



fill level



water level



pressure



temperature



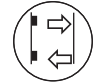
flow



visualization



signal converter



sensoric



*Sensors for your various applications*



## Flow measurement

*Flow switches  
Ultra-sonic flow meter  
Magnetic-inductive flow sensor  
vortex and swirl flowmeters  
Consumption sensor for  
compressed air and gases*





### F2-UN

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Ultrasonic flowmeter F2-UN  
Non-contact flow measurement

F2-UN

## Product description

The non-contact, ultrasonic low sensor F2-UN detects the low volumes of conductive and non-conductive liquids.

Swimming against the current requires more strength than with the current – this is the simple fact on which ultrasonic flow measurement according to the phase difference process is based.

The device has a compact design, and its wide range of possible applications means it can also be used in restricted spaces.

The seal-free sensor design, with high-quality polysulfone (Ultrason S) combined with enclosure rating IP 67, not only makes it possible to use the device in harsh ambient conditions, but also guarantees high process reliability. The large text display also helps ensure simple, fast and problem-free commissioning.

## At a glance

- Flow sensor for conductive and nonconductive liquids
- No moving parts, compact design
- Process temperature up to 80 °C, process pressure up to 10 bar
- High chemical resistance thanks to seal-free sensor design
- Large display with membrane keyboard
- Integrated teaching tube detection
- Easy-to-clean, hygienic variants available (EHEDG certification and conformance with FDA), CIP capable

## Your benefits

- **Maintenance-free** flow sensor; saves maintenance costs
- Adjustable measuring ranges, reduced number of variants
- Can be used **for conductive and nonconductive liquids** – fewer variants and lower storage costs
- Straight measuring tube reduces pressure loss, thus **saving energy costs**
- Sensor without seals increases process reliability and availability
- **Flexible measurement system** for all industries



## Specifics

 liquids	 LCD display
 compact design	 easy-to-use
 up to 10 bar pressure	 closed operating interface

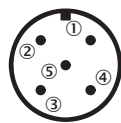
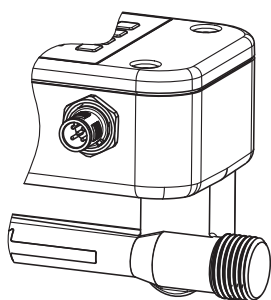
Order code. . . . . page | 10 |

Features				
Measuring principle	Ultrasonic sensor			
Medium	Fluids			
Nominal width measuring tube	NW 10 / NW 15 / NW 20 / NW 25			
Process temperature	0 °C ... +80 °C			
Process pressure	NW 10 und NW 15: Max. 10 bar / NW 20 und NW 25: Max. 6 bar			
EHDG approval	yes			
Performance				
Minimum flow	NW10: 0.3 l/min	NW15: 0.9 l/min	NW20: 3.5 l/min	NW25: 5 l/min
Maximum flow	NW10: 21 l/min	NW15: 36 l/min 6	NW20: 0 l/min	NW25: 240 l/min
Inlet zone	NW10: 10 cm	NW15: 30 cm	NW20: 50 cm	NW25: 80 cm
Outlet zone	NW10: 0 cm	NW15: 5 cm	NW20: 10 cm	NW25: 20 cm
Conductivity	No limitation			
Accuracy	2 % (of final value)			
Reproducibility	0.5 %			
Resolution	NW 10:0.003 l/min; NW 15: 0.006 l/min; NW 20: 0.012 l/min; NW 25:0.03 l/min			
Mechanics				
Process connection:	NW 10 NW 15 NW 20 NW 25	G 1/2 G 3/4 G 1 G 1 1/4	1/2" NPT 3/4" NPT 1" NPT 1 1/4" NPT	Clamp 11864 Clamp 11864 Clamp 11864 Clamp 11864
Wetted parts	PSU			
Housing material	PSU			
Weight	NW10: 340 g; NW15: 350 g, NW20: 420 g; NW25: 460 g			
Electronics				
Supply voltage <sup>1)</sup>	18 V DC ... 30 V DC			
Ripple <sup>2)</sup>	≤ 5 Vpp			
Power consumption <sup>3)</sup>	≤ 180 mA			
Initialization time	≤ 5 s			
Protection class	III			
Electrical connection	M12x1, 5-pin / M12x1, 8-pin (depending on type)			
Electronics	see order code			
Impuls/frequency output	0 kHz ... 10 kHz			
Signal voltage	HIGH: Vs - 2 V, LOW: ≤ 2 V			
Output current	< 100 mA			
Load	Inductive: 1 H; capacitive: 100 nF			
Response time <sup>4)</sup>	Filter off 100 ms, filter low 300 ms, filter medium 1 s, filter strong 4.2 s			
Enclosure rating	IP 67			
Output load	< 500 Ohm			
Signal level	Lower: 3.8 mA ... 4 mA; upper 20 mA ... 20.5 mA			
Ambient data				
Ambient temperature	operation 0 °C ... +60 °C; storage -20 °C ... +70 °C			

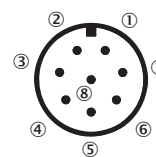
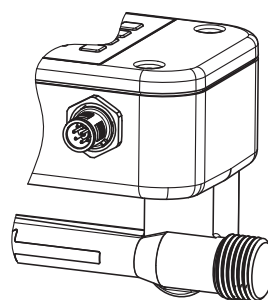
<sup>1)</sup> All connections are polarity protected. All outputs are overload and short-circuit protected. <sup>2)</sup> May not exceed or fall short of VS tolerances.

<sup>3)</sup> Without load. <sup>4)</sup> Analog output and display.

## Connection type and diagram



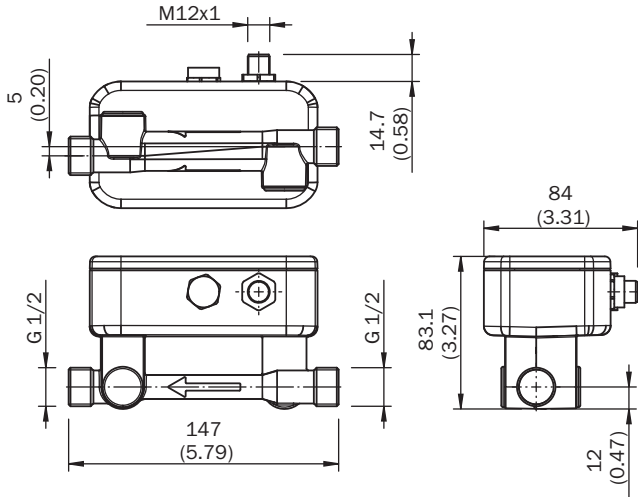
- ① L: Supply voltage
- ② Q: Digital output PNP/NPN
- ③ M: Ground
- ④ C: Communication
- ⑤ Q: Analog current output



- ① L: Supply voltage
- ② Q: Digital output PNP/NPN
- ③ M: Ground
- ④ Q: Digital output PNP/NPN
- ⑤ Q: Analog current output
- ⑥ C: Communication
- ⑦ IN: Digital input
- ⑧ No function

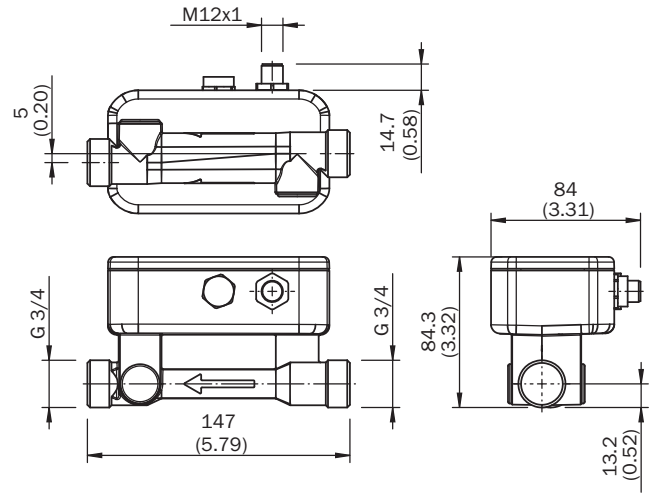
## F2-UN

**NW 10, process connection G 1/2**



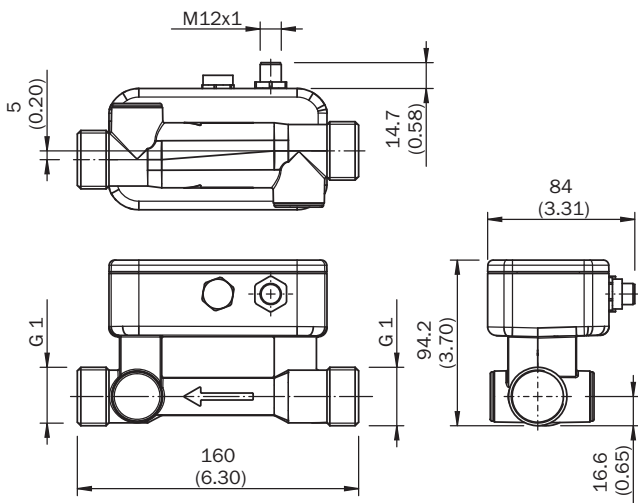
All dimensions in mm (inch)

**NW 15, process connection G 3/4**



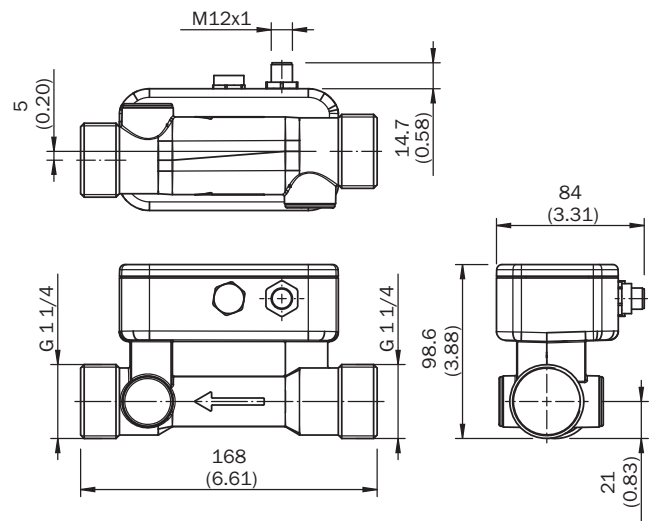
All dimensions in mm (inch)

**NW 20, process connection G 1**



All dimensions in mm (inch)

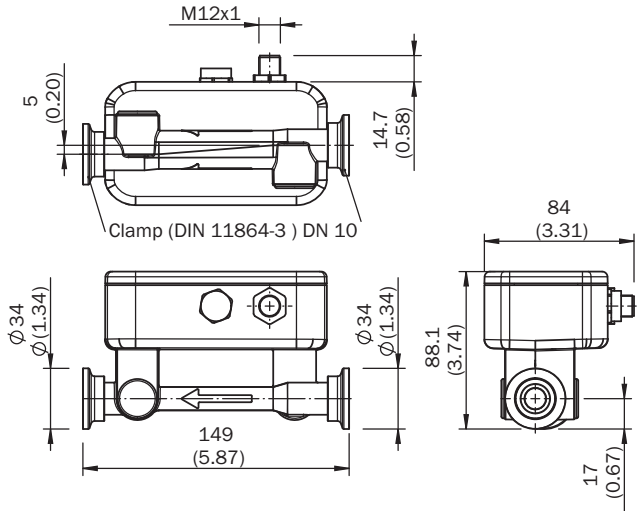
**NW 25, process connection G 1 1/4**



All dimensions in mm (inch)

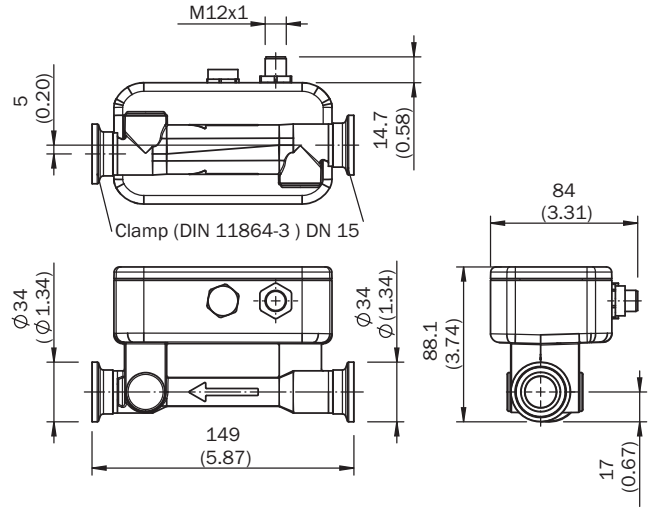
# Dimensional drawings

**NW 10, Clamp (DIN 11864-3)**



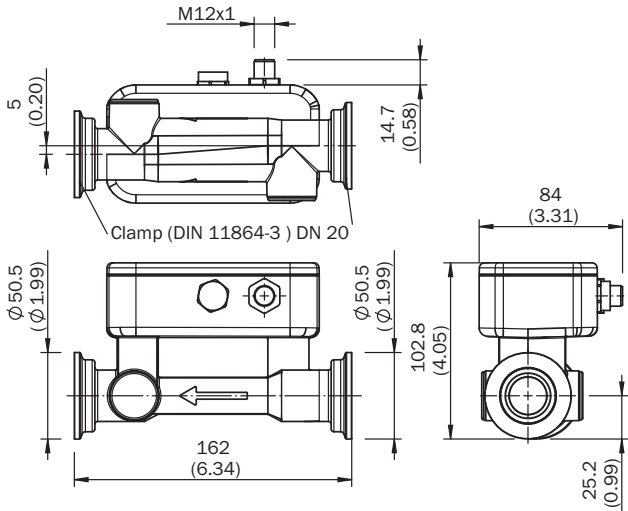
Dimensions in mm (inch)

**NW 15, Clamp (DIN 11864-3)**



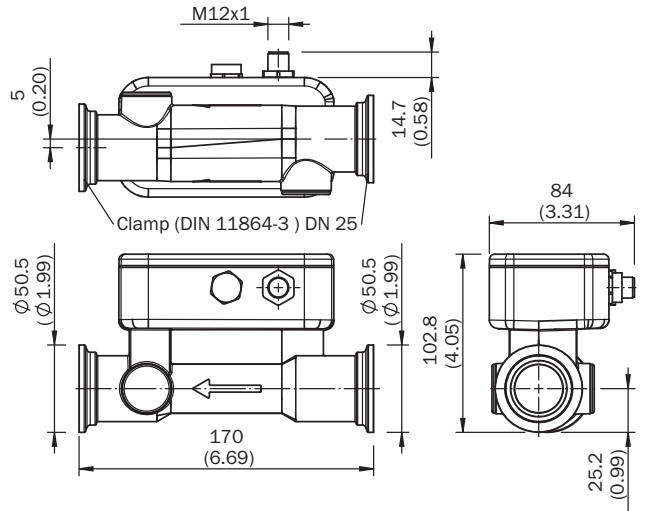
All dimensions in mm (inch)

**NW 20, Clamp (DIN 11864-3)**



All dimensions in mm (inch)

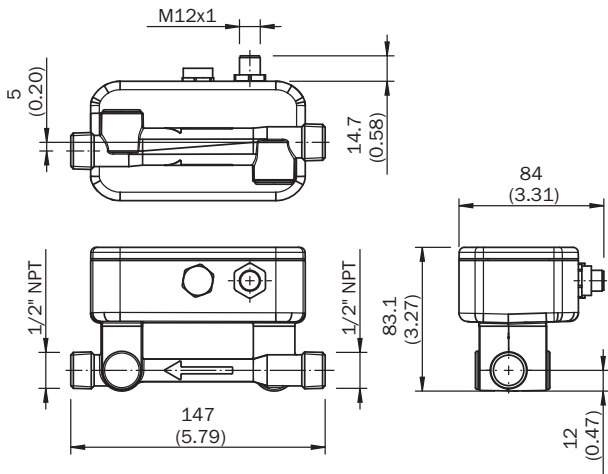
**NW 25, Clamp (DIN 11864-3)**



All dimensions in mm (inch)

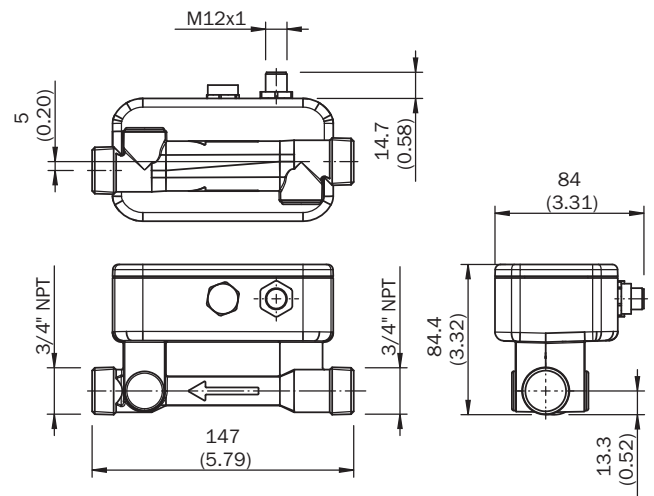
## F2-UN

### NW 10, 1/2" NPT



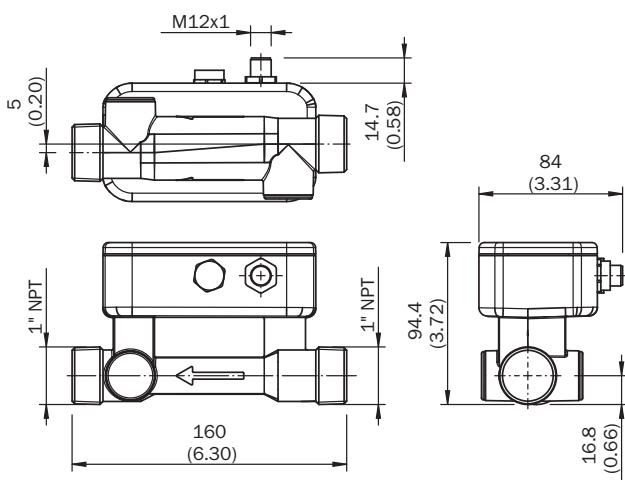
All dimensions in mm (inch)

### NW 15, 3/4" NPT



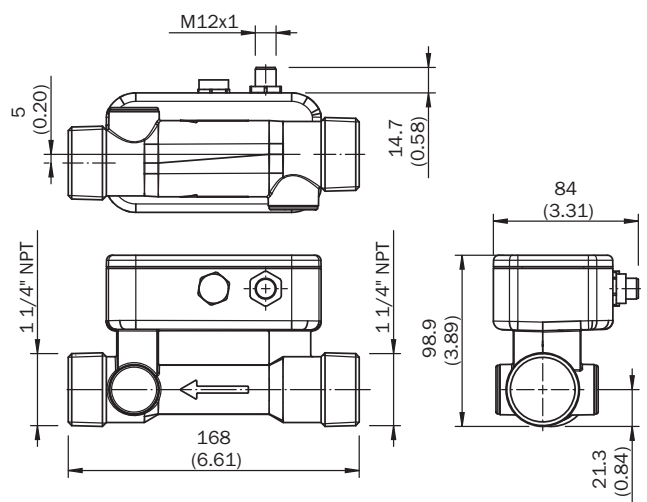
All dimensions in mm (inch)

### NW 20, 1" NPT



All dimensions in mm (inch)

### NW 25, 1 1/4" NPT



All dimensions in mm (inch)



Select parameter or change values by using the arrow keys



Set: Save settings



Esc: Leaving current selection level / menu item

Display information:

- Current flow value in l/min
- Volume in l
- Bar graph with percentage value of current measurement range

Setting of:

- Analog output
- Pulse output
- Status output
- Measurement unit
- Creeping flow
- Medium calibration





Tube has to be fully filled

### Inlet and outlet paths

In order to receive an accurate volume measurement, it is necessary to observe inlet and outlet paths. The diameter of the tube - as given by the process connector of the FFU - should not change directly in front of the device and directly after the device. Minimum inlet and outlet paths are:

In applications where the flowmeter is exposed to high temperatures ( $t \geq 60^\circ\text{C}$ ), the device should be mounted upside down:

Correct positioning



False positioning



Device nominal width	1/2"	3/4"	1"	1 1/4"
Inlet path	10 cm	30 cm	50 cm	80 cm
Outlet path	0 cm	5 cm	10 cm	10 cm

# Order code

## F2-UN

### construction

UN Standard ultrasonic flow meter for non-conductive liquids

### Tube size

10	NW 10	Minimum flow 0,3 l/min...Maximum flow 21 l/min
15	NW 15	Minimum flow 0,9 l/min...Maximum flow 36 l/min
20	NW 20	Minimum flow 3,5 l/min...Maximum flow 60 l/min
25	NW 25	Minimum flow 5 l/min...Maximum flow 240 l/min

### Sensor material

1 PSU black

### Process connector

G1	Pipe thread G acc. to ISO 228 (Standard)
N1	Thread NPT
C1	Clamp (DIN11864-3) BKS form A

### Elektronik

IO Current output, 1 transmitter output, M12x1, 5-pin (Standard)

*Elektronics: 1 analog output: 4 mA ... 20 mA, 0 mA ... 20 mA current flow, 1 pulse/status output: PNP-transistor output for flow rate meter, empty pipe detection, flow monitoring*

SR Current output, 2 transmitter output, 1 signal input, M12x1, 8-pin

*Elektronics: 1 analog output: 4 mA ... 20 mA, 0 mA ... 20 mA current flow, 2 pulse/status output: PNP-transistor output for flow rate meter, empty pipe detection, flow monitoring, 1 digital input*

Bestellschlüssel

**F2-**

UN

1



Calorimetric flow meter, hygienic design, accurate level control in liquids

## F1-FP

### Description

Hein Lanz presents the F1-FP, a robust and hygiene optimized calorimetric flow switch for liquids.

This compact device both the sensor and the housing is made of stainless steel and it has no moving parts installed - along with the closed, smooth user interface the F1-FP is insensitive to dirt and is therefore approved for use in hygienic applications.

The influence on the medium to be measured can be kept low and also in the installation situation more flexibility is possible due to the design with only one sensor tip.

Suitable for measurement ranges in liquids from 0.03 to 3 m / s, this sensor can be used for a variety of measurement tasks. The device is also equipped with either optional universal current adapter with relay output or optional DC version with PNP switching output.

The modern evaluation electronics lead to a simple switching point adjustment and easy setup and operation.

The new sensor technology also enables faster response times. The stainless steel casing and the user interface with a bright 10-digit bar display can be rotated and thus ensure optimum operation in any mounting position.

### Application

- For measurement range in liquids from 0,03 to 3m/s
- Monitoring of cooling circuits, pumps, turbines, compressors and heat exchangers
- Dry-running protection for pumps
- Monitoring of lubrication circuits, filters and sieves

### Your benefits

- Easy use due to *intuitive user guidance*
- *bright LED display*
- Closed *smooth surface* - no dirt holes
- high reproducibility
- small sensor diameter



### Specials

 liquids	 hygienic design
 CIP SIP capable	 easy-to-use
 AC / DC Relais	 DC PNP

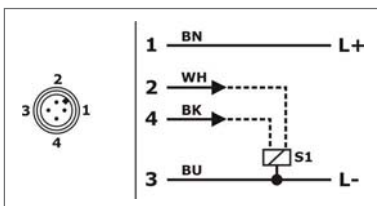
Order code. . . . . page |14|



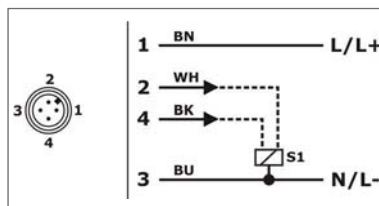
## Technical data

Technische Daten	
Supply voltage:	Type GA 16..45 VDC, protected against reverse polarity Type WB 20..253 VAC/DC, 48..62 Hz, protected against reverse polarity
Supply power $P_{In}$ :	Type GA $\leq 1$ W Switch output with no load Type WN $\leq 1$ VA / 1 W
Relay output Type WB	
Function:	Changing contact, switching to L/+L
Contact data:	$\leq 2$ A – 62,5 VA / 60 W (at ohmic load)
Input	
Measurement range:	3...300 cm/s Greatest sensitivity 3...100 cm/s Factory setting 5...100 cm/s
PNP switch output Type GA	
Function:	PNP switching to +L
Output current:	0... $\leq 500$ mA <span style="float: right;">current limited, short circuit protected</span>
Rise time:	$< 30 \mu\text{s}$ ( $R_L < 3 \text{ k}\Omega$ / $I_{out} > 4,5 \text{ mA}$ )
Electrical connection	
Version:	M12 connector 4-pole
Measuring accuracy	
Long term drift:	$\leq \pm 2\%$ FS / year (Referring to nominal measuring span resp. full scale (FS); for water, 5...100 cm/s, 25°C)
Warm-up time:	$\leq 60$ s
Temperature deviation:	$\leq \pm 1$ cm/s / K (for water, 5...100 cm/s, 10...70°C)
Materials	
Process connection: (process wetted)	Steel 1.4404/316L bzw. 1.4571/316Ti
Sensor: (process wetted)	Steel 1.4404/316L bzw. 1.4571/316Ti
Connection housing:	CrNi-Steel
Control panel surface:	PC/PES
Gaskets: (process wetted)	EPDM – ethylene-propylene-dienmonomere
Environmental conditions	
Environmental temperature:	- 40°C...+85°C
Process temperature:	Compensated operating range -20°C...+85°C Process temperature limits -40°C...+140°C
Process pressure:	$\leq 100$ bar limitation depending on process connection
Protection:	IP68 [ $\leq 1$ mWs-1h] <span style="float: right;">EN/IEC 60529</span>

## Connection



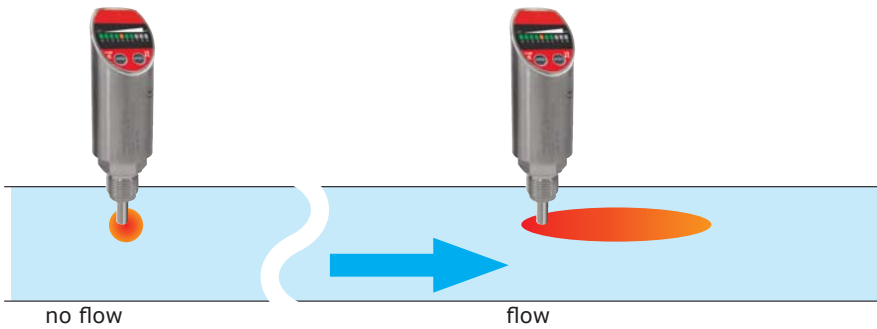
Cable colors standard connection cable M12:  
BN = brown, WH = White, BU = Blue, BK = black



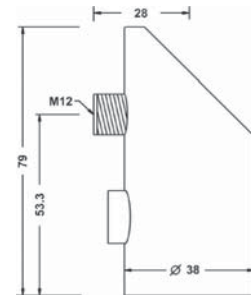
Cable colors standard connection cable M12:  
BN = brown, WH = White, BU = Blue, BK = black

## F1-FP

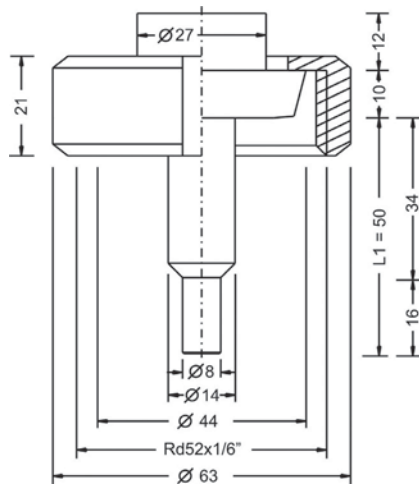
F1-FP installation



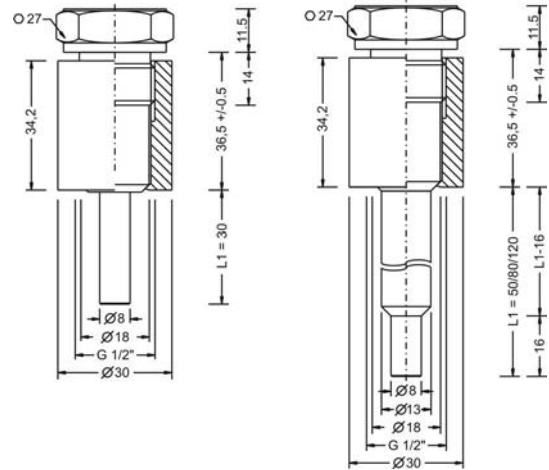
Connection housing



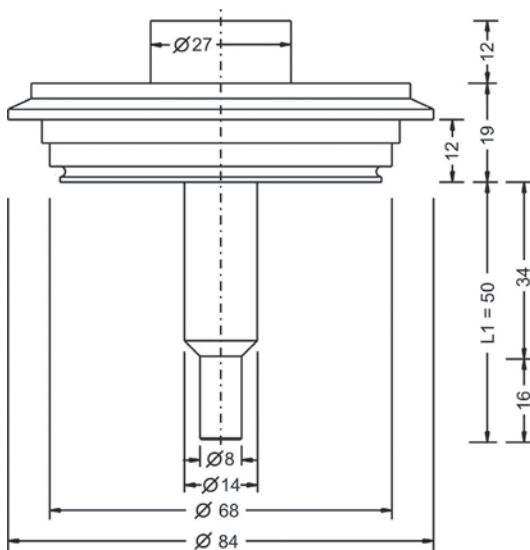
Type R  
DN25 DIN 11851



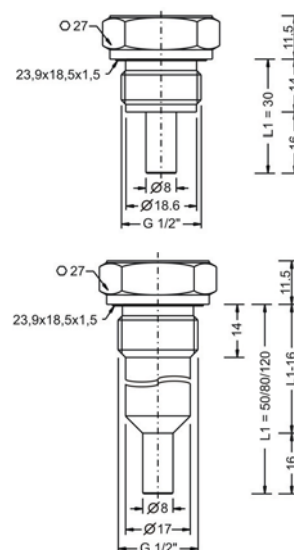
Type 2  
G 1/2" ISO 228-1 - metallisch dichtend



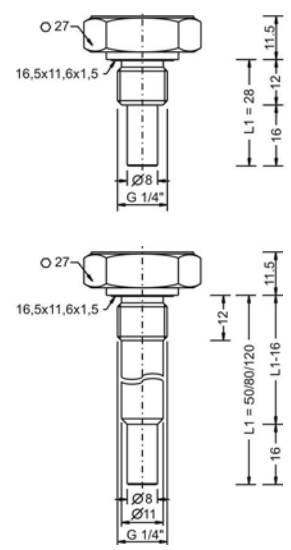
Type P  
Varivent® N, Ø68 mm



Type 0  
G 1/2" ISO 228-1



Type 3  
G 1/4" ISO 228-1



## F1-FP

### Typee

FP Standard

### Process connection

- 0 G½" B, ISO 228-1
- 2 G½" B, ISO 228-1, metallic sealing
- 3 G¼" B, ISO 228-1
- R Milk tube DIN 11851, DN25, PN40
- P Varivent® N, Ø68 mm, DN40-125 (1½"-6"), PN40
- Y other

### Material Process connection/Sensor (process wetted)

V Steel 1.4404/316L oder 1.4571/316Ti

### Sensor length L1 / mm

- 0 Process connection Type 0/2 - G½" >> 30 mm  
Process connection Type 3 - G¼" >> 28 mm  
Process connection Type R/P >> not available
- 1 50 mm
- 2 80 mm
- Process connection Type R/P >> not available
- 3 120 mm
- Process connection Type R/P >> not available
- Y other

### Process temperature

- 0 Standard, -20°C...+85°C

### Material connection housing

C CrNi-Steel

### Electronic - output

- GA Direct voltage 16...45V<sub>DC</sub>, PNP switch output
- WB Universal voltage 20...253V<sub>AC/DC</sub>, relay output

### Electrical connection

S Plug M12

Order code

<b>F1-</b>	FP	V	0	C	S
------------	----	---	---	---	---



Meter for compressed air and gas including measurement section

## F2-GF-TMS 300

### Description

The affordable consumption counter TMS 300 works according to the proven calorimetric measuring principle. An additional pressure and temperature compensation is not necessary. The newly developed evaluation electronic detects, unlike the bridge circuits commonly used, all readings digitally. Thus very precise and fast measurements are possible. Due to the new evaluation electronic all TMS 300 come with a Modbus output. Thus all measured variables can be transmitted via Modbus.

In addition to pressure air, other gases can e.g. Nitrogen, oxygen, CO2 be measured, too.

The installation of the meter TMS 300 is simple and fast. A particular advantage is the removable measuring unit. This allows the unit of measurement for calibration or cleaning purposes be removed quickly and easily without removing the complete measuring section.

Due to its compact design it is possible the new cheap consumption meters TMS 300 are usable for all pressure air pipe lines, from production to consumption smallest unit („1/4 to 2 inches). For larger pipe diameters from DN 50 to DN 300 the consumption sensors TMS 500 are available.

### Application

- Mobile compressed air measurement in front of single machines / systems
- Flow measurement of process gases such as Nitrogen, CO2, Oxygen, argon, nitrous oxide
- Flow measurement at nitrogen generators
- Determine leakage air / leak rate
- For accounting and consumption measurement of compressed air
- Display shows 2 values: Current consumption in m3 / h, l / min ... Total consumption (meter reading) in m3, l
- Units freely selectable via keypad: m3 / h, m3 / min, l / min l / s, kg / h, kg / s, cfm
- Compressed air meter up to 1,999,999,999 m3, resetable to „zero“ via keyboard

### Your benefits

- Modbus RTU output: Connection to higher-level systems such as energy management systems, central building control systems, PLC, SCADA ...
- Simple and inexpensive installation
- Display head and display values rotatable by 180 ° eg in the reverse direction of flow or overhead installation
- Measuring device removable: Dismounting of the whole measuring section is not necessary, no bypass required
- 4 ... 20 mA output, pulse output (galvanically isolated)
- High accuracy in the lower measuring range (ideal for leakage measurement)
- Negligible small pressure loss
- Calorimetric principle, no additional pressure and temperature measurement required, no mechanical moving parts
- Gas types adjustable via software (nitrogen, oxygen, CO2, nitrous oxide, argon)
- Extensive diagnostics functions readable on the display or remotely via Modbus RTU such as exceeded Max. / Min values ° C, calibration cycles, error codes, serial number - all parameters via Modbus readable / changeable



### Specials



Ordercode . . . . . page |18|



# Technical data

Technical data	
Measurement:	Flow and consumption
Standard settings ex works:	DIN 1945, ISO 1217 at 20°C and 1000 mbar
Selectable Units:	m <sup>3</sup> /h (Standard settings ex works) m <sup>3</sup> /min, l/min, l/s, ft <sup>3</sup> /min, cfm, m/s, kg/h, kg/min, kg/s
Measuring principle:	calorimetric measurement
Sensor:	Pt45, Pt1000
Measuring medium:	Air, gases
Operating temperature:	-30 ... 80°C
Operating pressure:	up to 16 bar, special version PN 40 (40 bar)
Power supply:	18 to 36 VDC
Power consumption:	max. 5W
Digital output:	RS 485 interface (Modbus RTU)
Analog output:	4...20 mA (see table below), max. burden < 500 Ohm
Pulse output:	pulse output potential free (dry contact) passive: max. 48Vdc, 500mA; 1 pulse pro m <sup>3</sup> resp. pro l Valency adjustable with the display keys
Accuracy:	± 1,5 % m.v., ± 0,3 % f. s.* (* m.v. = measured values; f.s. = full scale)
Display:	TFT 1.8 Resolution 220 x 176
Mounting thread:	R 1/4", R1/2", R3/4", R1", R 1 1/4" R1 1/2", R 2" DIN EN 10226 (ISO 7-1)
Material:	Stainless steel 1.4301 / 1.4404 Version with flange DIN EN 1092-1: Stainless steel 1.4404

## Details



Inner diameter adjustable via keys



Dismounting of the whole measuring section is not necessary



Stationary use



Mobile use



Solution for big screw-on pipe diameters up to DN300 with the TMS 500

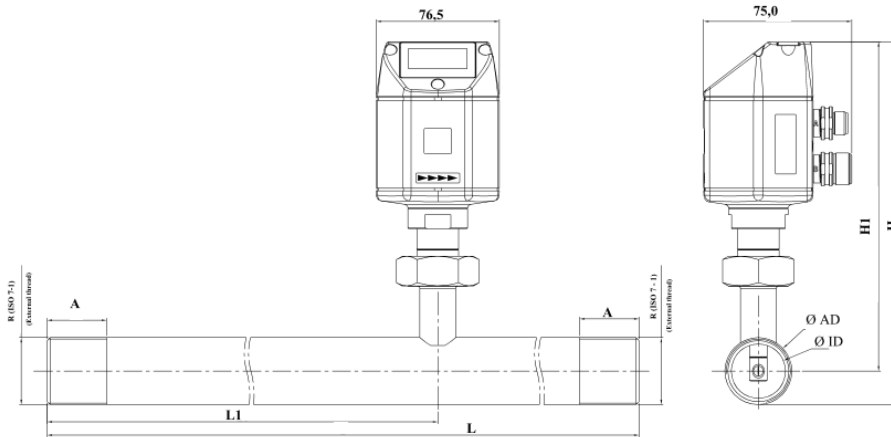


Application sample



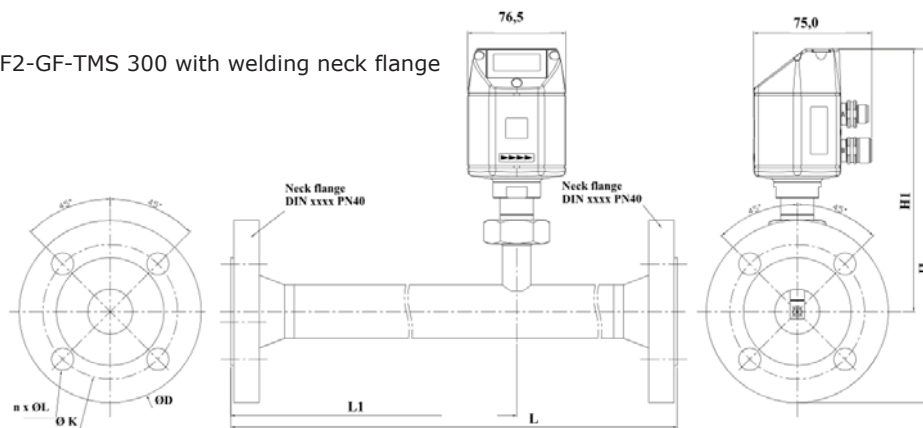
## F2-GF-TMS 300

F2-GF-TMS 300 without flange with connection thread



Dimensions F2-GF-TMS 300 with connecting thread							Flow measuring ranges F2-GF-TMS 300 for compressed air (ISO 1217: 1000 mbar, 20 ° C)			
Pipe size	AD / ID (mm)	L (mm)	L1 (mm)	H (mm)	H1 (mm)	R	A (mm)	A mm	Measurement ranges	
DN 8	13,7 / 8,5	194	137	176,6	166,3	R 1/4"	15	165,7	0,8...90 l/min	
DN 15	21,3 / 16,1	300	210	177,0	166,3	R 1/2"	20	165,7	0,2...90 m³/h	
DN 20	26,9 / 21,7	475	275	179,8	166,3	R 3/4"	20	165,7	0,3...170 m³/h	
DN 25	33,7 / 27,3	475	275	183,2	166,3	R 1"	25	165,7	0,5...290 m³/h	
DN 32	42,4 / 36,0	475	275	187,5	166,3	R 1 1/4"	25	165,7	0,7...530 m³/h	
DN 40	48,3 / 41,9	475	275	190,5	166,3	R 1 1/2"	25	165,7	1,0...730 m³/h	
DN 50	60,3 / 53,1	475	275	196,5	166,3	R 2"	30	165,7	2,0...1195 m³/h	

F2-GF-TMS 300 with welding neck flange



Dimensions F2-GF-TMS 300 with weld neck						Flange DIN EN 1092-1			Flow measuring ranges F2-GF-TMS 300 for compressed air (ISO 1217: 1000 mbar, 20 ° C)
Pipe size	AD/ID	L (mm)	L1 (mm)	H (mm)	H1 (mm)	Ø D (mm)	Ø K (mm)	n x ØL (mm)	Measurement ranges
DN 15	21,3 / 16,1	300	210	213,8	166,3	95	65	4 x 14	0,2...90 m³/h
DN 20	26,9 / 21,7	475	275	218,8	166,3	105	75	4 x 14	0,3...170 m³/h
DN 25	33,7 / 27,3	475	275	223,8	166,3	115	85	4 x 14	0,5...290 m³/h
DN 32	42,4 / 36,0	475	275	263,3	166,3	140	100	4 x 18	0,7...530m³/h
DN 40	48,3 / 41,9	475	275	2 40,7	166,3	150	110	4 x 18	1,0...730 m³/h
DN 50	60,3 / 53,1	475	275	248,2	166,3	165	125	4 x 18	2,0...1195 m³/h

## F2-GF-TMS 300

<p><b>model</b></p> <p>300 standard</p>	<p><b>process connection</b></p> <p>0 connection thread 1/4"</p> <p>1 connection thread 1/2"</p> <p>2 connection thread 3/4"</p> <p>3 connection thread 1"</p> <p>5 connection thread 1 1/2"</p> <p>6 connection thread 2"</p> <p>4 connection thread 1 1/4"</p> <p>A connection flange DN15</p> <p>B connection flange DN20</p> <p>C connection flange DN25</p> <p>D connection flange DN32</p> <p>E connection flange DN40</p> <p>F connection flange DN50</p> <p>Y special version</p>
<p><b>material (medium contact)</b></p> <p>V2 1.4301 stainless steel</p> <p>V4 1.4404 stainless steel</p> <p>Y special version</p>	<p><b>pressure stage</b></p> <p>16 PN16</p> <p>40 PN40</p> <p>Y special version</p>
<p><b>gas type standard measuring range</b></p> <p>LUFT air - measuring range according to DIN 1945/ ISO 1217 please specify</p> <p>11AR argon measuring range according to DIN 1343 please specify</p> <p>1CO2 carbon dioxide CO2 measuring range according to DIN 1343 please specify</p> <p>11O2 oxygen incl. cleaning oil and fat free measuring range according to DIN 1343 please specify</p> <p>111N nitrogen measuring range according to DIN 1343 please specify</p> <p>111Y special medium</p>	<p><b>accuracy calibration</b></p> <p>A +/- 1,5% from measured value (standard).</p> <p>B +/- 1,0% from measured value.</p> <p>Y special calibration via 5-point ISO-certificate</p>
<p><b>output</b></p> <p>AP analog output: 4 .. 20 mA for m³/h resp. l/min</p> <p>impulse output: 1 impulse pro m³ resp. per liter galvanically isolated</p> <p>digital output: RS 485 interface (Modbus-RTU)</p> <p>5-pol. cable socket M12 included</p> <p>Y special version</p>	<p><b>supply</b></p> <p>2 24 VDC smoothed +/- 15%</p> <p>5-pol. cable socket M12 included</p> <p>Y special version</p>

Order code	<b>F2-GF-TMS</b>	300					
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### Equipment

With the help of this special drilling device, after welding a 1/2 „ball valve within minutes a measuring point can be established. As an alternative to welding the 1/2 „socket, a tapping sleeve can be used.



Drilling device



Highpressure protection Tapping under pressure





Consumption sensor for compressed air and gases  
Screw-on pipe diameters up to DN300

## F2-GF-TMS 500

### Description

The affordable consumption counter TMS 500 works according to the proven calorimetric measuring principle. A heated sensor is cooled by the gas flowing around him. The flow-dependent cooling is utilized as a measuring scale while the degree of cooling is directly dependent on the passing air or gas mass. An additional pressure and temperature compensation is therefore not necessary.

For larger pipe diameters from DN 50 to DN 300 the consumption sensors TMS 500 are available. In addition to pressure air, other gases can be measured e.g. Nitrogen, oxygen, CO2.

The installation of the TMS 500 via a standard G 1/2 „ball valve under pressure. The retaining ring prevents the probe is thrown out uncontrollably during installation and removal by the operating pressure. For installation in different pipe diameters the TMS 500 can be associated with different probe lengths. The exact positioning of the sensor in the center of the pipe is possible via an engraved depth scale.

### Application



- Mobile compressed air measurement in front of single machines / systems
- Flow measurement of process gases such as Nitrogen, CO2, Oxygen, argon, nitrous oxide
- Flow measurement at nitrogen generators
- Determine leakage air / leak rate
- For accounting and consumption measurement of compressed air
- Display shows 2 values: Current consumption in m<sup>3</sup> / h, l / min ... Total consumption (meter reading) in m<sup>3</sup>, l
- Units freely selectable via keypad: m<sup>3</sup> / h, m<sup>3</sup> / min, l / min l / s, kg / h, kg / s, cfm
- Compressed air meter up to 1,999,999,999 m<sup>3</sup>, resettable to „zero“ via keyboard

### Your benefits

- Depth scale for accurate installation
- *Easy installation* under pressure
- Inner diameter adjustable via keys
- *Consumption counter resettable*
- High accuracy
- Negligible small pressure loss



### Specials

 gas flow	 no moving parts
 easy-to-use	 easy installation
 robust	 compact

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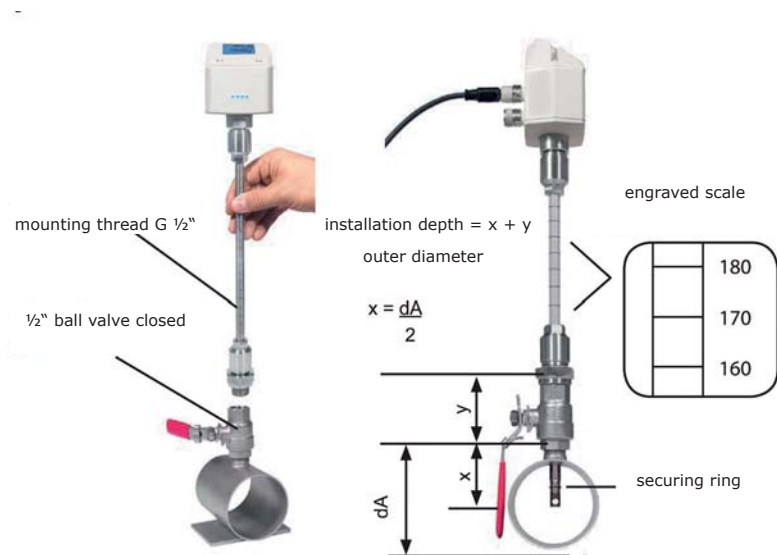
## Technical data

Technical data	
Measurement:	Flow, Consumption and Velocity
Reference:	Standard settings ex works: DIN 1945, ISO 1217 at 20°C and 1000 mbar other standards can be adjusted by Display keys (optional) or means of the Service Software.
Selectable Units:	m <sup>3</sup> /h (Standard settings ex- factory) m <sup>3</sup> /min, l/min, l/s, ft <sup>3</sup> /min, cfm, m/s, kg/h, kg/min, kg/s
Measuring principle:	calorimetric measurement
Sensor:	Pt45, Pt1000
Measuring medium:	Air, gases
Operating temperature:	-30 ... 80°C
Operating pressure:	up to 50 bar
Power supply:	18 to 36 VDC
Power consumption:	max. 5W
Digital output:	RS 485 interface (Modbus RTU)
Analog output:	4...20 mA (see tables page 13 -18), max. burden < 500 Ohm
Pulse output:	pulse output potential free (dry contact) passive: max. 48Vdc, 500mA; 1 pulse pro m <sup>3</sup> resp. pro l Valency adjustable with the display keys
Accuracy:	± 1,5 % m.v.*, ± 0,3 % f.s.* (* m.v. = measured values; f.s. = full scale)
Display:	optional TFT 1.8" Resolution 220 x 176
Mounting thread:	G 1/2"
Material:	Stainless steel 1.4301 / 1.4404
Protection class:	IP65

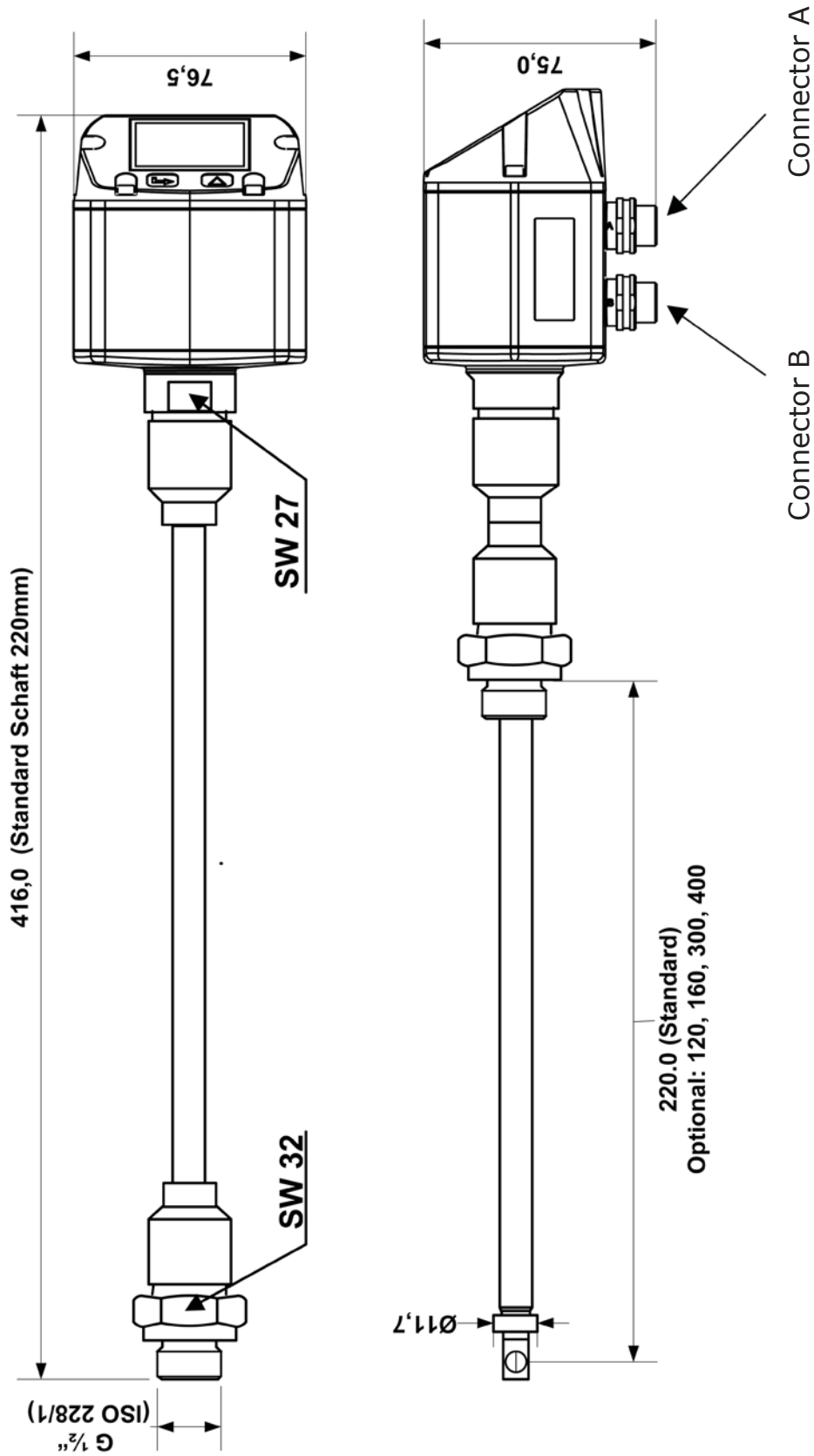
## Details



Inner diameter adjustable via keys



F2-GF-TMS 500



## F2-GF-TMS 500

<p><b>model</b></p> <p>500 standard</p>	<p><b>connection thread</b></p> <p>1 1/2"</p> <p>Y special version</p>	<p><b>material (medium contact)</b></p> <p>V2 1.4301 stainless steel</p> <p>Y special version</p>	<p><b>probe length pipe</b></p> <p>A 220 mm</p> <p>B 120 mm</p> <p>C 160 mm</p> <p>D 300 mm</p> <p>E 400 mm</p> <p>F 500 mm</p> <p>G 600 mm</p> <p>H 700 mm</p> <p>Y special version</p>	<p><b>gas type standard measuring range</b></p> <p>LUFT air - measuring range according to DIN 1945/ ISO 1217 please specify</p> <p>11AR argon measuring range according to DIN 1343 please specify</p> <p>1CO2 carbon dioxide CO2 measuring range according to DIN 1343 please specify</p> <p>11O2 oxygen incl. cleaning oil and fat free measuring range according to DIN 1343 please specify</p> <p>111N nitrogen measuring range according to DIN 1343 please specify</p> <p>111Y special medium</p>	<p><b>accuracy calibration</b></p> <p>A +/-1,5% of measured value (Standard)</p> <p>B +/-1,0% of measured value</p> <p>Y on request: special calibration via 5-point ISO-certificate</p>	<p><b>output</b></p> <p>AP analog output: 4 .. 20 mA for m<sup>3</sup>/h resp. l/min impulse output: 1 impulse pro m<sup>3</sup> resp. per liter galvanically isolated digital output: RS 485 interface (Modbus-RTU) 5-pol. cable socket M12 included</p> <p>Y special version</p>	<p><b>supply</b></p> <p>2 24 VDC smoothed +/- 15%</p> <p>5-pol. cable socket M12 included</p> <p>Y special version</p>	<p><b>measuring range</b></p> <p>S standard measuring range up to 92,7m/s</p> <p>M max version measuring range up to 185m/s</p> <p>H high speed version measuring range up to 224m/s</p> <p>Y special version</p>	<p><b>display</b></p> <p>S without display</p> <p>D LCD-Display</p> <p>Y special version</p>
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Order code

**F2-GF-** 500

### Equipment

If no suitable measuring site with 1/2 „ball valve is present, there are two easy ways to set up a measuring point. Either by welding an 1/2 „ threaded connector and screwing an 1/2“ ball valve or by mounting a tapping sleeve including ball valve. With the help of a special drilling device, after welding a 1/2 „ball valve within minutes a measuring point can be established.



Drilling device



Threaded connection



Tapping sleeve



Tapping under pressure



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