

# Online CO<sub>2</sub> AND TEMPERATURE TRANSMITTER

**HD37BT....**

**HD37BTV....**

**HD377BT....**

**HD37V7TV....**

The HD37BT... and HD37VBT... series transmitters are mainly employed in air quality control through CO<sub>2</sub> (Carbon Dioxide) measurement in ventilation systems. This allows changing the air change rate per hour according to ASHRAE and IME norms. The purpose is dual: a good air quality in trafficked spaces and saving energy by increasing or decreasing the air change rate, according to the request. They are used in crowded spaces, in discontinuously Crowded Areas, Kitchens, Auditoria, Schools, Hospitals, Greenhouses, Livestock Holdings, etc.

The HD377BT... and HD37V7BT... models measure, in addition to CO<sub>2</sub>, also the Temperature. The analog outputs, current 4...20mA or voltage 0...10Vdc, should be specified when making the order. All transmitters have an alarm digital output suitable to control, for example, an external relay coil. The alarm switches when the factory preset threshold of 1500ppm is exceeded. This limit that causes discomfort to human beings when exceeded. The sensitive element is a particular infrared sensor (NDIR technology: Non-Dispersive Infrared Technology) that, by using a double filter and a particular measurement technique, compensates its aging effect guaranteeing accurate and stable measurements over a long time.

The analyzed air passes through a protection Membrane, reducing to the minimum the negative effect of Atmospheric Agents and Dust on the Transmitter Performance. On the transmitter's air inlet, there is a filter that can be removed and cleaned.

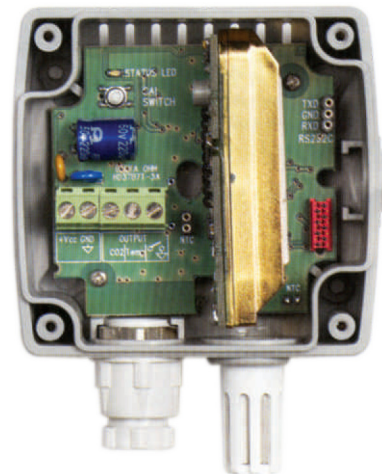
The installation methods may be:

- Wall Mounted - TV Version,
- With horizontal air inlet, attached to the case, for ventilation ducts measurement - TC Version,
- Wall Mounted with separate air inlet, connected to the electronics by means of two small tubes, for ventilation ducts measurement - TC Version,

In the duct versions and with the air inlet separate from the electronics, the air is transferred inside the measurement chamber. The same flow then returns to the duct through a second tube. The air flow needs to be at least 1 m/s.

To mount the air inlet to the duct, you can use the HD9008.31 flange, a 3/8" biconical universal fitting or a PG16 metallic fairlead with a  $\tau$  14 mm internal diameter.

The air inlets connected to the transmitter by means of flexible tubes are attached to the ducts in which the air is flowing: we supply air inlets for square or rectangular ducts (code HD3719) and for circular ducts (code HD3721). In order to maintain the specified accuracy, the cable length should be 1 m.



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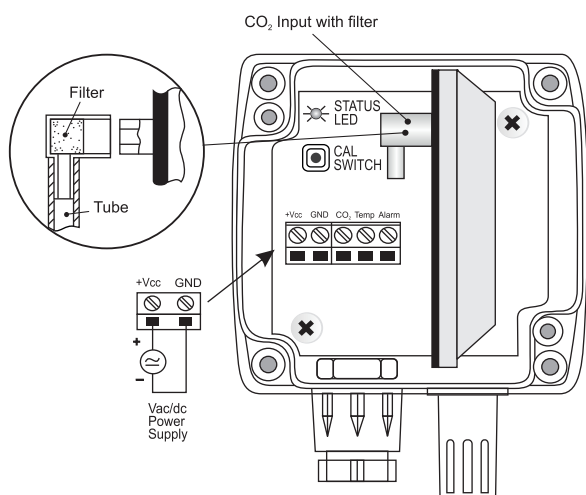
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Technical Specification			Notes
CO <sub>2</sub> Measurement Principle		Double wave length infrared technology (NDIR)	
CO <sub>2</sub> Measurement Range		0...2000ppm 0...5000ppm	
CO <sub>2</sub> Accuracy	f.s. 2000ppm	±(50ppm+3% of measurement)	at 20°C, 50%RH and 1013hPa
	f.s. 5000ppm	±(50ppm+4% of measurement)	
Temperature Measurement Range		0....+50°C	Models HD377BT...and HD37V7BT....
Temperature Accuracy		±0.3°C	
Analog Outputs (according to the models)		4...20mA 0...10VDC	R <sub>L</sub> < 500Ω R <sub>L</sub> > 10kΩ
Digital Output (all models)	Type	Open-collector (N.O.)	(*) Factory Preset
	CO <sub>2</sub> Threshold	1500ppm (*)	
	Vmax	40VDC	
	Pmax	400mW	
Power		16...40Vdc or 24Vac±10%	
Absorption		<2W	
Startup Stabilization Time		15 minutes	To Guarantee the stated accuracy
Response Time T <sub>63%</sub>		120s	Wind speed of at least 1m/s.
Temperature Effect		0.2% / °C CO <sub>2</sub>	Typical Value
Atmospheric Pressure Effect		1.6% / kPa	Deviation Compared to the value at 101kPa
Long-term Stability		5% of the range / 5 years	Typical Value
Calibration		At one point at 0 ppm or 400 ppm clear air	Automatic detection of the applied CO <sub>2</sub> Level.
Working Temperature / Relative Humidity		-5...+50°C, 0...95%RH without condensation	
Storage Temperature / Relative Humidity		-10...+60°C, 0...95%RH without condensation	
Electronics Protection Degree		IP21	Wall mounted models (TV).
		IP65	Horizontal probe models (TO), probe excluded.
		IP65	Separate probe models (TC), probe excluded.
Case Size		80×84×44	Probe excluded
Case Material		ABS	

**Proceed as Follows:**



**Calibration**

The instruments are calibrated in the factory; no calibration is usually required by the user.

However, you can perform a new calibration to correct the sensor offset:

- (approx. 400ppm) in clean air
- at 0ppm with nitrogen bottles.

The instrument can automatically detect the calibration methods used: whether 400ppm or 0ppm. The calibration should be performed at one point only: each new calibration cancels the previous one.

Open the instrument upper cover to expose the CAL SWITCH calibration key on the card and the calibration gas inlet.

1. Let the inlet open if you want to perform a calibration at 400ppm: in such case, ensure clean air is applied to the instrument.
2. For a calibration at 0ppm, connect the tube from the nitrogen bottle to the CO<sub>2</sub> input. Regulate the bottle flow meter at a flow from 0.3 to 0.5l/min.
3. Apply power to the instrument according to specifications and wait at least 15 minutes before continuing.
4. Supply CO<sub>2</sub> for at least 2 minutes so as to stabilize the measurement.
5. Continue to supply CO<sub>2</sub> to the instrument, keep the CAL SWITCH key pressed for at least 5 seconds until the STATUS LED starts blinking: The calibration will start and last two minutes. In this phase the instrument measures the CO<sub>2</sub> and calibrates at a point near 0ppm if you use a nitrogen bottle, or 400ppm if you calibrate it in clean air.
6. Wait the two minutes necessary for calibration without changing the working conditions.
7. When the LED turns off, the calibration is complete.



- ▶ HD37BT...: CO<sub>2</sub> Active Transmitter, Analog Output 4...20mA. Power supply 16...40VDC or 24VAC. Functioning temperature -5°C...+50°C. Alarm digital output for levels of CO<sub>2</sub>>1500ppm.  
 HD37BT.V: Wall mounted one-piece version. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD37BT.V.1: Wall mounted one-piece version. CO<sub>2</sub> Measurement Range 0...5000ppm.  
 HD37BTO.1: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=115mm. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD37BTO.11: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=115mm. CO<sub>2</sub> Measurement Range 0...5000ppm.  
 HD37BTO.2: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=115mm. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD37BTO.21: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=315mm. CO<sub>2</sub> Measurement Range 0...5000ppm.  
 HD37BTC: Wall mounted one-piece version with attachments for an air inlet separate from the duct CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD37BTC.1: Wall mounted one-piece version with attachments for an air inlet separate from the duct CO<sub>2</sub> Measurement Range 0...5000ppm.

HD37VBT...: CO<sub>2</sub> Active Transmitter, Analog Output 0...10VDC. Power supply 16...40VDC or 24VAC, Functioning Temperature -5°C...+50°C. Alarm digital output for levels of CO<sub>2</sub>>1500ppm.

- ▶ HD37VBT.V: Wall mounted one-piece version. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD37VBT.V.1: Wall mounted one-piece version. CO<sub>2</sub> Measurement Range 0...5000ppm.  
 HD37VBTO.1: Duct version with horizontal air inlet in AISI 304 Steel diameter 14mm, L=115mm. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD37VBTO.11: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=115mm. CO<sub>2</sub> Measurement Range 0...5000ppm.  
 HD37VBTO.2: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=315mm. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD37VBTO.21: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=315mm. CO<sub>2</sub> Measurement Range 0...5000ppm.  
 HD37VBTC: Wall mounted one-piece version with attachments for an air inlet separate from the duct CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD37VBTC.1: Wall mounted one-piece version with attachments for an air inlet separate from the duct CO<sub>2</sub> Measurement Range 0...5000ppm.

HD377BT...: CO<sub>2</sub> and Temperature Active Transmitter, Analog Output 0...20A. Temperature Range 0...+50°C, non-modifiable. Power supply 16...40VDC or 24VAC, Functioning Temperature -5°C...+50°C. Alarm digital output for levels of CO<sub>2</sub>>1500ppm.

- ▶ HD377BT.V: Wall mounted one-piece version. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD377BT.V.1: Wall mounted one-piece version. CO<sub>2</sub> Measurement Range 0...5000ppm.  
 HD377BTO.1: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=120mm. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD377BTO.11: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=120mm. CO<sub>2</sub> Measurement Range 0...5000ppm.  
 HD377BTO.2: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=320mm. CO<sub>2</sub> Measurement Range 0...2000ppm.  
 HD377BTO.21: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=320mm. CO<sub>2</sub> Measurement Range 0...5000ppm.

HD377BT...: CO<sub>2</sub> and Temperature Active Transmitter, Analog Output 0...10DC. Temperature Range 0...+50°C, non-modifiable. Power supply 16...40VDC or 24VAC, Functioning Temperature -5°C...+50°C. Alarm digital output for levels of CO<sub>2</sub>>1500ppm.

- ▶ HD37V7BT.V: Wall mounted one-piece version. CO<sub>2</sub> Measurement Range 0...2000ppm.

HD37V7BT.V.1: Wall mounted one-piece version. CO<sub>2</sub> Measurement Range 0...5000ppm.

HD37V7BTO.1: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=120mm. CO<sub>2</sub> Measurement Range 0...2000ppm.

HD37V7BTO.11: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=120mm. CO<sub>2</sub> Measurement Range 0...5000ppm.

HD37V7BTO.2: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=320mm. CO<sub>2</sub> Measurement Range 0...2000ppm.

HD37V7BTO.21: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=320mm. CO<sub>2</sub> Measurement Range 0...5000ppm.

HD9008.31: Wall flange with fairlead for ø 14mm probe mounting.

PG16: Metallic fairlead for ø 14mm probes.

HD3719: Air inlet for square or cylindrical ducts. Two 1 m tube segments ø3,2 / ø6.4. For ...BTC and ...BTC.1 models.

HD3721: Air inlet for cylindrical ducts, in plastic material. Two 1 m tube segments ø3,2 / ø6.4. For ...BTC and ...BTC.1 models.

MINICAN.20A: Nitrogen bottle for CO<sub>2</sub> at 0ppm calibration. Volume 20 liters. With adjustment valve.

MINICAN.20A1: Nitrogen bottle for CO<sub>2</sub> at 0ppm calibration. Volume 20 liters. Without adjustment valve.

T37...m: PVC Crystal tube ø int. 3,2mm / ø ext. 6,4mm, length upon request.

▶ Order Codes for CO<sub>2</sub> Transmitters

