



** Pump Pulsation Dampers * Pipeline Surge Absorbers * Thermal Expansion Compensators * Hydro-pneumatic Accumulators **

FB Series Pulsation Dampers

General

These units may be used as Pump Pulsation Dampers, Pipeline Surge Absorbers, Thermal Expansion Compensators or Accumulators and all operate by having a compressible gas on one side of a separating membrane, the other side being connected to the liquid line, used correctly they are totally safe and will give many years of reliable service.

Safety

As with all hydro-pneumatic products great care should be exercised when handling and charging this type of equipment and should only be carried out by trained personnel, as they contain energy in the form of compressed inert gas.

It is essential to read and understand the CA-7 Charging Instructions before any maintenance work is carried out.

UNDER NO CIRCUMSTANCES PRE-CHARGE WITH OXYGEN DUE TO THE RISK OF EXPLOSION

It is however perfectly acceptable for pressures below 7 bar to pre-charge using air pressure from an airline, foot or hand pump, and nitrogen from a high pressure cylinder above this. (Refer to CA-7 Charging Instructions).

Unless otherwise specified in your purchase order, a small amount of silicon grease will be used to lubricate the rubber components during assembly at the factory, please check that this will not affect the process or the liquid being handled.

When provided lifting eyes or lugs should be used for lifting the unit.

Storage

Units must be stored in such a way as to prevent mechanical damage to the shell and branch connections, if the unit is to be put into storage for a period of more than 6 months it is advisable to release the gas pre-charge, however where units have a pre-charge exceeding 320 bar g the gas pressure should be released when it is put into storage for a period more than 2 weeks.

If the unit has been in use prior to storage then the bellows should be removed and cleaned of any process fluid.

Prior to Installation

- Check the correct connection has been supplied.

Ensure that the maximum working pressure and pressure to which the unit may be subjected does not exceed the working pressure and temperature marked on the unit. If for any reason the working pressure of the unit cannot be ascertained, then check with Flowguard Ltd. quoting the serial number of the unit.

Check that the unit is pre-charged. Units are usually supplied already pre-charged this would normally be marked on the unit. If installation is taking place within 3-4 months of original supply then it should not need checking. If the unit has not been supplied pre-charged or only has a nominal 'transit' pre-charge (often 1 bar) then pre-charging should be carried out in accordance with relevant Flowguard charging instructions. As a general guide pre-charge pressure should be as follows.

- o Pump Discharge & Suction Dampers -80% of minimum operating or minimum suction pressure at working temperature. If the pre-charge off any of your units is significantly different to this or if you have any other queries regarding the pre-charge then contact Flowguard Limited by telephone or fax quoting the serial number.

All units are tested in our works before shipment and traces of test fluid may still be present inside the unit. Test fluid is normally water/oil emulsion. If these traces of fluid are likely to cause any problems when mixed with your process fluid then the units must first be flushed out at system pressure.

Mounting

Bellows units should be mounted in a vertical position either way up. Single ported dampers should be fitted on a 'Tee' as close as practicable to the pump, keeping the length of the branch as short as possible – the longer the branch then the less effective the damper will be.

Note: Unless stated otherwise on the order, we have made no allowances for supporting the damper. The installer should support the damper and pipe work in such a manner as to prevent excessive loadings and stress on the branches.

After Installation

- Ensure that the charging valve cap is hand tight. This cap contains a seal that is the main defence against loss of gas through the charging valve core. The valve core, a non return valve, which prevents loss in the short term, can leak over a long period.

Using soapy water (50% washing up liquid is ideal) check the charging valve, charging valve cap and the whole vessel end for any signs of gas leakage. This is best done with the unit at normal working pressure but it is usually effective if carried out at pre-charge pressure.

If a pressure gauge is fitted to the pump watch the needle closely when the pump is first switched on. As pressure builds up the flickering of the needle due to pulsations should cease or be considerably reduced as the pre-charge is reached. In the absence of the correct pre-charge checking device this is reasonably accurate way of checking pre-charge pressure.

Maintenance

Bellows dampers need very little maintenance. The gas pre-charge should be checked periodically to ensure that no leakage has taken place using charging kit No. CA7. It should be noted that when checking the pressure a small amount of nitrogen is released from the damper into the charging assembly and its connecting hose.

This will cause the reading to be slightly low. If small losses are detected the pressure should be topped up. If, however, losses are significant or persistent the cause of the leak should be ascertained and a repair effected.

Disassembly

Note: Extreme caution should be exercised during disassembly when the unit has been used on corrosive or toxic substances as, even after flushing small amounts of fluid may remain, particularly if the bellows has punctured. In the case of metal bellows dampers it is recommended that the upper and lower seals (when fitted) are replaced each time the damper is stripped down.

Prior to disassembly ensure that the unit is isolated from the process line or the process line is depressurized and drained down.

Release the gas using a suitable charging assembly (see leaflet CA-7 Charging Assembly).

- Remove the charging valve from the top of the shell.

Remove the bellows from the shell as follows:

- The liquid header (the part with the fluid connection) is attached to the shell with either socket head cap screws or stud bolts. Remove these bolts and detach the liquid header from the shell.
- The bellows may now be removed from the shell.

Reassembly

It is recommended that any seals (when fitted) are replaced each time the damper is stripped down.

Metal Bellows:

- Fit upper and lower seals in their respective grooves making sure that the outer edges are not damaged on the corner of the groove.
 - If the seals are PTFE and are not a correct fit the diameter can be significantly altered by cooling in a fridge or warming in boiling water.

PTFE Bellows:

- Fit the lower shell with the bellows ensuring that the seal portion fits correctly into the groove and that the groove is clean.
 - If the seals are PTFE and are not a correct fit the diameter can be significantly altered by cooling in a fridge or warming in boiling water.

Replace the liquid header and bolt up.

Replace the charging valve and pre-charge the damper in accordance with the CA7 Charging Instructions to the pressure specified on the label.

Follow the instructions labelled "After Installation".

Dampers that may be subjected to high compression ratios may be furnished with a cushion fluid on the gas side of the bellows to prevent the bellows from coming into contact with the end of the shell. The volume to be used is normally indicated in the unit reference (prefixed CF) but is normally 25% of the nominal volume. The fluid used should be compatible with the system fluid in order to avoid any problems in the event of bellows failure.

Basic Accessories & Spares

Description	Part Number
Standard 1215 stainless steel charging valve – BSP Thread.	SK-CV-1215/B
Standard 1215 stainless steel charging valve – UNF Thread.	SK-CV-1215/U
Low pressure adaptor – allows 1215 valves to be charged using a foot pump.	SK-AD-15/11