

# Pressure Transmitters & ON/OFF Relay Switches

## HD402... and HD402TR... series

### ○ ACCURATE AND RELIABLE

Sensor with high accuracy and temperature compensation for excellent linearity, repeatability and stability over the time

### ○ GREAT FLEXIBILITY

Analog, RS485 Modbus-RTU and relay outputs at choice according to the model

### ○ IMMEDIATE AND DIRECT READING

Models with display option for direct reading in the selected measurement unit

### ○ EASY TO SET UP AND QUICK TO INSTALL

Supplied **ready to use** and **factory calibrated**  
Configuration through dip switches

### ○ VERY LOW MAINTANANCE

### Easy & quick control of relative or differential pressure

The presence of very pure air, i.e. with a very low content of microparticles of suspended dust, is in some fields mandatory. In the **industrial and scientific research** and **microelectronics industry** in general, in the field of bottling and food and moreover in the **pharmaceutical field**, **cleanrooms** are used to always ensure a controlled atmosphere.

Especially in these applications, a highly precise and reliable instruments are indispensable for the measurement of differential pressure.

The series of small and compact transmitters **HD402xT...** is suitable for measuring relative pressure with respect to atmosphere or differential pressure in the range from as low as **0...50 Pa** to **0...200 kPa**.

These transmitters use a **silicon piezoresistive sensor with high accuracy** and temperature compensation, which **has excellent linearity, repeatability and stability** over the time. Thanks to the particular sensor used, the transmitters are insensitive to orientation and position. Moreover, the **high stability** of the sensor over the time and in comparison to the changes in temperature allows the elimination of the operations of maintenance typically required to **compensate for the aging and the deviation of the sensor zero**.

Depending on the needs, the wide variety of the models offer an output signal of the sensor that is converted into a **digital RS485 Modbus-RTU output** (HD402ST), into a **voltage 0...10 V** or **active current 0...20 mA / 4...20 mA analog output** (HD402T) or into a **2-wire (current loop) 4...20 mA analog output** (HD402AT).

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### Main Applications

Control of HVAC  
Filter control  
Clean Rooms monitoring  
Pneumatic control  
Respirators  
Vaporizers



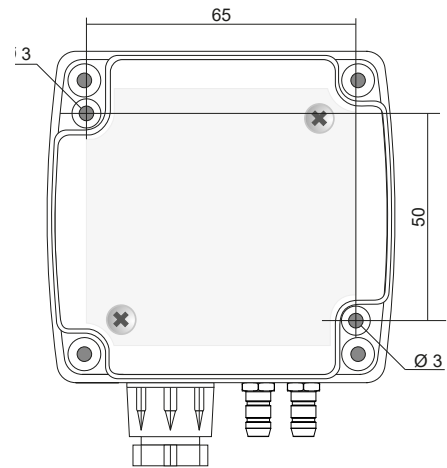
**HD402TR...L**  
**Pressure ON/OFF Relay Switches**

## Transmitters Technical Specifications

Sensor	Piezoresistive, high stability
Measuring range	
Resolution	
Accuracy	See table 1
Long-term stability	
Overpressure limit	
Output	<b>HD402T...</b> : active analog 0...10Vdc $(R_{Lmin} = 10\text{ k}\Omega)$ or 0/4...20 mA $(R_{Lmax} = 500\Omega)$ <b>HD402AT...</b> : 2-wire (current loop) 4...20 mA $(R_{Lmax} = (Vcc-12)/0,022)$ <b>HD404ST...</b> : digital RS485 Modbus-RTU
Response time	0.5 seconds for the display updating For transmitters: configurable 0.125, 1, 2 or 4 seconds for the output
Connection to PC	<b>HD402T.../HD402AT...</b> RS232 serial port can be connected to a USB port by using the optional CP27 adapter <b>HD402ST...</b> : can be connected to a USB port by using the optional RS48 adapter
Zero calibration	Manual
Compatible media	Only air and non-aggressive dry gases
Power supply	<b>HD402T...</b> : 24 Vac $\pm 10\%$ or 18...40Vdc <b>HD402AT.../HD404ST...</b> : 12...30Vdc
Absorption	<b>HD402T.../HD402AT...</b> : < 1 W @ 24Vdc <b>HD402ST...</b> : < 100 mW @ 12Vdc
Pressure connection	Nickel-plated brass, $\varnothing 6$ mm
Electrical connections	Screw terminal block, max 1.5 mm <sup>2</sup> , PG9 cable gland
Operating conditions	-10...+60 °C / 0...95% RH
Storage temperature	-20...+70 °C
Protection degree	IP65

## Installation

By opening the lid, 3 mm diameter holes are available so to allow securing the base of the instrument directly to a panel or to the wall.



Fixing holes (mm)

Dimensions (mm)

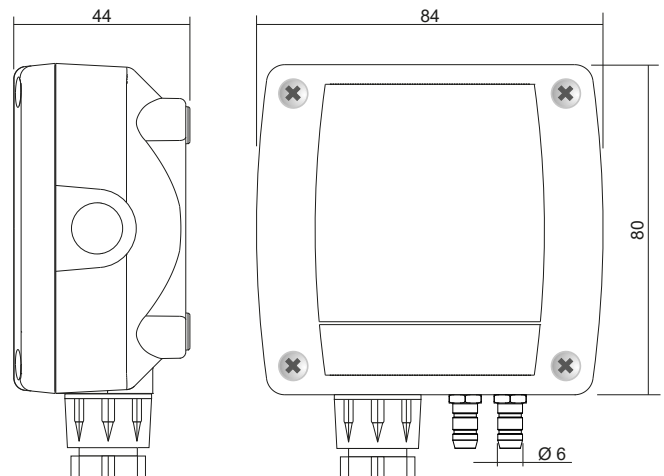


TABLE 1	Measuring range	Resolution	Accuracy (*)	Long Term Stability (1000 h @ 25 °C)	Overpressure limit
HD402T/ST/AT1	$\pm 50/100/250$ Pa (also in mmH <sub>2</sub> O, inchH <sub>2</sub> O, mbar)	0.1 Pa (also in mmH <sub>2</sub> O, inchH <sub>2</sub> O, mbar)	$\pm 1.5\%$ FSS @ 25 °C $\pm 3\%$ FSS @ 0...50 °C	$\pm 0.5\%$ FSS	50 kPa
HD402T/ST/AT2	$\pm 250/500/1000$ Pa (also in mmH <sub>2</sub> O, inchH <sub>2</sub> O, mbar)	1 Pa (also in mmH <sub>2</sub> O, inchH <sub>2</sub> O, mbar)	$\pm 0.75\%$ FSS @ 25 °C $\pm 1\%$ FSS @ 0...50 °C		
HD402T/ST/AT3	$\pm 2.5/5/10$ kPa (also in mmHg, PSI, mbar)	0.01 kPa (also in mmHg, PSI, mbar)	$\pm 1\%$ FSS @ 0...50 °C	$\pm 0.35\%$ FSS	200 kPa
HD402T/ST/AT4	$\pm 25/50/100$ kPa, (also in mmHg, PSI, mbar)	0.1 kPa (also in mmHg, PSI, mbar)		$\pm 0.25\%$ FSS	
HD402T/ST/AT5	$\pm 50/100/200$ kPa (also in mmHg, PSI, mbar)	0.1 kPa (also in mmHg, PSI, mbar)			400 kPa

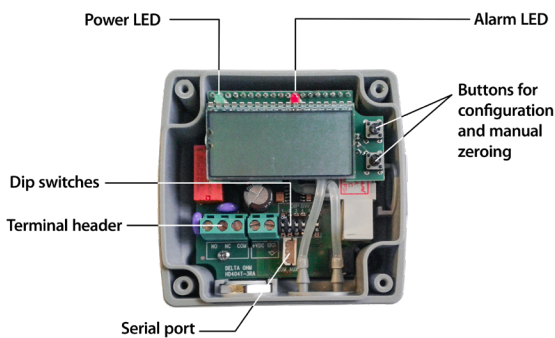
(\*) FSS = nominal range (= 2 x f.s. high range).

# Pressure ON/OFF Relay Switches

## HD402TR...L series

- Rugged technopolymer case
- Relay output
- Configurable from your PC
- Manual setting possible with push buttons
- Visible (LED) alarm and audible alarm
- Settable thresholds, hysteresis and delay
- **Auto-zeroing** feature in the low range model to ensure **highest precision** and excellent long term stability
- Clear LCD display with measured value
- Wide selection in ranges
- Selectable units of measurement
- **Excellent linearity**, repeatability and stability
- Very low maintenance
- Factory calibrated

### Internal view



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### ON/OFF Relay Switches Technical Specifications

The same specifications of HD402... apply to this model, with the exception of the following. For measuring range, resolution, accuracy, long-term stability and overpressure limit, see table 2.

Output	SPDT Relay switch, 3 A/250 Vac, 3 A/30 Vdc resistive load
Alarm	Front LED, internal buzzer, relay switch
Response time	0.5 seconds for the display updating Immediate or configurable for the output
Connection to PC	RS232 serial port can be connected to a USB port by using the optional CP27 adapter
Zero calibration	Automatic for HD402TR1L, manual for the other models
Power supply	24 Vac $\pm$ 10% or 15...36 Vdc
Absorption	< 1 W @ 24 Vdc

TABLE 2	Measuring range	Resolution	Accuracy	Long Term Stability (1000 h @ 25 °C)	Overpressure limit
HD402TR1L	$\pm$ 50/100/250 Pa (also in mmH <sub>2</sub> O, inchH <sub>2</sub> O, mbar)	0.1 Pa (also in mmH <sub>2</sub> O, inchH <sub>2</sub> O, mbar)	$\pm$ (0.8% measure + 0.5 Pa) @ 0...50 °C	$\pm$ 0.2 Pa with auto-zero	50 kPa
HD402TR2L	$\pm$ 250/500/1000 Pa (also in mmH <sub>2</sub> O, inchH <sub>2</sub> O, mbar)	1 Pa (also in mmH <sub>2</sub> O, inchH <sub>2</sub> O, mbar)	$\pm$ 0.75% FSS @ 25 °C $\pm$ 1% FSS @ 0...50 °C	$\pm$ 0.5% FSS	
HD402TR3L	$\pm$ 2.5/5/10 kPa (also in mmHg, PSI, mbar)	0.01 kPa (also in mmHg, PSI, mbar)	$\pm$ 1% FSS @ 0...50 °C	$\pm$ 0.35% FSS	200 kPa
HD402TR4L	$\pm$ 25/50/100 kPa, (also in mmHg, PSI, mbar)	0.1 kPa (also in mmHg, PSI, mbar)		$\pm$ 0.25% FSS	
HD402TR5L	$\pm$ 50/100/200 kPa (also in mmHg, PSI, mbar)	0.1 kPa (also in mmHg, PSI, mbar)		400 kPa	

(\*) FSS = nominal range (= 2 x f.s. high range).

## Ordering Codes

HD402

T	-	Blank = without display L = with LCD display
<p><b>Nominal full scale (f.s.)</b>            1 = ± 250 Pa / 25 mmH<sub>2</sub>O / 1 inchH<sub>2</sub>O / 2.5 mbar            2 = ± 1000 Pa / 100 mmH<sub>2</sub>O / 4 inchH<sub>2</sub>O / 10 mbar            3 = ± 10 kPa / 50 mmHg / 1.5 PSI / 100 mbar            4 = ± 100 kPa / 500 mmHg / 15 PSI / 1000 mbar            5 = ± 200 kPa / 1000 mmHg / 30 PSI / 2000 mbar</p>		
<p><b>Output</b>            Blank = voltage and active current analog output            A = 2-wire (current loop) 4...20 mA output            S = RS485 Modbus-RTU output</p>		

HD402TR

L

**Range:**

1 = ± 250 Pa / 25 mmH<sub>2</sub>O / 1 inchH<sub>2</sub>O / 2,5 mbar  
 2 = ± 1000 Pa / 100 mmH<sub>2</sub>O / 4 inchH<sub>2</sub>O / 10 mbar  
 3 = ± 10 kPa / 50 mmHg / 1,5 PSI / 100 mbar  
 4 = ± 100 kPa / 500 mmHg / 15 PSI / 1000 mbar  
 5 = ± 200 kPa / 1000 mmHg / 30 PSI / 2000 mbar



### Further accessories

- RS27** RS232 null-modem serial connection cable with SubD 9-pin connector on the PC side and 3-pole connector on the instrument side.
- CP27** Connection cable with built-in USB/RS232 converter. USB connector on the PC side and 3-pole connector on the instrument side.
- RS48** Cable for RS485 connection with built-in USB/RS485 converter. The cable has USB connector for PC and 3 separate wires for the instruments.
- AP3719** Flow port for square or cylindrical duct. Supplied with two pieces of silicone tube internal Ø 4 mm / external Ø 6 mm, length 1 m.
- AP3721** Plastic flow port for cylindrical duct. Supplied with two pieces of silicone tube, internal Ø 4 mm / external Ø 6 mm, length 1 m.



In order to ensure the quality of our instruments, we are constantly re-evaluating our products. Improvements can imply changes in specification; we advise you to always check our website for the newest version of our documentation.

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