HD 2004T... - HD 20V4T...
HD 9408T...



PASSIVE PRESSURE TRANSMITTERS WITH DIN 43650 CONNECTOR

Description

HD 2004T and HD 20V4T are microprocessor pressure transmitters, the first one having a current output (4÷20 mA) and the second one a voltage output (0÷5V, 1÷5V or 0÷10V).

The sensitive element consists of a bridge of piezoresistive resistances laid on a ceramic diaphragm. When changing the applied pressure, the bending of this diaphragm causes a linear and proportional change of the bridge resistances.

The stainless steel case (30 mm diam.) includes both the sensor and the electronics:

unscrewing the base equipped with faston connectors, you access the keys to adjust the upper and the full scale. A LED helps the user during the calibration procedure. A 1/4" BSP threaded connection and a slot on the case for a 24 mm wrench are provided to connect the transmitter with the plant under pressure. On the other side, a 3/4-pole (depending on models) male faston connector, the relevant outlet and a PG7 cable gland pursuant to DIN 43650 are provided to grant the electrical links.

Technical Specifications

Output Signal	Current	4...20 mA (HD 2004T...)
	Voltage	0...5V (HD 20V4T... 1), 1...5V (HD 20V4T... 2), 0...10V (HD 20V4T... 3)
Pressure range		**1, 2.5, 4, 6, 10, 16, 25, 40, 60, 100, 160, 250, 400 and 600 absolute bars 1, 2.5, 4, 6, 10, 16, 25, 40, 60 relative bars**
Overpressure limit	Up to 250 bars	Twice the rated value
	400 nominal bars	750 bars
	600 nominal bars	750 bars
Sensor		Piezoresistive
Material in contact with the measuring fluid		Alumina
Fluid in contact with the diaphragm		Gas or liquids
Operating temperature		-30...+80°C
Power supply voltage		10...30Vdc (15...30Vdc for models having 0...10Vdc output)
Span and full scale adjustment		±10% through up, down and enter)
Accuracy (linearity, hysteresis and repeatability)		≤ ±0.4%F.S.
Gain sensitivity to temperature changes (@ 25°C)		≤ ±0.008%F.S. between 0 and 70°C ≤ ±0.012%F.S. between -30°C and 0°C and between 70°C and 80°C
Zero sensitivity to temperature changes (@ 25°C)		≤ ±0.04%F.S.
Process connection		1/4"BSP male
Electrical connection		3/4 -pole faston male connector + DIN 46350 female connector (outlet)
Housing made of		AISI 304 stainless steel
Size		Ø 30x90 mm (included DIN 43650 connector)
Weight		190 g
Load resistance for HD 2004T models... (see Fig.2)		R_{Lmax} = 636 Ω a 24 Vdc $R_{Lmax} = \frac{(Vdc - 10)}{22mA}$
Load resistance for HD 20V4T models...		$R_L \geq 10K$
Response time		1 sec. (Time required to achieve the 63% of the final variation)
Protection class		IP54

Installation and connections

HD 2004T... and HD 20V4T... transmitters can be installed in any position. Open the female connector to make the electrical connections (see fig.3).

Transmitter Calibration

The transmitter output is factory-calibrated, thus, no user's operation is generally requested.

Current output transmitters supply 4 mA at scale beginning and 20 mA at full scale;

0...5V, 1...5V and 0...10V voltage output transmitters generate 0V or 1V at scale beginning pressure and 5V or 10V at full scale pressure.

To adjust these values (within a ±10% of the range), you need the following instruments:

- a pressure calibrator with an adequate full scale;
- a voltage generator with the value included between 10 and 30Vdc;
- a 25 mA full scale precision ammeter or a voltmeter having an adequate scale (5.5 or 11V, at least, according to the model).

Procedure

1) Connect the HD 2004T... or the HD 20V4T... to the pressure generator using proper gaskets, if necessary.
2) Unscrew the plastic ring nut at the bottom of the transmitter without turning the faston connector (see fig.5).
   Behind the plastic ring nut there is the calibration circuit with the keys and the LED as shown in fig.6.
3) Follow the indications shown on fig.7 to make the electrical connections and insert the connector into the transmitter.
4) Apply the upper range pressure, and press ENTER to calibrate the first point: the programming LED lights up to indicate that the first calibration of the transmitter is being carried out.
5) Ad just the output value using the ▲ and ▼ keys.
6) Press ENTER to confirm data: the programming LED will turn to off. To calibrate the second full scale current or voltage value, repeat the procedure from item 4) to 6), applying the full scale pressure.
7) Screw the ring nut and check that the ground terminal fits its seat and touches the transmitter metallic ground: the calibration procedure is over.

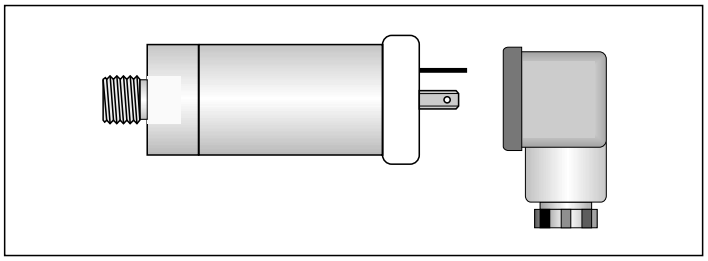


Fig.1 HD 2004T transmitter with DIN 43650 connector.

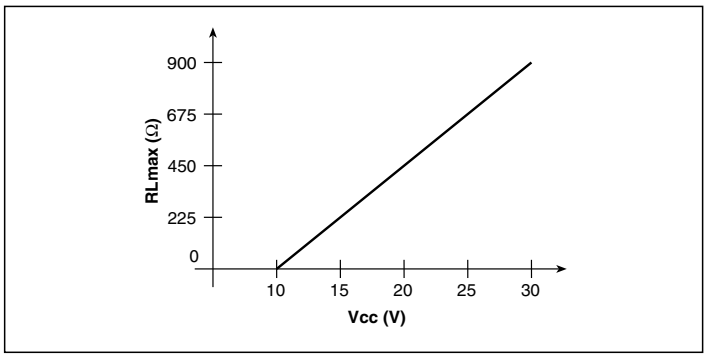
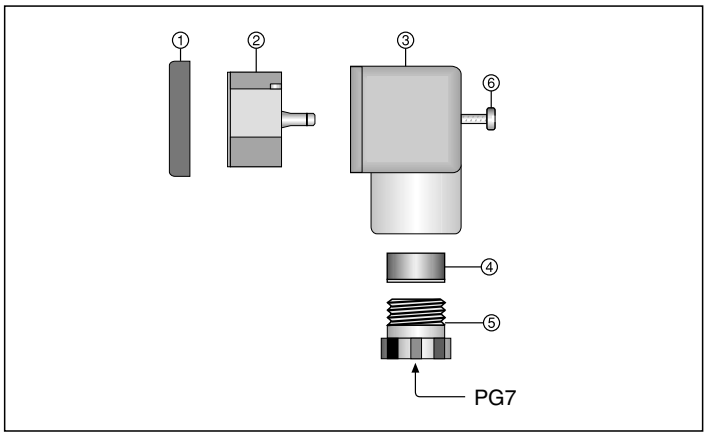


Fig.2 4...20 mA output load resistance according to the power supply voltage.



Remove the gasket **1**. Unscrew the cable gland **5** and take the gasket **4** away. Using a screwdriver, lever and remove the terminal carrier **2**. Follow the indications shown on figure 4 to make the connections: the ground terminal has to be connected with the braid of the screened cable. After carrying out the connections, close again the connector. Mount the HD 2004T... or the HD 20V4T... : the transmitters have a 1/4" BSP male threaded connection. By mounting, take care that the fitting is properly pressure-sealed and, if necessary, use adequate seals. Apply the connector to the transmitter and fix it with the provided **6** screw.

Fig.3 DIN 43650 connector.

Notes

A) To avoid storing wrong data, HD 2004T... and HD 20V4T series transmitters are provided with a protection system that automatically quits the calibration procedure without editing stored data, if more than 45 seconds elapse since the last key has been pressed,.

B) HD 2004T... and HD 20V4T... series transmitters automatically acknowledge the applied pressure as upper range pressure, if it does not exceed 15% of the nominal pressure, and as full scale pressure if it exceeds the 40% of the transmitter nominal pressure.

HD 2004T... and HD 20V4T... series pressure transmitters can be connected with Delta Ohm HD 9022 Single Input Configurable Controllers / Panel Meters or with Double Input DO 9404 ones.

Caution: the pressure transmitter has a 1/4" BSP male threaded connection. Check attentively that the connection fitting is pressure-sealed when installing the transmitter. If needed, use proper gaskets.

Be careful when installing the transmitters into under-pressure containers or into pipes. Pay attention in selecting the full scale flow: a mistake, besides damaging irreparably the transmitter, might cause even heavy physical injuries to the operator and damages to things and equipments. Mount always a stop key before the transmitter and check that no peak or abnormal and unexpected rushes of the fluid under pressure occur on the plant.

Order codes

HD20**0**4T - **1BG1**

- Output: **1** = 0...5V; **2** = 1...5V; **3** = 0...10V; **none** = 4...20 mA
- **A** = Absolute pressure; **G** = Relative pressure
- **B** = bar
- **Nominal full scale (bar)**: 1-2.5-4-6-10-16-25-40-60 relative or absolute bar; 100-160-250-400-600 absolute bar
- Type of output: **0** = Current; **V** = Voltage

FULL SCALE	RELATIVE Ref.: atmospheric pressure	ABSOLUTE Ref.: vacuum	ABSOLUTE Ref.: 1 bar s.g.
1 bar	HD 20...4T- 1 BG...	HD 20...4T- 1 BA...	
2.5 bar	HD 20...4T- 2 B5G...	HD 20...4T- 2 B5A...	
4 bar	HD 20...4T- 4 BG...	HD 20...4T- 4 BA...	
6 bar	HD 20...4T- 6 BG...	HD 20...4T- 6 BA...	
10 bar	HD 20...4T- 10 BG...	HD 20...4T- 10 BA...	
16 bar	HD 20...4T- 16 BG...	HD 20...4T- 16 BA...	
25 bar	HD 20...4T- 25 BG...	HD 20...4T- 25 BA...	
40 bar	HD 20...4T- 40 BG...	HD 20...4T- 40 BA...	
60 bar	HD 20...4T- 60 BG...	HD 20...4T- 60 BA...	
100 bar			HD 20...4T- 100 BA...
160 bar			HD 20...4T- 160 BA...
250 bar			HD 20...4T- 250 BA...
400 bar			HD 20...4T- 400 BA...
600 bar			HD 20...4T- 600 BA...

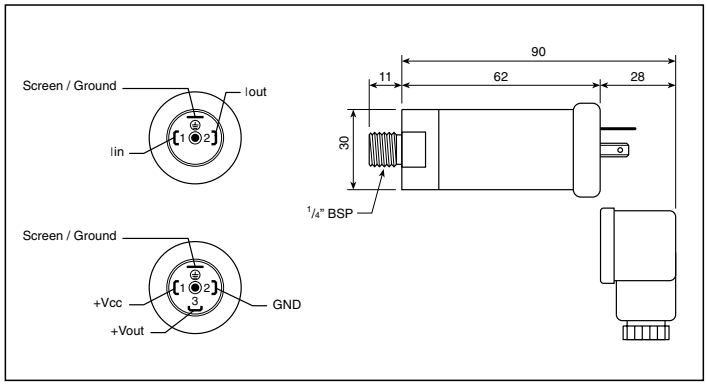


Fig.8 Mechanical dimensions.

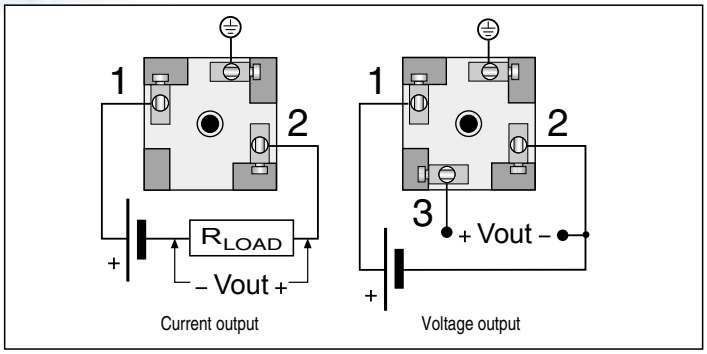


Fig.4 DIN 43650 connector: electrical connections.

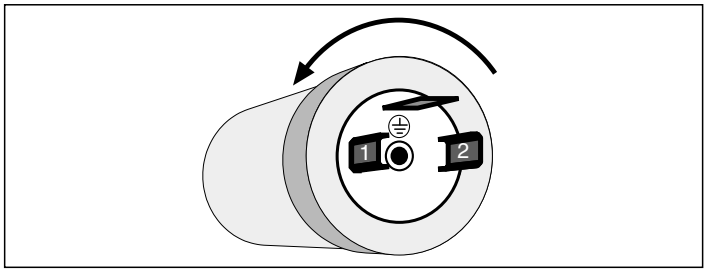


Fig.5

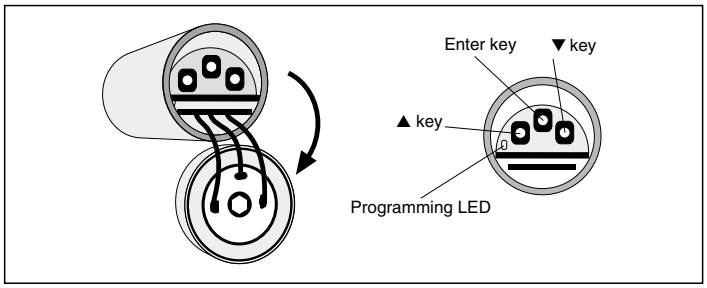


Fig.6 Key and LED description

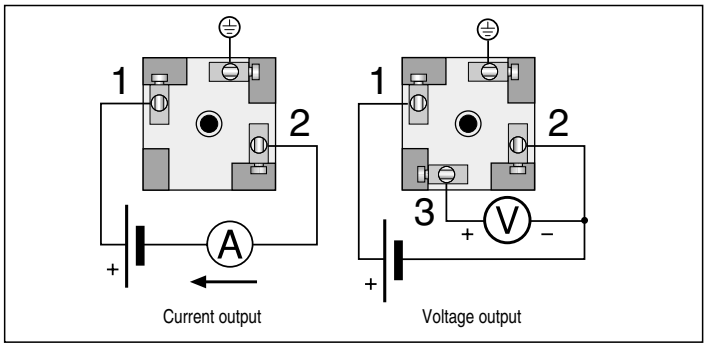
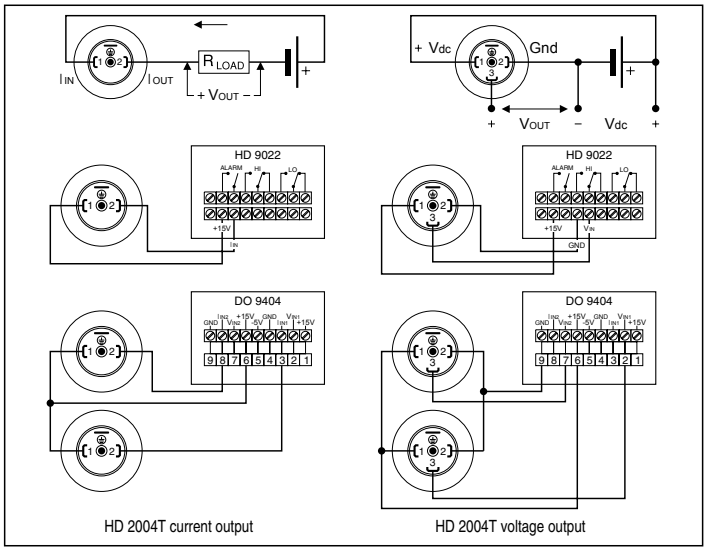


Fig.7



Connection examples with HD 9022 and DO 9404 controllers and panel meters

PASSIVE PRESSURE TRANSMITTERS WITH DIN 45326 CONNECTOR

Description

The passive pressure transmitters in the **HD 9408T...** series convert the pressure variation exerted on a flexible diaphragm into a proportional and linear 4÷20 mA signal on two wires.

The sensitive element is a bridge of piezoresistive resistances laid on a diaphragm of special ceramic material. The bending of the diaphragm leads to a variation in the resistances that is proportional to and linear with the pressure applied. The quality of the materials and the technology used allow the creation of elements that are very precise, reliable and repeatable over time.

The sensitive element is housed inside a container made of stainless steel, diameter 30x60 mm., containing the pressure sensor and the electronics; at the base there is a socket for a 24 mm spanner, while the threaded part for connection top the pressurized system is 1/4" BSP. On the opposite side the transmitter is complete by a three-pole circular metal connector in accordance with DIN 41524 and two multirev trimmers with which start and end of scale may be adjusted by about ±5% of their value.

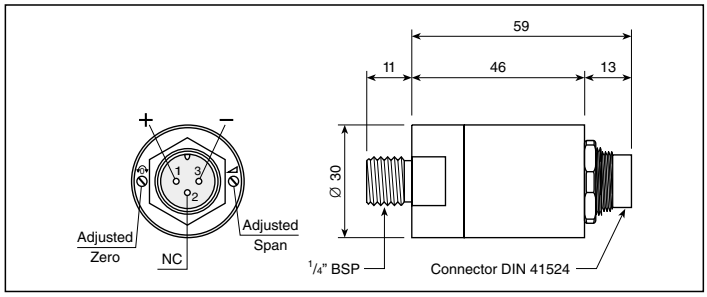
Technical Specifications

Output Signal		4...20 mA
Pressure range		**2.5, 4, 6, 10, 16, 25, 40, 60, 100, 160, 250, 400 and 600 absolute bars 250, 400, 600 relative mbars 1, 2.5, 4, 6, 10, 16, 25, 40, 60 relative bars**
Resolution		Infinite
Overpressure limit	limit Up to 250 bars	Twice the rated value
	400 nominal bars	750 bars
	600 nominal bars	750 bars
Sensor		Piezoresistive
Material in contact with the measuring fluid		Alumina, AISI 316 for models 250, 400 and 600 relative mbars
Fluid in contact with the diaphragm		Gas or liquids
Operating temperature		-10...+70°C
Storage temperature		+20...+80°C
Power supply voltage		9...30Vdc , maximum ripple ≤ 4Vpp
Span and full scale adjustment		±5% by two trimmers
Accuracy (Linearity, hysteresis, and repeatability)		≤ ±0.4%F.S.
Temperature compensation		0...80°C
Process connection		1/4"BSP male
Electrical connection		Male three-pole circular connector in accordance with DIN 41524
Housing made of		AISI 304 stainless steel and Viton
Size / Weight		Ø 30x70 mm / 190 g
Load resistance		$R_{Lmax} = \frac{(Vdc - 9)}{22mA}$
Response time		0.5 sec. (Time required to achieve the 63% of the final variation)
Assembly position		Immaterial
Fixing spanner		27 mm

The pressure transmitters in the series **HD 9408T...** may be connected to Delta Ohm **HD 9022** configurable regulating indicators with a single input or **DO 9404** with two inputs.

Warnings: The pressure transmitter has a male 1/4" BSP threaded coupling; during assembly, take great care with the coupling pressure seal, using suitable gaskets if necessary.

Great care must be taken when installing the transmitters in pressurized containers or in pipes. Take care when choosing the transmitter full-scale range. Besides causing irreparable damage to the transmitter, a mistake can also cause severe physical harm to the operator and to things. A stop key must always be fitted before the transmitter. Ensure that there are no abnormal or sudden increases or peaks in the fluid under pressure.



Mechanical dimensions

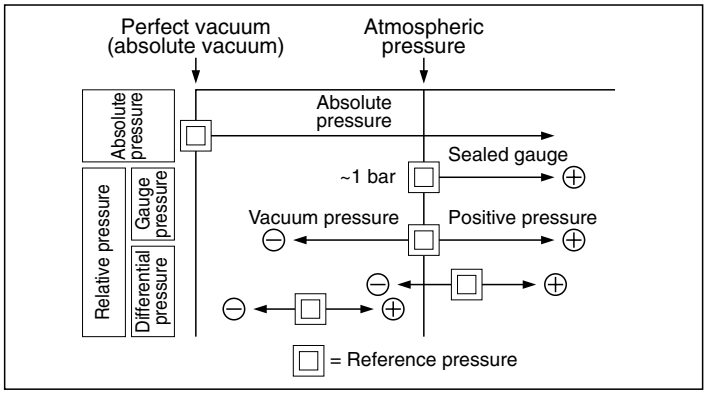
Order codes

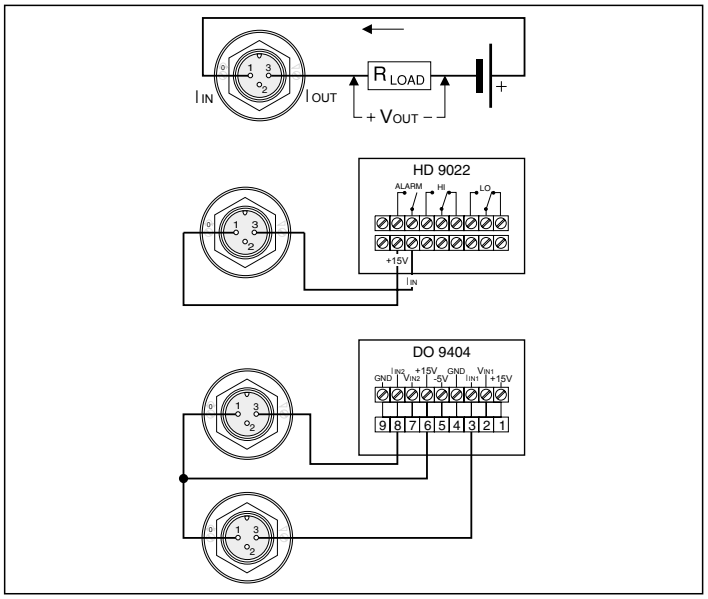
HD9408T - 1BG

- **A** = Absolute pressure
- **G** = Relative pressure
- **B** = bar
- **Nominal full scale**
  - 250-400-600 relative mbar
  - 1-2.5-4-6-10-16-25-40-60 relative bar
  - 2.5-4-6-10-16-25-40-60 absolute bar (ref. vacuum)
  - 100-160-250-400-600 absolute bar (ref. 1 bar)
- Output: 4...20 mA

FULL SCALE	RELATIVE Ref.: atmospheric pressure	ABSOLUTE Ref.: vacuum	ABSOLUTE Ref.: 1 bar s.g.
250 mbar	HD 9408T- 250 MBG		
400 mbar	HD 9408T- 400 MBG		
600 mbar	HD 9408T- 600 MBG		
1 bar	HD 9408T- 1 BG		
2.5 bar	HD 9408T- 2 B5G	HD 9408T- 2 B5A	
4 bar	HD 9408T- 4 BG	HD 9408T- 4 BA	
6 bar	HD 9408T- 6 BG	HD 9408T- 6 BA	
10 bar	HD 9408T- 10 BG	HD 9408T- 10 BA	
16 bar	HD 9408T- 16 BG	HD 9408T- 16 BA	
25 bar	HD 9408T- 25 BG	HD 9408T- 25 BA	
40 bar	HD 9408T- 40 BG	HD 9408T- 40 BA	
60 bar	HD 9408T- 60 BG	HD 9408T- 60 BA	
100 bar			HD 9408T- 100 BA
160 bar			HD 9408T- 160 BA
250 bar			HD 9408T- 250 BA
400 bar			HD 9408T- 400 BA
600 bar			HD 9408T- 600 BA

Types of pressure





Connection examples with HD 9022 and DO 9404 controllers and panel meters.