HD37BT…
HD37VBT...
HD377BT…
HD 37V7BT...

• Wall outlet with flow separate with two tubes, connected to the electronics to the extent ventilation duet – **TC Version**,

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

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

The air inlets connected to the transmitter by means of flexible tubes are attached to the channels flowing air: 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 1m.

Technical characteristics			Notes
CO_2 Measurement Principle		Double wave length infrared technology (NDIR)	
CO_2 Measurement Range		0 … 2000ppm 0 … 5000ppm	
CO_2 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	$R_L < 500Ω$ $R_L > 10kΩ$
Digital Output (all models)	Type	Open-collector (N.O.)	(*) Factory Preset
	CO_2 Threshold	1500ppm (*)	
	Vmax	40VDC	
	Pmax	400mW	
Power supply		16…40Vdc or 24Vac ±10%	
Absorption		<2W	
Startup Stabilization Time		15 minutes	To guarantee the stated accuracy.
Response Time $τ_{63\%}$		120s	Wind speed of at least 1m/s.
Temperature effect %		0.2%/°C CO_2	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 0ppm or 400ppm clear air	Automatic detection of the applied CO_2 level.
Working Temperature/ Relative Humidity		-5 …+50°C, 0 ... 90%RH without condensation	
Storage Temperature/Relative Humidity		-10 …+60°C, 0 ... 90%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		80x84x44	Probe excluded.
Case material		ABS	

Air Quality - CO - CO_2

HD 37BT…, HD 37VBT..., HD 377BT…, HD 37V7BT...
CO_2, CO_2 AND TEMPERATURE TRANSMITTERS

The series of transmitters HD37BT… and HD37VBT... are used mainly in air quality control by measuring CO_2 (carbon dioxide) in the ventilation systems. This allows you 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 CO_2, also the temperature. *The analog outputs, current 4...20mA or voltage 0...10Vdc, should be specified when ordering*.

All transmitters have an alarm digital output suitable to control, for example, an external relay coil. All transmitters have a digital alarm suitable to control, for example, an external relay coil. The alarm is activated to pass a threshold set at the factory to 1500ppm, 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.

The installation methods may be:

• Wall mounted – **TV Version**,
• With power flow horizontally fixed to the container, to be extent ventilation duct – **TO Version**,

Model description

Model	Type of output		Measured quantities	
	4 … 20mA	0 …10Vdc	CO_2	Temperature
HD37BT...	✓		✓	
HD37VBT...		✓	✓	
HD377BT...	✓		✓	✓
HD37V7BT...		✓	✓	✓

| Model	Probe	CO_2 Measurement Range
…BTV	Wall mounted model	0...2000ppm
…BTV.1	Wall mounted model	0...5000ppm
…BTO.1	CO_2 model with horizontal air inlet L=115mm CO_2 /temperature model with horizontal air inlet L=120mm	0...2000ppm
…BTO.11	CO_2 model with horizontal air inlet L=115mm CO_2 /temperature model with horizontal air inlet L=120mm	0...5000ppm
…BTO.2	CO_2 model with horizontal air inlet L=315mm CO_2 /temperature model with horizontal air inlet L=320mm	0...2000ppm
…BTO.21	CO_2 model with horizontal air inlet L=315mm CO_2 /temperature model with horizontal air inlet L=320mm	0...5000ppm
…BTC	Wall mounted model with attachments for an air inlet separate from the duct	0...2000ppm
…BTC.1	Wall mounted model with attachments for an air inlet separate from the duct	0...5000ppm

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:

AQ-11

• (approx. 400ppm) in clean air
• to 0ppm with nitrogen bottles (code MINICAN.20A).
The instrument can automatically recognize the calibration methods used: whether 400ppm or 0ppm. The calibration should be performed on one point only: each new calibration cancels the previous one.

Proceed as follows:

CO$_2$ Input with filter
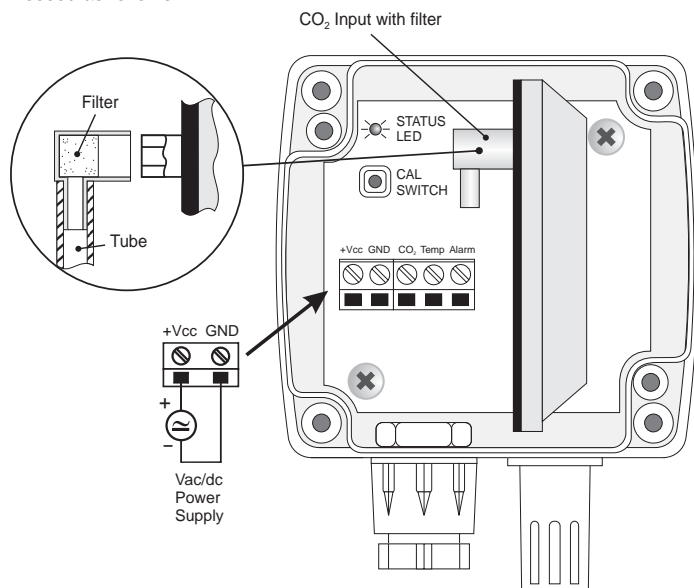
Open the instrument top cover to discover the CAL SWITCH calibration key on the board and the calibration gas inlet.

1. If you need to make a calibration around 400ppm, leave the entrance open: in this case, make sure to apply clean air to the instrument.
2. For a calibration at 0ppm, connect the tube of the nitrogen cylinder to the CO$_2$ input. Adjust the bottle flow meter on a flow between 0.3 and 0.5l/min.
3. Power up the instrument according to specifications and wait at least 15 minutes before proceeding.
4. Supply CO$_2$ for at least 2 minutes so as to stabilize the measurement.
5. By continuing providing CO$_2$ 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 CO$_2$ and is calibrated at a value closed to 0ppm, if you use the nitrogen cylinder, or to 400ppm, 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.

HD37VBTV

Installation Notes
The choice of the number of CO$_2$ transmitters to be used in a typical installation and location should be based on the fact that the distribution of CO$_2$ 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 CO$_2$ transmitter (TV model) in each place where a temperature controller is installed. You can also opt for a single device (TO or TC model) installed in the control point of the air quality.

For the wall mounted 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 TO models with horizontal air inlet from the duct*
• The transmitter should be installed so that the air inlet is correctly oriented with the flow into the channel. In the probe head there is an arrow indicating the correct direction of airflow. To facilitate the installation, on the left side of the container, **at the flow inlet that goes to the sensor**, the following symbol is printed.
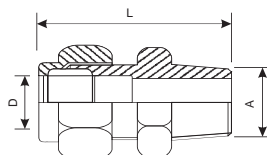

• To fix the probe into a duct with a flat surface (square or rectangular), use the HD9008.31.12 flange, a PG16 metallic fairlead with Ø 14 mm internal hole or a 3/8" biconical universal fitting with Ø 14 mm internal hole.
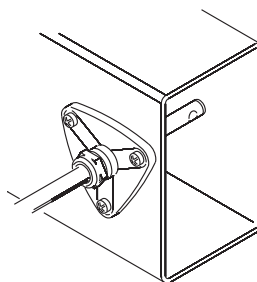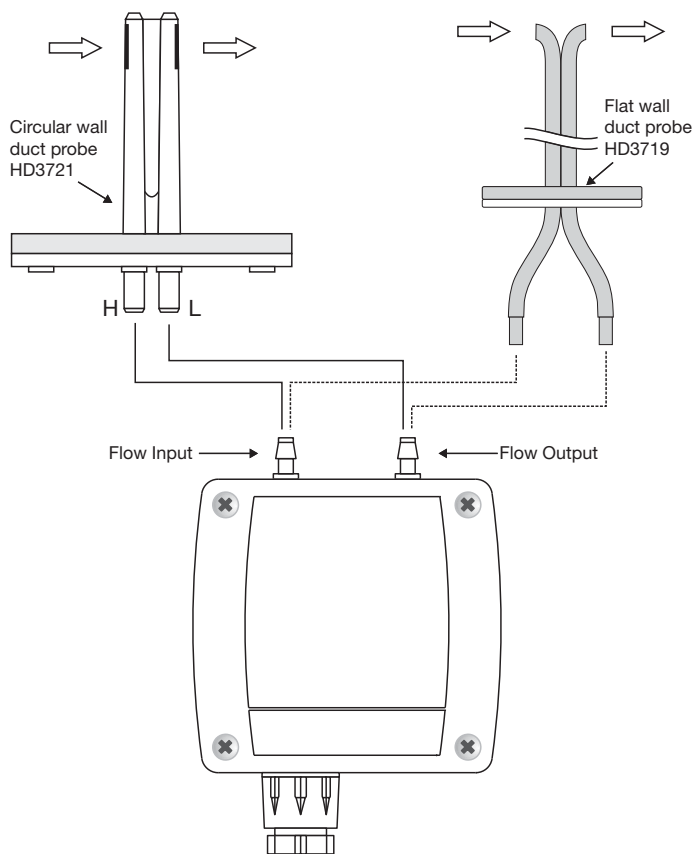

HD9008.31 flange
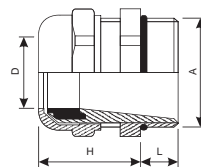
PG16 metallic fairlead
D = 10…14mm
L = 6.5mm
H = 23 mm
A = PG16

Biconical universal fitting
L = 35 mm
D = 14 mm
A = 3/8"

For the TC models with air inlet separated from electronics
There are two probes available: one coded HD3719, for flat walls ducts (square or rectangular section), the other coded HD3721, for circular section ducts. Please see the following figures.

Circular wall duct probe HD3721

H   L

Flow Input → ← Flow Output

Flat wall duct probe HD3719

The diagram shows an example of application of digital output that, in this case, controls an **external relay** coil. When exceeding the alert threshold (1500ppm), 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 information.

HD37BTV / HD377BTV sizes

44.0 mm   84.0 mm   80.0 mm

65 mm   Ø 3mm   50 mm   Ø 3mm

Drilling template

The outlet channel should be oriented so that the flow enters from the inlet connected to the junction on the left side of the housing and exits from the right side.
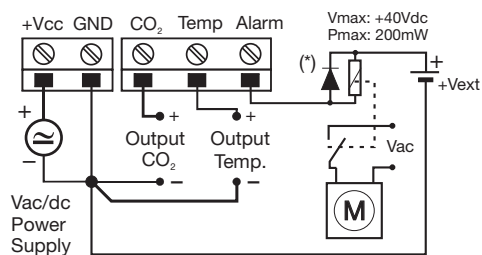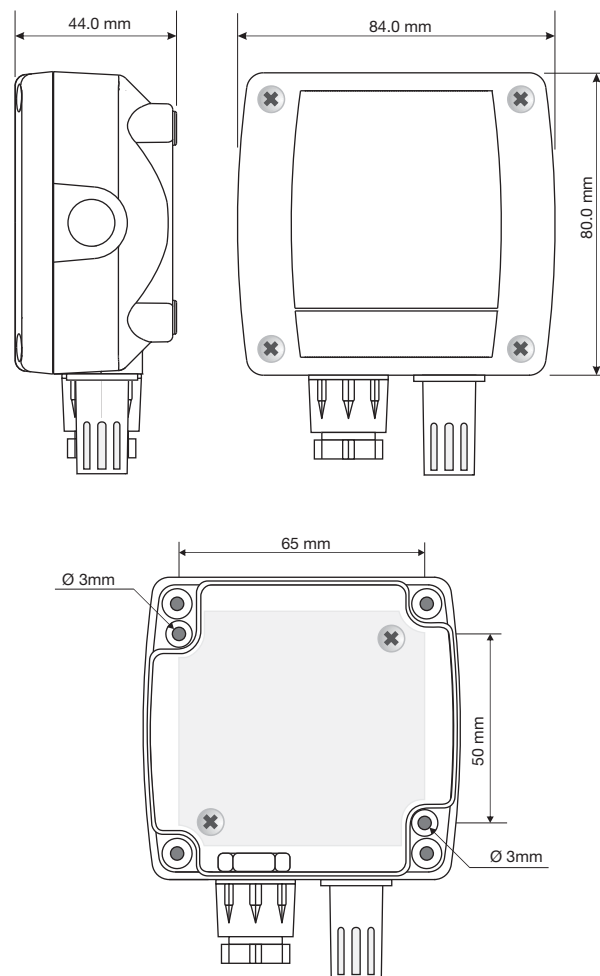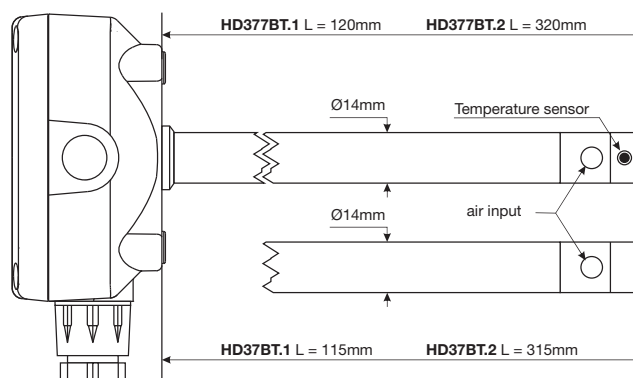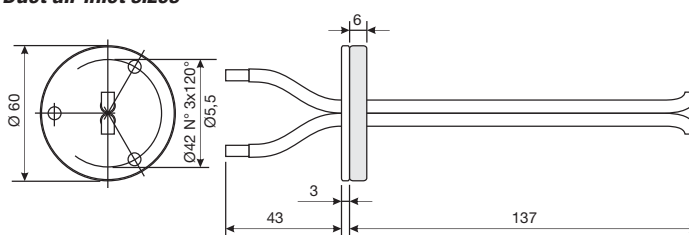
Electrical connections

Power supply

Supply the instrument with the voltage reported on the technical specifications: the power terminals are indicated by +Vdc and GND.

Analog Outputs

The output depends on each model:

- for CO_2 transmitters, it is between CO_2 and GND terminals
- for CO_2 and temperature transmitters, it is between CO_2 and GND, Temp and GND terminals

+Vcc GND CO₂ Temp Alarm

Vmax: +40Vdc
Pmax: 200mW

(*) +Vext

Output CO₂   Output Temp.

Vac/dc Power Supply

Vac   M

Digital Output

HD37BTC

HD377BT.1 L = 120mm   **HD377BT.2** L = 320mm

Ø14mm   Temperature sensor

Ø14mm   air input

HD37BT.1 L = 115mm   **HD37BT.2** L = 315mm

Duct air inlet sizes

Ø 60   Ø42 N° 3x120°   Ø5,5   6   3   43   137

HD3719 Duct Probe

13 | 6 | 135 | 69 | 88 | Ø 4.5 | H L | FLOW → | 31

AP3721 Duct Probe

Purchasing codes

HD37BT...: CO₂ 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_2 > 1500ppm.

HD37BTV: Wall mounted one-piece version. CO_2 Measurement Range 0…2000ppm.

HD37BTV.1: Wall mounted one-piece version. CO_2 Measurement Range 0…5000ppm.

HD37BTO.1: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=115mm. CO_2 Measurement Range 0…2000ppm.

HD37BTO.11: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=115mm. CO_2 Measurement Range 0…5000ppm.

HD37BTO.2: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=315mm. CO_2 Measurement Range 0…2000ppm.

HD37BTO.21: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=315mm. CO_2 Measurement Range 0…5000ppm.

HD37BTC: Wall mounted one-piece version with attachments for an air inlet separate from the duct CO_2 Measurement Range 0…2000ppm.

HD37BTC.1: Wall mounted one-piece version with attachments for an air inlet separate from the duct CO_2 Measurement Range 0…5000ppm.

HD37VBT...: CO₂ 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_2 > 1500ppm.

HD37VBTV: Wall mounted one-piece version. CO_2 Measurement Range 0…2000ppm.

HD37VBTV.1: Wall mounted one-piece version. CO_2 Measurement Range 0…5000ppm.

HD37VBTO.1: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=115mm. CO_2 Measurement Range 0…2000ppm.

HD37VBTO.11: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=115mm. CO_2 Measurement Range 0…5000ppm.

HD37VBTO.2: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=315mm. CO_2 Measurement Range 0…2000ppm.

HD37VBTO.21: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=315mm. CO_2 Measurement Range 0…5000ppm.

HD37VBTC: Wall mounted one-piece version with attachments for an air inlet separate from the duct CO_2 Measurement Range 0…2000ppm.

HD37VBTC.1: Wall mounted one-piece version with attachments for an air inlet separate from the duct CO_2 Measurement Range 0…5000ppm.

HD377BT...: CO₂ and temperature active transmitter, analog output 4…20mA. 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_2 > 1500ppm.

HD377BTV: Wall mounted one-piece version. CO_2 Measurement Range 0…2000ppm.

HD377BTV.1: Wall mounted one-piece version. CO_2 Measurement Range 0…5000ppm.

HD377BTO.1: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=120mm. CO_2 Measurement Range 0…2000ppm.

HD377BTO.11: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=120mm. CO_2 Measurement Range 0…5000ppm.

HD377BTO.2: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=320mm. CO_2 Measurement Range 0…2000ppm.

HD377BTO.21: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=320mm. CO_2 Measurement Range 0…5000ppm.

HD37V7BT...: CO₂ and temperature active transmitter, analog outputs 0...10VDC. 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_2 > 1500ppm.

HD37V7BTV: Wall mounted one-piece version. CO_2 Measurement Range 0…2000ppm.

HD37V7BTV.1: Wall mounted one-piece version. CO_2 Measurement Range 0…5000ppm.

HD37V7BTO.1: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=120mm. CO_2 Measurement Range 0…2000ppm.

HD37V7BTO.11: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=120mm. CO_2 Measurement Range 0…5000ppm.

HD37V7BTO.2: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=320mm. CO_2 Measurement Range 0…2000ppm.

HD37V7BTO.21: Duct version with horizontal air inlet in AISI 304 steel diameter 14mm, L=320mm. CO_2 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_2 at 0ppm calibration. Volume 20 liters. With adjustment valve.

MINICAN.20A1: Nitrogen bottle for CO_2 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.

( )

124,
SK   1013
TEL : 031-776 2525   E-mail : dhtc@ dhtc.co.kr
Web : www.dhtc.co.kr

Order codes for CO₂ transmitters

HD37 X B T X . X

No sign = Range CO_2 0…2000ppm.
1 = Range CO_2 0…5000ppm.

V = Wall mounted
0.1 = 115mm air inlet from ducts
0.2 = 315mm air inlet from ducts
C = Separate probe from ducts

B = CO_2 output

No sign = Analog output 4…20mA
V = Analog output 0…10Vdc

Order codes for CO₂ and temperature transmitters

HD37 X 7B T X . X

No sign = Range CO_2 0…2000ppm.
1 = Range CO_2 0…5000ppm.

V = Wall mounted
0.1 = 120mm air inlet from ducts
0.2 = 320mm air inlet from ducts

B = CO_2 output
7 = Temperature output

No sign = Analog output 4…20mA
V = Analog output 0…10Vdc