Low Pressure Transmitters

HD404... series

WIDE VARIETY FOR ANY APPLICATION

Ranges from 50 Pa to 100 mbar
Models with auto-zero circuit
Optional airflow speed measurement

GREAT FLEXIBILITY

Wide availability of output signals
for **easy integration** in any installation

HIGHLY ACCURATE AND RELIABLE SYSTEM

Sensor with **excellent linearity, repeatability** and **stability** over time

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 **already calibrated**

Member of GHM GROUP

Main Applications

Clean room monitoring
Filter control
Flow measures
Air conditioning control
Ventilation control

Accurate measurements even at very low pressure!

The series of HD404T transmitters is able to measure **relative pressures** with reference to the **atmosphere or differential** in the range:

- **from 50 to 1000 Pa** (from 0.2" H_2O to 4" H_2O) for the versions with analog output;
- **250 Pa / 1000 Pa / 100 mbar** for the versions with RS485 Modbus-RTU output.

The transmitters use a "micromachined" temperature compensated silicon sensor that has an excellent linearity, repeatability and stability over time.

The sensor signal is amplified and converted, depending on the model, into a **standard current** (4-20 mA) or **voltage** (0-10 V) **analog output,** or into a **digital RS485 Modbus RTU output**, and can therefore be transmitted over long distances with a high noise immunity.

In the models with analog output it is possible to choose, via a dip switch, between two measurement ranges in order to select the optimal scale for each application.

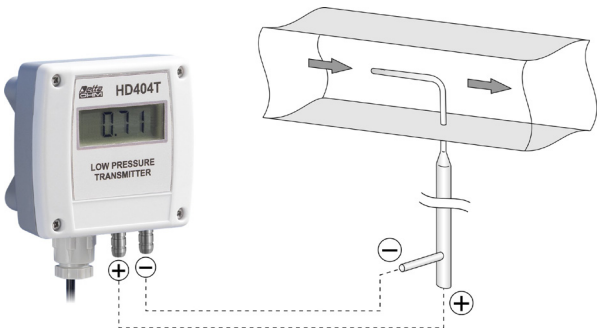
An optional **auto-zero circuit (AZ)** periodically equalizes the differential pressure at the sensor input and corrects the offset; the transmitters equipped with this circuit are insensitive to the mounting position. In addition, the auto zero circuit compensates the sensor aging and deviation of the zero with temperature changes, eliminating the maintenance.

The **display option (L)** is available, in which the pressure is visualized on a 4-digit display in the chosen measurement unit.

The **"square root" version (SR)** is especially useful if the transmitter is connected to a Pitot or Darcy tube, as the output is directly proportional to the speed of airflow. The SR version with L option also allows displaying, in addition to the pressure measured, the calculated airflow speed. It is possible to set the coefficient of the Pitot or Darcy tube used and the parameters for the calculation of the speed (air flow temperature, barometric pressure, differential static pressure in the duct). In the models with analog output it is possible to set the full scale speed for the output.

Technical Specifications

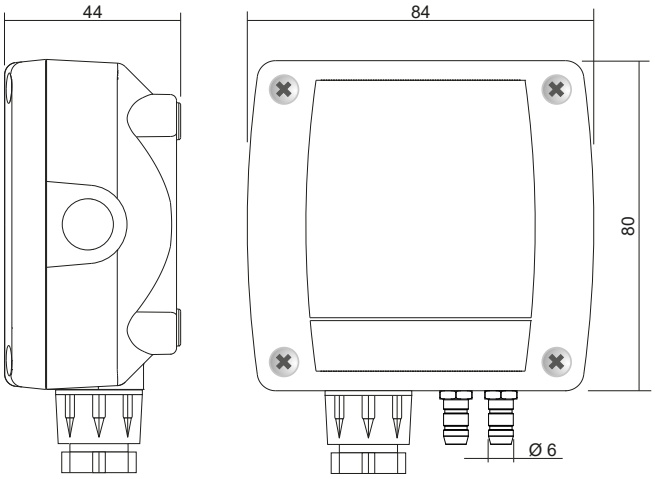
Sensor	Piezoresistive
Measuring range	See table 1 and 2
Resolution	0.1 Pa for HD404ST2… 0.5 Pa for f.s. up to 500 Pa (except HD404ST2…) 1 Pa for f.s. 1000 Pa 0.1 mbar for HD404ST5… 0.05 mmH_2O for f.s. up to 50 mmH_2O 0.1 mmH_2O for f.s. 100 mmH_2O 0.002" H_2O for f.s. up to 4" H_2O 0.01 m/s (only SR versions)
Accuracy	See table 1
Long-term stability	See table 1
Output	**HD404T…:** active analog 0…10 Vdc (R_{Lmin}=10 kΩ) or 4…20 mA (R_{Lmax}= 500Ω) **HD404ST…:** digital RS485 Modbus-RTU
Response time	**HD404T…** with dip-switch set to FAST: 0.125 s in pressure mode 1 s in speed mode (only SR versions) **HD404T…** with dip-switch set to LOW: configurable 1, 2 or 4 s (default 2 s) **HD404ST…** configurable 0.125, 1, 2 or 4 s (default 2 s)
Overpressure limit	50 kPa
Connection to PC	**HD404T…:** RS232 serial port can be connected to a USB port by using the optional CP27 adapter **HD404ST…:** can be connected to a USB port by using the optional RS48 adapter
Zero calibration	Automatic for the versions with AZ option
Compatible media	Only air and non-aggressive dry gases
Power supply	**HD404T…:** 24 Vac ± 10% or 18…40 Vdc **HD404ST…:** 12…30 Vdc
Absorption	**HD404T…:** < 1 W @ 24 Vdc **HD404ST…:** < 100 mW @ 12 Vdc
Pressure connection	Nickel-plated brass, Ø 6 mm
Electrical connections	Screw terminal block, max 1.5 mm^2 , PG9 cable gland
Operating conditions	-10…+60 °C (-5…+50 °C for the models with AZ option), 0…95% RH
Storage temperature	-20…+70 °C
Protection degree	IP65



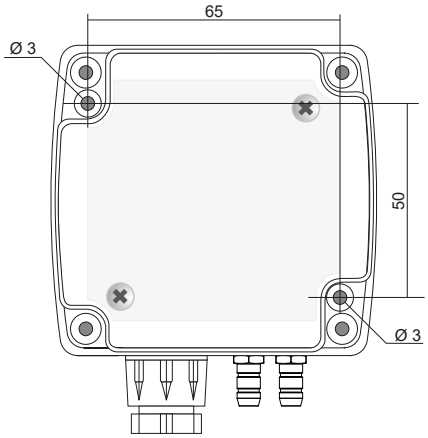
Transmitter with SR option connected to a Pitot tube

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.



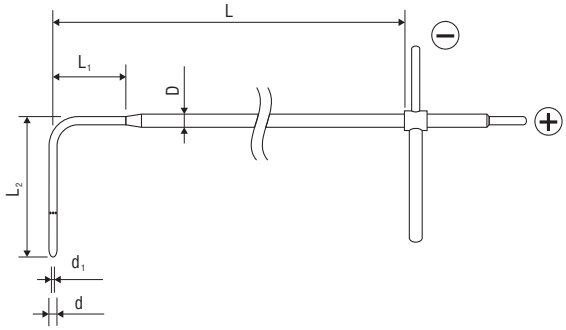
Dimensions (mm)



Fixing holes (mm)

PITOT TUBES

AISI 316 stainless steel Pitot tubesfor measuring the air speed. The models with TC suffix also measure the temperature with K thermocouple sensor. Supplied with two pieces of silicone tube, internal Ø 4 mm / external Ø 6 mm, length 1.5 m.



	d mm	d_1 mm	D mm	L mm	L_1 mm	L_2 mm	Operating temp.	Temp. sensor
T1-300	3	1	6	300	30	72	0…600 °C	---
T2-400	5	2	8	400	45	120		---
T3-800	8	3.2	8	800	---	192		---
T3-800TC	8	3.2	8	800	---	192		TC K

TABLE 1	MEASURING RANGE		ACCURACY (@ 0…50 °C)		LONG-TERM STABILITY	
MODEL	**LOW**	**HIGH**	**AZ**	**NO AZ**	**AZ**	**NO AZ**
MODELS WITH ANALOG OUTPUT (HD404T…)						
Pa (HD404Tx**P**…)						
HD404T1PGAZ…	0…50	0…100	±(0.8% measure + 0.5)	-	≤±0.2	-
HD404T2PGAZ…	0…100	0…250				
HD404T3PG…	0…250	0…500		±1% f.s. nom.		≤±8
HD404T4PG…	0…500	0…1000				
HD404T1PDAZ…	±50	±100		-		-
HD404T2PDAZ…	±100	±250				
HD404T3PD…	±250	±500		±1% f.s. nom.		≤±8
HD404T4PD…	±500	±1000				
mmH_2O (HD404Tx**M**…)						
HD404T1MGAZ…	0…5	0…10	±(0.8% measure + 0.05)	-	≤±0.02	-
HD404T2MGAZ…	0…10	0…25				
HD404T3MG…	0…25	0…50		±1% f.s. nom.		≤±0.8
HD404T4MG…	0…50	0…100				
HD404T1MDAZ…	±5	±10		-		-
HD404T2MDAZ…	±10	±25				
HD404T3MD…	±25	±50		±1% f.s. nom.		≤±0.8
HD404T4MD…	±50	±100				
$inchH_2O$ (HD404Tx**I**…)						
HD404T1IGAZ…	0…0.2	0…0.4	±(0.8% measure + 0.002)	-	≤±0.0008	-
HD404T2IGAZ…	0…0.4	0…1				
HD404T3IG…	0…1	0…2		±1% f.s. nom.		≤±0.04
HD404T4IG…	0…2	0…4				
HD404T1IDAZ…	±0.2	±0.4		-		-
HD404T2IDAZ…	±0.4	±1				
HD404T3ID…	±1	±2		±1% f.s. nom.		≤±0.04
HD404T4ID…	±2	±4				
MODELS WITH RS485 MODBUS-RTU OUTPUT (HD404**S**T…)						
HD404ST2AZ…	±250 Pa		±(0.8% measure + 0.5) Pa		≤±0.2 Pa	
HD404ST4…	±1000 Pa			±1% f.s.		≤±8 Pa
HD404ST5…	±100 mbar		±(0.8% measure + 0.005) mbar	±1% f.s.	≤±0.002 mbar	≤±0.08 mbar

(1) f.s. nom. (nominal) = full scale of "HIGH" measuring range. - (2) Long-term stability refers to 1 year.

TABLE 2	MAX SPEED MEASURABLE (m/s)*		ANALOG OUTPUT DEFAULT FULL SCALE (m/s)
MODEL	**LOW**	**HIGH**	
HD404Tx**P**…SR			
HD404T1PGAZ…SR	9.06	12.82	10
HD404T2PGAZ…SR	12.82	20.27	20
HD404T3PG…SR	20.27	28.67	25
HD404T4PG…SR	28.67	40.55	40
HD404Tx**M**…SR			
HD404T1MGAZ…SR	8.98	12.70	10
HD404T2MGAZ…SR	12.70	20.08	20
HD404T3MG…SR	20.08	28.39	25
HD404T4MG…SR	28.39	40.16	40
HD404Tx**I**…SR			
HD404T1IGAZ…SR	9.05	12.80	10
HD404T2IGAZ…SR	12.80	20.24	20
HD404T3IG…SR	20.24	28.62	25
HD404T4IG…SR	28.62	40.48	40

* maximum speed measurable with the factory default values: K = 1.0; T = 16.0 °C; Patm = 1013.25 mbar; Ps = 0. In SR models, the analog output full scale is configurable.

Ordering Codes

HD404T

(models with analog output)

				Blank= pressure output **SR** = speed output (only G version)
			Blank = without LCD **L** =with LCD	
		Blank= without auto-zero circuit (only HD404T3… and HD404T4…) **AZ** = with auto-zero circuit		
	D = differential pressure -f.s. …+f.s. **G** = relative pressure with respect to the atmosphere 0…+f.s.			

Nominal full scale (f.s.)

1P = 100 Pa	**1M** = 10 mmH₂O	**1I** = 0.4″ H₂O
2P = 250 Pa	**2M** = 25 mmH₂O	**2I** = 0.8″ H₂O
3P = 500 Pa	**3M** = 50 mmH₂O	**3I** = 2″ H₂O
4P = 1000 Pa	**4M** = 100 mmH₂O	**4I** = 4″ H₂O

HD404ST

(models with RS485 Modbus-RTU)

			Blank = pressure output **L** =speed output
		Blank= without LCD **AZ** = = with LCD	
	Blank = without auto-zero circuit (only HD404ST4… and HD404ST5…) **AZ** = with auto-zero circuit		

Nominal full scale (f.s.)

2 = -250 … +250 Pa

4 = -1000 … +1000 Pa

5 = -100 … +100 mbar

All transmitters are supplied with 2 m silicone tube, internal Ø 5 mm / external Ø 8 mm and two plastic fittings (HD434T.5).

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.
PW	K thermocouple extension cable. Length 2 m, miniature connector. For Pitot tubes with K thermocouple sensor.

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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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