VA 500 - Flow meter for compressed air and gases

NEW:
As option, integrated pressure sensor



Movable mounting thread G 1/2″

Circlip
Ø 11,7 mm

Special features:

- Including temperature measurement, optional: pressure measurement
- RS 485 interface, Modbus-RTU as standard
- Integrated display for m³/h and m³
- Applicable from 1/2” to DN 1000
- Easy installation under pressure
- 4...20 mA analogue output for m³/h or m³/min
- Pulse output for m³ or M-Bus (optional)
- Inner diameter adjustable by means of keys
- Flow meter can be reset
- Adjustable by means of keypad on the display: Reference conditions, °C and mbar, 4...20 mA scaling, pulse weight



Inner diameter adjustable via keypad



Option:
Bi-directional measurement. Blue or green arrows in the display indicate the direction of flow.
A meter reading is available for each flow direction.





The sensor can be removed during operation and cleaned if necessary.

TECHNICAL DATA VA 500	
Parameters:	m³/h, l/min (1000 mbar, 20 °C) in case of compressed air or Nm³/h, Nl/min (1013 mbar, 0 °C) in case of gases
Units adjustable via keys at display:	m³/h, m³/min, l/min, l/s, ft/min, cfm, m/s, kg/h, kg/min, g/s, lb/min, lb/h
Adjustable via keypad:	Diameter for volume flow calculation, counter resettable
Sensor:	Thermal mass flow sensor
Measured medium:	Air, gases
Gas types are adjustable over CS service software or CS data logger:	Air, nitrogen, argon, helium, CO2, oxygen, vacuum
Measuring range:	See table page 94
Accuracy: (m.v.: of meas. value) (f.s.: of full scale)	± 1.5% of m.v. ± 0.3 % of f.s. on request: ± 1% of m.v. ± 0.3% of f.s.
Operating temperature:	-30...110 °C sensor tube -20...85 °C with pressure sensor -20...+70 °C housing
Operating pressure:	-1…50 bar (for pressure > 10 bar - order additional high-pressure protection)
Digital output:	RS 485 interface, (Modbus-RTU), optional: Ethernet interface PoE, M-Bus, IO-Link
Analogue output:	4…20 mA for m³/h or l/min
Pulse output:	1 pulse per m³ or per litre electrically isolated. Pulse weight can be set on the display. Alternatively, the pulse output can be used as an alarm
Supply:	18…36 VDC, 5 W
Burden:	< 500 Ω
Housing:	Polycarbonate (IP 65)
Sensor tube:	Stainless steel, 1.4301 Installation length 220 mm, Ø 10 mm
Mounting thread:	G 1/2″, 1/2″ NPT male thread
Ø housing:	65 mm
Mounting position:	any

VA 500- Flow meter

Example order code VA 500:

0695 5001_B1_C1_D1_E1_F1_H1_J1_K1_L1_M1_N1_O1_P1_R1_Y1

Measuring range (see table page 134 to 137)	
B1	Standard version (92,7 m/s)
B2	Max version (185 m/s)
B3	High-Speed version (224 m/s)
B4	Low-Speed version (50 m/s)

Screw-in thread	
C1	G 1/2" male thread
C2	1/2" NPT male thread
C3	PT 1/2" male thread

Installation length / shaft length	
D1	220 mm
D2	120 mm
D3	160 mm
D4	300 mm
D5	400 mm
D6	500 mm
D7	600 mm
D8	700 mm

Display option	
E1	with integrated display
E2	without display

Signal outputs / bus connection option	
F8	M-Bus, 1 x 4…20 mA analogue output (not electrically isolated), RS 485 (Modbus-RTU)
F9	1 x 4…20 mA analogue output (not electrically isolated), pulse output, RS 485 (Modbus-RTU)
F10	Ethernet interface (Modbus / TCP), 1 x 4...20 mA analogue output (not electrically isolated), RS 485 (Modbus-RTU)
F11	Ethernet interface PoE (Power over Ethernet) (Modbus/TCP), 1 x 4…20 mA analogue output (not electrically isolated), RS 485 (Modbus-RTU)
F12	IO-Link, 1 x 4…20 mA analog output (not galvanically isolated), RS 485 (Modbus RTU), pulse output not applicable

Surface conditon	
H1	standard version
H2	special cleaning - oil and grease free (e.g. for oxygen applications and so on)
H3	Silicone-free version including special cleaning oil- and grease-free

Adjustment / calibration	
J1	No real gas adjustment - gas type configuration per gas constant
J2	Real gas adjustment in the gas type selected below

Gas type	
K1	Compressed air
K2	Nitrogen (N2)
K3	Argon (Ar)
K4	Carbon dioxide (CO2)
K5	Oxygen (O2)
K6	Nitrous oxide (N2O)
K7	Natural gas (NG)
K8	Helium (He) (real gas adjustment **J2** required)
K9	Propane (C3H8) (real gas adjustment **J2** required)
K10	Methane (CH4)
K12	Further gas / please indicate gas type (on request)
K13	Gas mixture / please indicate mixture ratio (on request)

Reference standard	
L1	20 °C, 1000 mbar
L2	0 °C, 1013,25 mbar
L3	15 °C, 981 mbar
L4	15 °C, 1013,25 mbar

Accuracy class	
M1	± 1.5% of the measured value ± 0.3% f.s. (standard)
M2	± 1% of the measured value ± 0.3% f.s. (precision)

Approvals	
N1	Non-explosive area - no approval

Bi-directional measurement	
O1	without
O2	with (includes 2 x 4...20 mA analog outputs and 2x pulse outputs. These are omitted for Ethernet (PoE) and M-Bus).

Maximum pressure (more than 10 bar high-pressure protectection required!)	
P1	50 bar
P2	16 bar

Special measuring range	
R1	Special measuring range (please specify when placing order)

Option pressure measurement (only with: D1, D4, D5, D6, K1, K2, K3, H1, O1, P2)	
Y1	without pressure sensor
Y2	with integrated pressure sensor 0...16 bar(g) (Output only via digital interfaces)
Y3	with integrated pressure sensor 10...2000 mbar (abs), for vacuum applications (output only via digital interfaces)

DESCRIPTION	ORDER NO.
High-pressure protection recommended for installation from 10 to 50 bar (for VA 400/500)	See page 117
ISO calibration certificate (5 calibration points) for VA sensors	3200 0001
Additional calibration curve stored in the sensor	Z695 5011
Certificate of origin	Z695 5012

For further accessories refer to pages 126 to 130

Simple installation and removal under pressure

1) Even under pressure, the flow probe VA 500 is mounted by means of a standard 1/2" ball valve.

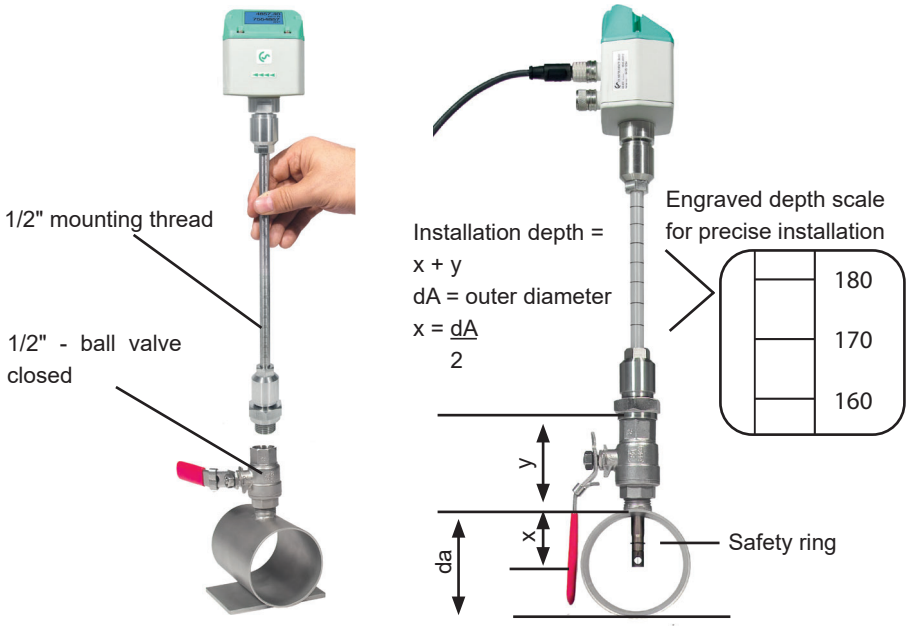
During mounting and dismounting the safety ring avoids an uncontrolled ejection of the probe which may be caused by the operating pressure.

For the mounting into different pipe diameters, VA 500 is available in the following probe lengths: 120, 160, 220, 300, 400 mm.

The flow probes are therefore suitable for being mounted into existing pipes with diameters of 1/2" to DN 300 upwards.

The exact positioning of the sensor in the middle of the pipe is granted by means of the engraved depth scale.

The maximum mounting depth corresponds to the respective probe length. (Probe length 220 mm = 220 mm maximum mounting depth).



2) If there is no suitable measuring site with 1/2" ball valve, there are two easy ways to set up a measuring site:

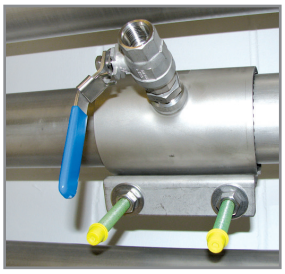
A Weld on a 1/2" screw neck and screw on a 1/2" ball valve

B Mount spot drilling collar incl. ball valve (see accessories).

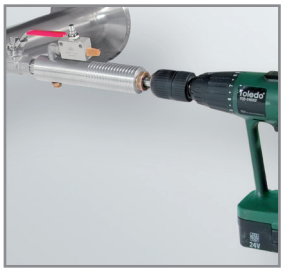
By means of the drilling jig, it is possible to drill under pressure through the 1/2" ball valve into the existing pipe. The drilling chips are collected in a filter. Then install the probe as described under 1).



A Screw neck



B Spot drilling collars



Drill under pressure with the CS drilling jig

3) Due to the large measuring range of the probe even extreme requirements to the consumption measurement (high volume flow in small pipe diameters) can be met.

The measuring range is depending on the pipe diameter - see table on the right hand side.

Flow measuring ranges VA 500 for compressed air (ISO 1217: 1000 mbar, 20 °C)
Measuring ranges for other types of gas see pages 136 to 137

Inside diameter of pipe			**VA 500 Standard** (92.7 m/s)		**VA 500 Max.** (185.0 m/s)		**VA 500 High-Speed** (224.0 m/s)	
Inch	mm		Measuring range full scale		Measuring range full scale		Measuring range full scale	
			m³/h	(cfm)	m³/h	(cfm)	m³/h	(cfm)
1/2″	16.1	DN 15	759 l/min	26	1516 l/min	53	1836 l/min	64
3/4″	21.7	DN 20	89 m³/h	52	177 m³/h	104	215 m³/h	126
1″	27.3	DN 25	148 m³/h	86	294 m³/h	173	356 m³/h	210
1 1/4″	36.0	DN 32	266 m³/h	156	531 m³/h	312	643 m³/h	378
1 1/2″	41.9	DN 40	366 m³/h	215	732 m³/h	430	886 m³/h	521
2″	53.1	DN 50	600 m³/h	353	1197 m³/h	704	1450 m³/h	853
2 1/2″	68.9	DN 65	1028 m³/h	604	2051 m³/h	1207	2484 m³/h	1461
3″	80.9	DN 80	1424 m³/h	838	2842 m³/h	1672	3441 m³/h	2025
4″	110.0	DN 100	2644 m³/h	1556	5278 m³/h	3106	6391 m³/h	3761
5″	133.7	DN 125	3912 m³/h	2302	7808 m³/h	4594	9453 m³/h	5563
6″	159.3	DN 150	5560 m³/h	3272	11096 m³/h	6530	13436 m³/h	7907
8″	200.0	DN 200	8785 m³/h	5170	17533 m³/h	10318	21229 m³/h	12493
10″	250.0	DN 250	13744 m³/h	8088	27428 m³/h	16141	33211 m³/h	19544
12″	300.0	DN 300	19814 m³/h	11661	39544 m³/h	23271	47880 m³/h	28177