

VA 550 - Flow meter insertion type



Flow sensor for installation in existing compressed air or gas line of 3/4" to DN 1000



Housing IP 67

Outputs:
4...20 mA, pulse, Modbus,
M-Bus, Profi Bus, Ethernet,
HART

Housing rotatable, display
180° rotatable (on the head).
Settings can be modified via
display, flow meter can be
reset



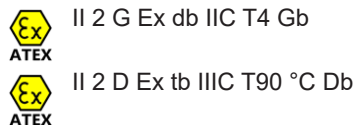
Advantages of optical keys:

The sensor can also be config-
ured in the ATEX area, without
the housing needing to be
opened.

All wetted parts made from stain-
less steel 1.4571



Approvals:



The sensor can
be removed and
cleaned

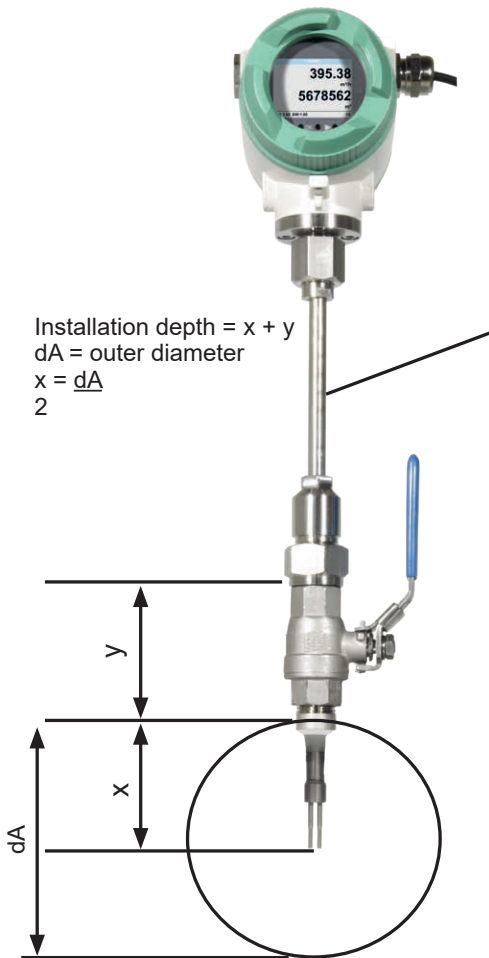
Special measurement technology features:

- 4 values on the display: Flow, total consumption, velocity, temperature. Units freely adjustable
- All measured values, settings such as gas type, inner diameter, serial number and so on can be accessed via Modbus-RTU
- Comprehensive diagnostic functions readable on the display or remote access via Modbus such as calibration cycle, error codes, serial number
- Notification in case of exceeding the calibration cycle
- Standard version accuracy 1.5% of m.v. ± 0.3% of f.s.
- Precision version accuracy 1.0% of m.v. ± 0.3% of f.s.
- Measuring span of 1 : 1000 (0.1 up to 224 m/s)
- Configuration and diagnosis via display, hand-held device PI 500, PC service software on-site
- Gas type (air, nitrogen, oxygen, argon and so on) freely adjustable via PC service software or external device DS 400, DS 500, PI 500
- Reference conditions °C and mbar/hPa freely adjustable
- Zero-point adjustment, leak flow volume suppression
- Pressure loss negligible

Special mechanical features:

- Robust impact-proof aluminium die cast housing for the outdoor area IP 67
- All wetted parts made from stainless steel 1.4571
- Suitable as an insertion version for 3/4" to DN 1000
- On request with DVGW approval for natural gas (up to 16 bar)
- Pressure range up to 50 bar, special version up to 100 bar
- Temperature range up to 180 °C
- No moveable parts, no wear
- Sensor tip very robust, easy to clean
- Easy installation and removal under pressure via 1/2" ball valve
- Housing rotatable, display rotatable by 180°
- Safety ring for installation and removal under pressure
- Depth scale for precise installation

Easy mounting/dismounting of **VA 550** under pressure - without disconnection of the line - without emptying the line



Installation depth = $x + y$
 $dA = \text{outer diameter}$
 $x = \frac{dA}{2}$

Engraved depth scale for precise installation

			180
			170
			160

If there is no suitable measuring site with 1/2" ball valve, there are two simple possibilities 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 including ball valve

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 the probe can be mounted.



A Screw neck

Order no.: 3300 0006



B Spot drilling collars

Order no.: see page 106



Drill under pressure with the CS drilling jig

Order no.: 0530 1108



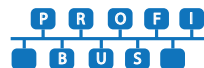
Ethernet Modbus TCP
 M12 Ethernet port, x-coded

Optional: Connection to different Bus systems

There are different options available for connection to modern Bus systems:

- Ethernet interface (Modbus-TCP) / PoE
- M-BUS
- Modbus-RTU
- Profibus DP interface (in process)
- Profinet interface (in process)
- HART (in process)

For further accessories refer to pages 102 to 106



VA 550 - Flow meter insertion meter

Example order code VA 550:

0695 0550_A1_B1_C1_D1_E1_F1_G1_H1_I1_J1_K1_L1_M1_R1

Measuring range (see table page 110 to 113)

A1	Standard version (92,7 m/s)
A2	Max version (185 m/s)
A3	High-speed version (224 m/s)
A4	Low-speed version (50 m/s)

Screw-in thread

B1	G 1/2" male thread
B2	1/2" NPT male thread

Installation length / shaft length

C1	220 mm
C2	300 mm
C3	400 mm
C4	500 mm
C5	600 mm
C6	700 mm (not with ATEX)
C7	160 mm
C8	1000 mm (not with ATEX)
C9	1500 mm (not with ATEX)

Display option

D1	with integrated display
D2	without display

Signal outputs / bus connection option

E1	2 units 4...20 mA analogue output (electrically isolated), pulse output, RS 485 (Modbus-RTU)
E4	1 x 4...20 mA analogue output (not electrically isolated), pulse output, RS 485 (Modbus-RTU)
E5	Ethernet interface (Modbus / TCP), 1 x 4...20 mA analogue output (not electrically isolated), pulse output, RS 485 (Modbus-RTU)
E8	M-Bus, 1 x 4...20 mA analogue output (not electrically isolated), pulse output, RS 485 (Modbus-RTU)
E9	Ethernet interface PoE (Power over Ethernet) (Modbus/TCP), 1 x 4...20 mA analogue output (not electrically isolated), pulse output, RS 485 (Modbus-RTU)

Adjustment / calibration

F1	No real gas adjustment - gas type configuration per gas constant
F2	Real gas adjustment in the gas type selected below

Gas type

G1	Compressed air
G2	Nitrogen (N2)
G3	Argon (Ar)
G4	Carbon dioxide (CO2)
G5	Oxygen (O2)
G6	Nitrous oxide (N2O)
G7	Natural gas (NG)
G8	Helium (He) (real gas adjustment F2 required)
G9	Propane (C3H8) (real gas adjustment F2 required)
G10	Methane (CH4)
G11	Biogas (methane 50% : CO2 50%)
G12	Hydrogen (H2) (real gas adjustment F2 required)
G90	Further gas / please indicate gas type (on request)
G91	Gas mixture / please indicate mixture ratio (on request)

Maximum pressure (more than 10 bar high-pressure protection required!)

H1	50 bar
H2	100 bar
H3	16 bar

Surface condition

I1	standard version
I2	special cleaning - oil and grease free (e.g. for oxygen applications and so on)
I3	Silicone-free version including special cleaning oil- and grease-free

Accuracy class

J1	± 1.5% of the measured value ± 0.3% f.s. (standard)
J2	± 1% of the measured value ± 0.3% f.s. (precision)

Maximum gas temperature on the sensor tip

K1	up to 120 °C gas temperature (only for ATEX version)
K2	up to 180 °C gas temperature (standard)

Approvals

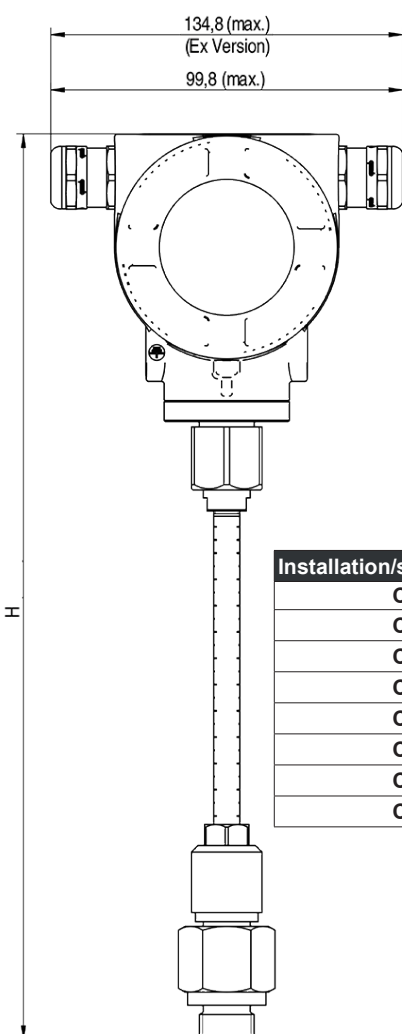
L1	Non-explosive area - no approval
L2	ATEX II 2G Ex db IIC T4 Gb ATEX II 2D Ex tb IIIC T90 °C, Db
L3	DVGW approval for natural gas (max. pressure 16 bar)

Reference standard

M1	20 °C, 1000 mbar
M2	0 °C, 1013.25 mbar
M3	15 °C, 981 mbar
M4	15 °C, 1013.25 mbar

Special measuring range

R1	Special measuring range (please specify when placing order)
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Installation/shaft length	L (mm)	H (mm)
C1	220	441
C2	300	521
C3	400	621
C4	500	721
C5	600	821
C7	160	381
C8	1000	1221
C8	1500	1721

Further accessories:

DESCRIPTION	ORDER NO.
Connection cable for probes 5 m with open ends	0553 0108
Connection cable for probes 10 m with open ends	0553 0109
Ethernet connection cable length 5 m, M12 plug x-coded (8 pin) to RJ 45 plug	0553 2503
Ethernet connection cable length 10 m, M12 plug x-coded (8 pin) to RJ 45 plug	0553 2504
Mains unit in wall housing for maximum 2 sensors of the series VA/FA 5xx, 100-240 V, 23 VA, 50-60 Hz / 24 VDC, 0.35 A	0554 0110
ISO calibration certificate at 5 measuring points for VA 500/550	3200 0001
Additional calibration point for volume flow (point freely selectable)	0700 7720
CS Service Software VA 550 incl. interface cable to PC (USB) and power supply - for configuration / parametrization of VA 550	0554 2007
High-pressure protection recommended for installation from 10 to 100 bar (for VA 550)	0530 1115
High-pressure protection recommended for installation from 10 to 16 bar DVGW (for VA 550)	0530 1116
PNG cable screwing - standard VA 550/570	0553 0552
PNG cable screwing - for ATEX version VA 550/570	0553 0551

Order no. VA 550

DESCRIPTION	ORDER NO.
VA 550 Flow meter, measuring head in robust aluminium die casting housing	0695 0550 + Order code A...R_

TECHNICAL DATA VA 550

Measuring range VA 550:	up to 50 Nm/s, low-speed version* up to 92.7 Nm/s, standard version* up to 185 Nm/s, max. version* up to 224 Nm/s, high-speed version*
	* Measuring range Nm ³ /h for different pipe diameters and gases, see table measuring ranges flow * All measured values related to DIN 1343 standard conditions 0° and 1013 mbar ex works
Accuracy: Accuracy class (o. M. V. = of measured value) (o. F. S. = of full scale)	± 1.5 % of m.v. ± 0.3 % of f.s. on request: ± 1.0 % of m.v. ± 0.3 % of f.s.
Accuracy indications:	relative to ambient temperature 22 °C ± 2 °C, system pressure 6 bar
Repeatability:	0.25 % of m.v. in case of correct mounting (mounting aid, position, inlet section)
Measuring principle:	Thermal mass flow sensor
Response time:	t 90 < 3 s
Operating temperature range sensor tube/display unit:	-40...180 °C standard version, sensor tube -20...70 °C display unit -20...120 °C for ATEX version
Adjustment possibilities via display, external hand-held device PI 500, PC Service Software, remote diagnosis:	Nm ³ /h, Nm ³ /min, Nl/min, l/s, ft/min, cfm, kg/h, kg/min, inner diameter, reference conditions ° C/° F, mbar/hPa, zero point correction, leak flow volume suppression, scaling analogue output 4...20 mA, pulse/alarm, error codes etc.
Outputs:	Standard: 1 x 4...20 mA analogue output (electrically not isolated), pulse output, RS 485 (Modbus-RTU) Optional: 2 x 4...20 mA active, Modbus TCP, HART, Profibus DP, Profinet, M-Bus
Burden:	< 500 ohm
Additional average value calculation:	for all parameters freely adjustable from 1 minute up to 1 day, e. g. 1/2 hours average value, average day value
Protection class:	IP 67
Material:	Die-cast aluminum housing, sensor tube stainless steel 1.4571
Screw-in thread:	G 1/2" ISO 228, NPT 1/2", R 1/2", PT 1/2"
Operating pressure VA 550:	50 bar, in special version 100 bar (with DVGW approval max. 16 bar)
Power supply:	18...36 VDC, 5 W
Approval:	ATEX II 2G Ex db IIC T4 Gb, ATEX II 2D Ex tb IIC T90 °C, Db, DVGW