

# Manual for Installation

## **aSENSE™ m III**

in industrial wall mounted housing  
CO<sub>2</sub> / CO sensor with built-in general purpose  
controller

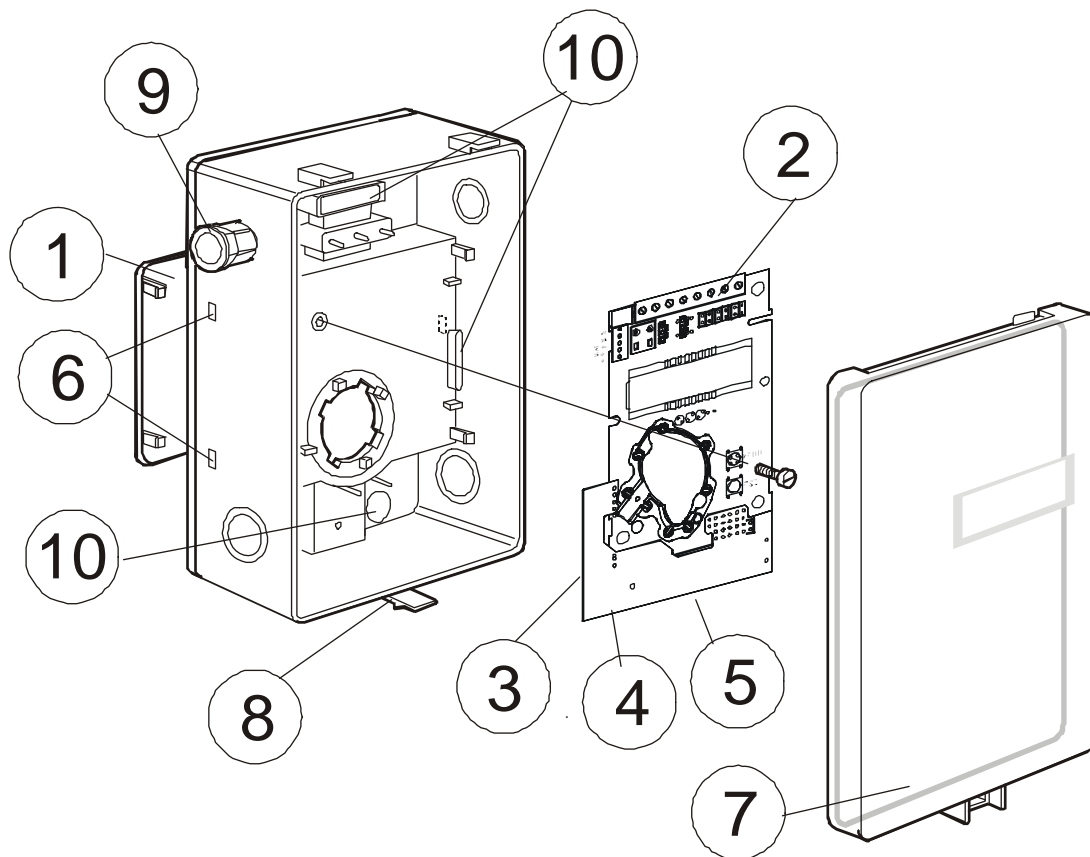


Fig. 1

- |   |  |    |                                      |
|---|--|----|--------------------------------------|
| 1 | Wall plate   | 5  | Carbon monoxide sensor (not shown)   |
| 2 | PCB (Factory supplied mounted in box)                    | 6  | Hole for wall plate hooks            |
| 3 | Temperature sensor for internal compensation (not shown) | 7  | Snap-in lid                          |
| 4 | RH sensor for internal compensation (not shown)          | 8  | Locking screw of the lid (not shown) |
|   |  | 9  | PG9 cable entry bushing              |
|   |  | 10 | Air holes                            |

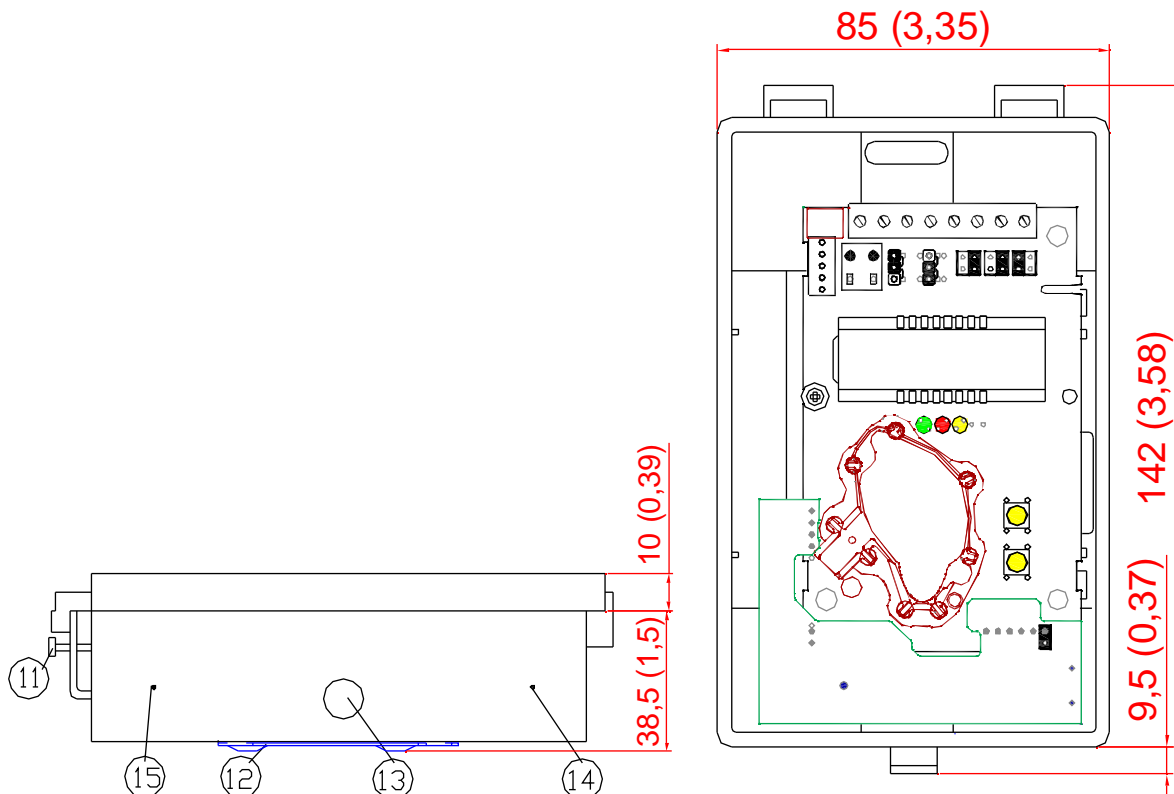


Fig. 2

11 Lidlocking screw

12 Wall plate

13 Screw to hold the wall plate

14 Marking to drill hole for PG7

15 Marking to drill hole for PG9

## Wall Mounting Instruction

1. **Dismount the wall plate.** The sensor is delivered with the wall plate mounted. The wall plate has to be removed before the sensor is mounted onto the wall. Unscrew the screw on the side of the box. See figure 3.
2. **Screw the wall plate onto the wall.** The sensor should be mounted 1 to 1,8 m above the floor. The wall plate has holes for three screws. Drill holes for 3,5mm screws and put dowel into them. Dowels and screws 3,5 x 25mm are included in a plastic bag
3. **Attach the sensor box to the wall plate.** It is done by a snap-in fitting. The wall plate has three hooks that fit in holes in the sensor box. Fasten the screw on the side of the box.
4. **Electrical cable entry.** The box has a factory mounted cable entry bushing in dimension PG9. Never feed more than one cable through each cable entry bushing, or else gas might leak through!

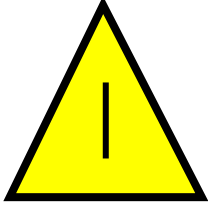
**The lid can be locked** with the screw (11) at the bottom of the sensor box.



**Please note!** Normally the PCB should not be removed from the housing. If for some reason the PCB must be removed it must be handled carefully and protected from electrostatic discharge.

## Electrical connections

The power supply has to be connected to G+ and G0. G0 is considered as system ground. The same ground reference has to be used for the aSENSE™ m III unit and for any connected device! Unless different transformers are used, special precautions need to be taken.



**PLEASE NOTE!** The signal ground is not galvanically separated from the aSENSE™ m III power supply!

**PLEASE NOTE!** The same ground reference has to be used for the aSENSE™ m III unit and for the control system!

Connection Terminal	Function	Electrical Data	Remarks
G+	Power (+)	24 VAC/DC+ (+-20%), 3W	2W without output load See note 1!
G0	Power ground (-)	24 VAC/DC-	
OUT 1	Analogue Output 1 (+)	0-10 VDC or 0-20 mA, 2-10 VDC or 4-20 mA,	According to positions of OUT1 jumper and start point selection. See note 2!
OUT 2	Analogue Output 2 (+)	Same as Output 1	According to positions of OUT2 jumper and start point selection. See note 2!
M	Signal Ground (-)	Connected to G0 via PTC fuse	See note 1!
Relay	Normally closed	Contact free relay minimum load 1mA/5V	Triggered by register OUT3
Relay	Open at alarm situations and power loss	rated load 0,5A/125VAC; 1A/24VDC	
OUT4	Analogue Output 4 (+) or Open Collector	0-10 VDC Max 0,5A, 55VDC / 40VAC (half-wave rectifier protection)	According to positions of OUT4. See note 2 & 3!
DI1	Digital Input 1	Closed contact current 1mA Open contact voltage max 5V	<b>Do not apply any voltage on this input!</b>

Table I. Electrical terminal connections for aSENSE™ m III

**Note 1:** The ground terminal is used as negative power supply DC input or AC phase ground G0 (halfwave rectifier). The signal ground M, protected by a PTC resistor, is the same as power ground G0 (permitting a "3-wire" configuration). A single transformer may be used for the entire system.

**Note 2:** aSENSE™ m III can deliver both a voltage or a current loop for OUT1/OUT2. For OUT4 a voltage output or an open collector output is selected with jumper OUT4. To change between voltage and current output mode the hardware jumpers are used. There is one jumper for OUT1 and one for OUT2, so that one output can be a voltage output and the other a current output. Both, voltage output and current output, can have start points 0 % (0-10 VDC or 0-20mA) or 20% (2-10 VDC or 4-20mA) selected from PC software. See the function manual.

**Note 3:** Current of Open Collector is internally returned to G0 terminal.

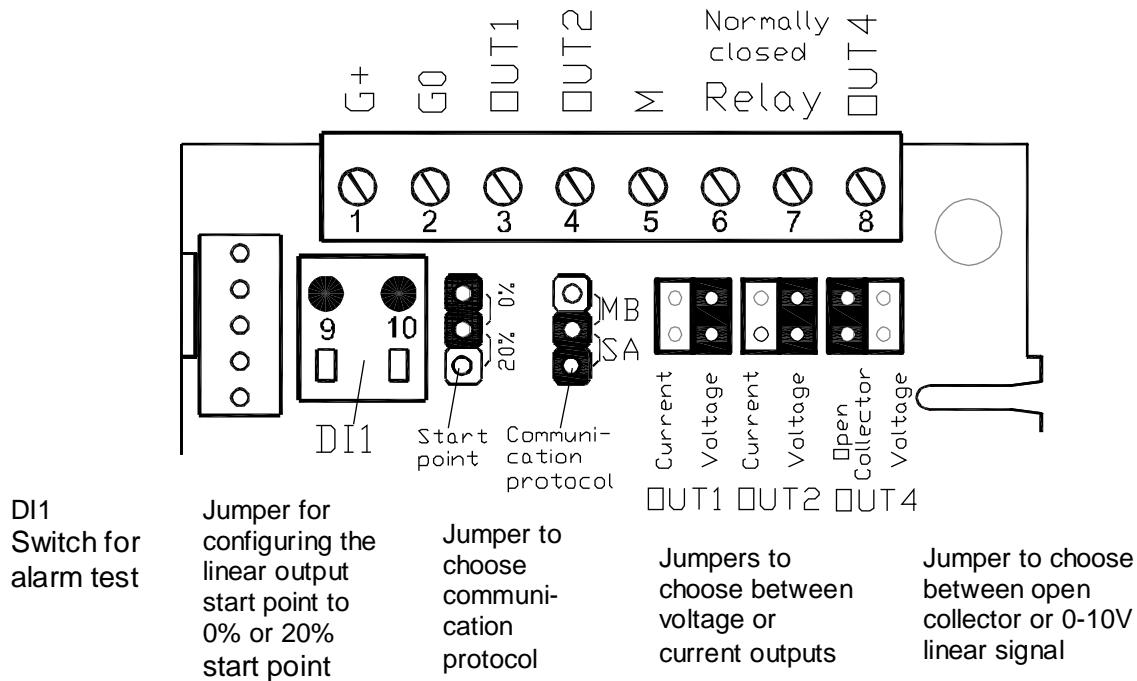


Fig. 3. Terminals and jumpers on *aSENSE™ m III*. The darker positions are default settings.

No.	Label	Function (configurable)
3	OUT1	CO-transm. 0...100 ppm
4	OUT2	CO <sub>2</sub> -transm. 0...2000 ppm
6, 7	OUT3	Gas alarm CO >35 ppm or CO <sub>2</sub> >1500 ppm
8	OUT4	Drift disturbing alarm or gas alarm
9, 10	DI 1	Extra terminal. Test function (N.O.)

**If more holes are needed** the box has several drill markings for holes in two dimensions, PG7 and PG9. Then fasten the cable entry bushing and seal properly. Never feed more than one cable through each cable entry bushing, or else gas might leak through!

The PCB can be removed during the making of holes. The PCB must be handled carefully and protected from electrostatic discharge!

If the PCB is in the housing when the hole is made a background calibration, CALb, using the push buttons should be made. See the function and maintenance description.

### Start-up of the *aSENSE™ m III*

Connect the power directly after mounting. The unit works best if the sensor is continuously powered. The analogue outputs do not need to be connected before use. An internal delay function prevents the alarm functions of the relay and OUT4 output during 15 minutes after power up. After short power failures the CO measurements need this power up time to stabilize. The alarm outputs may be tested after the 15 minutes delay by shorting the switch DI1. After long power failures the sensor may need several days to restore the measuring functions.



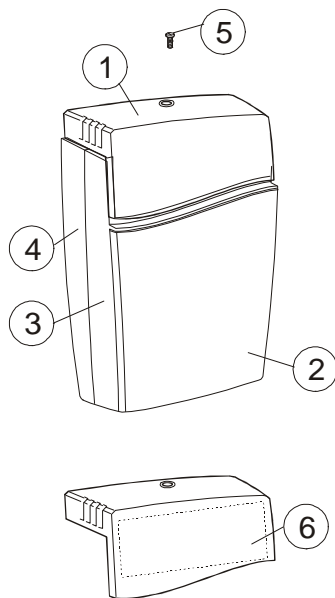
**NOTE! The CO probe gives incorrect readings near some chemicals, e.g. silicone. This makes certain environments unsuitable for the sensor.**

# Installation Manual for All Housings

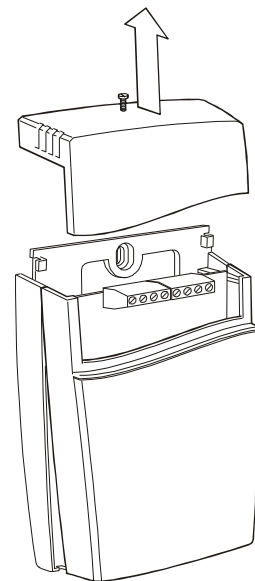
## aSENSE™ VAV

CO<sub>2</sub> / temperature sensor with built-in  
general purpose controller for wall mounting

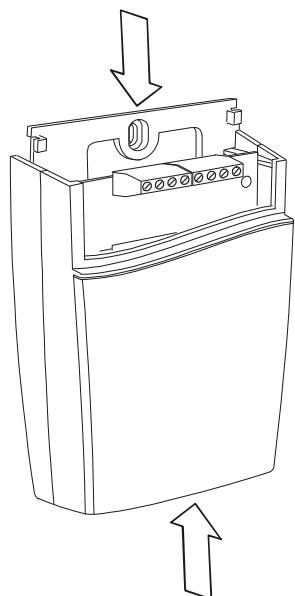
### Dismounting of the sensor



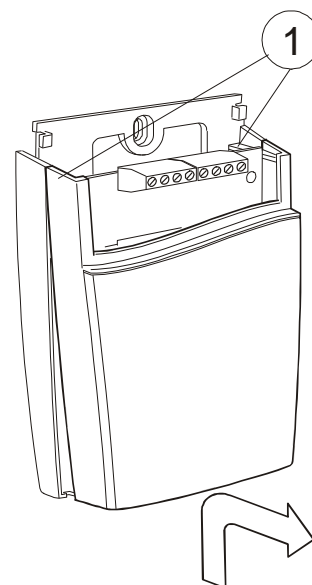
- 1 top part
- 2 lid
- 3 front part
- 4 wall plate
- 5 screw
- 6 label with settings inside the top part



*Pull the top part upwards*

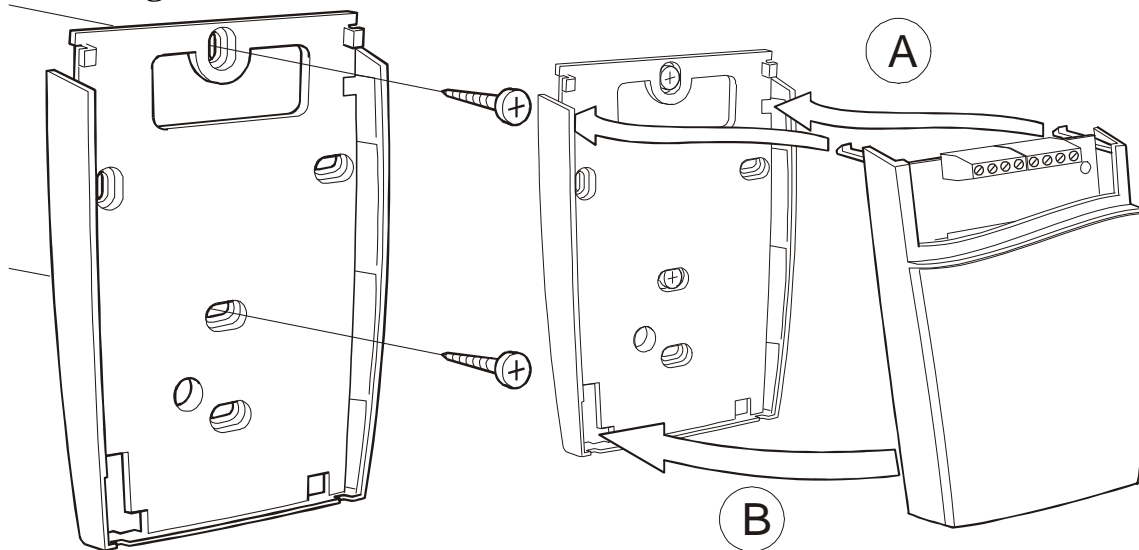


*Push the front part with the lid upwards while keeping the wall plate steady*



*Fold the front part with the lid forwards and loose it from the hooks (#1)*

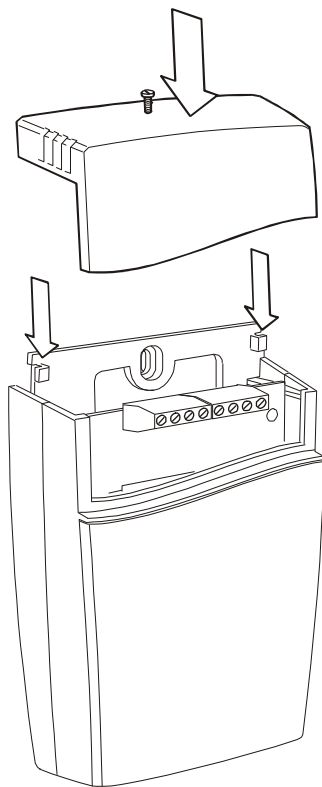
## Mounting of the sensor



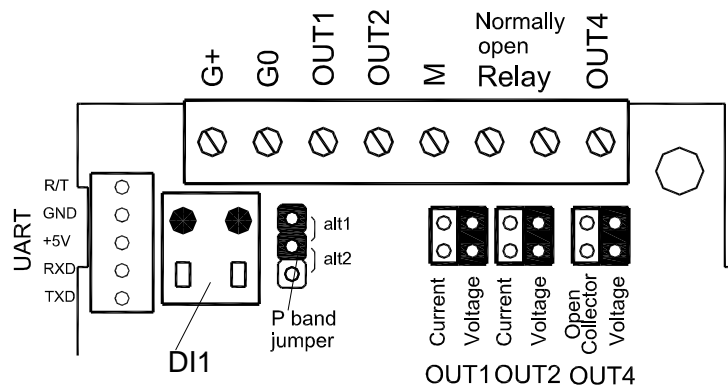
The wall plate is screwed onto the wall  
The screw heads should be max 4 mm

A Put the top tabs of the front part into the top holes of the wall plate.

B Press the lower edge of the case onto the wall plate to latch



The top part is pushed under the locking hooks of the wall plate and is secured with a screw

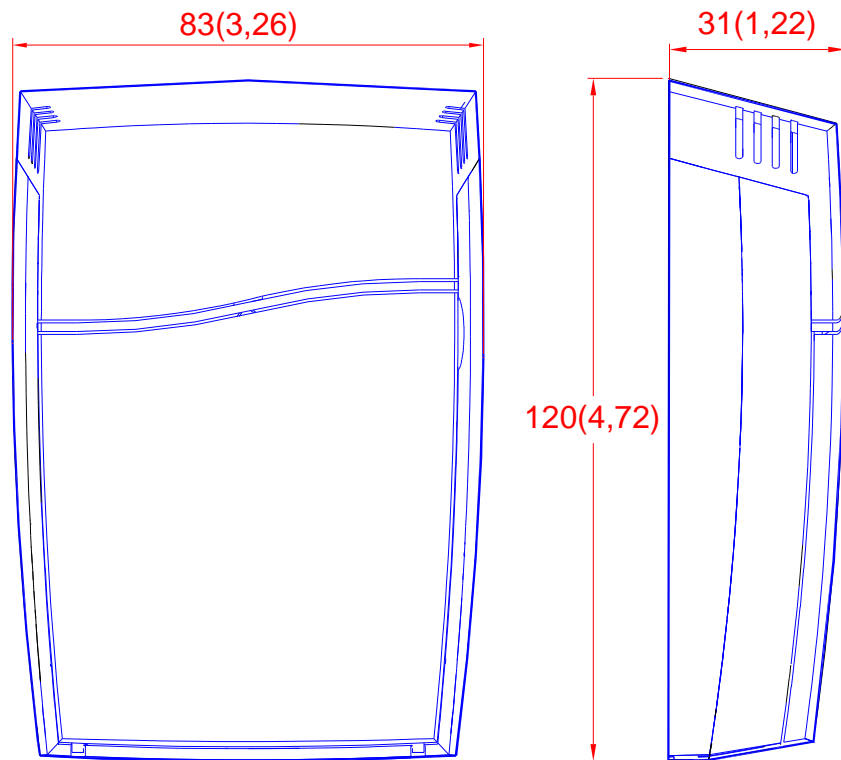


Terminals and jumpers on **aSENSE™ VAV** standard.  
The darker positions are default settings.  
Terminals and jumpers are located under the top part.

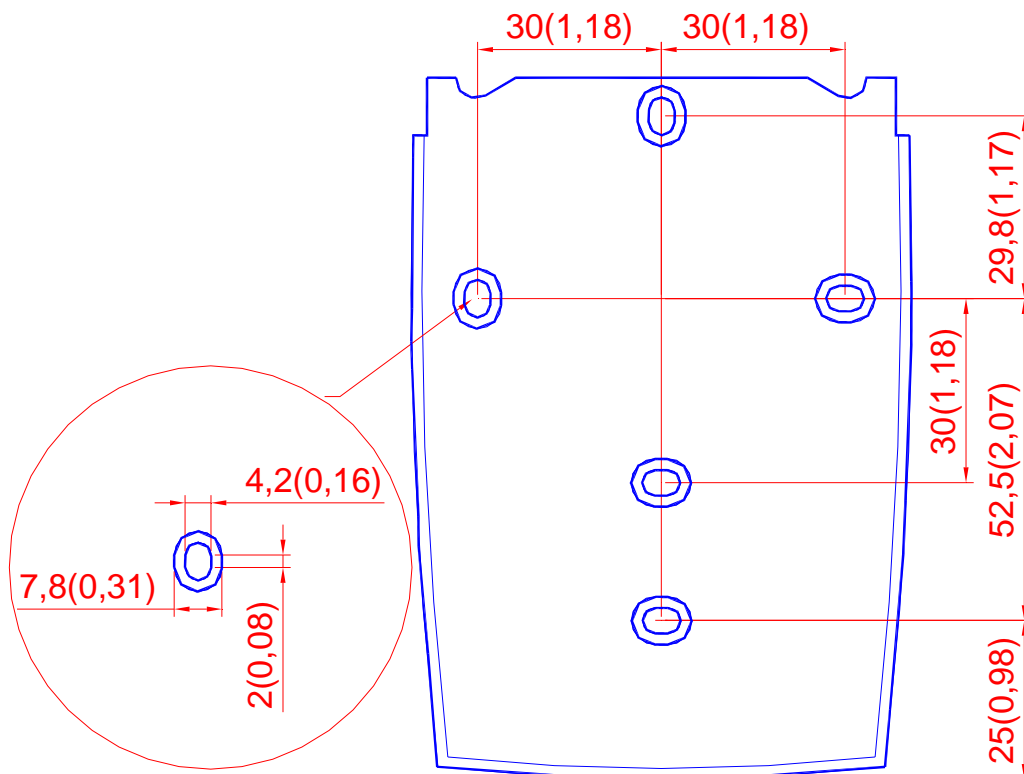


If for some reason the PCB must be removed it must be handled carefully and protected from electrostatic discharge! Normally, removing the PCB is not required.

## Dimensions and holes



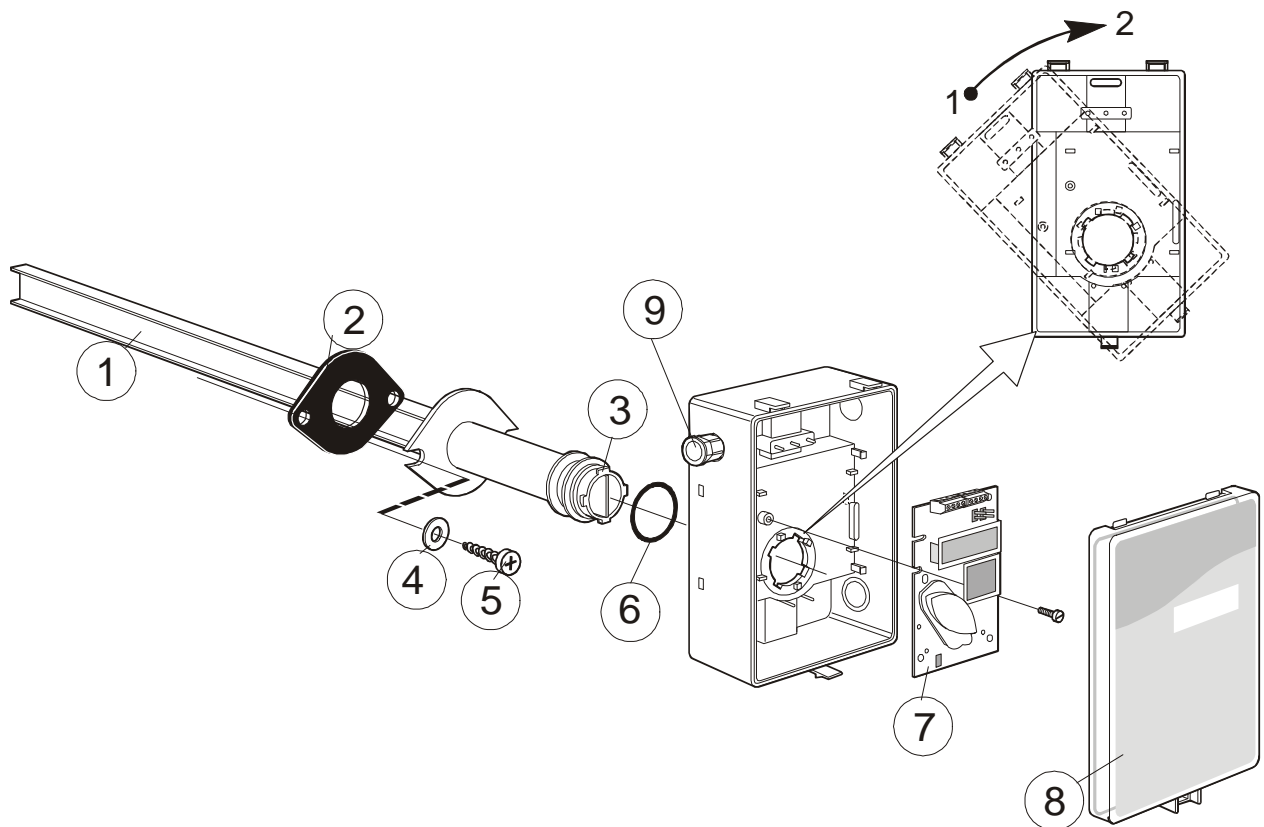
*Dimensions of sensor in mm and (inches)*



*Dimensions of mounting plate in mm and (inches)*

# aSENSE™ VAV

CO<sub>2</sub>/ temperature sensor with built-in  
general purpose controller for mounting in  
ventilation ducts

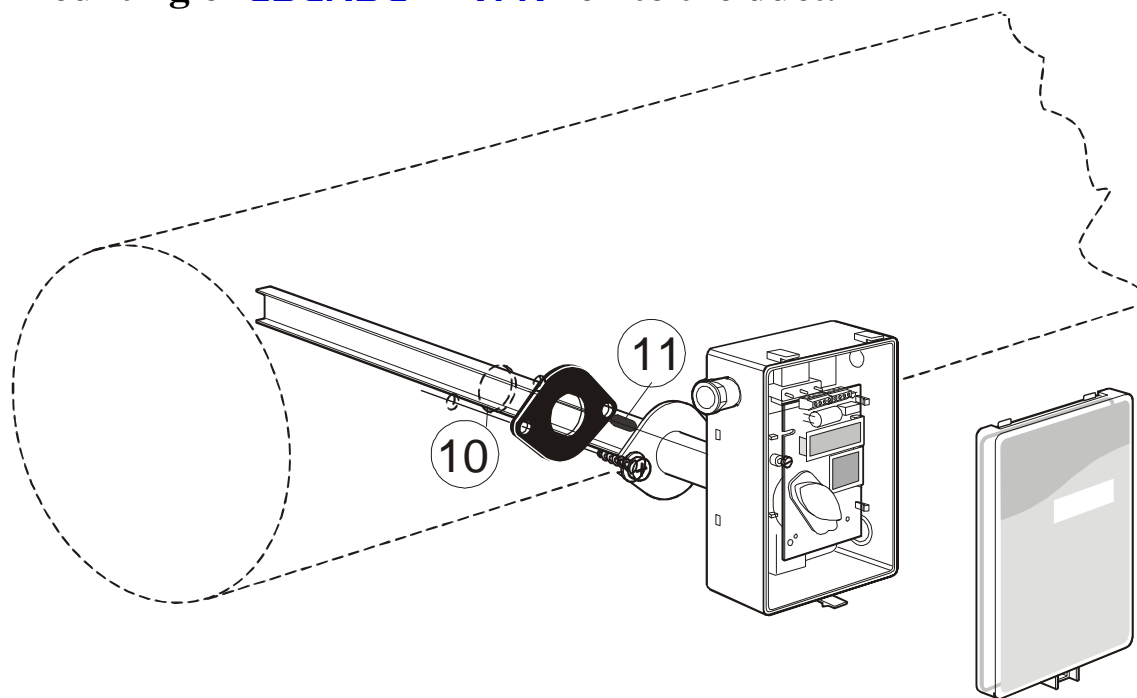


- 1 Sampling probe
- 2 Sealing gasket
- 3 Largest locking nob
- 4 2 washers BRB 5,3x10x1
- 5 2 screws RXS 4,8x16

- 6 O-ring 29,2x3,53 (Factory supplied mounted in box)
- 7 PCB (Factory supplied mounted in box)
- 8 Snap-in lid
- 9 PG9 cable entry bushing



## Mounting of *aSENSE™ VAV* on to the duct.



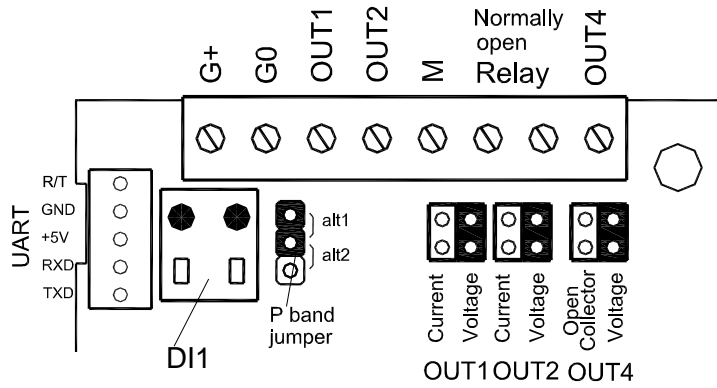
10 Hole with 25 mm diameter

11 Temperature sensor with 110 mm cable mounted in the sampling probe

### Mounting Instruction

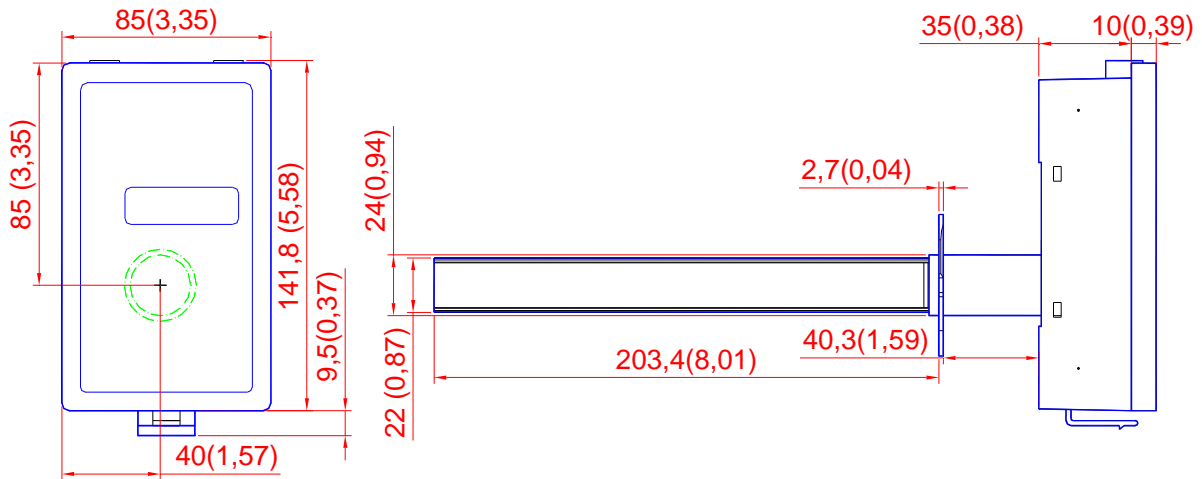
Since there might be a substantial pressure difference in duct mounting applications, it is essential to avoid ambient air from suction into the duct-mounting box. For correct function it is indispensable that the sealing of the box cover, the cable entry bushings, the cable feed through and the duct entrance are absolutely tight. The duct entrance may need extra sealing paste in order to prevent leakage. The PCB must be handled carefully and protected from electrostatic discharge.

- 1) **Electrical cable entry:** The box has a factory mounted cable entry bushing in dimension PG9. Never feed more than one cable through each cable entry bushing, or else gas might leak through!
- 2) **Mounting the tube:** Drill a hole (10) with 25 mm diameter (or 1 inch) for the sampling probe and two holes with 4 mm diameter for the screws (5) into the air duct and mount the tube (1) with the gasket (2). The sampling probe should be mounted with the largest locking knob on top. The unit can be mounted with the air coming from the left or right.
- 3) **Attaching the sensor box** is made to the sampling probe by a snap-in bayonet fitting. First, carefully stick the temperature probe (11) into the sampling probe. (1). Orient the box onto the sampling probe so that the box upside is on the same side as the largest locking knob (3). When the probe is fitted into the notches of the box, then turn the box clockwise until stop (see Figure 1). Position 1 indicates *open* where the box can be removed from the sampling probe. In position 2 the box is locked to the probe.

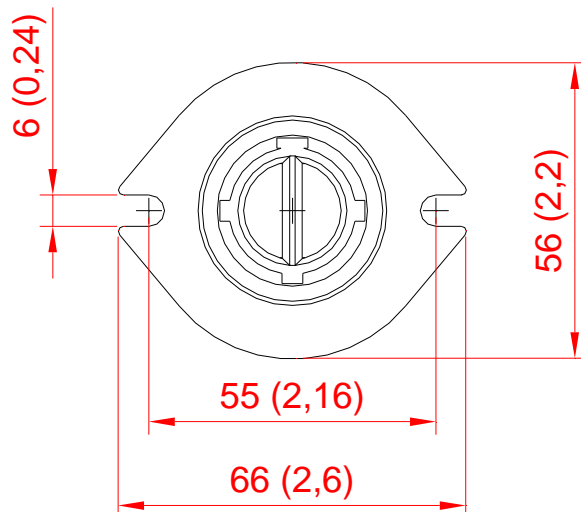


Terminals and jumpers on **aSENSE™ VAV** standard. The darker positions are default settings.

## Dimensions



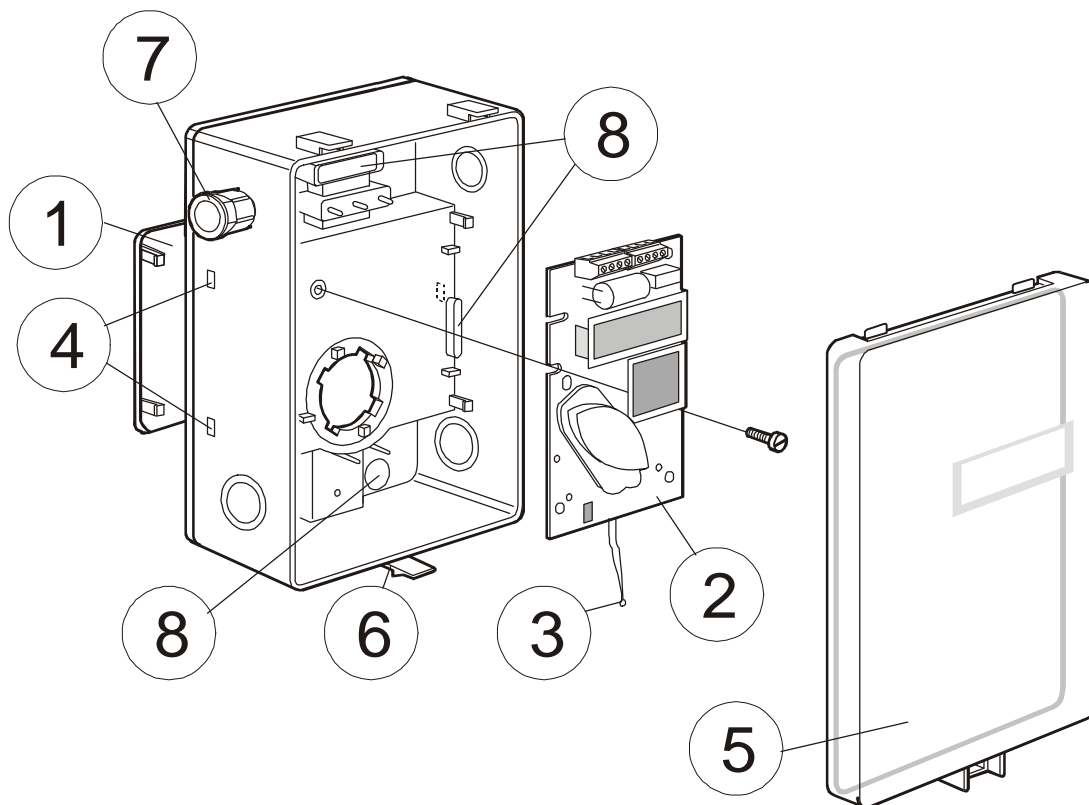
Dimensions of sensor in mm and (inches)



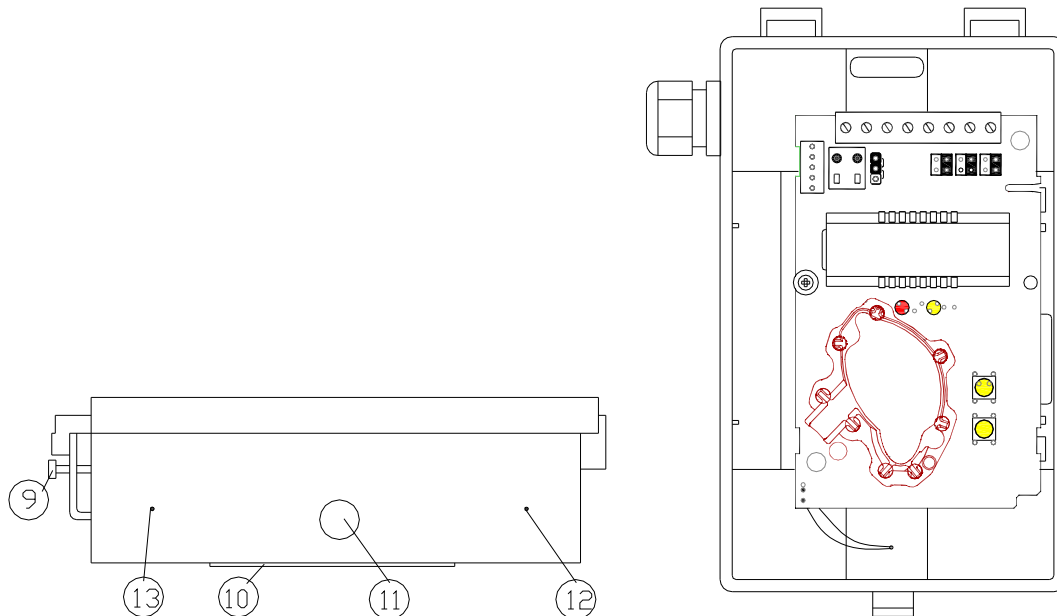
Dimensions of sampling probe in mm and (inches)

## aSENSE™ VAV

CO<sub>2</sub> / temperature sensor with built-in  
general purpose controller mounted in industrial  
housing



- |   |                                       |   |                                      |
|---|---------------------------------------|---|--------------------------------------|
| 1 | Wall plate                            | 5 | Snap-in lid                          |
| 2 | PCB (Factory supplied mounted in box) | 6 | Locking screw of the lid (not shown) |
| 3 | Temperature sensor                    | 7 | PG9 cable entry bushing              |
| 4 | Hole for wall plate hooks             | 8 | Air holes                            |



- 9 Lid locking screw
- 10 Wall plate
- 11 Screw to hold the wall plate
- 12 Drill mark for cable entry bushing
- 13 Drill mark for cable entry bushing

## Dismounting the wall plate

The sensor is delivered with the wall plate mounted. The wall plate has to be removed before the sensor is mounted onto the wall. Unscrew the screw on the side of the box. See figure 3.

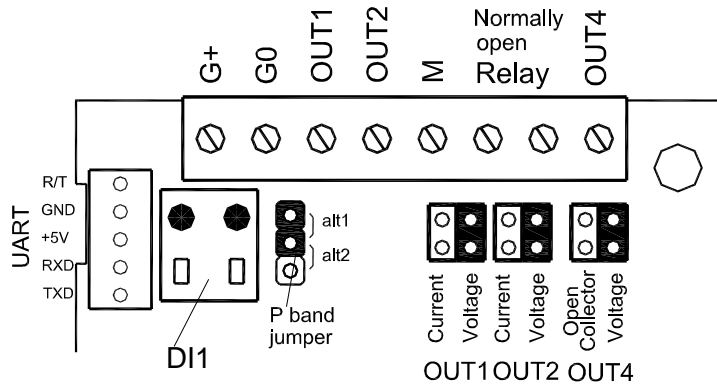
## Wall Mounting Instruction

Normally the PCB should not be removed from the housing. If for some reason the PCB must be removed it must be handled carefully and protected from electrostatic discharge.

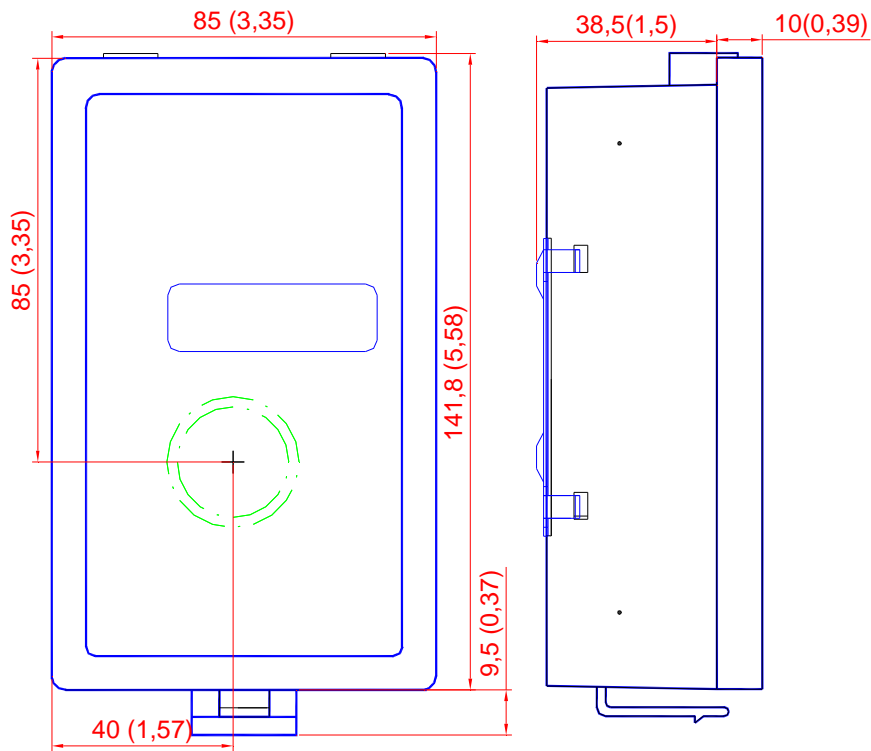
- 1) **Electrical cable entry:** The box has a factory mounted cable entry bushing in dimension PG9. Never feed more than one cable through each cable entry bushing, or else gas might leak through!
- 2) **Screw the wall plate onto the wall:** The wall plate has holes for three screws. Drill holes for 3,5mm screws and put dowel into them. Dowels and screws 3,5 x 25mm are included in a plastic bag
- 3) **Attaching the sensor box** to the wall plate is done by a snap-in fitting. The wall plate has three hooks that fit in holes in the sensor box. Fasten the screw on the side of the box.
- 4) **The lid can be locked** with the screw at the bottom of the sensor box.



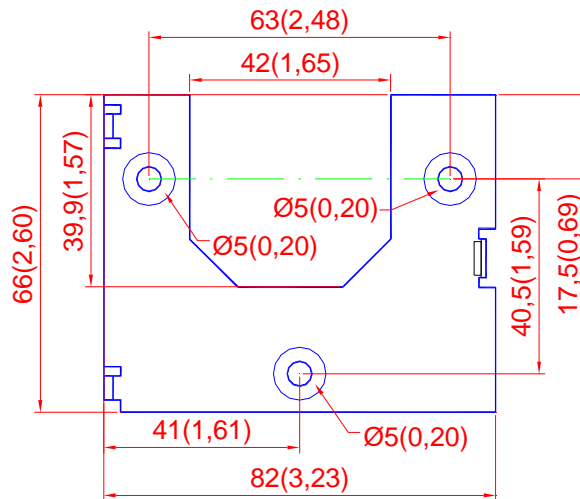
If for some reason the PCB must be removed it must be handled carefully and protected from electrostatic discharge! Normally, removing the PCB is not required.



Terminals and jumpers on **aSENSE™ VAV** standard. The darker positions are default settings.



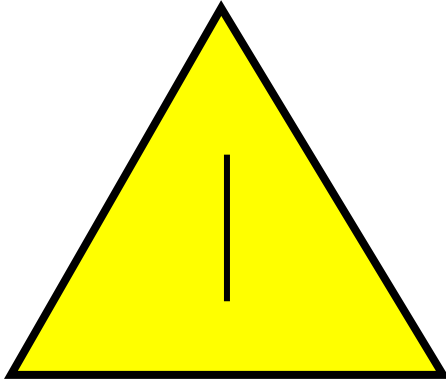
Dimensions of sensor in mm and (inches)



Dimensions of wall plate in mm and (inches)

## Electrical connections

The power supply has to be connected to G+ and G0. G0 is considered as system ground. *The same ground reference has to be used for the aSENSE™ VAV unit and for any connected device!* Unless different transformers are used, special precautions need to be taken.



### **PLEASE NOTE!**

The signal ground *is not* galvanically separated from the aSENSE™ VAV power supply!

### **NOTE!**

The same ground reference has to be used for the aSENSE™ VAV unit and for any connected device!

If possible keep the sensor powered up after mounting. Connect the analogue output before measuring.

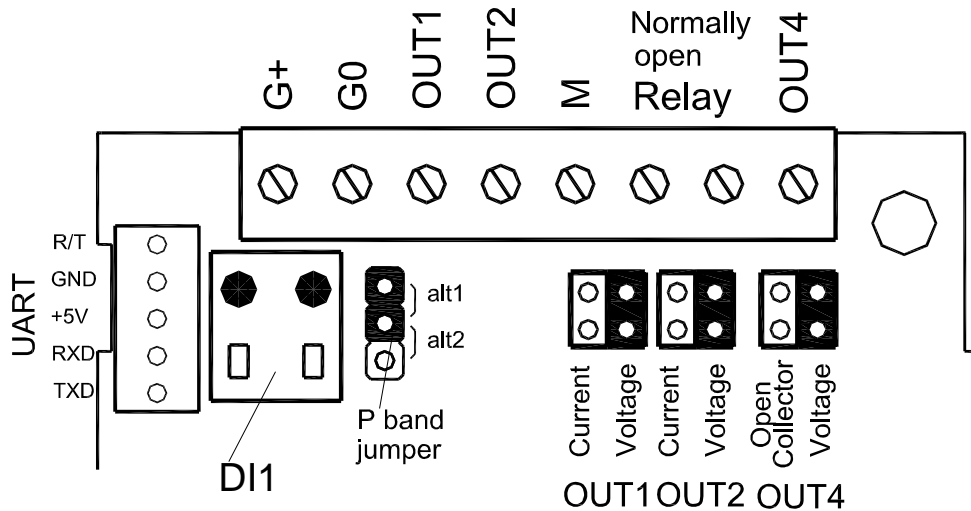
Connection Terminal	Function	Electrical Data	Remarks
G+	Power (+)	24 VAC/DC+ (+-20%), 3W	2W without output load See note 1!
G0	Power ground (-)	24 VAC/DC-	
OUT 1	Analogue Output 1 (+)	0-10 VDC or 0-20 mA, 2-10 VDC or 4-20 mA,	According to positions of OUT1 jumper and start point selection. See note 2!
OUT 2	Analogue Output 2 (+)	Same as Output 1	According to positions of OUT2 jumper and start point selection. See note 2!
M	Signal Ground (-)	Connected to G0 via PTC fuse	See note 1!
Relay Relay	Normally open	Contact free relay minimum load 1mA/5V rated load 0,5A/125VAC; 1A/24VDC	Triggered by register OUT3
OUT4	Analogue Output 4 (+) or Open Collector	0-10 VDC  Max 0,5A, 55VDC / 40VAC (half-wave rectifier protection)	According to positions of OUT4. See note 2 & 3!
DI1 DI1	Digital Input 1	Closed contact current 1mA Open contact voltage max 5V	<b>Do not apply any voltage on this input!</b>

Table I. Electrical terminal connections for aSENSE™ VAV

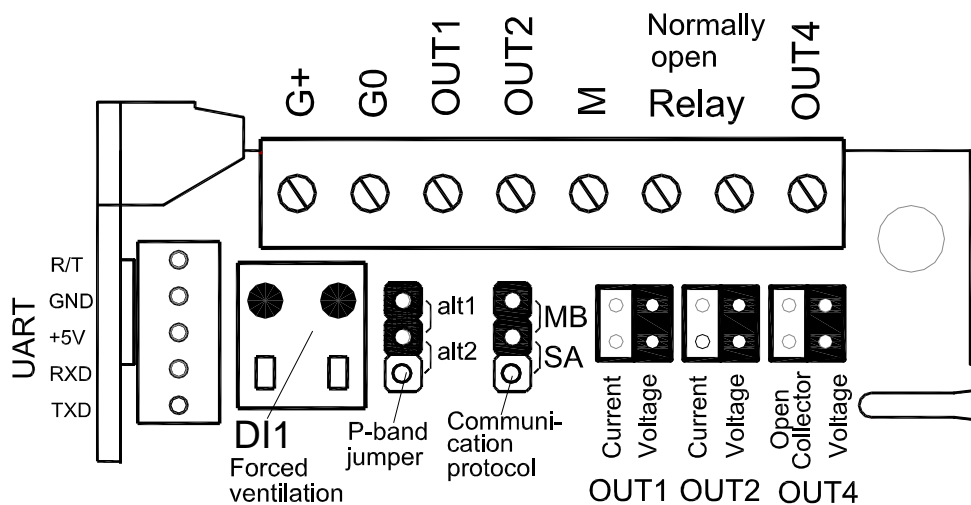
**Note 1:** The ground terminal is used as negative power supply DC input or AC phase ground G0 (halfwave rectifier). The signal ground M, protected by a PTC resistor, is the same as power ground G0 (permitting a "3-wire" configuration). A single transformer may be used for the entire system.

**Note 2:** *aSENSE™ VAV* can deliver both a voltage or a current loop for OUT1/OUT2. For OUT4 a voltage output or an open collector output is selected with jumper OUT4. To change between voltage and current output mode the hardware jumpers are used. There is one jumper for OUT1 and one for OUT2, so that one output can be a voltage output and the other a current output. Both, voltage output and current output, can have start points 0 % (0-10 VDC or 0-20mA) or 20% (2-10 VDC or 4-20mA) selected from PC software.

**Note 3:** Current of Open Collector is internally returned to G0 terminal.



Terminals and jumpers on *aSENSE™ VAV* standard.



Terminals and jumpers on *aSENSE™ VAV* with communication jumper