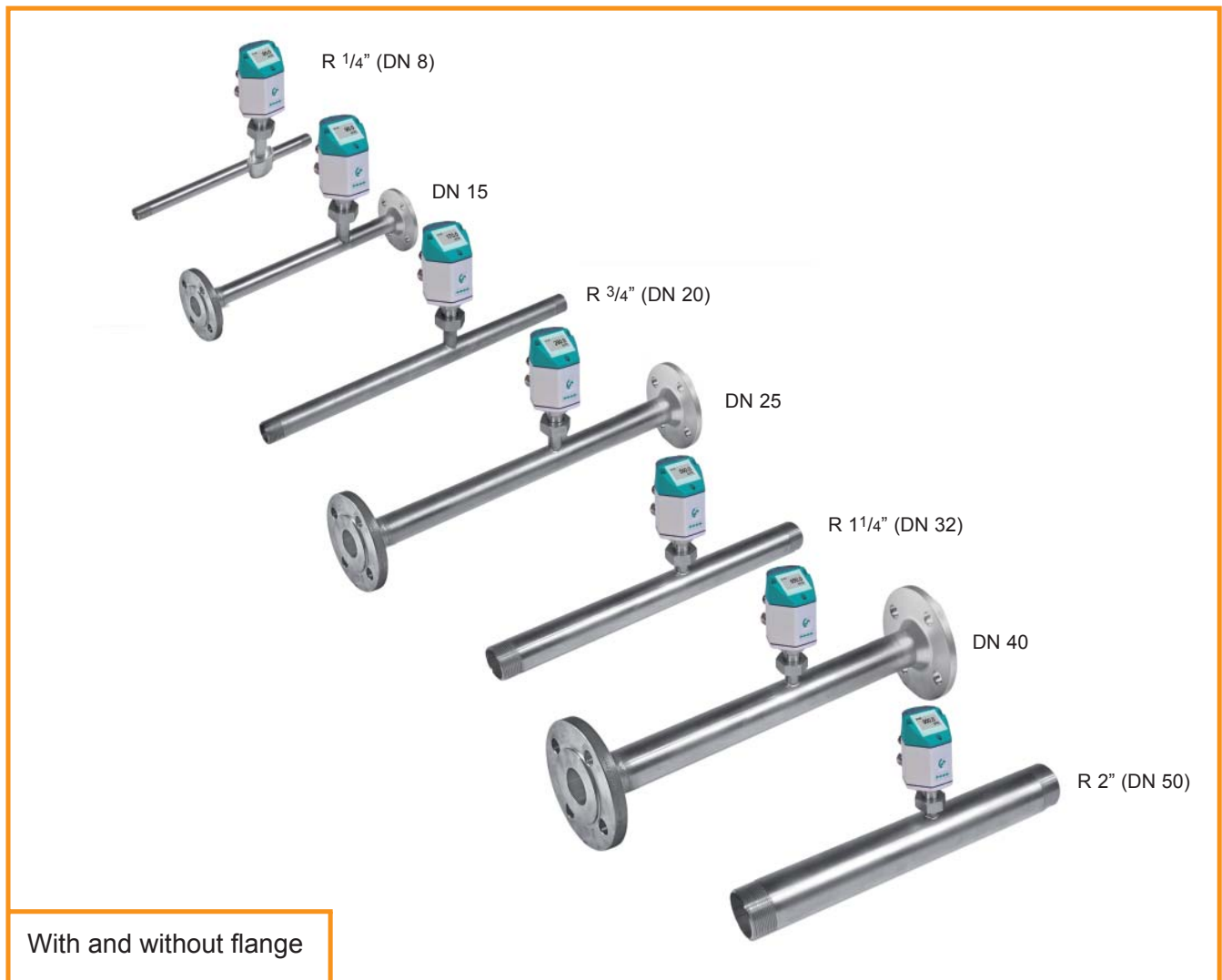




# VA 420

**NEW**

The affordable consumption counter for compressed air and gases



## Intelligent solutions for accurate consumption measurement for compressed air and gases

The new affordable consumption counters VA 420 work according to the approved calorimetric measuring principle. In this process a heated sensor is cooled down by the gas circulating around it. The flow-dependent cooling-down is used as a

measuring effect while the degree of cooling-down is directly depending on the passing air resp. gas mass. Therefore, an additional pressure and temperature compensation is not necessary.

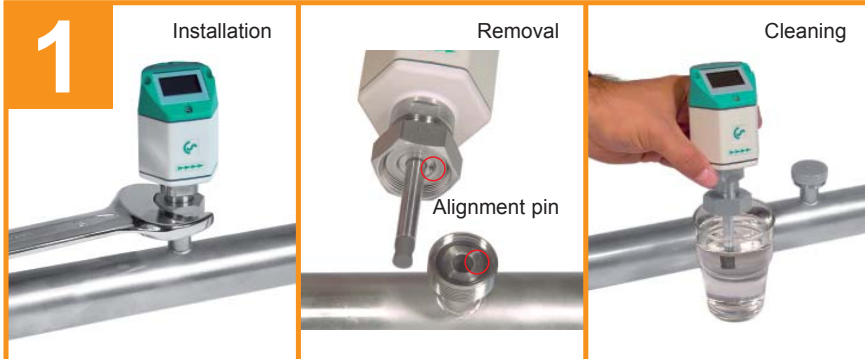
Due to its compact design it is possible to monitor all compressed air systems from the compressor to the smallest compressed air tool (1/4" to 2 inch) with the new affordable consumption counter VA 420. VA 400 consumption sensors are available

for larger pipe diameters from DN 50 to DN 300. Apart from compressed air also other gases like e. g. nitrogen, oxygen and CO<sub>2</sub> can be measured.

The installation of the compressed air counters VA 420 can be done easily and quickly. A special advantage is the removable measuring device. The measuring device can be demounted quickly and easily for calibration or cleaning purposes without removing the complete measuring section.



## Removal of the measuring device without complete dismantling of the measuring section



In most cases the compressed air is not free from oil, condensate, dirt and particles. In the course of time this leads to a soiling of the compressed air counters which may

cause errors in measurement or even a total breakdown. The compressed air counters which have been on the market up to now generally

cannot be cleaned and will be exchanged if they are soiled. In case of compressed air counters with integrated measuring section the "measuring device" cannot be removed. For this reason an expensive bypass line is necessary.

**New.** The design of **VA 420** enables the removal and cleaning of the "measuring device" with e. g. soap water without any dismantling of the measuring section. A closing cap grants a continuous use of the line for the duration of the cleaning. A bypass line is not necessary. The alignment pin grants an accurate installation of the measuring device.

## Stationary use



For stationary use there are the following outputs available for the data transfer to a building management system or PLC:  
4...20 mA for actual consumption.  
Pulse output (galvanically separated) for the total consumption.

## Mobile use



By means of quick couplings the compressed air counter can be integrated quickly into the feed hose of a machine. During the shutdown of the machine it is possible to determine the leak rate, the actual consumption can be obtained when the machine is running. The power supply is effected via the power socket by means of the mains unit. For data recording over a longer period of time we recommend to use the compressed air analyzer DS 300 mobile.

## Solution for large pipe diameters



The approved consumption sensor VA 400 is available for pipe diameters of 2" to DN 300. Its constructively sophisticated design enables the installation into pipes with nominal diameters up to DN 300 even under pressure. The installation is effected by means of a standard 1/2" ball valve.



## VA 420 – The advantages at a glance

4...20 mA output for actual consumption

Pulse output for total consumption  
(counter reading)

Measuring device removable:  
Dismounting of the whole measuring section  
is not necessary, no bypass required.

Screw-in thread:  
Easy installation into the existing pipeline  
due to integrated measuring section  
(suitable for 1/4", 1/2", 3/4", 1", 1 1/4", 1 1/2"  
or 2" lines).

High measuring accuracy due  
to defined measuring section  
(inlet and outlet section).



Display twistable by 180°

Display shows 2 values:  
Actual consumption in m³/h, l/min,...  
Total consumption  
(counter reading) in m³, l

Values indicated in the display  
turnable by 180°, e. g. in case  
of overhead installation



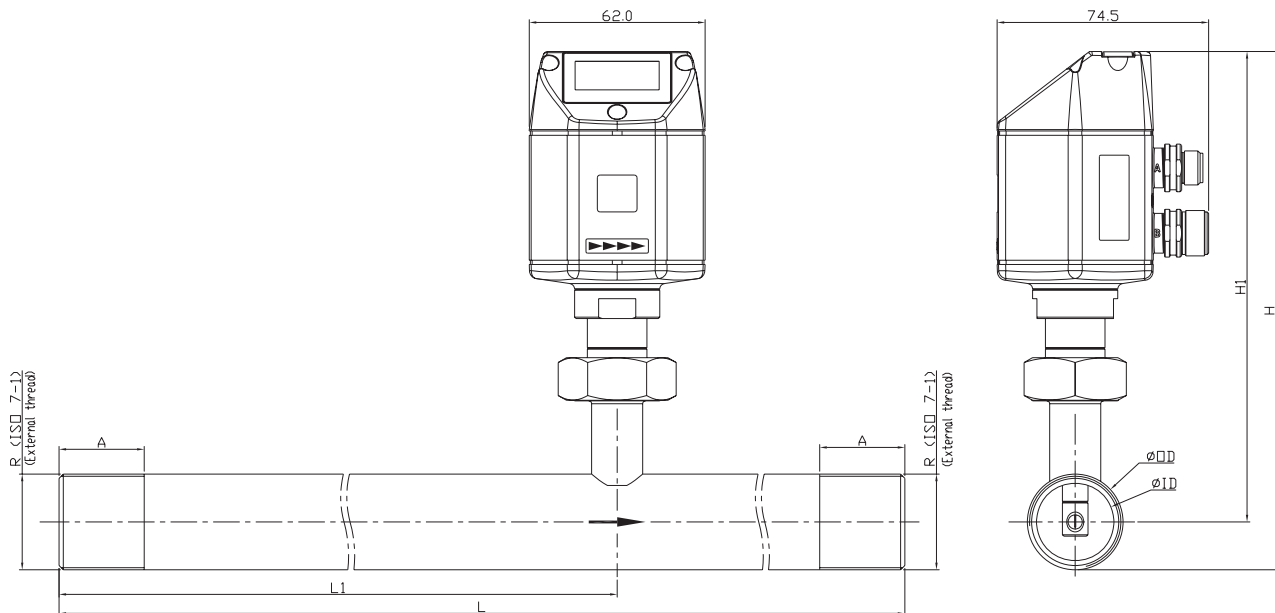
At the touch of a button:  
– reset of counter reading  
– selection of units

## Application-technological features of the consumption counters VA 420:

- Easy and affordable installation
- Units freely selectable via keypad m³/h, m³/min, l/min, l/s, kg/h, kg/min, kg/s, cfm
- Compressed air counter up to 1,999,999,999 m³. Resettable to "zero" via keypad
- Analogue output 4...20 mA, pulse output (galvanically separated)
- High measuring accuracy also in the lower measuring range (ideal for leakage measurement)
- Negligibly small loss of pressure
- Calorimetric measuring principle, no additional pressure and temperature measurement necessary, no mechanically moved parts
- Gas types adjustable via software (nitrogen, oxygen, CO<sub>2</sub>, nitrous oxide, argon)

## Application range of VA 420:

- Compressed air balancing, compressed air consumption measurement
- Leakage air / leak rate determination
- Mobile compressed air measurement in front of single machines/plants
- Flow measurement of process gases like e. g. nitrogen, CO<sub>2</sub>, oxygen, argon, nitrous oxide
- Flow measurement at nitrogen generators



### Flow measuring ranges VA 420 for compressed air (ISO 1217: 1000 mbar, 20°C)

| Connection thread | Outer pipe dia. mm | Inner pipe dia. mm | Measuring range from to   | L mm | L <sub>1</sub> mm | H mm  | H <sub>1</sub> mm | A mm |
|-------------------|--------------------|--------------------|---------------------------|------|-------------------|-------|-------------------|------|
| R 1/4"            | 13.7               | 8,5                | 0.8 90 l/min              | 194  | 137               | 174.7 | 165.7             | 15   |
| R 1/2"            | 21.3               | 16.1               | 0.2 90 m <sup>3</sup> /h  | 300  | 210               | 176.4 | 165.7             | 20   |
| R 3/4"            | 26.9               | 21.7               | 0.3 170 m <sup>3</sup> /h | 475  | 275               | 179.2 | 165.7             | 20   |
| R 1"              | 33.7               | 27.3               | 0.5 290 m <sup>3</sup> /h | 475  | 275               | 182.6 | 165.7             | 25   |
| R 1 1/4"          | 42.4               | 36.8               | 0.7 480 m <sup>3</sup> /h | 475  | 275               | 186.9 | 165.7             | 25   |
| R 1 1/2"          | 48.3               | 41.8               | 1.0 550 m <sup>3</sup> /h | 475* | 275               | 189.9 | 165.7             | 25   |
| R 2"              | 60.3               | 53.1               | 2.0 900 m <sup>3</sup> /h | 475* | 275               | 195.9 | 165.7             | 30   |

\* Attention: Shortened inlet section! Please observe the recommended minimum inlet section (length = 10 x inner diameter) on site.

| Description  | Order no.              | Order no.              |
|--|------------------------|------------------------|
|  | Stainless steel 1.4404 | Stainless steel 1.4301 |
| VA 420 with integrated 1/4" measuring section  | 0695 1420              | 0695 0420              |
| VA 420 with integrated 1/2" measuring section  | 0695 1421              | 0695 0421              |
| VA 420 with integrated 3/4" measuring section  | 0695 1422              | 0695 0422              |
| VA 420 with integrated 1" measuring section  | 0695 1423              | 0695 0423              |
| VA 420 with integrated 1 1/4" measuring section  | 0695 1426              | 0695 0426              |
| VA 420 with integrated 1 1/2" measuring section  | 0695 1424              | 0695 0424              |
| VA 420 with integrated 2" measuring section  | 0695 1425              | 0695 0425              |
| Option: High-pressure version PN 40  |                        | Z695 0411              |
| Special scaling VA 420 due to customer's requirements  |                        | Z695 4006              |
| <b>Connection cables:</b>  |                        |                        |
| Connection cable 5 m (power supply, analogue output)   |                        | 0553 0104              |
| Connection cable 10 m (power supply, analogue output)  |                        | 0553 0105              |
| Pulse cable for consumption sensors with M12 plug, length 5 m  |                        | 0553 0106              |
| Pulse cable for consumption sensors with M12 plug, length 10 m   |                        | 0553 0107              |
| <b>Further accessories:</b>  |                        |                        |
| Closing cap for meas. section VA 420 (Material: Aluminium)   |                        | 0190 0001              |
| Closing cap for meas. section VA 420 (Material: Stainless steel 1.4404)  |                        | 0190 0002              |
| CS Service Software for FA/VA 400 sensors including PC connection set, USB interface and interface adapter to the sensor as well as CS Soft Professional for data recordin |                        | 0554 2005              |
| Mains unit in wall housing 100-240 V, 10 VA, 50-60 Hz/24VDC, 0.35 A  |                        | 0554 0108              |
| Mains unit 100-240 VAC / 24 VDC, 0.35 A for VA/FA 400 Series, 2 m cable  |                        | 0554 0107              |
| 5 point precision calibration with ISO certificate   |                        | 3200 0001              |

### Technical data VA 420

|   |  |
|---|--|
| <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 keypad:</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>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 the left  |
| <b>Accuracy:</b>                          | ±1.5% of m.v., ±0.05% of f.s. On request: Special calibration via 5 point ISO calibration certificatet                                   |
| <b>Operating temp.:</b>                   | -30...80 °C  |
| <b>Operating press.:</b>                  | up to 16 bar<br>Optional up to PN 40   |
| <b>Analogue output:</b>                   | 4...20 mA for m <sup>3</sup> /h resp. l/min  |
| <b>Pulse output:</b>                      | 1 pulse per m <sup>3</sup> resp. per liter galvanically separated  |
| <b>PC connection:</b>                     | SDI interface  |
| <b>Power supply:</b>                      | 24 VDC smoothed ± 15 %   |
| <b>Burden:</b>                            | < 500 Ohm  |
| <b>Housing:</b>                           | polycarbonate  |
| <b>Meas. section:</b>                     | stainless steel, 1.4301 oor 1.4404   |
| <b>Mounting thread meas. section:</b>     | R 1/4", R 1/2", R 3/4", R 1", R 1 1/4", R 1 1/2", R 2" external thread   |

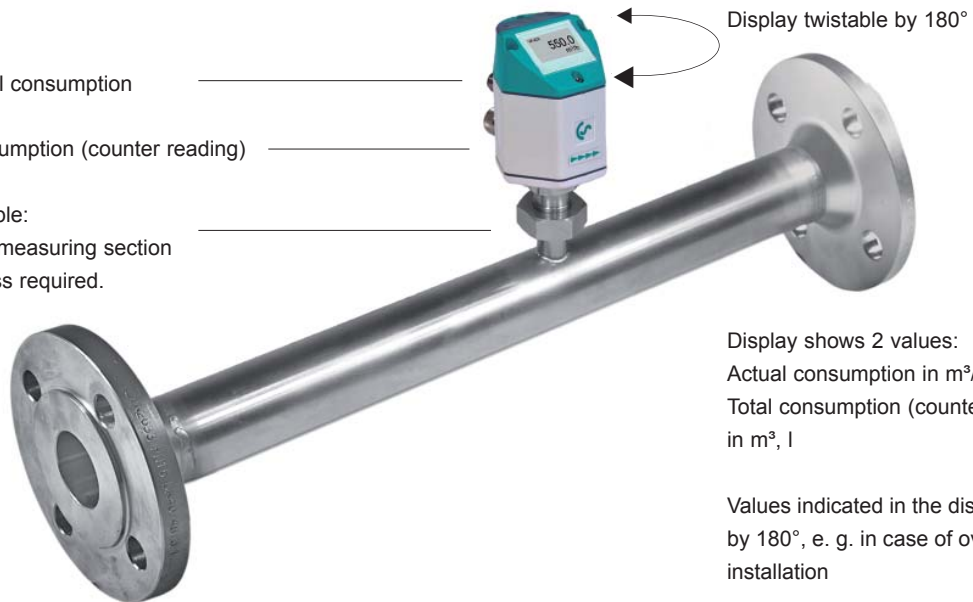


## VA 420 – The advantages at a glance

4...20 mA output for actual consumption

Pulse output for total consumption (counter reading)

Measuring device removable:  
Dismounting of the whole measuring section  
is not necessary, no bypass required.



Display shows 2 values:  
Actual consumption in m<sup>3</sup>/h, l/min,...  
Total consumption (counter reading)  
in m<sup>3</sup>, l

Values indicated in the display turnable  
by 180°, e. g. in case of overhead  
installation

Easy installation into the existing pipeline  
due to integrated measuring section  
and weld neck flange  
(according to EN 1092-1 PN 40)

High measuring accuracy due  
to defined measuring section  
(inlet and outlet section).



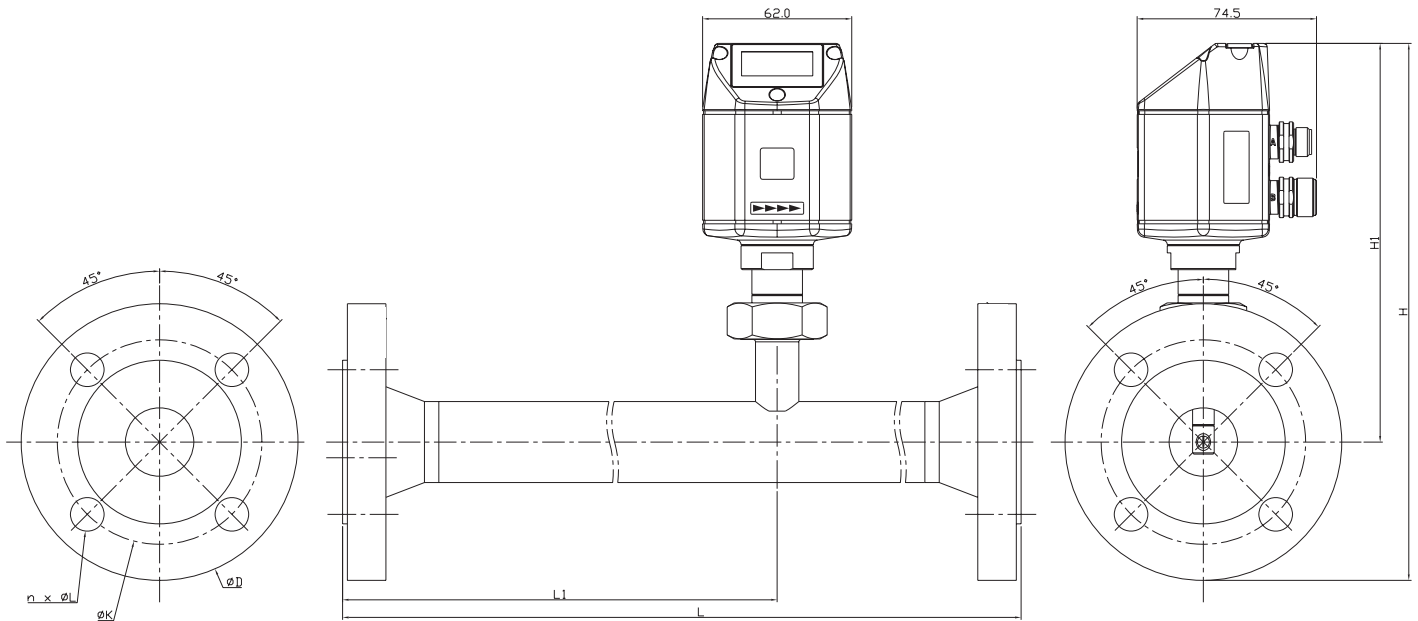
At the touch of a button:  
– reset of counter reading  
– selection of units

## Application-technological features of the consumption counters VA 420:

- Easy and affordable installation
- Units freely selectable via keypad m<sup>3</sup>/h, m<sup>3</sup>/min, l/min, l/s, kg/h, kg/min, kg/s, cfm
- Compressed air counter up to 1,999,999,999 m<sup>3</sup>. Resettable to "zero" via keypad
- Analogue output 4...20 mA, pulse output (galvanically separated)
- High measuring accuracy also in the lower measuring range (ideal for leakage measurement)
- Negligibly small loss of pressure
- Calorimetric measuring principle, no additional pressure and temperature measurement necessary, no mechanically moved parts
- Gas types adjustable via software (nitrogen, oxygen, CO<sub>2</sub>, nitrous oxide, argon)

## Application range of VA 420:

- Compressed air balancing, compressed air consumption measurement
- Leakage air / leak rate determination
- Flow measurement of process gases like e. g. nitrogen, CO<sub>2</sub>, oxygen, argon, nitrous oxide
- Flow measurement at nitrogen generators



### Flow measuring ranges VA 420 for compressed air (ISO 1217: 1000 mbar, 20°C)

| Meas. section | Outer pipe dia. mm | Inner pipe dia. mm | Measuring range from to   | L mm | L <sub>1</sub> mm | H mm  | H <sub>1</sub> mm | Flange ØD | DIN EN 1092-1 ØK | n x ØL |
|---------------|--------------------|--------------------|---------------------------|------|-------------------|-------|-------------------|-----------|------------------|--------|
| DN 15         | 21.3               | 16.1               | 0.2 90 m <sup>3</sup> /h  | 300  | 210               | 213.2 | 165.7             | 95        | 65               | 4 x 14 |
| DN 20         | 26.9               | 21.7               | 0.3 170 m <sup>3</sup> /h | 475  | 275               | 218.2 | 165.7             | 105       | 75               | 4 x 14 |
| DN 25         | 33.7               | 27.3               | 0.5 290 m <sup>3</sup> /h | 475  | 275               | 223.2 | 165.7             | 115       | 85               | 4 x 14 |
| DN 32         | 42.4               | 36.8               | 0.7 480 m <sup>3</sup> /h | 475  | 275               | 235.7 | 165.7             | 140       | 100              | 4 x 18 |
| DN 40         | 48.3               | 41.8               | 1.0 550 m <sup>3</sup> /h | 475* | 275               | 240.7 | 165.7             | 150       | 110              | 4 x 18 |
| DN 50         | 60.3               | 53.1               | 2.0 900 m <sup>3</sup> /h | 475* | 275               | 248.2 | 165.7             | 165       | 125              | 4 x 18 |

\* Attention: Shortened inlet section! Please observe the recommended minimum inlet section (length = 10 x inner diameter) on site.

| Description  | Order no. |
|--|-----------|
| VA 420 with integrated DN 15 measuring section with weld neck flange   | 0695 2421 |
| VA 420 with integrated DN 20 measuring section with weld neck flange   | 0695 2422 |
| VA 420 with integrated DN 25 measuring section with weld neck flange   | 0695 2423 |
| VA 420 with integrated DN 32 measuring section with weld neck flange   | 0695 2426 |
| VA 420 with integrated DN 40 measuring section with weld neck flange   | 0695 2424 |
| VA 420 with integrated DN 50 measuring section with weld neck flange   | 0695 2425 |
| Option: High-pressure version PN 40  | Z695 0411 |
| Special scaling VA 420 due to customer's requirements  | Z695 4006 |
| <b>Connection cables:</b>  |           |
| Connection cable 5 m (power supply, analogue output)   | 0553 0104 |
| Connection cable 10 m (power supply, analogue output)  | 0553 0105 |
| Pulse cable for consumption sensors with M12 plug, length 5 m  | 0553 0106 |
| Pulse cable for consumption sensors with M12 plug, length 10 m   | 0553 0107 |
| <b>Further accessories:</b>  |           |
| Closing cap for meas. section VA 420 (Material: Aluminium)   | 0190 0001 |
| Closing cap for meas. section VA 420 (Material: Stainless steel 1.4404)  | 0190 0002 |
| CS Service Software for FA/VA 400 sensors including PC connection set, USB interface and interface adapter to the sensor as well as CS Soft Professional for data recordin | 0554 2005 |
| Mains unit in wall housing 100-240 V, 10 VA, 50-60 Hz/24VDC, 0.35 A  | 0554 0108 |
| Mains unit 100-240 VAC / 24 VDC, 0.35 A for VA/FA 400 Series, 2 m cable  | 0554 0107 |
| 5 point precision calibration with ISO certificate   | 3200 0001 |

### Technical data VA 420

|   |   |
|---|---|
| <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 keypad:</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>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 the left   |
| <b>Accuracy:</b>                          | ±1.5% of m.v., ±0.05% of f.s.<br>On request: Special calibration via 5 point ISO calibration certificat                                 |
| <b>Operating temp.:</b>                   | -30...80 °C   |
| <b>Operating press.:</b>                  | up to 16 bar<br>Optional up to PN 40  |
| <b>Analogue output:</b>                   | 4...20 mA for m <sup>3</sup> /h resp. l/min   |
| <b>Pulse output:</b>                      | 1 pulse per m <sup>3</sup><br>resp. per liter<br>galvanically separated   |
| <b>PC connection:</b>                     | SDI interface   |
| <b>Power supply:</b>                      | 24 VDC smoothed ± 15 %  |
| <b>Burden:</b>                            | < 500 Ohm   |
| <b>Meas. section:</b>                     | stainless steel, 1.4404   |
| <b>Flanges:</b>                           | Weld neck flange according to DIN EN 1092-1<br>Groove-faced and tongue-faced flange on request  |