



# HK Instruments AVT Series Air Flow and Velocity Transmitters Instruction Manual

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## HK INSTRUMENTS

USER-FRIENDLY MEASURING DEVICES  
AIR FLOW AND VELOCITY TRANSMITTERS  
AVT Series  
INSTALLATION INSTRUCTIONS

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## INTRODUCTION

Thank you for choosing an HK Instruments AVT series air velocity transmitter. The AVT series is intended for use in commercial environments.

It is designed with a duct mount probe and adjustable collar suitable for round or rectangular ducts. The AVT series provides separate readings for air velocity and temperature.

The AVT series comes with three measurement ranges in a single device (0–2 m/s, 0–10 m/s, 0–20 m/s). The AVT series is available with optional display and relay.

## APPLICATIONS

AVT series devices are commonly used in HVAC/R systems for:

- in-duct air flow and velocity monitoring
- in-duct temperature monitoring
- VAV applications



### WARNING

- READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS DEVICE.
- Failure to observe safety information and comply with instructions can result in PERSONAL INJURY, DEATH AND/OR PROPERTY DAMAGE.
- To avoid electrical shock or damage to equipment, disconnect power before installing or servicing and use only wiring with insulation rated for full device operating voltage.
- To avoid potential fire and/or explosion do not use in potentially flammable or explosive atmospheres.
- Retain these instructions for future reference.
- This product, when installed, will be part of an engineered system whose specifications and performance characteristics are not designed or controlled by HK Instruments. Review applications and national and local codes to assure that the installation will be functional and safe. Use only experienced and knowledgeable technicians to install this device.
- Fuse at load supply (normally 6 A, 10 A, 16 A) does not always limit the relay output load current to 6 A. Relay Maximum Load (250 V x 6 A res.)
- Add an external fuse to relay common connector. Use a time-lag fuse (max 6 A) that is in accordance with the standard IEC 60127-2.

The product doesn't have an internal fuse for the relay.

**CAUTION:** The product may only be connected to overvoltage category II electricity network according to IEC 60664-1.

## SPECIFICATIONS

### Performance

#### Measurement ranges:

Velocity:

Range: 0–2 m/s

Range: 0–10 m/s

Range: 0–20 m/s

Temperature: 0–50 °C

#### Accuracy:

Velocity:

Range: 0...2 m/s: <0.2 m/s + 5 % from reading

Range: 0...10 m/s: <0.5 m/s + 5 % from reading

Range: 0...20 m/s: <1.0 m/s + 5 % from reading

Thermal shift:  $\pm 0.8$  % FS / °C

Units calibrated at 22 °C. Rapid thermal shift

stabilisation time 10 min.

Temperature:  $< 0.5$  °C typical @25°C (velocity  $> 0.5$  m/s)

## Technical Specifications

### Media compatibility:

Dry air or non-aggressive gases

### Measuring units:

m/s and °C

### Measuring element:

Temperature: ntc10k

Velocity: Pt1000

### Environment:

Operating temperature: 0...50 °C

Storage temperature: -20...70 °C

Humidity: 0 to 95 % rH, non-condensing

## Physical

### Dimensions:

Case : 86.0 x 95.0 x 36.0 mm

Probe: OD 10 mm, length 210 mm from bottom of the cover

Immersion Length with Flange: Adjustable 50–180 mm

Weight: 220 g

Mounting: Mounting flange,  $\varnothing$  4.0 mm

### Materials:

Case: ABS

Lid: PC

Probe: Stainless steel 304

Mounting flange: LLPDP

Protection standard: IP54

### Display

3 1/2 digit LCD backlit display

Size: 45.7 x 12.7 mm

### Electrical connections:

Power supply & signal out: 4-screw terminal block

16–24 AWG (0.2–1.5 mm<sup>2</sup>)

Relay Out: 3-screw terminal block

16–24 AWG (0.2–1.5 mm<sup>2</sup>)

Cable entry: M16

## Electrical

Input: 24 VDC / 24 VAC  $\pm 10$  %

Current consumption 35 mA (50 mA with relay)

+ 40 mA with mA-outs

Output signal 1: (T out)

0–10 V (linear to temperature)

L min 1 k $\Omega$

4–20 mA (linear to temperature)

L max 400  $\Omega$

Output signal 2: (v out)

0–10 V (linear to m/s)

L min 1 k $\Omega$

4–20 mA (linear to m/s)

L max 400  $\Omega$

Relay Out: 3-screw terminal block

(NC, COM, NO)

Potential free SPDT

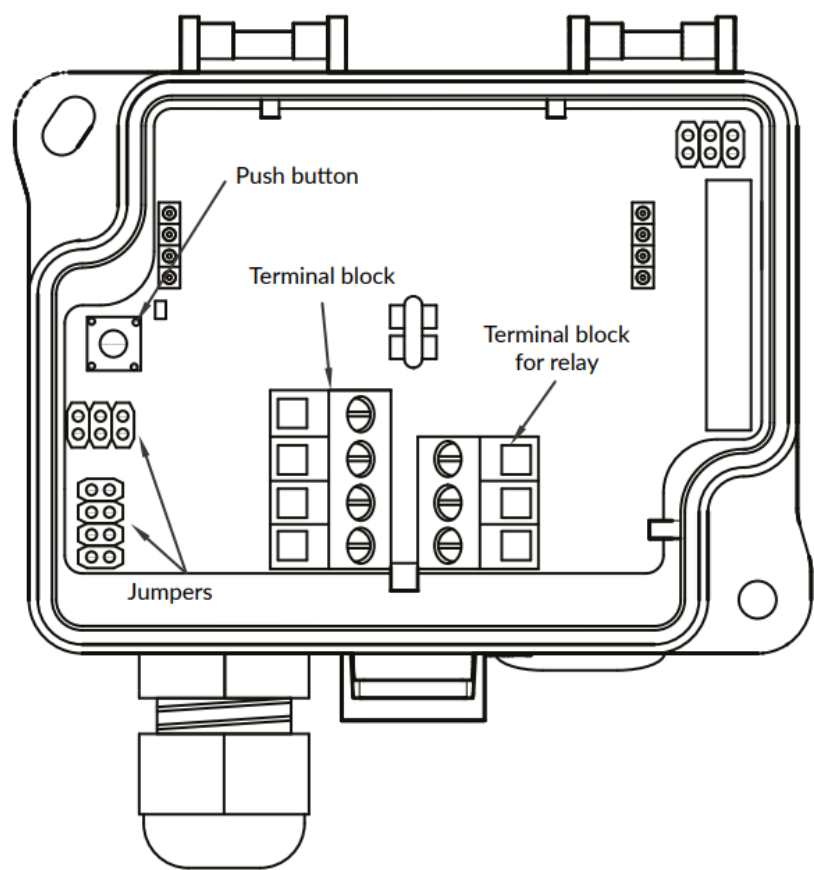
250 VAC, 6A / 30 VDC, 6 A adjustable switching point and hysteresis

**Conformance**

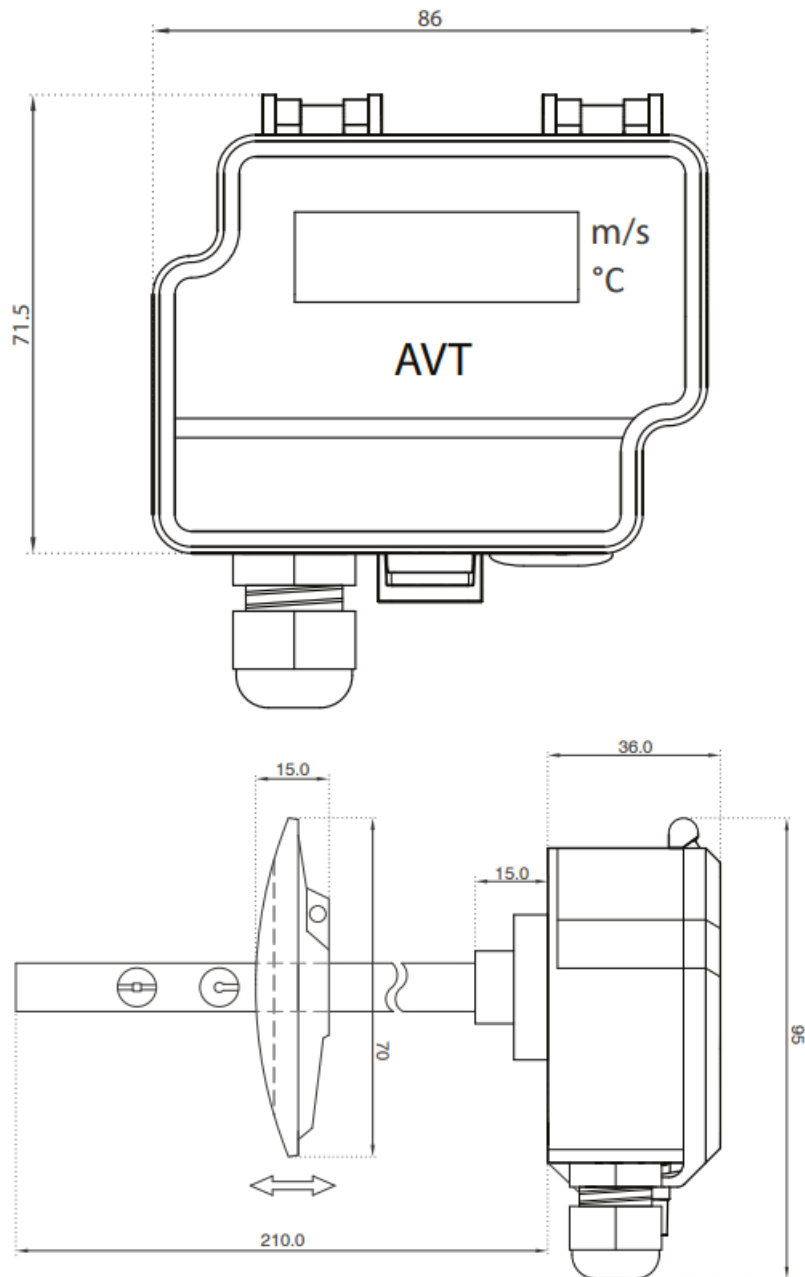
Meets the requirements for:

EMC: RoHS: LVD/EESR: WEEE:	CE: 2014/30/EU 2011/65/EU 2014/35/EU 2012/19/EU
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**SCHEMATICS**



**DIMENSIONAL DRAWINGS**



## INSTALLATION

1. Mount the device in the desired location (see step 1).
2. Open the lid and route the cable through the strain relief and connect the wires to the terminal block (see step 2). Use a separate strain relief for each cable.
3. The device is now ready for configuration.



**WARNING!** Apply power only after the device is properly wired.

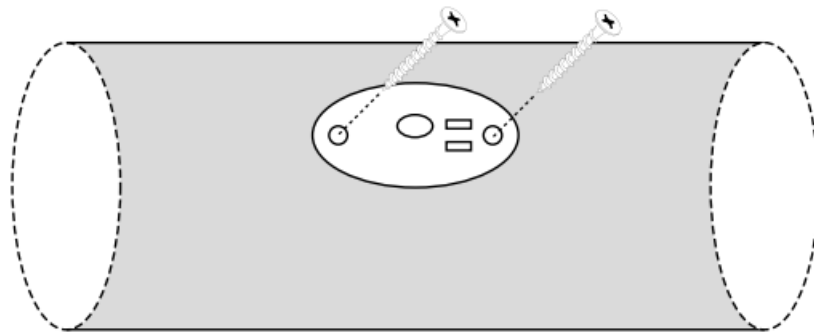
### STEP 1: MOUNTING THE DEVICE

1. Select the mounting location (on a duct).
2. Use the mounting flange of the device as a template and mark the screw holes.
3. Mount the flange on the duct with screws (not included). (Figure 1a)
4. Adjust the probe to the desired depth. Ensure that the end of the probe reaches the middle of the duct. (Figure

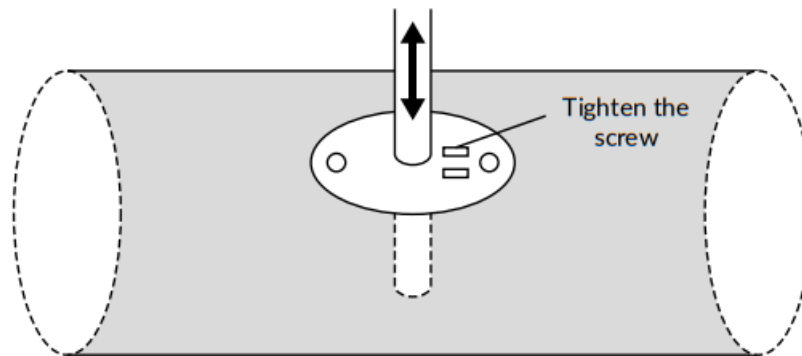
1b)

5. Tighten the screw on the flange to hold the probe in position.

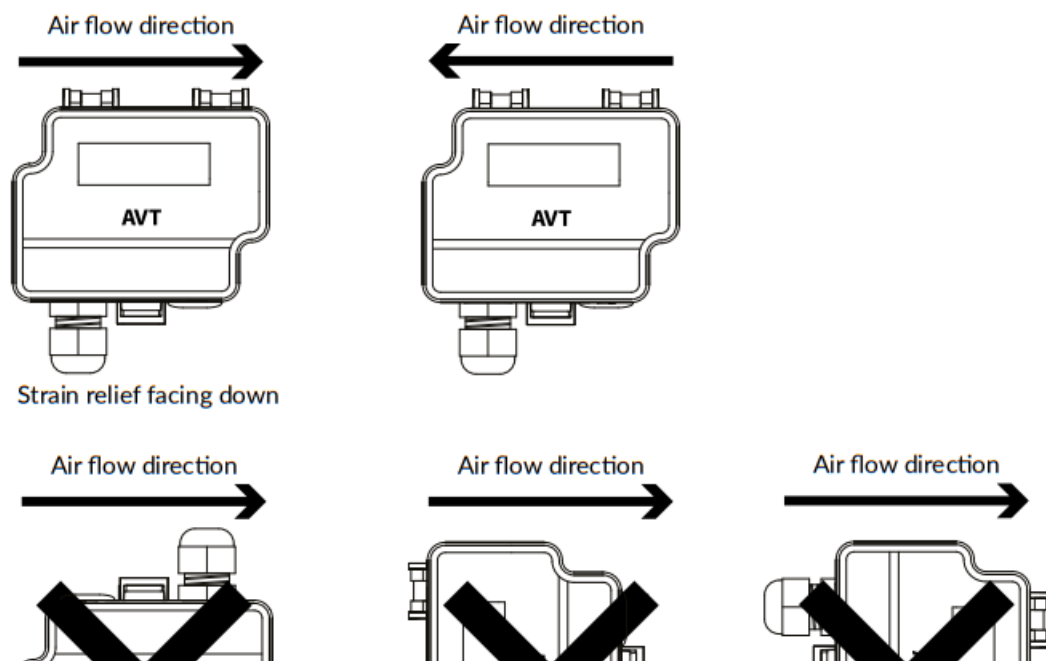
**Figure 1a - Mounting a flange**

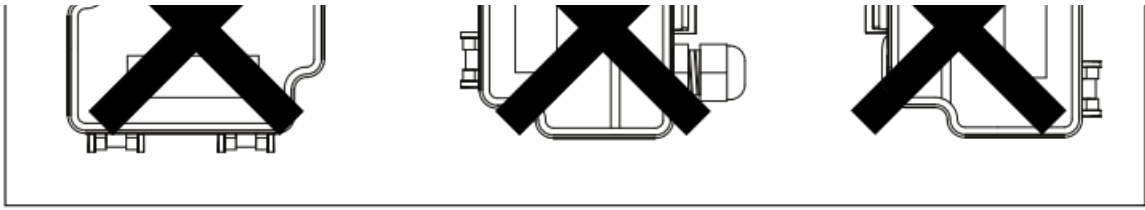


**Figure 1b - Mounting the probe in a flange**



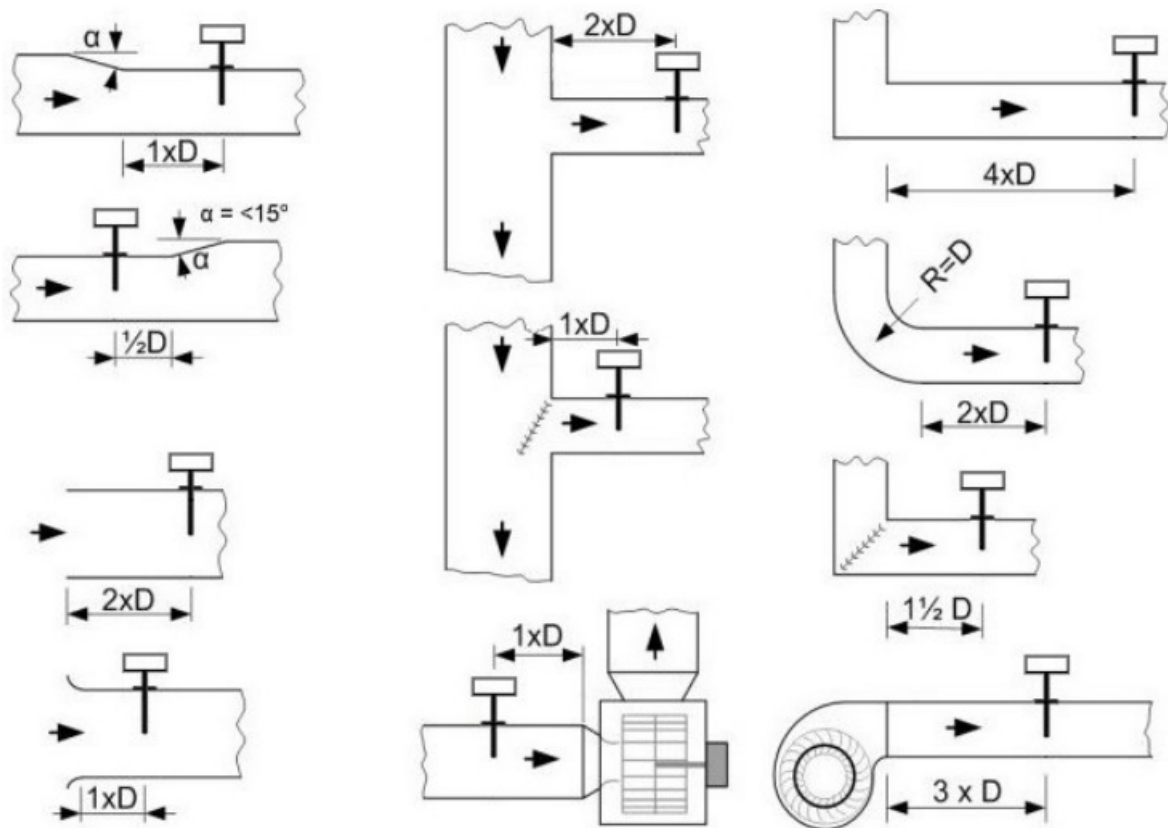
**Figure 1c - Mounting orientation**





## MOUNTING THE DEVICE CONTINUED

Figure 1d – Correct positioning of the probe: minimum straight duct approach



Round ducts:

D = duct diameter

Rectangular ducts:

If there is a horizontal curve or change in the duct size,

D = width of the duct

If there is a vertical curve or change in the duct size,

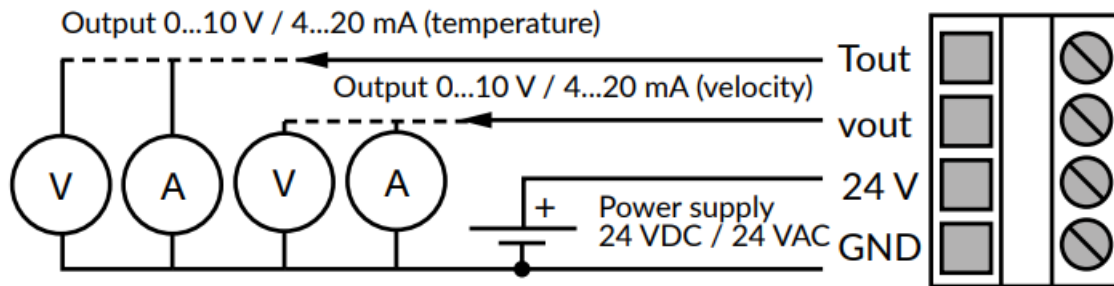
D = height of the duct

## STEP 2: WIRING DIAGRAMS

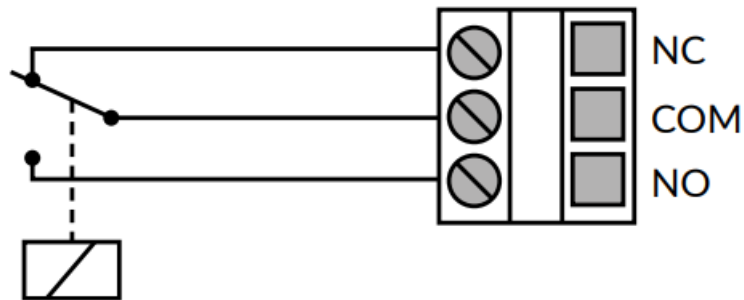
For CE compliance a properly grounded shielding cable is required.

1. Unscrew the strain relief and route the cable(s). Use the strain relief on the left for power in and signal out (Tout/vout) and the strain relief on the right for relay.
2. Connect the wires as shown in figure 2a and 2b.
3. Tighten the strain relief.

**Figure 2a - Wiring diagram: Tout & Vout**



**Figure 2b - Wiring diagram: relay output**



## CONFIGURATION

1. Select the desired measurement range (see step 3).
2. Select the desired measurement mode (see step 4).
3. Configure the relay (optional) (see step 5).

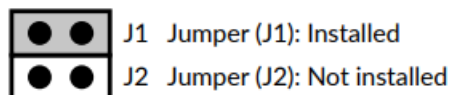
The device is now ready to be used.

## STEP 3: SELECTING THE MEASUREMENT RANGE

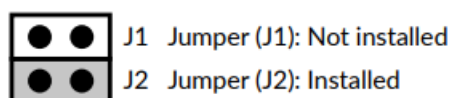
Select the measurement range by installing jumpers as shown in Figure 3a. (See Figure 3a-3b – Jumper settings)

**Figure 3a**

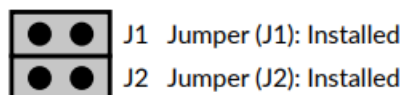
### Range 2 (0-2 m/s)



### Range 10 (0-10 m/s)

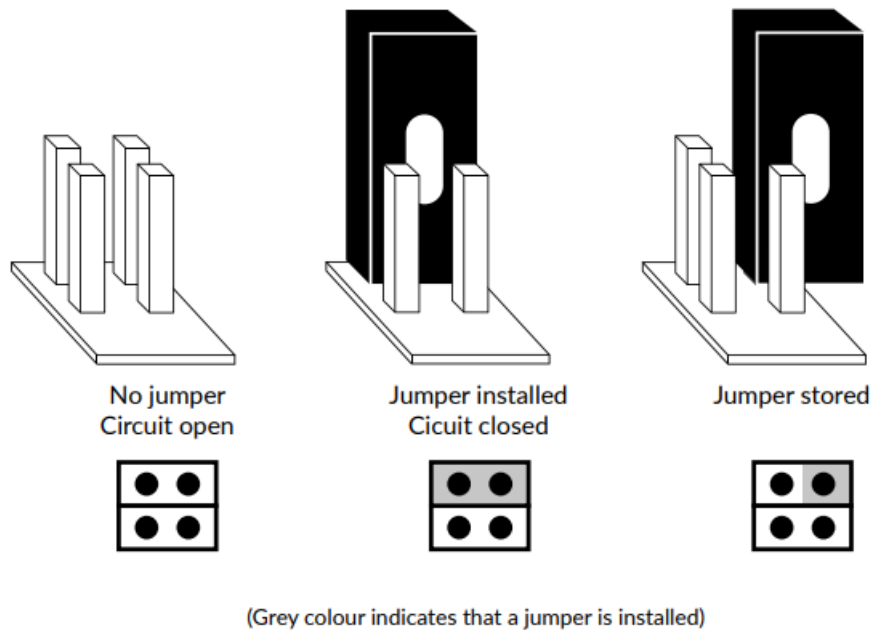


### Range 20 (0-20 m/s)





**Figure 3b - Jumper installation**



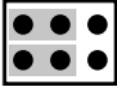
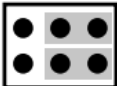
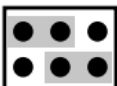
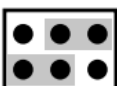
#### STEP 4: SELECTING THE MEASUREMENT MODE

Configure the outputs:

- Temperature output (Tout)
- Velocity output (vout)

Select the output mode, current (mA) or voltage (V), by installing jumpers as shown in Figure 4. Both outputs, temperature (T) and velocity (v), are configured separately.

**Figure 4**

 V    mA	T v	Temperature output (Tout): T = voltage (V) Velocity output (vout): v = voltage (V)
 V    mA	T v	Temperature output (Tout): T = current (mA) Velocity output (vout): v = current (mA)
 V    mA	T v	Temperature output (Tout): T = voltage (V) Velocity output (vout): v = current (mA)
 V    mA	T v	Temperature output (Tout): T = current (mA) Velocity output (vout): v = voltage (V)

## STEP 5: CONFIGURING THE RELAY RELAY MODEL ONLY

### 1. Switching point (display required)

- Install a jumper to pins labeled sw.p. (switching point).

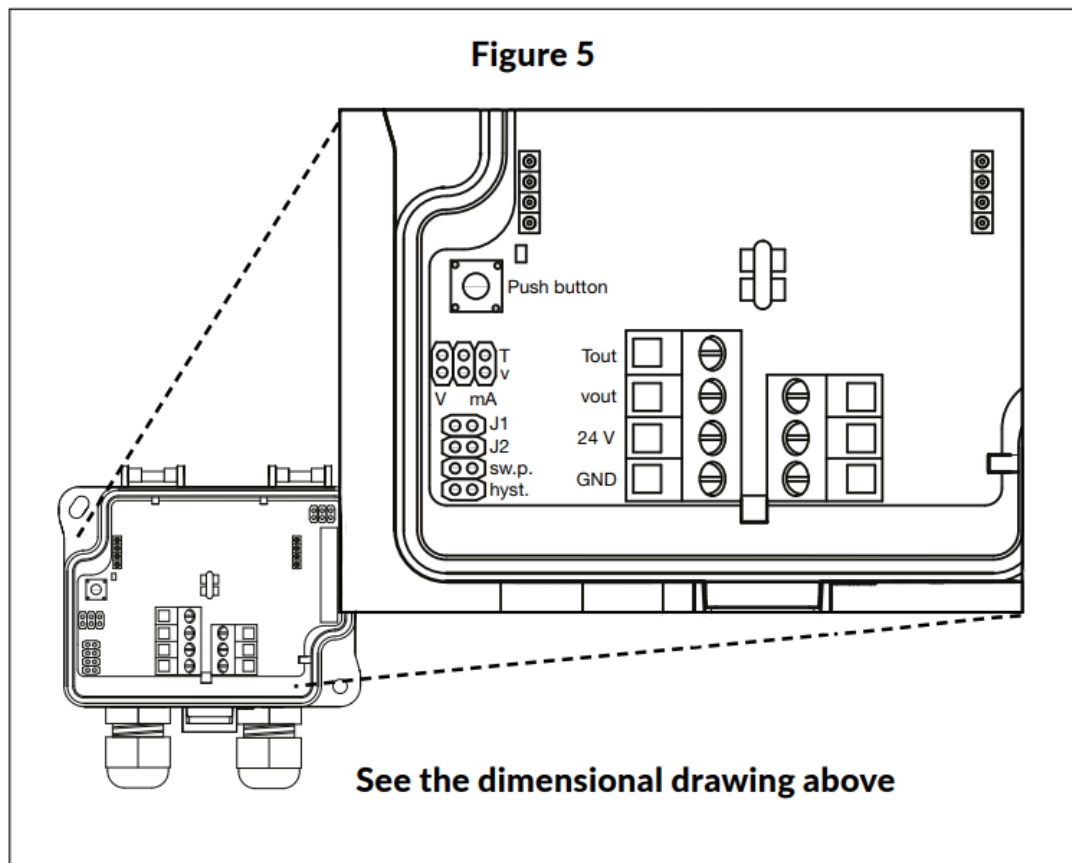
(See Figure 5)

- Press down on the pushbutton to select the switching point (e.g. 5,05 m/s = NC) of the relay. The chosen value (m/s) is shown on the display.
- Remove and store the jumper after the configuration is completed.

### 2. Hysteresis (display required)

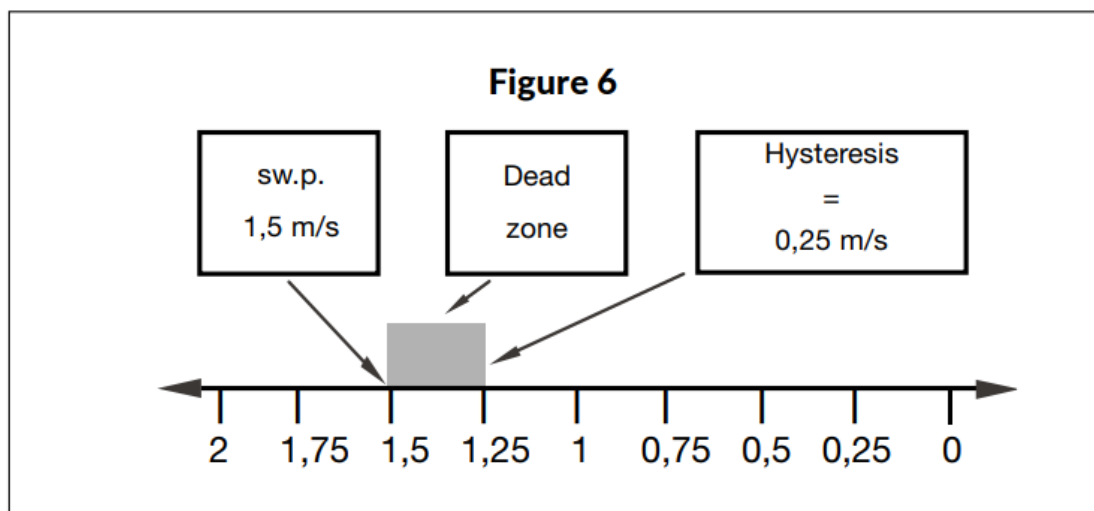
- Install a jumper to pins labeled hyst. (hysteresis). (See Figure 5)
- Press down on the pushbutton to select the hysteresis of the relay switching point. The chosen value (m/s) is shown on the display.
- Remove and store the jumper after the configuration is completed.

**NOTE!** Relay configuration jumpers must be removed and stored for proper operation.



## Hysteresis

Hysteresis represents a dead-zone less than or equal to 20 % of the range selected. The hysteresis is anchored at the switching point (sw.p.), extending to the hysteresis range selected.



In the above example switching point is set at 1,5 m/s, and hysteresis is set at 0,25 m/s. As the velocity increases over 1,5 m/s, the relay will open/close. As velocity reduces, the relay will not close/open until the velocity passes 1,25 m/s, thus preventing rapid cycling.

## Hysteresis CONTINUED

**Figure 7**

Range	Maximum Hysteresis
m/s	m/s
0 – 2	0.4
0 – 10	2
0 – 20	4

The hysteresis maximum setting is based on the range selected.

## RECYCLING/DISPOSAL



The parts left over from installation should be recycled according to your local instructions. Decommissioned devices should be taken to a recycling site that specializes in electronic waste.


## WARRANTY POLICY

The seller is obligated to provide a warranty of five years for the delivered goods regarding material and manufacturing. The warranty period is considered to start on the delivery date of the product. If a defect in raw materials or a production flaw is found, the seller is obligated, when the product is sent to the seller without delay or before expiration of the warranty, to amend the mistake at his/her discretion either by repairing the defective product or by delivering free of charge to the buyer a new flawless product and sending it to the buyer. Delivery costs for the repair under warranty will be paid by the buyer and the return costs by the seller. The warranty does not comprise damages caused by accident, lightning, flood or other natural phenomenon, normal wear and tear, improper or careless handling, abnormal use, overloading, improper storage, incorrect care or reconstruction, or changes and installation work not done by the seller. The selection of materials for devices prone to corrosion is

the buyer’s responsibility, unless otherwise is legally agreed upon. Should the manufacturer alter the structure of the device, the seller is not obligated to make comparable changes to devices already purchased. Appealing for warranty requires that the buyer has correctly fulfilled his/her duties arisen from the delivery and stated in the contract. The seller will give a new warranty for goods that have been replaced or repaired within the warranty, however only to the expiration of the original product’s warranty time. The warranty includes the repair of a defective part or device, or if needed, a new part or device, but not installation or exchange costs. Under no circumstance is the seller liable for damages compensation for indirect damage.

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Installation version 7.0 2022

**Documents / Resources**



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AVT Series Air Flow And Velocity Transmitters, AVT Series, Air Flow And Velocity Transmitters,  
Velocity Transmitters, Transmitters