

4.1 Technical features

Max working pressure PS:	360 bar
Test pressure PT:	PS x 1,43 bar
Temperature range min. and max TS:	-40°C ÷ +120°C (subject to restrictions due to bladder material)
Nominal capacities:	0,2 ÷ 55 litres

4.2 Construction features

THE STANDARD VERSION (AS) INCLUDES:

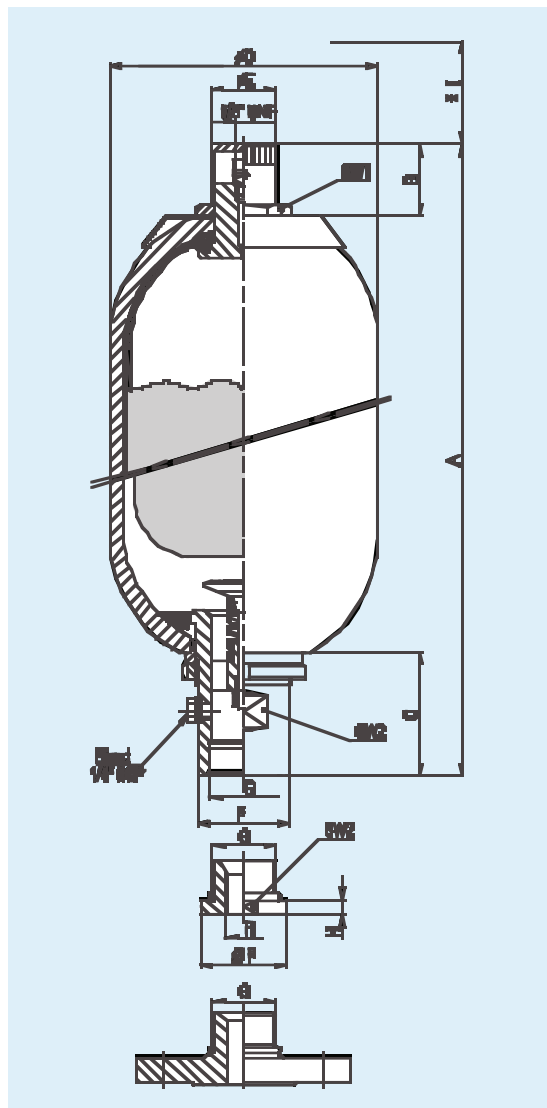
- Shell in hardened and tempered carbon steel, sandblasted and painted outside with a coat of rust inhibitor.
- Valves in phosphated carbon steel.
- Female ISO 228 G threaded fluid port connection.
- Bladder and gaskets in standard nitrile rubber (P).
- Testing and certification according to directive 97/23/EC.
- Preloading with nitrogen at **30 bar** (other values available if specified in order).

N.B. Technical features of **AS** standard version are also valid for **AST** and **ASL** versions except for the structure of gas side valve (see pages 36 and 37).

ON REQUEST the accumulator can be supplied with the following features:

- **SHELL AND VALVES PROTECTED** with a chemical coating of nickel (25 microns thick. Specify other thickness if required).
- **SHELL AND VALVES IN STAINLESS STEEL**
0.2 lts. capacity: max working pressure **210 bar** and **360 bar**.
0.7-1-1.5-3 lts. capacities: max working pressure **150 bar**.
5 lts. capacity: max working pressure **120 bar**.
10-55 lts. capacities: max working pressure **100 bar**.
For other pressure values contact our Technical Department.
- **BLADDER IN BUTYL, NEOPRENE, ETHYLENE-PROPYLENE, HYDROGENATED NITRILE, NITRILE FOR LOW TEMPERATURES (-40°C), NITRILE FOR HYDROCARBONS, EPICHLOROHYDRIN FOR FOODSTUFFS.**
- **WORKING PRESSURE PS = 550 BAR** for capacities 0,2 and 0,7 litres in carbon steel.
- **SAE 3000 or SAE 6000 FLUID PORT CONNECTION** (see page 24).
- **NPT, SAE or METRIC THREADED FLUID PORT CONNECTION.**
- **ADAPTER R** with ISO 228 thread for the diameters indicated in the table, with other threads to be specified or blind.
- **FLUID PORT FLANGED CONNECTION** (specify PN and DN and flange standards. For order code see page 24)¹⁾.
- **GAS SIDE FLANGED CONNECTION** for special applications¹⁾.
- **SAFETY VALVE** gas side or liquid side or only with the adapter for this valve (see pages 26-27)¹⁾.
- **SPECIAL ANTI-PULSATION CONNECTION** liquid side (see page 25)¹⁾.
- **TESTINGS AND CERTIFICATIONS DIFFERENT FROM EC** (Ask for availability).

1) Specify features separately.



4.3 Dimensions 2)

Type	Max work. pressure (bar)	Gas volume (Litres)	Dry weight (kg)	Fluid port connection		A	B	C	øD	øE	øF	H	I*	SW 1	SW 2
				G BSP ISO228	R BSP ISO228										
AS 0,2	360-550	0,2	1,7	1/2"	—	250 ± 2	22	40	53 + ¹ ₀	20	26	—		24	23
AS 0,7	360-550	0,65	4,2	3/4"	0=blind 3/8" 1/2"	280 ± 3	47	52	90 ± 1	25	36	11	140	32	32
AS 1	360	1	5,2			295 ± 5			114 ± 1						
AS 1,5	360	1,5	6,3			355 ± 5									
AS 3	360	2,95	11	1"1/4	0=blind 3/8" - 1/2" - 3/4"	553 ± 8	65	65	168 ± 1,5	53	53	11	140	32	50
AS 5	360	5	15			458 ± 10									
AS 10	360	9,1	33	2"	0=blind 3/8" 1/2" 3/4" 1" 1"1/4 1"1/2	568 ± 15	60	101	224 ± 2	55	77			11	140
AS 15	360	14,5	43			718 ± 15									
AS 20	360	18,2	48			873 ± 15									
AS 25	360	23,5	59			1043 ± 15									
AS 35	360	33,5	78			1392 ± 20									
AS 55	360	50	108			1910 ± 20									

* I = Overall dimensions of pre-loading unit.

2) = Data related to standard version in carbon steel PS = 360 bar.

Subject to change

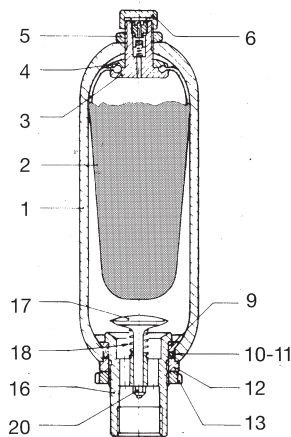
4.4 Components and spare parts

Table 4.4.1 provides a list of accumulator components and, for each model, the part number to be used when ordering spare parts: **THIS NUMBER IS VALID FOR STANDARD VERSIONS ONLY.**

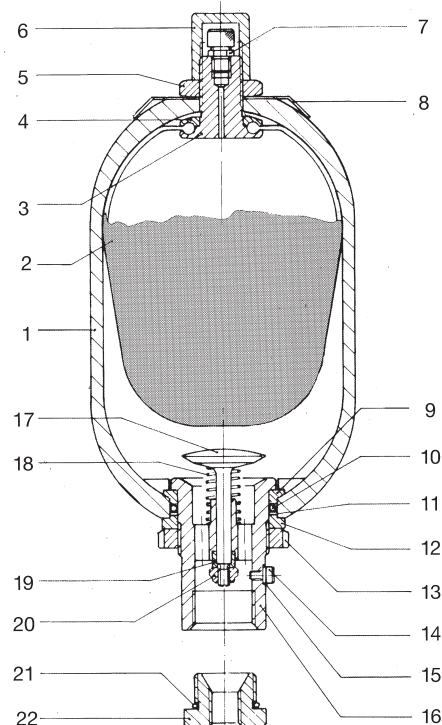
For all versions differing from standard it is necessary to give the **manufacturer's serial number and the material.**

The bladder must be ordered according to the instructions provided on Page 37 or giving the accumulator identification code or manufacturer's serial number.

Capacity 0.2 litres



Capacities 0.7÷55 litres



4.4.1 Spare parts list and part number

Item	Description	Pcs.	Models					AS 10-15-20 25-35-55
			AS 0,2	AS 0,7	AS 1 - 1,5	AS 3	AS 5	
1	Accumulator shell	1	Not supplied as spare part					
2	Bladder	1	See detailed designation on Pages 36-37					
3	Gas valve body	1	2001	10107			10202	10333
4	Rubber-coated washer	1	10024	10104	10106		10205	10334
5	Gas valve locknut	1	10023	10109				10302
6	Protection cap	1	10337	10103				10301
7	Gas-fill valve	1	—	2072				
8	Name plate	1	—	10300-A	10300-B		10300-C	10300-D
9	Retaining ring	1	10035	10123	10127	10146	10222	10317
10	“O” ring	1	OR4112	OR4150		OR159	OR6212	OR181
11	Supporting ring	1	10038	10133		10150	10227	10320
12	Space ring	1	10037	10120		10145	10223	10319
13	Fluid port ring nut	1	10039	10122		10217		10321
14	Bleed screw	1	—	10128				10316-A
15	Seal ring	1	—	10129				10336-A
16	Fluid port body	1	10031	10115		10144		10311
17	Poppet	1	10028	10111		10221		10310
18	Spring	1	10029	10112		10149		10322
19	Brake bushing	1	—	10113		10226		10314
20	Selflocking nut	1	10033	10116		10211		10315
21	Adapter “O” ring	1	—	OR2093		OR3150		OR3218
22	Adapter	1	—	10131/Ø thread		10233/Ø thread		10323/Ø thread
Gas valve assembly (parts 3-4-5-6-7)		1	2002	2021	2022		2042	2062
Fluid port assembly (parts 9 +20)		1	2004	2023	2024	2025	2044	2064
Gasket sets		1	2010 { OR2050 10341 10342 OR4112 10038	2030 { OR2050 10341 10342 OR4150 10133 10129 OR2093	2031 { OR2050 10341 10342 OR159 10149 10129 OR3150	2050 { OR2050 10341 10342 OR6212 10227 10129 OR3150	2080 { OR2050 10341 10342 OR181 10320 10336 OR3218	

5.1 Technical features

Max working pressure PS:	30-80 bar
Test pressure PT:	PS x 1,43 bar
Temperature range min. and max TS:	-40°C ÷ 150°C (subject to restrictions due to bladder material)
Nominal capacities:	1.5-3-5-10-15-20-25-35-55 Litres
Precharge pressure:	≤ 15 bar

5.2 Construction features

THE STANDARD VERSION (AS) INCLUDES:

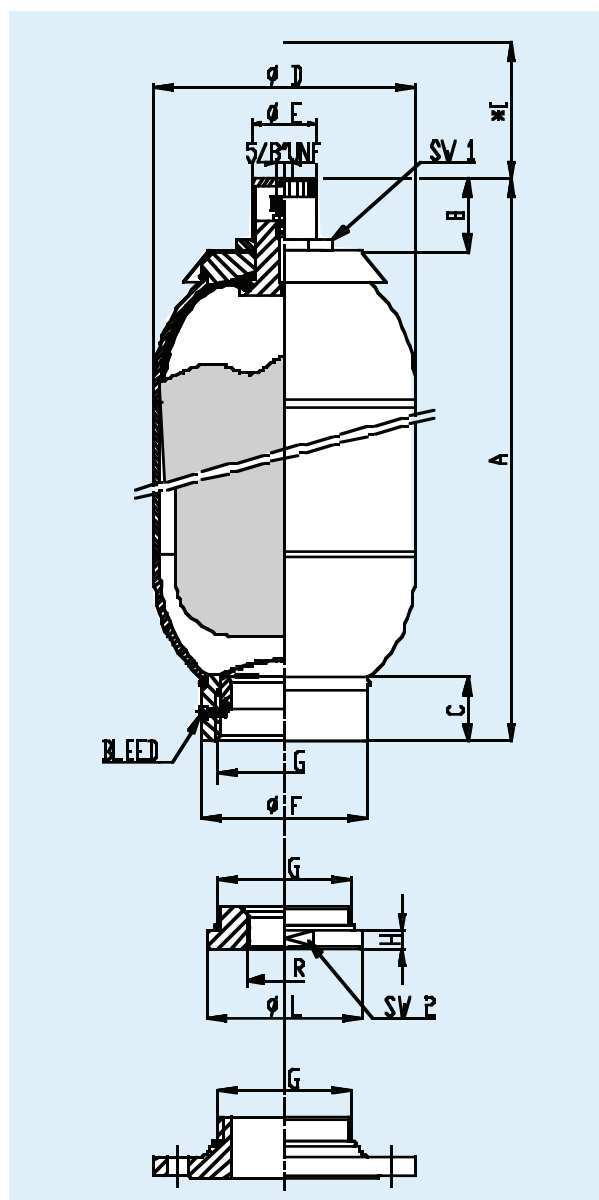
- Shell in welded carbon steel, sandblasted and painted outside with a coat of rust inhibitor.
- Gas valve in phosphated carbon steel.
- Female (G) ISO 228 threaded fluid port connection.
- Bladder in standard oil resistant nitrile rubber (P).
- Testing and certification according to directive 97/23/EC.
- Preloading with nitrogen at **5 bar** (other values available if specified in order).

N.B. Technical features of **AS** standard version are also valid for **AST** and **ASL** versions except for the structure of gas side valve (see pages 36 and 37).

ON REQUEST the accumulator can be supplied with the following features:

- **SHELL AND VALVES PROTECTED** with a chemical coating of nickel (25 microns thick. Specify other thickness if required).
- **SHELL AND VALVES IN STAINLESS STEEL**
1.5-3 and 5 lts. capacities: max working pressure **40 bar**.
10 - 55 lts. capacities: max working pressure **25 bar**.
For all sizes the certificate for the material and works test can be supplied.
- **BLADDER IN BUTYL, NEOPRENE, ETHYLENE-PROPYLENE, HYDROGENATED NITRILE, NITRILE FOR LOW TEMPERATURE (-40°C), NITRILE FOR HYDROCARBONS, EPICHLOROHYDRIN FOR FOODSTUFF.**
- **WORKING PRESSURE 50 bar** for capacities 10 ÷ 55 litres in carbon steel.
- **ADAPTER R** with ISO 228 thread for the diameters indicated in the table, with other threads to be specified or blind.
- **FLUID PORT FLANGED CONNECTION** (specify PN and DN and flange standards. For order code see page 24)¹⁾.
- **GAS SIDE FLANGED CONNECTION** for special applications (specify flange data)¹⁾.
- **SAFETY VALVE** gas side or liquid side or only with the adapter for this valve (see page 26-27)¹⁾.
- **SPECIAL ANTI-PULSATION CONNECTION** liquid side (see page 25)¹⁾.

1) Specify features separately.



5.3 Dimensions ²⁾

Type	Max work. pressure (bar)	Gas volume (litres)	Dry weight (kg)	Fluid port connection G ISO 228	Fluid port connection R ISO 228	A	B	C	ø D	ø E	ø F	H	*I	ø L	SW 1	SW 2
AS 1,5	80	1,5	6,1	2"	0 = blind	330 ± 3	47	48	114 ± 1	25	75	11	140	74	32	70
AS 3		2,95	9,1		3/4"-1"-1 1/4"	510 ± 5										
AS 5		5	15,7		1"-1 1/4"-1 1/2"	423 ± 5										
AS 10	30	9,6	18	4"	0 = blind 1/2" 1 1/4" 2" - 3"	475 ± 5	60	50	219 ± 2	55	130	14	140	130	70	120
AS 15		14,5	23			615 ± 5										
AS 20		18,8	28			755 ± 8										
AS 25		23,5	33			900 ± 8										
AS 35		33,5	47			1285 ± 10										
AS 55		50	65			1765 ± 10										

* I = Overall dimensions of pre-loading unit.

2) = Data related to standard version in carbon steel.

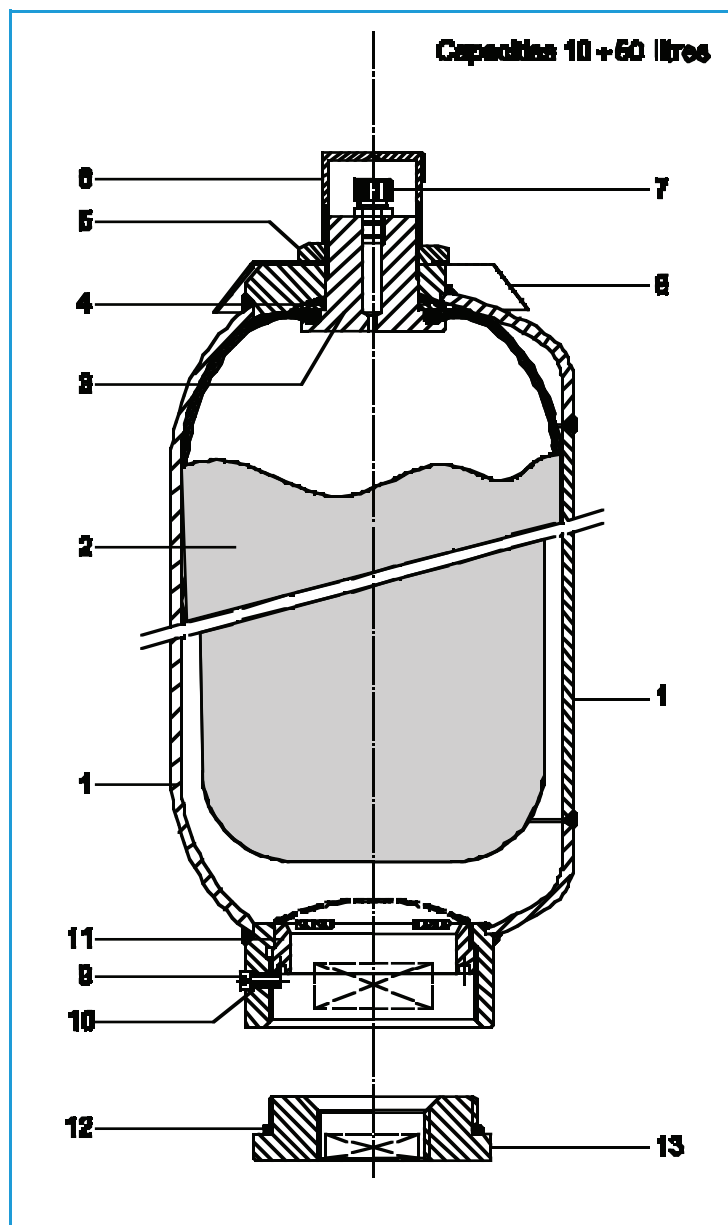
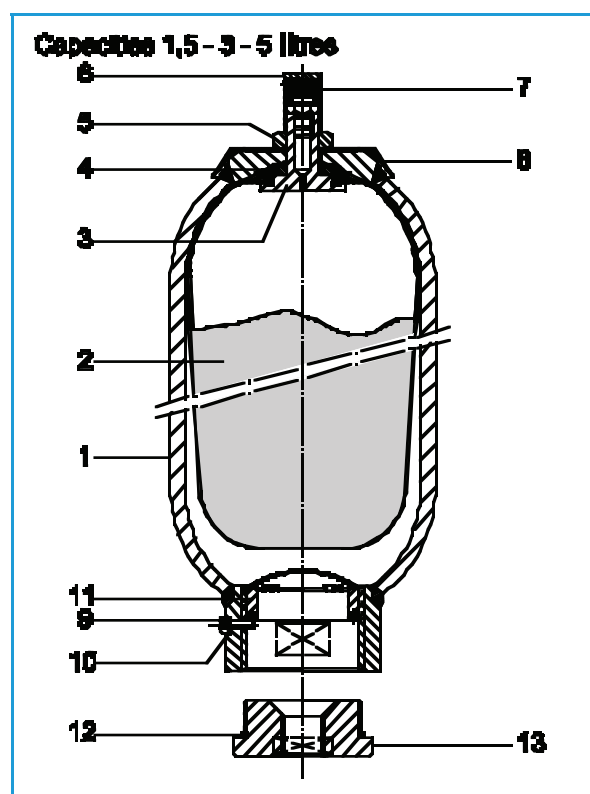
Subject to change

5.4 Components and spare parts

The table 5.4.1 provides a list of accumulator components and, for each model, the part number to be used when ordering; this number is **VALID FOR STANDARD VERSION ONLY**.

For all versions differing from standard it is necessary to give the **manufacturer's serial number and the material**.

Orders for bladder must be carried out as per instructions on Page 37 or giving the accumulator identification code or manufacturer's serial number.



5.4.1 Spare parts list and part number

Item	Description	Pcs.	Models		
			AS 1,5 - 3	AS 5	AS 10-15-20 25-35-50
1	Accumulator shell	1	Not supplied as spare part		
2	Bladder	1	See detailed designation on Page 37		
3	Gas valve body	1	10107	10202	10333
4	Rubber-coated washer	1	10106	10205	10334
5	Gas valve locknut	1	10109		10302
6	Protection cap	1	10103		10301
7	Gas-fill valve	1	2072		
8	Name plate	1	10300-B	10300-C	10300-D
9	Bleed screw	1	10316		
10	Seal ring	1	10336		
11	Anti-extrusion plate	1	10159-1	10241-1	10421-1
12	Adapter "O" ring	1	OR3218	OR3281	OR4425
13	Adapter	1	10323/Ø thread	10244/Ø thread	10444/Ø thread
Gas valve assembly (parts 3-4-5-6-7)			2022	2042	2062
Gasket sets			2032 { OR2050 10341 10342 OR3218	2052 { OR2050 10341 10342 OR3281	2082 { OR2050 10341 10342 OR4425

Subject to change

10.1 General

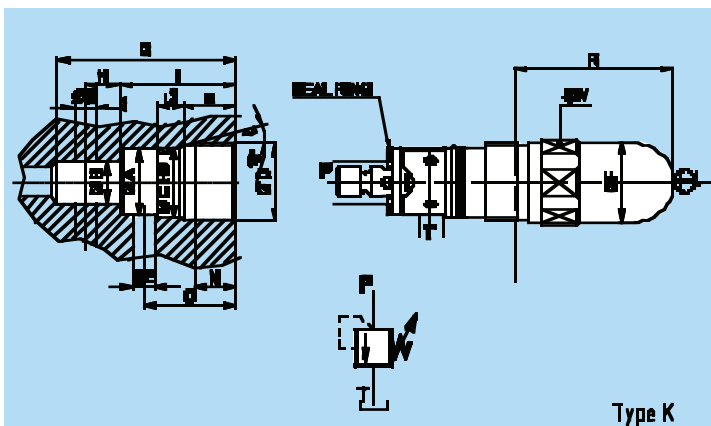
The hydraulic system in which the hydropneumatic accumulator is mounted, must have a relief valve installed on the liquid side. This valve should have a **pressure setting equal or lower than the maximum working pressure** marked on the name plate of the accumulator.

The valve must not be used for controlling the system pressure and its setting should only be carried out by authorized personnel.

10.2 Technical and constructional features

Valve DBD... is a direct acting relief valve with conical sealing and it can be adjusted through a screw. If **EC** testing is required, the valve is supplied with **fixed setting and lead seal**. On the execution without certificate the calibration value, marked on the body, indicate the **superior limit** of calibration range; the **lower limit** coincides with the value of the valve just before. It is provided with a protective cap and flat seal. The valve body is in burnished carbon steel; the seals are in Perbunan.

10.3 DBD... relief valve - dimensions



Type	Weight (kg)	øA	øB	øC	øD	øE	øF	G	H	I	L	M	N	O	R	SW
DBD..6...	0,4	24,9	15	25	M28x1,5	6	35	67	11,5±5,5	45	11	19	15	35	70	32
DBD..10...	0,5	31,9	18,5	32	M35x1,5	10	35	80	15,5±7,5	52	12	23	18	41	68	36
DBD..20...	1	31,9	24	40	M45x1,5	20	41	110	21,5±8,5	70	18	27	21	54	66	46

10.5 Identification code

DBD S 10 K 13/ 200 P 8 -						
Adjustment method	Nominal size	Mounting method	Operative pressure range		Sealing	Test certification
S = set screw H = handknob A = lockable hand knob (for size 6 and 10 only)	6 = size 6 10 = size 10 20 = size 20	K = cartridge version G = with block BPV TYPE G for threaded connection P = with block BPV TYPE P for subplate mounting	25 = up to 25 bar 50 = up to 50 bar 100 = up to 100 bar 200 = up to 200 bar 315 = up to 315 bar	400 = up to 400 bar 630 = up to 630 bar (for size 10 only) * = on request other calibration with EC	P = fluids on mineral oil base V = fluids on phosphate-ester base	0 = factory testing 8 = 97/23/EC
						- = phosphated steel X = stainless steel

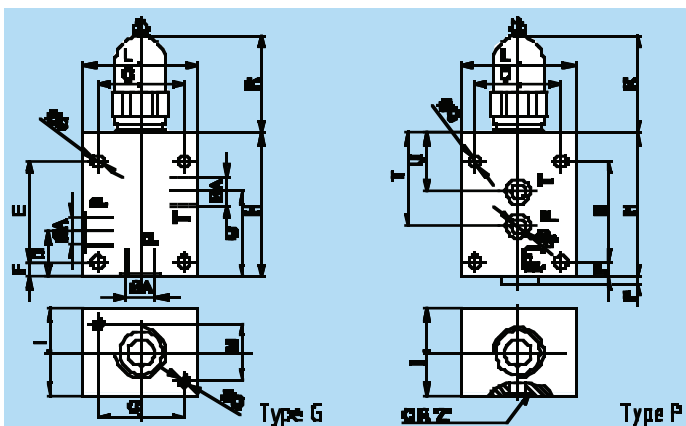
10.6 BAPV 10 accumulator block for DBDS10K...

This block is used for the assembling of the valve DBD..10... It is made of burnished carbon steel. The two connections **P** and **P1** are used indifferently for the connection to the accumulator through a nipple and to the system. The discharge line **T** mustn't have counterpressures and must have a free passage.

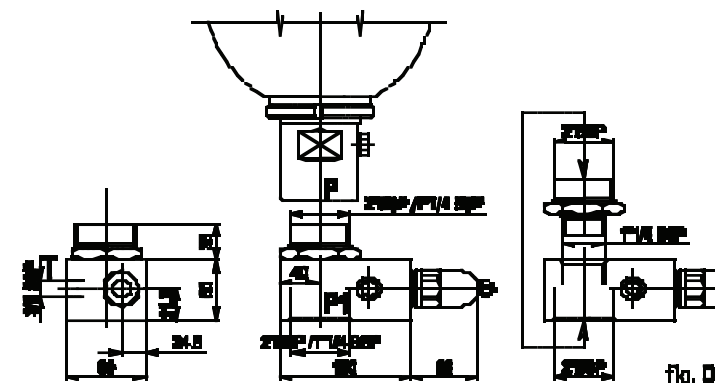
There are three possibilities:

- Cartridge type **DBD...**; this is more frequently used thanks to its practical style and economical advantages (see par. 10.3);
 - Safety valve **VS214/...**; this is used for high flow discharge (par. 11.3);
 - Burst disk **DR8/...**; this is used for narrow spaces and with discharge not conveyed to the tank (see par. 11.4).
- Nominal size: DBD 6 - 10 - 20
 - Standard pressure calibration with CE setting: P=5-630 bar
 - Standard pressure calibration without cert.: P=25-50-100-200-315-400 bar; (630 bar only for DBD10)
 - Overpressure by full flow: 10% of P
 - Blow down: <10% of P
 - Flow rate: max 50lt/1'(DBD6) 120lt/1'(DBD10) 250lt/1'(DBD20)
 - Testing certificate: 97/23/EC

10.4 BPV... blocks for relief valve - dimensions



Type	Valve	Weight (kg)	øA (BSP)	øB	C	D	E	F	G	H	I	L	M	P	øQ	S	T	U	Z OR
BPV 6..	DBD..6.. K	1,2	1/4"	6,6	4,5	25	55	10	45	80	40	60	25	3	M6	6	35	55	7x1,5
BPV 10..	DBD..10.. K	3,2	1/2"	9	60	31	70	10	59	100	60	80	40	4	M8	10	41	65	12,3x2,4
BPV 20..	DBD..20.. K	6	1"	9	70	50	100	15	81	135	70	100	50	5,5	M8	20	54	85	22x3



11.1 General

These valves and burst disks are mounted in order to protect the accumulator in case of gas overpressures higher than the value of the maximum allowable working pressure.

So the **calibration** of the valve or of the burst disk **must be equal or lower than this value**.

Are available the following types: valves VS214/... with EC testing (ISPESL on request) and burst disks DR8/... with EC testing (others on request).

For the **designation** merely add the setting pressure and the type of testing to the valve code.

11.2 Installation

The valve or the burst disk must be mounted close to the gas valve and in direct contact with the nitrogen contained into the accumulator. In particular cases are installed on the fluid side (see page 26-28-29-30-31).

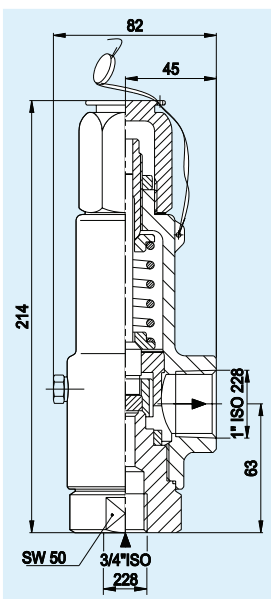
Each type of valve or of burst disk can be supplied with adapter for a direct mounting on the different types of gas valves.

A shut-off cock between accumulator and valve is allowed only if it is sealed in "open" position.

Before mounting, be sure that the accumulator is completely discharged.

Gas side adapters

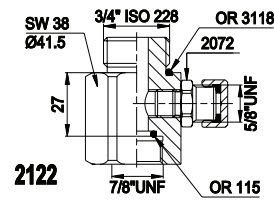
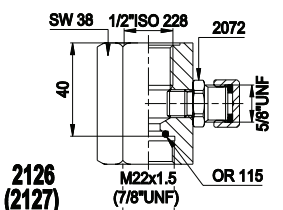
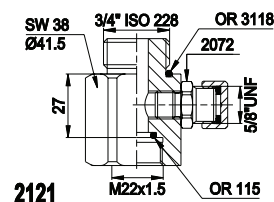
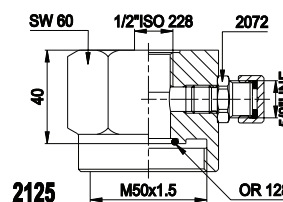
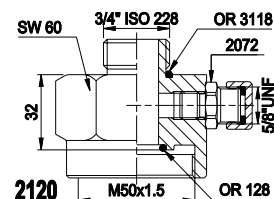
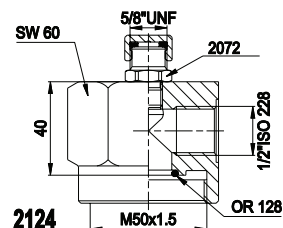
11.3 Safety valve type VS214/... (with related adapters)



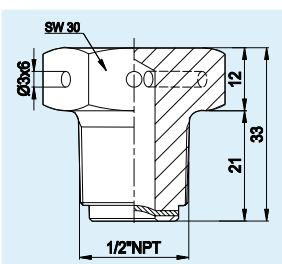
Technical and constructional features

This valve is characterised by a port size of 9,5 mm. and by a copra-aluminium disc with flat seat. Seals are not provided; valve tightness is ensured by an accurate lapping of disc surfaces. The body is made of steel A105, the disc is made of AISI 431.

● Port size	: Ø 9,5 mm
● Calibrations P	: up to 413 bar on request
● Overpressure by full flow	: 10% of P
● Blow down	: 7% of P
● Lift mm 2,1	: fluid nitrogen
● Spring adjustment	: ± 5% calibration
● Gas discharge coefficient	: K = 0,95
● Liquids discharge coefficient	: K = 0,6
● Temperatures range	: min. -20°C max +150°C
● Test certificate	: 97/23/EC (ISPESL on request)

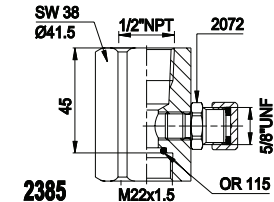
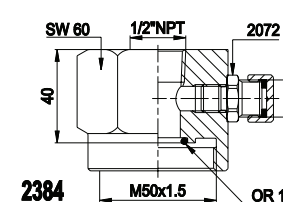


11.4 Burst disk type DR8/... (with related adapters)

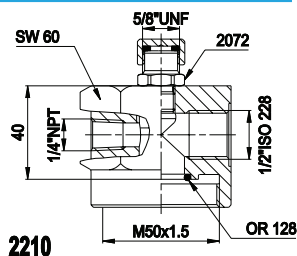
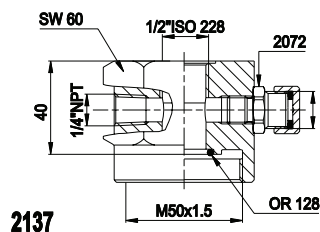
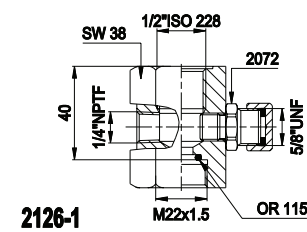
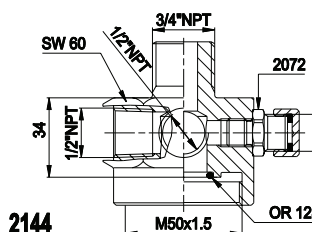
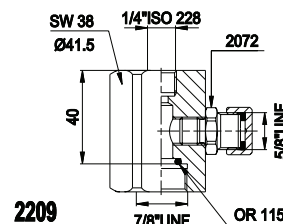
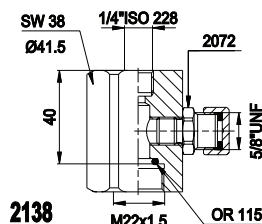
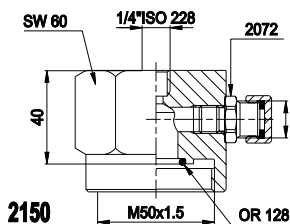
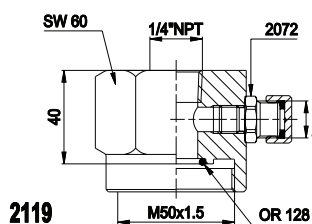


Technical features

● Materials	: AISI 316L
● Port size	: 6 holes Ø 3
● Calibration	: on request
● Overpressure	: ± 10%
● Temperature range	: min. -40°C max +150°C
● Test certificate	: 97/23/EC



11.5 Some gas side adapters for the connection of valves and manometers ¹⁾



1) Other versions on request

12.1 General

Safety blocks series B10-20 combine in a compact unit all the components required for an easy **connection** of accumulator on an hydraulic circuit and its **protection** from overpressure. They also allow a quick disassembly of the accumulator or a check of accumulator pre-charge pressure also when the system is operating. Series **B10-B20** is suitable for accumulators from **0,7 litres up to 55 litres**.

12.2 Construction

STANDARD VERSION INCLUDES:

- Phosphated steel body.
- **3-way** ball valve, in chrome-plated steel, connecting accumulator to inlet or discharge.
- Seat for assembling of relief valve.
- Installation side connection, BSP female parallel threaded ISO 228.
- Accumulator side connection, metric female parallel threaded.
- Flow control valve for adjusting the flow rate during the accumulator discharge (Only on B20).
- Discharge and manometric connections.
- Gaskets for mineral oil (Perbunan).

ON REQUEST it is supplied with:

- BODY nickel-coated; relief valve in stainless steel.
 - NIPPLE for connection to accumulator.
 - PLUG no. 2375 for closing of valve seat.
 - RELIEF VALVE TYPE DBDS not adjusted (see page 26).
 - RELIEF VALVE TYPE DBDS sealed with lead and EC certified.
 - VALVE TYPE VS214/... with ISPEL certificate or EC (see page 27).
 - TWO-WAY SOLENOID VALVE for electrical discharge, "normally open".
- Technical features (voltage, frequency, etc.) or version "normally close" have to be specified.
- GASKETS IN VITON.



12.3 Technical features

Diameter of inlet port:	Ø 10 or 20 mm.
Nominal flow rates at ~ 10 m/s:	B10 = 50 l/min; B20 = 190 l/min
Max. working pressure:	360 bar
Temperature range:	– 20 ÷ +80°C standard (70°C with electrovalve) – 20 ÷ +150°C (seals in Viton)
Relief valve:	– Ø flow = 10 mm. – DBDS not adjusted (see chapter 10.2) – DBDS adjustable from 5 to 360 bar with EC certification – VS214/... with EC or ISPEL certification
Solenoid valve:	– Power voltage = DC 24V - 110 V AC 110/220V – Power consumption = 26W – Protection = IP65

12.4 Identification code

The example shows a safety block series B, with inlet port 20 mm, with only manual discharge, with relief valve type DBDS tested by EC at 360 bar, accumulator side connection 2" BSP, installation side connection 3/4" BSP, gaskets in Perbunan, block in phosphated steel. (If the solenoid valve will be installed, specify electrical data in detail).

B20 M P 360 G R P - -

Type and inlet port	Discharge	Relief valve (see pages 26-27)	Valve calibration (bar)	Accumulator side connection	Installation side connection	Gasket material	Block material
B 10 B 20	M = Only manual E = Electric and manual F = Manual plus drilling for electrovalve	A =without valve with plastic plug B =valve type DBDS... (Not adjusted) C =valve type VS214/... (ISPEL certified) P =valve type DBDS... (EC certified) V =valve type VS214/... (EC certified) T =without valve (with plug 2375)	Valves type DBDS10 or VS214 adjusted with certificate 5 ÷ 360 Valves DBDS10 not adjusted* 25 - 50 - 100 200 - 315 - 400 *(superior limits of regulation range)	G = 2" BSP G1 = 1"1/4 BSP G3 = 3/4" BSP M = M 50x1,5 M1 = M 40x1,5 G = 2" BSP G1 = 1"1/4 BSP M = M 50x1,5 M1 = M 40x1,5 H = without nipple S = SAE thread A = other	B10 R = 1/2" BSP female B20 R = 3/4" BSP female	P = Nitrile V = Viton	- = Phosphated steel N = Nickel coated steel 25 µm

12.5 Spare parts No.

In addition to the spare part number specify the complete block designation or its serial number, especially for non-standard version.

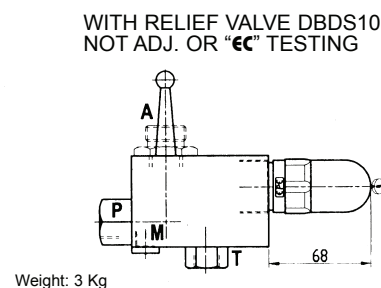
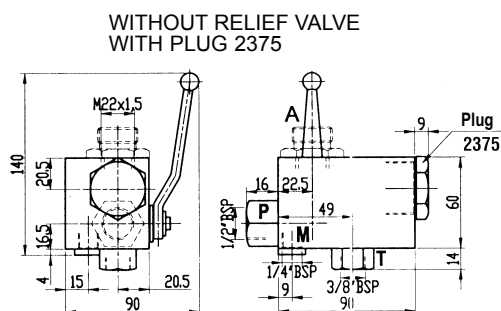
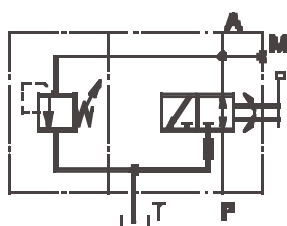
Type	Accumulator side connection					Ball of shut off valve with gaskets	Relief valve DBDS not adj. (without testing)	Relief valve DBDS adjusted (with cert. EC)	Safety valve Testings		Gaskets sets
	3/4" BSP	1"1/4 BSP	2" BSP	M40x1,5	M50x1,5				EC	ISPEL	
B 10	10450	10451	10452	10453	10454	2132	2105/ (bar)*	2106/ (bar)/ EC	VS214/ (bar)/ EC	VS214/ (bar)/ ISPEL	2140
B 20	-	10470	10471	-	10472	2133					2141

*Choose, among limits of regulation range, the value just higher than working pressure

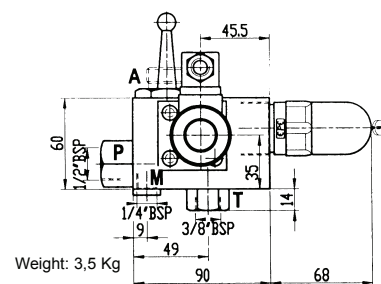
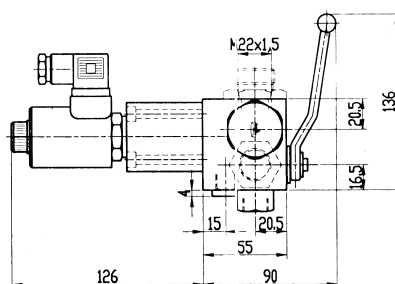
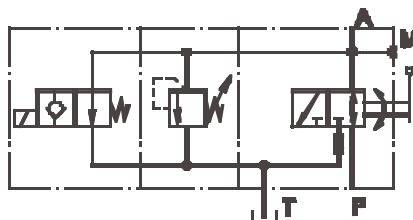
Subject to change

12.6 Dimensions

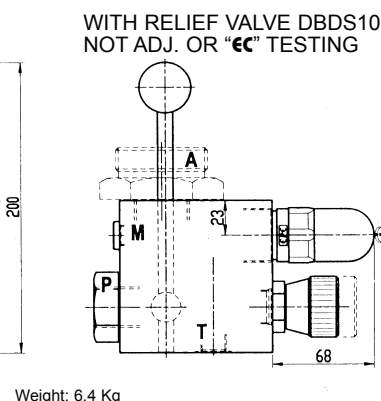
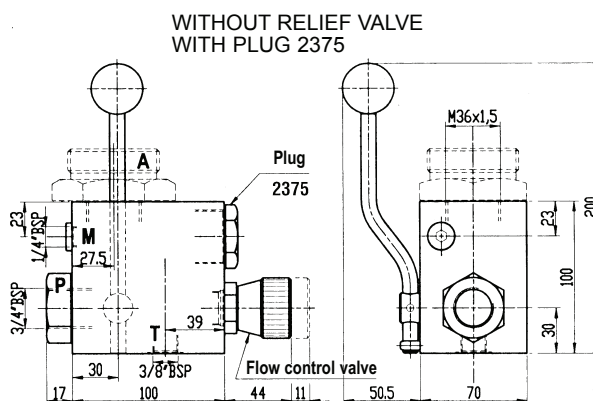
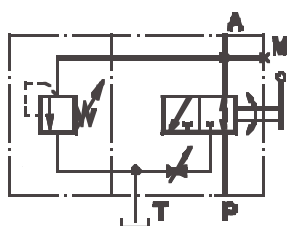
- **BLOCK TYPE B10**
- **MANUAL DISCHARGE**



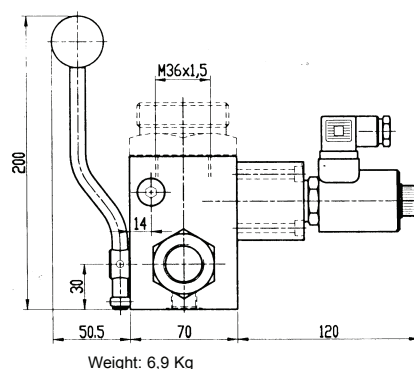
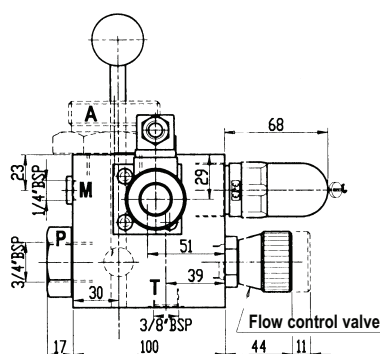
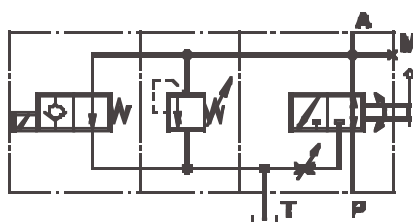
- **BLOCK TYPE B10**
- WITH RELIEF VALVE
- WITH ELECTR. & MANUAL DISCHARGE



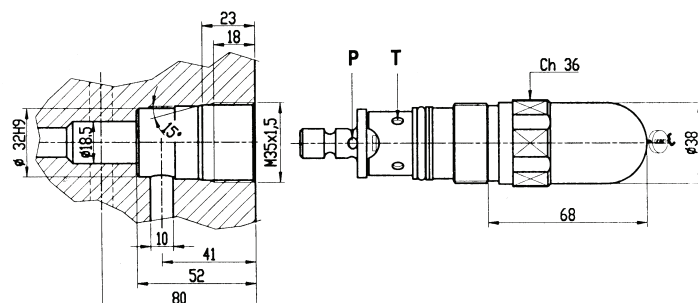
- **BLOCK TYPE B20**
- **MANUAL DISCHARGE**



- **BLOCK TYPE B20**
- **WITH RELIEF VALVE**
- **WITH ELECTR. & MANUAL DISCHARGE**



- **DBDS RELIEF VALVE**
- **CERTIFICATION ACCORDING TO DIRECTIVE 97/23/EC**



NIPPLE (with radial O-Ring)
Connection block-accumulator

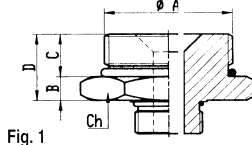


Fig. 1

NIPPLE (with frontal O-Ring)
Connection block-accumulator

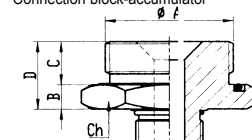


Fig. 2

Order No.	Type	Fig.	Ø A	B	C	D	Ch
10450	B10	1	3/4" BSP	8	14	20	36
10451		1	1 1/4" BSP	8	14	20	50
10452		1	2" BSP	8	16	24	70
10453		2	M40x1,5	8	14	20	50
10454		2	M50x1,5	8	16	24	70
10470	B20	1	1 1/4" BSP	10	16	26	50
10471		1	2" BSP	10	20	30	70
10467		2	M40x1,5	10	16	26	50
10472		2	M50x1,5	10	20	30	70

Subject to change

13.1 General

Safety blocks series BS25-32 combine in a compact unit all the components required for an easy **connection** of accumulator on an hydraulic circuit and its **protection** from overpressure.

They also allow a quick disassembly of the accumulator or a check of accumulator pre-charge pressure also when the system is operating.

Series **BS25-32** is suitable especially for applications with accumulators of **10 ÷ 55 litres** where are required **big flow-rates**.

13.2 Construction

STANDARD VERSION INCLUDES:

- Phosphated steel body.
- Shut off ball valve DN25 or DN32.
- Valve for accumulator discharge.
- Discharge connection T 3/8" BSP lateral (see page 31).
- Seat for assembling of relief valve.
- Installation side connection, BSP female parallel thread.
- Accumulator side flange, 2" BSP male parallel threaded.
- Discharge and manometric connections.
- Gaskets for mineral oil (Perbunan).

ON REQUEST it is supplied with:

- BODY nickel-coated or stainless steel; relief valve in stainless steel.
- PLUG no. 2375 for closing of valve seat.
- RELIEF VALVE TYPE DBDS not adjusted (see pag. 26).
- RELIEF VALVE TYPE DBDS sealed with lead and EC certified.
- VALVE TYPE VS214/... with ISPEL certificate or EC (see page 27).
- TWO-WAY SOLENOID VALVE for electrical discharge, "normally open".
- Technical features (voltage, frequency, etc.) or version "normally close" have to be specified.
- CONNECTION T1 installation side (see pag. 31).
- INSTALLATION SIDE CONNECTION for SAE and CETOP flanges.
- FLANGE on accumulator side different from 2" BSP.
- FLANGE on installation side (to be specified in detail).
- GASKETS IN VITON.

13.4 Identification code

The example shows a safety block series BS, inlet port 25 mm, with manual discharge only, lateral discharge connection standard T 3/8" BSP, with relief valve type DBDS with EC testing calibrated at 360 bar, accumulator side connection 2" BSP, installation side 1" BSP, gaskets in Perbunan, block in phosphated steel. (If the solenoid valve will be installed, specify electrical data in detail).

BS25 M P 360 G R P - - -

Type and inlet port	Discharge	Relief valve (see pages 26-27)	Valve calibration (bar)	Accumulator side connection Ø A	Installation side connection	Gaskets material	Block material	Discharge connection position
BS 25	M = Only manual	A = without valve, with plastic plug B = valve type DBDS... (not adjusted) C = valve type VS214/... (ISPEL certified) P = valve type DBDS... (EC certified) V = valve type VS214/... (EC certified) T = without valve (with plug 2375)	Valves type DBDS10 or VS214 adjusted with certificate 5 ÷ 400 Valves DBDS10 not adjusted* 25 - 50 - 100 200 - 315 - 400 (superior limits of regulation range)	H = without flange G = 2" BSP G1 = 1"1/4 BSP M = M 50x1,5 M1 = M 40x1,5 P = 2" NPT S = SAE thread (to be specified) A = other (to be specified)	R = BSP female par. thread S = SAE drilling ¹⁾ C = CETOP drilling ¹⁾ FS = with SAE flange ¹⁾ FC = with CETOP flange ¹⁾	P = Nitrile V = Viton	- = Phosphated steel N = Nickel-coated steel 25 µ X = Stainless steel	- = Lateral standard T=3/8" BSP 1 = Installation side T1 ÷ 5 (see page 31)

¹⁾ Specify flange data in detail.

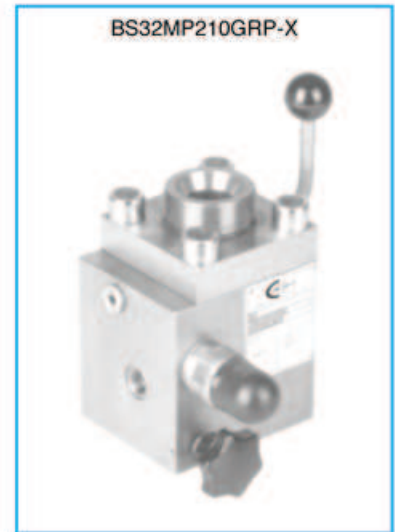
13.5 Spare parts No.

In addition to the spare part number specify the complete block designation or its serial number, especially for non-standard versions.

Type	Accumulator side flange Ø A					Ball of shut off valve with gaskets	Complete valve for manual discharge	Relief valve DBDS without certif.	Relief valve DBDS with cert. EC	Safety valve EC or ISPEL	Gaskets sets
	2" BSP	1"1/4 BSP	M50x1,5	M40x1,5	2" NPT						
BS 25	10349	10473	10347	10492	10448	2134	2152	2105/(bar)*	2106/(bar)/EC	VS214/(bar)/...	2142
BS 32	-	-	-	-	-	2135	-	2143

*Choose, among limits of regulation range, the value just higher than working pressure

Subject to change

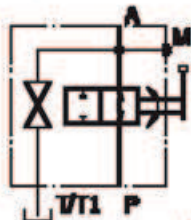


13.3 Technical features

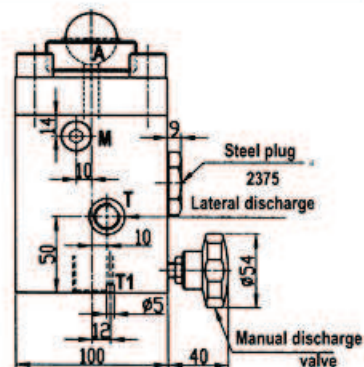
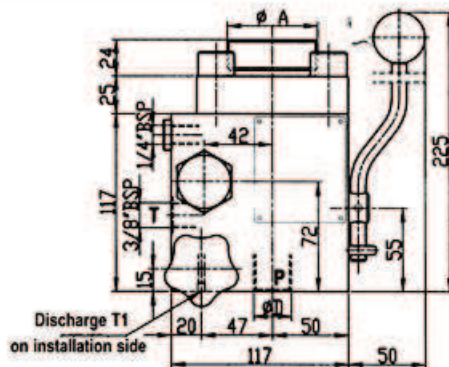
Diameter of inlet port:	Ø 25 or 32 mm.
Nominal flow rates at ~ 6 m/s:	BS25 = 180 l/min; BS32 = 290 l/min
Max. working pressure:	400 bar
Temperature range:	- 20 ÷ +80°C (70°C with electrovalve) - 20 ÷ +150°C (seals in Viton)
Relief valve:	- Ø flow = 10 mm. - DBDS not adjusted (see chapter 10.2) - DBDS adjustable from 5 to 400 bar, EC cert. - VS214/... adjustable from 5 to 400 bar with EC or ISPEL certification
Solenoid valve:	- Power voltage = DC 24V - 110 V AC 110/220V - Power consumption = 26W - Protection = IP65

13.6 Dimensions

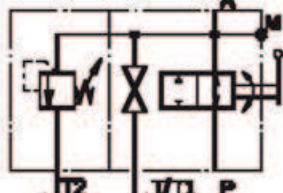
- BLOCK WITHOUT RELIEF VALVE
- MANUAL DISCHARGE



Weight: 12.2 Kg

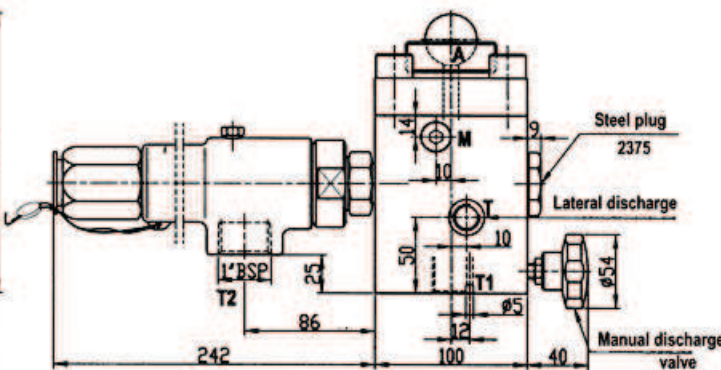
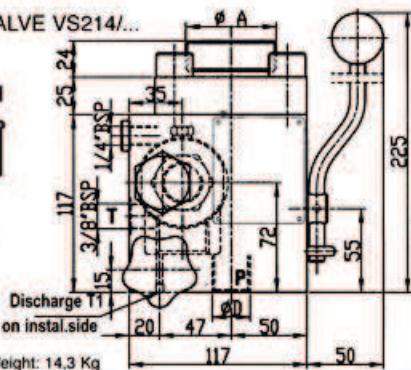


- BLOCK WITH SAFETY VALVE VS214/...
- MANUAL DISCHARGE

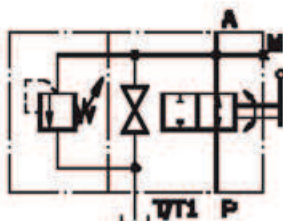


The block with valve VS214/... must have a connection for the manual discharge connection T1 or T1 and one to the valve (connection T2)

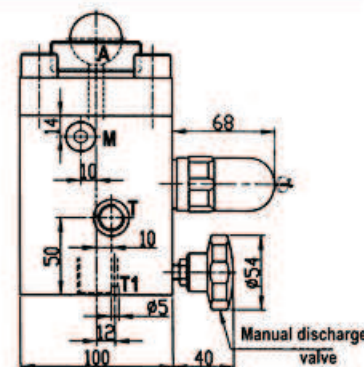
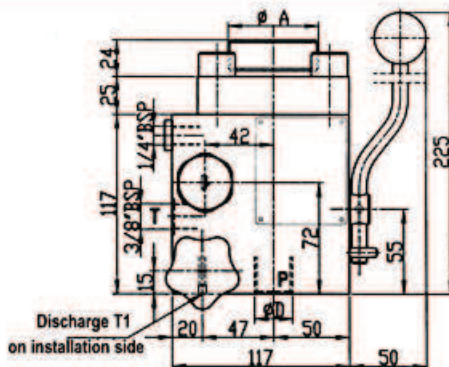
Weight: 14.3 Kg



- BLOCK WITH RELIEF VALVE DBDS
- MANUAL DISCHARGE



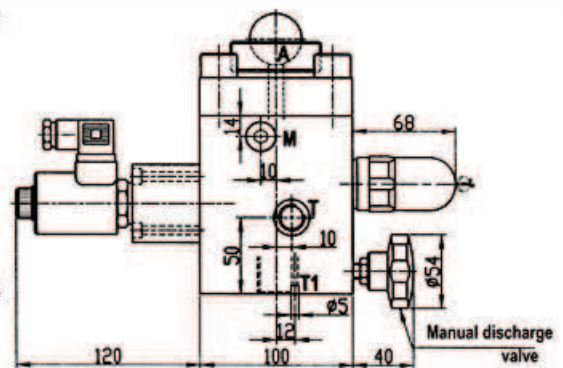
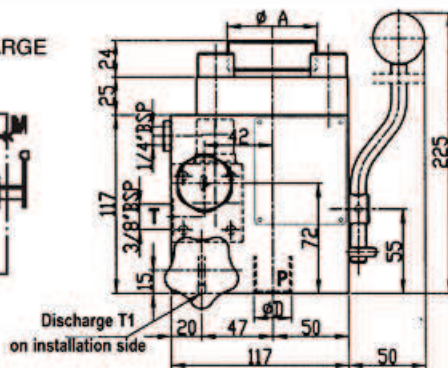
Weight: 12.2 Kg



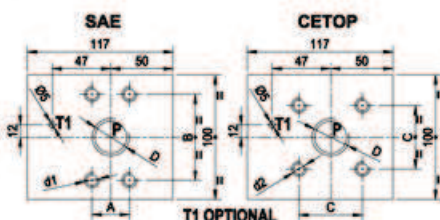
- BLOCK WITH RELIEF VALVE DBDS
- ELECTRICAL AND MANUAL DISCHARGE



Weight: 13.1Kg



Attention: the standard execution has the discharge connection T; on request is possible to have the discharge connection T1.



All dimensions in mm.

INSTALLATION SIDE CONNECTIONS

Type	Standard version Ø D	For SAE Flanges		On request		For CETOP Flanges			
		A	B	d1	Thread height	C	d2	Thread height	
BS 25	1"	1 1/4 SAE 6000	31,6	66,7	M14	24	CETOP 38-400	51,6	M12
		1 1/4 SAE 6000	31,6	66,7	M14	24	CETOP 38-400	51,6	M12
		1 1/2 SAE 6000	36,7	79,4	M16	24	CETOP 38-400	51,6	M12
BS 32	1 1/2"	1 1/2 SAE 3000	35,7	70	M12	20	CETOP 50-400	60,1	M14
		2" SAE 3000	42,9	77,8	M12	20	CETOP 50-400	60,1	M14

Subject to change

14.1 General

The block series BC is used in order to make safer and more practical the connection of one or more additional nitrogen bottles with a bladder accumulator “transfert” version or with a piston accumulator. It includes substantially the following equipment:

- Shut-off valve **R** that remains open during the operation in order to assure the free nitrogen flow between bottles and accumulator and vice versa; it should be closed only for a check or for the accumulator maintenance.
- Check valve **VR** that guarantee the nitrogen passage from accumulator to bottles even when the cock **R** is wrongly closed.
- Safety valve **VS214** or burst disk for the protection of overpressures.
- Filling valve **PC** for the charging or the check of nitrogen pre-charge through pre-loading set PC250S1.

14.2 Construction features

THE BASIC VERSION INCLUDES:

- Body in phosphated steel with shut-off valve (**R**) and check valve (**VR**).
- Nipple for safety valve.
- Female threaded nipple on accumulator side (**A**) and gas side (**B**).
- Female threaded nipple for manometer (**M**).
- Valve with connection for pre-loading and checking set PC250S1.
- Gasket sets in NBR (Perbunan P).

ON REQUEST:

- Body in nickel-plated carbon steel.
- Safety valve with EC or ISPESE testing.
- Burst disk with EC testing.
- Gaskets in VITON.
- Pressure gauge with possible isolator valve (to be specified in detail).

14.3 Identification code

The example given below shows a BC block made of phosphated steel, with 25 mm port, safety valve tested by EC and calibrated at 210 bar, a 1” BSP connection both on the accumulator and on the bottle side, Perbunan gaskets.

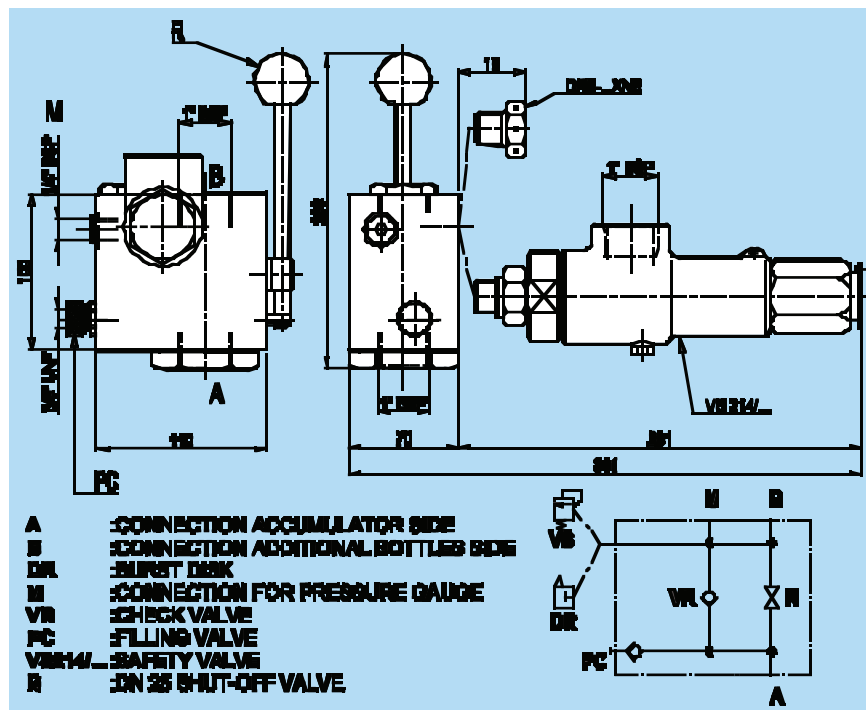
Type	Safety valve or burst disk	Calibration (bar)	Connection sides A and B	Gaskets material	Surface treatment
BC 25	A = without valve C = with VS214/... valve with ISPESE certificate V = with VS214/... valve with 97/23/EC certificate R = with burst disk	5 ÷ 400 (calibration value indicated by the user)	G = 1” BSP (Standard) A = Other to be specified	P = Perbunan V = Viton	- = phosphated steel N = Nickel-plated steel 25 µm

14.5 Spare parts No.

In addition to the spare part number it is essential to indicate also the complete identification code of the block or its serial number.

Type	Valve with gaskets	Check valve	Gas filling valve	Safety valve ISPESE tested	Safety valve EC tested	Burst disk EC tested	Gaskets
BC 25	2134	2305	2072	VS214/(bar)/ISPESE	VS214/(bar)/EC	DR8/(bar)	2304

Subject to change



14.3 Technical features

Port:	25 mm.
Max working pressure:	400 bar
Working temperature:	-20°C / +80°C (+150°C with Viton seals)
Safety valve:	VS214/... with EC or ISPESE certification and calibrated at the value indicated by the user
Burst disk:	DR8/... with EC certification

15.1 General

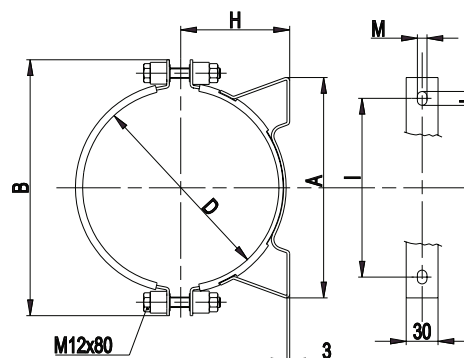
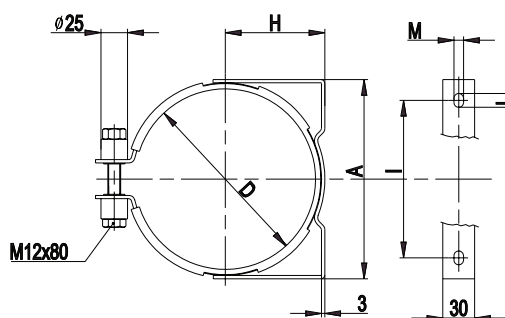
The fixing must be done in such a way as to not lie with outward stresses on the shell or on the accumulator connection. Especially for the horizontal assembling and for the most heavy types is necessary to use fixing equipments (clamps, brackets, etc...) that support the accumulator and avoid dangerous vibrations.

15.2 Construction

Clamps and brackets are manufactured of galvanized carbon steel but, on request, they can be supplied entirely in stainless steel. The support ring are of nitril rubber 80°Sh. On request can be used other elastomers.

15.3

Clamps



Dimensions and order code

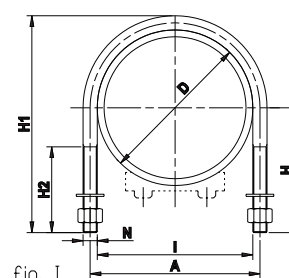
Type	Accumulator Max. press. (bar)	Order code	Fig.	Weight (kg)	A	B	D	H	I	L	M
AS 0,7	360 - 550	10155	I	0,65	125	—	89 ÷ 93	53 ÷ 55	90	13	9
AS 1-1,5-3	80 - 360	10157	II	0,85	135	194	114 ÷ 122	66 ÷ 70	100	13	9
AS 5	80 - 360	10250	II	1,1	185	251	167 ÷ 176	95 ÷ 100	146	13	9
AS 10 ÷ 55	30 - 360	10410	II	1,35	298	285	215 ÷ 227	120 ÷ 126	216	20	10

15.4 U-Bolt clamps and plastic pipe saddles

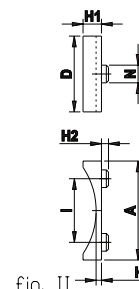
Dimensions and order codes

Accumulator Type	Order code	Fig.	Weight (kg)	A	D	H	H1	H2	I	N
AS1 - 1,5 - 3	11468	I	0.12	123	115	84	149	35	115	M8
ASA 1/4	11475	II	...	75	70	8	17	10	40	15
AS 5	11469	I	1.74	178	168	118	211	45	168	M10
ASA 1	11476	II	...	140	75	8	26	10	90	25
AS 10÷55 ASS 10÷55	11470	I	2.75	236	220	157	282	60	220	M16
ASA 2.5÷15 BB52	11477	II	...	140	75	8	26	10	90	25

U-Bolt clamps

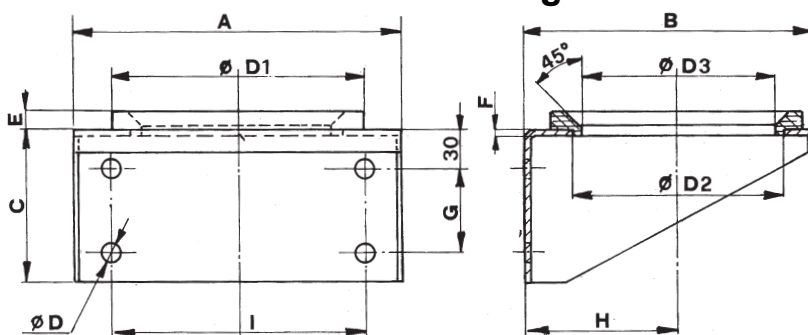


Plastic pipe saddles

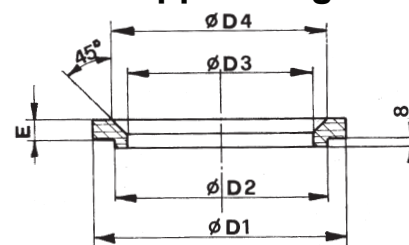


15.5

Bracket with ring



Support ring



Dimensions and order code

Accumulator Type	Order code Bracket with ring	Order code Support ring	Weight (kg)	A	B	C	ø D	ø D1	ø D2	ø D3	ø D4	E	F	G	H	I
AS 5	10263		1,5	200	175	90	11	140	120	90		10	3	40	96	140
AS 10 ÷ 55	10363		3 6	260	232	120	17	200	170	150		15	3	70	125	200
AS 1 ÷ 5		10266	0,13					140	120	90	112	10				
AS 10 ÷ 55		10345	0,22					200	170	150	175	15				

16.1 General

It is used for the periodic check of accumulator pre-charge and for the inflation of accumulators themselves after the replacement of the bladder or it is used for the change of pre-charge value. For the inflation is necessary a connection to a bottle filled with industrial dry nitrogen with a pressure higher than the precharge value required, provided with **pressure reducer** (mandatory, for safety reasons, during the inflation of accumulators with PS < 210 bar). Furthermore the use of a pressure reducer make easier the **slow and graduated** inflow of nitrogen on the bladder avoiding in this way the possibility of damaging of the bladder itself.

16.2 Construction

STANDARD VERSION includes:

- Valve body complete with ring nut connection to accumulator gas valve, pressure gauge, bleed and non return snap-in hose connection.
- 3 m charging hose for high pressure series complete with bottle connections.
- One connection nipple to pressure reducer.
- Set of spare gaskets.
- Case.

ON REQUEST:

- ADAPTER for special accumulator gas valves.
- CHARGING HOSE with lenght of 6 m.

16.3 Technical features

Max working pressure: 600 bar

Accumul. connection: 5/8" UNF (standard)
7/8" UNF; \varnothing 7,7x1/32" (Vg8); 1/4" ISO 228; (on request)

Bottle connection: See designation (ch 16.5), drawings and table ch. 16.7 page 35

Pressure gauges: - \varnothing 63 connection 1/4" ISO 228
- Full scale 250 bar for high pressure accumulators
- Full scale 25 bar for low pressure accumulators

Weight: 1,8 kg (case included)

16.4 Spare parts

Gasket set	2160	Complete bleed	2164
Non-return valve	2162	Charging hose	2166/ (metres)
Central pin	2165	Pressure gauge	2163/ (bar)

16.5 Identification code

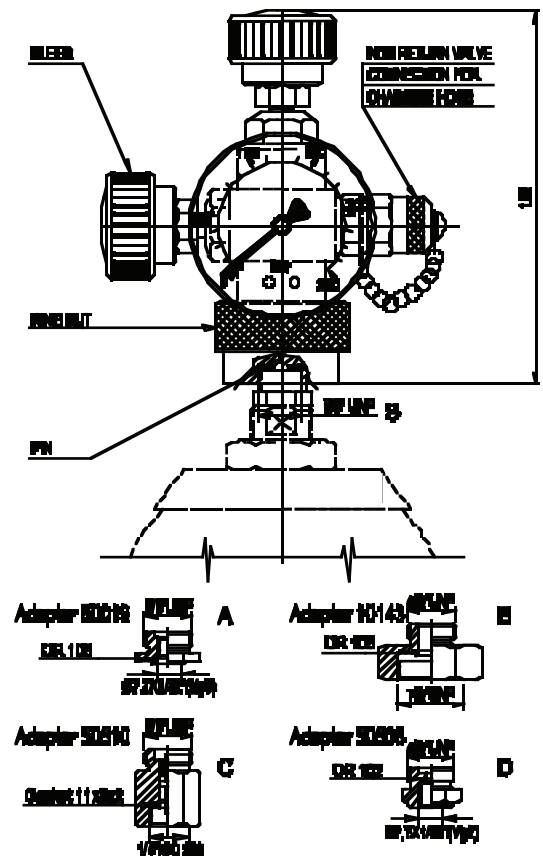
The example below shows equipment for filling and checking with pressure gauge of 250 bar, with accumulator connection 5/8" UNF and standard bottle connection, complete with 3 m hose and case.

SAMPLE OF DESIGNATION:

PC 250 S 1 - -

Type	Pressure gauge (bar)	Connection to accumulator	Connection to bottle ¹⁾ (according to Country standards)				Charging hose (metres)
PC Pre-loading and checking	25	S = 5/8" UNF (standard) A = \varnothing 7,7x1/32" (Vg8) (adapter 50019) B = 7/8" UNF (adapter 10143) C = 1/4" ISO 228 (adapter 50510) D = \varnothing 7,7x1/32" (Vg8) (long thread) (adapter 50508)	1 = Italy 2 = Austria Czech Republic Denmark Finland Germany Netherlands Norway Poland Sweden Switzerland	3 = Belgium Egypt France Hungary Mexico Morocco Romania Saudi Arabia Slovenia Spain Tunisia	4 = Argentina Australia Great Britain Greece India Indonesia New Zeland Philippines Portugal Singapore Turkey	5 = Brazil South America 6 = South Africa 7 = Canada USA 8 = Russia Venezuela 9 = Japan 10 = Taiwan 11 = China 12 = Korea	- = 3 m (standard) L = 6 m (on request)
	250						

1) Other types on request



17.1 General

The EPE bladder is made by two different and separable parts. One is the rubber bladder of which the main feature lies in an original and well developed process that allows the construction in a **single piece**. The second part is the gas valve assembly that is seal connected on the bladder mechanically. This unique method allows to seal connect on the same bladder **different types**

of gas valve assembly (see pag. 37).

The two parts, bladder and gas valve assembly, can be ordered separately (for the assembling see pag. 41) so when is necessary the replacement of the bladder, it is possible to use again the gas valve assembly saving in this way money on the purchasing price of the spare bladder.

17.2 Technical and constructional features

- **THE BLADDER**, used in the standard version of the accumulators of all the series offered by EPE, is made in butadiene-acrylonitrile rubber (NBR) with medium-high ACN content which we have denoted "**standard nitrile**" and distinguished with the letter **P**. The "**P**" bladder is above all suitable for use with mineral oils but gives also excellent results with many other liquids (see ch. 3.15 page 16). The operating temperature range is between -20 and +85°C. For special requirements, temperatures exceeding the above limits, special liquids, etc. the bladder can be supplied in the following materials: Nitrile for low temperatures (**F**), Nitrile for hydrocarbons (**H**), Hydrogenated Nitrile (**K**), for foodstuffs (**A**), Butyl (**B**), Ethylene-propylene (**E**), Neoprene (**N**), Epichlorohydrin (**Y**).
N.B. Not all the bladders sizes are available in all the materials. Please consult our Technical Service Department before ordering.

- **THE GAS VALVE** used in the EPE accumulators is made of phosphated carbon steel, in the following three versions:

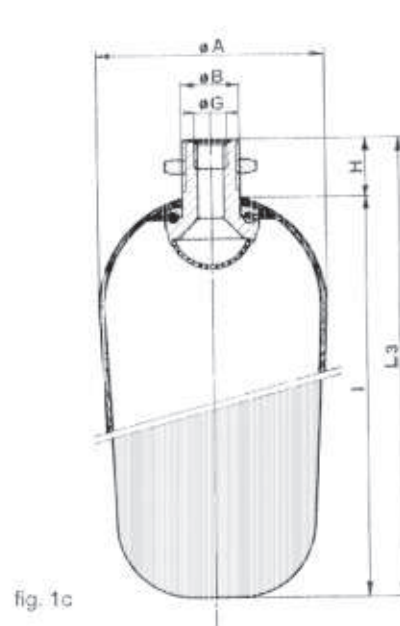
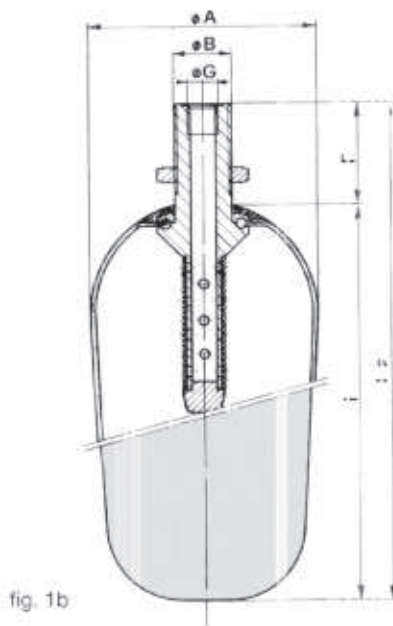
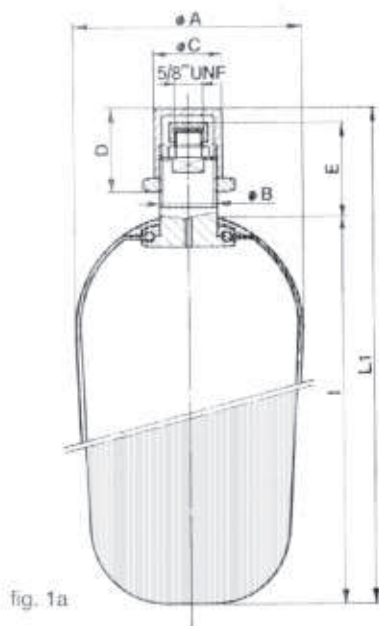
S = STANDARD, (fig. 1a). For capacities from 0,2 to 55 litres with inflating valve 5/8" UNF.

This valve can be supplied with Ø B and special inflation connections (see ch. 18.4).

ST = TRANSFER (fig. 1b). Suitable for use with the accumulator connected to one or more additional nitrogen bottles. For capacities from 5 to 55 litres.

SL = LIQUID SEPARATOR (fig. 1c). It is used when a liquid is also inside the bladder. For capacities from 0,2 to 55 litres.

- **UPON REQUEST**, all the valves can be supplied with chemical nickel coating 25 µm. (other thickness to be specified) or in stainless steel.



17.3 Bladder dimensions and spare codes for standard valves

Nominal capacities (Litres)	Bladder dimensions with valves fig. 1a - 1b - 1c												Bladd. weight kg	Gas valve assembly					
	ø A	ø B	ø C	ø G ISO 228	D	E	F	H	I	L ₁	L ₂	L ₃		fig. 1a code No.	weight kg	fig. 1b code No.	weight kg	fig. 1c code No.	weight kg
0,2	38	5/8" UNF	20	1/8" BSP	—	25	—	23	155	180	—	178	0,03	2002	0,1	—	—	2003	—
0,7	75	M22x1,5 (Spec. ø B s. section 18.4)	25	1/4" BSP	47	51	36	28	126	182	—	154	0,07	2021	0,3	2026	0,55	2027	0,18
1	148								204	184	176	0,13	2022						
1,5	198								254	234	226	0,17							
2,5	325								381	361	353	0,30							
3	374								430	410	402	0,36							
4	146					52	37	32	215	272	252	247	0,33	2042	0,42	2043	1,1	2048	0,33
5									284	341	321	316	0,43						
10	198	M50x1,5 (Spec. ø B s. section 18.4)	55	1" BSP	60	63	72	43	315	390	387	358	0,96	2062	1,7	2065	2,6	2073	1,1
12									400	475	472	443	1,08						
15									450	525	522	493	1,29						
20									583	658	655	626	1,79						
25									735	810	807	778	2,22						
35									1080	1155	1152	1123	3,28						
55									1535	1610	1607	1578	4,59						

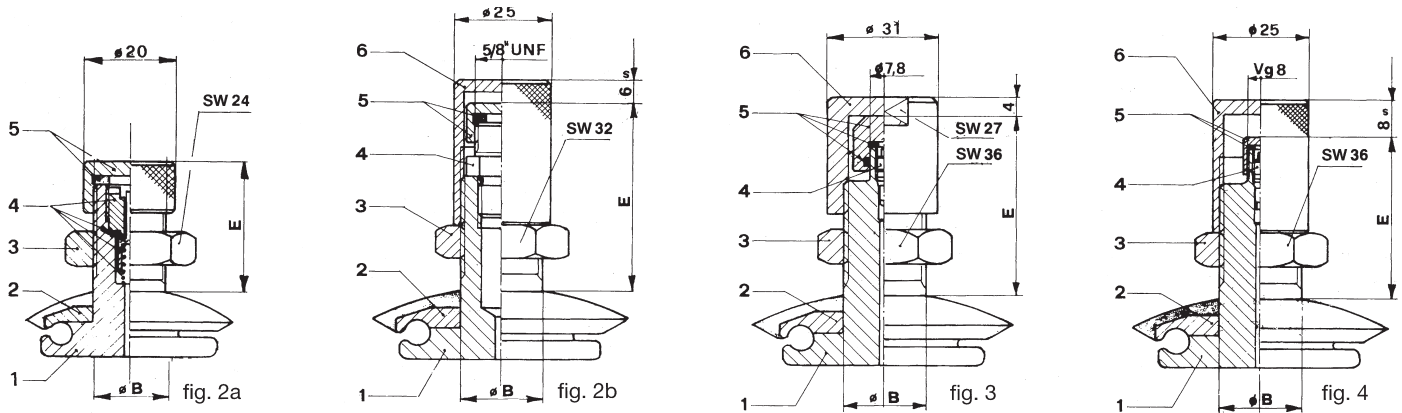
All dimensions in mm

Subject to change

17.4 Special gas valve

EPE bladders, in addition to their use in EPE accumulators, are perfectly interchangeable with many others brands available in the market.

In order to do that, gas valves (see below) are available with non-standard stem diameters ($\varnothing B$) and charge-connections.



17.4.1 Dimensions and spare codes for special valves

Nominal capacities (litres)	Fig.	Bladder with valve code	Dimensions		Weight Kg	Spare order codes						
			$\varnothing B$	E		²⁾ Gas valve assembly	Item 1 valve body	²⁾ Item 2 washer	Item 3 locknut	Item 4 fill valve	Item 5 valve cap	Item 6 protect. cap
0,7 - 1 - 1,5 2,5 - 3	2a	S...2	5/8" UNF	26	0,15	2015	10110	10105	10023	2070	10337	—
	3	S...3	7/8" UNF	46	0,38	2019	10118	10106	10108	2069	10201	10200
	4	S...4			0,3	2020	10119				10134	10135
4 - 5	2a	S...2	5/8" UNF	30	0,27	2041	10255	10257	10023	2070	10337	—
	3	S...3	7/8" UNF	49	0,48	2045	10258	10205	10108	2069	10201	10200
	4	S...4			0,4	2046	10259				10134	10135
10 - 12 - 15 20 - 25 - 35 55	2b	S...2	M22x1,5	57	0,75	2061	10332	10331	10109	2072	10337	10103
	3	S...3	7/8" UNF	52	0,83	2084	10329		10108	2069	10201	10200
	4	S...4			0,75	2085	10330				10134	10135

1) The code denotes components made in carbon steel and washer coated in standard nitrile rubber. For different executions, add the letter N for nickel plated steel and the letter X for stainless steel to the code number.

2) If the washer is coated with an elastomer different from the standard nitrile, the code number should be followed by both the letter denoting the steel and the letter denoting the elastomer.

17.5 Identification code

The letter sequence denoting the bladders is very simple and follows the first part code of EPE accumulator (the type without the letter A, size, bladder material), to which is added 0 when the valve is not required and 1 when the bladder has to be completed with valve (fig. 1a-1b-1c).

For bladders used as a replacement in another brand of accumulator, in addition to the size and the material of the bladder, should

be indicated also the exact type of valve. The valve can be selected from either the standard types (fig. 1a/1b/1c), and denoted by 1, or from the special valves, respectively denoted by 2 (fig. 2a-2b), 3 (fig. 3), 4 (fig. 4), 5 (see page 22) and 6 for other types to be specified. When uncertain, the best way is to indicate also the type and brand of the accumulator. The example given is of a standard version bladder, for a 25 litres accumulator, in Nitrile, complete with $\varnothing B$ valve = M50x1,5 in phosphated C40 steel.

<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">S</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">25</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">P</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">1</div> <div style="font-size: 2em;">-</div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> </div> </div>				
Bladder Type	Nominal capacities (Litres)	¹⁾ Bladder material	Gas valve	Gas valve material
S = Standard (fig. 1a) ST = Transfer (fig. 1b) SL = Liquid separator (fig. 1c)	0,2 - 0,7 - 1 1,5 - 2,5 - 3 4 - 5 - 10 12 - 15 - 20 25 - 35 - 55	P = Nitrile standard F = Nitrile for low temp. H = Nitrile for hydrocarbons K = Hydrogenated nitrile A = Nitrile for food-stuffs B = Butyl E = Ethylene-propylene N = Chloroprene (Neoprene) Y = Epichloridrin	0 = without valve 1 = with valve: standard $\varnothing B$ (fig. 1a, 1b, 1c) 2 = with valve: special $\varnothing B$ (fig. 2a, 2b) 3 = with valve: special $\varnothing B$ and filling connection (fig. 3) 4 = with valve: special $\varnothing B$ and filling connection (fig. 4) 5 = with valve for ASME U.S. (see page 22) 6 = others (on request)	- = Phosphated carbon steel N = Nickel coated carbon steel, thick 25 μm X = Stainless steel AISI 316