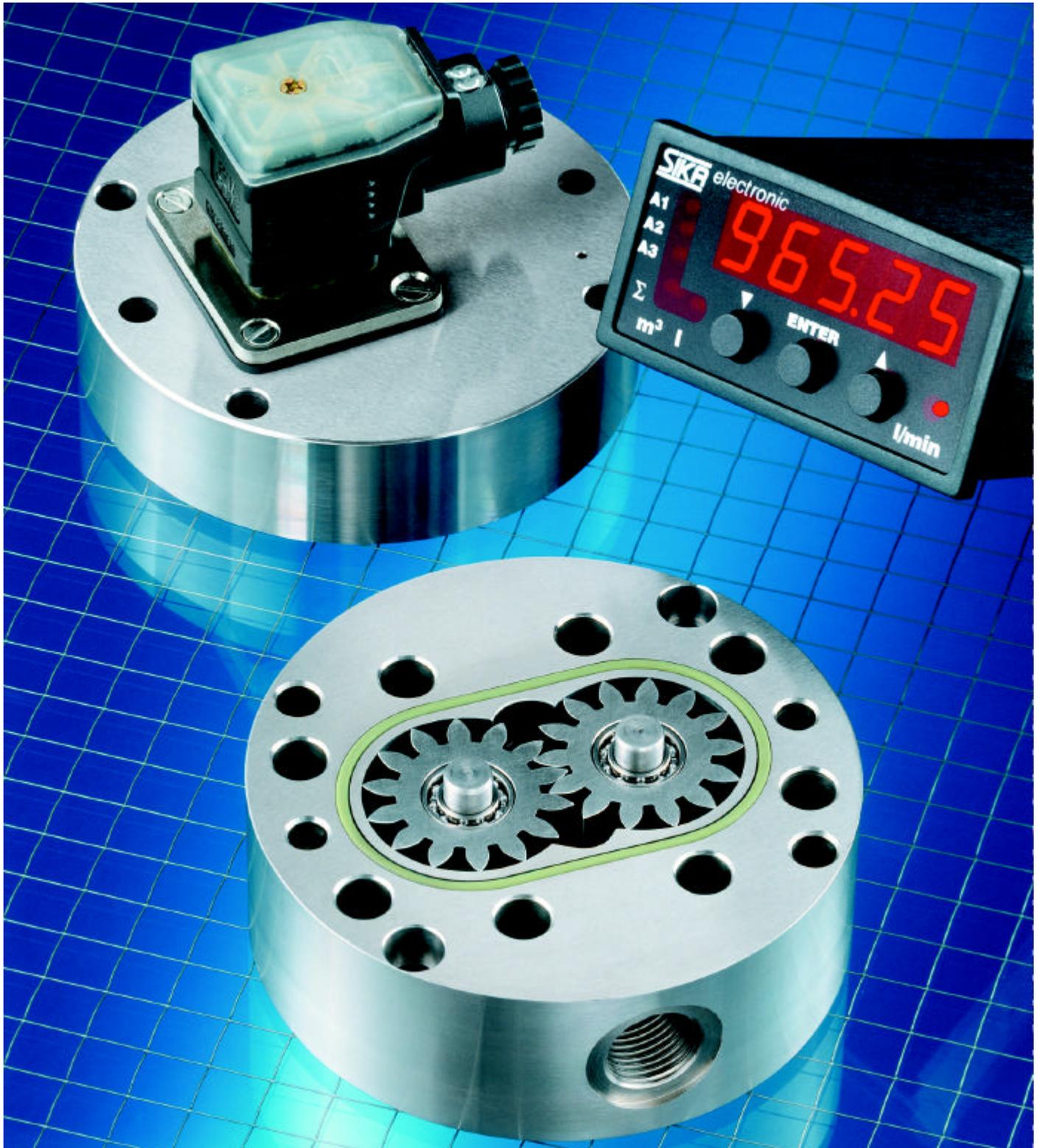


# Positive displacement flow sensors

Series VZ...-S

**SIKA**<sup>®</sup>  
gegr. 1901  
Dr. Siebert & Kühn GmbH & Co. KG

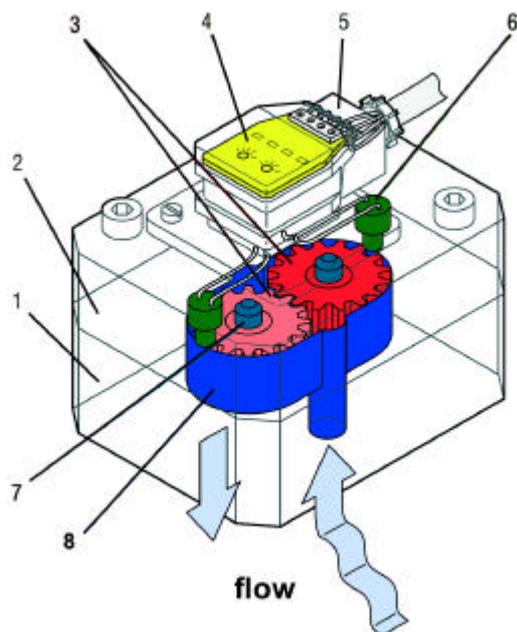


# SIKA positive displacement flow sensors, series VZ...-S

## One pulse per tooth!

### Functional description

SIKA positive displacement flow sensors are highly accurate transmitters that measure volume flows. They work on the positive displacement principle. The flowing medium causes a pair of gear wheels to rotate. The sensor is manufactured to the highest accuracy and is then precisely assembled. The rotation is scanned by two non-contact pick-offs. As each tooth generates a pulse, the resolution is very high. Very low flow rates can be accurately measured and small volumes can be dosed.



- |   |                     |
|---|---------------------|
| 1 | Housing bottom      |
| 2 | Housing cover       |
| 3 | Gear wheels         |
| 4 | Pre-amplifier       |
| 5 | Connection plug     |
| 6 | Pick-offs           |
| 7 | Bearing             |
| 8 | Measurement chamber |

The measurement unit contains two pick-offs that are circumferentially offset by  $\frac{1}{4}$  of a tooth pitch to generate a 2 channel flow-proportional frequency signal. Suitable processing of the signal provides a greater resolution and the option to identify the flow direction.

It is possible to measure not only high viscosity media but also media whose viscosity varies e.g. because of changes in temperature. The maximum pressure drop should not exceed 16 bars. This limits the measurement range of high viscosity media (see pressure drop dia-

grams). Basically, the measurement accuracy increases with increase in viscosity of the media.

Vice versa, measurement accuracy decreases with viscosities below 10 mm<sup>2</sup>/s and especially in the lower flow rate range.

By their very nature gear type flow sensors require the measured medium to be slightly lubricating.

Use with non-lubricating media, e.g. water, is impossible.

### Convincing advantages

- 7 different component sizes available
- Viscosity range: 1...100.000 mm<sup>2</sup>/s
- Measurement accuracy:  $\pm 0.3$  % of reading
- Temperature of the medium: -30 up to +120 °C (standard version)
- Version HT for temperatures up to 150 °C with thermally insulated pre-amplifier (optional)
- Types usable in explosion-hazardous areas according to ATEX (max. temperature of the medium: 80 °C)
- Various housing and seal materials provide a universal applicability with different measurement media
- Standard process connection via subplates, i.e. quickly exchangeable without longer process stops
- Signal processing by SIKA display and read out devices, available with and without monitoring function
- Transformation into analogue signals (0-20 mA, 4-20 mA, or 0-10 V) or optional processing via RS 232 C
- Accurate dosing by electronic batch controllers

### Options on request

- Slide bearings or hybrid bearings instead of ball bearings
- Special versions suitable for
  - printing ink
  - polyurethane foams (polyol and isocyanate)
  - highly viscous greases

### Common technical data for all sizes

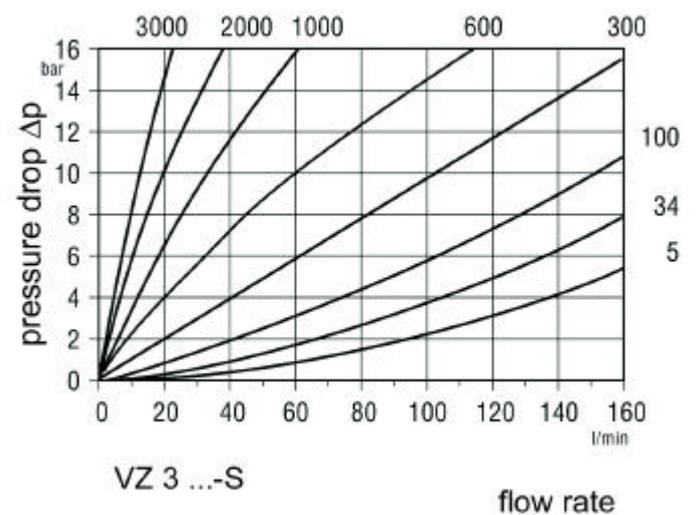
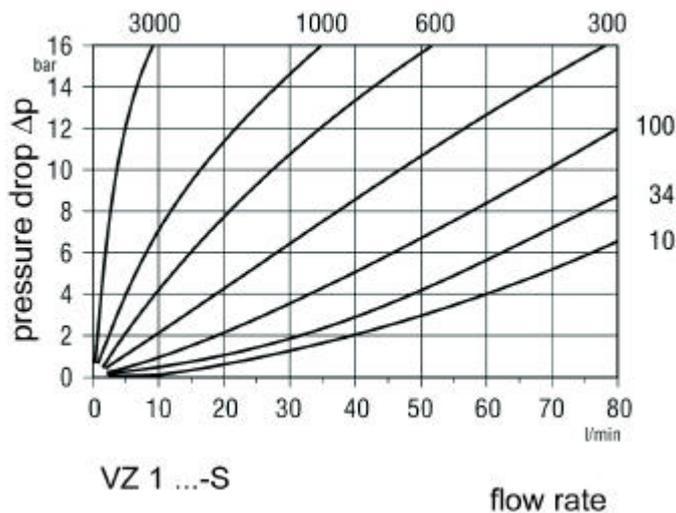
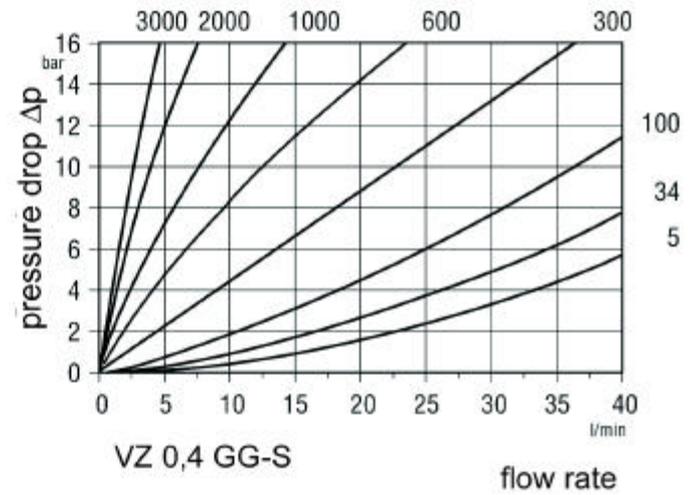
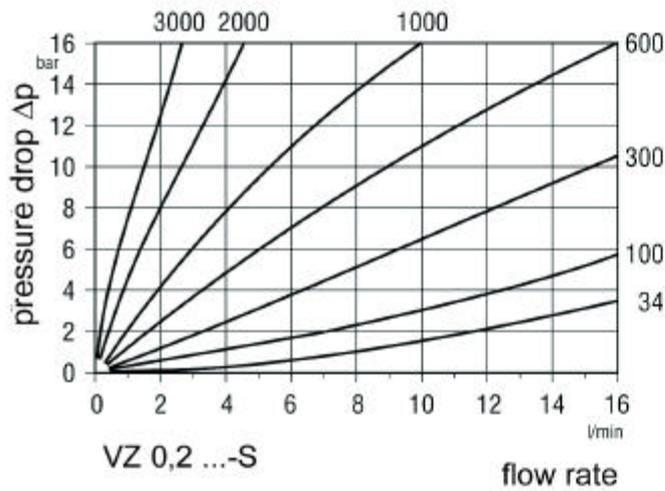
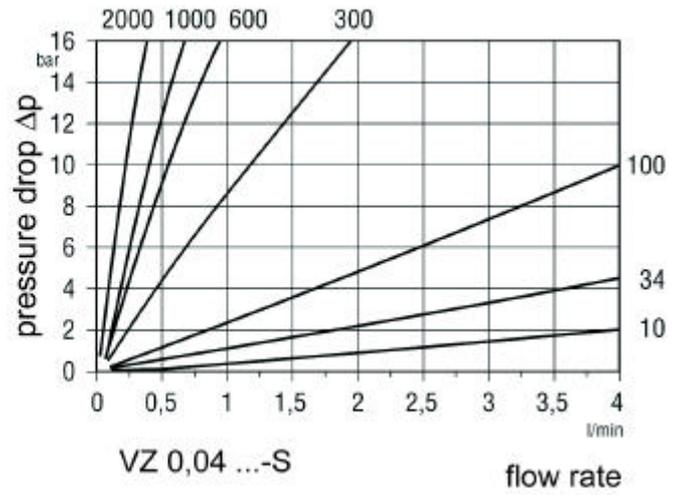
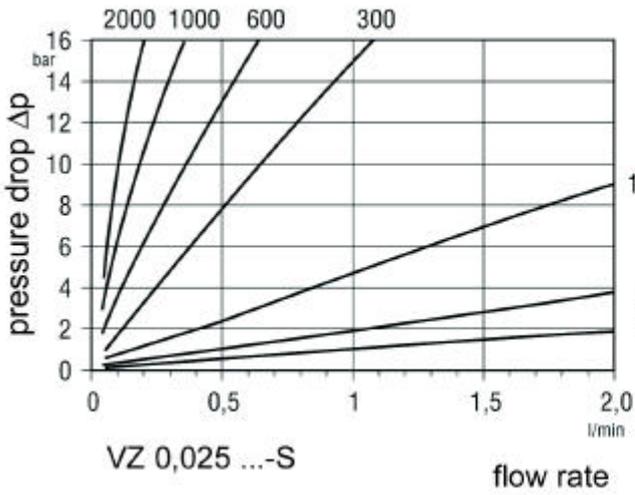
	VZ...GG-S	VZ...VA-S
Measuring accuracy	±0,3 % of measured value (at 21 mm/s <sup>2</sup> )	
Repeatability	0,05 % for same conditions	
Operating pressure	VZ 0,025... to VZ 1... 400 bar VZ 3... to VZ 5... 315 bar higher pressure rating on request	
Temperature range	-30 °C ... +120 °C -30 °C ... +150 °C with thermally isolated preamplifier -30 °C ... +80 °C for Ex version	
Material - housing - gear wheels - ball bearing	cast iron GGG 40 steel 1.7139 100CR6 / 1.3505	stainless steel 1.4404 stainless steel 1.4462 X105CrMo17 / 1.4125
Seals material	Standard: FPM (FKM) Option: EPDM, FEP	
Process connection	via subplate with lateral female thread connection	
Subplate material	cast iron GGG 40	stainless steel 1.4404
Power supply	12...30 VDC / max. 90 mA	
Electrical connection	via standard socket	
Protection class	IP 65	
Output signal	2-channel, square wave, keying ratio 1:1, PNP	

### Special technical data

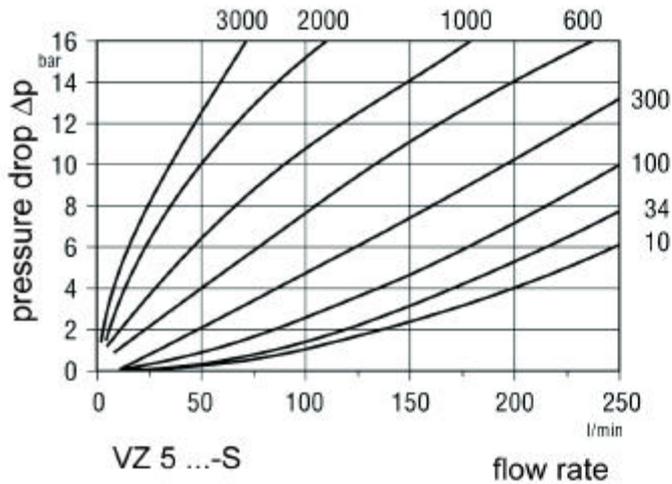
Size	Start of gear wheel rotation [l/min]	Measuring range* [l/min]	Measuring volume [cm <sup>3</sup> /pulse]	Resolution [pulses/l]
VZ 0,025-S	0,001	0,008...2	0,025	40 000
VZ 0,04-S	0,004	0,02...4	0,04	25 000
VZ 0,2-S	0,01	0,16...16	0,245	4 081,63
VZ 0,4-S	0,01	0,2...40	0,4	2 500
VZ 1-S	0,02	0,4...80	1,036	965,25
VZ 3-S	0,03	0,6...160	3,000	333,33
VZ 5-S	0,04	1...250	5,222	191,50

\* For media with high viscosity the measuring range is reduced. The max. pressure drop shouldn't exceeded 16 bar (see pressure drop diagrams).

Pressure drop diagrams (dependance of viscosity [ $\text{mm}^2/\text{s}$ ])

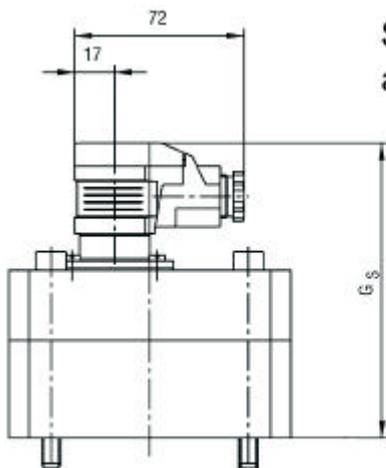


**Pressure drop diagram (dependence of viscosity [mm<sup>2</sup>/s])**

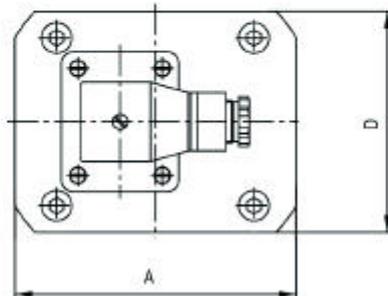


**Dimensions positive displacement flow sensors VZ...GG-S**

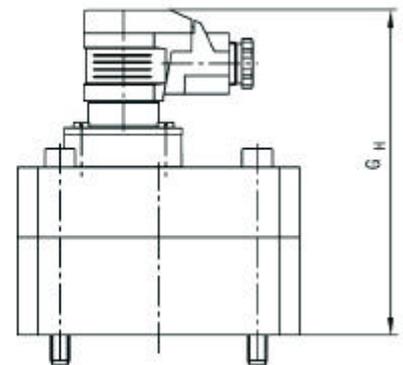
Size	A [mm]	D [mm]	G <sub>S</sub> [mm]	G <sub>H</sub> [mm]	Weight [kg]
0,025	85	60	101	114	1,8
0,04	85	60	107	120	2,0
0,2	85	60	108	121	2,0
0,4	100	90	114	127	3,7
1	120	95	123	136	5,2
3	170	120	140	153	9,0
5	170	120	156	169	13,0



Standard version  
and Ex version

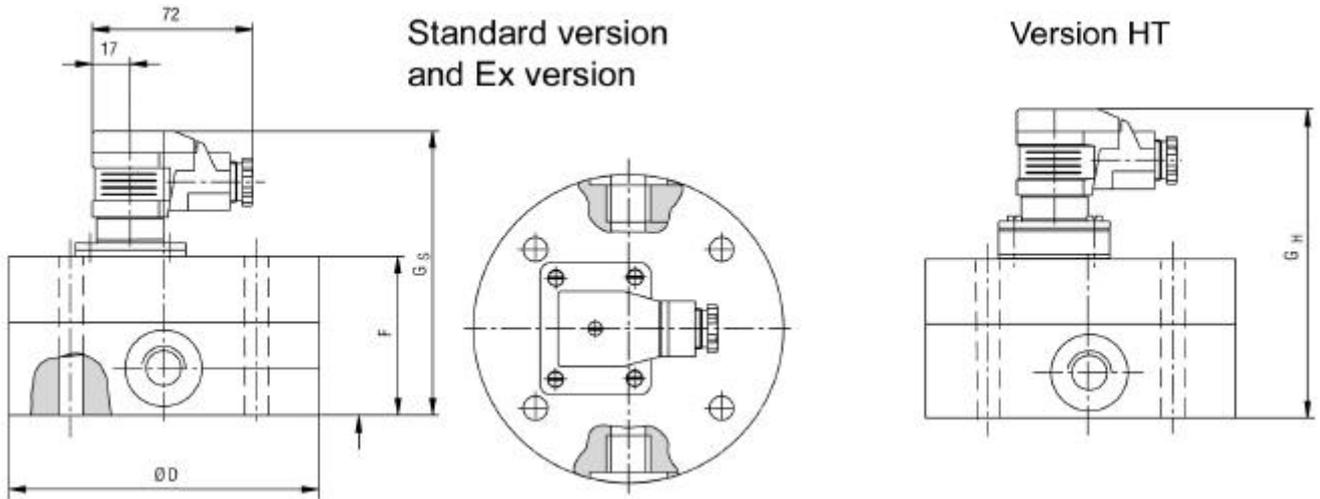


Version HT



## Dimensions positive displacement flow sensors VZ...VA-S

Size	D [mm]	F [mm]	G <sub>S</sub> [mm]	G <sub>H</sub> [mm]	Weight [kg]
0,025	94	55	106	119	3,0
0,04	94	56	107	120	3,0
0,2	94	57	108	121	3,1
1	124	72	123	136	7,0
3	170	89	140	153	15,9
5	170	105	156	169	18,7

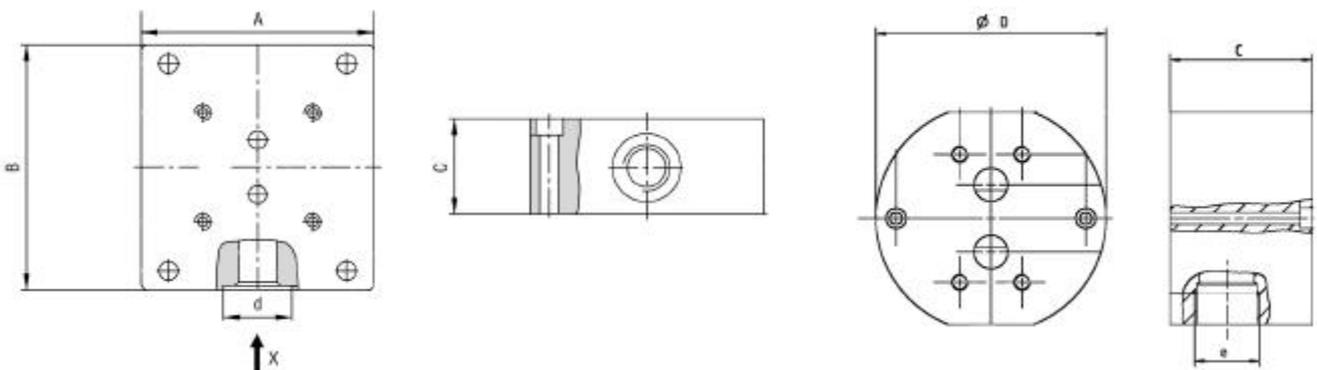


## Dimensions subplates VZ ... GG-S

Appropriate to	Connection	A [mm]	B [mm]	C [mm]	d [mm]	Weight [kg]
0,025 / 0,04 / 0,2	3/8"BSP	85	90	35	25	1,8
0,4	1/2"BSP	100	110	37	29	2,7
1	1/2"BSP	100	120	37	29	2,9
3 / 5	1"BSP	160	165	80	42	14

## VZ ... VA-S

Appropriate to	Connection	C [mm]	D [mm]	Weight [kg]
0,025 / 0,2	3/8"BSP	35	94	1,7
0,04	3/8"BSP	35	94	1,7
1	1/2"BSP	37	124	3,2
3 / 5	1"BSP	80	170	13,9



### Order code for sensors

Order number	VZ	xxx	xx	x	x	x	x	x	0	S
Size	0,025 0,04 0,2 0,4 1 3 5	0025 004 020 040 100 300 500								
Material	cast iron stainless steel		GG VA							
Seals	FPM (FKM) EPDM FEP			V E P						
Power supply	12...30 VDC				3					
Process connection	with subplates direct (only for VA)					2 1				
Preamplifier	standard isolated for HT (not possible for Ex)						I E			
Version	standard intrinsically safe Ex with isolation amplifier							0 1		
Specialities	special version								0	S

### Order code for subplates

Order number	AP	xxx	xx	xxx	0	S
Appropriate to	VZ 0,025 VZ 0,04 VZ 0,2 VZ 0,4 VZ 1 VZ 3 VZ 5	0025 004 020 040 100 300 500				
Material	cast iron stainless steel			GG VA		
Female thread connection Please select only permissible combinations of sensor sizes and female thread connections (see table "Dimensions subplates")	3/8"BSP 1/2"BSP 1"BSP			038 012 100		
Specialities					0	S