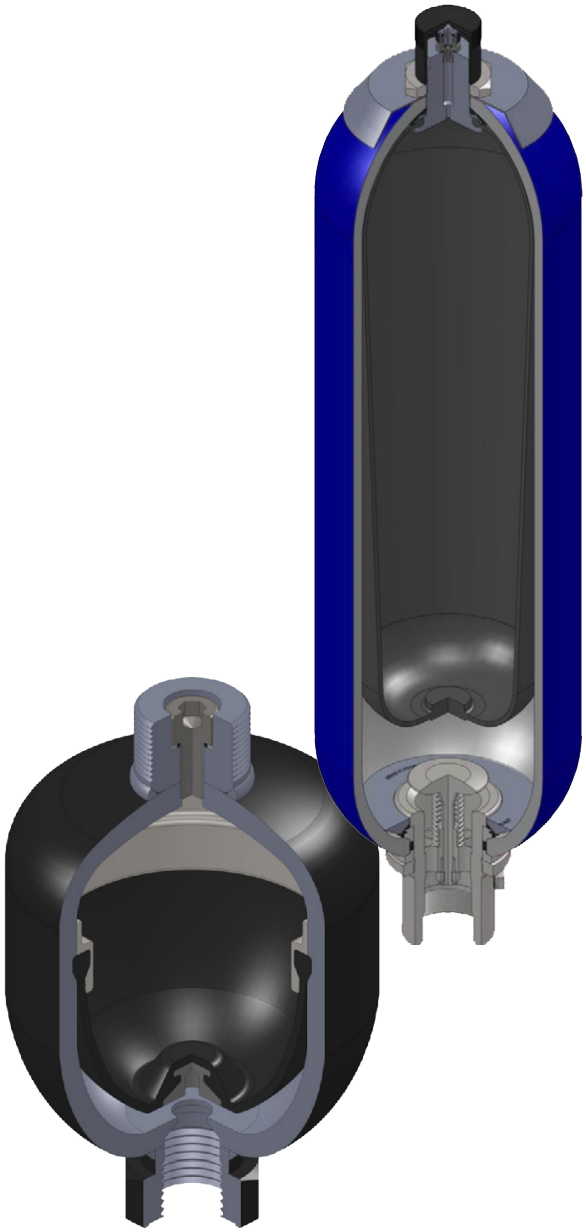
HYDROPNEUMATIC ACCUMULATORS



PASSION TO PERFORM

MPFILTRI®

Document no: 206.002 Rev 2

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Technical data

In hydropneumatic accumulators oil or other fluids are maintained under pressure by a pre-compressed gas, usually nitrogen.

The accumulator body for the AS range is constructed from a carbon steel one-piece shell. The body for the AMS models is manufactured with a high-strength alloy steel and a welded assembly. Internally, it is fitted with a nitrile diaphragm for the separation of gas and fluid. The AMS models are normally used as shock absorbers and pulsation dampeners for the industrial and mobile markets.

AMS models are specially designed for volume applications, these accumulators represent exceptional value for money.

Please contact MP Filtri UK Ltd for accumulator sizing and application details.

AS / AMS

Applications

- Shock absorption
- Energy storage
- Energy standby
- Leakage make-up
- Pulsation and noise dampening
- Water hammer (Stainless Steel)*
- Compensation for volume changes
- Pressure stabilisation

* Please consult MP Filtri UK Ltd

Specification

Type	Max Pressure	Volume/Size
AS	360 bar	5 to 55 Litres
AMS	210/250 bar	0.075 to 3.5 Litres

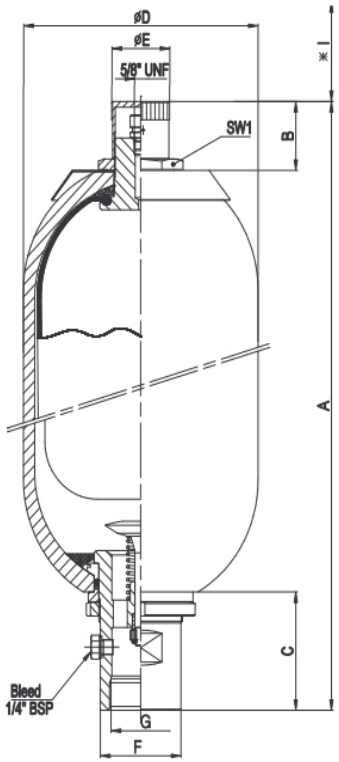
AS models - Higher working pressure models with alternative materials are available please contact MP UK

AS Type

Technical Data

Operating pressure	360 bar
Gas filling (Nitrogen only)	Max 90% of min operating pressure*
Admissable pressure ratio	Max ≤4/1**
Operating temperature	From -15°C to +80°C
Mounting	Vertical with gas valve upwards

* Max pre-charge pressure is 90% of the minimum operating pressure to increase service life
** Min pre-charge pressure is 1/6th of the maximum operating pressure to increase the service life



Standard Construction Characteristics

Material or body	Carbon steel
Bladder	NBR
Gas connection valve	5/8" UNF as standard
Paint	Anti-rust primer
Test	On request

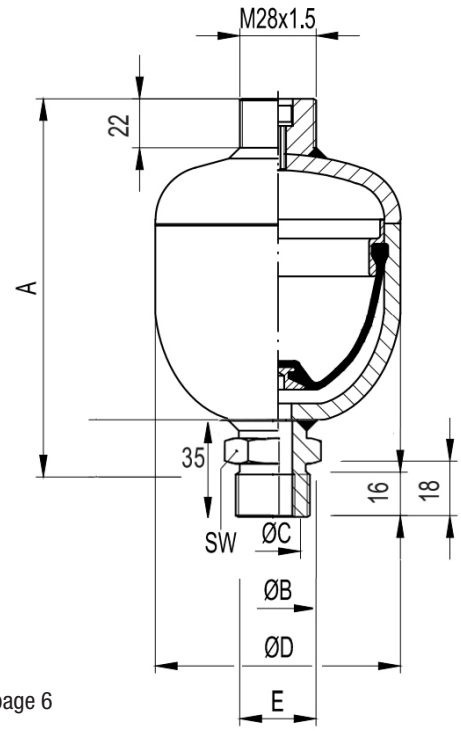
Dimensions

Type	Nominal volume (Litres)	Effective volume (Litres)	Dry weight (Kg)	G Fluid Port	A mm	B mm	C mm	ØD mm	ØE mm	F mm	SW1 mm
AS5	5	5	15	1¼"BSP	458 ±10	47	65	168	25	53	32
AS10	10	9.1	33	2"BSP	569 ±10	60	93	220	60	77	70
AS15	15	14.5	43	2"BSP	719 ±10	60	93	220	60	77	70
AS20	20	18.2	48	2"BSP	879 ±10	60	93	220	60	77	70
AS25	25	23.5	59	2"BSP	1044 ±15	60	93	220	60	77	70
AS35	35	33.5	78	2"BSP	1393 ±15	60	93	220	60	77	70
AS55	55	50	108	2"BSP	1904±15	60	93	220	60	77	70

How to order - Example AS-55-P-360-C-A9-V-8-CO-CO-PO

AS	55	P	360	C	A9	V	8	CO	CO	PO
Type	Volume 55 Ltrs	Bladder Material Nitrile	Max Pressure 360 Bar	Shell Material Carbon	Fluid Port AS5 = 1 1/4" All other models 2" BSP	Gas Valve V=5/8" UNF V2= 1/4" BSP in brass	Cert 8=PED97/ 23/EC	Fluid Port Carbon Steel	Gas Port Carbon Steel	Pre-charge Optional

AMS Type



Dimensions on page 6

Overview

This rugged gas valve features an internal hexagonal locking screw with sealing washer. AMS diaphragm accumulators are normally used as shock absorbers and pulsation dampeners in the industrial, machine tools and agriculture sectors. Compared to other accumulator types, the diaphragm models have the highest energy density (energy content / mass). This feature is due to the spherical shape of the accumulator shell.

For diaphragm accumulators, you can choose any type of installation. The preferred assembly is, however, the vertical one. For other hydraulic fluid and/or temperatures, please consult us.

Diaphragm - temperature - liquid compatibility. When selecting variations, pay attention to the following non-binding notes with regard to hydraulic fluid, diaphragm material and the permitted temperature range - see page 7.

Technical Data

Operating pressure	210/250 bar
Gas filling (Nitrogen only)	Max 90% of min operating pressure*
Admissable pressure ratio	Max 8/1**
Operating temperature	From -30°C to +80°C
Mounting	Horizontal or vertical with gas valve upwards

* Max pre-charge pressure is 90% of the minimum operating pressure to increase the service life
** Min pre-charge pressure is 1/6th of the maximum operating pressure to increase the service life

Standard Construction Characteristics

Material or body	Carbon steel
Bladder	NBR
Gas connection valve	M28
Paint	Anti-rust primer
Test	On request
Fluid port standard	See ØC column below

Dimensions

Type	Nominal volume (ltrs)	Dry weight (kg)	Working pressure (bar)	Flow rate (l/min)	Max compression ratio PO/P2	Max differential pressure (bar)	A mm	ØC BSP	ØD mm	E	SW mm
AMS 0.075	0.075	0.7	250	20	1:8	210	111	1/2”	64	-	32
AMS 0.16	0.16	1.0	250	20	1:8	210	135	1/2”	75	M33 X 1.5	41
AMS 0.32	0.32	1.4	210	40	1:8	140	155	1/2”	93	M33 X 1.5	41
AMS 0.5	0.5	2.0	210	50	1:8	175	167	1/2”	106	M33 X 1.5	41
AMS 0.75	0.75	2.6	210	50	1:8	175	181	1/2”	116	M33 X 1.5	41
AMS 1.0	1.0	3.5	250	50	1:8	170	195	1/2”	130	M33 X 1.5	41
AMS 1.4	1.4	5.4	210	50	1:8	120	214	1/2”	157	M33 X 1.5	41
AMS 2.0	2.0	7.5	210	70	1:8	140	220	1/2”	157	M33 X 1.5	41
AMS 2.8	2.8	10.0	210	70	1:4	140	284	1/2”	170.5	M33 X 1.5	41
AMS 3.5	3.5	11.5	250	70	1:4	140	300	3/4”	174	-	41

How to order - Example AMS-1.4-P-210-C-W-4-W-30

AMS	1.4	P	210	C	W	4	VM	30
Type	Nominal capacity Ltrs	Diaphragm Material Nitrile	Max Pressure 250 Bar	Body Material Carbon	Fluid Port Connection	Dimensions of fluis connection side	Gas side connection M28 x 1.5	Precharge Pressure 30bar

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).

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

Series

Diaphragm accumulator = AMS

Diaphragm material

Nitrile (NBR) = P

Body material

Carbon Steel = C

Maximum Working Pressure

Capacity (Litres)	Carbon steel (bar)
0.075	250
0.16	250
0.32	210
0.5	210
0.75	210
1.0	250
1.4	210
2.0	210
2.8	210
3.5	250

Fluid port connection

BSP ISO 128 female = G
BSP ISO Female and Metric Male M33 x 1.5 = W

Fluid connection port dimensions

For the type of connection:
G (for capacity 0.075 to 1.4 Ltrs) 1/2” = 4
G (for capacity 3.5 Ltrs) 3/4” = 5

Precharge pressure (bar)

Standard 30bar = 0 to 130 (max 130)

Gas side connection

Standard filling valve thread M28x1.5 = VM

Dimensions

Type	Nominal volume (ltrs)	Dry weight (kg)	Working pressure (bar)	Flow rate (l/min)	Max compression ratio P0/P2	A mm	ØC BSP female thread	ØD mm	E male thread	SW mm	Comments
AMS 0.075	0.075	0.7	250	20	1:8	111	1/2”	64	-	32	Nearest 0.05
WA2	0.05		210			85	1/4” male	55			
AMS 0.16	0.16	1.0	250	20	1:8	135	1/2”	75	M33x1.5	41	
WA2	0.16		250			104	1/2”	70			
AMS 0.32	0.32	1.4	210	40	1:8	155	1/2”	93	M33x1.5	41	
WA2	0.35		250			130	1/2”	96			
AMS 0.5	0.5	2.0	210	50	1:8	167	1/2”	106	M33x1.5	41	
WA2	0.5		140-210-300			144	1/2”	105			
AMS 0.75	0.75	2.6	210	50	1:8	181	1/2”	121	M33x1.5	41	
WA2	0.75		140-280-350			153	1/2”	117			
AMS 1.0	1.0	3.5	250	50	1:8	195	1/2”	136	M33x1.5	41	
WA2	1.0		210-250			189	1/2”	117			
AMS 1.4	1.4	5.4	210	50	1:8	214	1/2”	150	M33x1.5	41	
WA2	1.4		140-250-350			172	1/2”	153			
AMS 2.0	2.0	7.5	210	70	1:8	228	1/2”	163	M33x1.5	41	
WA2	2.0		210-250			211	1/2”	153			+3/4 BSP
AMS 2.8	2.8	10.0	210	70	1:4	284	1/2”	167	M33x1.5	41	
WA2	3.15		250			257	3/4”	174			
AMS 3.5	3.5	11.5	250	70	1:4	300	1/2”	174	-	41	
WA2	3.55		250			284	1/2”	174			

PRODUCTS DESIGNED AND MANUFACTURED BY EPE ITALIANA SRL

Europe market
All hydraulic accumulators are pressure vessels and are subject to the national regulations and directives, valid at the place of installation.

Diaphragm accumulator type AMS, up to and including 1 litre, must not be CE marked.

For diaphragm accumulator type AMS, greater than 1 litre, every shipping batch is provided with a conformity declaration and use and maintenance instructions and/or all documents requested.

All vessel categories (see Table 5.3e) must be protected by means of a pressure relief valve in accordance with Directive 2014/68/EU.

Delivery conditions
Bladder accumulators are delivered pre-charged with nitrogen at a pressure of 30 bar or at the value of pressure required at time of order. The precharge value is also on the nameplate of the accumulator.

Depending on the size and quantity ordered, the bladder accumulators are shipped in boxes, in cartons, on pallets or wooden boxes on request.

Unless not required, certificates and documentation are provided together with the accumulators.

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.

You will need to protect the accumulator from impact and handle with care.

Storage
During storage in the warehouse, we recommend you 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 months of storage, the pre-charge pressure must be to two bar and you should ensure that inside there is lubrication fluid compatible with bladder polymer.

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 accumulator
With reference to the PED 2014/68/EU classification, Article 3, Paragraph 3 and / or risk categories I or II depending on the volume and maximum working pressure, the accumulator 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 working temperature in celsius
- Volume V in litres
- Group of fluids allowed (II)
- CE marking (for volumes exceding 1 litre) with the identification number of the notified body
- Pre-charge pressure in bar

It is strictly forbidden to:
- Weld, rivet or screw any item of the accumulator
- Engrave or permanently stamp the surfaces of the accumulator shell and / or carry out other operations that could affect or change the mechanical properties of the accumulator
- Use the accumulator as a structural element: it should not be subjected to stresses or loads
- Change the data of the nameplate and / or accumulator 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 accumulator has not suffered any damage during shipping / handling. Verify that the requested type matches with what is stamped on the nameplate.

We recommend using the accumulator with a suitable security valve or a security block (type BS). This device provides user and equipment protection against possible damage caused by pressure surges and also makes the maintenance of the accumulator easier, facilitating the interception and the discharge.

Ensure there is a space of 200 mm above the gas pre-charge valve to allow access to and control of the pre-charge equipment.

AS accumulators - installed in vertical position. The nameplate must be visible.

AMS accumulators - may be installed in any position from horizontal to vertical (preferably with the pre-charge valve at the top), and the nameplate must be visible.

Proceed with the assembly so that no abnormal force affects the pipes connected directly or indirectly to the accumulator. We recommend the use of supporting components and also fastening to avoid the transmission of vibrations.

If are you are not using compatible safety blocks, make sure the accumulator is connected to the hydraulic circuit by suitable connection devices.

Make sure the fluid is compatible with the elastomer of the bladder. Check that the max. allowed accumulator 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 and/or abrasive particles.

Pre-charge of nitrogen.
Normally, the bladder accumulators are delivered pre-charged with pressurized gas.

The pre-charge of gas can be controlled and / or adjusted before or after installation of the accumulator in the hydraulic circuit.

For the pre-charge, use only industrial dry nitrogen with a purity of min.99%. It is important to use the nitrogen from a bottle equipped with a pressure reducing valve.

Use only EPE authorised equipment to check that the pressure is that required, or to adjust it

If the pre-charge pressure is lower than required, connect the charging hose on one side and the other side and then connect it to the nitrogen bottle or to the pressure reducer.

Slowly fill the nitrogen in the accumulator until reaching a pressure slightly higher than that set value (+ 10 ÷ 15%).

Close the bottle and remove the charging hose pipe from the pre-loading set; wait until the gas temperature has stabilised (two hours) and calibrate the pressure, discharging the excess gas.

Make sure the gas valve is not leaking and, if necessary, use soap and water.

Tighten the protective caps manually.

Hydraulic pressurisation
- Check that the pre-charge pressure is adequate for the application
- Ensure that the hydraulic pressure never exceeds the max. (PS) allowed and shown on the accumulator shell.

Maintenance
- Periodically check the pre-charge pressure of the gas: 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 at annual intervals. For heavy-duty applications, check the pre-charge every 6 months.
- Periodically (annually) carry out a visual inspection of the accumulator 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 accumulator.

Disassembly
If, in the event of failure, scheduled check, or retest, it is necessary to remove the accumulator from the system, isolate the accumulator prior to removal from the installation and discharge pressure of the liquid.

AMS diaphragm accumulators may be repaired.
- Fix the accumulator.
- Remove the pre-charge valve (after having discharged completely the nitrogen).

Repair
If you are replacing the pre-charge valve, it is recommended to use only original spare parts.
Before starting the repair completely drain the nitrogen contained in the accumulator.

Refitting
After thorough cleaning, check and replace the pre-charge valve.

Pre-charge
- Screw the pre-charge PCM equipment on the gas valve.
- Connect the equipment to the cylinder of nitrogen or to the pressure reducer with the inflation tube.
- Slowly enter the nitrogen in the accumulator until reaching a pressure slightly higher than the set value (+ 10 ÷ 15%).
- Close the cylinder and remove the connecting pipe from the equipment.
- Wait until the gas temperature has stabilised (one hour).
- Calibrate the pressure discharging the excess gas.

Demolition and recycling of the accumulator
Before accumulator demolition or recycling, you should always discharge completely the pre-charge pressure and remove the gas valve.

Any pre-charge pressure should be discharged before disposal.

GAS FILLING AND CHECKING APPARATUS (CHARGING KIT)

Part number	PCM 250 S	PCM 250 M
Max Pressure	400bar	400bar
Accumulator gas valve	5/8"UNF	M28 x 1.5
Bottle fitting	W 5/8" ext	W 5/8" ext
Pressure gauge	63mm. 1/4" BSP. 21/2, 5, 6, 10, 12, 16, 25, 40, 60, 100, 160, 250 or 400bar (250bar supplied unless specificied)	63mm. 1/4" BSP. 21/2, 5, 6, 10, 12, 16, 25, 40, 60, 100, 160, 250 or 400bar (250bar supplied unless specificied)
Weight	2kg	2kg
Hose length	3m	3m

For spare components please contact MP Filtri UK Ltd

SEPARATING ELEMENTS

The membrane inside the accumulator which separates the gas from the liquid. For spare bladders please consult MP Filtri UK Ltd. Please note diaphragm accumulators are not repairable.

CERTIFICATION

The standard product is supplied factory tested and CE marked for products larger than 1Ltr (PED/23/EC).
For other certifications please consult MP Filtri UK Ltd

OTHER TYPES/OPTIONS

For other types of accumulators not included in this brochure please consult MP Filtri UK Ltd. Options include: different body and barrier materials and larger and smaller volume accumulators.

Overview

The BS range of safety blocks combines all the features necessary to protect, isolate and discharge a hydraulic accumulator.

Available in four sizes, the BS10 and BS20 feature a 90º movement shut-off valve that also simultaneously discharges the accumulator to tank. In the larger BS25 and BS32 sizes the discharge is controlled by a separate flow control valve.

Discharge can also be initiated by a solenoid valve. The safety blocks have DBDS CE certified pressure relief valves fitted as standard.

Technical Data

Max pressure	420 bar
Nominal internal passage diameter	10mm, 20mm, 25mm, 32mm
Working temperature	-20 to +80ºC (Consult MP Filtri UK Ltd for others)
Viscosity range	10 to 400 cSt
Max recommended contamination level	ISO4406 21/19/16
Shut-off valve	Ball type
Pressure relief valve	DBDS 10
Discharge valve	Manual or dual manual and electric
Mounting position	Any
Block and valve material	Carbon steel as standard
Seals	Nitrile standard
Nominal flow rates to system (ΔP=1.5 bar)	BS10*= 40l/m, BS20*=190l/m, BS25=240l/m, and BS32+400m/m

* Please note - with the BS10 and BS20, during discharge all three ports (P, A and T) are momentarily interconnected. The ball valves should be either fully open or fully closed and should not be used as flow control valves.

Connections

BS10
A5 = 3/4"BSP
A7 = 1 1/4"BSP
A9 = 2"BSP
BS20
A7 = 1 1/4"BSP
A9 = 2"BSP
BS25
A7 = 1 1/4"BSP
A9 = 2"BSP
BS32
A7 = 1 1/4"BSP
A9 = 2"BSP

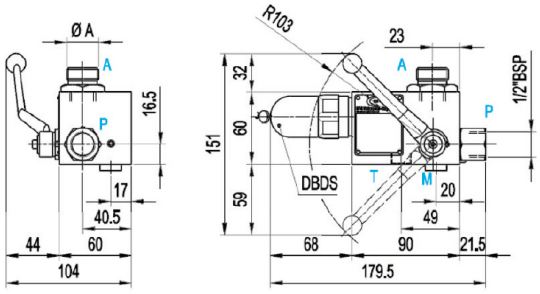
Solenoid Options

24D-C =24V DC n/c
24D-O =24V DC n/o
110D-C= 110VDC n/c
110D-O=110VDC n/o
220D-C= 220VDC n/c
220D-O=220VDC n/o
24A-C =24V AC n/c
24A-O =24V AC n/o
110A-C= 110VAC n/c
110A-O =110VAC n/o
220A-C= 220VAC n/c
220A-O =220VAC n/o

How to order

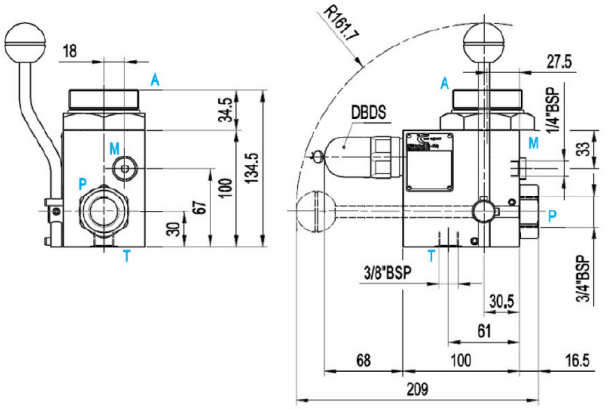
BS	10	M	P	360	A5	G4	C	P	24D-C
Safety block	Size (mm) Internal nominal diameter	Discharge M=Manual E= Manual and electric	Relief valve P=DBDS CE certified	Relief valve setting (Specify - max 400 bar)	Connection options (see table above)	System side connection **BS10** = G4 = 1/2" BSP **BS20** = G5 = 3/4" BSP **BS25** = G6 = 1" BSP **BS32** = G8 = 1 1/2" BSP	Block material C = Carbon Steel	Seal material P = nitrile V=fluorocarbon E=EPDM	Solenoid Options (See table above)

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



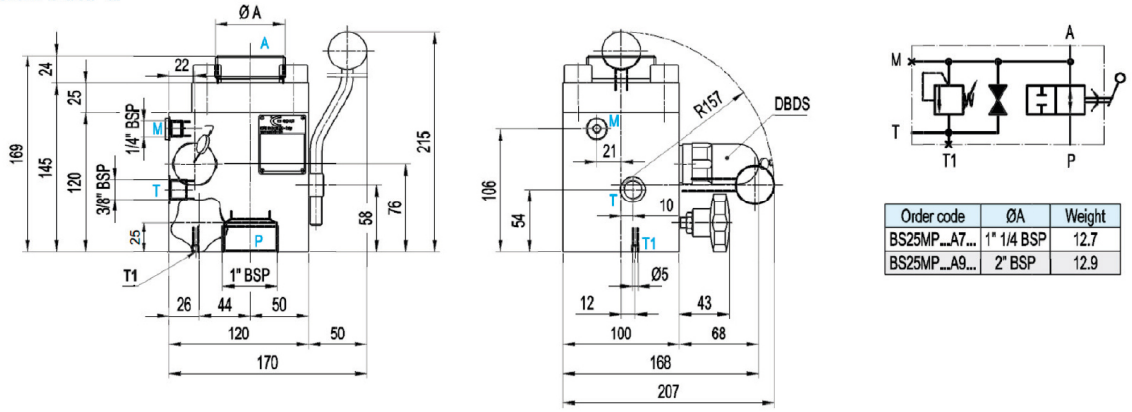
Order code	ØA	Weight
BS10MP...A5...	3/4" BSP	3.2
BS10MP...A7...	1" 1/4 BSP	3.4
BS10MP...A9...	2" BSP	3.5

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



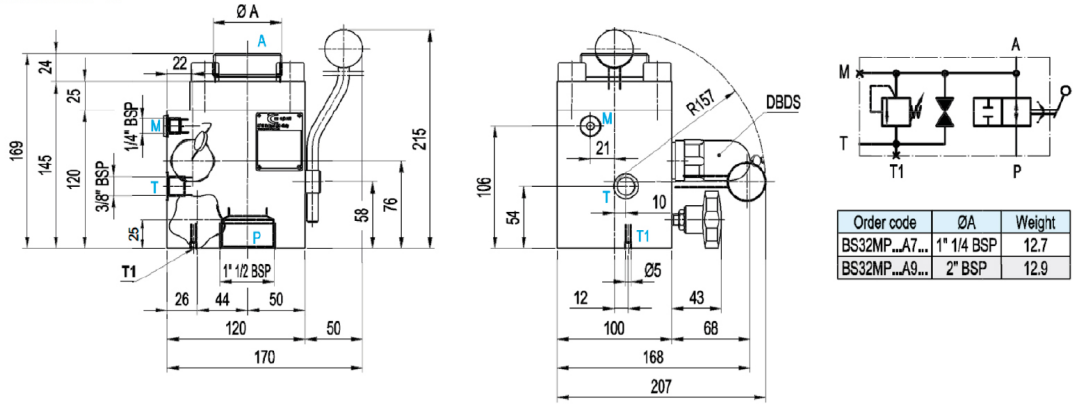
Order code	ØA	Weight
BS20MP...A7...	1" 1/4 BSP	6.1
BS20MP...A9...	2" BSP	6.7

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



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

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



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

* measurements in mm

Overview

The mounting clamps can be used with all type of accumulators. Secure design provides independent mounting on installations.
A rubber insert is provided to reduce mechanical vibration – compensating for shell manufacturing tolerances and to prevent stresses at the connection.
The clamp type C90 has one piece construction with one central screw. All other types have a two-piece construction for easy installation and removal while improving the strength-to-weight ratio.
We recommend using a single clamp when the length of the accumulator is less than twice its diameter.
For greater lengths, we recommend using two clamps or one clamp and one bracket with support ring.

How to order

C	220	C	P
C= Clamp	Nominal diameter (Internal diameter range) 89-93 = 90 114-122 = 115 167-172 = 170 209-230 = 220	Clamp material C = Carbon steel galvanised X = Stainless steel AISI 316	Elastomer material P= Rubber in NBR

Dimensions

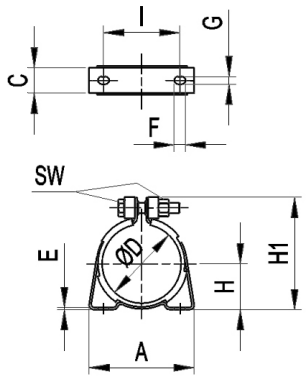


fig. I

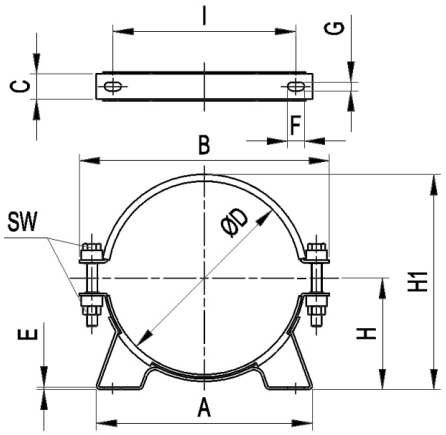


fig. II

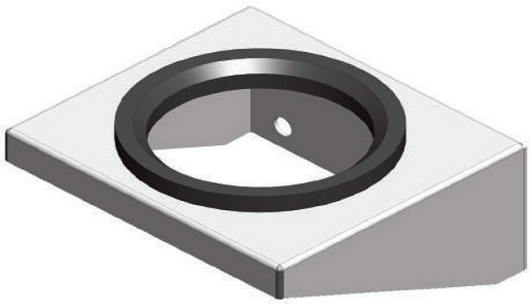
Clamp nominal size	Clamp order code *	Fig	A (mm)	B (mm)	C (mm)	ØD (mm)	E (mm)	F (mm)	G (mm)	H (mm)	H1 (mm)	I (mm)	SW (mm)	Acc dry weight (kg)
90	C90	I	125	-	30	89-93	2.5	13	9	53-55 (9+1/2ØD)	132.5	90	18	0.65
115	C115	II	135	195	30	114-122	3	13	9	66-70 (9+1/2ØD)	131-139 (17+ØD)	100	18	0.85
170	C170	II	185	250	30	167-172	3	13	9	95.5-98 (12+1/2ØD)	187-192 (20+ØD)	146	18	1.1
220	C220	II	255	295	30	209-230	3	20	10	117-127.5 (12.5+1/2ØD)	230-251 (21+ØD)	216	18	1.35

* Clamp order codes: 89-93 = C90; 114-122 = C115; 167-172 = C170; 209-230 = C220

Usage Table

Clamp nominal size	Int ø dimension	Bladder accumulator type	Diaphragm accumulator type
90	90-93	AS	AMS 0.32 - 0.75
115	114-122	AS	AMS 0.5 - 0.75 - 1.5 - 2.5
170	167-172	AS	
220	209-230	AS	

Overview

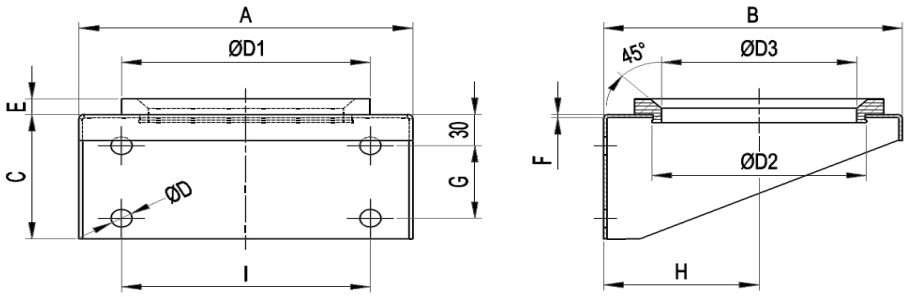


Brackets can be used with all type of accumulators. Secure design provides independent mounting on installations.
Rubber insert provided to reduce mechanical vibration, to compensate for shell manufacturing tolerances and to not lie with outward stresses on the connection.
The brackets can be easily bolted to the system. We recommend using a bracket and support ring with one or two clamps or U-bolts.
For greater lengths, we recommend using two clamps or one clamp and one bracket with support ring.

How to order

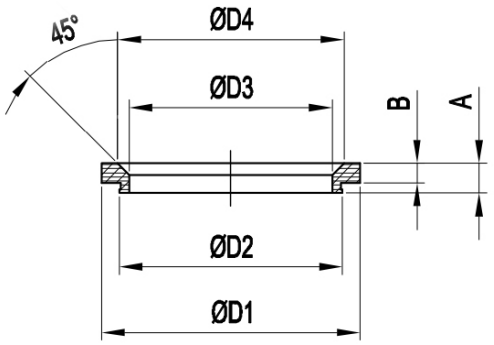
MA	150	C	P
MA = Bracket	Nominal diameter (Internal diameter) 100 = 100 150 = 150	Clamp material C = Carbon steel galvanised X = Stainless steel AISI 316	Elastomer material P= Rubber in NBR

Dimensions



Brackets nominal size	A	B	C	ØD	ØD1	ØD2	ØD2	E	F	G	H	I	Weight (kg)
100	200	175	90	11	140	120	90	10	3	40	96	140	1.5
150	260	232	120	17	200	170	150	15	3	70	125	200	3.6
200	260	235	120	17	200	170	150	15	3	70	128	200	3.7

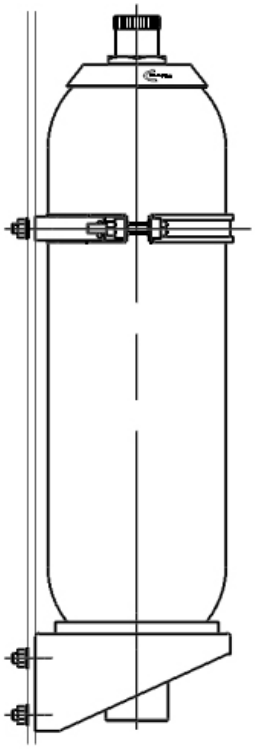
Dimensions



Support ring nominal size	A (mm)	B (mm)	ØD1 (mm)	ØD2 (mm)	ØD1 (mm)	ØD3 (mm)	ØD4 (mm)
100	18	10	140	120	100	112	0.13
150	23	15	200	170	150	175	0.22

Usage Table

Bracket nominal size	Supporting ring nominal size	Bladder accumulator type	Additional bottle type
100	100	AS	AS
115	114/122	AS	AS



Mounting example

How to order

AG	150	P
AG = Support Ring	Nominal diameter (Internal diameter) 100 = 100 150 = 150	Elastomer material P= Rubber in NBR

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