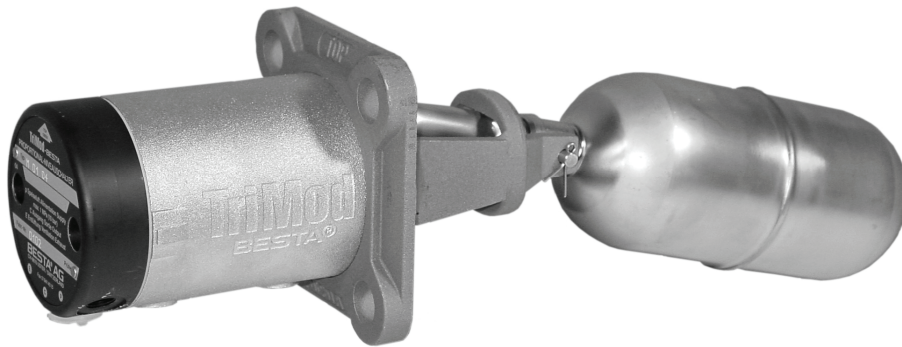


### Pneumatic switch module 3/2-way valve (On/Off)

Types P...

Types FP... Function tested for use of the float in Ex-zone 0



### Contents

1. Safety Instructions
2. Conformity to standards
3. Technical data
4. Installation and initial start-up
5. Maintenance
6. Replacement of the switch module
7. Fire protection
8. Disposal

### Legend



**Information:** Application hints and important information. To be followed for optimal function.




**Attention:** Requirements and prohibitions to prevent damages, especially to material and the environment.




**Danger:** Dangerous situation that can lead to injury and death if instructions are not followed.


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## 1. Safety Instructions

 The operating manual must be read and understood before installation. If you are uncertain on any point, please contact Besta AG.

 During work in potentially explosive atmospheres at the operator's site, please ensure that you always observe the special regulations applicable to work on Ex-devices (applies to type series FP...).

Every Trimod Besta level switch must be selected by qualified personnel in accordance with the specifications stipulated by the customer. These specifications must be kept by the operator in a safe place, together with the operating manual, the customer-specific designation and the type number (see type plate). In the event of any deviation of the physical quantities (pressure, temperature, density, etc.) from the original specification, the suitability of the level switch must be checked again by qualified, trained personnel or by the manufacturer, with regard to the new specifications. Process vessels / float chambers must be brought to atmospheric pressure and appropriately vented before work is carried out.

 The Trimod Besta level switches must under no circumstances be used as a support aid or as a security fixture for equipment structures or persons.

## 2. Conformity to standards

The Trimod Besta level switches of the type series P... correspond to the requirements of the Machine Directive 98/37/EC.

In addition, the Trimod Besta level switches of type series FP... correspond to the requirements of the standards according to EN 50284:1999, EN 50014:1997 +A1 +A2

## 3. Technical data

### Pneumatic connection

Supply air (compressed air quality) : Quality class 4 to ISO 8571  
(max. particle size 15 µm, max. particle density 8 mg/m<sup>3</sup>)

Max. control pressure : 10 bar

Test pressure : 12 bar


Internal opening at 10 bar : 1.5 mm

Kv factor : 1

Internal leakage rate : Max. 1 cm<sup>3</sup>/min

Flow rate : 90 NI/min at 6 bar

Pressure drop : 1 bar

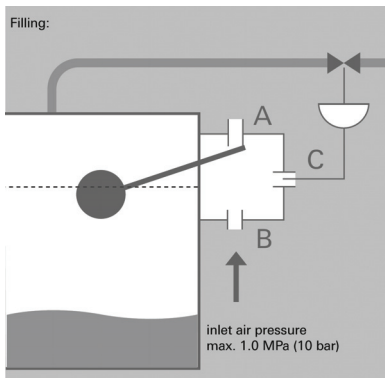
 The connection of the type series FP... should be carried out in accordance with the rules and safety regulations for Ex-devices.

## Principles of use

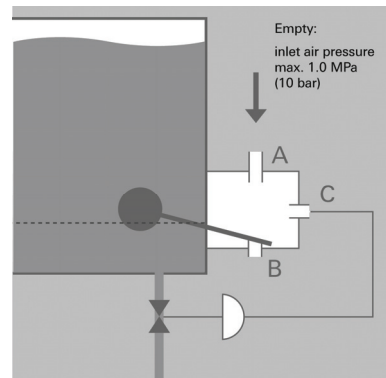
Depending on the required function, the supply air can be connected to the 3/2-way valve optionally at A or B, according to whether the filling process (Fig. 1) or the emptying process (Fig. 2) or the actuator is fail-safe to close or fail-safe to open. This means that the pressurization occurs via A-C and the venting via C-B or vice versa, pressurization via B-C and venting via C-A.

## Connection diagram

(Fig. 1) Filling



(Fig. 2) Emptying



## Special conditions for safe use

Temperature application ranges

Type series	P... , PV...	2P... , 2PV...	5P... , 5PV...
Housing material	Aluminium untreated	Aluminium chromated (Alodine)	stainless steel
Operating temperature $T_0$ (of medium)	1°C ... 250°C	1°C ... 250°C	1°C ... 380°C
Ambient temperature $T_A$	1°C ... 80°C	1°C ... 80°C	1°C ... 80°C

Type series	FP... , FPV...	F2P... , F2PV...	F5P... , F5PV...
Housing material	Aluminium untreated	Aluminium chromated (Alodine)	stainless steel
Operating temperature $T_0$ (of medium)	1°C ... 250°C	1°C ... 250°C	1°C ... 380°C
Ambient temperature $T_A$	1°C ... 80°C	1°C ... 80°C	1°C ... 80°C

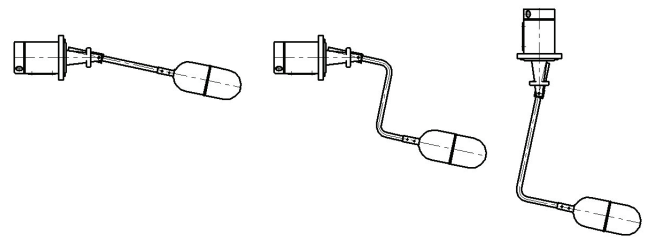
## 4. Installation and initial start-up

During installation (see Fig. 3), the correct operating position must be observed.

For side mounting, observe the "Top" arrow on the type plate.

The float must be able to move freely over the whole range of movement and must not be restricted by the tank walls or by fittings in the tank.

Applications where turbulence is present (e.g. stirring apparatus) can interfere with the function and should, in all cases, be avoided.



(Fig. 3)

### Process connection flange - industrial series

For switches of the industrial series with flanges according to DIN, ANSI, etc., the gaskets <sup>1)</sup> and connecting stud bolts <sup>1)</sup> used must correspond to the industry standard as regards material, pressure class and type of gasket and must be tightened to the corresponding tightening torques.

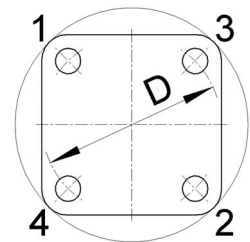
In the case of uncertainty on any point, refer to the corresponding standard or consult the manufacturer.

### Process connection flange - standard series

For switches of the standard series PN 25 (360 psi), corresponding gaskets are supplied with the unit.

### Minimum tightening torques and tightening sequence

Flange	D	Gasket	Stud bolts carbon steel	Stud bolts stainless steel
01 / 011	92 mm	Garlock Blue Gard 3000	18 Nm <sup>2)</sup>	22 Nm <sup>2)</sup>



### Connecting

1. Remove protective plugs from the valve body
2. Assemble the hose or pipe screwed connection and check that it is seated correctly.
3. Carefully allow the control pressure (supply air) to build up.

 **Caution: Use only clean control air; if necessary, install a filter!**

<sup>1)</sup> Not included in the scope of supply

<sup>2)</sup> Data refer to lubricated stud bolts

## 5. Maintenance

 **Level switches must be periodically (min. 1x annually) tested and cleaned.**

### Procedure:

1. Loosen the flange connection and remove the switch.
2. Check the float and mechanism for damage and contamination.
3. Remove deposits and metal particles by means of suitable and approved methods. Care must be taken to ensure that no mechanical damage occurs as a result of the cleaning.
4. In the case of floats with protective bellows, the bellows must be removed before cleaning and should be cleaned separately, both internally and externally.
5. Inspect the float and mechanism for complete deflection, as well as for smooth and unrestricted operation.
6. In the event that it becomes necessary to replace individual components, please note that only original spare parts, split pins, float, switch module, etc. may be installed.
7. After completion of the cleaning / inspection work, the switch module must be checked for correct function by means of simultaneous complete deflection of the float, followed by recording in the inspection log book.
8. In order to guarantee the absence of leaks between process vessel / float chamber, the flange gasket must be replaced after each dismantling.
9. After carrying out the inspection work, the device is re-assembled at the intended location.

 **Adjustment screws in the interior of the housing must not be adjusted!**

## 6. Replacement of the switch module

Defective switch modules must be replaced with new, works-tested units. In order that the complete type designation can be stamped on the type plate, the complete designation of the existing switch must be specified at the time of ordering. If a complete identification of the switch is not possible, then the manufacturer should be consulted before dispatching the complete device.



In the case of uncertainty on any point, please contact the local Trimod Besta agent or the manufacturer.

## Replacing the switch module

### **i** Important notes:

The level switch does not have to be removed from the process vessel in order to replace the switch module.

### Procedure:

1. Observe Chapter 1 "Safety instructions".
2. Detach the hose or pipe screwed connection from the valve body.
3. Remove socket head cap screws from housing with Allen key (5 mm).
4. Carefully remove the switch module from the flange.
5. Fit a new gasket on the flange and check that it is correctly seated.
6. Place the replacement switch module (incl. gasket) on the flange and tighten the socket head cap screws with the Allen key.
7. Assemble the hose or pipe screwed connection in the valve body and check that it is seated correctly.
8. Carefully allow the supply air (pressure) to build up.

## 7. Fire protection

Trimod Besta level switches must be protected against external fire hazard.

## 8. Disposal

Trimod Besta level switches are free of any asbestos-containing or otherwise hazardous materials. Disposal must be carried out in an environmentally-friendly manner and in accordance with the local regulations.

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**BESTA**

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With reservation of technical modification