

# VD 500 - flow sensor for wet compressed air

For measuring immediately downstream of the compressor in moist air up to +180 °C

## FIELD OF APPLICATION:

- Measurement immediately downstream of the compressor
- Measurement at high temperatures
- Measurement of fast processes



## Benefits at a glance:

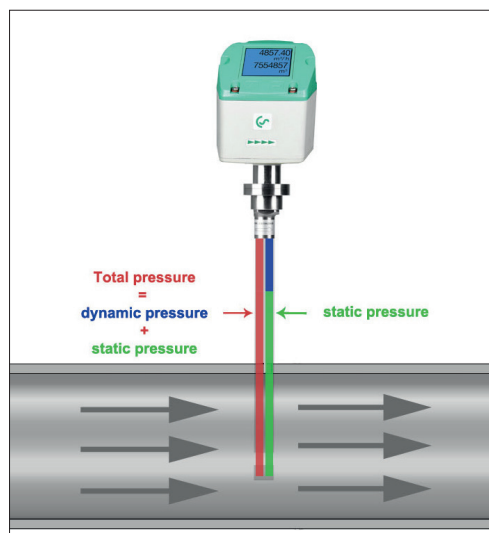
- Particularly suitable for extremely high flow rates
- Extremely fast response time: 100 ms
- Flow, total consumption, temperature and pressure
- Measurement at high temperatures, max. temperature 180 °C
- Measurement in various gases by selecting the gas type, on request
- Can be used in pipes from DN 20 to DN 500
- Installation via 1/2" ball valve under pressure
- RS 485 interface (Modbus-RTU), 4...20 mA, pulse output as standard

## Typical applications:

- Measurement of the capacity of compressors
- Compressed air audits
- Efficiency measurement of compressed air systems

## Installation requirements:

- After functioning water separator
- In horizontal lines (recommended) or in risers



The integrated, precise differential pressure sensor measures the differential pressure/dynamic pressure at the sensor tip. The pressure depends on the respective gas velocity. The flow is therefore easy to determine by means of the pipe diameter.

The additional measurement of temperature and absolute pressure and calculation of the relevant density means that measuring can be carried out for various gases, a wide variety of temperatures and pressures.

## TECHNICAL DATA VD 500

|   |  |
|---|--|
| <b>Measuring range:</b>   | up to 224 m/s / 600 m/s  |
| <b>Measured medium:</b>   | Air, non-aggressive gases  |
| <b>Accuracy:<br/>(m.v.: of meas. value) (f.s.: of full scale)</b> | ± 1.5% of m.v. ± 0.3% of f.s. (20...224 m/s)<br>± 1.5% of m.v. (> 224 m/s)                                   |
| <b>Measuring principle:</b>                                       | Differential pressure  |
| <b>Measuring span:</b>  | 1:10   |
| <b>Response time:</b>   | t <sub>99</sub> : < 1 sec.   |
| <b>Temperature of the medium:</b>                                 | -30 °...+180 °C  |
| <b>Operating pressure:</b>  | Max. 20 bar  |
| <b>Ambient temperature:</b>                                       | -30 °...+70 °C   |
| <b>Screw-in thread:</b>   | G 1/2", ISO 228  |
| <b>Power supply:</b>  | 18...36 VDC, 5 W   |
| <b>Signal outputs:</b>  | As standard:<br>RS 485 (Modbus-RTU), 4...20 mA, pulse<br><b>Optional:</b><br>Ethernet Interface (PoE), M-Bus |

Example order code VD 500:

0690 5001\_A1\_B1\_C1\_D1\_E1\_F1\_G1\_K1

| Measuring range |         |
|-----------------|---------|
| A1              | 224 m/s |
| A2              | 600 m/s |

| Screw-in thread |                        |
|-----------------|------------------------|
| B1              | G 1/2"                 |
| B2              | G 1/2" NPT male thread |

| Installation length / shaft length |        |
|------------------------------------|--------|
| C1                                 | 220 mm |
| C2                                 | 400 mm |

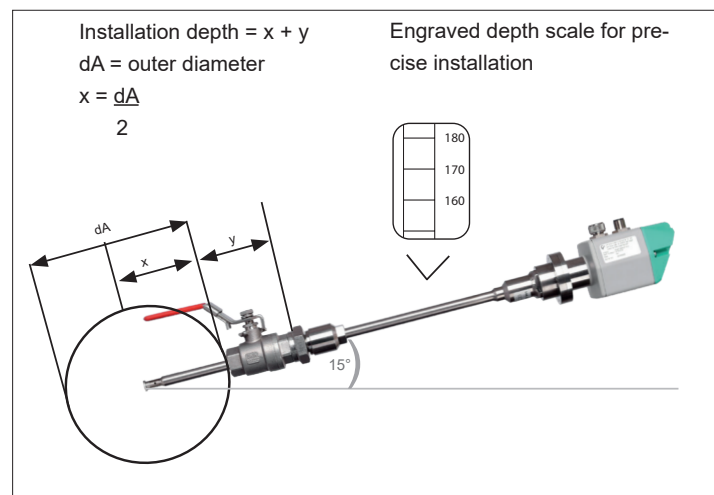
| Display |                         |
|---------|-------------------------|
| D1      | with integrated display |

| Signal outputs / bus connection option |   |
|--|---|
| E1                                     | 1x 4...20 mA analogue output (electrically not isolated), pulse output, RS 485 (Modbus-RTU)   |
| E2                                     | Ethernet interface (Modbus/TCP), 1 x 4...20 mA analogue output (not electrically isolated), RS 485 (Modbus-RTU)                           |
| E3                                     | Ethernet interface PoE (Power over Ethernet) (Modbus/TCP), 1 x 4...20 mA analogue output (not electrically isolated), RS 485 (Modbus-RTU) |
| E4                                     | M-Bus, 1 x 4...20 mA analogue output (not electrically isolated), RS 485 (Modbus-RTU)   |

| Reference standard |                     |
|--------------------|---------------------|
| G1                 | 20 °C, 1000 mbar    |
| G2                 | 0 °C, 1013.25 mbar  |
| G3                 | 15 °C, 981 mbar     |
| G4                 | 15 °C, 1013.25 mbar |

| Gas type |                           |
|----------|---------------------------|
| K1       | Compressed air            |
| K90      | Additional gas on request |

Simple installation and removal under pressure



Recommended installation position

| DESCRIPTION                               | ORDER NO.                     |
|---|-------------------------------|
| VD 500 flow sensor for wet compressed air | 0690 5001 + Order code A...K_ |
| <b>Accessories:</b>                       |                               |
| ISO calibration certificate               | 3200 0001                     |
| High-pressure protection                  | 0530 1117                     |

For further accessories refer to pages 88 to 92

| Flow measuring ranges VD 500 for compressed air at a typical 7 bar (abs) and 50 °C (ISO 1217:1000 mbar, 20 °C) |       |        |   |                |
|--|-------|--------|---|----------------|
| Inside diameter of pipe  |       |        | VD 500<br>20 ... 224 m/s                      |                |
| Inch   | mm    | DN     | Measuring range initial values and full scale |                |
|  |       |        | m <sup>3</sup> /h                             | (cfm)          |
| 3/4"   | 21.7  | DN 20  | 19 ... 215                                    | 11 ... 127     |
| 1"   | 27.3  | DN 25  | 32 ... 357                                    | 19 ... 210     |
| 1 1/4"   | 36.0  | DN 32  | 57 ... 644                                    | 34 ... 379     |
| 1 1/2"   | 41.9  | DN 40  | 79 ... 886                                    | 47 ... 522     |
| 2"   | 53.1  | DN 50  | 130 ... 1450                                  | 76 ... 853     |
| 2 1/2"   | 68.9  | DN 65  | 222 ... 2484                                  | 131 ... 1462   |
| 3"   | 80.9  | DN 80  | 307 ... 3440                                  | 181 ... 2025   |
| 4"   | 110.0 | DN 100 | 571 ... 6391                                  | 336 ... 3762   |
| 5"   | 133.7 | DN 125 | 844 ... 9453                                  | 497 ... 5564   |
| 6"   | 159.3 | DN 150 | 1200 ... 13436                                | 706 ... 7908   |
| 8"   | 200.0 | DN 200 | 1896 ... 21230                                | 1116 ... 12495 |
| 10"  | 250.0 | DN 250 | 2966 ... 33211                                | 1746 ... 19547 |
| 12"  | 300.0 | DN 300 | 4276 ... 47881                                | 2517 ... 28182 |