

IMI FAS FLEXISOL

K15M.0001

Operation & Service Manual

Engineering
GREAT Solutions

Solder free / direct
connection to PCB

0.8 W

Single fixation
screw

Footprint
6.5 mm

Up to kv 0.26

Captive seal

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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.

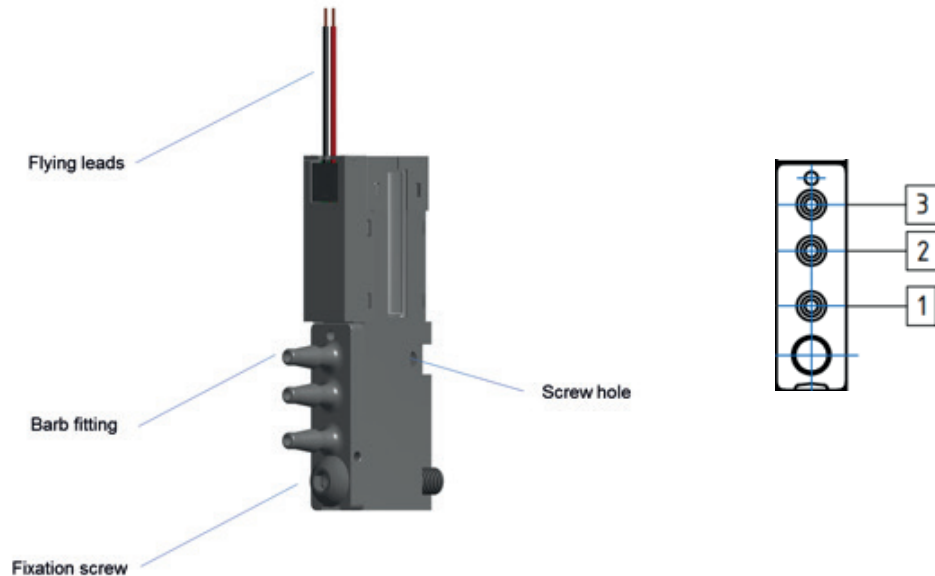


Figure 1: FLEXISOL for tubing connection (left, screw not part of the delivery). Port numbering (right).

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.

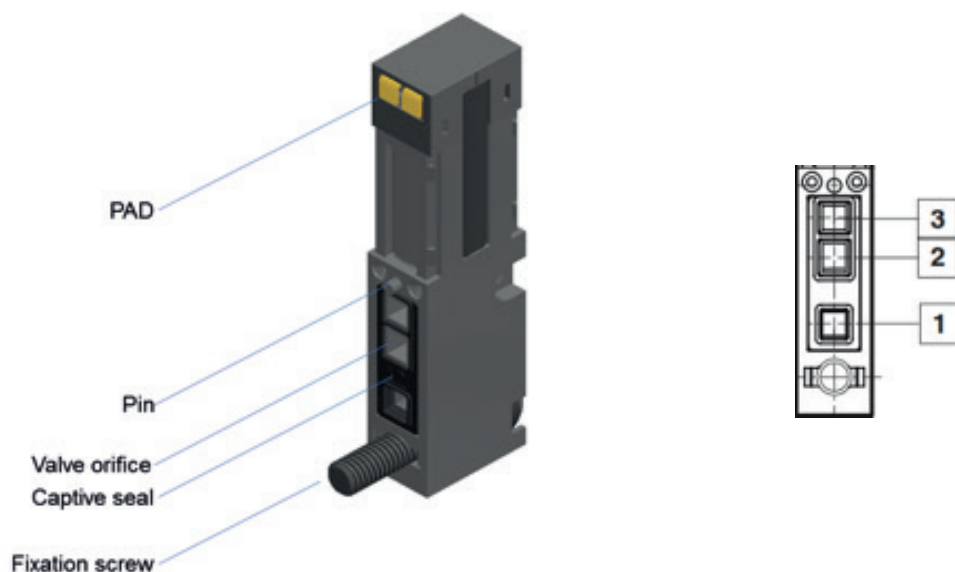


Figure 2: FLEXISOL for manifold mounting with electrical PAD connection (left). Port numbering (right).

1.3 Label



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.

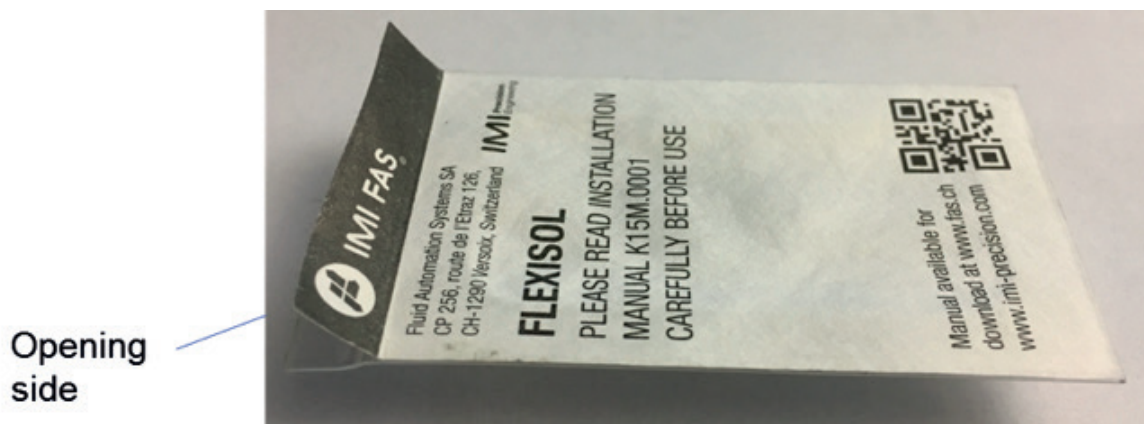


Figure 2: FLEXISOL blister packaging.

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.

Screw type	Manifold material	Torque
M3x16.4 (not included)	Aluminum, brass, stainless steel	0.15 +/- 0.05 Nm
M1.6x8 (not included)	Aluminum, brass, stainless steel	0.15 +/- 0.05 Nm

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.

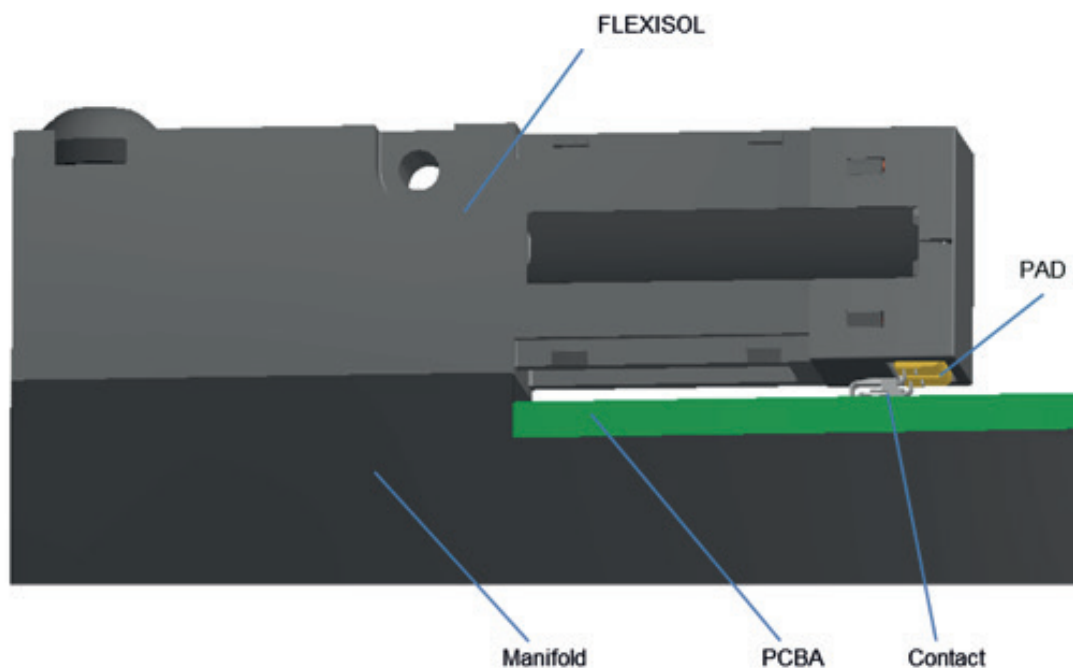


Figure 3: FLEXISOL with PAD connection installed on manifold with a PCBA.

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.

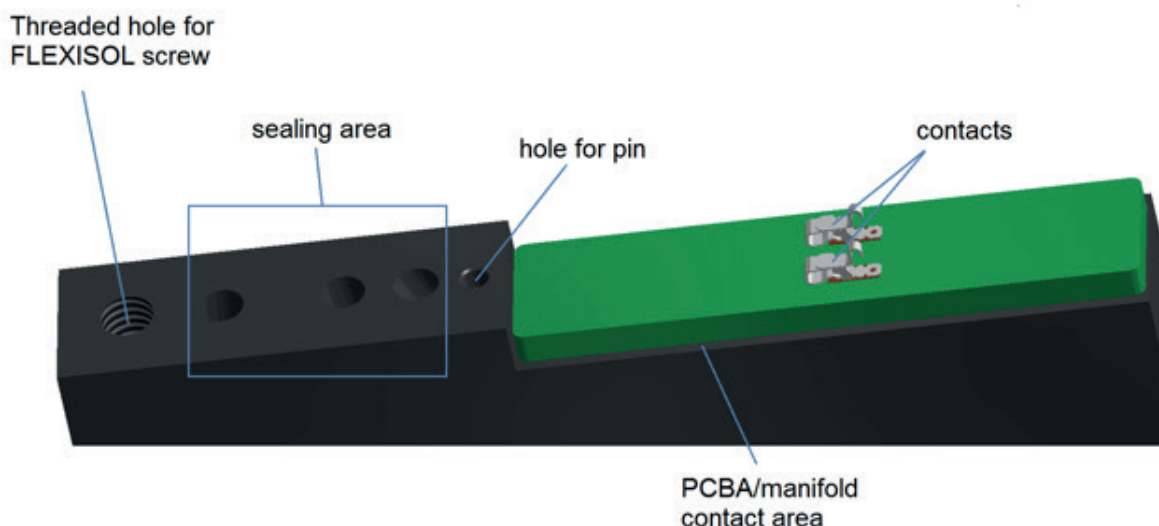


Figure 4: Typical manifold for the installation of one FLEXISOL valve.

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.

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

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 $<40\mu\text{m}$ and concentration $<10\text{ mg/m}^3$.

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 $1.6\text{mm} \pm 10\%$ thick PCB mounted on the manifold. In this case, $2.75 \pm 0.025\text{mm}$ between the sealing area and the PCB/manifold contact area shall be respected (Figure 5).

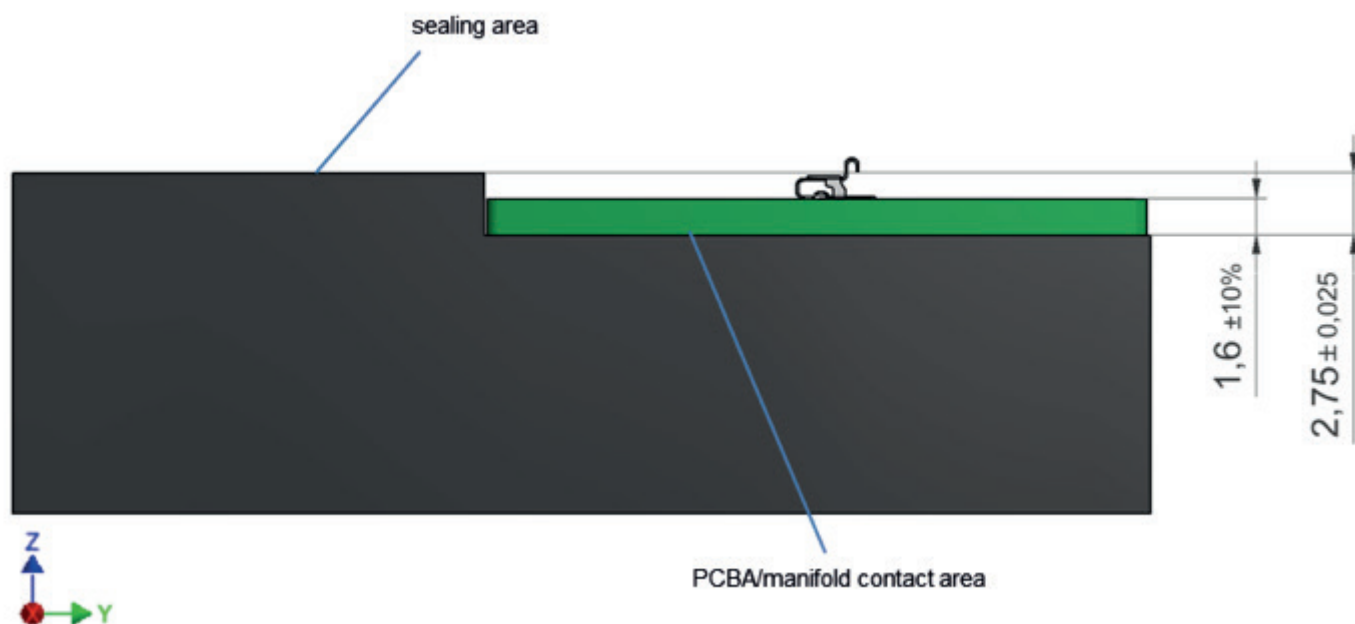


Figure 5 Positioning of a PCBA on a manifold (z-axis)

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.

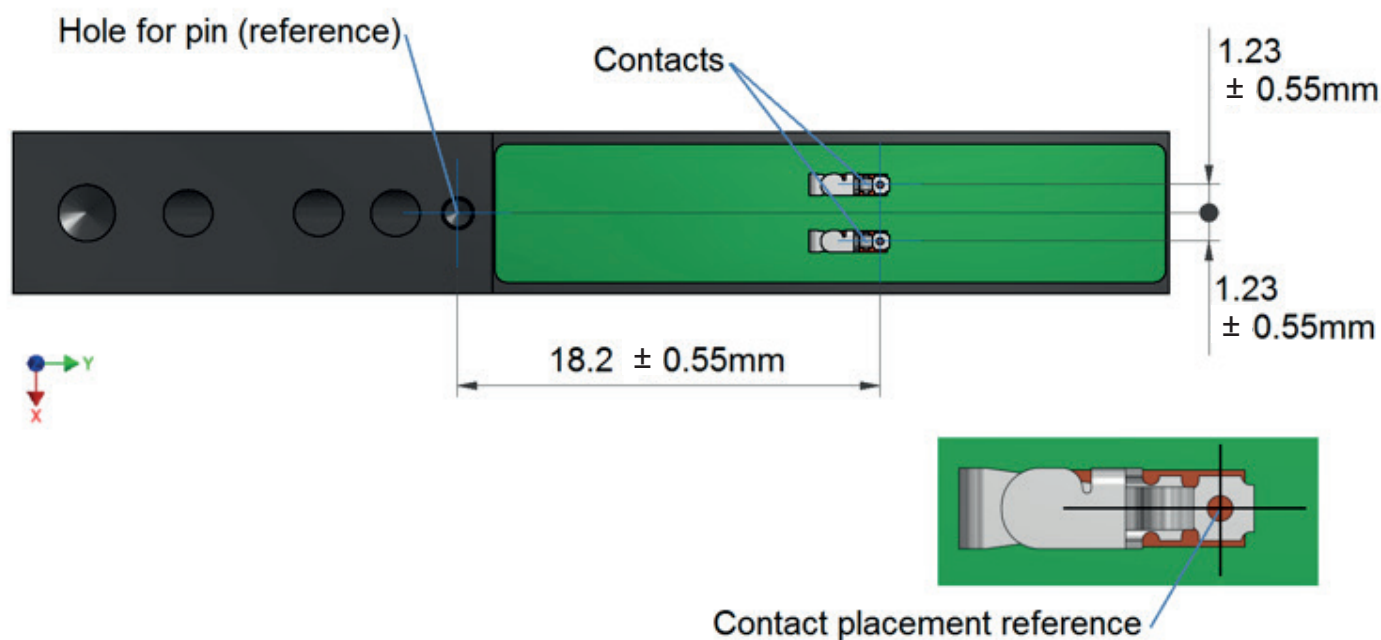


Figure 6: Positioning of the contacts on the PCBA

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

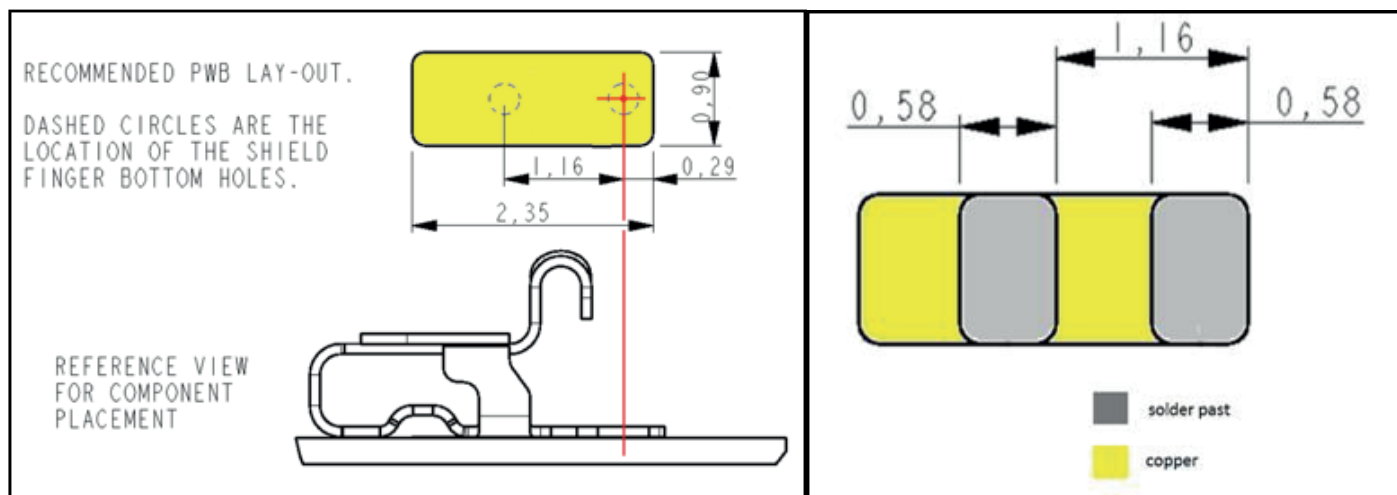
Number ¹	Details
5.2.065	FLEXISOL datasheet
T15x.xxxx	FLEXISOL technical specification
S15x.xxxx	FLEXISOL technical drawing

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.