



## Installation and Operation Instructions A/CO2-DUCT Series

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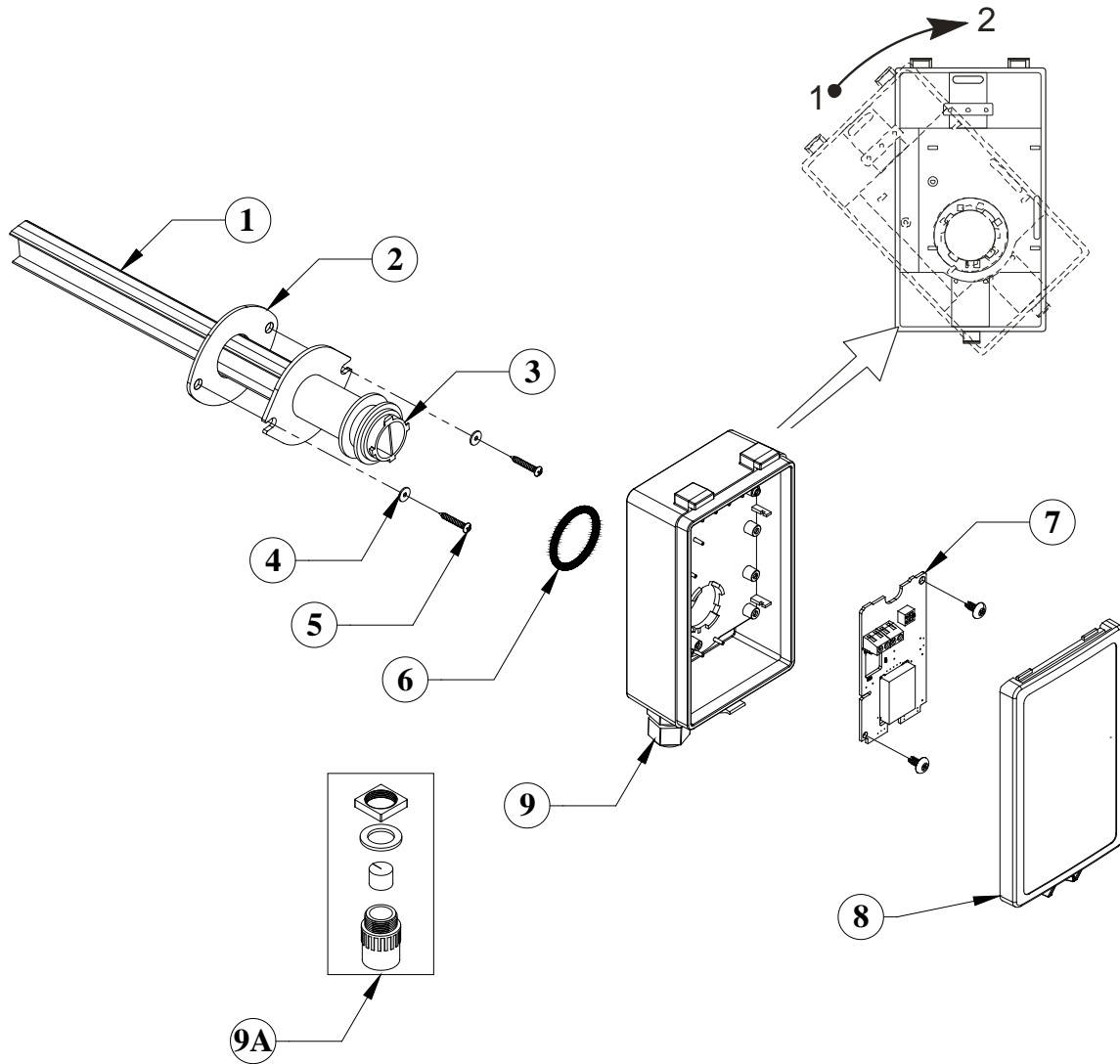
*Please Read Instruction Carefully Before Installation!*



Figure 1: A/CO2-DUCT

### PRECAUTIONS

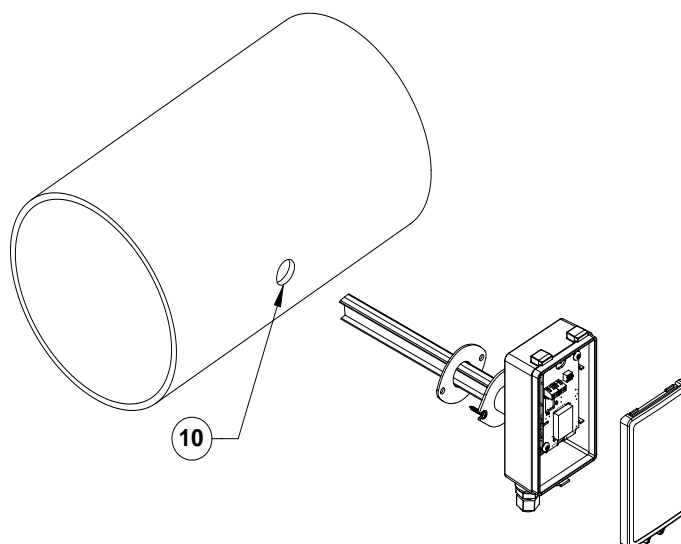
- **REMOVE POWER BEFORE WIRING. NEVER CONNECT OR DISCONNECT WIRING WITH THE POWER APPLIED. DO NOT ALLOW LIVE WIRES TO TOUCH THE CIRCUIT BOARD.**
- **AN ISOLATION TRANSFORMER IS RECOMMENDED WHEN POWERING THE DEVICE WITH 24VAC.**
- **DO NOT RUN THE WIRING IN ANY CONDUIT WITH LINE VOLTAGE.**
- **FAILURE TO WIRE DEVICES WITH THE CORRECT POLARITY WHEN USING A SHARED TRANSFORMER MAY RESULT IN DAMAGE TO ANY DEVICE POWERED BY THE SHARED TRANSFORMER.**



- |                             |   |
|-----------------------------|---|
| 1. Sampling probe           | 6. O-ring 29,2x3,53   |
| 2. Sealing gasket           | 7. PCB (Factory supplied mounted in box)                              |
| 3. Largest locking nob      | 8. Snap-in lid  |
| 4. 2 washers (Not included) | 9. Cable entry bushing (A/CO2-DUCT)                                   |
| 5. 2 screws (Not included)  | 9A. 1/2" Conduit Adapter (A/CO2-DUCT-C)<br>w/foam plug, rubber washer |

**Figure 2: Parts of the A/CO2-DUCT for Duct Mounting**

# MOUNTING



**Figure 3: Mounting of the sensor to the Ventilation Duct**  
(#10 Hole with 1" [25 mm] diameter)

## 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) **Place the O-ring** around the hole at the back of the box. See figure 2.
- 2) **Electrical cable entry:** The box has a factory mounted cable entry bushing. Never feed more than one cable through each cable entry bushing, or else gas might leak through!
- 3) **Mounting the tube:** Drill a 1" (25 mm) diameter hole for the sampling probe and two holes with 0.16" (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.
- 4) **Attaching the sensor box** is made to the sampling probe by a snap-in bayonet fitting. 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 2). Position 1 indicates *open* where the box can be removed from the sampling probe. In position 2 the box is locked to the probe.

## WIRING

The **power supply** has to be connected to VIN and COM. COM is considered as system ground. *The same ground reference has to be used for the A/CO2-DUCT unit and for the DDC/signal receiver.*



### PLEASE NOTE!

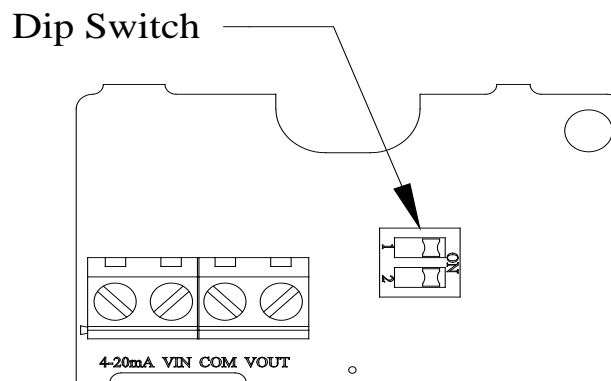
**The same ground reference has to be used for the A/CO2-DUCT unit and for the control system!**

Terminal	Function	Electrical data	Remarks Standard settings
VIN	Power (+)	24 VAC/DC (+) (+/-20%), 2W	
COM	Power ground (-)	24 VAC/DC (-)	System voltage reference
VOUT	Analogue output 1 (+)	0-5 VDC or 0-10 VDC	0-2000 ppm CO <sub>2</sub>
4-20mA	Analogue output 2 (+)	4 to 20mA	0-2000 ppm CO <sub>2</sub>

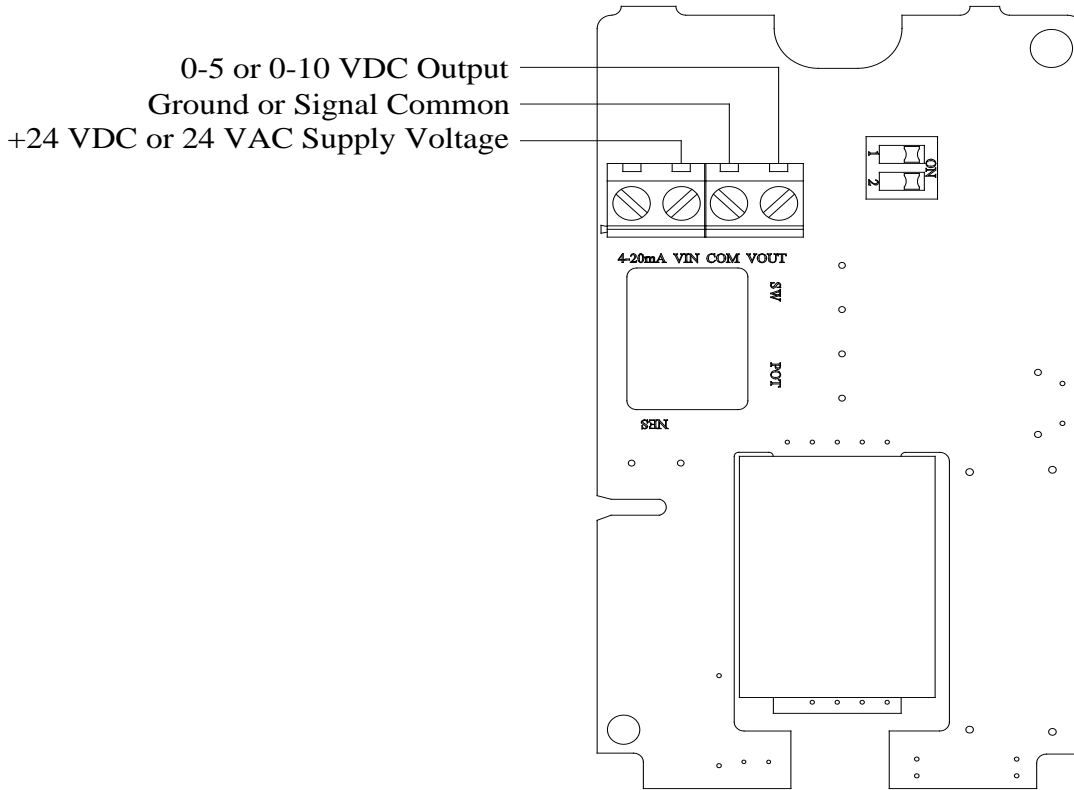
### Connections of the main terminal of A/CO2-DUCT

**Shielded cable with 16 to 22AWG conductors is recommended.** The cover must be removed to wire the unit's terminal blocks.

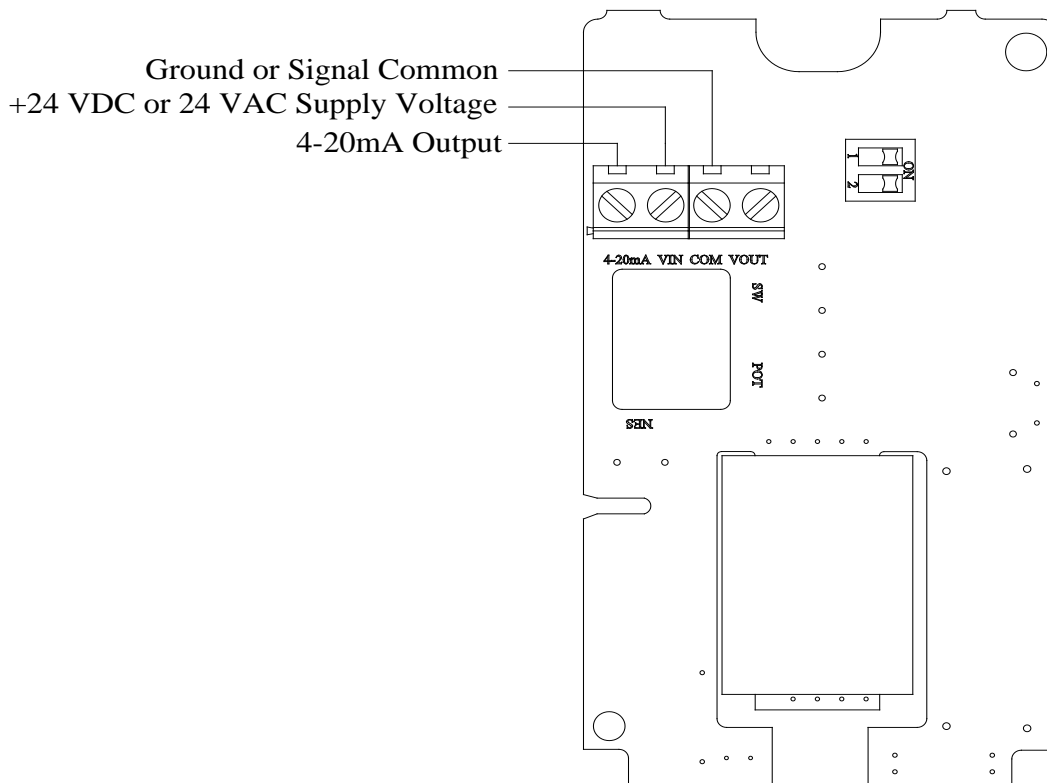
- When using ½" conduit, the strain relief fitting must be removed from the enclosure.
- Make sure that any conduit or metal fittings do not come in contact with the circuit board.



**Figure 4: Dip Switch #1 & #2 set to default settings  
(Output #1: 0–10 VDC & ABC On)**



**Figure 5: Wire connections for Output #1: 0-10 or 0-5 VDC  
(Change Dip Switch #1 for different voltage output)**



**Figure 6: Wire connections for Output #2: 4-20mA**

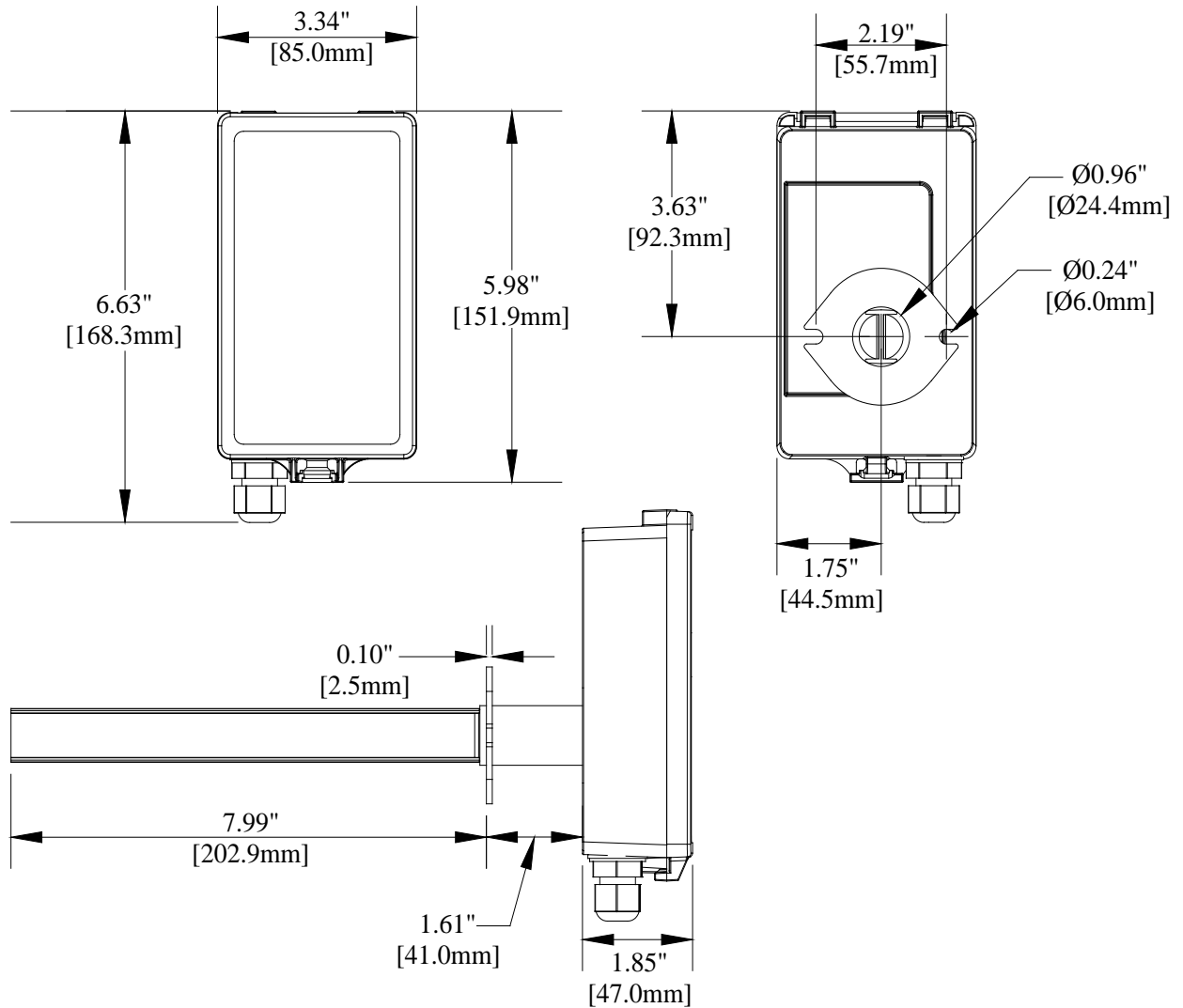
## Maintenance

The *A/CO<sub>2</sub>-DUCT* is basically maintenance free in normal environments thanks to the built-in self-correcting *ABC* algorithm. Discuss your application with ACI in order to get advice for a proper calibration strategy.

### **PLEASE NOTE!**

**The sensor accuracy is defined at continuous operation (at least 3 weeks after installation)**

## Dimensions



**Figure 7:**

# PRODUCT SPECIFICATIONS

Supply Voltage	24 VAC $\pm$ 20%, 50/60Hz (half-wave rectifier input) Absolute max. ratings 16.5 to 40 VDC
Power Consumption	< 0.9 W Average
Peak Power Consumption	3VA for 24 VAC, 3W for 24 VDC
CO2 Output Signal	<b>Out 1:</b> 0-5 or 0-10VDC for 0-2,000 ppm, Set by Dip Switch #1. Default: 0-10VDC Rout < 100 Ohms (DC) Rload >5K Ohms <b>Out 2:</b> 4-20mA for 0-2,000 ppm Rload < 500 Ohms
CO2 Accuracy	$\pm$ 40ppm $\pm$ 3% of reading
Pressure Dependence	+1.6% reading per kPa
Response Time	$\leq$ 2 minutes, diffusion
Warm Up Time	< 1 minute (@ full specs < 15 minutes)
Storage Temperature Range	-4 to 158°F (-20 to 70°C)
Operating Temperature Range	59 to 95°F (15 to 35°C)
Humidity	0 to 95% RH, non-condensing
Sensing Coverage Area	7,500 sq. ft. maximum
Life Expectancy	> 15 Years
Sensing Technology	Single Beam Infrared Technology (NDIR) with Automatic Background Calibration (ABC) Set by Dip Switch #2. Default: On
Enclosure	Housing: UL94-V0 rated, flame retardant ABS/PC, Duct Tube: UL94-5VB rated, flame retardant ABS/PC
Approvals	REACH RoHS WEEE

**Table 1: Product Specifications**

## WARRANTY SPECIFICATION

The A/CO2-DUCT Series are covered by ACI's Five (5) Year Limited Warranty, which is located in the front of ACI'S SENSORS & TRANSMITTERS CATALOG or can be found on ACI's web site: [www.workaci.com](http://www.workaci.com).

### WEEE Directive

At the end of their useful life the packaging and product should be disposed of via a suitable recycle centre. Do not dispose of with household waste. Do not burn.

