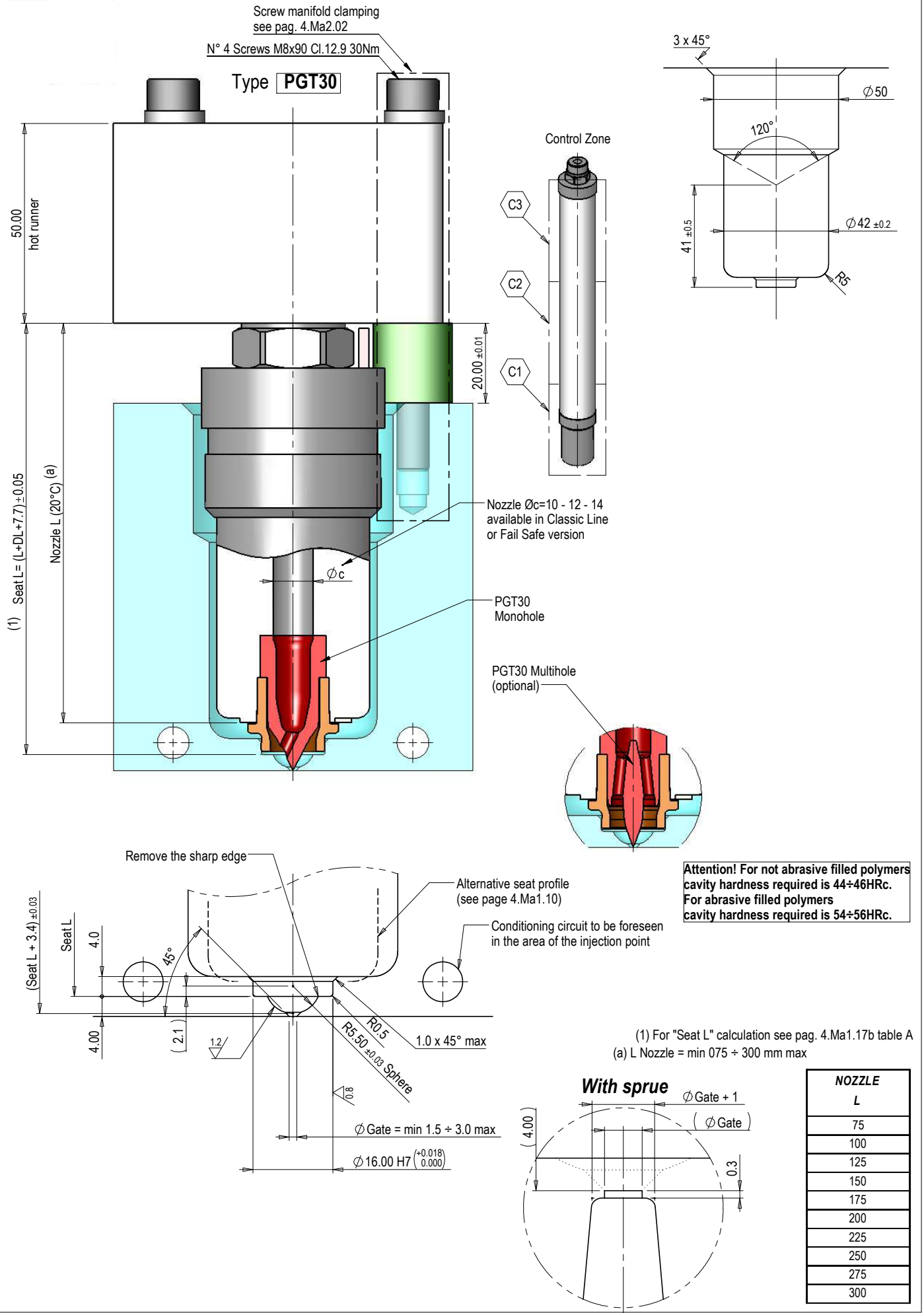


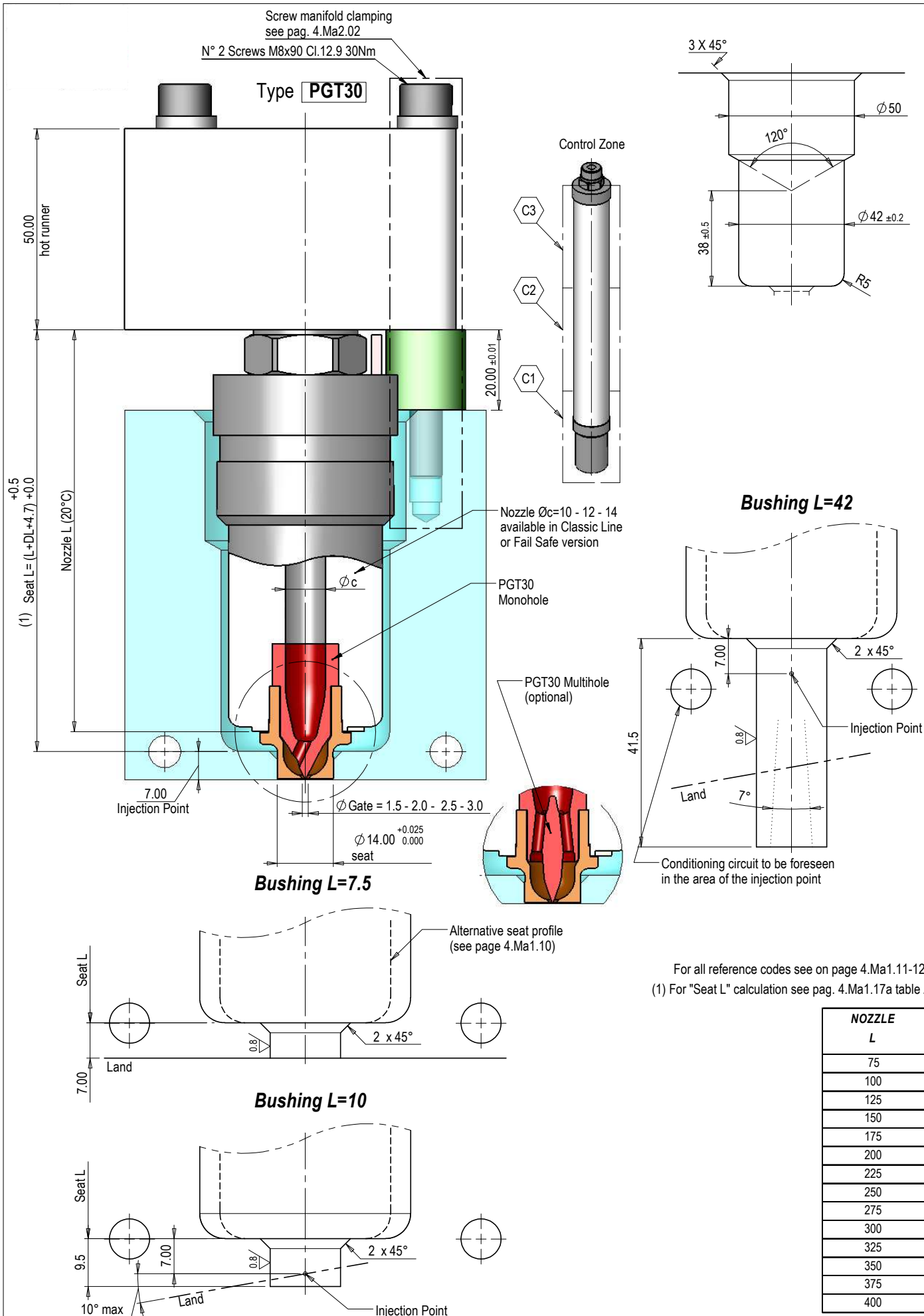


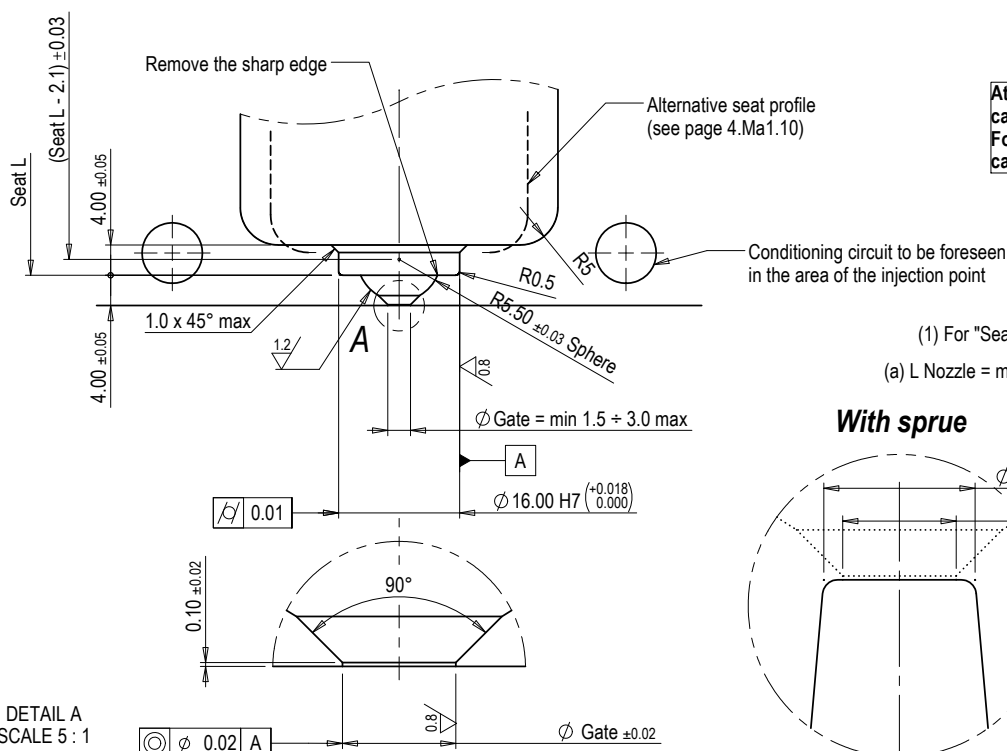
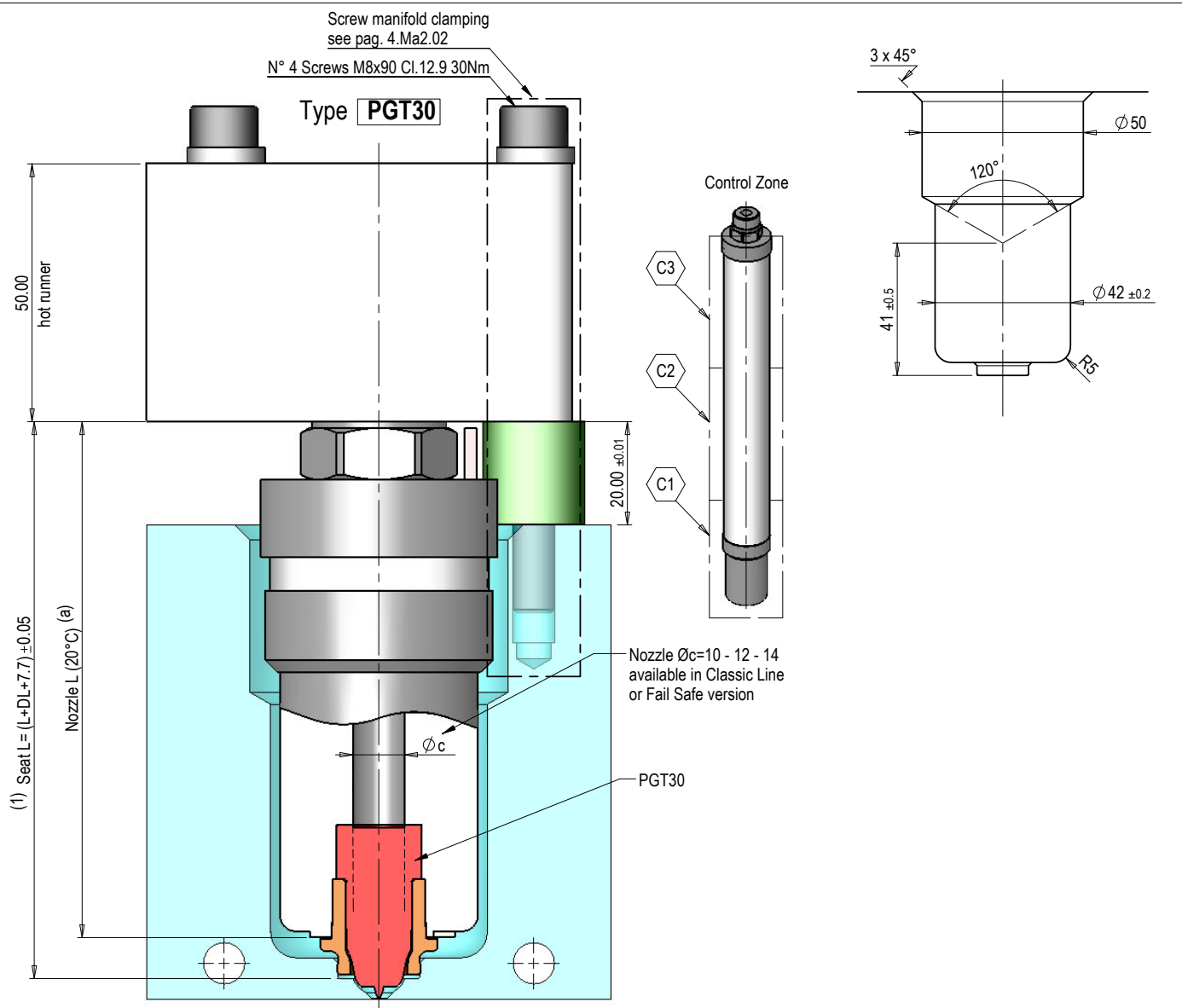
For all reference codes see on page 4.Ma1.11-12
(1) For "Seat L" calculation see pag. 4.Ma1.17a table A

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







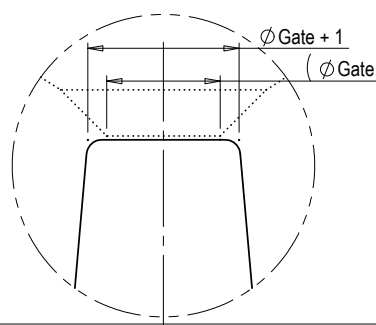


**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**

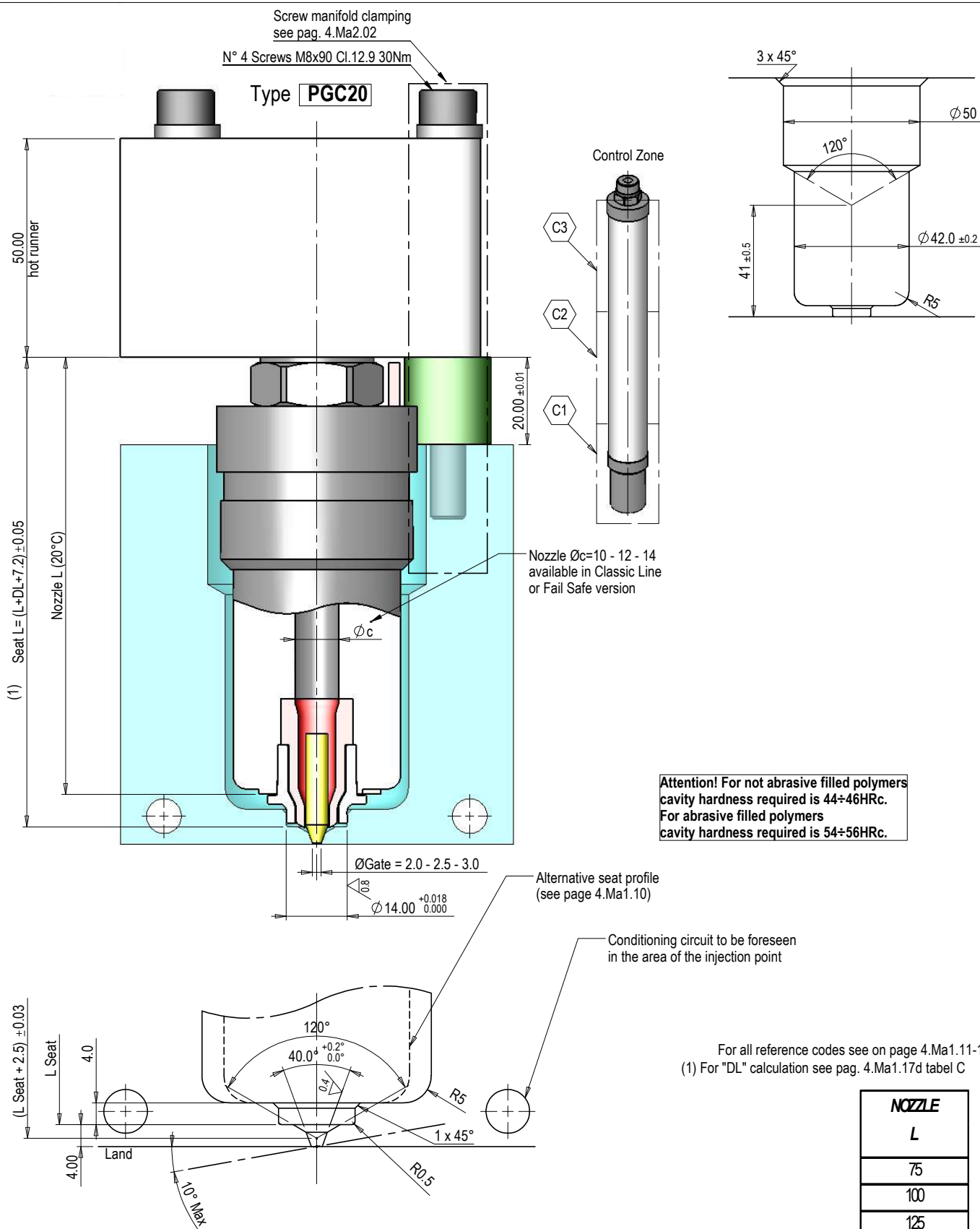
(1) For "Seat L" calculation see pag. 4.Ma1.17b table A

(a) L Nozzle = min 075 + 300 mm max

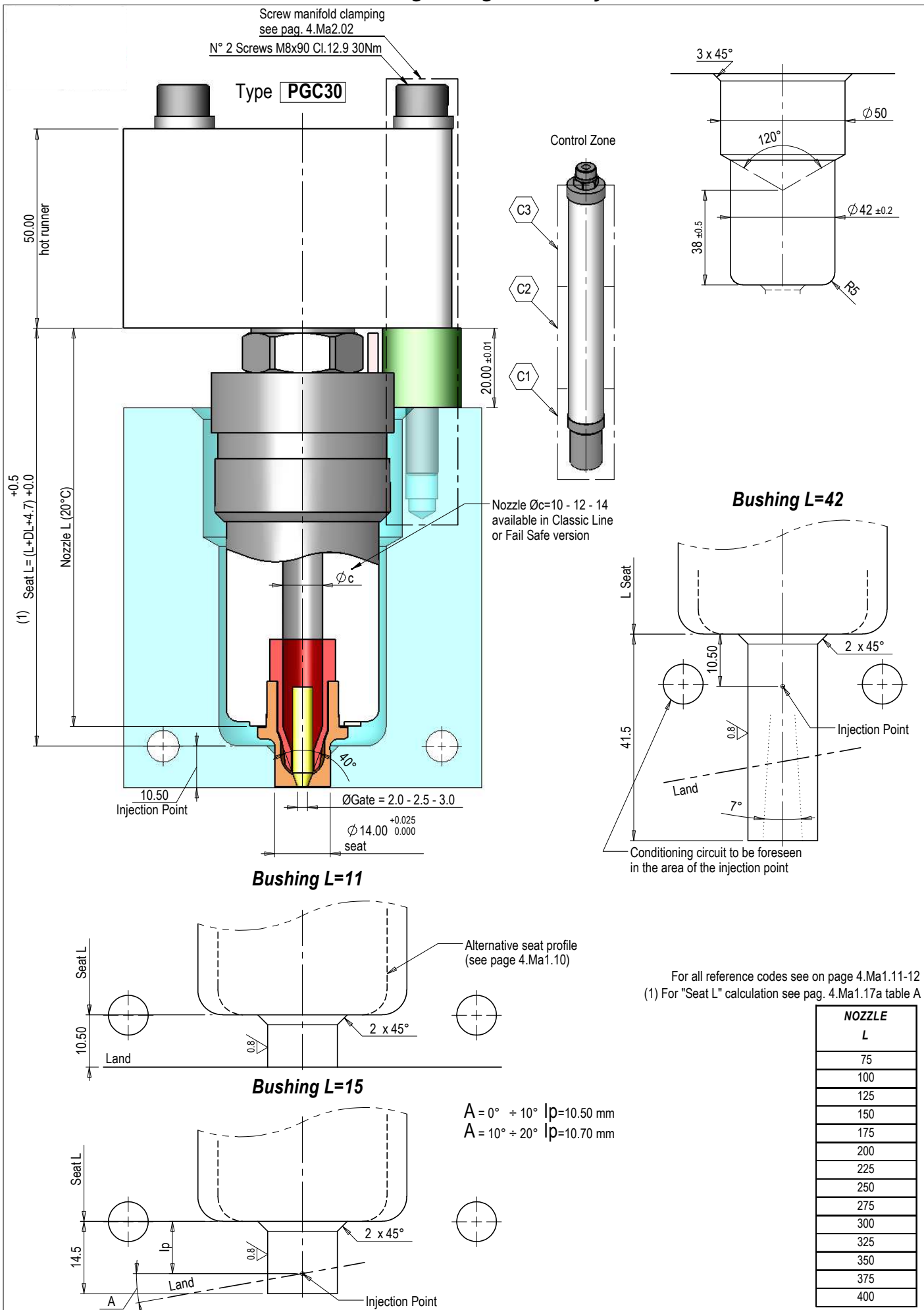
With sprue

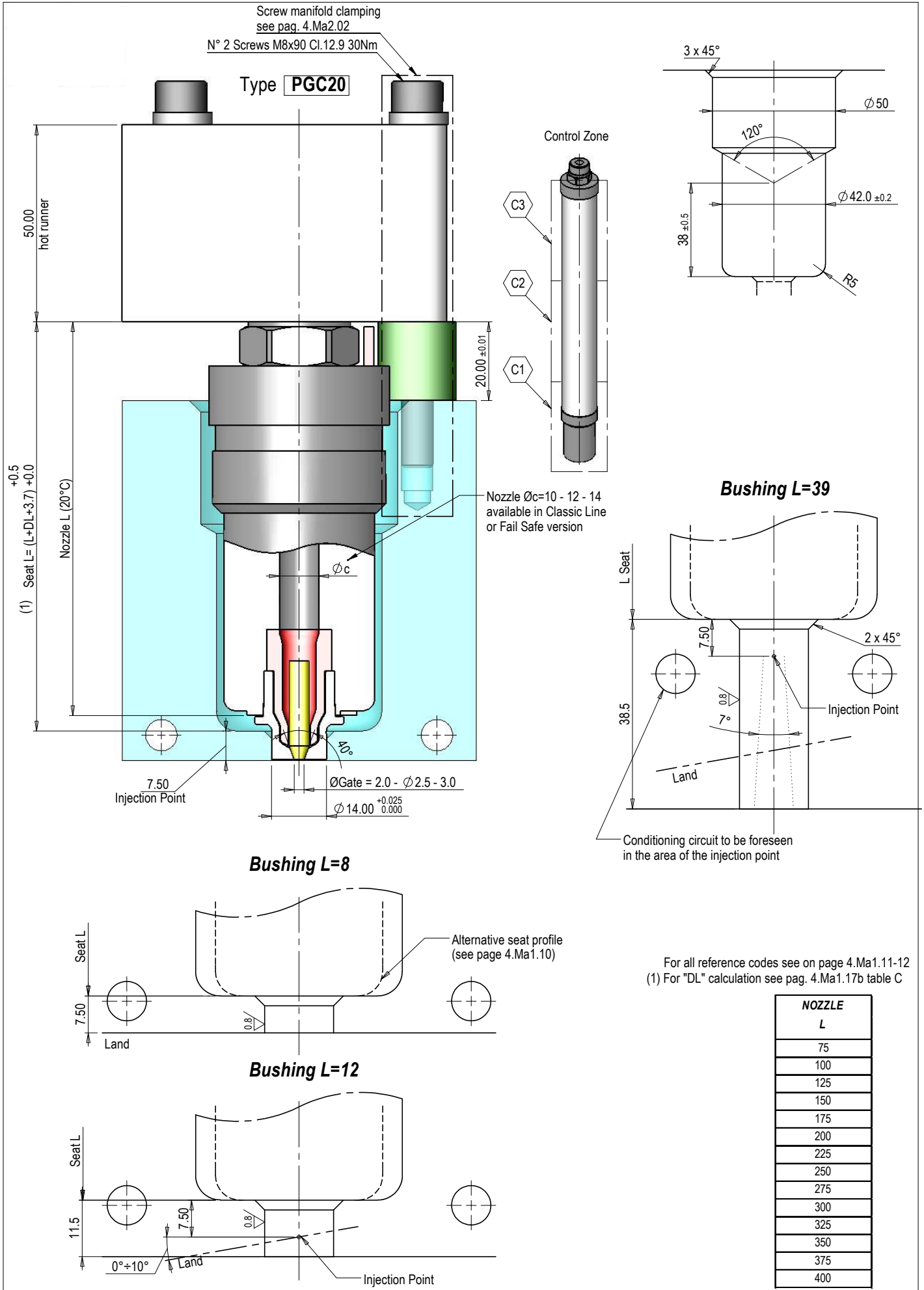


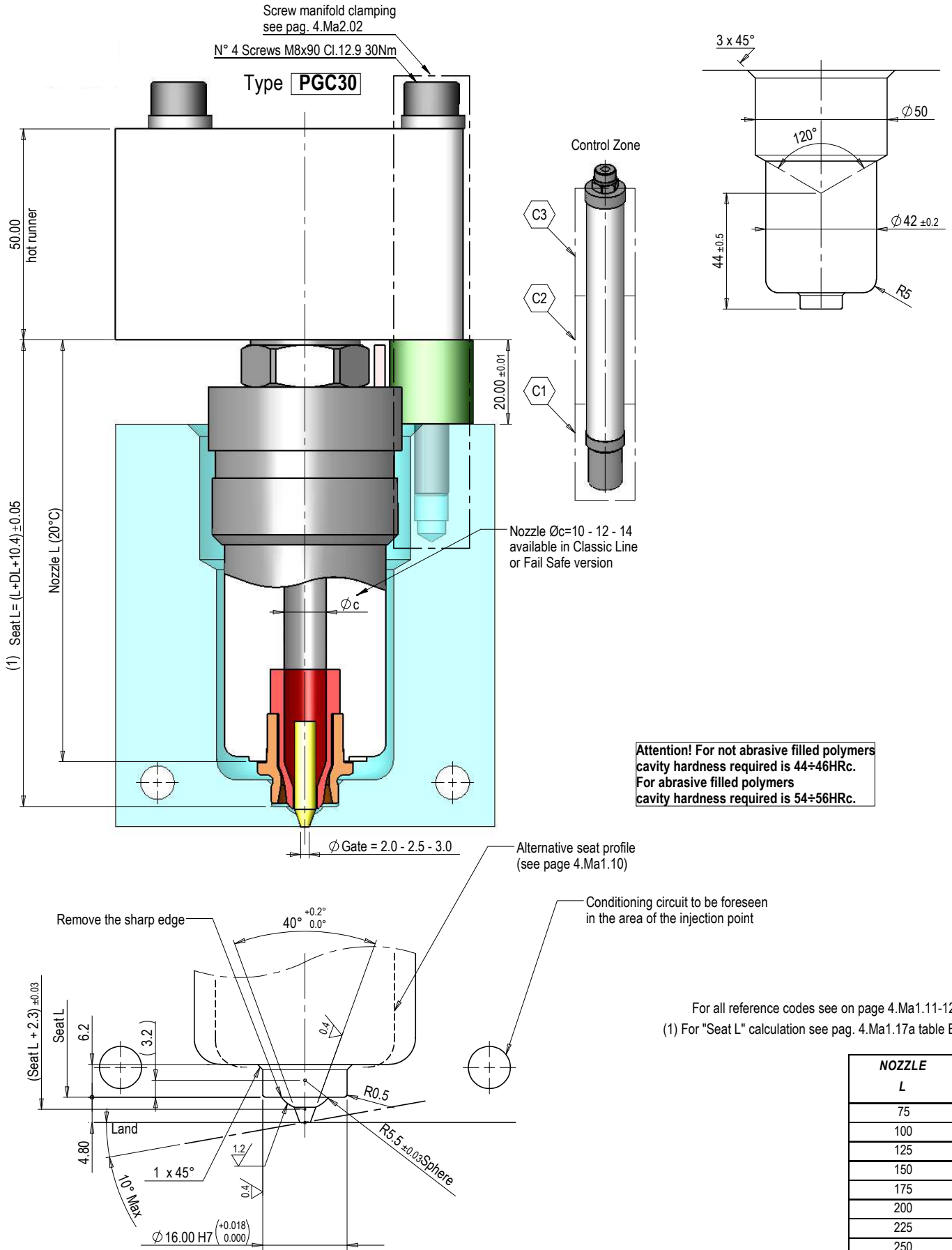
NOZZLE L
75
100
125
150
175
200
225
250
275
300



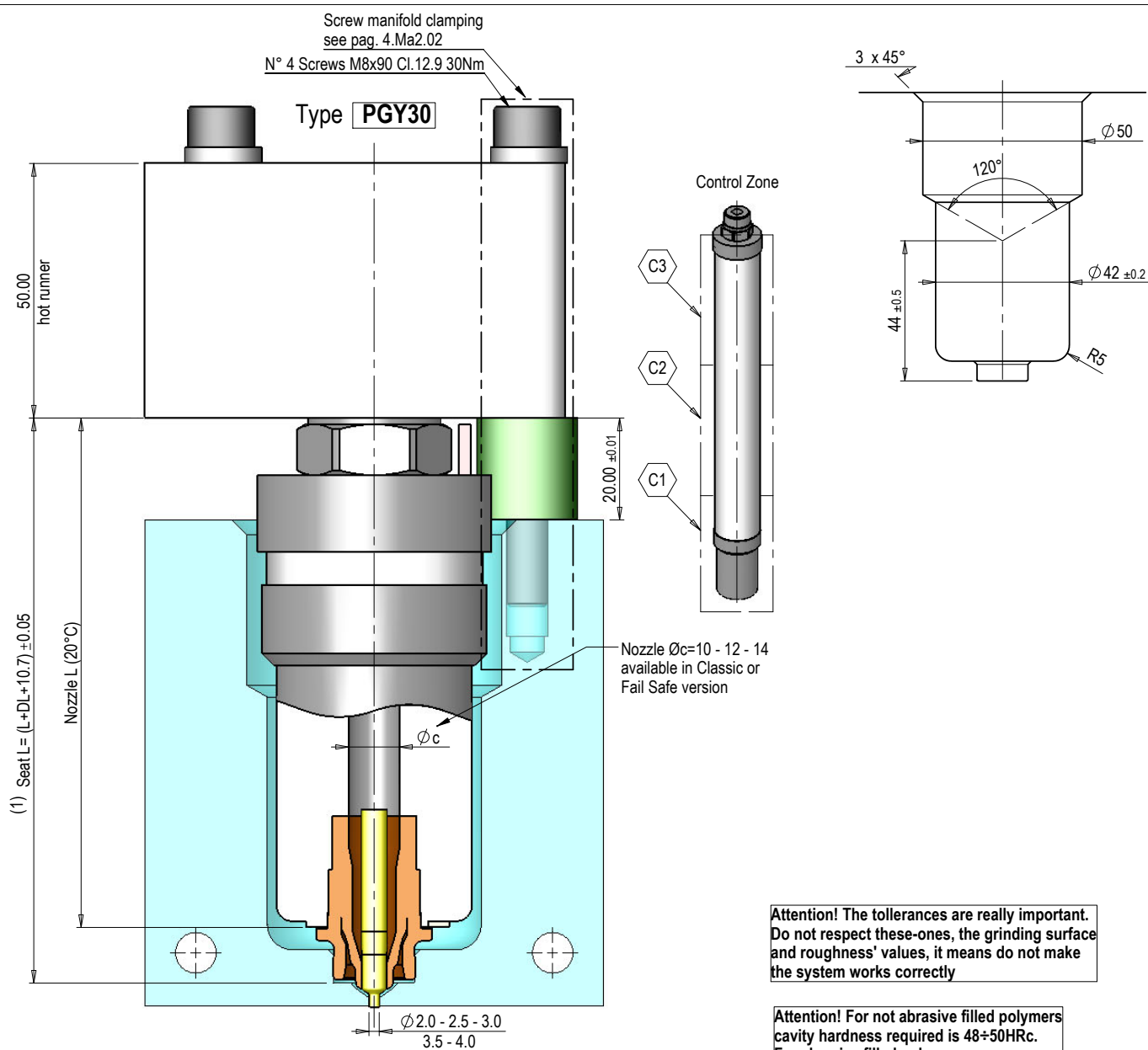
NOZZLE
L
75
100
125
150
175
200
225
250
275
300





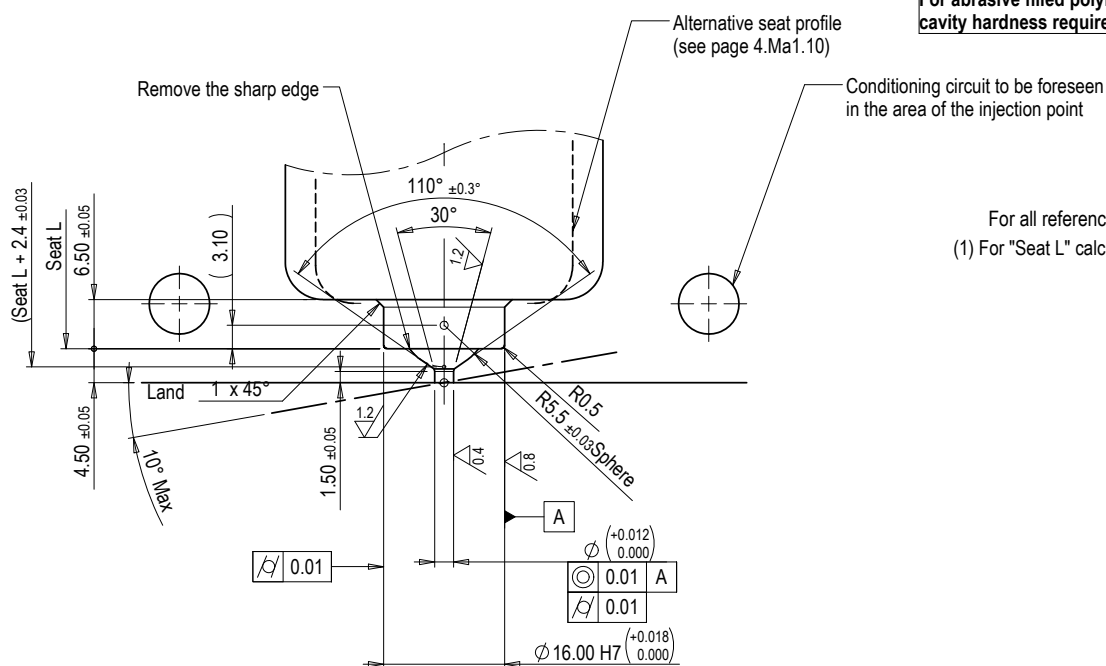


NOZZLE L
75
100
125
150
175
200
225
250
275
300
325
350
375
400



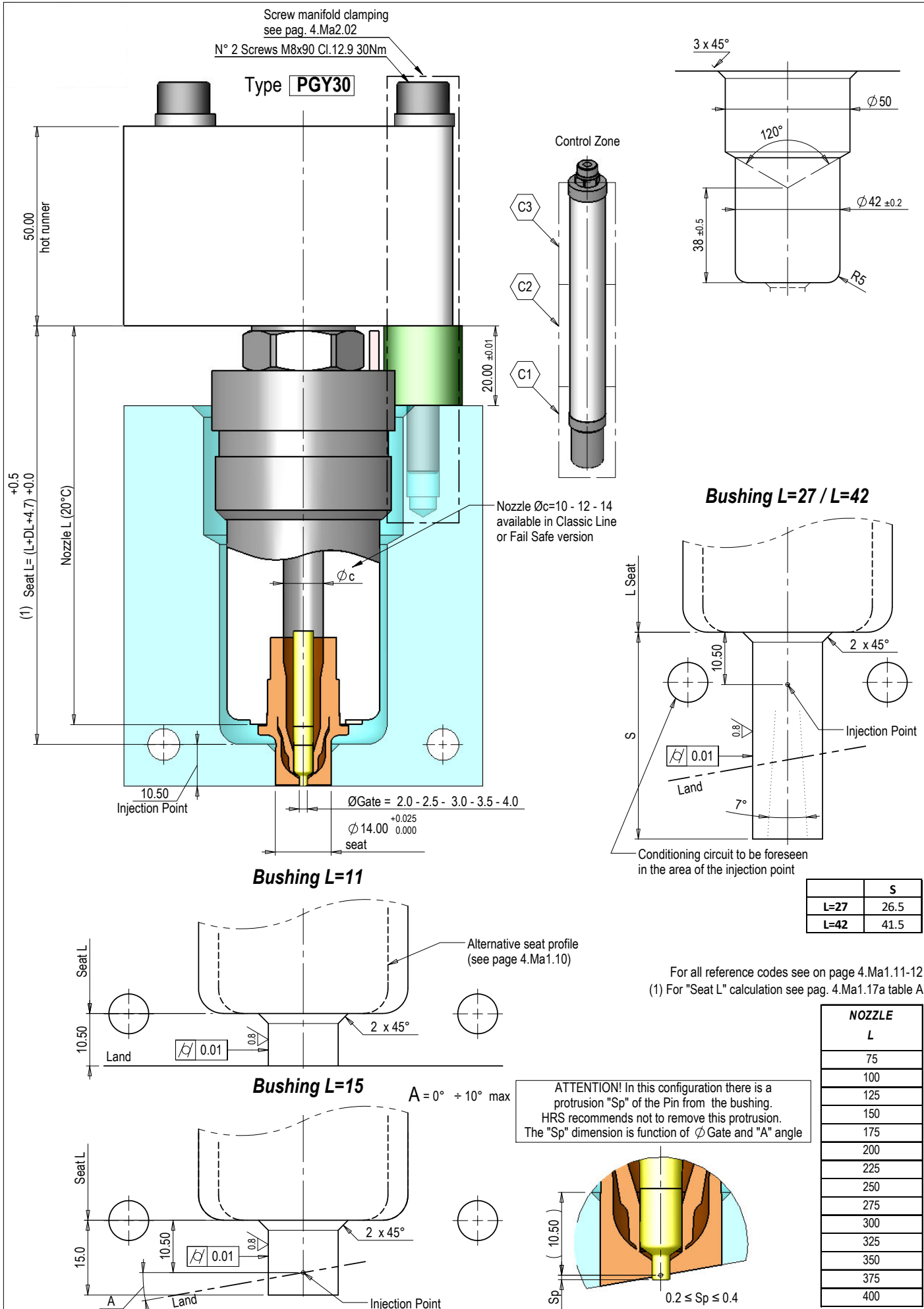
Attention! The tolerances are really important. Do not respect these ones, the grinding surface and roughness' values, it means do not make the system works correctly

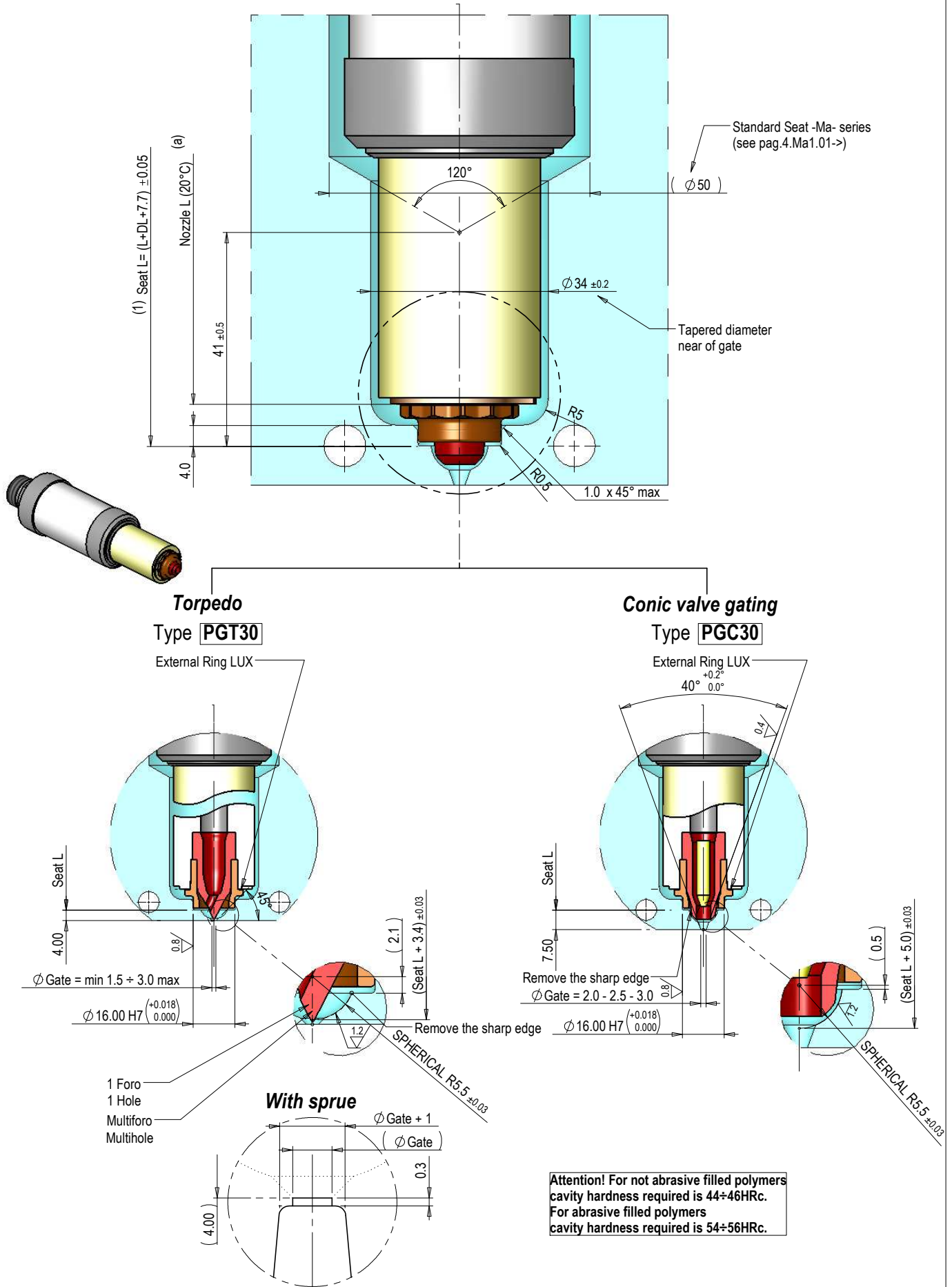
**Attention! For not abrasive filled polymers
cavity hardness required is 48÷50HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**



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

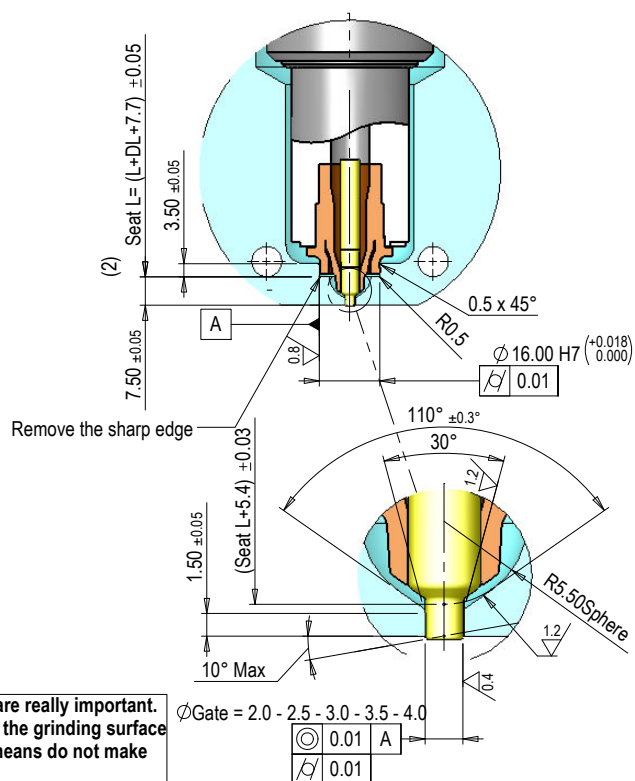
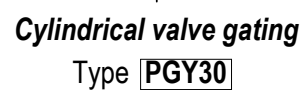
NOZZLE L
75
100
125
150
175
200
225
250
275
300
325
350
375
400





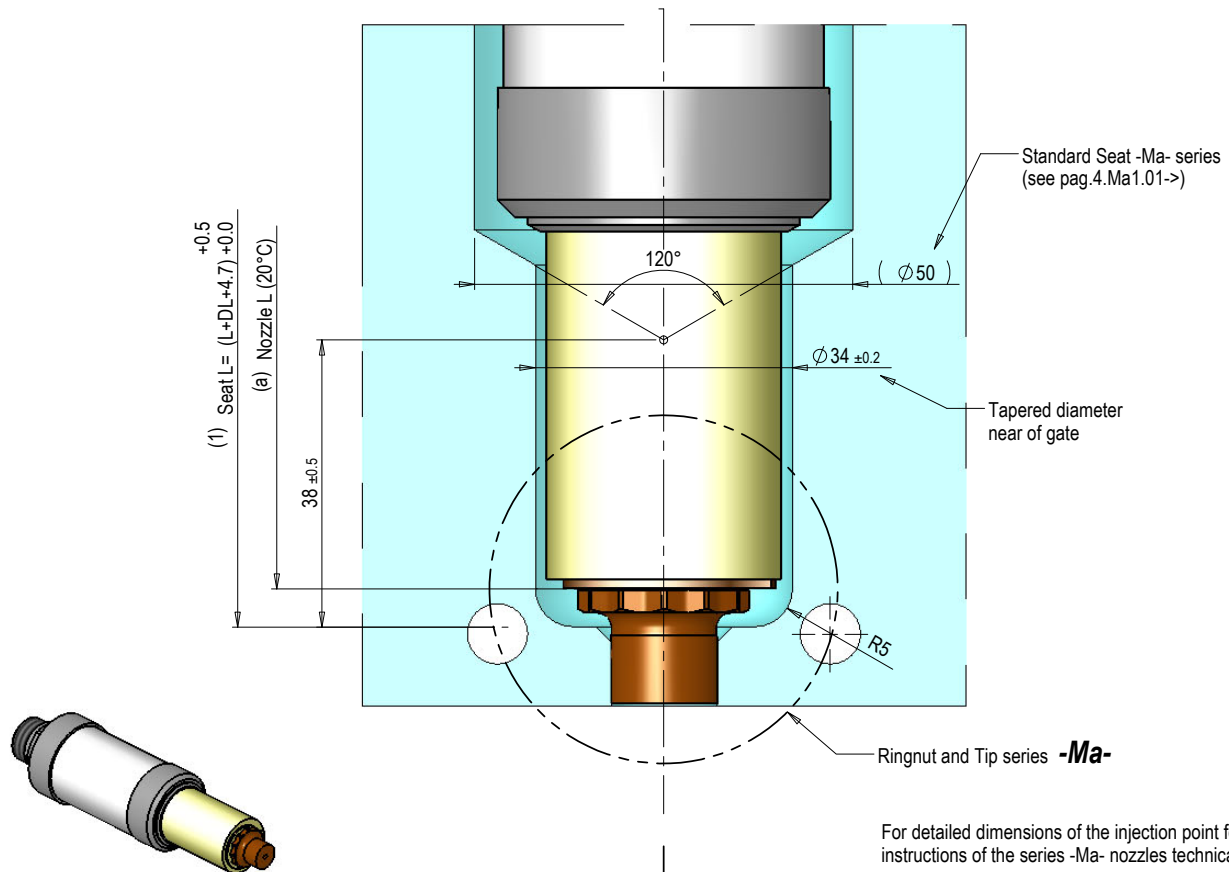
(a) L Nozzle = min 075 + 300 mm max

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



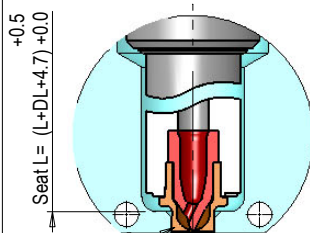
**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRC.
For abrasive filled polymers
cavity hardness required is 54÷56HRC.**

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Type **PGT30**

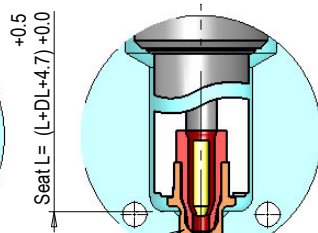
pag. 4.Ma1.03



available for Ring Through the Cavity L=7.5-10-42

Type **PGC30**

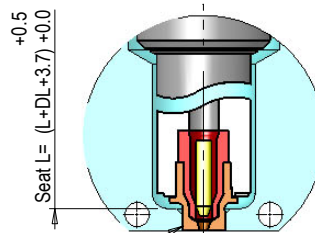
pag. 4.Ma1.05



available for Ring Through the Cavity L=11-15-42

Type **PGC20**

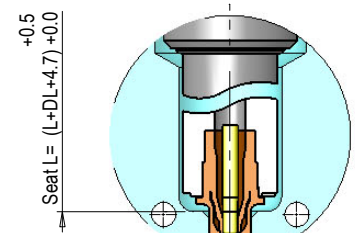
pag. 4.Ma1.25



available for Ring Through the Cavity L=08-12-39

Type **PGY30**

pag. 4.Ma1.08-09



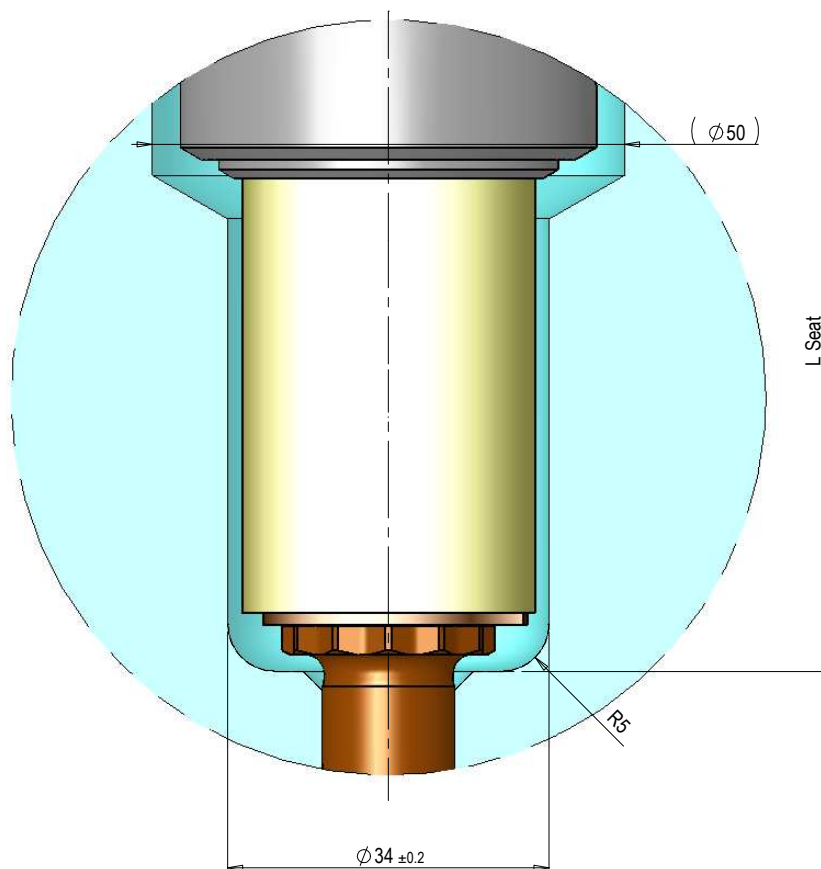
available for Ring Through the Cavity L=11-15-27-42
Ring L=6-10-37

(a) "L Nozzle" = min 075 ÷ 500 mm max

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

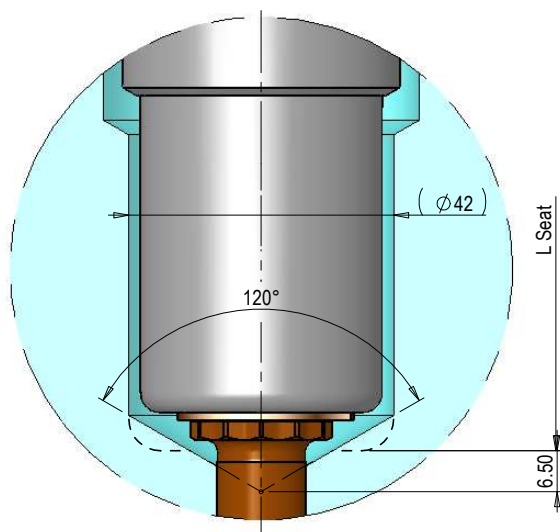
Compact Seat

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)

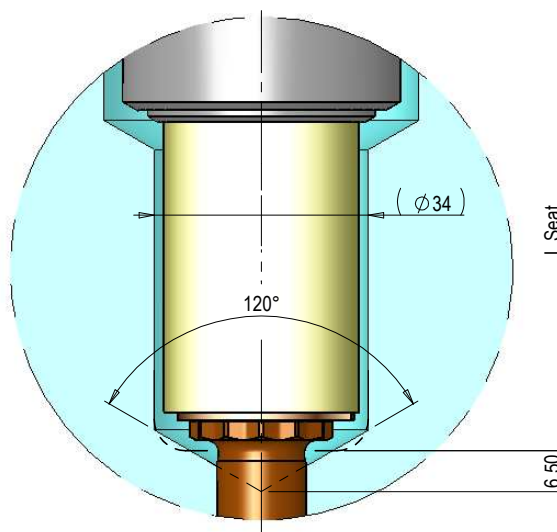


Seat made with 120° tip (*)

Application on STANDARD seat



Application on COMPACT seat



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

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

TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30 0012-00583 0012-00584 for high resistance	External end ring Ø16 (LUX) 0013-00955	
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)	Bushing through the cavity gate PGF30 PGF20 PGF10 Ø1.2 - 0013-00597 - Ø1.5 0013-00915 0013-00598 0013-00928 Ø1.8 - 0013-00598 - Ø2.0 0013-00916 - 0013-00929 Ø2.5 0013-00917 - 0013-00930	
PGF10 0012-00597 for high resistance		
TORPEDO		
PGT30 Monohole 0012-00268 0012-00269 for high resistance 0012-00331 for high conductivity	External end ring Ø16 (LUX) 0013-00955 Ø16 0013-02110 for engineering polymers	
PGT30 Multihole 0012-00270 0012-00271 for high resistance 0012-00328 for high conductivity 0012-01002 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 for Rubber for high conductivity Ø0.45 0012-00390 0012-00393 Ø0.60 0012-00391 0012-00394 Ø0.75 0012-00392 0012-00395	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)	
PGT30 Torpedo for Rubber for high conductivity Ø0.45 0012-00396 0012-00399 Ø0.60 0012-00397 0012-00400 Ø0.75 0012-00398 0012-00401		
CONICAL VALVE GATING		
PGC30 0012-00273 0012-00533 For high conductivity with End Ring 0012-00324 For high conductivity with Bushing th.cavity 0012-00427 for high resistance	PGC30 External end ring Ø16 (LUX) 0013-00955 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 ring nut for Bushings through cavity
PGC20 0012-00808 0012-00810 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
PGC20 Antistagnation 0012-00809 0012-00811 for high resistance		
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

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

$\Delta T = T1 - T2$
 $\lambda = 0.000012 (1/^{\circ}\text{C})$

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
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100^{\circ}\text{C}$]	[$\Delta T=120^{\circ}\text{C}$]	[$\Delta T=140^{\circ}\text{C}$]	[$\Delta T=160^{\circ}\text{C}$]	[$\Delta T=180^{\circ}\text{C}$]	[$\Delta T=200^{\circ}\text{C}$]	[$\Delta T=220^{\circ}\text{C}$]	[$\Delta T=240^{\circ}\text{C}$]	[$\Delta T=260^{\circ}\text{C}$]	[$\Delta T=280^{\circ}\text{C}$]	[$\Delta T=300^{\circ}\text{C}$]
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
	$\text{Seat } L = L + DL + 4.7$										
	[$\Delta T=100^{\circ}\text{C}$]	[$\Delta T=120^{\circ}\text{C}$]	[$\Delta T=140^{\circ}\text{C}$]	[$\Delta T=160^{\circ}\text{C}$]	[$\Delta T=180^{\circ}\text{C}$]	[$\Delta T=200^{\circ}\text{C}$]	[$\Delta T=220^{\circ}\text{C}$]	[$\Delta T=240^{\circ}\text{C}$]	[$\Delta T=260^{\circ}\text{C}$]	[$\Delta T=280^{\circ}\text{C}$]	[$\Delta T=300^{\circ}\text{C}$]
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	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
	$\text{Seat } L = L + DL + 10.4$										
	[$\Delta T=100^{\circ}\text{C}$]	[$\Delta T=120^{\circ}\text{C}$]	[$\Delta T=140^{\circ}\text{C}$]	[$\Delta T=160^{\circ}\text{C}$]	[$\Delta T=180^{\circ}\text{C}$]	[$\Delta T=200^{\circ}\text{C}$]	[$\Delta T=220^{\circ}\text{C}$]	[$\Delta T=240^{\circ}\text{C}$]	[$\Delta T=260^{\circ}\text{C}$]	[$\Delta T=280^{\circ}\text{C}$]	[$\Delta T=300^{\circ}\text{C}$]
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

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

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

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 + 3.7										
	[$\Delta T=100°C$]	[$\Delta T=120°C$]	[$\Delta T=140°C$]	[$\Delta T=160°C$]	[$\Delta T=180°C$]	[$\Delta T=200°C$]	[$\Delta T=220°C$]	[$\Delta T=240°C$]	[$\Delta T=260°C$]	[$\Delta T=280°C$]	[$\Delta T=300°C$]
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	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 + 10.7										
	[$\Delta T=100°C$]	[$\Delta T=120°C$]	[$\Delta T=140°C$]	[$\Delta T=160°C$]	[$\Delta T=180°C$]	[$\Delta T=200°C$]	[$\Delta T=220°C$]	[$\Delta T=240°C$]	[$\Delta T=260°C$]	[$\Delta T=280°C$]	[$\Delta T=300°C$]
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

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

$\Delta T = T1 - T2$
 $\lambda = 0.000012 \text{ (1/°C)}$

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
	$DL = (L * T * \lambda)$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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
	$\text{Seat L} = L + DL + 7.7$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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
	$\text{Seat L} = L + DL + 10.4$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

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

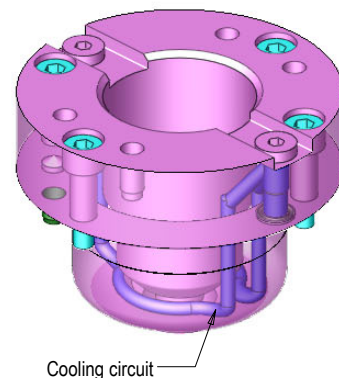
$\Delta T = T1 - T2$
 $\lambda = 0.000012 \text{ (1/°C)}$

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										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

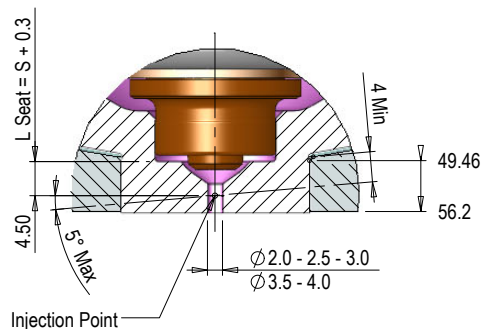
Tab. D - "Seat L" Calculation

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										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

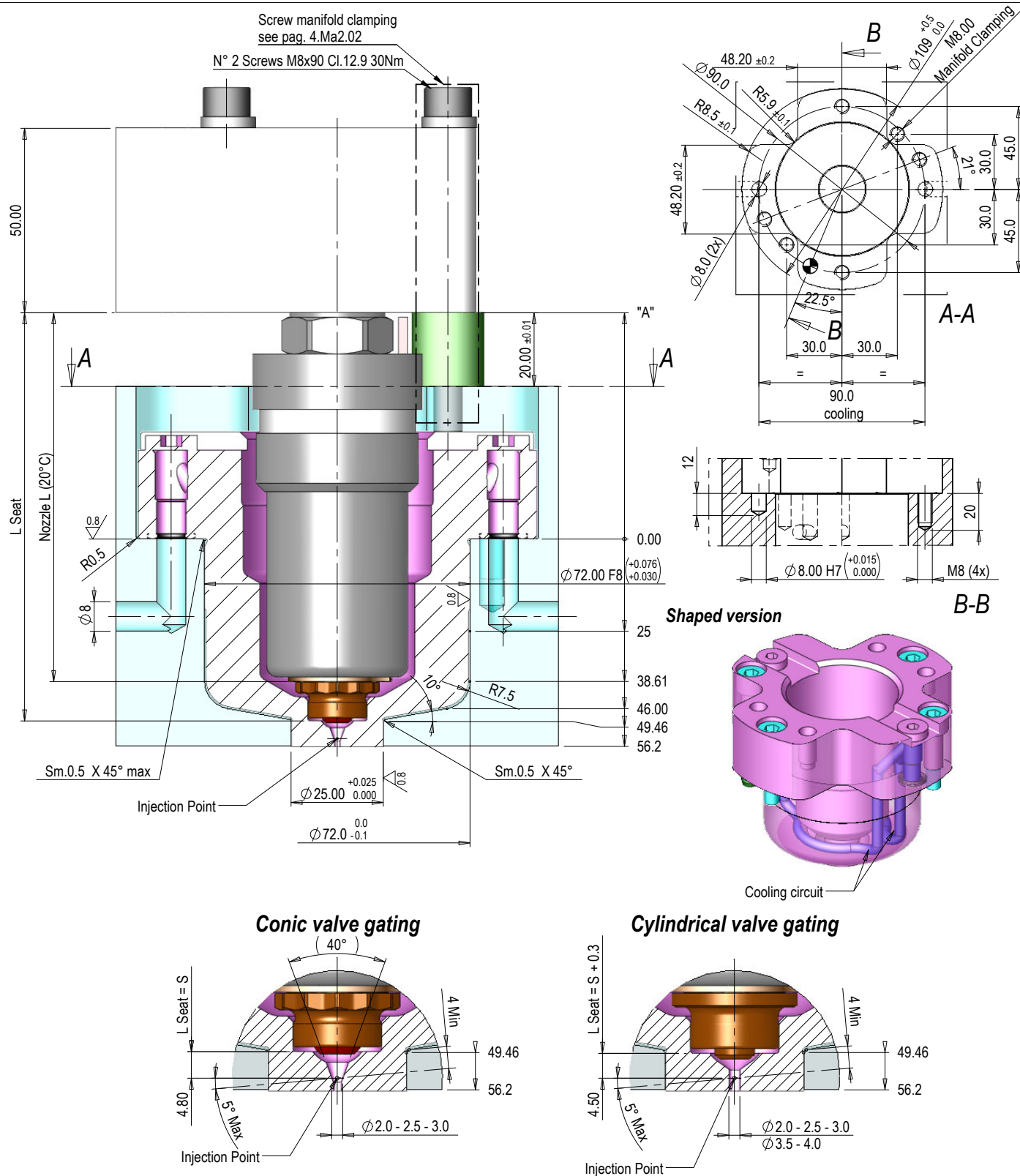


B-B

Cylindrical valve gating



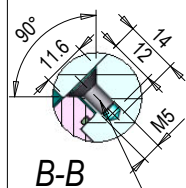
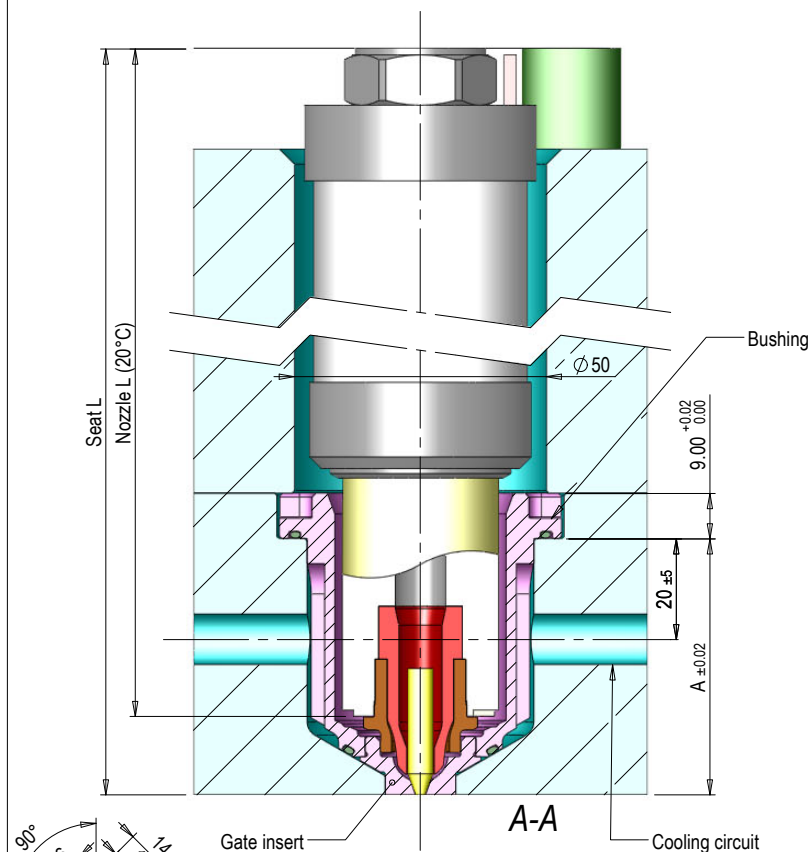
NOZZLE L	DL 200°C	S	A	NOZZLE L	DL 200°C	S	A	COOLING BUSHING
125	0.30	135.70	86.40	325	0.78	336.18	286.88	Conic valve gating Ø2.0 - 0002-00116 Ø2.5 - 0002-00117 Ø3.0 - 0002-00118
150	0.36	160.76	111.46	350	0.84	361.24	311.94	
175	0.42	185.82	136.52	375	0.90	386.30	337.00	
200	0.48	210.88	161.58	400	0.96	411.36	362.06	
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					



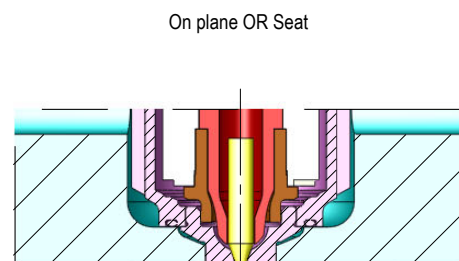
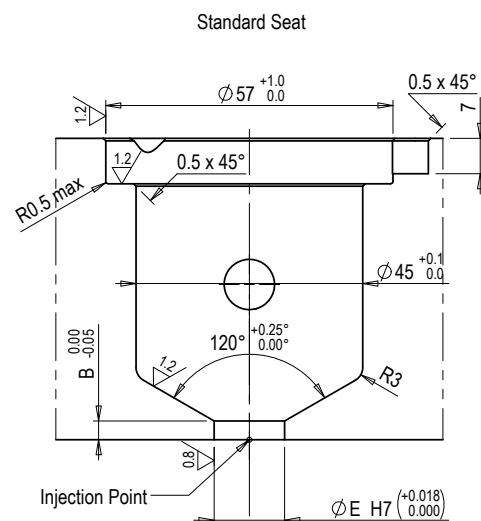
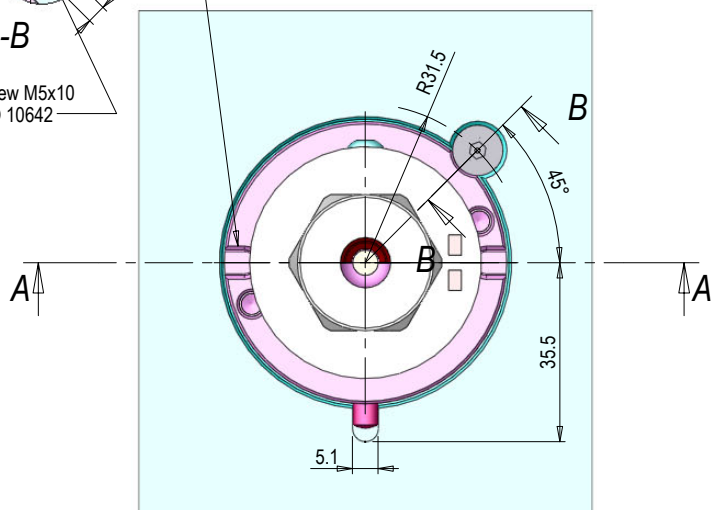
SHAPED Cooling bushing to be used with "L Nozzle" $88 \leq L < 125$ mm (*). For version with "L Nozzle" ≥ 125 see pag. 4.Ma1.13

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: minimum limit standard out (only on request)

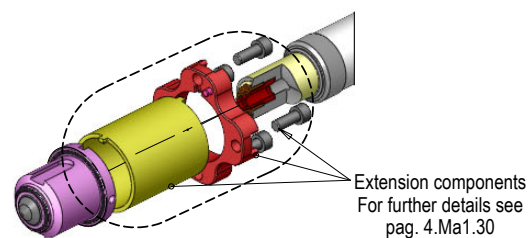


Slots for orientation of cooling insert
in case of extension (see pag. 4.Ma1.21)



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

COOLING INSERT Extension

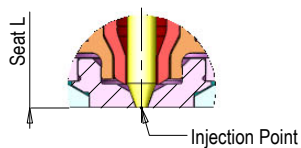


1) Cooling note: suggested hole Ø10 to cool max 4 bushings
with only 1 circuit (range 4÷6 Bar)

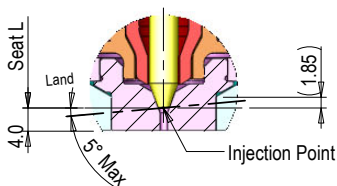
	Seat L	A	B	C	D	E
PGC20	L+DL+11.2	47.80	1.85	2.00	4.40	18
PGC30 / PGY30	L+DL+15.2	50.80	3.70	3.70	7.40	14

Type **PGC20**

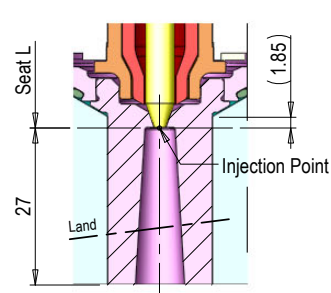
Version L=08



Version L=12

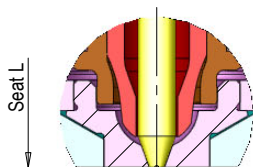


Version L=39

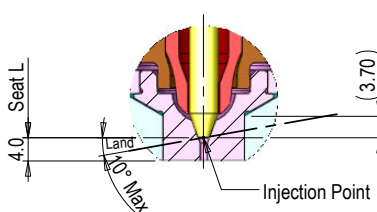


Type **PGC30**

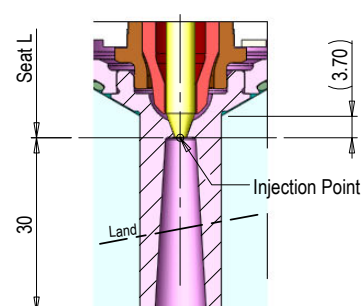
Version L=11



Version L=15

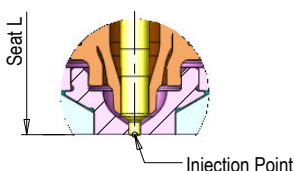


Version L=42

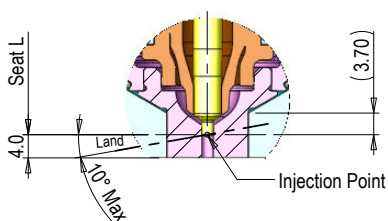


Type **PGY30**

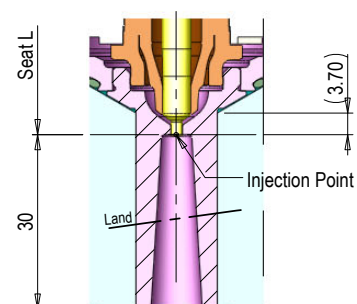
Version L=11



Version L=15



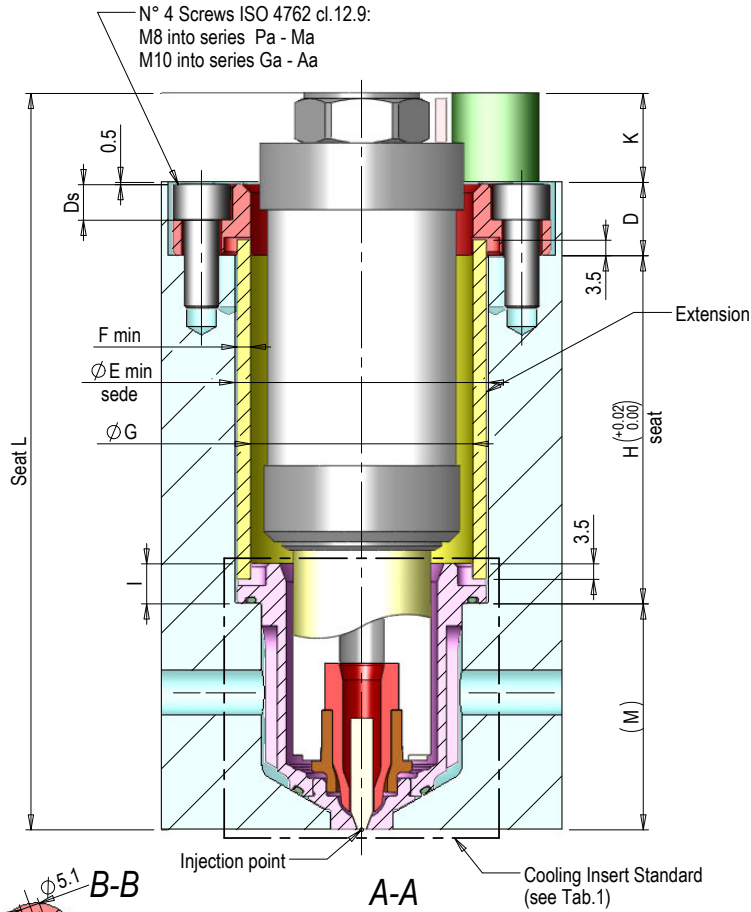
Version L=42



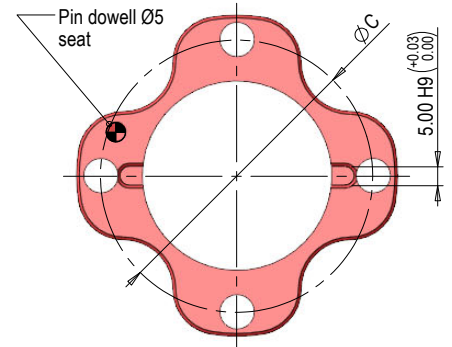
For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

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

COOLING INSERT EXTENSION (customer's care)

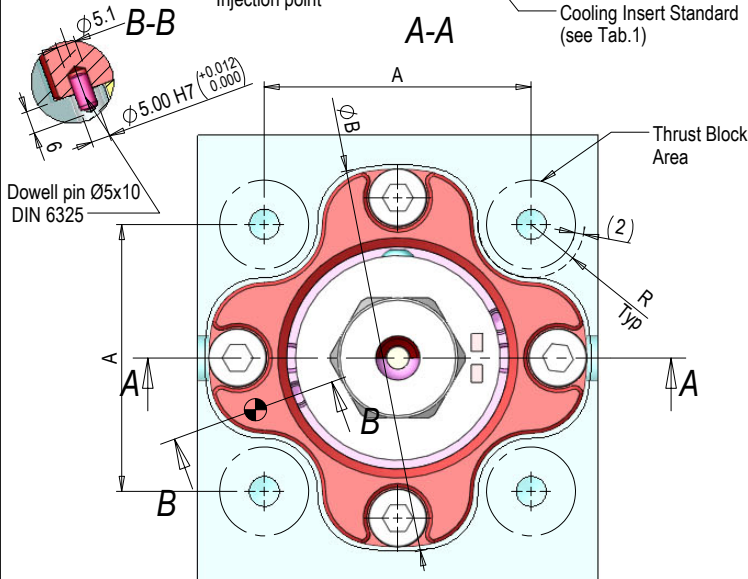
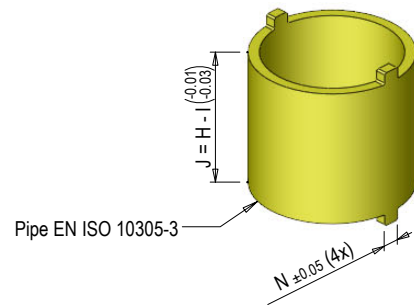


**Part. Flange - rear view
(manufacturing by customer)**



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

**Part. Extension
(manufacturing by customer)**

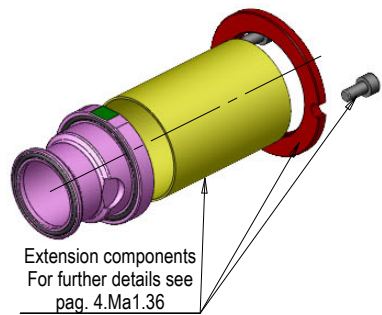


Tab.1

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

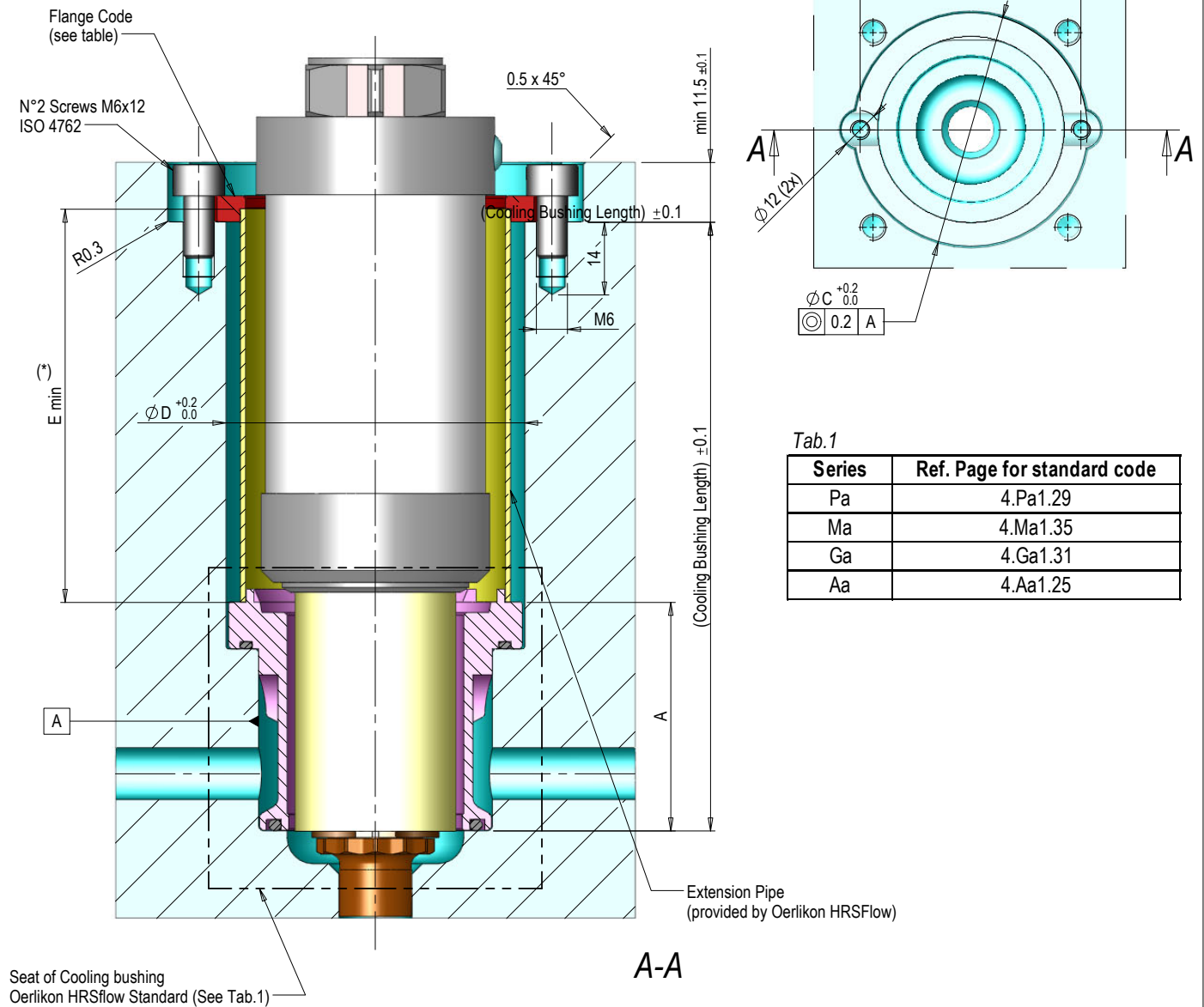
Manufacturing dimensions (cooling insert and flange):

Dim.	Description	Series			
		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	Minimum diameter of seat extension	46	57	67	78
F	Thickness 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 - 101.7 [PGC20]	= Seat L - 101.3 [PGC20]
I	Collar thickness of extension		= Seat L - 83.7 [PGC/Y30]	= Seat L - 105.5 [PGC/Y30]	= Seat L - 103.5 [PGC/Y30]
J	Height of extension	9		9.5	
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	



(*) Applicable to all type Nozzles Compact type

- 



Series	Flange Code	Dimensions				
		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": minimum length request to be able to use the extensions

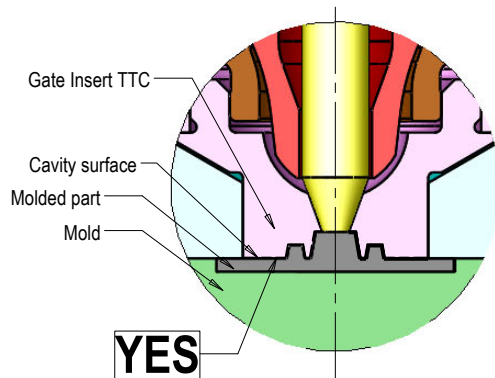
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The Gate Insert TTC solution (ex. page 4.Ma1.31) or Cooling Insert TTC (ex. Page 4.Ma1.28) are suitable for any standard Injection process. However, there are some precautions to keep in mind during the designing to use the component properly:

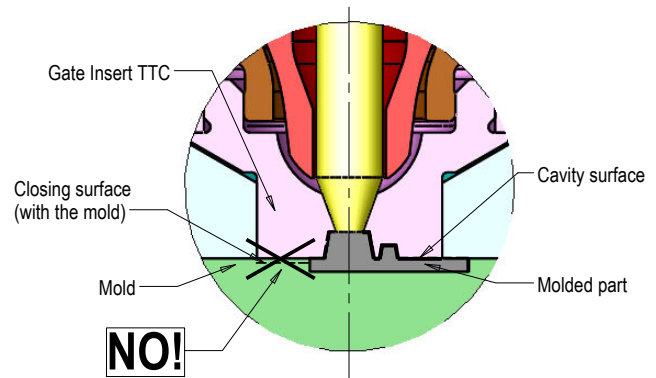
- 1) The cavity surface of the Gate Insert TTC, in the standard applications, must be totally in contact with the molded part (see Pic.1):



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.



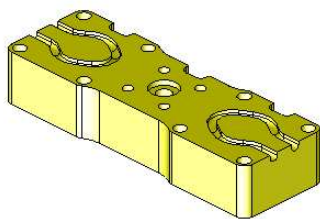
Pic.1



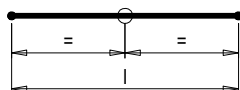
Pic.2

- 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

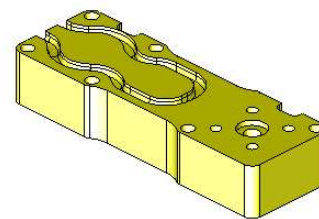
-HL-



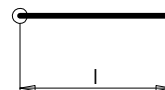
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l=150-200-250-300-350-400-450 mm



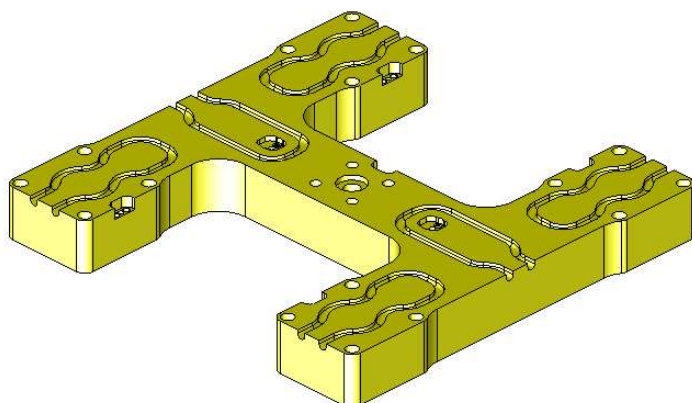
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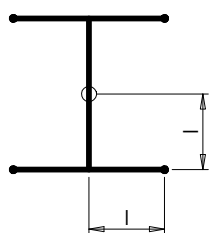
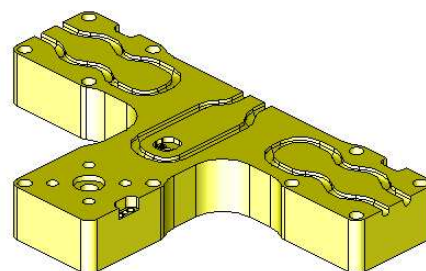
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l=75-100-125-150-175-200-225 mm



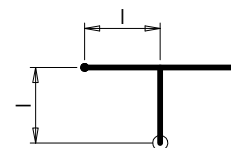
-HH-



-HT-

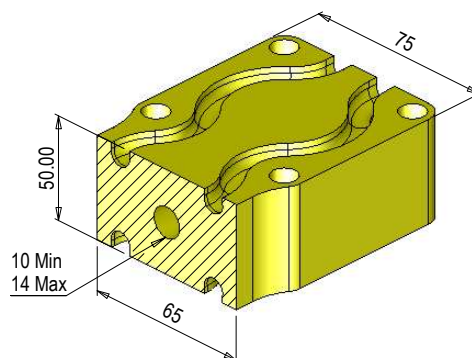


Standard
l=100-125-150 mm



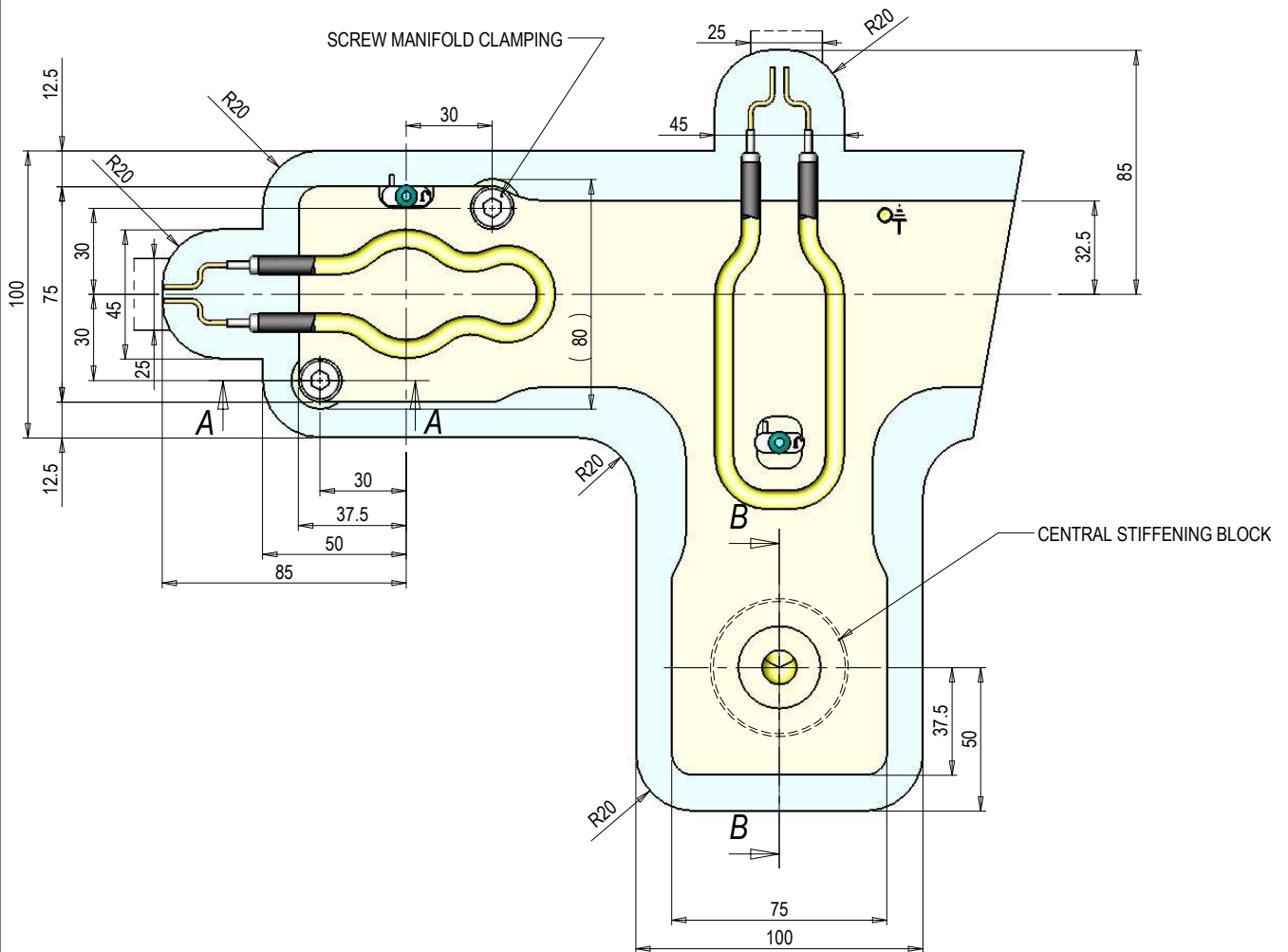
Standard
l=100-125-150 mm

Ma series

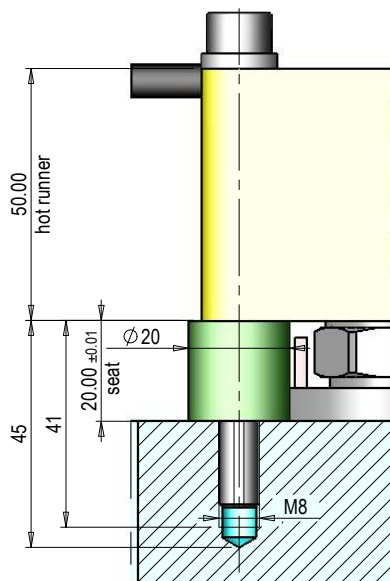


Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

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)

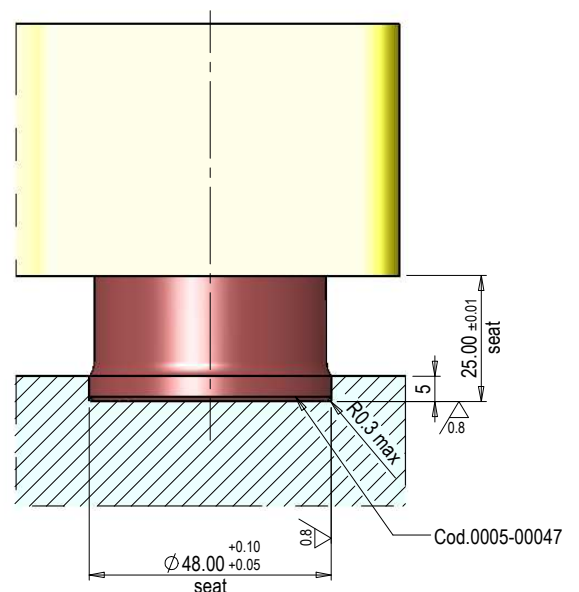


Screw manifold clamping
Screw M8x90 cl.12.9 30 Nm



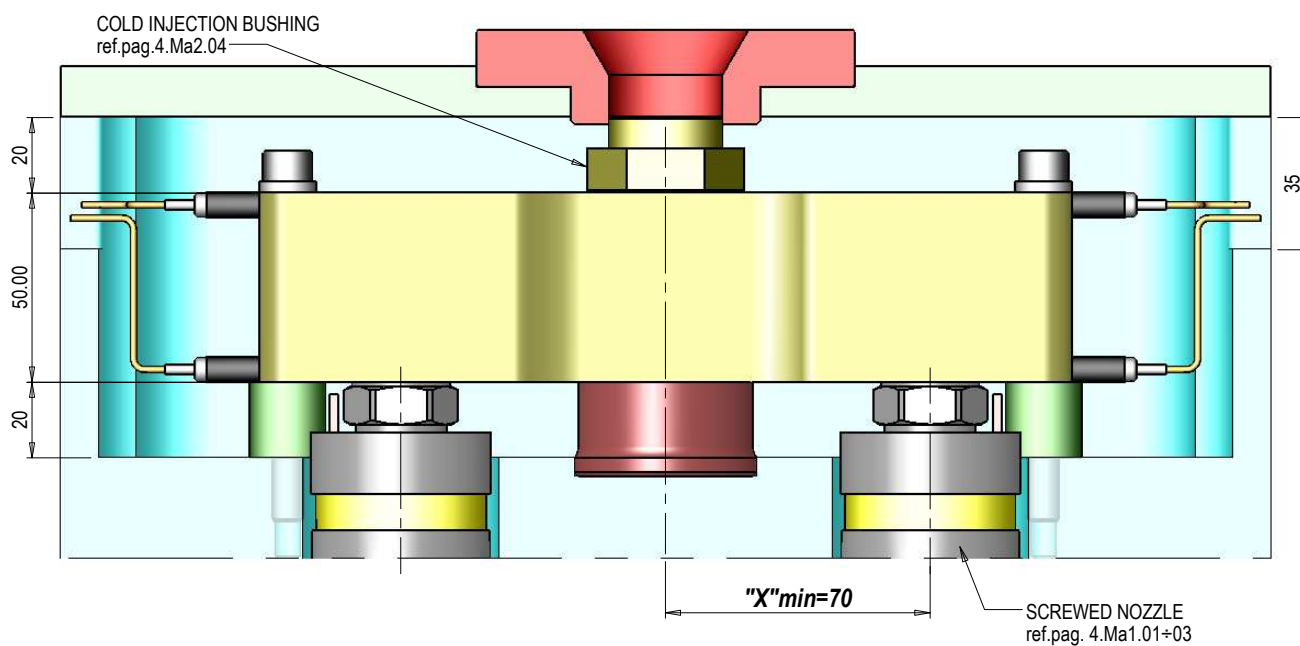
A-A

Pocket central stiffening block



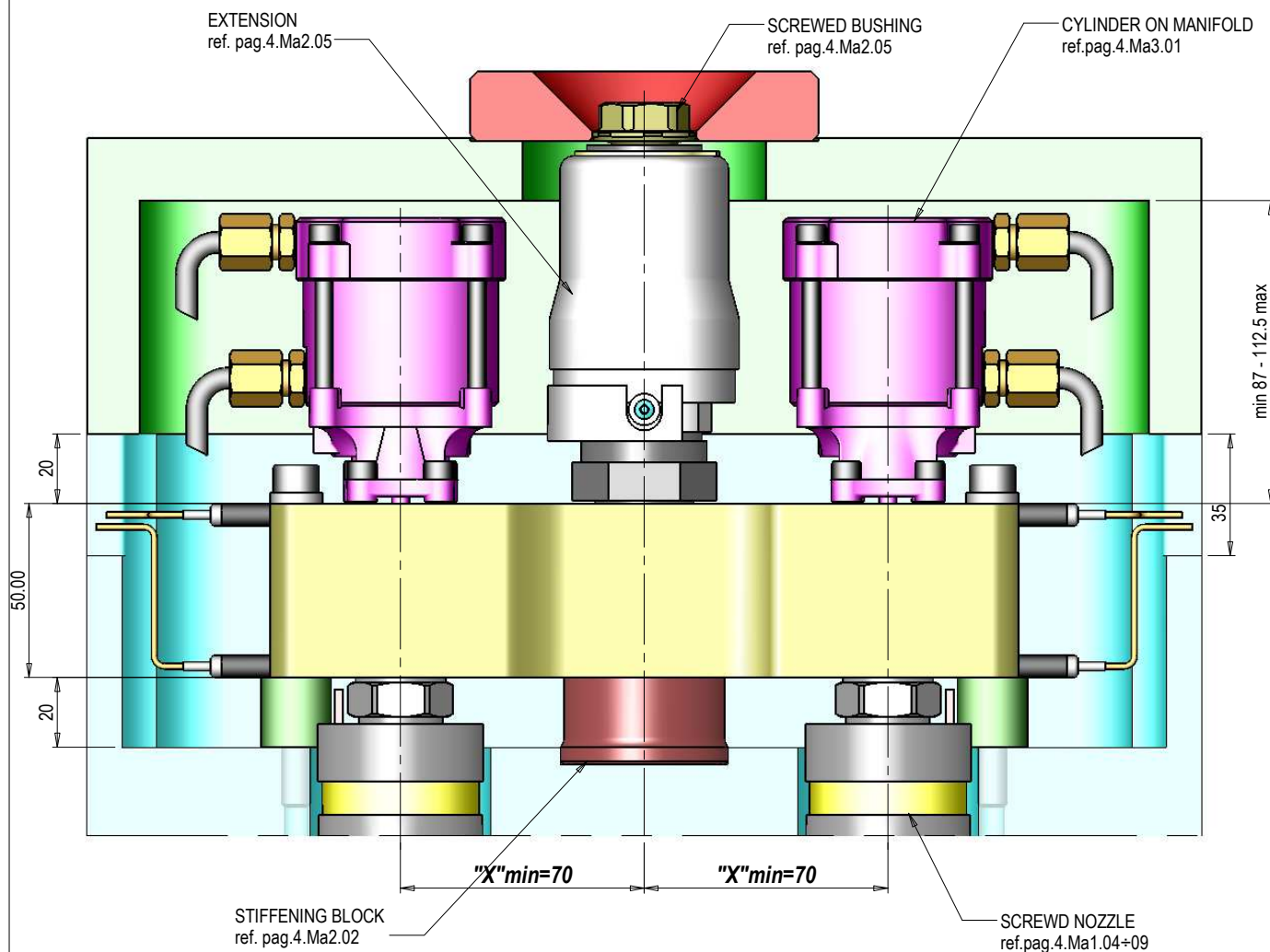
B-B

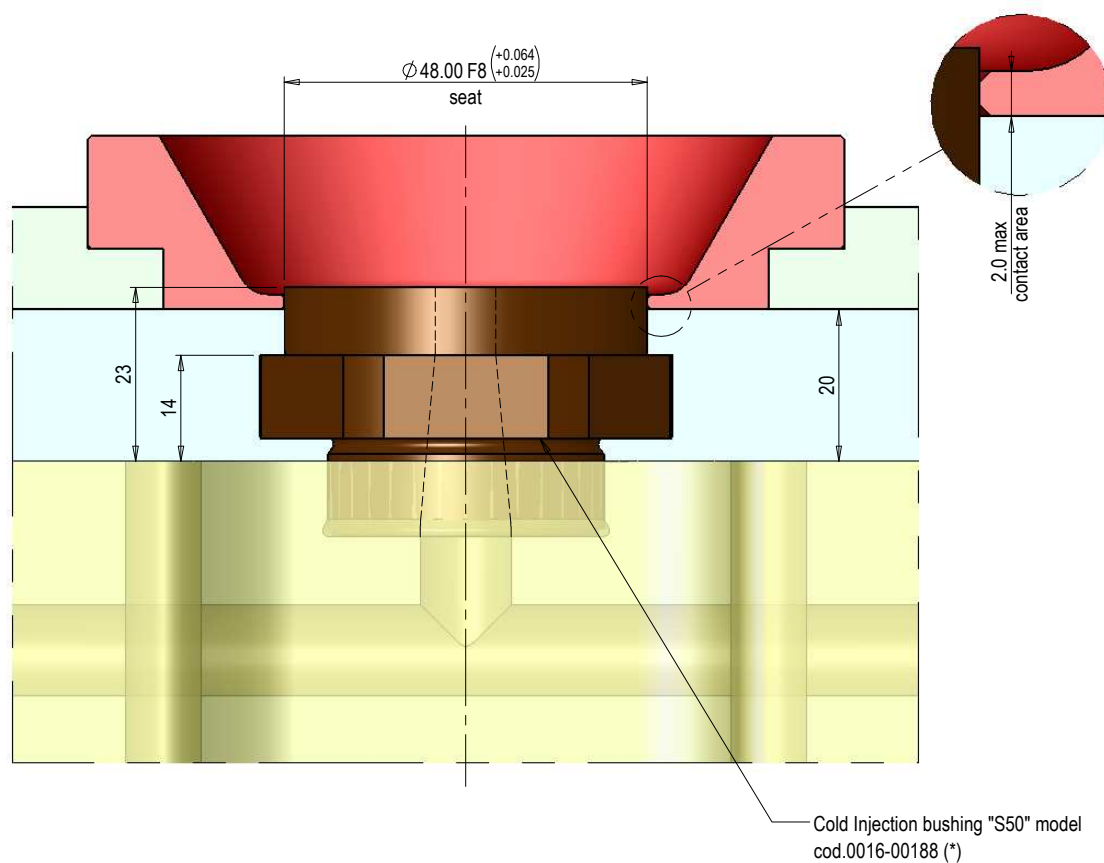
Structure for TORPEDO or FREE FLOW systems



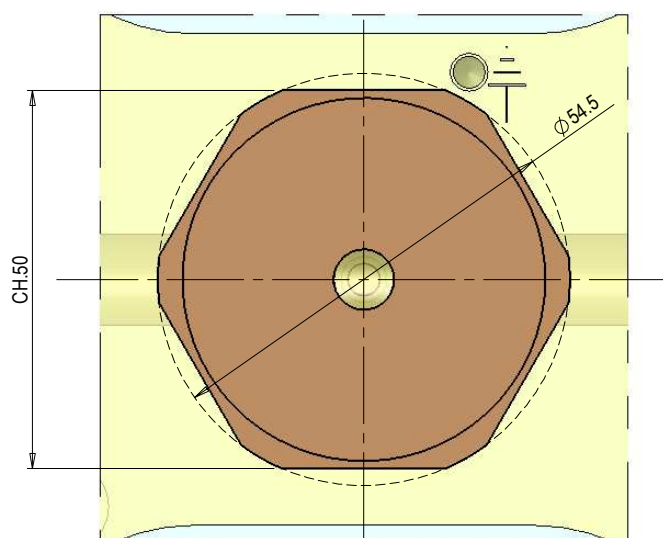
Xmin= min centre distance between injection bushing and nozzle for non standard systems

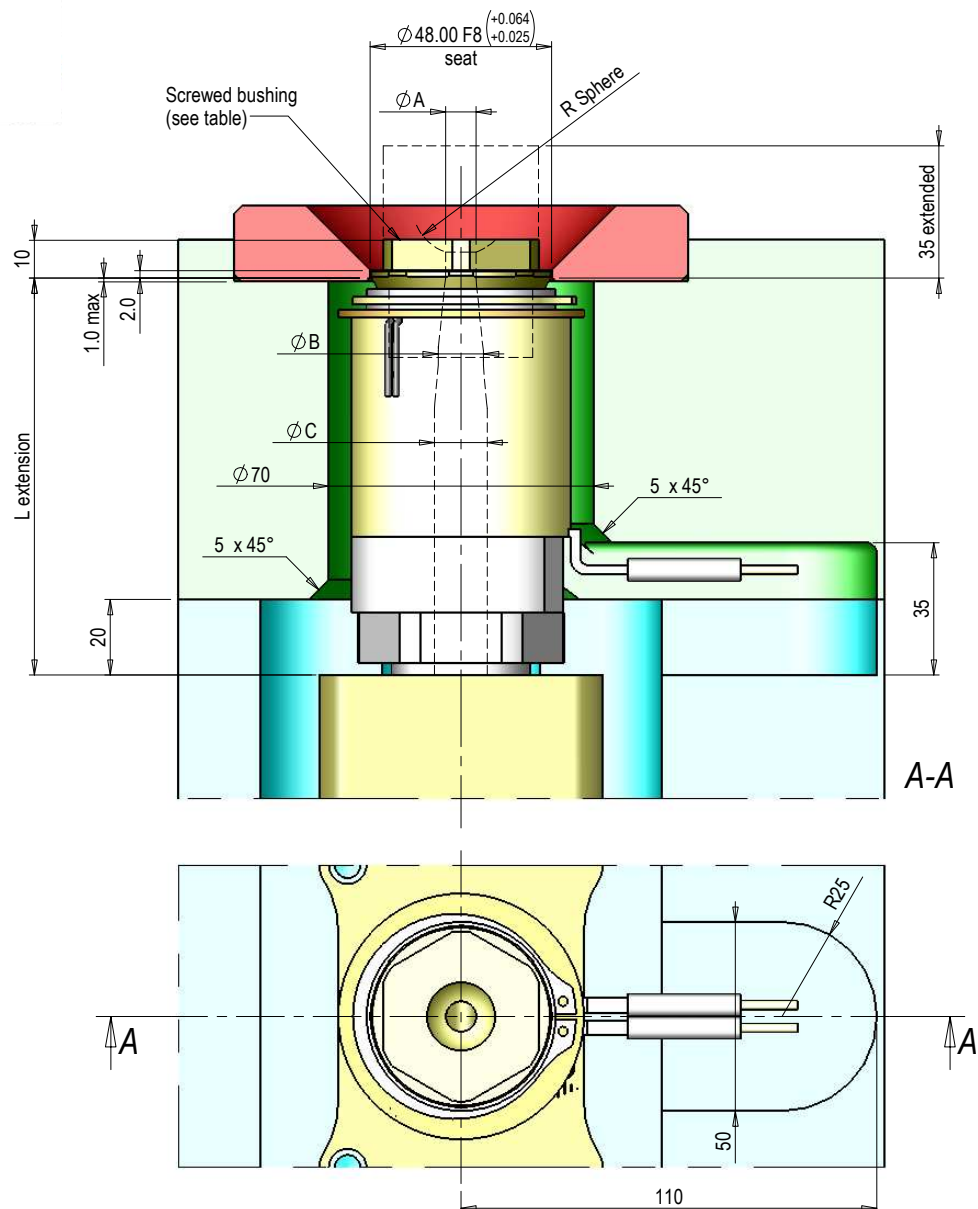
Structure for VALVE GATING systems



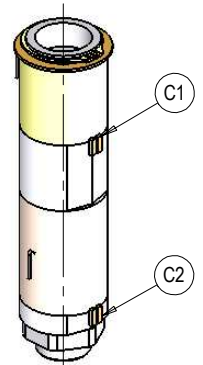


(*)Standard code with R sphere=0. Others R sphere sizes to be required.

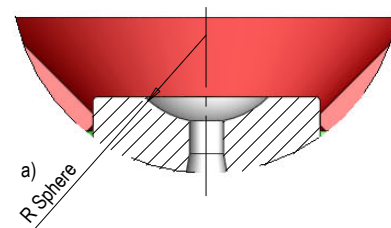
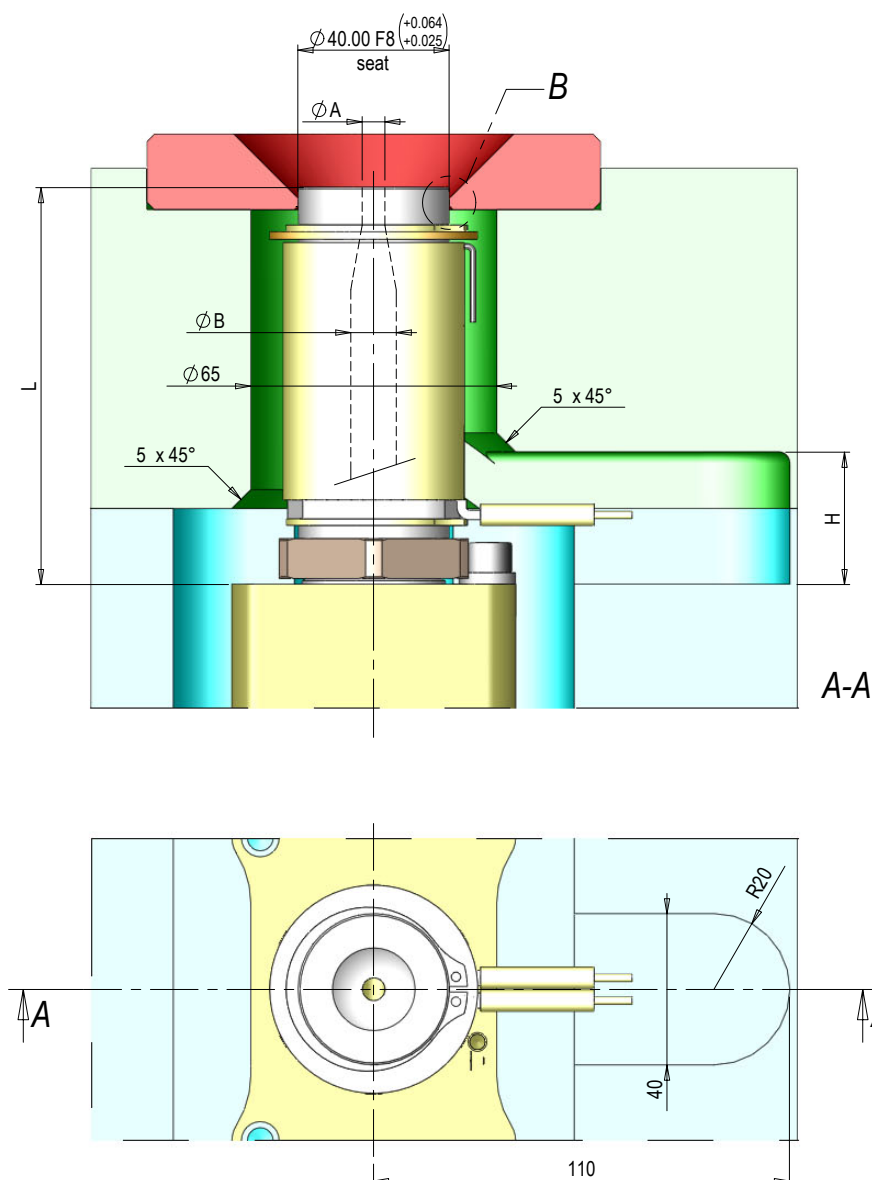




Control Zone

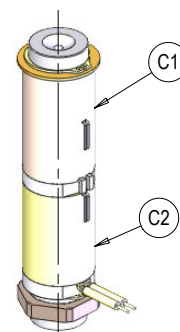


"L" (*)	MAXIMUN N° OF ZONES	STANDARD SCREWED BUSHING CODE	SPHERE RADIUS	ØA	ØB
040.00 ÷ 210.69	1 [C1]	0015-00468	R 0	6	10
210.70 ÷ 309.99	2 [C1 + C2]	0015-00450	R 12.7		
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)		0015-00451	R 15.5		
		0015-00452	R 19.1		
ØB	ØC	0015-00507	R 20		
10	10	0015-00453	R 25		
12	14	0015-00454	R40	8	12
	16	0015-00447	R 0		
	18	0015-00456	R 12.7		
(*) 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)		0015-00457	R 15.5		
		0015-00458	R 19.1		
		0015-00508	R 20		
		0015-00459	R 25		
		0015-00460	R40	4	4
		Extended 0015-00449 (***)	R 0		



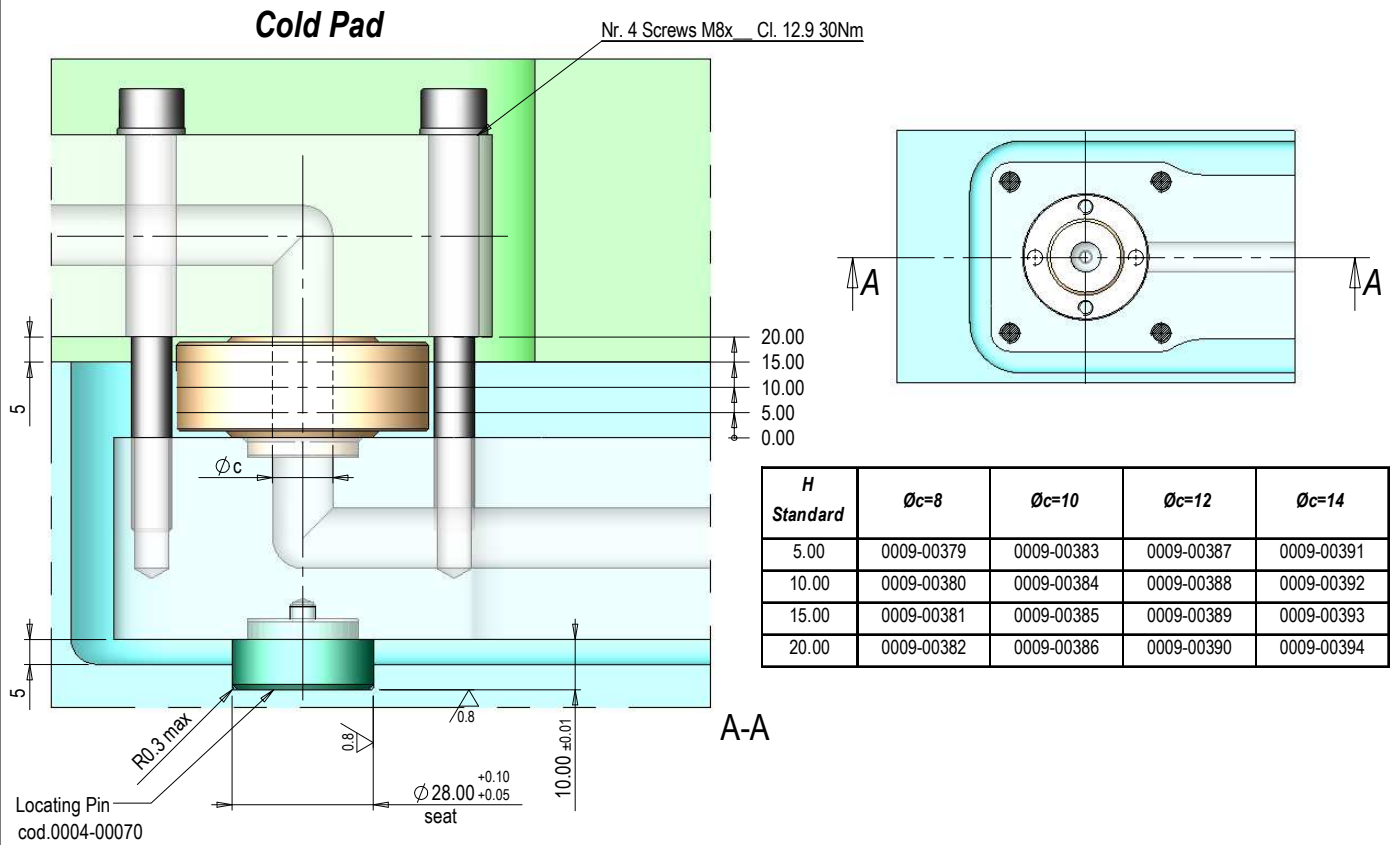
DETAIL B

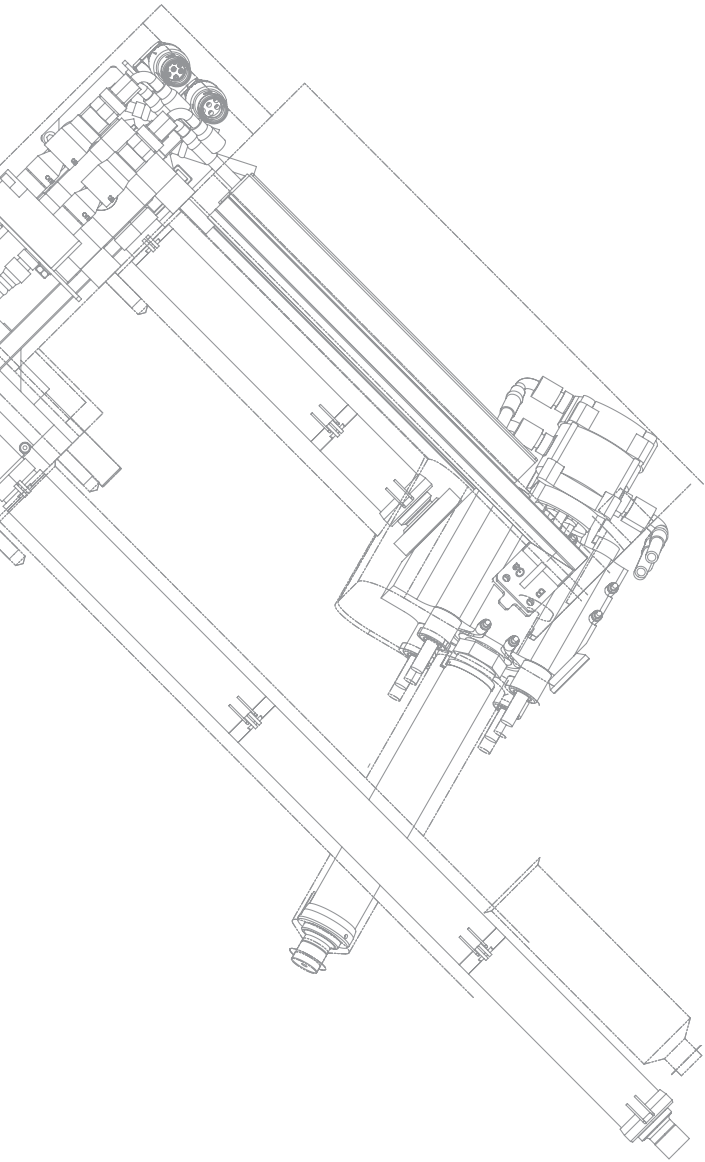
Control Zone



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
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
H		with 20 30.00 ≤ L ≤ 44.99 35 L ≥ 45.00		7	8 - 10 - 12 - 14
				7.5	8 - 10 - 12 - 14
				8	8 - 10 - 12 - 14 - 16 - 18 - 20 -
X	Y	Z	with	8.5	10 - 12 - 14 - 16 - 18 - 20
1.8min	0.5max	2.8max	L ≤ 54.99	9	10 - 12 - 14 - 16 - 18 - 20
2	1	4	L ≥ 55.00	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





Ga Series 100÷1225 cm³/s

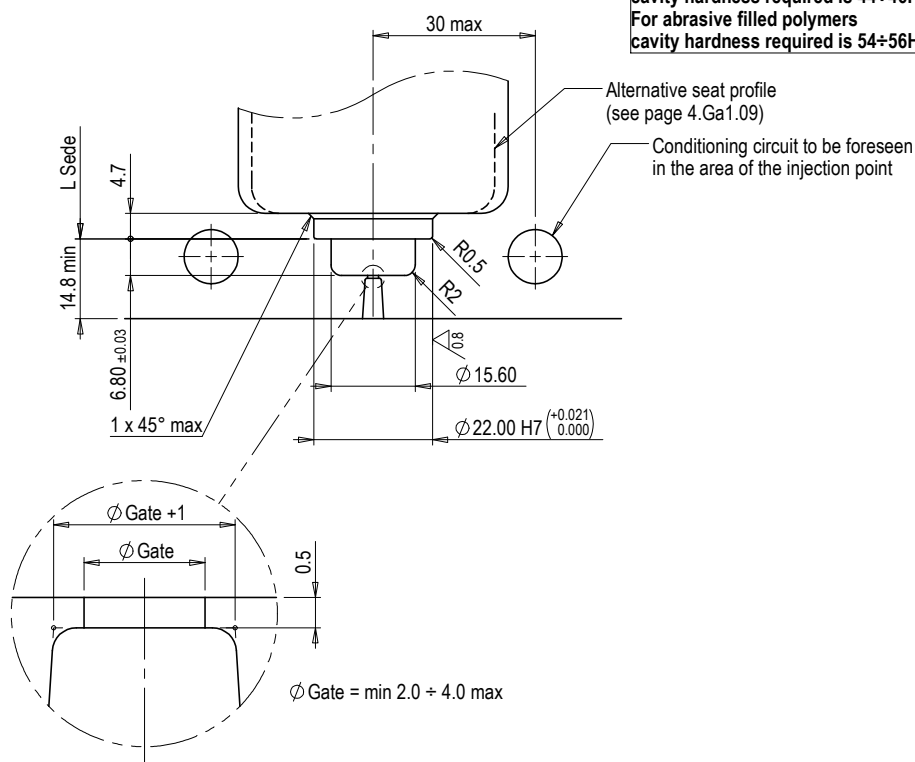
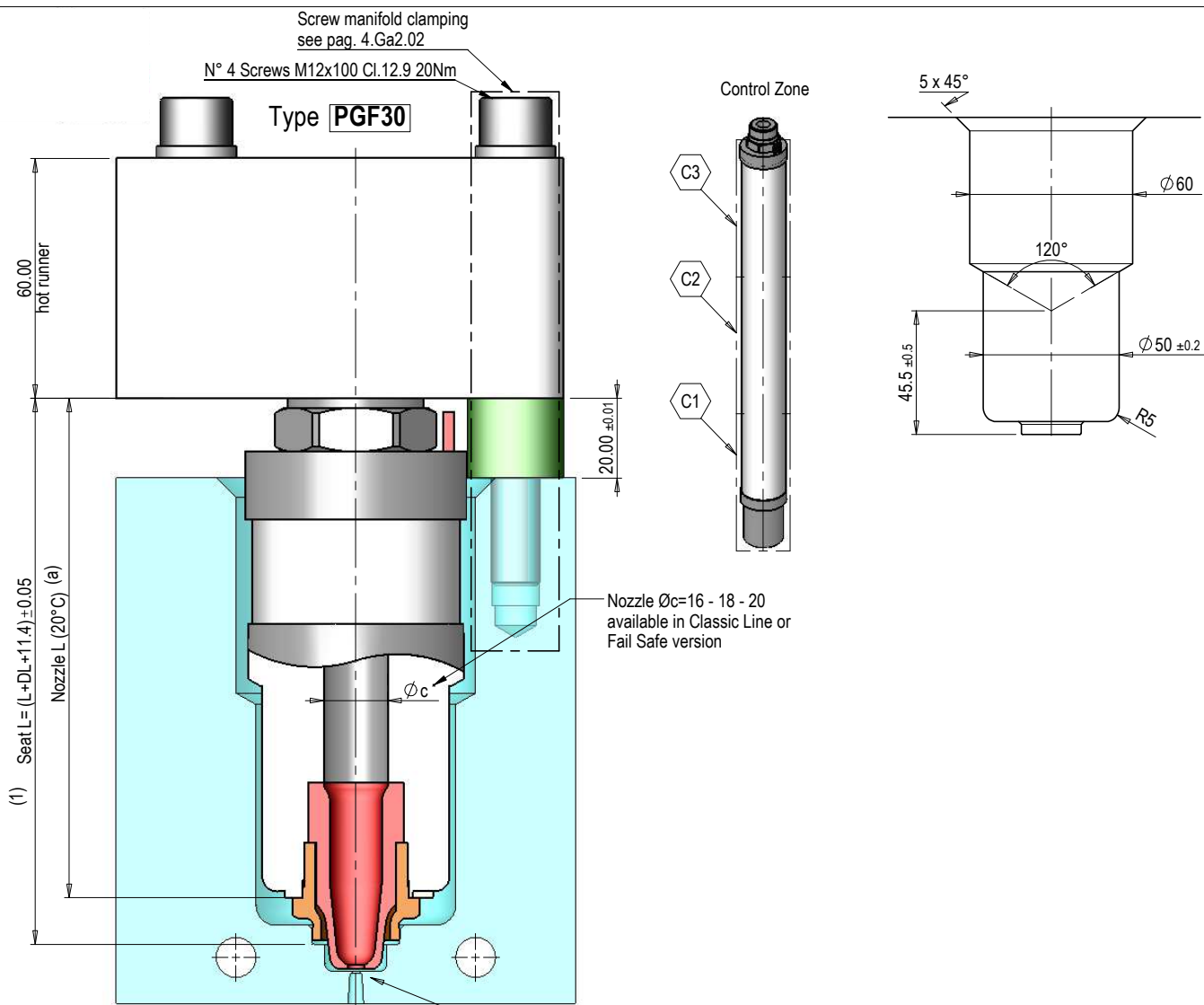
Serie Ga

Ga Serie

Ga Série

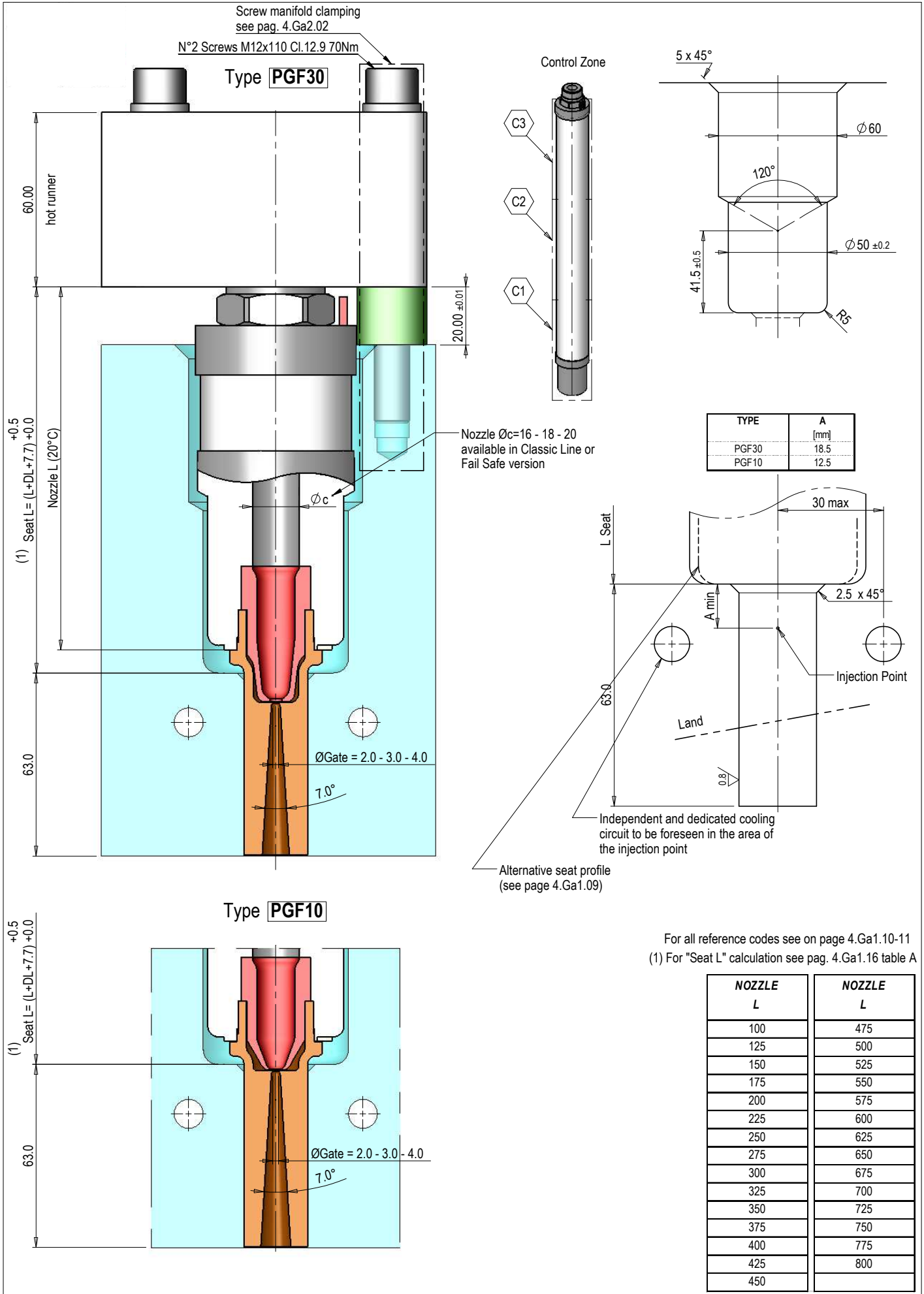
Ga Serie

Ga Série



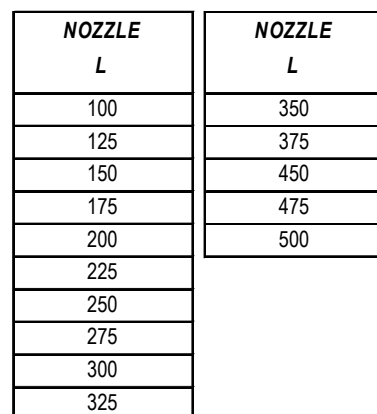
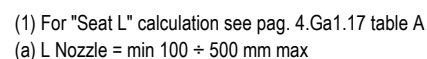
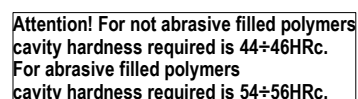
(1) For "Seat L" calculation see pag. 4.Ga1.17 table A
(a) L Nozzle = min 100 ÷ 600 mm max

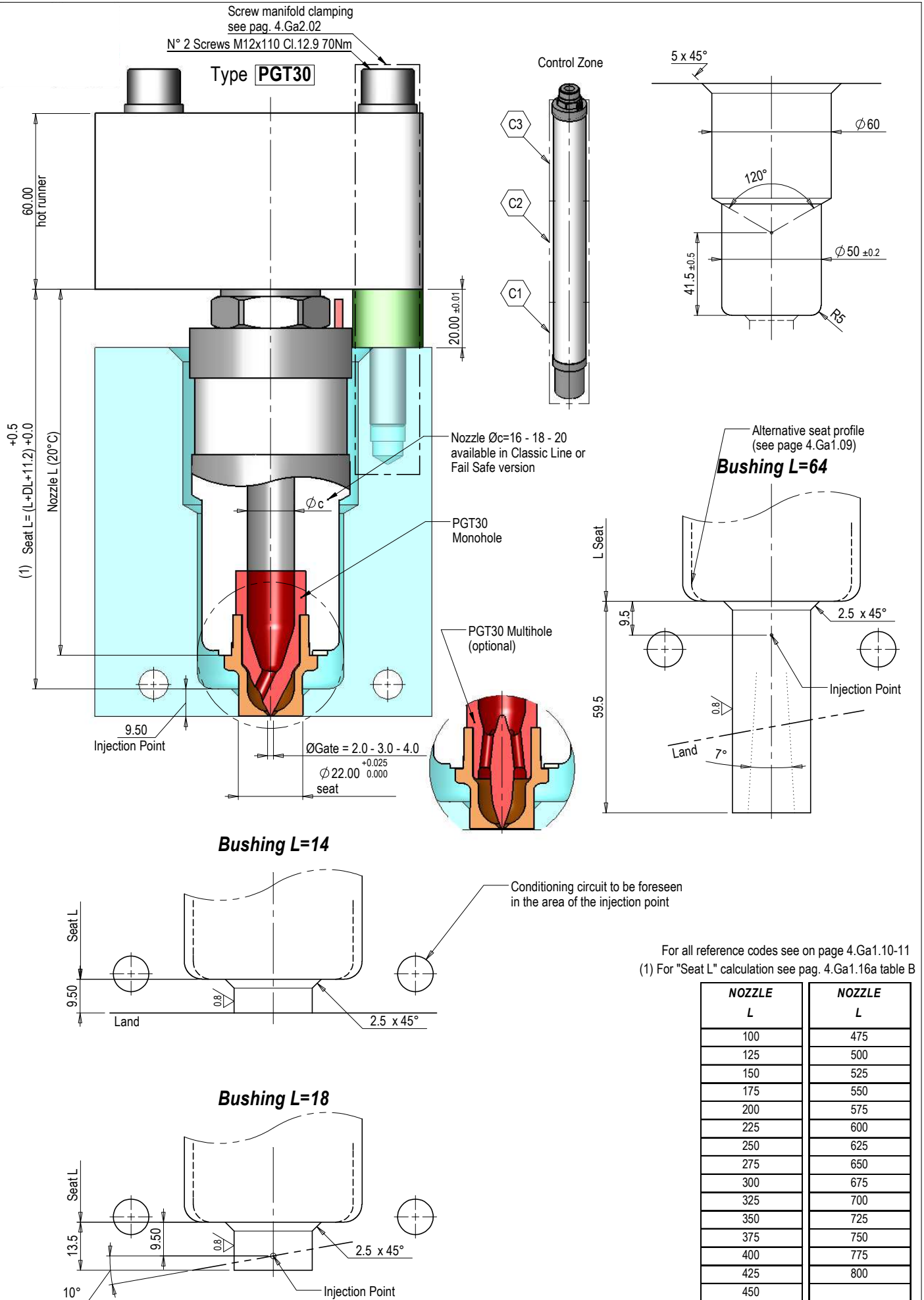
NOZZLE L	NOZZLE L
100	350
125	375
150	450
175	475
200	500
225	
250	
275	
300	
325	

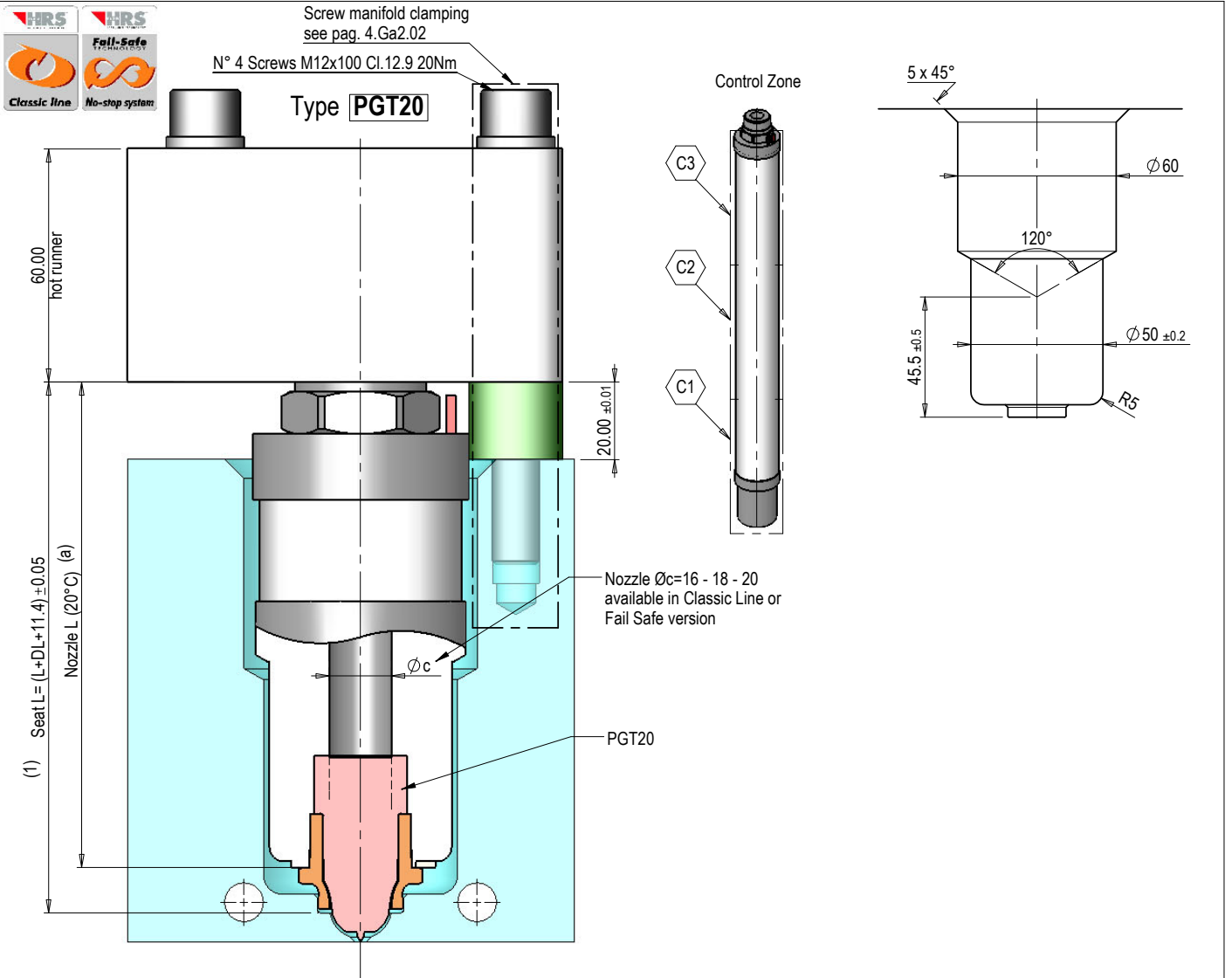


For all reference codes see on page 4.Ga1.10-11
(1) For "Seat L" calculation see pag. 4.Ga1.16 table A

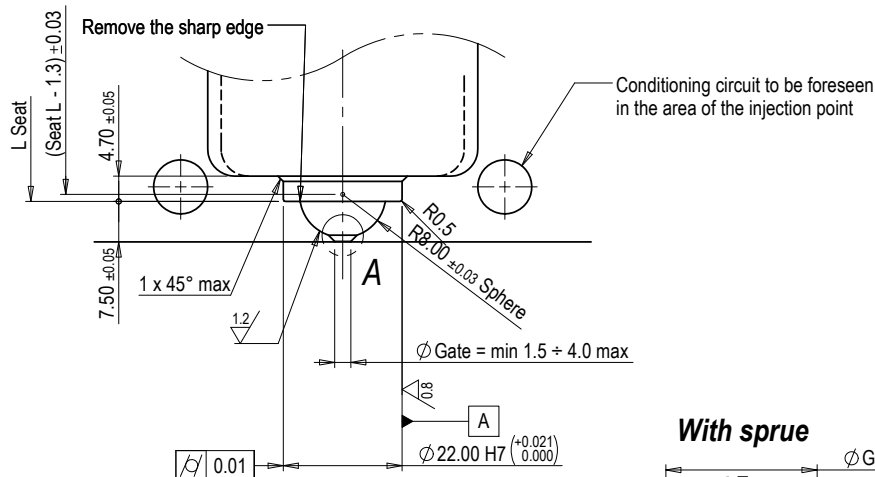
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	



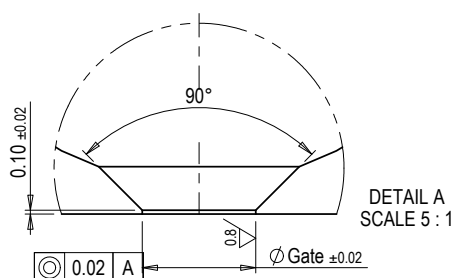




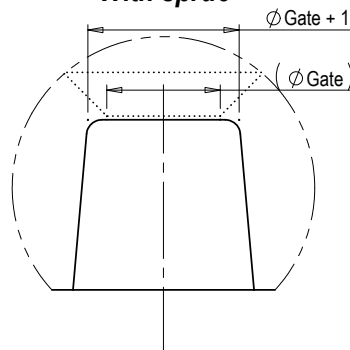
**Attention! For not abrasive filled polymers
cavity hardness required is 44÷46HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**



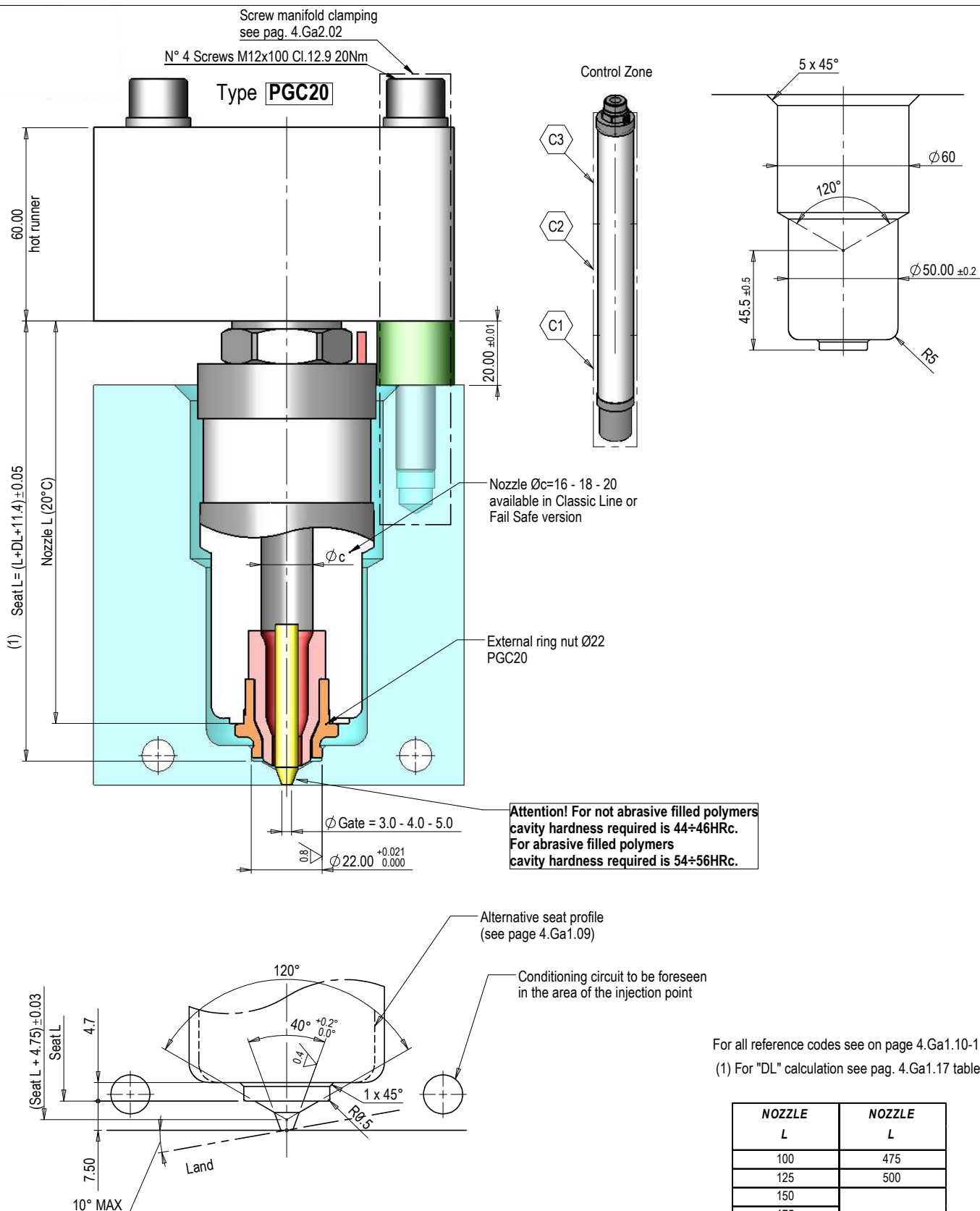
(1) For "Seat L" calculation see pag. 4.Ga1.17 table A
(a) L Nozzle = min 100 ÷ 500 mm max



With sprue



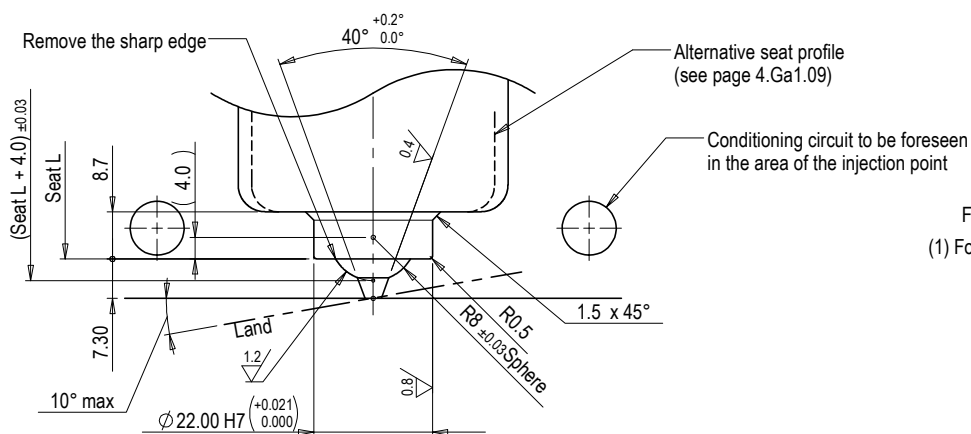
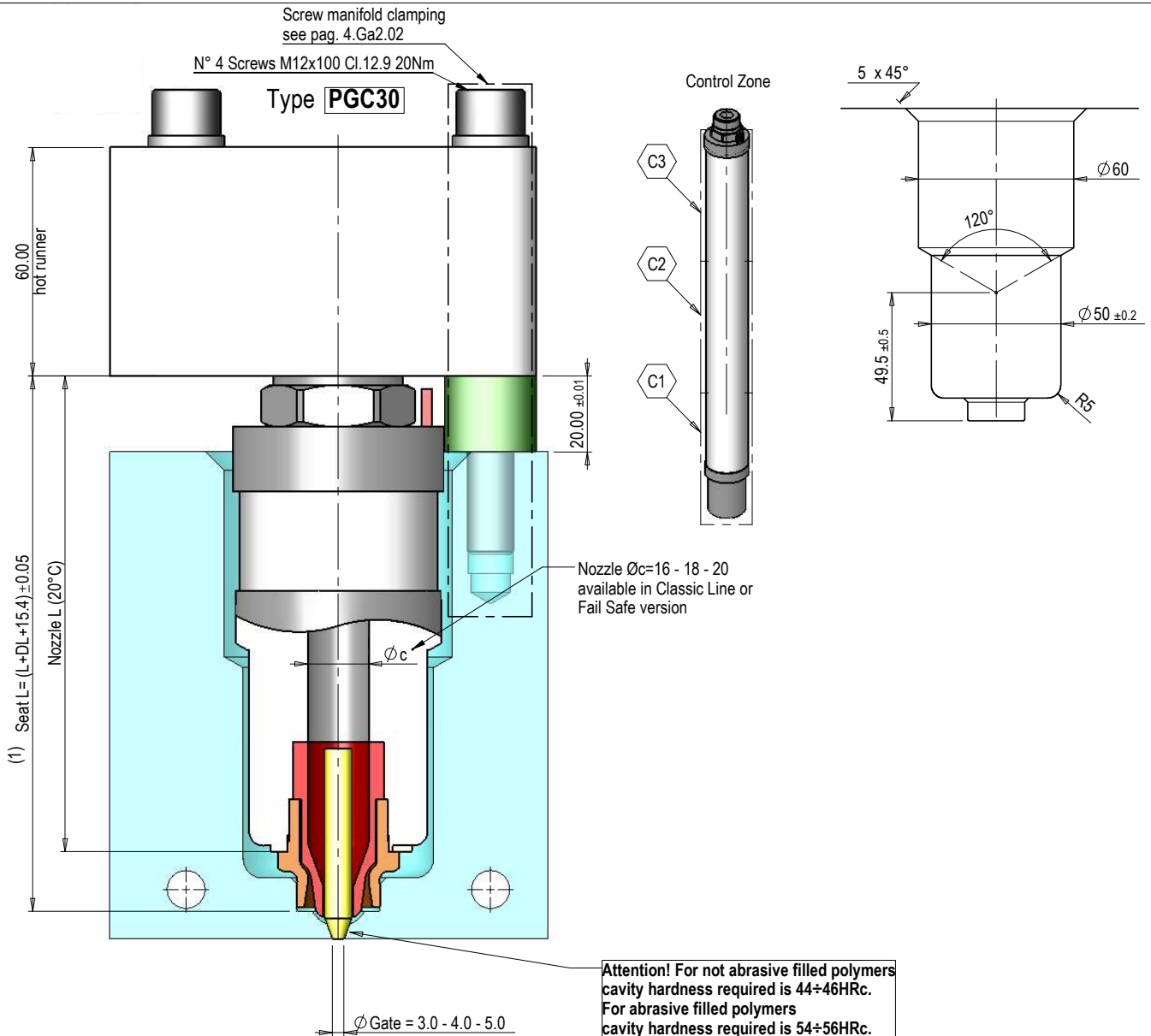
NOZZLE L	NOZZLE L
100	350
125	375
150	450
175	475
200	500
225	
250	
275	
300	
325	



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

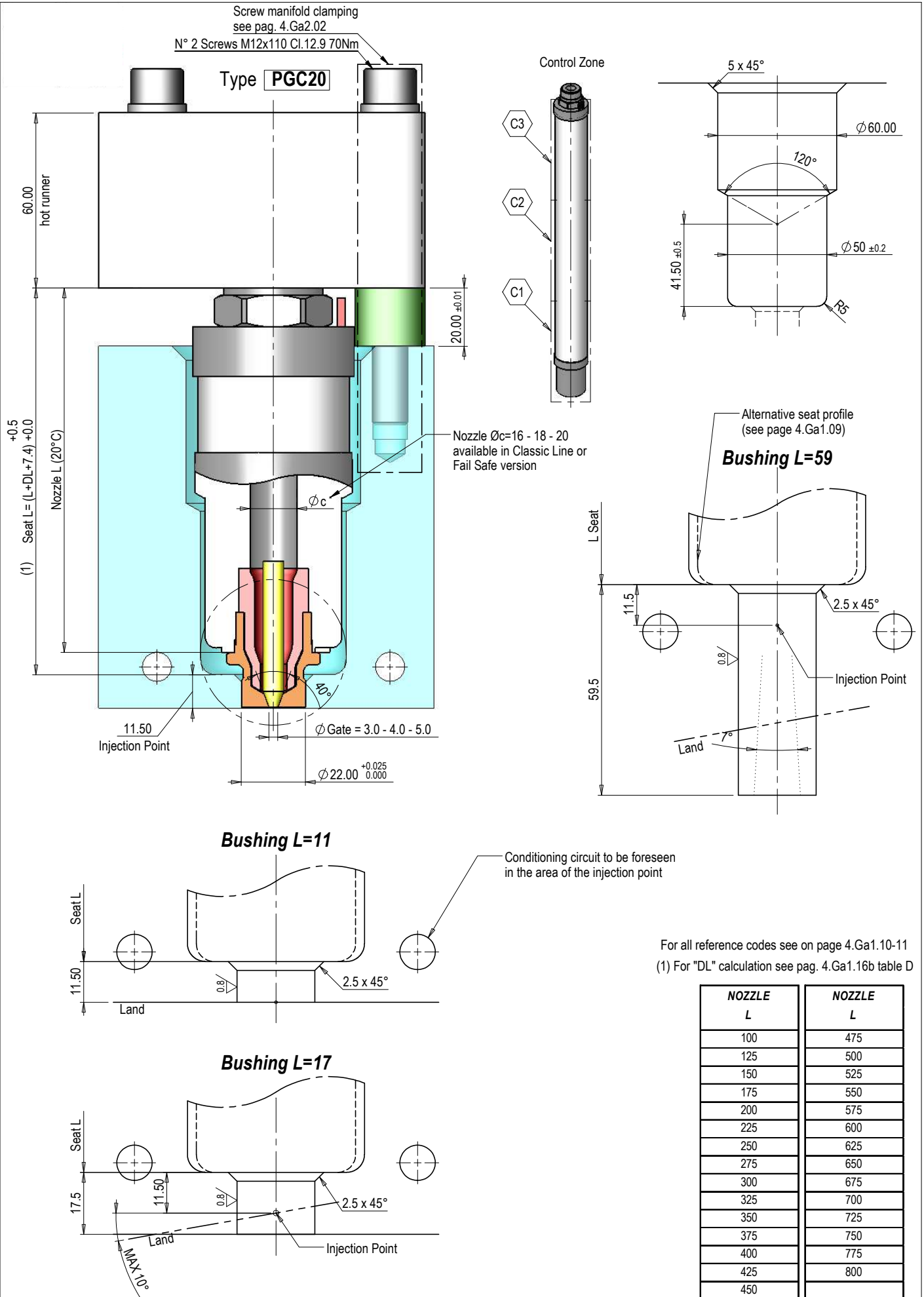
(1) For "DL" calculation see pag. 4.Ga1.17 table A

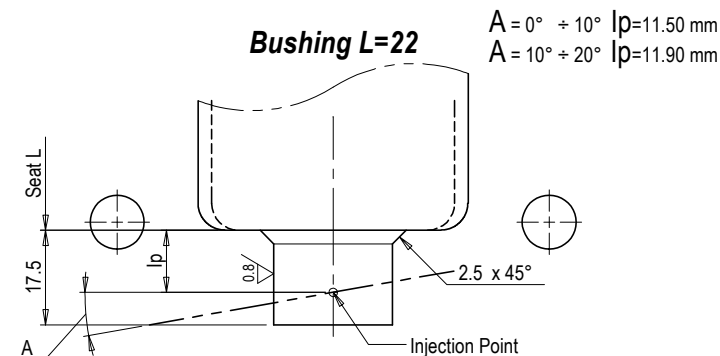
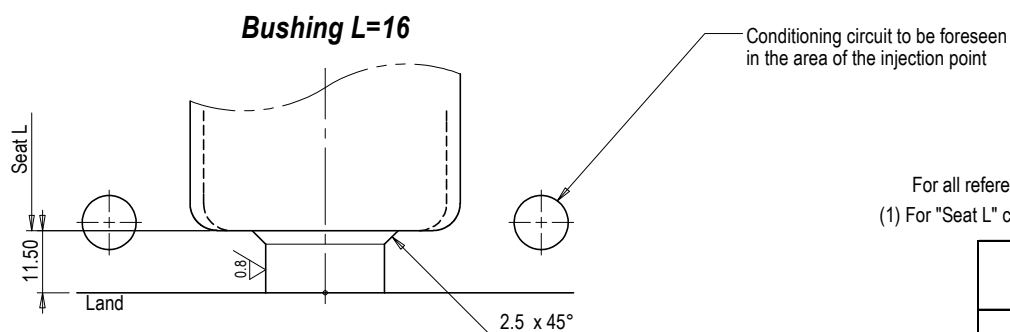
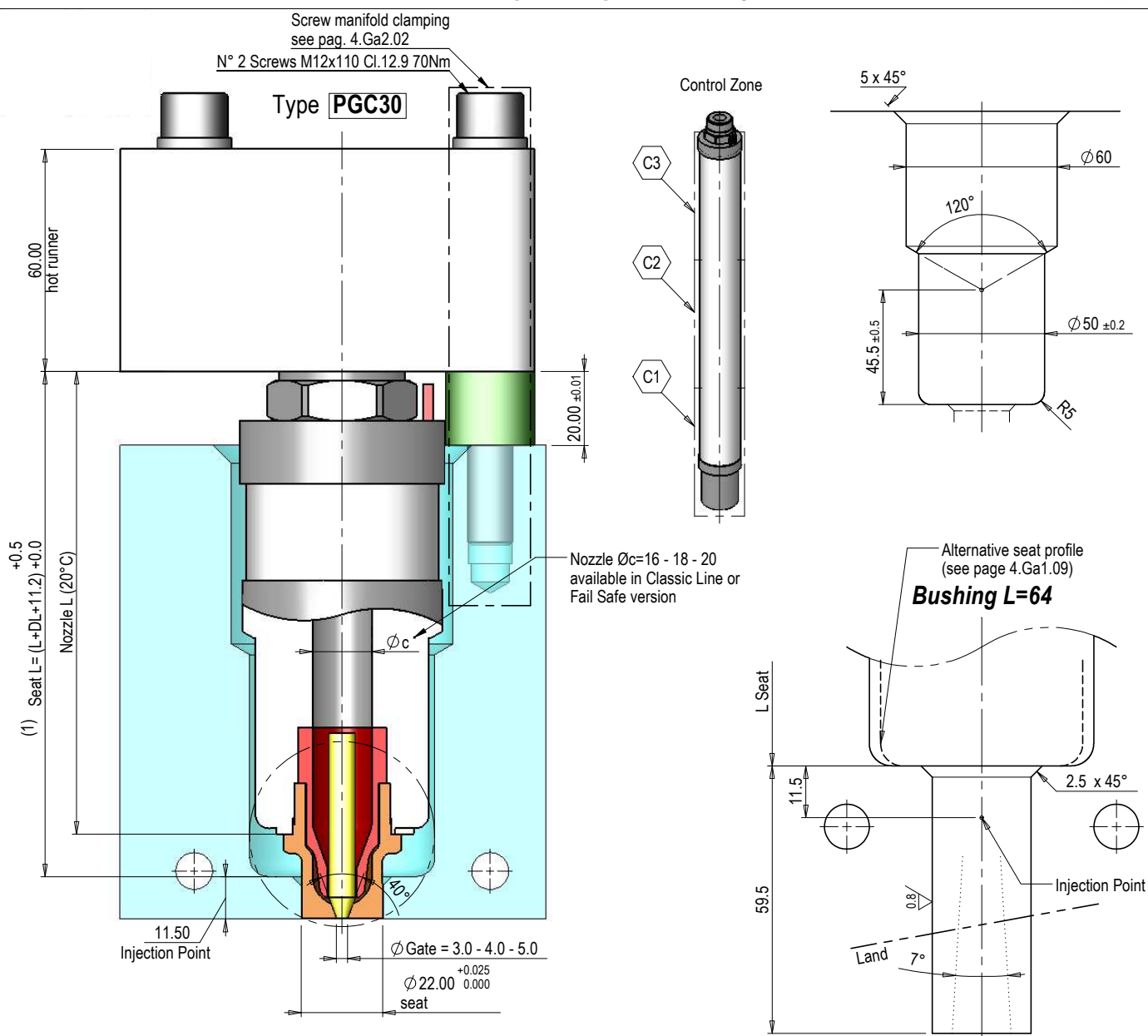
NOZZLE L	NOZZLE L
100	475
125	500
150	
175	
200	
225	
250	
275	
300	
325	
350	
375	
400	
425	
450	



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

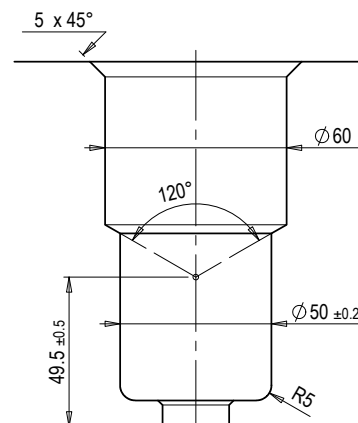
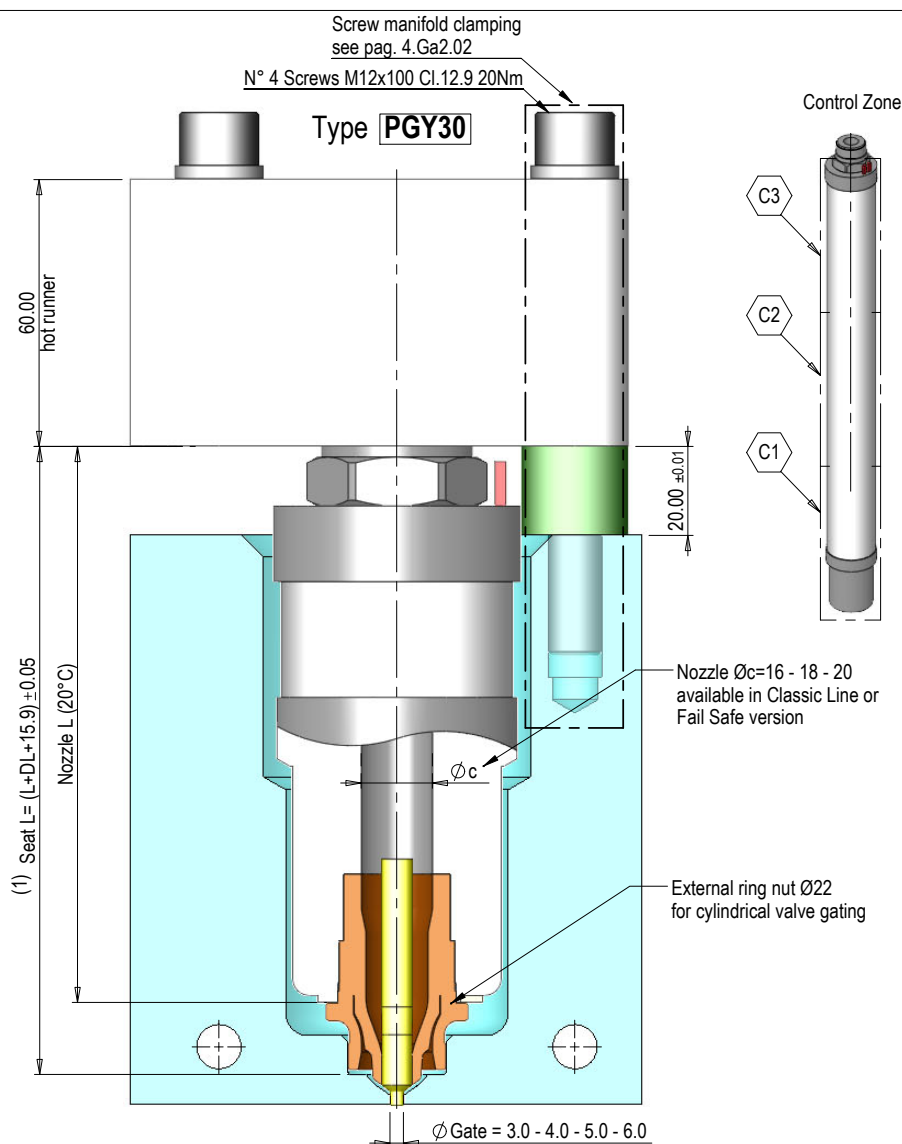
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	





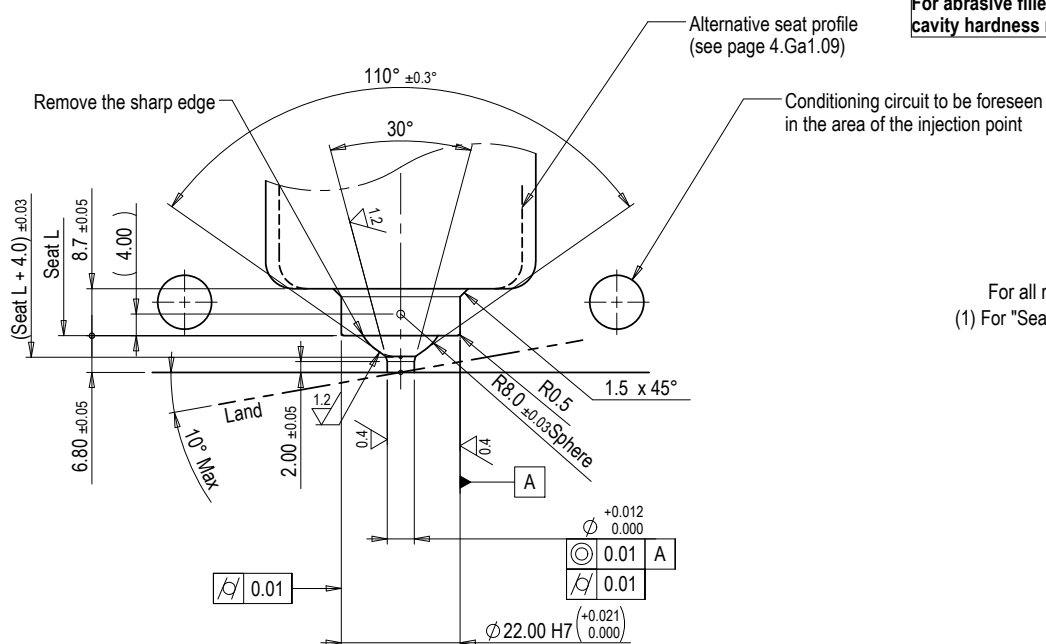
(1) For "Seat L" calculation see pag. 4.Ga1.16a table B

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	



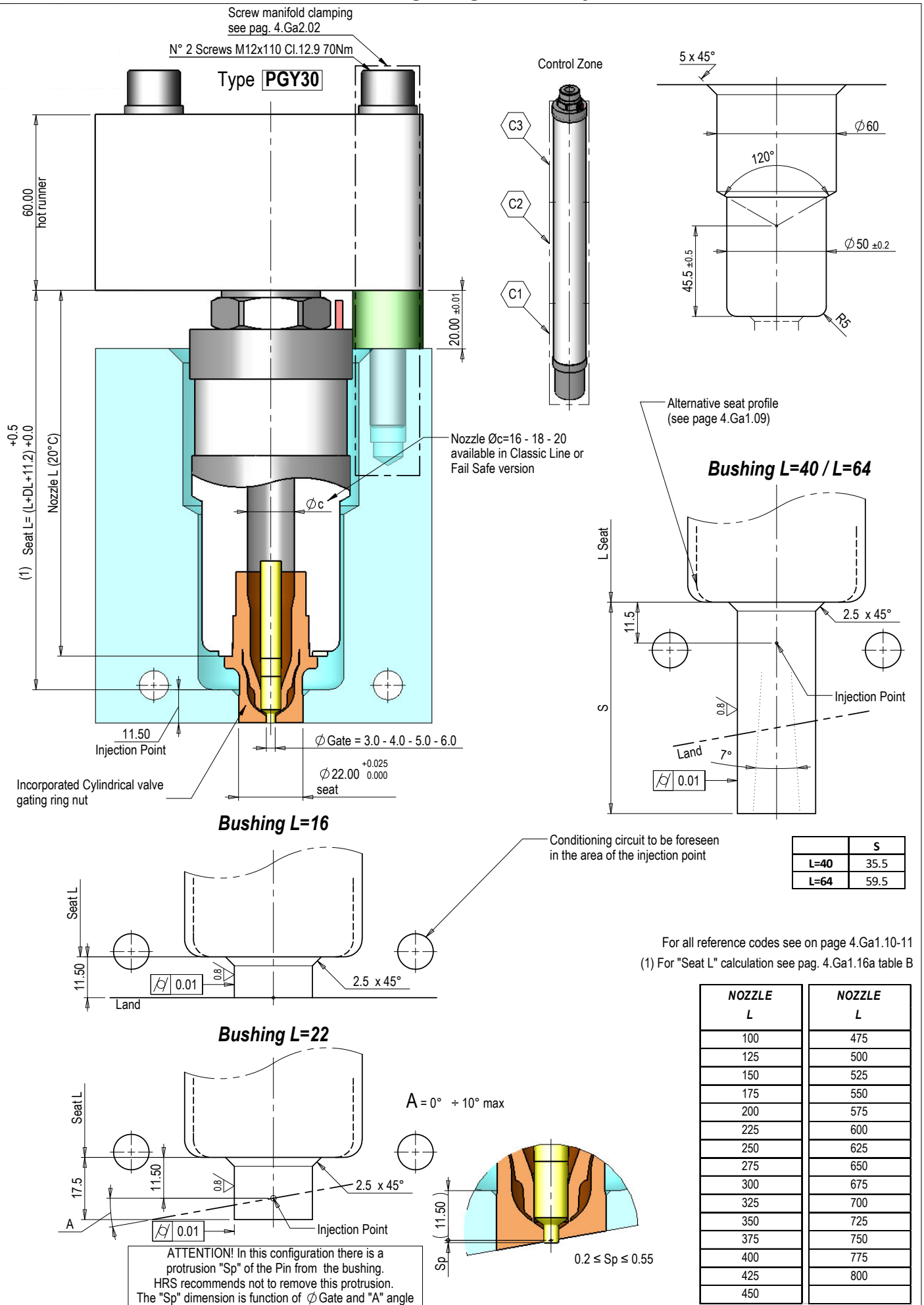
Attention! The tolerances are really important. Do not respect these ones, the grinding surface and roughness' values, it means do not make the system works correctly

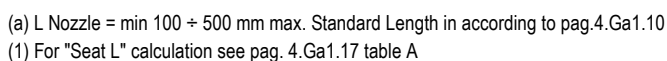
**Attention! For not abrasive filled polymers
cavity hardness required is 48÷50HRc.
For abrasive filled polymers
cavity hardness required is 54÷56HRc.**

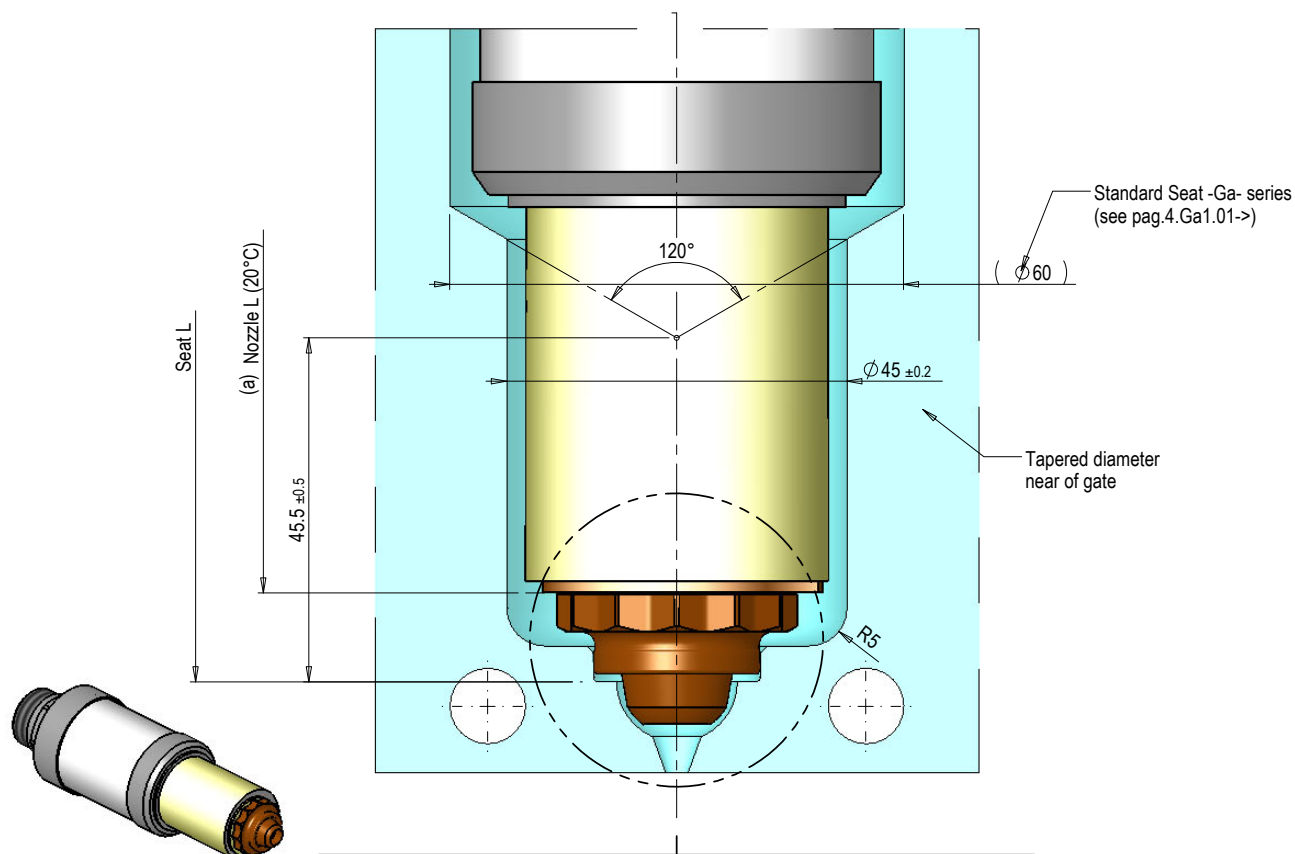


For all reference codes see on page 4.Ga1.10-11
(1) For "Seat L" calculation see pag. 4.Ga1.16b table E

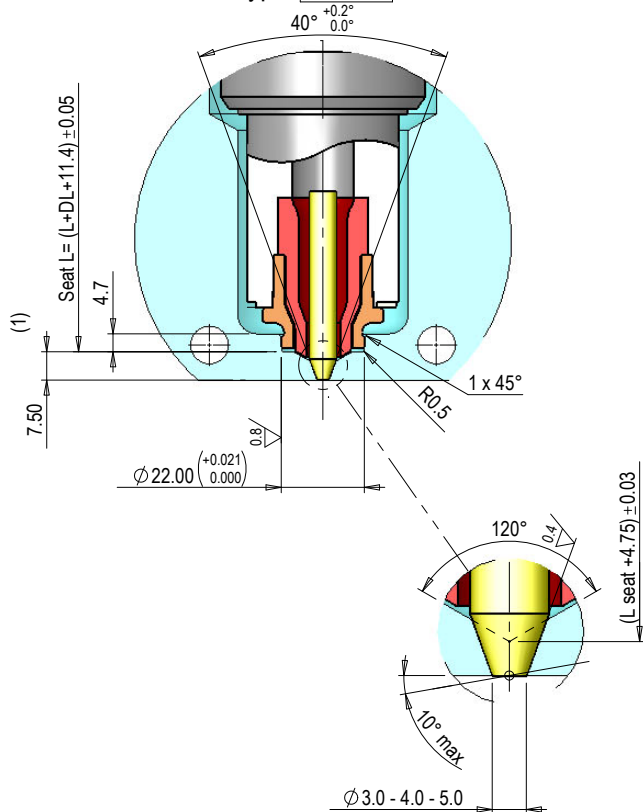
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	



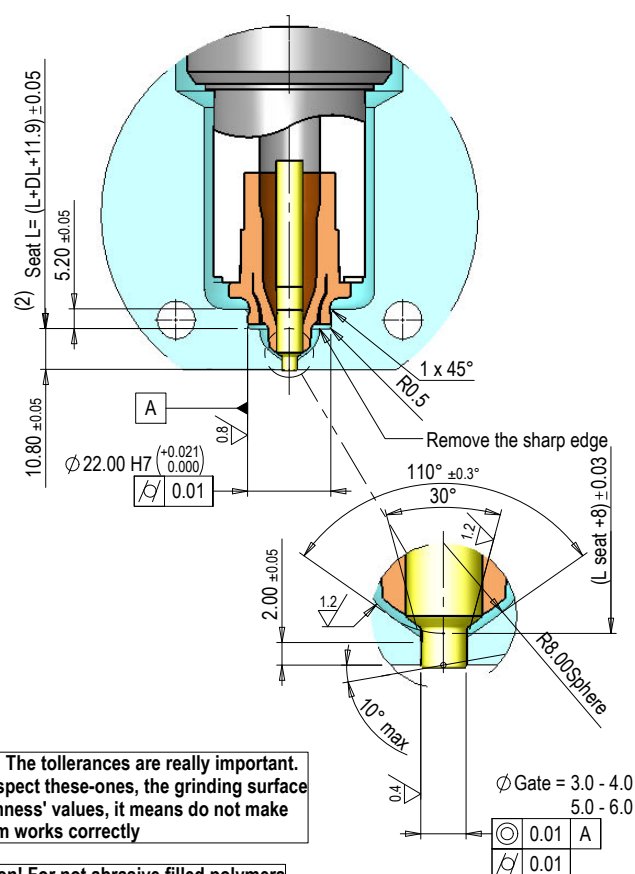




Conic valve gating

Type **PGC20**

Cylindrical valve gating

Type **PGY30**

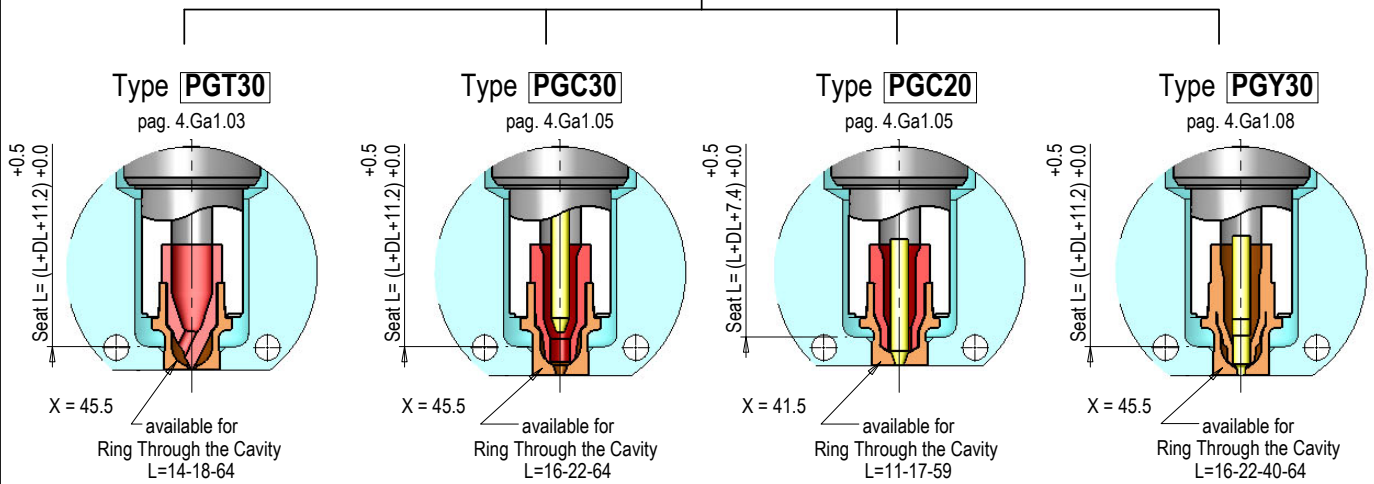
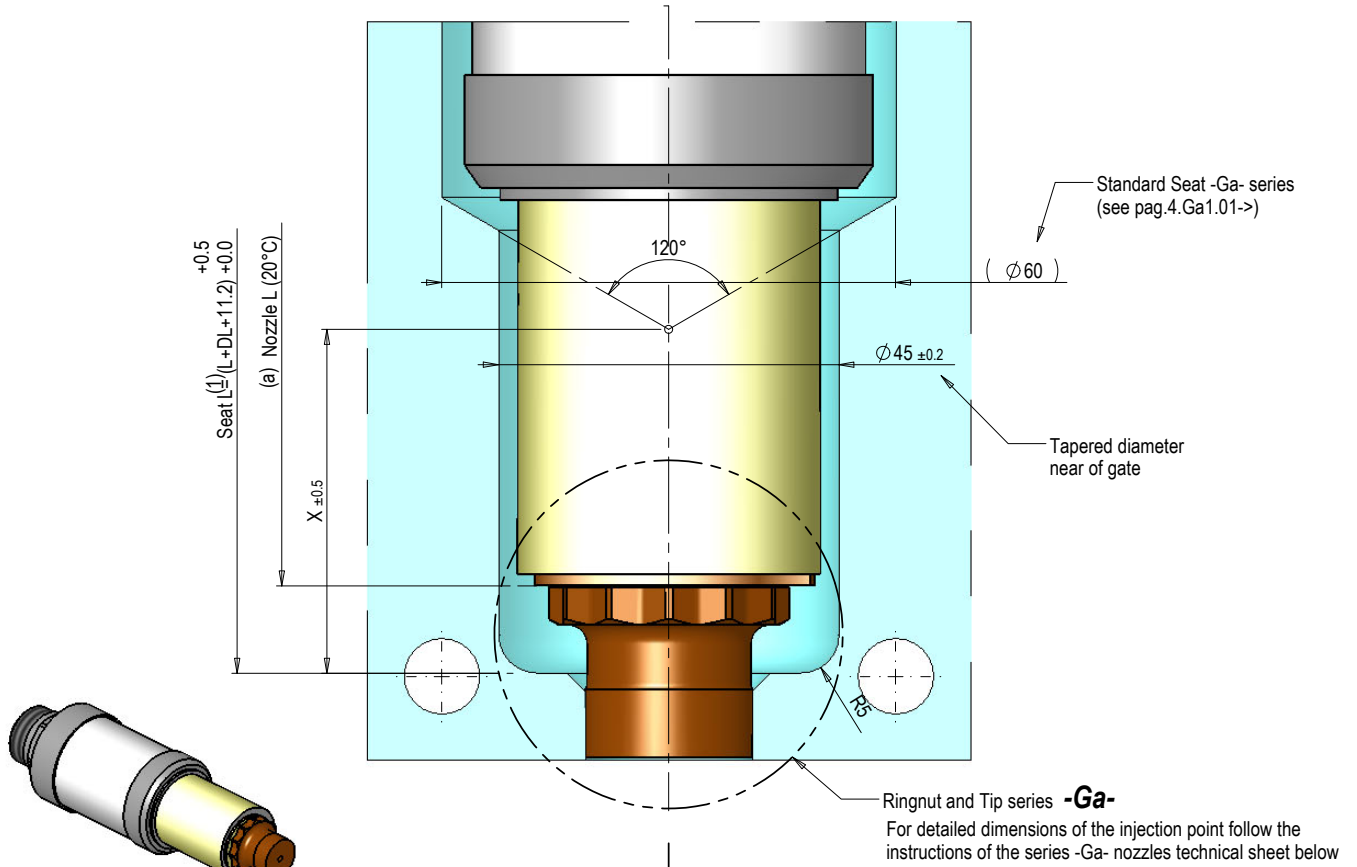
Attention! The tolerances are really important. Do not respect these ones, the grinding surface and roughness' values, it means do not make the system works correctly

**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

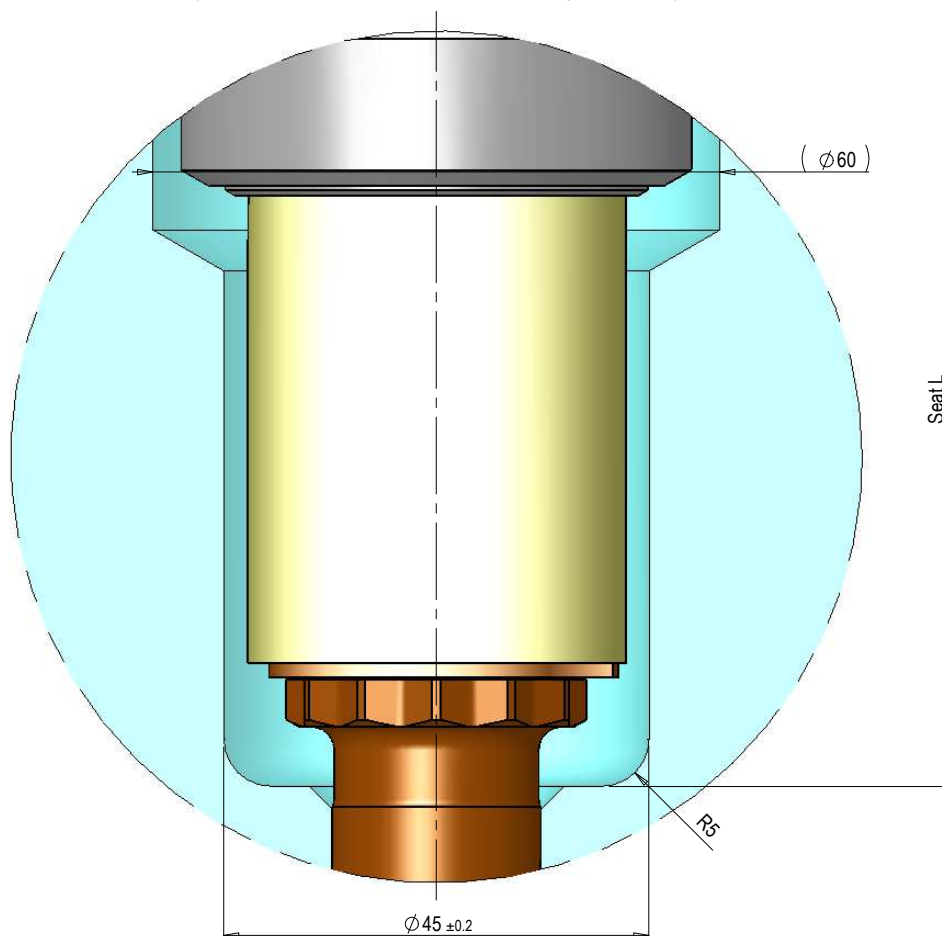


(a) "L Nozzle" = min 100 ÷ 800 mm max. Standard Length in according to pag.4.Ga1.10

(1) For "Seat L" calculation see pag. 4.Ga1.17a table B

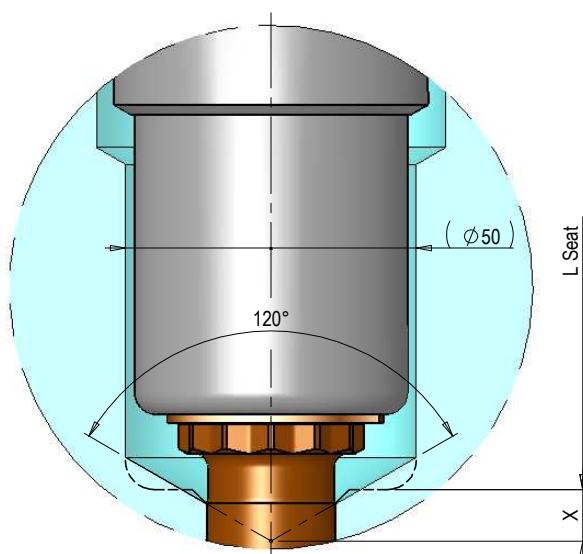
Compact Seat

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)

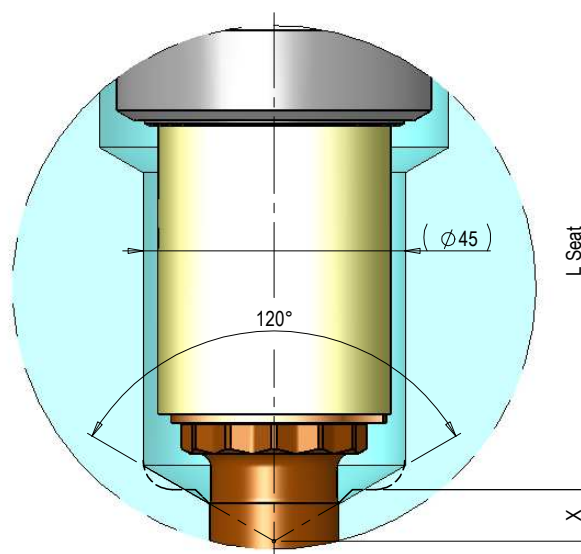


Seat made with 120° tip (*)

Application on STANDARD seat



Application on COMPACT seat



X=8.85 for all configurations, except for **PGC20** configuration whose value it's **9.0**

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

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.

TIP CODE	BUSHING CODE	ANTISTAGNATION RING CODE (*)
FREE FLOW		
PGF30 0012-00586 0012-00584 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	
PGF10 0012-00599 for high resistance		
TORPEDO		
PGT30 Monohole 0012-00281 0012-00282 for high resistance 0012-00333 for high conductivity 0012-01008 for engineering polymers PGT30 Multihole 0012-00283 0012-00284 for high resistance 0012-00334 for high conductivity	External end ring Ø22 (LUX) 0013-00964 Ø22 0013-02112 for engineering polymers PGT30 Bushing 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 conductivity with End Ring 0012-00326 For high conductivity with Bushing th.cavity 0012-00431 for high resistance PGC30 Antistagnation 0012-00772 For high conductivity with End Ring 0012-00773 For high conductivity 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

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

$\Delta T = T1 - T2$
 $\lambda = 0.000012 (1/^{\circ}\text{C})$

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
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100^{\circ}\text{C}$]	[$\Delta T=120^{\circ}\text{C}$]	[$\Delta T=140^{\circ}\text{C}$]	[$\Delta T=160^{\circ}\text{C}$]	[$\Delta T=180^{\circ}\text{C}$]	[$\Delta T=200^{\circ}\text{C}$]	[$\Delta T=220^{\circ}\text{C}$]	[$\Delta T=240^{\circ}\text{C}$]	[$\Delta T=260^{\circ}\text{C}$]	[$\Delta T=280^{\circ}\text{C}$]	[$\Delta T=300^{\circ}\text{C}$]
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
	$\text{Seat } L = L + DL + 7.7$										
	[$\Delta T=100^{\circ}\text{C}$]	[$\Delta T=120^{\circ}\text{C}$]	[$\Delta T=140^{\circ}\text{C}$]	[$\Delta T=160^{\circ}\text{C}$]	[$\Delta T=180^{\circ}\text{C}$]	[$\Delta T=200^{\circ}\text{C}$]	[$\Delta T=220^{\circ}\text{C}$]	[$\Delta T=240^{\circ}\text{C}$]	[$\Delta T=260^{\circ}\text{C}$]	[$\Delta T=280^{\circ}\text{C}$]	[$\Delta T=300^{\circ}\text{C}$]
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

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										
	$[\Delta T=100^{\circ}\text{C}]$	$[\Delta T=120^{\circ}\text{C}]$	$[\Delta T=140^{\circ}\text{C}]$	$[\Delta T=160^{\circ}\text{C}]$	$[\Delta T=180^{\circ}\text{C}]$	$[\Delta T=200^{\circ}\text{C}]$	$[\Delta T=220^{\circ}\text{C}]$	$[\Delta T=240^{\circ}\text{C}]$	$[\Delta T=260^{\circ}\text{C}]$	$[\Delta T=280^{\circ}\text{C}]$	$[\Delta T=300^{\circ}\text{C}]$
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										
	$[\Delta T=100^{\circ}\text{C}]$	$[\Delta T=120^{\circ}\text{C}]$	$[\Delta T=140^{\circ}\text{C}]$	$[\Delta T=160^{\circ}\text{C}]$	$[\Delta T=180^{\circ}\text{C}]$	$[\Delta T=200^{\circ}\text{C}]$	$[\Delta T=220^{\circ}\text{C}]$	$[\Delta T=240^{\circ}\text{C}]$	$[\Delta T=260^{\circ}\text{C}]$	$[\Delta T=280^{\circ}\text{C}]$	$[\Delta T=300^{\circ}\text{C}]$
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

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 + 7.4										
	$[\Delta T=100^{\circ}\text{C}]$	$[\Delta T=120^{\circ}\text{C}]$	$[\Delta T=140^{\circ}\text{C}]$	$[\Delta T=160^{\circ}\text{C}]$	$[\Delta T=180^{\circ}\text{C}]$	$[\Delta T=200^{\circ}\text{C}]$	$[\Delta T=220^{\circ}\text{C}]$	$[\Delta T=240^{\circ}\text{C}]$	$[\Delta T=260^{\circ}\text{C}]$	$[\Delta T=280^{\circ}\text{C}]$	$[\Delta T=300^{\circ}\text{C}]$
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	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 + 15.9										
	$[\Delta T=100^{\circ}\text{C}]$	$[\Delta T=120^{\circ}\text{C}]$	$[\Delta T=140^{\circ}\text{C}]$	$[\Delta T=160^{\circ}\text{C}]$	$[\Delta T=180^{\circ}\text{C}]$	$[\Delta T=200^{\circ}\text{C}]$	$[\Delta T=220^{\circ}\text{C}]$	$[\Delta T=240^{\circ}\text{C}]$	$[\Delta T=260^{\circ}\text{C}]$	$[\Delta T=280^{\circ}\text{C}]$	$[\Delta T=300^{\circ}\text{C}]$
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

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

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

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
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100°C$]	[$\Delta T=120°C$]	[$\Delta T=140°C$]	[$\Delta T=160°C$]	[$\Delta T=180°C$]	[$\Delta T=200°C$]	[$\Delta T=220°C$]	[$\Delta T=240°C$]	[$\Delta T=260°C$]	[$\Delta T=280°C$]	[$\Delta T=300°C$]
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

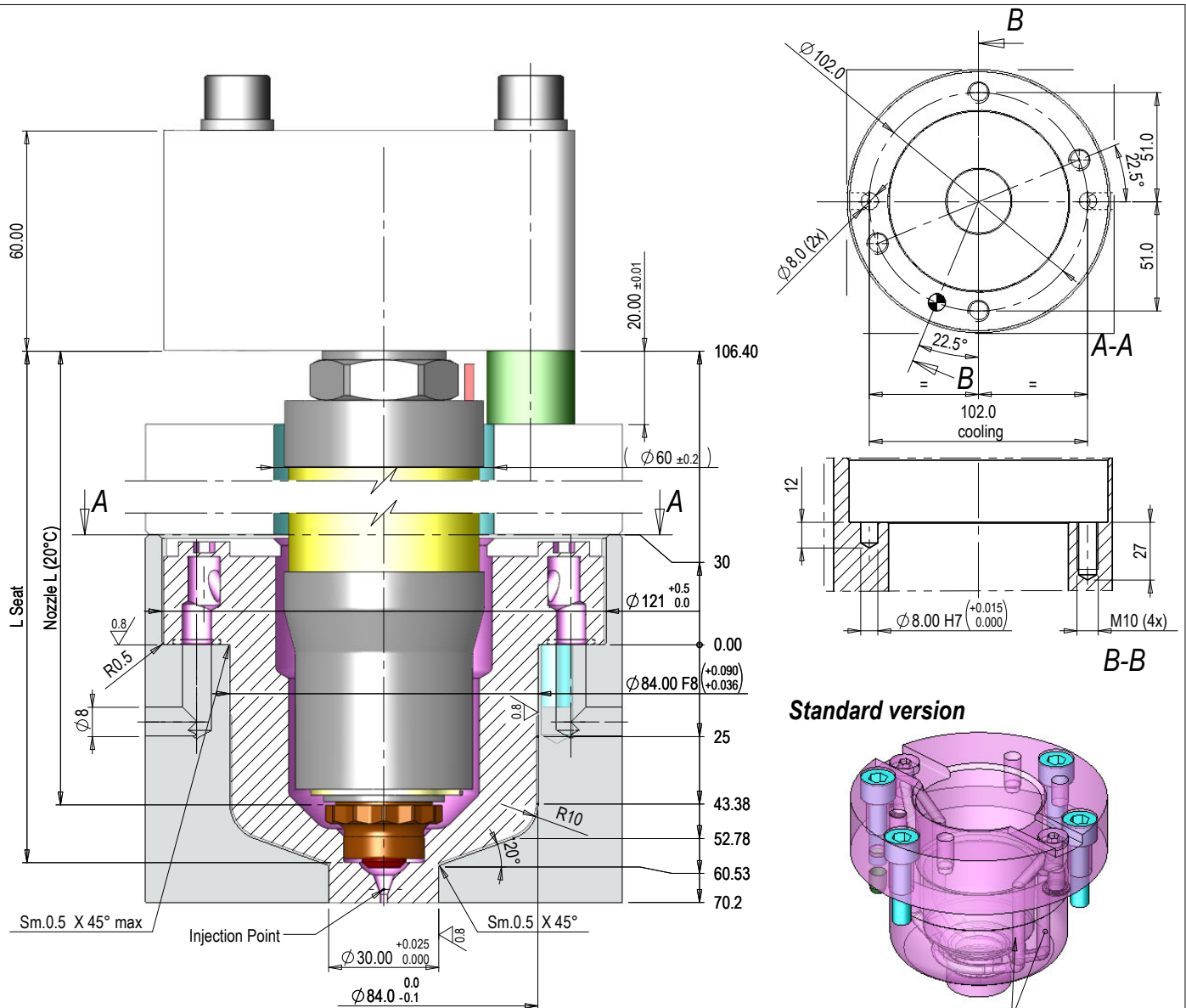
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$Seat L = L + DL + 11.4$										
	[$\Delta T=100°C$]	[$\Delta T=120°C$]	[$\Delta T=140°C$]	[$\Delta T=160°C$]	[$\Delta T=180°C$]	[$\Delta T=200°C$]	[$\Delta T=220°C$]	[$\Delta T=240°C$]	[$\Delta T=260°C$]	[$\Delta T=280°C$]	[$\Delta T=300°C$]
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

Tab. B - "Seat L" Calculation

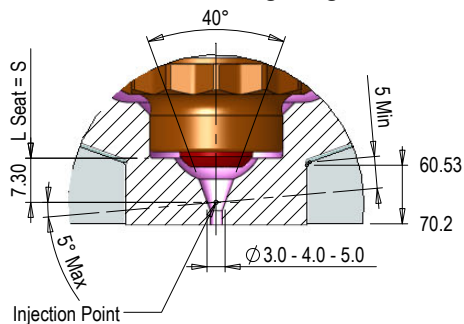
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	Seat L = L + DL + 11.2										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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

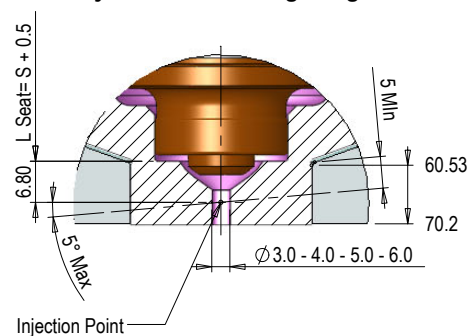
0 [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	= L + DL + 11.9										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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



Conic valve gating

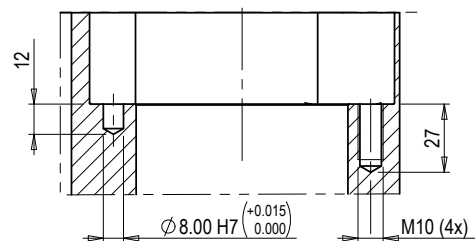
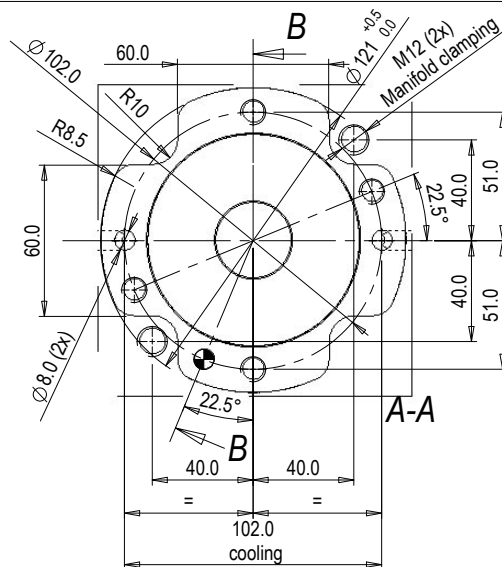
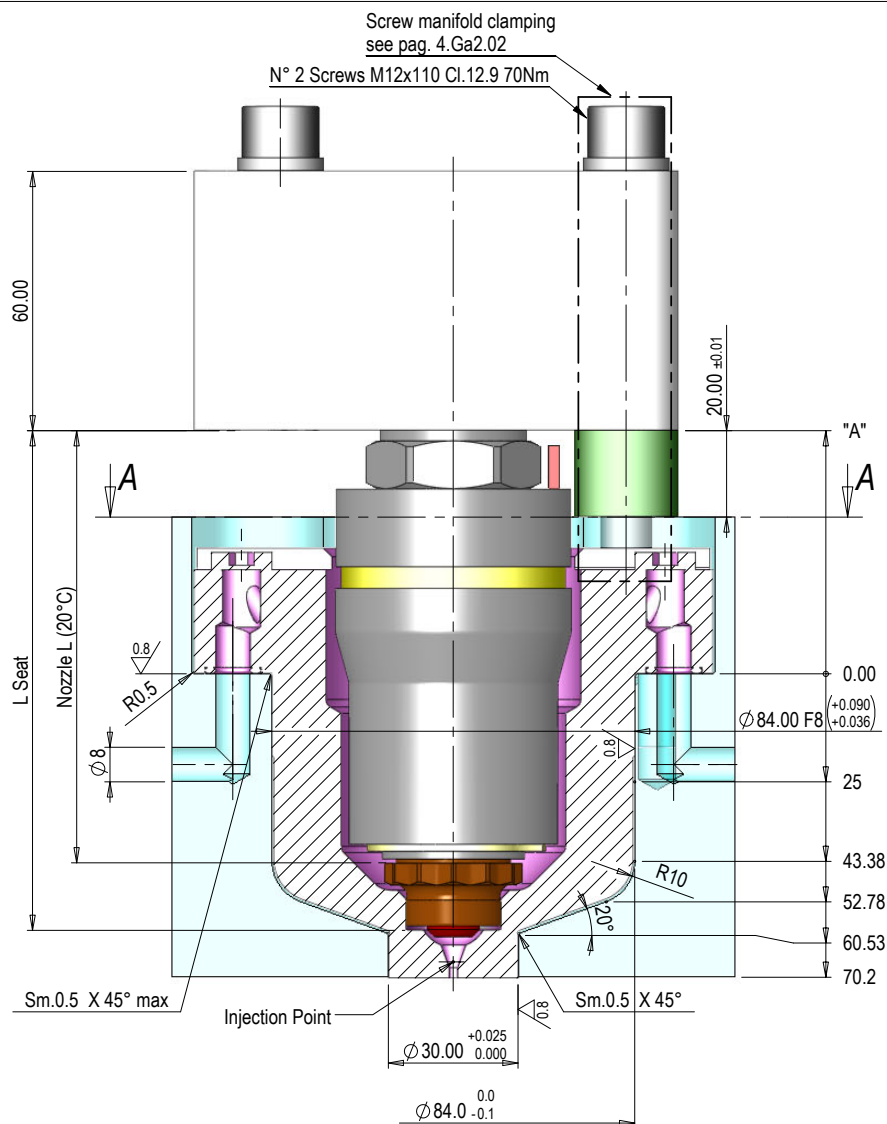


Cylindrical valve gating



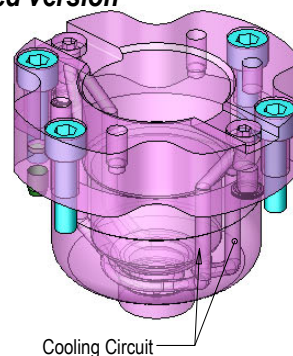
Cooling bushing STANDARD to be used with "L Nozzle" ≥ 150. For version with "L Nozzle" < 150 see pag. 4.Ga1.13

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 Ø3.0 - 0002-00128 Ø4.0 - 0002-00129 Ø5.0 - 0002-00130
175	0.42	190.82	131.46	400.00	0.96	416.36	357.00	625	1.50	641.90	582.54	
200	0.48	215.88	156.52	425.00	1.02	441.42	382.06	650	1.56	666.96	607.60	
225	0.54	240.94	181.58	450.00	1.08	466.48	407.12	675	1.62	692.02	632.66	
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 Ø3.0 - 0002-00360 Ø4.0 - 0002-00361 Ø5.0 - 0002-00362 Ø6.0 - 0002-00363
275	0.66	291.06	231.70	500.00	1.20	516.60	457.24	725	1.74	742.14	682.78	
300	0.72	316.12	256.76	525.00	1.26	541.66	482.30	750	1.80	767.20	707.84	
325	0.78	341.18	281.82	550.00	1.32	566.72	507.36	775	1.86	792.26	732.90	
350	0.84	366.24	306.88	575.00	1.38	591.78	532.42	800	1.92	817.32	757.96	



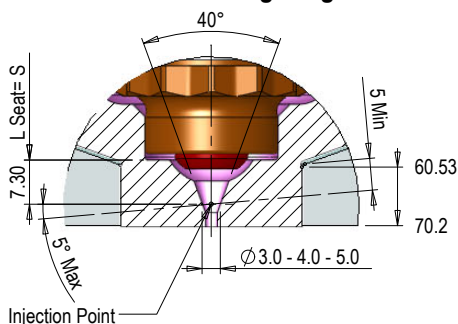
Shaped version

B-B

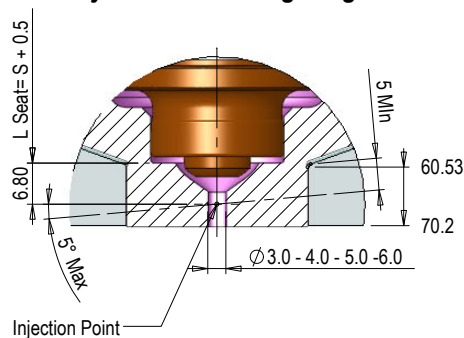


Cooling Circuit

Conic valve gating

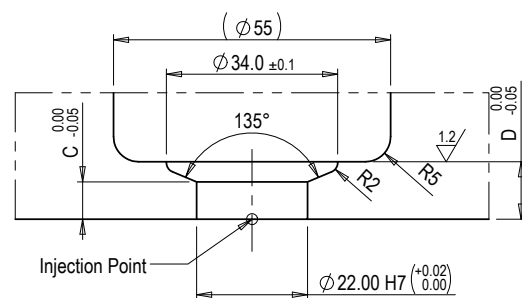
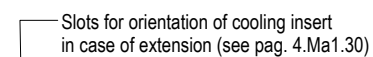
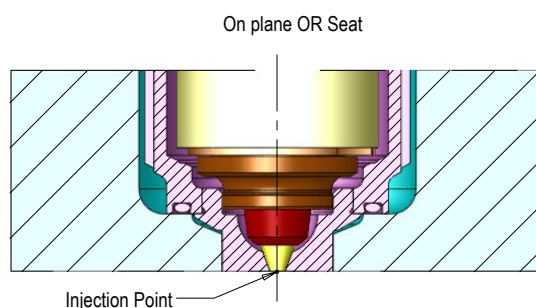


Cylindrical valve gating



SHAPED Cooling bushing to be used with "L Nozzle" < 150 mm. For version with "L Nozzle" ≥ 150 see pag. 4.Ga1.12

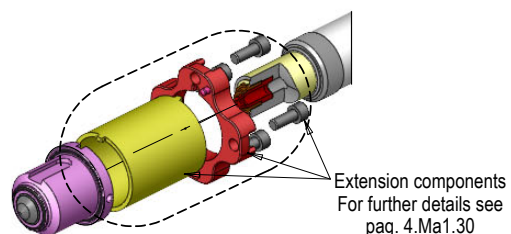
L INIETTORE	DL 200°C	S	A	BUSSOLA DI RAFFREDDAMENTO	
				Otturazione Conica	Otturazione Cilindrica
100	0.24	115.64	56.28	Ø3.0 - 0002-00131	Ø3.0 - 0002-00364
125	0.30	140.70	81.34	Ø4.0 - 0002-00132	Ø4.0 - 0002-00365
				Ø5.0 - 0002-00133	Ø5.0 - 0002-00366
					Ø6.0 - 0002-00367



Standard Bushing
cod. 0121-00407

Bushing on plane OR
cod. 0121-00408

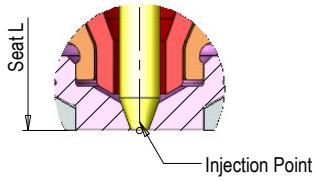
COOLING INSERT Extension



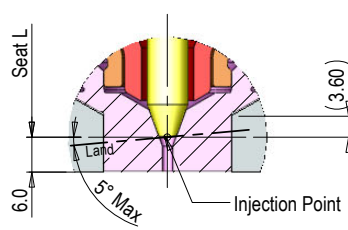
	<i>Seat L</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
PGC20	L+DL+18.9	62.20	3.60	3.50	7.60
PGC30 / PGY30	L+DL+22.7	66.00	7.40	7.40	11.40

Type **PGC20**

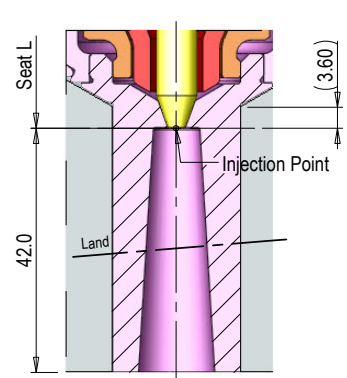
Version L=11



Version L=17

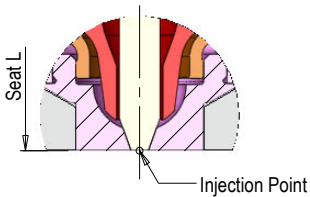


Version L=59

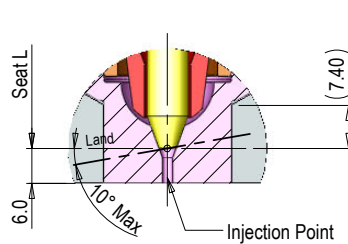


Type **PGC30**

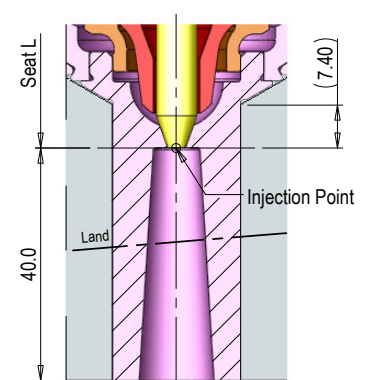
Version L=16



Version L=22

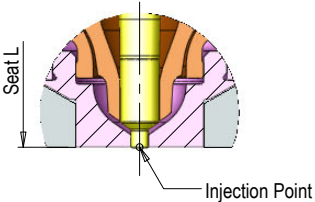


Version L=59

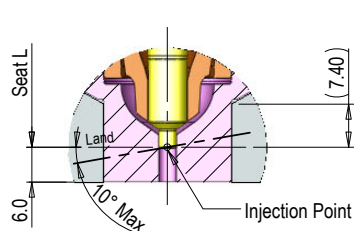


Type **PGY30**

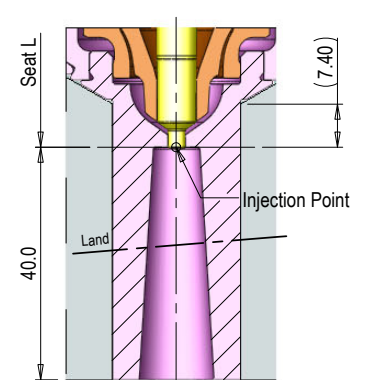
Version L=16



Version L=22

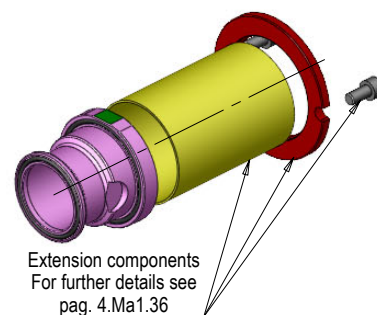


Version L=59



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

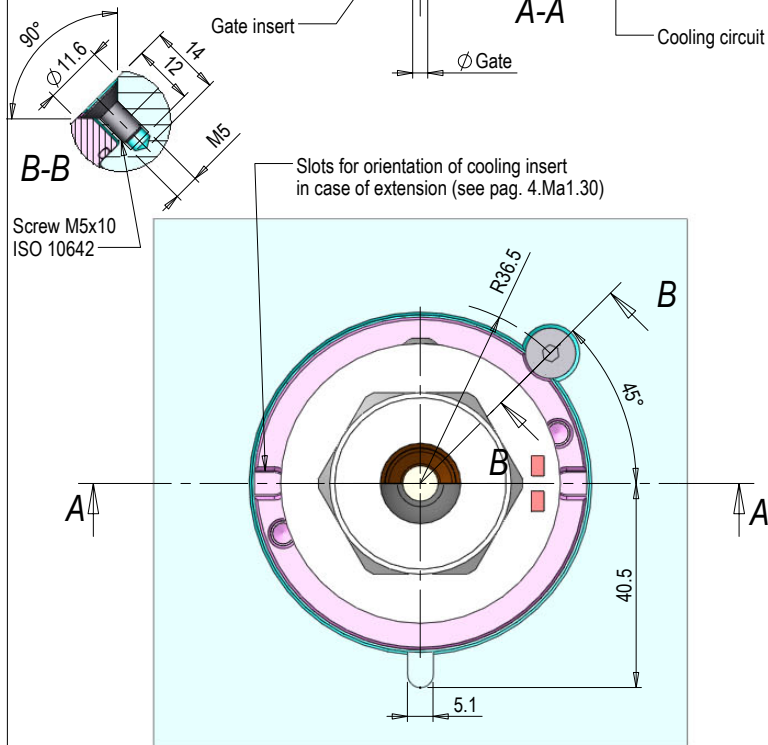
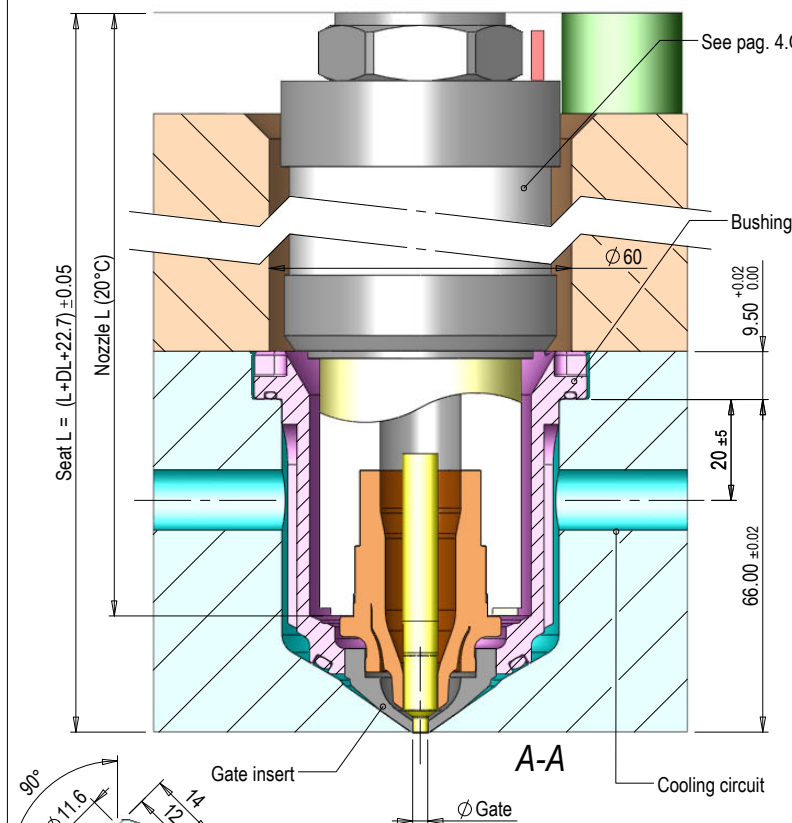
GATE INSERT			
	Version L=11	Version L=17	Version L=59
PGC20	Gate Ø3.0 - 0335-00064	Gate Ø3.0 - 0335-00071	Gate Ø3.0 - 0335-00078
	Ø3.5 - 0335-00065	Ø3.5 - 0335-00072	Ø3.5 - 0335-00079
	Ø4.0 - 0335-00066	Ø4.0 - 0335-00073	Ø4.0 - 0335-00080
	Ø4.5 - 0335-00067	Ø4.5 - 0335-00074	Ø4.5 - 0335-00081
	Ø5.0 - 0335-00068	Ø5.0 - 0335-00075	Ø5.0 - 0335-00082
	Version L=16	Version L=22	Version L=64
PGC30	Gate Ø3.0 - 0335-00085	Gate Ø3.0 - 0335-00092	Gate Ø3.0 - 0335-00099
	Ø3.5 - 0335-00086	Ø3.5 - 0335-00093	Ø3.5 - 0335-00100
	Ø4.0 - 0335-00087	Ø4.0 - 0335-00094	Ø4.0 - 0335-00101
	Ø4.5 - 0335-00088	Ø4.5 - 0335-00095	Ø4.5 - 0335-00102
	Ø5.0 - 0335-00089	Ø5.0 - 0335-00096	Ø5.0 - 0335-00103
PGY30	Gate Ø3.0 - 0335-00106	Gate Ø3.0 - 0335-00110	Gate Ø3.0 - 0335-00114
	Ø4.0 - 0335-00107	Ø4.0 - 0335-00111	Ø4.0 - 0335-00115
	Ø5.0 - 0335-00108	Ø5.0 - 0335-00112	Ø5.0 - 0335-00116
	Ø6.0 - 0335-00109	Ø6.0 - 0335-00113	Ø6.0 - 0335-00117



(*) Applicable to all type Nozzles Compact type

- 

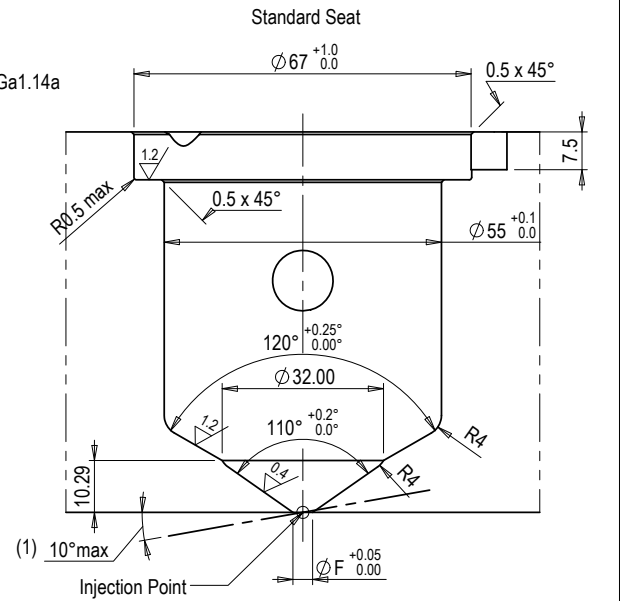
Type **PGY30**



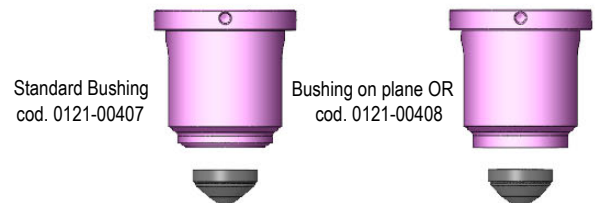
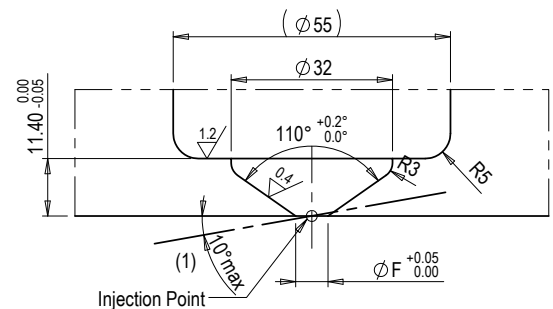
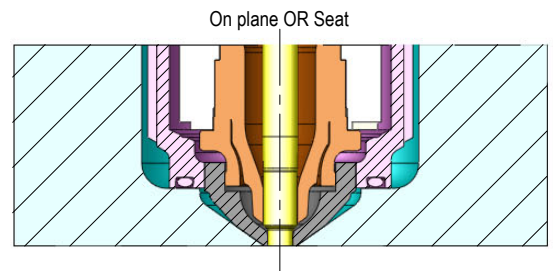
1) Cooling note: suggested hole Ø10 to cool max 4 bushings with only 1 circuit (range 4÷6 Bar)

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

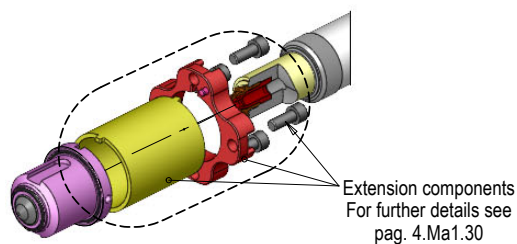
Installation KIT cod: 0283-00649



(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.

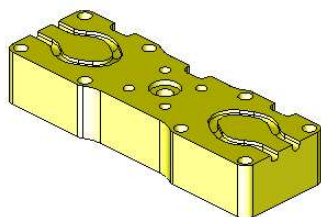


COOLING INSERT Extension

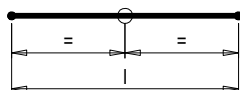


Extension components
For further details see
pag. 4.Ma1.30

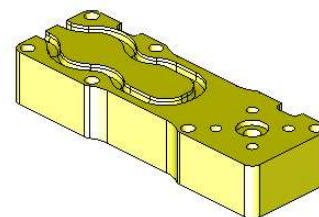
-HL-



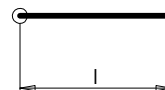
Standard
l=150-200-250-300-350-400-450 mm



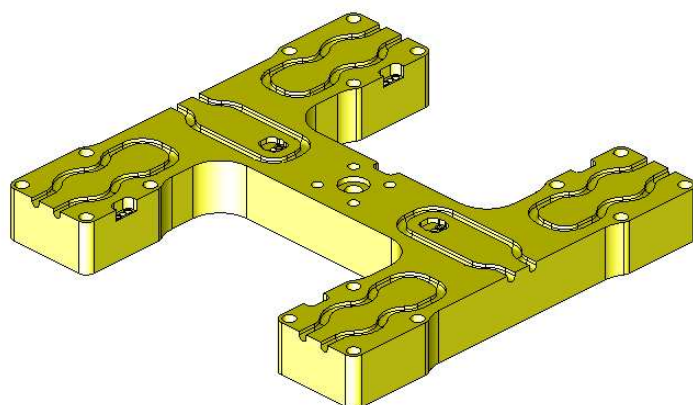
-HD-



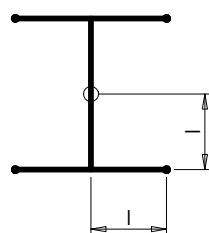
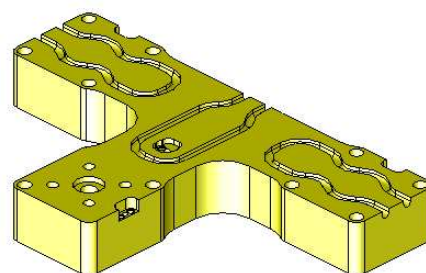
Standard
l=75-100-125-150-175-200-225 mm



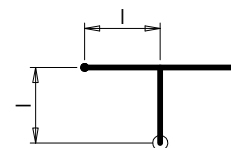
-HH-



-HT-

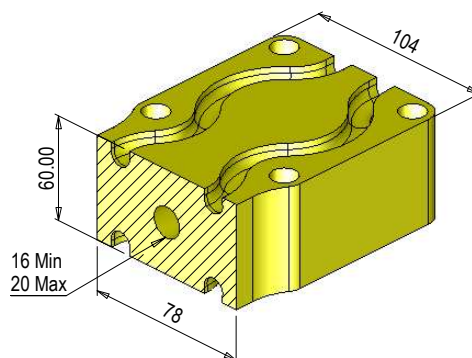


Standard
l=100-125-150 mm



Standard
l=100-125-150 mm

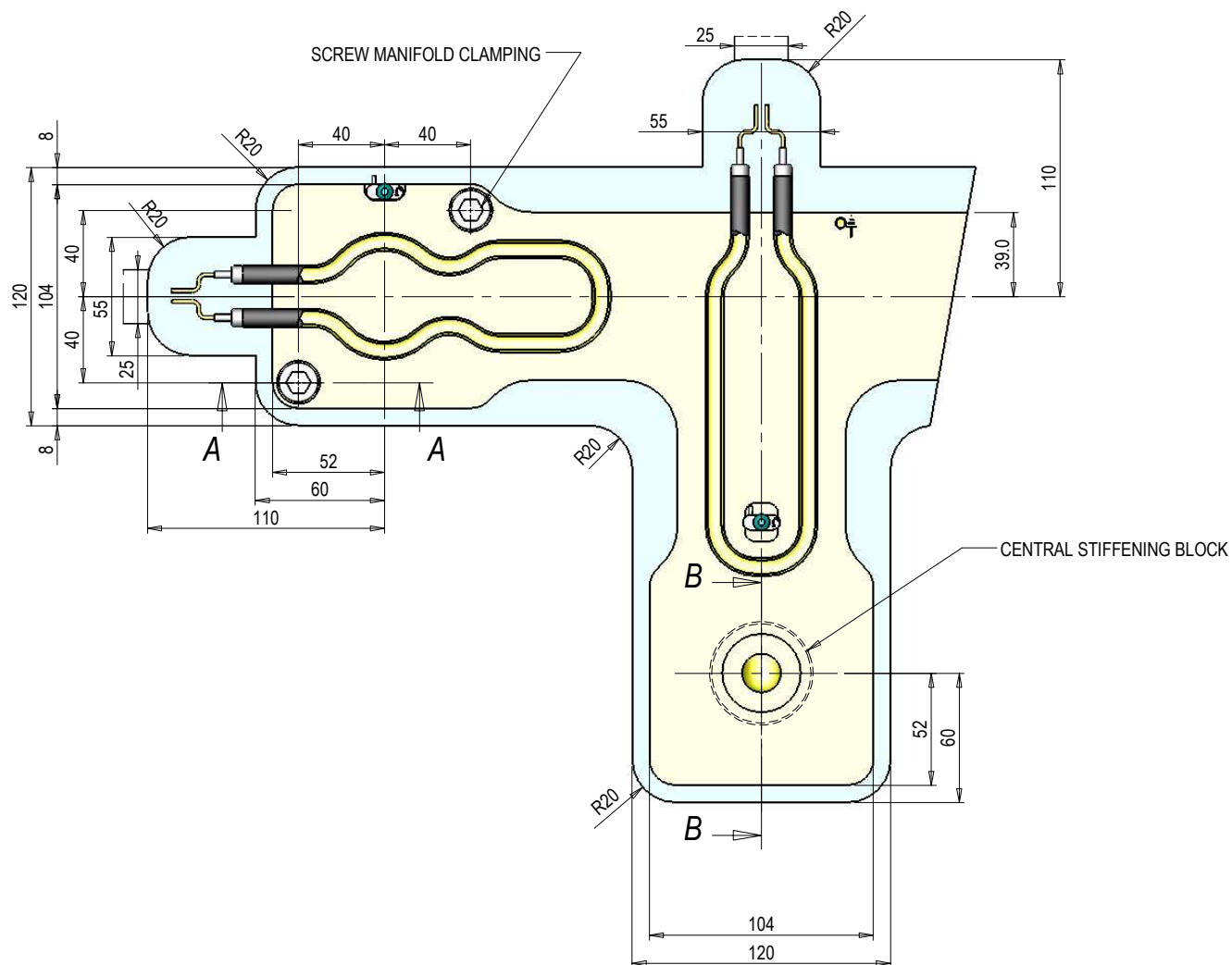
Ga series



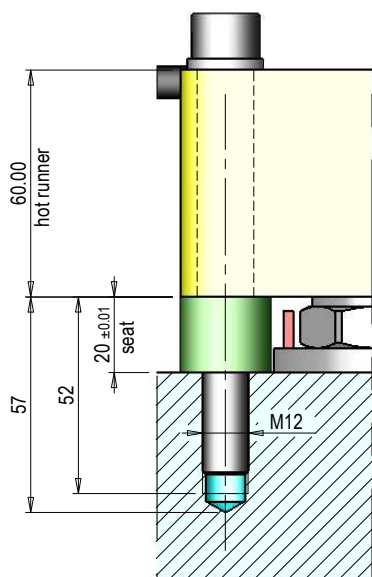
Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

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)

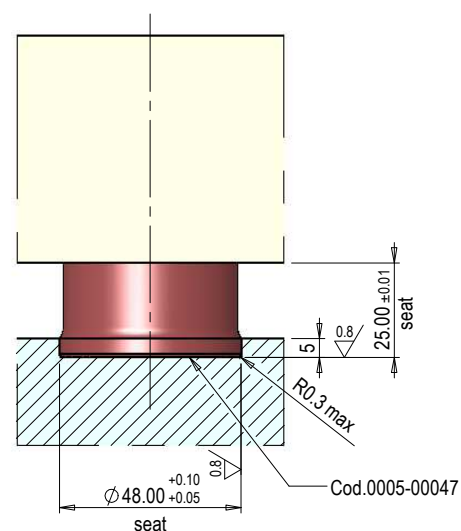


Screw manifold clamping
Screw M12x110 cl.12.9 70 Nm



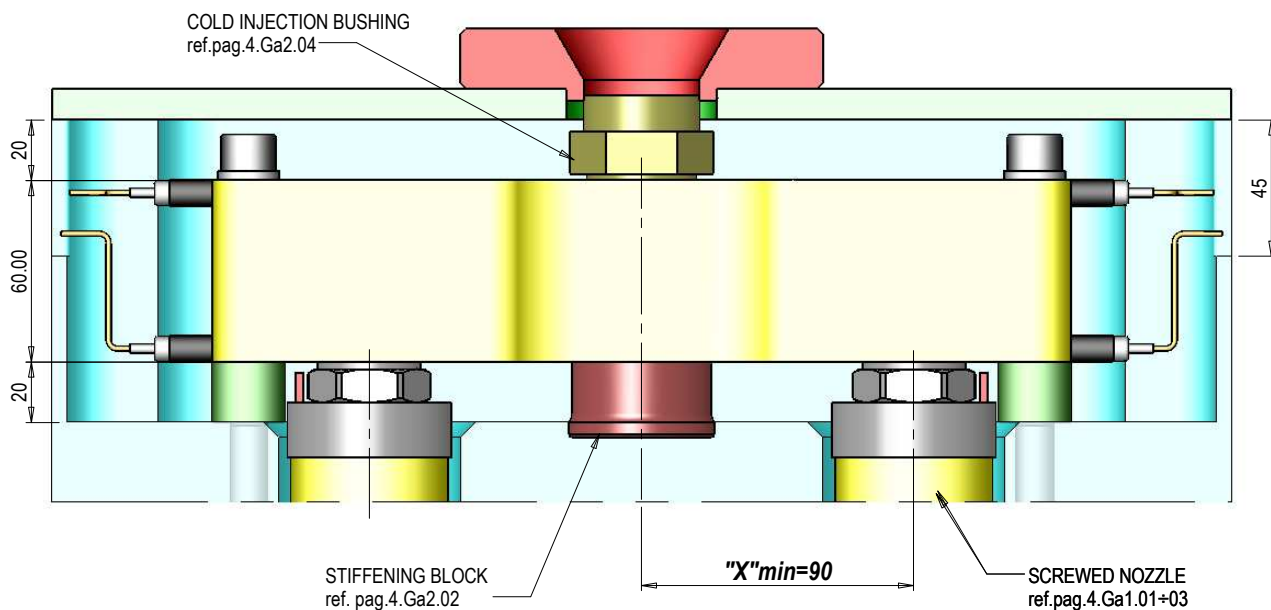
A-A

***Pocket
central stiffening block***



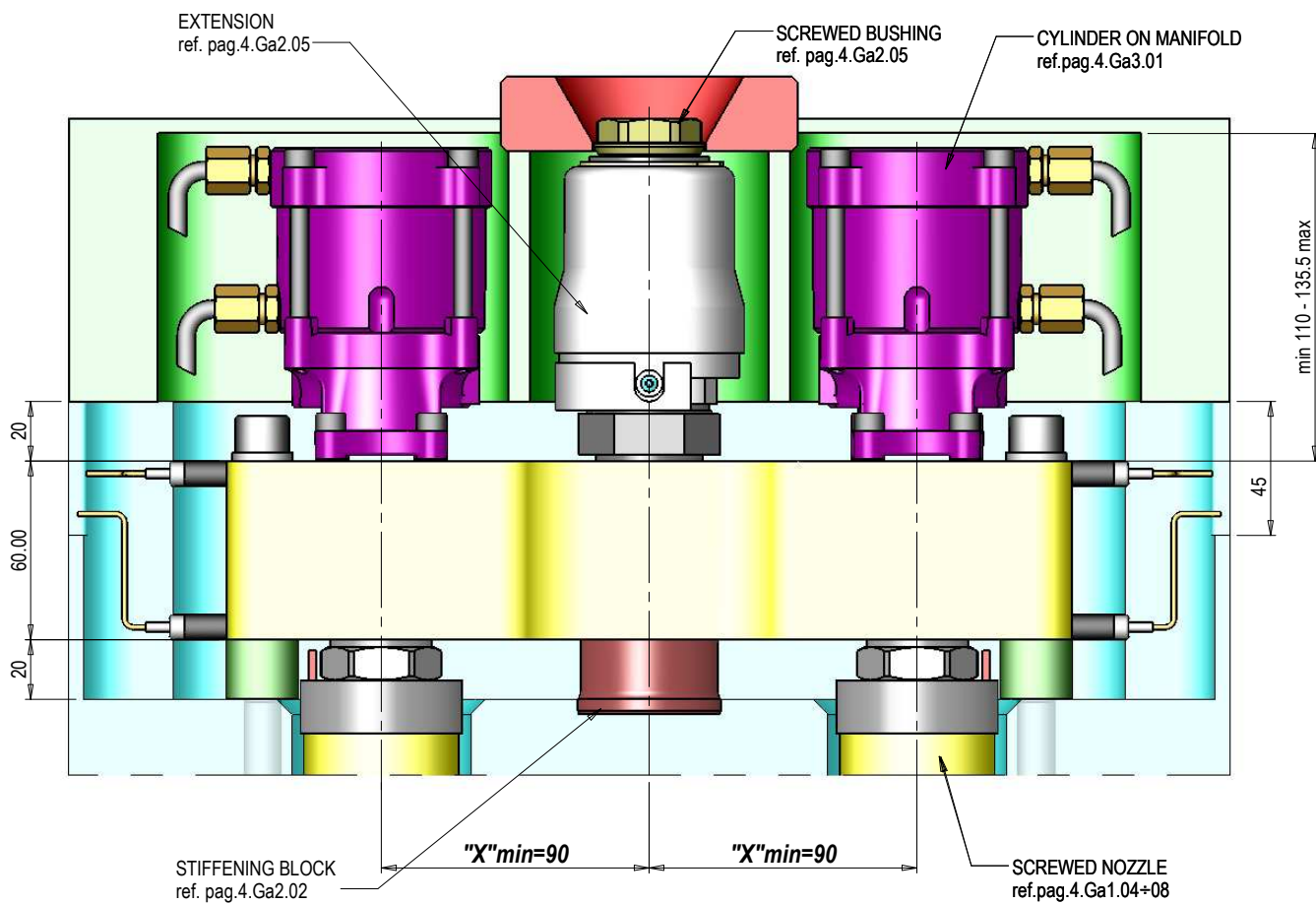
B-B

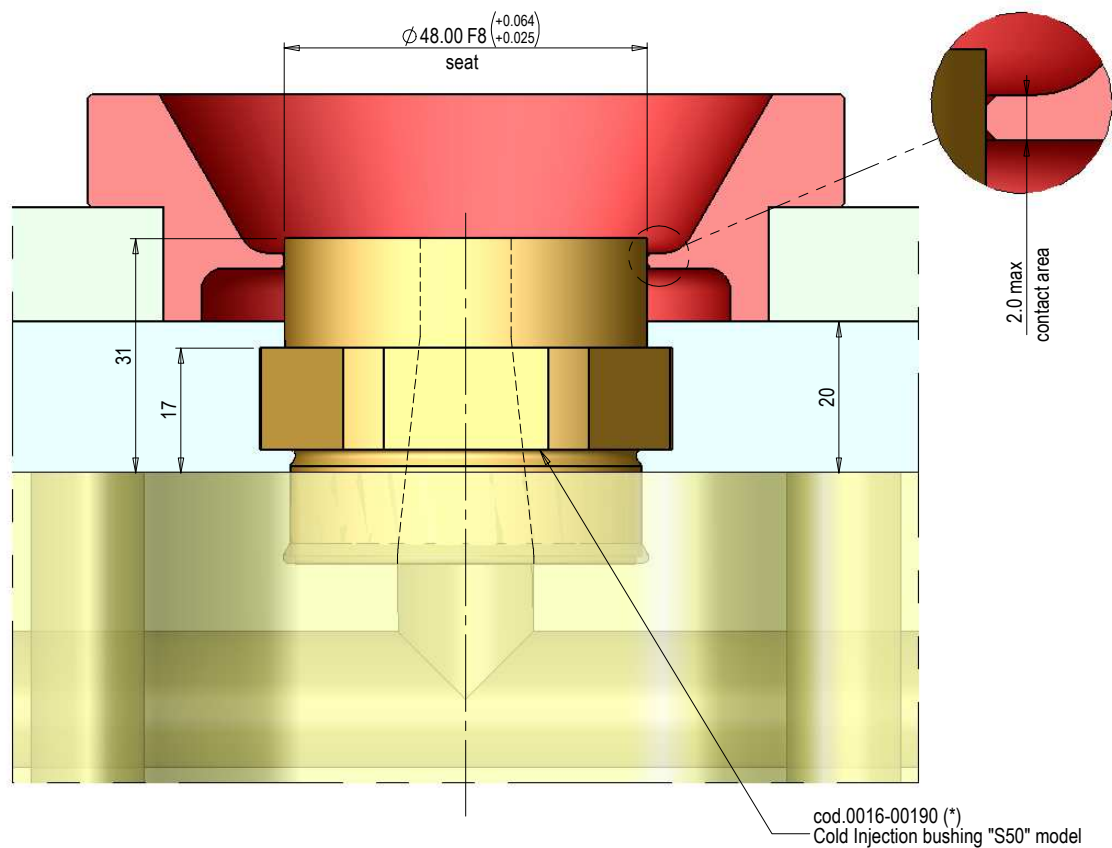
Structure for TORPEDO or FREE FLOW systems



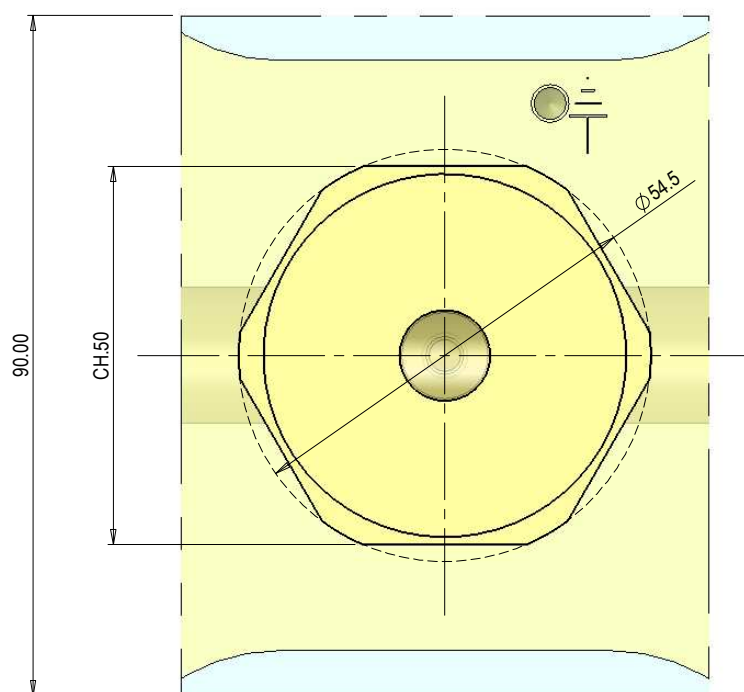
Xmin= min centre distance between injection bushing and nozzle for non standard systems

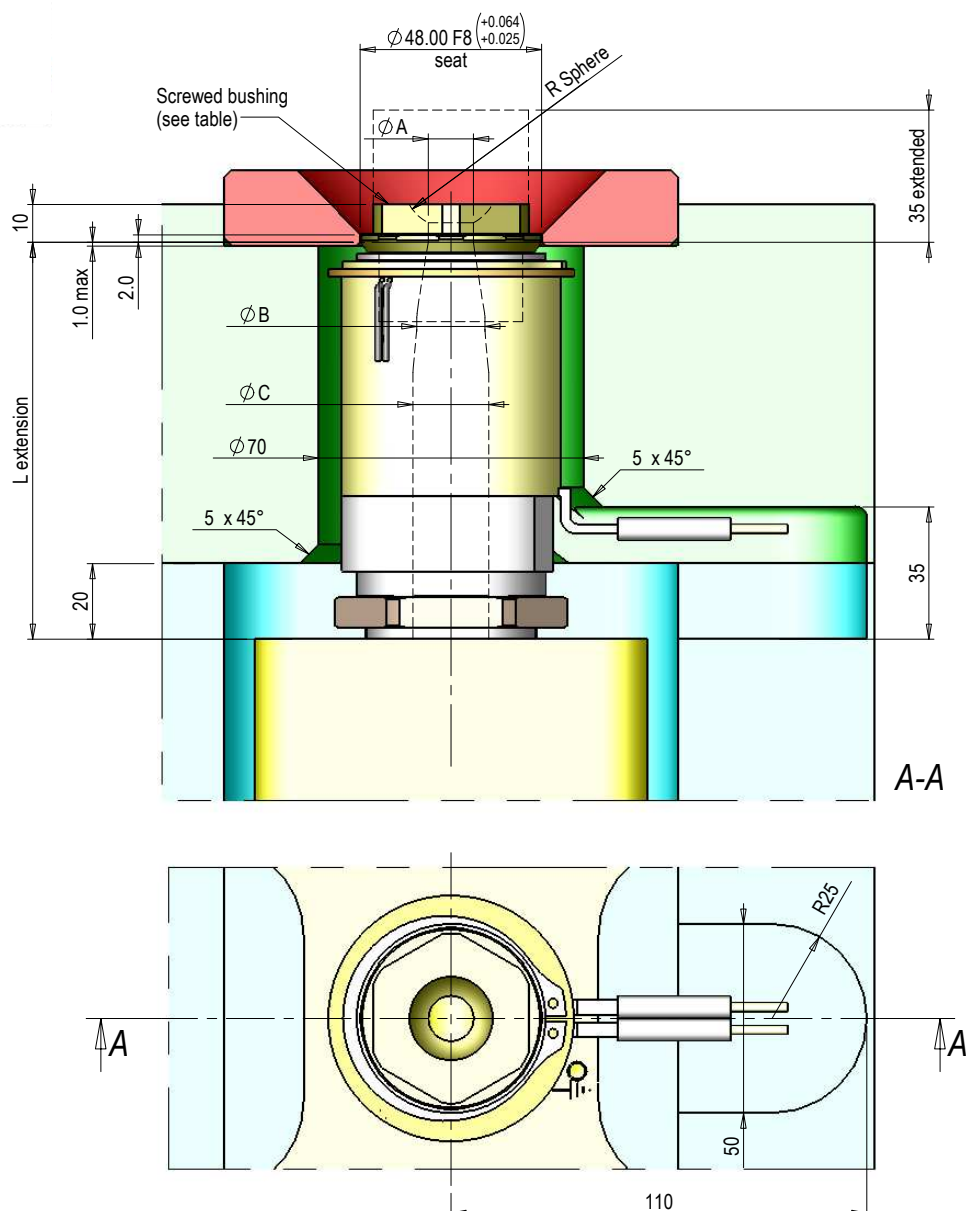
Structure for VALVE GATING systems



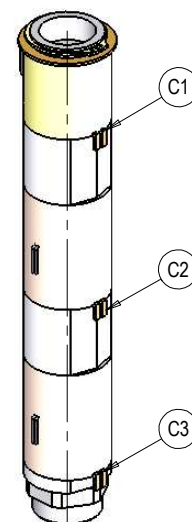


(*)Standard code with R sphere=0. Others R sphere sizes to be required.

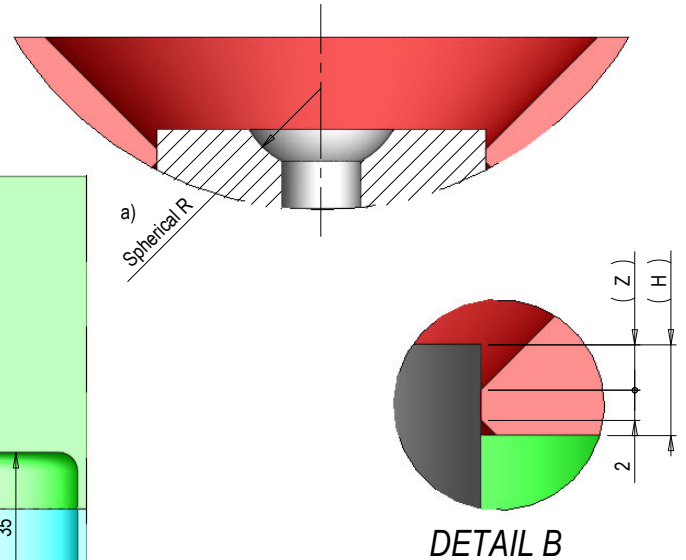
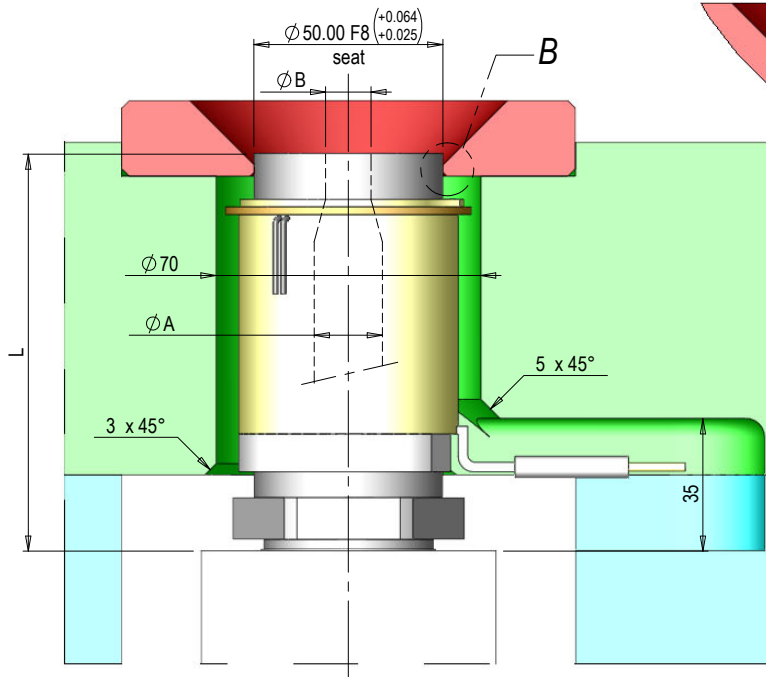




Control Zone

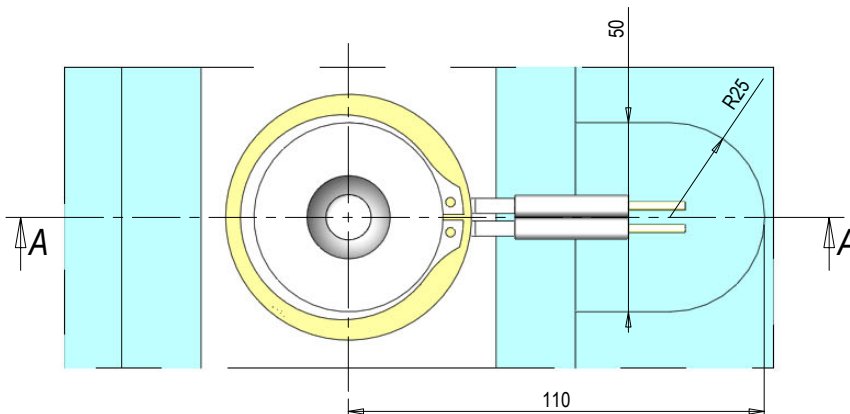


"L " (*)	MAXIMUN N° OF ZONES	STANDARD SCREWED BUSHING CODE	SPHERE RADIUS	ØA	ØB
040.00 ÷ 205.69	1 [C1]	0015-00448 0015-00462 0015-00463 0015-00464 0015-00509 0015-00465 0015-00466	R 0	12	18
205.70 ÷ 356.39	2 [C1 + C2]		R 12.7		
356.40 ÷ 520.00	3 [C1 + C2 + C3]		R 15.5		
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)			R 19.1		
ØB	ØC		R 20		
18	18		R 25		
	20	R40			
	22	Ex tended 0015-00449 (***)	R 0		
	24			4	
(*) 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)					



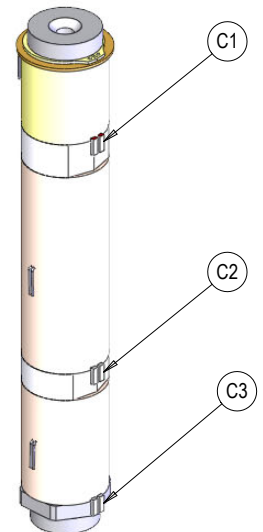
L	H	Z
35.00-54.99	3.50	1.0
55.00-555.00	max 9.0	min 3.0

A-A



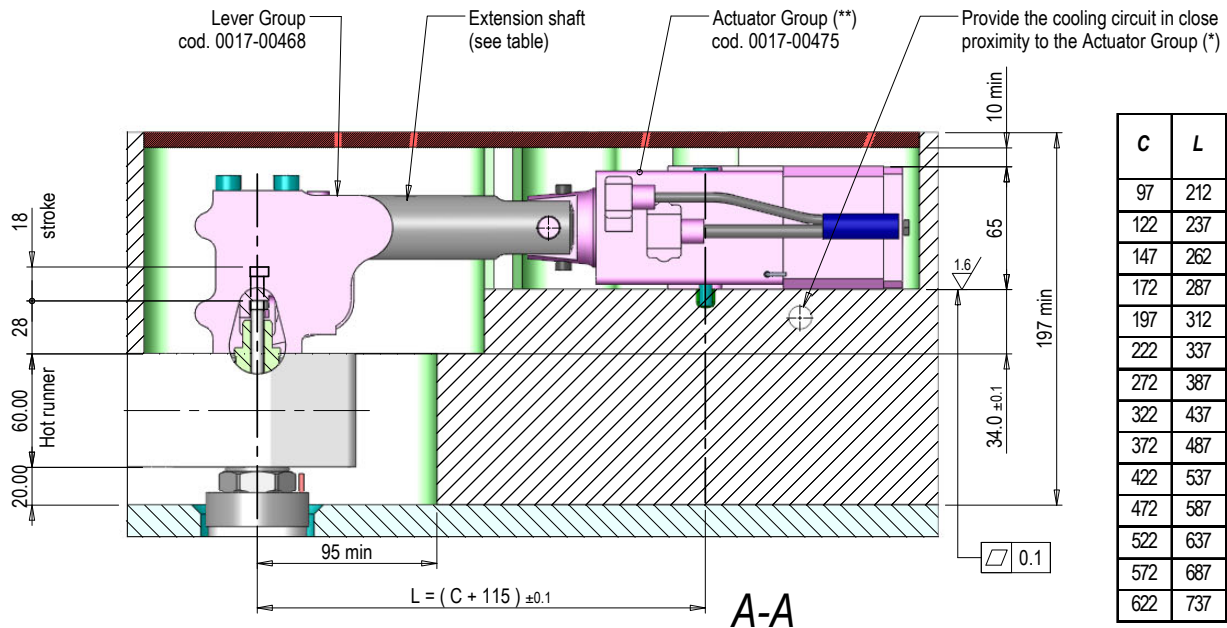
a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

Control Zone



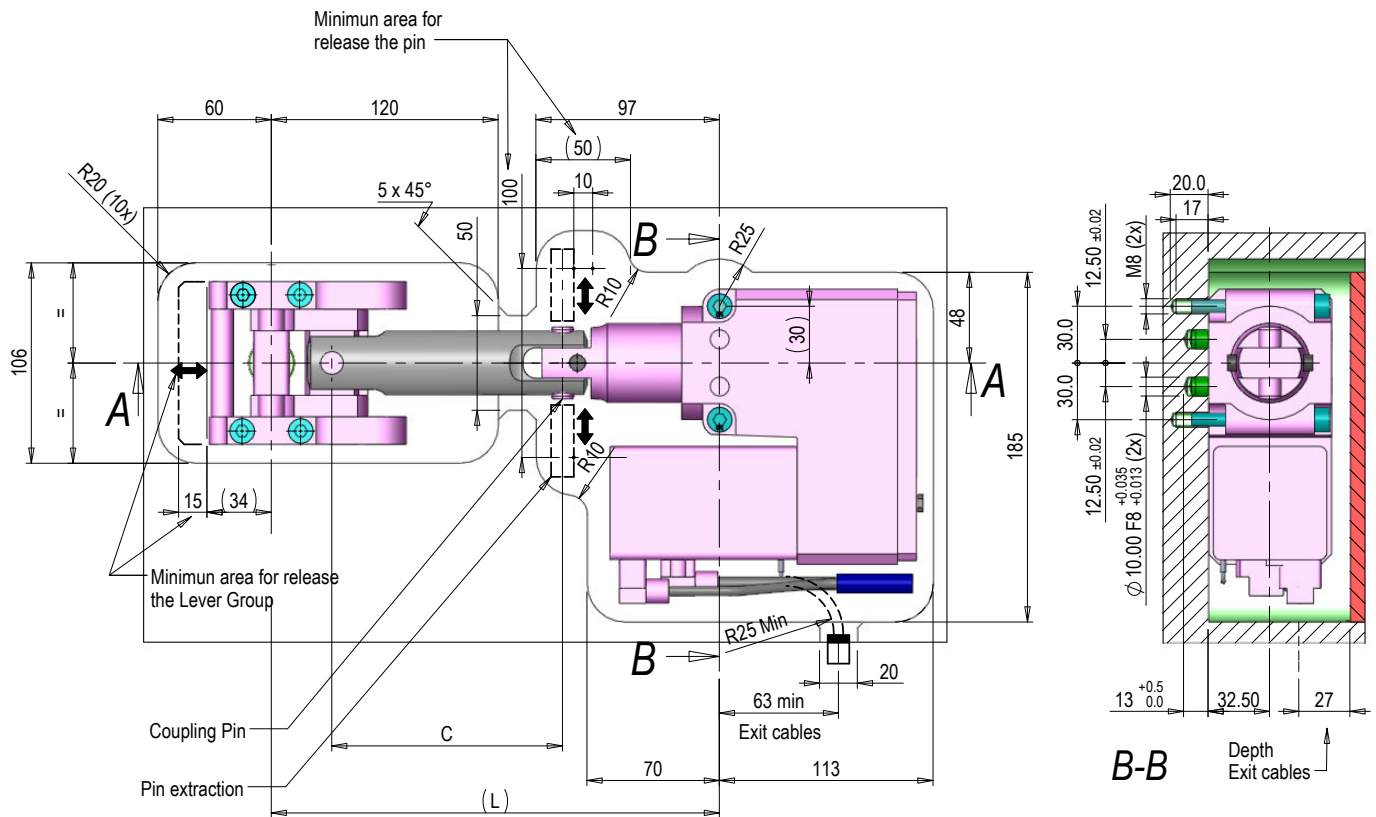
"L" (*)	MAXIMUN N° OF ZONES	STANDARD DIAMETERS OF EXTENSIONS DUCT	
		ØA	ØB
035.00 ÷ 212.89	1 [C1]	8	8
212.90 ÷ 363.19	2 [C1 + C2]	10	8 - 8.5 - 10
363.20 ÷ 555.00	3 [C1 + C2 + C3]	12	8 - 10 - 12
(*) L = min 055.00 ÷ 555.00 mm max		14	8 - 8.5 - 10 - 12 - 14
		16	8 - 10 - 12 - 14 - 16
		18	10 - 12 - 14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

POCKET and DIMENSIONS standard

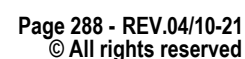


(*) For more information see section "General rules for the cooling of plate" page 4.Ga3.05a

(**) Cod. 0017-00475 for the applications "FLEXflow". For the applications "FLEXflow One" is available the Actuator group cod. 0017-00472.



The Right or Left configuration of the electrical cylinder is obtained turning the actuator group and its pocket by 180° on the longitudinal axis

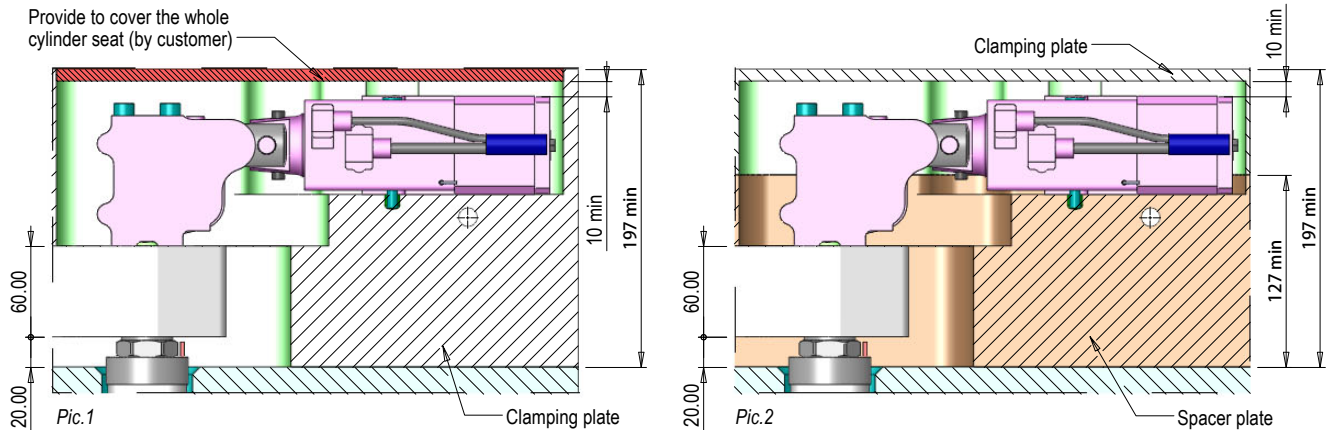


MOLD REQUIREMENTS

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:

Provide to cover the whole cylinder seat (by customer)



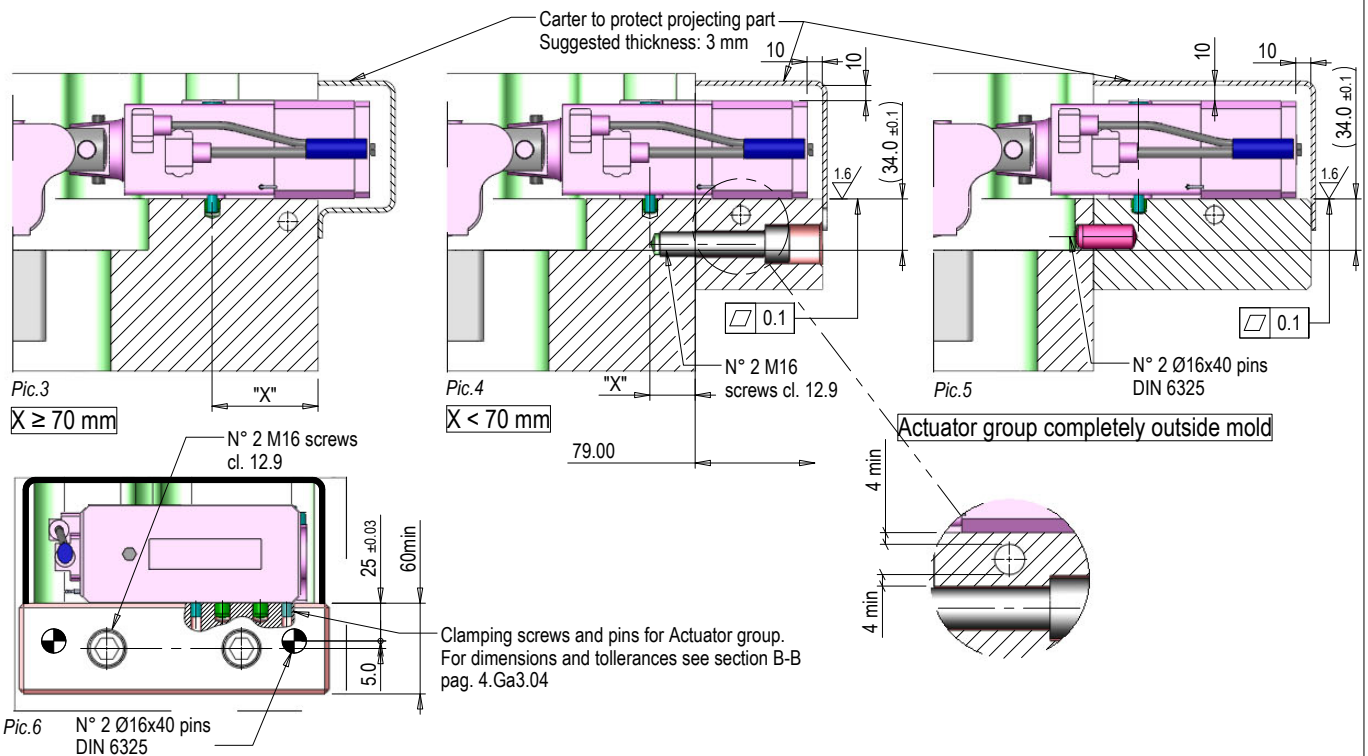
2- Cylinder protrusion from mold edge

In particular conditions, Actuator groups of electrical cylinder can be placed partially above the mold edge (Pic. 3 & 4) or completely outside (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:

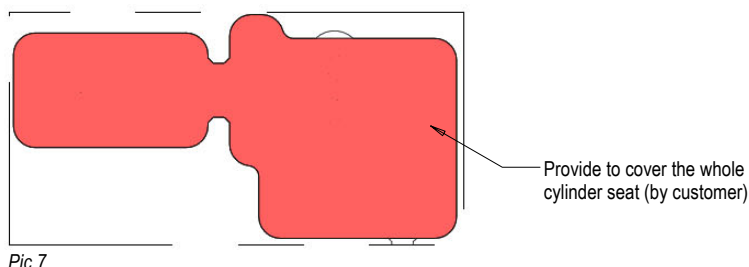
- minimum thickness 60 mm and hardness min 30 HRC;
- use N°2 M16 cl.12.9 clamping screws (Pic. 4 & 6) + N°2 cylindrical pins Ø16x40 DIN6325 (Pic. 5 & 6); in case of a single plate supporting more than one actuators in the same time it is necessary to place at least 2 M16 cl. 12.9 screws in **correspondance 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).**



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 the carter, whose design is realized by customer (see Pic. 7). Suggested thickness: 3 mm



General rules for the cooling of the plate

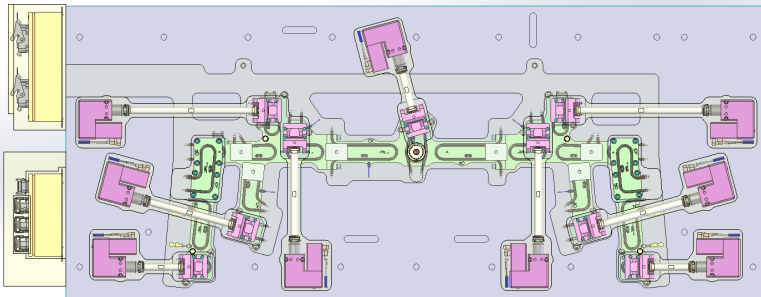
T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximum Mold temperature
Tc (°C) = Coolant temperature

1- Rules for which the cooling of the plate is NOT MANDATORY

For materials with $T1 \leq 260^{\circ}\text{C}$ [500°F] and $T2 \leq 60^{\circ}\text{C}$ [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)



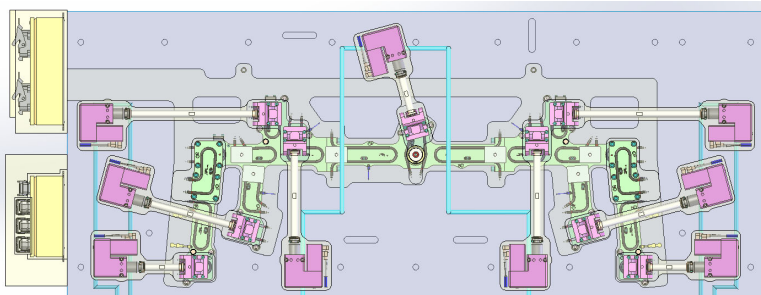
Pic.1

2- Rules for which the cooling of the plate is MANDATORY

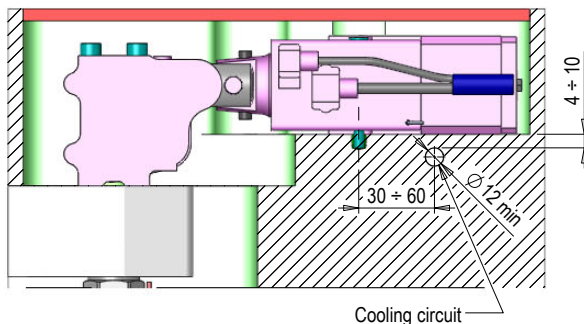
For materials with $T1 > 260^{\circ}\text{C}$ [500°F] or $T2 > 60^{\circ}\text{C}$ [140°F], cooling of the actuators' plate IS MANDATORY.

The correct cooling of the plate must include:

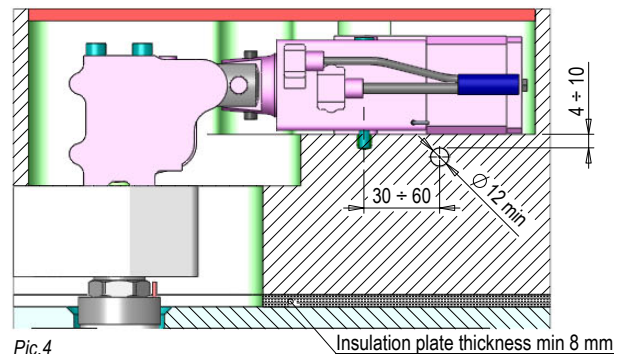
- 2a- Maximum No. 3 actuator groups can be cooled through 1 circuit (ex. Pic.2);
- 2b- Cooling circuits must be positioned in the plate right below the actuator groups as illustrated in Pic.3;
- 2c- An insulation plate with a minimum thickness of 8mm is also necessary (ex. Pic.4);
- 2d- A minimum diameter $\varnothing 12\text{mm}$ is recommended for the circuit (minimum pressure 1.5 bar);
- 2e- Maximum incoming coolant temperature for the cooling of the plate $Tc \leq 25^{\circ}\text{C}$ [77°F].



Pic.2



Pic.3



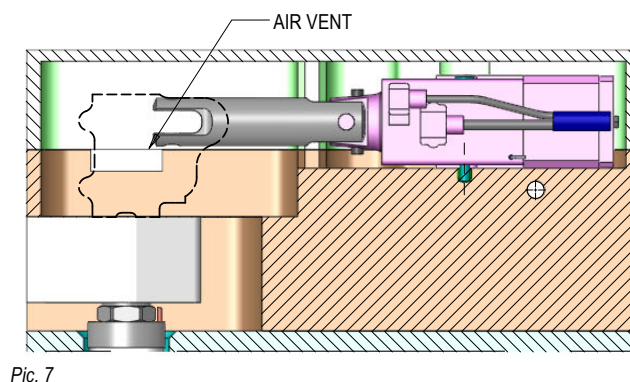
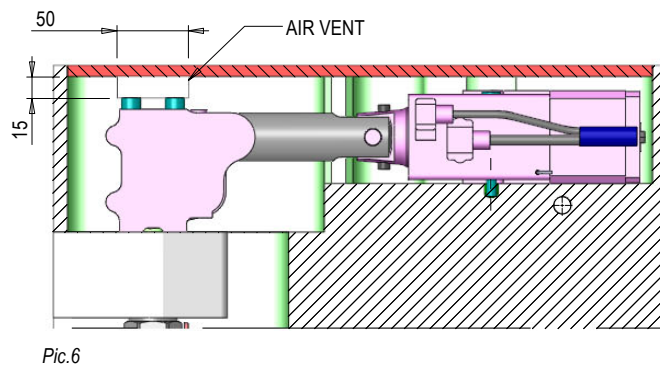
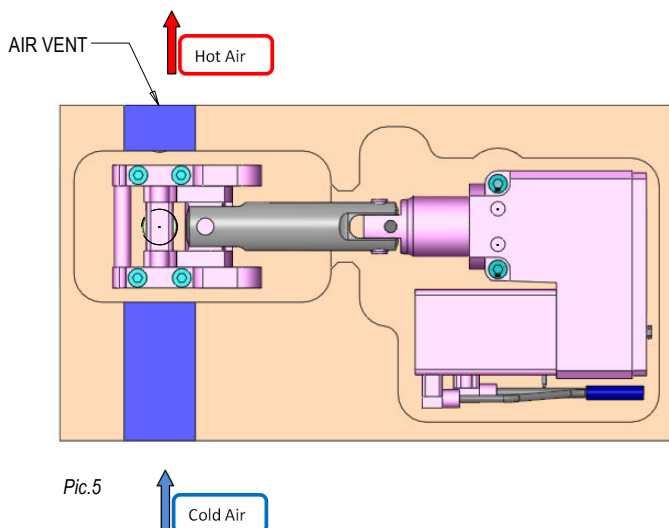
Pic.4

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.

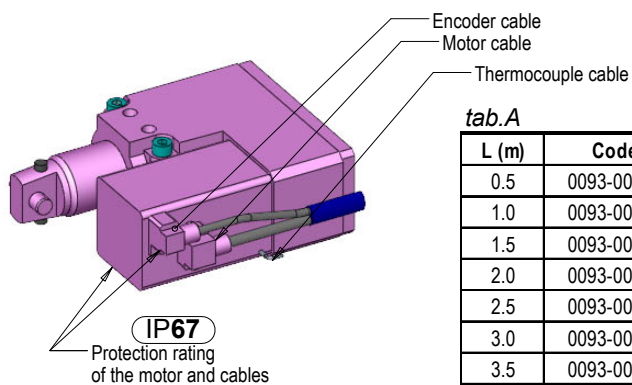
- The air vents must through the plate from bottom mold to top mold near the lever group (Pic.5/6/7)
- Avoid hot air exit from vents near electrical boxes eventually present on top mold.
- The minimum dimensions requested for Air vents are: 50mm (width) x 15mm (depth)



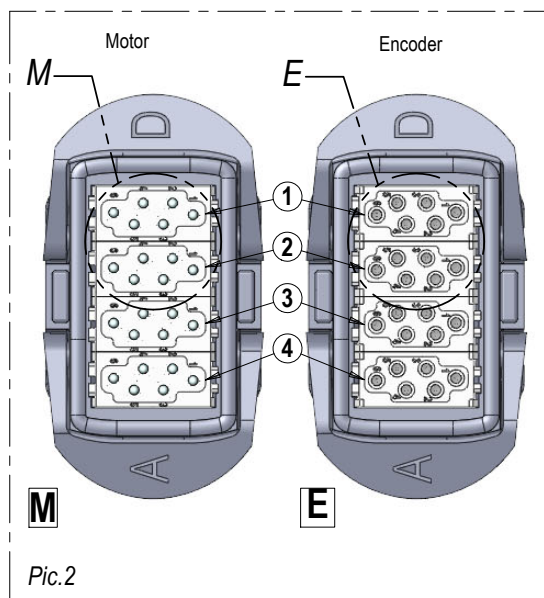
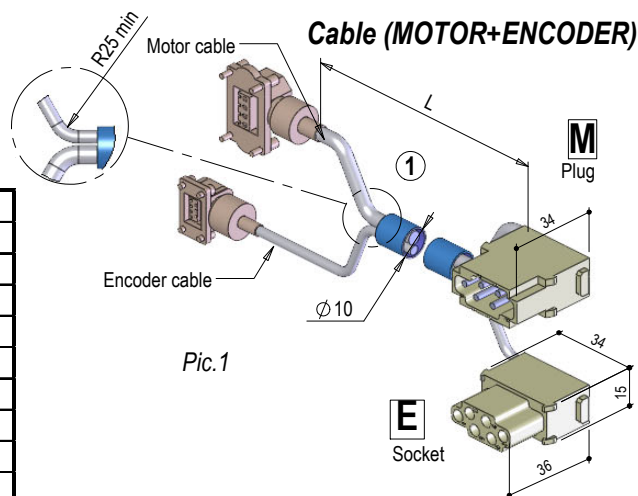
Electricals specification for FLEXflow

Every actuator group is electrically powered through a couple of cables (ENCODER+MOTOR). For cable codes with available lengths see table "A". The cable is supplied separated from the group; its length 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).

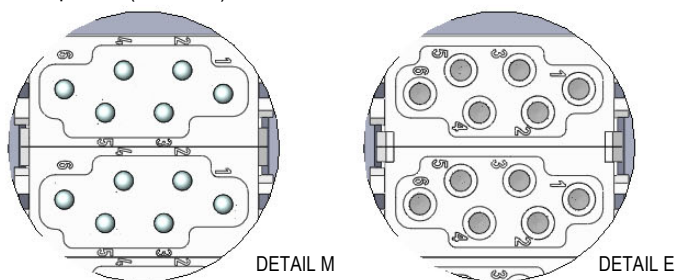


L (m)	Code
0.5	0093-00173
1.0	0093-00174
1.5	0093-00135
2.0	0093-00136
2.5	0093-00137
3.0	0093-00138
3.5	0093-00139
4.0	0093-00140
4.5	0093-00175

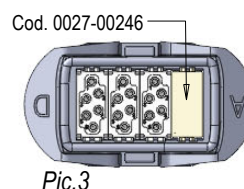


NOTES:

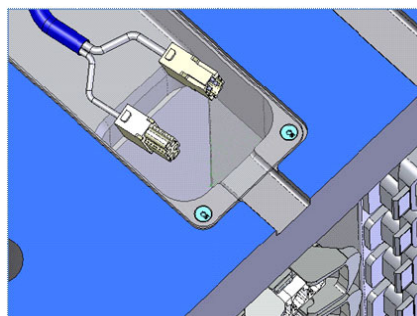
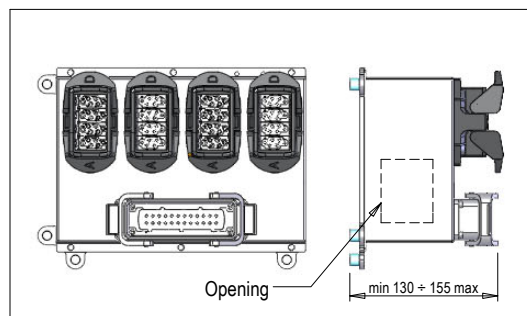
- 1) The Plug and Socket of the same cable must be put in their housing with the same sequence (Pic.1 & 2)

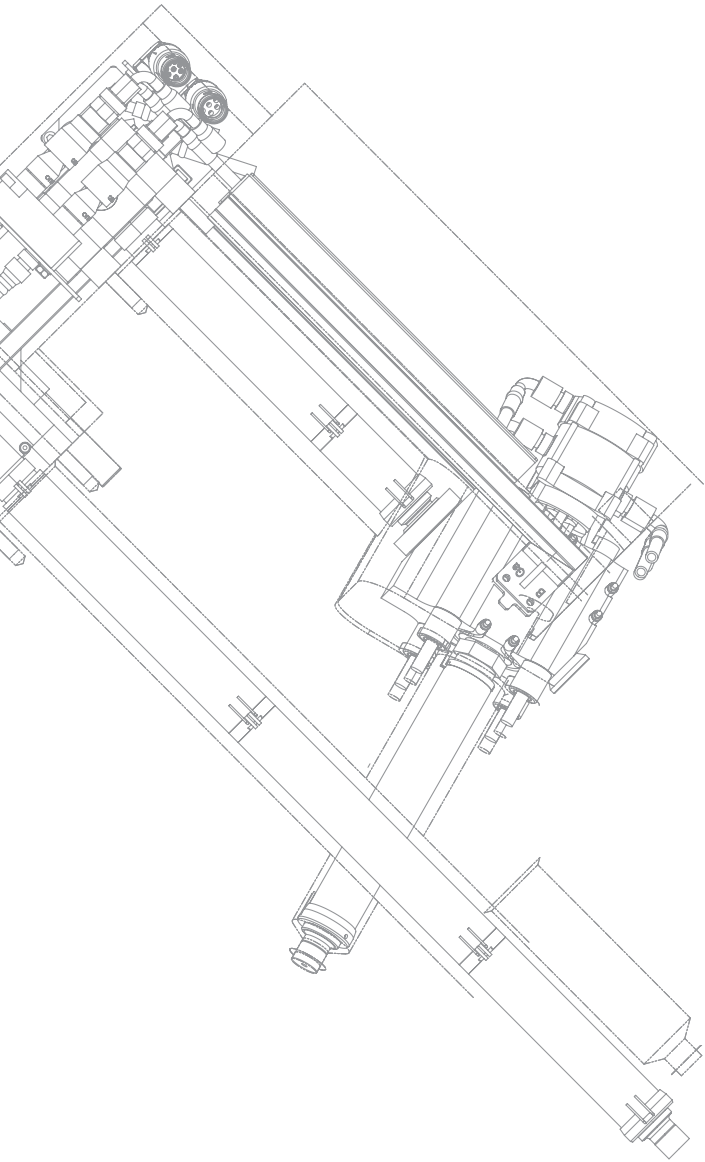


- 2) Always cover empty positions on the housing (Pic.3)



- 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)





Aa Series 270÷3150 cm³/s

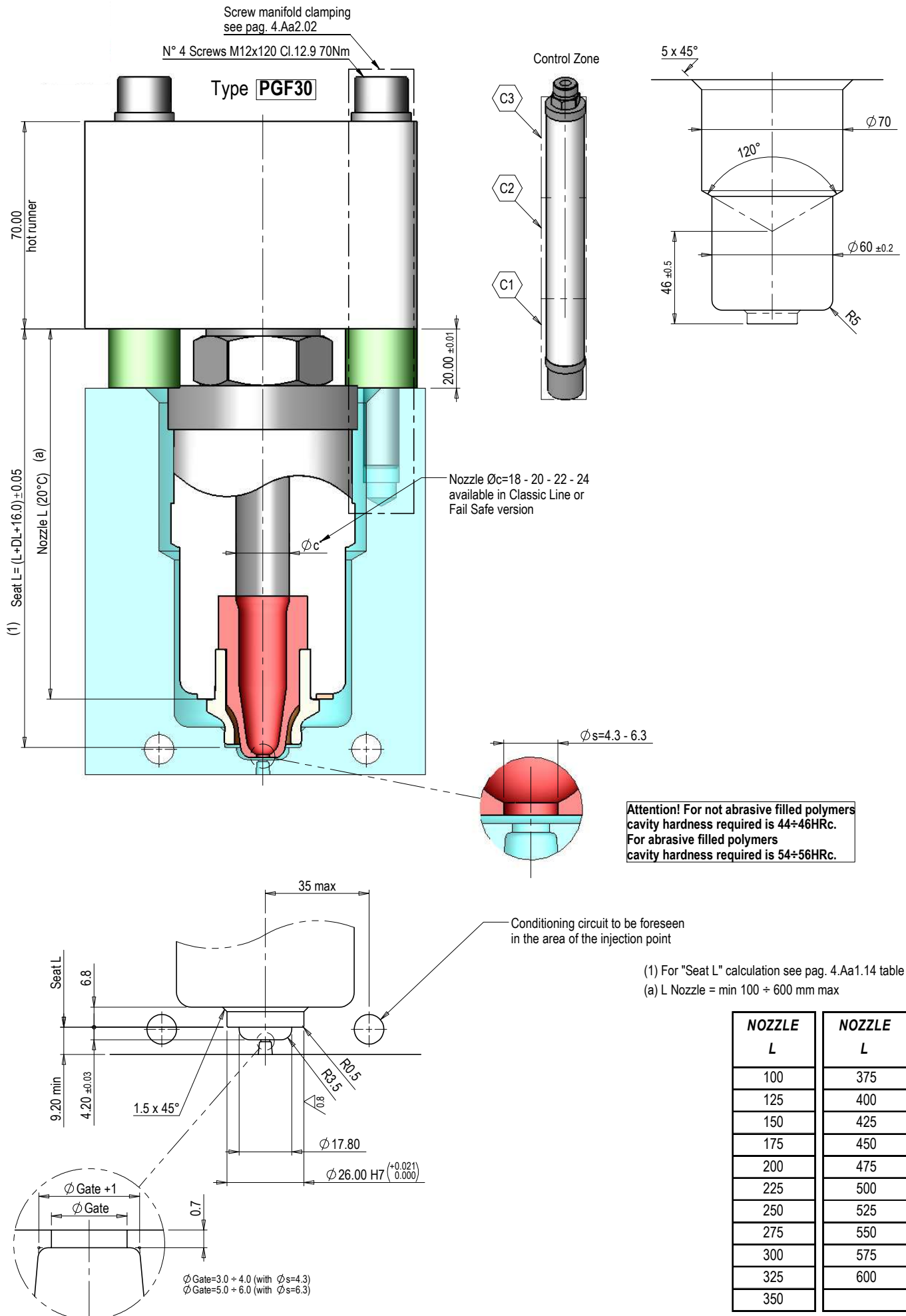
Serie Aa

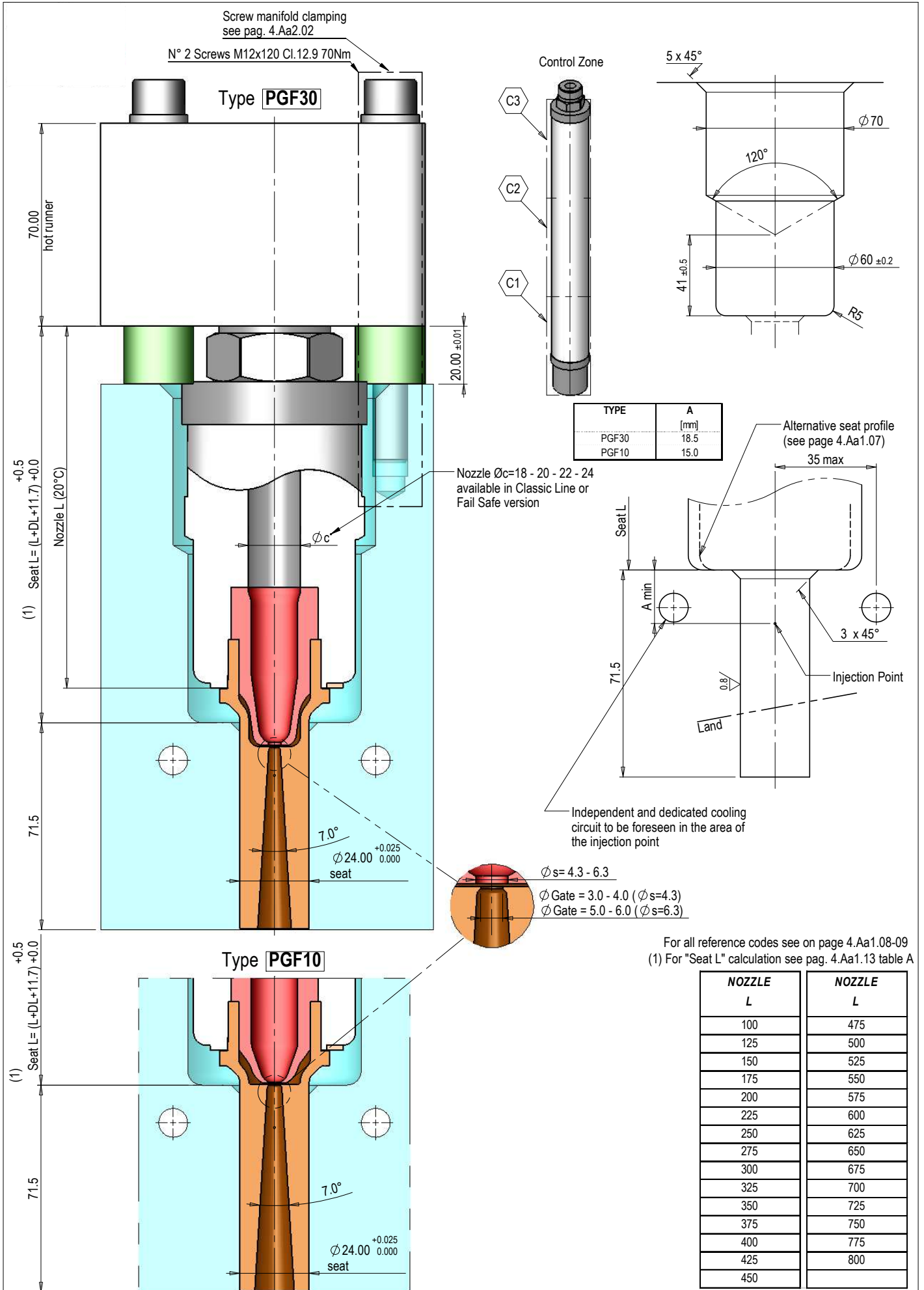
Aa Serie

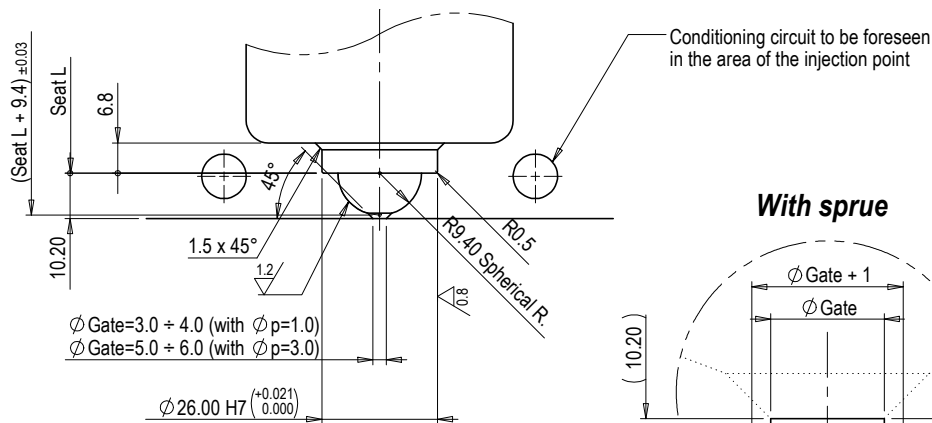
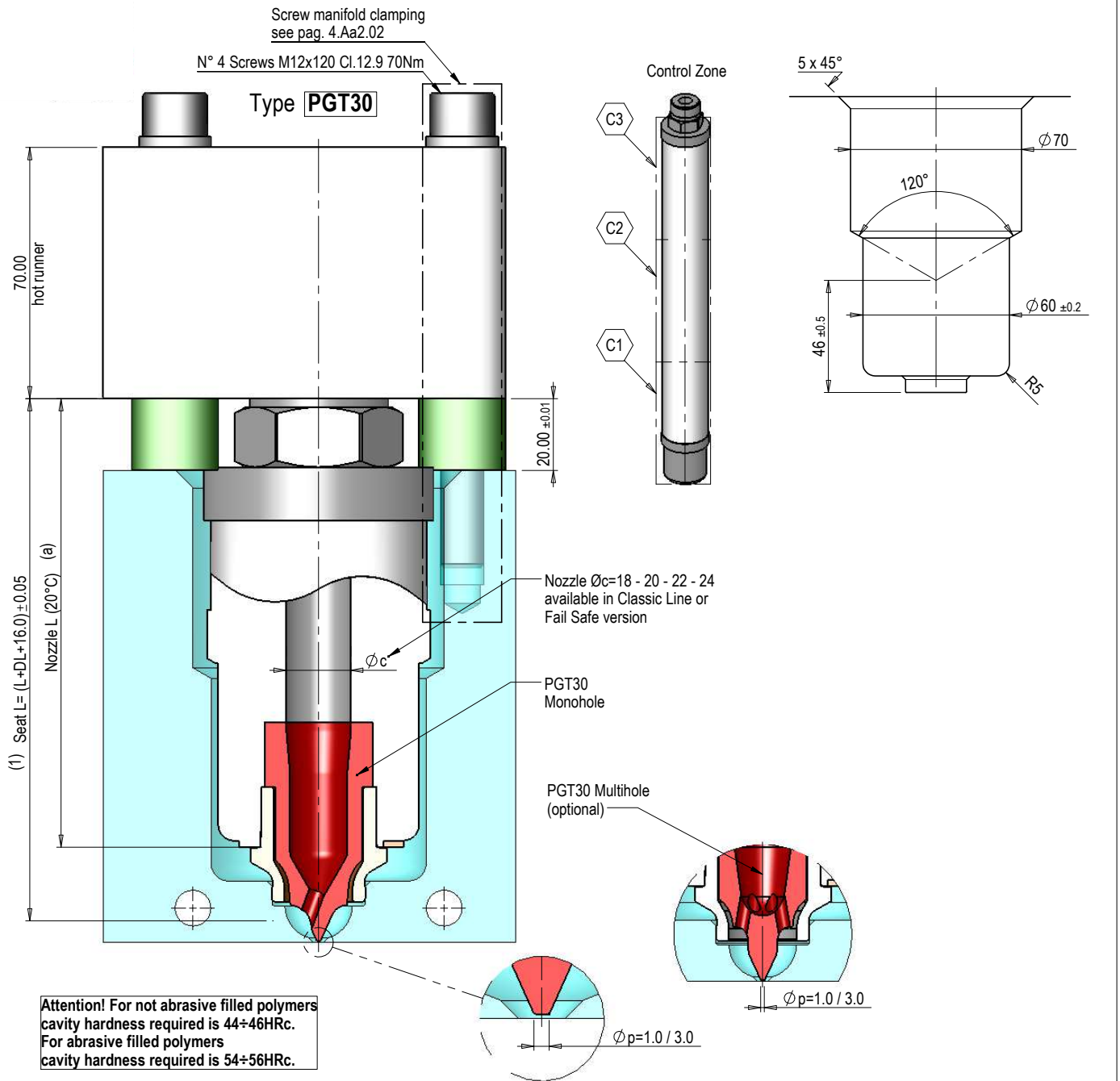
Aa Série

Aa Serie

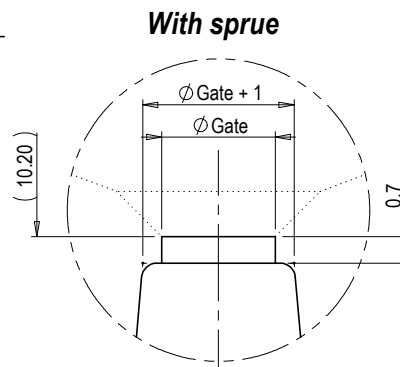
Aa Série



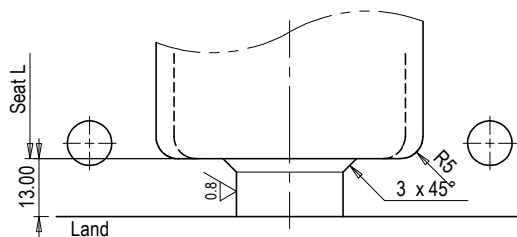
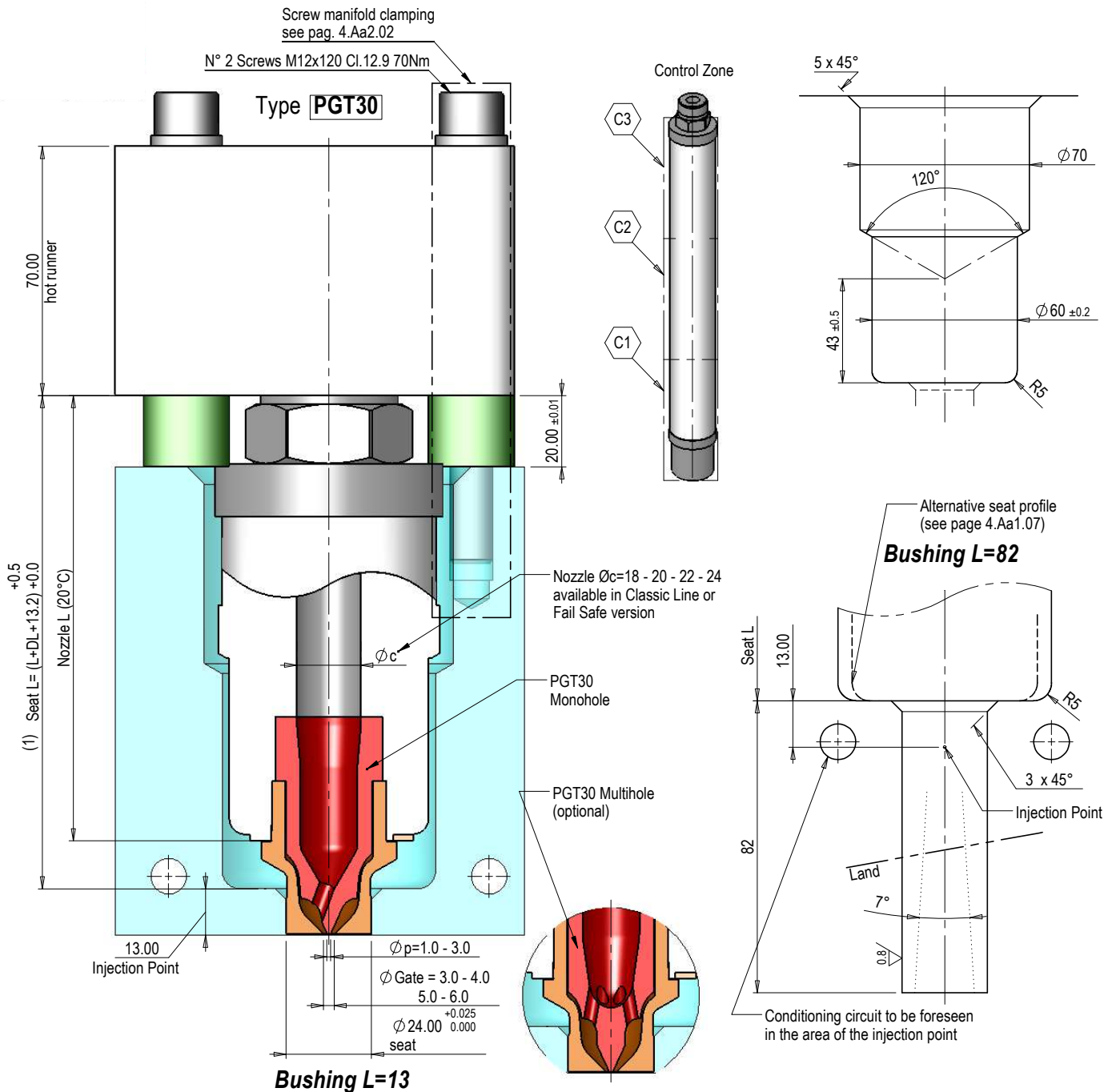




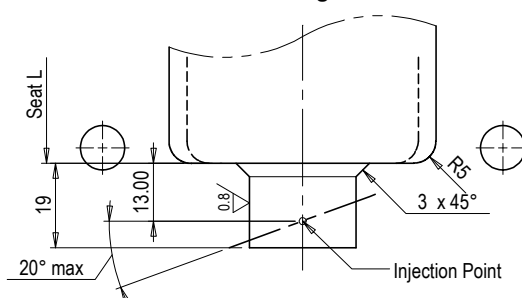
(1) For "Seat L" calculation see pag. 4.Aa1.14 table A
(a) L Nozzle = min 100 ÷ 600 mm max



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	

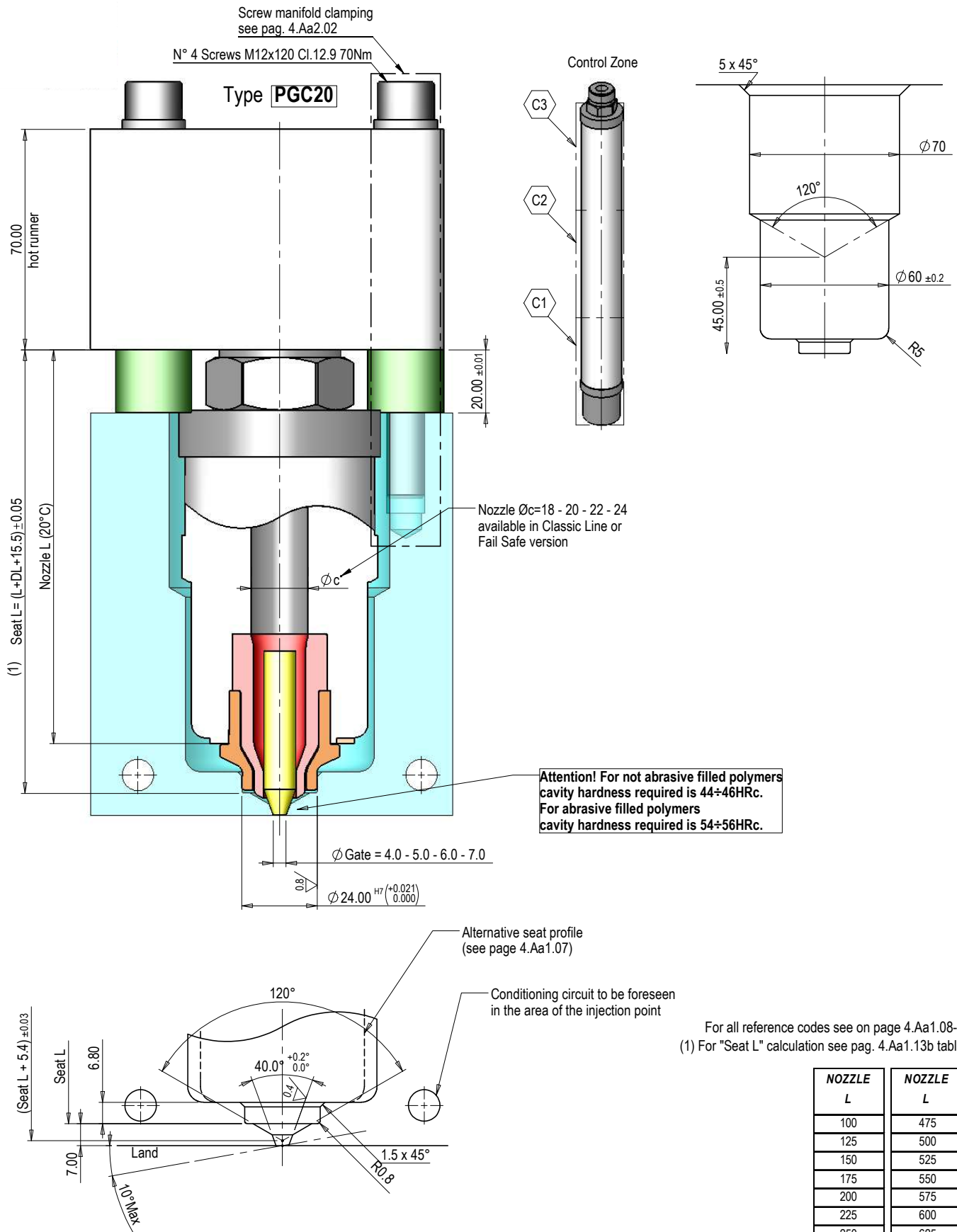


Bushing L=19

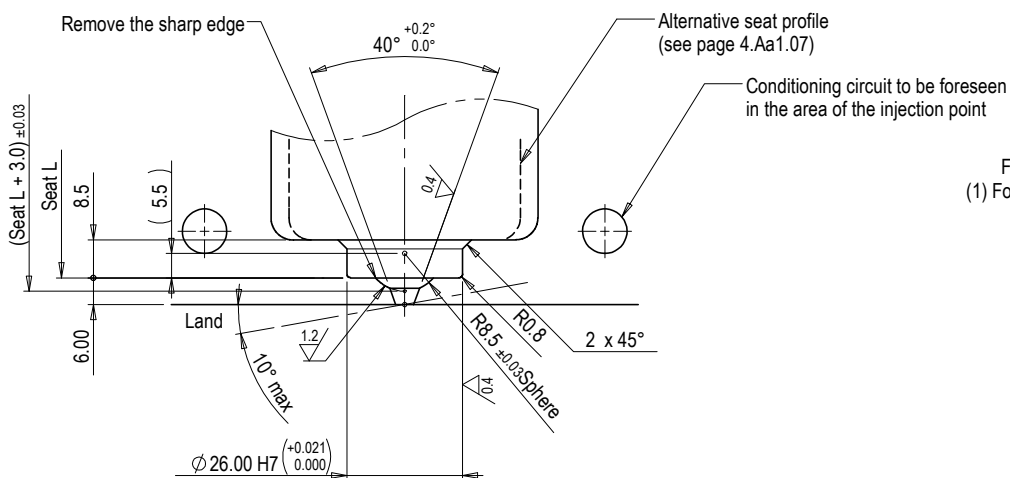
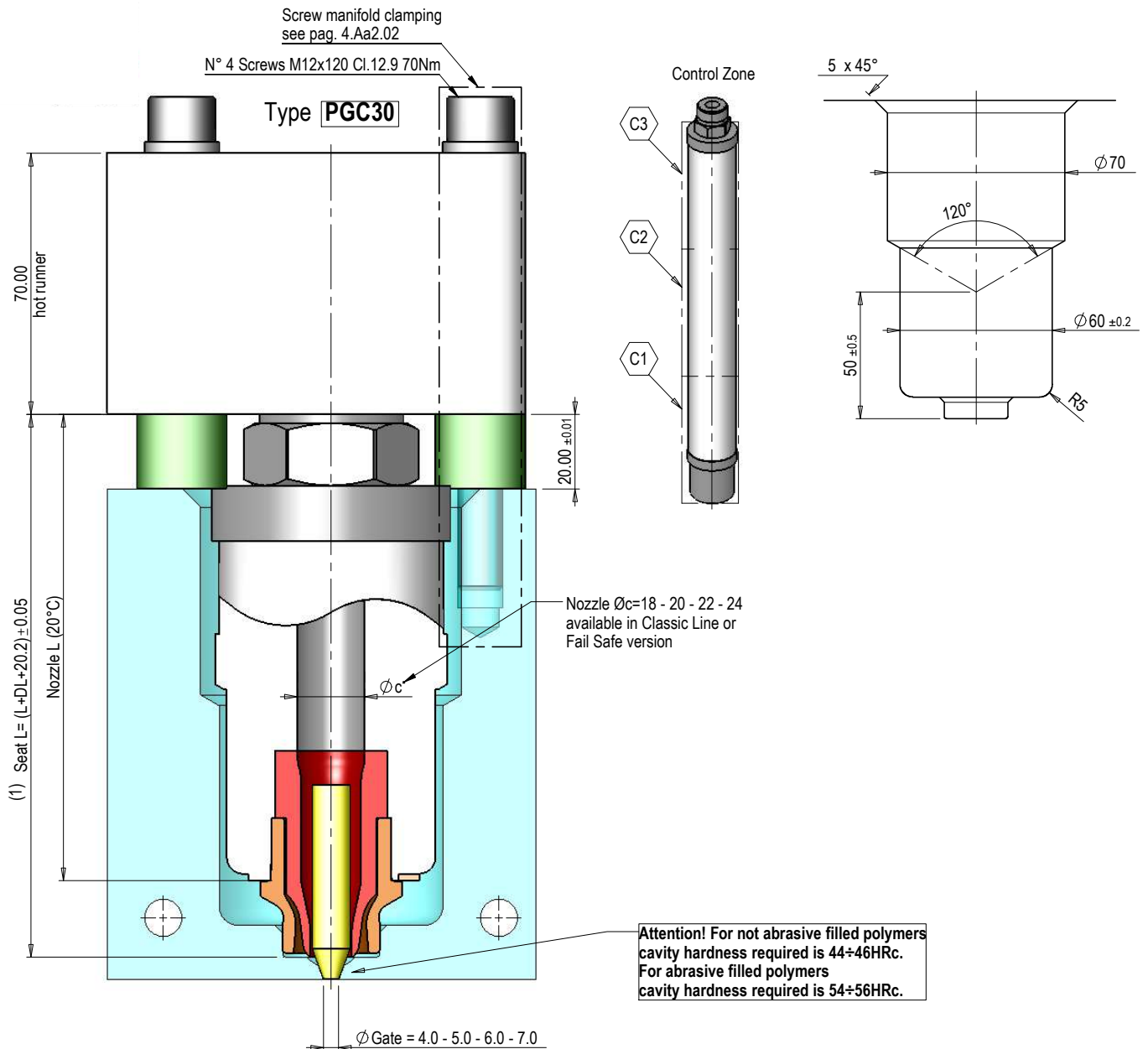


(1) For "Seat L" calculation see pag. 4.Aa1.13a table B

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	

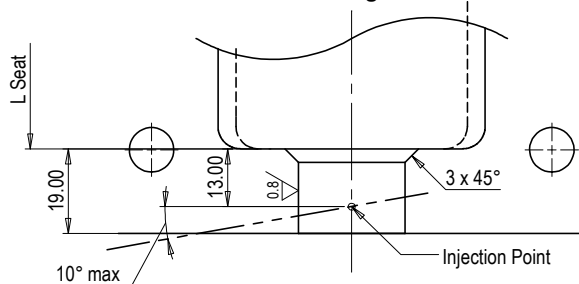
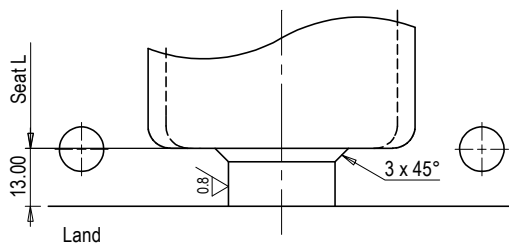
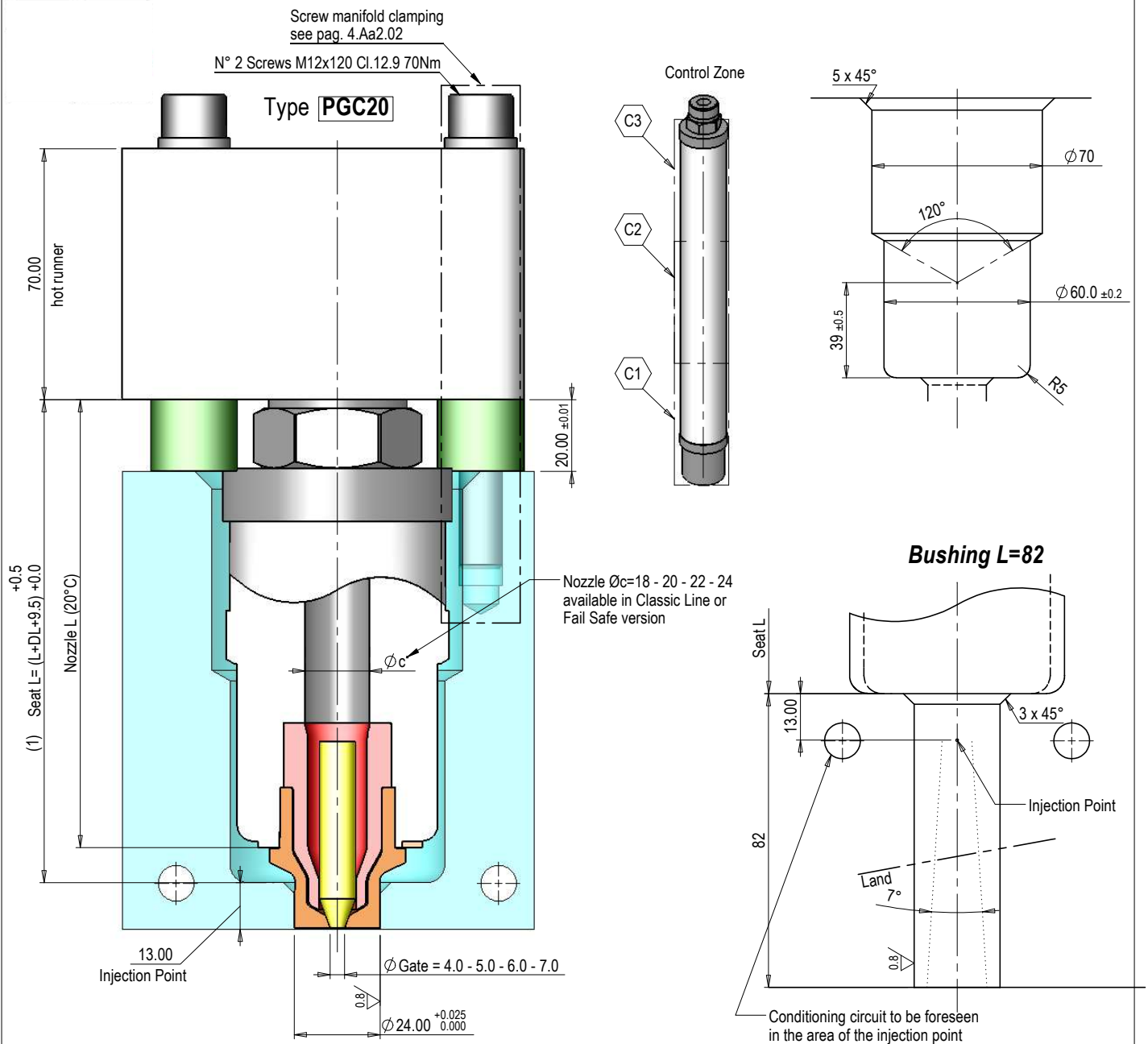


NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	



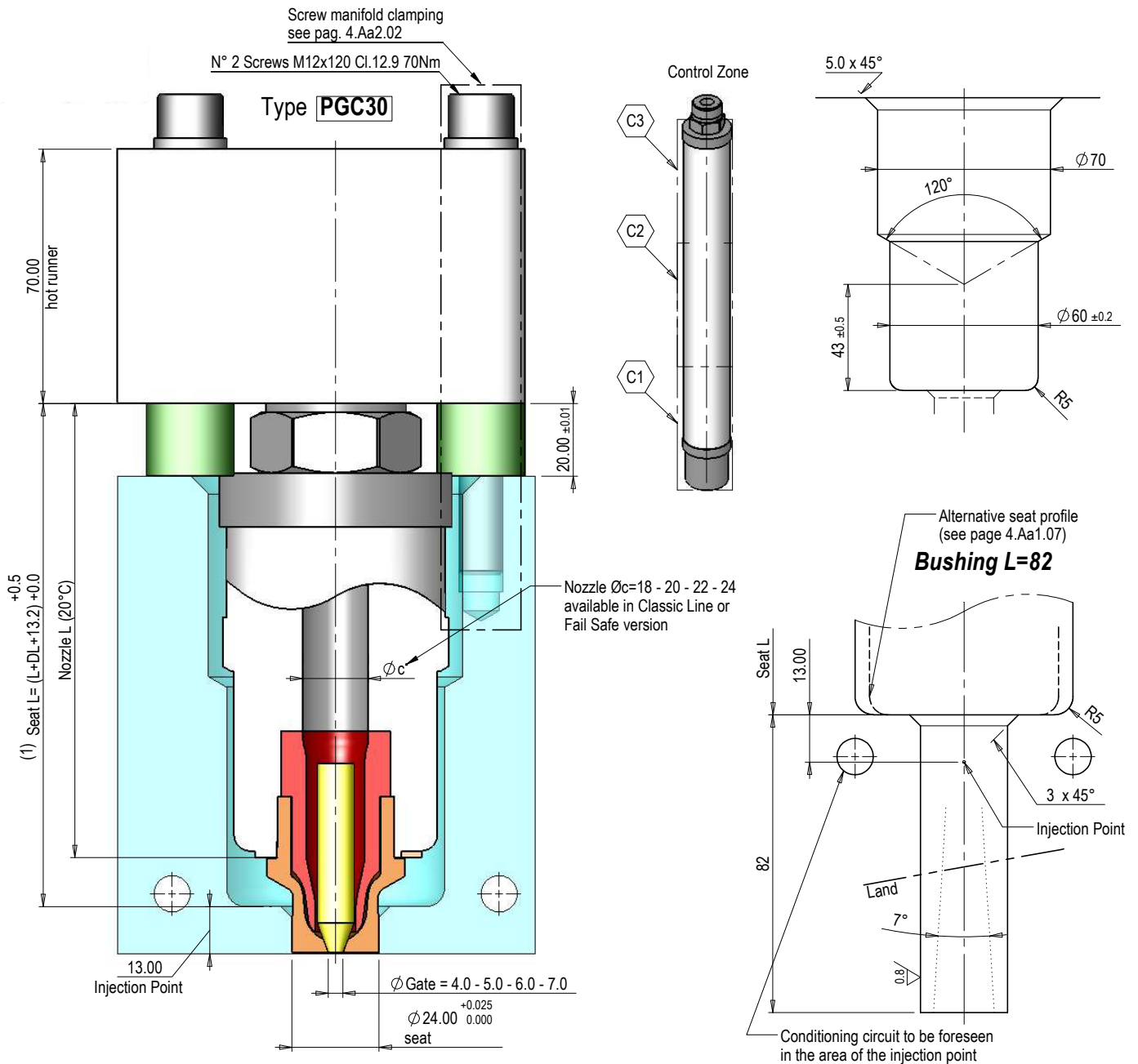
For all reference codes see on page 4.Aa1.08-09
(1) For "Seat L" calculation see pag. 4.Aa1.13a table C

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	

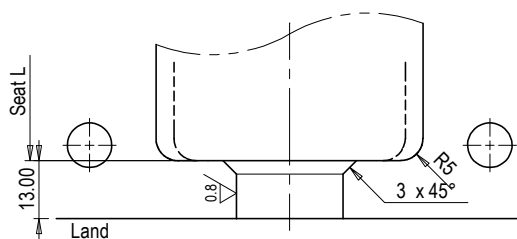


(1) For "Seat L" calculation see pag. 4.Aa1.13b table D

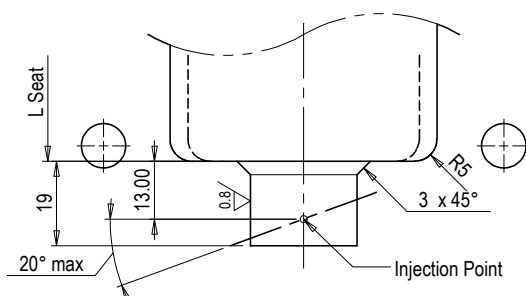
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	



Bushing L=13

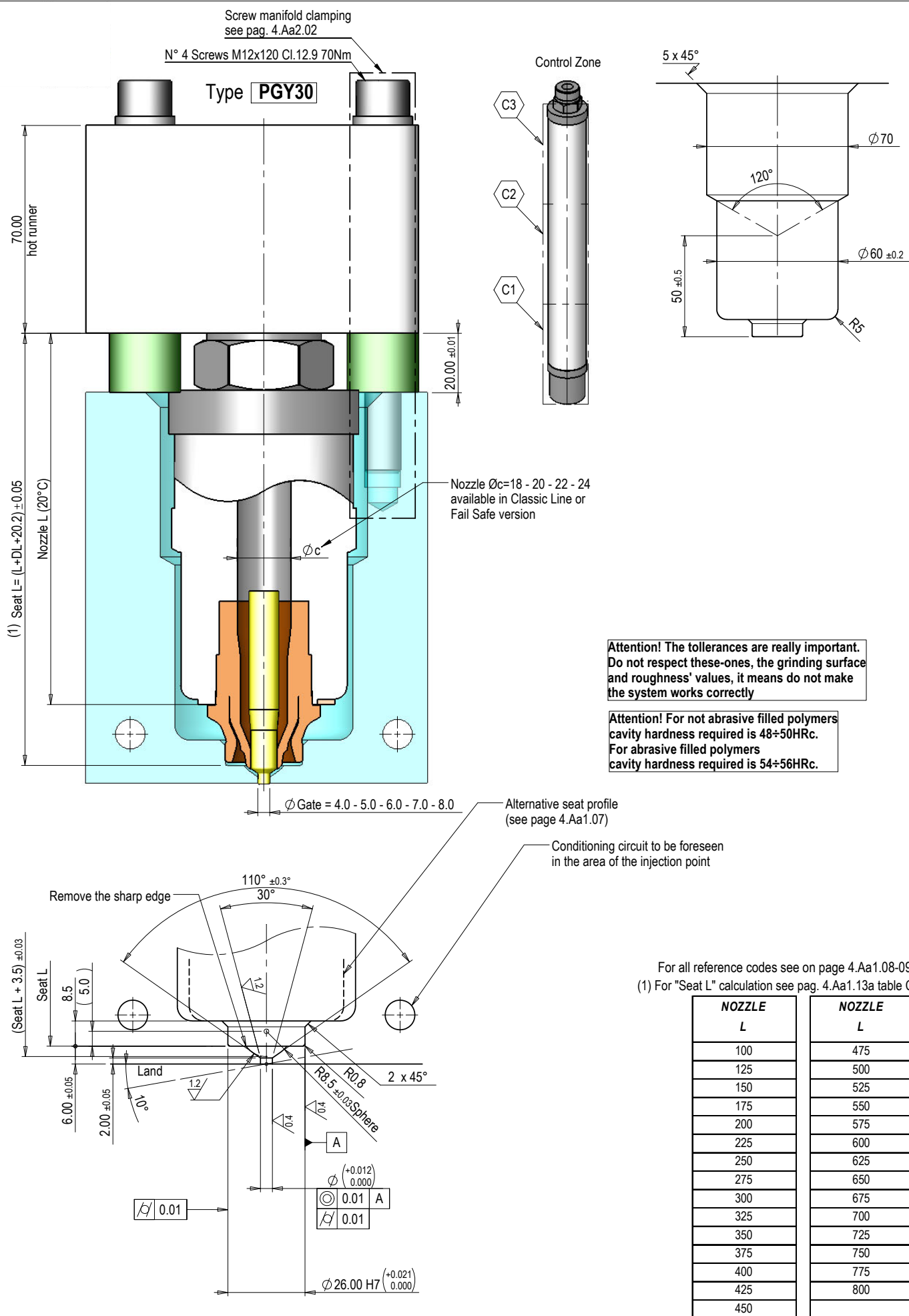


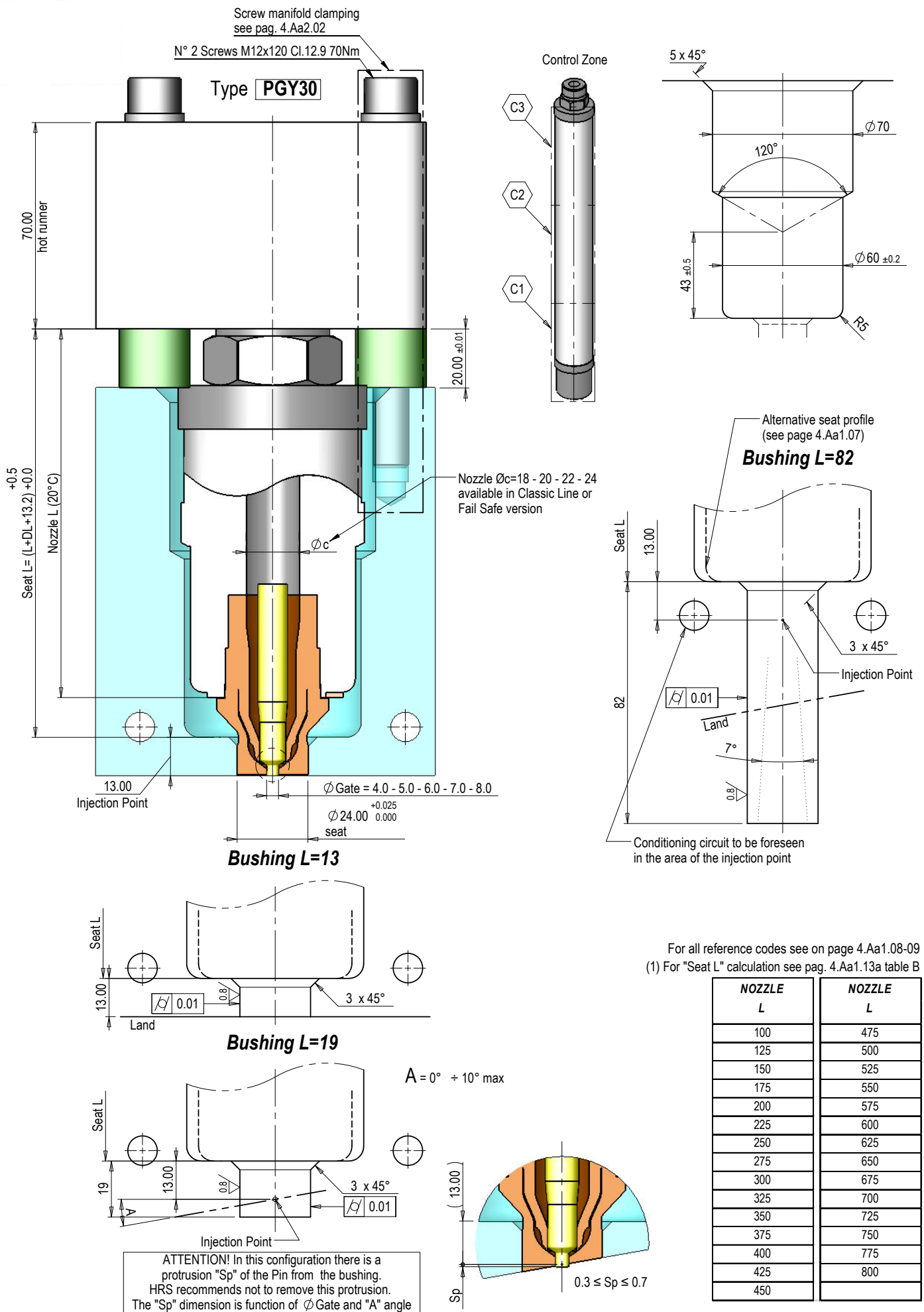
Bushing L=19



(1) For "Seat L" calculation see pag. 4.Aa1.13a table B

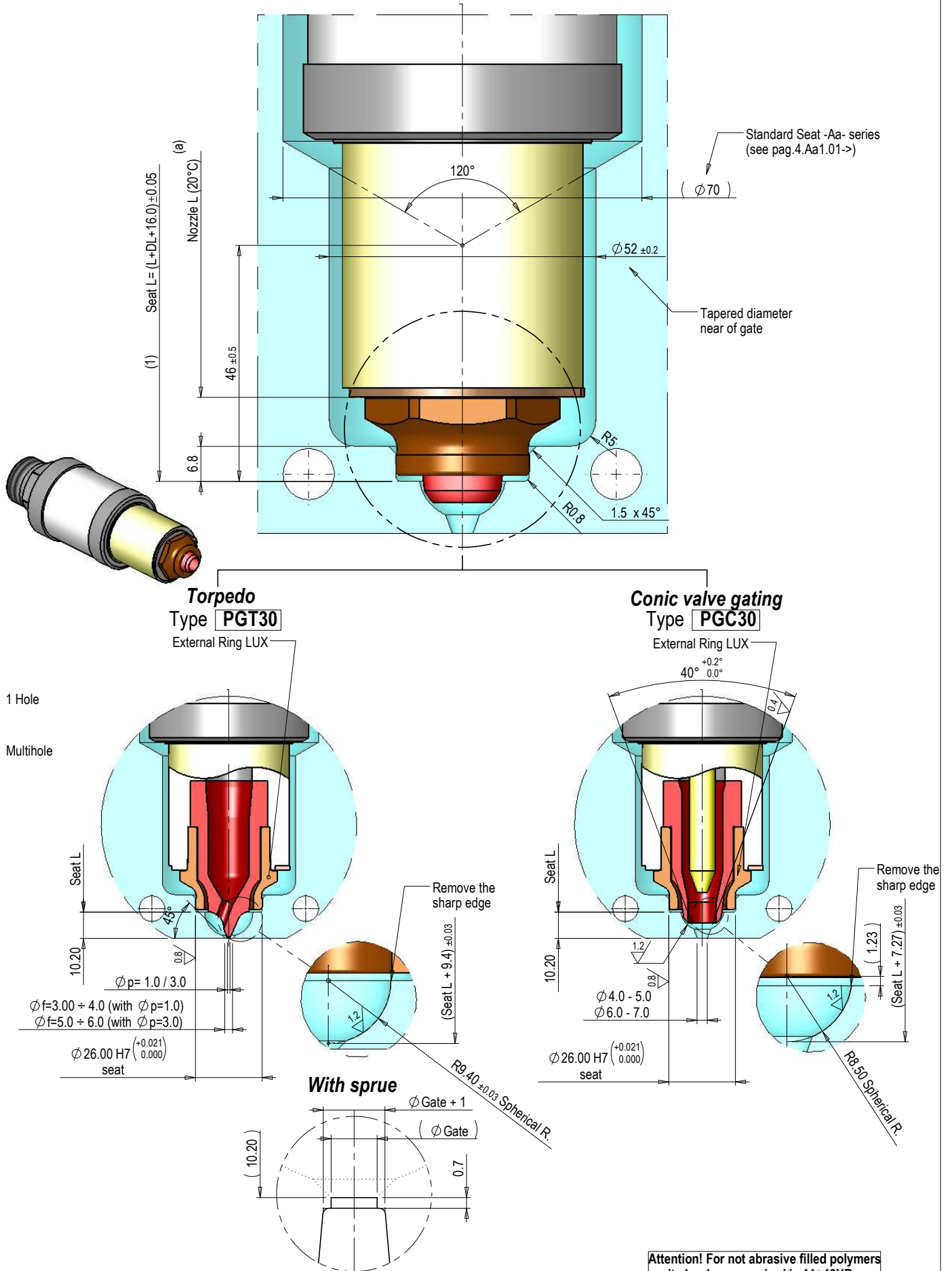
NOZZLE L	NOZZLE L
100	475
125	500
150	525
175	550
200	575
225	600
250	625
275	650
300	675
325	700
350	725
375	750
400	775
425	800
450	

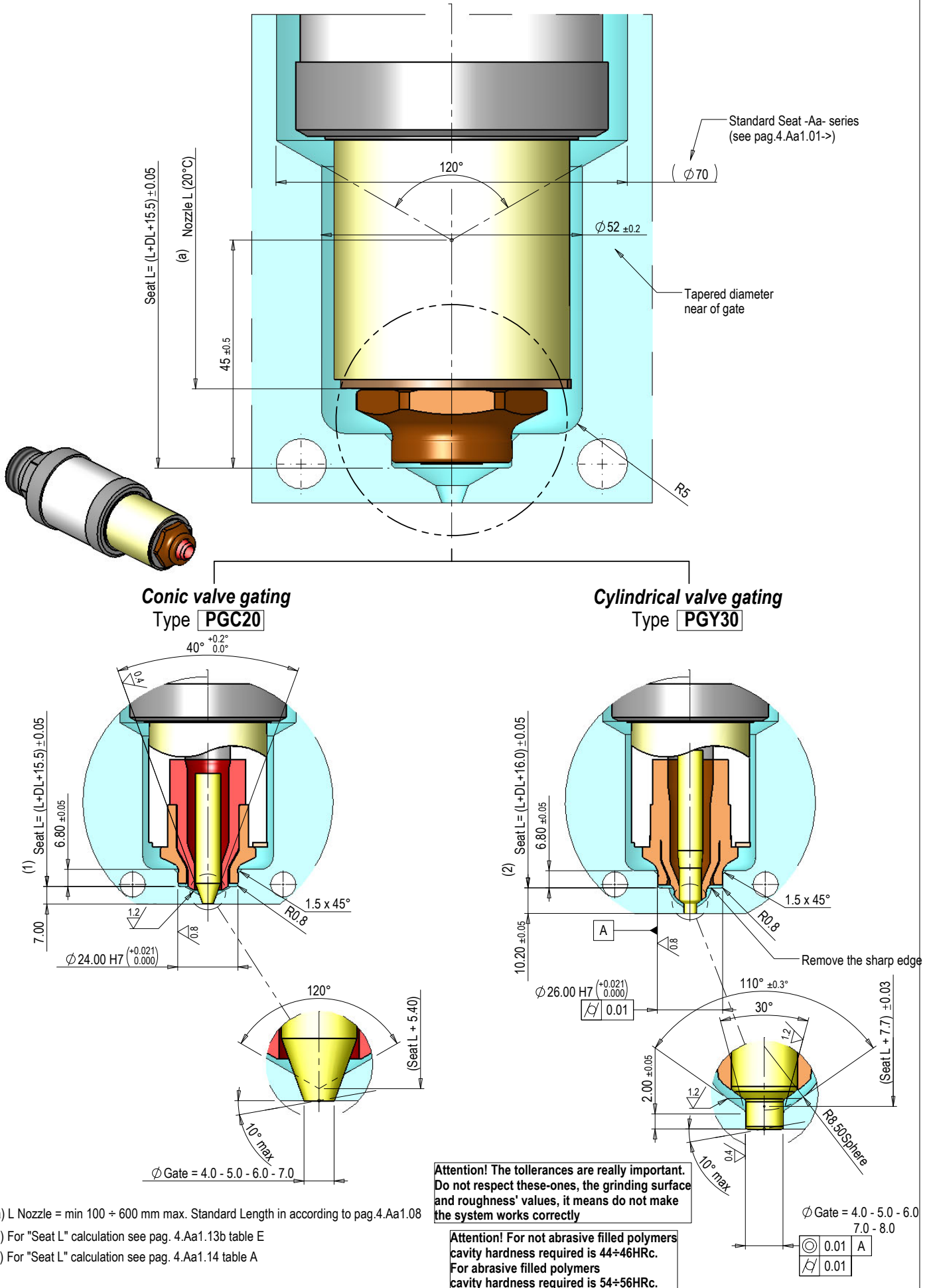


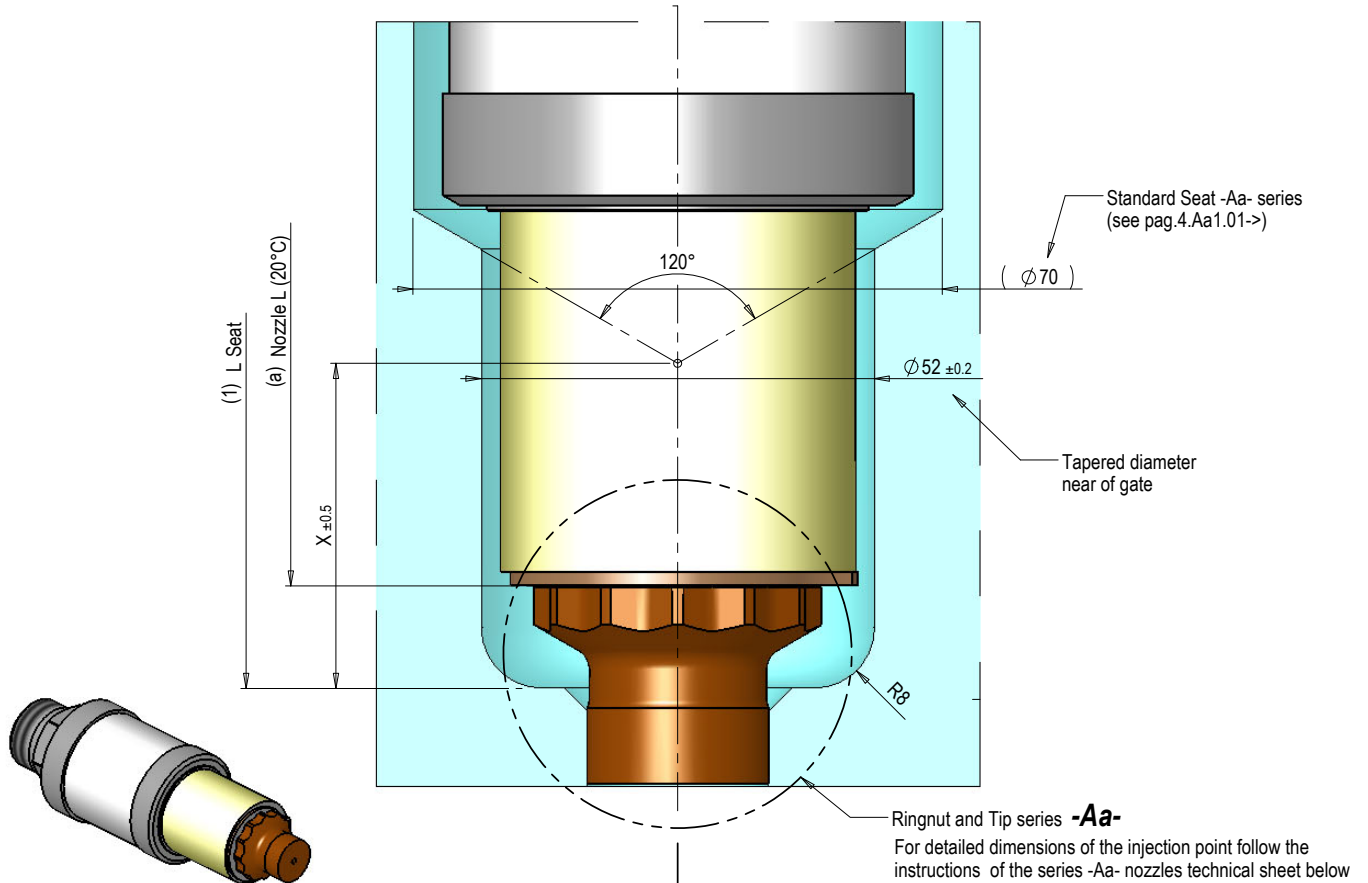


For all reference codes see on page 4.Aa1.08-09
(1) For "Seat L" calculation see pag. 4.Aa1.13a table B

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	

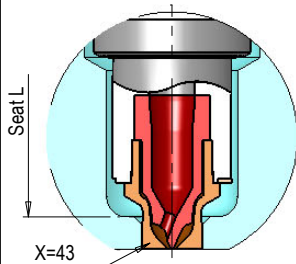






Type **PGT30**

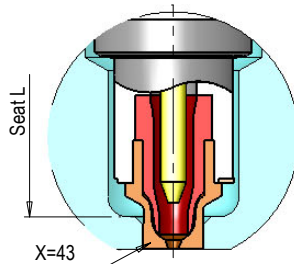
Torpedo
pag. 4.Aa1.02



available for
Ring Through the Cavity L=13-19-82

Type **PGC30**

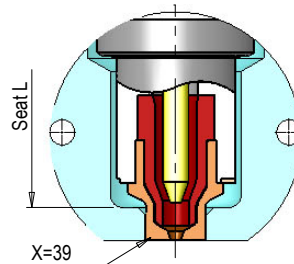
Conical valve gating
pag. 4.Aa1.04



available for
Ring Through the Cavity L=13-19-82

Type **PGC20**

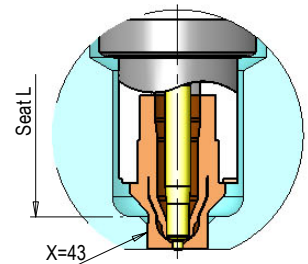
Conical valve gating
pag. 4.Aa1.20



available for
Ring Through the Cavity L=13-19-82

Type **PGY30**

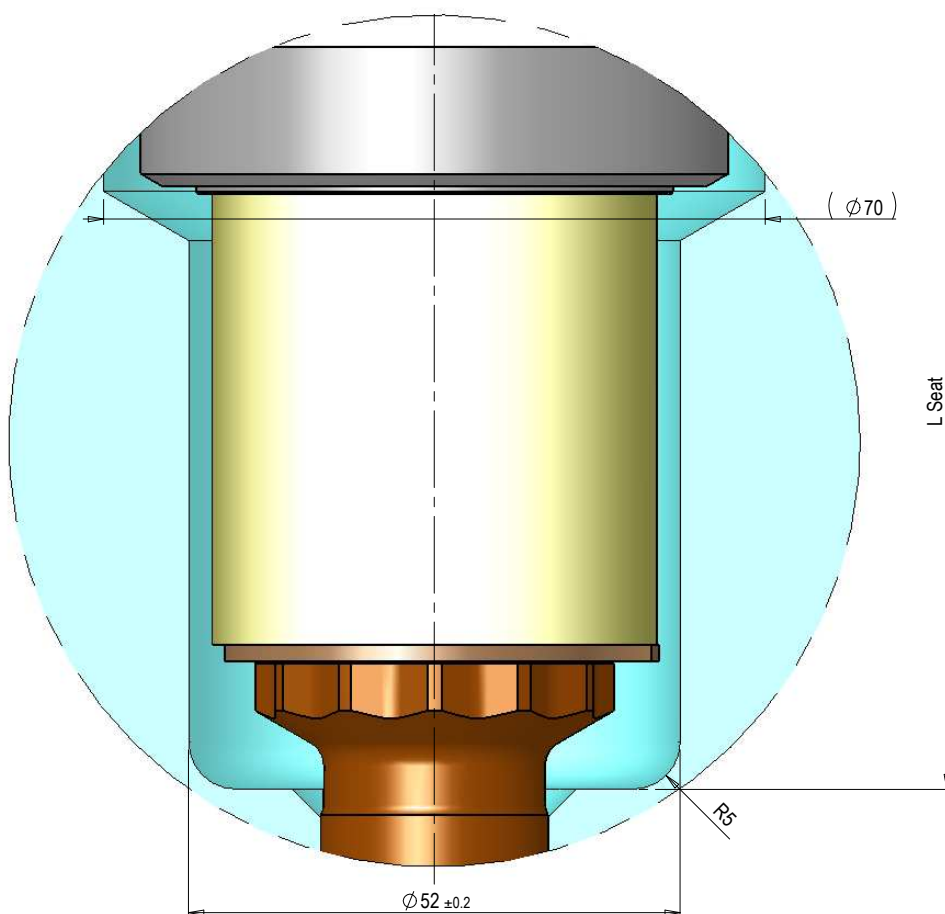
Cylindrical valve gating
pag. 4.Aa1.06



available for
Ring Through the Cavity L=13-19-82

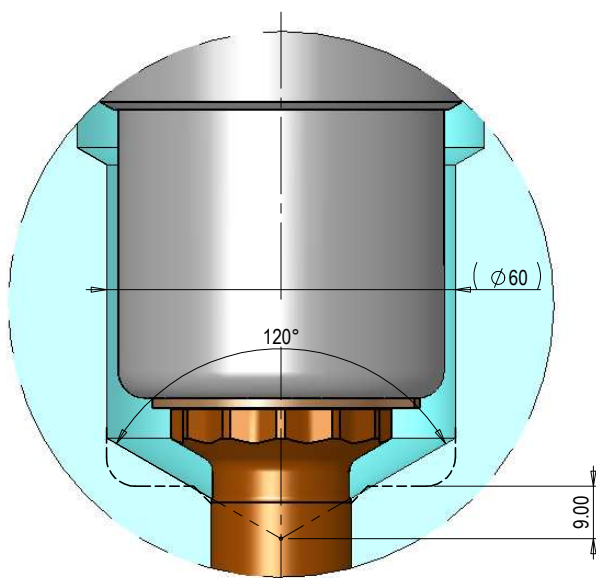
Compact Seat

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)

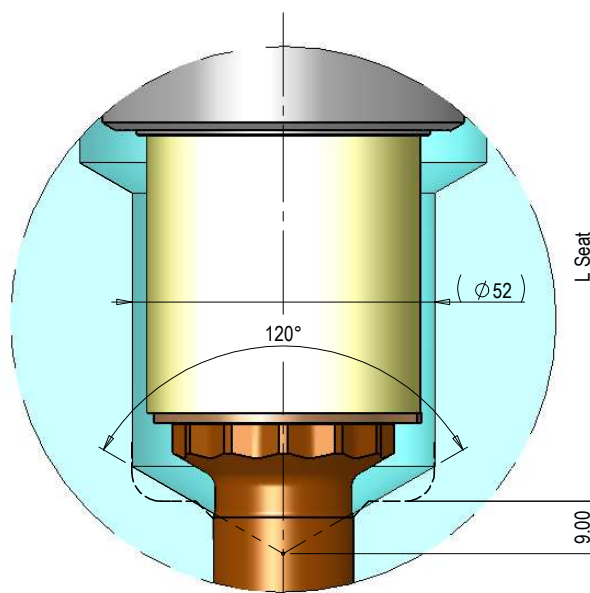


Seat made with 120° tip (*)

Application on STANDARD seat



Application on COMPACT seat



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

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.

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 conductivity with End Ring 0012-00790 For high conductivity with Bushing th.cavity 0012-00792 for high resistance PGC30 Antistagnation 0012-00828 For high conductivity with End Ring 0012-00829 For high conductivity 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

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

$\Delta T = T1 - T2$
 $\lambda = 0.000012$ (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
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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
	$Seat L = L + DL + 11.7$										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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

Tab. B - Calcolo "L Sede"

L (INMETTORE) [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										
	$[\Delta T=100^\circ C]$	$[\Delta T=120^\circ C]$	$[\Delta T=140^\circ C]$	$[\Delta T=160^\circ C]$	$[\Delta T=180^\circ C]$	$[\Delta T=200^\circ C]$	$[\Delta T=220^\circ C]$	$[\Delta T=240^\circ C]$	$[\Delta T=260^\circ C]$	$[\Delta T=280^\circ C]$	$[\Delta T=300^\circ C]$
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 (INMETTORE) [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										
	$[\Delta T=100^\circ C]$	$[\Delta T=120^\circ C]$	$[\Delta T=140^\circ C]$	$[\Delta T=160^\circ C]$	$[\Delta T=180^\circ C]$	$[\Delta T=200^\circ C]$	$[\Delta T=220^\circ C]$	$[\Delta T=240^\circ C]$	$[\Delta T=260^\circ C]$	$[\Delta T=280^\circ C]$	$[\Delta T=300^\circ C]$
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

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										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

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

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

NOZZLE EXPANSION Table

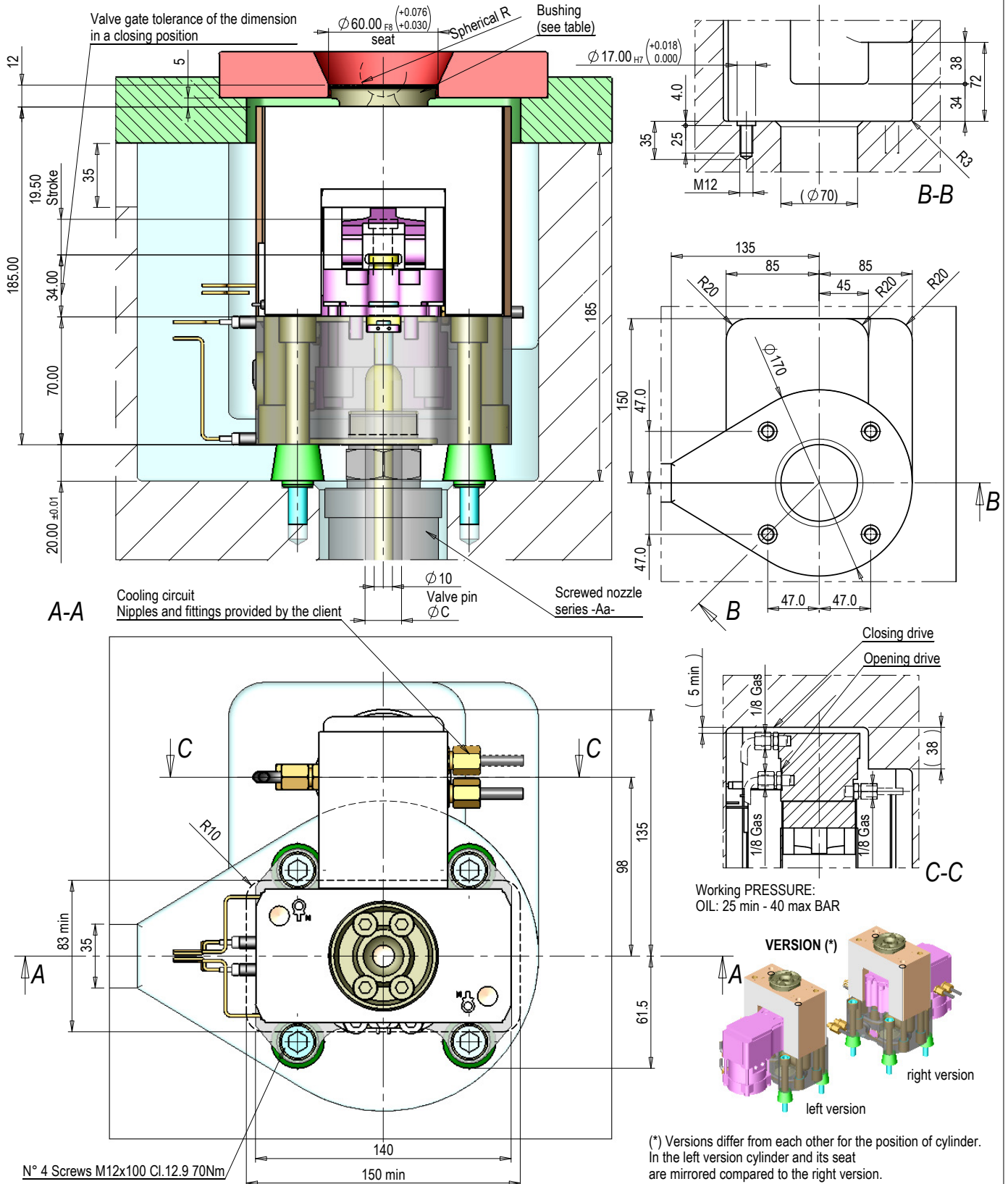
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$DL = (L * \Delta T * \lambda)$										
	$[\Delta T=100^\circ C]$	$[\Delta T=120^\circ C]$	$[\Delta T=140^\circ C]$	$[\Delta T=160^\circ C]$	$[\Delta T=180^\circ C]$	$[\Delta T=200^\circ C]$	$[\Delta T=220^\circ C]$	$[\Delta T=240^\circ C]$	$[\Delta T=260^\circ C]$	$[\Delta T=280^\circ C]$	$[\Delta T=300^\circ C]$
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

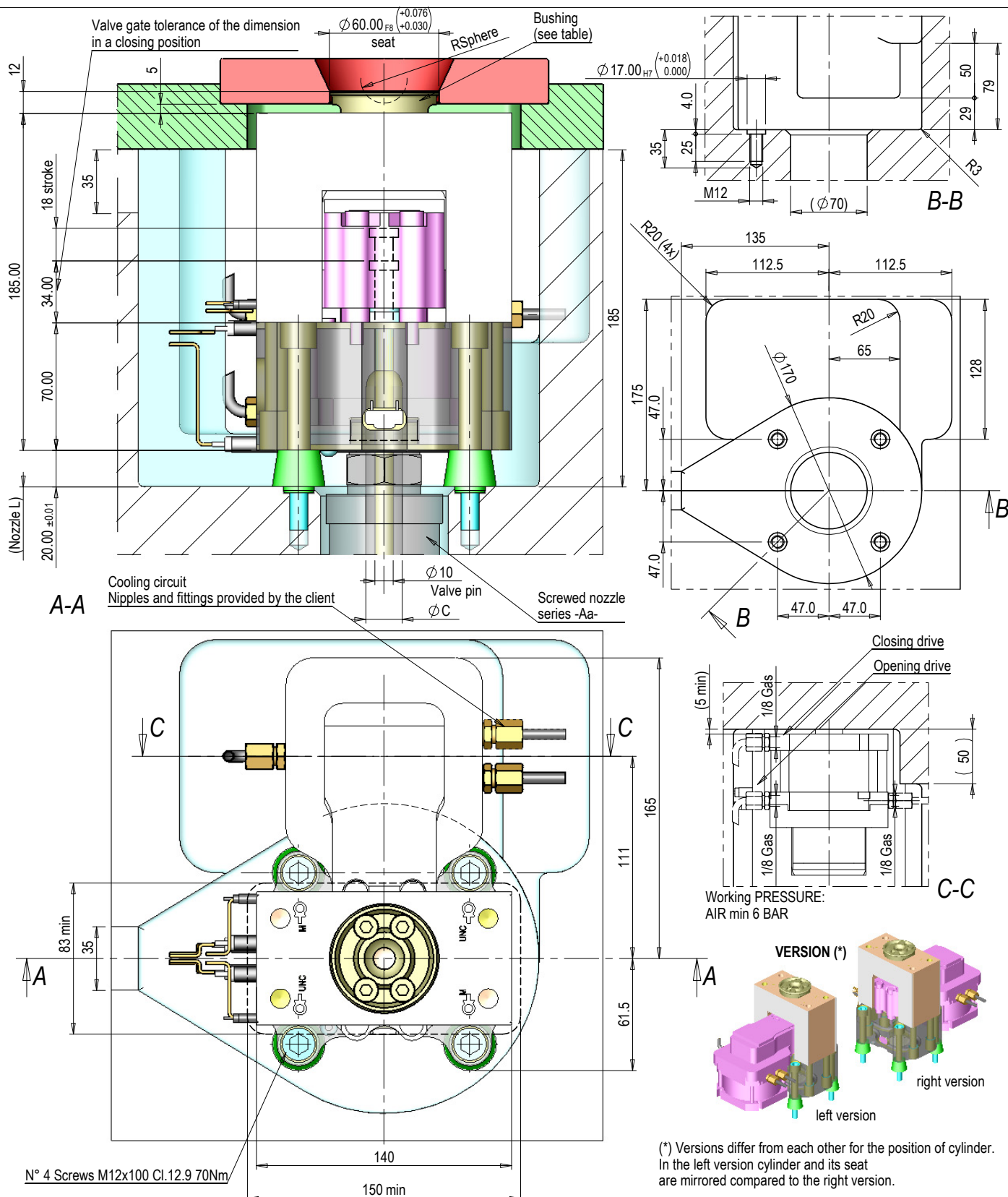
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$Seat L = L + DL + 16.0$										
	$[\Delta T=100^\circ C]$	$[\Delta T=120^\circ C]$	$[\Delta T=140^\circ C]$	$[\Delta T=160^\circ C]$	$[\Delta T=180^\circ C]$	$[\Delta T=200^\circ C]$	$[\Delta T=220^\circ C]$	$[\Delta T=240^\circ C]$	$[\Delta T=260^\circ C]$	$[\Delta T=280^\circ C]$	$[\Delta T=300^\circ C]$
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

Tab. B - Calcolo "L Sede"

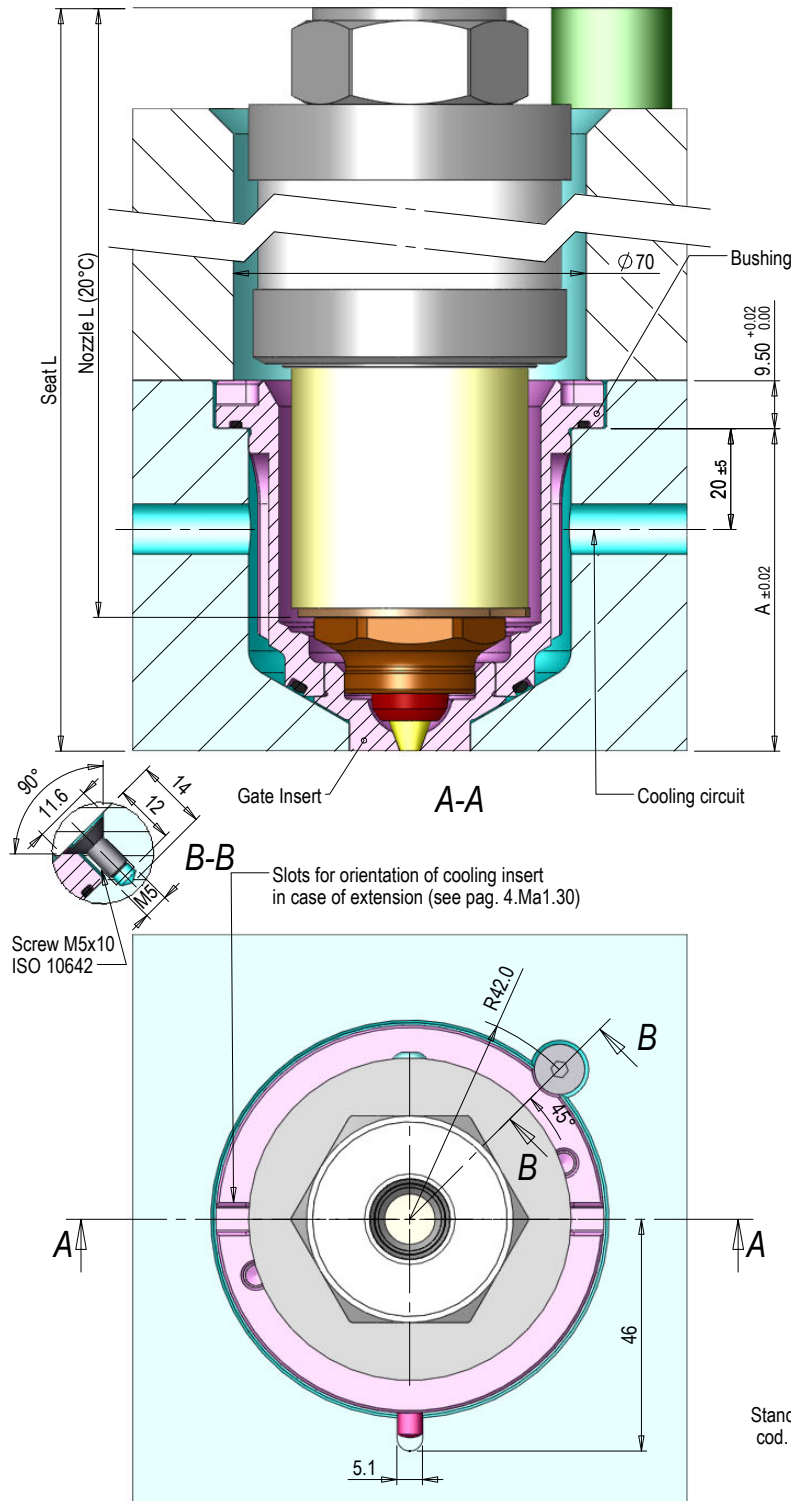
L (INMETTORE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	L Sede = L + DL + 13.2										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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



VALVE GATING GROUP CODE	BUSHING CODE	R SPHERE	VALVE PIN CODE		SPARE PARTS KIT
for nozzles $\phi c=20$	0016-00154	R 0	(Nozzle L) 100 $\pm$ 300 (301) $\pm$ 800	Valve pin	Cylinder OR 0038-00063
	0016-00155	R 12.7		0018-00043	
	0016-00156	R 15.5		0018-00044	
for nozzles $\phi c=22$	0016-00157	R 19.1			
	0016-00158	R 25			
	0016-00159	R 40			

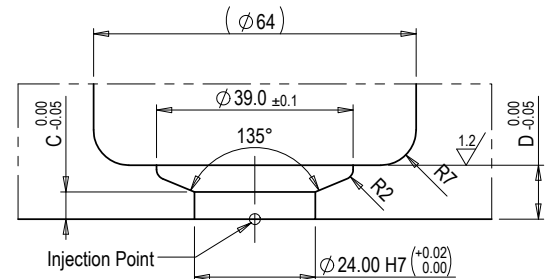
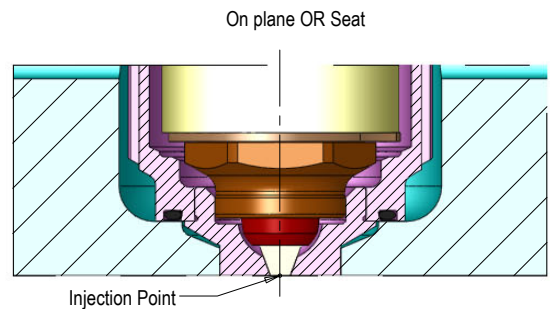
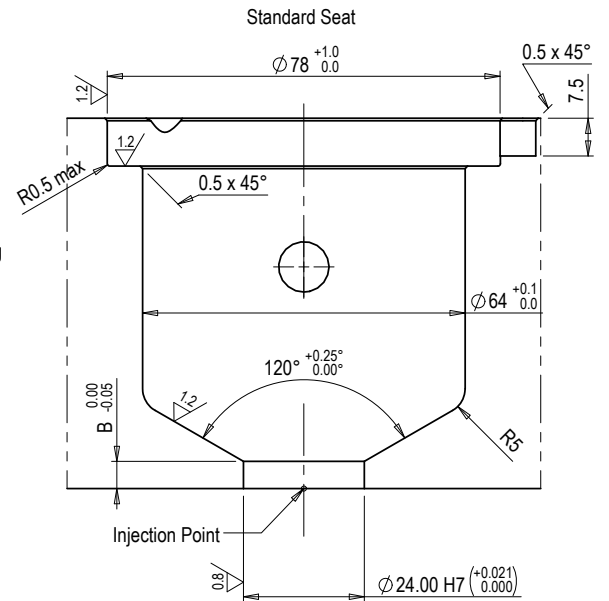


VALVE GATING GROUP CODE	BUSHING CODE	R SPHERE	VALVE PIN CODE		SPARE PARTS KIT
for nozzles Øc=20	0016-00154	R 0	(Nozzle L) 100 +300 (301) +800	Valve pin 0018-00043 0018-00044	Cylinder OR 0038-00044
0152-00079 right version	0016-00155	R 12.7			
0152-00081 left v version	0016-00156	R 15.5			
for nozzles Øc=22	0016-00157	R 19.1			
0152-00080 right version	0016-00158	R 25			
0152-00082 left v version	0016-00159	R 40			



Screw M5x10
ISO 10642

1) Cooling note: suggested hole $\phi 14$ to cool max 4 bushings
with only 1 circuit (range 4÷6 Bar)

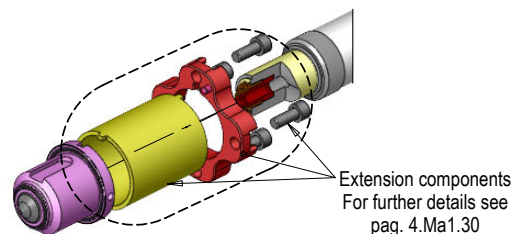


Standard Bushing
cod. 0121-00409

Bushing on plane OR
cod. 0121-00410

for ϕ gate and codes check page 4.Aa1.23

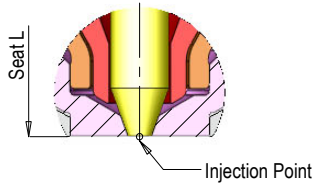
COOLING INSERT Extension



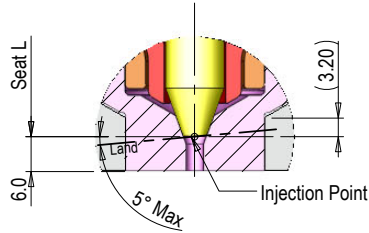
	Seat L	A	B	C	D
PGC20	L+DL+22.5	61.80	3.20	3.20	8.50
PGC30 / PGY30	L+DL+26.2	64.00	5.40	5.40	10.70

Type **PGC20**

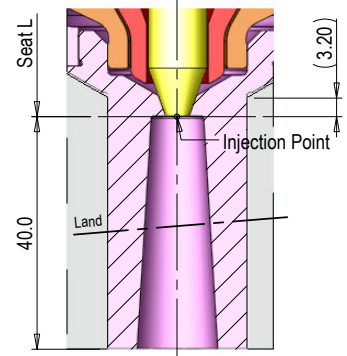
Version L=13



Version L=19

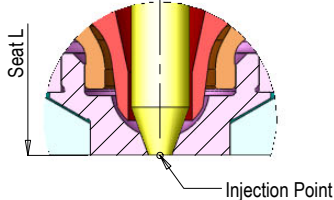


Version L=82

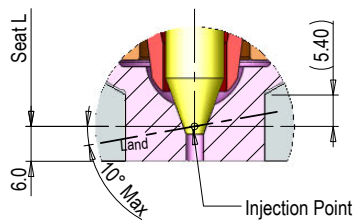


Type **PGC30**

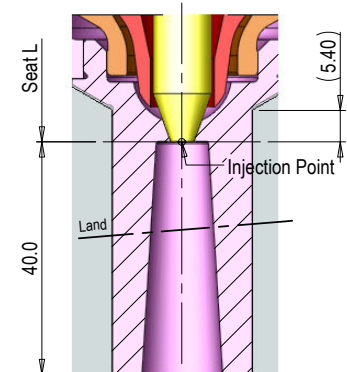
Version L=13



Version L=19

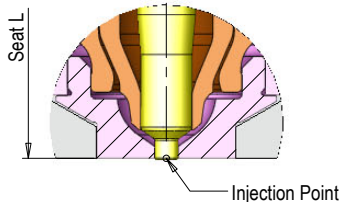


Version L=82

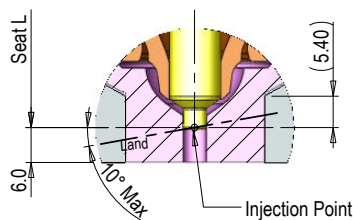


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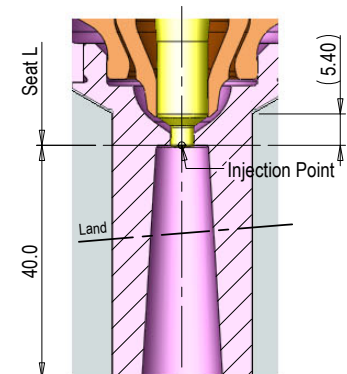
Version L=13



Version L=19

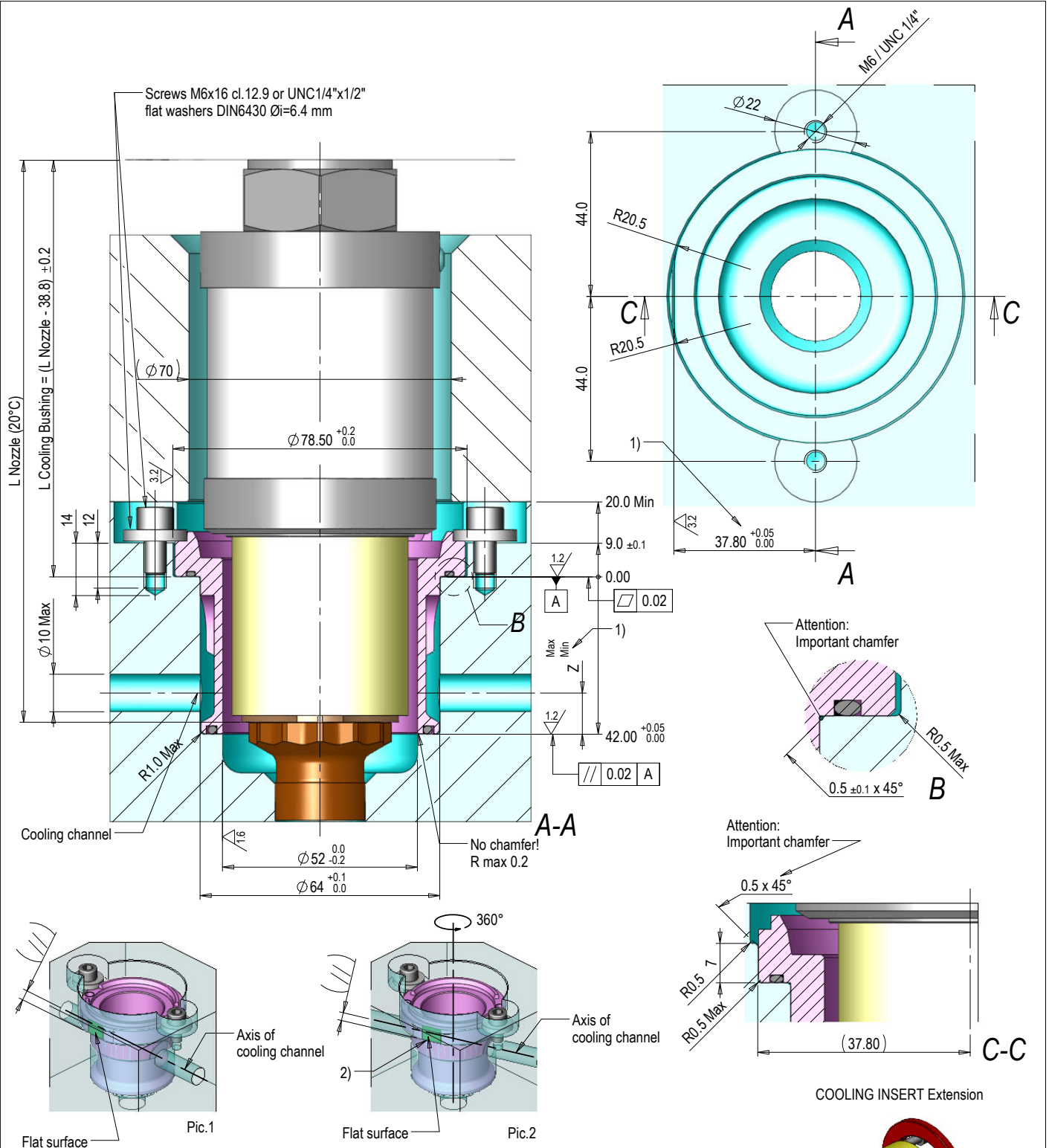


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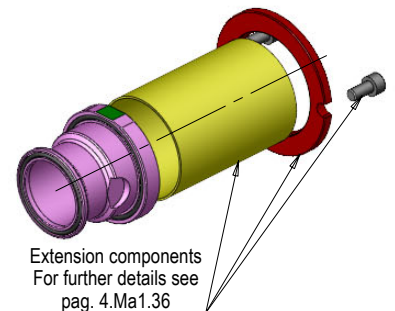


For more details about the correct application of the GATE INSERT TTC product see page 4.Ma1.34

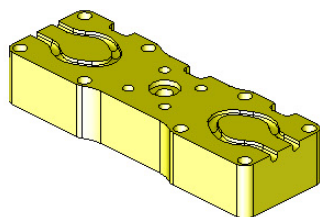
GATE INSERT			
	Version L=13	Version L=19	Version L=82
PGC20	Gate	Gate	Gate
	Ø4.0 - 0335-00118	Ø4.0 - 0335-00123	Ø4.0 - 0335-00128
	Ø5.0 - 0335-00119	Ø5.0 - 0335-00124	Ø5.0 - 0335-00129
	Ø6.0 - 0335-00120	Ø6.0 - 0335-00125	Ø6.0 - 0335-00130
	Ø7.0 - 0335-00121	Ø7.0 - 0335-00126	Ø7.0 - 0335-00131
PGC30	Gate	Gate	Gate
	Ø4.0 - 0335-00133	Ø4.0 - 0335-00138	Ø4.0 - 0335-00143
	Ø5.0 - 0335-00134	Ø5.0 - 0335-00139	Ø5.0 - 0335-00144
	Ø6.0 - 0335-00135	Ø6.0 - 0335-00140	Ø6.0 - 0335-00145
	Ø7.0 - 0335-00136	Ø7.0 - 0335-00141	Ø7.0 - 0335-00146
PGY30	Gate	Gate	Gate
	Ø4.0 - 0335-00148	Ø4.0 - 0335-00153	Ø4.0 - 0335-00158
	Ø5.0 - 0335-00149	Ø5.0 - 0335-00154	Ø5.0 - 0335-00159
	Ø6.0 - 0335-00150	Ø6.0 - 0335-00155	Ø6.0 - 0335-00160
	Ø7.0 - 0335-00151	Ø7.0 - 0335-00156	Ø7.0 - 0335-00161
	Ø8.0 - 0335-00152	Ø8.0 - 0335-00157	Ø8.0 - 0335-00162



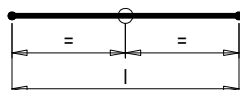
- 1) Attention: for cooling channels drilled with "Z Max" > 18 mm, then the bushing requires a mandatory positioning on the mold seat by mean a flat surface (see section C-C) parallel to the axis of the cooling channels (Fig.1).
- 2) For all cases with "Z Max" > 18, then the positioning face can be located 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.



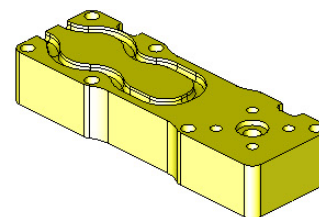
-HL-



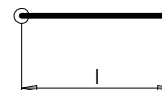
Standard
l=150-200-250-300-350-400-450 mm



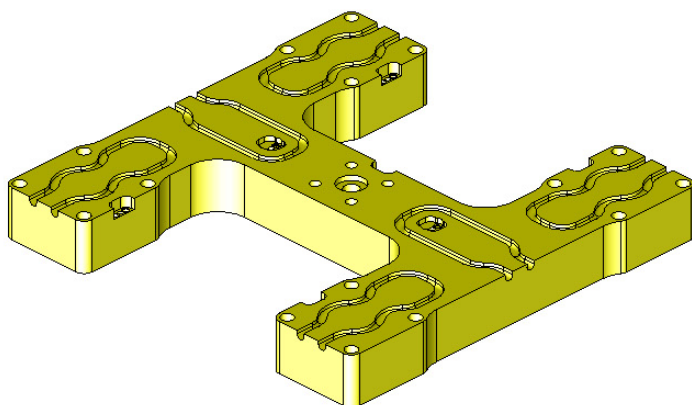
-HD-



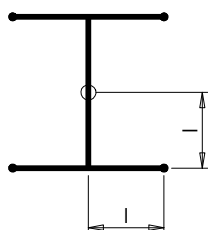
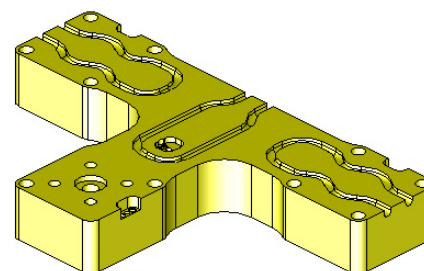
Standard
l=75-100-125-150-175-200-225 mm



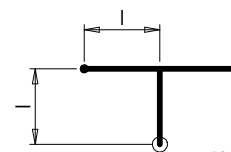
-HH-



-HT-

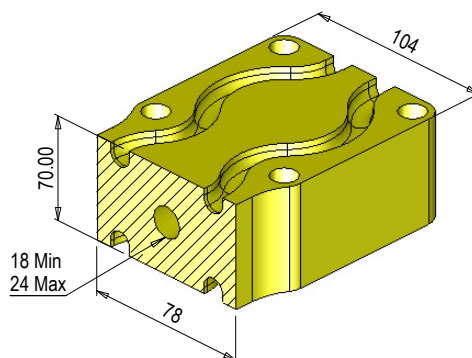


Standard
l=100-125-150 mm



Standard
l=100-125-150 mm

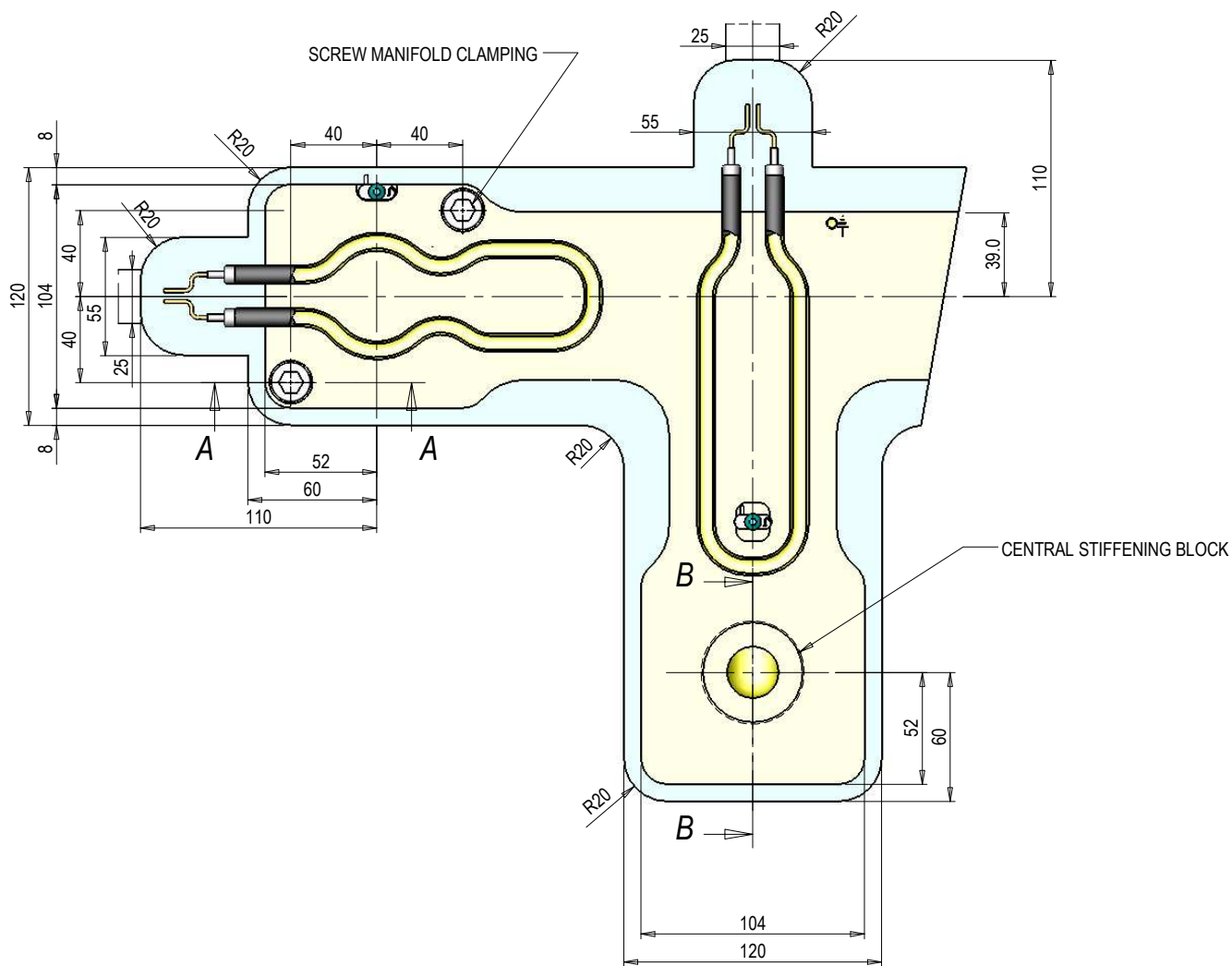
Aa series



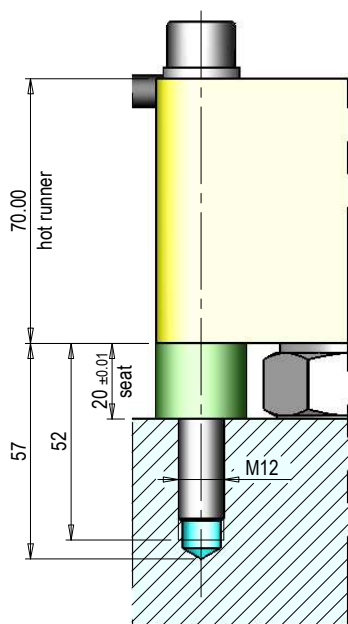
Upon request you can order hot runners with Interaxis "I" and profiles different from the above-listed ones.
Models are available both in "Classic" version and in "Fail Safe" version

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)

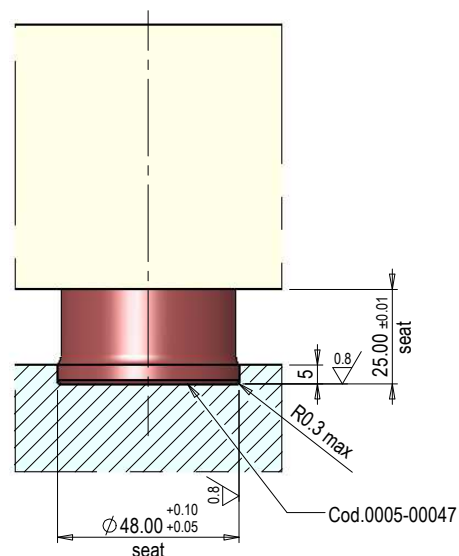


Screw manifold clamping
Screw M12x120 cl.12.9 70 Nm



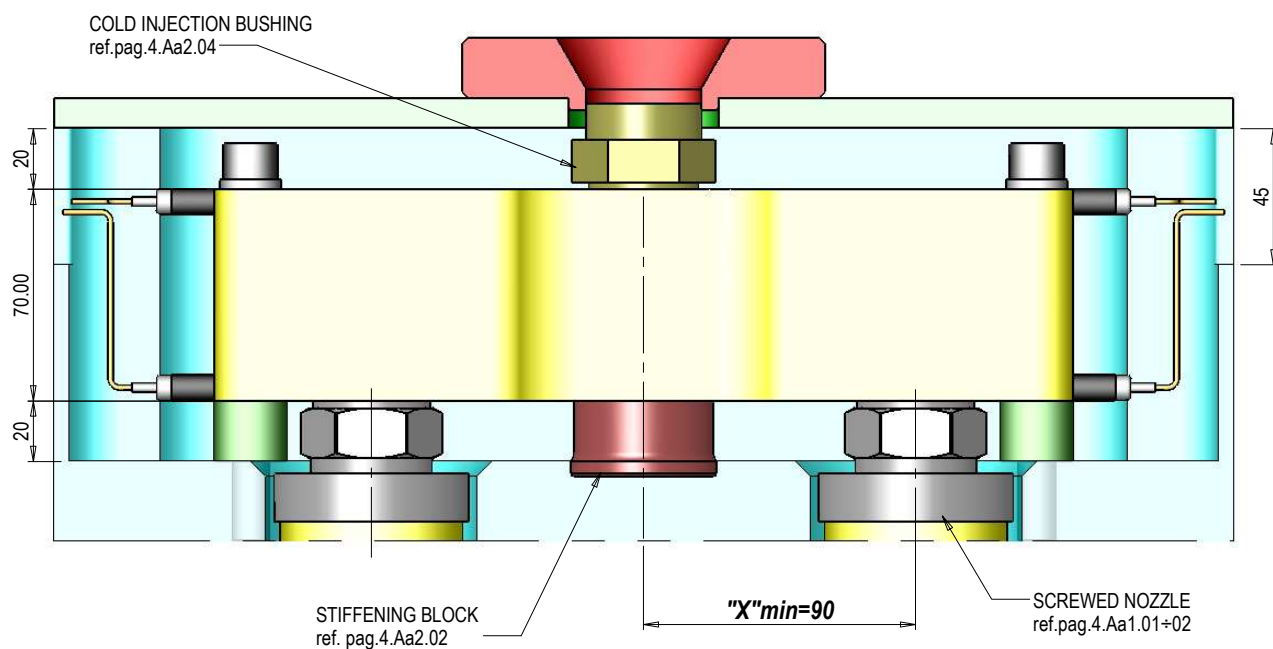
A-A

**Pocket
central stiffening block**



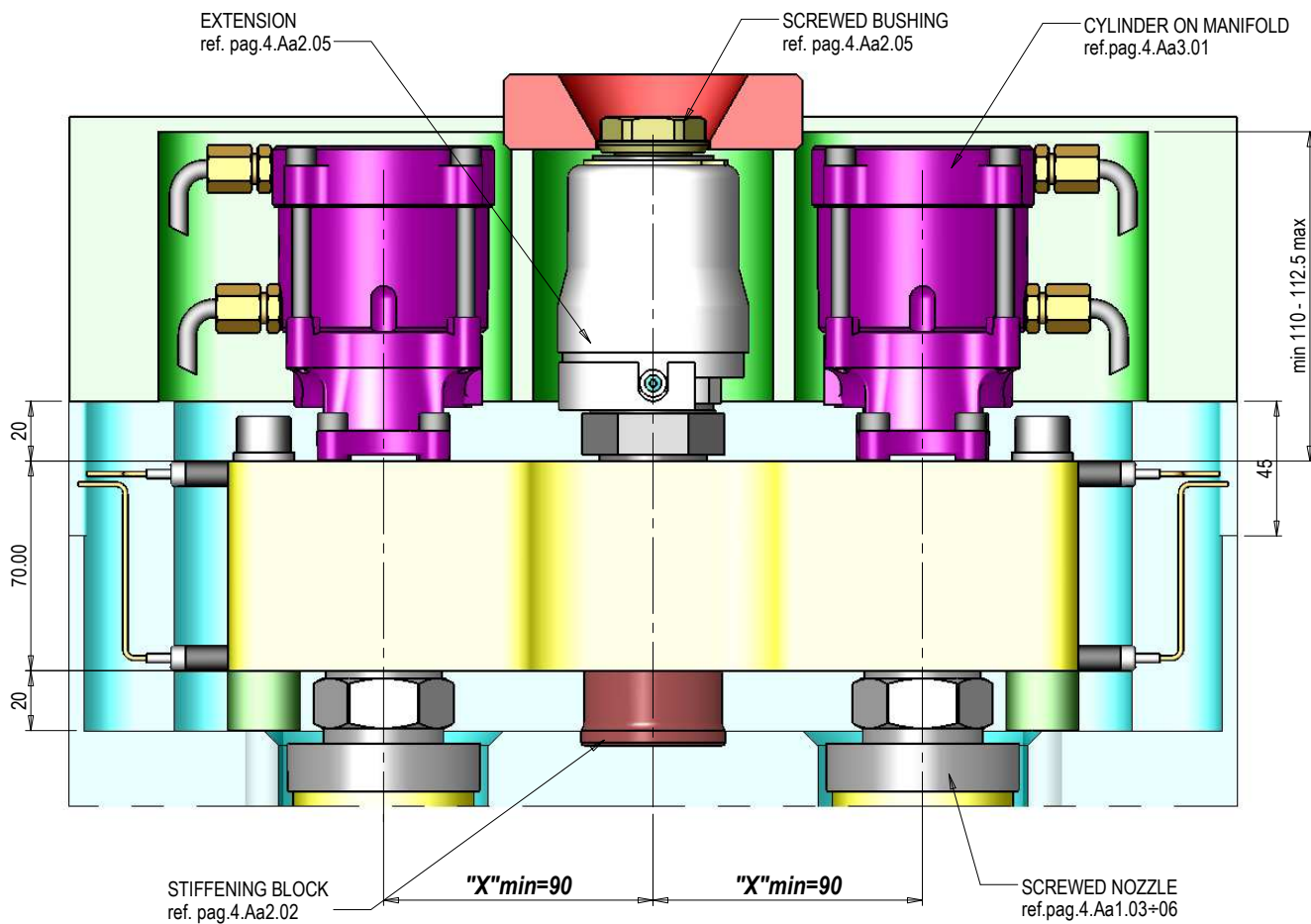
B-B

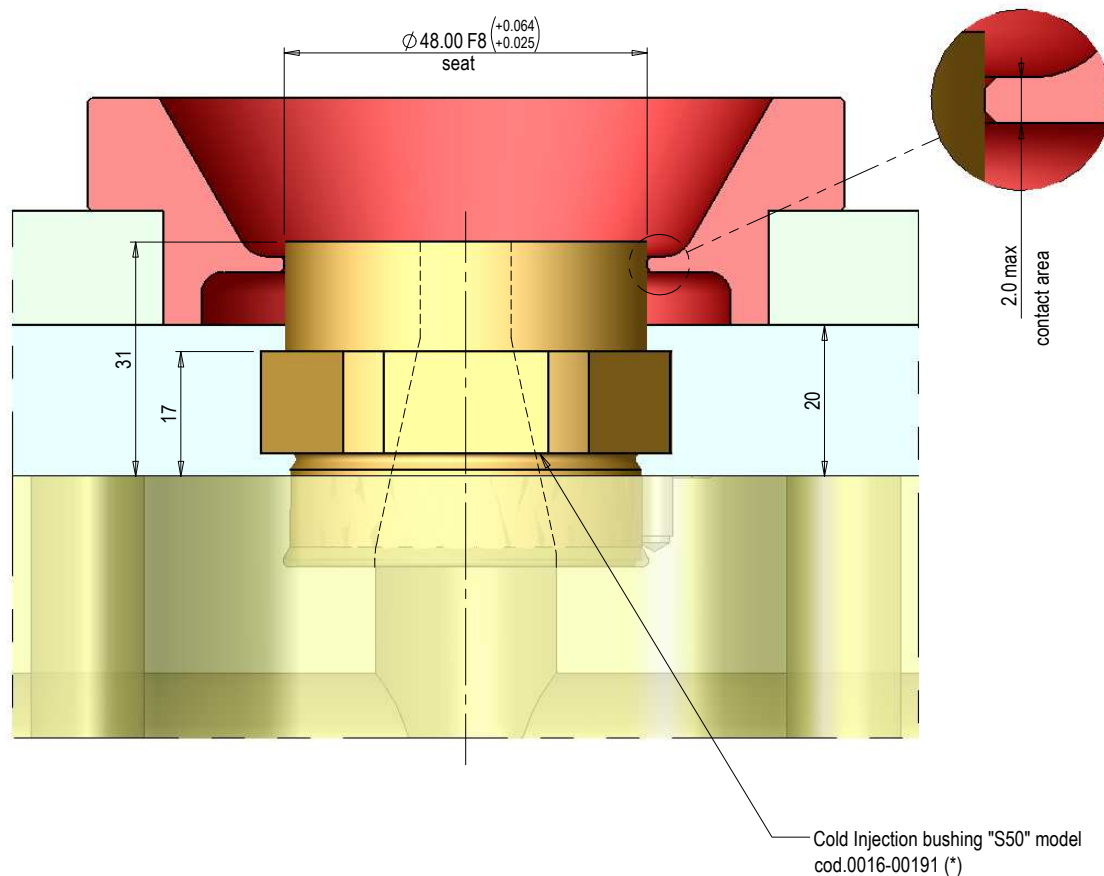
Structure for TORPEDO or FREE FLOW systems



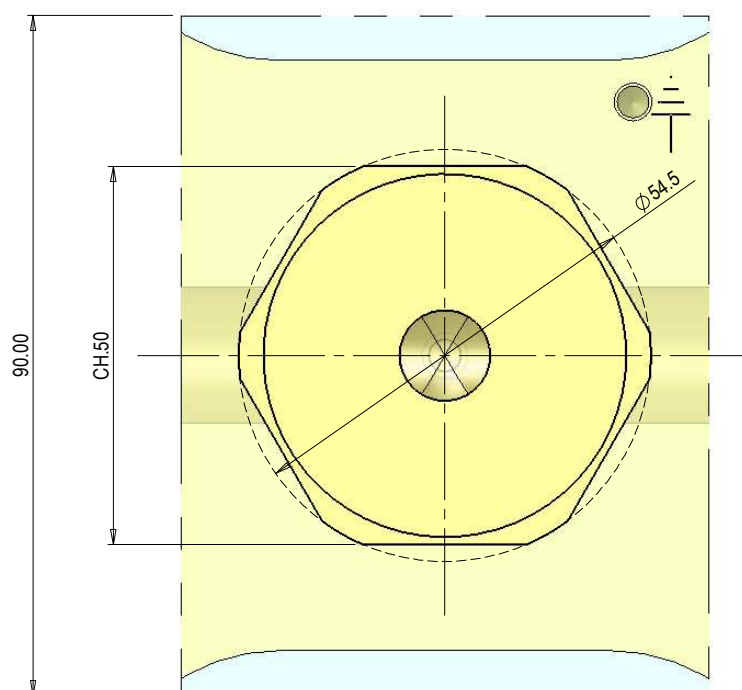
Xmin= min centre distance between injection bushing and nozzle for non standard systems

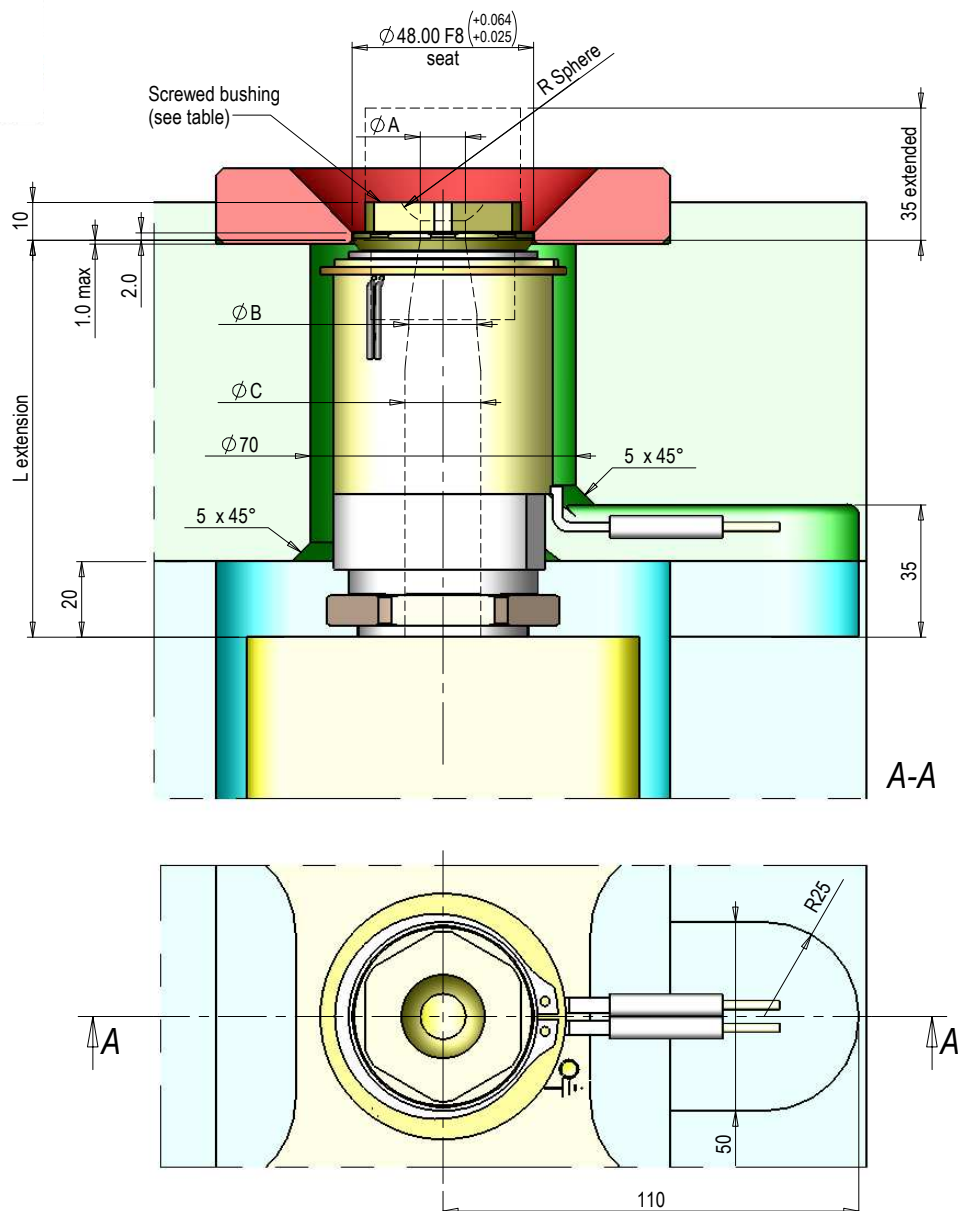
Structure for VALVE GATING systems



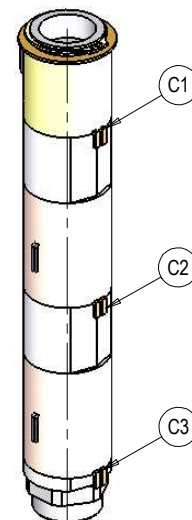


(*)Standard code with R sphere=0. Others R sphere sizes to be required.

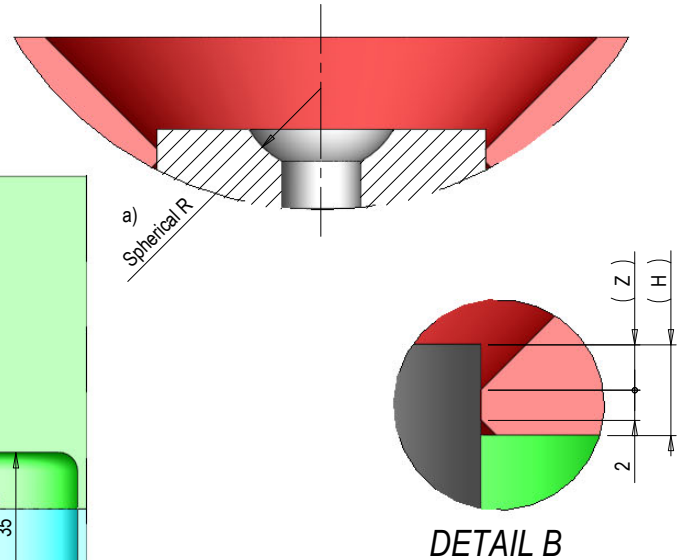
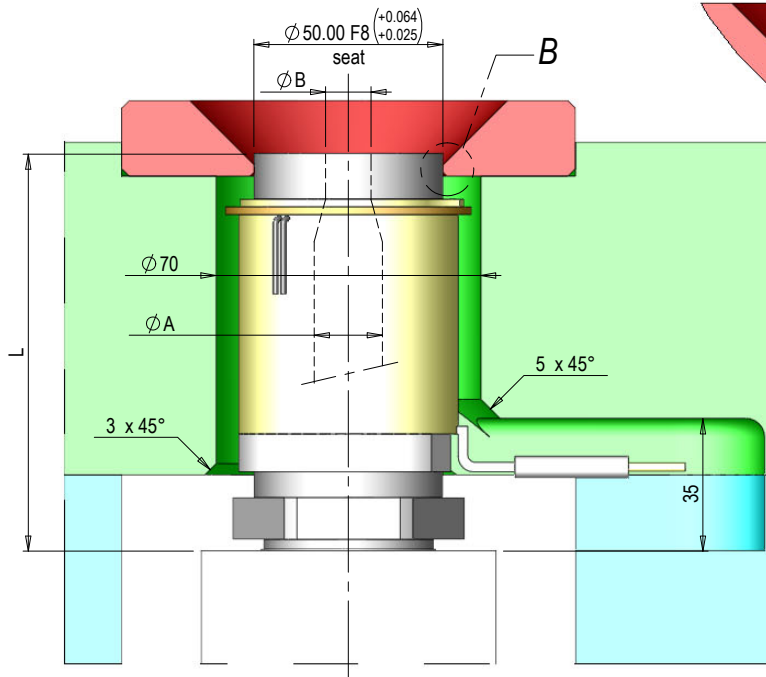




Control Zone

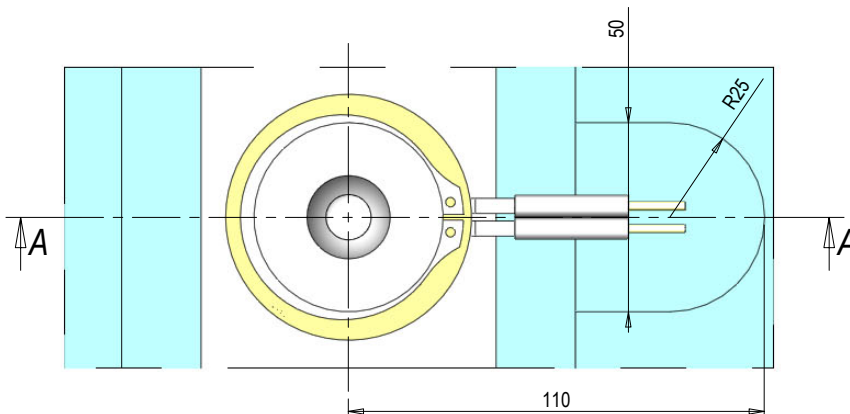


"L" (*)	MAXIMUN N° OF ZONES	STANDARD SCREWED BUSHING CODE	SPHERE RADIUS	ØA	ØB
040.00 ÷ 205.69	1 [C1]	0015-00448	R 0	12	18
205.70 ÷ 356.39	2 [C1 + C2]	0015-00462	R 12.7		
356.40 ÷ 520.00	3 [C1 + C2 + C3]	0015-00463	R 15.5		
STANDARD DIAMETERS OF EXTENSIONS DUCT (**)		0015-00464	R 19.1		
ØB	ØC	0015-00509	R 20		
18	18	0015-00465	R 25		
	20	0015-00466	R40		
	22	Extended 0015-00449 (***)	R 0	4	4
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)					



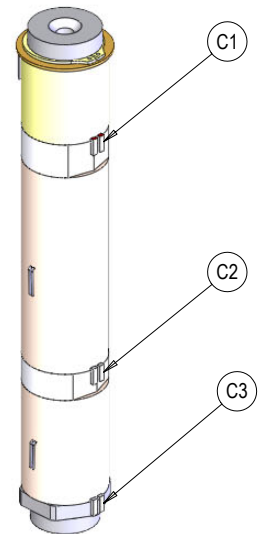
L	H	Z
35.00-54.99	3.50	1.0
55.00-555.00	max 9.0	min 3.0

A-A



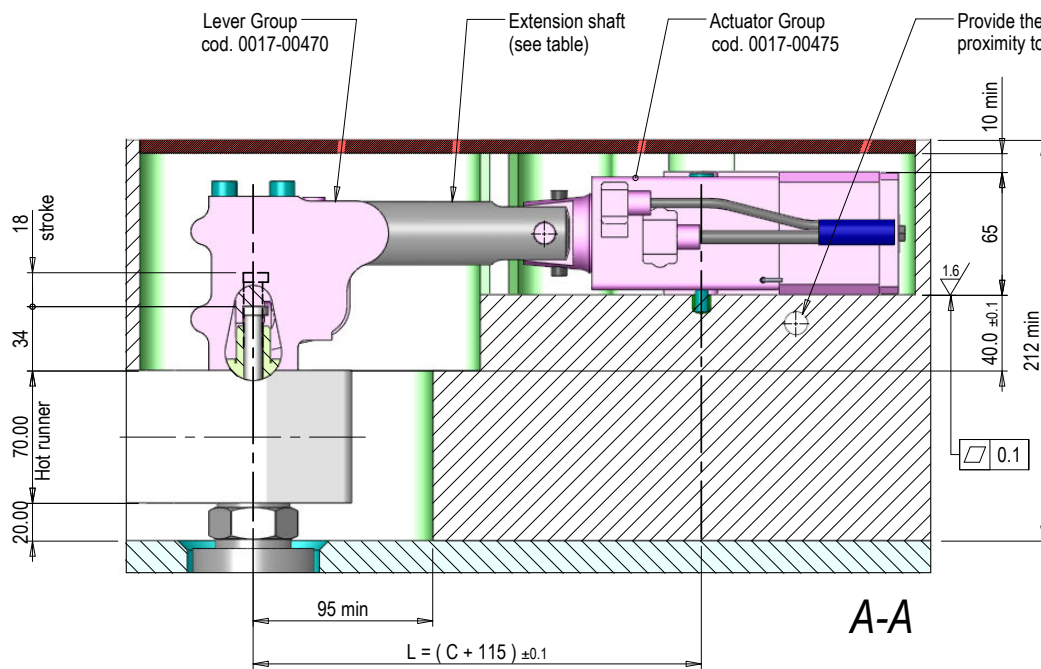
a) Standard Spherical Radius = 0, 12.7, 15.5, 19.1, 20, 25, 40 mm. Other RSphere to be required.

Control Zone



"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

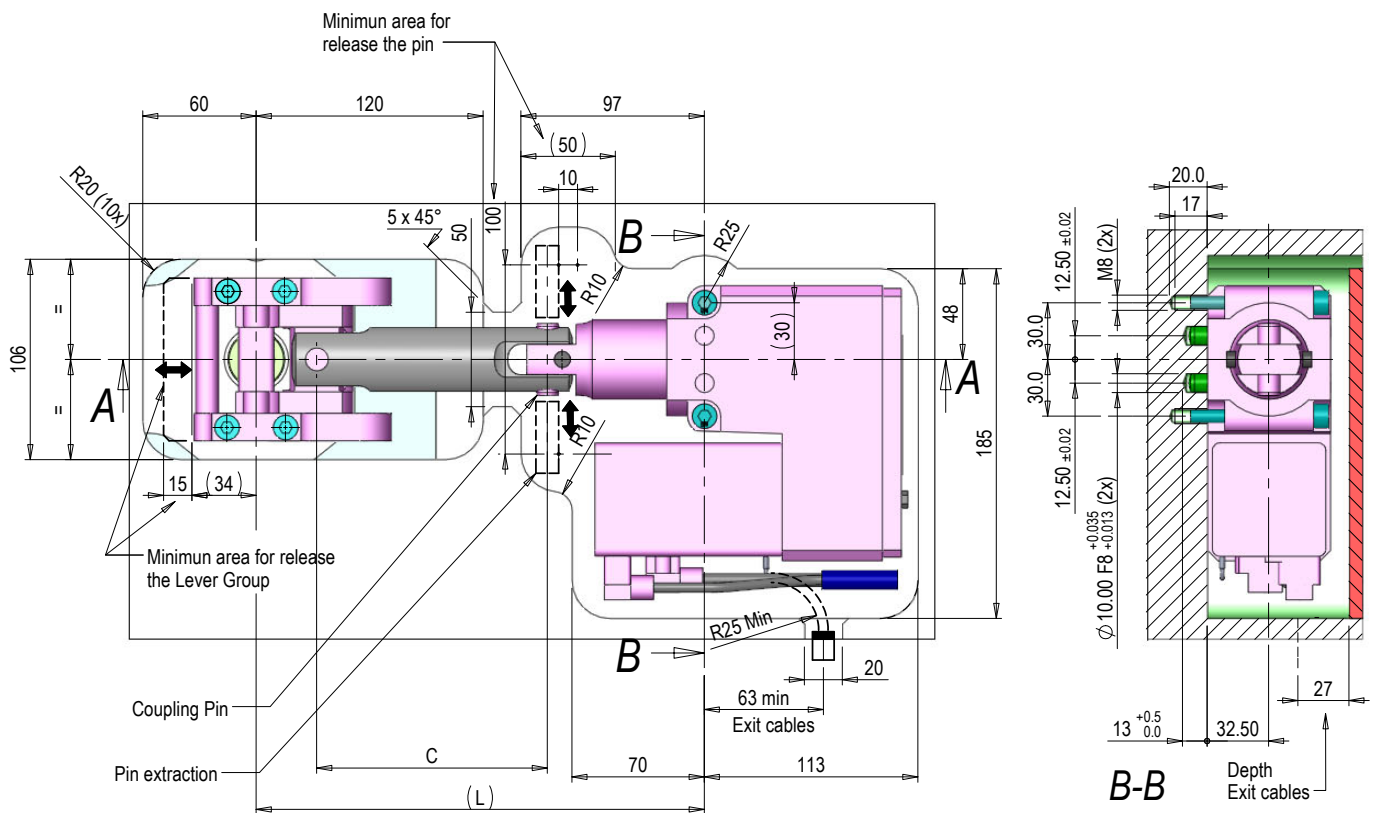
POCKET and DIMENSIONS standard



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

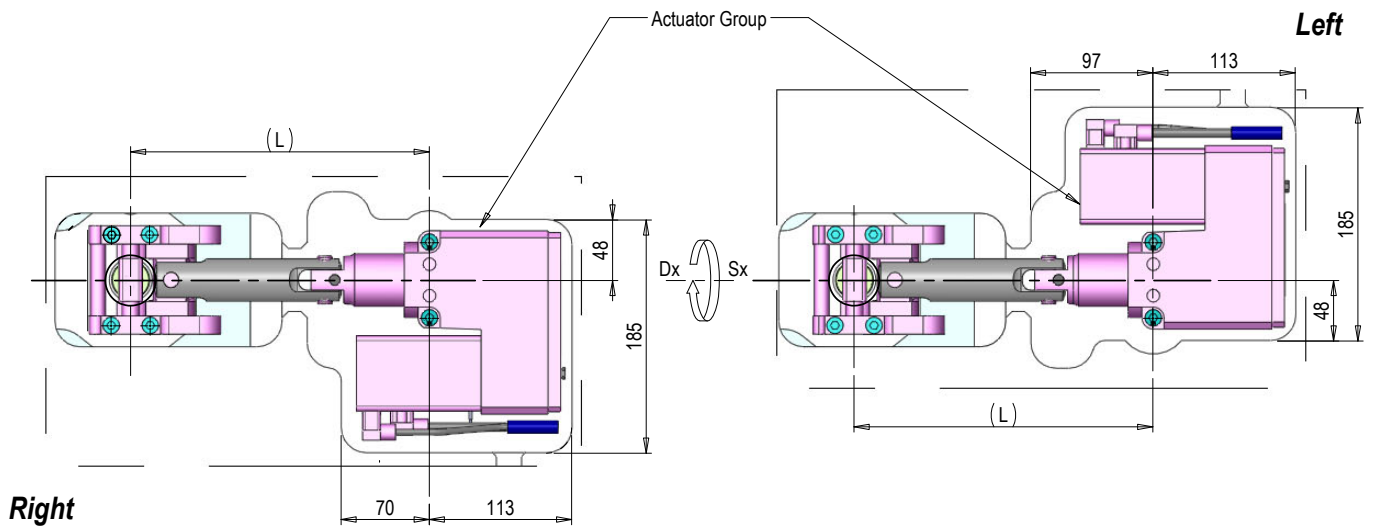
(**) Cod. 0017-00475 for the applications "Flex Flow". For the applications "FLEXflow One" is available the Actuator group cod. 0017-00472.



POSSIBLE CONFIGURATIONS

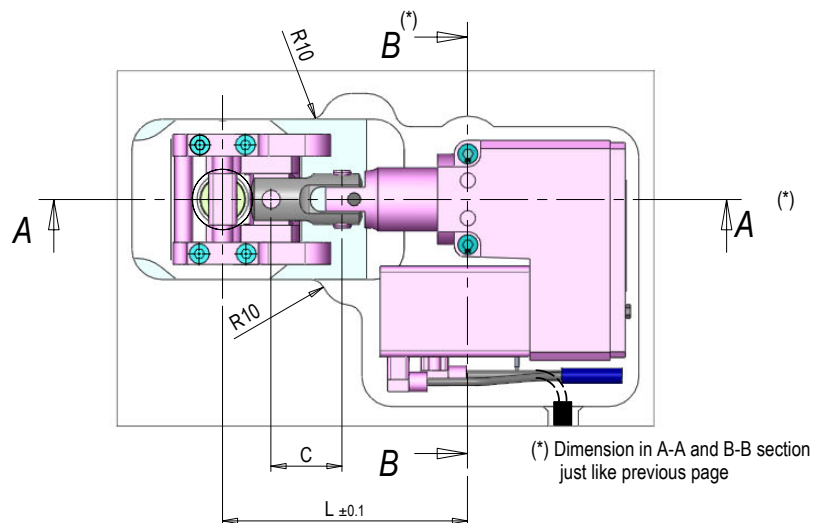
1- Right or Left Configuration

The Right or Left configuration of the electrical cylinder is obtained turning the actuator group and its pocket by 180° on the longitudinal axis



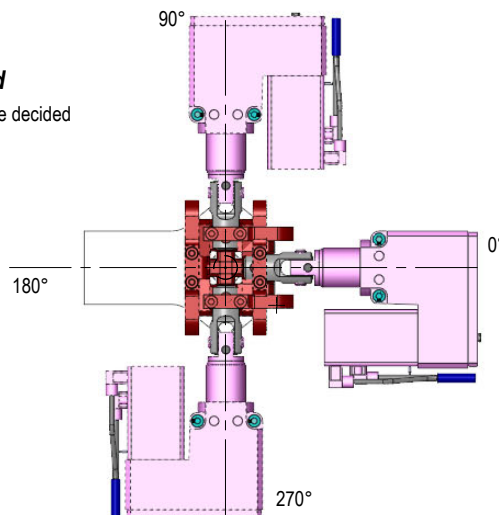
2- Configuration without Extension shaft

On limit conditions the actuator can be further approached on leverage hooking using specific extension shafts with small lengths $C=47$ or 72 mm. It is possible to use this configuration only after HRS feasibility 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.



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

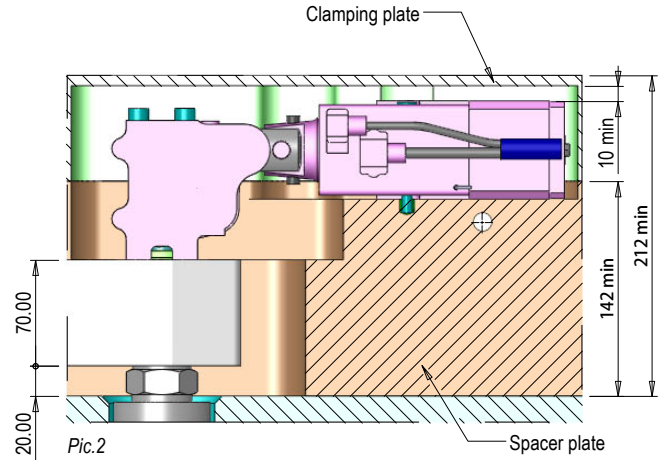
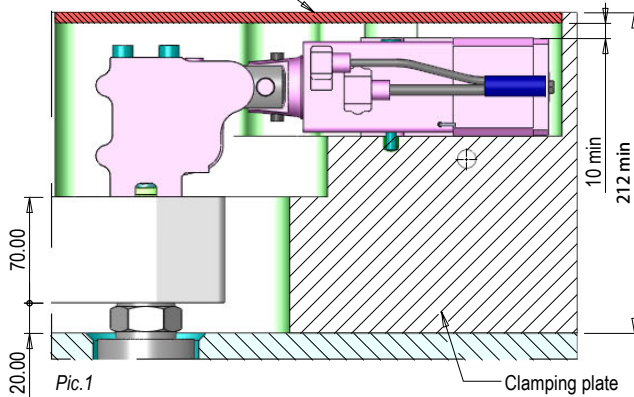


MOLD REQUIREMENTS

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:

Provide to cover the whole cylinder seat (by customer)



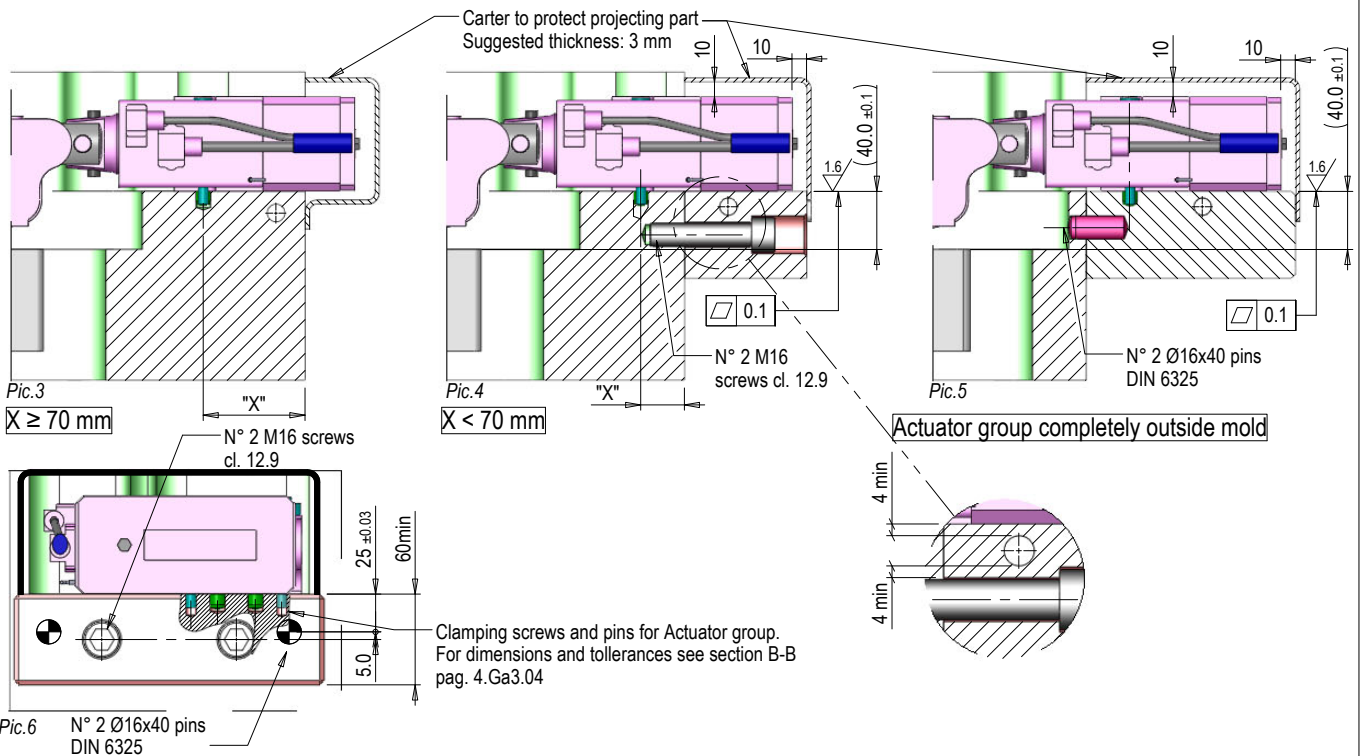
2- Cylinder protrusion from mold edge

In particular conditions, Actuator groups of electrical cylinder can be placed partially above the mold edge (Pic. 3 & 4) or completely outside (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:

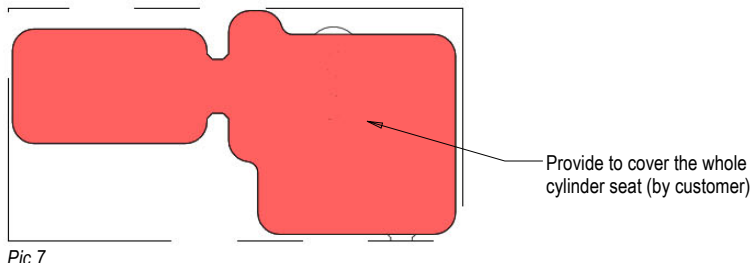
- minimum thickness 60 mm and hardness min 30 HRC;
- use N°2 M16 cl.12.9 clamping screws (Pic. 4 & 6) + N°2 cylindrical pins Ø16x40 DIN6325 (Pic. 5 & 6); in case of a single plate supporting more than one actuators in the same time it is necessary to place at least 2 M16 cl. 12.9 screws in **correspondance 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).**



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



General rules for the cooling of the plate

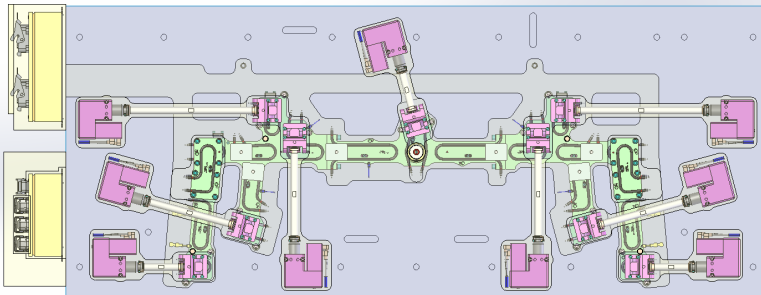
T1 (°C) = Maximum Molding temperature of polymer
T2 (°C) = Maximum Mold temperature
Tc (°C) = Coolant temperature

1- Rules for which the cooling of the plate is NOT MANDATORY

For materials with $T1 \leq 260^{\circ}\text{C}$ [500°F] and $T2 \leq 60^{\circ}\text{C}$ [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 $C=97\text{mm}$ on each actuator group (Pic.1);
- 1b- Presence of AIR VENTS on the mold (see following point 3)



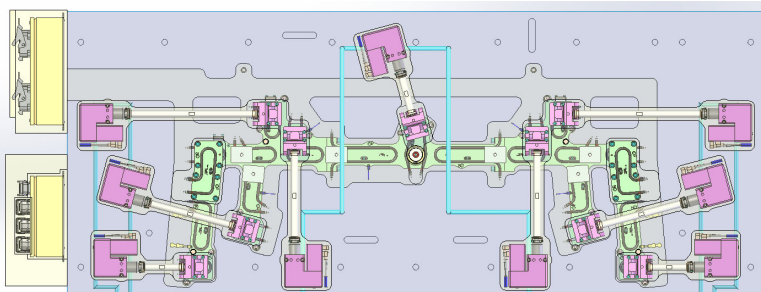
Pic.1

2- Rules for which the cooling of the plate is MANDATORY

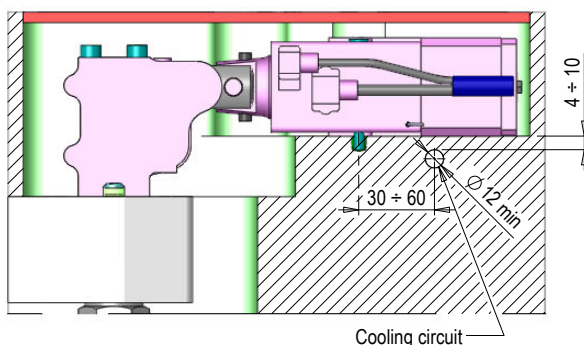
For materials with $T1 > 260^{\circ}\text{C}$ [500°F] or $T2 > 60^{\circ}\text{C}$ [140°F], cooling of the actuators' plate IS MANDATORY.

The correct cooling of the plate must include:

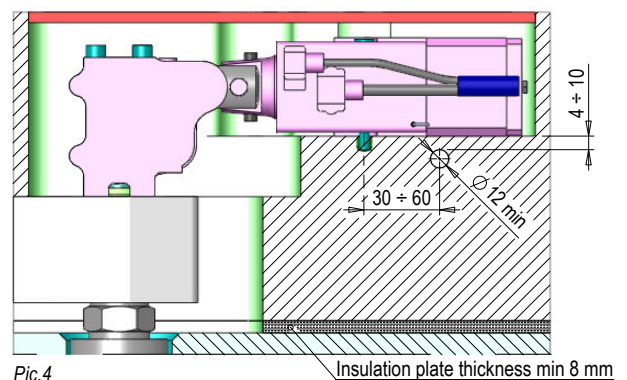
- 2a- Maximum No. 3 actuator groups can be cooled through 1 circuit (ex. Pic.2);
- 2b- Cooling circuits must be positioned in the plate right below the actuator groups as illustrated in Pic.3;
- 2c- An insulation plate with a minimum thickness of 8mm is also necessary (ex. Pic.4);
- 2d- A minimum diameter $\varnothing 12\text{mm}$ is recommended for the circuit (minimum pressure 1.5 bar);
- 2e- Maximum incoming coolant temperature for the cooling of the plate $Tc \leq 25^{\circ}\text{C}$ [77°F].



Pic.2



Pic.3



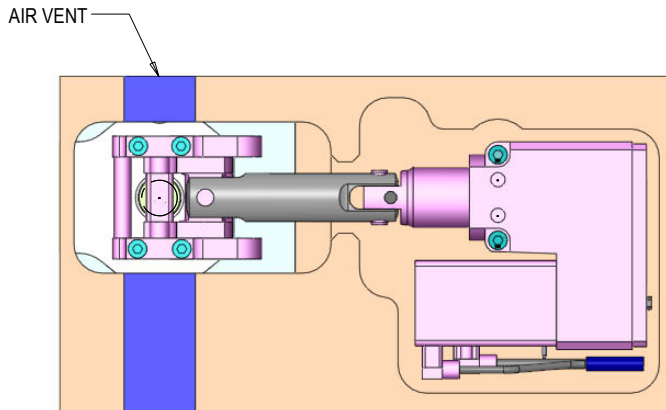
Pic.4

Insulation plate thickness min 8 mm

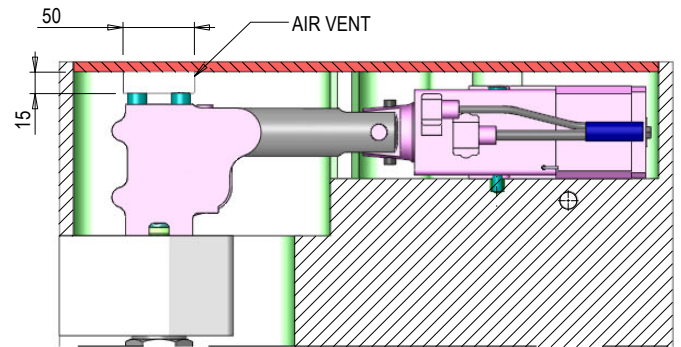
General rules for the cooling of the plate**3- Air vents**

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

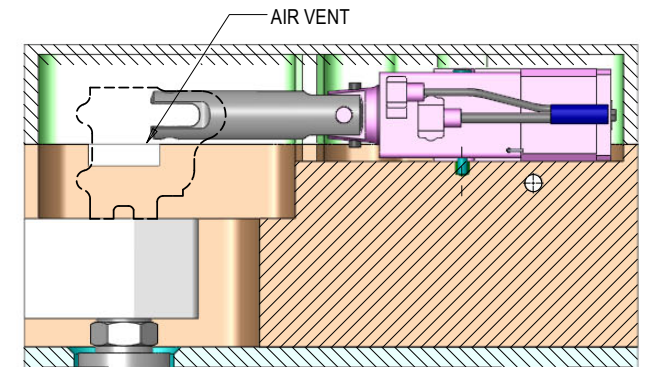
- The air vents must through the plate from bottom mold to top mold near the lever group (Pic.5/6/7)
- Avoid hot air exit from vents near electrical boxes eventually present on top mold.
- The minimum dimensions requested for Air vents are: 50mm (width) x 15mm (depth)



Pic.5



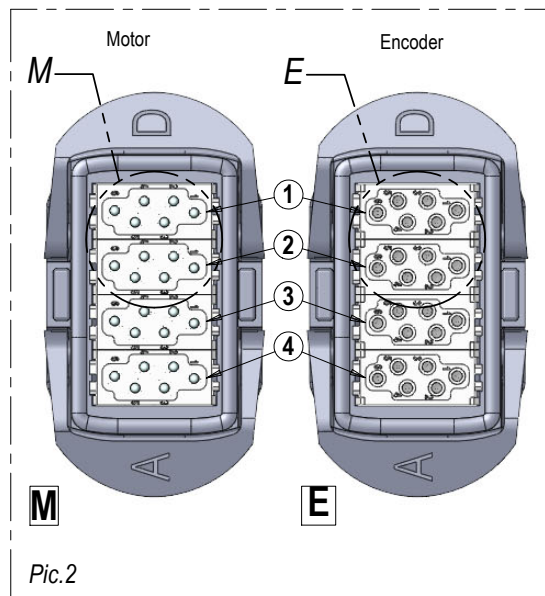
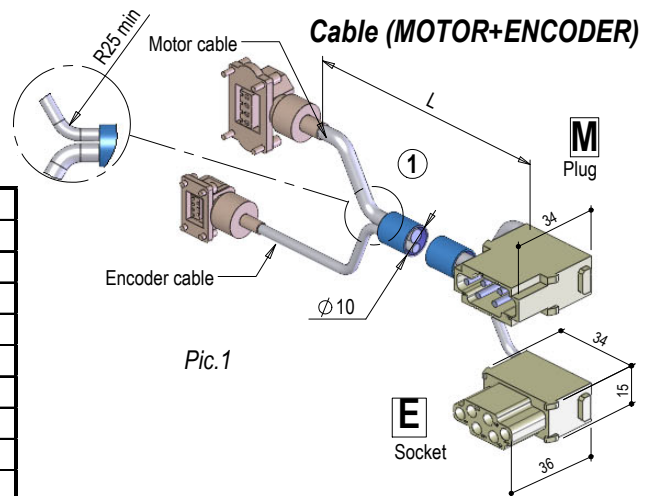
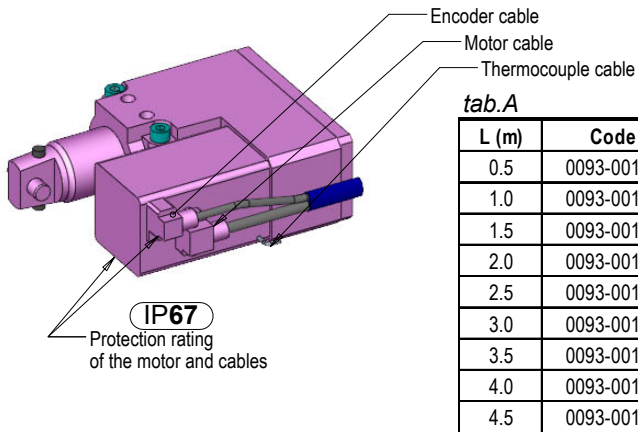
Pic.6



Pic. 7

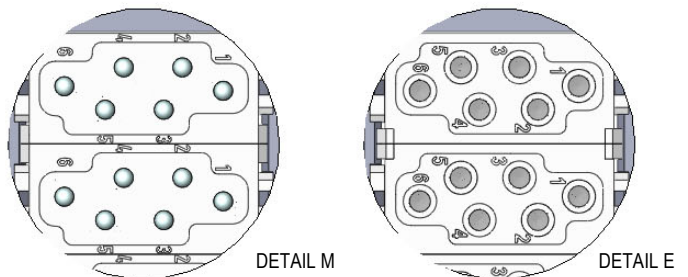
Electrical specification for FLEXflow

Every actuator group is electrically powered through a couple of cables (ENCODER+MOTOR). For cable codes with available lengths see table "A". The cable is supplied separated from the group; its length 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).

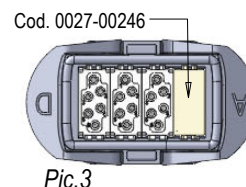


NOTES:

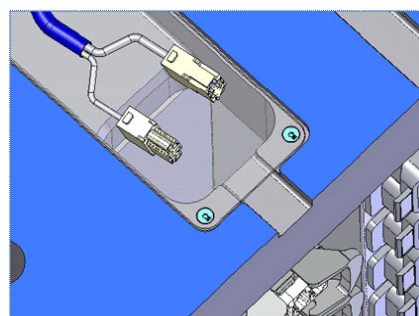
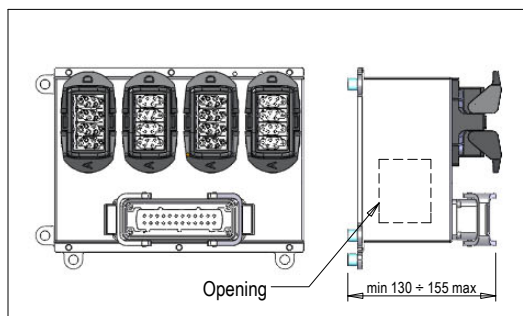
- 1) The Plug and Socket of the same cable must be put in their housing with the same sequence (Pic.1 & 2)



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



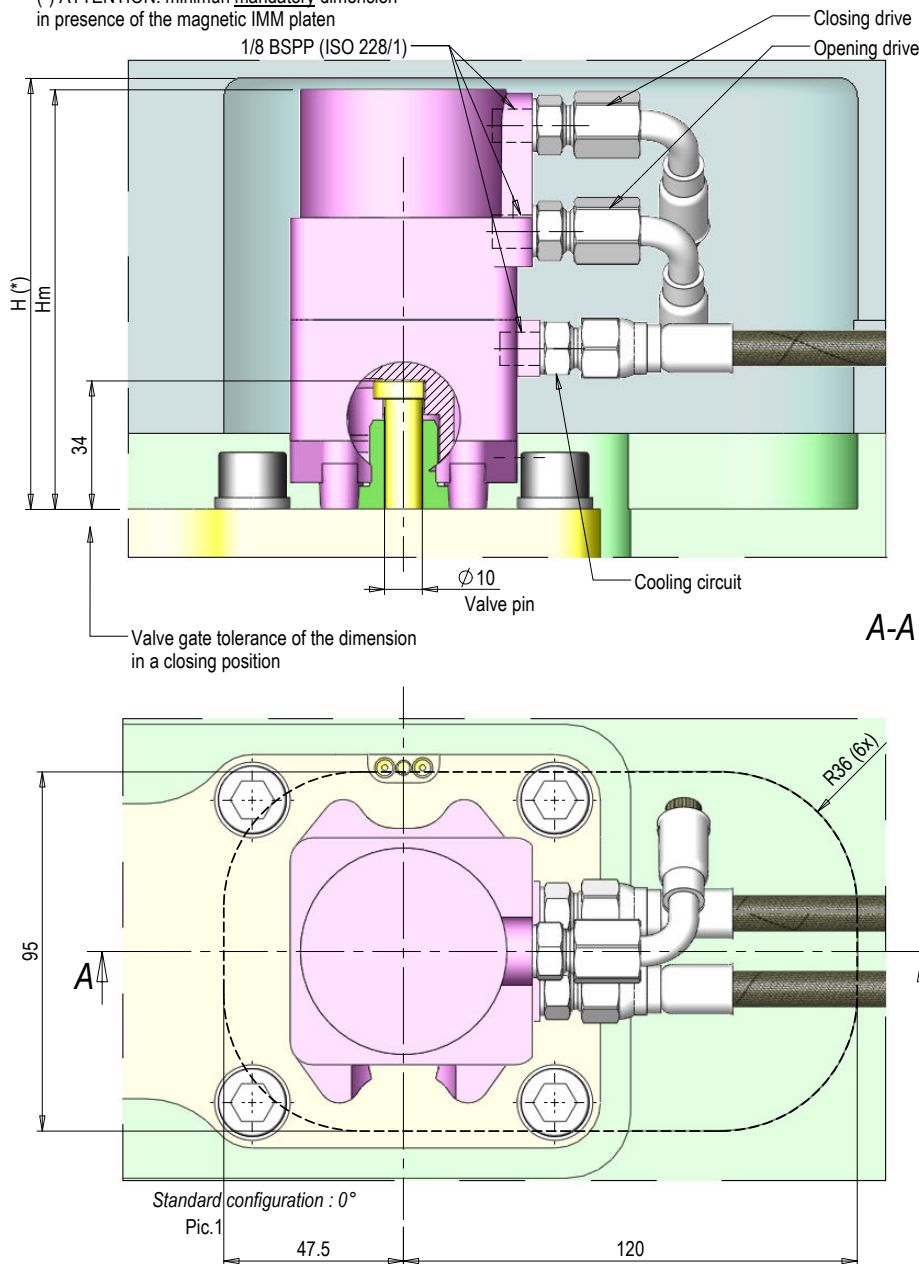
- 3) ENCODER+MOTOR cable (Pic.1) is provided yet wired. Openings on electrical box (supplied by HRS) or forced groove on the mold must take into consideration enough clearance for the connectors (see pic. 4-5)



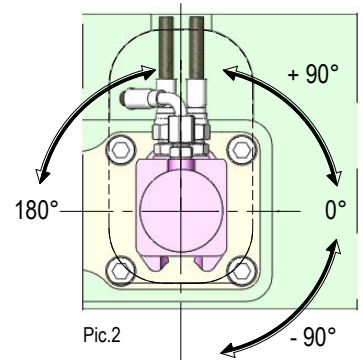
Hydraulic Cylinder: bore 42 mm - stroke 18 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

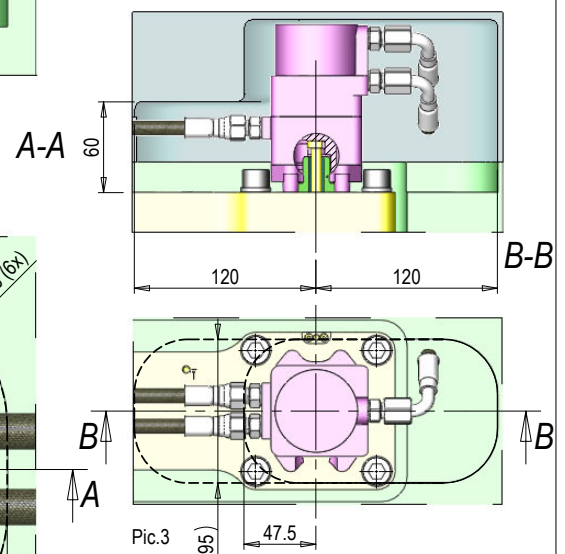
(*) ATTENTION: minimum mandatory dimension
in presence of the magnetic IMM platen



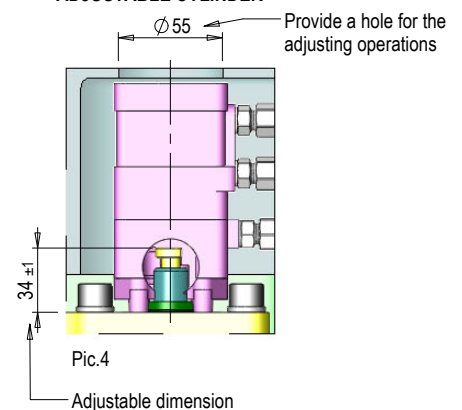
b) POSSIBLE ORIENTATIONS OF
THE COUPLINGS



ALTERNATIVE POSITIONS OF
THE COOLING CIRCUIT



ADJUSTABLE CYLINDER



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.

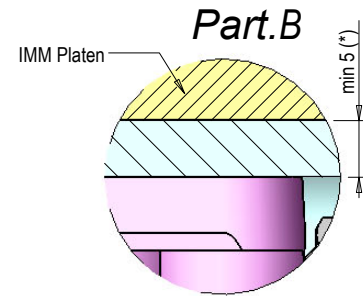
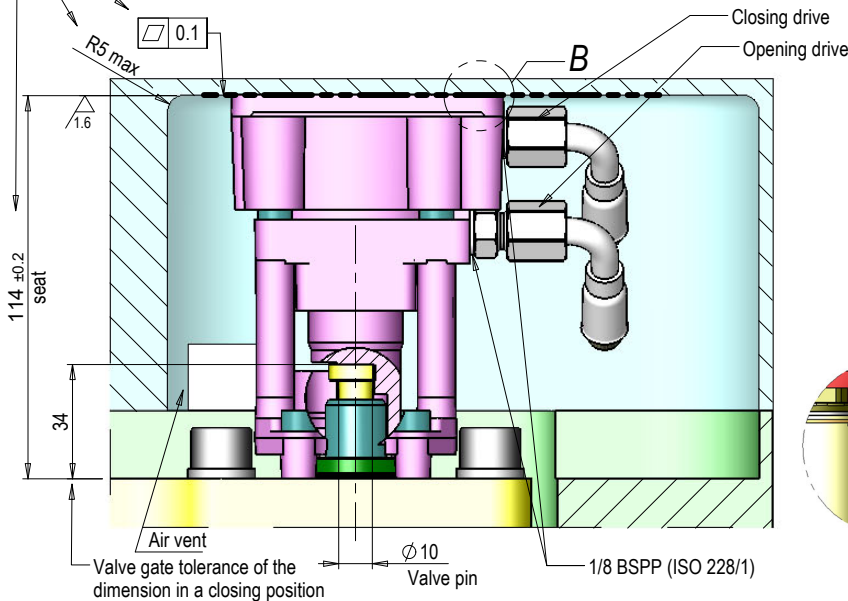
NOTE FOR THE ADJUSTABLE CYLINDER

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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1.

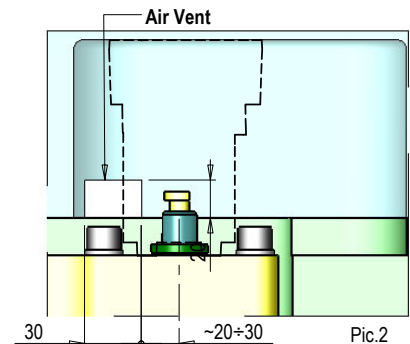
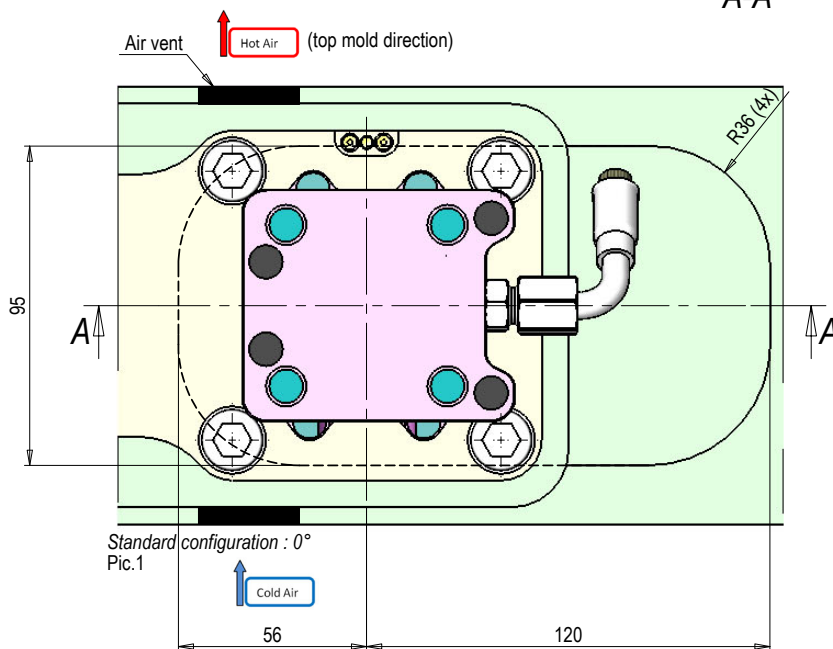
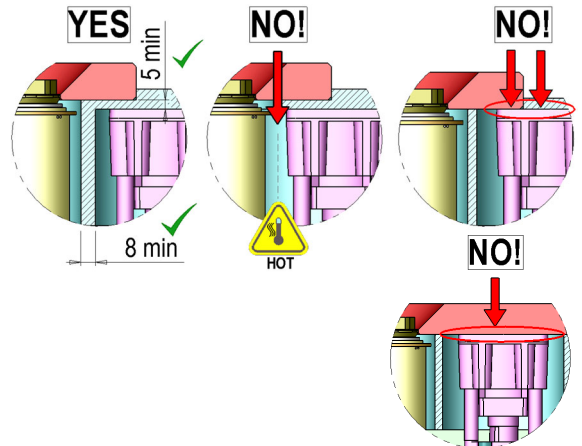
Hydraulic Cylinder: bore 42 mm - stroke 18 mm - passive cooling (HRS COOL)

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 continuous**. The seat's tolerances must be respected!

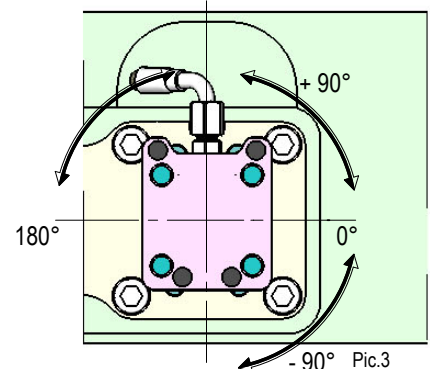


(*) ATTENTION: 5 mm minimum mandatory dimension. In presence of the magnetic IMM Platen increase dimension to "minimum 30 mm".

WARNINGS FOR THE SEAT CONSTRUCTION



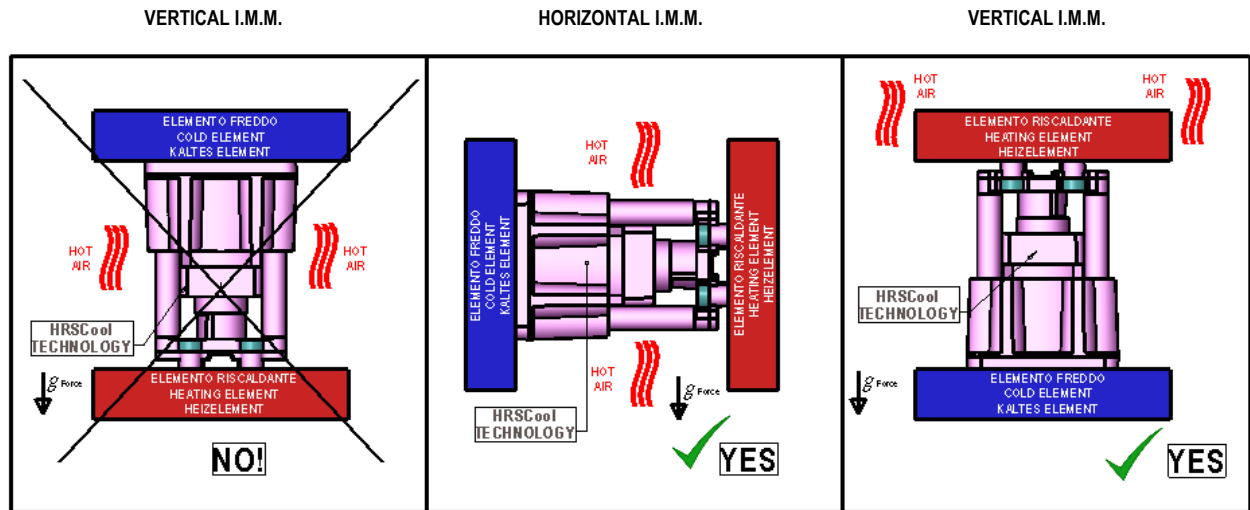
a) POSSIBLE ORIENTATIONS OF THE COUPLINGS



follow
➔

a) Alternative 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



Pic.4

System requirements ():**

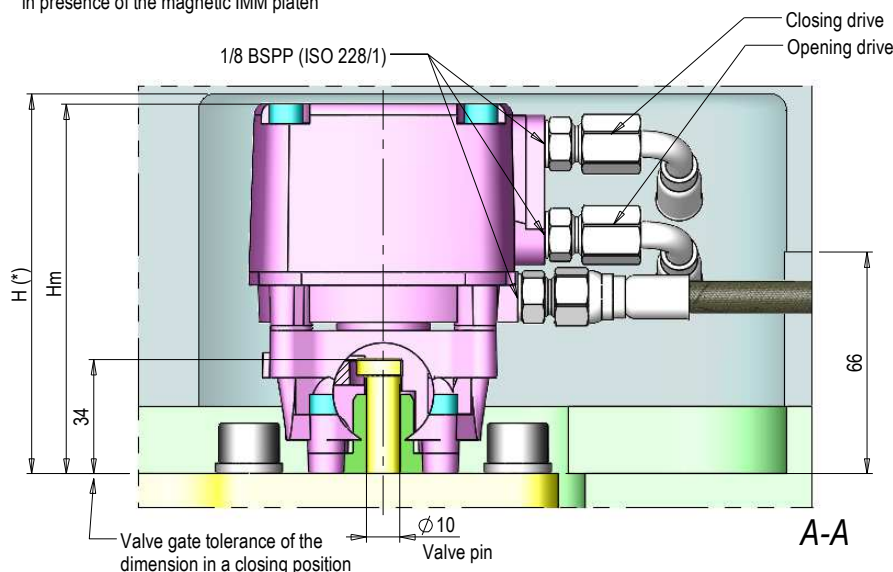
- 1- Maximum temperature allowed: T hot runner manifold: max 280°C [536°F] - T mold: max 60°C [140°F].
- 2- In case of cylinder plate temperature is higher than 60°C [140°F], it is mandatory to cool it at the temperature ≤ 60°C [140°F].
- 3- Working PRESSURE: HYDRAULIC max 80 BAR (absolute value).
The 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 HRS COOL 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.

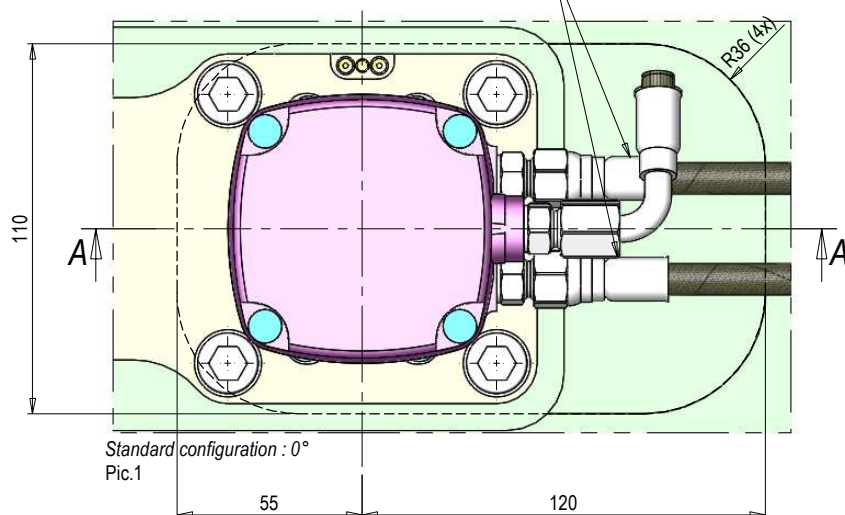
Pneumatic Cylinder: bore 70 mm - stroke 18 mm

a) Working PRESSURE: AIR max 12 BAR

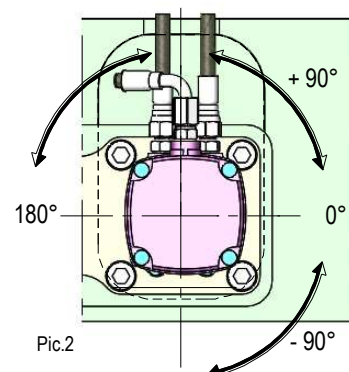
(*) ATTENTION: minimum mandatory dimension in presence of the magnetic IMM platen



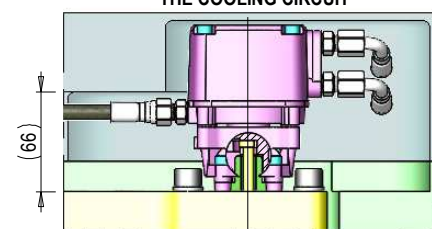
Cooling circuit (optional in some versions)
See note "General rules for the cooling"



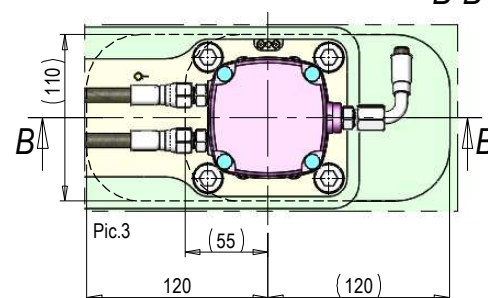
b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



B-B



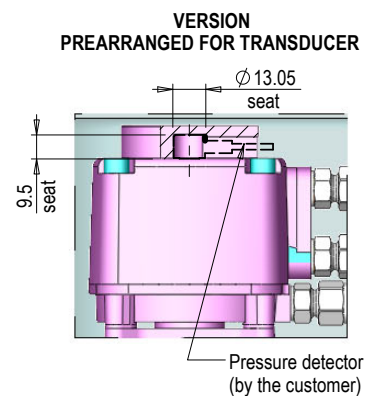
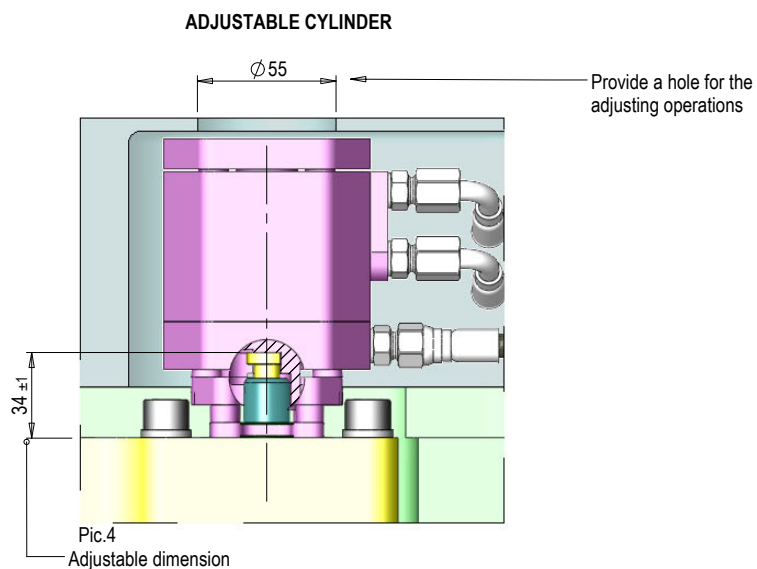
CODE	VERSION	COOLED	DAMPENED	COMPLETE GASKET SET	Hm	H
0017-00961	(standard)	✓	✗	0038-00133	110	113
0017-00962		✗	✗			
0017-00964		✓	✓	0038-00134		
0017-00965		✗	✓			
0017-00967	WITH 1 END OF STROKE	✓	✗	0038-00135	130.5	133.5
0017-00971		✓	✓	0038-00136		
0017-00969	WITH DOUBLE END OF STROKE	✓	✗	0038-00135	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 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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1.



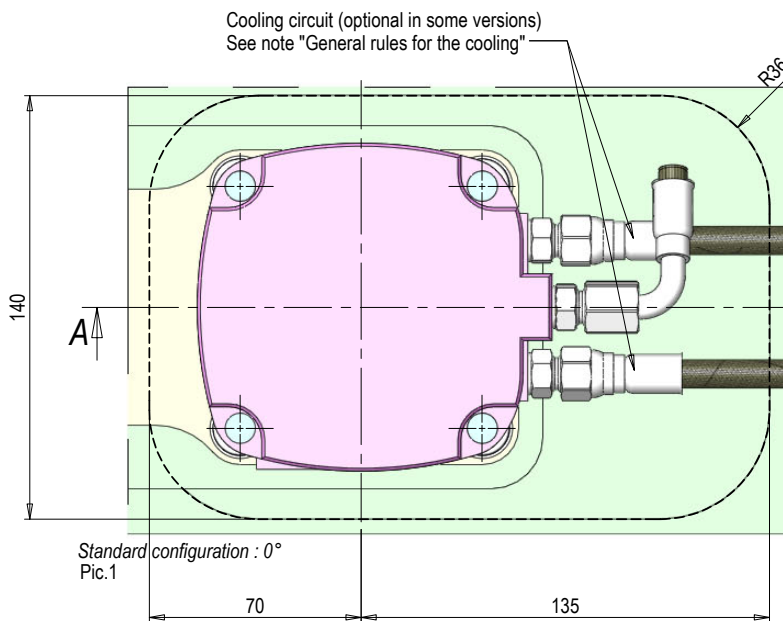
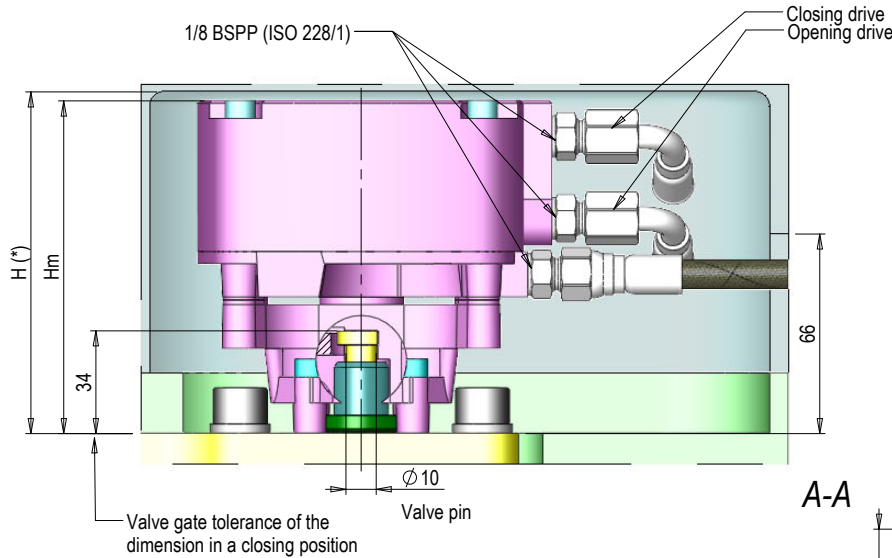
NOTE FOR THE ADJUSTABLE CYLINDER

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.

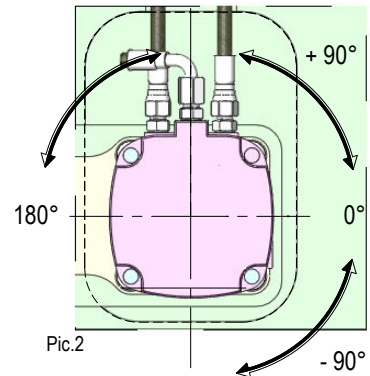
Pneumatic Cylinder: bore 100 mm - stroke 18 mm

a) Working PRESSURE: AIR max 12 BAR

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

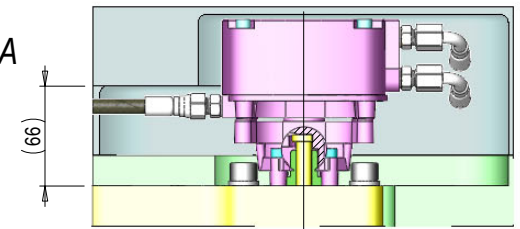


b) POSSIBLE ORIENTATIONS OF THE COUPLINGS

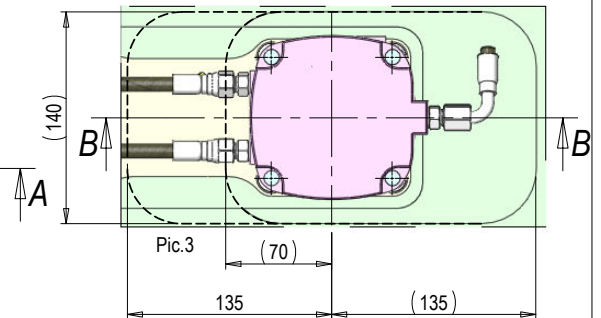


ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT

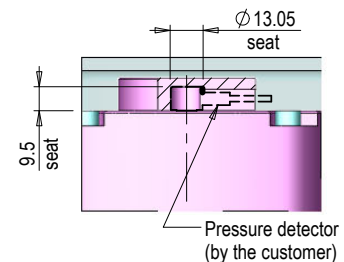
A-A



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

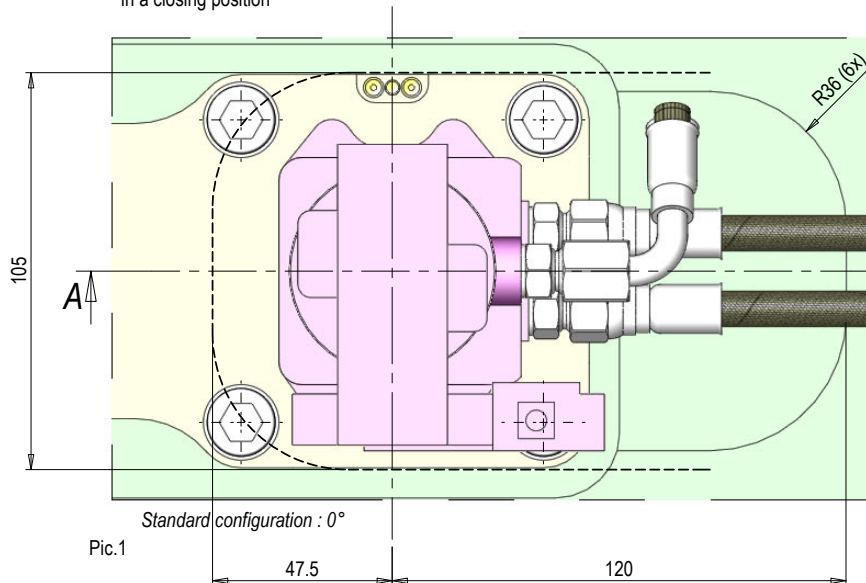
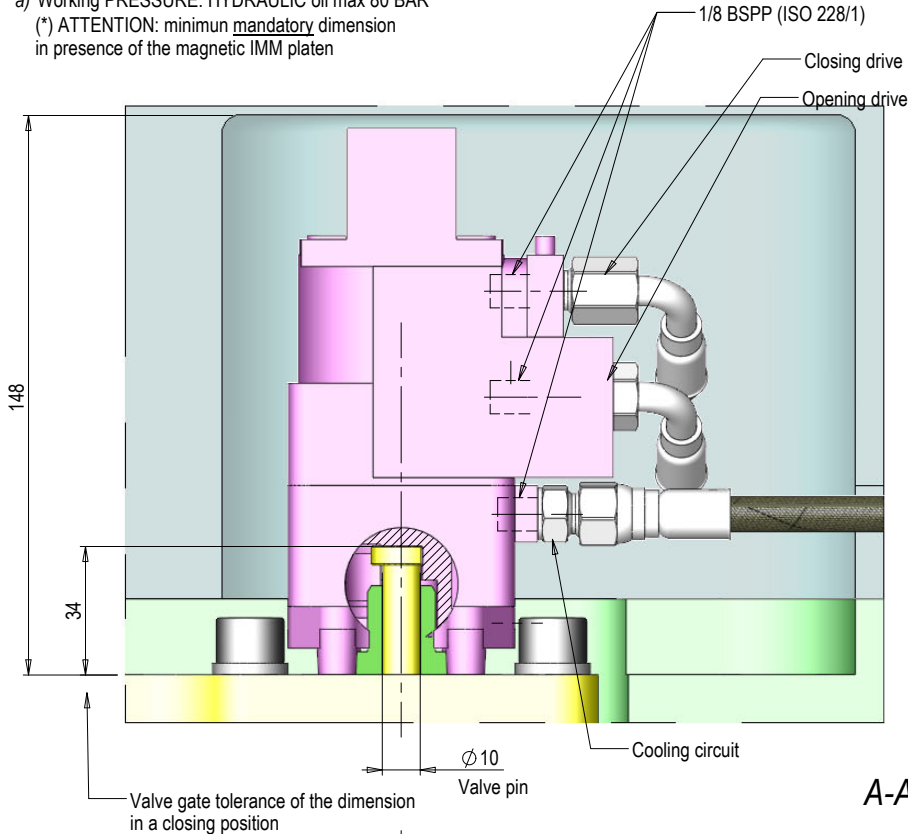
- Versions with optional cooling: is NOT MANDATORY to cooling the cylinder in presence of T1 ≤ 280°C [536°F] and T2 ≤ 80°C [176°F]
 - Versions with end of stroke: cooling ALWAYS MANDATORY with T1 ≥ 200°C [392°F].
 - During the shutdown phase of the HRS system, the cooling circuit of the cylinder can 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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1.

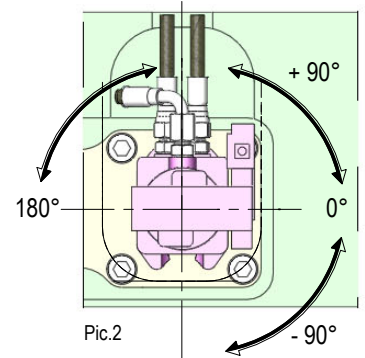
Hydraulic Cylinder: bore 42 mm - stroke 18 mm - COOLED

a) Working PRESSURE: HYDRAULIC oil max 80 BAR

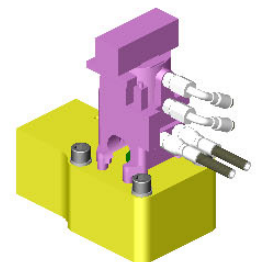
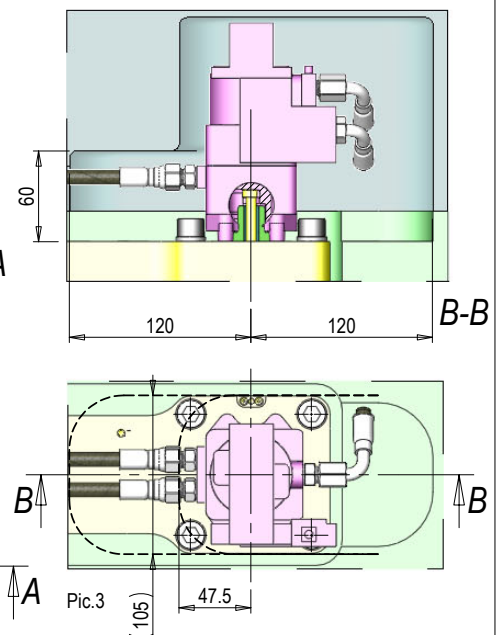
(*) ATTENTION: minimum mandatory dimension
in presence of the magnetic IMM platen



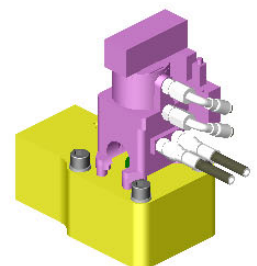
b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



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.

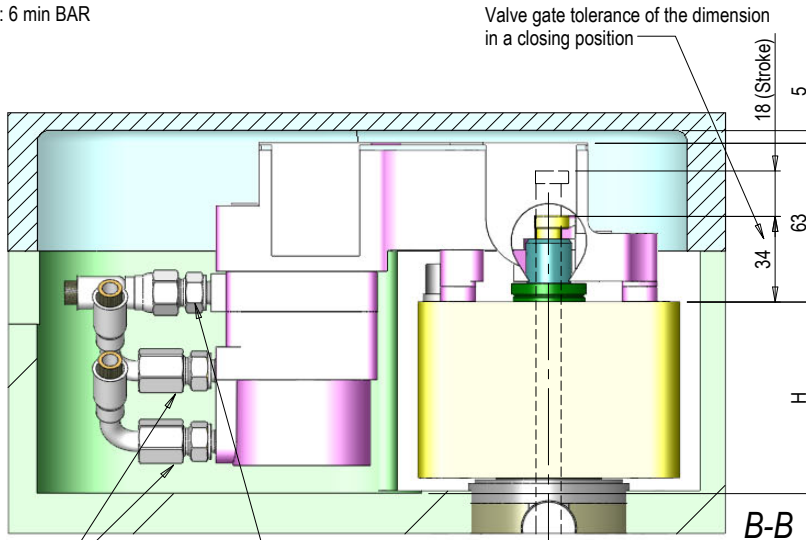
- a) The working pressure below is only for reference: for the correct choice of maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
 b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1.

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

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

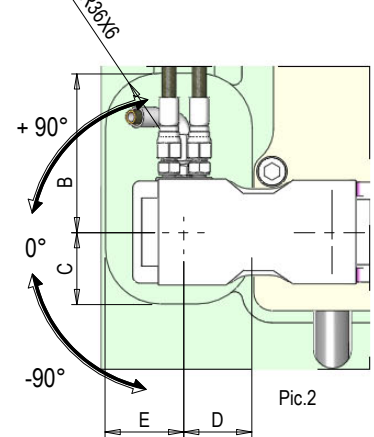
Working PRESSURE:
OIL: 40 max BAR
PNEUMATIC: 6 min BAR

Valve gate tolerance of the dimension
in a closing position

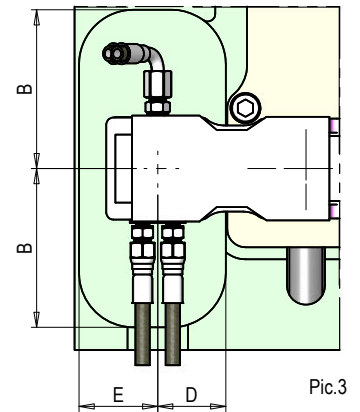


Opening drive
Closing drive
Cooling circuit (optional in some versions)
See note "General rules for the cooling"

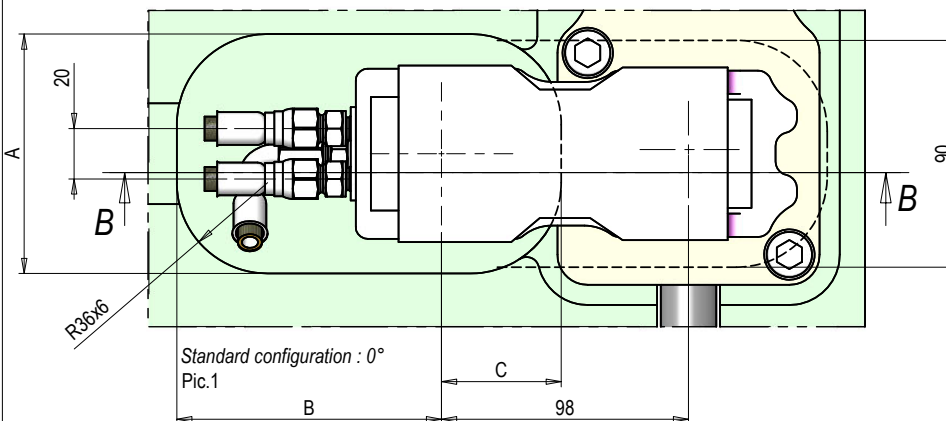
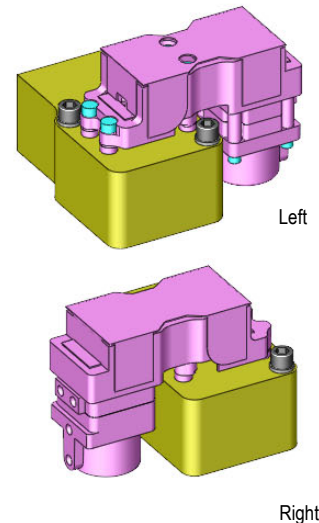
b) POSSIBLE ORIENTATIONS OF THE COUPLINGS



ALTERNATIVE POSITIONS OF THE COOLING CIRCUIT



POSSIBLE ORIENTATIONS CYLINDER ON MANIFOLD

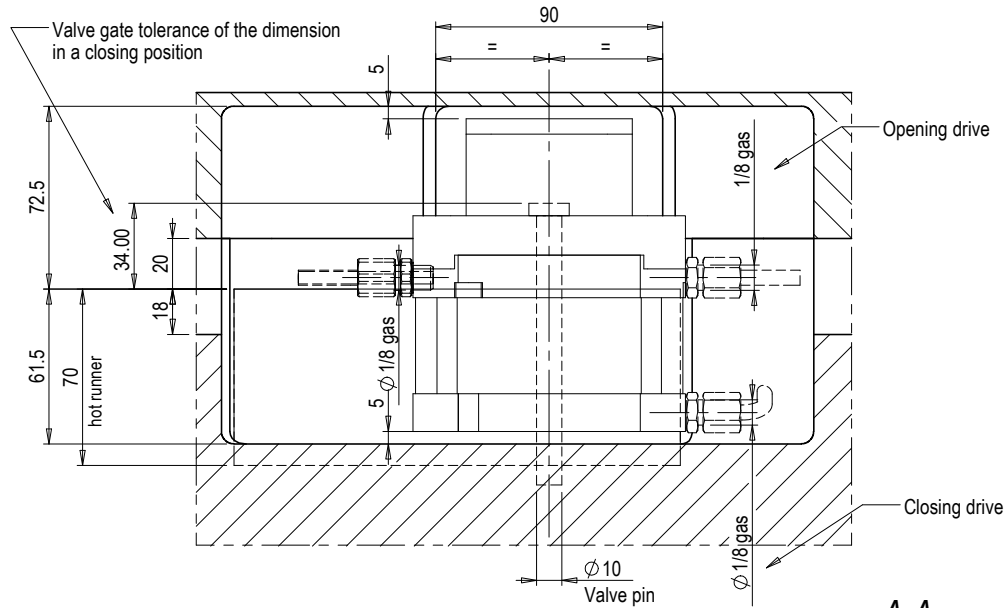


CODE	WORKING	DESCRIPTION	COOLED	COMPLETE GASKET SET	SEAT						
					A	B	C	D	E	H	
0017-01152	OIL	(standard)	✓	0038-00102	95	105	47.5	45	52	70	
0017-01154		WITH 1 END OF STROKE	✓	0038-00107						90	
0017-01156		WITH DOUBLE END OF STROKE	✓							95	
0017-00869	AIR	(standard)	✓	0038-00133	110	120	55	55	55	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			✗								

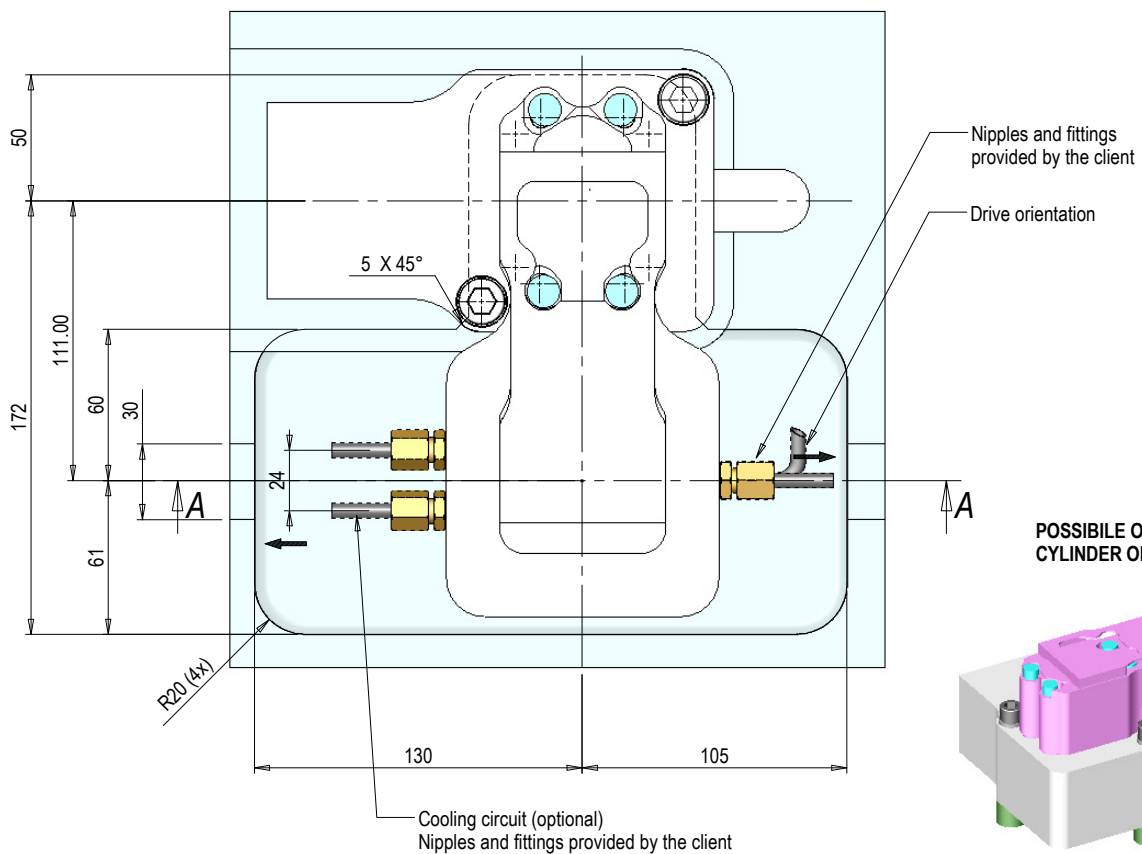
GENERAL RULES FOR THE COOLING

- Pneumatic 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. Right
 - 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.

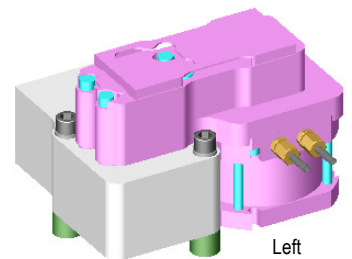
- a) The working pressure below is only for reference: for the correct choice of maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;
b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1.



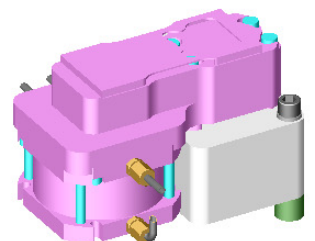
A-A



**POSSIBLE ORIENTATIONS
CYLINDER ON MANIFOLD**



Left



Right

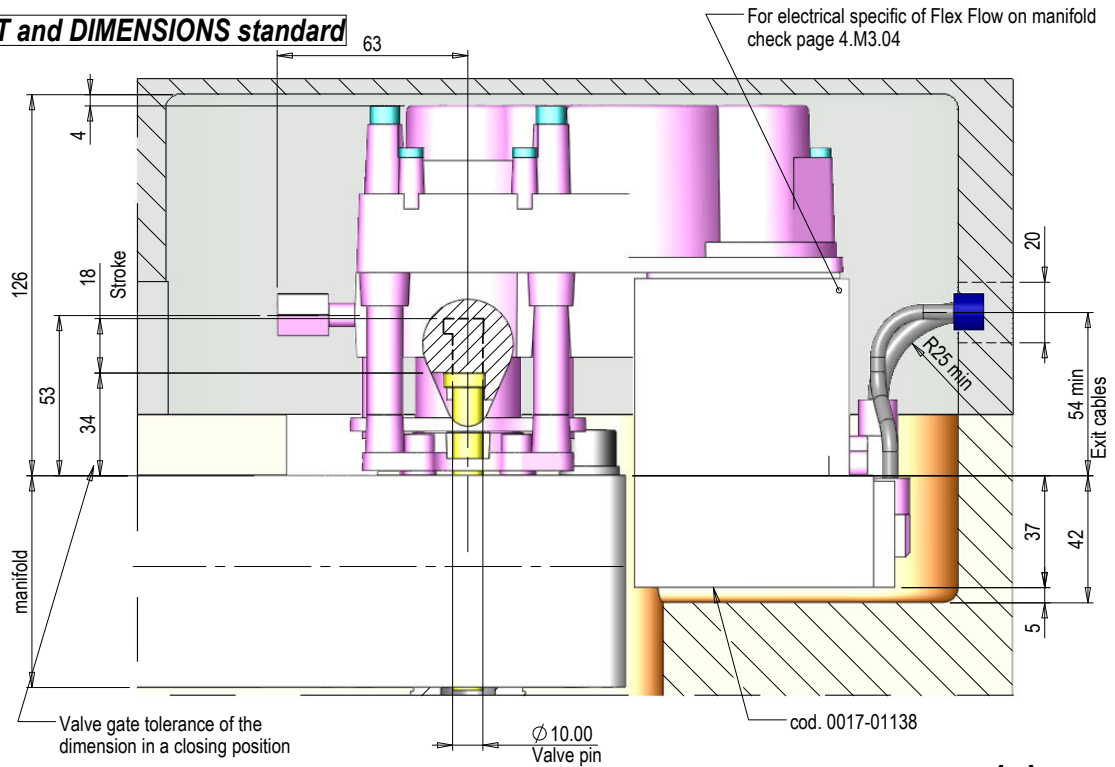
The working pressure below is only for reference: for the correct choice of maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job

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.

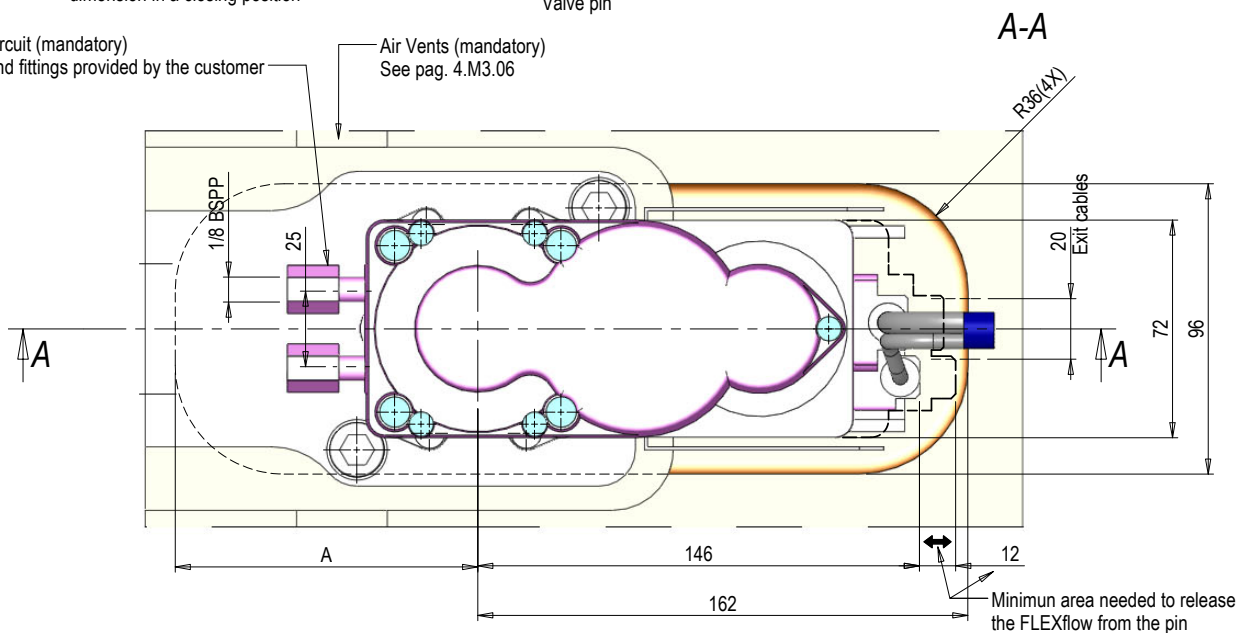
Cooled air cylinder cod. 0017-00484: bore 100 mm - stroke 18 mm
Complete gasket set: 0038-00044

POCKET and DIMENSIONS standard

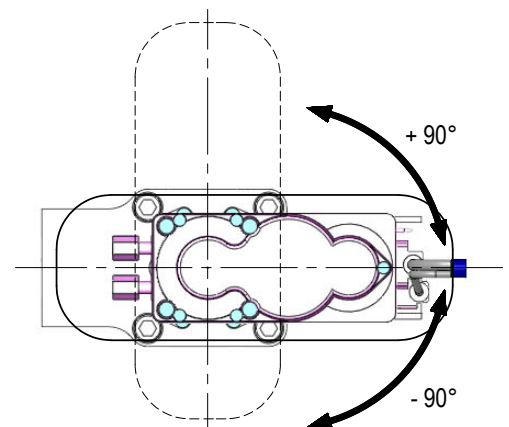


Cooling circuit (mandatory)
Nipples and fittings provided by the customer

Air Vents (mandatory)
See pag. 4.M3.06



POSSIBLE ORIENTATIONS FLEX FLOW ON MANIFOLD



General rules for the cooling of the FLEXflow on manifold

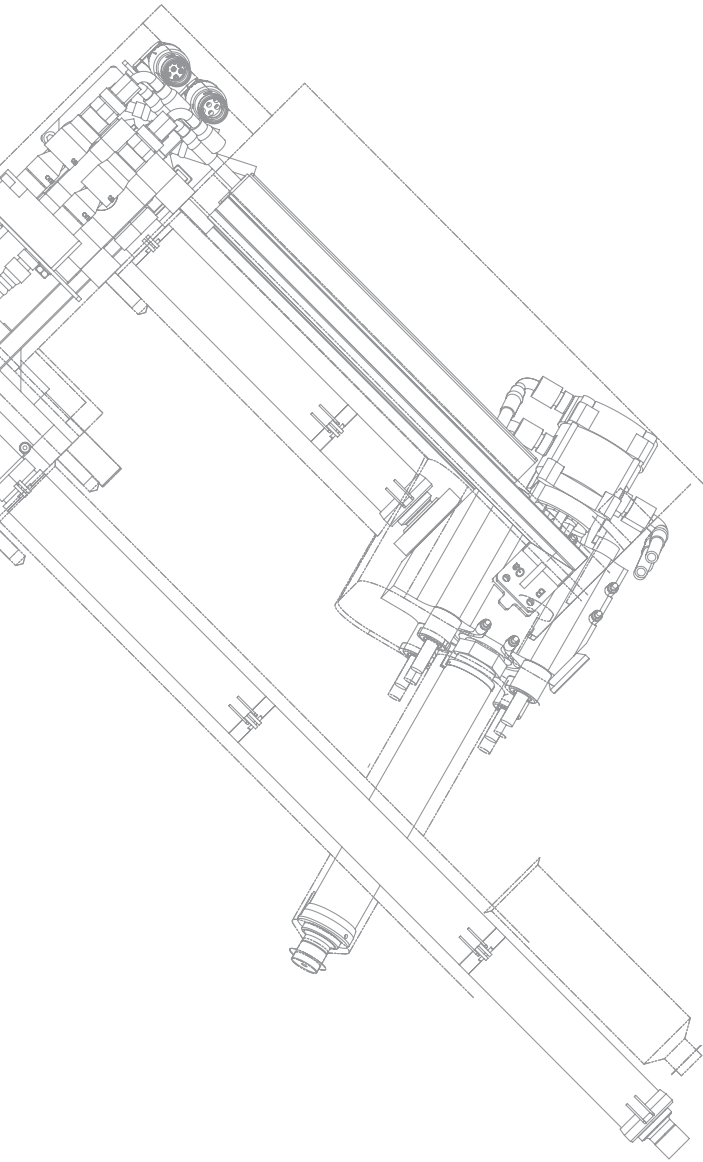
T1 (°C) = Max molding temperature of polymer
Tc (°C) = Coolant temperature

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



Wa Series 400 – 4700 cm³/s

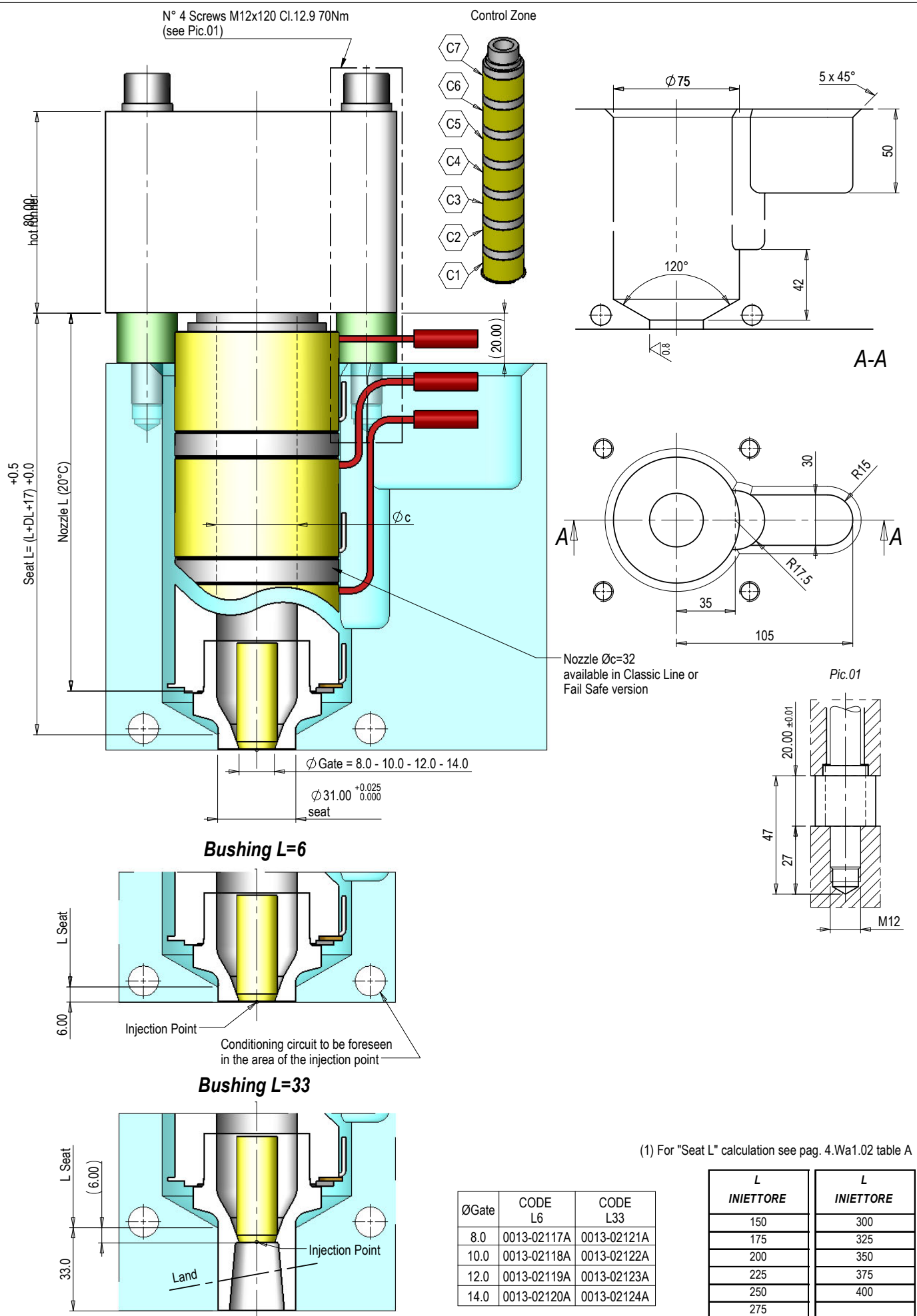
Serie Wa

Wa Serie

Wa Série

Wa Serie

Wa Série



T1 (°C) = Spritztemperatur
T2 (°C) = Formtemperatur

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

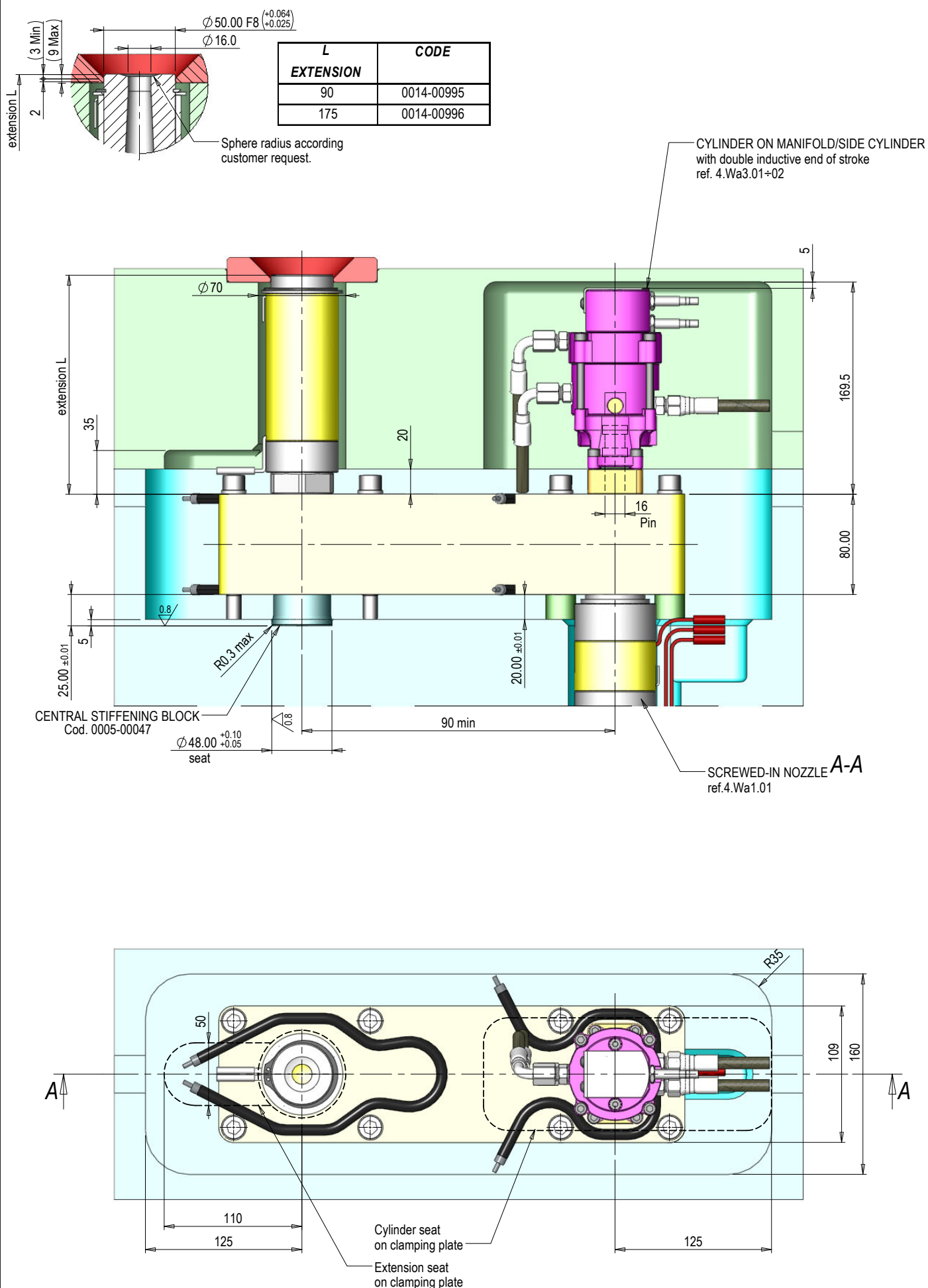
Tab. DÜSE AUSDEHNUNG

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
	$DL = (L \cdot \Delta T \cdot \lambda)$										
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

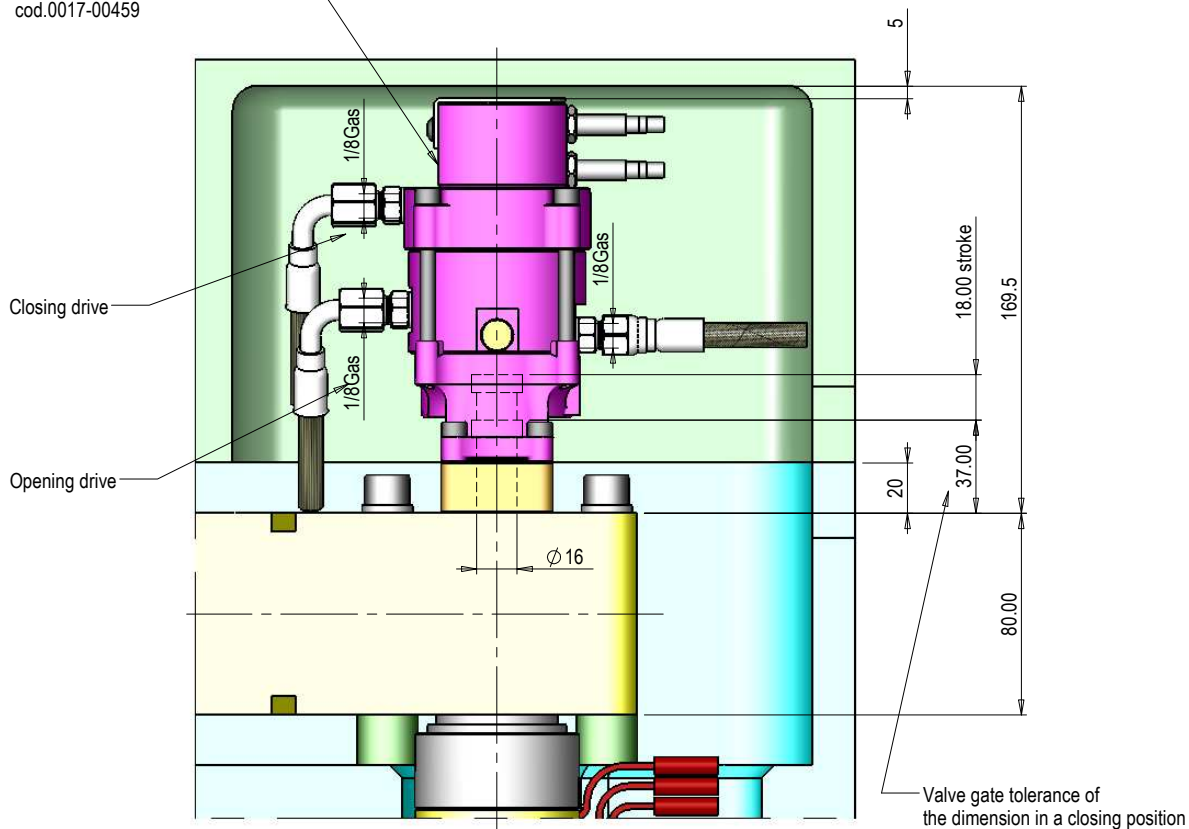
Tab. A – „L Sitz“ Kalkulieren

L (DÜSE) [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
	$L \text{ Sitz} = L + DL + 17.6$										
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
	$= L + DL + 17$										
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



CYLINDER ON MANIFOLD
with double inductive end of stroke
cod.0017-00459



A-A

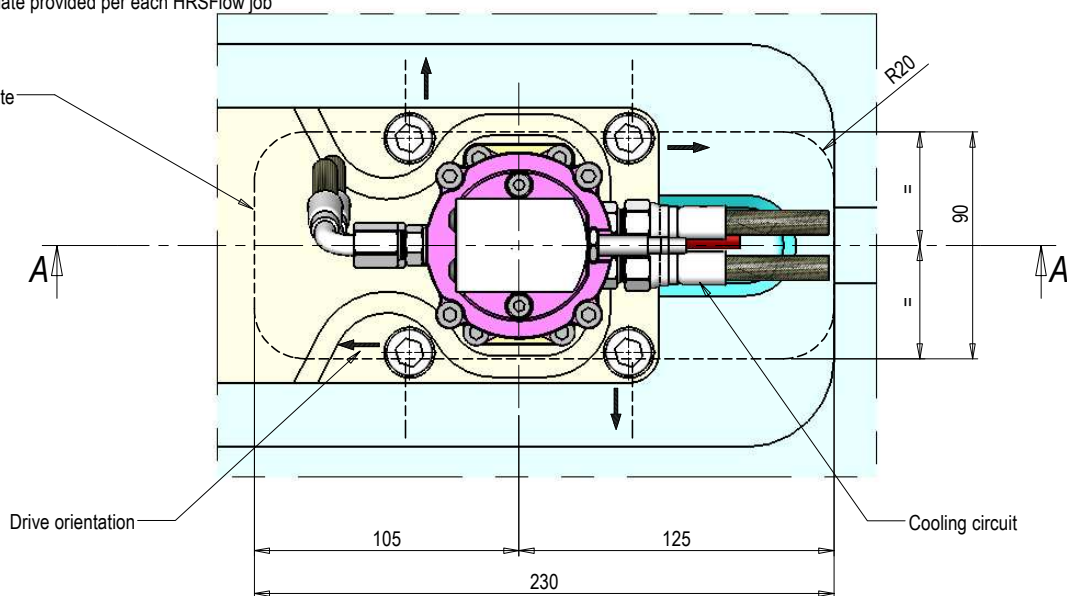
Working PRESSURE:
OIL: 80 max BAR

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

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.

Cylinder seat
on clamping plate



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

(*) ATTENTION: minimum 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

Valve gate tolerance of the dimension
in a closing position

Adjustable Cooling plate

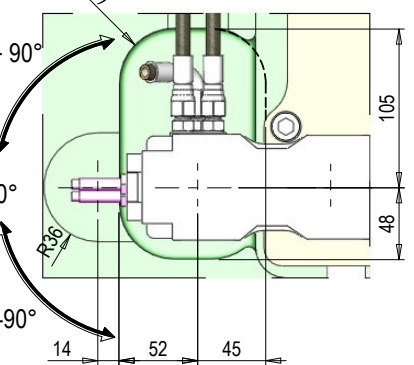
Opening drive

Closing drive

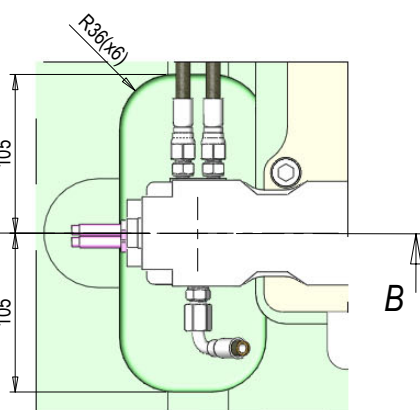
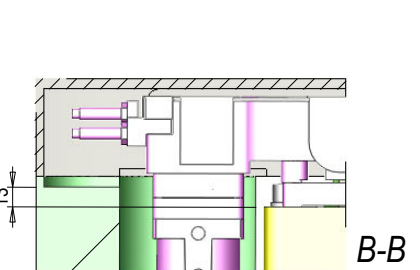
Cooling circuit (optional in some versions)
See note "General rules for the cooling"—

b) POSSIBLE ORIENTATIONS OF THE COUPLINGS

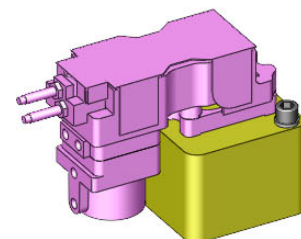
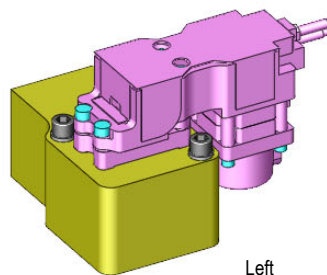
R30



c) ALTERNATIVE POSITIONS OF THE COOLING PLATE



POSSIBLE 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:

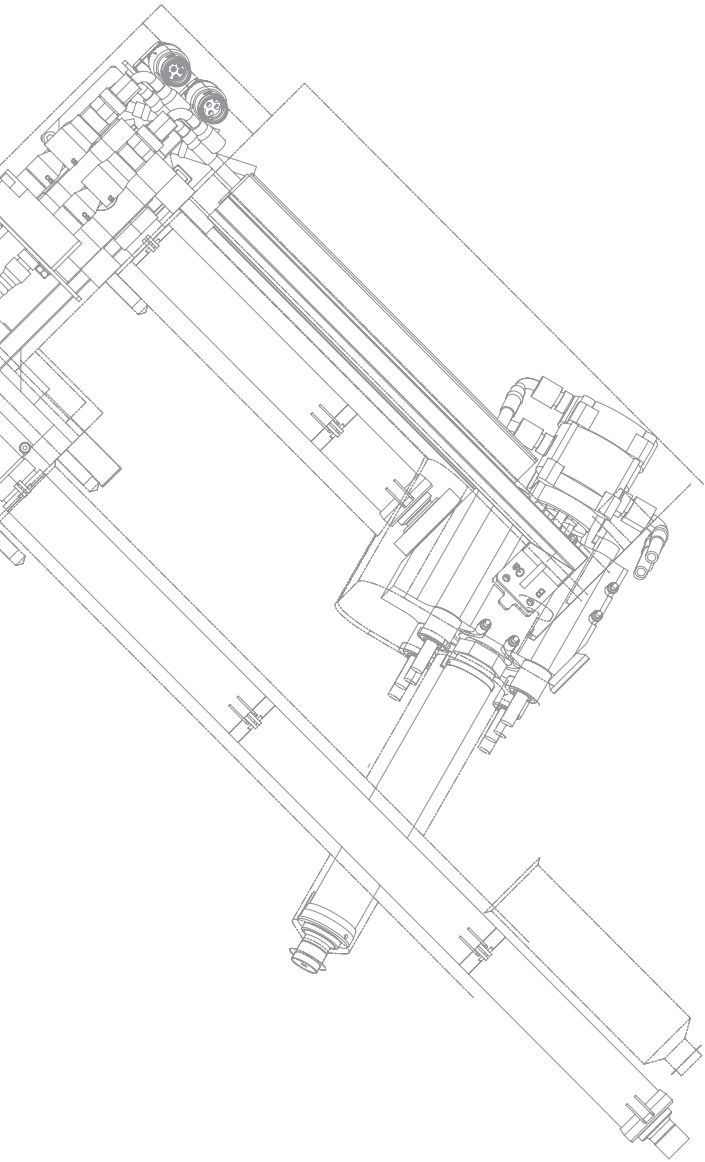
- 60° C [140° F] Temperature of the mold
- 280° C [536° F] Temperature of the hot runner system

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 maximum allowed working pressure, please refer to the specific steel plate provided per each HRSFlow job;

b) Alternative positions of the couplings than the STANDARD configuration shown in Pic.1,

c) In alternative, the cooling plate with its couplings can be oriented on the opposite side of the hydraulic connections.



Ja Series 2÷70 cm³/s

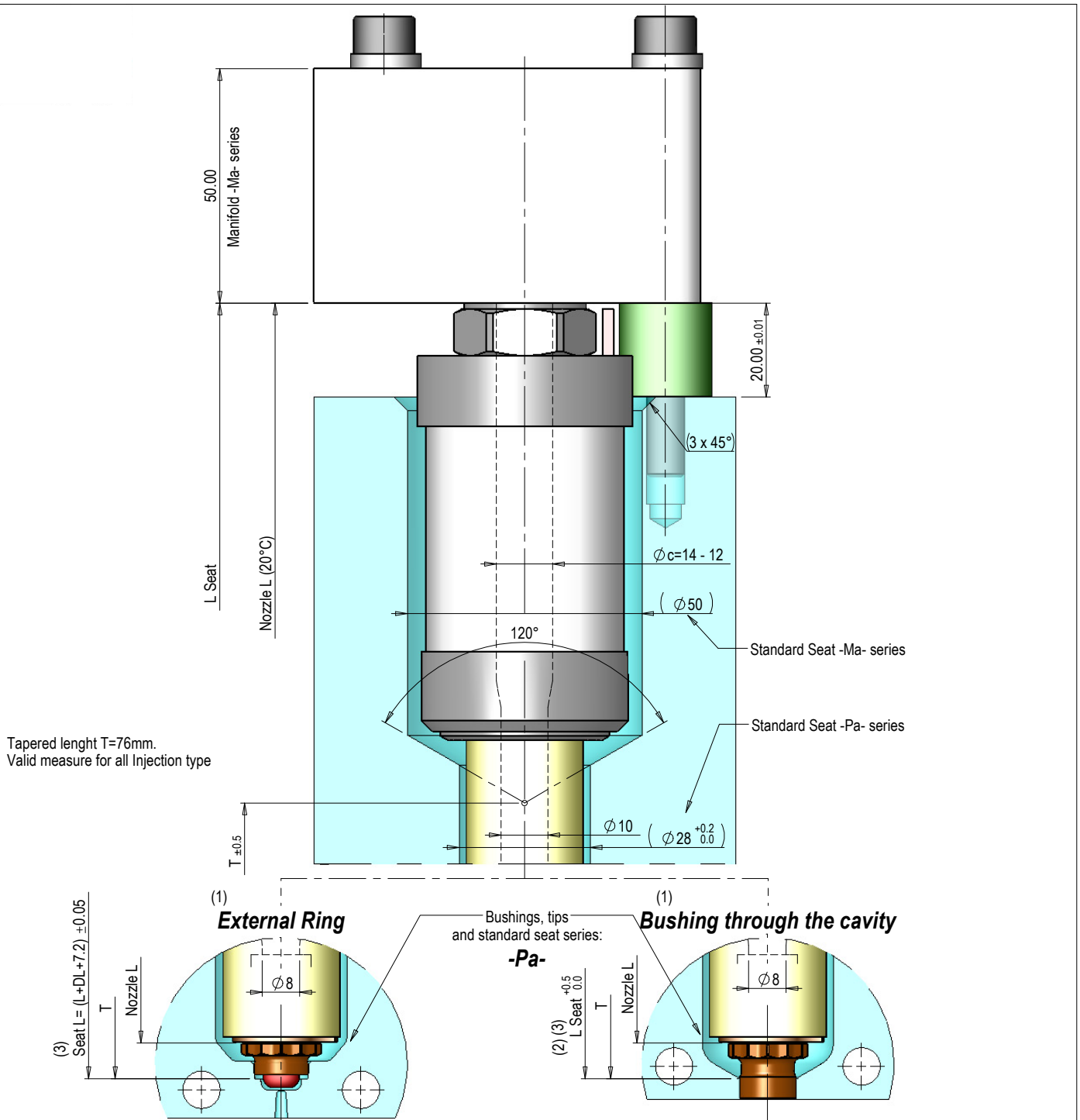
Serie Ja

Ja Serie

Ja Série

Ja Serie

Ja Série



- (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 length

(*) External ring nut not allowed with PGC20

T1 (°C) = Injection temperature

T2 (°C) = Mold temperature

 $\Delta T = T1 - T2$ $\lambda = 0.000012 (1/^\circ\text{C})$

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
	$DL = (L \cdot \Delta T \cdot \lambda)$										
	$[\Delta T=100^\circ\text{C}]$	$[\Delta T=120^\circ\text{C}]$	$[\Delta T=140^\circ\text{C}]$	$[\Delta T=160^\circ\text{C}]$	$[\Delta T=180^\circ\text{C}]$	$[\Delta T=200^\circ\text{C}]$	$[\Delta T=220^\circ\text{C}]$	$[\Delta T=240^\circ\text{C}]$	$[\Delta T=260^\circ\text{C}]$	$[\Delta T=280^\circ\text{C}]$	$[\Delta T=300^\circ\text{C}]$
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

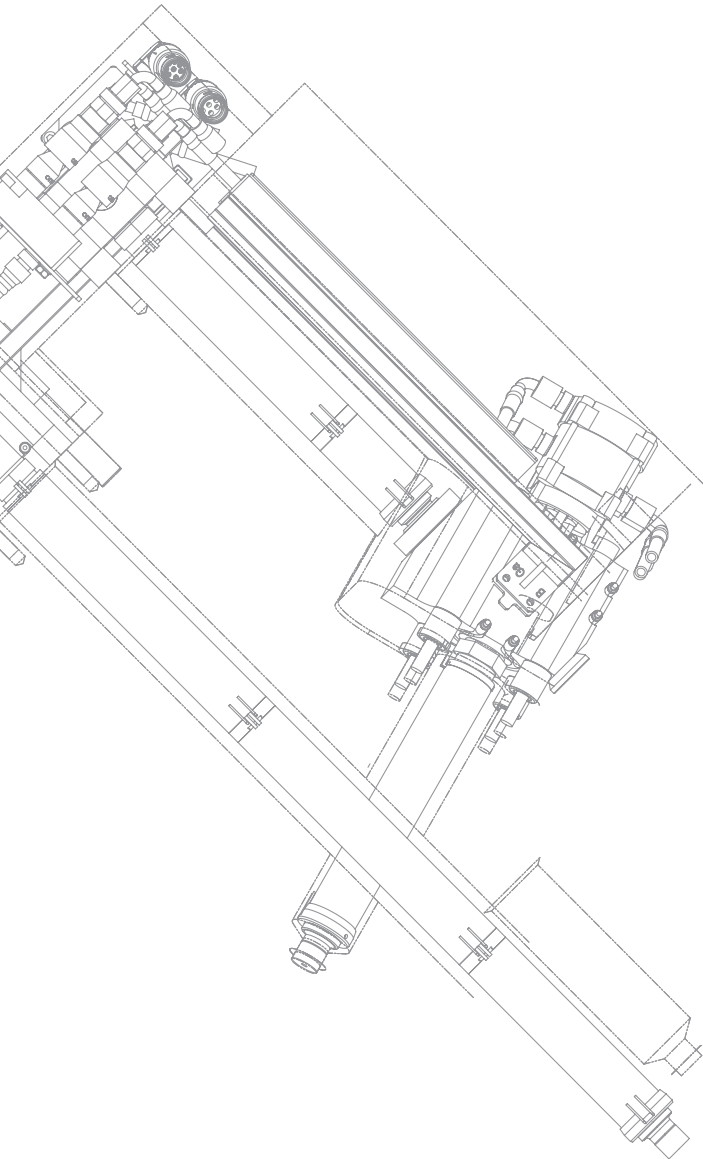
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$L_{\text{Seat}} = L + DL + 7.2$										
	$[\Delta T=100^\circ\text{C}]$	$[\Delta T=120^\circ\text{C}]$	$[\Delta T=140^\circ\text{C}]$	$[\Delta T=160^\circ\text{C}]$	$[\Delta T=180^\circ\text{C}]$	$[\Delta T=200^\circ\text{C}]$	$[\Delta T=220^\circ\text{C}]$	$[\Delta T=240^\circ\text{C}]$	$[\Delta T=260^\circ\text{C}]$	$[\Delta T=280^\circ\text{C}]$	$[\Delta T=300^\circ\text{C}]$
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
	$L_{\text{Seat}} = L + DL + 6.2$										
	$[\Delta T=100^\circ\text{C}]$	$[\Delta T=120^\circ\text{C}]$	$[\Delta T=140^\circ\text{C}]$	$[\Delta T=160^\circ\text{C}]$	$[\Delta T=180^\circ\text{C}]$	$[\Delta T=200^\circ\text{C}]$	$[\Delta T=220^\circ\text{C}]$	$[\Delta T=240^\circ\text{C}]$	$[\Delta T=260^\circ\text{C}]$	$[\Delta T=280^\circ\text{C}]$	$[\Delta T=300^\circ\text{C}]$
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

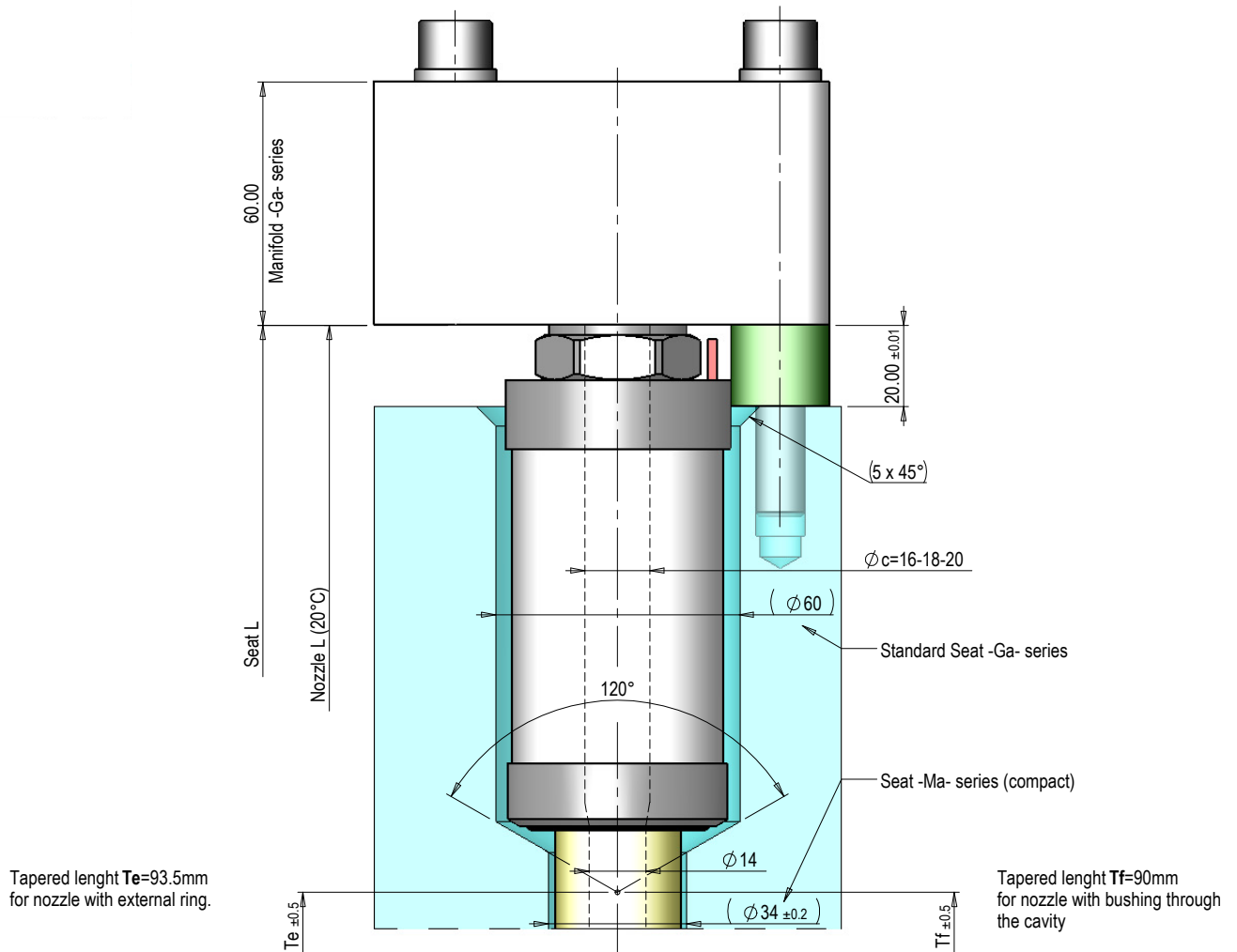
Tab. C - "Seat L" Calculation

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										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

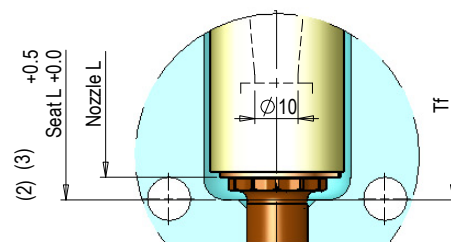
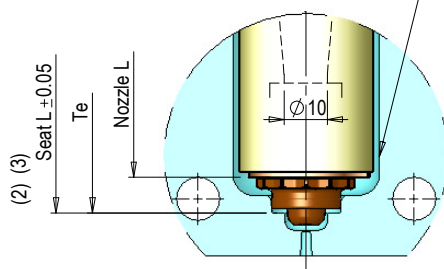


Ha Series 10÷265 cm³/s

Serie Ha
Ha Serie
Ha Série
Ha Serie
Ha Série



Bushings, tips and seat series:

-Ma-(1) **External Ring**(1) **Bushing through the cavity**

(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

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

T1 (°C) = Injection temperature

T2 (°C) = Mold temperature

 $\Delta T = T1 - T2$ $\lambda = 0.000012 \text{ (1/°C)}$

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
	$DL = (L \cdot \Delta T \cdot \lambda)$										
	$[\Delta T=100^\circ\text{C}]$	$[\Delta T=120^\circ\text{C}]$	$[\Delta T=140^\circ\text{C}]$	$[\Delta T=160^\circ\text{C}]$	$[\Delta T=180^\circ\text{C}]$	$[\Delta T=200^\circ\text{C}]$	$[\Delta T=220^\circ\text{C}]$	$[\Delta T=240^\circ\text{C}]$	$[\Delta T=260^\circ\text{C}]$	$[\Delta T=280^\circ\text{C}]$	$[\Delta T=300^\circ\text{C}]$
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

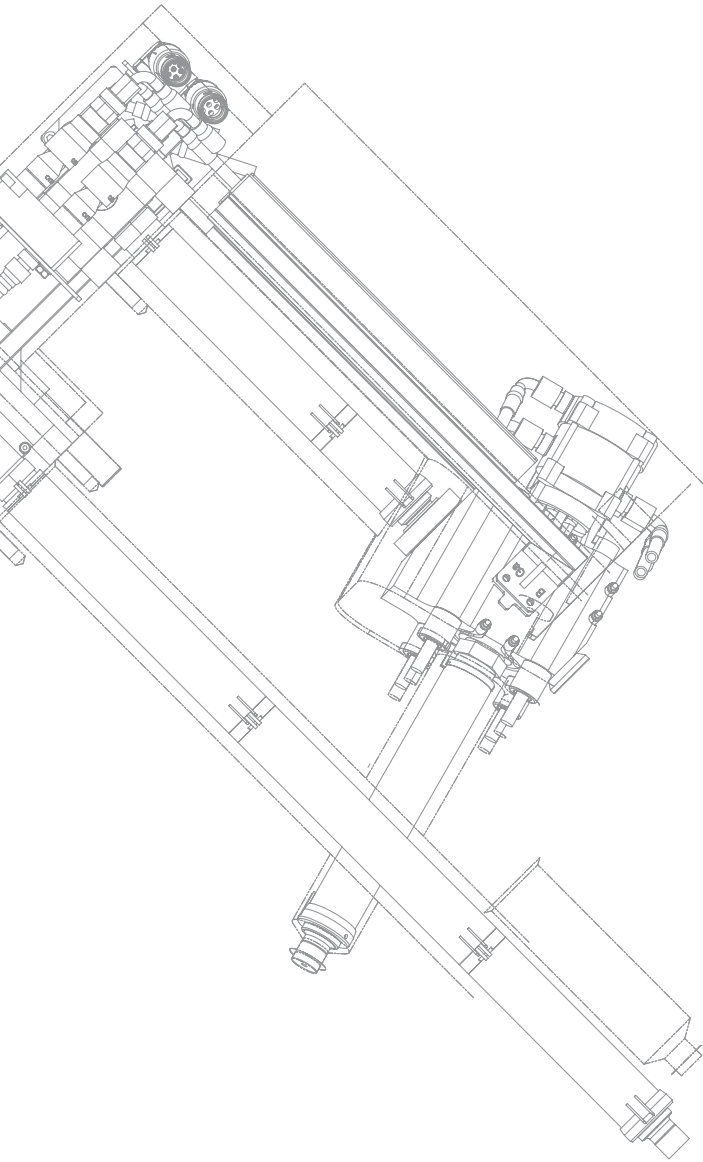
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$\text{Seat } L = L + DL + 7.7$										
	$[\Delta T=100^\circ\text{C}]$	$[\Delta T=120^\circ\text{C}]$	$[\Delta T=140^\circ\text{C}]$	$[\Delta T=160^\circ\text{C}]$	$[\Delta T=180^\circ\text{C}]$	$[\Delta T=200^\circ\text{C}]$	$[\Delta T=220^\circ\text{C}]$	$[\Delta T=240^\circ\text{C}]$	$[\Delta T=260^\circ\text{C}]$	$[\Delta T=280^\circ\text{C}]$	$[\Delta T=300^\circ\text{C}]$
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
	$\text{Seat } L = L + DL + 10.4$										
	$[\Delta T=100^\circ\text{C}]$	$[\Delta T=120^\circ\text{C}]$	$[\Delta T=140^\circ\text{C}]$	$[\Delta T=160^\circ\text{C}]$	$[\Delta T=180^\circ\text{C}]$	$[\Delta T=200^\circ\text{C}]$	$[\Delta T=220^\circ\text{C}]$	$[\Delta T=240^\circ\text{C}]$	$[\Delta T=260^\circ\text{C}]$	$[\Delta T=280^\circ\text{C}]$	$[\Delta T=300^\circ\text{C}]$
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

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 + 4.7										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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



Ca Series 100÷1225 cm³/s

Serie Ca
Ca Serie
Ca Série
Ca Serie
Ca Série



T1 (°C) = Injection temperature

T2 (°C) = Mold temperature

 $\Delta T = T1 - T2$ $\lambda = 0.000012 (1/^\circ\text{C})$ **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
	$DL = (L \cdot \Delta T \cdot \lambda)$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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
	$\text{Seat } L = L + DL + 7.7$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

Tab. B - "Seat L" Calculation

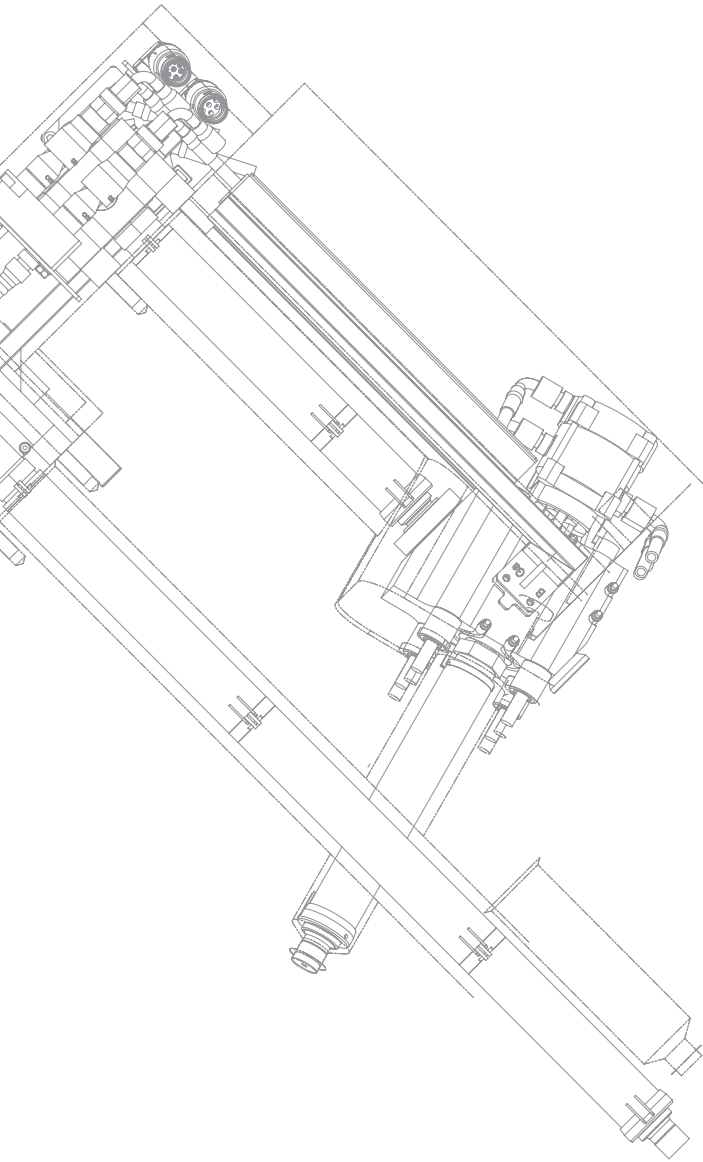
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	Seat L = L + DL + 11.2										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

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 + 15.4										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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



Mz series 10÷265 cm³/s

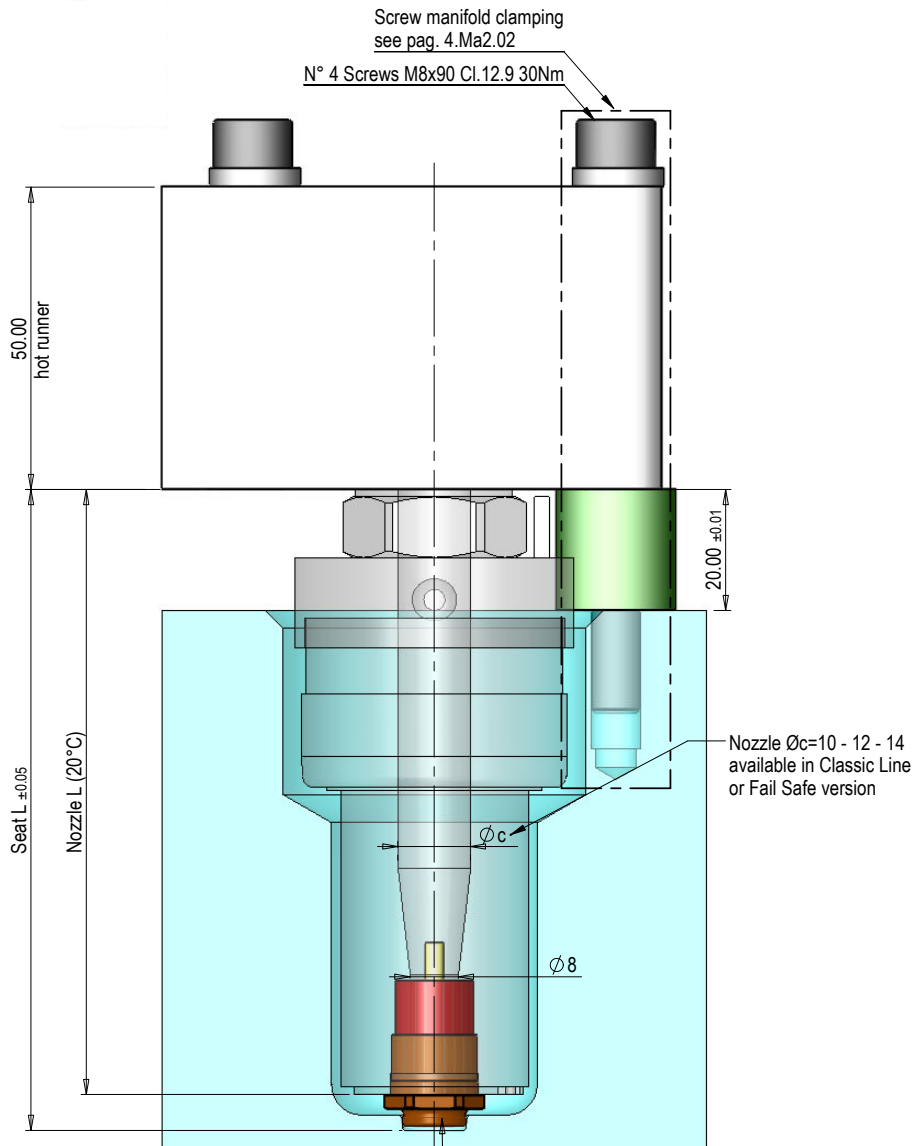
Serie Mz

Mz Serie

Mz Série

Mz Serie

Mz Série



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	✗	✓

Ringnut and Tip series **-Pa-**

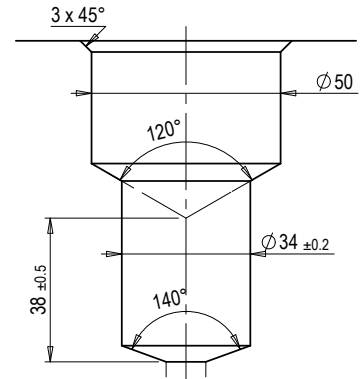
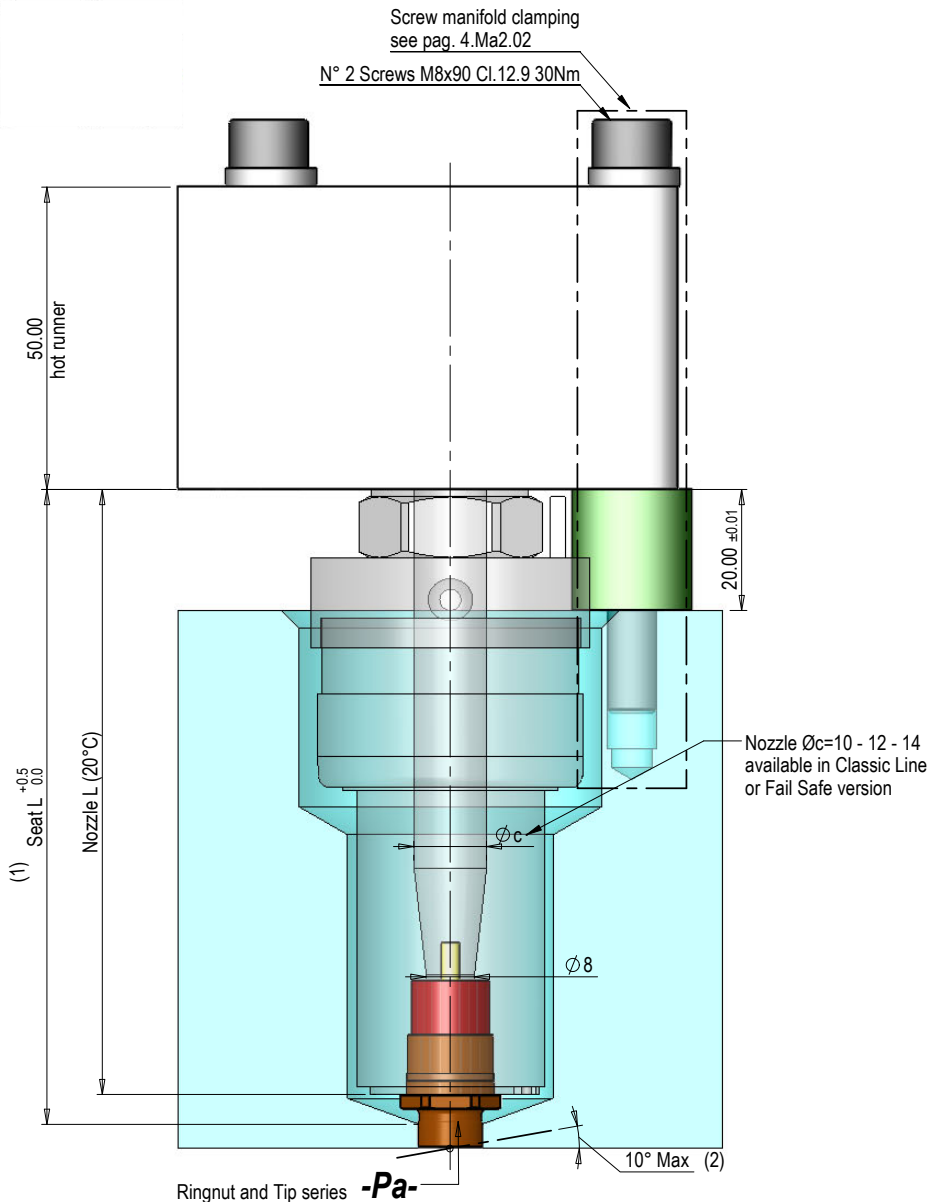
For detailed dimensions of the injection point follow the instructions of the series -Pa- nozzles technical sheets (4.Pa1.18 ->)

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

$$\begin{aligned} \text{Seat L} &= L + \text{DL} + 5.7 \Rightarrow \text{PGC20} \\ \text{Seat L} &= L + \text{DL} + 7.2 \Rightarrow \text{PGC30, PGY30} \end{aligned}$$

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.



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:

$$\text{Seat L} = L + DL + 4.7 \Rightarrow \text{PGC20}$$
$$\text{Seat L} = L + DL + 7.2 \Rightarrow \text{PGC30, PGY30}$$

(2) Max angle allowed in all configurations (PGC30 included)

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.

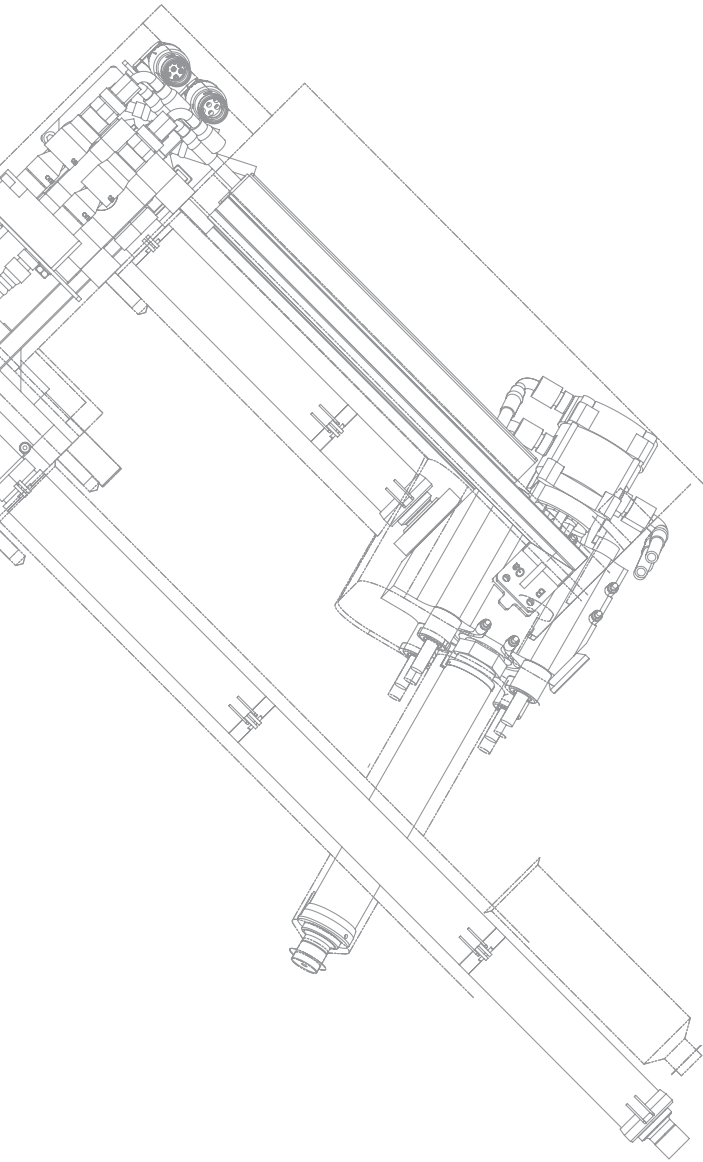
T1 (°C) = Injection temperature
T2 (°C) = Mold temperature

$$\Delta T = T1 - T2$$

$$\lambda = 0.000012 \text{ (1/°C)}$$

NOZZLE EXPANSION Table

NOZZLE L [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
	$DL = (L * \Delta T * \lambda)$										
	$[\Delta T=100°C]$	$[\Delta T=120°C]$	$[\Delta T=140°C]$	$[\Delta T=160°C]$	$[\Delta T=180°C]$	$[\Delta T=200°C]$	$[\Delta T=220°C]$	$[\Delta T=240°C]$	$[\Delta T=260°C]$	$[\Delta T=280°C]$	$[\Delta T=300°C]$
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



Gz series 100÷1265 cm³/s

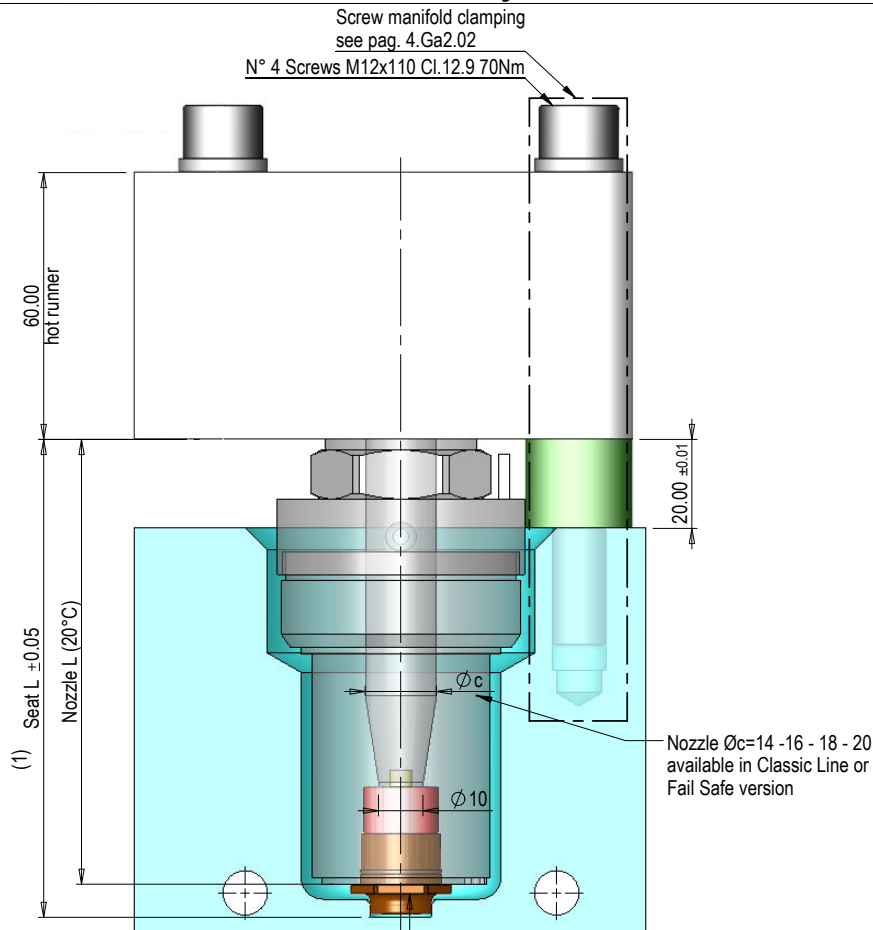
Serie Gz

Gz Serie

Gz Série

Gz Serie

Gz Série



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

NOZZLE L	Available Length:	
	PGC20 - PGC30 Lux - PGY30 Lux	PGC30 PGY30
100	✓	✓
125	✓	✓
150	✓	✓
175	✓	✓
200	✓	✓
225	✓	✓
250	✓	✓
300	✓	✓
350	✓	✓
400	✗	✓
450	✗	✓
500	✗	✓
550	✗	✓
600	✗	✓
650	✗	✓
700	✗	✓
725	✗	✓

Ringnut and Tip series **-Ma-**

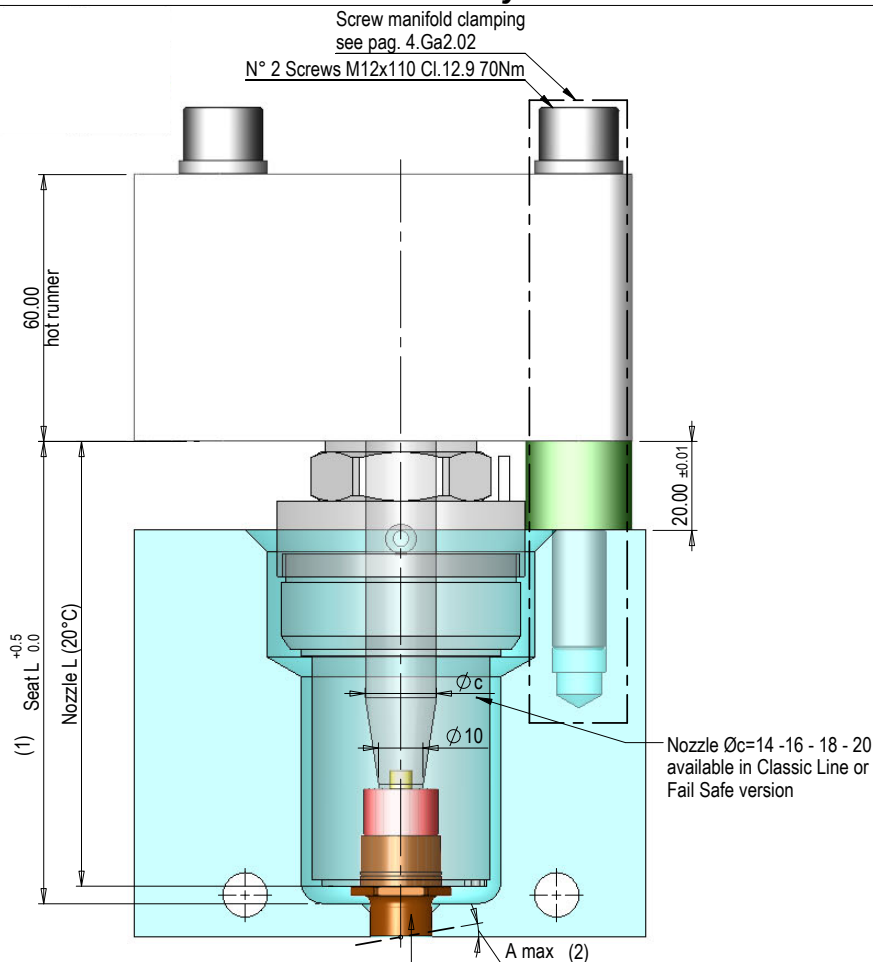
For detailed dimensions of the injection point follow the instructions of the series -Ma- nozzles technical sheets (4.Ma1.24 ->)

(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.

Ringnut and Tip series **-Ma-**

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:

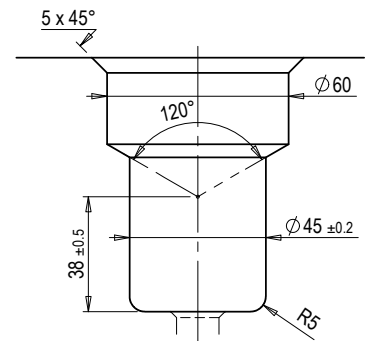
Seat L = L + DL + 3.7 => PGC20

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



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

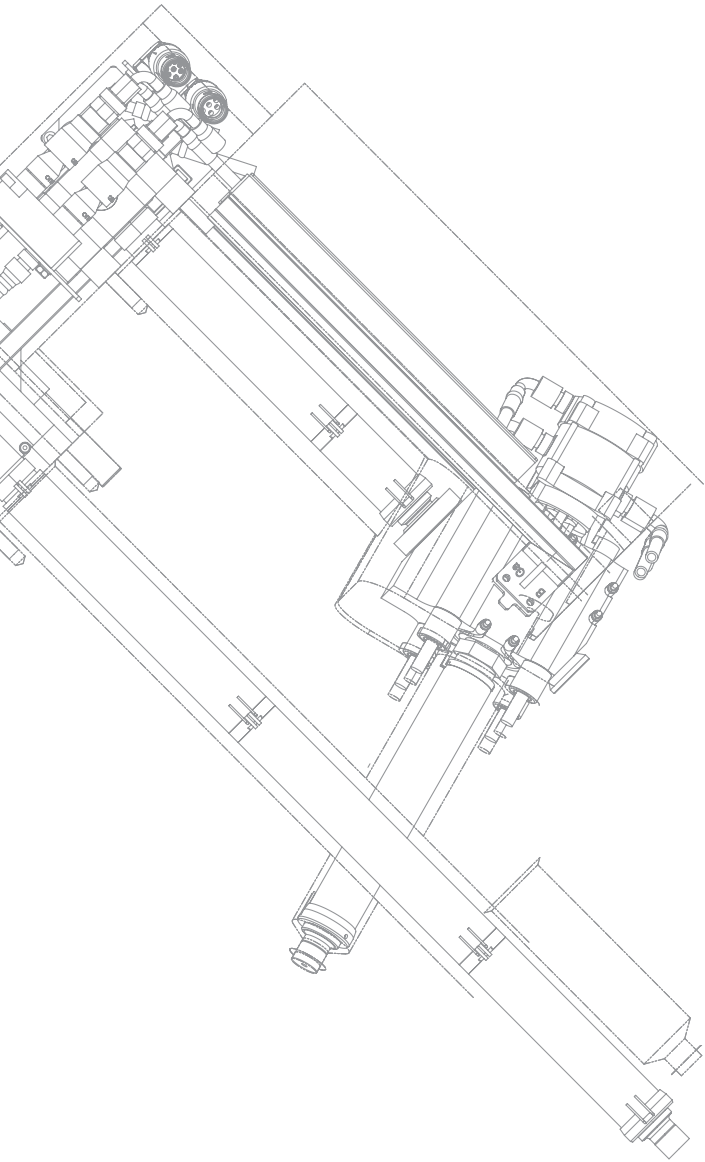
NOZZLE EXPANSION Table

NOZZLE L [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
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100^\circ C$]	[$\Delta T=120^\circ C$]	[$\Delta T=140^\circ C$]	[$\Delta T=160^\circ C$]	[$\Delta T=180^\circ C$]	[$\Delta T=200^\circ C$]	[$\Delta T=220^\circ C$]	[$\Delta T=240^\circ C$]	[$\Delta T=260^\circ C$]	[$\Delta T=280^\circ C$]	[$\Delta T=300^\circ C$]
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

T1 (°C) = Injection temperature

T2 (°C) = Mold temperature

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

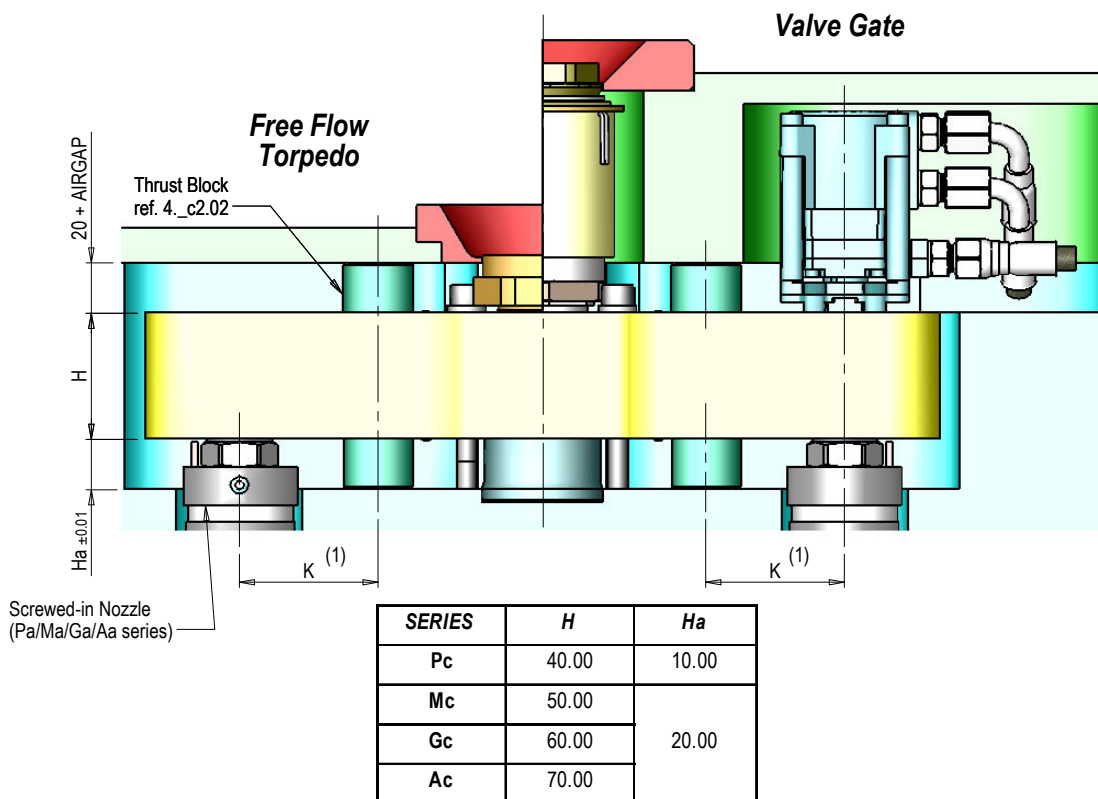


Thrusted System

Serie Contrastata
Geprüftes System

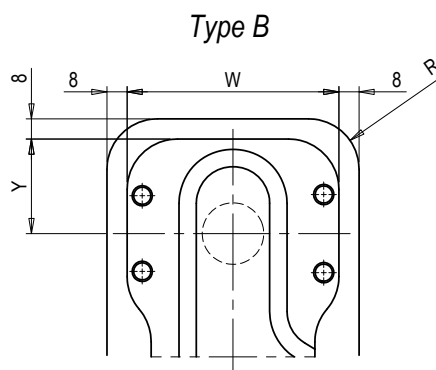
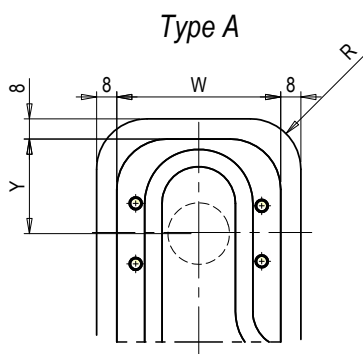
MANIFOLD WITHOUT FIXING SCREWS ("THRUSTED" system)

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.



(1) The "K" value will be defined by the HRS Technical Office during the design.

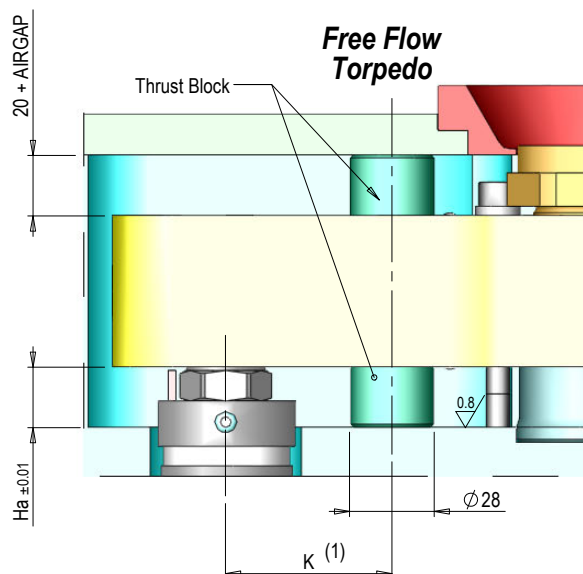
Manifold Shape



SERIES	INJECTION TYPE	CYLINDER TYPE	SHAPE	W	R	Y
Pc - Mc	Free Flow / Torpedo	-	Type A	Pc 47	Pc 7.5	38
	Valve Gate	on manifold pneumatic /		Mc 65	Mc 20	
	Valve Gate	Lateral / Electric	Type B	84	20	
Gc - Ac	Free Flow / Torpedo	-	Type A	78	20	52
	Valve Gate	on manifold pneumatic /				
	Valve Gate	Lateral / Electric	Type B	84		

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 an air 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 of the thrust blocks ("K" value) will also be notified during the design.

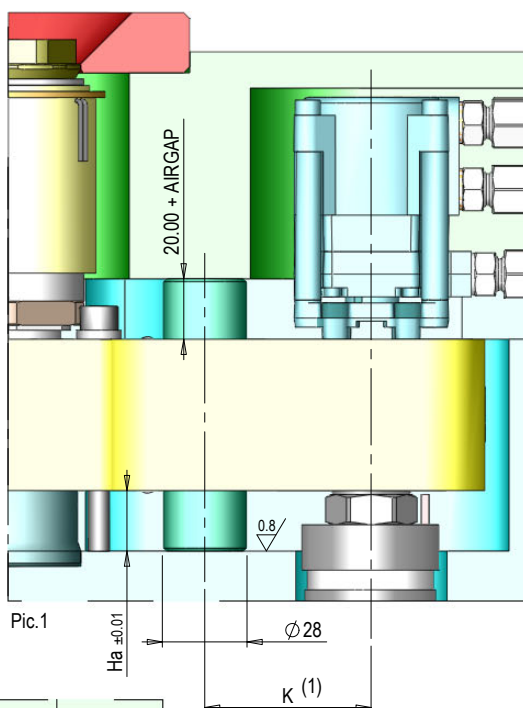


SERIES	Ha	CODE
Pc	10.00	0004-00070
Mc	20.00	0004-00072
Gc		
Ac		

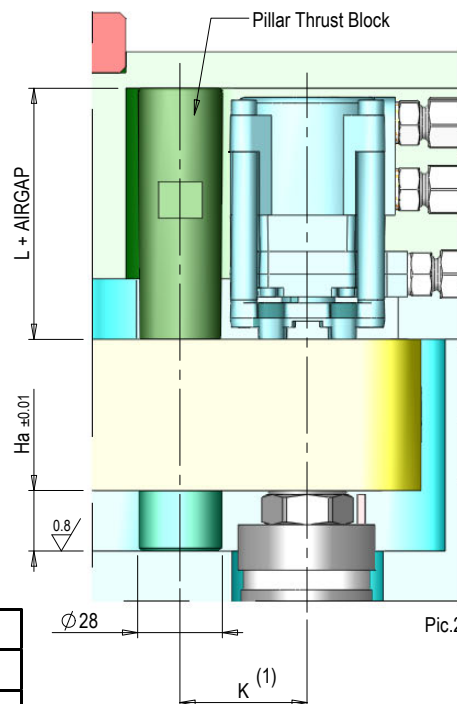
(1) The "K" value will be defined by the HRS Technical Office during the design.

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 contact with the mold. (Pic.3)



Pic.1

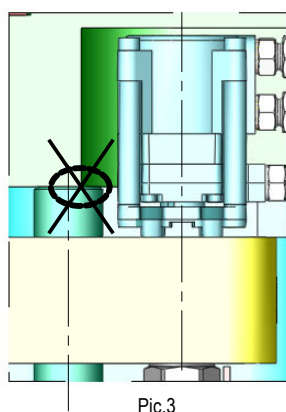


Pic.2

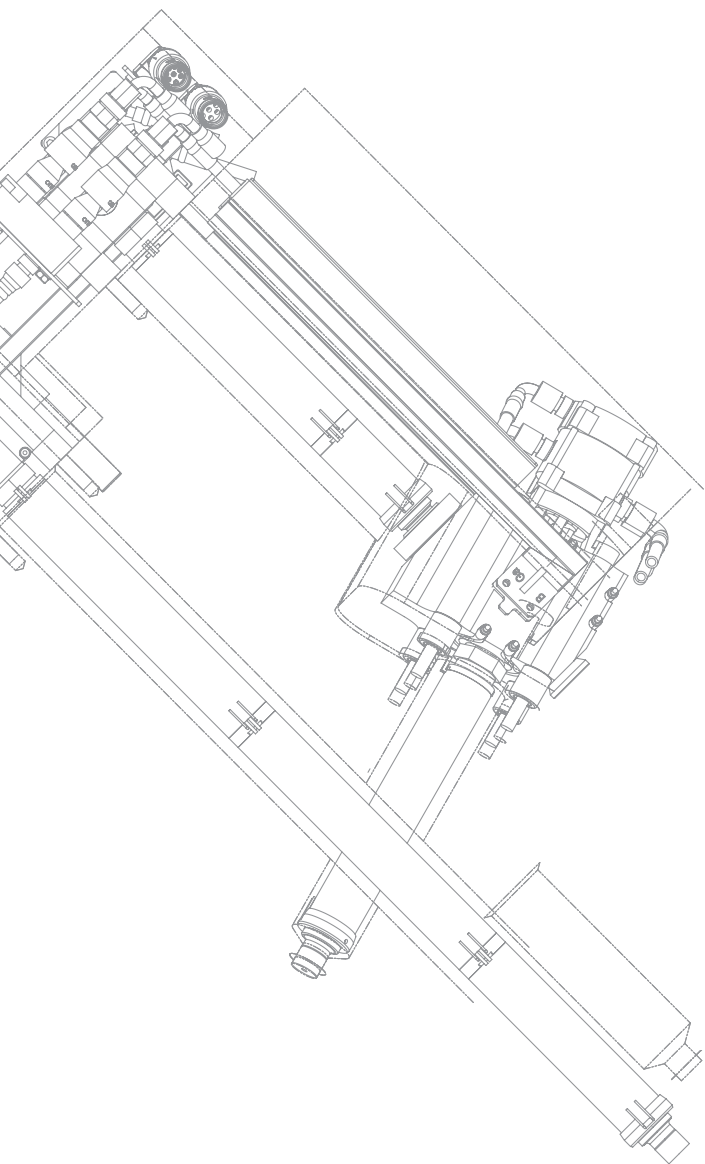
SERIES
Pc
Mc
Gc
Ac

$$\text{mm } 66.5 \leq L \leq 148 \text{ mm}$$

(1) The "K" value will be defined by the HRS Technical Office during the design.

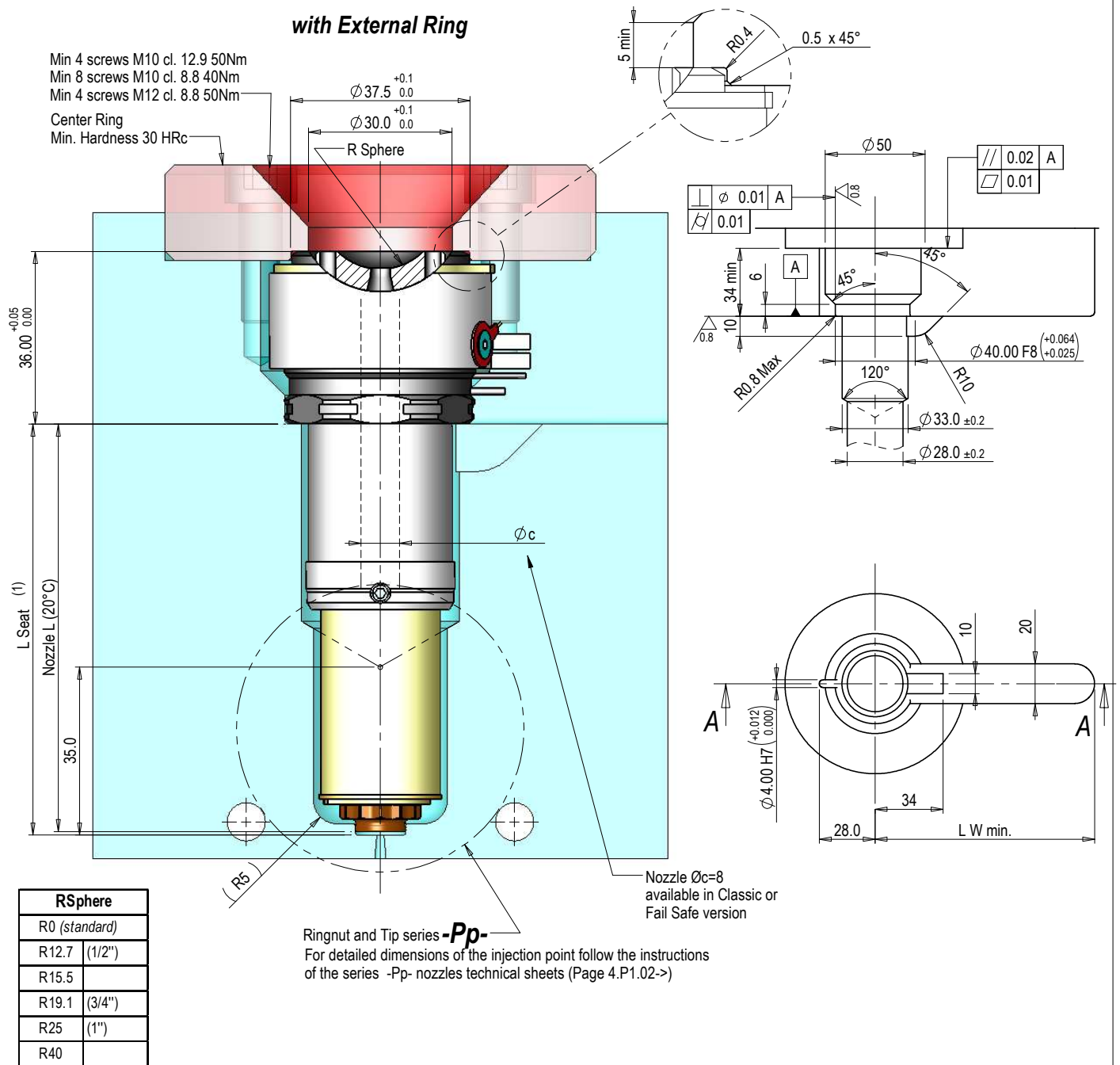


Pic.3

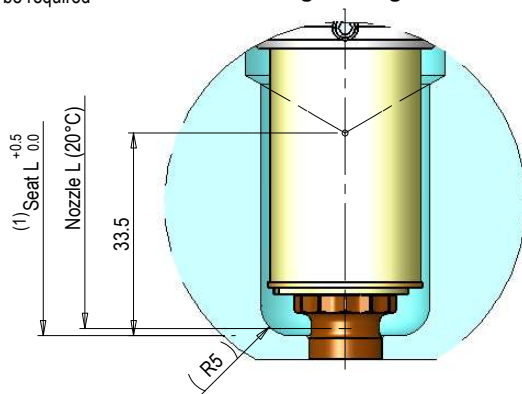


Single Nozzles Series

Serie Iniettori Singoli
Einzeldüsen Serie
Série Mono Buses
Serie Boquillas Unitárias
Série Bicos Unitários



with Bushing through the cavity

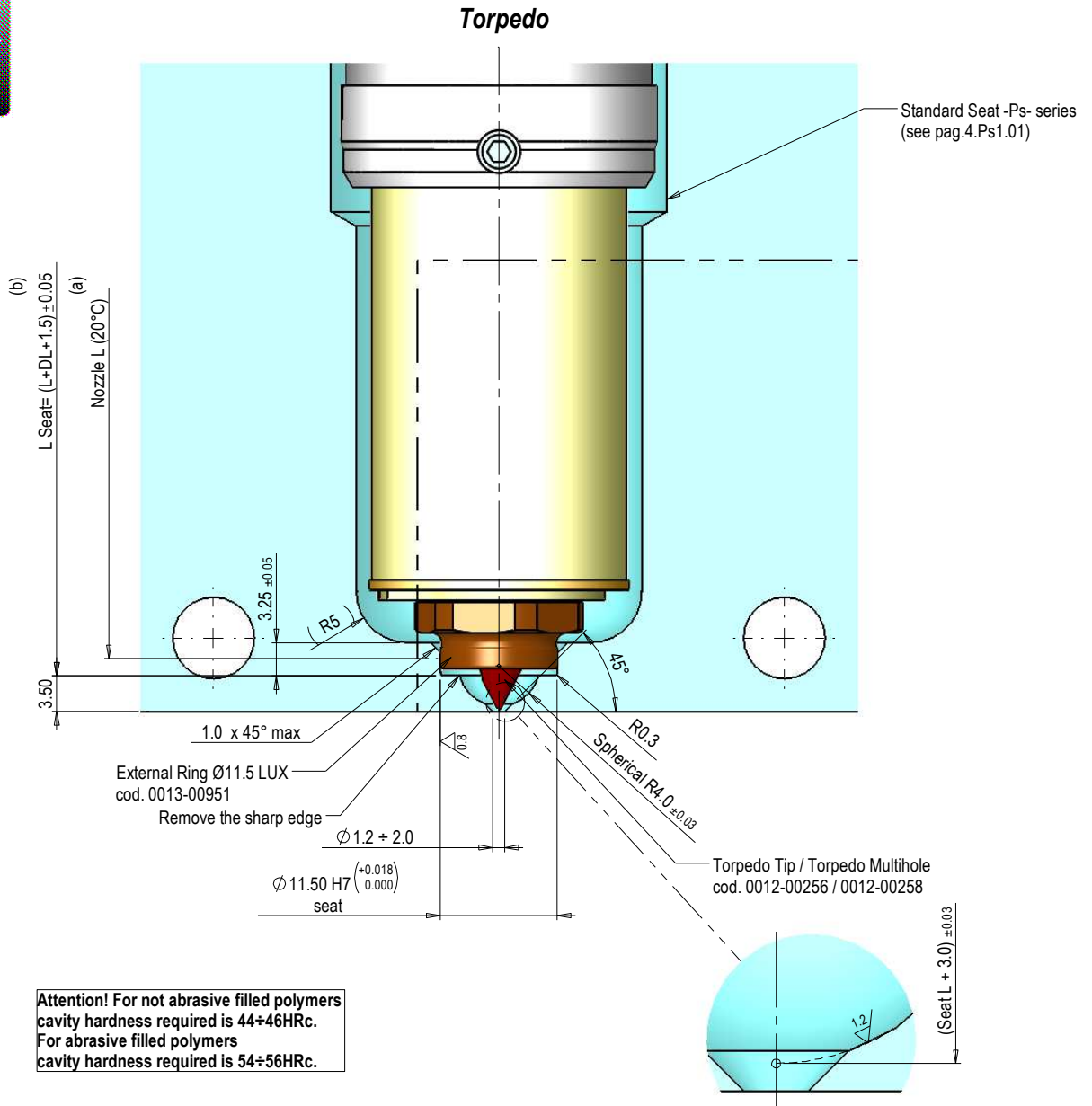


(1) Dimension and tolerance of the "Seat L" in according to the formula
showed in the -Pp- technical sheet of injection point pre-selected.
For values of "Nozzle L" and "DL" refer to table pag. 4.Ps1.02.

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.



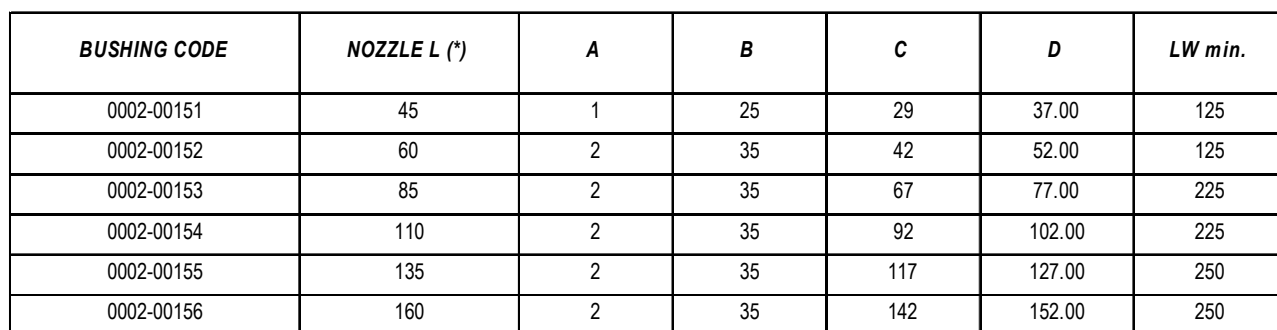
(a) (b) For values of "Nozzle L" and "DL" refer to below table.

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

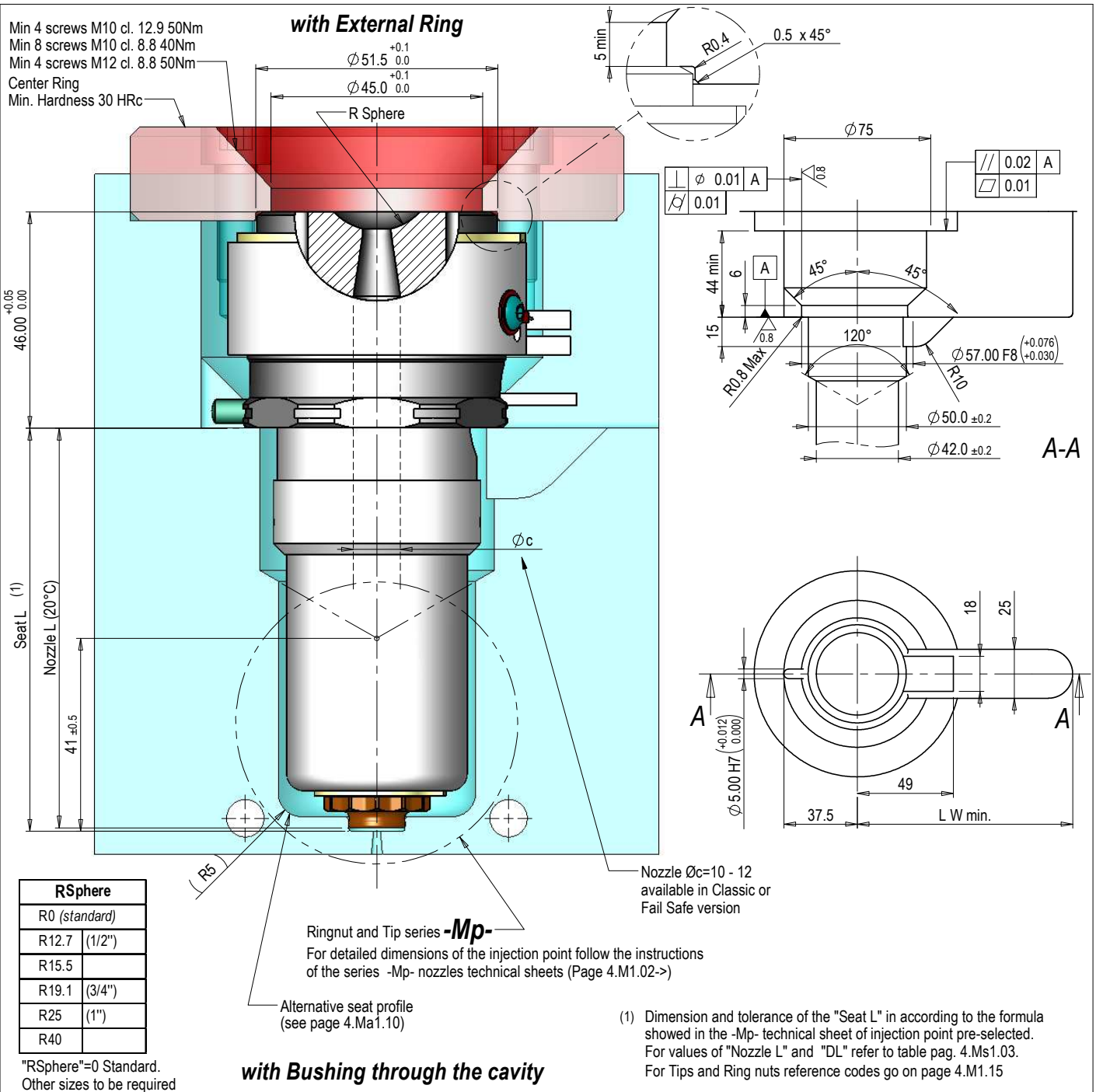
$\Delta T = T1 - T2$
 $\lambda = 0.000012 (1/°C)$

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
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100°C$]	[$\Delta T=120°C$]	[$\Delta T=140°C$]	[$\Delta T=160°C$]	[$\Delta T=180°C$]	[$\Delta T=200°C$]	[$\Delta T=220°C$]	[$\Delta T=240°C$]	[$\Delta T=260°C$]	[$\Delta T=280°C$]	[$\Delta T=300°C$]
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

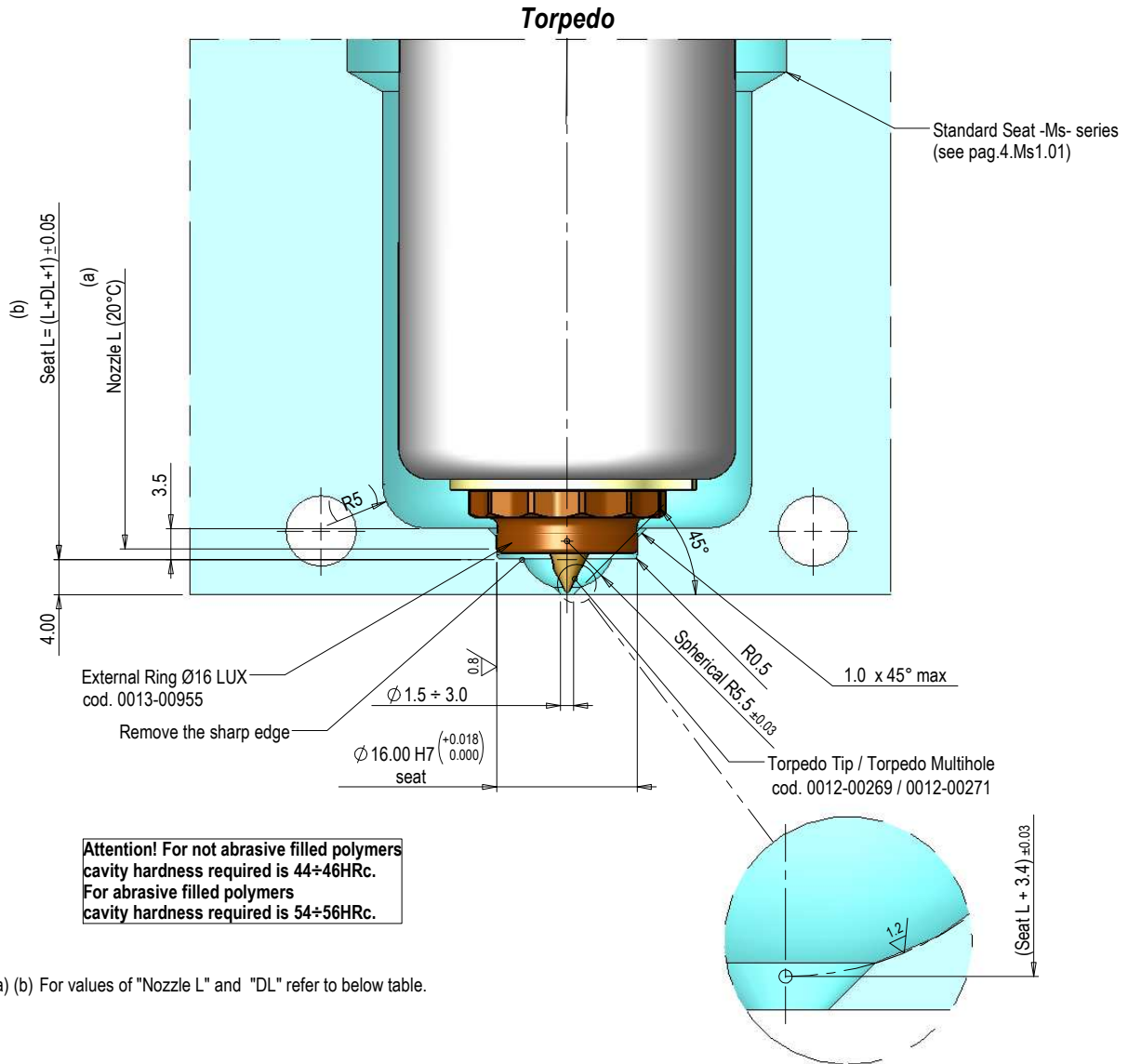


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NOZZLE L	L W min.
L	
45	125.00
60	125.00
85	125.00
110	125.00
135	125.00
160	275.00
185	275.00
210	175.00
235	175.00
260	125.00
285	125.00
310	225.00
335	225.00
360	250.00

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.



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

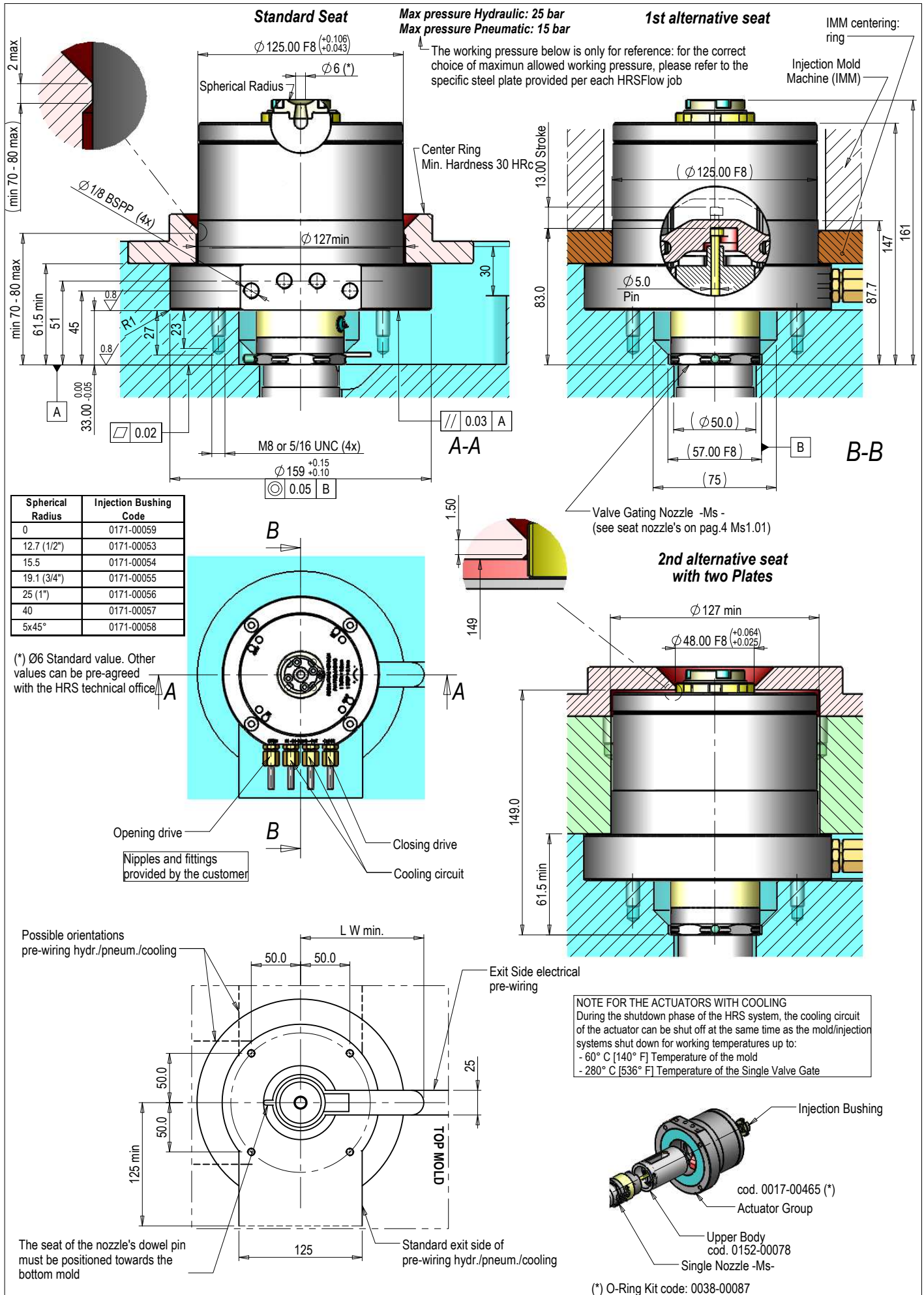
$\Delta T = T1 - T2$
 $\lambda = 0.000012 (1/°C)$

NOZZLE EXPANSION Table

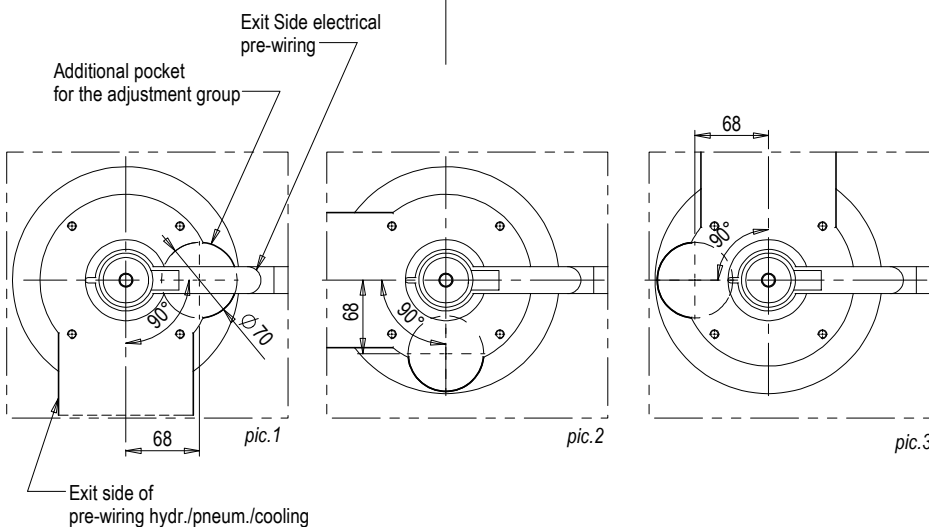
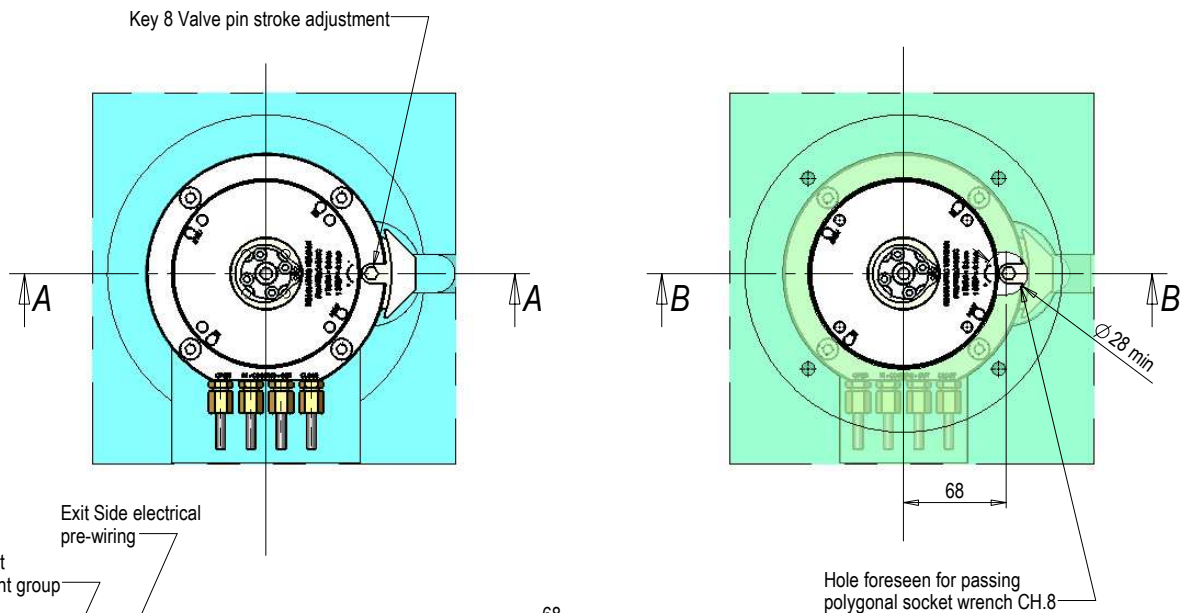
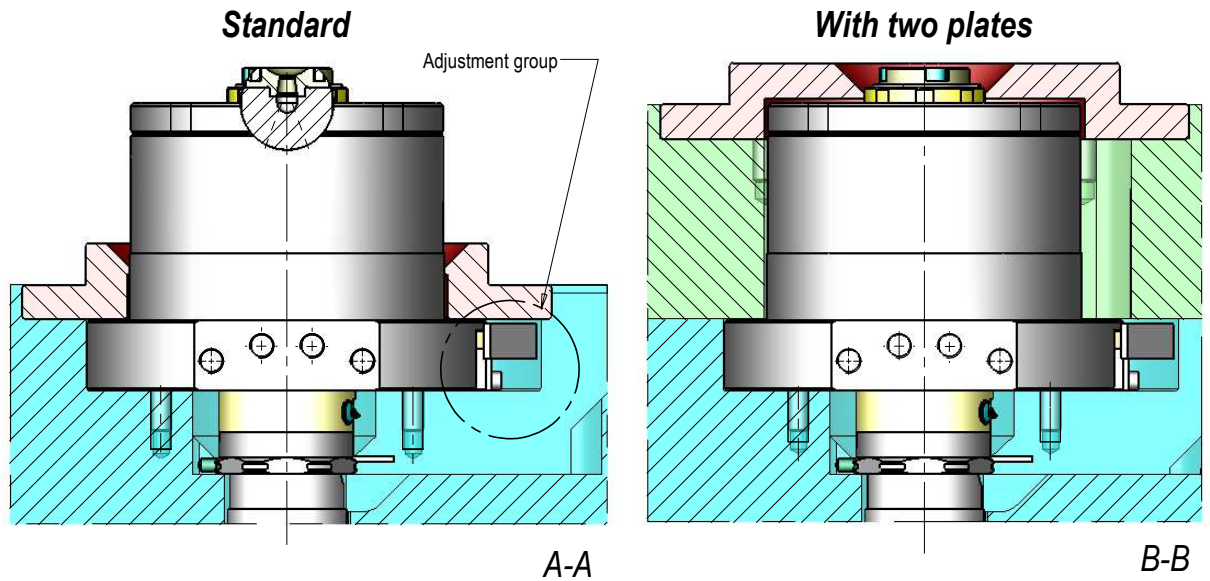
L (NOZZLE) [20°C]	ΔT										
	100 ÷ 110°C	111 ÷ 130°C	131 ÷ 150°C	151 ÷ 170°C	171 ÷ 190°C	191 ÷ 210°C	211 ÷ 230°C	231 ÷ 250°C	251 ÷ 270°C	271 ÷ 290°C	291 ÷ 300°C
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100°C$]	[$\Delta T=120°C$]	[$\Delta T=140°C$]	[$\Delta T=160°C$]	[$\Delta T=180°C$]	[$\Delta T=200°C$]	[$\Delta T=220°C$]	[$\Delta T=240°C$]	[$\Delta T=260°C$]	[$\Delta T=280°C$]	[$\Delta T=300°C$]
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



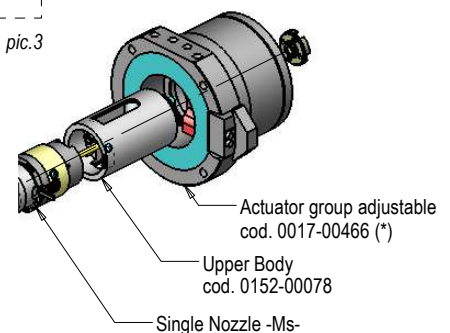
(*) In case cooling is required on standard nozzle with $L>185\text{mm}$, an extension insert is needed. Its manufacturing is on customer's care.
For further manufacturing details, refer to page 4_s1.02



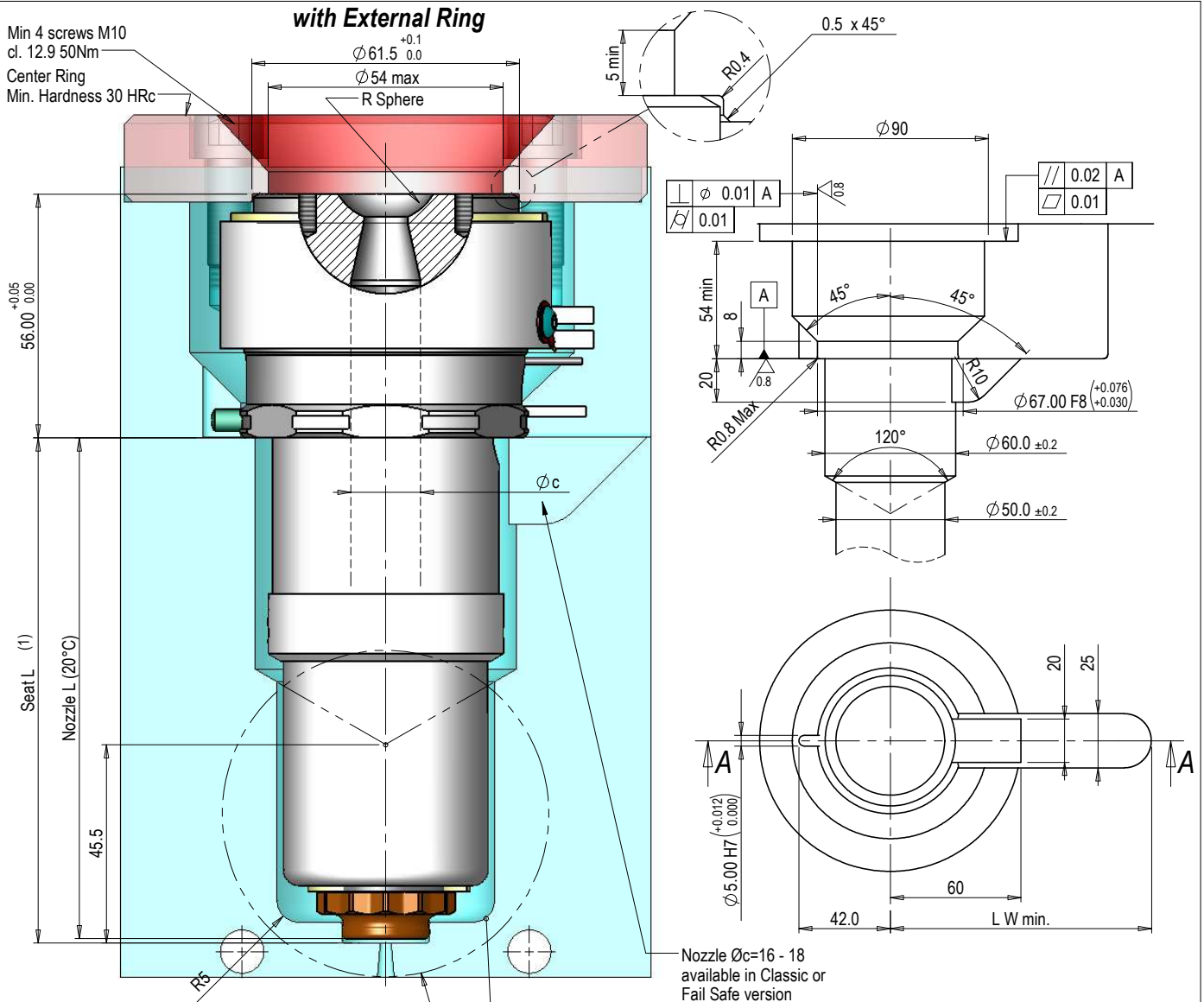
The coaxial single valve gating group in the "adjustable" version allows the stroke adjustment of ± 1.5 mm. The adjustment is realized via polygonal socket wrench CH.8. The adjustment group requires the realization of an additional pocket on the standard seats shown in previous page.



- 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



(*) O-Ring Kit code: 0038-00087



RSphere	
R0 (standard)	
R12.7 (1/2")	
R15.5	
R19.1 (3/4")	
R25 (1")	
R40	

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->)

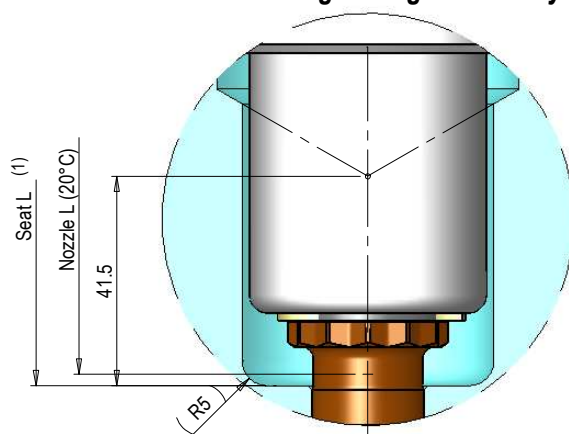
(1) Dimension and tolerance of the "Seat L" in according to the formula showed in the -Gp- technical sheet of injection point pre-selected.
For values of "Nozzle L" and "DL" refer to table pag. 4.Gs1.03.

"RSphere"=0 Standard.
Other sizes to be required

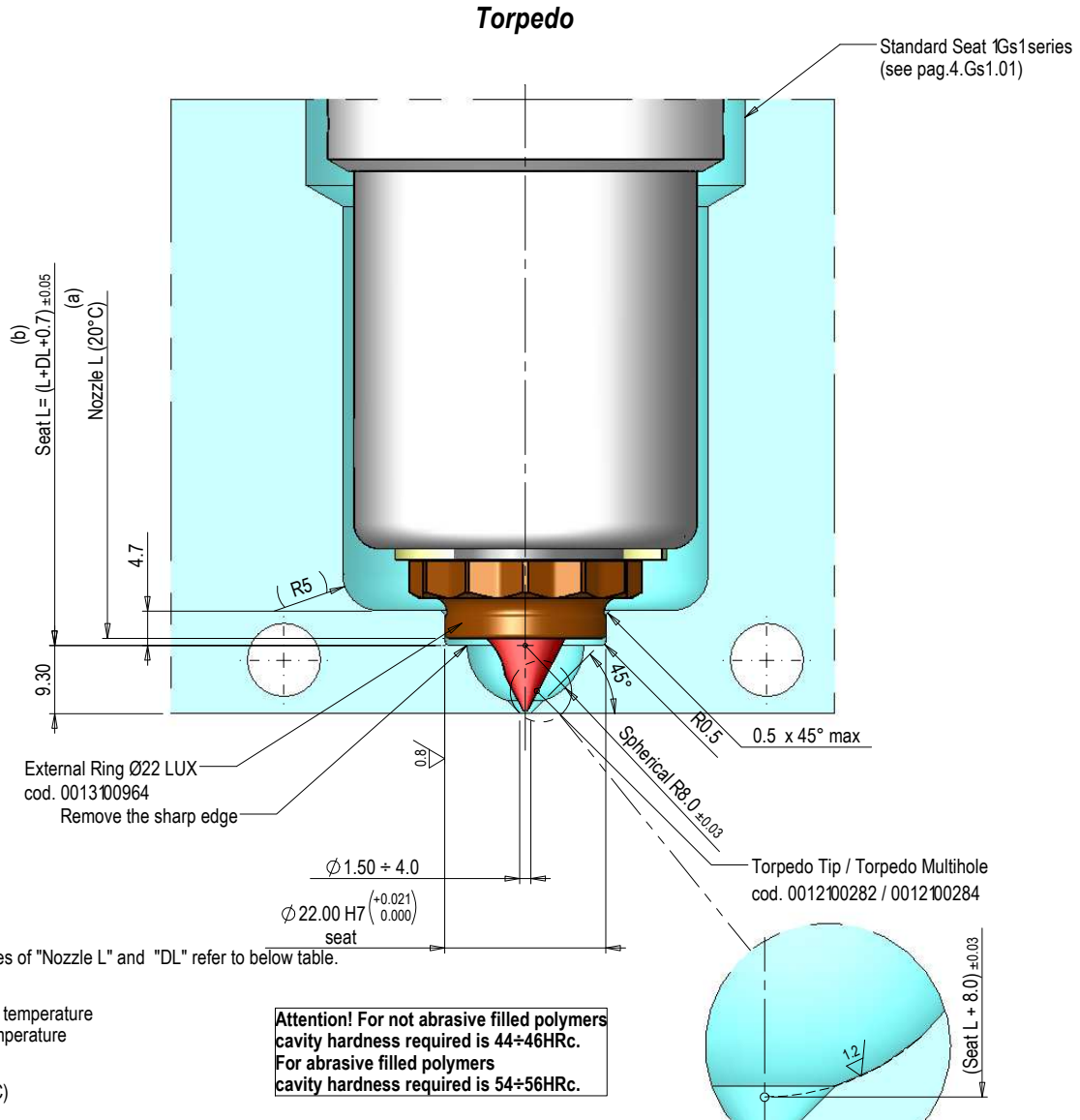
For Tips and Ring nuts reference codes go on page 4.G1.14

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

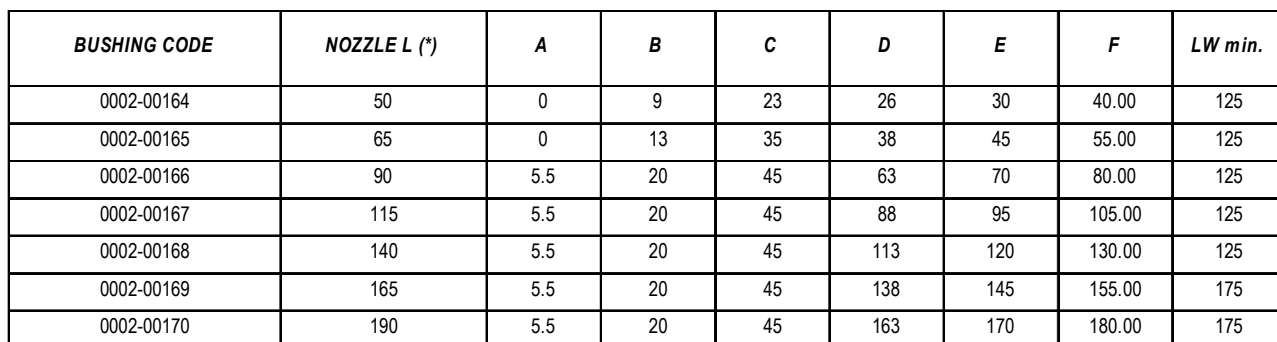


HRS nozzles are normally provided with thermocouples of the "J" isolated type. Upon request they can be supplied with thermocouples of the "K" isolated type.

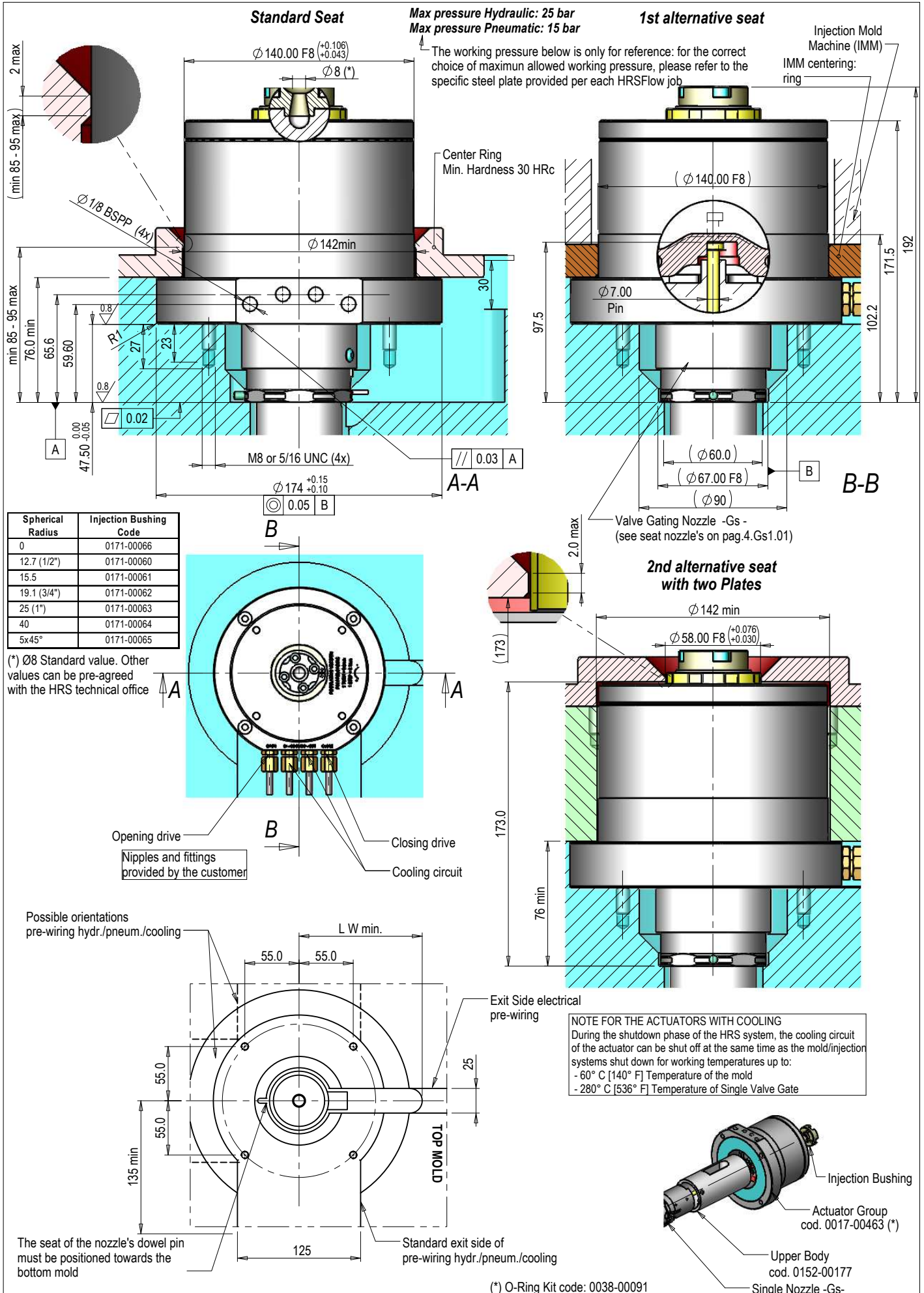


Tab. DÜSE AUSDEHNUNG

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
	$DL = (L \cdot \Delta T \cdot \lambda)$										
	[$\Delta T=100°C$]	[$\Delta T=120°C$]	[$\Delta T=140°C$]	[$\Delta T=160°C$]	[$\Delta T=180°C$]	[$\Delta T=200°C$]	[$\Delta T=220°C$]	[$\Delta T=240°C$]	[$\Delta T=260°C$]	[$\Delta T=280°C$]	[$\Delta T=300°C$]
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

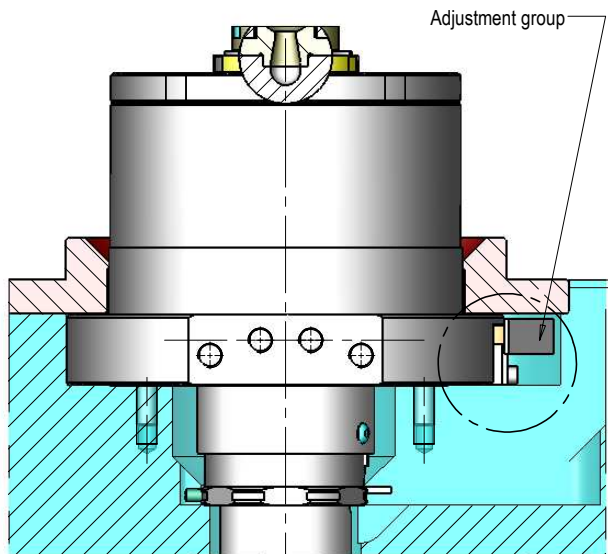


For further manufacturing details, refer to page 4_s1.02



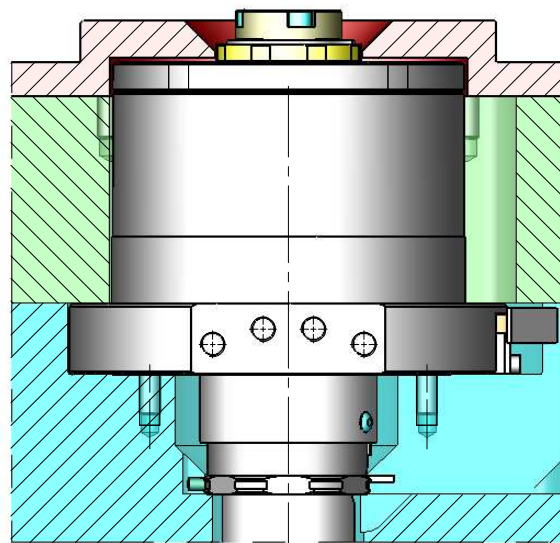
The coaxial single valve gating group in the "adjustable" version allows the stroke adjustment of ± 1.5 mm. The adjustment is realized via polygonal socket wrench CH.8. The adjustment group requires the realization of an additional pocket on the standard seats shown in previous page.

Standard



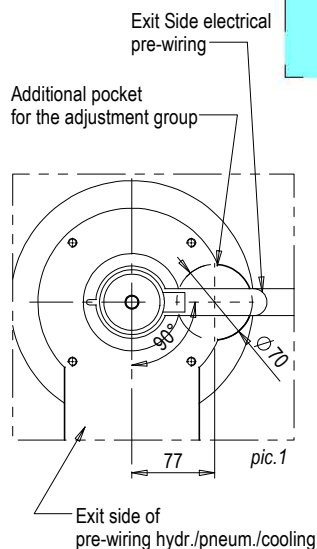
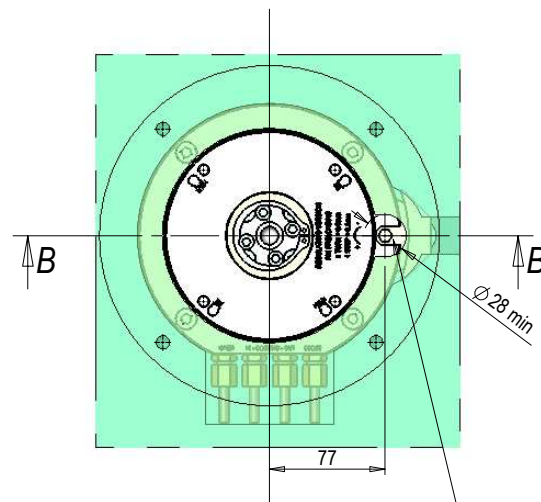
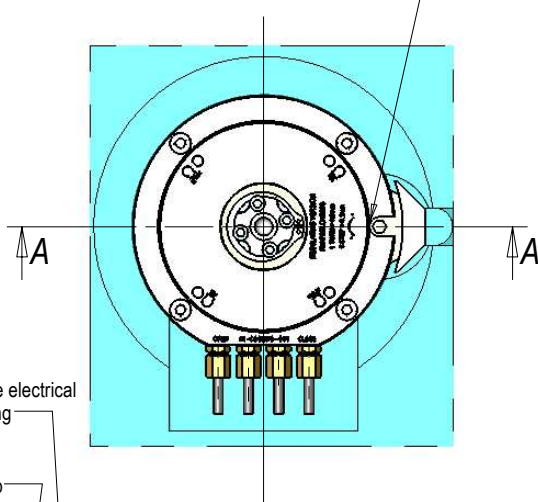
A-A

With two plates

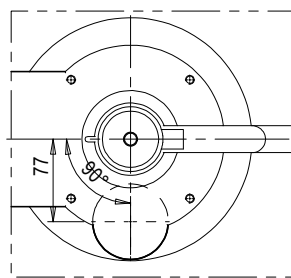


B-B

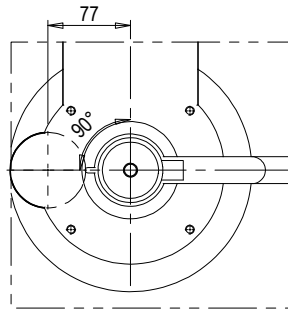
Key 8 Valve pin stroke adjustment



pic.1

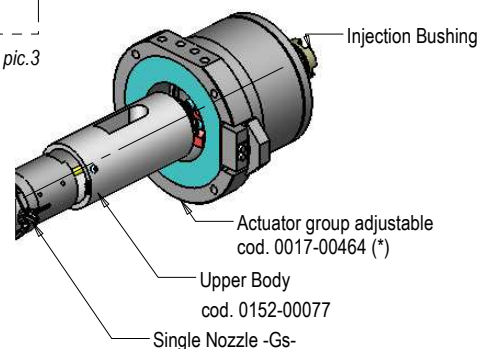


pic.2



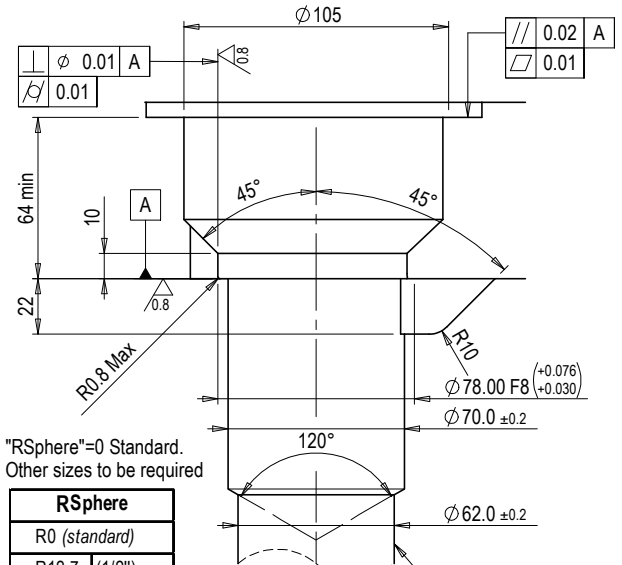
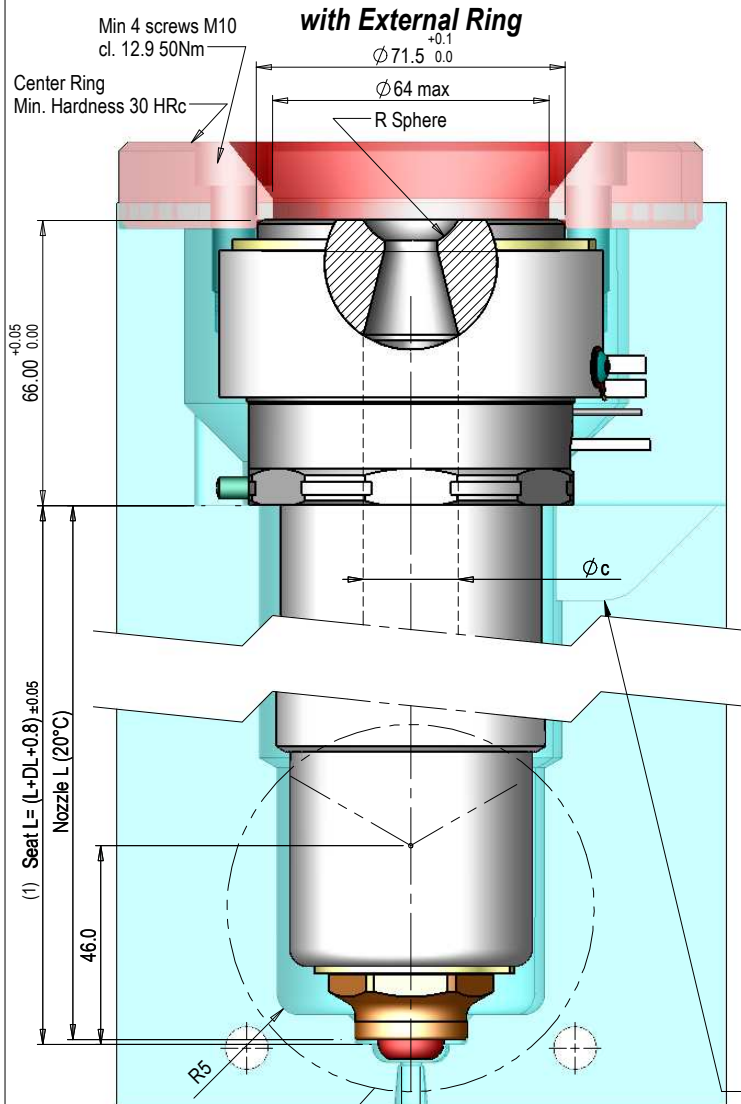
pic.3

Hole foreseen for passing polygonal socket wrench CH.8



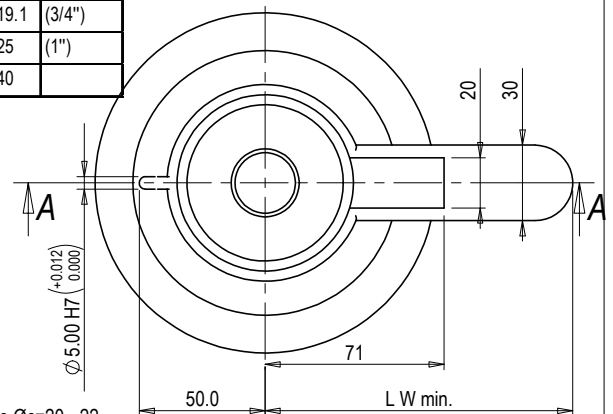
- Alternative seats as shown in the pic. 1-2-3
- The pocket of Actuator group it's positioned always at -90° from the pre-wiring hydr./pneum./cooling.

(*) O-Ring Kit code: 0038-00091



"RSphere"=0 Standard.
Other sizes to be required

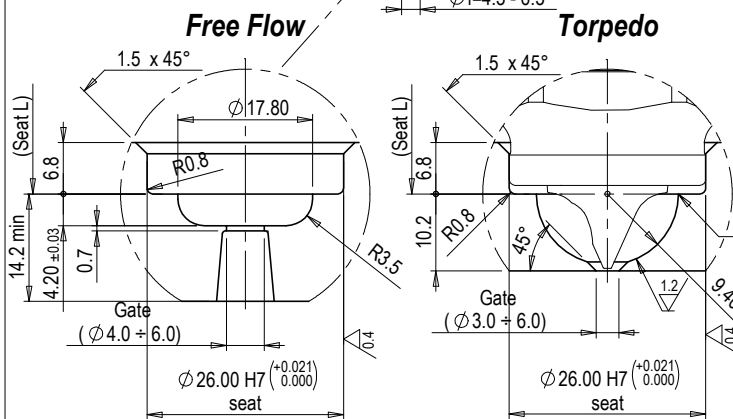
RSphere	
R0 (standard)	
R12.7 (1/2")	
R15.5	
R19.1 (3/4")	
R25 (1")	
R40	



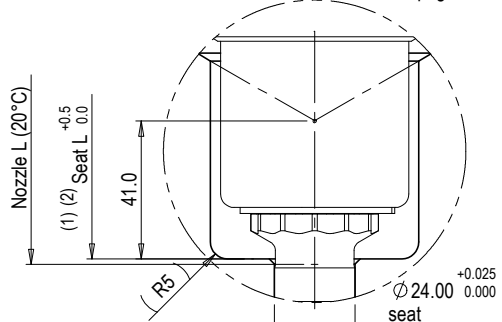
Nozzle Øc=20 - 22
available in Classic or
Fail Safe version

(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)

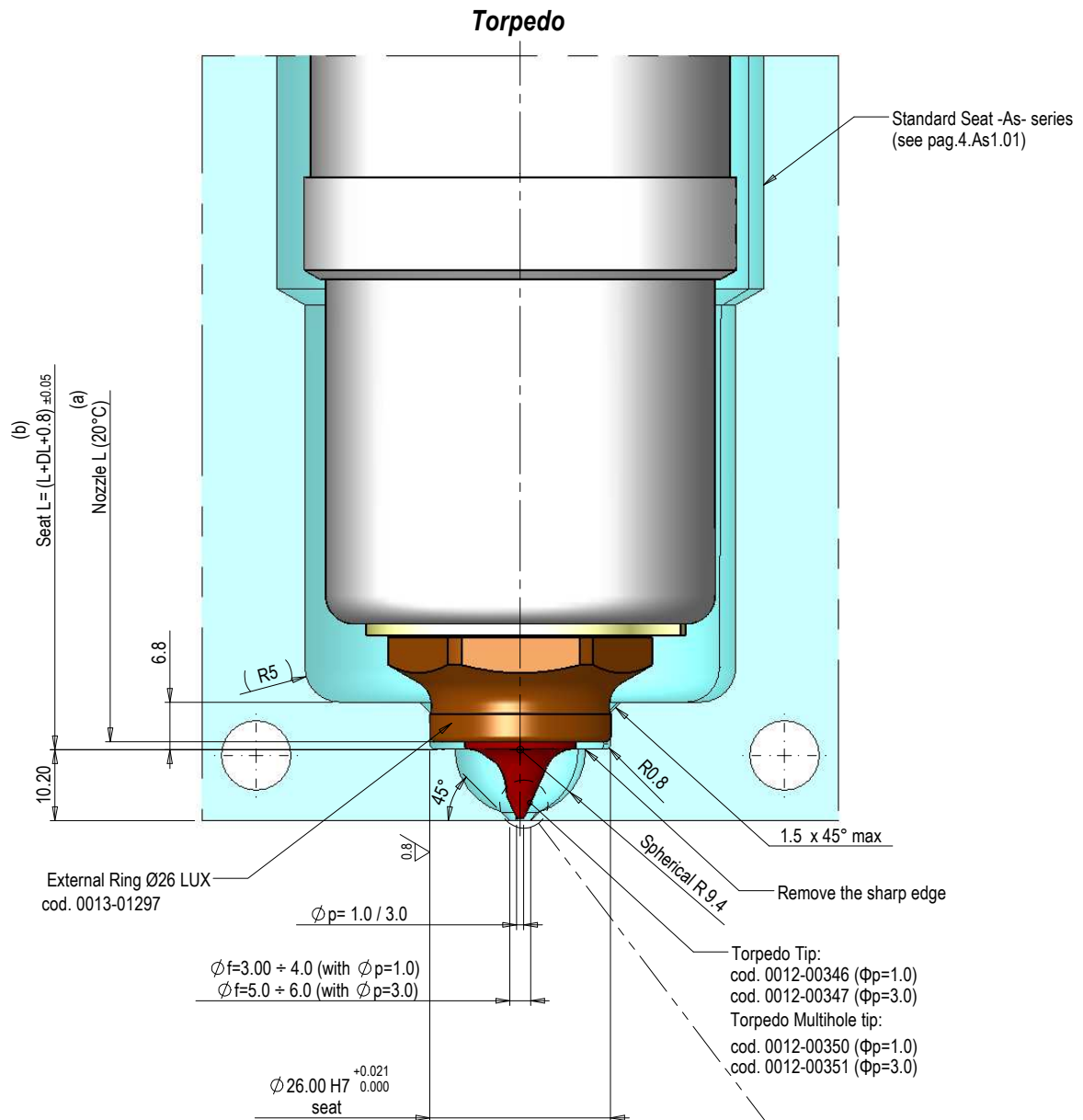


with Bushing through the cavity
See on technical sheets nozzles -Aa- page 4.Aa1.01->



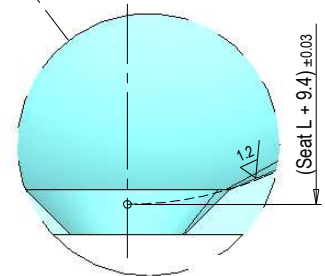
NOZZLE L L	L W min.
75	125.00
90	125.00
115	125.00
140	125.00
165	175.00
190	175.00
215	125.00
240	125.00
265	225.00
290	225.00
315	175.00
340	175.00
365	125.00
390	125.00
415	300.00
440	275.00
465	275.00
490	225.00
515	225.00
540	175.00
565	175.00
590	125.00
615	125.00

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.



**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



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

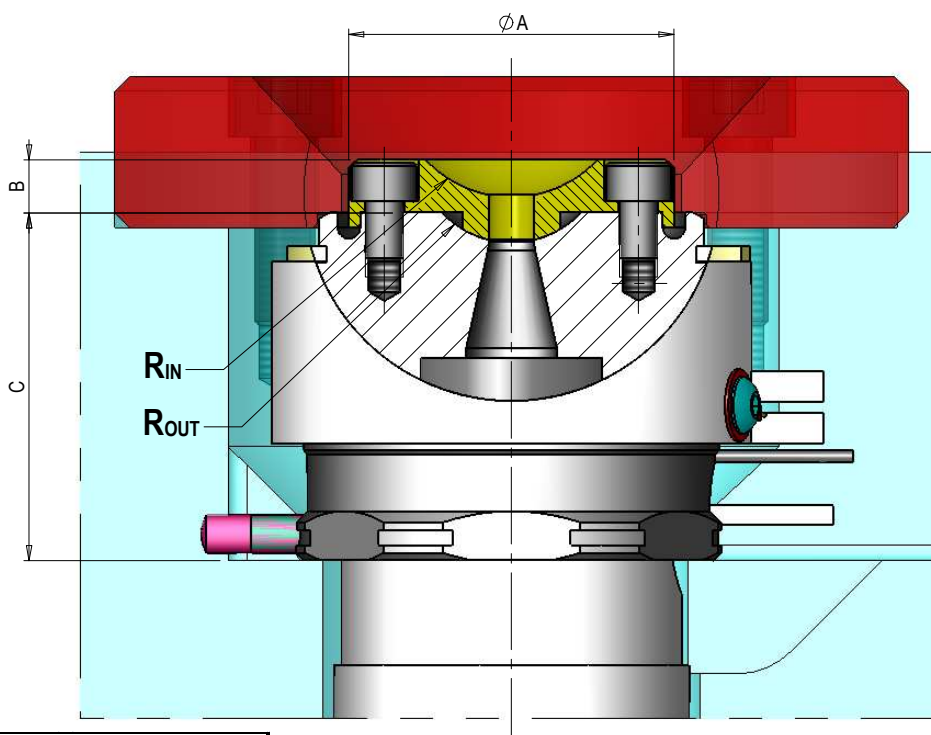
$\Delta T = T1 - T2$
 $\lambda = 0.000012 \text{ (1/°C)}$

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
	$DL = (L * \Delta T * \lambda)$										
	[$\Delta T=100^\circ\text{C}$]	[$\Delta T=120^\circ\text{C}$]	[$\Delta T=140^\circ\text{C}$]	[$\Delta T=160^\circ\text{C}$]	[$\Delta T=180^\circ\text{C}$]	[$\Delta T=200^\circ\text{C}$]	[$\Delta T=220^\circ\text{C}$]	[$\Delta T=240^\circ\text{C}$]	[$\Delta T=260^\circ\text{C}$]	[$\Delta T=280^\circ\text{C}$]	[$\Delta T=300^\circ\text{C}$]
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

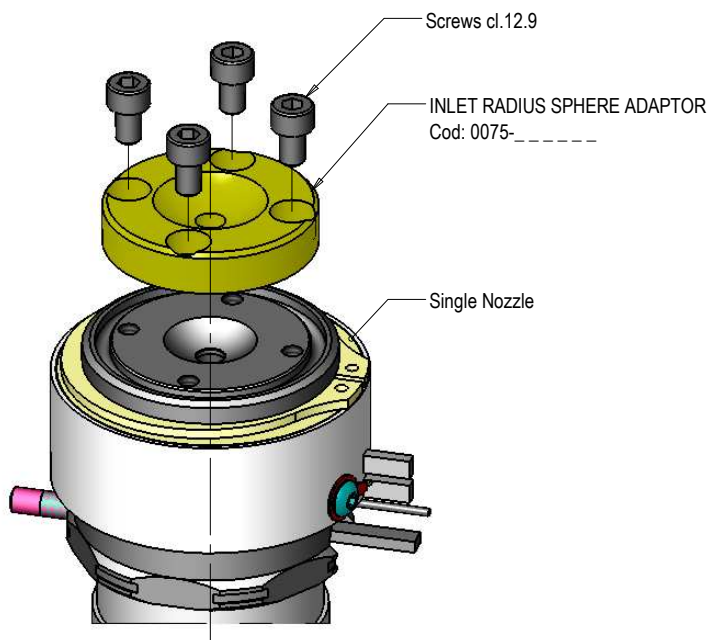
INLET RADIUS SPHERE ADAPTOR for single nozzle - Ps - Ms - Gs - As - series

WARNING. The following INLET ADAPTOR must be adopted only for the TRY OUT of the mold.



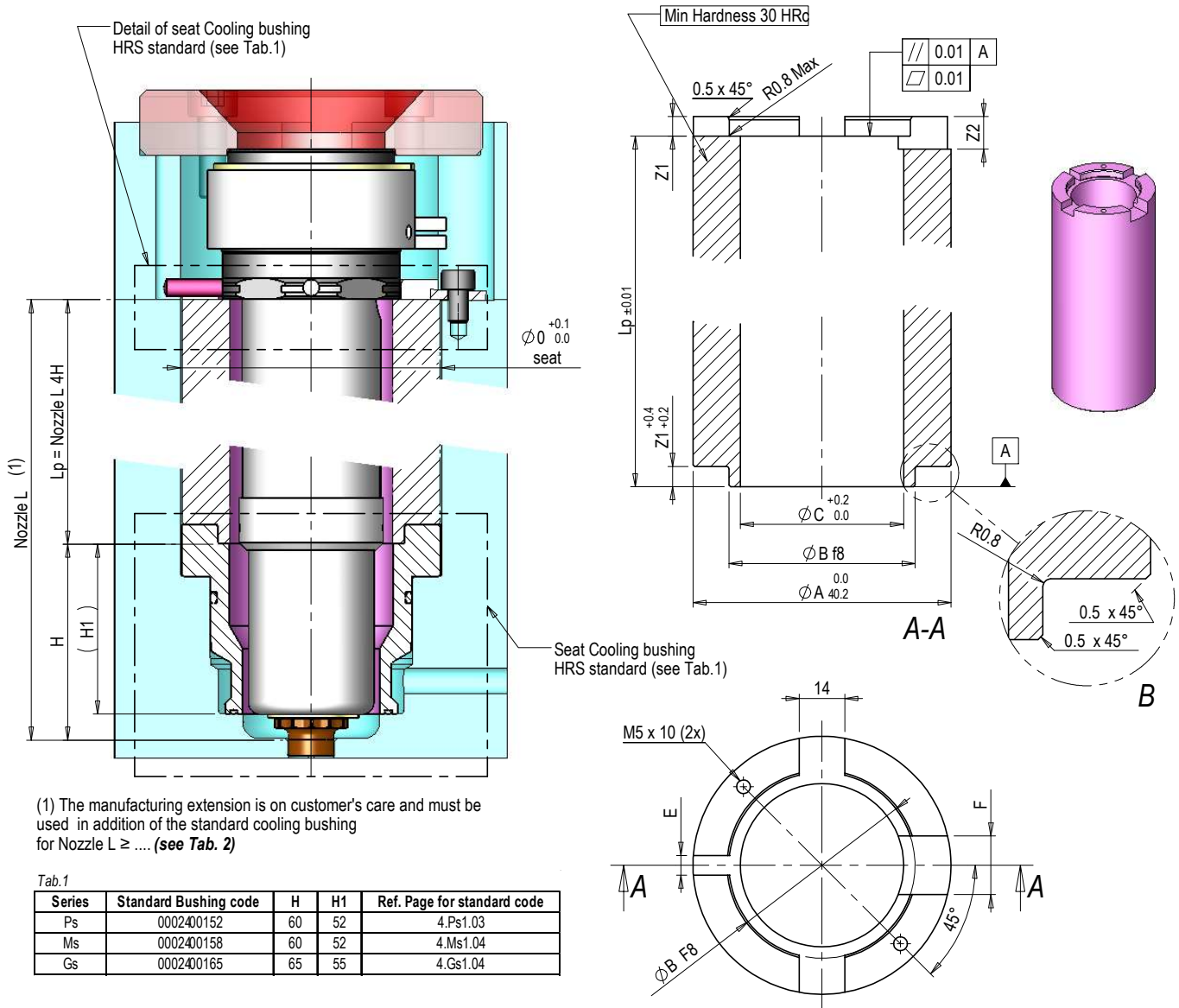
Standard radius combinations	
RIN	ROUT
0	12.7
12.7	15.5
15.5	19.1
19.1	25
25	40
40	

(*) 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)

COOLING BUSHING EXTENSION (customer's care)



Tab.1

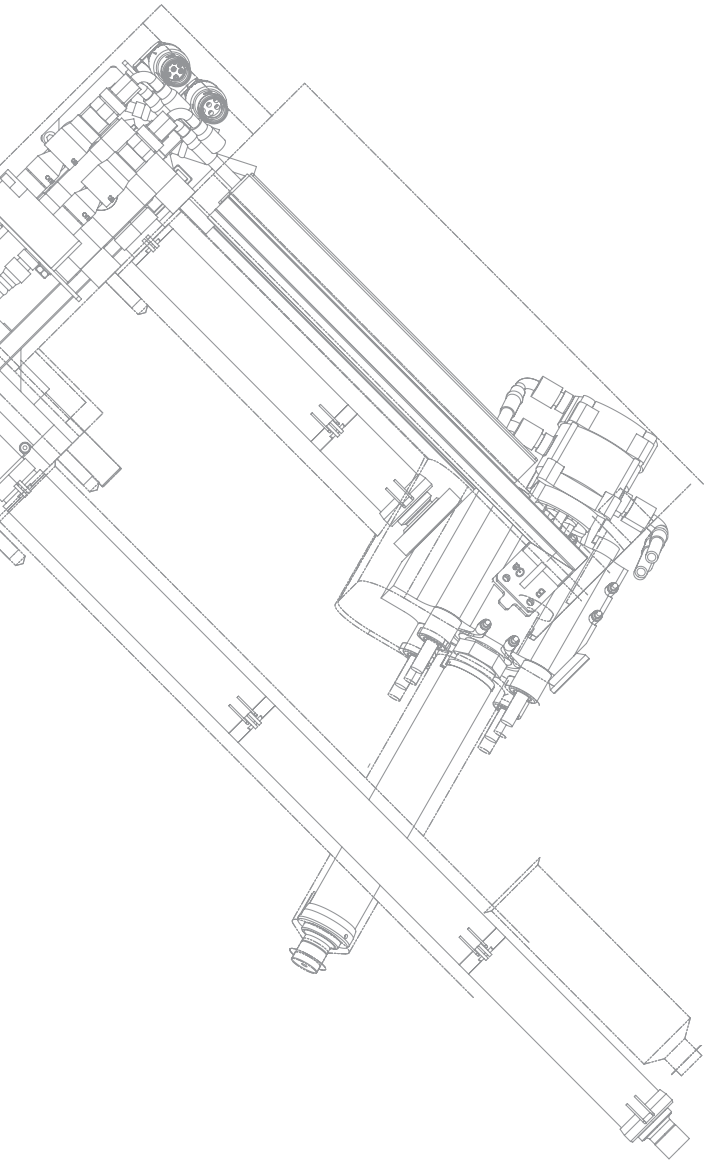
Series	Standard Bushing code	H	H1	Ref. Page for standard code
Ps	0002400152	60	52	4.Ps1.03
Ms	0002400158	60	52	4.Ms1.04
Gs	0002400165	65	55	4.Gs1.04

Tab.2

Series	Nozzle L ≥
Ps	185
Ms	210
Gs	215

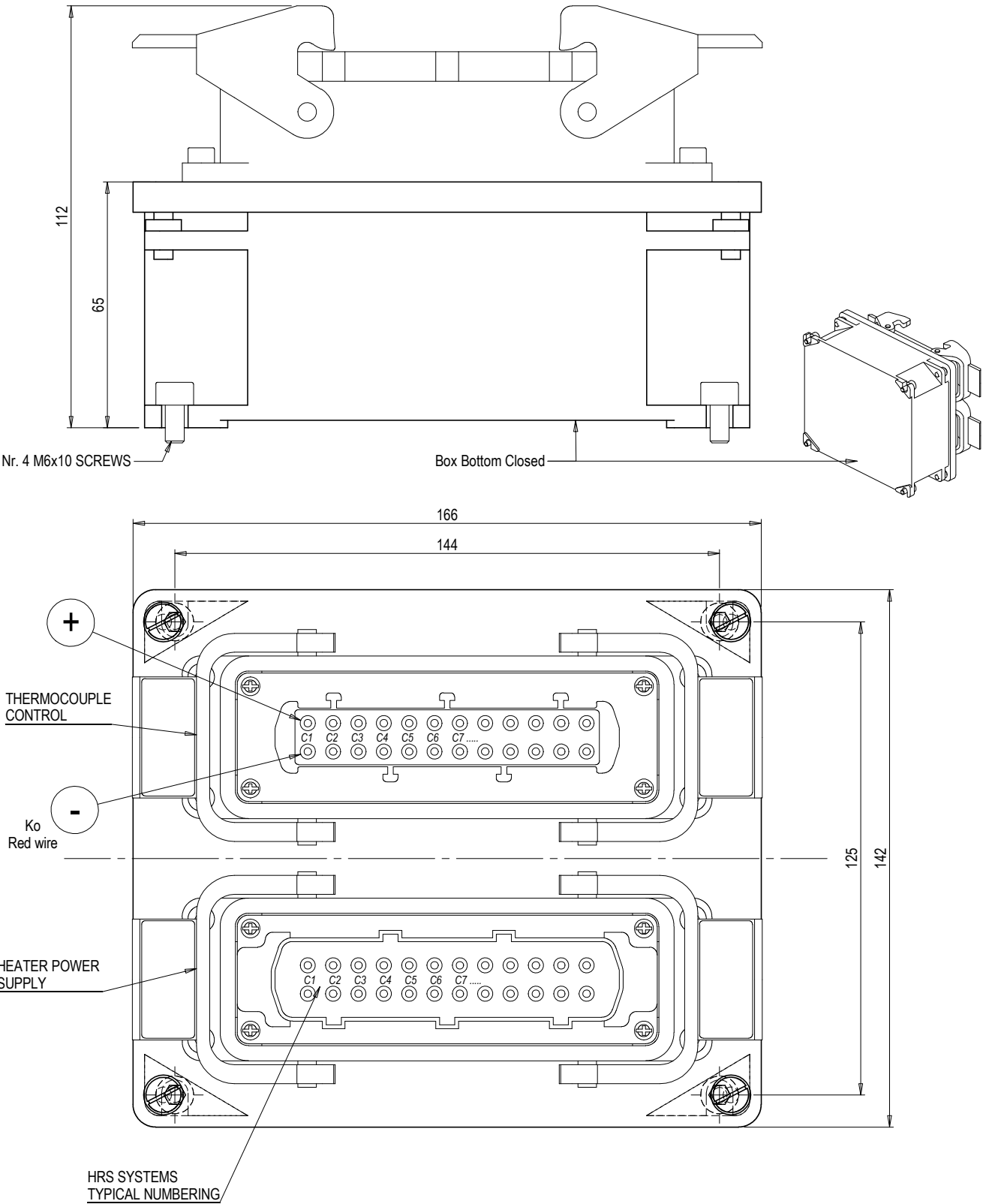
Manufacturing dimensions:

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



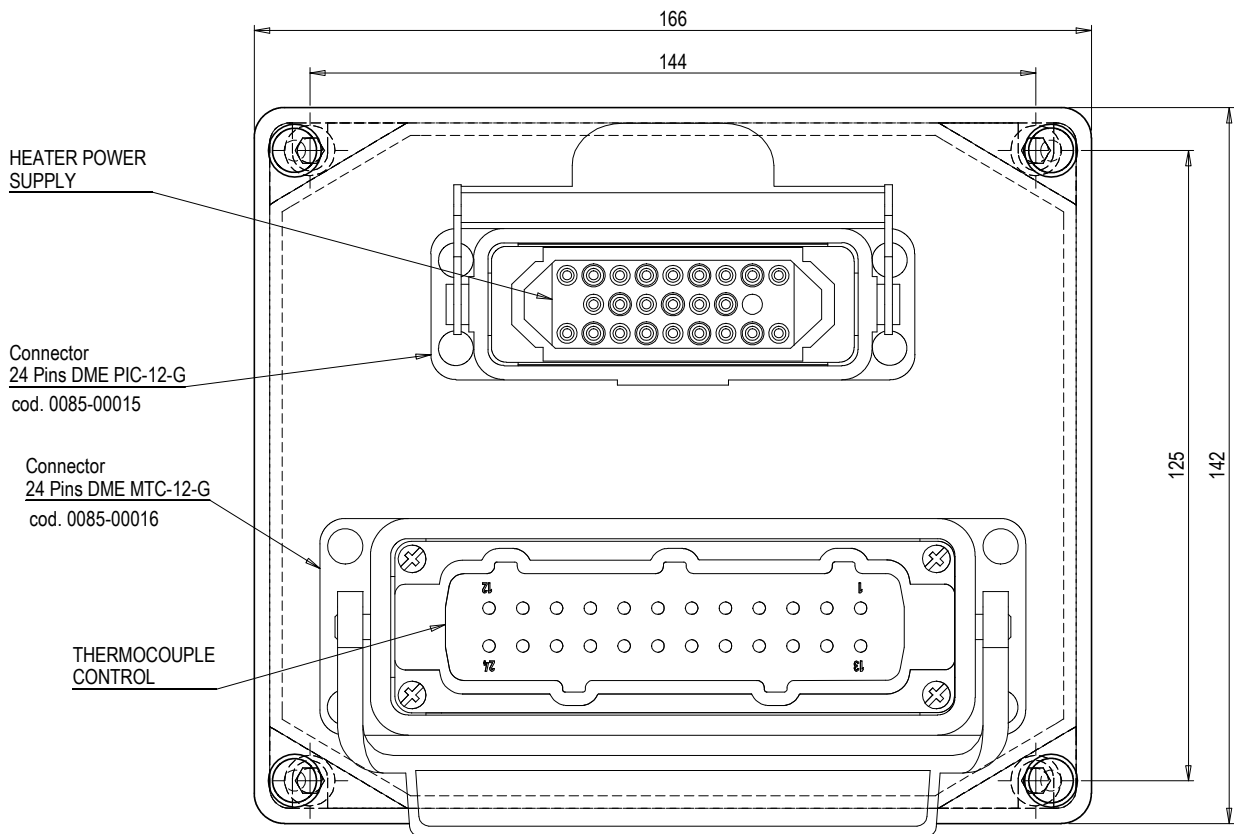
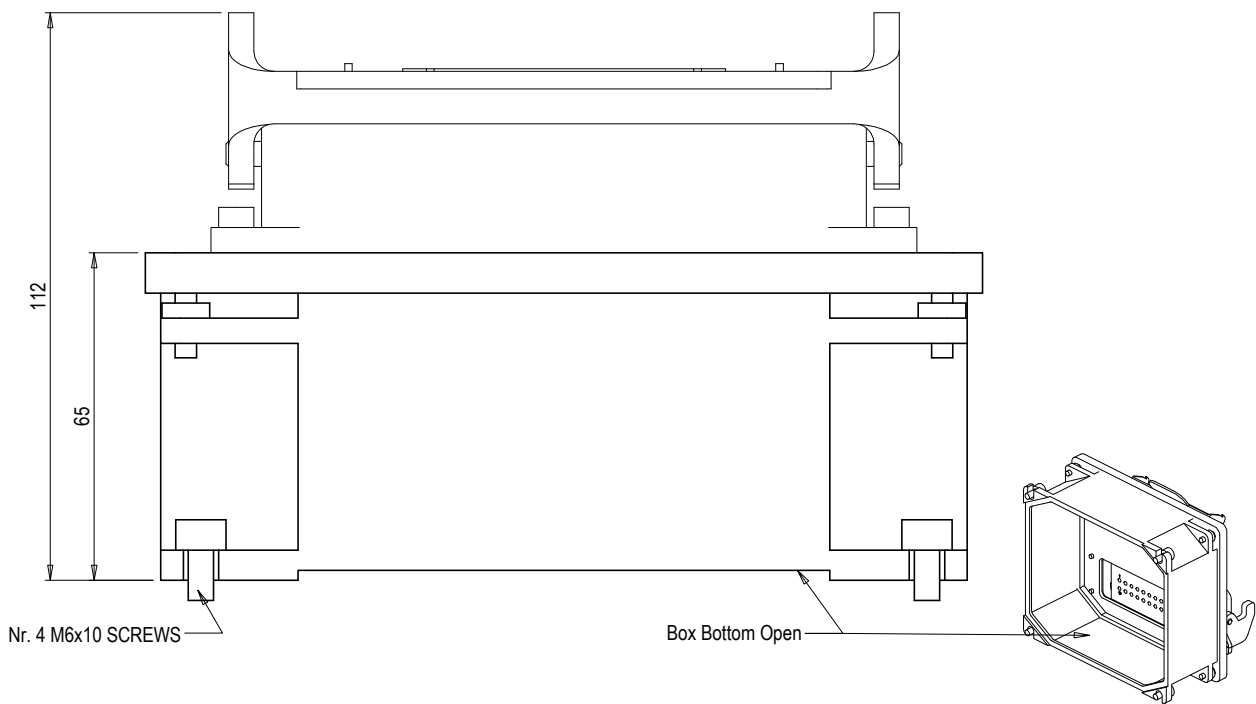
Accessories

Accessori
Zubehör
Accessoires
Accesorios
Accessórios

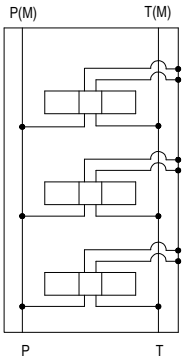


CODE	DESCRIPTION
0028-00006	N° 2 16-PIN CONNECTORS (1 MALE + 1 FEMALE)
0028-00008	N° 2 24-PIN CONNECTORS (1 MALE + 1 FEMALE)





CODICE	DESCRIZIONE
0028-00166	ASSEMBLATO CASSETTA DI COLLEGAMENTO 2X24 POLI CON CONNETTORI DME



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		

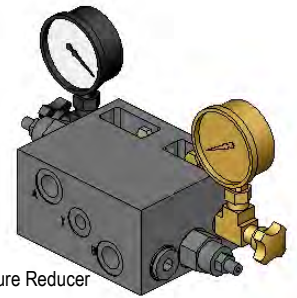


N° STATIONS	H	K	PNEUMATIC ELECTROVALVES	
			CODE	MODEL
1	65	83	0076-00014	Monostable 24V AC
2	108	126		
3	151	169	0076-00013	Monostable 24V DC
4	194	212		
5	237	255	0076-00016	Bistable 24V AC
6	280	298		
7	323	341	0076-00015	Bistable 24V DC
8	366	384		
9	409	427		
10	452	470		
11	495	513		
12	538	556		

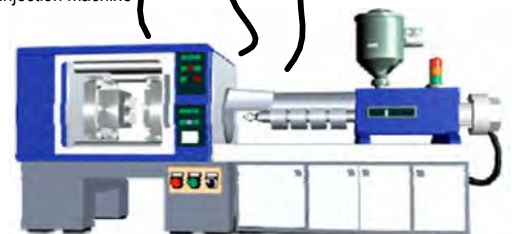
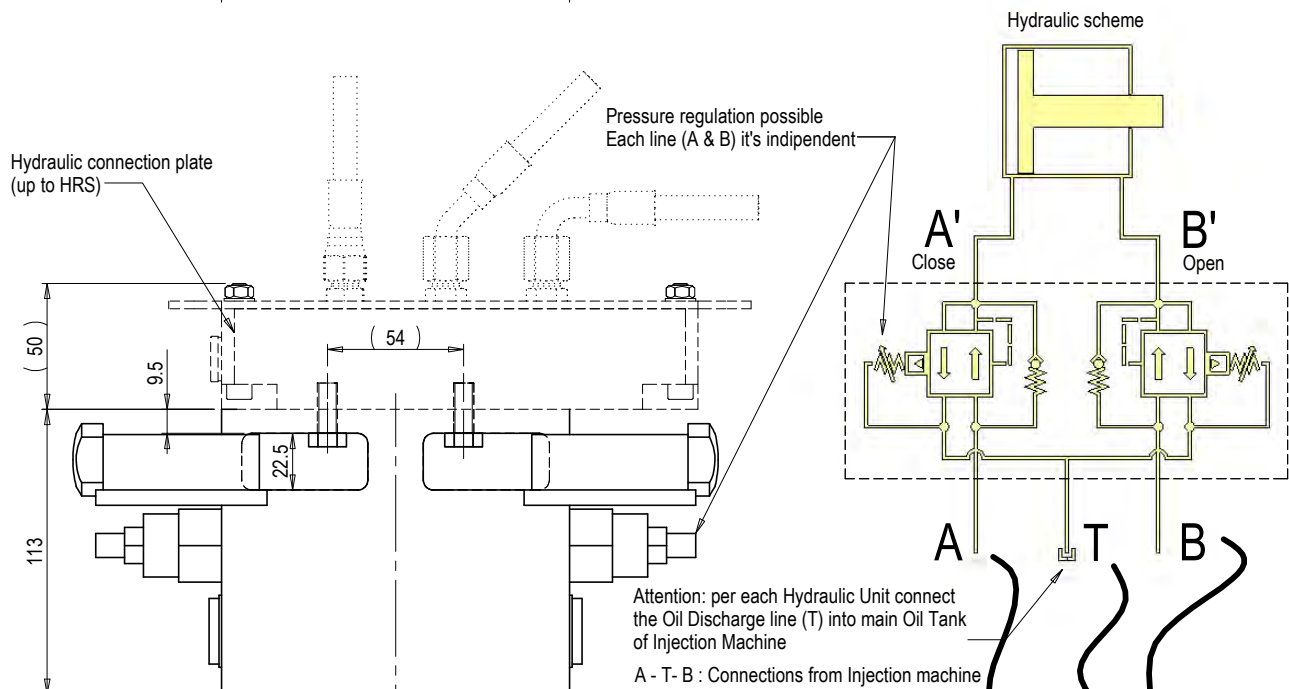
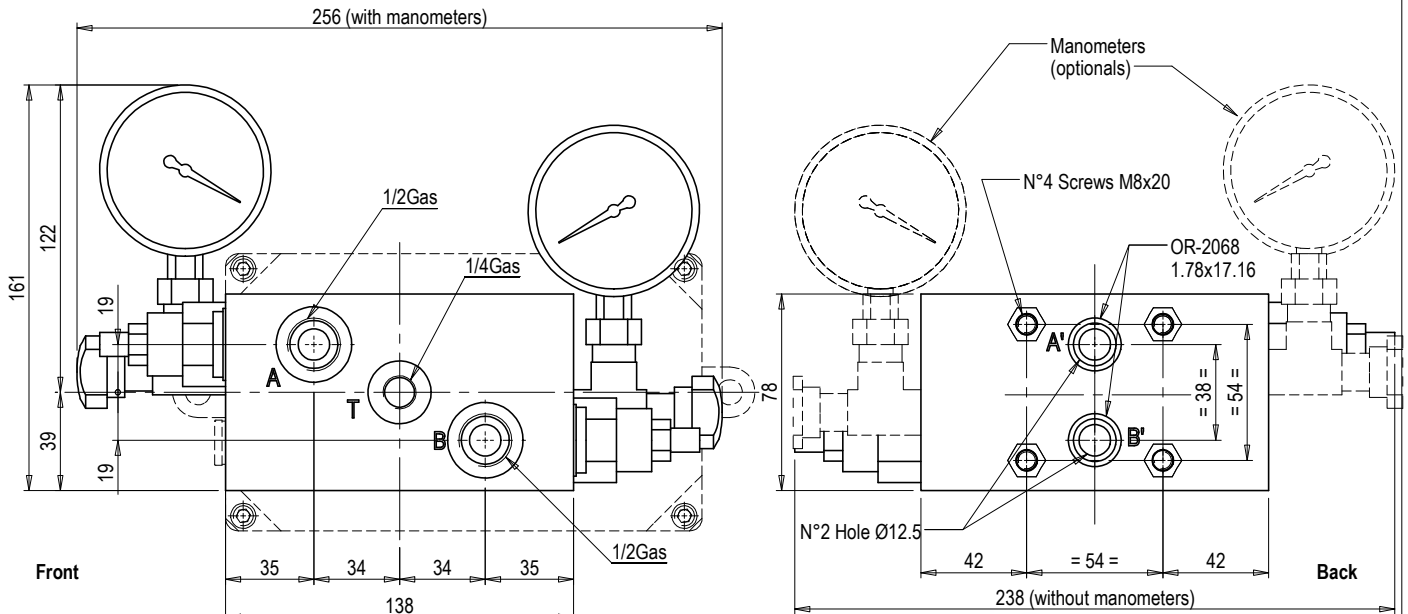
The pressure reducer HRS allows the use of Hydraulic oil supplied from Injection machine to feed the HRS Hydraulic circuit.
The in-line pressure is pre-emptively reduced to the correct value foreseen for in working order of HRS system.

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

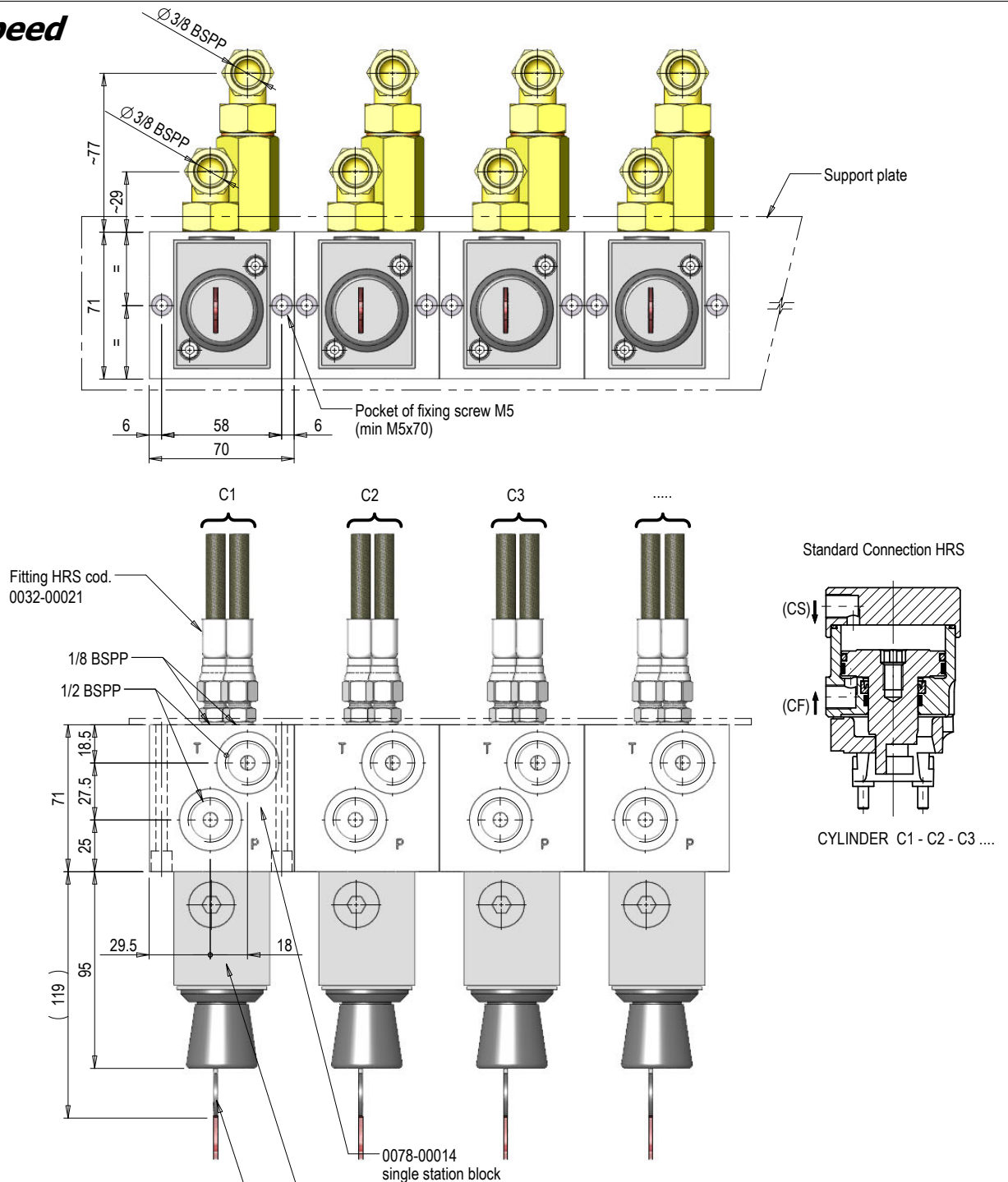


⚠ Attention: The pressure reducer circuit provides the discharge oil "T", absolutely to be connected to oil tank of Injection machine. The failure respect of connection, heavily damages the HRS system because the line pressure is not reduced.

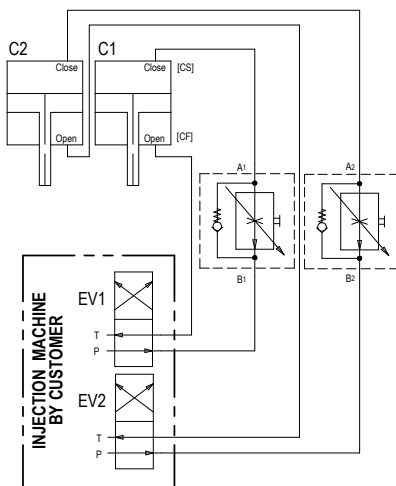


HYDRAULIC MANUAL FLOW CONTROL with solenoid valve on injection machine (by customer)

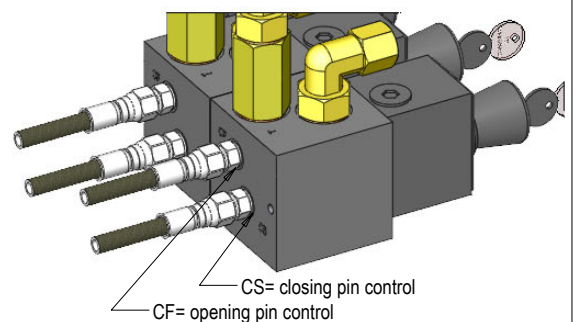
FLEX Speed



Hydraulic diagram



The flow control valve allow to adjust manually only the opening speed pin.
The closing speed is not adjustable.

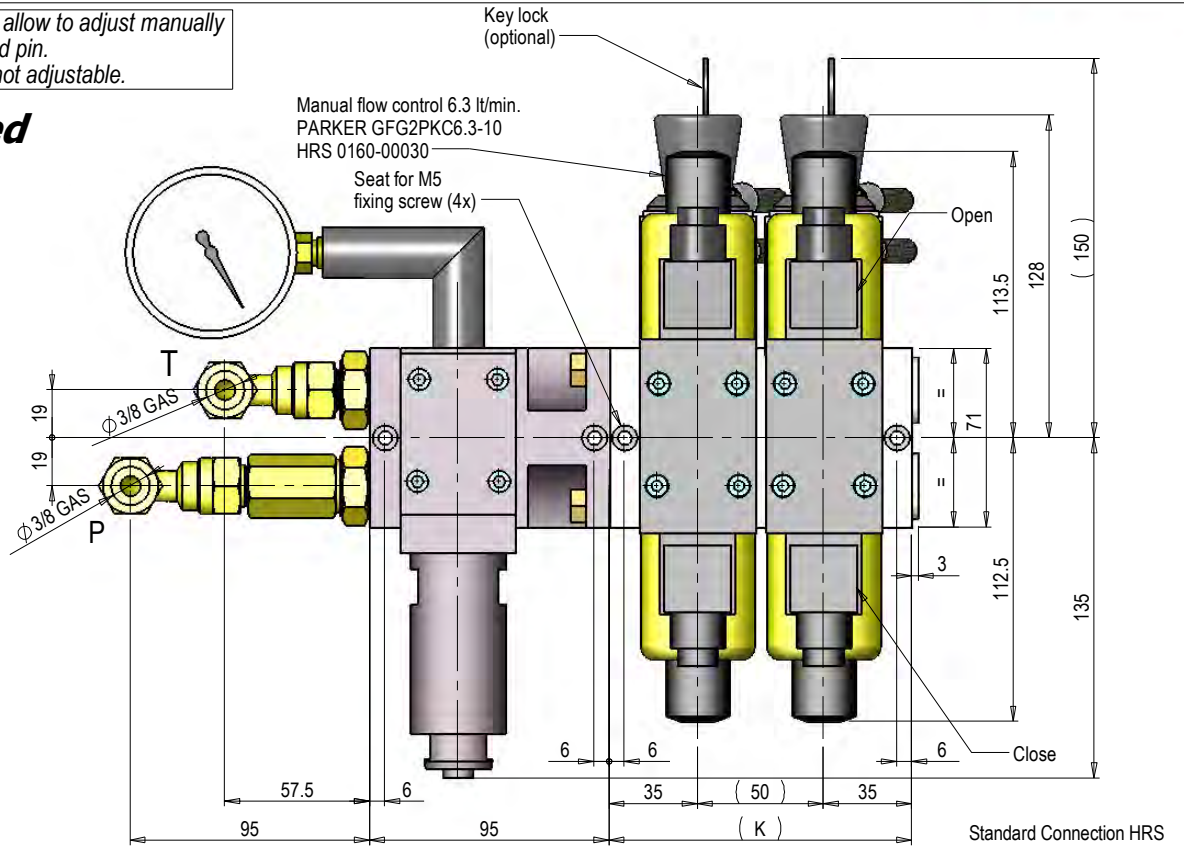


HYDRAULIC MANUAL FLOW CONTROL with solenoid valve by HRS

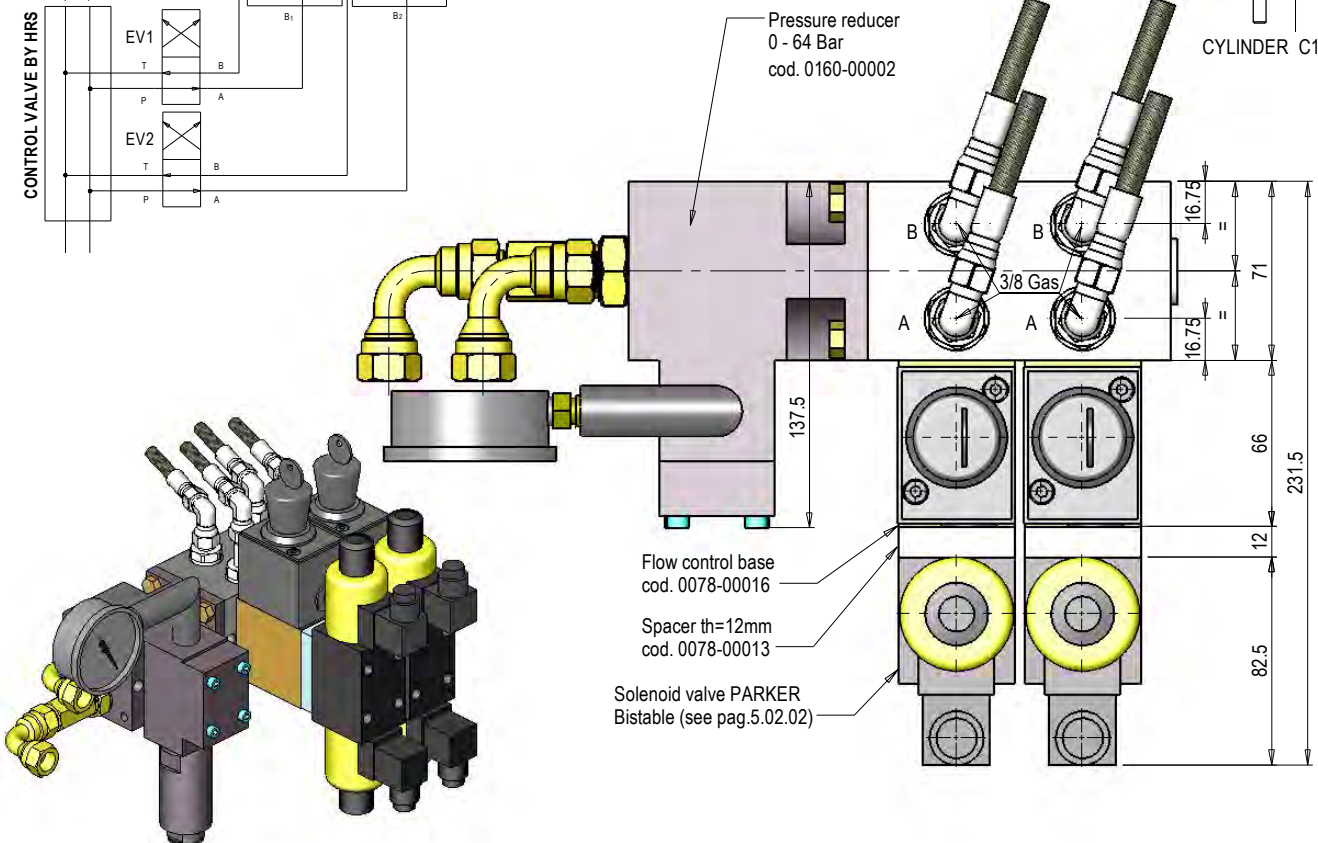
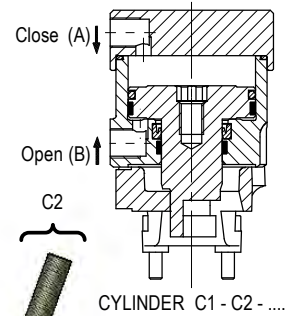
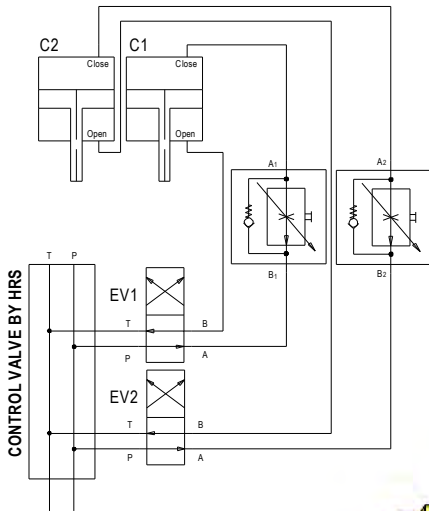
ærlikon
hrsflow

The flow control valve allow to adjust manually
only the opening speed pin.
The closing speed is not adjustable.

FLEX Speed



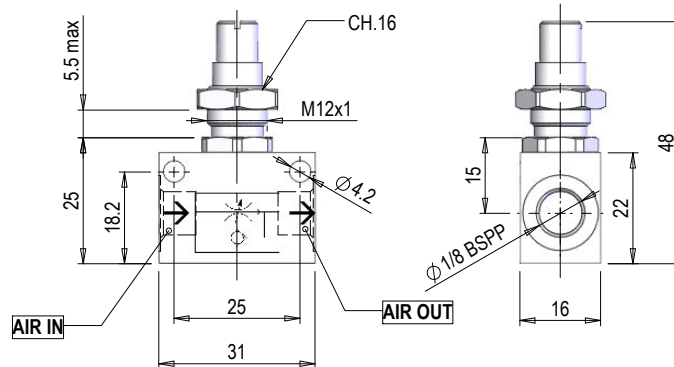
Hydraulic diagram



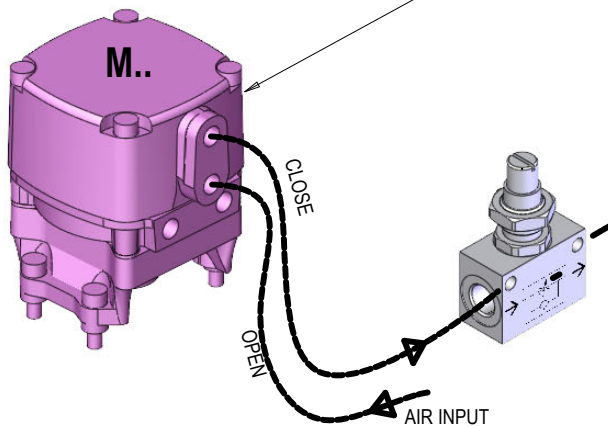
FLEX Speed cod. 0160-00100
max 10 bar
max 70°C [158°F]

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.

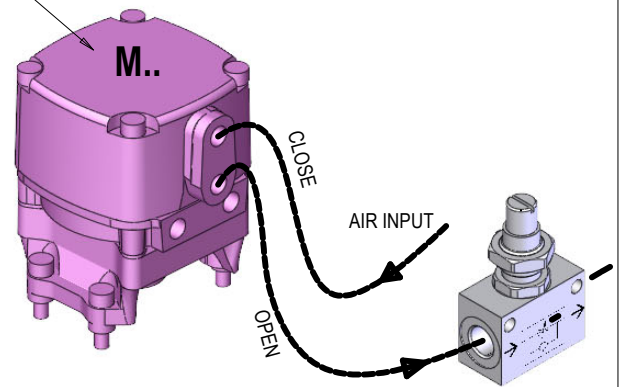
Overall Dimensions



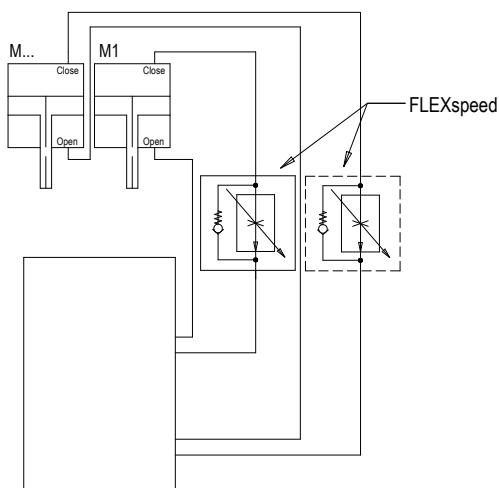
OPENING ADJUSTMENT
of the pin speed



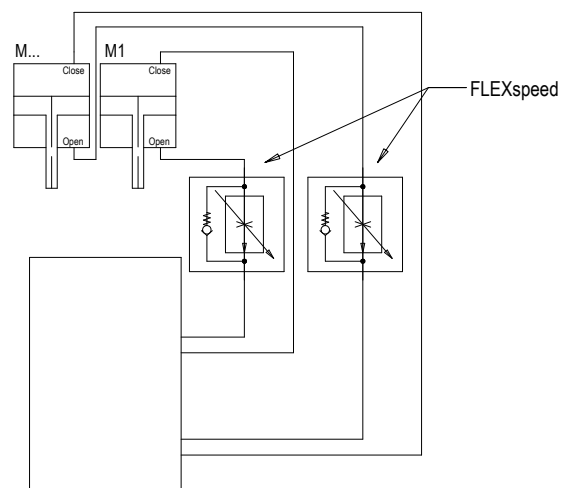
CLOSING ADJUSTMENT
of the pin speed



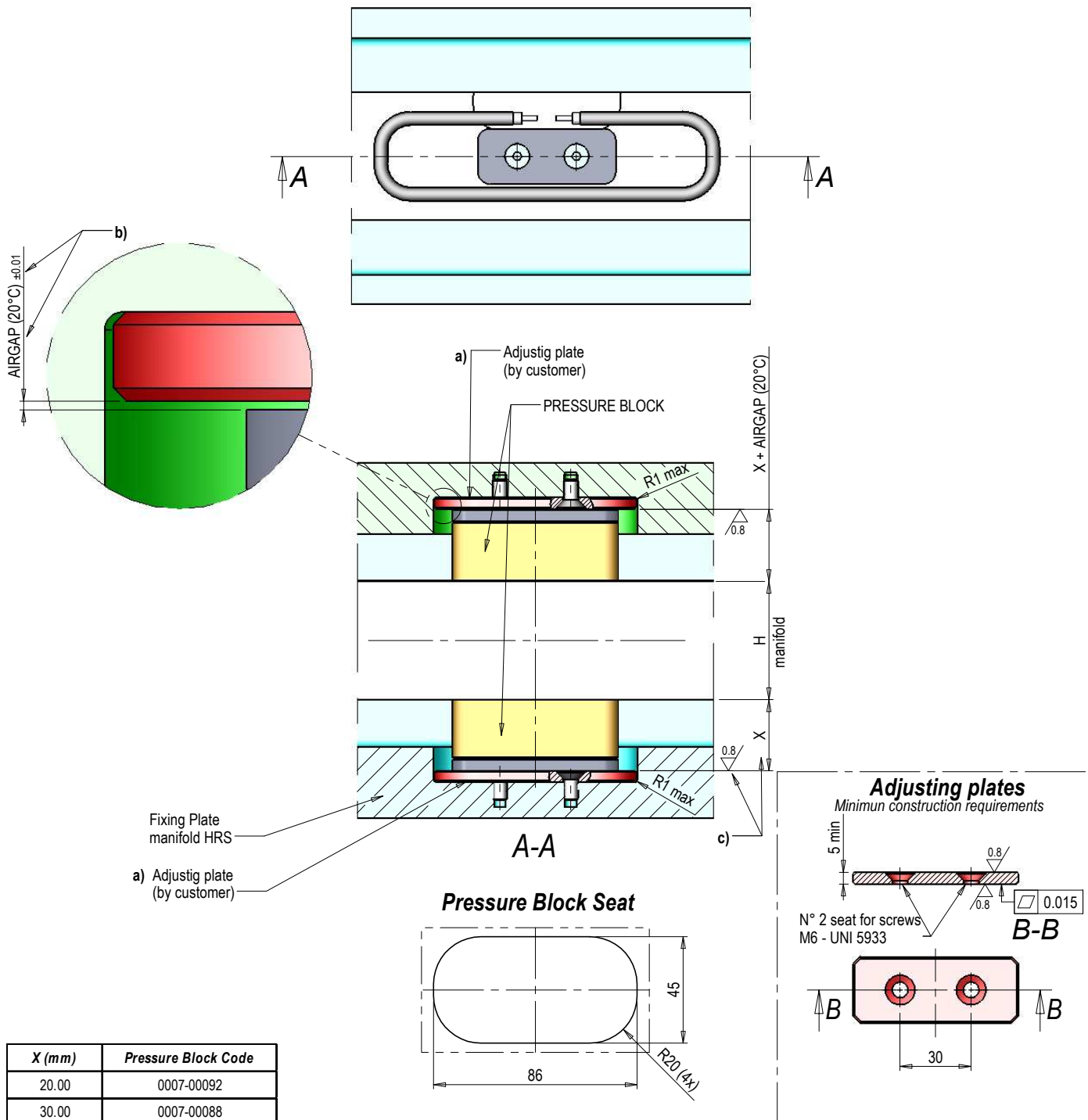
Hydraulic diagram



Pneumatic diagram



The pressure block is a component exclusively providable by design of HRS technical office which manages the feasibility, quantity and positioning on manifold. HRS declines every responsibility 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	VALUE
	with "X"=20 mm	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.

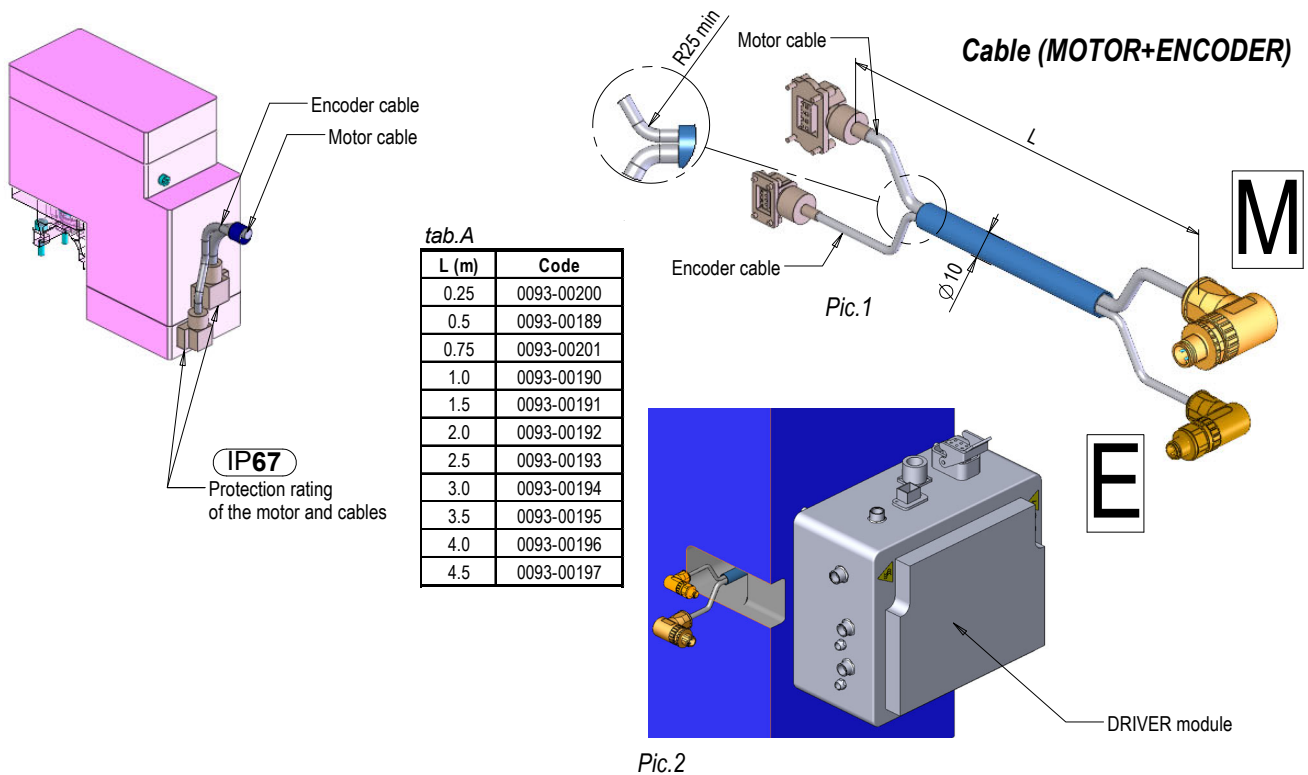
d) Requirements b) and c) must be satisfied for ALL pressure blocks required by HRS system

(*) 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.

Electricals specification for Flexflow One

1- Flexflow One cables

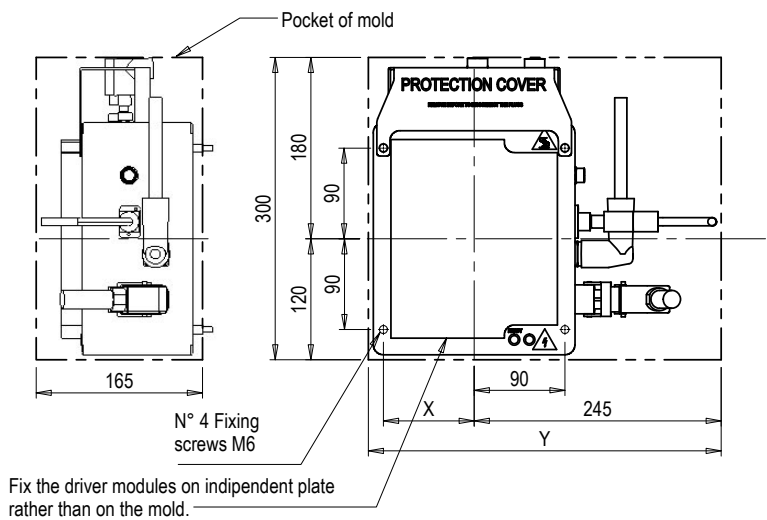
Every actuator group is electrically powered through a couple of cables (ENCODER+MOTOR). For cable codes with available lengths see table "A". The cable is supplied separated from the group; its length must be carefully calculated during wiring design.



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 they can manage a max numbers of actuators as shown on table "B".

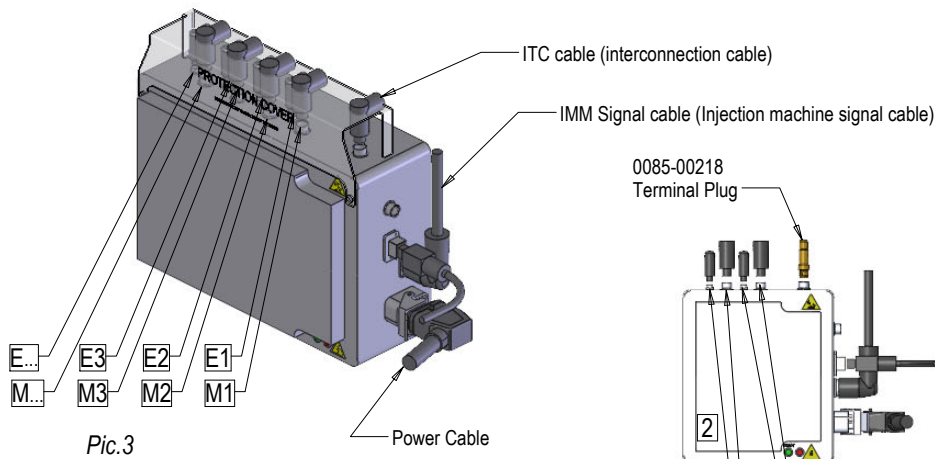


tab.B

X	Y	N° of ACTUATORS
90	350	1
		2
220	480	3
		4
490	750	5
		6
		7
		8

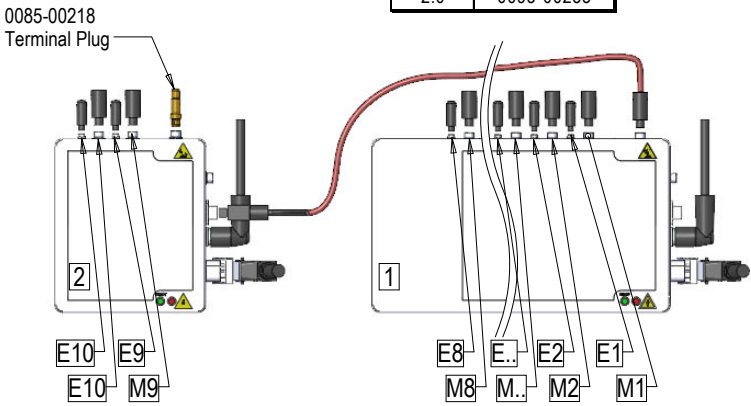
WARNING! Every single driver module it's specifically set for the system where it have to operate; at the customer it's not allowed to remove this component in complete autonomy and replace him with other equal or bigger sizes modules. Please contact the customer service Oerlikon HRSflow.

More driver module (max n°3) may be connected between 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".

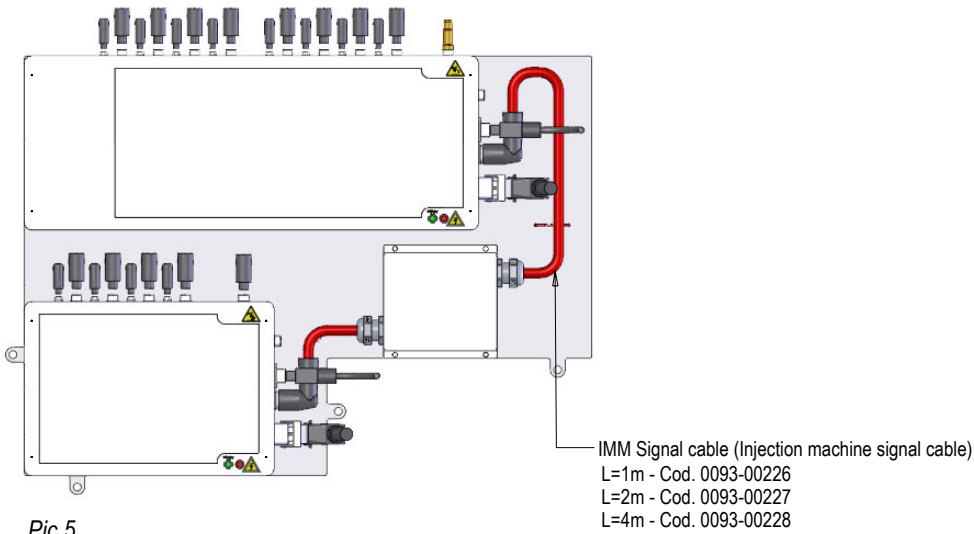


tab.C

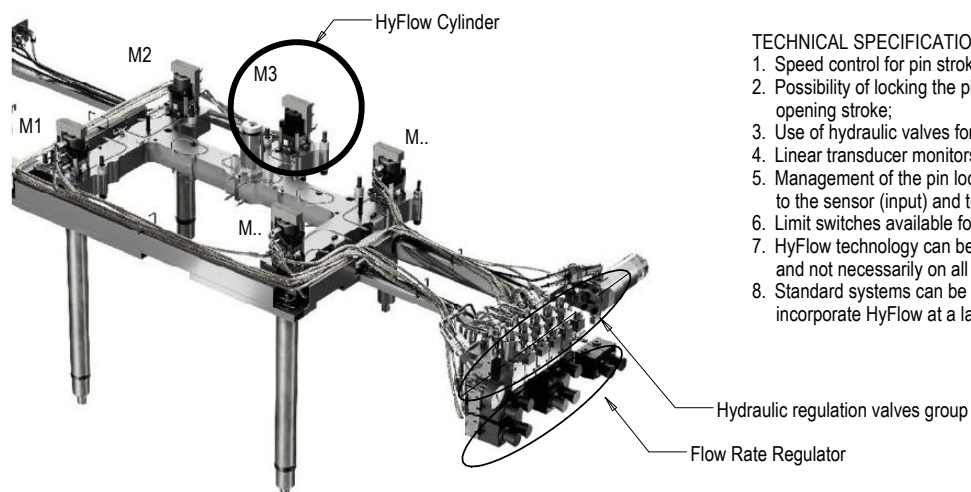
L (m)	Code
0.5	0093-00231
0.75	0093-00232
1.0	0093-00233
1.5	0093-00234
2.0	0093-00235



The Injection Molding Machine and the driver modul are connected with a specific cable and connector (Pic.5)



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.



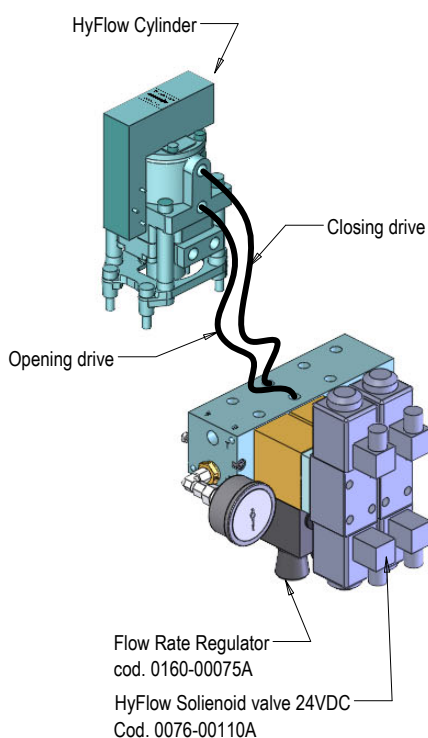
TECHNICAL SPECIFICATIONS:

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:

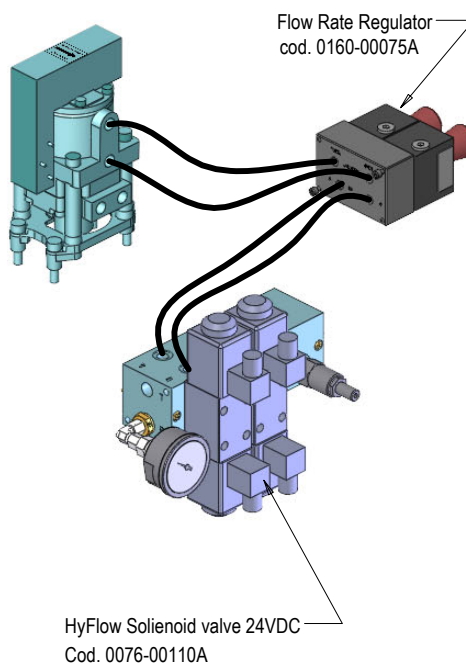
1VOS

Adjust the OPENING speed with pin stop in a intermediate position (OPENING only)

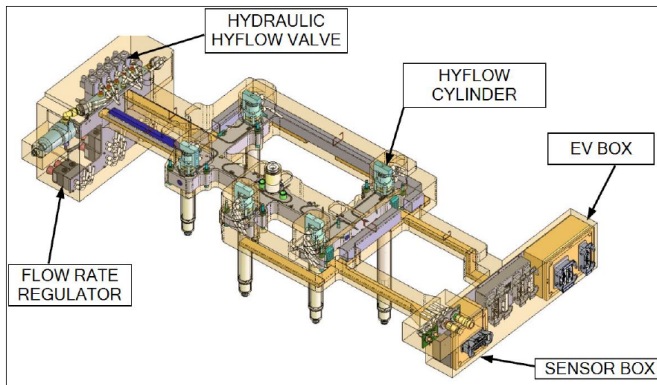


2VOS

Adjust the OPENING and CLOSING speed with pin stop in a intermediate position (OPENING only)



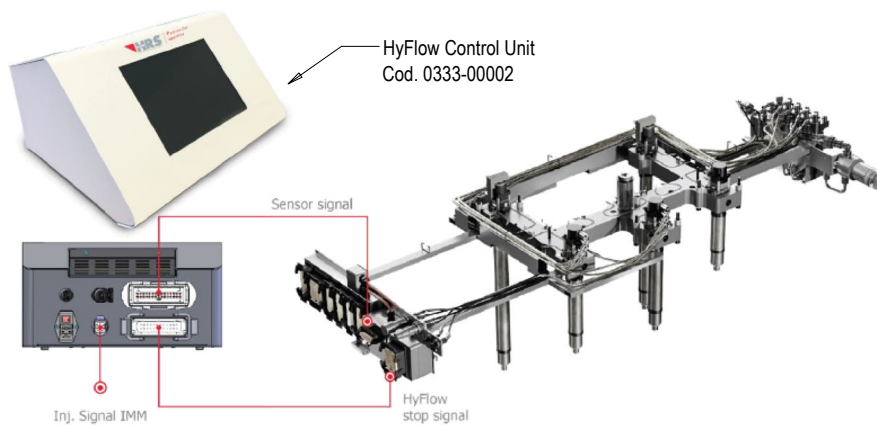
Regarding the electrical part, the "HyFlow" system is equipped with two special boxes: "EV BOX" for controlling the hydraulic valves and the "SENSOR BOX" for reading the linear sensor with which the HyFlow cylinder is equipped (see Fig. 1). These two BOXES make the interface between the mechanical portion 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

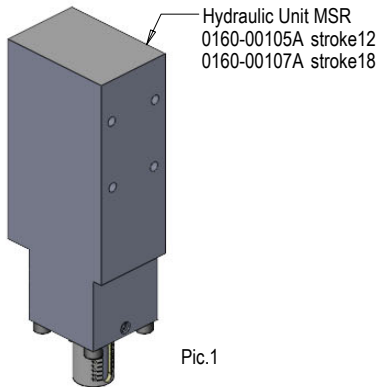
For more information about the "HyFlow" system, please contact HRS

MSR - MECHANICAL STROKE REGULATOR SYSTEM for HYDRAULIC ACTUATORS

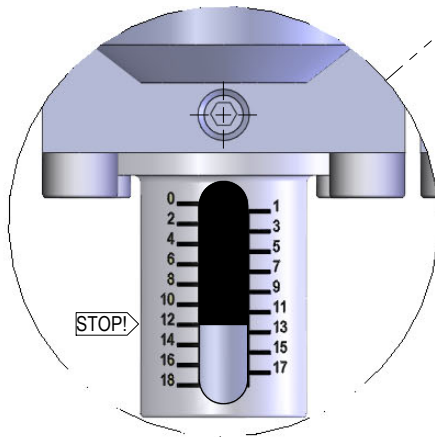
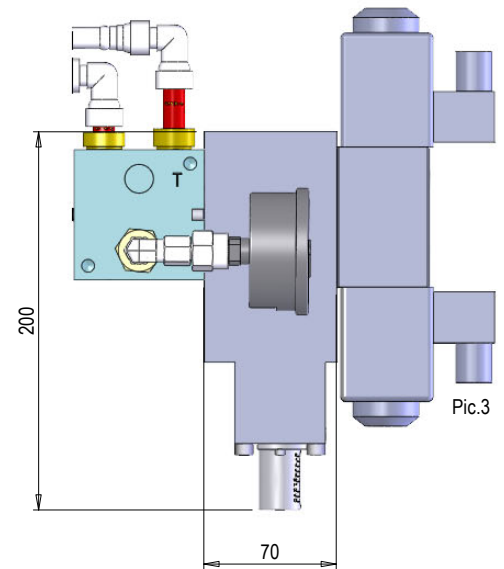
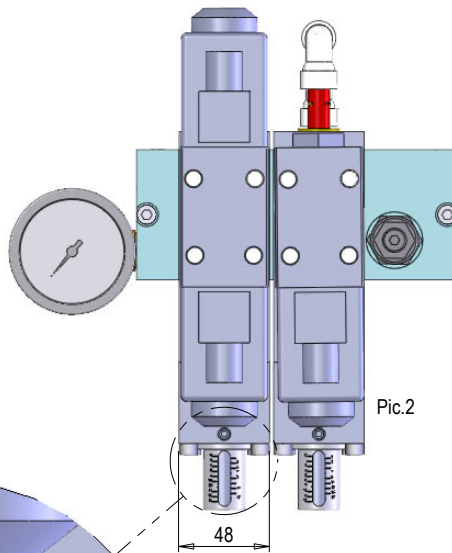
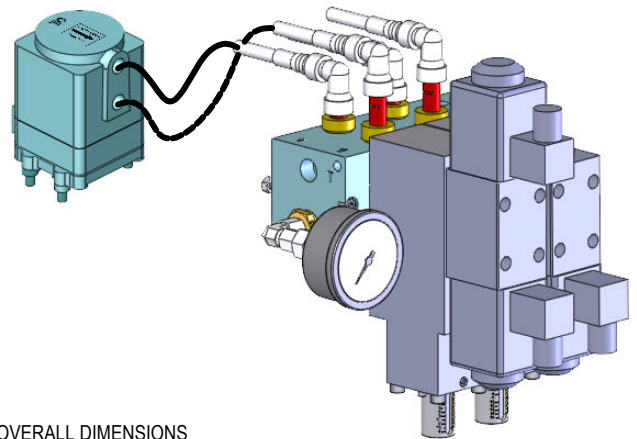
The MSR solution (Pic.1) allows adjustment of the position of the pin in the systems with hydraulic actuators. Managing the oil volume is possible to set different position of needle in opening phase by mean a mechanical device installed on solenoid valve block (Pic.2-3)

TECHNICAL SPECIFICATIONS:

- Valve pin opening stroke adjustment;
- Installed in EV block (Pic.3);
- Possible to install only in required EV position;
- Possible to install with the FLEXSpeed (optional) (Pic.4);
- Compatible with all types and series HRS hydraulic cylinder.

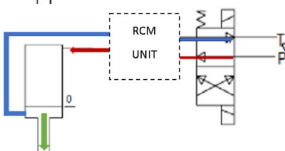
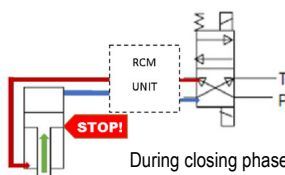


Pic.1

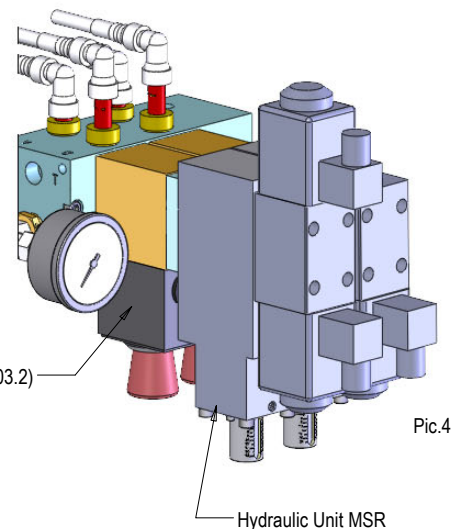


FUNCTIONALITY

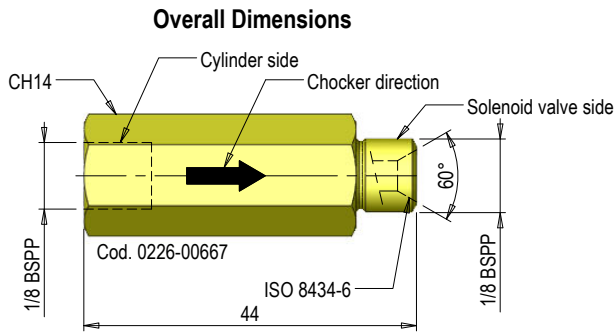
During opening phase (Stroke regulation)



FLEXSpeed
(see pag.5.03.2)

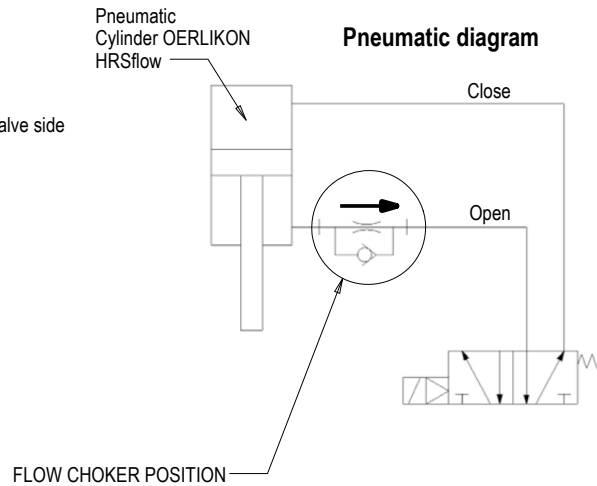


It's a particular kind of PNEUMATIC fitting used to slow down the closing stroke of the cylinder. If the design rules require it, in case of wired systems OERLIKON HRSflow foresees it already installed by default. In case of no-wired systems, the customer will have to carry out the installation independently according to the specifications below:

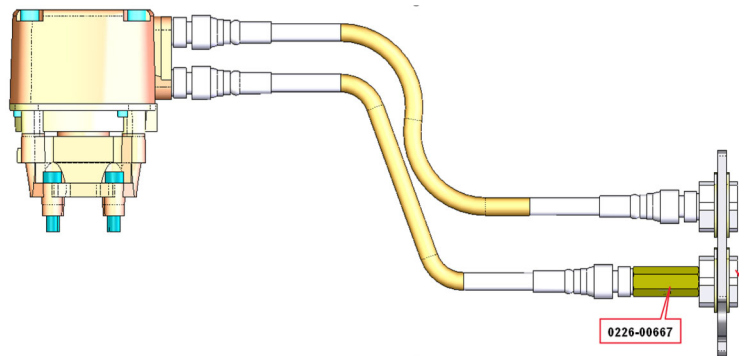


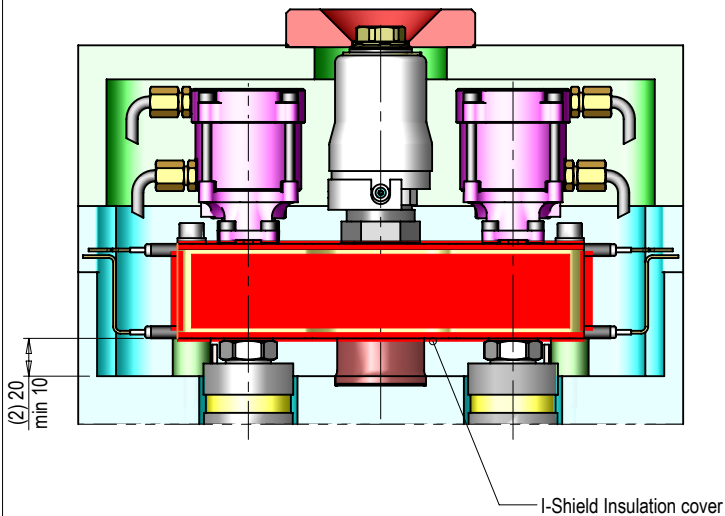
Technical data sheet		
Fluid:	Compressed Air	
Max Pression:	15 bar	
(*) Max working temperature :	+300°C [+572°F]	
Materials:	Body	Stainless Steel
	Springs	Stainless Steel

(*) 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!



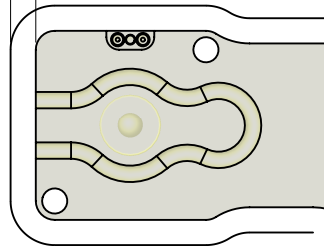
Assembly (only for example)
for more detail please contact OERLIKON HRSflow Technical Office





- 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.

Cutout Standard + 10mm



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 practices is recommended to control dust;
- Eye Protection: Safety glasses;
- Skin Protection: Safety gloves.

