

Air Velocity Probe

Features

- Hotwire compact thermal sensor
- Fixed ranges: 0…1, 0…2, 0…5, 0…10 and 0…20 m/s
- Special ranges possible upon request
- Modbus / RS485 port
- Calibration over Modbus
- AV analog output signal as 4-20 mA or 0...10 Vdc
- Operating voltage 24V AC/DC

Applications

- HVAC supply or extract air measuring
- Clean room monitoring and control etc

Ordering Codes

model	*output 1*	*range*	*options*
	0 no output **1** 0…10 Vdc **2** 2…10 Vdc **3** 0…5 Vdc **4** 1…5 Vdc **5** 4…20 mA	**01** 1 m/s **02** 2 m/s **05** 5 m/s **10** 10 m/s **20** 20 m/s	**M** modbus

General Notes

1. High density of humidity may effect the measurements.
2. Observe maximum permissible cable lengths.
3. If cable runs parallel to the mains cable: Use shielded cables.
4. Never test with flammable gasses.
5. Transmitters should be far away from humidifiers, min. 2 meters.

Electrical Connections

1. Please be sure about current direction for current outputs and polarity for voltage outputs.
2. Please use shielded and twisted paired cables for Modbus connections
3. Please observe RS485 termination rules, max. 32 devices in a single Modbus line

Cable Colors

brown	24V	15…35 Vdc or 24 Vac (± %5, 50-60 Hz)
white	GND	ground for power and reference for outputs
green	AO	analog output for AV
yellow	RS485 A	modbus communication positive pair
gray	RS485 B	modbus communication negative pair

Technical Data

Electrical	Power Supply	AC 24V (± %5), 50-60 Hz DC 15…35 V
	Power Consumption	< 2.5 W
Outputs	Current Output	4…20 mA, maximum 500 Ω
	Voltage Output	0…10 Vdc, minimum 1.000 Ω 0…5 Vdc, minimum 1.000 Ω
Accuracy	Air Velocity	±5% for FS
General Data	Sensing Element	Hotwire PT1200
	Media	Air or non-aggressive gasses
	Operating Temperature	-25…+70°C
	Storage Temperature	-30…+85°C
General Data	Sensing Element	Electrochemical Cell
	Media	Air or non-aggressive gasses
	Storage Temperature	0 …+20°C recommended
Ranges	fixed at factory	0…1, 0…2, 0…5, 0…10 and 0…20 m/s
Connections	cable	5x0.34 mm^2 LIYY, 1 meter
	brown	15…35 Vdc or 24 Vac (± %5, 50-60 Hz)
	white	ground for power and reference for outputs
	green	analog output for AV
	yellow	modbus communication positive pair
	gray	modbus communication negative pair
Protection	enclosure	IP65 or NEMA 4
	probe	IP10 or NEMA 1
Standards	EMC Directive	EN 61326-1
Dimensions	enclosure	⌀ 13 mm x 270 mm
	probe	⌀ 13 mm x 250 mm
	packed	340 x 115 x 20 mm
Weight	packed	100 gr

Modbus RS485 Protocol

Default Settings: Modbus ID:1, 9600, 8bit, None, 1. Register Table starts from Base 1.

Use Function 3 for Reading and Function 6 for Writing Holding Registers. Whenever writing to any Modbus Parameter, new parameter is activated instantly and you should have to configure master device according to new parameters. For every reboot/initializing, Modbus is activated with default parameters for 3 seconds. After 3 seconds, Modbus is reconfigured according your parameter settings.

Unlisted registers are for analog output calibrations and some system parameters. Please do not change unlisted registers.

Register	R/W	Range	Description
1	R & W	1…254	Modbus Address
2	R & W	0…4	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
3	R & W	0…3	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R	0…20.000	AV as m/s x1000, divide by 1000 for exact value
5	R	0…3.937	AV as fpm, 1m/s = 196.85fpm
6	R	-	blank for future needs
7	R	-	blank for future needs
8	R	-	blank for future needs
9	R	-	blank for future needs
10	R	-	blank for future needs
11	R & W	0…20	Response time as second
12	R & W	0…20	AV range as m/s
13	R	-	blank for future needs
14	R	-	blank for future needs
15	R & W	0…10.000	Raw value for U_0
16	R & W	0…20.000	Raw value for U_{50}
17	R & W	0…5.000	Square root of mid-range x 1.000
18	R	0…1.000	K constant, calculated by transmitter, specific for every unit
19	R	0…20.000	Raw value of actual velocity
20	R	0…20.000	AV as m/s x1000, divide by 1000 for exact value
21 to 23	R & W	0…1.000	Analog output parameters
24	R & W	0, 9	Record command, 0: work mode, 9: set command
25	R & W	0…1.000	Test parameter
26	R	-	blank for future needs

Calibration

Set-up for Calibration

1. Power the unit and make Modbus connections as below:
   Brown: Power, 15…35 Vdc or 24 Vac (± %5, 50-60 Hz)
   White: Ground for power and reference for outputs
   Green: Analog output for AV
   Yellow: Modbus communication positive pair
   Gray: Modbus communication negative pair
2. Check MR_11 for response time, response time can be set from 1 sec. to 20 sec.,
   It is recommended to set 1 second for any calibration,
   You can finally set to needed response time after calibration,
   for setting any parameter, please write 9 to MR_24,
3. Check MR_12 for range as m/s, range can be set from 1 m/s to 20 m/s,
   if you need to change range, please write 9 to MR_24,

ZERO Calibration

4. Keep the probe working with no air velocity about 10 minutes,
5. Close the probe with the original cap for making air velocity 0 m/s,
6. Read U_0 value from MR_19, note this value to your records,
7. Write U_0 value to MR_15 and set it by writing 9 to MR_24,
8. Remove the cap and you are ready for span calibration,

SPAN Calibration

9. After ZERO please do not loose much time,
10. Apply air velocity as much as (range/2),
    If your range is 1 m/s, apply 0.5 m/s,
    or, if your range is 5 m/s, apply 2.5 m/s,
11. You do not need wait too much, just be sure that you have a stable measurement,
12. Read U_{50} value from MR_19, note this value to your records,
13. Write U_{50} value to MR_16 and set it by writing 9 to MR_24,

Parameter Setting

14. Please calculate the value for V_{50}: square root of (range/2) X 1.000
15. Typical V_{50} values:
    for the range 1 m/s V_{50} is 707, for the range 5 m/s V_{50} is 1.581, for the range 10 m/s V_{50} is 2.236,
16. Write V_{50} value to MR_17 and set it by writing 9 to MR_24,
17. Calibration is done.

Notes:

18. Please do not un-power the unit while calibration,
19. Please use filtered clean air while applying air velocity,
20. Please re-power the unit and check the parameters that you set,

Drawings

