



ADDITIONAL BOTTLES type B

6.1



ADDITIONAL BOTTLES type ASS

6.2



ADDITIONAL BOTTLES type ASSA

6.3



ADDITIONAL BOTTLES type AB

6.4

6.1.1 TECHNICAL DATA

MAX OPERATING PRESSURE (PS): 360 bar

PRESSURE TEST (PT): 1.43 x PS

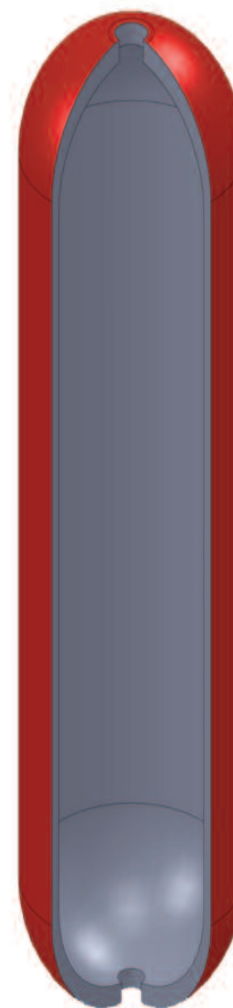
NOMINAL CAPACITIES: 52 - 75 litres

WORKING TEMPERATURE: -40 ÷ +150 °C

BODY MATERIAL: - carbon steel shell painted with rust inhibitor RAL 8012
- nickel coating 25 - 40 µ

FLUID PORT CONNECTION: 3/4" BSP ISO 228 and
1" BSP ISO 228

WEIGHT: see Table 6.1c



6.1a

6.1.2 DESCRIPTION

Additional bottles type B consist of a seamless cylindrical pressure vessel made of high-tensile steel. They have one connection of 3/4" BSP ISO 228 and one of 1" BSP ISO 228.

The additional bottles are used to take in and store nitrogen to increase the gas volume in the accumulator station (with bladder or piston accumulator). This means that smaller accumulators can be used for the same gas volume and costs can be reduced. EPE offers a wide selection of bottles type, such as forged "B" version, shell of bladder accumulator "ASS" and "ASSA" versions or body piston type "AB" version.

6.1.3 "B" ADDITIONAL CYLINDERS ADVANTAGES

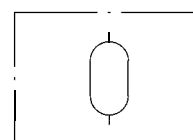
- compact
- simple construction
- quick, easy installation
- low cost

6.1.4 EUROPE MARKET

All hydraulic cylinders are pressure vessels and are subject to the national regulations and directives valid at the place of installation. For additional bottles type B, every shipping batch is complete of a conformity declaration and instructions of use and maintenance and/or all documents requested.

All vessel categories (see Table 6.1c) must be protected by means of a pressure relief valve in accordance with Directive 97/23/EC.

6.1.6 HYDRAULIC SYMBOL



6.1b

6.1.5 ACCESSORIES

For support equipment, see section 7

For gas side's safety equipment, see section 8

For pre-loading and charging set, see section 11

For other components, see section 12

6.1.7 ORDER CODE

1	2	3	4	5	6	7	8	9	10
B	52	P	360	C	G	6	G	5	- 8

1	Series
	Seamless additional bottle = B

2	Nominal capacity (litres)
	52 = 52 75 = 75

3	Seals
	Without

4	Max working pressure (bar)
	360 = 360

5	Body material
	Carbon steel = C Nickel coated carbon steel 25 µ = N Nickel coated carbon steel 40 µ = M

6	Bottom connection
	BSP ISO 228 = G

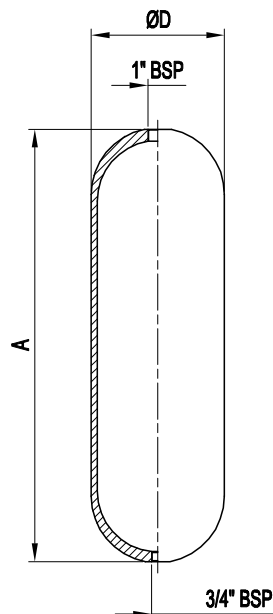
10	Test and certification
	Factory testing = 0 TR (Russia) = 1 Australian Standard = 2 ML (China) = 3 RINA = 4 PED97/23/EC (for capacity greater than 1 l) = 8 ATEX 94/9EC = 9 DNV = 10 RTN Passport (Ukraine) = 11 Algeria passport = 12 Standard regulation (NR13) (Brazil) = 13 Tunisia passport = 14

9	Top connection dimension
	1" = 6

8	Top connection
	BSP ISO 228 = G

7	Bottom connection dimension
	3/4" = 5

6.1.8 DIMENSIONS



Additional bottle type in carbon steel	Nominal gas volume litres	Effective gas volume litres	Working pressure bar	Ped category for the liquids of group 2	Maximum differential pressure bar	A mm	ØD mm	Dry weight kg
B52	52	50	360	IV	100	1722± 10	220	93,5
B75	75	75	360	IV	100	2520± 10	220	135

6.1c

* The maximum differential pressure is the maximum allowable difference between the maximum pressure and the minimum working pressure (P2-P1) to have an infinite life cycle of the accumulator (greater than 2,000,000 cycles).

6.1.9 COMMISSIONING AND MAINTENANCE

Delivery condition

The additional bottles type B are shipped on pallets or wooden boxes upon request. Unless otherwise required, certificates and documentation are provided together with the bottles.

Handling

The original packaging is suitable for handling and storage. Where necessary, you should use suitable lifting equipment to support the weight of the bottles. However protect from impact the packaging and handle it with care.

Storage

During storage in the warehouse, leave the product in its original packaging, keeping it away from heat sources and naked flames. The storage temperature should be between +10 and +40°C.

Marking of the cylinder body

With reference to the PED 97/23/EC classification, Article 3, Paragraph 3 and / or risk categories I or IV depending on to the volume and maximum working pressure, the cylinder indicates the following data:

- logo and country of the manufacturer
- month / year of production
- product code
- serial number
- maximum PS pressure and PT test pressure in bar
- min. and max. TS working temperature in Celsius
- volume V in litres
- group of fluids allowed
- CE marking with the identification number of the notified body

It is strictly forbidden to:

- weld, rivet or screw any item of the cylinder
- engrave or permanently stamp the surfaces of the cylinder shell and / or carry out other operations that could affect or change the mechanical properties of the cylinder
- use the cylinder as a structural element: it should not be subjected to stresses or loads
- change the data of the nameplate without the permission of the manufacturer
- use a (dangerous) fluid of Group 1 with equipment designed and manufactured for fluids of Group 2.

Installation

Before installation, you must perform a visual check to verify that the bottles has not suffered any damage during shipping / handling.

Verify that the requested type matches with what stamped on the nameplate.

We recommend using the additional bottles connected to the accumulator with a suitable safety valve (see Chapter 8).

This device provides the user and equipment protection against damage caused by pressure peaks.

The additional bottles type B may be installed in any position from horizontal to vertical (preferably with the connections vertically) and the data must be visible.

Proceed to the assembly so that no abnormal force affects the pipes connected directly or indirectly to the additional bottles, so we recommend

the use of supporting components and also fastening (please see Chapter 7) to avoid the transmission of vibrations.

Make sure that the cylinder is connected to the circuit through suitable connection devices.

Check that the max. allowed bottles pressure is equal to or greater than that of the circuit and that the temperature during operation is maintained within the range expected.

Make sure the fluid does not contain contaminants.

Maintenance

- Periodically check the pre-charge pressure of the system: after the commissioning, check after 2-3 weeks of operation and if there were no leaks, repeat the operation after 3 months; if the pressure at the same temperature was stable, repeat the test yearly. For heavyduty applications, check the pre-charge every 6 months.
- Periodically (yearly) carry out a visual inspection of the bottle in order to detect any early signs of deterioration such as corrosion, deformation, etc.
- Comply with the requirements of the regulations concerning the verification of the functionality of the equipment according to the country of installation of the bottle.

Disassembly

If for failure, scheduled check or retest it is necessary to remove the additional bottle from the system, prior to removal, completely discharge the pressure within the circuit.

Demolition and recycling of the additional cylinder

Before demolition or recycling of the additional cylinder, you should always discharge the internal pressure.

If needed, proceed decontaminating in relation to the gas/fluid used prior to demolition.

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In The Spirit Of Continuous Improvement, Our Products May Be Changed.

6.2.1 TECHNICAL DATA

MAX OPERATING PRESSURE (PS): 360 bar

PRESSURE TEST (PT): 1.43 x PS

NOMINAL CAPACITIES: 3 - 5 - 10 - 15 - 20 - 25 - 35 - 55 litres

WORKING TEMPERATURE: -40 ÷ +150 °C

BODY MATERIAL: - carbon steel shell painted with rust inhibitor RAL 8012
 - nickel coating 25 - 40 µ
 - internal and external coating with RILSAN th. 0.6 mm

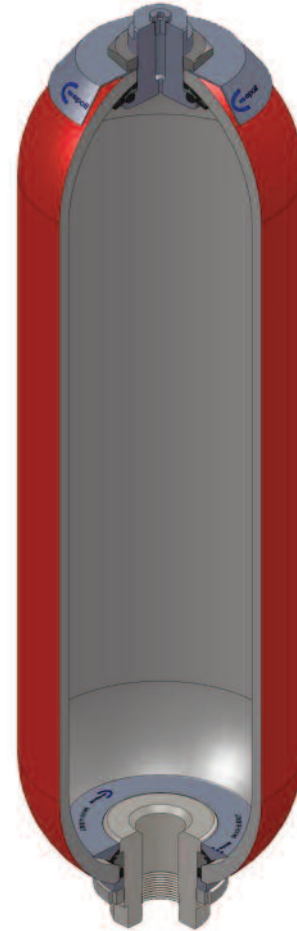
VALVES MATERIAL: - phosphated or
 - galvanized carbon steel in compliance with Directive 2002/95/EC (RoHS) to resist to corrosion
 - stainless steel AISI 316L
 - nickel coating 25-40 µ

SEALS MATERIAL: - **P** = Nitrile rubber (NBR)
 - **F** = Low temp. nitrile rubber
 - **H** = Nitrile for hydrocarbons
 - **K** = Hydrogenated nitrile (HNBR)
 - **B** = Butyl (IIR)
 - **E** = Ethylene-propylene (EPDM)
 - **N** = Chloroprene (Neoprene)
 - **Y** = Epichlorohydrin (ECO)
 - **V** = Fluorocarbon (FPM)

See Table 6.2c and/or Chapter 1.5

CONNECTIONS: see Table 6.2db - 6.2dc - 6.2df

WEIGHT: see Table 6.2db- 6.2df



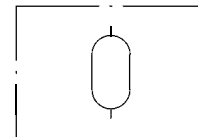
6.2a

6.2.2 DESCRIPTION

Additional bottles type ASS consist of a seamless cylindrical pressure vessel made of high-tensile steel.

They are derived from the same shells of the AS bladder accumulator. The additional bottles are used to take in and store nitrogen to increase the gas volume in the accumulator station (with bladder or piston accumulator). This means that smaller accumulators can be used for the same gas volume and costs can be reduced. EPE offers a wide selection of bottles type, such as forged "B" version, shell of bladder accumulator "ASS" and "ASSA" versions or body piston type "AB" version.

6.2.4 HYDRAULIC SYMBOL



6.2b

6.2.3 "ASS" ADDITIONAL CYLINDERS ADVANTAGES

- compact
- simple construction
- wide range of small-medium capacity
- works well on water, low lubricity fluids
- quick, easy installation

6.2.5 SEALS-TEMPERATURE-LIQUID COMPATIBILITY

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

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).
H	Nitrile for hydrocarbons	NBR	-10 ÷ +90	Regular and premium grade slightly aromatic gasoline (and all the liquids for standard nitrile).
K	Hydrogenated nitrile	HNBR	-30 ÷ +130	The same as with standard nitrile but with excellent performance at high and low temperatures.
B	Butyl	IIR	-30 ÷ +100	Hot water up to 100°C, glycol-based brake fluids, many acids and bases, salt solutions, polar solvents such as alcohols, ketones and esters, polyglycol-based hydraulic fluids (HFC fluids) and bases of esters of phosphoric acid (HFD-R fluids), silicone oils and greases, Skydol 500 and 7000, resistance to ozone, aging and weathering.
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), Skydol 500 and 7000, resistance to ozone, aging and weathering.
N	Chloroprene (Neoprene)	CR	-30 ÷ +100	Mineral oils of paraffin, silicone oils and greases, water and aqueous solutions, refrigerants (ammonia, carbon dioxide, Freon), naphthenic mineral oils, low molecular aliphatic hydrocarbons (propane, butane, fuel), brake fluids based on glycol, better resistance to ozone, weathering and aging compared to NBR rubber.
Y	Epichloridrin	ECO	-30 ÷ +110	Mineral oils and greases, aliphatic hydrocarbons (propane, butane and gasoline), silicone oils and greases, water at room temperature, 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.

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

6.2c

6.2.6 ORDER CODE

1	2	3	4	5	6	7	8	9
ASS	25	P	360	C	G	5	VT	- 8

1	Series
	Additional bottle = ASS

2	Nominal capacity (litres)
	3 = 3
	5 = 5
	10 = 10
	15 = 15
	20 = 20
	25 = 25
	35 = 35
	52 = 52

3	Seals material material
	Nitrile rubber (NBR) = P
	Nitrile for low temp. = F
	Nitril for hydrocarbons = H
	Hydrogenated nitrile (HNBR) = K
	Butyl (IIR) = B
	Ethylene-propylene (EPDM) = E
	Chloroprene (Neoprene) = N
	Epichlorohydrin (ECO) = Y
	Fluorocarbon (FPM) = V

4	Max working pressure (PS)
Capacity litres	Carbon steel
3 ÷ 55	360
	210 only for the version with connection L

5	Body material
	Carbon steel = C
	Nickel coated carbon steel 25 μ = N
	Nickel coated carbon steel 40 μ = M
	Rilsan coating = V

6	Bottom connection
	BSP ISO 228 (std) = G
	adapter for flange SAE 3000 Psi = L
	adapter for flange SAE 6000 Psi = H

9	Test and certification
	Factory testing = 0
	TR (Russia) = 1
	Australian Standard = 2
	ML (China) = 3
	RINA = 4
	PED97/23/EC (for capacity greater than 1 l) = 8
	ATEX 94/9EC = 9
	DNV = 10
	RTN Passport (Ukraine) = 11
	Algeria passport = 12
	Standard regulation (NR13) (Brazil) = 13
	Tunisia passport = 14

8	Top connection
	Thread hole M12x1.5 plugged = VT
	1/4" BSP ISO 228 = G2
	1/2" BSP ISO 228 = G4
	3/4" BSP ISO 228 = G5
	1" BSP ISO 228 = G6
	1 1/4" BSP ISO 228 = G7
	1 1/2" BSP ISO 228 = G8

7	Bottom connection dimension
	For the type of connection:
	G 3/4" BSP ISO 228 = 5
	1" BSP ISO 228 = 6
	1 1/4" BSP ISO 228 = 7
	1 1/2" BSP ISO 228 = 8
	L (3÷5 l) 1" 1/4 SAE3000 = 7
	(10÷55 l) 1" 1/2 SAE 3000 = 8
	2" SAE 3000 = 9
	H (3÷5 l) 1" 1/4 SAE6000 = 7
	(10÷55 l) 1" 1/2 SAE 6000 = 8
	2" SAE 6000 = 9
	Special variants upon request

6.2.7 DIMENSIONS

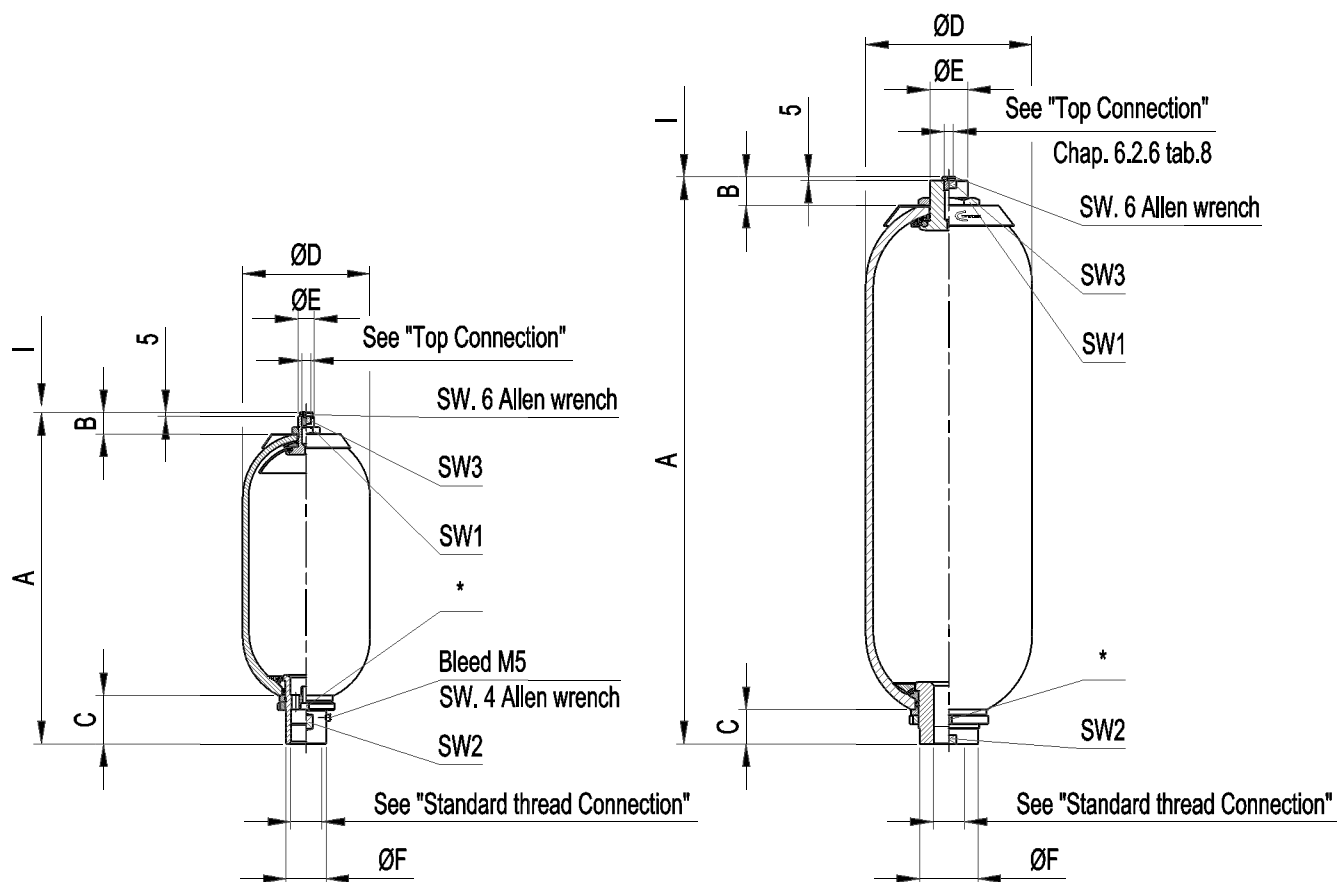


Fig. I

Fig. II

6.2da

Acc. type ASS in carbon steel	Nominal gas volume litres	Working pressure bar	Ped cat. fluids of group 2 AS	Fig.	A mm	B mm	C mm	ØD mm	ØE mm	ØF mm	I mm	SW 1 mm	SW 2 mm	SW 3 mm	Acc. dry weight kg
ASS 3	3	360	III	I	534 ± 8	28	65	114	M22x1,5	53	140	32	50	18	8
ASS 5	5	360	III	I	438 ± 10	28	65	168	M22x1,5	53	140	32	50	18	13
ASS 10	10	360	IV	II	500 ± 10	35	55	220	M50x1,5	77	140	70	70	41	31
ASS 15	15	360	IV	II	650 ± 10	35	55	220	M50x1,5	77	140	70	70	41	41
ASS 20	20	360	IV	II	810 ± 10	35	55	220	M50x1,5	77	140	70	70	41	45
ASS 25	25	360	IV	II	975 ± 15	35	55	220	M50x1,5	77	140	70	70	41	56
ASS 35	35	360	IV	II	1325 ± 15	35	55	220	M50x1,5	77	140	70	70	41	74
ASS 55	55	360	IV	II	1835 ± 15	35	55	220	M50x1,5	77	140	70	70	41	102

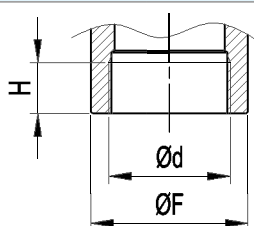
* see chapter 6.2.11 table 6.2dh

6.2db

- The maximum differential pressure is the maximum allowable difference between the maximum pressure and the minimum working pressure (P2-P1) to have an infinitelife cycle of the accumulator (greater than 2,000,000 cycles).

- Flow rate measured using mineral oil with viscosity of 36 cSt at 50°C and ΔP = 5 bar

6.2.7.1 STANDARD THREAD CONNECTIONS

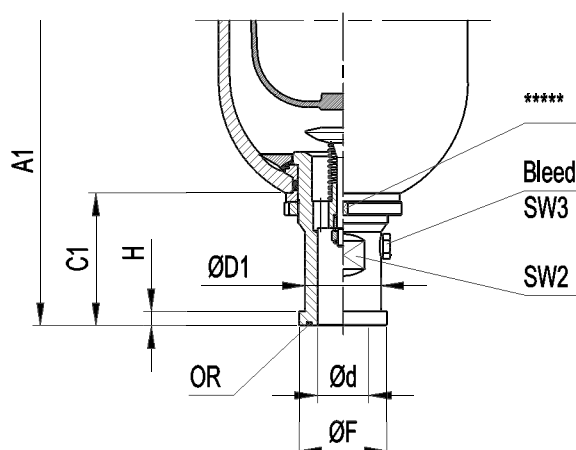
Dimensions	Connection Type	Accumulator type	Complete spare valve order code	Ød	ØD mm	ØF mm	H mm
	G	ASS 3	V 2250-G7-***	1" 1/4 BSP	-	53	25
		ASS 5	V 2253-G7-***				
		ASS 10 + 55	V 2267-G5-***	3/4" BSP	-	77	20
			V 2267-G6-***	1" BSP	-	77	22
			V 2267-G7-***	1" 1/4 BSP	-	77	25
			V 2267-G8-***	1" 1/2 BSP	-	77	25

* Gasket material

** Components material

6.2dc

6.2.7.2 ADAPTER FOR FLANGE SAE 3000/6000 PSI (L/H)



6.2de

Acc. type ASS in carbon steel	Dim.	A1 mm	C1 mm	SW2 mm	SW3 mm	Bleed	Ød mm	SAE 3000 (L)				SAE6000 (H)				OR	Acc. dry weight kg
								Spare valve order code	ØD1 mm	ØF mm	H mm	Spare valve order code	ØD1 mm	ØF mm	H mm		
ASS 3	1"	589 ± 8	100	38	4***	M5	-	-	-	-	-	V 2025-H6-***	38	47,6	9,5	0010R4131-*	11
	1" 1/4	578 ± 8	89				31	V 2025-L7-***	43	50,8	8	V 2025-H7-***	44	53,3	10,3		
ASS 5	1"	493 ± 10	100	38	4***	M5	-	-	-	-	-	V 2044-H6-***	38	47,6	9,5	0010R4131-*	15
	1" 1/4	482 ± 10	89				31	V 2044-L7-***	43	50,8	8	V 2044-H7-***	44	53,3	10,3		
ASS 10	1" 1/2	583 ± 10	115	42	19****	1/4"	32	V 2064-L8-***	50	60,3	8	V 2064-H8-***	51	63,5	12,5	0010R4187-*	33
	2"			55		BSP	45	V 2064-L9-***	62	71,5	9,5	V 2064-H9-***	67	77,6		0010R4225-*	
ASS 15	1" 1/2	733 ± 10	115	42	19****	1/4"	32	V 2064-L8-***	50	60,3	8	V 2064-H8-***	51	63,5	12,5	0010R4187-*	43
	2"			55		BSP	45	V 2064-L9-***	62	71,5	9,5	V 2064-H9-***	67	77,6		0010R4225-*	
ASS 20	1" 1/2	893 ± 10	115	42	19****	1/4"	32	V 2064-L8-***	50	60,3	8	V 2064-H8-***	51	63,5	12,5	0010R4187-*	48
	2"			55		BSP	45	V 2064-L9-***	62	71,5	9,5	V 2064-H9-***	67	77,6		0010R4225-*	
ASS 25	1" 1/2	1058 ± 15	115	42	19****	1/4"	32	V 2064-L8-***	50	60,3	8	V 2064-H8-***	51	63,5	12,5	0010R4187-*	59
	2"			55		BSP	45	V 2064-L9-***	62	71,5	9,5	V 2064-H9-***	67	77,6		0010R4225-*	
ASS 35	1" 1/2	1408 ± 15	115	42	19****	1/4"	32	V 2064-L8-***	50	60,3	8	V 2064-H8-***	51	63,5	12,5	0010R4187-*	78
	2"			55		BSP	45	V 2064-L9-***	62	71,5	9,5	V 2064-H9-***	67	77,6		0010R4225-*	
ASS 55	1" 1/2	1918 ± 15	115	42	19****	1/4"	32	V 2064-L8-***	50	60,3	8	V 2064-H8-***	51	63,5	12,5	0010R4187-*	108
	2"			55		BSP	45	V 2064-L9-***	62	71,5	9,5	V 2064-H9-***	67	77,6		0010R4225-*	

* Gasket material

** Components material

*** Allen wrench

**** Ex. Wrench

***** see chapter 6.2.11 table 6.2dh

6.2df

6.2.8 SPARE PARTS CODE (STANDARD VERSION)

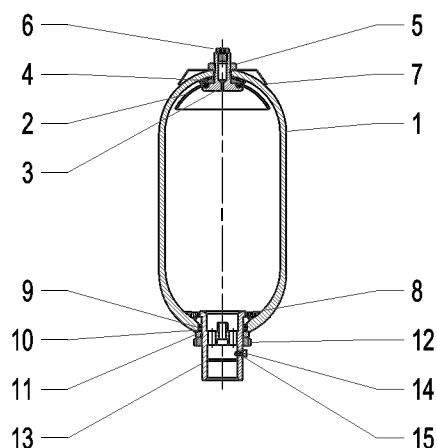


Fig. I

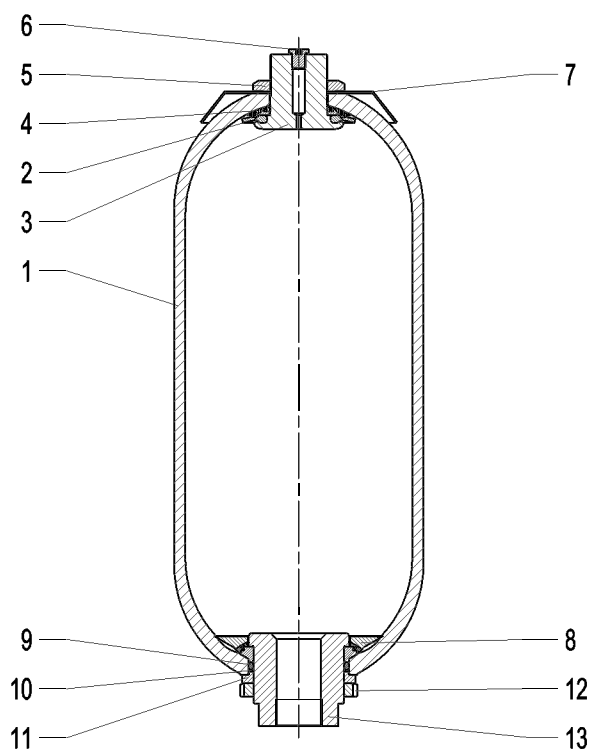


Fig. II

6.2dg

Item	Description	Q.ty	Type		
			ASS 3 (Fig. I)	ASS 5 (Fig. I)	ASS 10 + 55 (Fig. II)
1	Accumulator shell	1	Not supplied as spare part		
2	Seal gas side	1	B11250 - *	B11252 - *	B10052 - *
3	Gas valve body	1	B10107 - **	B10202 - **	B10333 - **
4	Rubber-coated washer	1	B10106 - ** / *	B10205 - ** / *	B10334 - ** / *
5	Gas valve looknut	1	B10109 - **		B10302 - **
6	Plug	1	B10043 - **		
7	Name plate	1	D10300B-A	D10300C-A	D10300D-A
8	Retaining ring	1	B10146 - ** / *	B10222 - ** / *	B10317 - ** / *
9	"O" ring	1	0010R0159 - *	0010R6212 - *	0010R0181 - *
10	Supporting ring	1	B10150-T	B10227-T	B10320-T
11	Space ring	1	B10223 - **		B10319 - **
12	Fluid port ring nut	1	B10217 - **		B10321 - **
13	Fluid port body	1	B10144 - *** - **		B10311 - *** - **
14	Bleed screw ****	1	B10128 - **		-
15	Seal ring ****	1	B10129-R		-
Standard gas valve ass. (parts 2 + 6)			V 2033 - ** / *	V 2049 - ** / *	V 2270 - ** / *
Standard fluid port ass. (parts 8 + 15)			V 2250 - *** - ** / *	V 2253 - *** - ** / *	V 2267 - *** - ** / *
Gasket sets			B2031-1- [*] { B11250- [*] 0010R0159- [*] B10150-T	B2050-1- [*] { B11252- [*] 0010R6212- [*] B10227-T	B2080-1- [*] { B10052- [*] 0010R0181- [*] B10320-T

* Gasket material

** Component material

*** See chapter 6.2.6 table 8 - 9

6.2dh

**** Only for Fig. I

6.2.9 EUROPE MARKET

All hydraulic additional bottles are pressure vessels and are subject to the national regulations and directives valid at the place of installation. For additional cylinders type ASS, every shipping batch is complete of a conformity declaration and instructions of use and. All vessel categories (see Table 6.2d) must be protected by means of a pressure relief valve in accordance with Directive 97/23/EC.

6.2.10 ACCESSORIES

For support equipment, see section 7
For gas side's safety equipment, see section 8
For pre-loading and charging set, see section 11
For other components, see section 12

6.2.11 COMMISSIONING AND MAINTENANCE

Delivery condition.

Depending on the size and quantity ordered, the additional bottles are shipped in cartons or in cartons on pallets, or wooden boxes upon request. Unless otherwise required, certificates and documentation are provided together with the bottles.

Handling

The original packaging is suitable for handling and storage. Where necessary, you should use suitable lifting equipment to support the weight of the bottles. However protect from impact the packaging and handle it with care.

Storage

During storage in the warehouse, leave the product in its original packaging, keeping it away from heat sources and naked flames. The storage temperature should be between +10 and +40°C. After six years of storage, it is essential to proceed with the replacement of all elastomeric parts before the commissioning.

Marking on the nameplate of the additional cylinder.

With reference to the PED 97/23/EC classification, Article 3, Paragraph 3 and / or risk categories I or IV depending on volume and maximum working pressure, the cylinder indicates the following data:

- logo, name and country of the manufacturer
- month / year of production
- product code
- serial number
- maximum PS pressure and PT test pressure in bar
- min. and max. TS working temperature in Celsius
- volume V in litres
- group of fluids allowed
- CE marking (by category I ÷ IV) with the identification number of the notified body

It is strictly forbidden to:

- weld, rivet, bolt or screw any item of the cylinder shell
- engrave or permanently stamp the surfaces of the cylinder shell and / or carry out other operations that could affect or change the mechanical properties of the cylinder
- use the cylinder as a structural element: it should not be subjected to stresses or loads

- change the data of the nameplate and / or the cylinder without the permission of the manufacturer
- use a (dangerous) fluid of Group 1 with equipment designed and manufactured for fluids of Group 2.

Installation

Before installation, you must perform a visual check to verify that the bottles has not suffered any damage during shipping / handling. Verify that the requested type matches with what stamped on the nameplate.

We recommend using the additional bottles connected to the accumulator with a suitable safety valve (see Chapter 8).

This device provides user and equipment protection against possible damages due to pressure peaks.

The additional bottles type ASS may be installed in any position from horizontal to vertical (preferably with the connections vertically) and the nameplate must be visible.

Proceed to the assembly so that no abnormal force affects the pipes connected directly or indirectly to the additional bottles, so we recommend the use of supporting components and also fastening (please see Chapter 7) to avoid the transmission of vibrations.

Make sure that the bottle is connected to the hydraulic circuit through suitable connection devices.

Make sure the gas is compatible with the elastomer of the seals.

Check that the max. allowed bottle pressure is equal to or greater than that of the hydraulic circuit and that the temperature during operation is maintained within the range expected.

Make sure the fluid does not contain contaminants.

Maintenance

- Periodically check the pre-charge pressure of the system: after the commissioning, check after 2-3 weeks of operation and if there were no leaks, repeat the operation after 3 months; if the pressure at the same temperature was stable, repeat the test yearly. For heavy-duty applications, check the pre-charge every 6 months.
- Periodically (yearly) carry out a visual inspection of the bottle in order to detect any early signs of deterioration such as corrosion, deformation, etc.
- Comply with the requirements of the regulations concerning the verification of the functionality of the equipment according to the country of installation of the bottle.

Disassembly

If for failure, scheduled check or retest it is necessary to remove the additional bottle from the system, prior to removal, completely discharge the pressure within the circuit.

All additional EPE bottles of the ASS series can be repaired.

Repair

It can consist in replacing the seals and/or parts of the valves.

For reasons of functionality and security, it is recommended to use only original spare parts.

Demolition and recycling of the additional cylinder

Before demolition or recycling of the additional bottle, you should always discharge the internal pressure.

If needed, proceed decontaminating in relation to the gas/fluid used prior to demolition.

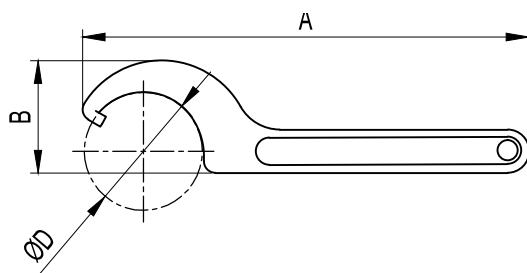
6.2.12 SPANNER WRENCH

Fits all standard size additional bottle type ASS, it is used to remove or install lock nut on fluid port essembly.

3÷5 lt code 2506/68

10÷55 lt code 2506/105

Dimension



CODE	A	B	ØD	For Accumulator
B2506/58	241	45	58	0,7 ÷ 1,5
B2506/68	241	43	68	3 ÷ 5
B2506/105	336	82	105	10 ÷ 55

6.2di

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In the spirit of continuous improvement, our products may be changed.

6.3.1 TECHNICAL DATA

MAX OPERATING PRESSURE (PS): 4000 PSI

PRESSURE TEST (PT): 1.5 x PS

NOMINAL CAPACITIES: 1/4 - 1 - 2.5 - 5 - 10 - 15 gallons

WORKING TEMPERATURE: -40 ÷ +200 °F (-40 ÷ +93 °C)

BODY MATERIAL:

- carbon steel shell (SA 372 grade E class 70)
- painted with rust inhibitor RAL 8012
- nickel coating 25 - 40 µ
- internal and external coating with RILSAN th. 0.6 mm

VALVES MATERIAL:-

- phosphated or
- galvanized carbon steel in compliance with Directive 2002/95/EC (RoHS) to resist to corrosion
- stainless steel AISI 316L
- nickel coating 25-40 µ

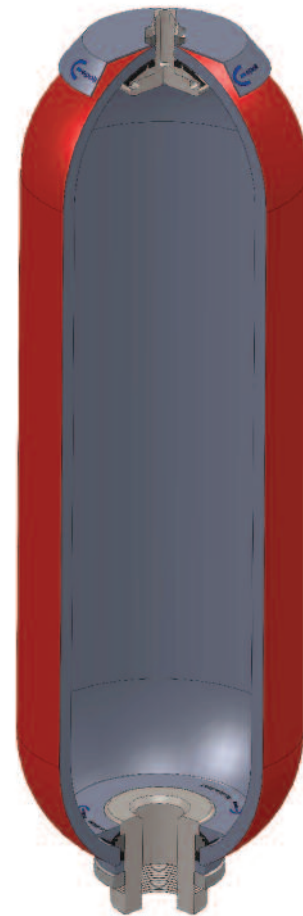
SEALS MATERIAL:-

- **P** = Nitrile rubber (NBR)
- **F** = Low temp. nitrile rubber
- **H** = Nitrile for hydrocarbons
- **K** = Hydrogenated nitrile (HNBR)
- **B** = Butyl (IIR)
- **E** = Ethylene-propylene (EPDM)
- **N** = Chloroprene (Neoprene)
- **Y** = Epichlorohydrin (ECO)
- **V** = Fluorocarbon (FPM)

See Table 3.1c and/or Chapter 6.2.5

CONNECTIONS: see Table 6.2db - 6.2dc - 6.2df

WEIGHT: see Table 6.2db - 6.2df



6.3a

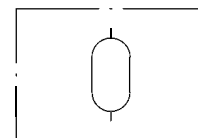
6.3.2 DESCRIPTION

Additional bottles type ASSA consist of a seamless cylindrical pressure vessel made of high-tensile steel.

They are derived from the same shells of the bladder accumulator type ASSA.

The additional bottles are used to take in and store nitrogen to increase the gas volume in the accumulator station (with bladder or piston accumulator). This means that smaller accumulators can be used for the same gas volume and costs can be reduced. EPE offers a wide selection of bottles type, such as forged "B" version, shell of bladder accumulator "ASS" and "ASSA" versions or body piston type "AB" version.

6.3.4 HYDRAULIC SYMBOL



6.3b

6.3.3 "ASSA" ADDITIONAL CYLINDERS ADVANTAGES

- compact
- simple construction
- wide range of small-medium capacity
- works well on water, low lubricity fluids
- quick, easy installation

6.3.5 SEALS-TEMPERATURE-LIQUID COMPATIBILITY

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

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).
H	Nitrile for hydrocarbons	NBR	-10 ÷ +90	Regular and premium grade slightly aromatic gasoline (and all the liquids for standard nitrile).
K	Hydrogenated nitrile	HNBR	-30 ÷ +130	The same as with standard nitrile but with excellent performance at high and low temperatures.
B	Butyl	IIR	-30 ÷ +100	Hot water up to 100°C, glycol-based brake fluids, many acids and bases, salt solutions, polar solvents such as alcohols, ketones and esters, polyglycol-based hydraulic fluids (HFC fluids) and bases of esters of phosphoric acid (HFD-R fluids), silicone oils and greases, Skydol 500 and 7000, resistance to ozone, aging and weathering.
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), Skydol 500 and 7000, resistance to ozone, aging and weathering.
N	Chloroprene (Neoprene)	CR	-30 ÷ +100	Mineral oils of paraffin, silicone oils and greases, water and aqueous solutions, refrigerants (ammonia, carbon dioxide, Freon), naphthenic mineral oils, low molecular aliphatic hydrocarbons (propane, butane, fuel), brake fluids based on glycol, better resistance to ozone, weathering and aging compared to NBR rubber.
Y	Epichloridrin	ECO	-30 ÷ +110	Mineral oils and greases, aliphatic hydrocarbons (propane, butane and gasoline), silicone oils and greases, water at room temperature, 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.

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

6.3c

6.3.6 ORDER CODE

1	2	3	4	5	6	7	8	9
ASSA	5	P	4000	C	H	8	VT	- 7

1 Series

Additional bottle with ASME U-Stamp = **ASSA**

2 Nominal capacity (gallons)

1/4 (0.95 l) =	1/4
1 (3.78 l) =	1
2.5 (9.46 l) =	2.5
5 (18.93 l) =	5
10 (37.85 l) =	10
15 (56.78 l) =	15

3 Seals material material

Nitrile rubber (NBR)	=	P
Nitrile for low temp.	=	F
Nitril for hydrocarbons	=	H
Hydrogenated nitrile (HNBR)	=	K
Butyl (IIR)	=	B
Ethylene-propylene (EPDM)	=	E
Chloroprene (Neoprene)	=	N
Epichlorohydrin (ECO)	=	Y
Fluorocarbon (FPM)	=	V

4 Max working pressure (PS)

4000 PSI (275 bar) = **4000**
(3000 only for the version with connection L)

5 Body material

Carbon steel	=	C
Nickel coated carbon steel 25 μ	=	N
Nickel coated carbon steel 40 μ	=	M
Rilsan coating	=	V

9 Test and certification

ASME U-stamp
(ASME VIII div.1 appendix 22) = **7**

8 Top connection

Thread hole M12x1.5 plugged	=	VT
1/4" BSP ISO 228	=	G2
1/2" BSP ISO 228	=	G4
3/4" BSP ISO 228	=	G5
1" BSP ISO 228	=	G6
1"1/4 BSP ISO 228	=	G7
1"1/2 BSP ISO 228	=	G8

7 Bottom connection dimension

For the type of connection:		
G 3/4" BSP ISO 228	=	5
1" BSP ISO 228	=	6
1"1/4 BSP ISO 228	=	7
1"1/2 BSP ISO 228	=	8
L (3÷5 l) 1" 1/4 SAE3000	=	7
(10÷55 l) 1" 1/2 SAE 3000	=	8
2" SAE 3000	=	9
H (3÷5 l) 1" 1/4 SAE6000	=	7
(10÷55 l) 1" 1/2 SAE 6000	=	8
2" SAE 6000	=	9
Special variants upon request		

6 Bottom connection

BSP ISO 228 (std)	=	G
adapter for flange SAE 3000 Psi	=	L
adapter for flange SAE 6000 Psi	=	H

6.3.7 DIMENSIONS

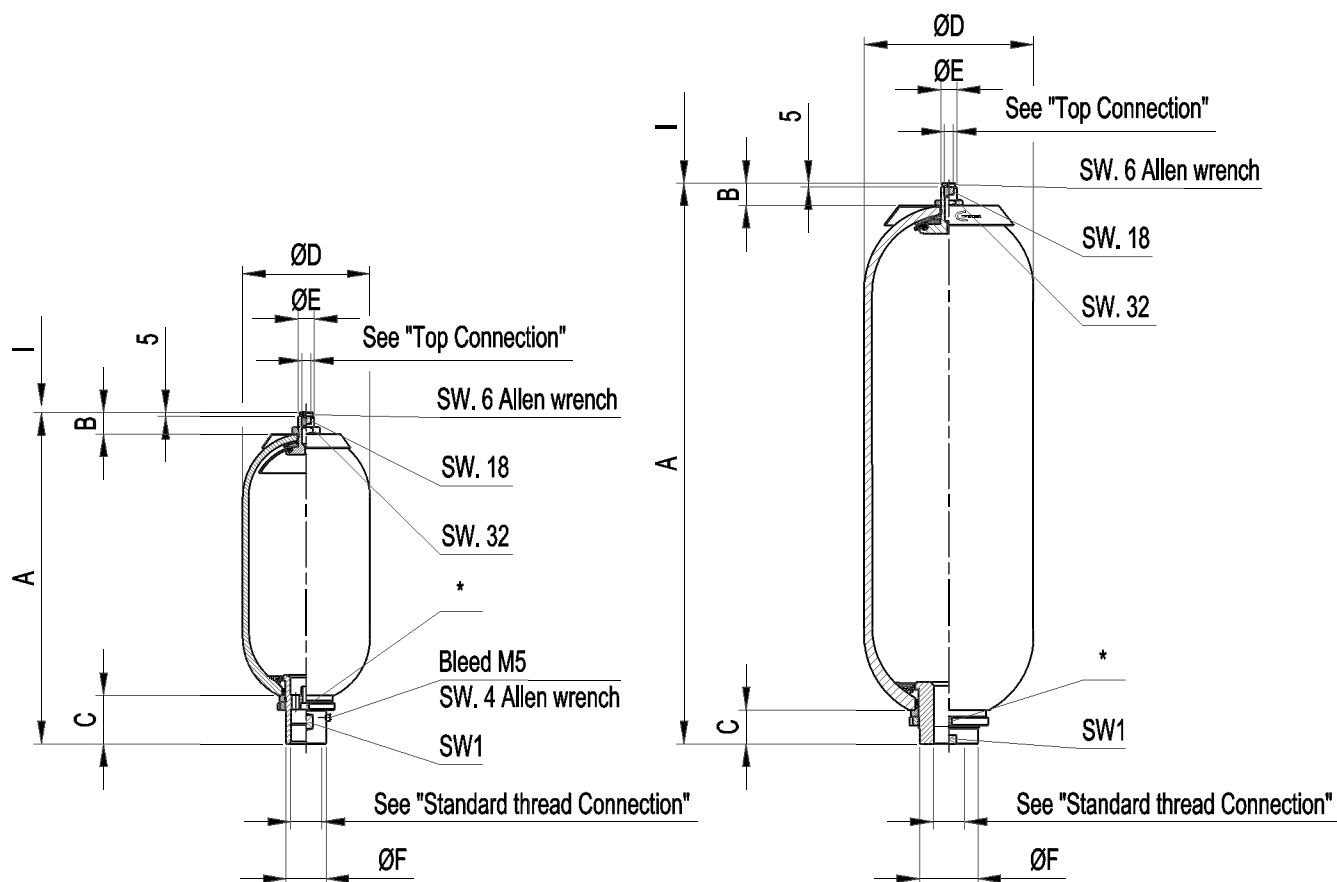


Fig. I

Fig. II

6.3da

Acc. type ASSA in carbon steel	Nominal gas volume gallons	Effective gas volume litres	Working pressure bar	Max.diff. pressure P2-P1 psi	Flow rate l/min	Max.comp. ratio P0/P2	Fig.	A mm	B mm	C mm	Ø D mm	Ø E mm	ØF mm	I mm	SW 1 mm	Acc. dry weight kg
ASSA 1/4	1/4	1	4000	1450	300	1:4	I	261 ± 5	15	52	114	M22x1.5	36	140	32	11
ASSA 1	1	3,5	4000	1450	600	1:4	I	364 ± 10	20	65	168	M22x1.5	53	140	50	21
ASSA 2,5	2,5	9,1	4000	1450	1000	1:4	II	471 ± 10	30	45	223	M22x1.5	77	140	70	35
ASSA 5	5	18,2	4000	1450	1000	1:4	II	775 ± 10	30	45	223	M22x1.5	77	140	70	55
ASSA 10	10	33,5	4000	1450	1000	1:4	II	1309 ± 10	30	45	223	M22x1.5	77	140	70	91
ASSA 15	15	50	4000	1450	1000	1:4	II	1830 ± 10	30	45	223	M22x1.5	77	140	70	127

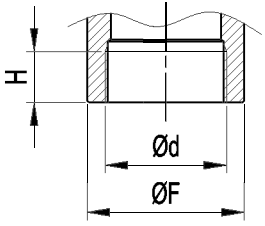
* see chapter 6.3.11 table 6.3dh

6.3db

- The maximum differential pressure is the maximum allowable difference between the maximum pressure and the minimum working pressure (P2-P1) to have an infinitelife cycle of the accumulator (greater than 2,000,000 cycles).

- Flow rate measured using mineral oil with viscosity of 36 cSt at 50°C and ΔP = 5 bar

6.3.7.1 STANDARD THREAD CONNECTIONS

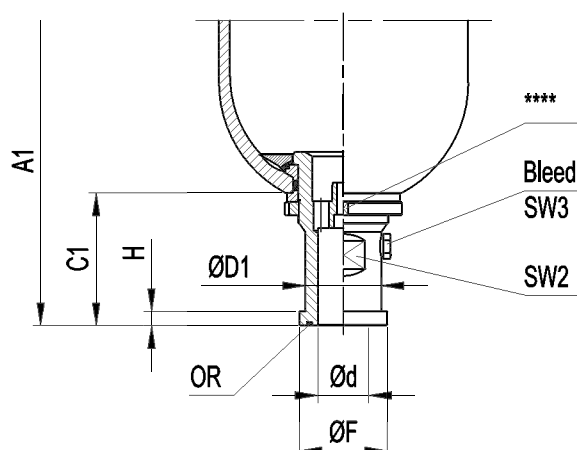
Dimensions	Connection Type	Accumulator type	Complete spare valve order code	Ød	ØD mm	ØF mm	H mm
	G	ASSA 1/4"	V 2250-A5-*/*	1" 1/4 BSP	-	53	25
		ASSA 1	V 2253-A7-*/*				
		ASSA 2,5 + 15	V 2267-G5-*/*	3/4" BSP	-	77	20
			V 2267-G6-*/*	1" BSP	-	77	22
			V 2267-G7-*/*	1" 1/4 BSP	-	77	25
			V 2267-G8-*/*	1" 1/2 BSP	-	77	25

* Gasket material

** Components material

6.3dc

6.2.3.2 ADAPTER FOR FLANGE SAE 3000/6000 PSI (L/H)



6.3de

Acc. type ASSA in carbon steel	Dim.	A1 mm	C1 mm	SW2 mm	SW3 mm	Bleed	Ød mm	SAE 3000 (L)				SAE6000 (H)				OR	Acc. dry weight kg
								Spare valve order code	ØD1 mm	ØF mm	H mm	Spare valve order code	ØD1 mm	ØF mm	H mm		
ASSA 1/4"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASSA 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASSA 2,5	1 1/2"	541± 10	115	42	19****	1/4"	32	V 2064-L8-*/*	50	60,3	8	V 2064-H8-*/*	51	63,5	12,5	0010R4187-*	38
	2"			55	19****	BSP	45	V 2064-L9-*/*	62	71,5	9,5	V 2064-H9-*/*	67	77,6		0010R4225-*	
ASSA 5	1 1/2"	845 ± 10	115	42	19****	1/4"	32	V 2064-L8-*/*	50	60,3	8	V 2064-H8-*/*	51	63,5	12,5	0010R4187-*	58
	2"			55	19****	BSP	45	V 2064-L9-*/*	62	71,5	9,5	V 2064-H9-*/*	67	77,6		0010R4225-*	
ASSA 10	1 1/2"	1379± 10	115	42	19****	1/4"	32	V 2064-L8-*/*	50	60,3	8	V 2064-H8-*/*	51	63,5	12,5	0010R4187-*	94
	2"			55	19****	BSP	45	V 2064-L9-*/*	62	71,5	9,5	V 2064-H9-*/*	67	77,6		0010R4225-*	
ASSA 15	1 1/2"	1900± 10	115	42	19****	1/4"	32	V 2064-L8-*/*	50	60,3	8	V 2064-H8-*/*	51	63,5	12,5	0010R4187-*	130
	2"			55	19****	BSP	45	V 2064-L9-*/*	62	71,5	9,5	V 2064-H9-*/*	67	77,6		0010R4225-*	

* Gasket material

** Components material

*** Allen wrench

**** Ex. Wrench

***** see chapter 6.3.11 table 6.3dh

6.3df

6.3df

6.3.8 SPARE PARTS CODE (STANDARD VERSION)

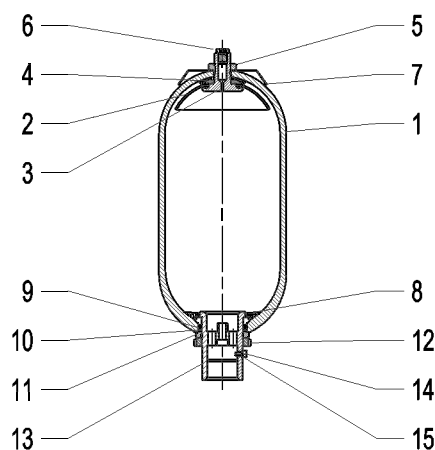


Fig. I

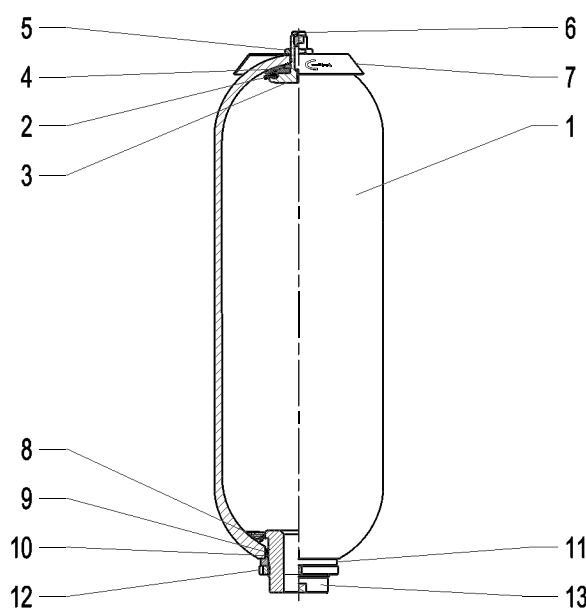


Fig. II

6.3dg

Item	Description	Q.ty	Type		
			ASSA 1/4 (Fig. I)	ASSA 1 (Fig. I)	ASSA 2,5 + 15 (Fig. II)
1	Accumulator shell	1	Not supplied as spare part		
2	Seal gas side	1	B11250 - *	B11252 - *	B10052 - *
3	Gas valve body	1	B10107 - **	B10202 - **	B10333 - **
4	Rubber-coated washer	1	B10106 - ** / *	B10205 - ** / *	B10334 - ** / *
5	Gas valve looknut	1	B10109 - **		B10302 - **
6	Plug	1	B10043 - **		
7	Name plate	1	D10300B-A	D10300C-A	D10300D-A
8	Retaining ring	1	B10146 - ** / *	B10222 - ** / *	B10317 - ** / *
9	"O" ring	1	0010R0159 - *	0010R6212 - *	0010R0181 - *
10	Supporting ring	1	B10150-T	B10227-T	B10320-T
11	Space ring	1	B10223 - **		B10319 - **
12	Fluid port ring nut	1	B10217 - **		B10321 - **
13	Fluid port body	1	B10144 - *** - **		B10311 - *** - **
14	Bleed screw ****	1	B10128 - **		-
15	Seal ring ****	1	B10129-R		-
Standard gas valve ass. (parts 2 + 6)		1	V 2033 - ** / *	V 2049 - ** / *	V 2270 - ** / *
Standard fluid port ass. (parts 8 + 15)		1	V 2250 - *** - ** / *	V 2253 - *** - ** / *	V 2267 - *** - ** / *
Gasket sets		1	B2380-1- [*] { B11250- [*] 0010R0159- [*] B10150-T	B2381-1- [*] { B11252- [*] 0010R6212- [*] B10227-T	B2382-1- [*] { B10052- [*] 0010R0181- [*] B10320-T

* Gasket material

** Component material

*** See chapter 6.3.6 table 8 - 9

6.3dh

**** Only for Fig. I

6.3.9 EUROPE MARKET

All the additional bottles are pressure vessels and are subject to the national regulations and directives valid at the place of installation.

For additional bottles type ASSA, every shipping batch is complete of a conformity declaration and instructions of use and. All vessel categories (see Table 6.3d) must be protected by means of a pressure relief valve in accordance with Directive 97/23/EC.

6.3.10 ACCESSORIES

For support equipment, see section 7

For gas side's safety equipment, see section 8

For pre-loading and charging set, see section 11

For other components, see section 12

06.3.11 COMMISSIONING AND MAINTENANCE

Delivery condition.

Depending on the size and quantity ordered, the additional bottles are shipped in cartons or in cartons on pallets, or wooden boxes upon request. Unless otherwise required, certificates and documentation are provided together with the bottles.

Handling

The original packaging is suitable for handling and storage. Where necessary, you should use suitable lifting equipment to support the weight of the bottles. However protect from impact the packaging and handle it with care.

Storage

During storage in the warehouse, leave the product in its original packaging, keeping it away from heat sources and naked flames. The storage temperature should be between +10 and +40°C.

After six years of storage, it is essential to proceed with the replacement of all elastomeric parts before the commissioning.

Marking on the nameplate of the additional bottle:

The additional bottle will be supplied with the following data stamped on the nameplate:

- Logo, name and country of the manufacturer
- Month/year of production
- Product code
- Serial number
- Maximum PS pressure and PT test pressure in Psi
- Min. and max. TS working temperature in Fahrenheit
- Volume V in gallons
- ASME U-stamp
- Pre-charge pressure in Psi

It is strictly forbidden to:

- weld, rivet, bolt or screw any item of the cylinder shell
- engrave or permanently stamp the surfaces of the cylinder shell and / or carry out other operations that could affect or change the mechanical properties of the cylinder
- use the cylinder as a structural element: it should not be subjected to stresses or loads
- change the data of the nameplate and / or the cylinder without the permission of the manufacturer
- use a (dangerous) fluid of Group 1 with equipment designed and manufactured for fluids of Group 2.

Installation

Before installation, you must perform a visual check to verify that the bottles has not suffered any damage during shipping / handling. Verify that the requested type matches with what stamped on the nameplate.

We recommend using the additional bottles connected to the accumulator with a suitable safety valve (see Chapter 8). This device provides user and equipment protection against possible damages due to pressure peaks.

The additional bottles type ASSA may be installed in any position from horizontal to vertical (preferably with the connections vertically) and the nameplate must be visible.

Proceed to the assembly so that no abnormal force affects the pipes connected directly or indirectly to the additional bottles, so we recommend the use of supporting components and also fastening (please see Chapter 7) to avoid the transmission of vibrations.

Make sure that the bottle is connected to the hydraulic circuit through suitable connection devices.

Make sure the gas is compatible with the elastomer of the seals.

Check that the max. allowed bottle pressure is equal to or greater than that of the hydraulic circuit and that the temperature during operation is maintained within the range expected.

Make sure the fluid does not contain contaminants.

Maintenance

- Periodically check the pre-charge pressure of the system: after the commissioning, check after 2-3 weeks of operation and if there were no leaks, repeat the operation after 3 months; if the pressure at the same temperature was stable, repeat the test yearly. For heavy-duty applications, check the pre-charge every 6 months.
- Periodically (yearly) carry out a visual inspection of the bottle in order to detect any early signs of deterioration such as corrosion, deformation, etc.
- Comply with the requirements of the regulations concerning the verification of the functionality of the equipment according to the country of installation of the bottle.

Disassembly

If for failure, scheduled check or retest it is necessary to remove the additional bottle from the system, prior to removal, completely discharge the pressure within the circuit.

All additional EPE cylinders of the ASSA series can be repaired.

Repair

It can consist in replacing the seals and/or parts of the valves.

For reasons of functionality and security, it is recommended to use only original spare parts.

Demolition and recycling of the additional cylinder

Before demolition or recycling of the additional cylinder, you should always discharge the internal pressure.

If you needed, proceed decontaminating in relation to the gas/fluid used prior to demolition.

6.3.12 SPANNER WRENCH

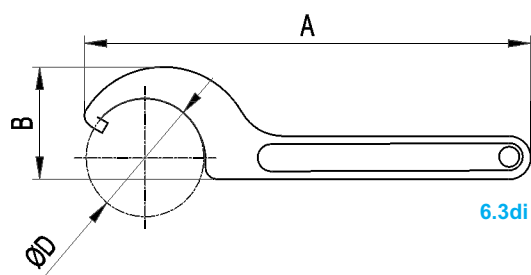
Fits all standard size bladder accumulator. It is used to remove or install lock nut on fluid port essembly.

0,7÷1,5 lt code 2506/58

3÷5 lt code 2506/68

10÷55 lt code 2506/105

Dimension



6.3di

CODE	A	B	ØD
B2506/58	241	45	58
B2506/68	241	43	68
B2506/105	336	82	105

6.3dj

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6.4.1 TECHNICAL DATA

MAX OPERATING PRESSURE (PS): 375 bar

PRESSURE TEST (PT): 1.43 x PS

NOMINAL CAPACITIES: 0.1 ÷ 1000 litres

WORKING TEMPERATURE: -50 ÷ +150 °C

BODY MATERIAL: - carbon steel shell painted with rust inhibitor RAL 8012
- nickel coating 25 - 40 µ

FLUID PORT CONNECTION: upon request

WEIGHT: see Table 6.4d

6.4.2 DESCRIPTION

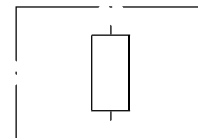
Additional bottles type AB consist of a pipe of high-tensile steel. The same pipe of the piston accumulator type AP.

The additional bottles are used to take in and store nitrogen to increase the gas volume in the accumulator station (with bladder or piston accumulator). This means that smaller accumulators can be used for the same gas volume and costs can be reduced. EPE offers a wide selection of bottles type, such as forged "B" version, shell of bladder accumulator "ASS" and "ASSA" version or body piston type "AB" version.

6.4.3 "AB" ADDITIONAL CYLINDERS ADVANTAGES

- compact
- simple construction
- quick, easy installation
- large volume

6.4.4 HYDRAULIC SYMBOL



6.4.5 SEALS-TEMPERATURE-LIQUID COMPATIBILITY

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

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).
S	Silicon-fluorine	MVQ	-50 ÷ +150	Motor oils, animal and vegetable greases and oils, glycol-based brake fluids, flammable hydraulic fluids, HFD-R and HFD-S fluids, aromatic chlorinated hydrocarbons, water up to 100°C, dilute salt solutions, fuels, mineral aromatic oils and aromatic low molecular hydrocarbons.
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.

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

6.4.6 ORDER CODE

1	2	3	4	5	6	7	8	9	10	11
AB	200	P	220	C	350	G	6	G	5	- 8

1	Series
	Additional bottle = AB

2	Nominal capacity (litres)
	Internal diameter $\varnothing 60 \text{ mm} = 0.1 \div 2.5$ $\varnothing 100 \text{ mm} = 1 \div 10$ $\varnothing 180 \text{ mm} = 6 \div 80$ $\varnothing 250 \text{ mm} = 30 \div 180$ $\varnothing 350 \text{ mm} = 80 \div 400$ $\varnothing 520 \text{ mm} = 180 \div 1000$

3	Seals material material
	Nitrile rubber (NBR) = P Nitrile for low temp. = F Silicon-fluorine = S Fluorocarbon (FPM) = V

4	Max working pressure (bar)
	Internal diameter $\varnothing 60 \text{ mm} = 375$ $\varnothing 100 \text{ mm} = 375$ $\varnothing 180 \text{ mm} = 250 - 375$ $\varnothing 250 \text{ mm} = 250 - 350$ $\varnothing 350 \text{ mm} = 220 - 350$ $\varnothing 520 \text{ mm} = 220 - 350$ (210 only for the version with connection L or other pressure related to connections B or U)

5	Body material
	Carbon steel = C Nickel coated carbon steel 25 μ = N Nickel coated carbon steel 40 μ = M

6	Nominal internal diameter
	Internal diameter $\varnothing 60 \text{ mm} = 60$ $\varnothing 100 \text{ mm} = 100$ $\varnothing 180 \text{ mm} = 180$ $\varnothing 250 \text{ mm} = 250$ $\varnothing 350 \text{ mm} = 350$ $\varnothing 520 \text{ mm} = 520$

11	Test and certification
	Factory testing = 0 TR (Russia) = 1 Australian Standard = 2 ML (China) = 3 RINA = 4 PED97/23/EC (for capacity greater than 1 l) = 8 ATEX 94/9EC = 9 DNV = 10 RTN Passport (Ukraine) = 11 Algeria passport = 12 Standard regulation (NR13) (Brazil) = 13 Tunisia passport = 14

10	Dimension of port connection B
	See the table on page 2

9	Type of port connection B
	Without connection = 0 Female thread: BSP ISO 228 = G BSP ISO 228 with chamfer for OR = A NPT-F = P SAE = S METRIC = M Holes for flange: SAE 3000 metric threads = L SAE 6000 metric threads = H ANSI metric threads = B UNI - DIN = U CETOP = C Special flange = F

8	Dimension of port connection A
	See the table on page 2

7	Type of port connection A
	Without connection = 0 Female thread: BSP ISO 228 = G BSP ISO 228 with chamfer for OR = A NPT-F = P SAE = S METRIC = M Holes for flange: SAE 3000 metric threads = L SAE 6000 metric threads = H ANSI metric threads = B UNI - DIN = U CETOP = C Special flange = F

8	Dimension of port connection A
Without connection = 0	
For the type of connection:	
G-A-P-L-H 1/8" = 1	
1/4" = 2	
3/8" = 3	
1/2" = 4 (std. DN 60)	
3/4" = 5	
1" = 6 (std. DN 100)	
1 1/4" = 7	
1 1/2" = 8 (std. DN 180-250-350)	
2" = 9 (std. DN 520)	
2 1/2" = 10	
3" = 11	
3 1/2" = 12	
4" = 13	
S = Diameter "inch" - Pitch "inch"	
Former. 9/16-18 = 9/16-18	
M = Diameter/pitch	
Former. M 22x1.5 = 22/1.5	
B = Dimension/Rating	
Former. 4" ANSI 300 = 4/300	
U = DN/PN	
Former. DN100 PN16 = 100/16	
C = Diameter "inch"/max Pressure "bar"	
Former. 3"Cetop 400 = 3/400	
F = to specify and EPE will assign a number	

9	Dimension of port connection B
Without connection = 0	
For the type of connection:	
G-A-P-L-H 1/8" = 1	
1/4" = 2	
3/8" = 3	
1/2" = 4 (std. DN 60)	
3/4" = 5	
1" = 6 (std. DN 100)	
1 1/4" = 7	
1 1/2" = 8 (std. DN 180-250-350)	
2" = 9 (std. DN 520)	
2 1/2" = 10	
3" = 11	
3 1/2" = 12	
4" = 13	
S = Diameter "inch" - Pitch "inch"	
Former. 9/16-18 = 9/16-18	
M = Diameter/pitch	
Former. M 22x1.5 = 22/1.5	
B = Dimension/Rating	
Former. 4" ANSI 300 = 4/300	
U = DN/PN	
Former. DN100 PN16 = 100/16	
C = Diameter "inch"/max Pressure "bar"	
Former. 3"Cetop 400 = 3/400	
F = to specify and EPE will assign a number	

6.4.7 EUROPE MARKET

All hydraulic bottles are pressure vessels and are subject to the national regulations and directives valid at the place of installation.

For additional cylinders type AB, every shipping batch is complete of a conformity declaration and instructions of use and maintenance and/or all documents requested. All vessel categories (see Table 6.4d) must be protected by means of a pressure relief valve in accordance with Directive 97/23/EC.

6.4.8 ACCESSORIES

For support equipment, see Cap. 7

For gas side's safety equipment, see Cap. 8

For pre-loading and charging set, see Cap. 11

For other components, see Cap. 12

6.4.9 DIMENSIONS

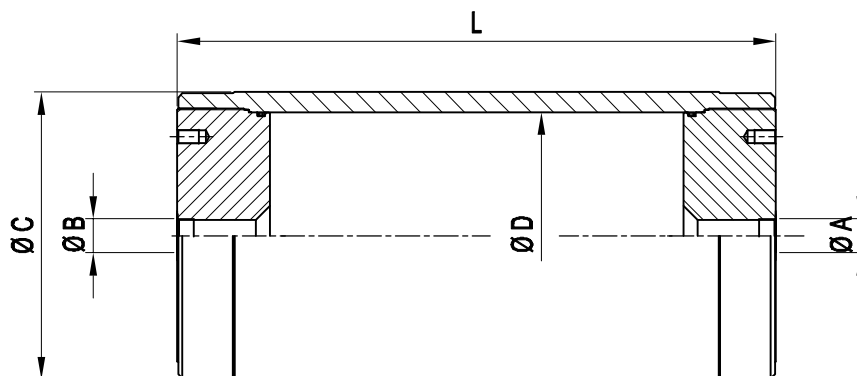


Fig. I

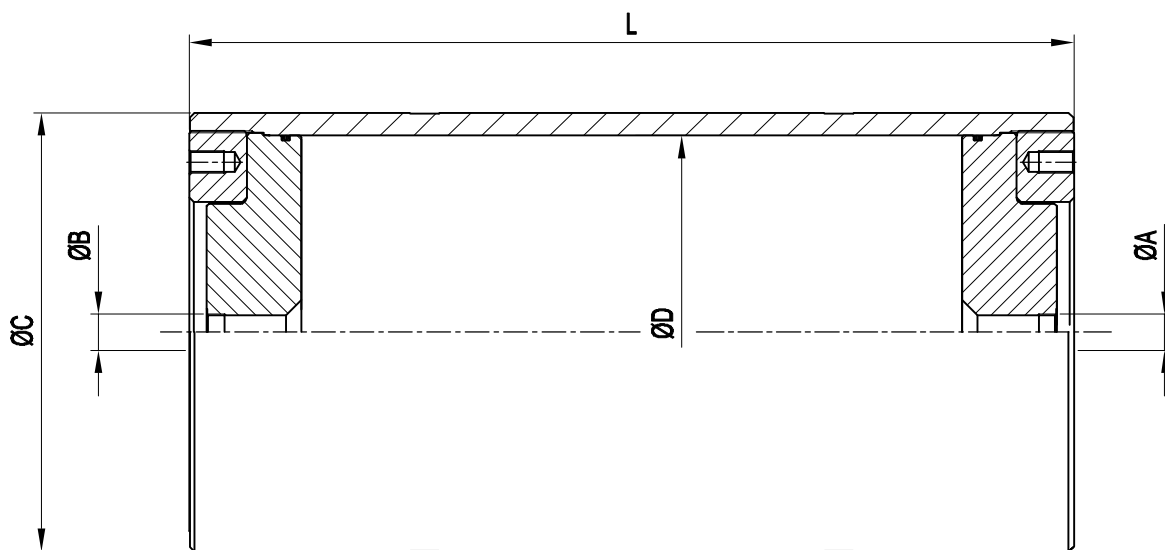


Fig. II

6.4d

Accumulator type APXXX Ø bore (ØD)	Fig	Gas capacity liters	Working pressure bar	Ped category for the liquids of group 2	Maximum differential pressure bar	ØA	ØB	ØC mm	ØD mm	L mm	Dry Weigh Kg			
											220 bar	250 bar	350 bar	375 bar
60	I	0,25	375	Art III (III)	300	Pre-charge valve 5/8" UNF	1/2" BSP	80	60	169			4,9	
		0,5		258							6,4			
		1		436							9,5			
		1,5		614							12,5			
		2		790							15,5			
100	I	1	375	II	300	Pre-charge valve 5/8" UNF	1" BSP	130	100	240			17,1	
		1,5		304							19,8			
		2		368							22,6			
		2,5		430							25,2			
		3		494							27,9			
		4		622							33,3			
		5		750							38,7			
		6		878							44,1			
		8		1134							54,9			
		10		1390							65,8			
		180		I						6	250	IV	180,5	Pre-charge valve 5/8" UNF
8	495				81,5									
10	573				89,2									
15	652				96,9									
20	771				108,6									
25	968				127,9									
30	1163				147,0									
40	1360				166,6									
50	1754				204,9									
60	2145				243,2									
80	2538				281,8									
250	I	30	250	IV	180	Pre-charge valve 5/8" UNF	1 1/2" BSP	292	250	983		229,6	302,3	
		40								1188		258,3	346,2	
		50								1388		283,3	389,0	
		60								1593		315,0	432,9	
		80								1998		317,7	519,5	
		100								2408		429,1	607,3	
		120	2818				486,5	695,5						
		150	3428				571,9	825,5						
		180	4038				657,3	966,1						
350	I	100	220	IV	165	Pre-charge valve 5/8" UNF	1 1/2" BSP	406	350	1552	643,1		772,5	
		120								1762	698,4		841,5	
		150								2072	780,0		942,6	
		180								2382	861,4		1036	
		200	2595		916,6						1212,6			
		250	3112		1053,4						1282,7			
		300	3632		1190,2						1452,7			
		400	4722								1806,7			
520	II	200	220	IV	120	Pre-charge valve 5/8" UNF	2" BSP	580	520	1570	1141,3			
		250								1806	1230,1			
		300								2041	1318,2			
		350								2276	1407,7			
		400			2511					1495,4				
		500			2982					1672,1				
		600			3453					1849,1				
		800			4395					2204,2				
		1000			5337					2558,0				

6.4e

* The maximum differential pressure is the maximum allowable difference between the maximum pressure and the minimum working pressure (P2-P1) to have an infinite life cycle of the accumulator (greater than 2,000,000 cycles).

6.4.10 SPARE PARTS CODES

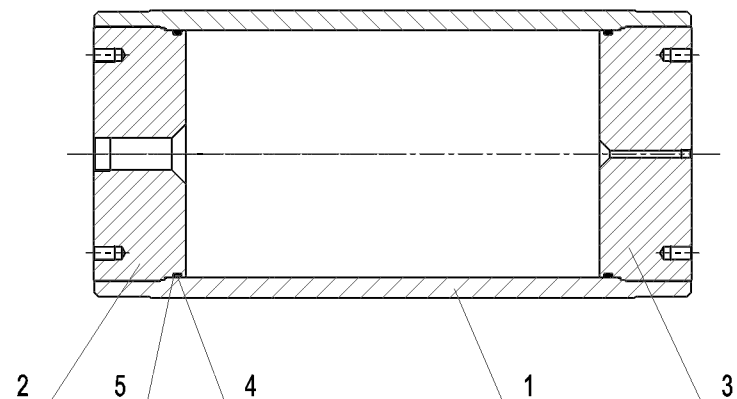


fig. I

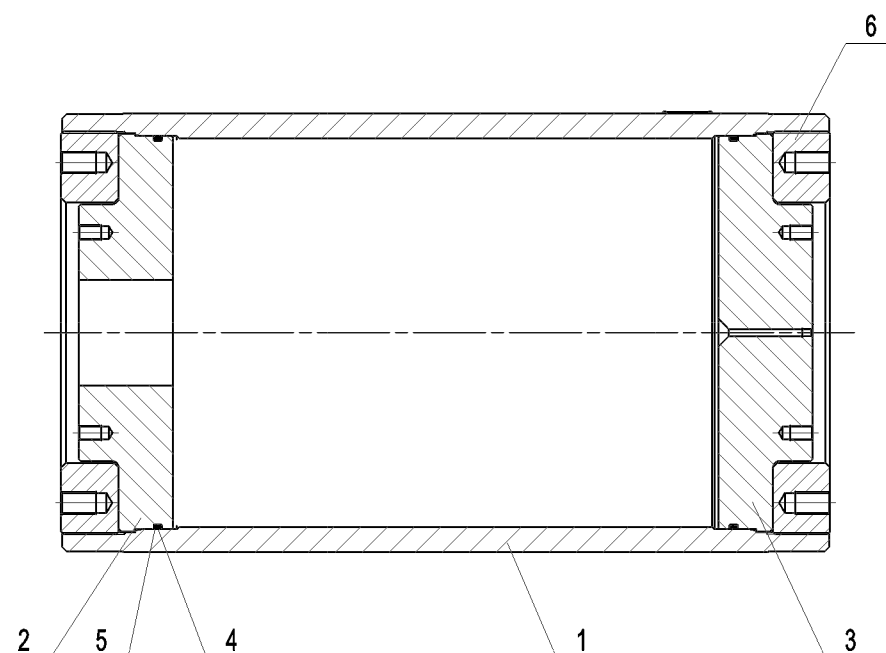


fig. II

6.4f

Pos.	Spare parts	Cylinder diameter	Fig.	Group code	Q.ty	Part description	Type / Code
1	Not supplied as spare parts					Accumulator cylinder	-
2						Oil side cap	
3						Gas side cap	
4	Accumulator gasket set	60	I	B2471-1 *	2	O - ring	0010R6200 - *
5					2	Anti-extrusion ring	0011P8329 - *
4	Accumulator gasket set	100	I	B2472-1 *	2	O - ring	0010R0185 - *
5					2	Anti-extrusion ring	0011P8341 - *
4	Accumulator gasket set	180	I	B2473-1 *	2	O - ring	0010R0228 - *
5					2	Anti-extrusion ring	0011P8439 - *
4	Accumulator gasket set	250	I	B2474-1 *	2	O - ring	0010R8925 - *
5					2	Anti-extrusion ring	0011P8447 - *
4	Accumulator gasket set	350	I	B2475-1 *	2	O - ring	0010R81300 - *
5					2	Anti-extrusion ring	0011P8455 - *
4	Accumulator gasket set	520	II	B2476-1 *	2	O - ring	0010R82000 - *
5					2	Anti-extrusion ring	0011P8469 - *
6	Not supplied as spare parts					Thread ring	-

* Gasket material

6.4g

6.4.11 COMMISSIONING AND MAINTENANCE

Delivery condition

The additional bottles type AB are shipped on pallets or wooden boxes upon request. Unless otherwise required, certificates and documentation are provided together with the bottles.

Handling

The original packaging is suitable for handling and storage. Where necessary, you should use suitable lifting equipment to support the weight of the bottles. However protect from impact the packaging and handle it with care.

Storage

During storage in the warehouse, leave the product in its original packaging, keeping it away from heat sources and naked flames. The storage temperature should be between +10 and +40°C. After six years of storage, it is essential to proceed with the replacement of all elastomeric parts before the commissioning.

Marking on the nameplate of the additional cylinder

With reference to the PED 97/23/EC classification, Article 3, Paragraph 3 and / or risk categories I or IV depending on the volume and maximum working pressure, the cylinder indicates the following data:

- logo, name and country of the manufacturer
- month / year of production
- product code
- serial number
- maximum PS pressure and PT test pressure in bar
- min. and max. TS working temperature in Celsius
- volume V in litres
- group of fluids allowed
- CE marking (by category I ÷ IV) with the identification number of the notified body

It is strictly forbidden to:

- weld, rivet, bolt or screw any item of the cylinder shell
- engrave or permanently stamp the surfaces of the cylinder shell and / or carry out other operations that could affect or change the mechanical properties of the cylinder
- use the cylinder as a structural element: it should not be subjected to stresses or loads
- change the data of the nameplate and / or the cylinder without the permission of the manufacturer
- use a (dangerous) fluid of Group 1 with equipment designed and manufactured for fluids of Group 2.

Installation

Before installation, you must perform a visual check to verify that the bottles has not suffered any damage during shipping / handling. Verify that the requested type matches with what stamped on the nameplate. We recommend using the additional bottles connected to the accumulator with a suitable safety valve (see Chapter 8). This device provides user and equipment protection against possible damages due to pressure peaks.

The additional bottles type AB may be installed in any position from horizontal to vertical (preferably with the connections vertically) and the nameplate must be visible.

Proceed to the assembly so that no abnormal force affects the pipes connected directly or indirectly to the additional bottles, so we recommend the use of supporting components and also fastening (please see Chapter 7) to avoid the transmission of vibrations.

Make sure that the bottle is connected to the hydraulic circuit through suitable connection devices.

Make sure the gas is compatible with the elastomer of the seals.

Check that the max. allowed bottle pressure is equal to or greater than that of the hydraulic circuit and that the temperature during operation is maintained within the range expected.

Make sure the fluid does not contain contaminants.

Maintenance

- Periodically check the pre-charge pressure of the system: after the commissioning, check after 2-3 weeks of operation and if there were no leaks, repeat the operation after 3 months; if the pressure at the same temperature was stable, repeat the test yearly. For heavy-duty applications, check the pre-charge every 6 months.
- Periodically (yearly) carry out a visual inspection of the bottle in order to detect any early signs of deterioration such as corrosion, deformation, etc.
- Comply with the requirements of the regulations concerning the verification of the functionality of the equipment according to the country of installation of the bottle.

Disassembly

If for failure, scheduled check or retest it is necessary to remove the additional bottle from the system, prior to removal, completely discharge the pressure within the circuit.

All additional EPE cylinders of the AB series can be repaired.

Repair

It may consist in replacing the seals.

For reasons of functionality and security, it is recommended to use only original spare parts.

Demolition and recycling of the additional cylinder

Before demolition or recycling of the additional cylinder, you should always discharge the internal pressure.

If needed, proceed decontaminating in relation to the gas/fluid used prior to demolition.

Reproduction is forbidden.

In the spirit of continuous improvement, our products may be changed.