

Control engineering information VARYCONTROL[®] VAV Units Diaphragm pressure transducer

VFP ...

Diaphragm pressure transducer VFP



Electronic controller



Intended Use

The diaphragm pressure transducer VFP is part of the air terminal unit and in conjunction with an electronic controller and actuator provide a control loop for flow rate or pressure control.

The air terminal units are suitable for use in ventilation and air conditioning systems. Particular conditions can restrict the functional capacity and must be taken into account during the design stage:

- Installation should only be carried out by specialists. The normal rules of site working, in particular the health and safety regulations must be complied with.
- For aggressive air, only air terminal units made of plastic materials should be used after extensive tests for suitability.
- Galvanised sheet steel units must not be installed in contaminated environments (e.g. acetic acid).

Dependency of orientation

The diaphragm pressure transducer operates based on the static measurement principle and comprises a diaphragm. The weight of the diaphragm means that the orientation of the transducer affects the measured signal. The transducer is factory fitted and adjusted with the diaphragm in a vertical position. The tube connection points can be on top or bottom also on either side but with the diaphragm still vertical. Other installation orientations must be specified on order.

Materials

Please note that in critical cases, material compatibility testing should be carried out on the air terminal unit and the diaphragm pressure transducer, taking into consideration the harmful substances involved and the concentrations in which they occur.

Maintenance

- The mechanical components are maintenance-free
- A yearly adjustment of the zero-point of the transducer is recommended.

Air terminal units with diaphragm pressure transducer VFP

Code ¹⁾	Controller	Diaphragm pressure transducer		
		Type	TROX-part No.	Range in Pa
BR..	VRP-M	VFP 100	M546EJ6	100
BG..	VRP-STP			
BP..	VRP-M	VFP 300	M546EJ1	300
BB..	VRP			
BJ..	VRP-STP			
BS..	VRP-M	VFP 600	M546EJ7	600
BH..	VRP-STP			

1) Control components according to order code

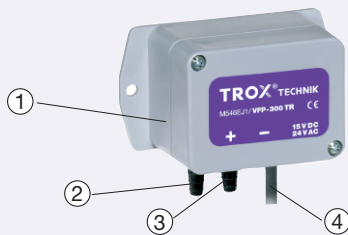
Control engineering information VARYCONTROL[®] VAV Units Diaphragm pressure transducer

VFP ...

VFP 100



VFP 300, VFP 600



- ① Diaphragm pressure transducer
- ② Positive pressure point
- ③ Negative pressure point
- ④ Connecting cable with plug

Area of application

The electronic diaphragm pressure transducer VFP... is designed for use in VAV systems. Combined with an electronic controller, it is used for measuring actual values of flow rate and for room or duct pressure control.

The mounting, wiring and tube connections for flow rate control are factory fitted. The tube connections for room or duct pressure control must be made by others.

The orientation dependency must be taken into account during installation. The correct installation orientation is shown by an arrow.

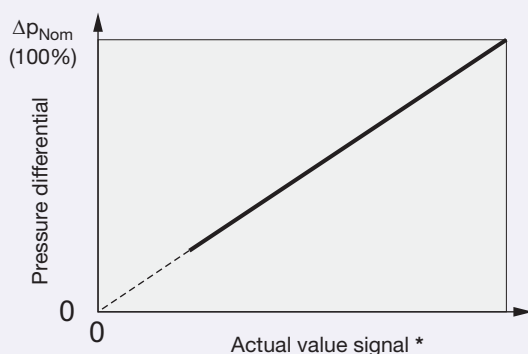
The VFP... is supplied with voltage from the controller VRP-M. Because of the static measurement principle, the VFP... is suitable for systems with contaminated air and/or aggressive media.

Functional description

The pressure differential is measured using the static differential pressure principle. The pressure differential causes the diaphragm in the differential pressure transducer to deflect, the movement is detected by induction and converted into a linear pressure/voltage signal.

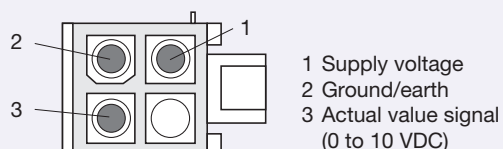
The measurement range is factory set. For parameters of the flow rate or pressure control see control engineering information on the controller being used.

Characteristic of actual value signal



* Actual value signal from VFP is not identical to the actual value signal of controller VRP-M

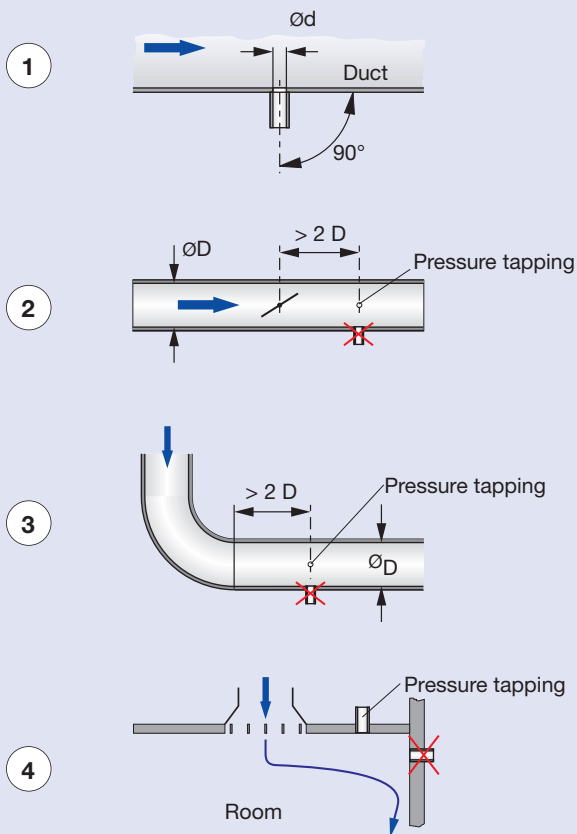
Connecting plug



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Diaphragm pressure transducer**

VFP ...

Measurement locations for static pressure



Measurement locations for static pressure

- ① Circular or rectangular duct
- ② Circular duct
- ③ Bend upstream of the pressure tapping
- ④ Pressure tapping into the false ceiling

Requirements for the measurement location

- The centre line of the pressure tapping must intersect the duct axis at right angles.
- The hole diameter (d) should be as small as possible but sufficiently large to minimise risks of blocking and insufficient dynamic response.

In example 1:

- Connecting nipple of pressure tapping must be 90° to the direction of air flow

In example 2 and 3:

- Minimum distance of $2D$ must be maintained downstream from a damper blade, elbow or bend.

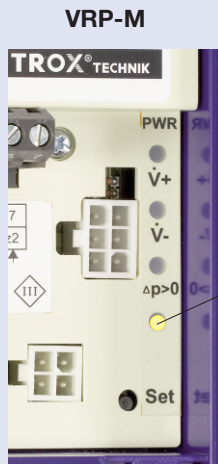
In example 4:

- Room pressure tapping must not be located in areas influenced by room air movement.

**Control engineering information
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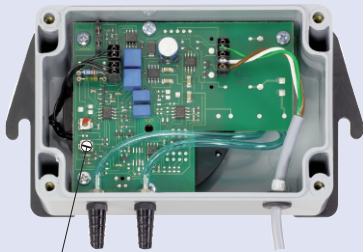
VFP ...

Zero point adjustment



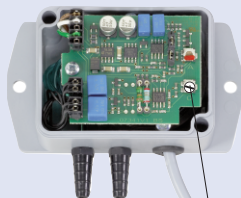
Zero point indicator light

VFP 100



Zero point potentiometer

VFP 300, VFP 600



Zero point potentiometer

Zero point adjustment

The supply voltage must be connected for at least an hour before carrying out measurements. With the tubing disconnected if the value shown is not zero then adjustment is required. More recent controllers provide an indicator light to carry out this function.

- VFP-M:
The zero indicator light indicates a non zero value.
- VFP and VFP-STP (new design)
The V+ light indicates a non zero value.
- VFP and VFP-STP (old design)
The U5 signal of VFP... is > 2,5 or < 1,7 VDC.

To adjust the zero point proceed as follows:

- Disconnect both (!) measuring tubes from VFP..
- Remove cover from VFP casing
- Turn zero point potentiometer clockwise until indicator light at VFP-M comes on
- Turn zero point potentiometer slowly counterclockwise backwards until indicator light goes off
- Replace tubing
- Replace cover