Volume flow transmitter

PTV

Description

The transmitters of the PTV series are used to measure volume flow, differential pressure, overpressure and vacuum. A jumper enables switching between volume flow and pressure measurement. Monitoring of gaseous, non-combustible and non-aggressive media. Possible usage areas are: Building automation and air conditioning systems, overpressure measurement in clean rooms and laboratories, measurement of constant pressure in VAV applications, dynamic filter and ventilator monitoring

Technical specification

Power supply	18 ... 30 VAC/DC
Output signal	0 ... 10 V or 4 ... 20 mA
Load for 4 ... 20 mA output	20...500 Ω
Load for 0 … 10 V output	≥ 1k Ω (≥10mA)
Units, selectable	m^3/h; m^3/s; cfm; l/s
K factor	0,001...9,9 x 10^5
Switching output	Transistor, maximum switching capacity of 30 VDC / 100 mA
Working temperature	0 ... 50°C
Storage temperature	-10 ... 70°C
Typical long-term stability (Pressure range)	≤± 1,0 % from end value / year
Linearity error incl. hysteresis and repetition accuracy (Pressure range)	≤ ± 1 % del FS, min ± 1 Pa
Humidity	0 ... 95 % RH, non-condensing
2 response times, selectable between 0.1 s and 20 s	0,1 - 1,0s
Process connection P1 and P2	Ø 6 mm
Electrical connection	Plug-in terminals for wires and strands up to 1.5 mm^2 with Cap nut
Housing material	ABS
Housing dimensions	ca. 81 x 43 x 41 mm
Weight	125 g
Protection class acc. to EN 60529	IP 65
Standards	EN 60770, EN 61326, 2014/30/EU, 2011/65/EU (RoHS II)

Models	Range		Overload capacity	Bursting pressure	Temperature error
PTV1..	0... 50 Pa	(0… 0,5 mbar)	60 kPa	100 kPa	≤ ± 3,0 % of full range
PTV2..	0... 100 Pa	(0… 1,0 mbar)	60 kPa	100 kPa	≤ ± 2,0 % of full range
PTV3..	0... 250 Pa	(0… 2,5 mbar)	60 kPa	100 kPa	≤ ± 2,5 % of full range
PTV4..	0... 500 Pa	(0… 5,0 mbar)	75 kPa	125 kPa	≤ ± 2,5 % of full range
PTV5..	0... 1000 Pa	(0… 10 mbar)	85 kPa	135 kPa	≤ ± 1,5 % of full range
PTV7..	0... 5 kPa	(0… 50 mbar)	85 kPa	135 kPa	≤ ± 1,0 % of full range
PTV8..	0... 10 kPa	(0… 100 mbar)	85 kPa	135 kPa	≤ ± 1,0 % of full range

Characteristics and settings

- Select a calculation formula and enter the k-factor. The k-factor can be found, for example, in documentation provided by the manufacturer of the ventilator or the probe.
- The output signal can be changed between 0...10 Volt and 4 ... 20 mA by removing a jumper.
- To give a switch signal at an user defined pressure level the transmitter has an adjustable transistor switching output (npn NO) with a maximum switching capacity of 30 Vdc/100 mA.
- The response time of the output signal can be configured using a jumper. If the jumper is in place the response time is slow (factory setting), which is useful for suppressing brief pressure peaks. If the application requires a fast response time the jumper must be removed.
- If there are any drifts on output, the transmitter can be adjusted by pressing the Offset-button to zero.
- The differential pressure transducer can be mounted in any position.

Order matrix

Configurable pressure range	0... 50 Pa	(0… 0,5 mbar)	**PTV**	**1**	
	0... 100 Pa	(0… 1,0 mbar)		**2**	
	0... 250 Pa	(0… 2,5 mbar)		**3**	
	0... 500 Pa	(0… 5,0 mbar)		**4**	
	0... 1000 Pa	(0… 10 mbar)		**5**	
	0... 5 kPa	(0… 50 mbar)		**7**	
	0... 10 kPa	(0… 100 mbar)		**8**	
Volume flow unit	m³/h; m³/s; cfm; l/s				**A**

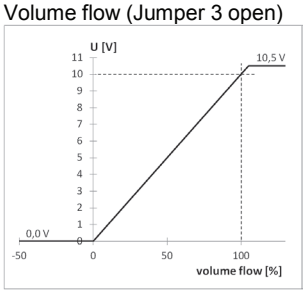
Formula configuration

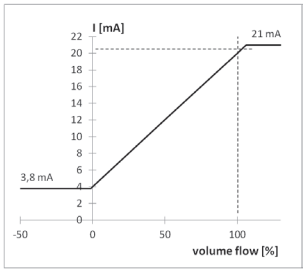
1) Select a calculation formula and enter the k-factor (jumper 1 open): This procedure is used when the k-factor is known. The k-factor can be found, for example, in documentation provided by the manufacturer of the ventilator or the probe. Use the menu guide on the device for configuration.
2) Creating reference volume flow (jumper 1 plugged in): Create a reference volume flow to configure the device. Use **FL□** in the menu guide for entry - see description in the operating instructions.

Selection on device	Manufacturer, e.g.	Formula in data sheet of manufactuter
F 1	Ebm-Papst, Ziehl-Abegg	$q = k \cdot \sqrt{\Delta p}$
F 2	Ziehl-Abegg	$q = \sqrt{\frac{\rho_{20}}{\rho}} \cdot k \cdot \sqrt{\Delta p}$
F 3	Nicotra-Gebhardt, Rosenberg	$q = k \cdot \sqrt{\frac{2}{\rho} \cdot \Delta p}$
F 4	Fläkt Woods	$q = \frac{1}{k} \cdot \sqrt{\Delta p}$

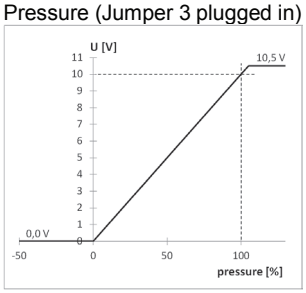
Diagramm

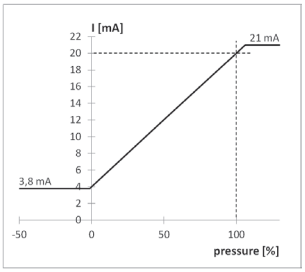
Volume flow (Jumper 3 open)





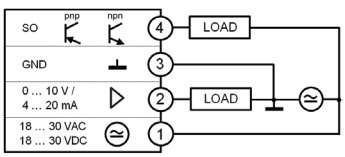
Pressure (Jumper 3 plugged in)





Terminal assignments

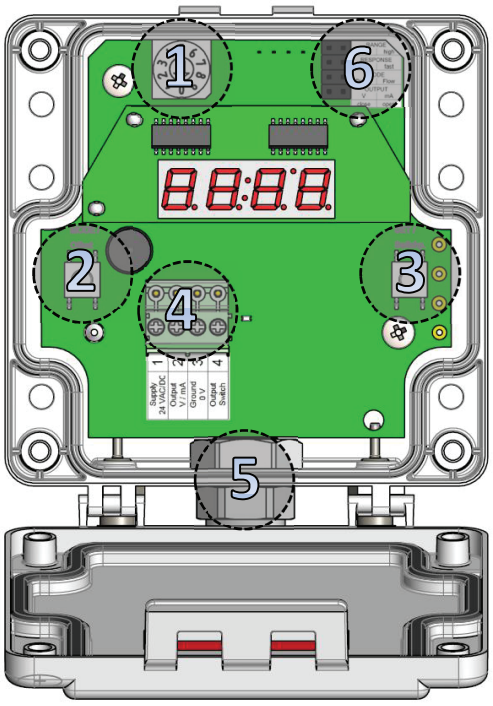
3-wire with switching output



Plug-in terminals, 4-pole	

4	Switching output (SO)
3	Ground (GND)
2	Output signal (0…10 V / 4…20 mA)
1	Supply voltage (18...30 VAC / VDC)

Jumper assignments

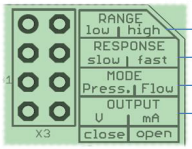


1. Rotary coding switch
2. Button MODE/Offset
3. Button SET/Switchp.
4. Plug-in terminals
5. Cap nut conduit
6. Jumper

Jumper assignments

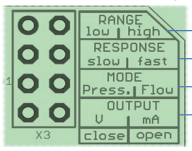
The function settings of differential pressure transducer are achieved by inserting jumpers appropriately within the transducer.

Volume flow mode: Jumper 3 open



Function	Switched	Open
Entry	ref. Volume flow	K-factor
Responce time	Slow	Fast
Operation mode		Volume flow
Output signal	0...10 V DC	4...20 mA

Volume flow mode: Jumper 3 plugged in



Function	Switched	Open
Setting	Zero- point	Analog end point
Responce time	Slow	Fast
Operation mode	Pressure	Volume flow
Output signal	0...10 V DC	4...20 mA

Dimensions (mm)