Assembly- , installation- and maintenance instruction manual for bladder accumulators IBV / EBV 100 - 575, top reparable

Content

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0 Legend

Danger

This symbol refers to a high injury risk for people.
It must be considered!

Warning

This symbol refers to an important information. Non-observance can lead to extensive damages.

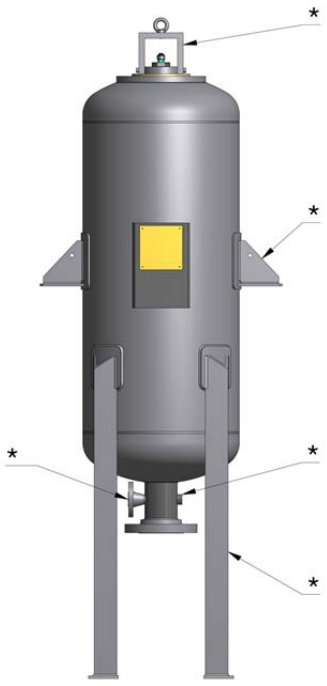
Safety informations must be respected!

Note

This symbol refers to an important information concerning the application.

Non-observance can lead to disturbances!

1 Overview



* customer specification

Manufacturing tolerances are not considered. Changes reserved.

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2 Accumulator assembly and installation

2.1 Check to be carried out on receipt of the acc.

The hydropneumatic accumulators with bladders are carefully checked and tested in the factory before delivery. They are delivered assembled and pre-charged with nitrogen in two possible choices:

- Pre-charged to a pressure P_0 as requested by the user with sealed valve
- pre-charged to 3 - 5 bar, in the case where no special request has been made by the user

When the accumulators are received by the user, it is necessary to make sure:

- that they have suffered no damage during the course of transportation
- that the indications of the name plate with the order and delivery documents
- that the working pressure given on the name plate is at least equal to the maximum pressure used in the system
- that the protective cap of the air valve is installed
- that the plug of the "liquid side" orifice has been removed before connexion

2.2 Pressurizing, pre-charge press. a. checking

Before use, the hydropneumatic accumulators with bladders must undergo two absolutely necessary operations:

- Pressurizing of the bladder with nitrogen
- Checking the pre-charge pressure of the bladder

These operations must necessary be carried out by the user when the equipment has been delivered not charged or when they have been totally depresssurized in the case of maintenance or checks on constituent parts.

2.2.1 Pre-charging the bladder

The bladder can be pressurized before or after the installation of the accumulator in the system. Its purpose is to fill into the bladder the quantity of nitrogen which determines the working characteristics and lifetime of the equipment. The pre-charge pressure depends on the working pressure, working temperature and application of the accumulator. It is carried out by means of the tester and pressurizer VGU (see chapter 3).

It is necessary to use dry nitrogen from a bottle. The use of an air compressor or oxygen is strictly forbidden!

The pre-charge pressure is determined by reference to:

1. The characteristics of the system
2. Expansion resulting from working temperatures
3. Limits of working temperatures
4. The function required, that is:

Energy reserve:
Equal to or lower than 9/10 of the minimum working pressure of the system and in no case lower than 1/5 of the maximum pressure in that system.

Anti pulsation:
Equal to 60 % of the average working pressure

Compensation for thermal expansion:
80 % of the static pressure at minimal temperature

Special cases:
Consult the Parker Olaer technical service which will determine the pre-charge pressure

2.2.2 Checking the pre-charge pressure

This check must not be carried out unless the accumulator is isolated and dis-charged from the hydraulic fluid.

Checking the pre-charge pressure is very important for the highest degree of safety and for the proper operation of the Parker Olaer accumulators. It is carried out by means of the VGU (see chapter 3), specially designed for that purpose.

- Before start-up it must be guaranteed that the pre-charge pressure is entirely correct for the tasks that the accumulator must carry out.
- 1 week after start-up (either after installation or maintenance) check the pre-charge pressure. If there is no nitrogen loss next check has to be done 6 month later. After that the accumulator has to be checked annually.

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2 Accumulator assembly and installation

2.3 Installation

2.3.1 Location

For maximum efficiency the accumulator should be placed as close as possible to the components in the system to which it is related.

- Allow a free space of 200 mm over the air valve at the top to fit the tester and pressurizer VGU. Leave the gas valve accessible
- Leave the operating instructions visible

The accumulator has to be fixed with supporting brackets or legs.

In no case collars or supports may be welded to the body of the accumulator!

The fluid port of the accumulator has to be flanged to the hydraulic system connection.

2.3.2 Recommendations

For efficient operation, it is advisable to take the following observations into account:

- Interpose a non-return valve between the pump and the accumulator (prevents back flow to the pump)
- Make sure that there is a pressure relief valve in the system to protect the accumulator
- If a pressure switch is used, take the pressure indication as close as possible to the accumulator.

2.3.3 Putting into service

Before putting the system under pressure, vent any air that the pipework may contain. Then put the system under maximum pressure to check whether the gaskets and connectors are leak proof.

2.4 Operation

The accumulator works maintenance-free and needs no manual action except for periodical checks. When the machine will be stopped, we advise the isolation of the charged accumulator before decompressing the whole system, so as to ensure a rapid restart.

Normally accumulators can be used between temperatures of -15 °C to +80 °C. The permissible operating temperatures of the accumulator shown on the name plate are evident.

2.5 Instructions for maintenance and repair

2.5.1 Overview

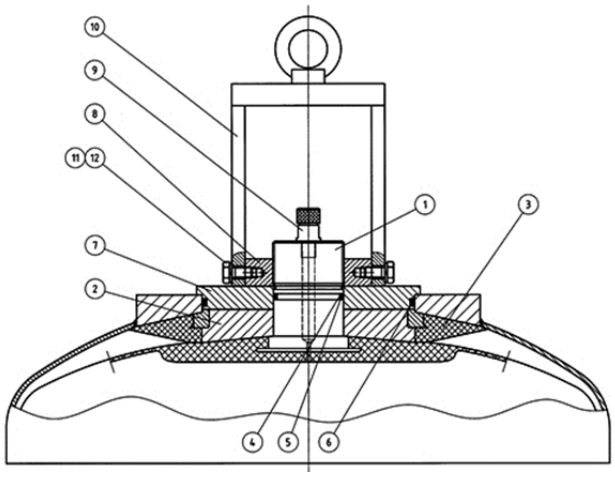

Fig. 2: Pressurizing unit

Pos.	Qty.	Description
1	1	Bladder
2	1	Gas plug
3	1	Anti-extrusion ring
4	1	Back-up ring
5	1	O-ring
6	1	O-ring
7	1	Plate gas end
8	1	Lock nut gas end
9	1	Gas valve
10	1	Valve guard
11	1	Hexagon head screw
12	1	Spring lock washer

2.5.2 Periodical check of pre-charge pressure

- Make sure that the pre-charge pressure is maintained
- Carry out the check at least once during the first week of use, by means of the tester and pressurizer VGU (see chapter 3)
- Repeat this check every six months. Afterwards check it once a year in ordinary operating cond.
- Never forget to retighten the valve guard at the top

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2 Accumulator assembly and installation

2.5.3 Checking the pre-charge pressure
(see fig. 3-2 page 7)

- Isolate the accumulator from the hydraulic sys.
- Discharge the accumulator on the fluid side
- Remove the valve guard and sealing cap of the gas valve
- Attach the tester and pressurizer VGU on the gas valve tighten by hand (see chapter 3)
- Make sure that the star knob of the bleed valve (20) is properly closed
- Turn star knob (6) clockwise until the pressure can be read on the pressure gauge
- Turn star knob of the bleed valve (20) anti clockwise and reduce the pressure
- To increase the pressure connect the charging hose (38) between the tester and pressurizer VGU and a nitrogen bottle. Open the stop valve of the nitrogen bottle slowly (a pressure-reducing valve on the nitrogen bottle is recommanded). Allow nitrogen to flow slowly into the accumulator until the desired pre-charge pressure is reached
- Close the stop valve of the nitrogen bottle. Wait several minutes to stabilize the pressure and temperature and then adjust the pressure accurately
- Turn star knob (6) anti clockwise to seal gas valve. Open the bleed valve (20) to exhaust gas from charging hose. Remove the tester and pressurizer VGU
- Test the accumulator gas valve for leaks using a leak detection spray or soapy water solution
- Replace the valve guard and sealing cap of the gas valve
- Increase slowly the hydraulic pressure on the fluid side of the accumulator

2.5.4 Dismantling the accumulator
(see fig. 2 page 4)

- Discharge the accumulator on the fluid side.
- Remove the valve guard (10).
- Remove the sealing cap of the gas valve (9).
- Vent the pre-charge pressure in the bladder using the tester and pressurizer VGU (s.ch 3).
- Remove the gas valve (9)
- Remove the lock nut gas end (8)
- Remove the plate gas end (7) and its O-ring (6)
- Push the bladder (1) with the gas plug (2) and the anti-extrusion ring (3) into the shell
- Loose the anti-extrusion ring (3) from the gas plug (2), fold and remove it
- Remove the gas plug (2)
- Remove the bladder (1)

2.5.5 Cleaning, inspection and repair

- Clean all the metallic parts of the accumulator carefully and dry with compressed air
- Inspect the inside of the shell on its cleanness and no internal damages
- Check that the O-rings show no signs of wear or rubbing
- Check that the bladder shows no signs of major rubbing or other damages
- Replace all worn or damaged parts
- Don't try to repair the bladder under no circumstances

2.5.6 Assembly
(see fig. 2 page 4)

- Ensure that no foreign parts remain in the shell of the accumulator
- Lubricate the bladder and the inside of the shell with the hydraulic system fluid, so as to facilitate the replacement of the bladder
- Roll up the bladder (1) longitudinally with fitted anti extrusion ring (3) and O-Ring (5) insert bladder (1) trough hole into shell and fit the gas valve (9)
- Check that the bladder (1) is neither folded nor twisted
- Pressurize the bladder lightly with nitrogen and put the gas valve (9) in the center of the shell opening
- Insert the gas plug (2) and install it on the bladder (1)
- Fold the anti-extrusion ring (3), insert and install it on the gas plug (2)
- Install the plate gas end (7) with fitted O-Ring (6)
- Install the lock nut gas end (8) by hand
- Tighten the gas valve (9) with a torque of 1,5 Nm
- Prefill the bladder slowly with nitrogen to a pressure of 1 to 1.5 bar using the tester and pressurizer VGU (see chapter 3)
- Tighten the lock nut gas end (8)
- Prefill the accumulator with the requested pre-charged pressure
- Tighten the sealing cap of the gas valve (9)
- Tighten the valve guard (10)

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2 Accumulator assembly and installation

2.5.7 Restarting into service

Before putting the system under pressure, vent any air that the pipework may contain. Then put the system under maximum pressure to check whether the gaskets and connectors are leak proof.

No welding, soldering or mechanical operations of any kind must be undertaken on the accumulator!

3 Tester and pressurizer, type VGU

3.1 Description

The VGU tester and pressurizer is used for the charging of bladder, piston and membrane accumulators with nitrogen and to test or change the pre-charge pressure. It is screwed onto the gas valve of the hydropneumatic accumulator and connected with a hose to a standard nitrogen bottle. If only the pre-charge pressure needs to be checked, the connection of the charging hose is not necessary.

Each unit comprises of:

- Tester and pressurizer with manometer, return valve on the charging connection release valve, valve spindle to open the gas inlet valve on the accumulator
- Charging hose, length 2,5 m
- Connections for the accumulator $^{7}/_{8}$“ - 14 UNF; $^{5}/_{8}$“ - 18 UNF; 0,305“ - 32 NFT; M 28 x 1,5
- Plastic protective case

3.2 Handling (see fig. 3-2 page 7)

3.2.1 Preparation

- Discharge the fluid side of the accumulator before each test and before filling or refilling with nitrogen
- Remove the valve guard and sealing cap of the gas valve
- Attach the pressurizer with adapter (25, 30 or 36) onto the gas valve
- Check that the bleed valve is closed. Turn the star knob (20) clockwise

Fig. 3-1
Tester and pressurizer, type VGU

3.2.2 Checking the pre-charge pressure

Turn the star knob (6) clockwise. This opens the gas valve and the pressure can be read on the manometer.

3.2.3 Reducing the pre-charge pressure

Turn the star knob (20) of the bleed valve slowly anti clockwise. The nitrogen escapes to the open.

3.2.4 Raising / filling the pre-charge pressure

Never prefill with oxygen: Risk of explosion! If the pressure of the nitrogen bottle is higher than the permitted accumulator working pressure, a pressure-reducing valve must be connected ahead.

- Connect one end of the charging hose to the return valve (7) and the other to a commercial nitrogen bottle
- Open the stop valve on the nitrogen bottle carefully. Allow the nitrogen to flow slowly into the accumulator, until the desired pre-charge pressure is reached
- Close the stop valve of the nitrogen bottle. After 5 to 10 minutes (temperature stabilisation) check the pre-charge pressure again and correct, if necessary (see 3.2.2 - 3.2.4)

3.2.5 Removal of the unit

- Turn the star knob (6) back
- Turn the star knob (20) anti clockwise to exhaust gas from the pressurizer
- Remove the pressurizer

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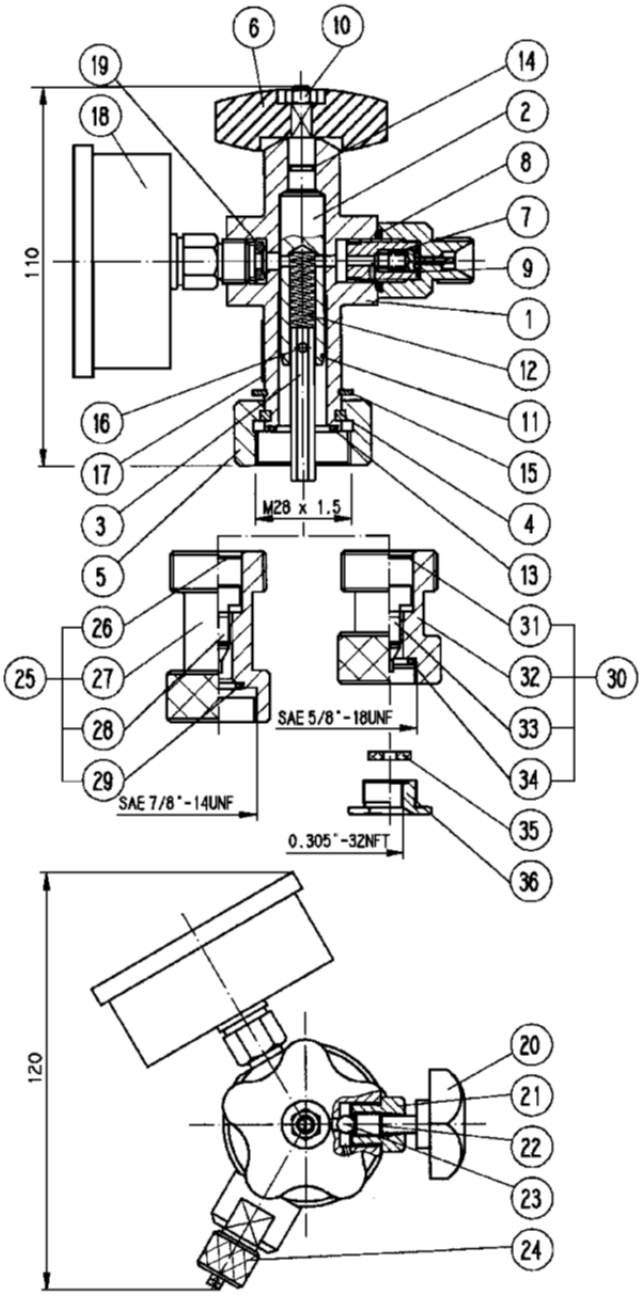
3 Tester and pressurizer, type VGU

3.3 Spare parts



Pos.	Qty.	Description
1	1	Valve body
2	1	Valve spindle
3	1	Bolts
4	1	Split ring
5	1	Spigot nut
6	1	Star knob
7	1	Return valve
8	1	O-ring
9	1	Flat seal
10	1	Hexagon nut
11	1	Retaining ring
12	1	Compression spring
13	1	O-ring
14	1	O-ring
15	1	Retaining ring
16	1	Centre-grooved dowel pin
17	1	Name plate
18	1	Connect. for manom. G $^1/_4$"
19	1	Copper seal
20	1	Star knob
21	1	Sealing gland
22	1	Valve spindle
23	1	Valve ball
24	1	Knurled cap
25	1	Adapter SAE $^7/_8$" - 14UNF compl.
26	1	Retainig ring
27	1	Adapter SAE $^7/_8$" - 14 UNF
28	1	Valve spindle
29	1	O-ring
30	1	Adapter SAE $^5/_8$" - 18 UNF compl.
31	1	Retaining ring
32	1	Adapter SAE $^5/_8$" - 18 UNF
33	1	Valve spindle
34	1	O-ring
35	1	Flat seal
36	1	Connect 0,305"-32 NFT
37	1	Gasket assembly (complete set)

Fig. 3-2: Tester and pressurizer , type VGU

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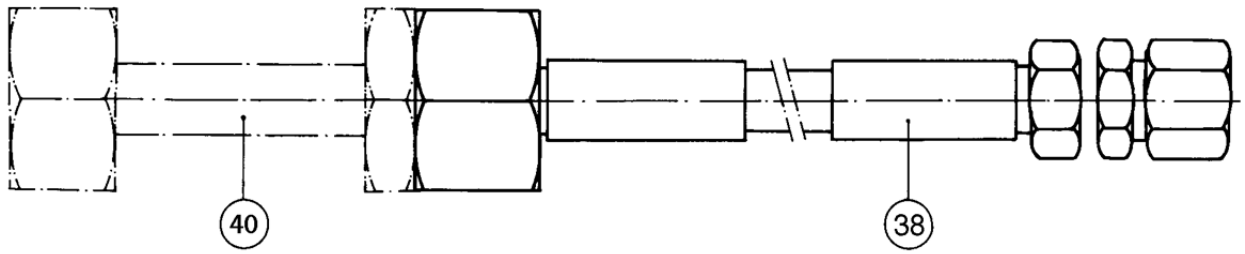

Fig. 3-3: Tester and pressurizer , type VGU

38	Charging hose	
40	Connections for foreign nitrogen flasks	
40b	GB / AUS	R $^{5}/_{8}$“ external
40c	USA	24,51 x $^{1}/_{14}$” external
40d	Italy	21,7 x $^{1}/_{14}$“ external
40e	Japan	22 x $^{1}/_{14}$“ internal
40f	Japan	W 23 x $^{1}/_{14}$“ external
40g	Brazil	R $^{1}/_{2}$“ internal
40h	F, B, E	21,7 x $^{1}/_{4}$” internal
40i	China	M 22 x 1.5 internal
40k	China	$^{5}/_{8}$“ internal
40l	Malaysia	G $^{7}/_{8}$“ external
40m	Trinidad	$^{7}/_{8}$“ - 14 UNF external
40n	Bulgaria	$^{3}/_{4}$“ internal
40o	Philippines	W 23 x $^{1}/_{14}$ “ left

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