



Filters . Accumulators
an ISO 9001 Company

EPE Accumulators are widely used in Hydraulic Systems for following applications :

- * Fluid Power Storage
- * Counter Balance
- * Pulsation Damper
- * Hydraulic Semi-Shock Damper
- * Emergency Energy Reserve
- * Shock Absorber
- * Volume Compensator
- * Hydraulic Spring
- * Pressure Compensator
- * Fluid Separator

Repairable Diaphragm Accumulators Type-AM



Technical Features

Design	:	Screwed Shell, Repairable
Max. Working pressure	:	210 Bar.
Test pressure	:	1.43 times Max. Working Pressure
Temperature range	:	-10° C to +80° C
Allowable pre. Ratio (P2/P0):	:	6:1
Nominal capacity	:	0.1 to 2.5 Ltrs.
Material of Construction		
Body	:	Carbon Steel / Stainless Steel
Diaphragm	:	Nitrile / Viton / EPDM
Connections - Gas Side	:	5/8" UNF (M)
Fluid Side	:	M18 x 1.5 (F)

Identification Code

Accumulator type	Nominal Capacity (Liters)	Diaphragm Material	Max. Working Pressure (Bar)	Body Material	Fluid Side Connection	Test Certification	Gas Fill Valve Material
AM = Diaphragm Accumulator - Repairable design	0.1 0.35 0.5 0.75 1 1.5 2 2.5	P = Nitrile (NBR) B = Butyl E = EPDM V = Viton	10 30 50 70 100 140 210	C = Carbon Steel - painted N = Nickel coated CS X = Stainless Steel	M = Female Metric Thread R = With adaptor ⁽¹⁾ F = With flange ⁽¹⁾ S = Special ⁽¹⁾	0 = Factory Testing 8 = CE/PED	- = Standard N = Nickel coated CS X = Stainless Steel

(1) To be specified in full besides the code.



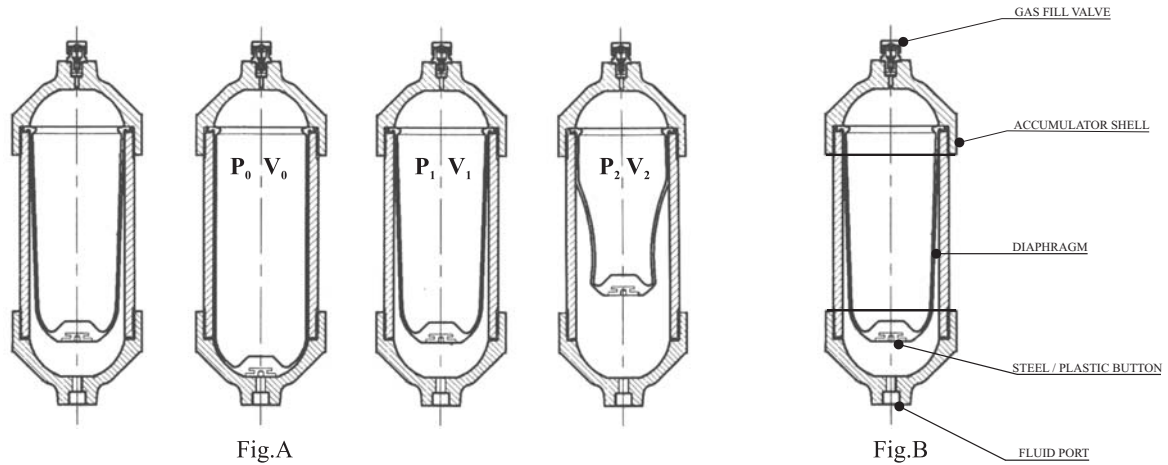
Note : Technical specifications are subject to change.

Catalogue Ref. : EPE/DTA-R/001

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General



Definition and Operation - (Refer Fig.A)

A hydro-pneumatic accumulator is a device used specifically for storage of liquid under pressure. As liquids, for all practical purposes, are incompressible, this objective is achieved by utilising the compressibility of gases.

- * A flexible rubber separator i.e., a diaphragm is fitted into the accumulator shell.
- * An inert gas - nitrogen - is filled into the diaphragm through a pressure valve to a pressure P_0 . The diaphragm expands, filling the entire volume V_0 of the accumulator shell.
- * When the system (circuit) pressure P_1 is higher than the gas precharge pressure P_0 , the hydraulic liquid enters the accumulator shell and the diaphragm is compressed reducing the gas volume to V_1 .
- * Should the liquid pressure rise to P_2 , the volume of gas reduces to V_2 with an attendant rise in the pressure, thus balancing the Liquid pressure.

A potential energy is now created in the accumulator to be utilised whenever needed.

Construction - (Refer Fig.B)

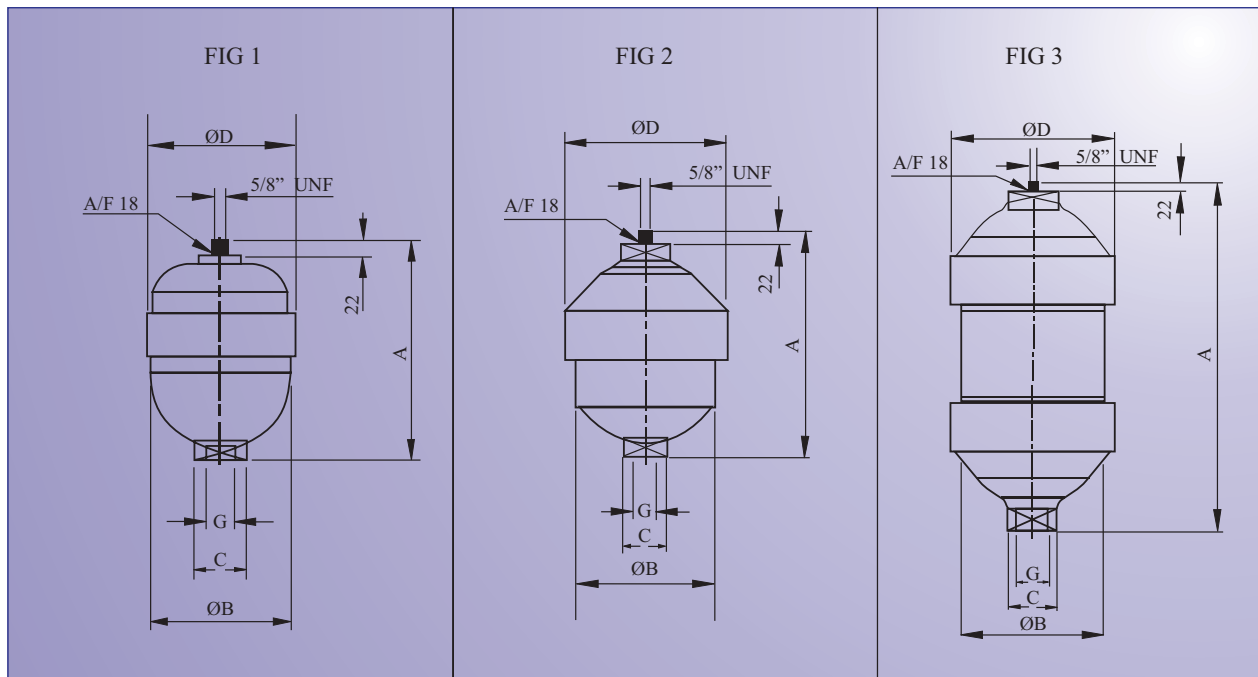
- * An accumulator shell is a combination of forged and machined components specifically designed for leak proof assembly.
- * Diaphragm is a flexible rubber component separating hydraulic fluid and nitrogen.
- * Fluid Port connects the accumulator to the hydraulic system.
- * Gas Fill Valve is a non-return valve provided on the accumulator for inflating the diaphragm in the accumulator with the help of a Pre-loading and Checking Set.

Accumulator Selection

- * While choosing the most suitable accumulator size, following aspects should be considered.
- * Maximum operating pressure of the system should be lower than maximum working pressure of the accumulator indicated in the catalogue or on the product name-plate.
- * Pressure ratio P_2/P_0 should be less than 6.
- * The material of the body and diaphragm should be compatible with the fluid used and with the operating temperature.

EPE Diaphragm Accumulators are charged with nitrogen before shipment, unless otherwise specified in the order, at a pressure of

- * 10 bar for despatch within India
- * Nil for exports



Dimensions

Type	Fig.	Max. Work Pre. (bar)	Gas Volume (Liters)	Dry Weight (kgs)	Fluid Port Connection G		A	B	C (A/F)	D
					Standard	On request				
AM-0.1	1	210	0.1	1.7	M18 x 1.5 (F)	1/2" BSP(F)	127	74	36	77
AM-0.35			0.32	2.5			150	91		99
AM-0.5			0.48	3.72			169	94		116
AM-0.75	2		0.72	6.17		201	116	136		
AM-1			0.9	9.3		259	120			
AM-1.5	3		1.4	10.4		299				
AM-2		1.9	12.25	364						
AM-2.5		2.4	14.55	454						

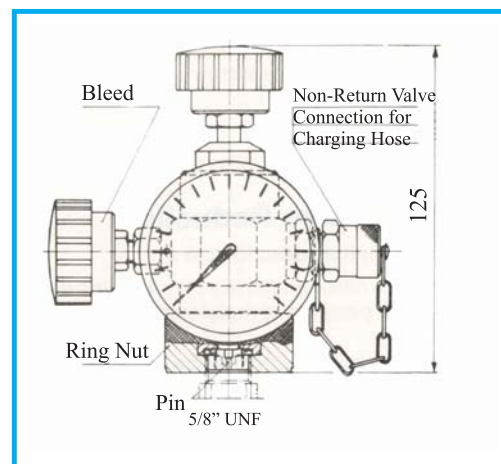
Checking & Charging

Pre-Loading & Checking Set type-PC is to be used for checking / charging of repairable Diaphragm Accumulators. When charging, the nitrogen bottles must be capable of delivering pressure higher than the desired accumulator gas pressure.

Use dry industrial nitrogen. **NEVER USE OXYGEN OR AIR.**

Proceed as follows:

- * Fit the suitable pre-charging equipment to the gas valve;
- * Connect it to the nitrogen cylinder with the charging hose;
- * Slowly introduce nitrogen into the accumulator until reaching a pressure slightly above the required level;
- * Close the valve of nitrogen cylinder and disconnect the charging hose from the equipment;
- * Wait for the gas temperature stabilization;



A PRESSURE REDUCING VALVE MUST BE INSTALLED BETWEEN THE NITROGEN GAS CYLINDER AND THE ACCUMULATOR WHEN THE GAS CYLINDER PRESSURE IS HIGHER THAN MAX PERMISSIBLE PRESSURE OF ACCUMULATOR.

Installation & Maintenance

General

The EPE diaphragm accumulator is designed, manufactured and tested in accordance with current standards. The maximum working pressure, model, precharge pressure, serial number & year of manufacture are marked on the accumulator shell, besides the manufacturers mark and legal conformity stamp (if required).

Instructions

- * Do not machine or weld the accumulator body.
- * The precharge gas must be nitrogen unless otherwise agreed between the manufacturer and the user.
- * Do not use liquids incompatible with the material of construction.
- * For system and personnel safety, ensure that all the necessary precautions required for pressure vessels are taken.

Preliminary checking

On receipt of an accumulator, check to ascertain that

- * the accumulator is not damaged in transit.
- * the identification code is as per the order.

Before installation, it is essential to check that

- * the working pressure marked on the accumulator shell is higher than the maximum operating pressure of the system and
- * the accumulator is precharged to the required pressure.

Installation

An accumulator may be installed in any position. However, the vertical position (fluid port down) is preferred.

- * Leave sufficient space to allow use of the precharging equipment.
- * Leave the markings clearly visible.
- * Ensure space for easy removal of accumulator from system.

Connection to the fluid port requires

- * An isolation and unloading valve.
- * A relief valve.
- * A pressure gauge connection.

This can easily be obtained by using safety blocks as per EPE Model B10 and B20.

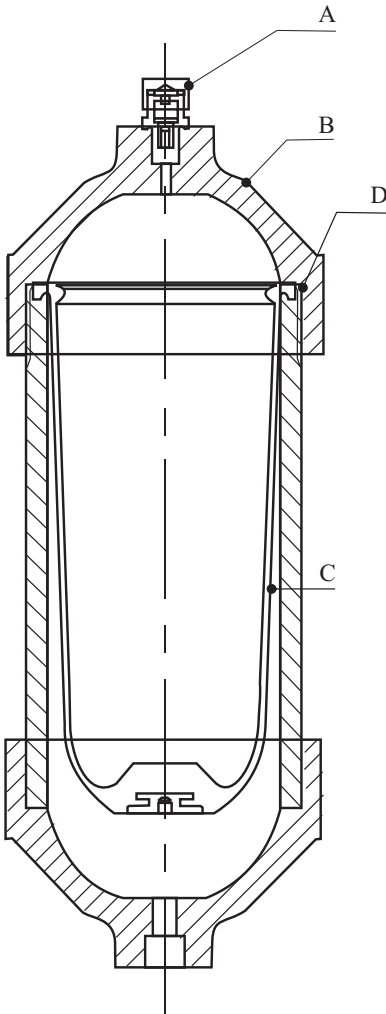
Mounting: There must be no additional forces or moments acting on the accumulator other than those due to the fluid power system. The accumulator mountings (brackets, clamps etc.) must ensure that the mechanical movements and vibrations are safely absorbed so that liquid and gas connections do not become additionally loaded.

No machining or welding should be carried out on the accumulator for the purpose of mounting.

Putting into service

Before the system is pressurised, check that

- * The precharged gas is at required pressure.
- * The setting of the safety or relief valve is lower than the max. working pressure of the accumulator and
- * Air is vented from the piping.



Installation & Maintenance

Periodic Checks

The accumulator should be checked to ensure that the gas precharge has not reduced.

Before checking, the accumulator must be isolated from the system and the fluid removed.

An initial check is required during the first week of installation.

A second check should be carried out approximately 3 months later and subsequent checks after every 3 to 6 months.

Maintenance

General

Before removing the accumulator for servicing, isolate it from hydraulic circuit and reduce pressure to zero by exhausting the fluid from the accumulator to reservoir.

Repair

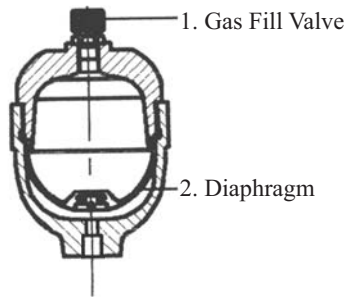
Repair work can involve replacing the diaphragm, seals or gas fill valve. For safety and functionality, use only parts supplied or recommended by EPE. Before any repair work is undertaken both the liquid and the gas chamber have to be depressurized.

Disassembly

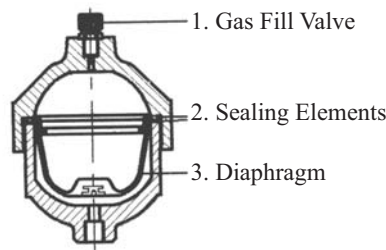
- * Firmly fasten the lower part of the accumulator in a vice.
- * Remove the gas fill valve (A) (after depressurizing the accumulator completely).
- * Unscrew the top cover (B) using a band or chain pipe wrench or spanner.
- * Extract the diaphragm (C) along with seals (D).

Spare Parts

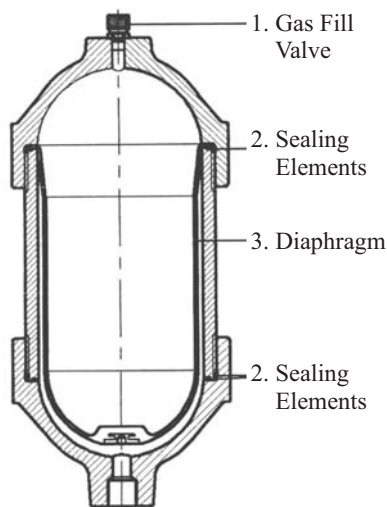
AM 0.1 & AM 0.35



AM 0.5 & AM 0.75



AM 1 to AM 2.5



Installation & Maintenance

Reassembly

After careful cleaning, replace all damaged components along with sealing elements. Wet the outer surface of the diaphragm and seals with the operating liquid. Reassemble the top cover and tighten it firmly .

Precharge

Carry out precharging using EPE pre-loading and checking equipment, **Type - PC**. Only dry industrial nitrogen should be used.

Follow procedure as explained in “**Checking & Charging**” on page-3 .

Mounting Instructions

The accumulators should be properly fitted / clamped on the system. Clamping should not cause the shell or the accumulator connection to be stressed due to over tightening. It is necessary, especially with larger capacities / lengths, horizontal mounting or with heavy units, to use fasteners (clamps, brackets etc) that support the accumulator and prevent dangerous vibrations.

To achieve a high degree of efficiency, the accumulator should be fitted as close as possible to the installation it serves. The space necessary for charging & gauging kit is atleast 150mm above the gas fill valve.

Position

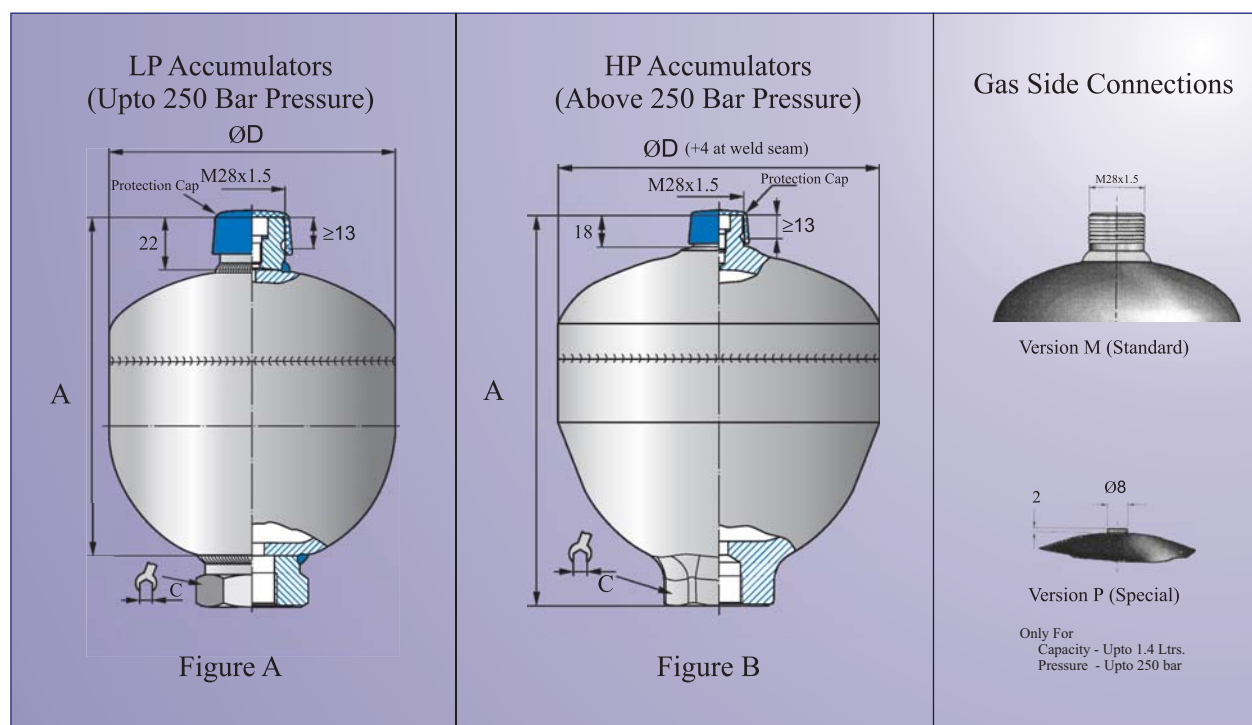
It is suggested that the accumulators are installed vertically with gas side on top. The manufacturers name plate stating the initial pressure must be visible. Moreover access to the vent screw, if any, must be kept unobstructed.

The mounting must be such that, should a rupture occur on the pipe system at the liquid connection, or should the gas fill valve break, the accumulator cannot be pulled from its mounting by the forces involved. No welding or other mechanical process must be carried out on the accumulator shell for the purpose of attaching fasteners.

Welded Diaphragm type Accumulators

Technical Features

Design	:	Welded Shell, Non-repairable
Max. Working pressure	:	40 - 350 Bar.
Test pressure	:	1.43 times Max. Working Pressure
Temperature range	:	-10° C to +80° C
Allowable pre. Ratio (P2/P0):	:	8:1 (4:1 for AMW-2.8)
Nominal capacity	:	0.075 to 5 Ltrs.
MOC - Body	:	Carbon Steel-Welded
Diaphragm	:	Nitrile / Epichloridrin (ECO)
Connections - Gas Side	:	M28x1,5 (M) OR Dia 8
Fluid Side	:	Female Threaded - 1/2", 3/4" OR With external and internal threads.



Dimensions

Model	AMW-0.07	AMW-0.16	AMW-0.32	AMW-0.32	AMW-0.5	AMW-0.75	AMW-0.75	AMW-0.75	AMW-0.75	AMW-1.0
Capacity (ltrs)	0.075	0.16	0.32	0.32	0.5	0.75	0.75	0.75	0.75	1.0
MWP (bar)	250	250	210	250	160	160	210	250	350	210
Weight (kgs)	0.62	1.0	1.4	1.7	1.6	2.6	2.6	3.7	4.6	3.5
Figure	A	A	A	A	A	A	A	A	B	A
Height A	91	99.5	114	120	127	143.5	144	150.5	169	158
Diameter D	Ø64	Ø75	Ø92.5	Ø95	Ø103	Ø121	Ø121.5	Ø127	Ø132.5	Ø136
Standard Conn	E1	C1	C1	C1	C2	E2	C2	C2	C4	C2

Model	AMW-1.4	AMW-1.4	AMW-1.4	AMW-2.0	AMW-2.0	AMW-2.0	AMW-2.8	AMW-3.5	AMW-3.5	AMW-5.0
Capacity (ltrs)	1.4	1.4	1.4	2.0	2.0	2.0	2.8	3.5	3.5	5.0
MWP (bar)	140	250	350	100	250	350	350	250	350	40
Weight (kgs)	4.2	6.0	7.5	3.5	7.5	11.5	14.5	13.5	16.5	9.0
Figure	A	A	B	A	A	B	B	A	B	A
Height A	169	176	200	218	229	220	265	286	305	247
Diameter D	Ø147	Ø155	Ø160	Ø144.3	Ø155	Ø180	Ø180	Ø174	Ø180	Ø213
Standard Conn	E6	C2	C4	E3	C3	C5	C5	C3	C5	E4

Note :

- * Charging of welded Accumulators is undertaken using pre-loading & Checking Set *Type-PCM*.
- * For further details / connections please refer the catalogue "*Welded Diaphragm Accumulators, Type - AMW*".



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Other Products of Interest

Bladder type Accumulators
Type-AS



Welded Diaphragm Accumulators
Type-AMW



Piston type Accumulators
Type-AP



Safety cum Shut-Off Blocks
Type-B/BS



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