



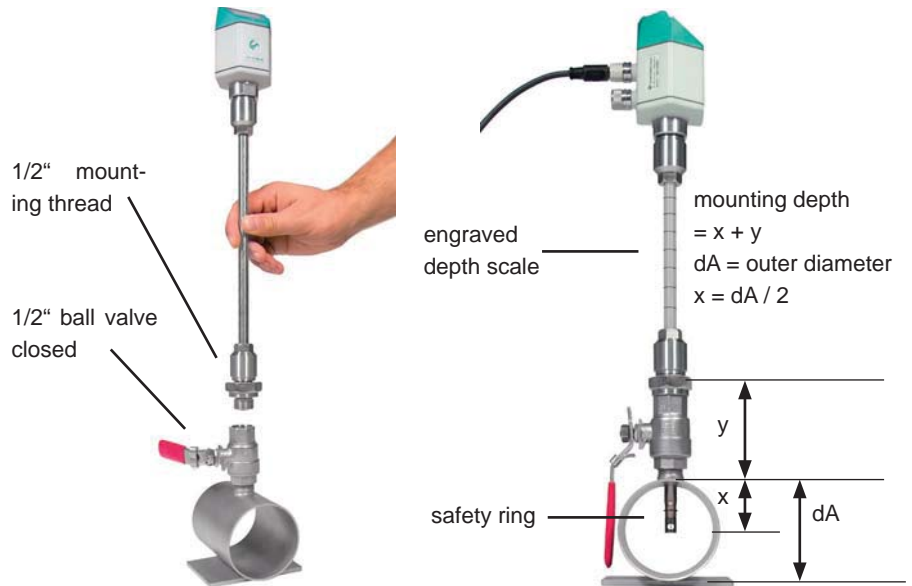
# What are the advantages of the flow measuring technology of CS Instruments ?

1) Even under pressure, the flow sensor VA 400 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 400 is available in the following probe lengths: 120, 160, 220, 300, 400 mm.

So the flow sensors are being mounted into existing pipelines with inner diameters of 1/2" 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 with the respective probe length. Example: VA 400 with probe length 220 mm has a maximum mounting depth of 220 mm.



2) If there is no suitable measuring site with a 1/2" ball valve present there are two simple possibilities to set up a measuring point:

- 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)



A Screw neck



B Spot drilling collar



Drilling under pressure

By means of the drilling jig it is possible to drill under pressure through the 1/2" ball valve into the existing pipeline. The drilling chips are collected in a filter. Then the probe can be mounted as described under point A.

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 400 for compressed air (ISO 1217:1000 mbar, 20 °C)					
Inner diameter of pipe			VA 400 Standard (92.7 m/s)	VA 400 Max. (185.0 m/s)	VA 400 High-Speed (224.0 m/s)
Inch	mm		Measuring range from to	Measuring range from to	Measuring range from to
1/2"	16.1	DN 15	2.5...760 l/min	3.5...1516 l/min	6.0...1836 l/min
3/4"	21.7	DN 20	0.3...89 m³/h	0.4...178 m³/h	0.7...215 m³/h
1"	27.3	DN 25	0.5...148 m³/h	0.6...295 m³/h	1.1...357 m³/h
1 1/4"	36.0	DN 32	0.9...280 m³/h	1.2...531 m³/h	2.5...644 m³/h
1 1/2"	41.9	DN 40	1.2...366 m³/h	1.5...732 m³/h	3.0...886 m³/h
2"	53.1	DN 50	2...600 m³/h	2.5...1198 m³/h	4.6...1450 m³/h
2 1/2"	71.1	DN 65	3.5...1096 m³/h	5...2187 m³/h	7...2648 m³/h
3"	84.9	DN 80	5...1570 m³/h	7...3133 m³/h	12...3794 m³/h
4"	110.0	DN 100	9...2645 m³/h	12...5279 m³/h	16...6391 m³/h
5"	133.7	DN 125	13...3912 m³/h	18...7808 m³/h	24...9453 m³/h
6"	159.3	DN 150	18...5560 m³/h	25...11097 m³/h	43...13436 m³/h
8"	200.0	DN 200	26...8786 m³/h	33...17533 m³/h	50...21230 m³/h
10"	250.0	DN 250	40...13744 m³/h	52...27429 m³/h	80...33211 m³/h
12"	300.0	DN 300	60...19815 m³/h	80...39544 m³/h	100...47881 m³/h



# VA 400

## Flow sensor for compressed air and gases

The new VA 400 for flow measurement of compressed air and gases in a robust housing with and without display with actual flow in m<sup>3</sup>/h and counter in m<sup>3</sup>.

### Special features:

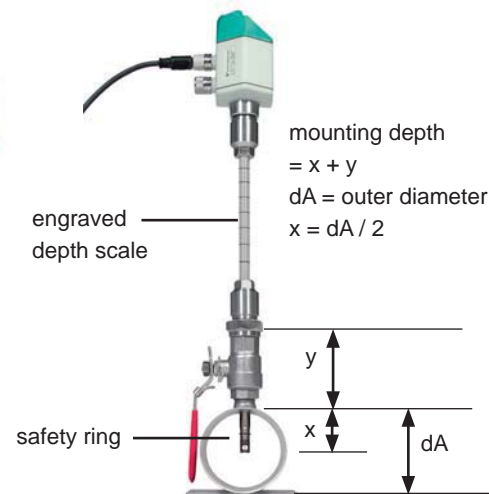
- Integrated display for m<sup>3</sup>/h and m<sup>3</sup>
- Depth scale for accurate installation
- Usable from 1/2" to 12" (DN 300)
- Easy installation under pressure
- 4...20 mA analogue output for m<sup>3</sup>/h resp. m<sup>3</sup>/min
- Pulse output for m<sup>3</sup>
- Inner diameter adjustable via keypad
- Consumption counter resettable



Inner diameter adjustable via keypad

flexible mounting thread G 1/2"

safety ring Ø 11.7 mm



### Technical data VA 400

<b>Parameters:</b>	m <sup>3</sup> /h, l/min (1000 mbar, 20°C) in case of compressed air resp. Nm <sup>3</sup> /h, NI/min (1013 mbar, 0°C) in case of gases
<b>Adjustable via software:</b>	m <sup>3</sup> /h, m <sup>3</sup> /min, l/min, l/s, ft/min, cfm, m/s, kg/h, kg/min
<b>Adjustable via keypad:</b>	diameter for volume flow calculation, counter resettable
<b>Meas. principle:</b>	calorimetric measurement
<b>Sensor:</b>	2 x silicium chip
<b>Meas. medium:</b>	air, gases
<b>Gas types adjustable via software:</b>	air, nitrogen, argon, nitrous oxide, CO <sub>2</sub> , oxygen
<b>Meas. range:</b>	see table at page 54
<b>Accuracy:</b>	± 4 % m.v. ± 3 % m.v. via 5 point ISO precision calibration
<b>Operating temp.:</b>	-30...110 °C probe tube -30...80 °C housing
<b>Operating pressure:</b>	up to 50 bar
<b>Analogue output:</b>	4...20 mA for m <sup>3</sup> /h resp. l/min on request: scaling for cfm, m <sup>3</sup> /min, l/min, l/s, ft/min, m/s
<b>Pulse output:</b>	1 pulse per m <sup>3</sup> , signal high 24 VDC, for 30 ms
<b>PC connection:</b>	SDI interface
<b>Power supply:</b>	24 VDC
<b>Burden:</b>	< 500 Ω
<b>Housing:</b>	polycarbonate
<b>Probe tube:</b>	stainless steel, 1.4301 mounting length 220 mm, Ø 10 mm
<b>Mounting thread:</b>	G 1/2"
<b>Ø housing:</b>	65 mm

Description	Order No.
VA 400 flow sensor in basic version: Standard (92.7 m/s), probe length 220 mm, without display	0695 4001
<b>Options for VA 400:</b>	
Display	Z695 4000
Max. version (185 m/s)	Z695 4003
HighSpeed version (224 m/s)	Z695 4002
Probe length 120 mm	ZSL 0120
Probe length 160 mm	ZSL 0160
Probe length 300 mm	ZSL 0300
Probe length 400 mm	ZSL 0400
<b>Connection cables:</b>	
Connection cable, 5 m (power supply, analogue output, pulse output)	0553 0104
Connection cable, 10 m (power supply, analogue output, pulse output)	0553 0105
<b>Further accessories:</b>	
CS Service Software for FA/VA 400 sensors incl. PC connection set, USB interface and interface adapter to the sensor (please see page 58)	0554 2005
Mains unit in wall housing 100-240 V, 10 VA, 50-60 Hz/24 VDC, 0.35 A	0554 0108
External wall display chart recorder DS 400	see page 72
5 point precision calibration with ISO certificate	3200 0001