English

1) Fitting (valve integration)

An insufficient deburring and / or a roughness which is too great (> Ra 0.8) may damage the o'rings during the assembly process and thus generate external leakage.

„C" = *Cartridge valve*

Refer to the fitting sketch D120.0010.

„P" = *Subbase valve*

Refer to the fitting sketch on the product drawing.

2) Valve assembly

The visual control of the cleanliness and the state of the o'rings before assembly greatly reduces the risk of external leakage.

„C" *Cartridge Valve*

Exert a movement of combined pressure and oscillating rotation on the hexagonal body of the valve, to ease the introduction of the o'rings whilst under radial compression. The aim is to create a dynamic movement which reduces friction and also avoids any damage caused by the o'rings becoming trapped.

„P" *Subbase Valve*

Check that the orifices for the passage of the fluid between the valves and the support surface correspond, because the latter is asymmetrical with regards to the screw.

3) Assembly aides (lubricant)

„C" *Cartridge Valve*

The use of a lubricant which is compatible with the type of elastomer and the fluids used is possible.

The application of a lubricating product on the o'rings must be localised and parsimonious to avoid internal pollution of the valve (increased risk of an accumulation of dirt)

If the use of oil or grease is prohibited, a compatible volatil liquid (see below table) allows for a temporary specific lubrication, which leaves no residue when dry.

Elastomer	Compatible volatile liquid
NBR	Ethanol (pure - 100%)
FPM / FKM	Isopropanol
EPDM	Ethanol (pure - 100%) or Isopropanol
FFPM / FFKM	Ethanol (pure - 100%) or Isopropanol

4) Assembly Tools

„C“ *Cartridge Valve*

The use of a 15mm spanner to manipulate the hexagonal body, aides the assembly of the valve

NOTE : Deterioration in the valve’s functioning

- The M3x6mm screws are only used to ensure the valve is in its fitting and in no case to ease or help in its introduction. The tightening of the screws must only be carried out after the complete introduction of the valve into it’s fitting.
- The use of a hammer or other object to introduce the valve axially by force is strictly forbidden.

5) Tightening of the screws

„C“ *Cartridge Valve*

M3x6mm steel screw => 0.45Nm

„P“ *Subbase Valve*

M3x18mm steel screw => 0.45Nm

6) Heating of the valve whilst in use.

During its use and following its configuration, the body of the valve (6 sides) may reach temperatures on its surface of up to 110°C (100% ED at an ambient temperature of 50°C).

A good cooling system by dissipation and/or ventilation may prove to be useful.

NOTE : It is necessary to put into place protective measures to avoid the operator burning their fingers whilst manipulating the valves in use.

7) Fluid filtering

The stroke or the movement of the mobile parts of a proportional valve which is <0.001 to ~0.3mm, means that this valve is sensitive to pollution which generally gets stuck between the seat and the sealing element. Even an effective rinsing (removal of the pollution) will not result in the tightness as originally, as an imprint will always remain on the elastomeric sealing surfaces.

Depending on the quality of the compatible fluids used and the diameter of the orifice, it is highly advisable to place a filter upstream of the valve.

If there is a risk that the fluid may flow back on itself, it is also advisable to place a filter downstream of the valve.

If the block on which the valve is assembled is not cleaned and maintained clean, the filter will only be partially effective.

The filtration level advised depending on the orifice size is :

- Up to ø0.4mm inclusively: 5µm,
- from ø0.5mm to 2mm : 10µm,
- > ø2mm : 20µm.

The filter material must be compatible with the fluids used.

The active surface of the filter must be fixed in such a way that pressure decay is kept to a minimum. Otherwise the filter will limit the flow and the valve will not be able to meet the flow specifications given.

8) Driving / electrical control of the valve

The electrical signal may be one of 3 types :

- *Current driving [A],*

  In a coil the electromagnetic force is directly proportional to the current passing through it.

  The current drive is as a consequence, the most favourable method because the influence of the coil's resistance variation due to the temperature (self-heating of the energised coil, variable room temperature) on the voltage according to the law of ohm U(V) = R(Ω) x I (A) will not affect the electromagnetic force.

  With a constant current, the flow rate will be stable as long as the entry pressure and the exit pressure are stable.

To ensure an optimal usage of the valve, do not limit the voltage to it's nominal value (shown in our specifications @ T=20°C), but foresee a factor of 1.5x this voltage.

For example : see example under "Voltage driving [V]"

- *Voltage driving [V],*

  In this case, you should size the electric circuit to be able to supply a maximum voltage equivalent to 1.5x the normal voltage if necessary.

  For example : 24V DC nominal which corresponds to a coil 104mA 230ohm, the voltage may in the worst case (maximum room temperature and weak cooling) reach 36V DC.

  With a constant voltage, the flow will slowly decrease as it heats (increasing coil resistance) according to the law of ohm U(V) = R(Ω) x I (A).

- *With a PWM (voltage pulse-width modulation),*

  The frequency should be f >= 3kHz in order to minimise the « noise » audible to the naked ear and above all not to create any noise on the flow signal

  The explanation of the voltage drive are valid in this instance.

9) Pneumatical response time

This remark concerns especially the EQI Flatprop, pressure compensated, which have longer response times than the direct Flatprop.

To guarantee response times at opening T90 (0 to 90% of the signal) and at closing T10 (100 to 10% of the signal) in the order of 10ms, it is necessary to « boost » the valve positively, respectively negatively.

The « boosting » time should not exceed 10ms and the « boosting » amplitude should not exceed the nominal current or 1.5x the nominal voltage (given @ T=20°C).

The 2 parameters of « boosting », time and amplitude must be optimised for each application specific to the user.