1. The Aim of the Standard

In accordance with this standard, the molds are produced in such a way that they can be used in production on specified injection molding machines in our premises for the injection of plastic without additional modifications. To produce an injection mold for required pressing means that on the basis of our order and provided data about the pressing (usually it is 3D model of the pressing in Catia V5 form without shrinkage, specification of tolerances, requirements on quality of surfaces, length of working cycle and assumed injection molding machine), the supplier delivers us a mold by which we can produce flawless pressings that match our order (automotive industry standard). In the case of need, this delivery also contains one optimization mold when it is necessary to adapt the pressing from the mold to related pressing.

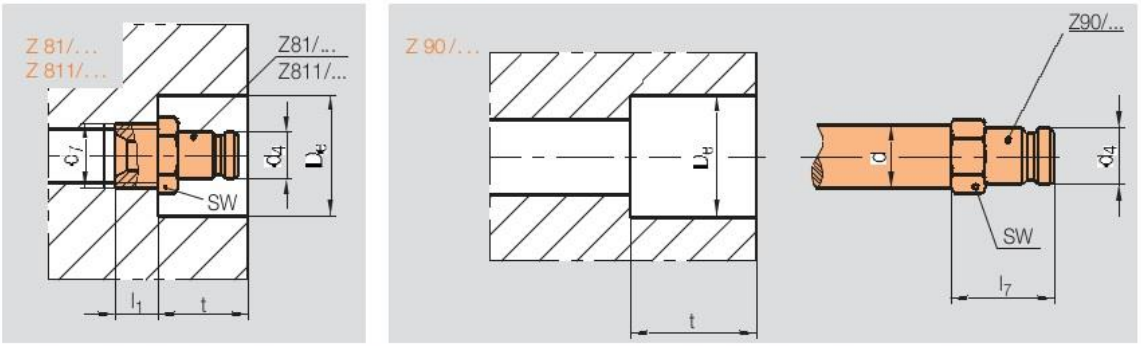
2. Standard for Connecting Nipples of Cooling System of the Mold

Connecting nipples **Z81/13 /R1/4** (Fig. 1) (manufacturer: HASCO or other adequate company) are standardly used for the connection of the mold with a cooling device. Forefronts of the nipples must be imbedded in the body of the mold to at least 1 mm in order to prevent their damage during handling of the mold. Where this is not enabled by the mold structure (due to the distance between axes of outlets of cooling channels, size of jaws, etc.), using **Z81/9/R1/4** nipples is allowed. It is possible to use the extended nipples of these dimensions in the case of jaws and other moveable parts of the injection mold without consultation, provided that they do not go beyond the plane of the mold body. **Connecting points** for all inlets of coolants **are on the back side of the mold** (non-operator site). This also applies if, e.g. the feeds into the jaw are on the front or bottom side of the mold.

Fig. 2.1

HASCO

● - JP-A STANDART ● - JP-A IF NECESSARY



t	l_1	D_e	SW	d_4	d_7	Nr./No.
14	5	13	7	5	M 5x0,5	Z81/ 5/ 5x0,5
	7	16	9		M 8x0,75	5/ 8x0,75
18		19	11	9	M 8x0,75	Z81/ 9/ 8x0,75
					M10x1	9/10x1
					G1/8A	9/R1/8
	9	22	15		M14x1,5	9/14x1,5
					G1/4A ●	9/R1/4
		24		13	M14x1,5	Z81/ 13/14x1,5
					G1/4A ●	13/R1/4
			17		M16x1,5	13/16x1,5
					G3/8A	13/R3/8
36	16	38	27	19	M24x1,5	Z81/ 19/24x1,5
	12	34	22		G1/2A	19/R1/2
	16	38	27		G3/4A	19/R3/4

t	l_1	D_e	SW	d_4	d_7	Nr./No.
24	5	16	9	5	M 5x0,5	Z811/ 5/ 5x0,5
	7				M 8x0,75	5/ 8x0,75
18	12	22	15	9	M14x1,5	Z811/ 9/14x1,5
					G1/4A	9/R1/4
19		24	17	13	M16x1,5	Z811/13/16x1,5
					G3/8A	13/R3/8
36	16	38	27	19	M24x1,5	Z811/19/24x1,5
					G3/4A	19/R3/4

d	SW	D_e	t	l_7	d_4	Nr./No.
5	7	13	17	15	5	Z90/ 5/ 63
						5/100
8	9	19	23	21	9	Z90/ 9/ 63
						9/100
10	11					9/120
						9/240
						9/360

d	SW	D_e	t	l_7	d_4	Nr./No.
14	15	24	25	23	13	Z90/13/150
						13/300
						13/450
21	22	34	37	35	19	19/500
						19/800

Tab. 2.1

http://www.hasco.de/gb/content/view/embed/21417/(docstart)/14344#21417 PAGE: 544

Use of other type of connection of a feeding hose to the mold must be approved by a responsible representative of Jasplastik-Automotive, s.r.o.

If the mold has a central feed of coolant (fig. 2, fig. 3), there is the same R 1" connecting thread on the input and output of the central manifold. There is a ball valve installed on the inlet and output of the central manifold for the pressure of 25 bars min. Central manifold is located on the back side of the mold.

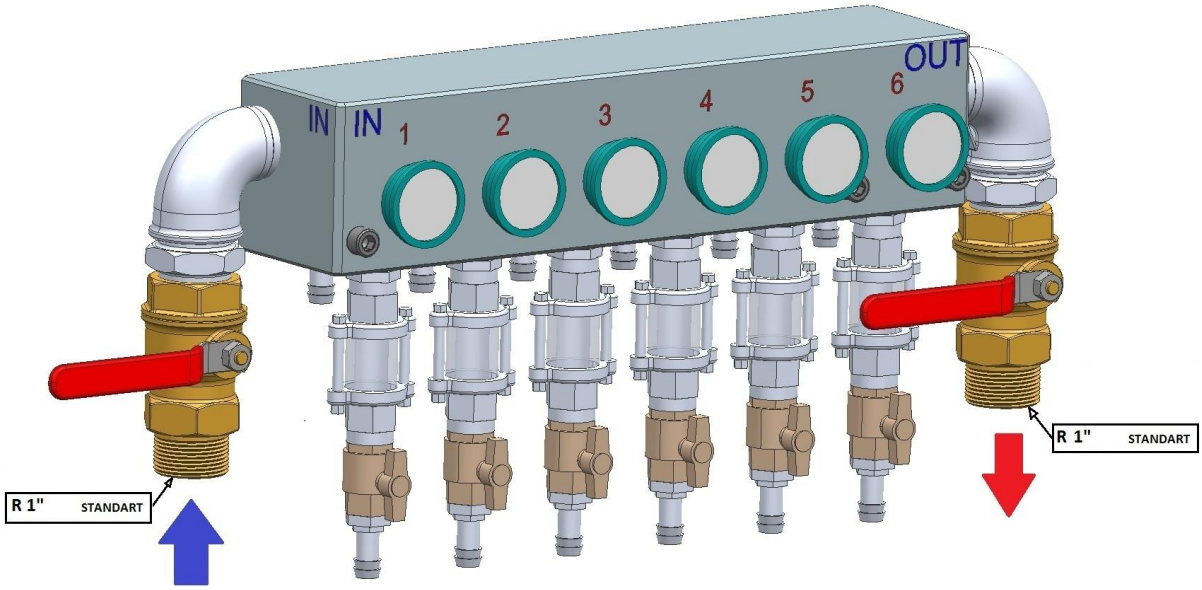

IN
IN
1
2
3
4
5
6
OUT
R 1" STANDART
R 1" STANDART

Fig. 2.2

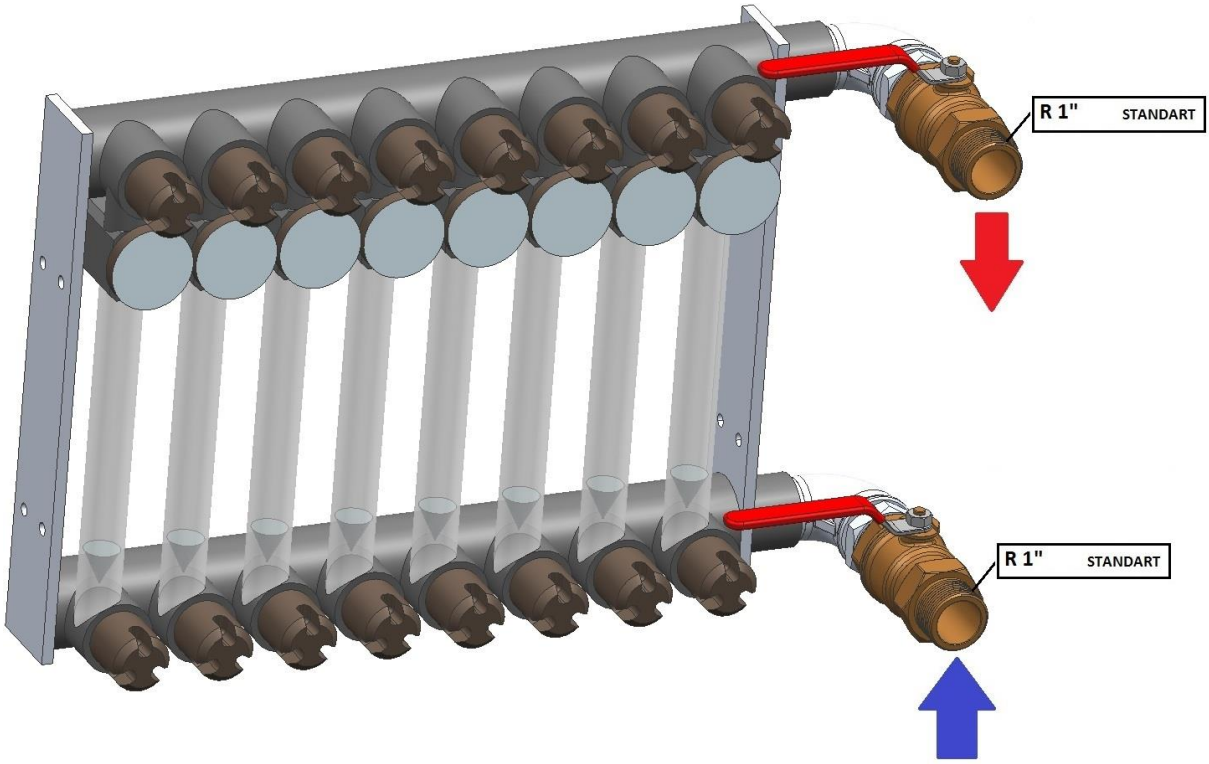

R 1" STANDART
R 1" STANDART

Fig. 2.3

Minimal diameter of drilled cooling channels in the mold is 6 mm. When connecting the cooling channels to the circuit, it is necessary to take care not to reduce the flow of the coolant through the cooling channels with different diameters (cooling channels with small diameters will be connected separately); if the cooling channels are too long, it is suitable to arrange them by a suitable connection in such a way that the difference between input and output temperatures of the coolant is 4° C max. Use standardized O-ring seals of Viton material to seal connecting links between separate metal parts. Supplied mold also includes one set of all sealings used in the mold.

3. Standard for Marking of the Cooling System Channels of the Mold

Input and output of one cooling channel in the mold are marked with the same number (e.g. IN11, OUT11). It also applies in the case of branching of the cooling channel in the mold (e.g. IN11, OUT11, OUT11). Numbers of the cooling circuit are assigned sequentially according to the number of the cooling channels of the respective part of the mold, and the order in which the connecting hoses have to be connected correctly. Connecting points of coolant are on the back side of the mold.

Marking of the Cooling Channels on Stable Part of the Mold:

- inputs of the cooling circuits on the stable part of the mold are marked as **IN10, IN11,**...,**IN59**
- outputs of the cooling circuits on the stable part of the mold are marked as **OUT10, OUT11**, ..., **OUT59**

Marking of the Cooling Channels on Moveable Part of the Mold:

- inputs of the cooling circuits on the moveable part of the mold are marked as **IN60, IN61, ..., IN99**
- outputs of the cooling circuits on the moveable part of the mold are marked as **OUT60, OUT61,...,OUT99**

4. Standard for Quick-Acting Couplings for Connection of Air to the Mold

Compressed air necessary for operation is produced by compressors. Pressure in the compressed air manifold is 0.8 MPa maximum and 0.6 MPa minimum. Quality of the compressed air will be in compliance with the standard DIN ISO 8573-1, class 5 (tab. 2). If its quality is not sufficient for the reliable and safe operation of supplied pneumatic devices, the supply also includes a unit for compressed air treatment. It

ensures compressed air of required quality and amount for respective pneumatic device.

Direct quick-acting couplings – type QS-G1/4-12 (tab. 3) or angle quick-acting couplings GSL-G1/4-12 (tab. 4) are used for the connection of the pressure hoses (Festo, PUN type). In reasonable cases, it is possible to use G3/8“, or G1/2“connecting thread.

Division of Classes according to DIN ISO 8573-1 Standard

class	Solid particles		Content of water	Content of oil
	max. size of particles [pm]	max. density of particles [mg/m^3]	max. dew point [°C]	max. density of oil particles [mg/m^3]
1	0.1	0.1	-70	0.01
2	1	1	-40	0.1
3	5	5	-20	1
4	15	8	3	5
5	**40**	**10**	**7**	**25**
6	-	-	10	-
7	-	-	Not defined	-

Tab. 4.1

Steckverschraubungen QS, Quick Star

FESTO

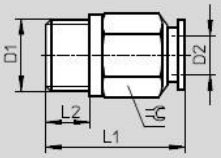
Datenblatt

Steckverschraubung QS
Außengewinde
mit Außensechskant

● - JP-A STANDART

● - JP-A IF NECESSARY

G-Gewinde



Abmessungen und Bestellangaben

Anschluss D1	Nennweite [mm]	Schlauch-Außen-Ø D2	L1	L2	⌀	Gewicht/ Stück [g]	Teile-Nr.	Typ	PE*
G-Gewinde mit Dichtring									
G⅛	2,6	4	20,4	5,1	13	10	186095	QS-G⅛-4	10
							132036	QS-G⅛-4-100	100
	4	6	21,5	5,1	13	9,1	186096	QS-G⅛-6	10
							132037	QS-G⅛-6-100	100
	5	8	26,7	5,1	14	14	186098	QS-G⅛-8	10
							132038	QS-G⅛-8-50	50
G¼	4	6	22	5,6	17	18	186097	QS-G¼-6	10
							132039	QS-G¼-6-100	100
	5	8	22,7	5,6	17	16	186099	QS-G¼-8	10
							132040	QS-G¼-8-50	50
	6,7	10	29,7	5,6	17	22	186101	QS-G¼-10	10
							132041	QS-G¼-10-50	50
	6,3	12 ●	34,9	5,6	21	51	186350	QS-G¼-12	10
							132042	QS-G¼-12-20	20
G⅜	5	8	22,4	6,6	19	24	186100	QS-G⅜-8	10
							132043	QS-G⅜-8-50	50
	6,7	10	26,2	6,6	19	25	186102	QS-G⅜-10	10
							132044	QS-G⅜-10-50	50
	8,7	12 ●	32,3	6,6	21	38	186103	QS-G⅜-12	10
							132045	QS-G⅜-12-20	20
	10,3	16	38,3	6,6	22	49	186347	QS-G⅜-16	1
G½	8,7	12 ●	28,8	7,6	24	46	186104	QS-G½-12	1
							132046	QS-G½-12-20	20
	12	16	36,3	7,6	24	53	186105	QS-G½-16	1
							132047	QS-G½-16-20	20

* Packungseinheit in Stück

* Packungseinheit in Stück

Tab. 4.2

http://www.festo.com/net/SupportPortal/Files/54156/PneumaticalConnection_de_0711_low.pdf

Steckverschraubungen QS, Quick Star

FESTO

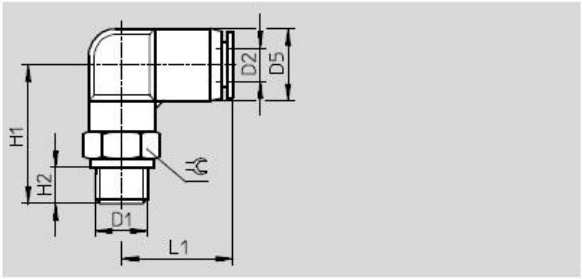
Datenblatt

L-Steckverschraubung QSL
360° schwenkbar
Außengewinde
mit Außensechskant

● - JP-A STANDART

● - JP-A IF NECESSARY

G-Gewinde



Abmessungen und Bestellangaben

Anschluss D1	Nennweite [mm]	Schlauch-Außen-Ø D2	D5 Ø	H1	H2	L1	⌀	Gewicht/ Stück [g]	Teile-Nr.	Typ	PE*
G-Gewinde mit Dichtring											
G⅛	2,3	4	10	23,3	5,1	18	13	14	186116	QSL-G⅛-4	10
									132048	QSL-G⅛-4-100	100
	3,6	6	12,5	24	5,1	19,8	13	15	186117	QSL-G⅛-6	10
									132049	QSL-G⅛-6-100	100
	4,6	8	14,5	27	5,1	22,7	14	18	186119	QSL-G⅛-8	10
									132050	QSL-G⅛-8-50	50
G¼	3,6	6	12,5	25,5	5,6	19,8	17	24	186118	QSL-G¼-6	10
									132051	QSL-G¼-6-100	100
	4,6	8	14,5	28,5	5,6	22,7	17	26	186120	QSL-G¼-8	10
									132052	QSL-G¼-8-50	50
	6,2	10	17,5	32,5	5,6	26,2	17	32	186122	QSL-G¼-10	10
									132053	QSL-G¼-10-50	50
	6,2	12 ●	21	34,5	5,6	29,4	21	51	186351	QSL-G¼-12	10
									132054	QSL-G¼-12-20	20
G⅜	4,6	8	14,5	30	6,6	22,7	19	39	186121	QSL-G⅜-8	10
									132055	QSL-G⅜-8-50	50
	6,2	10	17,5	34	6,6	26,2	19	42	186123	QSL-G⅜-10	10
									132056	QSL-G⅜-10-20	20
	7,7	12 ●	21	36	6,6	29,4	21	45	186124	QSL-G⅜-12	10
									132057	QSL-G⅜-12-20	20
	10,1	16	25	45	6,6	33,1	24	77	186348	QSL-G⅜-16	1
G½	7,7	12 ●	21	39	7,6	29,4	24	70	186125	QSL-G½-12	1
									132058	QSL-G½-12-20	20
	10,9	16	25	46	7,6	33,1	24	76	186126	QSL-G½-16	1
									132059	QSL-G½-16-20	20

* Packungseinheit in Stück

Tab. 4.3

http://www.festo.com/net/SupportPortal/Files/54156/PneumaticalConnection_de_0711_low.pdf

In the case of direct control of closing nozzles by pneumatic valves by inlets of the compressed air from controlled manifold of the injection press, it is necessary to use the quick-acting couplings for D=8 mm in the mold.

Add photo

Fig. 4.1

5. Standard for Marking of the Air System Circuits of the Mold

Marking of the connecting nipples of pneumatic ejection:

If the mold contains pneumatic ejection, the connecting nipples must be marked - **AIR EJECT.**

Marking of Connecting Nipples of the Pneumatic Clamping of Hot Runners:

If the mold contains pneumatic clamping of the hot runners by needles, the connecting nipples must be marked as follows:
air open, air close; in case of more circuits, they have to be marked **air open1** - **air close1**, **air open2 - air close2**, ... etc.

Marking of the connecting nipples of pneumatic cores:

If the mold contains pneumatic cores, the connecting nipples must be marked as **air core in**, **air core out**.

If there are more circuits of pneumatic cores, please mark them as follows: **air core1 in - air core1 out,**

air core2 in - air core2 out, ...etc.

6. Standard for Quick-Acting Couplings for the Connection of Hydraulic Pullers of the Cores into the Mold

Use **quick-acting couplings - PPV3 AG series** with external thread M18x1.5 according to **DIN 2353** standard (tab. 6.1). In extraordinary cases, it is also possible

to use a thread of lower or higher series after consultation with a representative of Jasplastik-Automotive s.r.o., Galanta. To connect pressure feed for the core to the mold for “removing the pressing from the mold“, use **PPV3.1318.302** quick-acting coupling (fig. 6.1). To connect pressure feed for the core to the mold for “putting the pressing to the mold“, use **PPV3.1318.303** quick-acting coupling (fig. 6.2).

OIL - IN

Fig. 6.1

PPV3.1318.302

OIL - OUT

Fig. 6.2

PPV3.1318.303

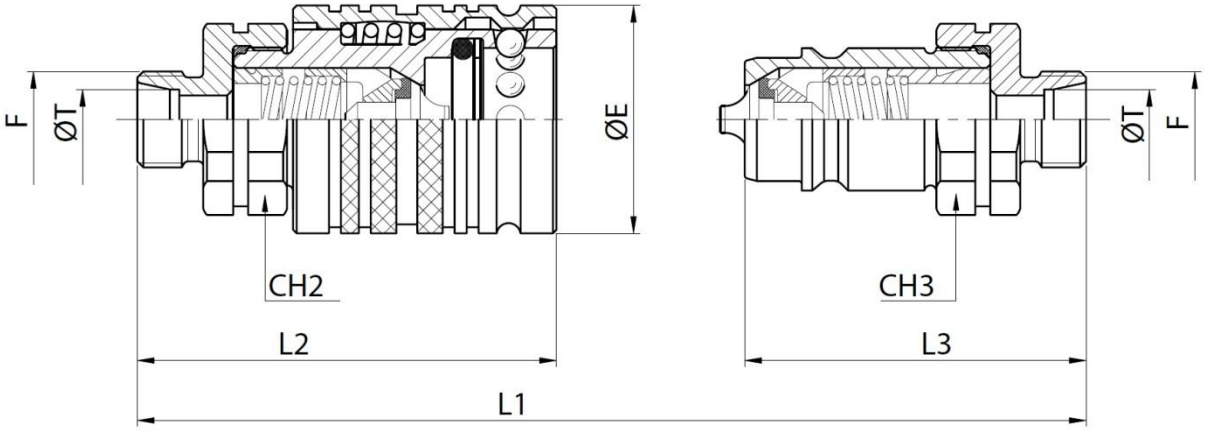


Fig. 6.3

	BG	USA	ISO	Ø T	CH 2	CH 3	Ø E	L1	L2	L3	F	COD. (F)	COD. (M)
13	**3**	**08**	**12,5**	08 L	30	30	38	103	69	56	M 14x1.5	PPV3.1314.302	PPV3.1314.303
				10 L	30	30	38	10[illegible]	70	57	M 16x1.5	PPV3.1316.302	PPV3.1316.303
				12 L	30	30	38	105	70	57	M 18x1.5	PPV3.1318.302	PPV3.1318.303
				15 L	30	30	38	107	71	58	M 22x1.5	PPV3.1322.302	PPV3.1322.303
				18 L	30	30	38	107	71	58	M 26x1.5	PPV3.1326.302	PPV3.1326.303

JP-A STANDARD

Tab. 6.1

Materials: zinc-plated and yellow bichromated steel with all high stressed components carbonidrided or hardened by induction. Locking is provided by 12 balls UNI 100CR6. **Seals:** standard in nitrile NBR. Other seals on request. **Working temperatures:** with NBR standard seals -25°C + 125°C **Back-up ring:** in pure Tefl on **Threads:** outside metric according to DIN 2353 L (light) or S (heavy). Other threads on request.

Werkstoff: verzinkter und gelb chromatierter Stahl mit allen verschleissbeanspruchten Komponenten carbonitriert oder induktivgehärtet. 12 Verriegelungskugeln UNI 100CR6. **Dichtungen:** aus Nitril NBR lieferbar. Andere Dichtungen auf Anfrage ebenfalls lieferbar. **Betriebstemperatur:** mit NBR Standard-Dichtung - 25°C + 125°C. **Stützring:** aus rein Teflon **Gewinde:** metrische Aussengewinde nach DIN 2353 L (leichter Baureihe) oder S (schwerer Baureihe). Andere Gewinde auf Wunsch ebenfalls lieferbar.

TECHNISCHE MERKAMALE

http://www.kroning.de/downloadcenter/Hydraulikkupplungskatalog%20DNP.pdf Page:88

The term "**removing of the pressing from the mold**": the core is in a position (ejected or inserted) which enables the safe opening of the mold and removing the pressing from the mold cavity

The term "**putting the pressing into the mold**": the core is in a position (ejected or inserted) before melt is injected into the mold cavity

7. Standard for Connectors and Connection of Hot Runners Heaters to the Mold

Use standard connectors manufactured by HARTING or other equal connectors for connecting the hot runners. Use a connector of 09 33 024 2601 type for the mold (fig. 7.1, fig. 7.2). If there are 1 to 6 zones of hot runners in the mold, use 1 connector Harting 09 33 024 2601. If there are 6 to 12 zones of the hot runners in the mold, use 2 connectors 09 33 024 2601. If there are 2 and more connectors for connection of the hot runners installed in the mold, they must be capitalized - A, B, C....

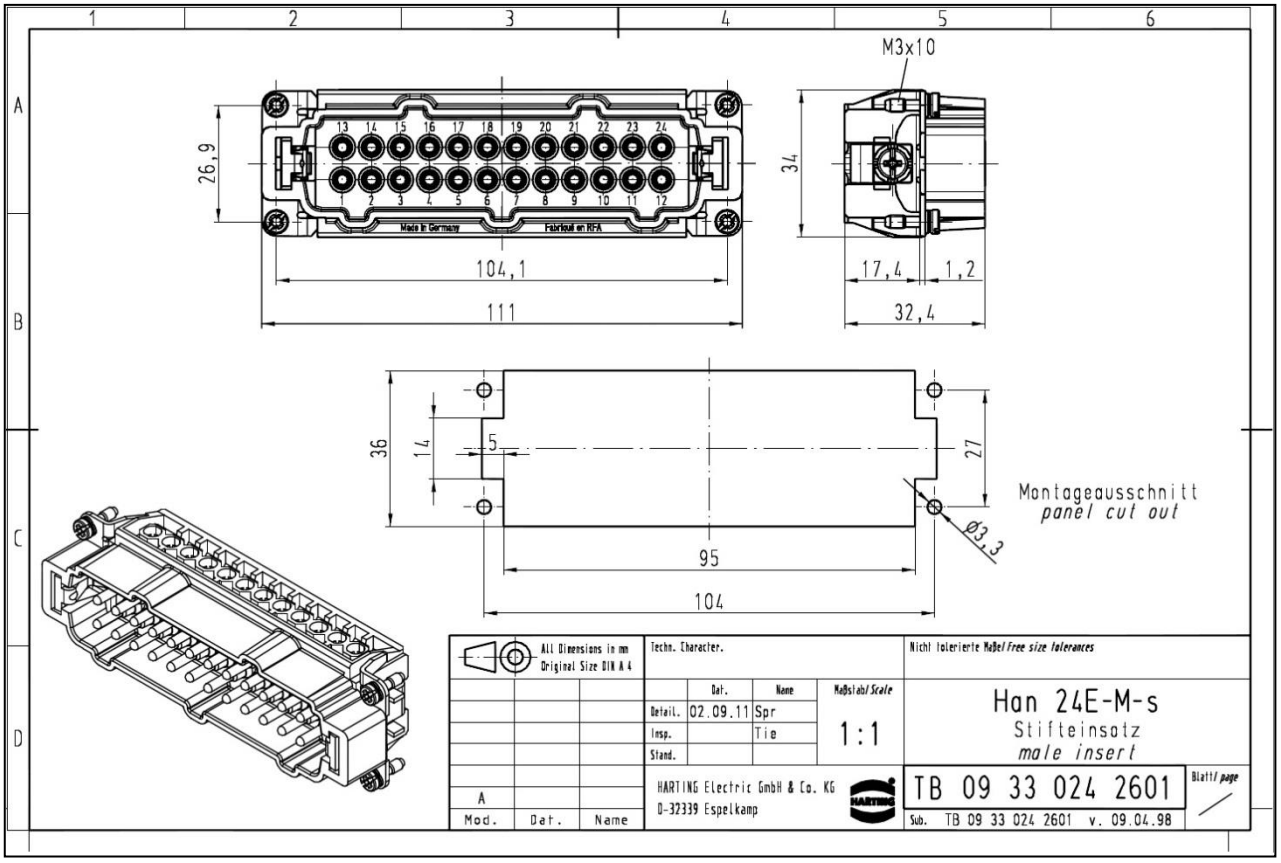


Fig. 7.1

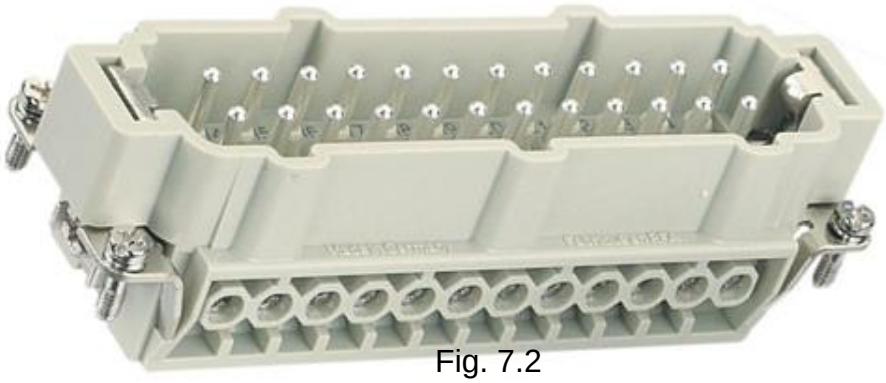


Fig. 7.2

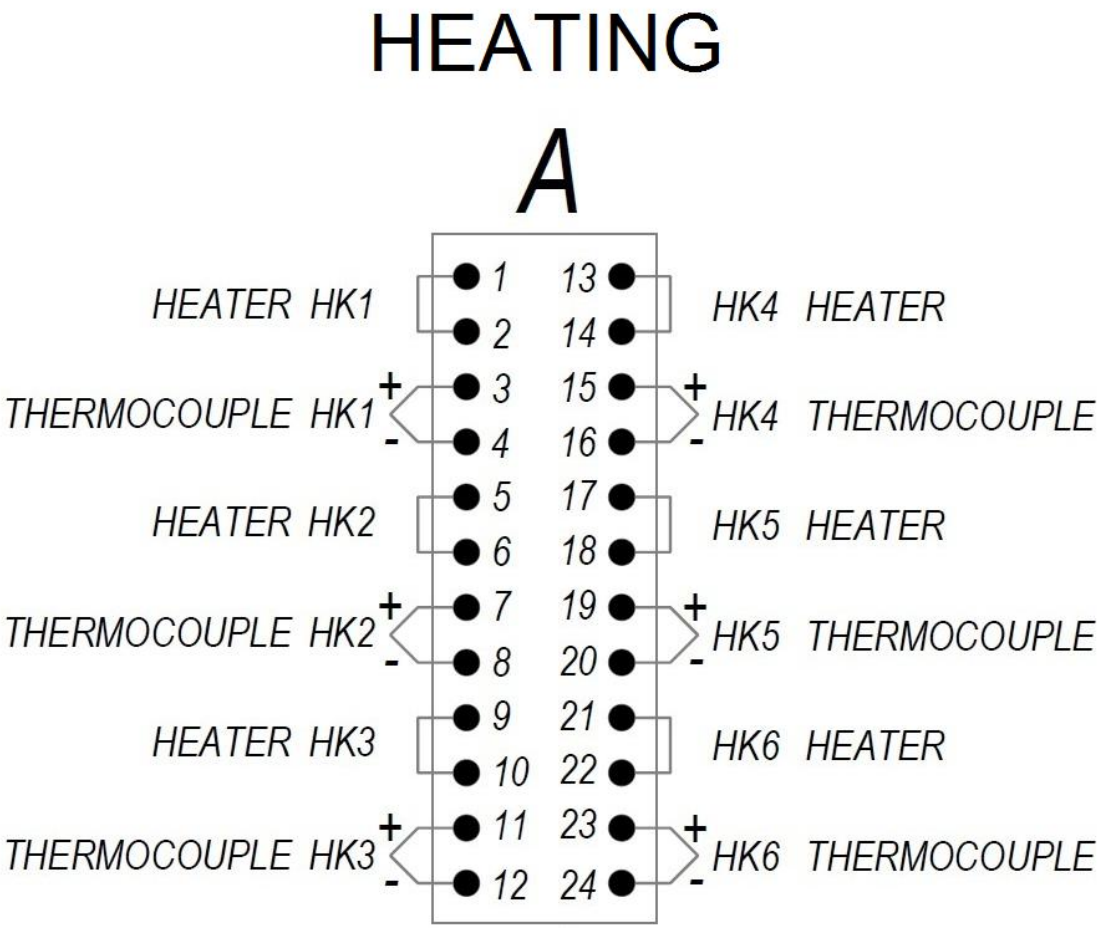


Fig. 7.3 – Wiring scheme of the heaters and temperature sensors

Temperature regulators are normally set to temperature sensors – type “J“ANSI MC 96.1 (Fe-CuNi). Information on the use of the temperature sensor does not have to be placed on the body of the mold. Other types of temperature sensors are not allowed.

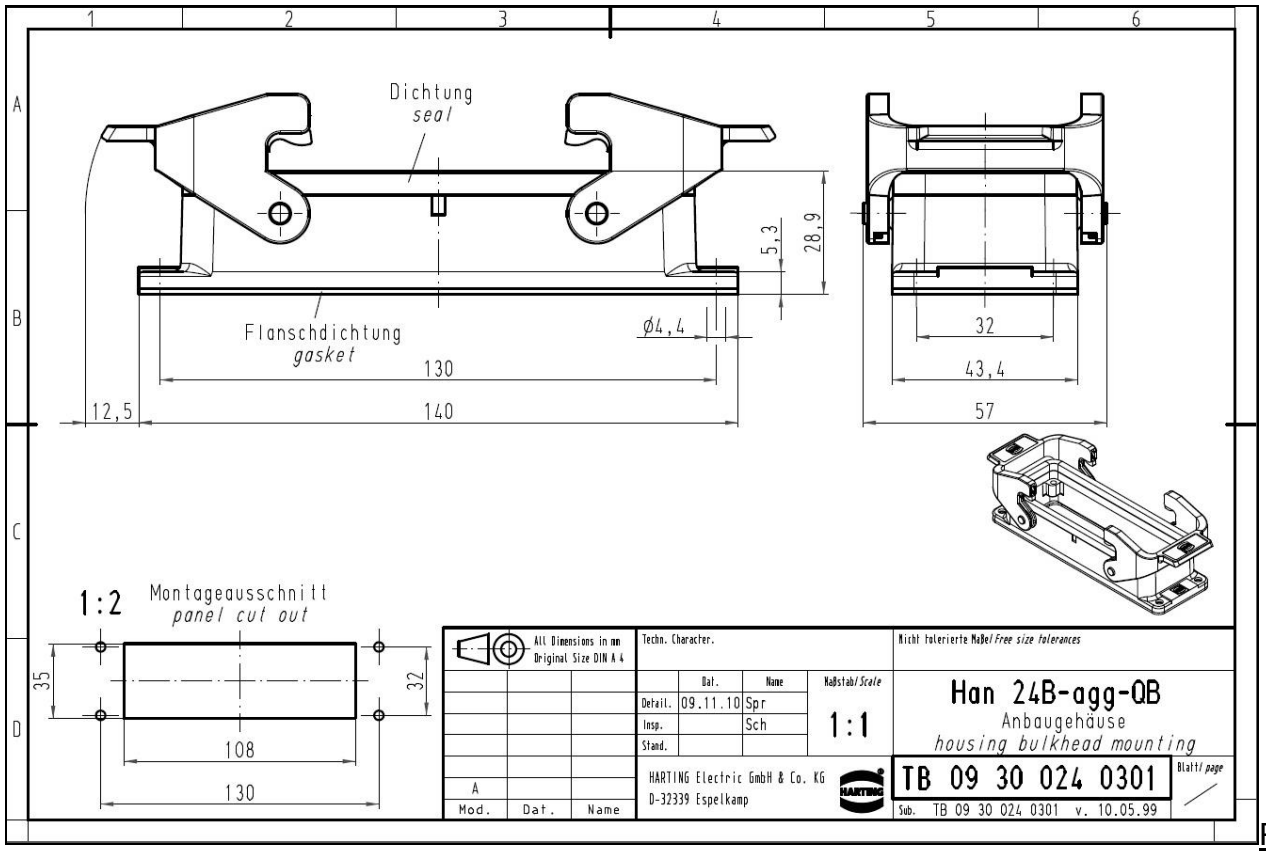
Place an insert - type HARTING 09 33 024 2601 (or its equal replacement) to the housing – type HARTING 09 30 024 0301 (fig. 7.4) – assembly on the panel or to the housing – type Harting 09 30 024 0270 (fig. 7.5) – separate assembly.

Both types of housings may be replaced by adequate equal replacements.

https://b2b.harting.com/files/download/PRD/PDF_TS/09330242616.PDF

https://b2b.harting.com/files/download/PRD/PDF_TS/09300240301.PDF

https://b2b.harting.com/files/download/PRD/PDF_TS/09300240270.PDF



F

Fig. 7.4

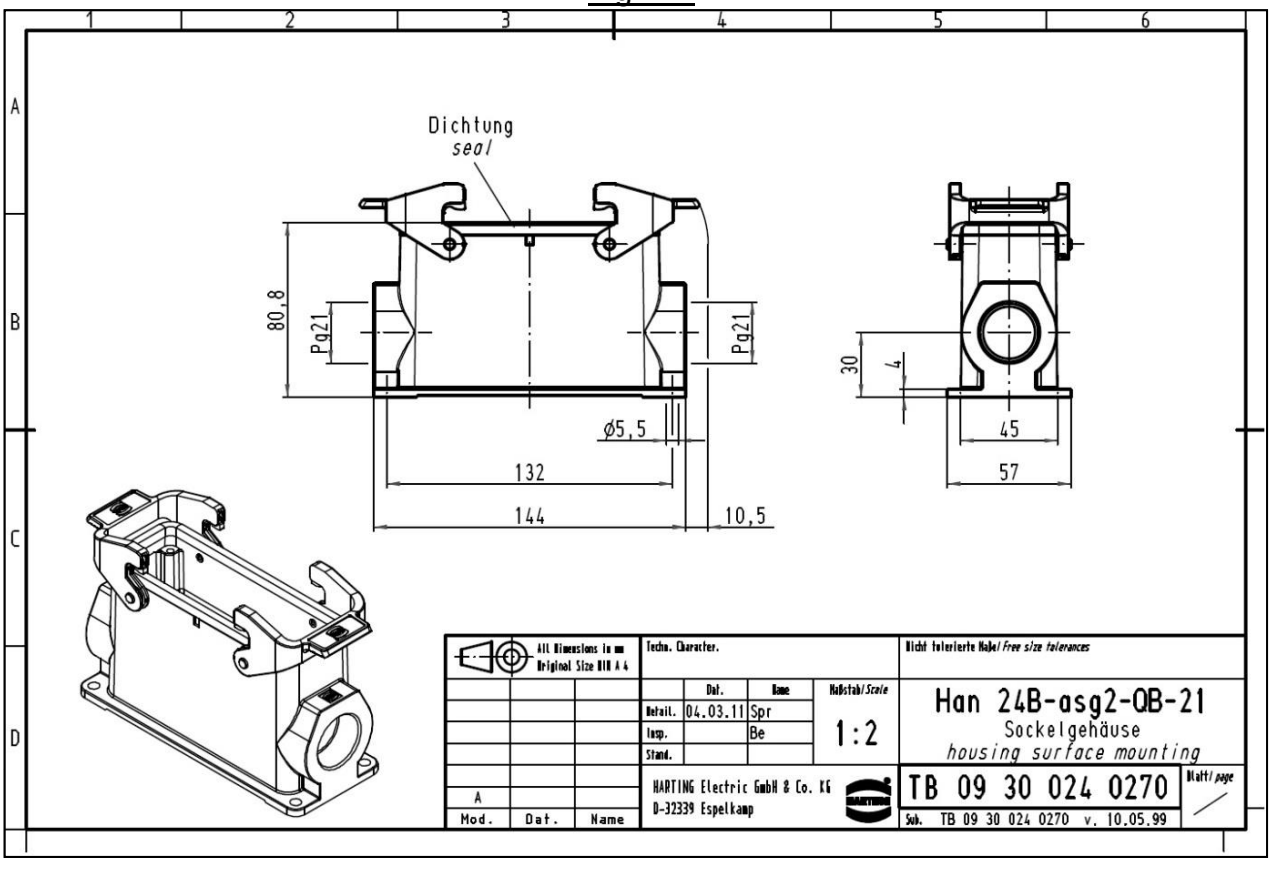
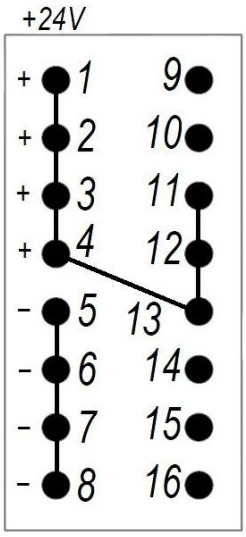


Fig.7.5

8. Standard for Connectors and Connection of Sensors of End Positions of the Pullers of the Cores

If the mold has one circuit of the pullers of the cores, the sensors of the end positions are connected according to the diagram in fig. 8.1



PIN 9 - CORE 1 PUTTING THE PRESSING INTO THE MOLD (CORE 1 SET)

PIN 10 - CORE 1 REMOVING THE PRESSING FROM THE MOLD (CORE 1 PULL)

PIN 11 - + 24 V DC

PIN 12 - + 24 V DC

PIN 13 - +24 V DC

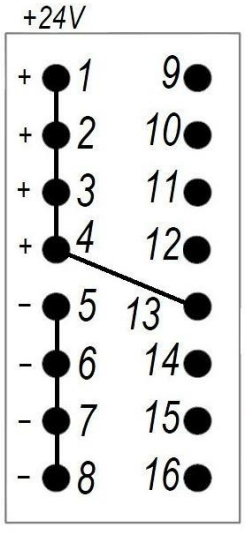
PIN 1 - FREE

PIN 15 - FREE

PIN 16 - FREE

Fig. 8.1

If the mold has two circuits of the pullers of the cores, the sensors of the end positions are connected according to the diagram in fig. 8.2.



PIN 9 - CORE 1 PUTTING THE PRESSING INTO THE MOLD (CORE 1 SET)

PIN 10 - CORE 1 REMOVING THE PRESSING FROM THE MOLD (CORE 1 PULL)

PIN 11 - CORE 2 PUTTING THE PRESSING INTO THE MOLD (CORE 2 SET)

PIN 12 - CORE 2 REMOVING THE PRESSING FROM THE MOLD (CORE 2 PULL)

PIN 13 - + 24 V DC

PIN 14 – FREE

PIN 15 – FREE

PIN 16 - FREE

Fig. 8.2

CORE SET = signal on the connector brings the core to the state when the plastic can be injected into the cavity

CORE PULL = signal on the connector brings the core to the state when the pressing can be safely removed from the cavity

Use standard connectors manufactured by HARTING or other equal connectors for connecting of the control cable. Use connector – type 09 20 016 2612 on the mold (fig. 8.3, fig. 8.4).

Fig. 8.3

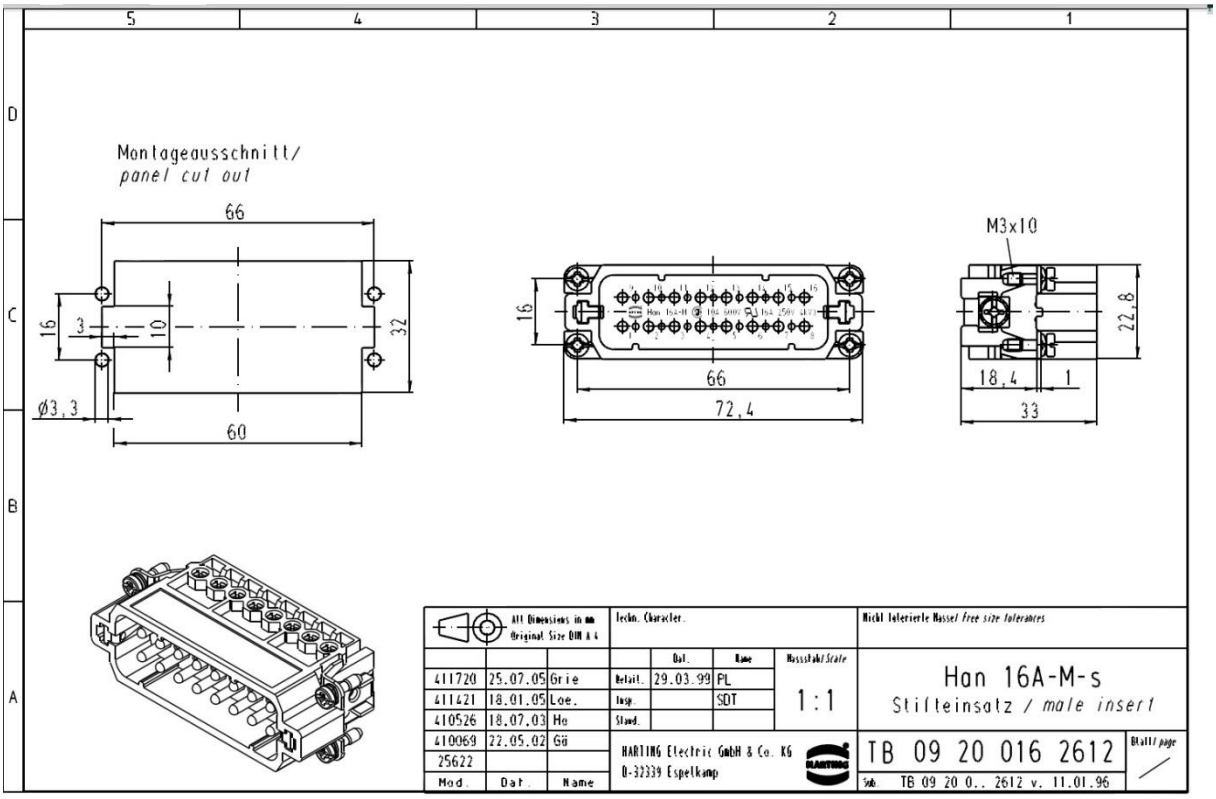


Fig. 8.4

In the case of assembly on the panel, put the insert into the housing

HARTING 09 20 016 0301 (fig. 8.5)

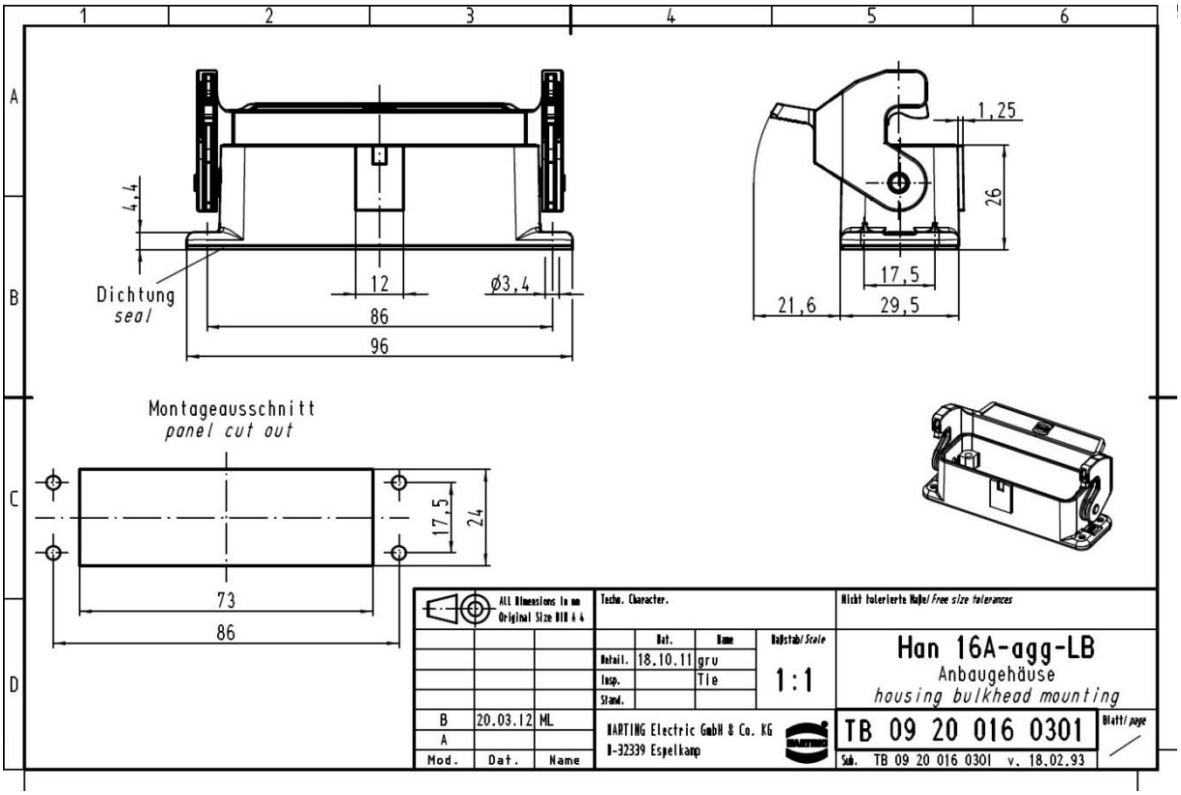


Fig. 8.5

In the case of assembly on the body of the mold, put the insert separately into the housing - type HARTING 09 20 016 0291 (fig. 8.6)

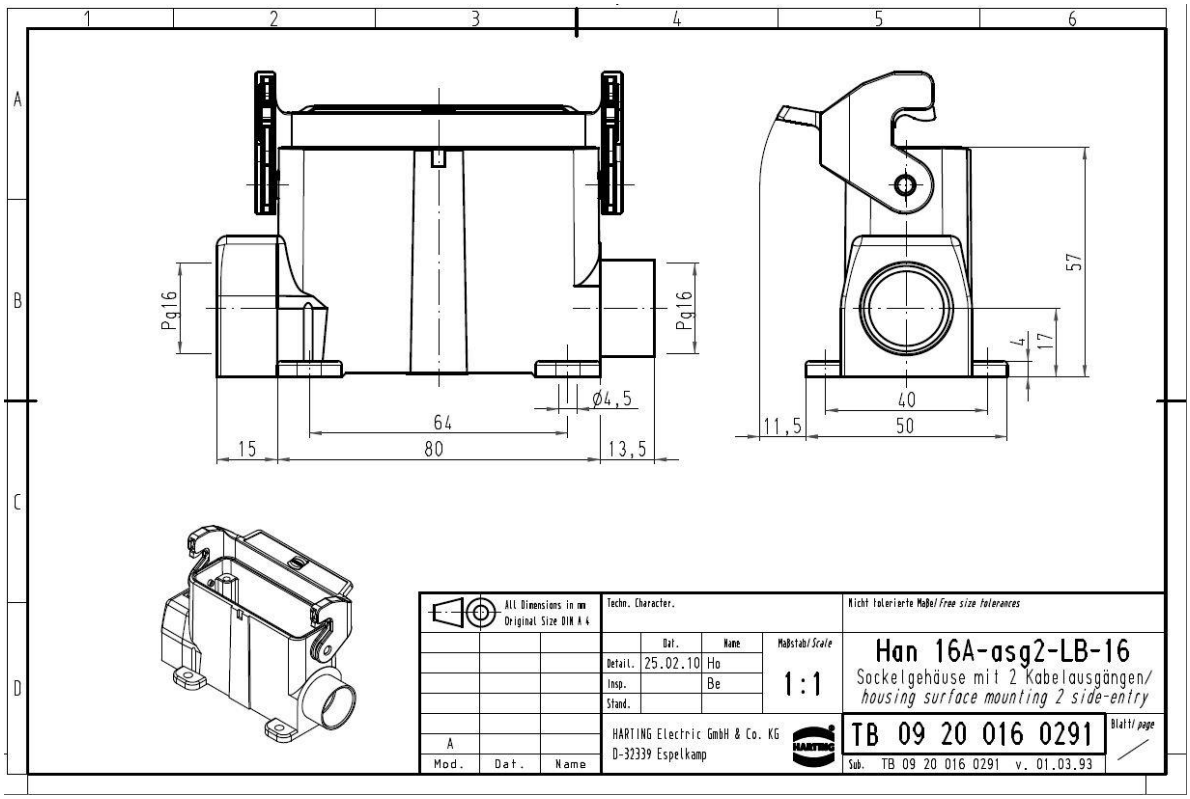


Fig. 8.6

Both types of housings may be replaced by adequate equal replacements.

https://b2b.harting.com/files/download/PRD/PDF_TS/09200162612.PDF

https://b2b.harting.com/files/download/PRD/PDF_TS/09200160301.PDF

https://b2b.harting.com/files/download/PRD/PDF_TS/09300160250.PDF

9. Standard for Connectors for Electromagnets Control on Valves of Clamping Needles

Supply voltage for the control of electromagnets on valves of control needles is 24 V DC (unidirectional). Standard for connectors and housings is the same as the standard for connectors of the cores pullers (16 – pins). If the mold has 1 to 8 circuits of electromagnetic valves, use one connector - type Harting 09 20 016 2612 (fig.8.4). If the mold has 9 to 18 circuits of electromagnetic valves, use two connectors Harting 09 20 016 2612. If the mold has two and more connectors for the connection of control of circuits of electromagnetic valves, it is necessary to number them as follows: 1, 2, 3... .
(Please verify in supplied documentation of the molds).

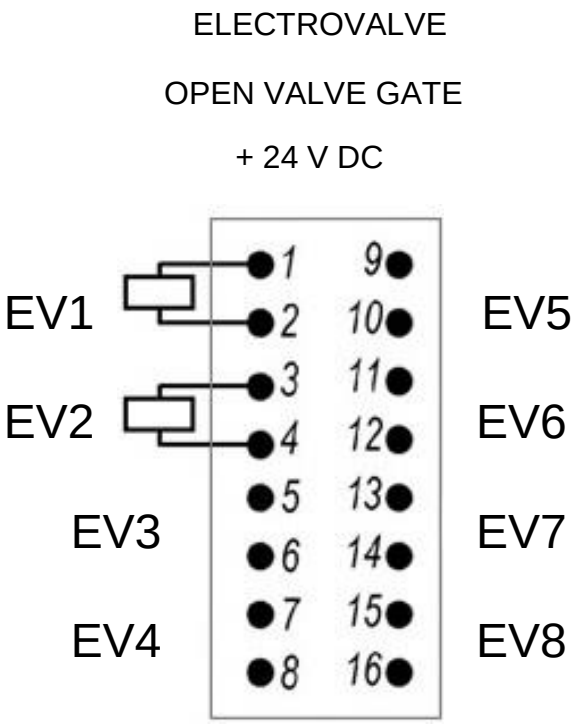


Fig. 9.1 Example of the connection of two circuits of control of electromagnetic valves

10. Standard for Connectors and Connection of Sensors of Ejector Plates´ End Positions

This standard applies only in the case of scanning the end position of the ejector plate in initial position (backwards). If both end positions (front and back) of the ejector plate are scanned, it is necessary to use connection and connectors that are valid also for the cores´ pullers (wiring scheme – see fig. 8.1; the connector – fig. 8.3; housing of the connector – fig. 8.5 or fig. 8.6). To connect signal cable, use insert of the connector HARTING 09 20 003 2611 (fig. 10.2) or its adequate replacement. Fig. 10.1 is a wiring scheme of a sensor of SQ1 end position on the ejector plate. If it is suitable to use two sensors SQ1 and SQ2 of the end position of the ejector plate that are diagonally positioned on the plate, these connectors must be connected in serial.

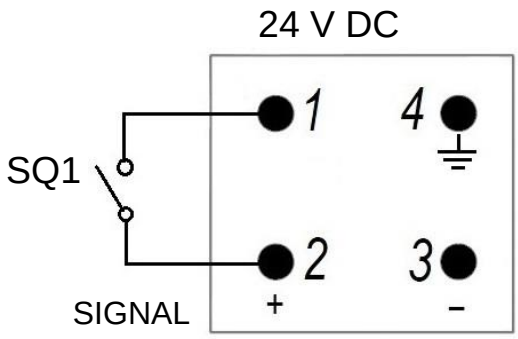


Fig. 10.1

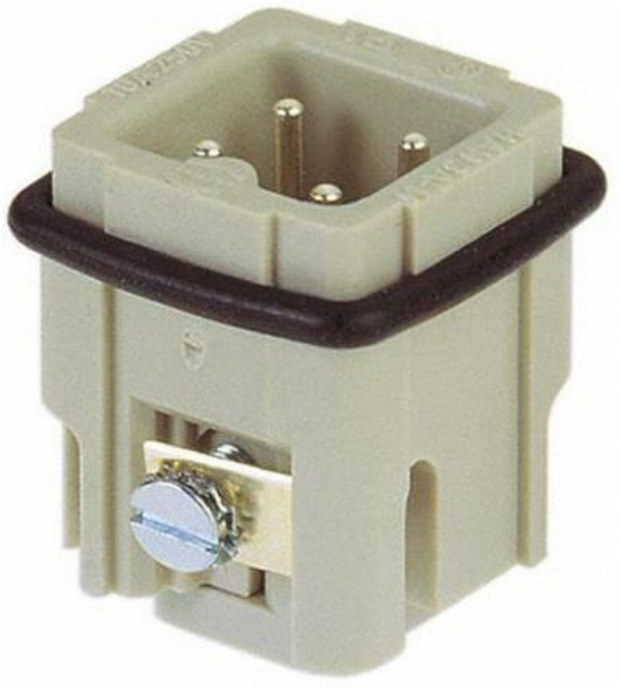


Fig. 10.2

In the case of assembly on the panel, imbed the insert (fig. 10.2) to the housing HARTING 09 20 003 0301 (fig. 10.4) or its adequate replacement.
In the case of assembly on the body of the mold, imbed the insert (fig. 10.2) separately to the housing HARTING 09 20 003 1250 (fig. 10.5) or its adequate replacement.

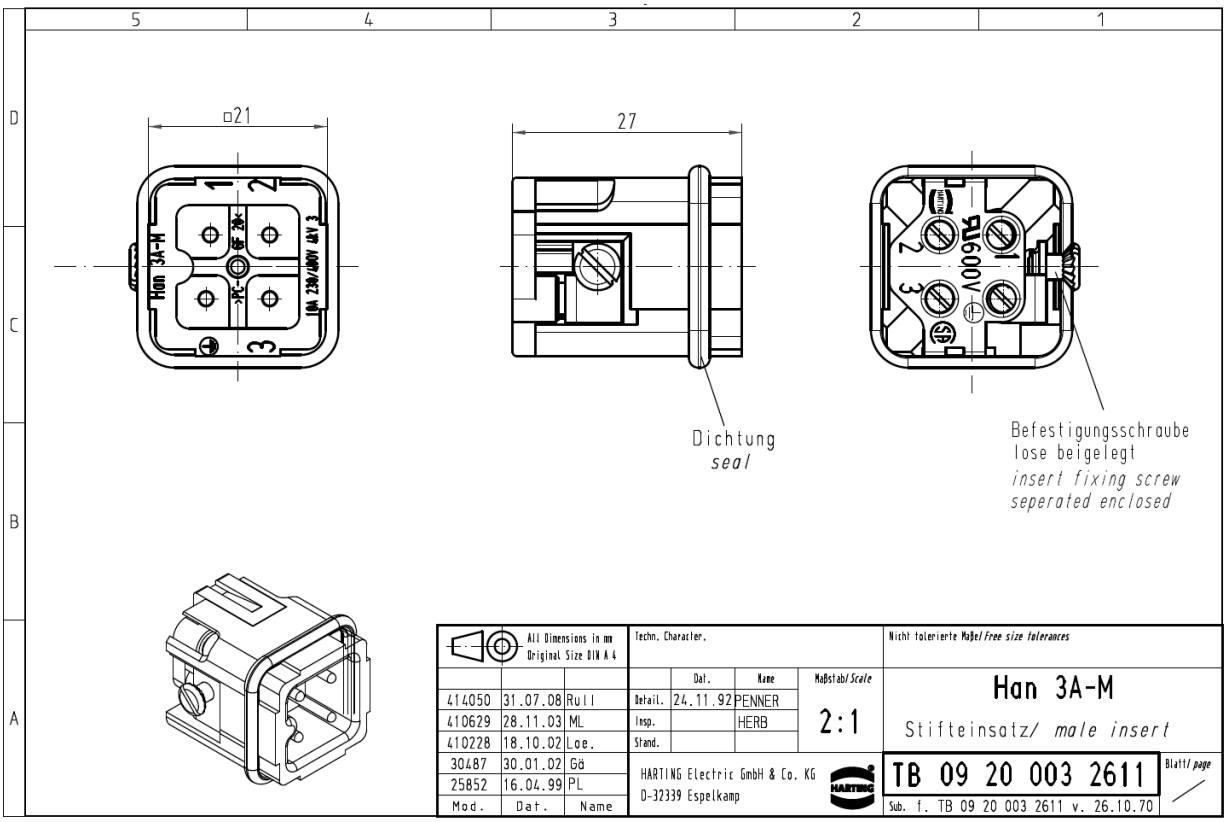


Fig. 10.3

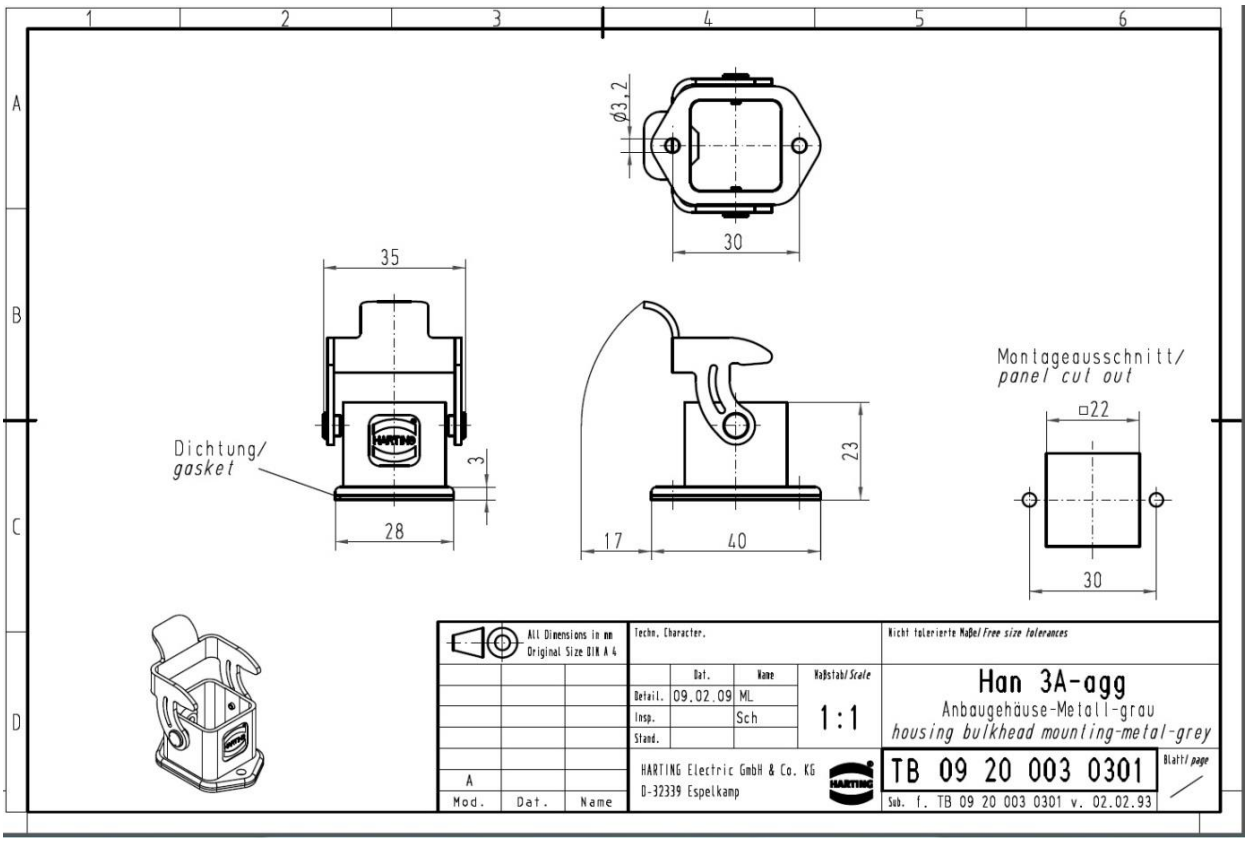


Fig. 10.4

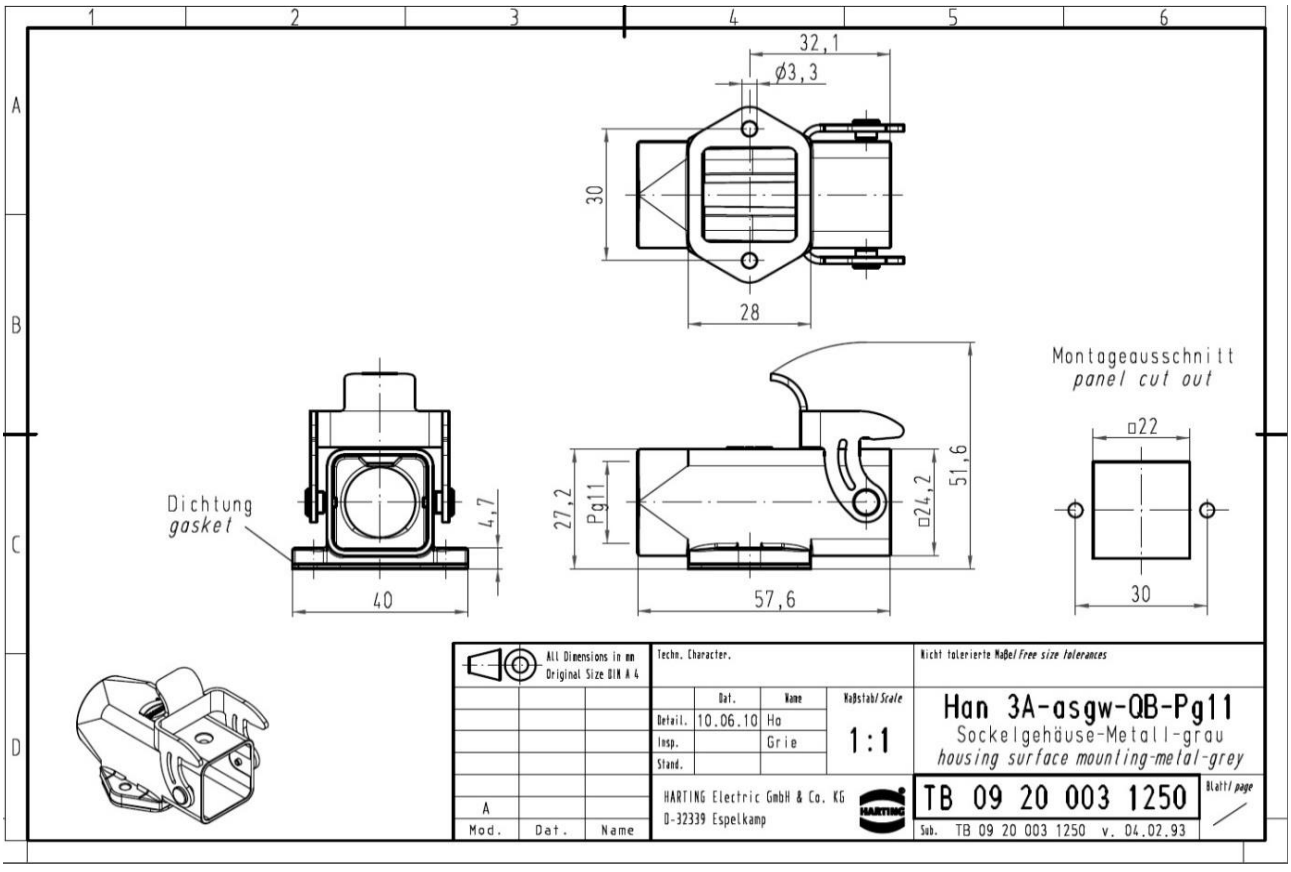


Fig. 10.5

https://b2b.harting.com/files/download/PRD/PDF_TS/09200032611.PDF

https://b2b.harting.com/files/download/PRD/PDF_TS/09200030301.PDF

https://b2b.harting.com/files/download/PRD/PDF_TS/09200031250.PDF

11. Standard for Sensors of End Positions

Electro-mechanic sensors - series BNS 819-99/100 produced by Baluff, with a sense probe if necessary, are used for the scanning of end positions on the ejector plates (example is presented in fig. 11.1). It is also possible to use their adequate replacements. It is also possible to use induction sensors BES 516-346 produced by Baluff, with LED identification of triggered mode (fig. 11.2). It is also possible to use their adequate replacements. If due to space reasons it is not possible to use the above mentioned types of sensors for the scanning of end positions of the cores pullers, it is also possible to use other types of sensors of the end positions with LED identification of triggered mode (e.g. magnetic). Place the sensors in such a way that operators can visually control the triggered mode of the sensors by looking at the active LED indicators. If not possible (e.g. due to their installation in the body of the mold), LED signalization must also be led to a separate LED panel located next to the connector of the core control in the field of view of operators. Signal leads are connected to the sensors in the standard way - by bolts to the terminal board of the sensor. It does not apply in the case that the connection between a leading-in cable and a sensor is fixed (the cable cannot be dismounted) (e.g. magnetic sensors on hydraulic valves).

Baluff BNS 819-100-R-11

(250 V AC) Ordering code:

BNS006E

Production of inject

Baluff BES 516 346 H2 Y

(24 V DC) Ordering code:

BES01FC

Fig. 11.1 Fig. 11.2

http://www.baluff.com/balluff/MDE/de/produkte/catalogue/products_downloads.jsp?id=BES01FC-121247

12. Standard for Shielding of Electric Wiring of the Mold

Required shielding of the electric wiring of the injection mold is at least IP44 pursuant to the standard STN EN 60529 (33 0330). All electric connecting points, including connecting points of cables to the sensors and connectors, will meet at least this shielding.

IP	Protection of people Protection against dangerous contact	Protection of device Protection against penetration of foreign objects
IP 0x	without protection	without protection
IP 1x	by back of the hand (> 50 mm)	big (≥ 50 mm)
IP 2x	by finger (> 12 mm, length 80 mm)	small (≥ 12.5 mm)
IP 3x	by tool (> 2.5 mm)	small (≥ 2.5 mm)
IP 4x	by tool, wire (> 1 mm)	very small (≥ 1 mm)
IP 5x	by any other tool	dust
IP 6x	by any other tool	dust-proof

IP	Level of protection
IP x0	without protection
IP x1	vertically falling drops of water
IP x2	drops of water falling at an angle
IP x3	water sprinkling (rain)
IP x4	against splashing water
IP x5	gushing water
IP x6	intensive gushing water
IP x7	temporary immersion
IP x8	permanent immersion

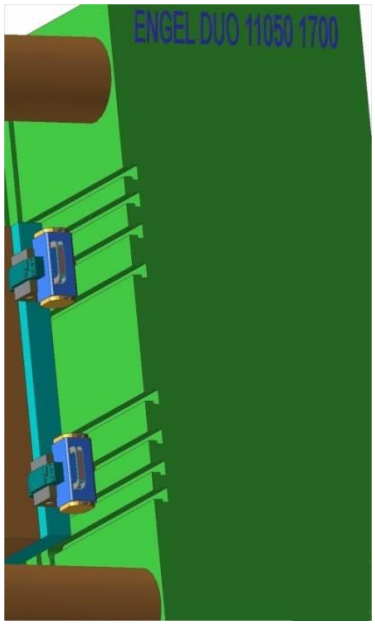
Mazacia hlavica plochá s guľatou hlavou
Flaschschmiernippel
Flat - head Grease Nipples

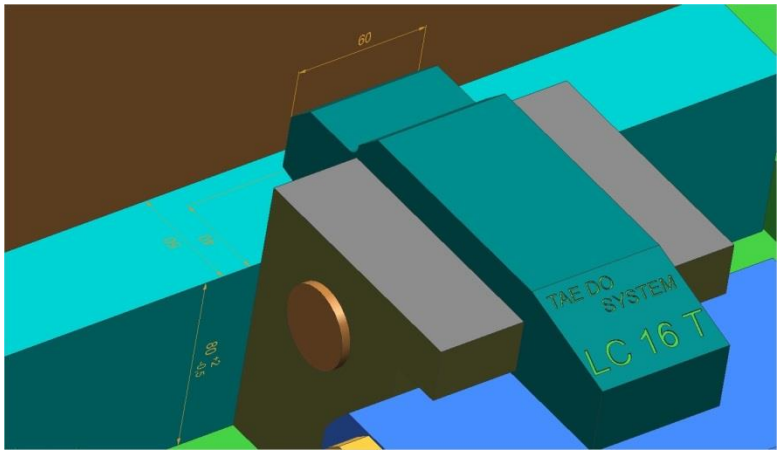
M1 Group	Shape of the head accoridng to **DIN 3404**					
Závit Gewinde Thread	Hlava Ø Kopf Ø Head Ø	Dĺžka závitu Gewindelänge Thread length	Celková dĺžka Gesamtlänge Total length	Šesťhran Sechskant Hexagon	Hmotnosť Gewicht Weight	Typ č. Best. - Nr. Type No.
	(mm)	(mm)	(mm)	(mm)	(g)	
M10 x 1	16	5.5	16.7	17	16.0	M 01 120
M12 x 1.5	16	7.5	19.0	17	17.5	M 01 121
G 1/8"	16	5.5	16.7	17	16.0	M 01 123
G 1/4"	16	7.5	19.0	17	17.5	M 01 124
G 3/8"	16	7.5	19.0	17	22.5	M 01 125
M8 x 1	16	5.5	16.7	17	14.0	M 01 127
M16 x 1.5	16	7.5	19.0	22	22.0	M 01 128

JP-A standard

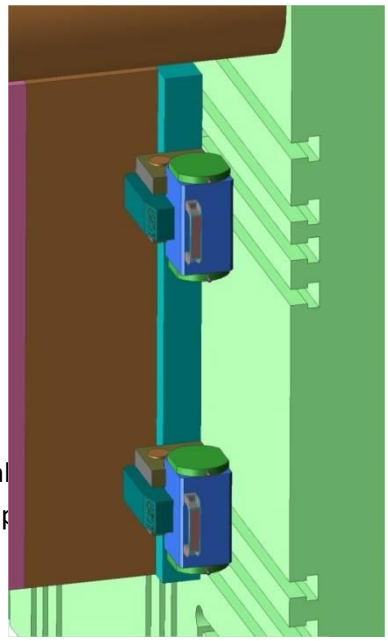
13. Standard for Clamping the Molds

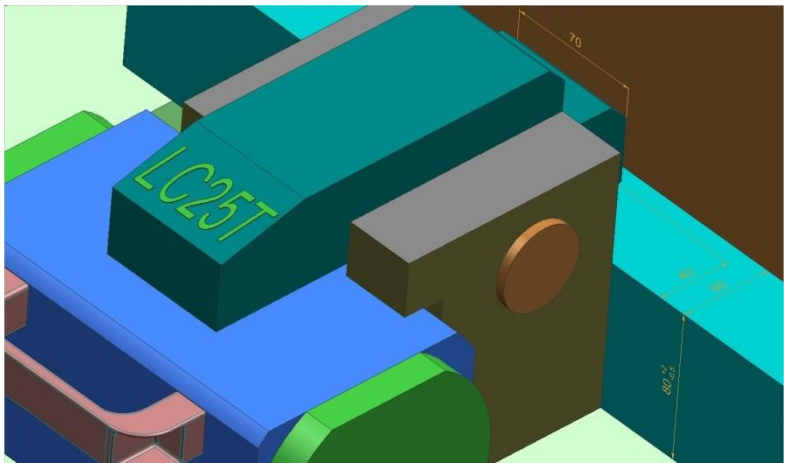
Clamping of all molds to the clamping plates of the injection molding machines must be done in such a way that clamps are only on vertical sides of the molds. **Clamping places on the upper and bottom part of the mold are non-permissible**. Thickness of clamping plates for clamping by mechanic clamps is specified in the table. Thickness of clamping plates for clamping by hydraulic clamps is from 79.5 to 82 mm. This dimension must be maintained for the thickness of the plate at the place of clamping by the hydraulic clamp. It may be achieved by the insertion of a thinner plate or by releasing the thicker plate. Width of clamping place is given by the type of hydraulic clamp. When designing the clamping place on the mold, it is necessary to consider clamping grooves on the clamping plates of the molding machines. 3D models of hydraulic clamps are part of the 3D models of clamping plates of the molding machines.



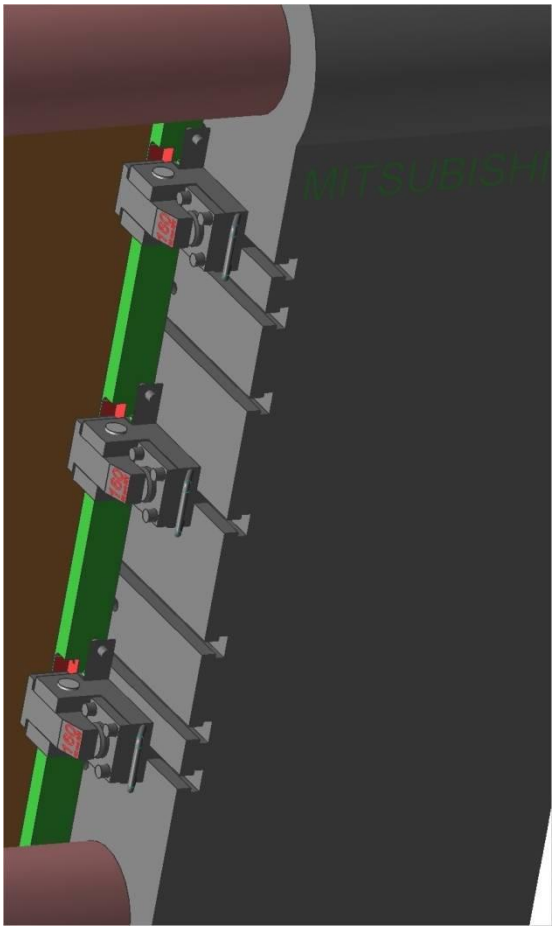


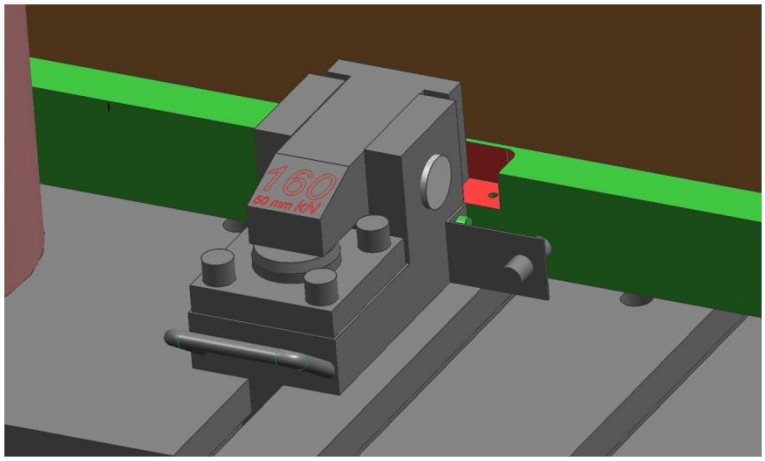
Hydraulic clamp for Engel Duo 1700

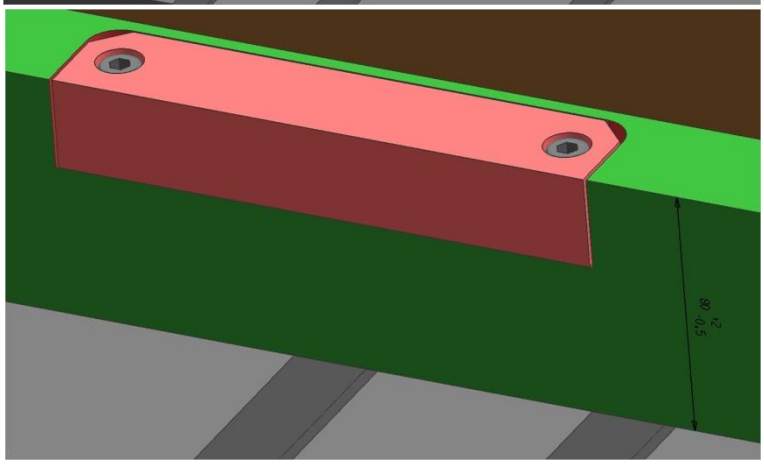


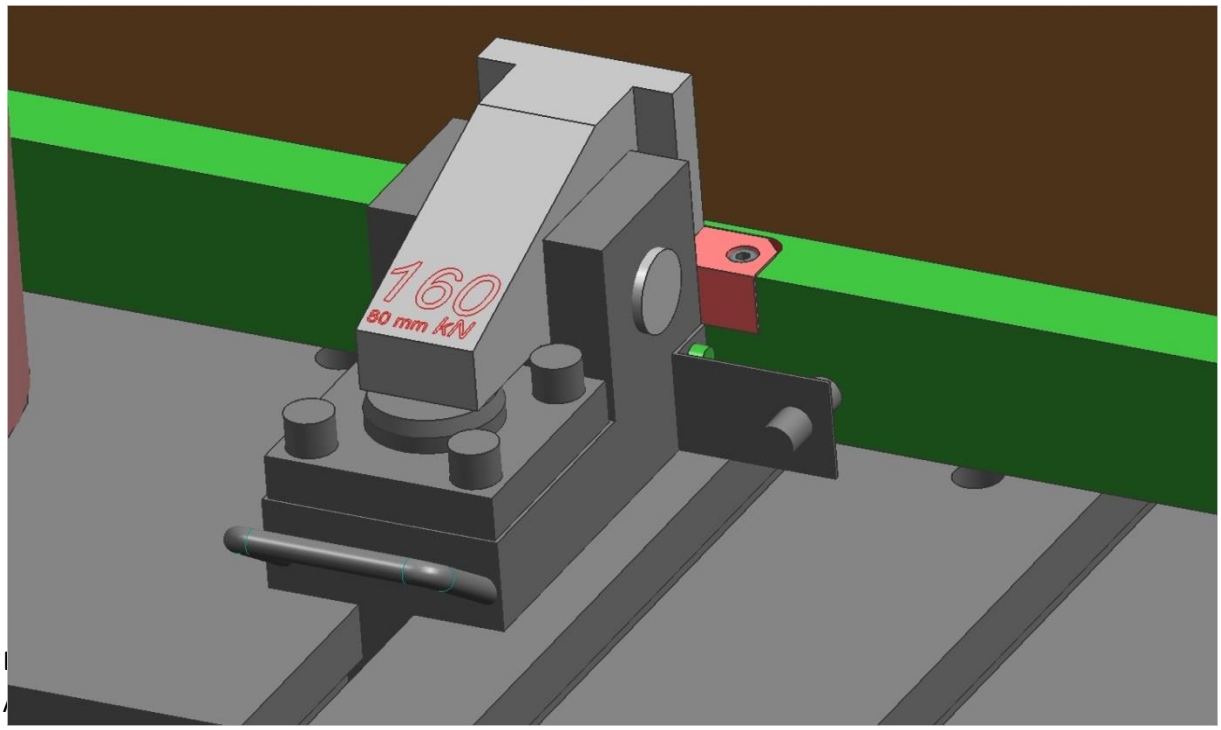


Hydraulic clamp for Engel Duo 2300 t

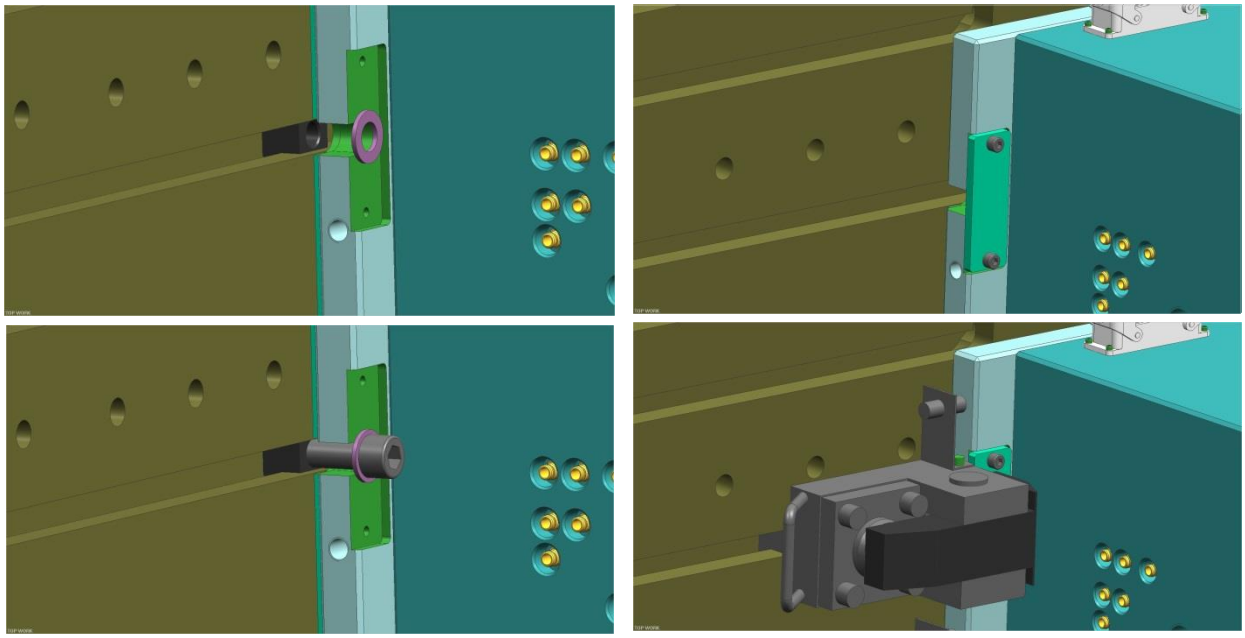



160
80 mm kN




160
80 mm kN

Hydraulic clamp for Mitsubishi 1450 t



Example of different thicknesses of clamping plate for mechanic clamping by a bold and clamping by the hydraulic clamp.

14. Standard for Inlet Pullers

Removal of the pressings from the molds is usually solved by manipulators with a gripper. If the gripper of the manipulator must remove both the pressing and the inlet system, we prefer to use a puller of the inlet shape according to fig. 14.1. Fig. 14.2 represents the recommended dimensions of inlet channel D – 10 mm. In the case of other diameters of inlet channels, it is necessary to adjust the dimensions.

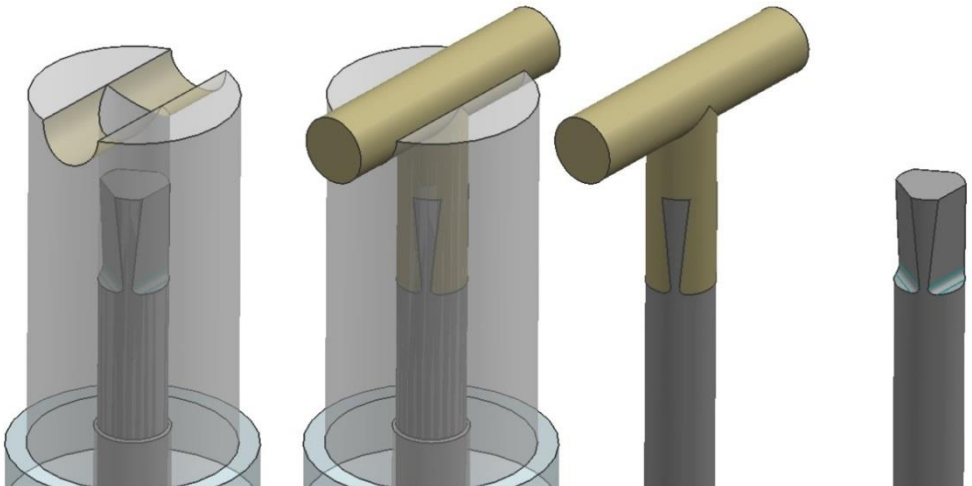


Fig. 14.1

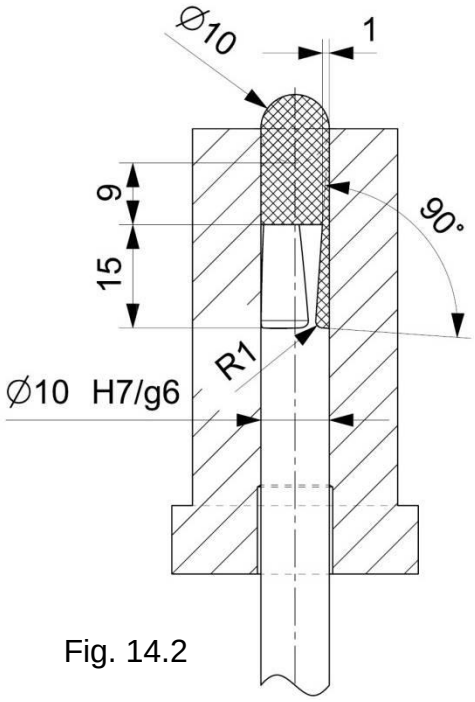


Fig. 14.2

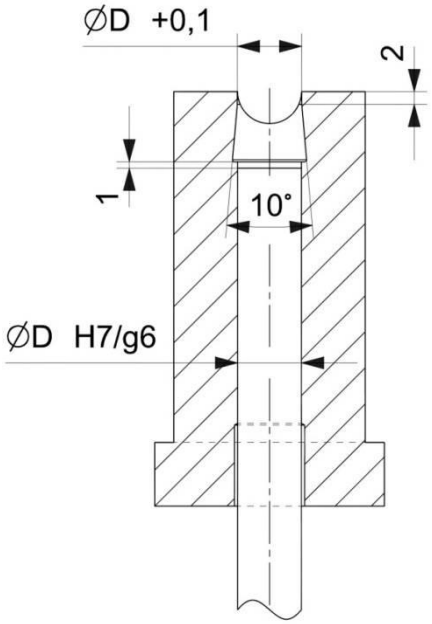


Fig. 14.4

If the inlet system is not removed by the gripper of the manipulator, we prefer the inlet puller as presented in fig. 14.3

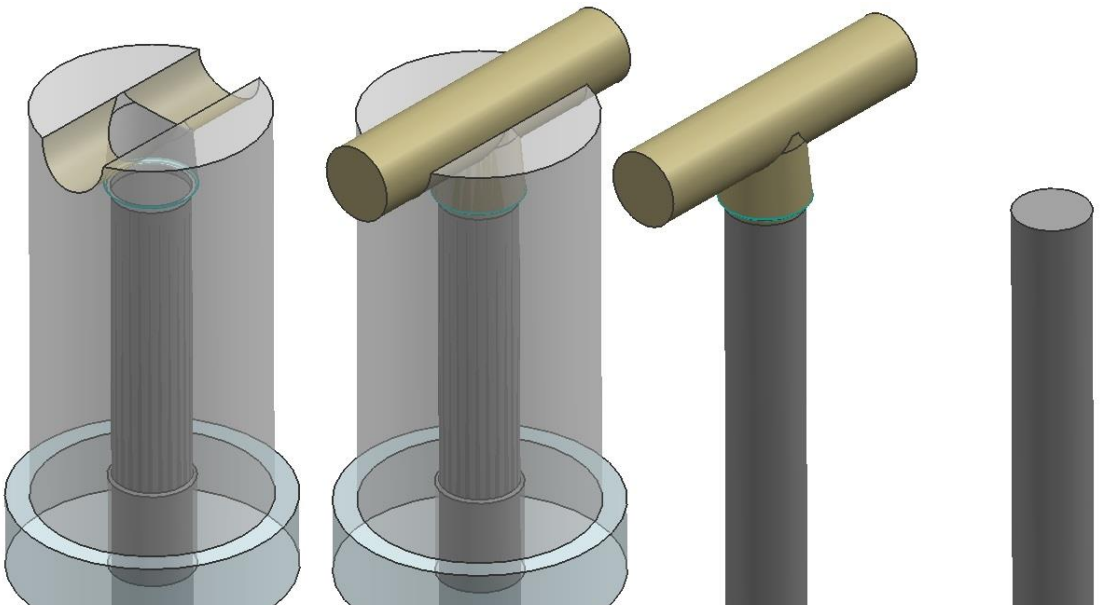


Fig. 14.3

This shape corresponds with standard pullers of the inlet, e.g. Hasco Z53, D-M-E FW34, and other producers of standard parts. Its basic parameters are in fig. 14.4.

15. Standard for Gates

The Gate is the thinnest part of the inlet system. Its position, shape and size are a compromise between the most optimum solution and a solution that is workable. However, we require meeting all generally verified solutions of inlet mouths that enable us to minimize pressure losses, sheer stress of melt during its injection, and to maximize the time of holding pressure effect.

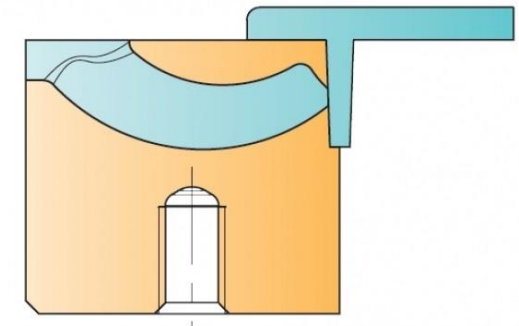


Fig. 15.1

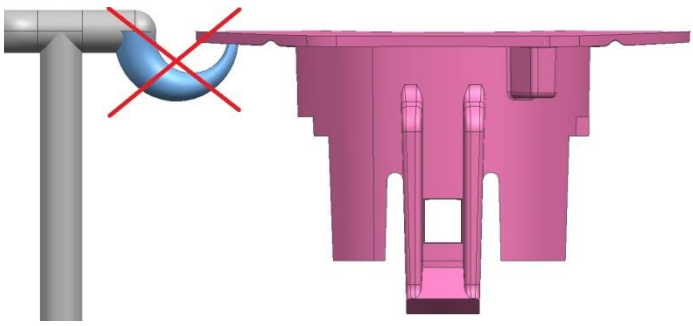


Fig. 15.2

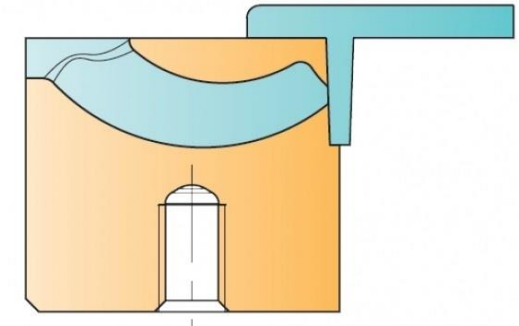


Fig. 15.3

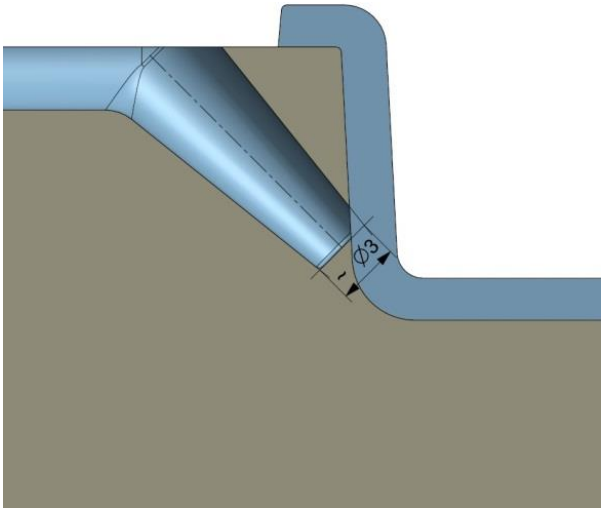


Fig. 15.4

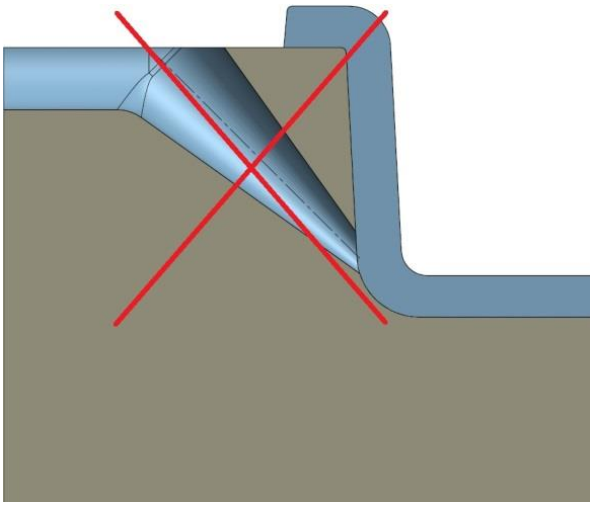


Fig. 15.5

16. Injection Pressures of Molding of Pressings

PS	80 Mpa
PE	
PP	
ABS	100 Mpa
ABS/ PC	
PMMA	
PA	
SAN	
ASA	
TPE	
PC	120 Mpa
PC*	
POM	
POM*	
PPE	
PPE*	
PPS	
PPS*	
PSU	
PSU*	
PET	
PET*	
PBT	
PBT*	
PP*	
PA*	
SAN*	

* filled plastic

Our company processes a wide range of plastic when producing pressings. Size of pressing pressures in the mold during the injection and holding pressure must meet the specifications for separate plastics and the shape severity of the pressings. We require from our suppliers of molds that the maximum value of injection pressure and holding pressure during the working cycle cannot exceed the values in the table. This can be achieved by a properly designed inlet system and optimizing the number and places of inlets.

We expect a complex analysis of a pressing in simulation software for analysis and in-leaks of plastic (Autodesk Moldflow, Cadmould, etc.) in the first phase of the development of a new mold. Results of these analysis form a base document for optimizing the pressing, inlet system and mold (arrangement of cooling and tempering channels). Failure to meet these maximum injection pressures will be deemed as the non-performance of ordering conditions during the production of the mold. It does not apply if the increased injection pressure and holding pressure is agreed in advance by and between a responsible representative of Jasplastik-Automotive, s.r.o. and a supplier of the mold in written form confirmed by both contractual parties.

17. Dependence of Drafting Angles, Roughness and Plastic

According to the standard VDI, the following Ra values correspond with roughness and they require drafting angles. In the case of plastic filled with glass fiber, it is necessary to choose a drafting angle that is higher for at least one set. The values are presented in tab. 17.1.

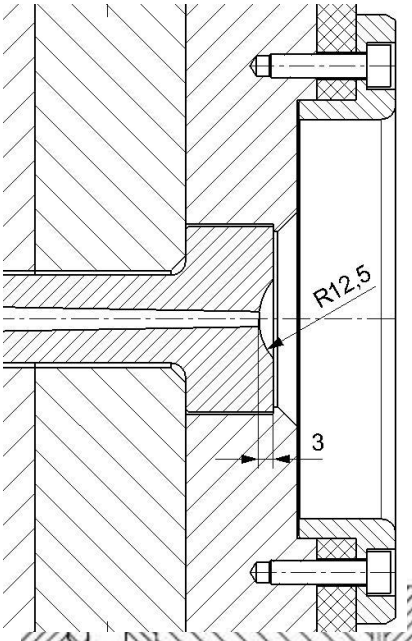
DA-PA = Drafting Angle for Polyamide
DA-PC = Drafting Angle for Polycarbonate …
DA-ABS = Drafting Angle for Acrilnitrile-Butadiene-Styrol

VDI 3400	ISO,VDI, ASA			ISO/TC 213	SPI			DA-PA	DA-PC	DA-ABS
Charmilles	Ra=CLA=AA		Rz		RMS					
CH	µm	µinch	µm		Tipo	µm	µinch			
	0.025	1		N1	A1	0. 022-0.043	0.5-1			
	0.05	2		N2	A2	0.043-0.08	1-2			
0	0.1	4		N3	A3	0.08-0.3	2-7			
1	0.11	4								
2	0.12	5								
3	0.14	6								
4	0.16	6								
5	0.18	7								
6	0.2	8		N4	B1	0.3-0.324	7-9.75			
7	0. 22	9			B2	0.324-0.422	9.75-12			
8	0.25	10								
9	0.28	11			B3	0.422-0.52	12-15			
10	0.32	13								
11	0.35	14			C1	0.52-0.65	15-20.5			
12	**0.4**	**16**	**1.5**	N5				**0**	**1**	**0.5**
13	0.45	18			C2	0.65-0.89	20.5-26			
14	0.5	20								
15	**0.56**	**22**	**2.4**					**0. 5**	**1**	**0.5**
16	0.63	25			C3	0.89-1.125	26-32			
17	0.7	28								
18	**0.8**	**32**		N6	D1	1.125-1.385	26-32	**0.5**	**1**	**0.5**
19	0.9	36								
20	1	40			D2		32-			
21	**1.12**	**45**	**4.7**					**0.5**	**1**	**0.5**
22	1.26	50								
23	1.4	56								
24	**1.62**	**63**	**6.5**	N7				**0.5**	**1. 5**	**1**
25	1.8	72								
26	2	80								
27	**2.2**	**88**	**10.5**					**1**	**2**	**1.5**
28	2.5	100								
29	2.8	112								
30	**3.2**	**125**	**12.5**	N8	D3			**1.5**	**2**	**2**
31	3.5	140								
32	4	160								
33	**4.5**	**180**	**17.5**					**2**	**3**	**2.5**
34	5	200								
35	5.6	224								
36	**6.3**	**250**	**24**	N9				**2.5**	**4**	**3**

37	7	280								
38	8	320								
39	**9**	**360**	**34**					**3**	**5**	**4**
40	10	400								
41	11.2	448								
42	**12.6**	**500**	**48**					**4**	**6**	**5**
43	14	560		N10						
44	16	640								
45	**18**	**760**	**69**					**5**	**7**	

Tab 17.1

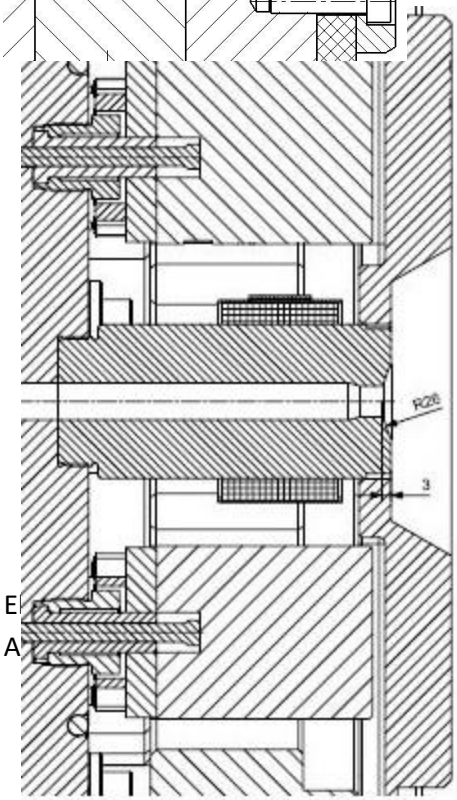
18. Standard for Bearing Surfaces of Sprue bushing of the Injection Molds



Bearing Radius of Sprue bushing for the mold up to 700 tons of closing force (including 700 t) is R = 12.5. Depth of imbedding is 3 mm.

Nozzle radius on the molding machines is R = 12

Fig. 18.1



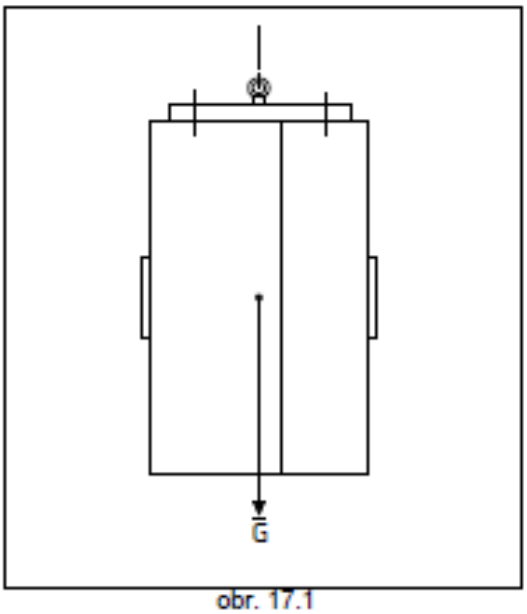
Bearing Radius of Sprue bushing for the mold above 700 tons of closing force is R = 26. Depth of imbedding is 3 mm.

Nozzle radius on the molding machines is R = 25.

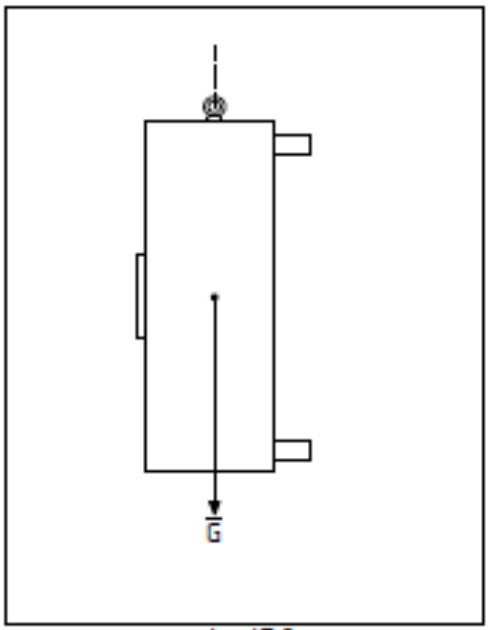
Fig. 18.2

19. Standard for Placing of Threads for Lifting Lugs

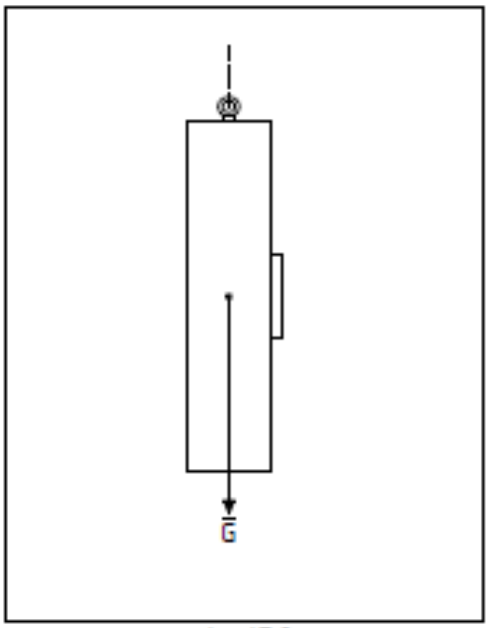
Threads for lifting lugs must be dimensioned for respective weight, and must be located on the injection mold or connecting bridge in the gravity centre (see fig. 19.1.), so they enable lifting of connected injection mold in its gravity centre. There must be threads for independent lifting of stable and moveable part of the injection mold in their gravity centers (see fig. 19.2, 19.3). Unless otherwise agreed, in the case of injection molds with total weight over 100 kg, there must be four threads on opposite sides, both on the stable and on the moveable part of the mold, so it is possible to open the mold with a crane. Size of the threads is identical with the thread for the lifting lugs for the respective part of the mold.



obr. 17.1



obr. 17.2



obr. 17.3

20. Standard for Using Marking Stamps

Marking of the pressing must be performed according to supplied documentation. Information about marking of the pressing is part of 3D or 2D documentation about the

pressing. If not, then the pressing must be marked on the basis of a proposal of a mold manufacturer, approved by a responsible employee of JP-A. As a standard, the marking of the pressing contains the following information:

1. Marking of the date of production
2. Code marking of the pressing
3. Code marking of the material of the pressing
4. Country of origin (place of molding process)
5. Version of the pressing (front-rear **Vo-Hi**, left-right **Li-Re**)
6. Logo of the supplier of the pressing
7. Logo of an automotive producer
8. Stand table
9. Code marking of a motor vehicle model

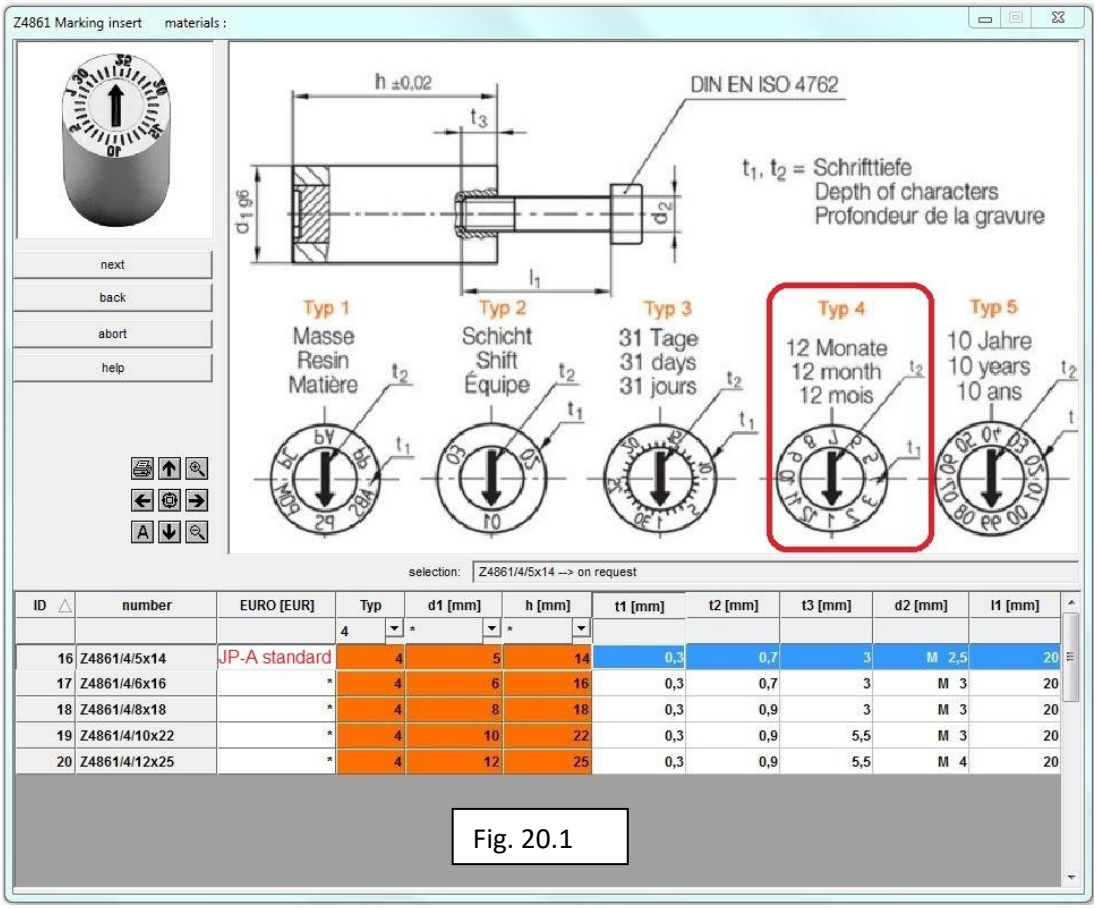
1. For marking the date of production, a date table is used. The first column indicates years (normally 10). An initial year is the year of the first test. The first row of the table indicates months of the year.

An example of the date table:

	1	2	3	4	5	6	7	8	9	10	11	12
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												

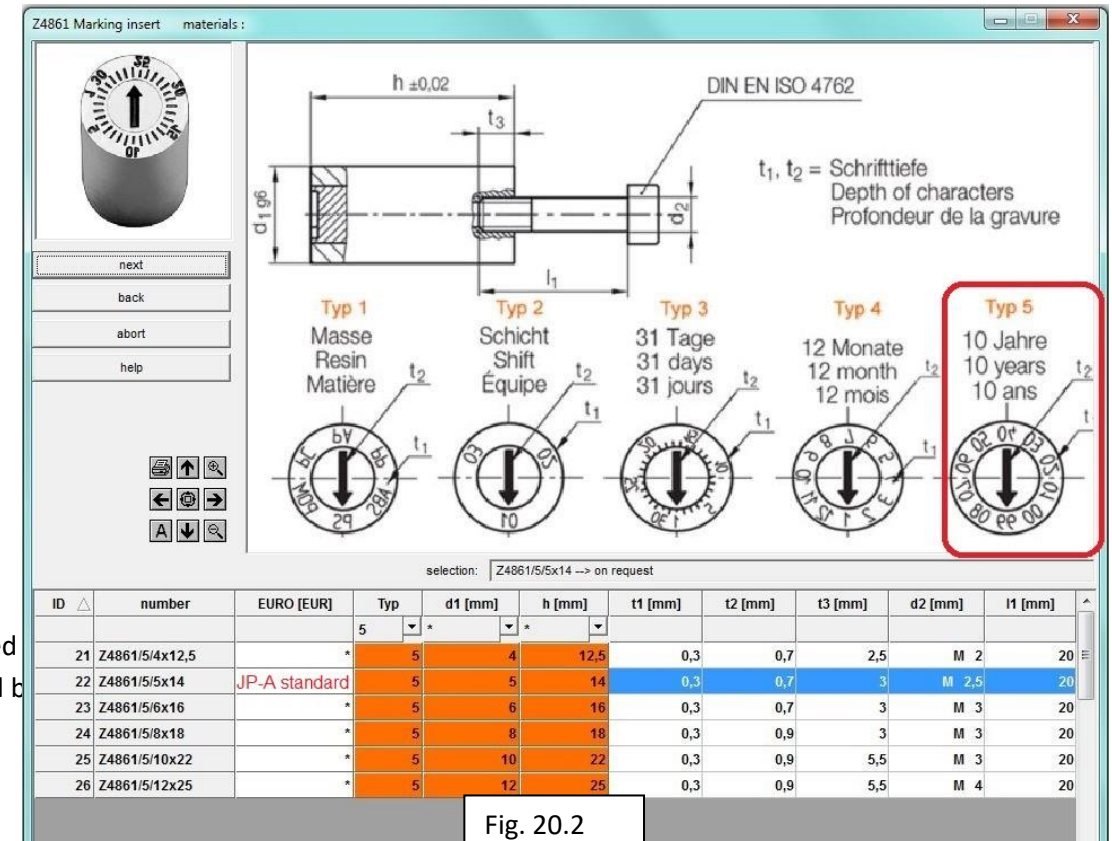
If it is not possible to use the date table due to space reasons on the pressings, the date of production may be marked by rotating the date inserts of HASCO, type Z 4861/4/5x14 for marking the month (fig. 20.1), type Z 4861/5/5x14 for marking the year of production

(fig. 20.2). Use of other type of rotating date insert must be approved by a responsible employee of JP-A.



ID	number	EURO [EUR]	Typ	d1 [mm]	h [mm]	t1 [mm]	t2 [mm]	t3 [mm]	d2 [mm]	l1 [mm]
			4	*	*					
16	Z4861/4/5x14	JP-A standard	4	5	14	0,3	0,7	3	M 2,5	20
17	Z4861/4/6x16	*	4	6	16	0,3	0,7	3	M 3	20
18	Z4861/4/8x18	*	4	8	18	0,3	0,9	3	M 3	20
19	Z4861/4/10x22	*	4	10	22	0,3	0,9	5,5	M 3	20
20	Z4861/4/12x25	*	4	12	25	0,3	0,9	5,5	M 4	20

Fig. 20.1



ID	number	EURO [EUR]	Typ	d1 [mm]	h [mm]	t1 [mm]	t2 [mm]	t3 [mm]	d2 [mm]	l1 [mm]
			5	*	*					
21	Z4861/5/4x12,5	*	5	4	12,5	0,3	0,7	2,5	M 2	20
22	Z4861/5/5x14	JP-A standard	5	5	14	0,3	0,7	3	M 2,5	20
23	Z4861/5/6x16	*	5	6	16	0,3	0,7	3	M 3	20
24	Z4861/5/8x18	*	5	8	18	0,3	0,9	3	M 3	20
25	Z4861/5/10x22	*	5	10	22	0,3	0,9	5,5	M 3	20
26	Z4861/5/12x25	*	5	12	25	0,3	0,9	5,5	M 4	20

Fig. 20.2

Elaborated

Approved b

2. Code marking of the pressing – it is usually the number of 2D drawing or the name of 3D file of the pressing (without marking a version date, if in the name of the file).

3. Code marking of the material of the pressing – it is a part of 2D documentation (e.g. >PC+PBT<, > PA+30GF<,…).

4. Geographic name of the country, where the pressing is produced (e.g. Slovakia, Germany,...)

5. Marking of the version of the pressing, if the pressing is produced in mirror versions: Front – **Vo** (**Vo**rne), rear - **Hi** (**Hi**nten), left – **Li** (**Li**nks), right - **Re** (**Re**chts).

6. Logo of a supplier of the pressing – to be specified when the mold is ordered

7. Logo of the automotive producer – e.g. logo Audi, BMW, ..., VW.

8. Stand table for marking the current version of the pressing.

Al	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**

The current version is marked by crossing the field of the respective number.

9. Code marking of a model of a motor vehicle, for which the pressing is designated. Marking is part of 2D documentation.

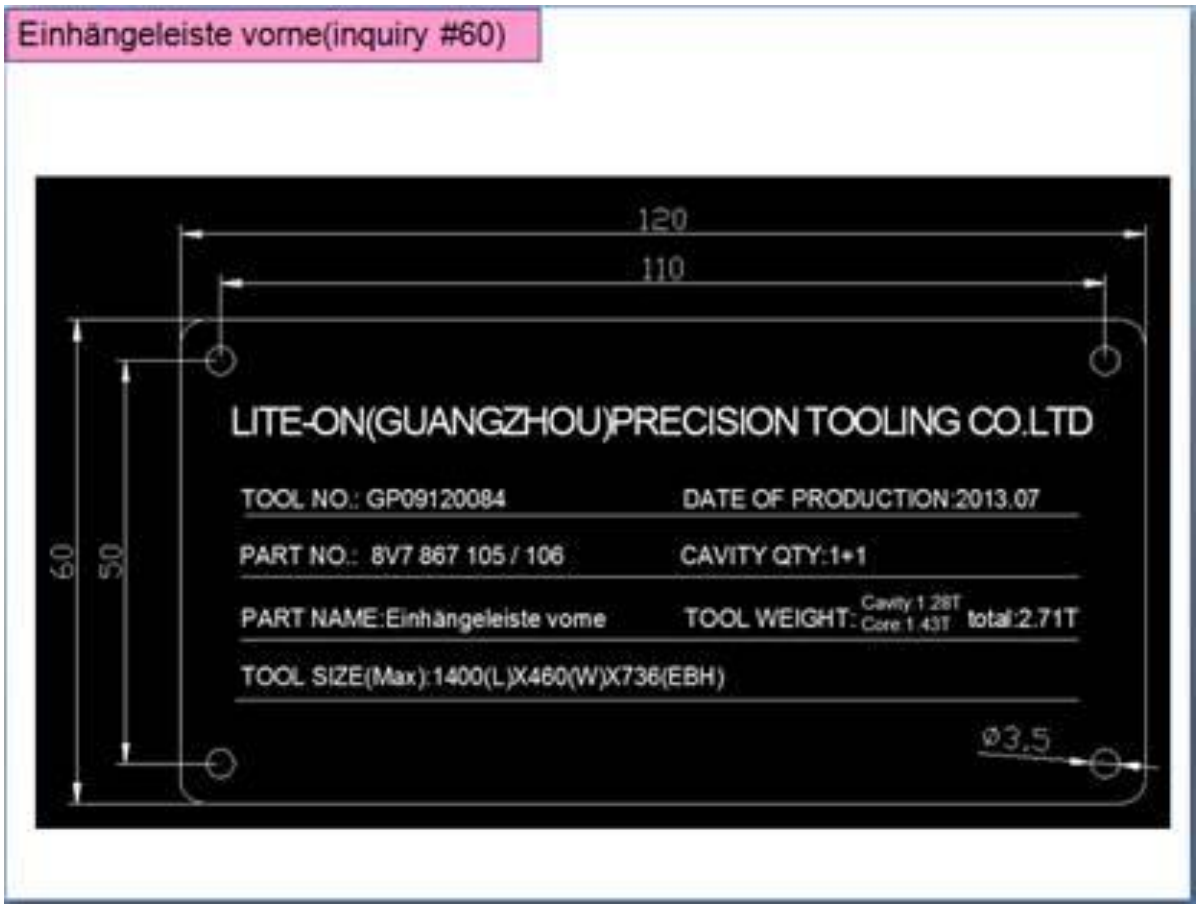
When marking the pressing in the mold, it is necessary to meet all the directives specified in 2D documentation of the pressing.

21. Standard for Identification and Additional Tags of the Injection Molds

21.1. Standard Identification Tag of the Injection Mold

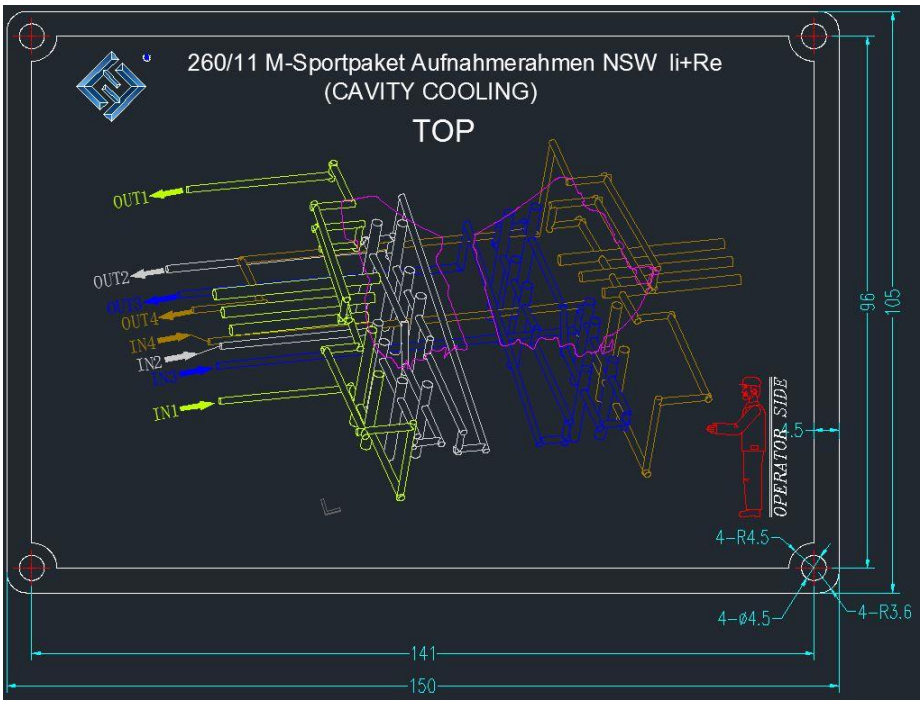
Identification tag contains:

Name of a manufacturer of the mold,
Name of an owner of the mold,
Mold number,
Year of production,
Name of a part,
Supply number of the part,
Multiplicity of the pressing in the mold,
Total weight of the mold,
Weight of the stable part of the mold,
Weight of the moveable part of the mold,



21.2. Tag of the Cooling Channels Scheme

A tag of the cooling channels scheme must be located on the side of a respective part of the mold. If it cannot be placed on the respective part of the mold, the tag must specify the part of the mold, e.g. Stable part of the mold, Moveable part of the mold.



21.3. Tag of the Producer of a Hot Runner

The tag of a producer of the hot runner must be placed on the stable part of the mold.

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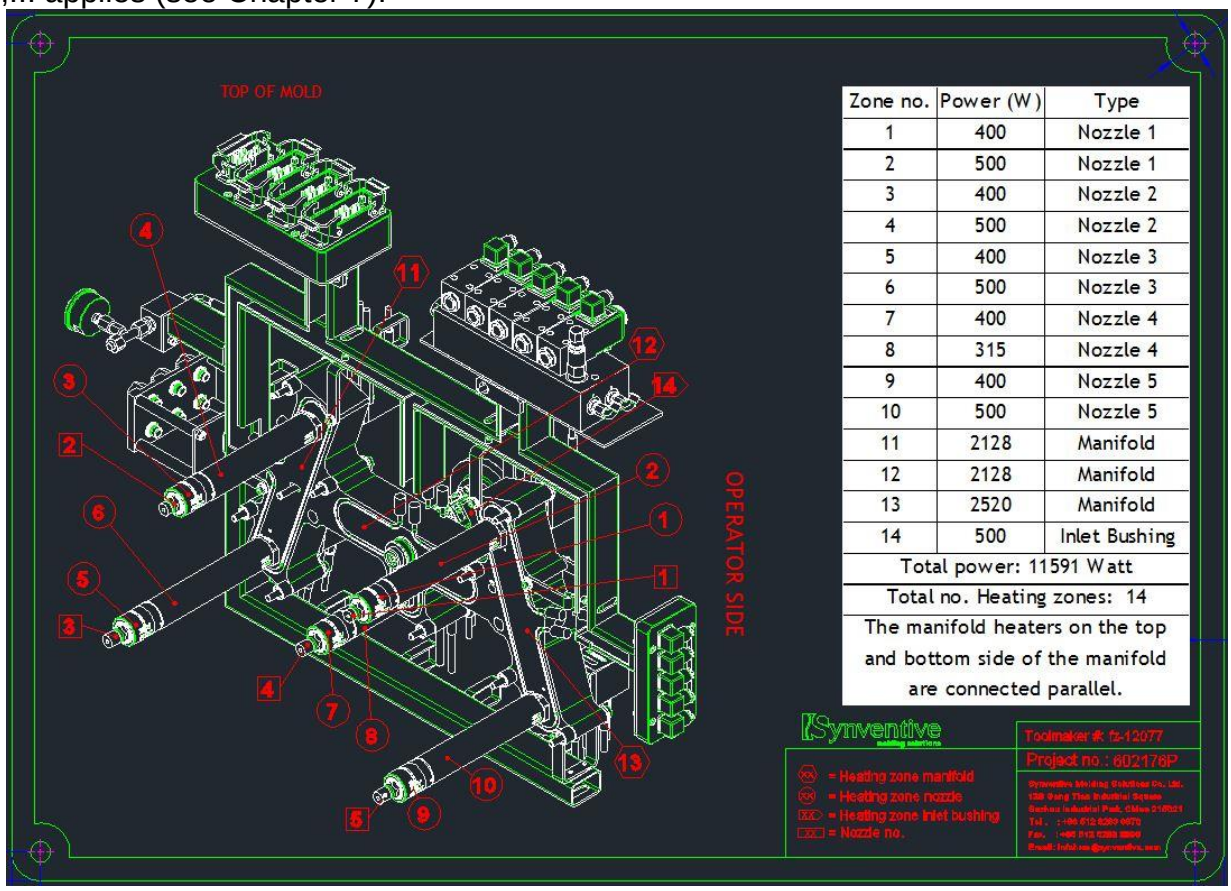
21.4. Tags with a Scheme of Connection of the Hot Runners and Information about Position

In the case of molds that have more than 1 connector for power supply of the hot runners, it is necessary to specify on the tag to which of the connectors wiring scheme A, B,... applies (see Chapter 7).



Zone no.	Power (W)	Type
1	400	Nozzle 1
2	500	Nozzle 1
3	400	Nozzle 2
4	500	Nozzle 2
5	400	Nozzle 3
6	500	Nozzle 3
7	400	Nozzle 4
8	315	Nozzle 4
9	400	Nozzle 5
10	500	Nozzle 5
11	2128	Manifold
12	2128	Manifold
13	2520	Manifold
14	500	Inlet Bushing
Total power: 11591 Watt		
Total no. Heating zones: 14		
The manifold heaters on the top and bottom side of the manifold are connected parallel.		

21.5. Tag of a Mold Sequence

Function flow Chart
Tool assembly
1. assembly of the tool to the machine 2. tool has to be closed 3. unplug the transportation lock 4. open the tool 5. move the ejector pins into front position
Injection cycle
1. move the ejector pins backwards 2. put metal insert into core insert 3. close the tool 4. injecting 5. open the tool 6. move the ejector pins into front position 7. take the part out
Tool removal from the machine
1. tool open ejectors into front position 2. move ejector pins into back position 3. close the tool 4. plug in the transportation loock 5. remove the tool from the machine
Tool No. JP-A 654321

22. Standard of Prescribed Preserving Substances

Use a preserving substance from Chem Trend - Lusin® Protect G31 as a standard. Do not preserve galvananic molds; let the mold cool down to 25°C before its closing, and check there is no water on the galvanic surface. Remove any water from the galvanic surface with a stream of dry air.

23. Standard for Placing the Mold during Transport

During transport, the injection mold must be closed and secured by a connecting bridge to prevent its opening. All movable parts of the mold must be secured against movement caused by shock, etc. The injection mold must be placed on the pallet in such a way that its centre of gravity is as low as possible. The pallet on which the injection mold is placed must have adequate load capacity and dimensions. After the correct placing of the injection mold, it must be secured against shifting with beams tightened with screws (fig. 23.1).

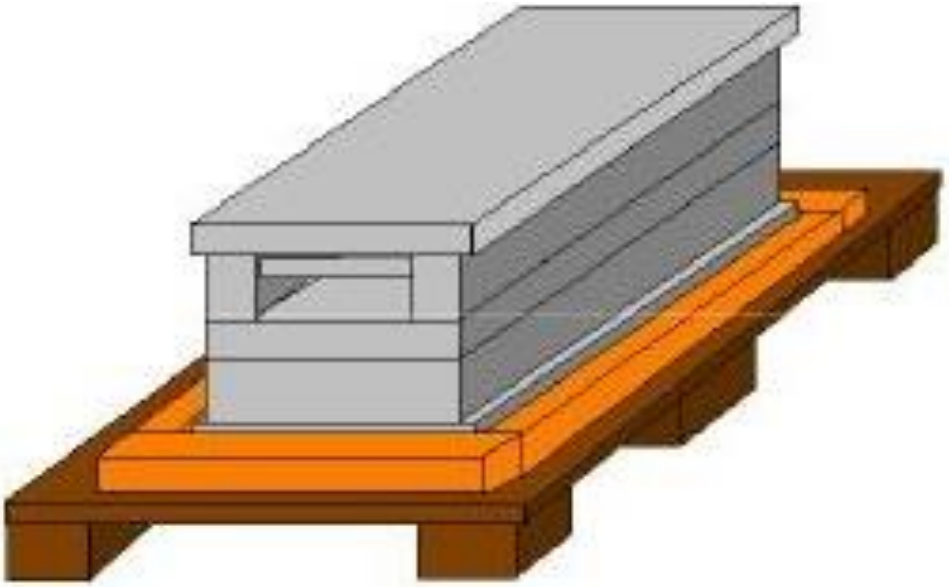


Fig. 23.1

After tightening the beams to the panel, tape the injection mold in both directions and wrap in stretch foil (see fig. 23.2) in order to prevent corrosion.

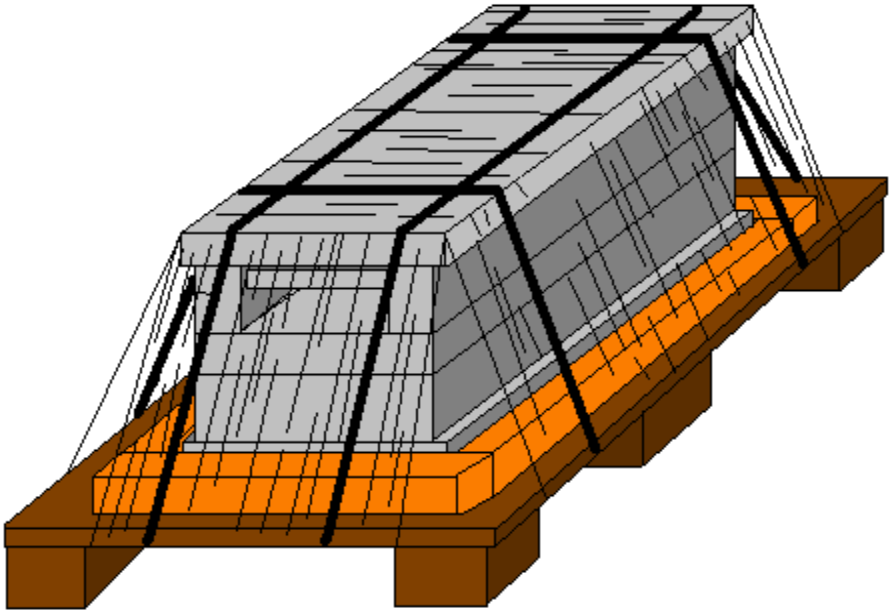
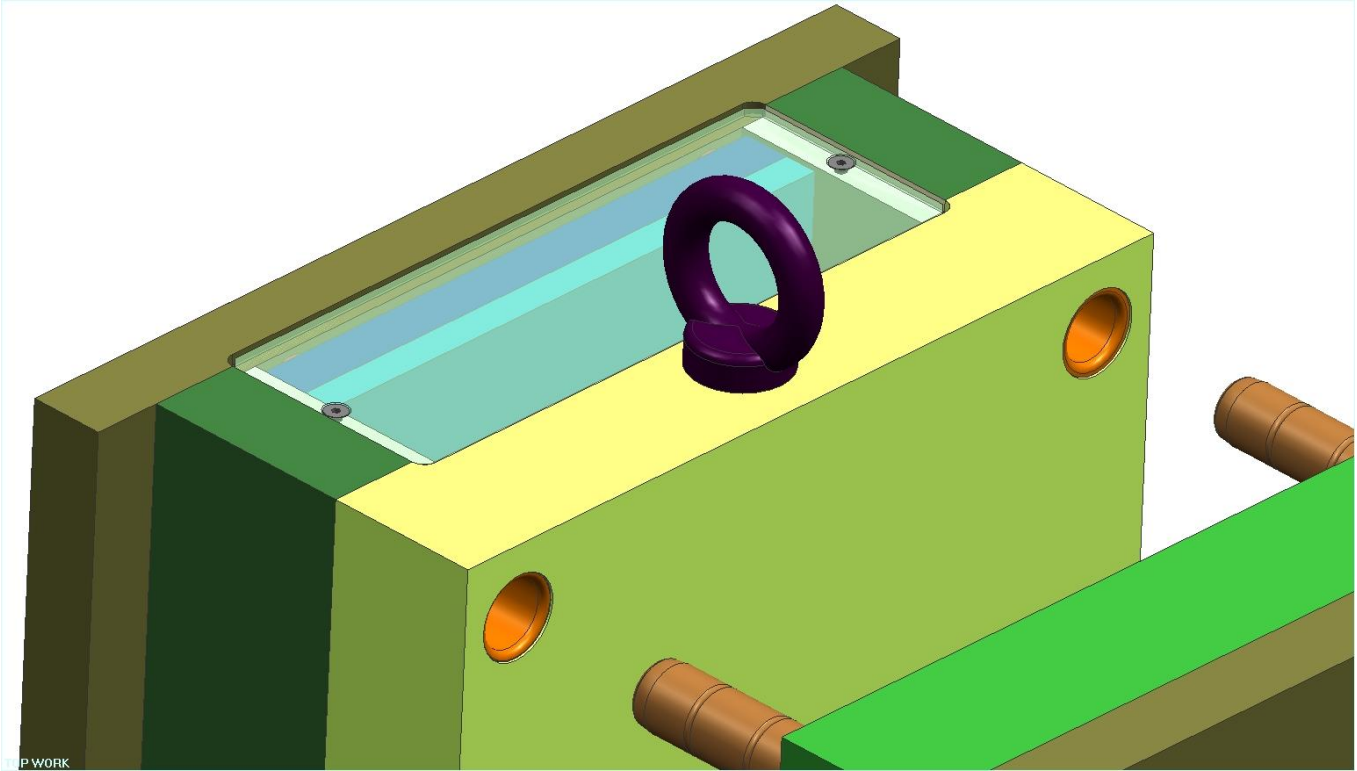


Fig. 23.2

24. Standard for Covering Ejective Plates



In order to prevent contamination of the sliding surfaces of guiding bushes of the ejective plates and ejectors, cover the space above the ejective plates with plate (PMMA or PC) of appropriate thickness (min. 3 mm). To ensure their maintenance, it is also necessary to ensure their ability to be dismounted when they are clamped on the injection machines.

25. Standard for Takeover of Production Documentation of the Mold

As a standard, each mold has to include the following:

- drawings (paper printed form), CD/DVD with 3D data of the mold and pressing that are used for repairs and maintenance of the mold, and for setting of the injection and pressing conditions. Drawings must contain the dimensions of mold cavities, inserts, moveable parts, bill of material, dimensions and descriptions of the spare parts. Interconnections of the cooling circuits, air connections and wirings in the mold. Wiring schemes and arrangement of heating circuits.

-spare parts defined by the producer according to the percentage probability of their damage.

- a sample pressing, complete, also with a runner (if it is not a mold without runners) that will be used as a standard for comparison with the first produced pressing.