

HD37... SERIES



HD37... SERIES CO₂, CO₂ AND TEMPERATURE ACTIVE TRANSMITTERS

The family of transmitters series **HD37...** are used mainly in **air quality control for measuring CO₂ (carbon dioxide) in the ventilation systems**. This allows to vary the number of air change per hour according to ASHRAE and IMC norms.

The purpose is twofold: **have a good air quality** in the presence of people and **save energy**, increasing or decreasing parts of air per hour, depending on the air quality set.

Their use is for environments where there is overcrowding of people, discontinuous crowding, cafeterias, auditoriums, schools, hospitals, greenhouses, livestock breeding, etc.

The models HD377BT... and HD37V7BT... measure, in addition to CO₂, **also the temperature**.

The **analog outputs, current 4...20 mA or voltage 0...10 Vdc**, should be specified when ordering.

All transmitters have a digital alarm suitable to control, for example, an external relay coil. The alarm is activated when passing a threshold set at the factory at 1500 ppm, the threshold beyond which a man feels uncomfortable.

The sensing element is made of a **particular infrared sensor** (NDIR technology: Non-Dispersive Infrared Technology) that compensates the effect of its aging thus **ensuring accurate and stable measurements for a long time**, by the use of a double filter and a particular measurement technique.

The use of a **protective membrane**, through which the air to be analyze is diffused, minimizes the negative effect of atmospheric agents and dust on the performance of the transmitter. A removable and washable filter is placed at the air flow transmitter inlet.

There are two versions:

- Wall mounted with integrated probe– **TV version**,
- Wall mounted with input/output flow connections for external duct probes – **TC version**.

In TC versions, the air is drawn into the measurement chamber and returns to the channel through a second tube. **The air flow needs to be at least 1 m/s.**

The transmitter air inlets are connected to the channels by means of flexible tubes and duct air ports (code AP3721). In order to maintain the specified accuracy, the cable length should be 1 m.

Technical specifications			Notes
CO ₂	Measurement principle	Double wave length infrared technology (NDIR)	
	Measurement range	0...2000 ppm 0...5000 ppm	
	Accuracy	f.s. 2000 ppm: ±(50 ppm +3% of measurement) f.s. 5000 ppm: ±(50 ppm +4% of measurement)	at 20 °C, 50 %RH and 1013 hPa
Temperature	Measurement range	0...+50 °C	Models HD377BT... and HD37V7BT...
	Accuracy	±0.3 °C	
Analog outputs (according to the model)		4...20 mA 0...10 Vdc	R _L < 500 Ω R _L > 10 kΩ
Digital outputs (all models)	Type	Open-collector (N.O.)	
	CO ₂ threshold	1500 ppm (*)	(*) Factory Preset
	Vmax	40 Vdc	
	Pmax	400 mW	
Power supply		16...40 Vdc or 24 Vac ±10%	
Absorption		<2 W	
Startup stabilization time		15 minutes	To guarantee the stated accuracy
Response time τ _{63%}		120 s	Wind speed of at least 1 m/s
Temperature effect %		0.2%/°C CO ₂	Typical value
Atmospheric pressure effect		1.6%/kPa	Deviation compared to the value at 101 kPa
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 ₂ level.
Operating conditions		-5...+50 °C 0...90 %RH without condensation	
Storage conditions		-10...+60 °C 0...90 %RH without condensation	
IP Electronics	TV models	IP21	
	TC models	IP65	Probe excluded
Case size		80 x 84 x 44 mm	Probe excluded
Case material		ABS	

Model	Output		Measured parameters	
	4...20 mA	0...10 Vdc	CO ₂	T
HD37BT...	✓		✓	
HD37VBT...		✓	✓	
HD377BT...	✓		✓	✓
HD37V7BT...		✓	✓	✓

CALIBRATION

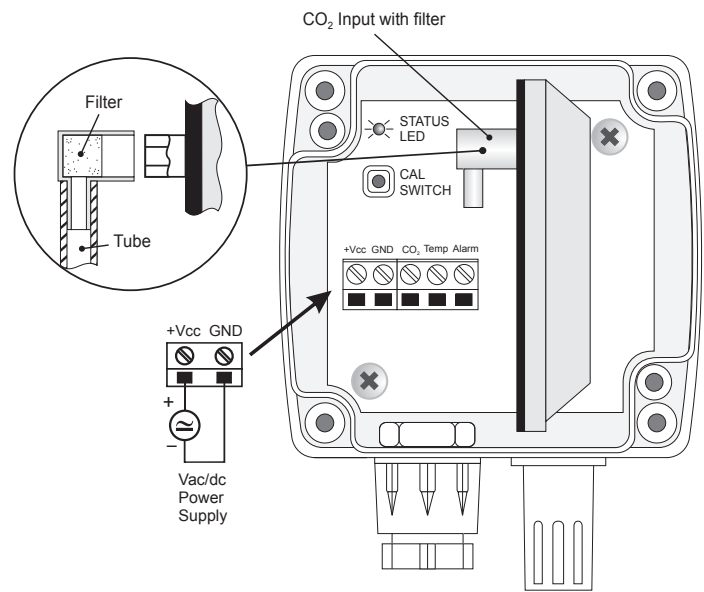
The instruments are **calibrated at the factory** and do not usually require further action by the user.

However, it is possible to perform a new calibration that corrects the sensor offset:

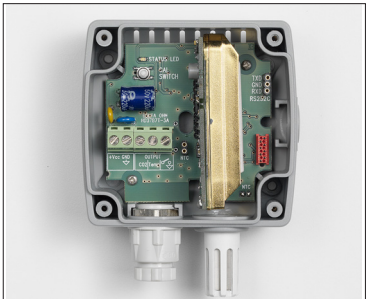
- in clean air (standard approx. 400 ppm)
- to 0 ppm with nitrogen bottles.

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

Proceed as follows:



- Open the instrument top cover to discover the CAL SWITCH calibration key on the board and the calibration gas inlet.
1. If you need to make a calibration around 400 ppm, leave the entrance open: in this case, make sure to apply clean air to the instrument.
 2. For a calibration at 0 ppm, connect the tube of the nitrogen cylinder to the CO₂ input. Adjust the bottle flow meter on a flow between 0.3 and 0.5 l/min.
 3. Power up the instrument according to specifications and wait at least 15 minutes before proceeding.
 4. Supply CO₂ for at least 2 minutes so as to stabilize the measurement.
 5. By continuing providing CO₂ to the instrument, keep the CAL SWITCH key pressed for at least 5 seconds until the STATUS LED starts flashing: the two-minutes calibration starts. At this stage, the instrument measures CO₂ and is calibrated at a value closed to 0 ppm, if you use the nitrogen cylinder, or to 400 ppm, if the calibration is performed at clean air.
 6. Wait the two minutes necessary for calibration without changing the working conditions.
 7. When the LED turns off, the calibration is completed.



INSTALLATION NOTES

The choice of the number of CO₂ transmitters to be used in a typical installation and location should be based on the fact that the distribution of CO₂ in the atmosphere is influenced by the same factors that determine temperature distribution. Among these factors are convection, diffusion and forced air movement in the environment.

For an accurate control, you should use a CO₂ transmitter in each place where a temperature controller is installed.

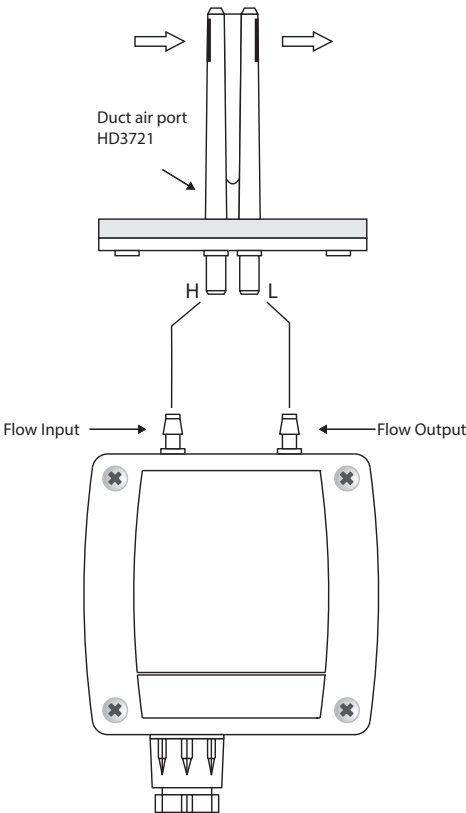
For the TV models

The transmitter has to be installed into a location with good air circulation, away from doors, windows or entry points of fresh air from outside.

The height from the floor should be at least 1.5 meters.

For the TC models

The AP3721 air port should be oriented so that the flow enters into the left transmitter inlet and exits from the right inlet (see following drawing).



ELECTRICAL CONNECTIONS

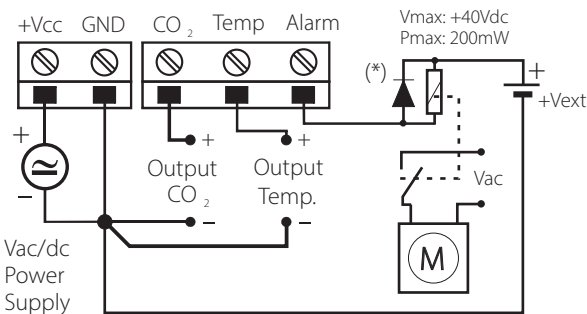
Power supply

Power the instrument at the voltage shown in the electrical specifications: power supply terminals are marked as +Vdc and GND.

Analog outputs

The output depends on each model:

- for CO₂ transmitters, it is between CO₂ and GND terminals
- for CO₂ and temperature transmitters, it is between CO₂ and GND, Temp and GND terminals.



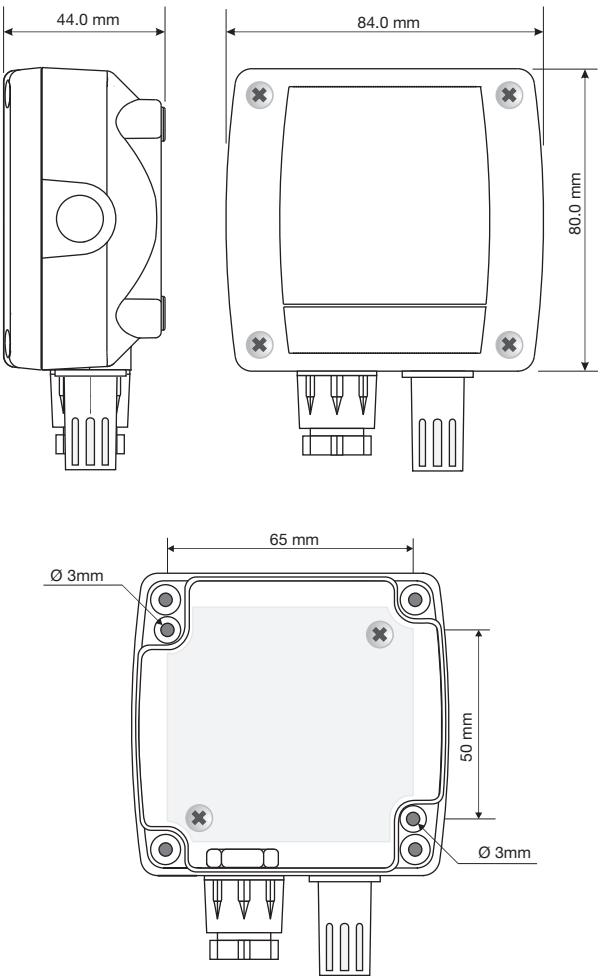
Digital output

The previous diagram shows an example of application of digital output that, in this case, controls an external relay coil. When exceeding the alert threshold (1500 ppm), the relay contact closes and activates an adjustment device.

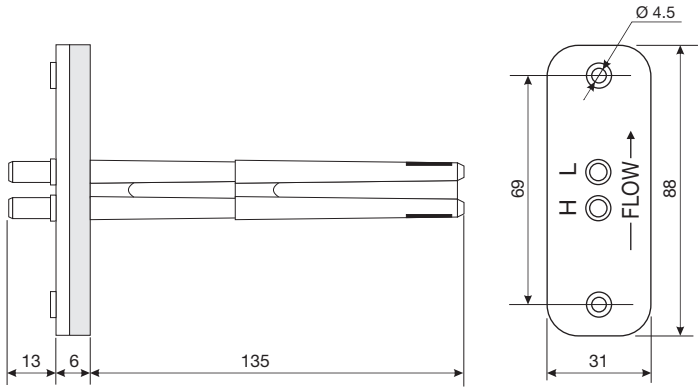
(*) **Warning: Protect the digital output by applying a protection diode as shown in the figure.**
Do not exceed the maximum reverse voltage and power limits indicated in the technical informations (Vmax - Pmax).



DIMENSIONS



AP3721



ORDERING CODES

CO₂ / CO₂ AND TEMPERATURE ACTIVE TRASMETTERS

HD37

B	Versions: TV = vertical f.s. 2000 ppm TV.1 = vertical f.s. 5000 ppm TC = wall mounted with connection for separated duct air port. f.s. 2000 ppm. Recommended tubes length 1m. TC.1 = wall mounted with connection for separated duct air port. f.s. 5000 ppm. Recommended tubes length 1m.
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Measured parameters
Blank = only CO₂
7 = CO₂ and Temperature

Output
Blank = 4...20 mA current analog output
V = 0...10 Vdc voltage analog output

ACCESSORIES

AP3721 : circular duct air port made of plastic. Two pieces of tube 1 m long int. Ø 4 mm / est. Ø 6 mm. For models ...BTC and ...BTC.1. Recommended tubes length 1 m.



WARRANTY

The manufacturer is required to respond to the “factory warranty” only in those cases provided by Legislative Decree 6 September 2005 - n. 206. Each instrument is sold after rigorous inspections; if any manufacturing defect is found, it is necessary to contact the distributor where the instrument was purchased from. During the warranty period (24 months from the date of invoice) any manufacturing defects found will be repaired free of charge. Misuse, wear, neglect, lack or inefficient maintenance as well as theft and damage during transport are excluded. Warranty does not apply if changes, tampering or unauthorized repairs are made on the product. Solutions, probes, electrodes and microphones are not guaranteed as the improper use, even for a few minutes, may cause irreparable damages. The manufacturer repairs the products that show defects of construction in accordance with the terms and conditions of warranty included in the manual of the product. For any dispute, the competent court is the Court of Padua. The Italian law and the “Convention on Contracts for the International Sales of Goods” apply

TECHNICAL INFORMATION

The quality level of our instruments is the result of the continuous product development. This may lead to differences between the information reported in the manual and the instrument you have purchased. We reserves the right to change technical specifications and dimensions to fit the product requirements without prior notice.

DISPOSAL INFORMATION



Electrical and electronic equipment marked with specific symbol in compliance with 2012/19/EU Directive must be disposed of separately from household waste. European users can hand them over to the dealer or to the manufacturer when purchasing a new electrical and electronic equipment, or to a WEEE collection point designated by local authorities. Illegal disposal is punished by law.

Disposing of electrical and electronic equipment separately from normal waste helps to preserve natural resources and allows materials to be recycled in an environmentally friendly way without risks to human health.

