



FLUID SAFETY VALVES type DBDS

9.1



BLOCKS FOR RELIEF VALVE type BPV and BAPV

9.2



SAFETY BLOCK type BS

9.3



FLUID SIDE ADAPTERS type TF

9.4

9.1.1 TECHNICAL DATA

MAX OPERATING PRESSURE (PS): sizes 6, 20: 400 bar
size 10: 630 bar
size 30: 315 bar

PRESSURE SETTING (P): (upon request)
sizes 6, 20: 6 ÷ 400 bar
size 10: 6 ÷ 630 bar
size 30: 30 ÷ 315 bar

NOMINAL SIZE: 6, 10, 20, 30

LIFT: 2 mm

WORKING TEMPERATURE: -20 ÷ +150 °C

REPETIBILITY: ± 3% of P

CALIBRATION ERROR: 3%

OVERPRESSURE BY FULL FLOW: 10% of P

BLOW DOWN: 10% of P

FLUID VISCOSITY RANGE: 10 ÷ 400 cSt

RECOMMENDED VISCOSITY: 36 cSt

FLUID CONTAMINATION DEGREE:
class 20/18/15 according to ISO 4406/99

BODY MATERIAL: - phosphated carbon steel or galvanized carbon steel
in compliance with Directive 2002/95/EC (RoHS) to
resist to corrosion.
- stainless steel (only DBDS 10 K)

SEALING MATERIAL: - **P** = Nitrile rubber (NBR)
- **V** = Fluorocarbon (FPM)

CONNECTIONS: see Table 9.1d

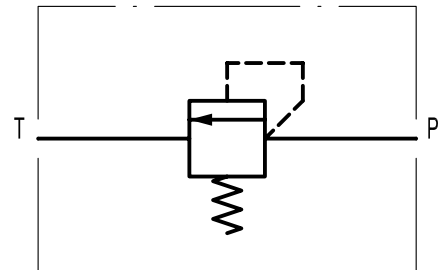
FLOW RATE: see Table 9.1d

WEIGHT: see Table 9.1d



9.1a

9.1.2 HYDRAULIC SYMBOL



9.1b

9.1.3 DESCRIPTION

Valves DBDS type are pressure direct command relief valves. Their function is to limit the pressure of a hydraulic system. The calibration of the system pressure is carried out continuously through the calibration device, which, by the spring, pushes the wedge against the seat.

The P channel is connected to the pressure line of the system, entering the valve, and acts on the active area of the wedge (or of the ball for the DBDS 10 at 630 bar).

When the pressure in channel P exceeds the value set on the spring, the wedge or the ball raises in contrast to the spring. The fluid now flows from the channel P to the channel T. The stroke of the wedge is limited by a pin in the damping chamber.

To obtain a good resolution of the pressure setting from 0 to 400 (630) bar, this has been divided into 7 pressure ranges. Each range has a specific spring for adjusting a maximum working pressure.

9.1.4 STRUCTURE

Body: in high strength steel, obtained by mechanical processing, in which are obtained the seats.

Poppet: obtained by mechanical processing from bar, it ensures the necessary seal degree on the valve seat. The poppet is well led by the damping piston and pushed by the spring against the seat.

Spring: it counteracts the pressure and the dynamic actions of the fluid and always ensures the closing of the valve after the discharge. The

coils of the spring, even when the obturator has reached its maximum lift, are never at pack.

The poppet has a mechanical lock and when it has reached it, the arrow of the spring does not exceed 85% of the maximum deviation.

Calibration system: threaded hexagon head screw which screws into the top of the valve by compressing the spring below. After the calibration, the position of the adjusting screw is kept unaltered by locking the counter nut and sealing the adjusting screw (valve with EC/PED/EC certification).

9.1.5 CALIBRATION

All valves are calibrated on the working bench with a flow rate of 2 l / min. and with an atmospheric counter pressure. The repeatability error of calibration is less than 3% than the pressure P. Up to a pressure equal to 97% of the calibration pressure verifying that there's no leakages.

9.1.6 ORDER CODE

1	2	3	4	5	6	7	8	9			
DBD	S	10	K	13	/	360	-	8	-	C	P

1	Series
Fluid safety valves	= DBD

2	Type of adjustment
Size 6, 10, 20	
Hexagon socket set screw	= S
Rotary knob	= H
Size 30	
Hexagon socket set screw	= S

3	Nominal diameter
6 mm	= 6
10 mm	= 10
20 mm	= 20
30 mm	= 30

4	Type of connection
Screw cartridge valve	= K
Threaded connection	= G
Sub-plate mounting	= P

5	Series number	5
Overall and mounting dimensions remain unchanged from 10 to 19.		

9	Sealing material
Nitrile (NBR)	= P
Viton (FKM)	= V

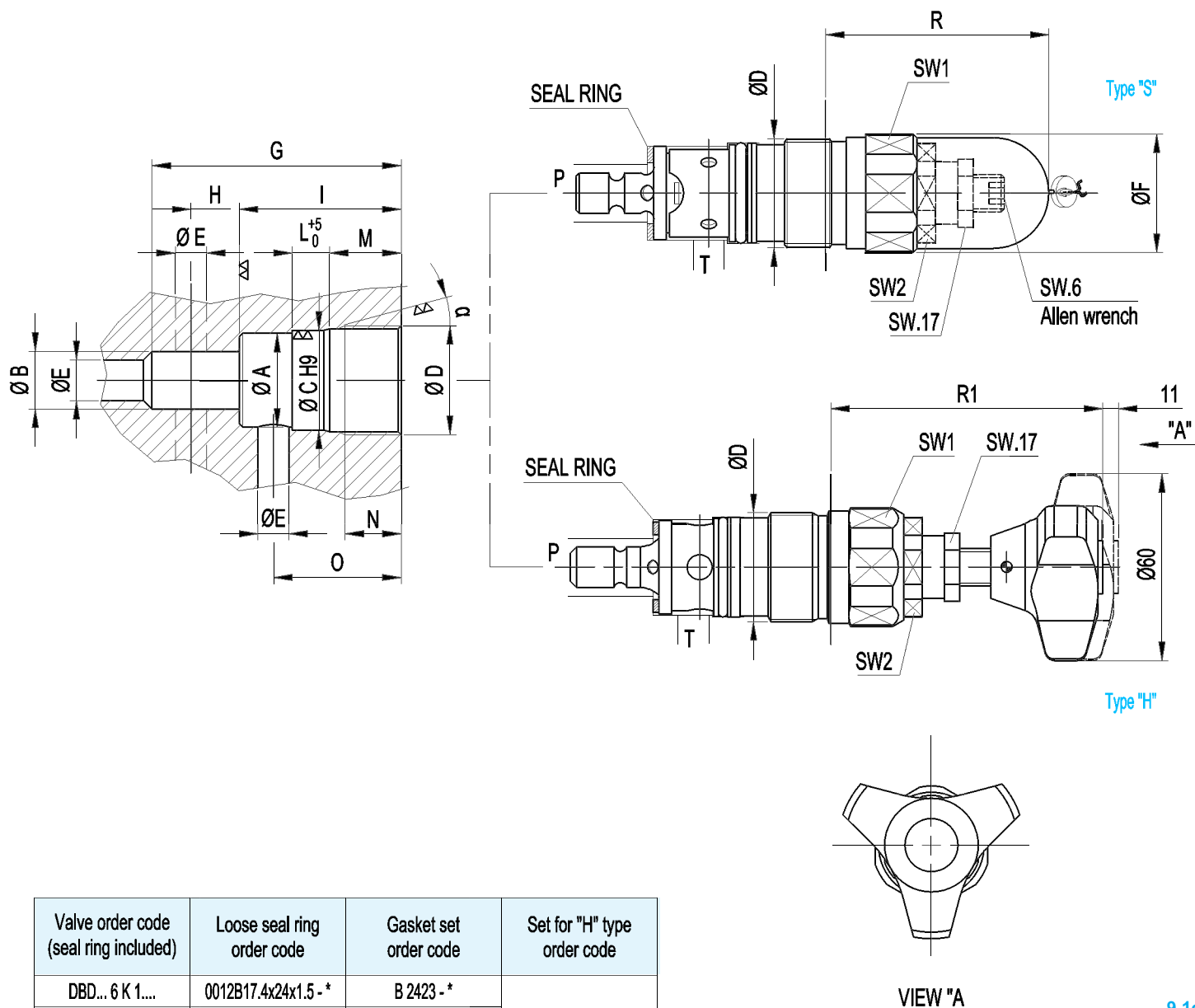
8	Body material
Carbon steel	= C
Stainless steel	= X

7	Certification
Without certification	= 0
TR (Russia)	= 1
PED 97/23/EC	
ATEX 94/9EC	= 9

Fixed Pressure setting (with certifications)		
DBDS6	6 ÷ 400	: upon request
DBDS10	6 ÷ 400	: upon request
DBDS20	6 ÷ 630	: upon request
DBDS30	30 ÷ 315	: upon request

6	Pressure rating (without certification)		
DBDS6	up to 25	:	25
	up to 50	:	50
	up to 100	:	100
	up to 200	:	200
	up to 315	:	315
DBDS10	up to 400	:	400
	up to 25	:	25
	up to 50	:	50
	up to 100	:	100
	up to 200	:	200
DBDS20	up to 315	:	315
	up to 400	:	400
	up to 630	:	630
	up to 25	:	25
	up to 50	:	50
DBDS30	up to 100	:	100
	up to 200	:	200
	up to 315	:	315
	up to 400	:	400
	up to 200	:	200

9.1.7.1 "K" VERSION DIMENSIONS



Valve order code (seal ring included)	Loose seal ring order code	Gasket set order code	Set for "H" type order code
DBD... 6 K 1....	0012B17.4x24x1.5 - *	B 2423 - *	B 2427
DBD... 10 K 1....	0012B24.7x31x2 - *	B 2424 - *	
DBD... 20 K 1....	0012B31x39x2 - *	B 2425 - *	
DBD... 30 K 1....	0012B42x52x3 - *	B 2426 - *	

* Gasket material

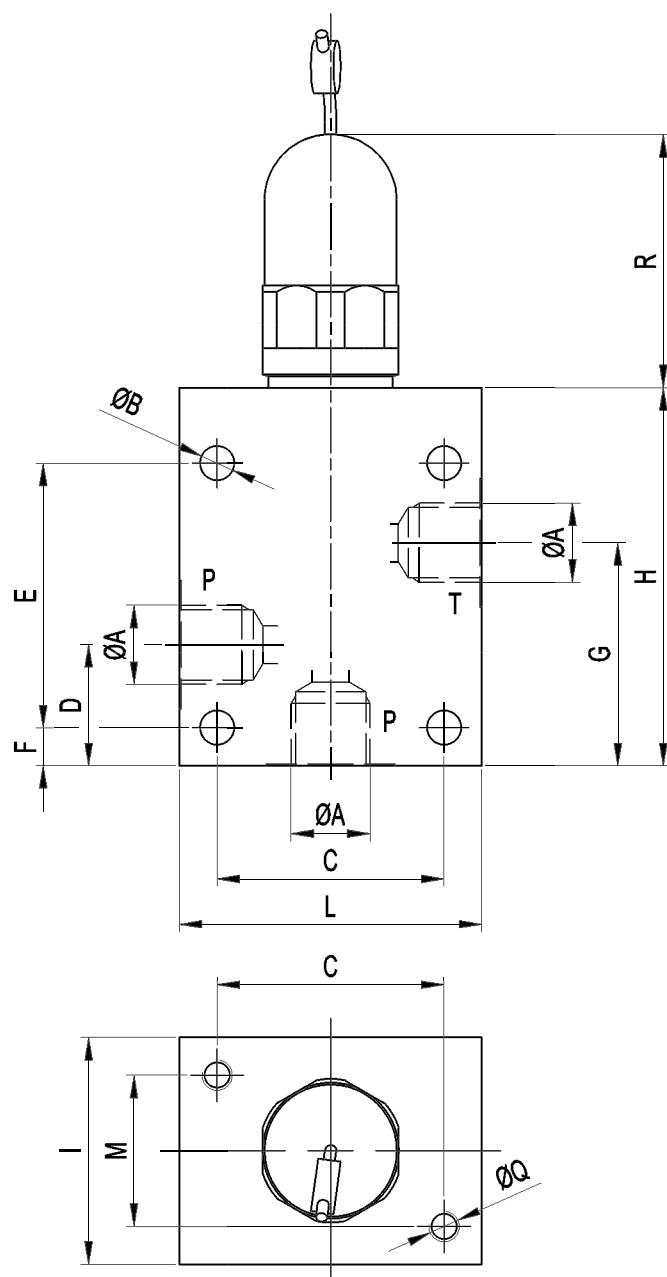
9.1d

Valve order code (seal ring included)	Ø A mm	Ø B mm	Ø C mm	Ø D	Ø E mm	Ø F Type S mm	G mm	H mm	I mm	L mm	M mm	N mm	O mm	R S type mm	R1 H type mm	SW1 mm	SW2 mm	α	Weight Kg
DBD... 6 K 1....	Ø24.9	15	Ø25 H9	M28x1.5	6	34	65	11.5±5.5	45	11	19	15	36	72	83	32	30	15°	0.36
DBD... 10 K 1....	Ø31.9	18.5	Ø32 H9	M35x1.5	10	38	80	15.5±7.5	52	12	23	18	41.5	68	79	36	30	15°	0.48
DBD... 20 K 1....	Ø39.9	24	Ø40 H9	M45x1.5	20	48	110	21.5±8.5	70	18	27	21	55	65	77	46	36	20°	0.86
DBD... 30 K 1....	Ø54.9	38.75	Ø55 H9	M60x2	30	63	140	29.5±11.5	84	16	29	23	63	83	-	60	46	20°	2

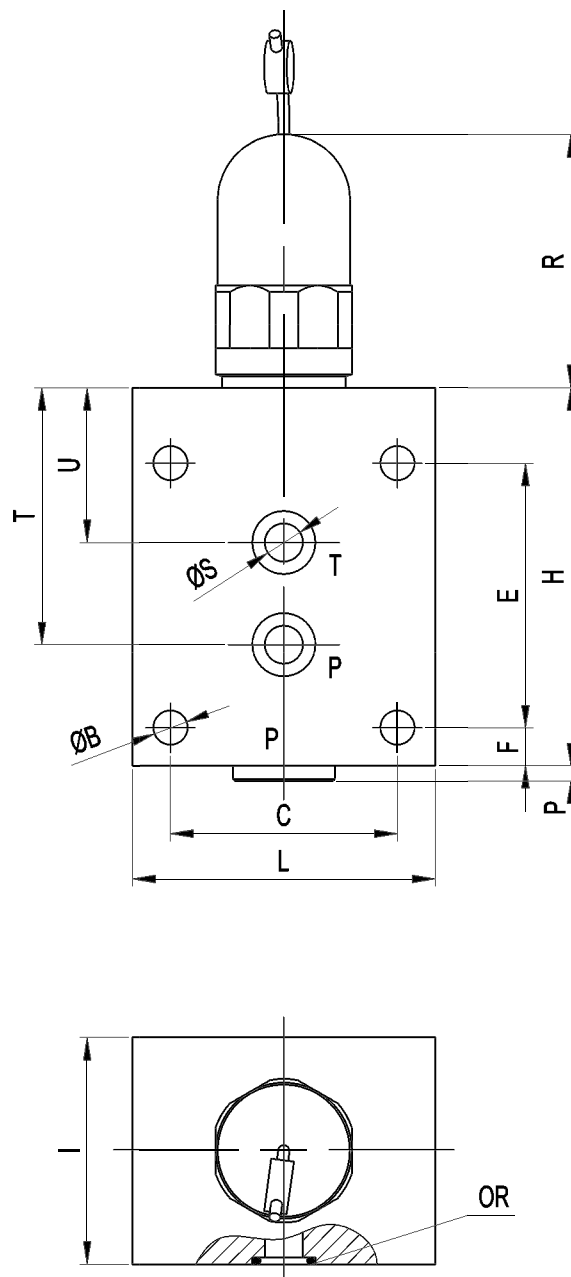
DBD... 30 K 1... type "H" not available

9.1e

9.1.7.2 "G" & "P" VERSIONS DIMENSIONS



BLOCK "G" TYPE



BLOCK "P" TYPE

9.1f

Complete valve order code	$\varnothing A$ BSP	$\varnothing B$ mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	L mm	M mm	P mm	$\varnothing Q$ mm	R mm	S mm	T mm	U mm	OR* metric	Weight Kg
DBDS6G1....	1/4"	6.6	45	25	55	10	45	80	40	60	25	4	M6	72	6	-	-	-	1.5
DBDS10G1....	1/2"	9	60	32	70	10	59	100	60	80	40	4	M8	68	10	-	-	-	3.7
DBDS20G1....	1"	9	70	50	100	15	81	135	70	100	50	5.5	M8	65	20	-	-	-	6.4
DBDS30G1....	1 1/2"	11	100	70	130	25	120	180	90	130	60	5.5	M10	83	30	-	-	-	13.9
DBDS6P1....	1/4"	6.6	45	25	55	10	45	80	40	60	25	4	M6	72	6	55	35	0010M7x1.5-*	1.5
DBDS10P1....	1/2"	9	60	32	70	10	59	100	60	80	40	4	M8	68	10	68	41	0010M12.3x2.4-*	3.7
DBDS20P1....	1"	9	70	50	100	15	81	135	70	100	50	5.5	M8	65	20	85	54	0010M22x3-*	6.4
DBDS30P1....	1 1/2"	11	100	70	130	25	120	180	90	130	60	5.5	M10	83	30	110	55	0010M22x3-*	13.9

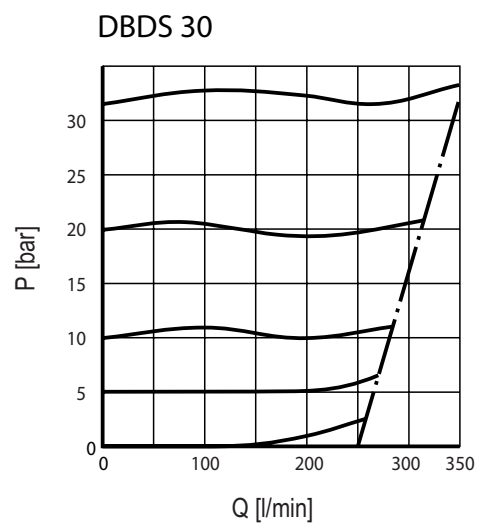
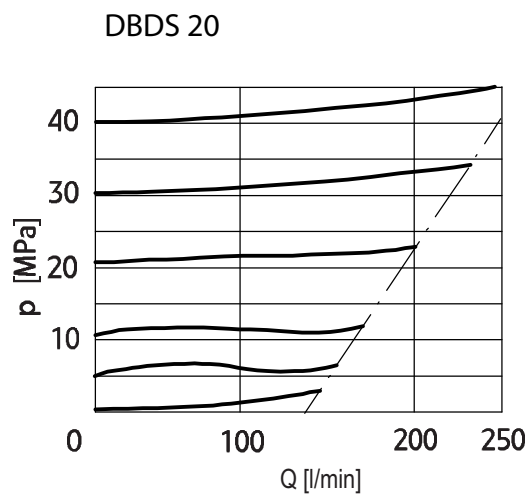
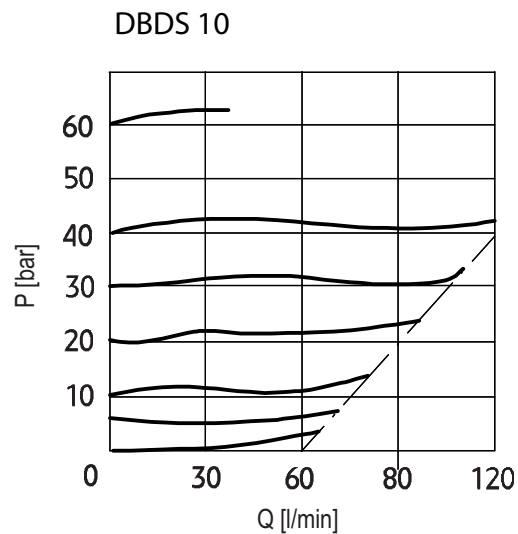
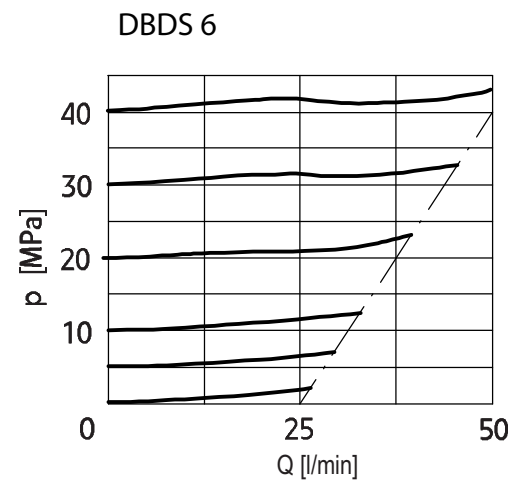
DBD... 30 K 1... type "H" not available

* Gasket material

9.1g

9.1.8 CHARACTERISTIC CURVES

Measured with viscosity of 36 cSt at 50°C.



9.1h

9.1.9 EUROPEAN MARKET

Directive 97/23/EC provides that pressure equipment, in which it's reasonably expected to be exceeded the allowable limits, should be provided with adequate protective equipment; for example, safety accessories such as the valves DBDS "G"/ DBDS "P" or the safety blocks type BS. These devices shall prevent that pressure permanently exceeds the maximum allowable pressure PS of the equipment protected by them. However, it is permissible a pressure peak of short duration limited to 10% of the maximum allowable pressure. For the choice and sizing of the adequate safety device, the user should refer to specific standards. In accordance with the regulations 97/23/EC, the safety valves are classified in Category IV.

9.1.10 ACCESSORIES

Blocks for relief valves, see section 9.2

Safety blocks, see section 9.3

9.1.11 COMMISSIONING AND MAINTENANCE

Installing the valves

Regarding the installation of the safety valves, you should be kept in mind the following key points:

- safety valves must be installed in correspondence of the area to be protected by any overpressures; the vessels, connected each other by appropriate piping with a diameter adapted by the Manufacturer and User and on which there weren't interposed the interceptions, can be considered for the installation of the safety valves as a single vessel;
- the connection between the valve and the equipment to be protected

should be as short as possible and must not have a cross section smaller than the one of the valve inlet. In any case, the standard EN 13136:2001/A1: 2005 states that the pressure drop between the protected vessel and the safety valve, at flow rate of full discharge, should not exceed 3% of the pressure value P, including any accessory inserted on the line;

- the choice of the safety valve displacement should consider that the operation of the valve results in the discharge of the fluid under pressure to be sent into the tank. The discharging pipe must be sized as not to affect the operation of the valve. Standard EN 13136:2001/A1:2005 requires that this pipeline should not generate, at full capacity, a pressure higher than 10% of the value of the calibration pressure.

Disassembly

Before removing the valve, make sure that the system on which it is mounted is not under pressure and that there is no pressure within the valve.

Ordinary maintenance

Check the system in order to verify that there are no leakages of oil into the tank, with overheating of the assembly.

Periodic retest according to the related standards of the country of installation. In Italy, see the Ministerial Decree 329 dd. 12/01/2004: for fluids of the group 1: every 2 years you must carry out a functional test and every 10 years you must check the integrity; for fluids of the group 2, every 3 years, you must carry out a functional test and every 10 years you must check the integrity.

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9.2.1 TECHNICAL DATA

MAX OPERATING PRESSURE: 400 BAR

PRESSURE TEST: 1.43 X PS

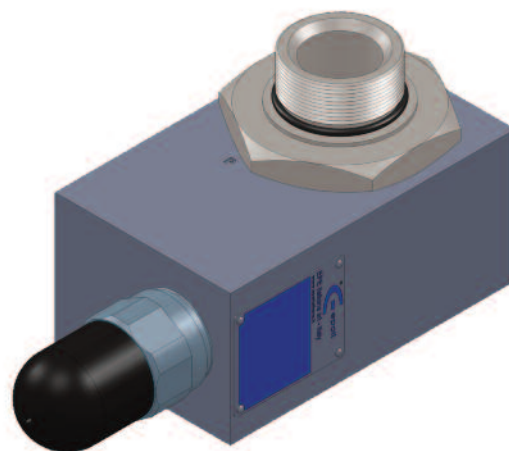
NOMINAL SIZE: 6, 10, 20

BODY MATERIAL: galvanized carbon steel

SEALS MATERIAL: Nitrile (NBR)
Viton (FKM)

See Table 9.2c and or Section 1.8

WEIGHT: see Table 9.2

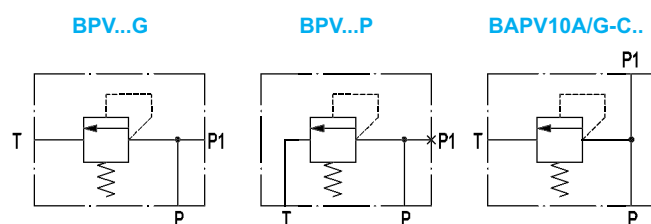


9.2a

9.2.2 DESCRIPTION

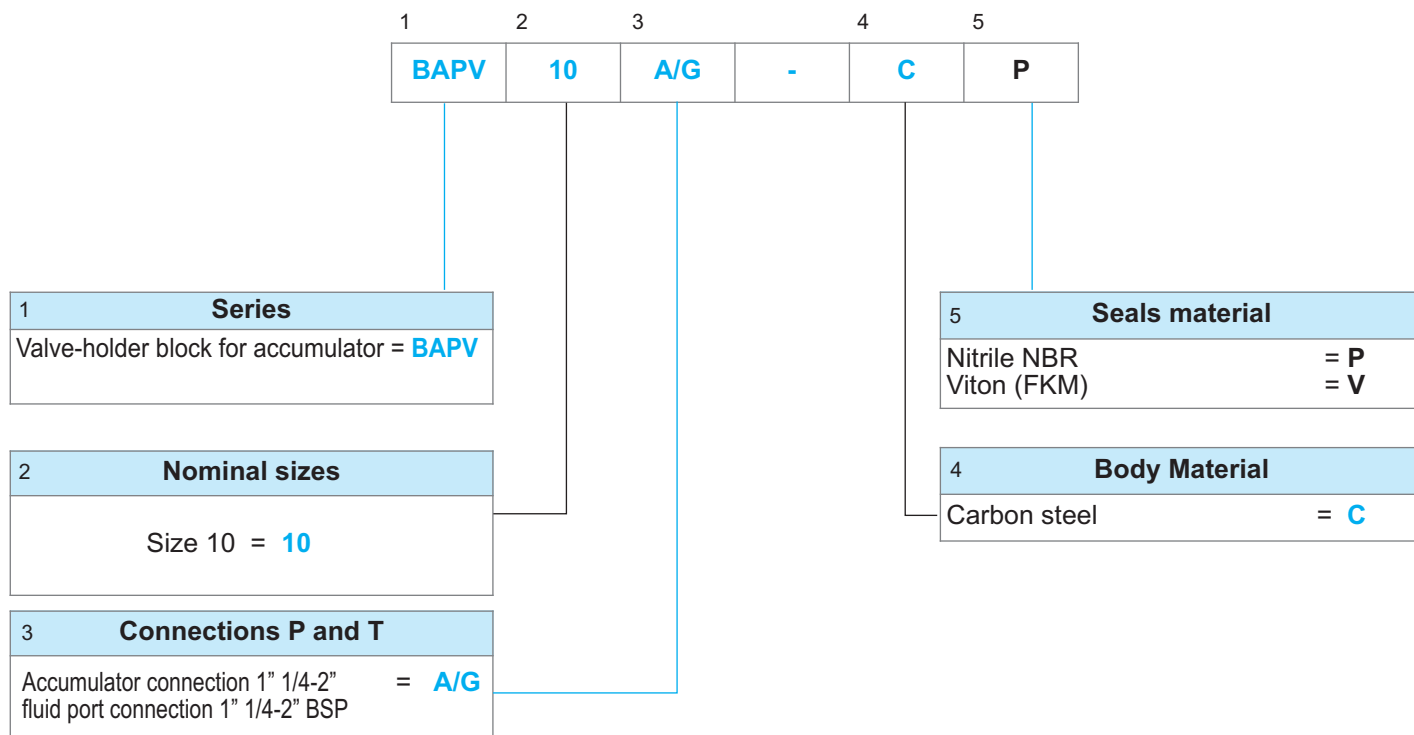
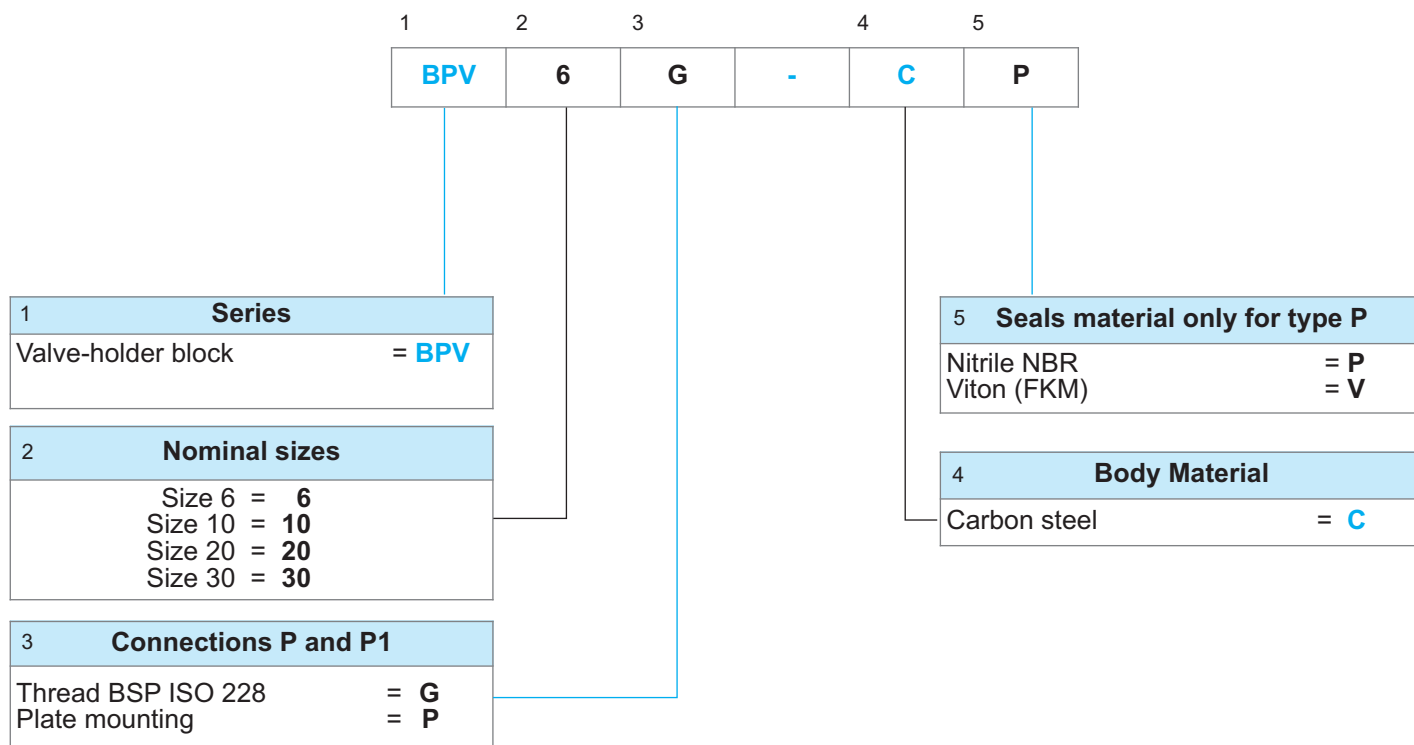
These blocks are used for installation of safety valves type DBDS (see Section 9.1) which must be ordered separately. The BPV type is built in sizes 6, 10, 20 and in the "G" versions with the threaded connections BSP ISO 228 or in the "P" version for mounting on plate. BAPV type instead can be mounted through a double thread nipple directly on the fluid valve of the bladder accumulators with a connection of 1"1/4 (type AS5 and ASA1) or 2" BSP (type AS10÷55, ASA2.5÷15) or with appropriate adaptors (see Section 9.4) directly on the back side of a fluid piston accumulator. This version is built only to accommodate the safety valves DBDS10.

9.2.2 HYDRAULIC SYMBOL

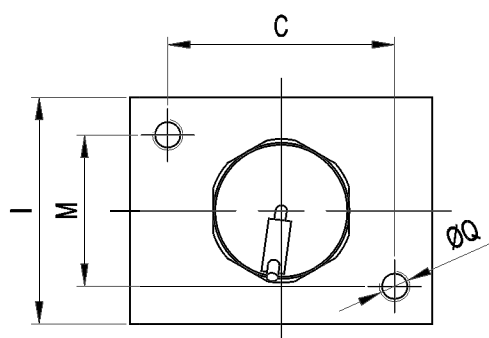
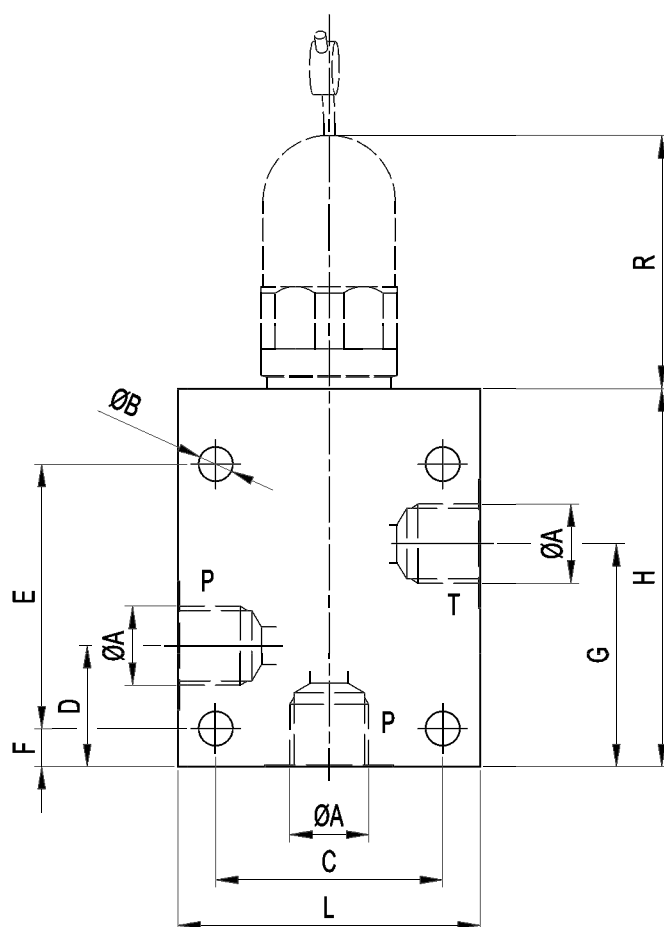


9.2b

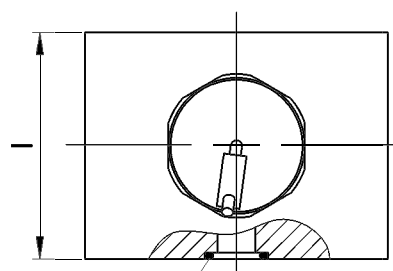
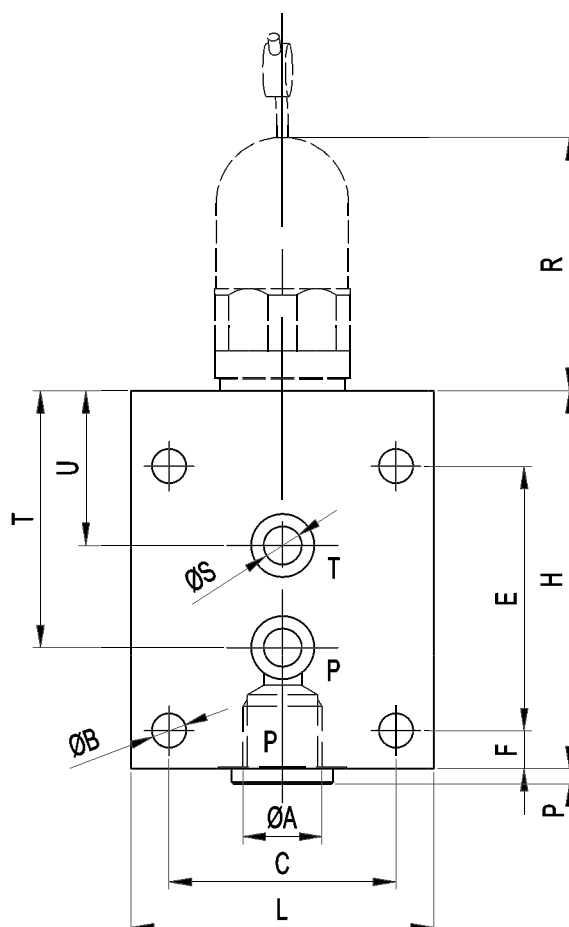
9.2.3 ORDER CODE



9.2.4.1 DIMENSIONS BPV "G" & "P" TYPE



BLOCK "G" TYPE



OR

BLOCK "P" TYPE

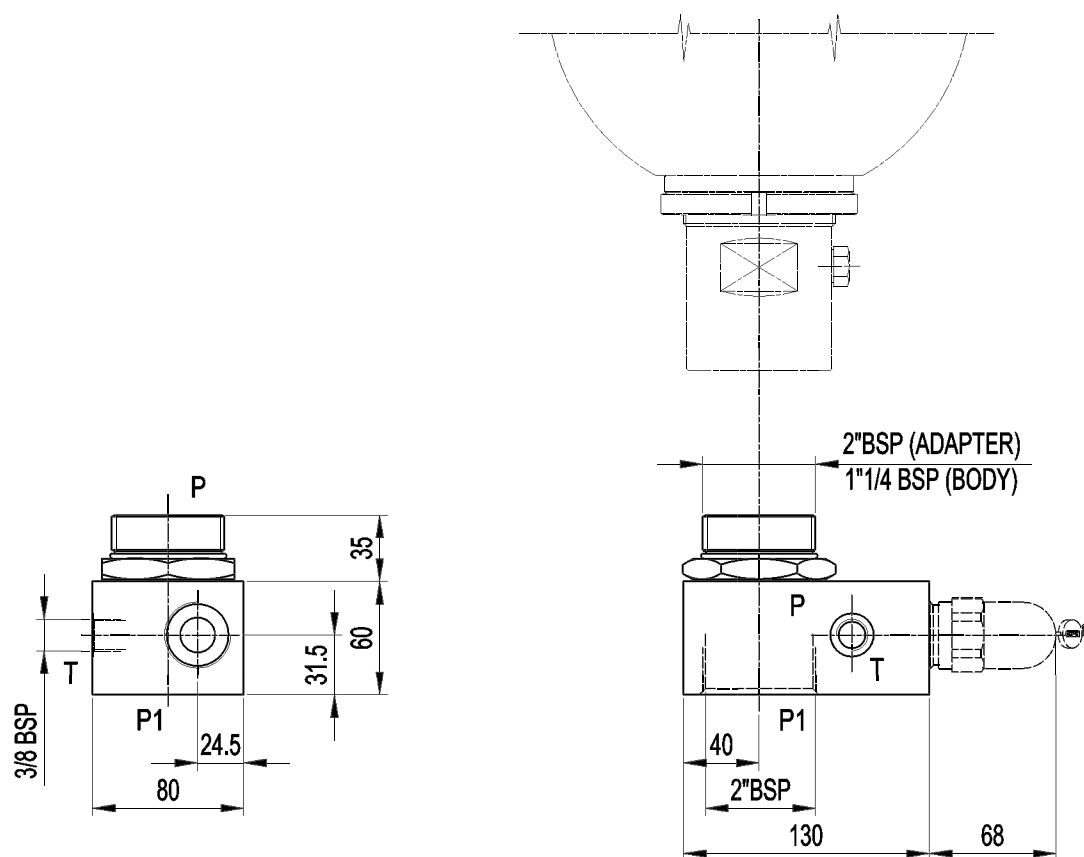
9.2c

Block order code	Valve order code	Ø A BSP	Ø B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	L mm	M mm	P mm	Ø Q mm	R mm	S mm	T mm	U mm	OR metric	Weight Kg
BPV 6.. -C*	DBD... 6 K 1...	1/4"	6.6	45	25	55	10	45	80	40	60	25	4	M6	72	6	55	35	0010M7x1.5-*	1.5
BPV 10.. -C*	DBD... 10 K 1....	1/2"	9	60	32	70	10	59	100	60	80	40	4	M8	68	10	68	41	0010M12.3x2.4-*	3.7
BPV 20.. -C*	DBD... 20 K 1....	1"	9	70	50	100	15	81	135	70	100	50	5.5	M8	65	20	85	54	0010M22x3-*	6.4
BPV 30.. -C*	DBD... 30 K 1....	1" 1/2	11	100	70	130	25	120	180	90	130	60	5.5	M10	83	30	110	55	0010M22x3-*	13.9

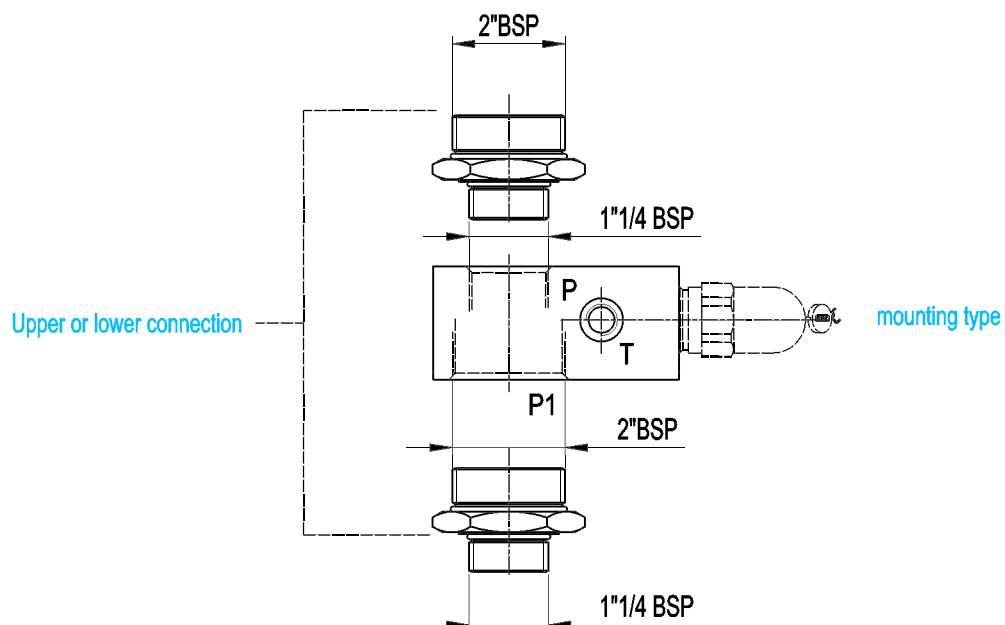
For "DBDS K" valve seat see chapter 9.1.7.1 table 9.1e

9.2d

BAPV10 TYPE



9.2e



9.2f

Block order code BAPV 10 A/G - C *

* gasket material

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9.3.1 TECHNICAL DATA

MAX OPERATING PRESSURE (PS): 420 bar

PRESSURE TEST (PT): 1.43 x PS

NOMINAL PASSAGE DIAMETER: 10mm, 20mm, 25mm, 32mm

WORKING TEMPERATURE: -40 ÷ +150

FLUID VISCOSITY RANGE: 10 ÷ 400 cSt

RECOMMENDED VISCOSITY: 36 cSt

FLUID CONTAMINATION DEGREE: class 21/19/16 according to ISO 4406/99

SHUT-OFF VALVE: ball type

SAFETY VALVE: with DBDS 10 cartridge

DISCHARGE VALVE: manual and electric

MOUNTING POSITION: every position

BODY MATERIAL: - phosphated or galvanized carbon steel
in compliance with Directive 2002/95/EC (RoHS) to resist to corrosion.
- nickel coating 25 - 40 µ
- stainless steel AISI 430 (only for BS25)

VALVES MATERIAL: - phosphated or galvanized carbon steel in compliance with Directive 2002/95/EC (RoHS) to resist to corrosion
- stainless steel

SEALS MATERIAL:
- **P** = Nitrile rubber (NBR)
- **F** = Low temp. nitrile rubber
- **K** = Hydrogenated nitrile (HNBR)
- **E** = Ethylene-propylene (EPDM)
- **V** = Fluorocarbon (FPM)

See Table 9.3B and/or section 1.5

ACCUMULATOR SIDE CONNECTION:
- 3/4" BSP with O-Ring for chamfer
- 1"1/4 BSP with O-Ring for chamfer
- 2" BSP with O-Ring for chamfer

FLUID PORT CONNECTION: see Chapter 9.3.8

FLOW RATE: see Chapter 9.3.10

POWER SUPPLY: 24 VDC, 105 VDC, 110 VDC, 220 VDC, P=26W, 100%ED, IP65 in compliance with DIN 40050, connector in compliance with DIN 43650 type A 2 poles + earthing with AC voltage; the internal connector has a bridge rectifier

WEIGHT: see Chapter 9.3.8



9.3a

9.3.2 HYDRAULIC SYMBOL

See section 9.3.8

9.3.3 DESCRIPTION

The EPE range of safety blocks BS is available in sizes NG10, NG20, NG25 and NG32. The safety blocks BS combine all the features to protect, isolate and discharge a hydraulic accumulator. The shut-off valve rotates of 90 degrees to instantly isolate the accumulator from the hydraulic system in emergency conditions or for maintenance. Once isolated, the accumulator can be discharged into a tank through a discharging valve with manual or electric controls. In version BS10 and BS20 when switching over the ball valve, the pump flow rate is stopped and simultaneously the accumulator discharged to the tank. During switching all three ports (P, A and T) are momentarily interconnected (negative switching overlap). Ball valves are not designed to be used as flow control valves; therefore they should always be either fully open or fully closed, to avoid damaging the sealing cups. The system security is ensured by a pressure PED an anti-tempering pressure valve certified CE/PED. The safety blocks BS allow easy and secure connection of an accumulator to a hydraulic system. Suitable for use with all types of bladder, piston and diaphragm accumulators, the compact and multifunction design allows saving space and reducing the wiring. By reducing the times required by the procedures of installation and maintenance, the security blocks BS help maximizing the productivity and profitability, minimizing the downtime of the system. For easy installation, we offer a full range of adapters, suitable for all standard fittings of any size and type. For diagnostic purposes and for continuous monitoring of pressure, all the security blocks BS are provided with a manometer connection of 1/4" BSP. The European Directive on pressure equipment 97/23/EC states that all accumulators must be provided with a safety device that intercepts, limit and discharge the pressure as well as allows carrying out the measurements. BS range satisfies all these requirements with a single and compact device. The safety block should always be mounted as close as possible to the accumulator.

9.3.4 PRESSURE RELIEF VALVE

The function of the pressure relief valve is to protect the accumulator during its operation. If the pressure exceeds the valve setting, this opens and discharges the fluid into the tank and allows the pressure in the system returning to a safe level. Thanks to its cartridge design, the pressure relief valve can be recalibrated to another pressure setting. This change requires a new approval according to PED 97/23 EC. The vessels discharge pressure expressed in bar, is stamped on the nameplate. The pressure relief valve is controlled and carefully sealed after approval in accordance with the rules of pressurized vessels. On their body there are stamped the CE mark, the certification ID and the serial number. All valves are supplied with a certificate attesting the calibration pressure. The documents provided with the pressure relief valve must be kept as they may be necessary in the event of repetition of the tests.

Manual and electric discharge valve

The discharge valve allows the discharge of the accumulator fluid in the

tank. All models of the safety block BS have a manually operated valve. In addition to the manual valve on request, could be installed a discharging electrically-controlled valve.

9.3.5 SAFETY BLOCK ADVANTAGES

- dirt tolerant
- light weight
- compact
- simple construction
- quick response
- works well on water, low lubricity fluids
- quick, easy installation
- low cost

9.3.6 SEALS-TEMPERATURE-LIQUID COMPATIBILITY

When selecting the additional seal variant, pay attention to the following non-binding notes with regard to hydraulic fluid, seals material and the permissive temperature range. (see Section 1.5)

Code letter	Polymer	ISO	Temperature range (°C)	Some of the liquids compatible with the polymer
P	Standard nitrile (Perburan)	NBR	-20 ÷ +80	Aliphatic hydrocarbons (propane, butane, gasoline, oils, mineral greases, diesel fuel, fuel oil, kerosene), mineral greases and oils, HFA - HFB - HFC fluids, many dilute acids, alkalis, saline solutions, water, water glycol
F	Low temperature nitrile	NBR	-40 ÷ +70	The same as with standard nitrile + a number of different types of Freon. (This contains less acrylonitrile than the standard and is therefore more suitable for low temperatures, but its chemical resistance is slightly lower).
K	Hydrogenated nitrile	HNBR	-30 ÷ +130	The same as with standard nitrile but with excellent performance at high and low temperatures.
E	Ethylene-Propylene	EPDM	30 ÷ +100	Hot water up to 100°C, glycol-based brake fluids, many organic and inorganic acids, detergents, solutions of sodium and potassium, phosphate ester-based hydraulic fluids, (HFD-R), silicone oils and greases, many polar solvents (alcohol, ketones, esters), Skydrol 500 and 7000, resistance to ozone, aging and weathering.
V	Fluorocarbon	FPM	-10 ÷ +150	Mineral oils and greases, non-flammable fluids of HFD group, silicone oils and greases, animal and vegetable oils and greases, aliphatic hydrocarbons (gasoline, butane, propane, natural gas), aromatics hydrocarbons (benzene, toluene), chlorinated hydrocarbons (Tetrachloroethylene, carbon tetrachloride), fuel (regular, super and containing methanol), excellent resistance to ozone, weathering and aging.

9.3b

For other hydraulic fluid and/or temperatures, please consult us.

9.3.7 ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12	
BS	10	M	P	360	A	5	G	4	-	C	P	K

1 Series
Safety block = **BS**

2 Internal nominal diameter
10mm = **10**
20mm = **20**
25mm = **25**
32mm = **32**

3 Discharge
Only manual = **M**
Electric and manual = **E**
Manual plus drilling for solenoid valve = **F**

4 Relief valve
Without valve, with plastic plug = **A**
Valve type DBDS...(CE certified) = **P**
Without valve (with plug B 2375) = **T**
Valve type VS224TX = **G**
Valve type DBDS (Gost certified) = **U**

5 Valve setting (bar)
Valves type DBDS or VS224 calibrated and certificate = **5 ÷ 400**

6 Accumulator side connection
BSP ISO 228 with chamfer for OR (std) = **A**
For BS25 and BS32: Holes for flange SAE 3000 Psi = **L**
Without adapter = **W**

7 Dimension of the accumulator side connection
For connection A:
3/4"BSP = **5**
1"1/4BSP = **7**
2"BSP = **9**
For connection L:
2" = **9**
Without adapter = **0**

8 Type of installation side connection
For BS25 and BS32: holes for flange CETOP -400, metric threads = **C**
with flange FC
For BS32: holes for flange SAE 3000 Psi, metric threads = **L**
For BS25 e BS32: holes for flange SAE 6000 Psi, metric threads = **H**
Thread BSP ISO 228 = **G**

12 Other variants
For type BS...E
Sol. valve power supply 24VDC normally closed = **24D-C**
Sol. valve power supply 110VDC normally closed = **110D-C**
Sol. valve power supply 220VDC normally closed = **220D-C**
Sol. valve power supply 24VAC normally closed = **24A-C**
Sol. valve power supply 110VAC normally closed = **110A-C**
Sol. valve power supply 220VAC normally closed = **220A-C**
Sol. valve power supply 24VDC normally open = **24D-O**
Sol. valve power supply 110VDC normally open = **110D-O**
Sol. valve power supply 220VDC normally open = **220D-O**
Sol. valve power supply 24VAC normally open = **24A-O**
Sol. valve power supply 110VAC normally open = **110A-O**
Sol. valve power supply 220VAC normally open = **220A-O**

Handle of the padlocked ball valve = **K**
Micro-switch on the ball handle = **S**
Two connections for manometer = **M2**
Discharge connection in installation side only for BS 25/32 = **1**
Special variants on request

11 Seal material
Nitrile rubber (NBR) = **P**
Nitrile for low temp. = **F**
Hydrogenated nitrile (HNBR) = **K**
Ethylene-propylene (EPDM) = **E**
Fluorocarbon (FPM) = **V**

10 Block material
Carbon steel = **C**
Nickel coated steel 25 µ. = **N**
Nickel coated carbon steel 40 µ = **M**
Stainless steel AISI 430 L (only for BS25) = **X**
(only for DBDS in stainless steel) = **CX**

9 Dimension of the installation side connection
For BS10 1/2"BSP = **4**
For BS20 3/4"BSP = **5**
For BS25 G 1" = **6**
H 1"1/4 = **7**
C 1"1/4 = **7**
For BS32 G1"1/2 = **8**
L 1"1/2 = **8**
L 2" = **9**
H 1"1/4 = **7**
H 1"1/2 = **8**
C 1"1/4 = **7**
C 1"1/2 = **8**

Special variants on request

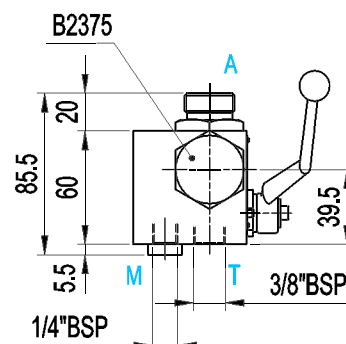
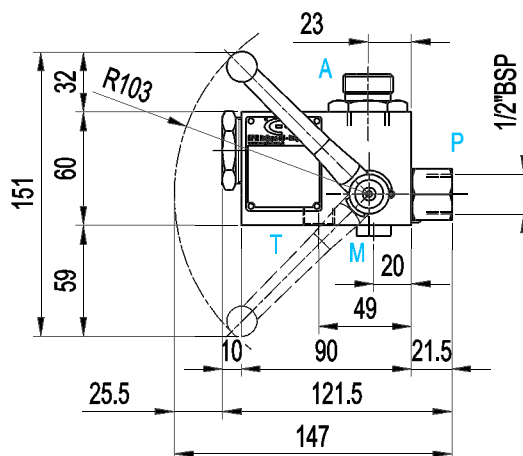
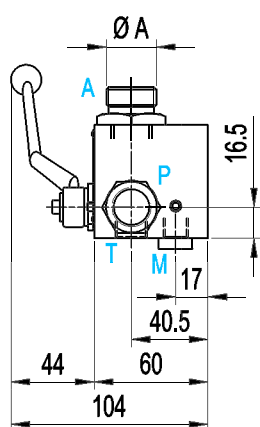
EPE ITALIANA s.r.l. - Viale Spagna,112 • 20093 Cologno Monzese (Mi) Italy

Tel.: +39 02 25459028 • Fax: +39 02 25 25459773 • E-mail: epeitaliana@epeitaliana.it • Internet: www.epeitaliana.it

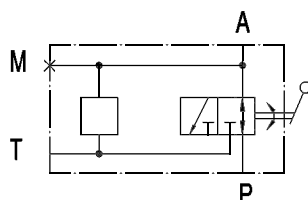
3

9.3.8 DIMENSIONS

BS10MT...A.G.. - ...

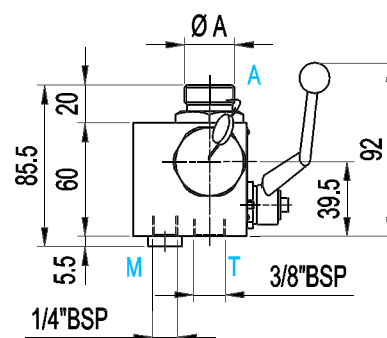
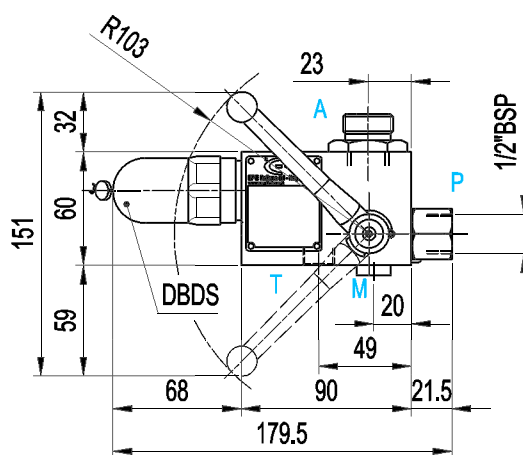
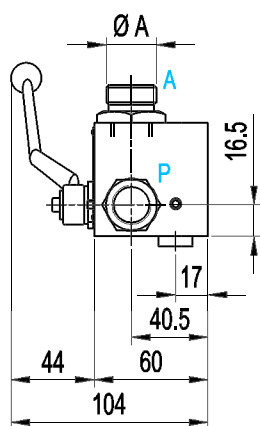


Order code	ØA	Weight
BS10MT...A5...	3/4" BSP	2.7
BS10MT...A7...	1" 1/4 BSP	2.9
BS10MT...A9...	2" BSP	3

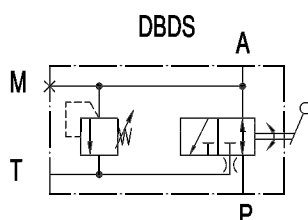


9.3ca

BS10MP...A.G.. - ...

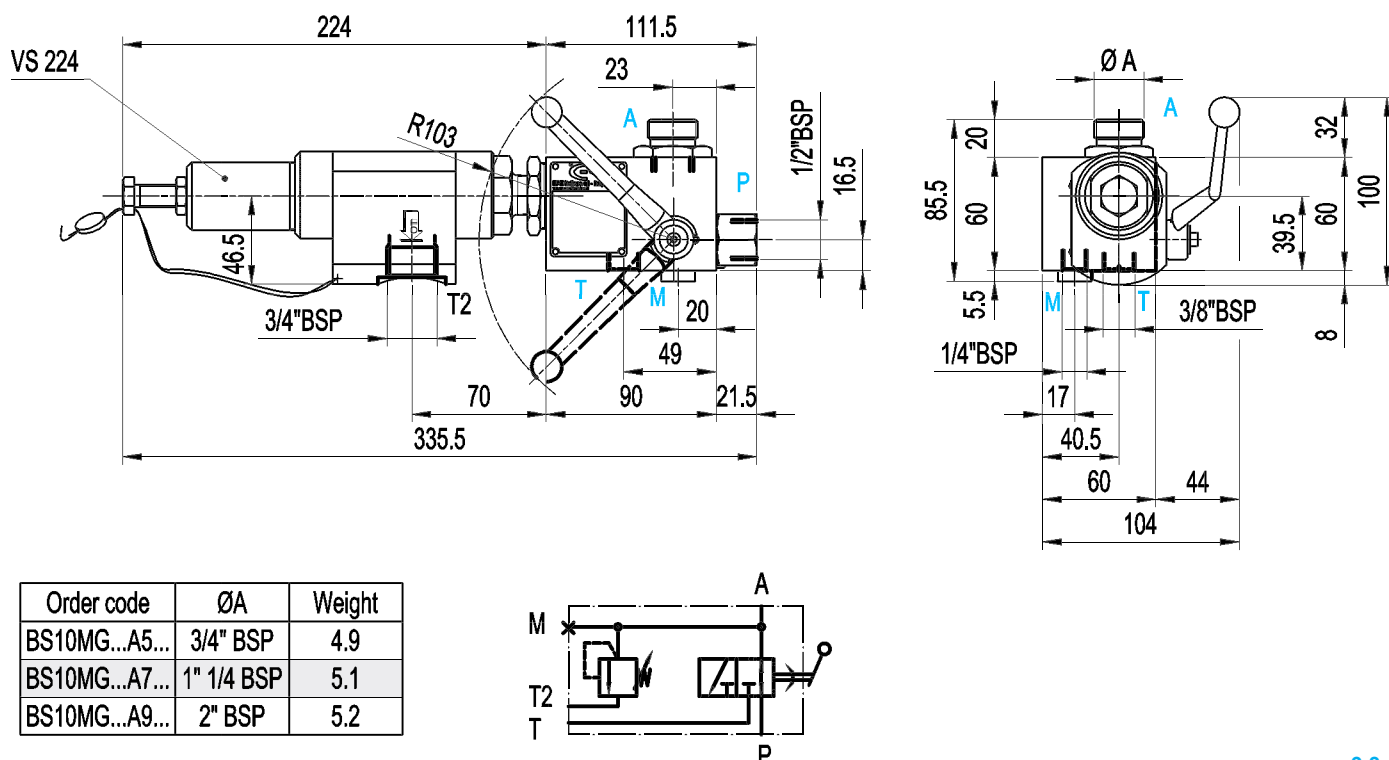


Order code	ØA	Weight
BS10MP...A5...	3/4" BSP	3.2
BS10MP...A7...	1" 1/4 BSP	3.4
BS10MP...A9...	2" BSP	3.5

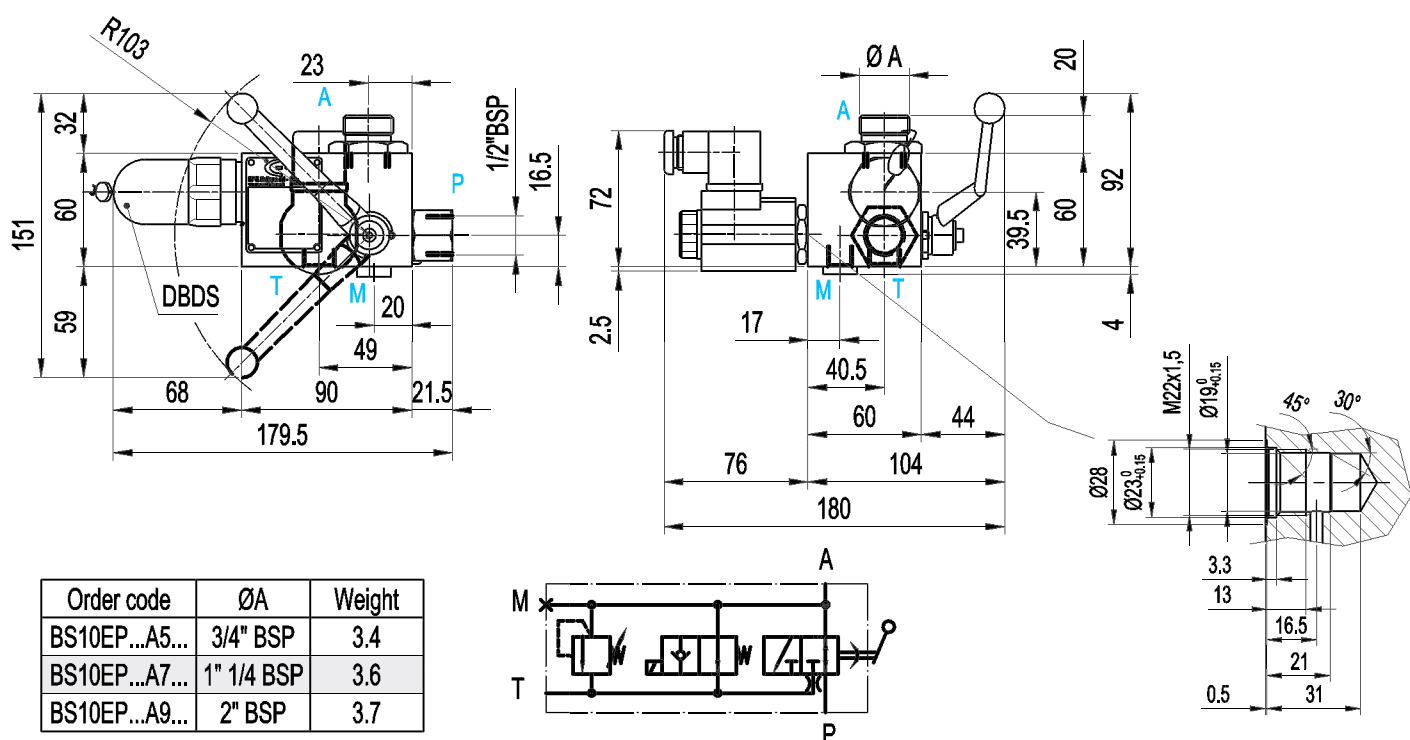


9.3cb

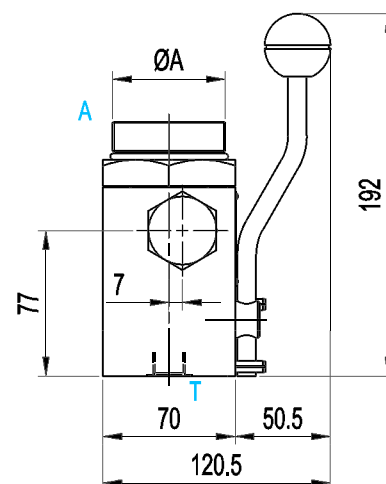
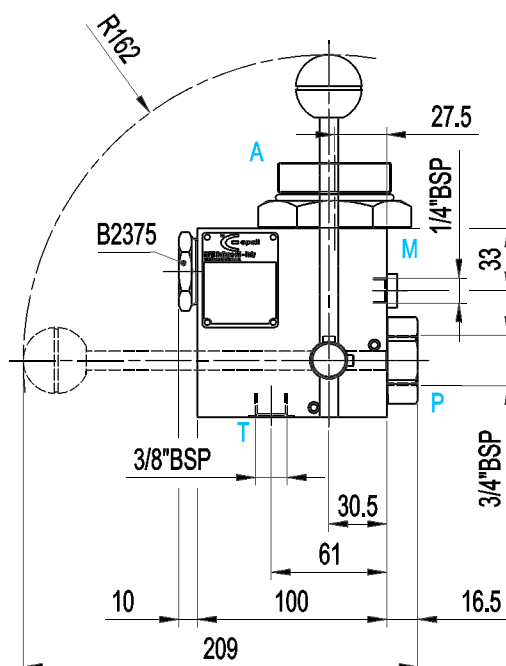
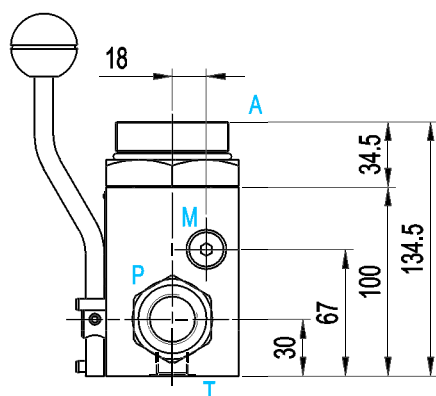
BS10MG..A.G.. - ...



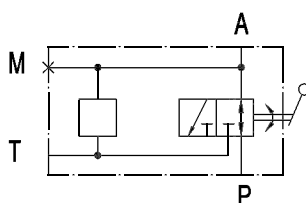
BS10EP..A.G.. - ...



BS20MT..A.G.. - ...

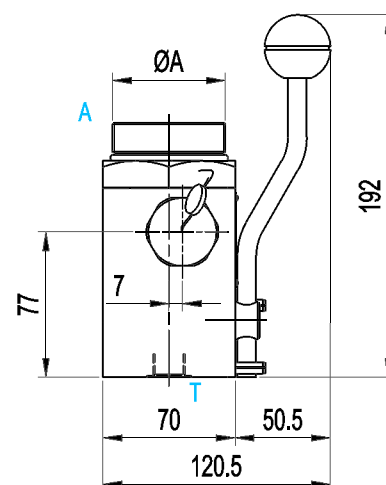
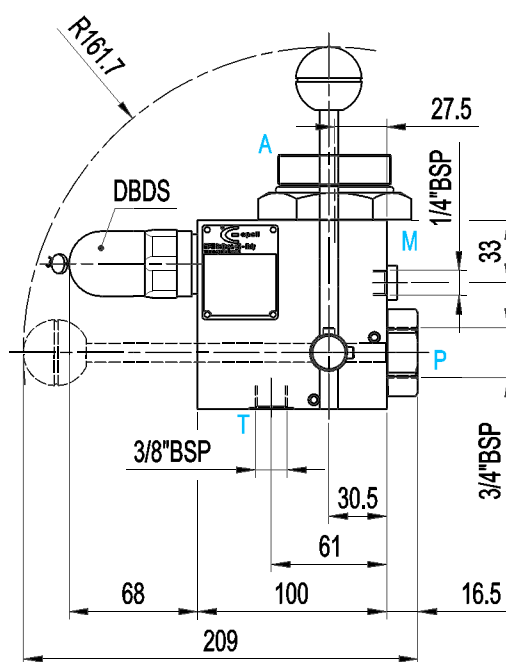
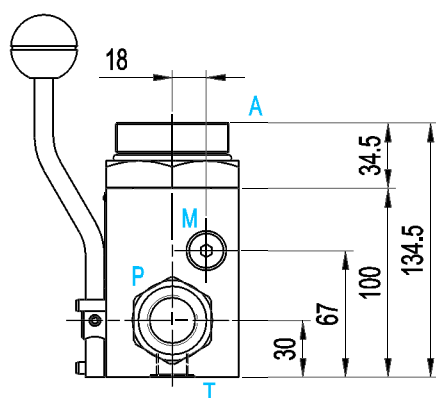


Order code	ØA	Weight
BS20MT...A7...	1" 1/4 BSP	5.6
BS20MT...A9...	2" BSP	6.1

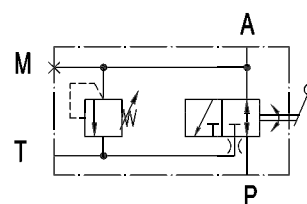


9.3ce

BS20MP..A.G.. - ...

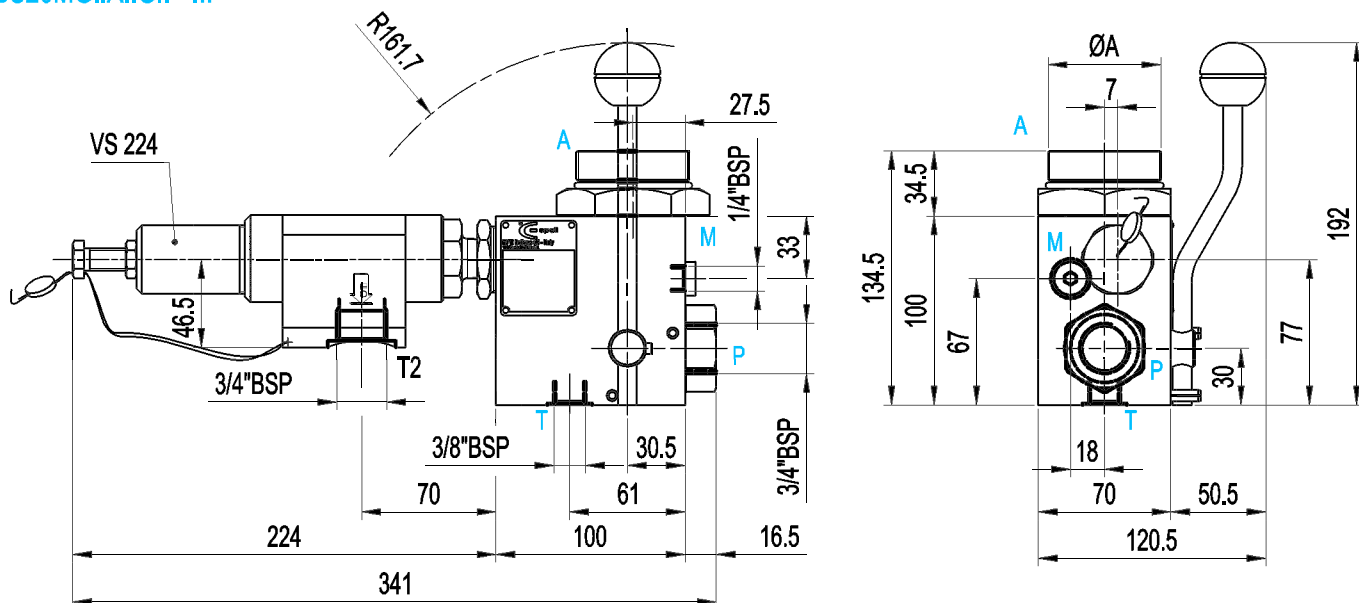


Order code	ØA	Weight
BS20MP...A7...	1" 1/4 BSP	6.1
BS20MP...A9...	2" BSP	6.7

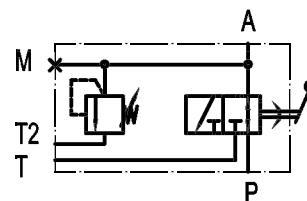


9.3cf

BS20MG..A..G.. - ...

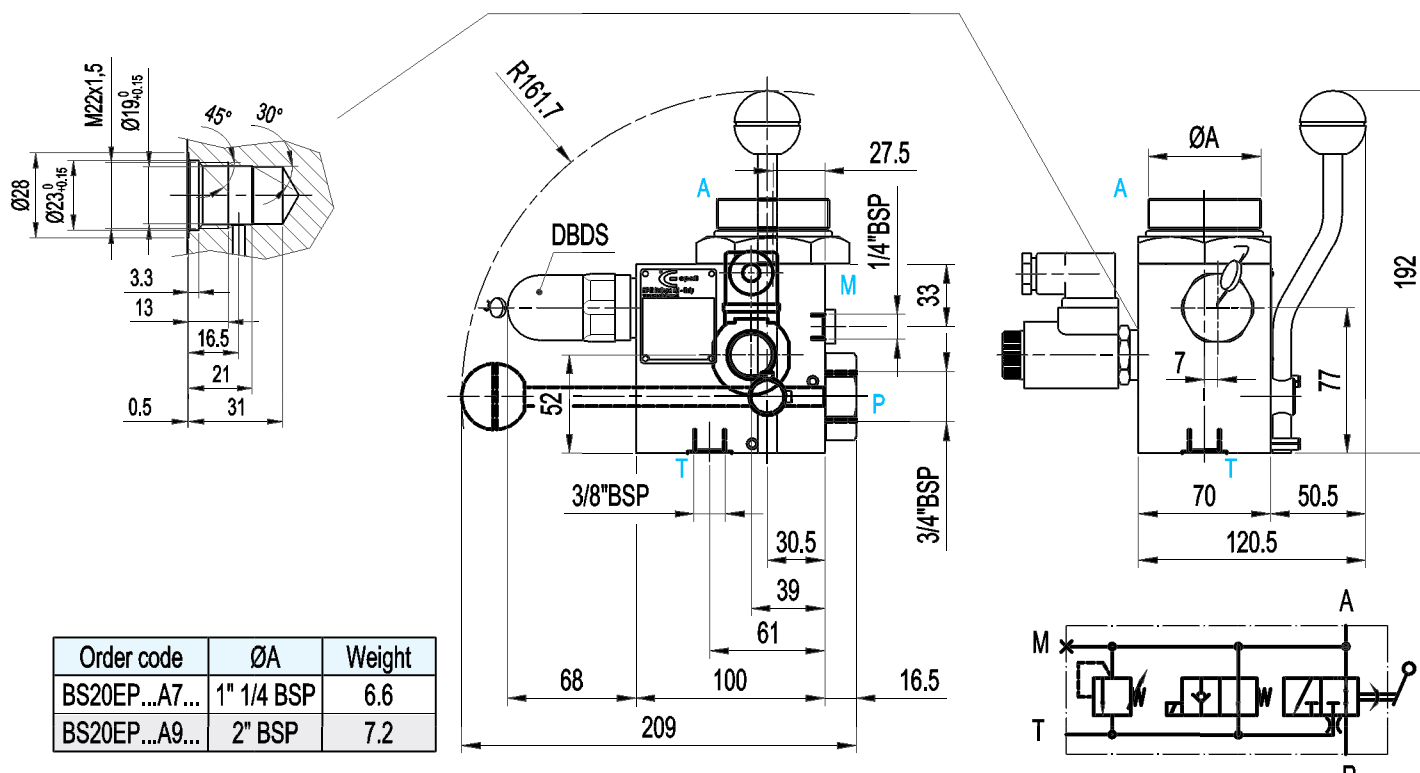


Order code	ØA	Weight
BS20MG...A7...	1" 1/4 BSP	7.8
BS20MG...A9...	2" BSP	8.3

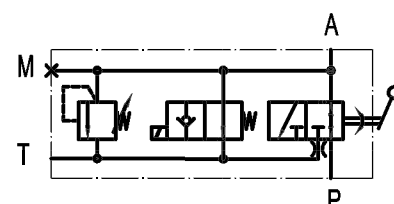


9.3cg

BS20EP..A..G.. - ...

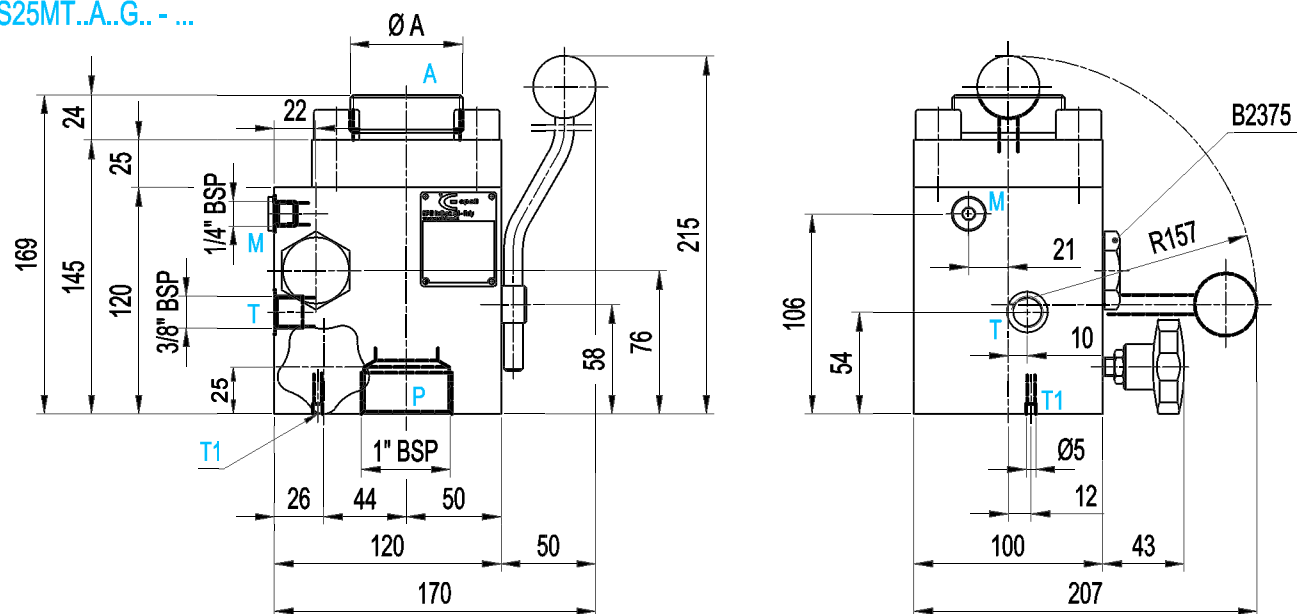


Order code	ØA	Weight
BS20EP...A7...	1" 1/4 BSP	6.6
BS20EP...A9...	2" BSP	7.2

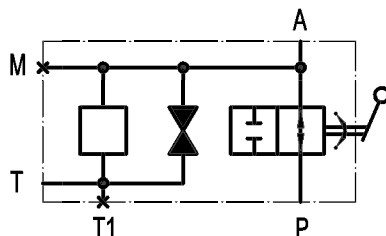


9.3ch

BS25MT...A..G.. - ...

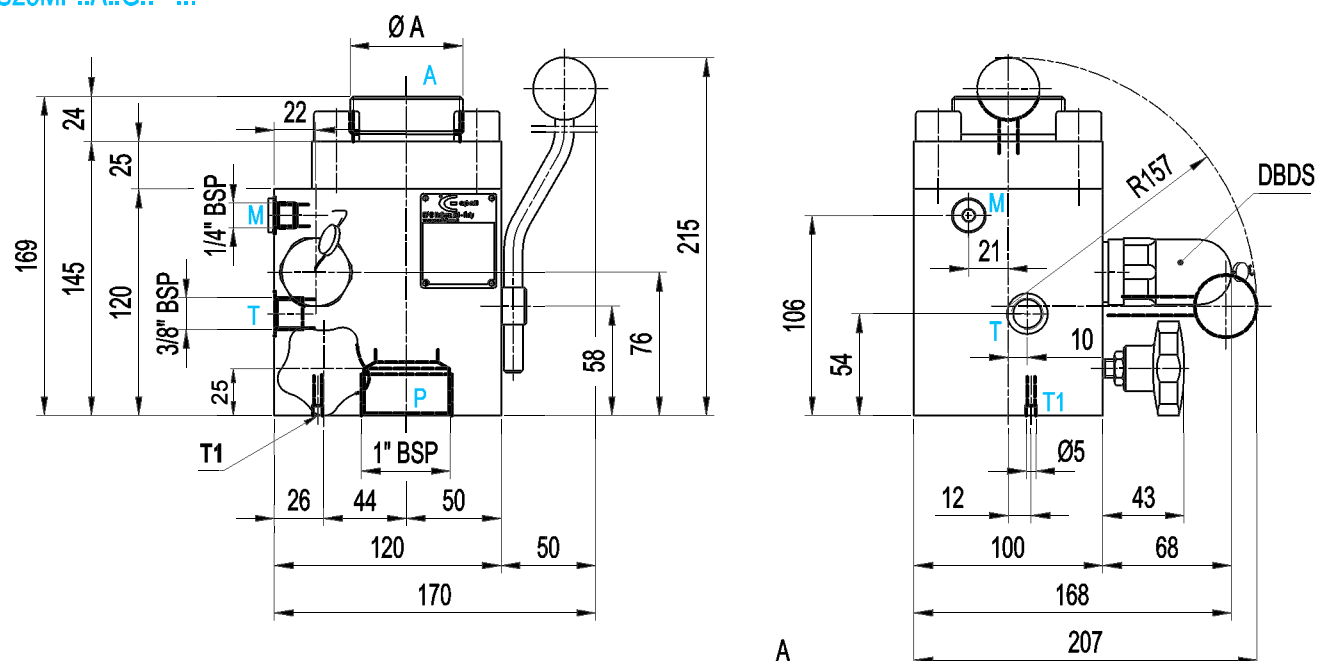


Order code	ØA	Weight
BS25MT...A7...	1" 1/4 BSP	12.4
BS25MT...A9...	2" BSP	12.5

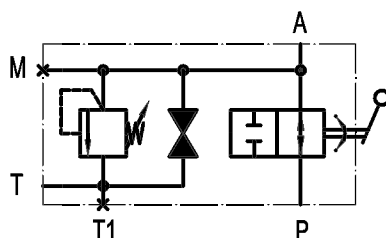


9.3ci

BS25MP...A..G.. - ...

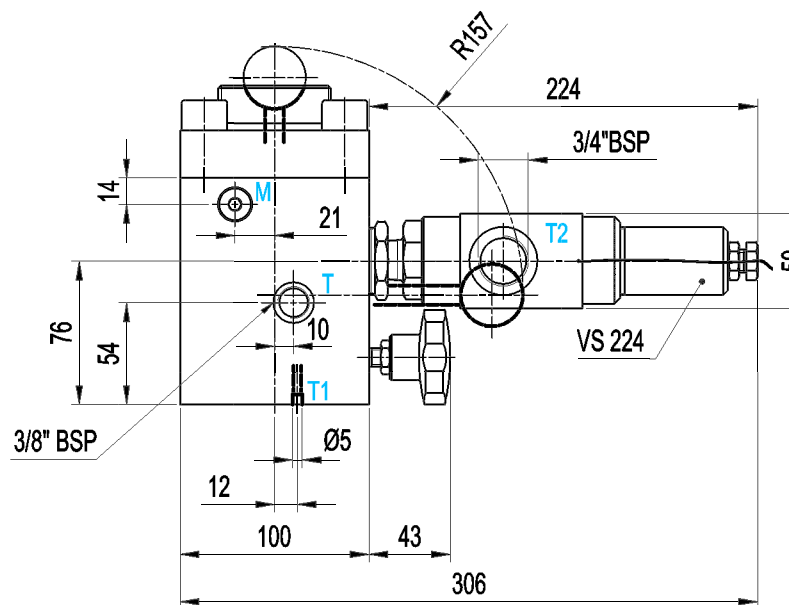
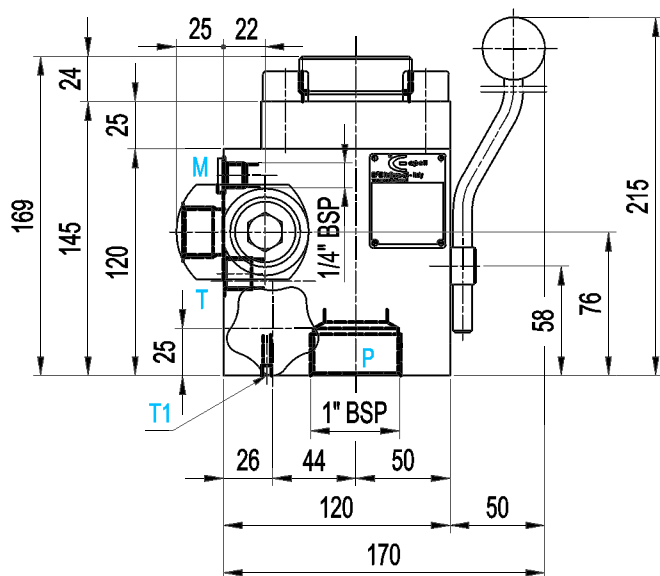


Order code	ØA	Weight
BS25MP...A7...	1" 1/4 BSP	12.7
BS25MP...A9...	2" BSP	12.9

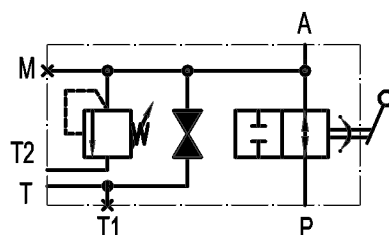


9.3cj

BS25EG..A..G.. - ...

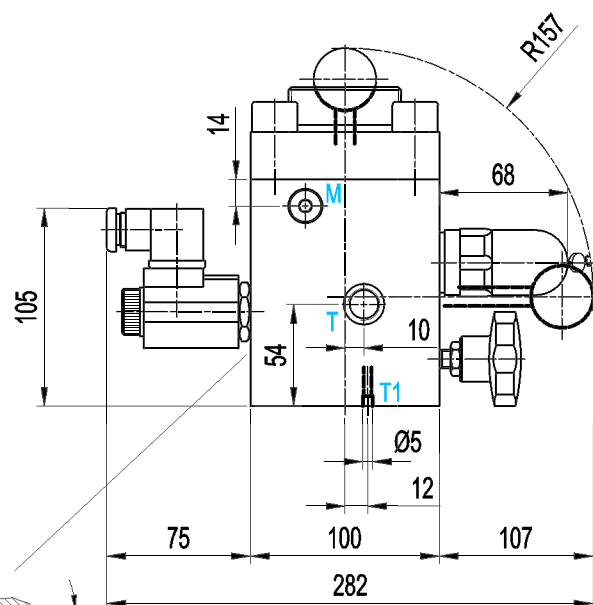
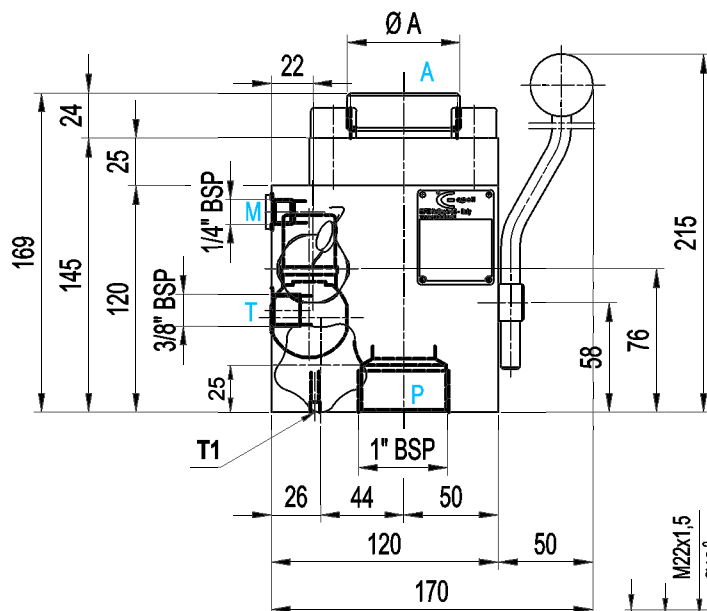


Order code	ØA	Weight
BS25EG...A7...	1" 1/4 BSP	14.5
BS25EG...A9...	2" BSP	14.6

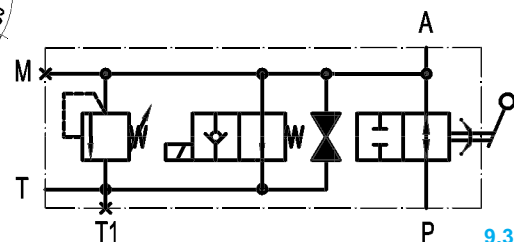
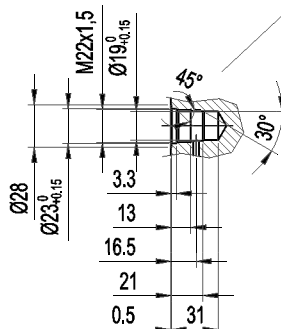


9.3ck

BS25FP..A..G.. - ...

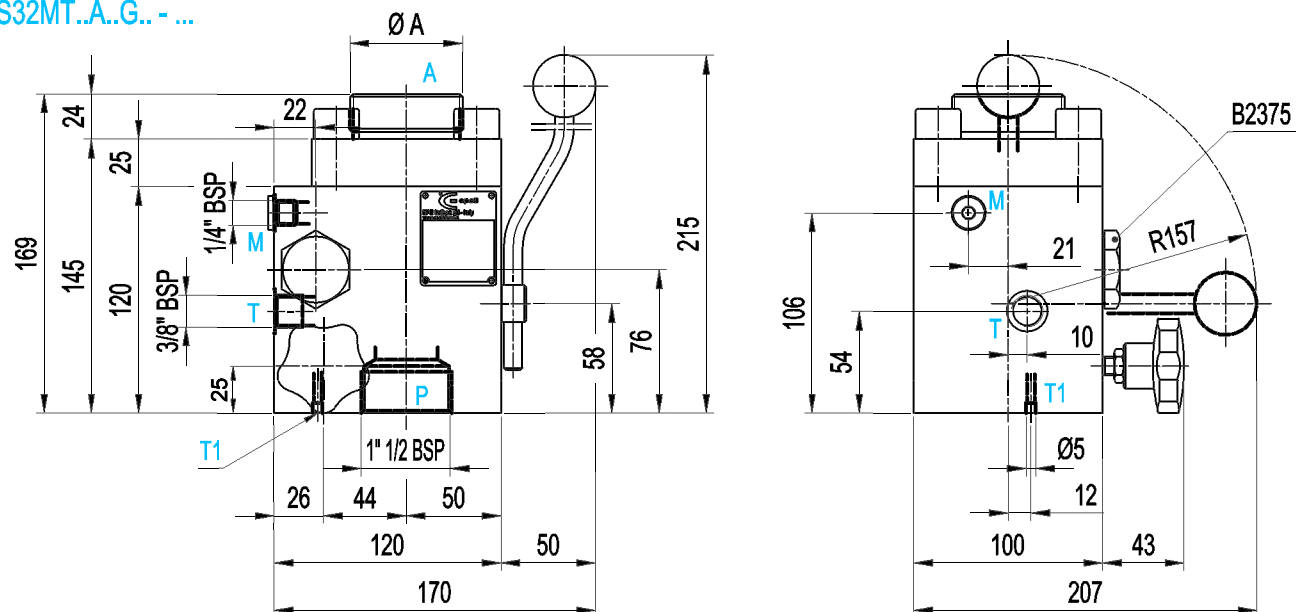


Order code	ØA	Weight
BS25FP...A7...	1" 1/4 BSP	12.9
BS25FP...A9...	2" BSP	13.1

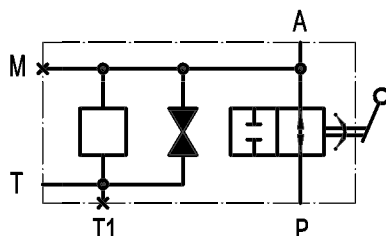


9.3cl

BS32MT..A..G.. - ...

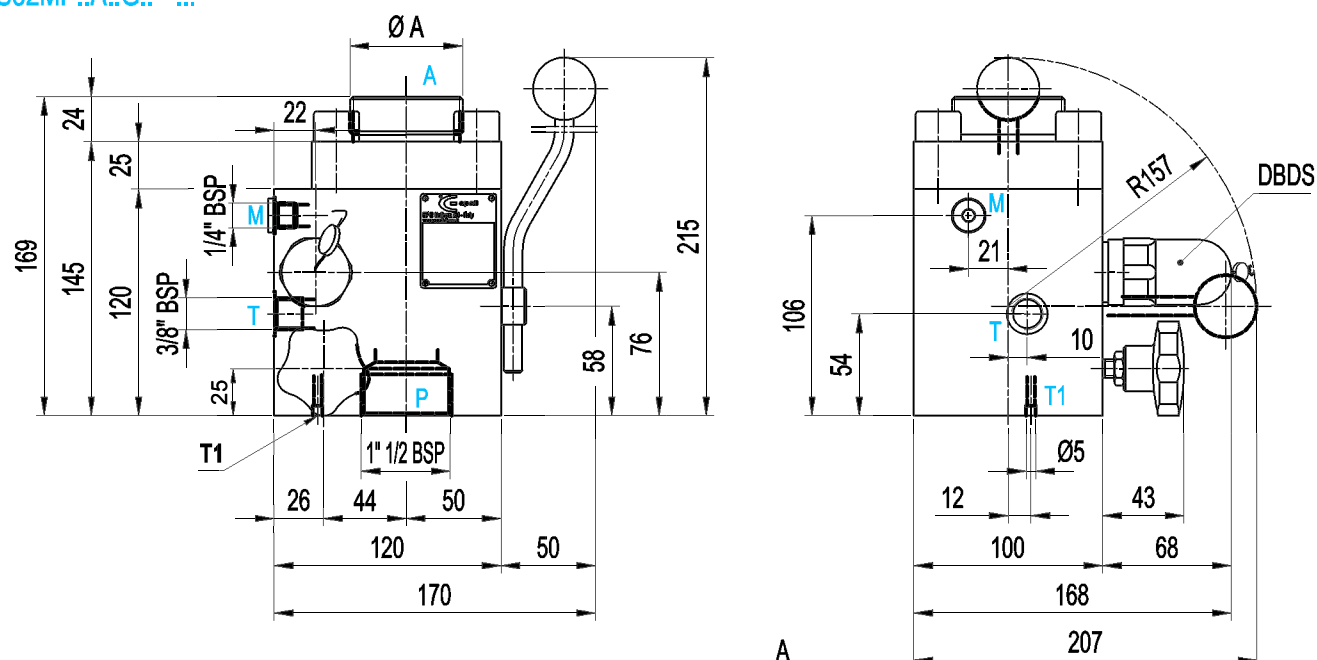


Order code	ØA	Weight
BS32MT...A7...	1" 1/4 BSP	12.4
BS32MT...A9...	2" BSP	12.5

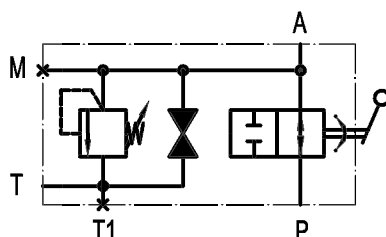


9.3cm

BS32MP..A..G.. - ...

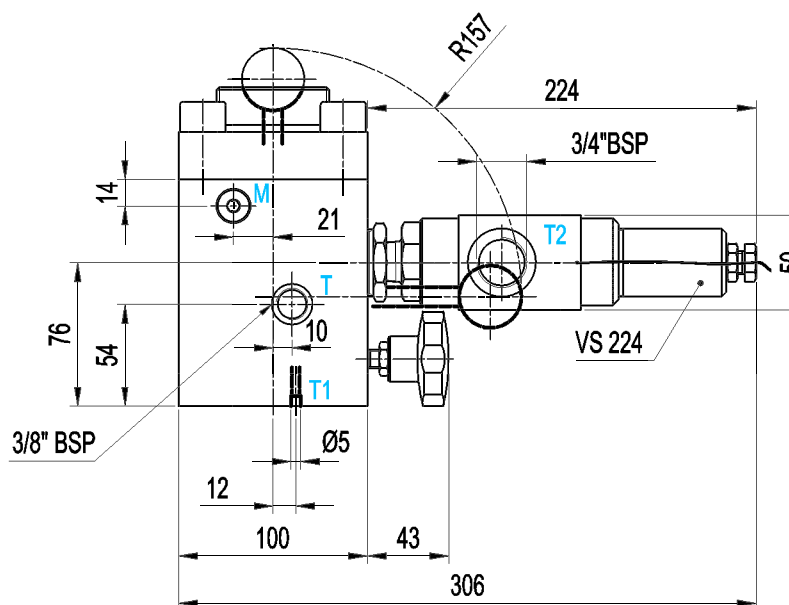
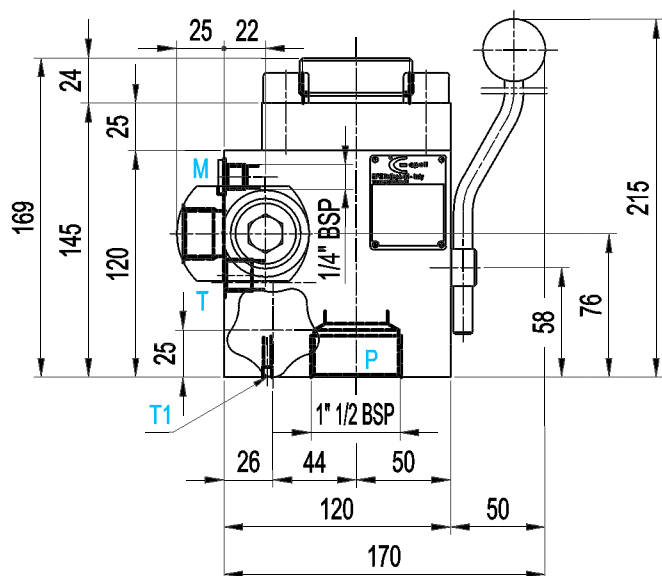


Order code	ØA	Weight
BS32MP...A7...	1" 1/4 BSP	12.7
BS32MP...A9...	2" BSP	12.9

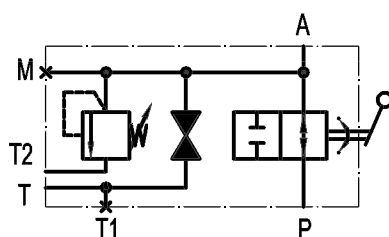


9.3cn

BS32MG..A..G.. - ...

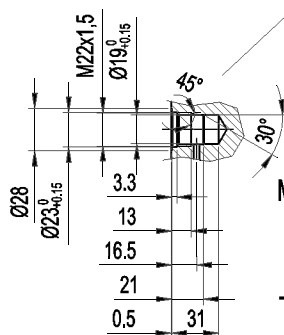
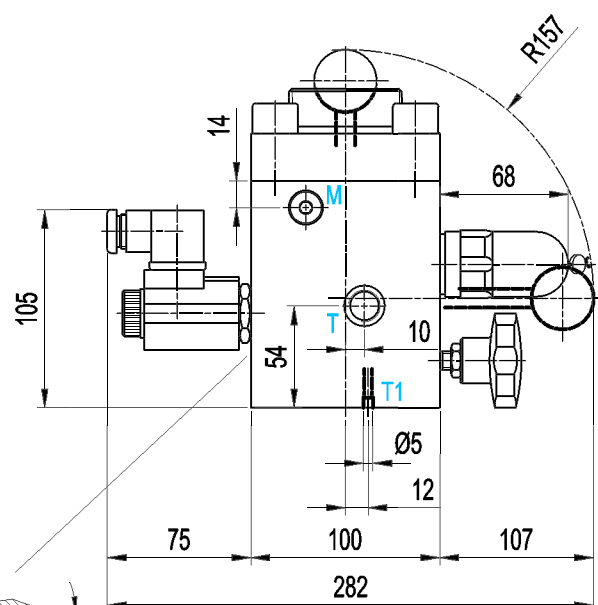
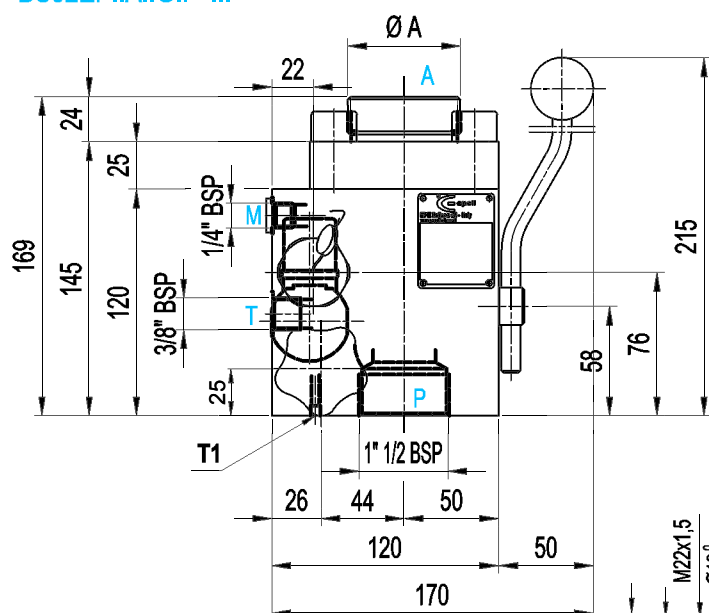


Order code	ØA	Weight
BS32MG...A7...	1" 1/4 BSP	14.5
BS32MG...A9...	2" BSP	14.6

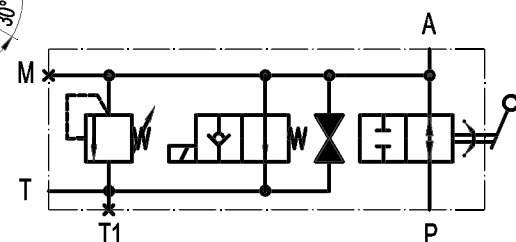


9.3co

BS32EP..A..G.. - ...

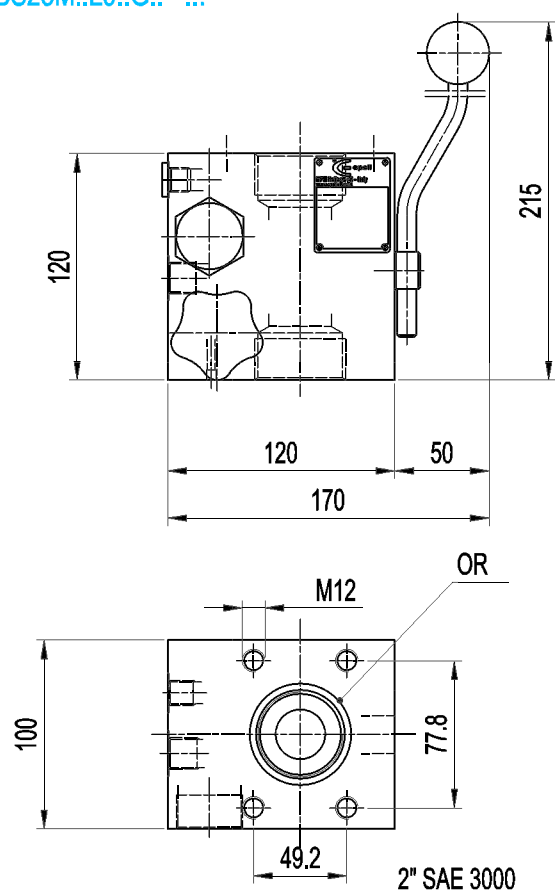


Order code	ØA	Weight
BS32EP...A7...	1" 1/4 BSP	12.9
BS32EP...A9...	2" BSP	13.1



9.3cp

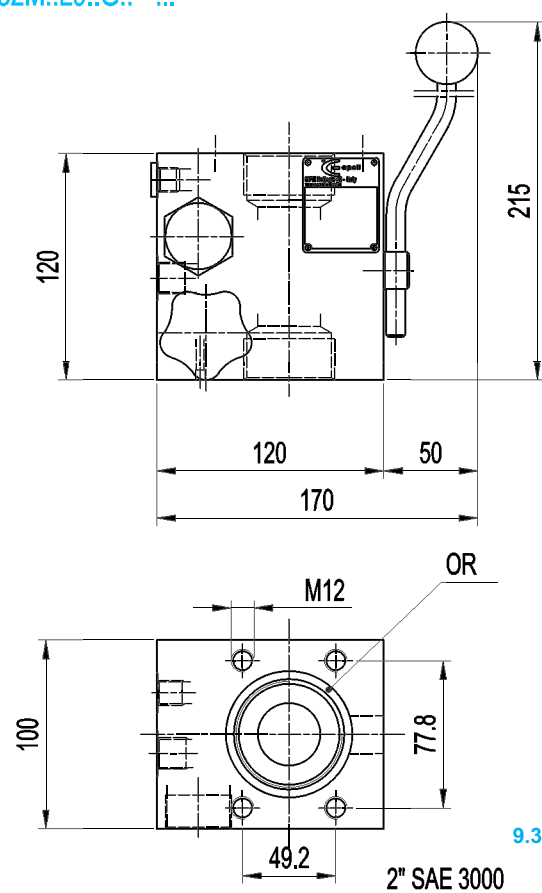
BS25M..L9..G.. - ...



9.3cq

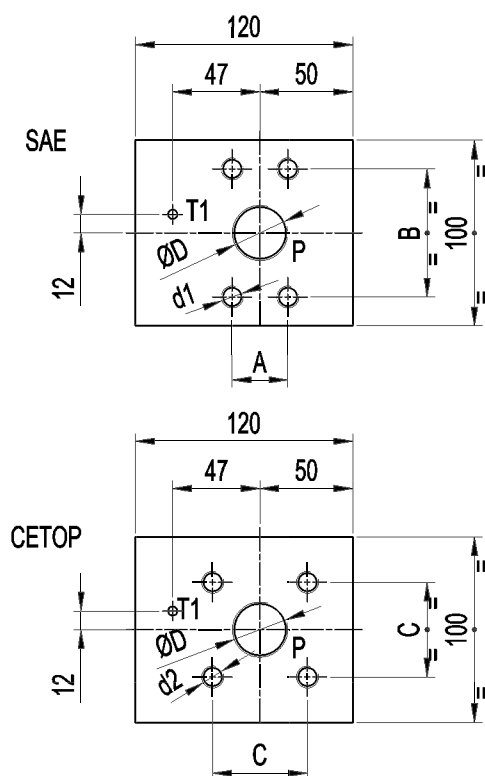
Other dimensions see previous pages

BS32M..L9..G.. - ...



9.3cr

Other dimensions see previous pages

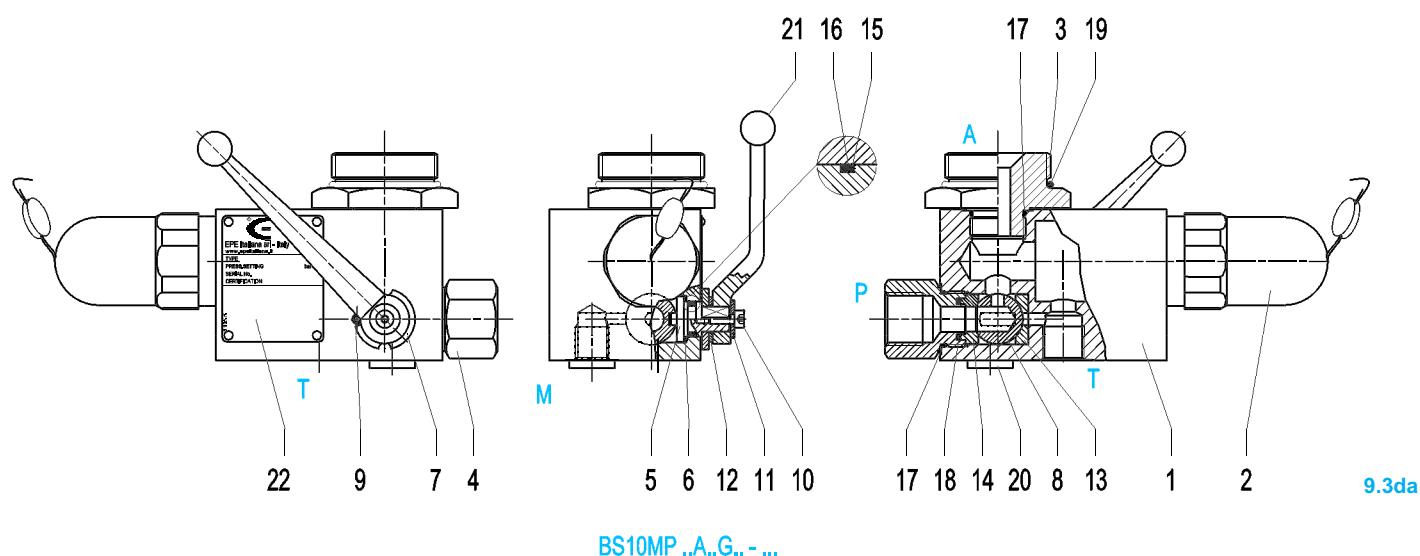


9.3cs

Type.	On request								
	For SAE Flanges					For CETOP Flanges			
		A	B	d1	Thread deep		C	d2	Thread deep
BS25	1" 1/4 SAE 6000	31,6	66,7	M14	24	CETOP 1" 1/4-400	51,6	M12	20
BS32	1" 1/4 SAE 6000	31,6	66,7	M14	24	CETOP 1" 1/4-400	51,6	M12	20
	1" 1/2 SAE 6000	36,7	79,4	M16	24				
	1" 1/2 SAE 3000	35,7	70	M12	20	CETOP 1" 1/2-400	60,1	M14	24
	2" SAE 3000	42,9	77,8	M12	20				

9.3ct

9.3.9.1 BS10 SPARE PARTS CODES

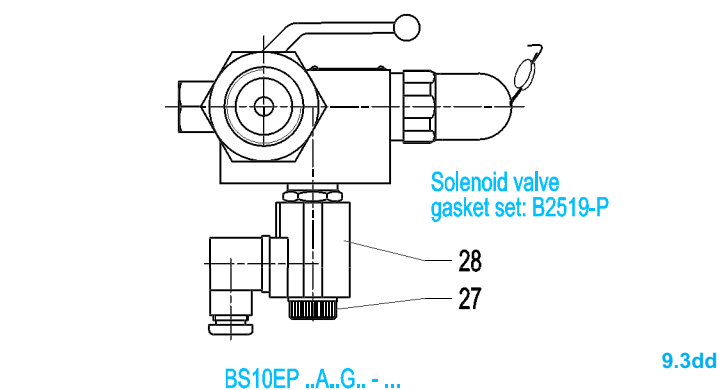
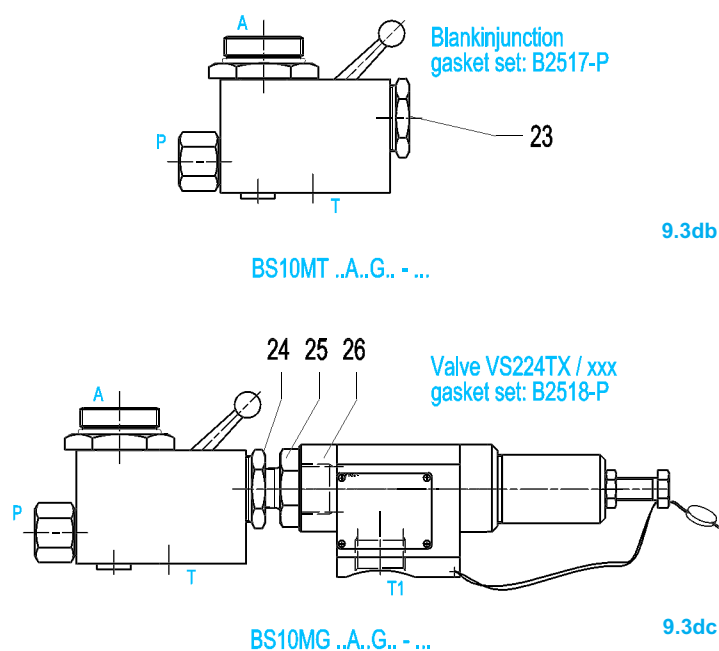


Item	Description	Q.ty	Order code
1	Body block BS10	1	Not supplied as spare part
2	Safety valve DBD ...10 k 1....	1	DBD... 10 k 1....
3	Niple side accumulator	1	3/4" B10450 - ** 1" 1/4 B10451 - ** 2" B10452 - **
4	Niple installation side	1	B11855 - **
5	Pin ball	1	B11856 - **
6	Gasket	1	B11857 - *
7	Washers stop end	1	B11858 - C
8	Ball DN10	1	0052S906831RN
9	Spring pins 4x8 UNI 6873	1	0023E4x8C
10	Hex. socket head cap screws M4x10 UNI5931	1	0022VTCEIM4x10CZ
11	Large whaser Ø4x12x1 UNI 6593	1	0021RL4x12x1CZ
12	Whaser Ø10 UNI 6592	1	0021RP10CZ
13	Seal for ball Ø10	1	0013G914497RN
14	Seal for ball Ø10	1	0013G913112RN
15	Antiextrusion ring Parbak	1	0011P8012 - *
16	"O" ring	1	0010R2037 - *
17	"O" ring	2	0010M20x2 - *
18	"O" ring	1	0010M12x2 - *
19	"O" ring	1	0010R3150 - *
20	Plug with rubber seals 1/4" BSP	1	0031TG2
21	Handle for BS10	1	B10100-A
22	Description plate	1	B11024 - 6 - A
23	Blankinjunction side accumulator plug	1	B2375 - **/*
24	Adapter	1	B10456-C
25	Nipple	1	B11638-C
26	Valve VS 224 TX	1	VS224TX / xxx
27	Complete solenoid valve	1	Normally open B2372-xxx-O Normally closed B2395-xxx-C
28	Coil + connector	1	B2370-xxx
Standard nipple ass. (parts 3-17-19)		1	3/4" N-M221.5A5 - **.* 1" 1/4 N-M221.5A7 - **.* 2" N-M221.5A9 - **.*
Safety block gasket sets		1	B 2140-*
Ball sets		1	B 2132-*

* Gasket material

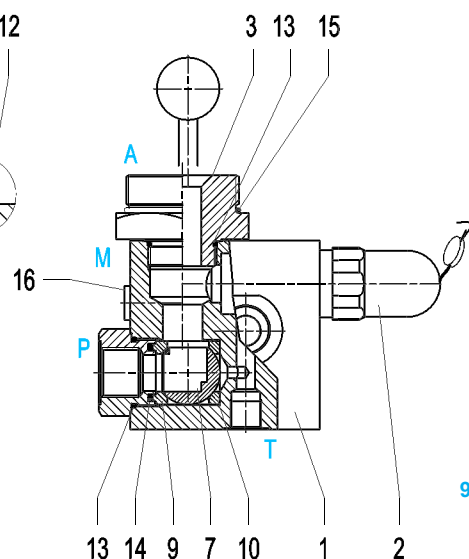
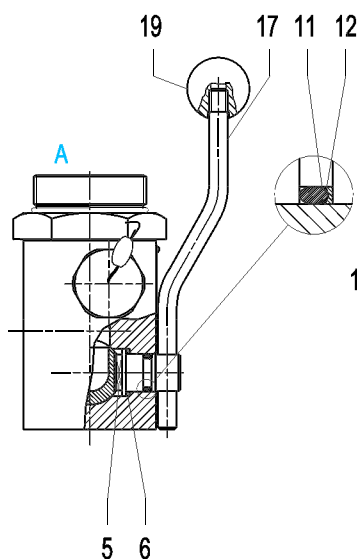
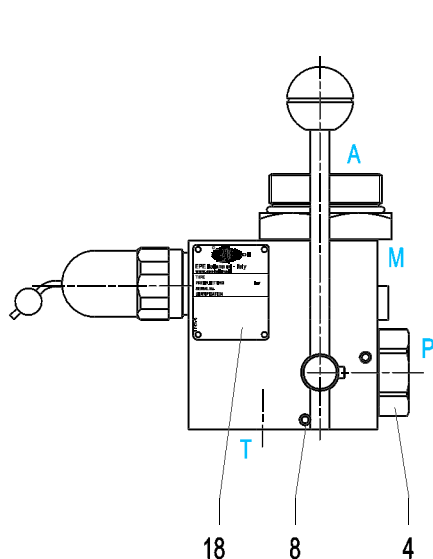
** Component material

9.3de



9.3dd

9.3.9.2 BS20 SPARE PARTS CODES



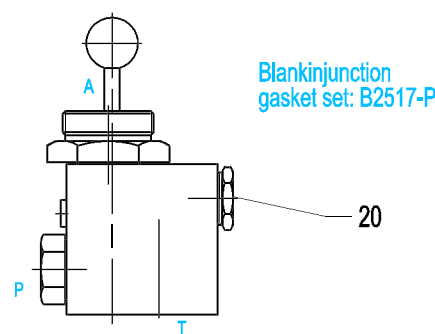
BS20MP ..A..G.. - ...

9.3df

Item	Description	Q.ty	Order code
1	Body block BS20	1	Not supplied as spare part
2	Safety valve DBD... 10 k 1...	1	DBD... 10 k 1...
3	Niple side accumulator	1	1" 1/4 B10470 - ** 2" B10471 - **
4	Niple installation side	1	B10463 - **
5	Pin ball	1	B10462 - **
6	Gasket	1	B10487 - *
7	Ball DN20	1	0052S906356RN
8	Spring pins 6x26 UNI 6873	2	0023E6x26C
9	Seal for ball Ø20	1	0013G913911RN
10	Seal for ball Ø20	1	0013G914051RN
11	Antitrusion ring Parbak	1	0011P8113 - *
12	"O" ring	1	0010R0119 - *
13	"O" ring	2	0010R3131 - *
14	"O" ring	1	0010M24x3 - *
15	"O" ring	1	0010R3218 - *
16	Plug with rubber seals 1/4" BSP	1	0031TG2
17	Handle for BS20	1	B10482 - **
18	Description plate	1	B11024 - 6 - A
19	Knob M10	1	0055PS.35-M10-EA
20	Blankinjunction side accumulator plug	1	B2375 - **/*
21	Adapter	1	B10456-C
22	Nipple	1	B11638-C
23	Valve VS 224 TX	1	VS224TX / xxx
24	Complete solenoid valve	1	Normally open B2372-xxx-O Normally closed B2395-xxx-C
25	Coil + connector	1	B2370-xxx
Standard nipple ass. (parts 3-13-15)			1" 1/4 N-M36/1.5A7 - **.* 2" N-M36/1.5A9 - **.*
Safety block gasket sets			B 2141 - *
Ball sets			B 2133 - *

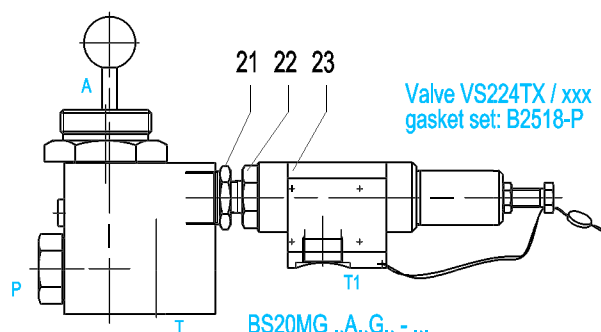
* Gasket material ** Component material

9.3dj

Blankinjunction
gasket set: B2517-P

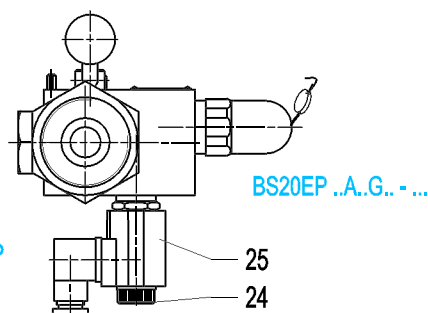
BS20MT ..A..G.. - ...

9.3dg

Valve VS224TX / xxx
gasket set: B2518-P

BS20MG ..A..G.. - ...

9.3dh

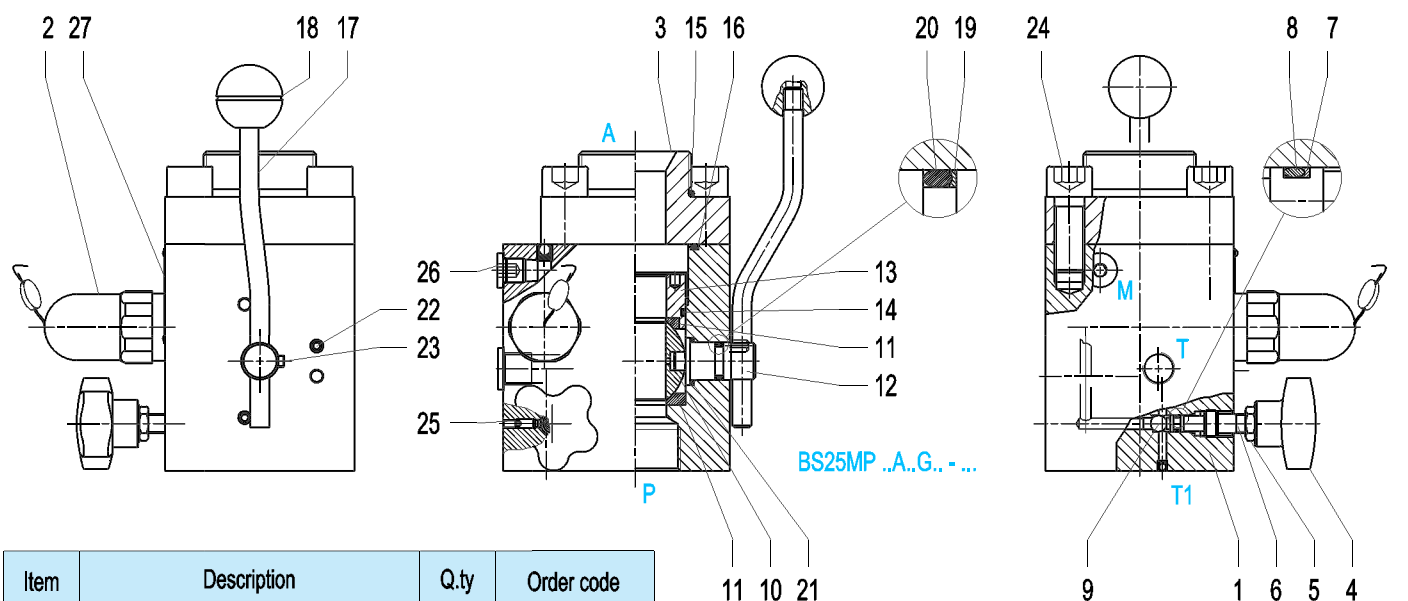


BS20EP ..A..G.. - ...

Solenoid valve
gasket set: B2519-P

9.3di

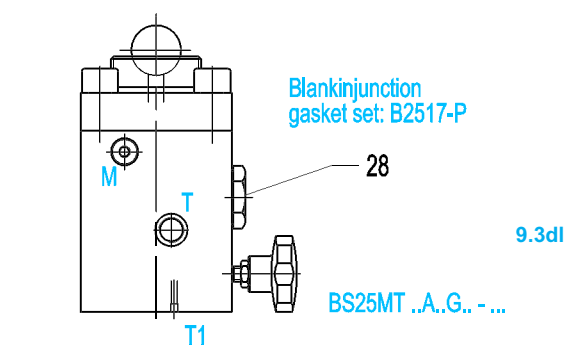
9.3.9.3 BS25 SPARE PARTS CODES



Item	Description	Q.ty	Order code
1	Body block BS25	1	Not supplied as spare part
2	Safety valve DBD... 10 k 1....	1	DBD... 10 k 1....
3	Flange accumulator side	1	1" 1/4 B10473 - ** 2" B10349 - 1 - **
4	Knob M10	1	055MVC.192/50B-M10EA
5	Hex. nut M10 UNI 5588	1	0020DNM10CZ
6	Manual discharge pin	1	B10417 - **
7	Antiextrusion ring Parbak	1	0011P8009 - *
8	"O" ring	1	0010R2021 - *
9	Ball Ø8.5	1	0051S8.5-C
10	Ball DN25	1	0052S906063RN
11	Seal for ball Ø25	2	0013G913912RN
12	Pin for ball	1	B10498 - **
13	Ring nut	1	B10494 - **
14	"O" ring	1	0010R3150 - *
15	"O" ring	1	0010R3218 - *
16	"O" ring	1	0010R0159 - *
17	Handle	1	B10482 - **
18	Knob M10	1	0055PS.35-M10-EA
19	Antiextrusion ring Parbak	1	0011P8113 - *
20	"O" ring	1	0010R0119 - *
21	Seal for pin	1	B10487 - *
22	Spring pin 6x26 UNI 6873	2	0023E6x26CZ
23	Set screw M6x8 UNI 5923-67	1	0022VSTEIM6x8CZ
24	Hex. socket head cap screws M16x40 UNI5931	4	0022VTCEIM16x40CZ
25	Set screw M5x12 UNI 5925-67	1	0022VSTEIM5x12CZ
26	Plug with rubber seal 1/4" BSP	1	0031TG2
27	Description plate	1	B11024 - 6 - A
28	Blankinjunction side accumulator plug	1	B2375 - ** / *
29	Adapter	1	B10456-C
30	Nipple	1	B11638-C
31	Valve VS 224 TX	1	VS224TX / xxx
32	Complete solenoid valve	1	Normally open B2372-xxx-O Normally closed B2395-xxx-C
33	Coil + connector	1	B2370-xxx
Standard flange accumulator assembly (parts 3 - 15 - 16)			1" 1/4 F 2454 A7 - ** / * 2" F 2454 A9 - ** / *
Safety block gasket sets			B 2142 - *
Ball sets			B 2134 - *

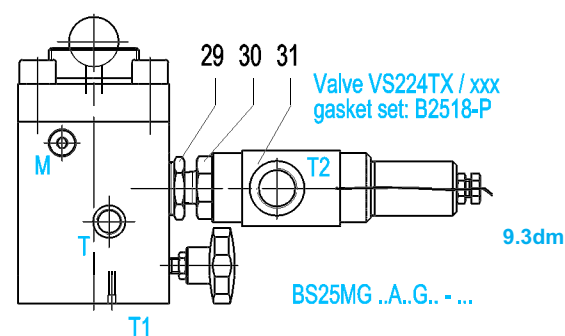
* Gasket material ** Component material

9.3do

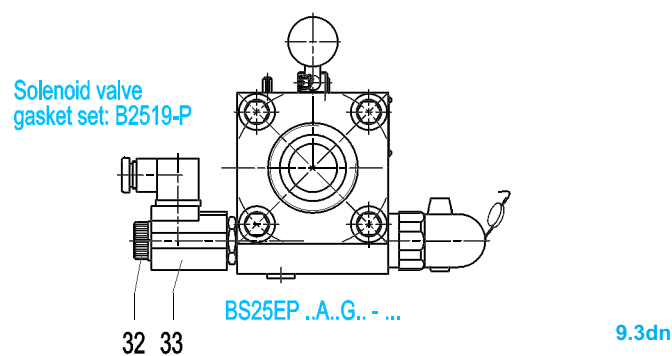


9.3dk

9.3dl

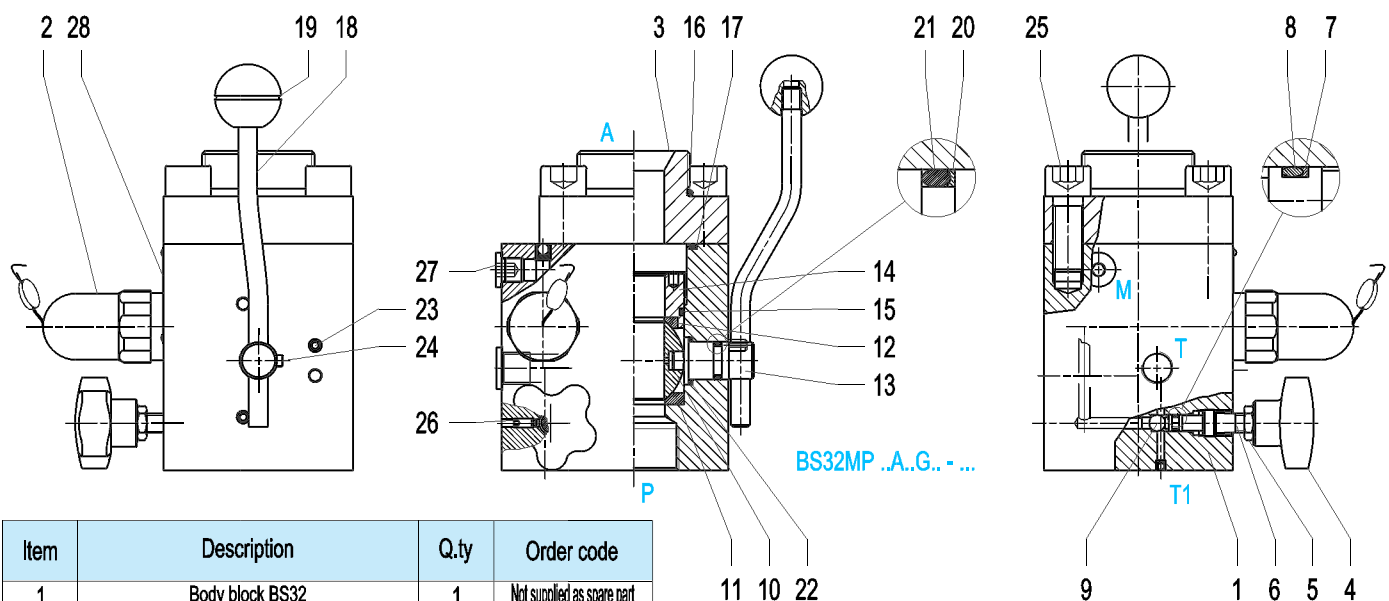


9.3dm



9.3dn

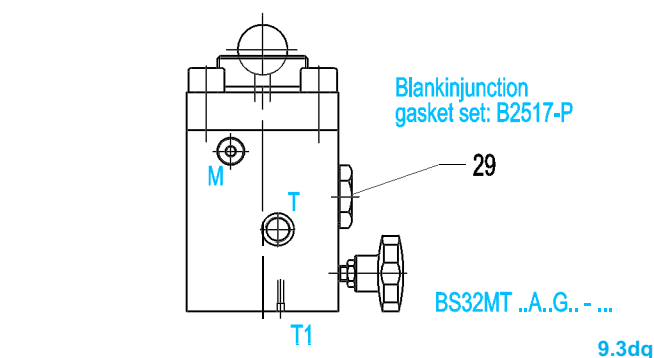
9.3.9.4 BS32 SPARE PARTS CODES



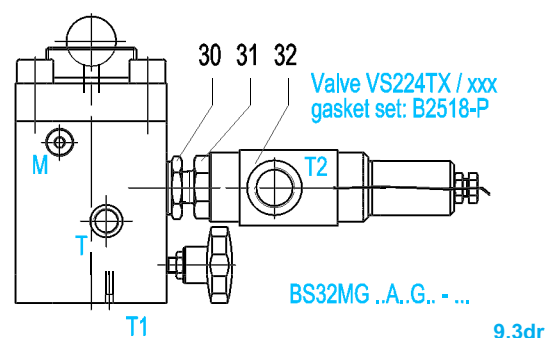
Item	Description	Q.ty	Order code
1	Body block BS32	1	Not supplied as spare part
2	Safety valve DBD... 10 k 1....	1	DBD... 10 k 1....
3	Flange accumulator side	1	2" B10349-1- **
4	Knob M10	1	055MVC.192/50BM10EA
5	Hex. nut M10 UNI 5588	1	0020DNM10CZ
6	Manual discharge pin	1	B10417 - **
7	Antiextrusion ring Parbak	1	0011P8009 - *
8	"O" ring	1	0010R2021 - *
9	Ball Ø8.5	1	0051S8.5-C
10	Ball DN32	1	0052S907744RN
11	Seal for ball Ø32	1	0013G913815RN
12	Seal for ball Ø32	1	0013G913813RN
13	Pin for ball	1	B10480R - **
14	Ring nut	1	B10478R - **
15	"O" ring	1	0010R3181 - *
16	"O" ring	1	0010R3218 - *
17	"O" ring	1	0010R0164 - *
18	Handle	1	B10482 - **
19	Knob M10	1	0055PS.35-M10-EA
20	Antiextrusion ring Parbak	1	0011P8113 - *
21	"O" ring	1	0010R0119 - *
22	Seal for pin	1	B10487 - *
23	Spring pin 6x26 UNI 6873	2	0023E6x26CZ
24	Set screw M6x8 UNI 5923-67	1	0022VSTEIM6x8CZ
25	Hex. socket head cap screws M16x40 UNI5931	4	0022VTCEIM16x40CZ
26	Set screw M5x12 UNI 5925-67	1	0022VSTEIM5x12CZ
27	Plug with rubber seal 1/4" BSP	1	0031TG2
28	Description plate	1	B11024 - 6 - A
29	Blankinjunction side accumulator plug	1	B2375 - ** / *
30	Adapter	1	B10456-C
31	Nipple	1	B11638-C
32	Valve VS 224 TX	1	VS224TX / xxx
33	Complete solenoid valve	1	Normally open B2372-xxx-C Normally closed B2395-xxx-C
34	Coil + connector	1	B2370-xxx
Standard flange accumulator assembly (parts 3 - 16 - 17)		1	2" F2454 A9 - ** / *
Safety block gasket sets		1	B 2143 - *
Ball sets		1	B 2135 - *

* Gasket material ** Component material

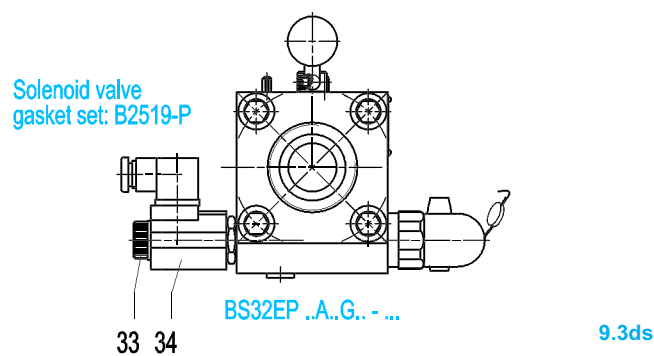
9.3dt



9.3dq



9.3dr

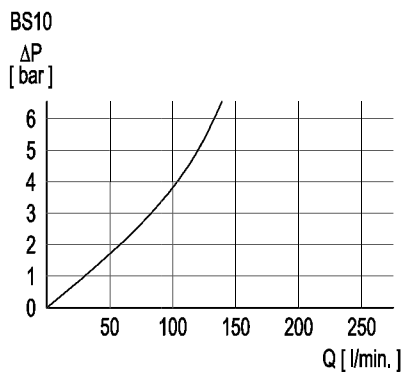


9.3ds

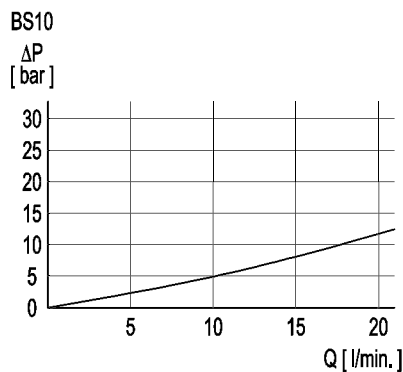
9.3.10 CHARACTERISTIC CURVES

ΔP Curves

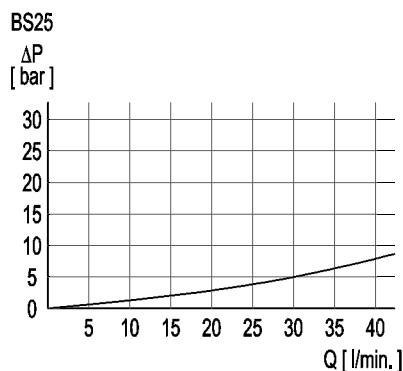
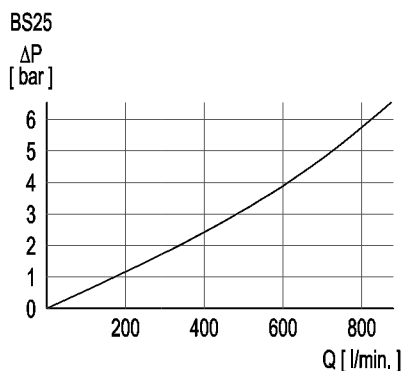
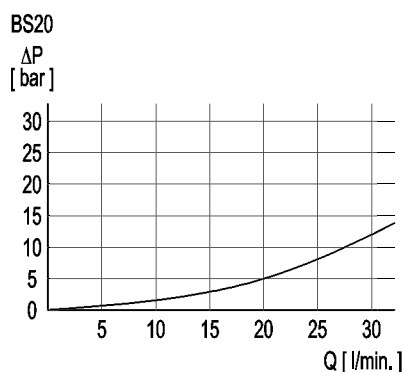
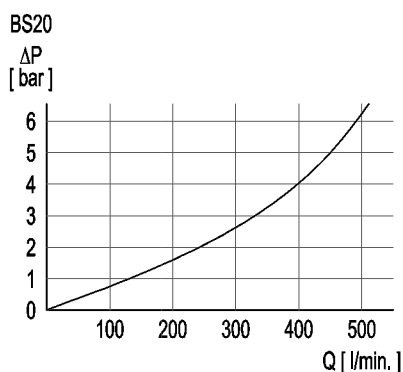
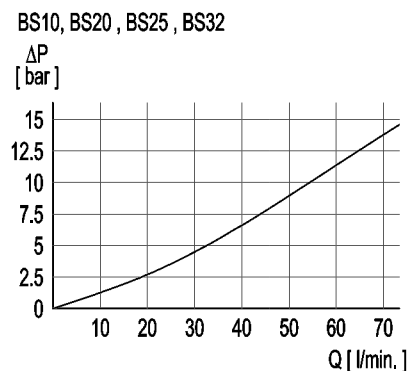
Flow rate from line to the accumulator and viceversa



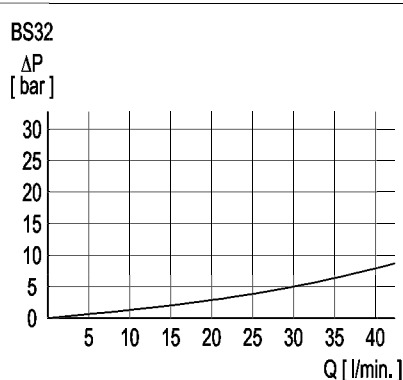
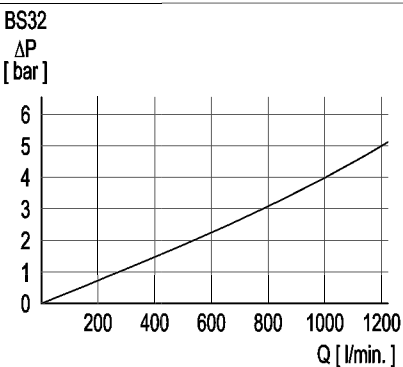
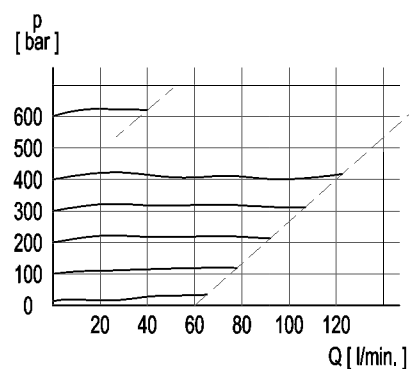
Flow rate from the accumulator to the tank



Flow rate from the accumulator via the solenoid valve to the tank



Flow rate from pressure relief valve to tank (only DBDS10)



Curves measured using mineral oil with viscosity of 36 cSt at 50°C

9.3.11 EUROPEAN MARKET

Directive 97/23/EC provides that pressure equipment, in which it's reasonably expected to be exceeded the allowable limits, should be provided with adequate protective equipment; for example, safety accessories such as the valves or the safety blocks type DBDS or BS. These devices shall prevent that pressure permanently exceeds the maximum allowable pressure PS of the equipment protected by them. However, it is permissible a pressure peak of short duration limited to 10% of the maximum allowable pressure. For the choice and sizing of the adequate safety device, the User should refer to specific standards. In accordance with the regulations 97/23/EC, the safety valves are classified in Category IV.

9.3.12 ACCESSORIES

For safety valve type VS, see section 8.1

For safety valve type DBDS, see section 9.1

For fluid side adapter, see section 9.4

For single acting flow control valves, see section 12.5

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9.4.1 TECHNICAL DATA

INTERNAL DIAMETER: 30 mm

MAX OPERATING PRESSURE (PS): 400 BAR

WORKING TEMPERATURE):

-20 ÷ 80 °C ("P" version with NBR seals)

-10 ÷ 150 °C ("V" version with VITON seals)

MATERIAL: phosphated or galvanized carbon steel in compliance with Directive 2002/95/EC (RoHS)
to resist to corrosion
- stainless steel

WEIGHT: see Table 9.4d



9.4a

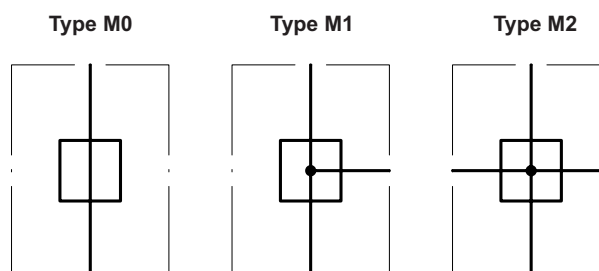
9.4.2 ADVANTAGES

- compact design
- flexible connection options

9.4.3 DESCRIPTION

The gas side adapters are blocks of various type, which can be mounted on the fluid side of an accumulator and which can fit the safety block. Special seal allows this adapter to be installed simply and securely in any position on all fluid valves of the bladder or piston accumulators. It's important to select the correct adapter based on the correct thread fluid valve and the connection of installation side.

9.4.4 HYDRAULIC SYMBOL



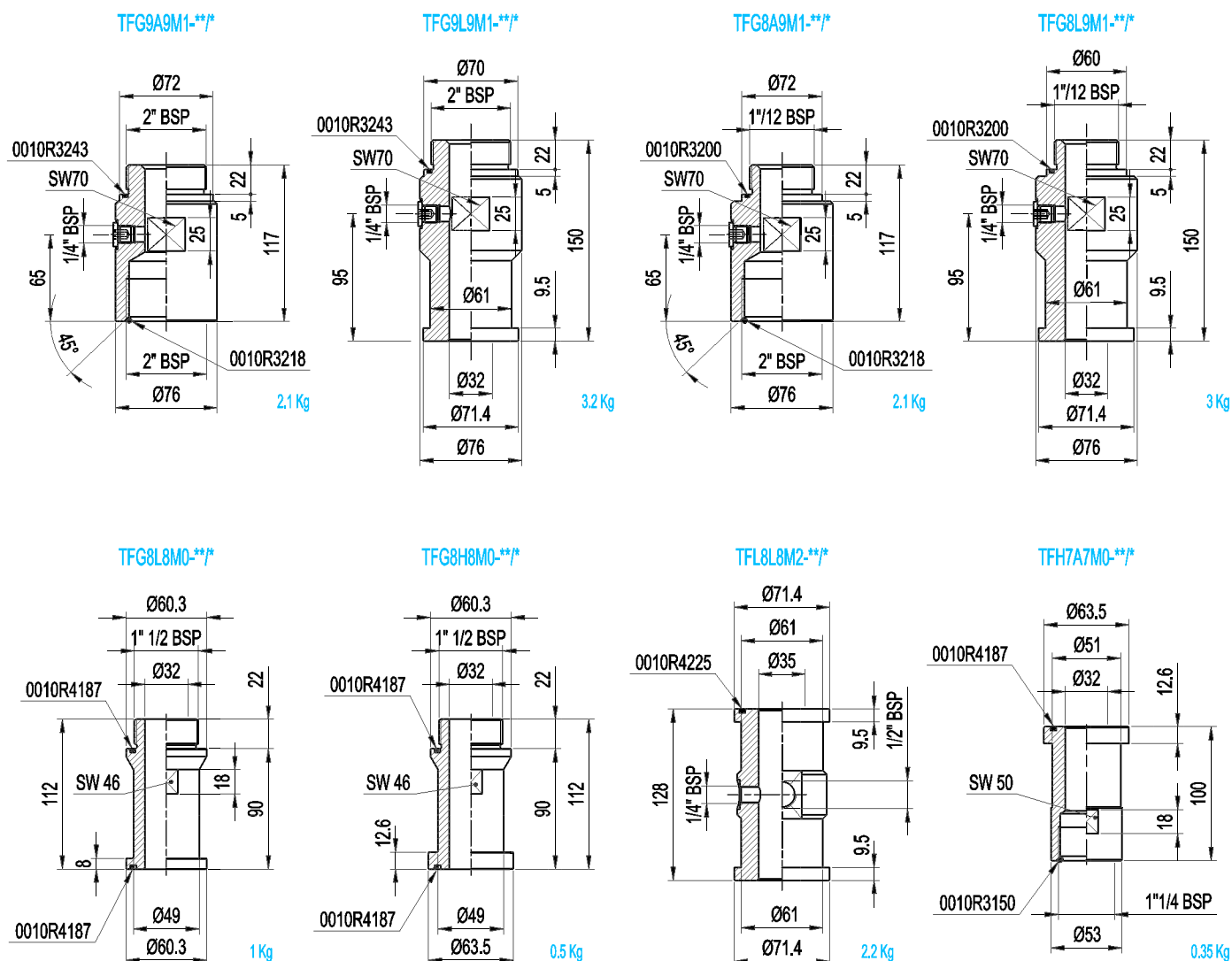
9.4b

9.4.5 ORDER CODE

1	2	3	4	5	6	7	8
TF	G	8	A	8	M1	-	C P

1 Series Gas side adapter = TF	2 Up connection Thread BSP 150228 male = G Adapter SAE 3000 = L Adapter SAE 6000 = H	3 Dimension of up connection 1"1/2 = 8 2" = 9	4 Bottom connection Thread BSP ISO 228 with chamfer for OR = A Adapter SAE 3000 without OR = L Adapter SAE 6000 without OR = H	5 Dimension of bottom connection 1"1/2 = 8 2" = 9	6 Lateral connection Without connection 1/4" = M0 1 connection 1/4" BSP plugged = M1 2 connections 1/4" BSP plugged = M2	7 Block material Carbon steel = C Nickel coating 25 µ. = N Nickel coating 40 µ = M Stainless steel = X	8 Seal material Nitrile (NBR) = C Viton (FKM) = V
-------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------

9.4.6 DIMENSIONS



9.4c

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