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L/LAV/AMP Type

Screwed
Diaphragm
Accumulators
L/LAV/AMP
for pressure up to
330 barg

SAIP
energy flow

Screwed Diaphragm Accumulators **L/LAV/AMP**

Operating principle

One of the primary functions of accumulators is to store a certain amount of pressurized fluid from a hydraulic system, then return it, in whole or in part, to the system when required. Diaphragm accumulators function like a hydraulic spring: the gas (nitrogen) contained in the rubber diaphragm is separated from the system fluid. When the system's hydraulic pressure exceeds the nitrogen's precharge pressure, the fluid enters the accumulator and is stored as potential energy within, thanks to the gas's compressibility. When the system fluid pressure decreases, the nitrogen pressure expands and returns the stored fluid to the system. Operating pressures appropriate for the maximum allowable pressure allow a pressurized liquid to be accumulated, stored, and recovered at any time. As pressurized vessels, they must be sized for the maximum (over) operating pressure, taking into account the acceptance standards applicable in the country of installation. Our screwed diaphragm accumulators are repairable and refillable with a rubber separator element. These hydraulic accumulators are compact and easy to maintain, making them ideal for hydraulic applications. Volumes range from 0.05 to 2.5 liters, and pressures up to 330 barg. The gas valve fills the membrane with nitrogen up to the required precharge pressure P0 (special equipment must be used for precharging).

The bottom plate, located at the bottom of the diaphragm, rests against the lower part of the body, preventing extrusion when the gas pressure is higher than the fluid pressure. This prevents the diaphragm from entering the fluid conduit and being destroyed.

Product Description

Repairable diaphragm accumulator with seamless body for use in mobile machines and stationary systems.

Applications

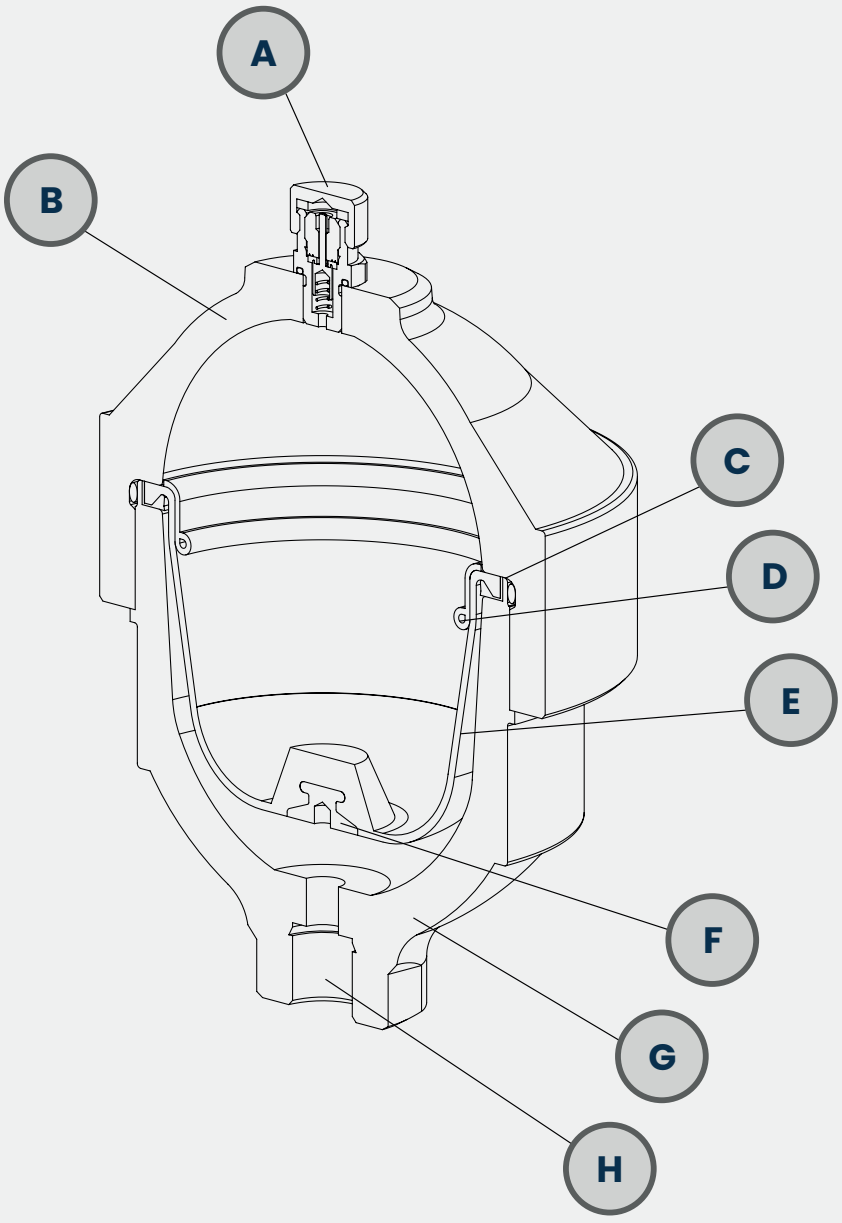
- Energy reserve in systems with intermittent operation due to pump power reduction.
- Energy reserve for emergencies, such as in the event of a motor-pump unit failure or power failure.
- Compensation for losses due to leakage.
- Pressure compensator (balancer).
- Vibration damping in the event of periodic oscillations.
- Volume compensation in the event of pressure and temperature variations.
- Hydraulic spring for vehicle suspensions.
- Shock absorption in the event of mechanical impact.
- Pulsation damping

Suggested positions for certain applications

The fluid-side connection is available with the threaded connections shown in the table.
The technical data and characteristics of the hydraulic accumulator are shown on the appropriate marking and/or label affixed to the accumulator body.
Screwed-in diaphragm accumulators can be installed vertically, in an inclined position (oil fluid connection at the bottom), or horizontally. If the installation position is horizontal or inclined, the effective fluid volume and the maximum permissible flow rate of the operating fluid are reduced.

Characteristics

A GAS VALVE
B UPPER CAP
C DIAPHRAGM SEAL RING
D DIAPHRAGM SUPPORT RING
E DIAPHRAGM
F BOTTOM CAP
G LOWER CAP
H FLUID CONNECTION



General characteristics

Nominal volume from
0.05 to 2,5 litres

Up to
MAX pressure 330 barg

According to
PED 2014/68/EU
EN 14359
EN13445-3
ASME VIII Div.1

Technical characteristics

Repairable construction

Screwed accumulators in carbon steel, stainless steel, and duplex

Standard coating for carbon steel

RAL 9005

Two-component anti-corrosive primer with water-based epoxy resins

alternatively

treatment of zinc-nickel plating (800 h salt-spray resistance)

Chemical nickel plating

Gas side connection
5/8" UNF -M28x1,5

Fluid side connection
(see table)

Separator element material
(see table)

* For ASME VIII Div. 1 contact SAIP to verify design pressures

L /LAV/AMP Type

Screwed diaphragm accumulators in carbon steel for pressures up to 330 BAR

Description

Accumulator /Pulsation dampener type L - Valv. 5/8" UNF - Vol. 0,05 L - NBR - CARB. STEEL. -M. 1/4" GAS

CODE EXAMPLE													
L	•	**1**	•	**0,05**	•	**1**	•	**O**	•	**A2**	•	**A**
1		2		3		4		5		6		7

1. ACCUMULATOR TYPE	
MODEL	barg
L	210
LAV	210
AMP	330

3. NOMINAL VOLUME	
0,05	L
0,1*	L
0,35*	L
0,5*	L
0,75*	L
1,5	L
2,5	L
0,05	L
0,1*	L
0,35*	L
0,5*	L

5. BODY MATERIAL	
O	Carbon steel
OZN	Zinc-Nickel plated carbon steel
O2	Kanigen-treated carbon steel

6. FLUID CONNECTION	
A2	M. 1/4" BSP-P
M8	F.M18x1,5
G4	F. 1/2" BSP-P
M8	F.M18x1,5
G4	F. 1/2" BSP-P
M8	F.M18x1,5
G4	F. 1/2" BSP-P
M8	F.M18x1,5
G4	F. 1/2" BSP-P
M8	F.M18x1,5
G5	F. 3/4" BSP-P
M8	F.M18x1,5
G5	F. 3/4" BSP-P
A2	M. 1/4" GAS
M8	F.M18x1,5
G4	F. 1/2" BSP-P
M8	F.M18x1,5
G4	F. 1/2" BSP-P
M8	F.M18x1,5
G4	F. 1/2" BSP-P

2. GAS CONNECTION (NITROGEN)	
1	5/8" UNF
2	M28x1,5

4. SEPARATOR ELEMENT MATERIAL	
1	Nitrile (NBR)
2	Butyl
4	Ethylene/propylene (EPDM)
8	Epichlorohydrin (ECO)
10	FKM
21C	FFKM

7. CERTIFICATION	
A	PED 2014/68/EU EN 14359:2017 EN13445-3:2021
E	PED 2014/68/EU ASME VIII Div.1

* Volume for which FFKM diaphragm is available

L /LAV Type

Screwed diaphragm accumulators in stainless steel and Duplex for pressures up to 250 BAR

Description

Accumulator /Pulsation dampener type L - Valv. 5/8" UNF - Vol. 0,05 L - NBR – AISI 316L - M. 1/4" GAS

CODE EXAMPLE													
L	•	1	•	0,05	•	1	•	X	•	A2	•	A
1		2		3		4		5		6		7

1. ACCUMULATOR TYPE
MODEL
L **
LAV **

3. NOMINAL VOLUME	
0,05	L
0,1*	L
0,35*	L
0,5*	L
0,75*	L
1,5	L
2,5	L

5. BODY MATERIAL	
X	Stainless steel
D	Duplex

6. FLUID CONNECTION	
A2	M. 1/4" BSP-P
M8	F.M18x1,5
N4	F. 1/2" NPT
M8	F.M18x1,5
N4	F. 1/2" NPT
M8	F.M18x1,5
N4	F. 1/2" NPT
M8	F.M18x1,5
N4	F. 1/2" NPT
M8	F.M18x1,5
N5	F. 3/4" NPT
M8	F.M18x1,5
N5	F. 3/4" NPT

2. GAS CONNECTION (NITROGEN)	
1	5/8" UNF
2	M28x1,5

4. MATERIALE ELEMENTO SEPARATORE	
1	Nitrile (NBR)
2	Butyl
4	Ethylene/propylene (EPDM)
8	Epichlorohydrin (ECO)
10	FKM
21C	FFKM

7. CERTIFICATION	
A	PED 2014/68/EU EN 14359:2017 EN13445-3:2021
E	PED 2014/68/EU ASME VIII Div.1

** DESIGN PRESSURE [barg]		
L	Stainless steel	150
LAV		
L	Duplex	250
LAV		210

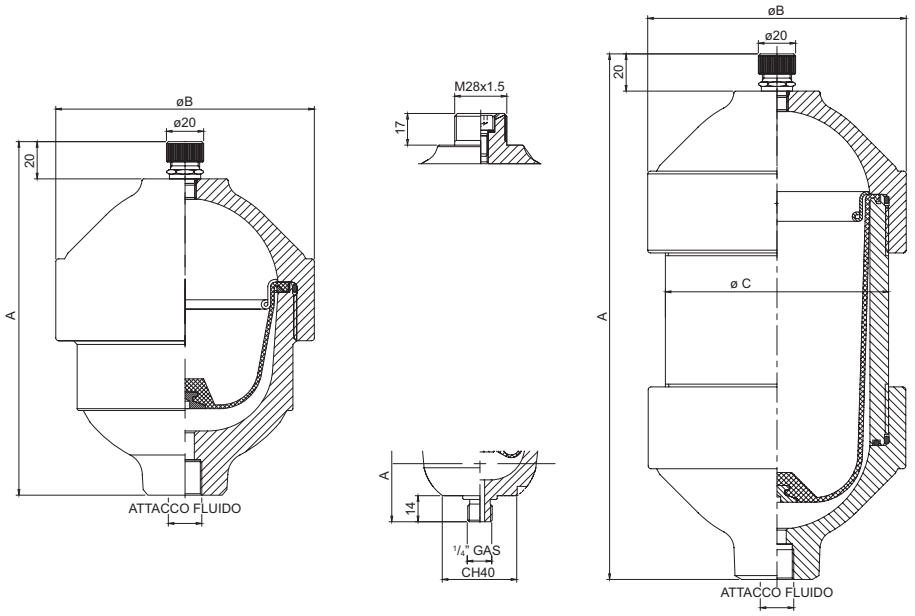
* Volume for which FFKM diaphragm is available

L /LAV/AMP Type Screwed diaphragm accumulators

BLADDER COMPATIBILITY / TEMPERATURE / FLUID*			
1	Rubber Perbunan Nitrile (NBR)	-15 / +80°C	**Suitable for:** • Mineral fats and oils • Aliphatic hydrocarbons (propane, butane, petrol, oils, mineral fats, diesel fuel, fuel oil, kerosene) • HFA - HFB - HFC fluids • Many diluted acids • Saline solutions • Water • Glycol water
8	Epichlorohydrin (ECO)	-30 / +120°C	Low gas permeability, good resistance to ozone, ageing and weathering. **Suitable for:** • Mineral fats and oils • Aliphatic hydrocarbons (propane, butane, petrol) • Silicone oils and greases • Water at room temperature
2	Butyl	-20 / +100°C	**Suitable for:** • Hot water up to 100° C • glycol-based brake fluids • silicone oils and greases • many acids and bases of phosphoric acid esters • salt solutions, polar solvents such as alcohols, ketones and esters • polyglycol-based hydraulic fluids
4	Ethylene/propylene (EPDM)	-30 / +130°C	**Suitable for:** • Hot water up to 100° C • glycol-based brake fluids • silicone oils and greases • many acids and bases of phosphoric acid esters • many polar solvents such as alcohols, ketones and esters
21C	Perfluoroelastomer (FFKM)	-10 / +220° C	**Suitable for:** • Mineral oils and greases, silicone oils and greases, animal and vegetable oils and fats • Aliphatic hydrocarbons (gasoline, butane, propane, natural gas), aroma tic hydrocarbons (benzene, toluene), chlorinated hydrocarbons (tetrachloroethylene, carbon tetrachloride) • Fuels (regular, premium, and containing methanol or ethanol) • Non-flammable fluids in the HFD group • Strong acids (sulfuric, nitric, hydrochloric), strong bases (caustic soda, ammonia), aggressive organic solvents (ketones, esters, ethers, alcohols) • Strong oxidants (hydrogen peroxide, ozone), steam, and high temperatures
10	Fluororated Rubber (FKM)	-10 / +150°C	**Suitable for:** • Mineral oils and fats, silicone oils and fats, animal and vegetable oils and fats • aliphatic hydrocarbons (petrol, butane, propane, natural gas), aromatic hydrocarbons (benzole, toluol) • chlorinated hydrocarbons (tetrachloroethylene, carbon tetrachloride) • fuels (normal, super and methanol-containing) • non-flammable fluids of the HFD group

* For use with different fluids and/or temperatures please contact SAIP

L /LAV/AMP Type Screwed diaphragm accumulators



Type **L/LAV/AMP** Screwed diaphragm accumulators in carbon steel for pressures up to 330 BAR

Volume	Model	Effective gas volume	Nominal volume	Design pressure EN (*)	Gas connection		A	B	C	D	Fluid Connection	Weight
		[L]		[barg]			[mm]	[mm]	[mm]			[kg]
0,05	L	0,05	0,05	210	5/8" UNF	M28x1,5	109	64,5	_	CH40	M. 1/4" BSP-P	1,3
0,1	L	0,1	0,1				133	77	_	CH36	F.M18x1,5 F. 1/2" BSP-P	1,9
0,35	L	0,35	0,35				159	99	_	CH36	F.M18x1,5 F. 1/2" BSP-P	2,9
0,50	LAV	0,50	0,50				173,5	116	_	CH36	F.M18x1,5 F. 1/2" BSP-P	4
0,75	LAV	0,75	0,75				190	139	_	CH36	F.M18x1,6 F. 1/2" BSP-P	6
1,50	LAV	1,50	1,50				283	139	120	CH41	F.M18x1,4 F. 3/4" BSP-P	10
2,5	LAV	2,5	2,5				437	139	120	CH41	F.M18x1,4 F. 3/4" BSP-P	14
0,05	AMP	0,05	0,05	330			109	64,5	_	CH40	M. 1/4" BSP-P	1,3
0,1	AMP	0,1	0,1				133	77	_	CH36	F.M18x1,5 F. 1/2" BSP-P	1,9
0,35	AMP	0,35	0,35				159	99	_	CH36	F.M18x1,5 F. 1/2" BSP-P	2,9
0,50	AMP	0,50	0,50				173,5	116		CH36	F.M18x1,5 F. 1/2" BSP-P	4

Tipe **L/LAV** Diaphragmm Accumuulators in stainless steel and Duplex for pressures up to 250 bar

Volume	Model	Effective gas volume	Nominal volume	Stainless steel design pressure (*)	Duplex design pressure (*)	Gas connection		A	B	C	D	Fluid Connection	Weight
		[L]		[barg]	[barg]			[mm]	[mm]	[mm]			[kg]
0,05	L	0,05	0,05	150	250	5/8" UNF	M28x1,5	109	65	_	CH40	M. 1/4" BSP-P	1,3
0,1	L	0,1	0,1	150	250			133	79	_	CH36	F.M18x1,5 F. 1/2" NPT	1,9
0,35	L	0,35	0,35	150	250			159	99	_	CH36	F.M18x1,5 F. 1/2" NPT	2,9
0,50	LAV	0,50	0,50	150	210			173,5	116	_	CH36	F.M18x1,5 F. 1/2" NPT	4
0,75	LAV	0,75	0,75	150	210			190	139	_	CH36	F.M18x1,6 F. 1/2" NPT	6
1,50	LAV	1,50	1,50	150	210			283	139	120	CH41	F.M18x1,4 F. 3/4" NPT	10
2,5	LAV	2,5	2,5	150	210			437	139	120	CH41	F.M18x1,4 F. 3/4" NPT	14

*Design pressure calculated according to EN14359:2017 (for pressure values according to other norms please contact SAIP)

L /LAV/AMP Type Screwed Diaphragm accumulators

Sizing

When sizing an accumulator, several factors must be considered:

- Minimum (P1) and maximum (P2) working pressures
- Minimum (T1) and maximum (T2) working temperatures
- Precharge pressure (P0)
- Required volumes

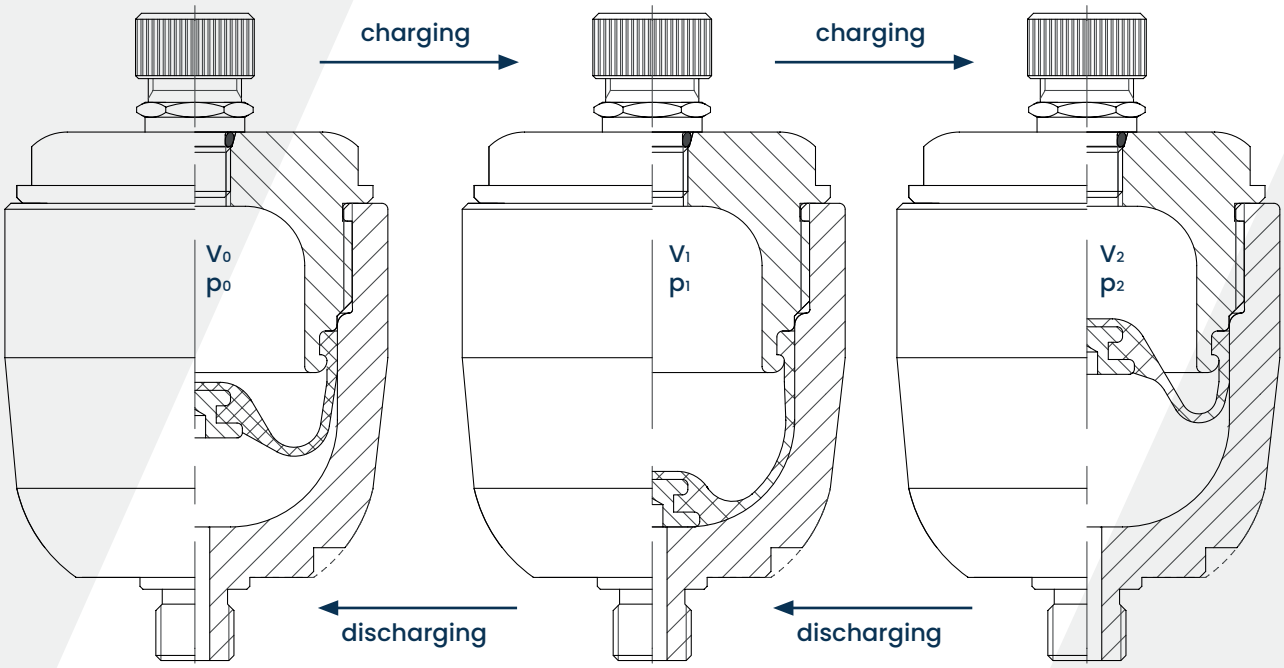
The formulas for correct sizing can be found in the data sheet:
GENERAL INFORMATION -> SIZING

Certifications

All hydraulic accumulators are pressure vessels and are subject to the national regulations and directives in force in the country of installation.
L-LAV-AMP accumulators are built in accordance with the European Pressure Equipment Directive 2014/68/EU, reference standards EN 14359:2017 and EN 13445-3:2021; they can be compliant with ASME VIII Div. 1.

For use with dangerous fluids (group 1) SAIP needs to be contacted.
For other countries, applications, norms, SAIP needs to be contacted.

Status conditions



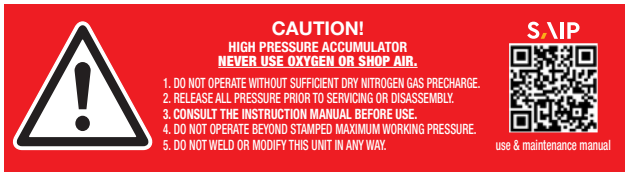
Usage information

Please refer to the following SAIP documents:

- WA USER AND MAINTENANCE MANUAL
- USER MANUAL FOR THE STORAGE AND PRESERVATION OF HYDRAULIC ACCUMULATORS/PULSATION DAMPENERS

Safety Equipment

Warning:
Hydropneumatic accumulators must be protected against operation beyond permissible limits in accordance with Directive 2014/68/EU on pressure equipment.
In order not to exceed the maximum operating pressure, SAIP recommends the use of a safety block.
(see Saip BSF catalogue)



Spare parts Carbon steel

Model	Effective volume	Complete diaphragm kit	Only 5/8" UNF nitrogen valve	for M28x1,5
L	0,05	KRL0,05-##PA16-01 *	VALPRE58OZ-1V2	VITCM814TF-O12-B + GUAUSITM8-1
	0,1	KRL0,1-##PA16-01*		
	0,35	KRL0,35-##PA16-01*		
LAV	0,5	KRLAV0,5-##PA16-01*		
	0,75	KRLAV0,75-##PA22-01*		
	1,5	KRLAV1,5-##PA22-01*		
	2,5	KRLAV2,5-##O32-01		
AMP	0,05	KRAMP0,05-##O16-01		
	0,1	KRAMP0,1-##O16-01		
	0,35	KRAMP0,35-##O16-01		
	0,5	KRAMP0,5-##O16-01		

PA up to P0 <= 120 bar and O for P0 > 120 bar

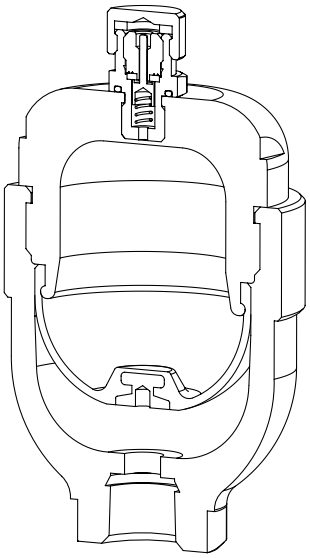
Spare parts Stainless steel and Duplex

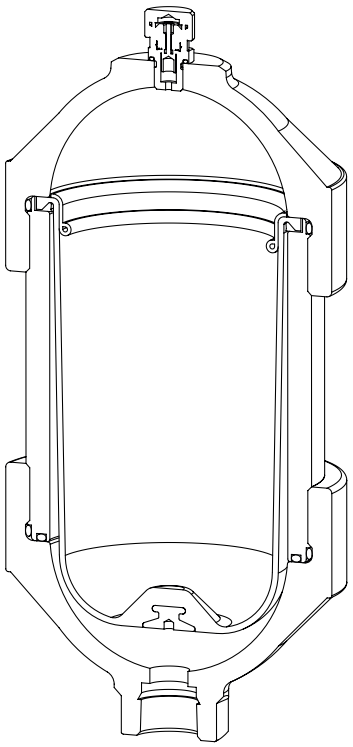
Model	Effective volume	Material	Complete diaphragm kit	Only 5/8" UNF nitrogen valve	for M28x1,5
L	0,05	Stainless steel	KRL0,05-##X16-01	VALPRE58X-10V0	VITCM814TF-X48+ GUAUSITM8-1X
		Duplex	KRL0,05-##D16-01	VALPRE58D-10V0	
	0,1	Stainless steel	KRL0,1-##X16-01	VALPRE58X-10V0	
		Duplex	KRL0,1-##D16-01	VALPRE58D-10V0	
	0,35	Stainless steel	KRL0,35-##X16-01	VALPRE58X-10V0	
		Duplex	KRL0,35-##D16-01	VALPRE58D-10V0	
LAV	0,5	Stainless steel	KRLAV0,5-##X16-01	VALPRE58X-10V0	
		Duplex	KRLAV0,5-##D16-01	VALPRE58D-10V0	
	0,75	Stainless steel	KRLAV0,75-##X22-01	VALPRE58X-10V0	
		Duplex	KRLAV0,75-##D22-01	VALPRE58D-10V0	
	1,5	Stainless steel	KRLAV1,5-##X22-01	VALPRE58X-10V0	
		Duplex	KRLAV1,5-##D22-01	VALPRE58D-10V0	
	2,5	Stainless steel	KRLAV2,5-##X32-01	VALPRE58X-10V0	
		Duplex	KRLAV2,5-##D32-01	VALPRE58D-10V0	

Replace ## with the code of the rubber part as per table below

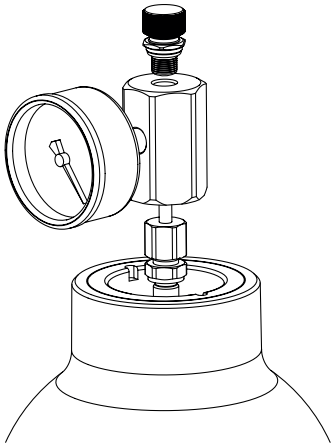
1	Nitrile (NBR)	**4**	Ethylene/propylene (EPDM)
8	Epichlorohydrin (ECO)	**10**	Fluororated Rubber (FKM)
2	Butyl	**21C**	Perfluoroelastomer (FFKM)**

**Available only for the volumes mentioned at page 4



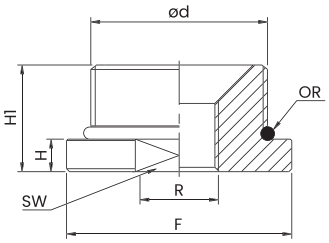


Accessories



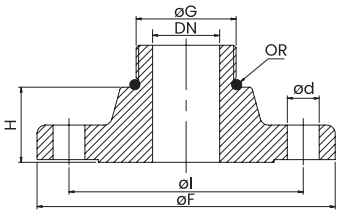
Nitrogen side pressure monitoring

Nozzle assembly with provision for mounting pressure gauge and/or fitting with rupture disk.
For codes or characteristics contact SAIP



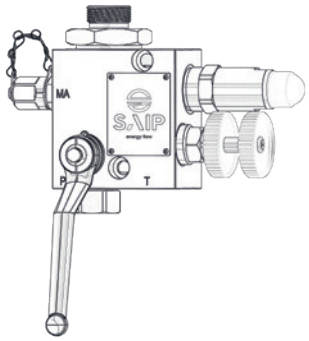
Adapters and reductions for Fluid connection

Adaptors and reductions for fluid connection:
suppliable on request in different dimensions, materials, etc.
For codes or characteristics please contact SAIP



Flange for fluid connection

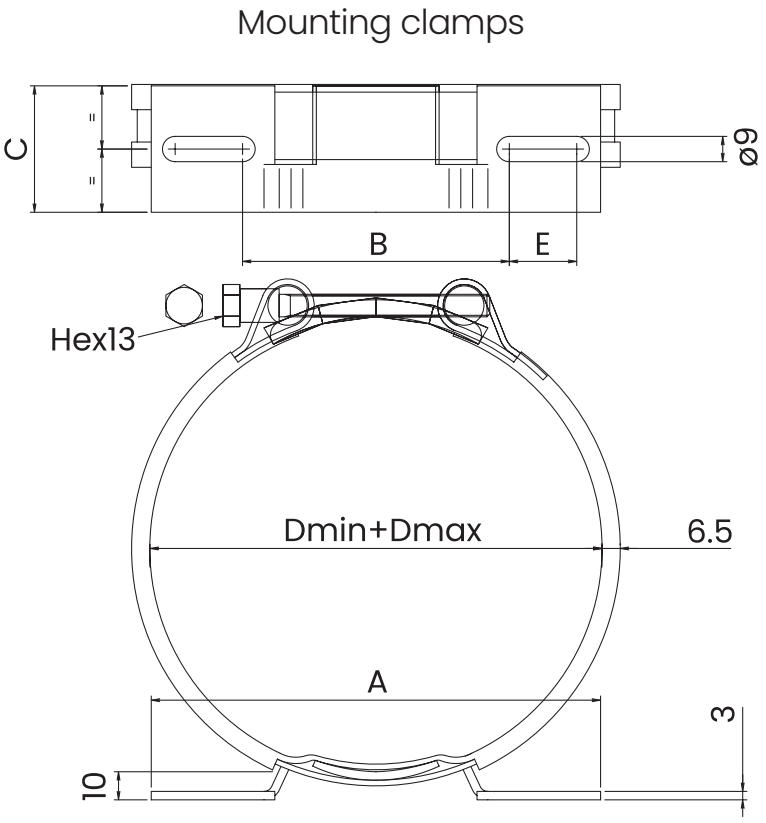
Flange for fluid connection: suppliable on request for norm (i.e. ASME B16.5, EN1092-1) dimensions, different material, etc.
For codes or characteristics please contact SAIP



Safety block

See BSF saip catalogue

Mounting clamps light series



Dimensions

Type		Description							
AISI 316L	CARBON STEEL	Dmin	Dmax	A	B	C	E	Peso	Use with L/LAV/AMP
		[mm]		[mm ±1]		[mm ±0,5]		[Kg]	
CFXZ96LF120	CFOZ96LF120	91	96	124	81	45	13	0,3	LAV 0,5 - AMP 0,5
CFXZ96LF160	CFOZ96LF160	91	96	144	93	45	17	0,5	
CFX102LF160	CFOZ102LF160	97	105	144	93	45	17	0,5	L 0,35 - AMP 0,35
CFX120LF160	CFOZ120LF160	115	123	144	93	45	17	0,5	LAV 0,75-1,5-2,5

SAIP

energy flow

L/LAV/AMP - October 2025

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SAIP S.r.l.
Hydropneumatic
Accumulator Company

Via Lambro 23/25/27
20073 Opera (MI) Italy
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DONWLOAD
DATA SHEET