IMI FAS FLEXISOL
K15M.0001

Operation & Service Manual

Engineering GREAT Solutions

Solder free / direct connection to PCB

Up to KV 0.26

Captive seal

0.8 W

Single fixation screw

Footprint 6.5 mm
# Table of Content

1. **Product presentation**  
2. **Recommendation for electrical connection**  
3. **Installation with tubing**  
4. **Installation on a manifold**  
5. **Air filtering**  
6. **Design recommendation for manifold and PCBA**  
6.1 **PCB thickness and z-positioning**  
6.2 **Alignment of the contacts and x-y positioning**  
6.3 **Mounting the PCBA on the manifold**  
6.4 **Mounting the contacts on the PCBA**  
7. **Further information**  
8. **Related documents**  

Annex 1 PCB soldering pads dimensions and contacts placements
1 Product presentation

FLEXISOL is available in a 2-way or a 3-way configuration, either for tube connection or for manifold mounting.

1.1 Valve for tubing connection

FLEXISOL is also available for a direct connection with tubes. Figure 1 shows the different elements ensuring the mechanical, pneumatic and electrical connections.

1.2 Valve for manifold mounting

FLEXISOL has unique connection features for installation on manifolds. Figure 2 shows the different elements ensuring the mechanical, pneumatic and electrical connections of the valve to an underlying printed circuit board assembly (PCBA) mounted on a manifold.
1.3 Label

![Valve label and information](image)

**Figure 1:** Valve label and information.

1.4 Packaging

FLEXISOL is packed in a blister closed with a Tyvek® foil. To open the packaging, pull the foil on the side opening as indicated on Figure 2.

![FLEXISOL blister packaging](image)

**Figure 2:** FLEXISOL blister packaging.

1.5 Sub-base specification

For specifications related to the sub-bases for manifold mounting, see product datasheet.

2 Recommendation for electrical connection

The functional isolation is ensured by the valve design. The plastic body and the mechanical fixation system of the valve withstand more than 500 V test voltage.

For safety isolation, the metallic parts of the valves (excluding parts used for valve’s fixation) are formally not isolated from the valve power supply and proper distances and considerations need to be taken at system level - Note: Applicable standards do not allow to consider the copper-wire varnish as an insulation barrier.

Unless it is defined in the technical specification document, without electronic module this valve does not require any polarity obligation.

Electrical power supply: See product specification or product datasheet.
3 Installation with tubing

FLEXISOL is available for tubing connection. To guarantee optimal performances throughout the instrument’s lifetime, tubes with the following specifications can be recommended:

- I.D: 2 mm
- O.D: 4 mm
- Hardness 60°ShA.
- Max pressure: 1 bar

Table 1: Screw type and recommended tightening torques. Refer to technical drawing for fixing area.

<table>
<thead>
<tr>
<th>Screw type</th>
<th>Manifold material</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3x16.4 (not included)</td>
<td>Aluminum, brass, stainless steel</td>
<td>0.15 +/- 0.05 Nm</td>
</tr>
<tr>
<td>M1.6x8 (not included)</td>
<td>Aluminum, brass, stainless steel</td>
<td>0.15 +/- 0.05 Nm</td>
</tr>
</tbody>
</table>

4 Installation on a manifold

The valve and its connection elements have been designed to ensure optimal performances throughout the lifetime of your device. To guarantee these performances, numerous vibration and shock simulations have been carried out and the optimal design requirements of the underlying PCBA have been drawn. Figure 3 shows an example of a mounting on a manifold.

Figure 3: FLEXISOL with PAD connection installed on manifold with a PCBA.
4.1 Alignment of the FLEXISOL PADS and the contact on the PCBPA

FLEXISOL is designed in a way that one single mounting operation connects both the electrical and pneumatic interface. The key elements of the manifold are shown on Figure 4.

To ensure optimal pneumatic and electrical connection, proceed as follows:

- Remove FLEXISOL from packaging
- Place the valve on sealing surface. Ensure that the valve screw and the valve pin are aligned with the threaded screw hole and the hole for the pin, respectively.
- Hold down firmly while screwing the M3 screws in the tapered hole.

The maximum admissible torque depends on the manifold material and the screw type. Recommendations are given in Table 2.

Table 2: Screw type and recommended tightening torques for various materials.

<table>
<thead>
<tr>
<th>Screw type</th>
<th>Manifold material</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3x16.4</td>
<td>Aluminum, brass, stainless steel</td>
<td>0.3 +/- 0.05 Nm</td>
</tr>
<tr>
<td>4-48 UNF X 16.4 (optional)</td>
<td>Aluminum, brass, stainless steel</td>
<td>0.3 +/- 0.05 Nm</td>
</tr>
<tr>
<td>PT K30x17.8 (optional)</td>
<td>Plastics</td>
<td>Value depends on the plastic used</td>
</tr>
</tbody>
</table>

4.2 Valve mounting in battery

Several FLEXISOL can be battery-mounted. In this case, a spacing of at least 0.05 mm must be kept between each valve.
5 Air filtering

The current air quality specification is ISO 8573-1 class 7-4-4, particles <40µm and concentration <10 mg/m³.

6 Design recommendation for manifold and PCBA

The following chapters aim to give recommendations on how a manifold and a PCBA could be designed to ensure optimal installation of FLEXISOL with PAD connection. The following geometric dimensions shall be respected in order to ensure the optimal electrical connection of the valve to the PCBA.

6.1 PCB thickness and z-positioning
Optimal loading on the contacts like TYCO SHIELDED FINGER 1857724-1 is realized by means of a 1.6mm ± 10% thick PCB mounted on the manifold. In this case, 2.75 ± 0.025mm between the sealing area and the PCB/manifold contact area shall be respected (Figure 5).

Other PCB thicknesses can be used. In that cases, ensure that the load on the contacts does not exceed 1.5N.

6.2 Alignment of the contacts and x-y positioning
The alignment of the contacts on the PCBA and the FLEXISOL PADS is described on Figure 6 using the position of the pin as reference.
6.3 Mounting the PCBA on the manifold
The PCBA should be fixed to the manifold with screws.

6.4 Mounting the contacts on the PCBA
Tyco SHIELDED FINGER 1857724-4 contacts can be assembled on PCB soldering pads using a standard reflow soldering method.

For further information on the soldering method, please see Annex 1.

7 Further information
For further information on the designing of manifolds and installation instruction, please refer to the IMI FAS FLEXISOL datasheet.

8 Related documents

<table>
<thead>
<tr>
<th>Number¹</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.065</td>
<td>FLEXISOL datasheet</td>
</tr>
<tr>
<td>T15x.xxxx</td>
<td>FLEXISOL technical specification</td>
</tr>
<tr>
<td>S15x.xxxx</td>
<td>FLEXISOL technical drawing</td>
</tr>
</tbody>
</table>

¹ Revision of doc number is not indicated.
Annex 1 PCB soldering pads dimensions and contacts placement

**Soldering pad dimension = 2.35*0.9mm:**

**Solder past on the pad:**

For complete information, please refer to the official datasheet of TE Connectivity Shield Finger 1857724-4.