

### 3.7.1 TECHNICAL DATA

**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 suitable for use with mineral oils but gives also excellent results with many other liquids. The operating temperature range is between  $-20$  and  $+80^{\circ}\text{C}$ . 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), Butyl (B), Ethylene-propylene (E), Neoprene (N), Epichlorohydrin (Y), Viton (V). See section 1,5.

N.B. Not all the sizes of bladders are available in all the materials.

Please consult our Technical Service Department before ordering of gas valve assembly.

The two parts, bladder and gas valve assembly, can be ordered separately 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.

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

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

This valve can be supplied with  $\varnothing$  B and special inflation connections.

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

SL = LIQUID SEPARATOR. 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  $25\ \mu\text{m}$  or  $40\ \mu\text{m}$ . (other thickness to be specified) or in stainless steel.



3.7a

### 3.7.2 DESCRIPTION

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.

### 3.7.3 SPECIAL GAS VALVE: NON EPOll ACCUMULATORS

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 nonstandard stem diameters ( $\varnothing$ B) and charge-connections.

### 3.7.4 BLADDER-TEMPERATURE-LIQUID COMPATIBILITY

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

Code letter	Polymer	ISO	Temperature range (°C)	Some of the liquids compatible with the polymer
P	Standard nitrile (Perburan)	NBR	-20 ÷ +80	Aliphatic hydrocarbons (propane, butane, gasoline, oils, mineral greases, diesel fuel, fuel oil, kerosene), mineral greases and oils, HFA - HFB - HFC fluids, many dilute acids, alkalis, saline solutions, water, water glycol.
F	Low temperature nitrile	NBR	-40 ÷ +70	The same as with standard nitrile + a number of different types of Freon. (This contains less acrylonitrile than the standard and is therefore more suitable for low temperatures, but its chemical resistance is slightly lower).
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, 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), Skydrol LD4 and 500B-4, 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	FKM	-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.

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### 3.7.5 ORDER CODE



1	Series
Standard	= <b>S</b>
Transfer	= <b>ST</b>
Liquid separator	= <b>SL</b>

2	Nominal capacity
	0.2 lt = <b>0.2</b>
	0.7 lt = <b>0.7</b>
	1 lt = <b>1</b>
	1.5 lt = <b>1.5</b>
	2.5 lt = <b>2.5</b>
	3 lt = <b>3</b>
	4 lt = <b>4</b>
	5 lt = <b>5</b>
	10 lt = <b>10</b>
	12 lt = <b>12</b>
	15 lt = <b>15</b>
	20 lt = <b>20</b>
	25 lt = <b>25</b>
	35 lt = <b>35</b>
	55 lt = <b>55</b>
	<b>for ASE range</b>
	<b>100 -:- 5000</b>

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

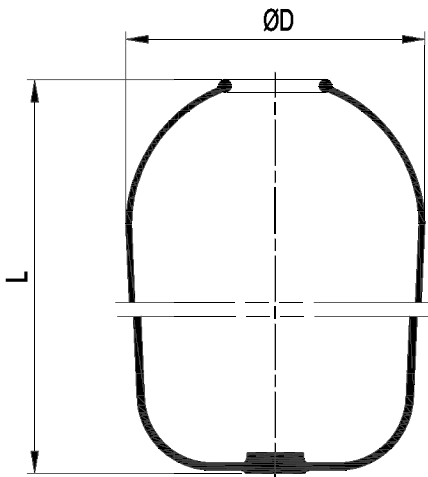
6	Type of filling valve*
	Standard filling valve 5/8" UNF thread = <b>V</b>
	Standard filling valve with 5/8" UNF thread in stainless steel = <b>VX</b>
	Without filling valve (thread hole M12x1.5) = <b>V0</b>
	Brass filling valve 1/4" BSP = <b>V2</b>
	Filling valve 7/8" UNF = <b>V4</b>
	For ASE Type = <b>-</b>

\* Only for S and ST series

5	Gas valve dimension
	M50X1.5 = <b>50</b>
	M22X1.5 = <b>22</b>
	7/8" UNF = <b>7/8</b>
	5/8" UNF = <b>5/8</b>
	For ASE 3/4 BSP = <b>3/4</b>

4	Gas valve material
	Whitout valve = <b>0</b>
	Carbon steel = <b>C</b>
	Nickel coated carbon steel 25 μ = <b>N</b>
	Nickel coated carbon steel 40 μ = <b>M</b>
	Stainless steel = <b>X</b>

### 3.7.6 BLADDER DIMENSIONS AND SPARE PARTS CODES



3.7c

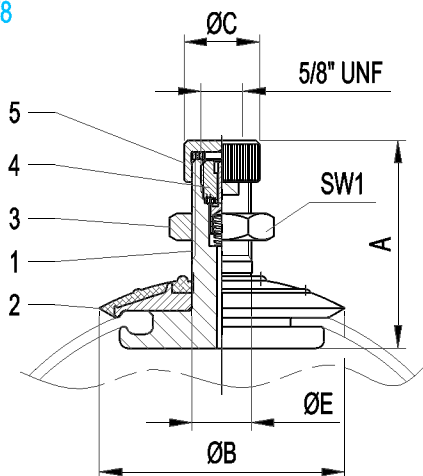
Bladder type S	Nominal gas volume litres	ØD mm	L mm	Bladder order code	Wheight Kg
S 0,2	0,2	38,5	148 ± 1,5	S 0,2* - 0	0,031
S 0,7	0,7	74	120 ± 2	S 0,7* - 0	0,060
S 1	1	95	140 ± 2	S 1* - 0	0,130
S 1,5	1,5	95	192 ± 2	S 1,5* - 0	0,165
S 2,5	2,5	95	320 ± 2	S 2,5* - 0	0,295
S 3	3	95	365 ± 2	S 3* - 0	0,348
S 4	4	144	201 ± 2	S 4* - 0	0,394
S 5	5	144	275 ± 2	S 5* - 0	0,415
S 10	10	198	305 ± 3	S 10* - 0	0,92
S 12	12	198	393 ± 3	S 12* - 0	1,09
S 15	15	198	440 ± 4	S 15* - 0	1,30
S 20	20	198	580 ± 5	S 20* - 0	1,73
S 25	25	198	725 ± 5	S 25* - 0	2,15
S 35	35	198	1105 ± 5	S 35* - 0	3,3
S 55	55	198	1550 ± 5	S 55* - 0	4,6

\* Bladder material

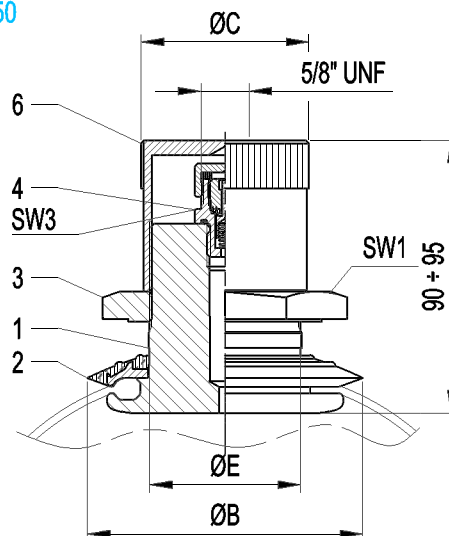
3.7d

3.7.7 VALVE DIMENSIONS AND SPARE PARTS CODE

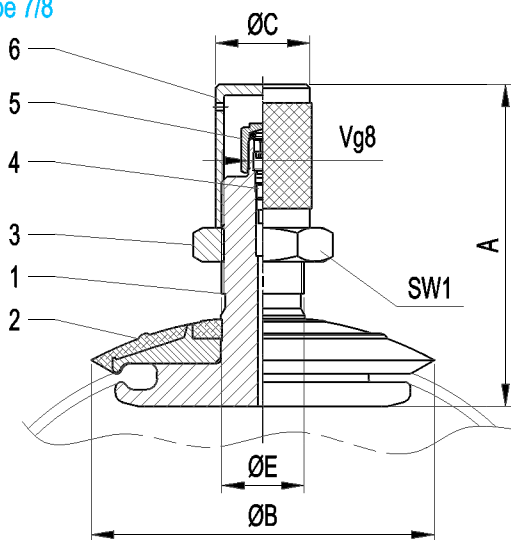
Type 5/8



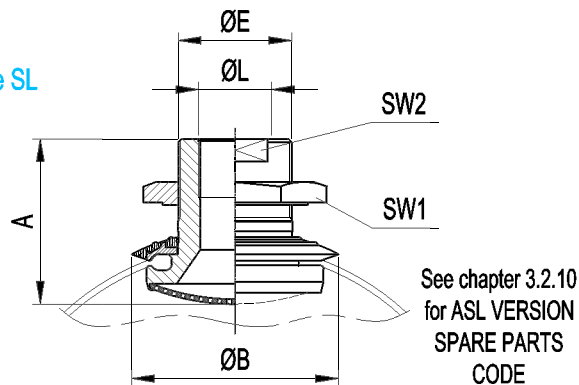
Type 50



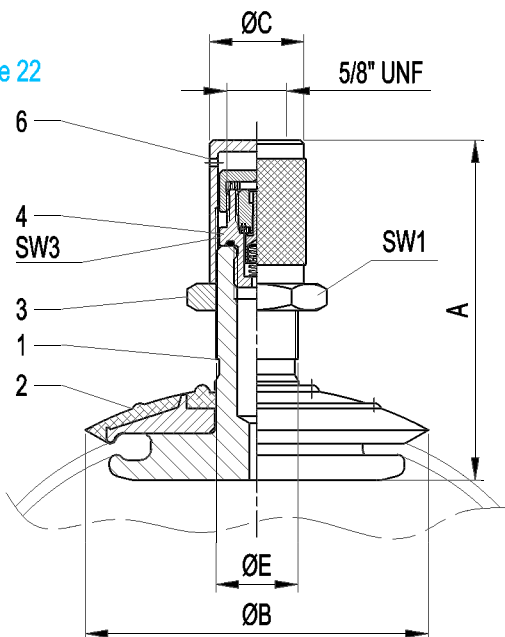
Type 7/8



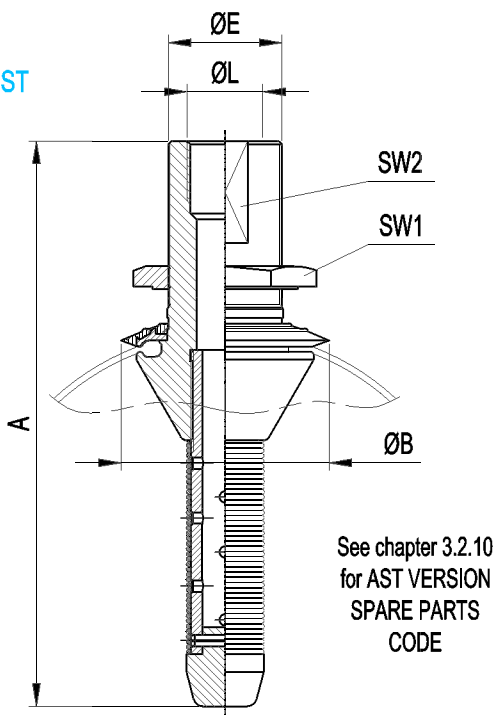
Type SL



Type 22



Type ST



3.7e

DIMENSIONS										
Nominal capacities (lt)	Valve type	Gas valve assembly	A mm	Ø B mm	Ø C mm	Ø E	Ø L	SW 1 mm	SW 2 mm	SW 3 mm
0,2	5/8	V 2002 - ** / *	40	34	20	5/8" UNF	-	24	-	-
	SL	V 2003 - ** / *	41	35	-	5/8" UNF	1/8" BSP	24	13	-
0,7	5/8	V 2015 - ** / *	45	48	20	5/8" UNF	-	24	-	-
	7/8	V 2020 - ** / *	65 ÷ 70	45	25	7/8" UNF	-	32	-	-
	22	V 2021 - ** / *	68 ÷ 73	45.5	25	M22x1.5	-	32	-	18
	SL	V 2027 - 1 - ** / *	48	45.5	-	M22x1.5	1/4" BSP	32	18	-
	ST	V 2456 - ** / *	236	45.5	-	M22x1.5	1/4" BSP	32	18	-
1 - 1,5 - 2,5 - 3	5/8	V 2015 - ** / *	45	48	20	5/8" UNF	-	24	-	-
	7/8	V 2020 - ** / *	65 ÷ 70	45	25	7/8" UNF	-	32	-	-
	22	V 2022 - ** / *	68 ÷ 73	45	25	M22x1.5	-	32	-	18
	SL	V 2027 - ** / *	48	45.5	-	M22x1.5	1/4" BSP	32	18	-
	ST	1-1,5-2,5 lt	V 2026 - ** / *	121	45	-	M22x1.5	1/4" BSP	32	18
3 lt		V 2029 - ** / *	236	45	-	M22x1.5	1/4" BSP	32	18	-
4 - 5	5/8	V 2041 - ** / *	55	65	20	5/8" UNF	-	24	-	-
	7/8	V 2046 - ** / *	75 ÷ 80	61.5	25	7/8" UNF	-	32	-	-
	22	V 2042 - ** / *	73 ÷ 78	61.5	25	M22x1.5	-	32	-	18
	ST	V 2043 - ** / *	201	61.5	-	M22x1.5	1/4" BSP	32	18	-
	SL	V 2048 - ** / *	57	61.5	-	M22x1.5	1/4" BSP	32	18	-
10 ÷ 55	7/8	V 2085 - ** / *	80 ÷ 90	91	25	7/8" UNF	-	32	-	-
	22	V 2061 - ** / *	80 ÷ 85	91	25	M22x1.5	-	32	-	18
	50	V 2062 - ** / *	90 ÷ 95	91	56	M50x1.5	-	70	-	18
	ST	AST 10-15 = V 2065 - ** / *	272	91	-	M50x1.5	1" BSP	70	46	-
		AST 20-25 = V 2066 - ** / *	395							
AST 35-55 = V 2067 - ** / *		495								
SL	V 2073 - ** / *	73	91	-	M50x1.5	1" BSP	70	41	-	

\* Gasket material

\*\* Component material

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Spare order codes										
Nominal capacities (lt)	Valve type	Ø E mm	Gas valve assembly	Pos. 1 valve body	Pos. 2 Rubber-coated washer	Pos. 3 locknut	Pos. 4 fill valve	Pos. 5 valve cap	Pos. 6 protect. cap	Weight kg
0,2	5/8	5/8" UNF	V 2002 - ** / *	B10026 - **	B10024 - ** / *	B10023 - **	V 2001 - ** / *	B10337/00 - ** - *	-	0,01
0,7	5/8	5/8" UNF	V 2015 - ** / *	B10110 - **	B10105 - ** / *	B10023 - **	V 2001 - ** / *	B10337/00 - ** - *	-	0,15
	7/8	7/8" UNF	V 2020 - ** / *	B10119 - **	B10104 - ** / *	B10108 - **	V 2069 - ** / *	B10134/00 - ** - *	B10135 - **	0,3
	22	M22x1.5	V 2021 - ** / *	B10107 - **	B10104 - ** / *	B10109 - **	V 2072 - ** / *	-	B10103 - **	0,28
1 - 1,5 - 2,5 - 3	5/8	5/8" UNF	V 2015 - ** / *	B10110 - **	B10105 - ** / *	B10023 - **	V 2001 - ** / *	B10337/00 - ** - *	-	0,15
	7/8	7/8" UNF	V 2020 - ** / *	B10119 - **	B10106 - ** / *	B10108 - **	V 2069 - ** / *	B10134/00 - ** - *	B10135 - **	0,3
	22	M22x1.5	V 2022 - ** / *	B10107 - **	B10106 - ** / *	B10109 - **	V 2072 - ** / *	-	B10103 - **	0,28
4 - 5	5/8	5/8" UNF	V 2041 - ** / *	B10255 - **	B10257 - ** / *	B10023 - **	V 2001 - ** / *	B10337/00 - ** - *	-	0,27
	7/8	7/8" UNF	V 2046 - ** / *	B10259 - **	B10205 - ** / *	B10108 - **	V 2069 - ** / *	B10134/00 - ** - *	B10135 - **	0,4
	22	M22x1.5	V 2042 - ** / *	B10202 - **	B10205 - ** / *	B10109 - **	V 2072 - ** / *	-	B10103 - **	0,4
10 ÷ 55	7/8	7/8" UNF	V 2085 - ** / *	B10330 - **	B10331 - ** / *	B10108 - **	V 2069 - ** / *	B10134/00 - ** - *	B10135 - **	0,75
	22	M22x1.5	V 2061 - ** / *	B10332 - **	B10331 - ** / *	B10109 - **	V 2072 - ** / *	-	B10103 - **	0,75
	50	M50x1.5	V 2062 - ** / *	B10333 - **	B10334 - ** / *	B10302 - **	V 2072 - ** / *	-	B10301 - **	1,54

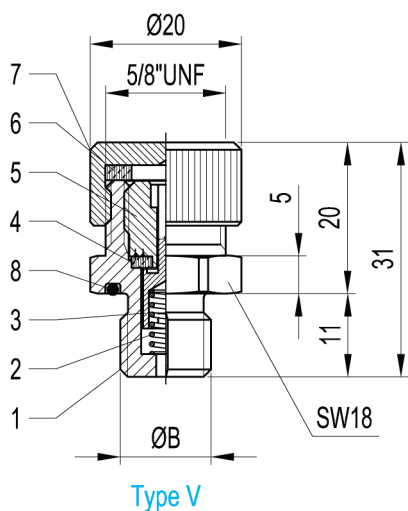
\* Gasket material

\*\* Component material

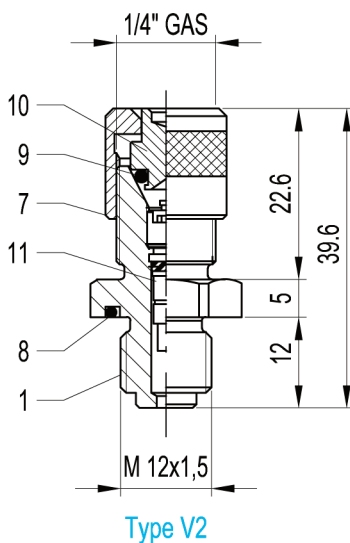
For ASL and AST type order code see chapter 3.2.10

3.7g

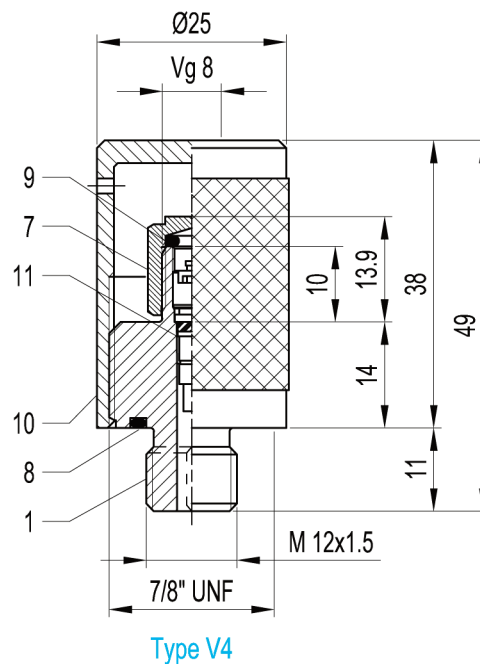
3.7.8 FILLING VALVES DIMENSIONS AND SPARE PARTS CODE



Type V



Type V2



Type V4

3.7h

Item	Description	Q.ty	Valve type				
			V / VX	VG2	VS1/2-20	V2	V4
1	Valve body	1	B10335 - **	B10335 - 1 - **	B10335 - 2 - **	B11605 - O	B10343 - 4 - **
2	Spring	1	B10339 - **			-	-
3	Pin	1	B10338 - **			-	-
4	Gasket pin	1	B10341 - *			-	-
5	Pin holder	1	B10340 - **			-	-
6	Gasket cap	1	B10342 - *			-	-
7	Valve cap	1	B10337 - **			B11603 - O	B10134 - O
8	Valve "O" ring	1	0010R2050 - *				
9	Valve cap "O" ring	1	-			0010R2018 - *	0010R0102 - *
10	Cap	1	-			B11604 - O	B10135 - **
11	Valve	1	-			V 2069-XP	
Cap assembly (parts 7-9-10)			-			B11604A-0	-
Valve assembly			V 2072 - ** / *	V 2072 - 1 - ** / *	V 2072 - 2 - ** / *	V 2396 - O / *	V 2077 - 4 - ** / *
Ø B			M12x1.5	1/4" BSP	1/2" UNF	-	-
Weight			0,042			0,04	0,094

\* Gasket material    \*\* Component material

3.7i

## 3.7.9 MAINTENANCE

### Handling

The original packaging is suitable for handling and storage. Where necessary, you should use suitable lifting equipment to support the weight of the accumulators.

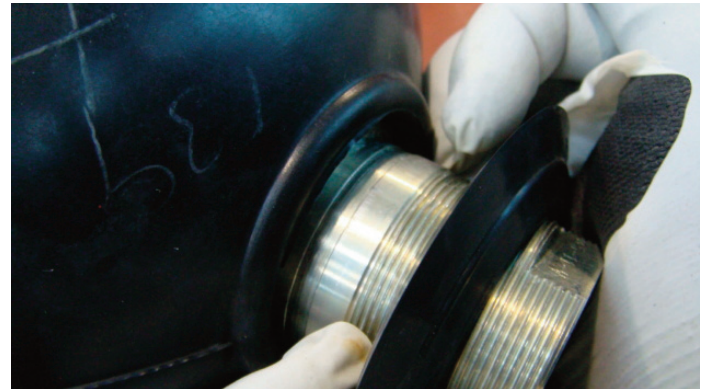
However protect from impact the packaging and handle it with care.

### 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. The maximum time of storage is two years. After time is no longer usable.

### Disassembly bladder from gas valve

- First time remove the assembly bladder plus gas valve from accumulator shell



- Remove the rubber-coated washer.

3.7n



3.7l

- Remove the rubber-coated washer, if is necessary use a small tool for to leverage.



- Remove the gas valve, tilting slightly

3.7o



3.7m

- Remove the rubber-coated washer, and slip-off



- Remove the gas valve, by pulling the bladder.

3.7p



- Remove the gas valve, by pulling the bladder whit hand

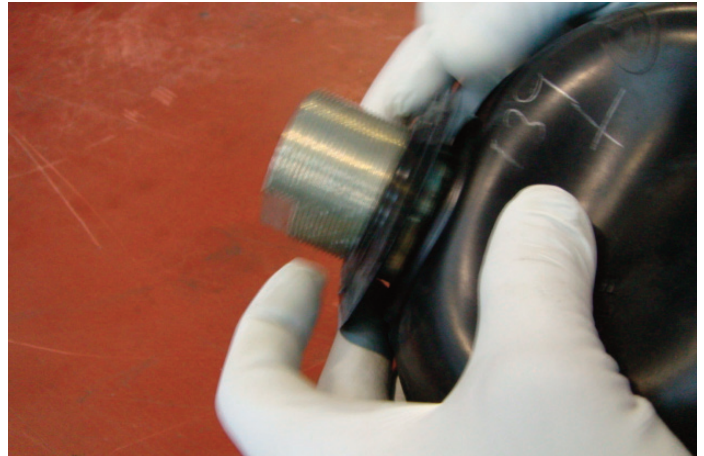
3.7p

Assembly the new bladder with the gas valve



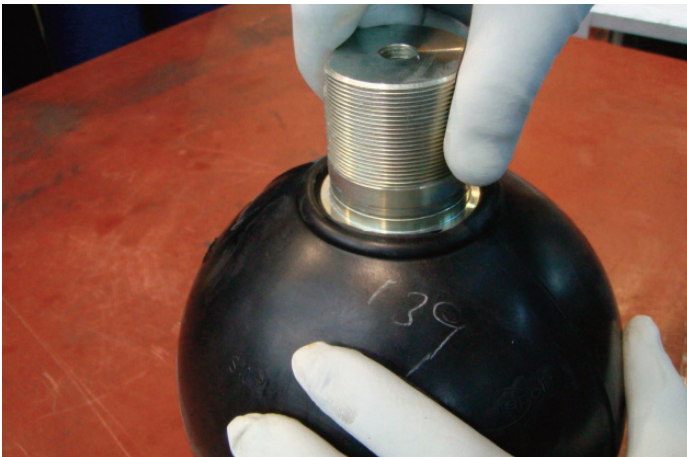
3.7r

- Put the gas body valve on the mouth of bladder and push.



3.7u

- Slip-on the rubber-coated washer.



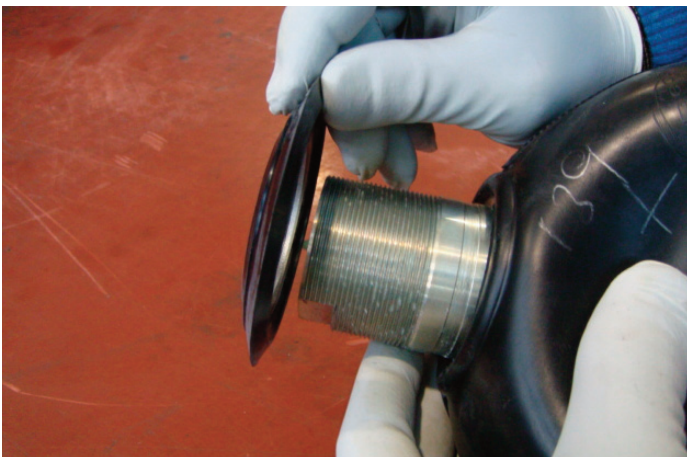
3.7s

- Position the body gas valve.



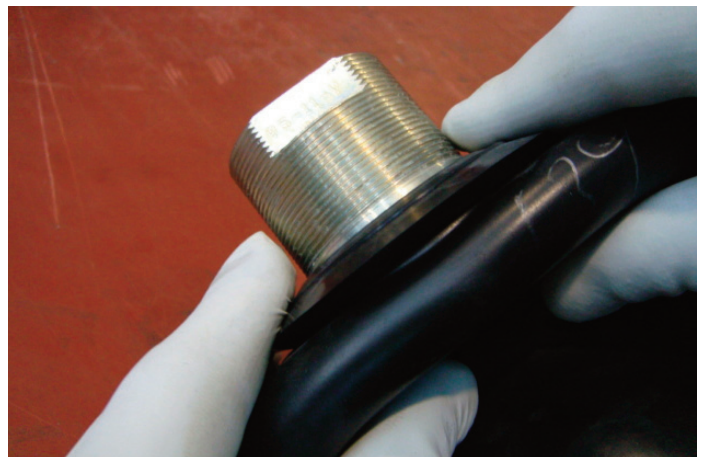
3.7v

- Press the body gas valve and the rubber-coated washer forward the bladder .



3.7t

- Insert the rubber-coated washer.



3.7z

- Body gas valve correctly assembled.

Reproduction is forbidden.

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