

Thermal Mass Flowmeter Sensyflow FMT400-VTS, FMT400-VTCS

for gases, compact

- **Direct measurement of mass flow and gas temperature**
 - No additional pressure and temperature compensation required
- **Wide measuring range up to 1:100**
 - Factory-calibrated, with (optional) DKD calibration certificate
 - Process-calibrated with clean gases and gas mixtures (optional)
- **High measuring accuracy**
- **Short response time of less than 0.5 seconds**
 - Optimized for sophisticated process control applications
- **Negligible pressure loss**
- **No moving parts, no wear, maintenance-free**
- **Defined, reproducible mounting position in the middle of the conduit**
 - Pipe components for DN 25...DN 200 (1"..."8")
 - Weld-on adapters for larger diameters and square ducts
 - Reliable and convenient hot tap fittings
- **Compact design, with signal output at the sensor head**

Application-oriented models:

- **FMT400-VTS
for process engineering**
 - robust and variable
- **FMT400-VTCS
for the food and beverage industry**
 - hygienic version, suitable for CIP and SIP



**Direct mass flow measurement
High accuracy
Compact design**

ABB

Type overview

Operating principle and system design

The devices of the Sensyflow FMT400-series operate according to the thermal measuring principle of a hot film anemometer. This measuring method determines the gas mass flow directly, with the result that it is not necessary to correct pressure and temperature influences.

Sensyflow FMT400-VTS is used in the field of process engineering and Sensyflow FMT400-VTCS in the food and beverage industry for flow measurement of gases and gas mixtures.

The measuring systems of the FMT400 series are made up of a transducer and a pipe component. The transducer comprises the sensor unit and an electronic transmitter circuit, and it directly delivers an electrically isolated 0/4...20 mA output signal. It is

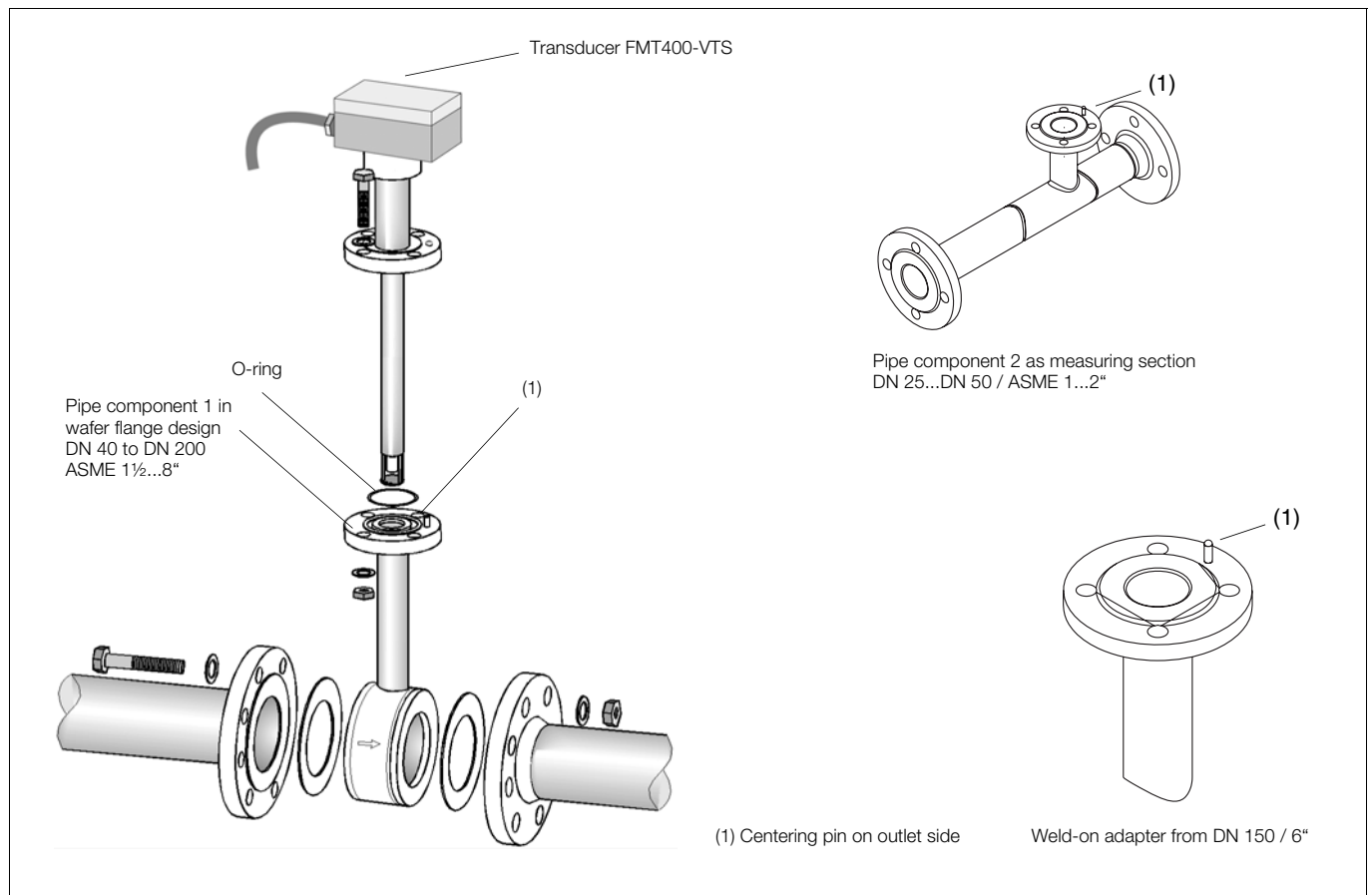
designed as a flange-mounted insertion sensor and is installed in the pipe component in a defined way.

The pipe component is available in nominal sizes ranging from DN 25 to DN 200 and in various designs. It is also possible to install the transducer in square ducts or pipes of any size by using a weld-on adapter.

Typical applications

- Gas flow measurement in the chemical and processing industries
- Compressed air balances
- Gas burner control
- Gas measurement for air separation systems
- Activation air measurement in sewage plants
- Hydrogen measurement in processes

Overview of measuring system Sensyflow FMT400-VTS, version for process engineering



For hygienic version see the overview on page 8.

Type	FMT400-VTS				FMT400-VTCS Hygienic version			
Application	Process engineering				Food and beverage industry			
Measured variable (measured gases)	Flow rate of gases and gas mixtures with known composition				Flow rate of air, N ₂ , CO ₂ , O ₂			
Measuring ranges Nominal sizes (DN)	q_{min} kg/h	q_{max} kg/h	q_{min} Nm³/h	q_{max} Nm³/h	q_{min} kg/h	q_{max} kg/h	q_{min} Nm³/h	q_{max} Nm³/h
	for 0 °C (32 °F) / 1013.25 hPa (14.696 psia)				for 0 °C (32 °F) / 1013.25 hPa (14.696 psia)			
DN 25	0 (1.6) ...	160	0 (1.2) ...	120	0 (1.6) ...	160	0 (1.2) ...	120
DN 40	0 (4) ...	430	0 (3) ...	330	0 (4) ...	430	0 (3) ...	330
DN 50	0 (7) ...	700	0 (5) ...	540	0 (7) ...	700	0 (5) ...	540
DN 65	0 (12) ...	1,200	0 (9) ...	940				
DN 80	0 (17) ...	1,700	0 (13) ...	1,300	0 (17) ...	1,700	0 (13) ...	1,300
DN 100	0 (30) ...	3,000	0 (23) ...	2,300				
DN 125	0 (51) ...	5,100	0 (39) ...	3,900				
DN 150	0 (80) ...	8,000	0 (62) ...	6,200				
DN 200	0 (130) ...	13,000	0 (100) ...	10,000				
up to 3000 mm	0 (27,000) ...	2,700,000	0 (21,000) ...	2,100,000				
(square ducts and larger diameters on request)								
Measuring ranges Nominal sizes (inch)	q_{min} lbs/h	q_{max} lbs/h	q_{min} SCFM	q_{max} SCFM				
	for 15 °C (59 °F) / 1013.25 hPa (14.696 psia)							
1.0	0 (3.1) ...	310	0 (0.7) ...	65				
1.5	0 (8.4) ...	840	0 (1.8) ...	180				
2.0	0 (14) ...	1,400	0 (3) ...	310				
3.0	0 (35) ...	3,500	0 (8) ...	760				
4.0	0 (60) ...	6,000	0 (13) ...	1,300				
6.0	0 (165) ...	16,500	0 (36) ...	3,600				
8.0	0 (285) ...	28,500	0 (62) ...	6,200				
120.0	0 (60,000) ...	6,000,000	0 (13,000) ...	1,300,000				
(square ducts and larger diameters on request)								
Note regarding measuring ranges	The above values are reference values for applications involving air or nitrogen under atmospheric conditions (other gases available upon request). The values for q _{max} can be increased by approx. 10 % upon request (with lower accuracy in the extended range). Readings are displayed for 0 kg/h / SCFM and higher (or other mass flow unit)							
Measured error Air, nitrogen other gases	Under calibration conditions in the stated measuring range ≤ ± 0.9 % of measured value ± 0.05 % of possible end value in this nominal size (see measuring ranges) ≤ ± 1.8 % of measured value ± 0.10 % of possible end value in this nominal size (see measuring ranges) For special calibration on request							
Repeatability error	< 0.25 % of measured value, t _{meas} = 10 s							
Influence of medium temperature	< 0.05 % / K of measured value (dependent on type of gas)							
Influence of medium pressure	< 0.2 % / 100 kPa (/bar) of measured value (dependent on type of gas)							
Response time	T ₆₃ = 0,5 s				T ₆₃ = 2 s			

Parameter setting

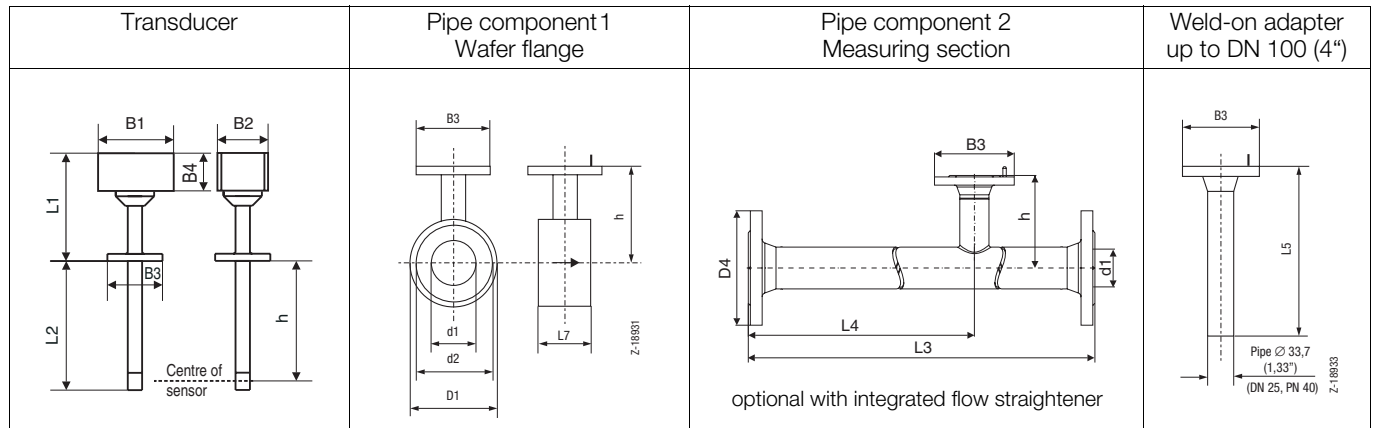
The output signal range of the FMT400-VTS/VTCS flowmeters can be set to either 0...20 mA or 4...20 mA. Additionally, the measuring range window can be extended such that a smaller span corresponds to a 20 mA current signal. Alarm signalling is possible at < 3.5 mA or > 22 mA (selectable).

The measuring instrument parameters can be set via the LKS-adapter. A standard PC or laptop allows you to change the used output signal and to adjust the measuring range.

Technical data

Type	Sensyflow FMT400-VTS	Sensyflow FMT400-VTCS
Operating conditions		
Recommended inlet and outlet runs	according to DIN EN ISO 5167-1 min. inlet 15 × D, outlet 5 × D	
Environmental conditions		
Ambient temperature	-25...70 °C	
Connection head	Zone 2/22 version: -20...50 °C (-4...122 °F)	
Storage temperature	-25...85 °C (-13...185 °F)	
Process conditions		
Operating temperature medium (transducer)	Standard range: -25...150 °C (-13...302 °F) Extended range: -25...300 °C (-13...572 °F) Zone 2/22 version: -20...130 °C (-4...266 °F)	-25...150 °C (-13...302 °F)
Operating pressure (max.)	40 × 10 ⁵ Pa (40 bar)	16 × 10 ⁵ Pa (16 bar) pipe fitting S (for DN 80: 10 × 10 ⁵ Pa (10 bar)) 10 × 10 ⁵ Pa (10 bar) FG flange
Pressure loss (logarithmic diagram)	<p>< 1.0 kPa (10 mbar), typical value 0.1 kPa (1 mbar)</p> <p>Z-18927</p>	
Mechanical construction		
Design/dimensions/weight	dependent on nominal size	dependent on nominal size
Material (standard)	1.4571, Ceramics	stainless steel e.g. 1.4301
Process connection (standard)	Flange acc. to EN1092-1 form B1, PN 40 (DIN 2635 form C) or ASME B 16.5 Cl. 150 / 300	Pipe fitting S acc. to DIN 11851 or FG flange
Components	- VTS transducer - VT pipe component design 1 or 2 or weld-on adapter	VTCS transducer VTC pipe component
Standard nominal pipe sizes	Pipe component design 1: Wafer flange DN 40, 50, 65, 80, 100, 125, 150, 200 – ASME 1½", 2", 3", 4", 6", 8" Pipe component design 2: measuring section DN 25, 40, 50, 65, 80 – ASME 1", 1½", 2" Weld-on adapter for square ducts or pipe sizes ≥ DN 100	Pipe component hygienic version: measuring section DN 25, 40, 50, 80
Type of protection	IP 65 / Nema 4X	
Auxiliary energy		
Electrical power supply	24 V DC ± 25 %; 24 V AC ± 25 %, 48...62 Hz	
Voltage	< 15 W	
Power consumption	< 600 mA, slow-blow fuse of at least 2 A recommended	
Current drain		
Cable entry	M20 x 1.5	
Output		
Output signal, analog	0/4...20 mA, load < 750 Ω, electrical isolated, alert < 3.5 or > 22 mA	
Explosion protection	Manufacturer's Declaration zone 2/22 II 3G EEx nA ib II T4 II 3D T 135°C IP 65	

Dimensional drawings, version for process engineering



PN 40		L2	h	D1	d1	d2	D4	L3	L4
DN 25		269 (10.59)	263 (10.35)	–	28.5 (1.12)	–	115 (4.53)	600 (23.62)	486 (19.13)
DN 40	B1 = 125 (4.92) B2 = 80 (3.15)			94 (3.70)	43.1 (1.70)	88 (3.46)	150 (5.91)	860 (33.86)	731 (28.78)
DN 50	B3 = Ø115 (4.53)			109 (4.29)	54.5 (2.15)	102 (4.02)	165 (6.50)	1000 (39.37)	837 (32.95)
DN 65	B4 = 58 (2.28)			129 (5.67)	70.3 (2.77)	122 (4.80)	185 (7.28)	1400 (55.12)	1190 (46.85)
DN 80				144 (5.67)	82.5 (3.25)	138 (5.43)	200 (7.87)	1700 (66.93)	1450 (57.09)
DN 100				170 (6.69)	107.1 (4.22)	162 (6.38)	–	–	–
DN 125	L1 = 188 (7.40)			196 (7.72)	131.7 (5.19)	188 (7.40)	–	–	–
DN 150	L5 = 450 (17.72)			226 (8.90)	159.3 (6.27)	218 (8.58)	–	–	–
DN 200	L7 = 65 (2.56)			293 (11.54)	206.5 (8.13)	285 (11.22)	–	–	–
> 350		431 (16.97)	425 (16.73)						
> 700		781 (30.75)	775 (30.51)						

Dimensions in mm (inch)

ASME B 16.5, Cl. 150 (ANSI), Sch 40 S		L2	h	D1	d1	d2	D4	L3	L4
1"		269 (10.59)	263 (10.35)	–	26.6 (1.05)	–	108 (4.25)	560 (22.05)	454 (17.87)
1½"	B1 = 125 (4.92)			85 (3.35)	40.9 (1.61)	73 (2.87)	127 (5.00)	864 (34.02)	741 (29.17)
2"	B2 = 80 (3.15)			103 (4.06)	52.6 (2.07)	92 (3.62)	154 (6.06)	1003 (39.49)	846 (33.31)
3"	B3 = Ø115 (4.53)			135 (5.31)	78.0 (3.07)	127 (5.00)	–	–	–
4"	B4 = 58 (2.28)			173 (6.81)	102.4 (4.03)	157 (6.18)	–	–	–
6"	L1 = 188 (7.40)			221 (8.70)	154.2 (6.07)	216 (8.50)	–	–	–
8"	L5 = 450 (17.72)			278 (10.94)	202.7 (7.98)	270 (10.63)	–	–	–
> 14"	L7 = 65 (2.56)								
> 28"		431 (16.97)	425 (16.73)						
		781 (30.75)	775 (30.51)						

Dimensions in mm (inch)

ASME B 16.5, Cl. 300 (ANSI), Sch 40 S		L2	h	D1	d1	d2	D4	L3	L4
1"		269 (10.59)	263 (10.35)	–	26.6 (1.05)	–	123.9 (4.88)	560 (22.05)	454 (17.87)
1½"	B1 = 125 (4.92)			94 (3.70)	40.9 (1.61)	73 (2.87)	155.4 (6.12)	864 (34.02)	741 (29.17)
2"	B2 = 80 (3.15)			110 (4.33)	52.6 (2.07)	92 (3.62)	165.1 (6.50)	1003 (39.49)	846 (33.31)
3"	B3 = Ø115 (4.53)			148 (5.83)	78.0 (3.07)	127 (5.00)	–	–	–
4"	B4 = 58 (2.28)			180 (7.09)	102.4 (4.03)	157 (6.18)	–	–	–
6"	L1 = 188 (7.40)			249 (9.80)	154.2 (6.07)	216 (8.50)	–	–	–
8"	L5 = 450 (17.72)			307 (12.09)	202.7 (7.98)	270 (10.63)	–	–	–
> 14"	L7 = 65 (2.56)								
> 28"		431 (16.97)	425 (16.73)						
		781 (30.75)	775 (30.51)						

Dimensions in mm (inch)

Weld-on adapter for Sensyflow FMT400-VTS

(1) Centering pin on outlet side

Sealing ring groove

Weld-on adapter (upon delivery)

Connection flange DN 25

450 mm (17,72")

min. 28 mm (1,10")

Ø D

← Direction of flow

Z-189341

Z-189342

Required accuracy of mounting
Centric mounting $\leq \pm 2$ mm (0.08")
Twist $\leq \pm 2^\circ$

Length h of the transducer in mm (inch)	Min./max. outer pipe diameter in mm (inch)
263 (10.35)	100...350 (3.94...13.78)
425 (16.73)	> 350...700 (13.78...27.56)
775 (30.51)	> 700...1400 (27.56...55.12)*

* This maximum pipe diameter specification is only valid when installing the sensor centrally in the pipe. For larger diameters or angular ducts a non-centric sensor position is taken into account for calibration.

Weld-on adapter with ball valve for Sensyflow FMT400-VTS

(1) Centering pin on outlet side
(2) ball valve DN 40
D Pipe diameter (outside)

Sealing ring groove

Weld-on adapter (upon delivery)

Connection flange DN 25

540 mm (21,26")

min. 28 mm (1,10")

Ø D

← Direction of flow

Z-20233

Required accuracy of mounting
Centric mounting $\leq \pm 2$ mm (0.08")
Twist $\leq \pm 2^\circ$

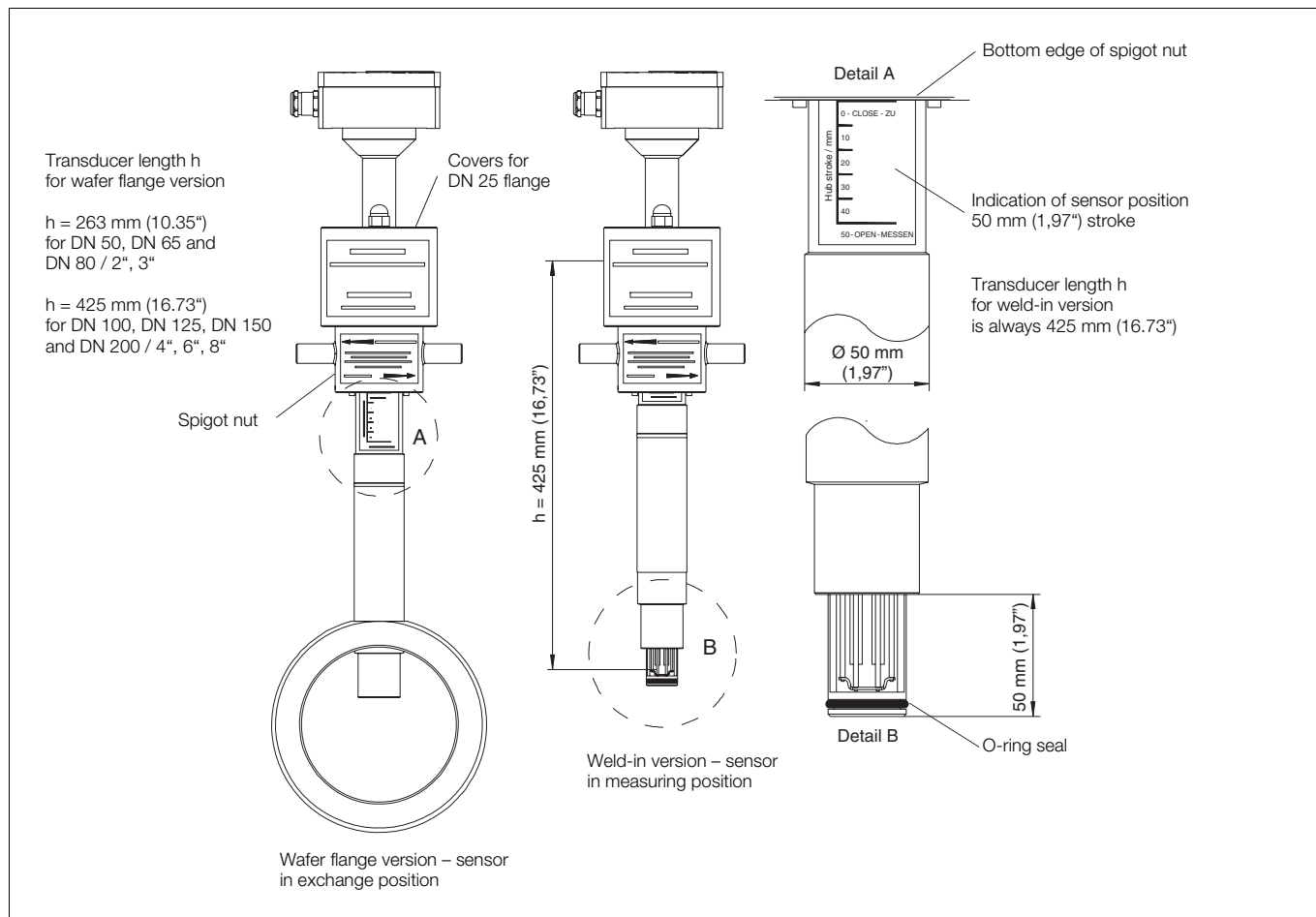
Length h of the transducer in mm (inch)	Min./max. outer pipe diameter in mm (inch)
263 (10.35)	100...150 (3.94...5.91)
425 (16.73)	> 150...500 (5.91...19.69)
775 (30.51)	> 500...1150* (19.69...45.28)

* This maximum pipe diameter specification is only valid when installing the sensor centrally in the pipe. For larger diameters or angular ducts a non-centric sensor position is taken into account for calibration.

Note:

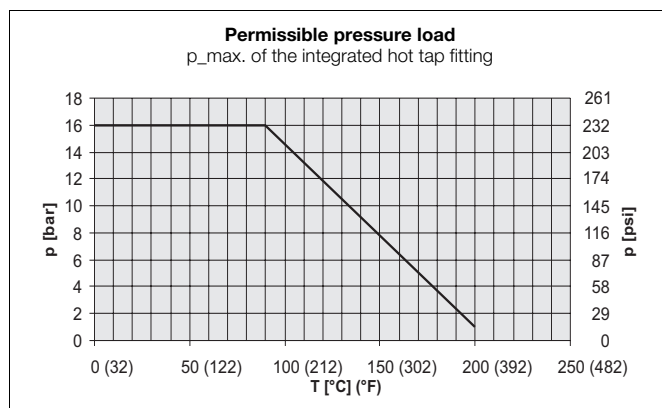
Prior to mounting the weld-on adapters must be shortened to length $L = h - 1/2 D_{outer}$
The distance h between the upper flange edge and the pipe center line must be within a tolerance of ± 2 mm (0,08").
The right angle to the pipe center line must be observed (max. tolerance $\pm 2^\circ$)
The centering pin of the adapter must be aligned centrally with the pipe center line in flow direction (on outlet run side, downstream of the measuring point).

Integrated hot tap fitting for Sensyflow FMT400-VTS



The integrated hot tap fitting is used instead of the pipe component and weld-on adapter assembly described above if the sensor must be exchangeable during operation with virtually no gas escaping from the system.

It is recommended to use the hot tap fitting for measurements in main conduits (e.g. compressed air systems) or for measuring points which otherwise require rinsing prior to removing the sensor. As a rule, hot tap fittings should be preferred for all systems where, otherwise, the entire system or parts of it must be switched off to replace a sensor.



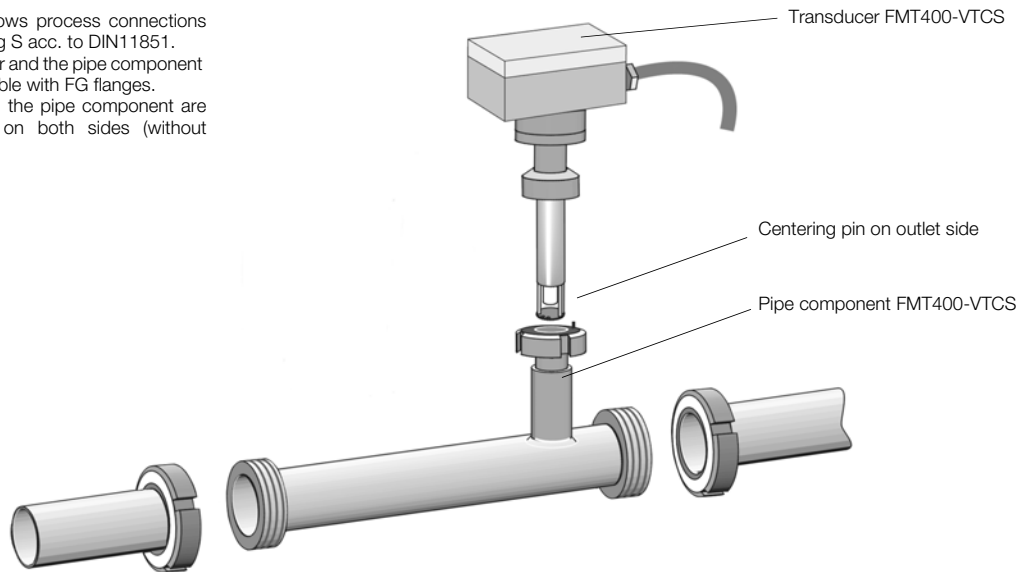
Maximum pressure/temperature values for the integrated hot tap fitting

Note:

For integrated hot tap fitting in wafer flange design DN 65, use connection flange PN16 with 4 screw holes on the process side. Wafer flange versions 2...8" only for connection flange ASME B16.5 Cl.150.

Overview of measuring system Sensyflow FMT400-VTCS, hygienic version

The figure shows process connections with pipe fitting S acc. to DIN11851. The transducer and the pipe component are also available with FG flanges. FG flanges on the pipe component are always plain on both sides (without groove).



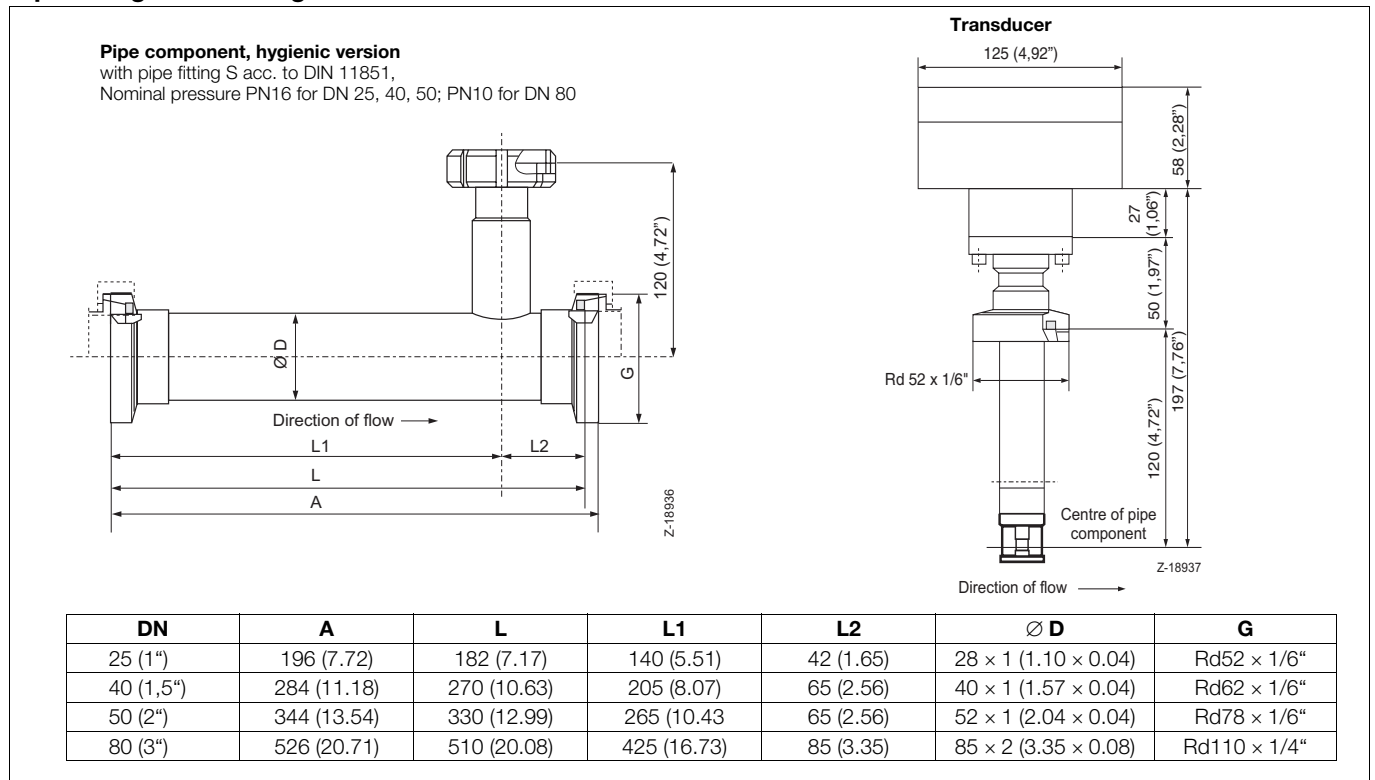
Measuring ranges at atmospheric pressure

Type of gas		Air, nitrogen, oxygen -25...150 °C (-13...302 °F)								
Nominal size:		q_{min}		q_{max}		q_{min}		q_{max}		
mm	inch	kg/h		kg/h		Nm ³ /h		Nm ³ /h		
						for 0 °C (32 °F) / 1013.25 hPa (14.696 psia)				
		0	(1.6) ...	160	0	(1.2) ...	120	0	(3.5) ...	350
DN 25	(1)	0	(1.6) ...	160	0	(1.2) ...	120	0	(3.5) ...	350
DN 40	(1,5)	0	(4) ...	430	0	(3) ...	330	0	(10) ...	950
DN 50	(2)	0	(7) ...	700	0	(5) ...	540	0	(15) ...	1,500
DN 80	(3)	0	(17) ...	1,700	0	(13) ...	1,300	0	(37) ...	3,700

Type of gas		Carbon dioxide -25...150 °C (-13...302 °F)								
Nominal size:		q_{min}		q_{max}		q_{min}		q_{max}		
mm	inch	kg/h		kg/h		Nm ³ /h		Nm ³ /h		
						for 0 °C (32 °F) / 1013.25 hPa (14.696 psia)				
		0	(1.8) ...	180	0	(0.9) ...	90	0	(4) ...	400
DN 25	(1)	0	(1.8) ...	180	0	(0.9) ...	90	0	(4) ...	400
DN 40	(1,5)	0	(4) ...	440	0	(2) ...	220	0	(10) ...	970
DN 50	(2)	0	(7) ...	730	0	(4) ...	370	0	(16) ...	1,600
DN 80	(3)	0	(19) ...	1,900	0	(10) ...	900	0	(42) ...	4,200

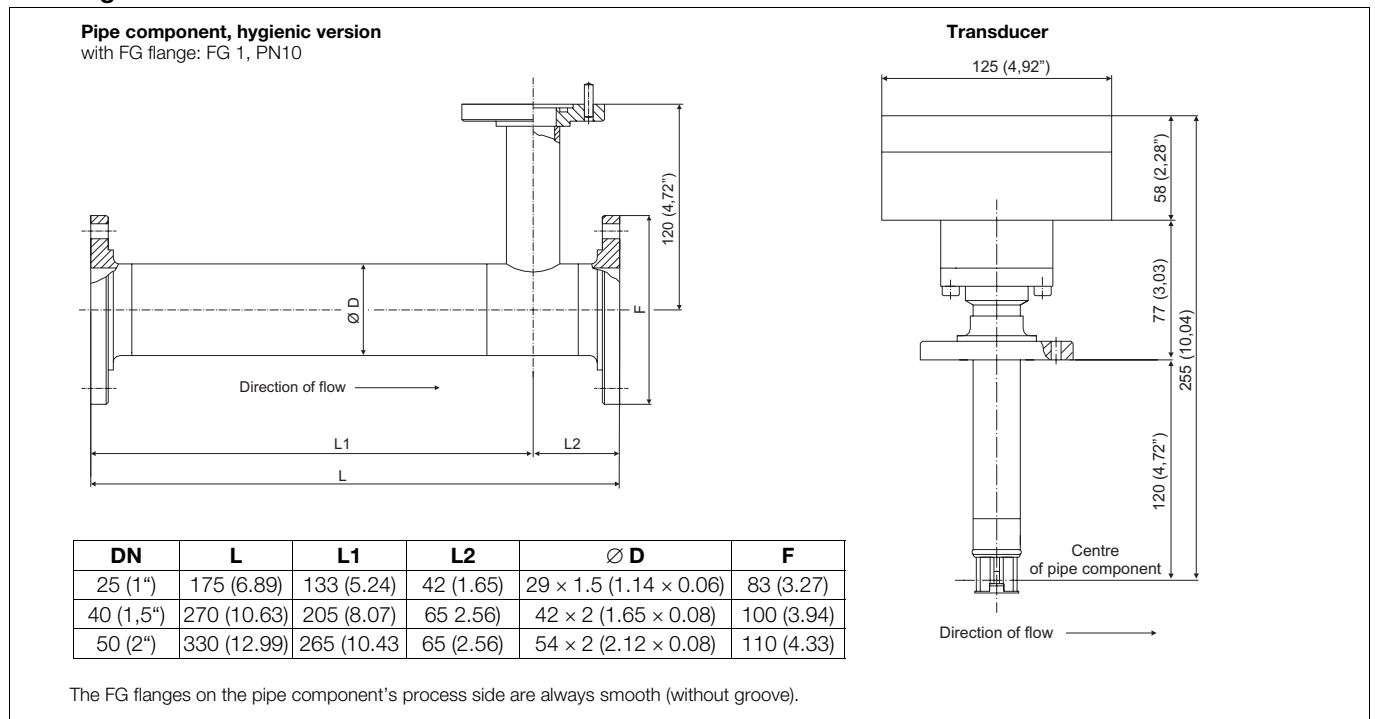
Dimensional drawings of hygienic version Sensyflow FMT400-VTCS

Pipe fitting S according to DIN 11851



Dimensions in mm (inch)

FG flange



Dimensions in mm (inch)

Recommended steadying lengths according to DIN EN ISO 5167-1

	<p>Expansion X = 15</p>
	<p>Reducer X = 15</p>
	<p>90° elbow X = 20</p>
	<p>Two 90° elbow in 1 level X = 25</p>
	<p>Two 90° elbow in 2 levels X = 40</p>
	<p>Valve/slide X = 50</p>

To achieve the stated measuring accuracy, the steadying lengths seen above must be provided. For combinations of inlet run disturbances, e. g. valve and reducer, you must always consider the longer inlet run length. In confined spaces at the mounting location the outlet run length can be shortened to 3 x D. The reduction of the minimum inlet run length, however, will impact on the achievable accuracy.

High repeatability of the measuring value is still provided. Under certain circumstances, special calibration can be performed for insufficient steadying lengths. For this purpose and in individual cases, consult the DKD Calibration Department at Alzenau. For gases with extremely low density (hydrogen, helium) the steadying lengths must be doubled.

Ordering information

	Main Code														Add. Code
	Variant digit No.	1 - 6	7	8	9	10	11	12	13	14					
FMT400-VTS Thermal Mass Flowmeter, Version for Process Engineering, for Gases, Compact	V14222		X	X	X	X	X	X	X	X	X	X	X	X	XXX
Sensor Unit Ceramic sensor			0												
Version VTS, process technology VTS, process technology, ATEX Zone 2 / 22					1 2										
Operating Temperature Standard range Extended range -25 ... 300 °C (-15 ... 572 °F) (not with Ex-Version)					6)	1 2									
Medium Gases and gas mixtures with max. 23.5 Vol% O2 Oxygen / gas mixtures > 23.5 Vol% O2, oil and grease-free, with O2 certificate (max. 150 °C / 302 °F) Natural gas, with DVGW certificate (max. 80 °C / 176 °F) Hydrogen, Helium (max. 8 bar / 0.8 MPa / 116 psi, always with process gas calibration)						1) 1 2 2)	0 1 2 3								
Mounting Length / Material 263 mm (10.4 in.) / AISI 316Ti SST (1.4571) (DN 25 ... DN 350 [1 ... 14 in.]) 425 mm (17 in.) / AISI 316Ti SST (1.4571) (> DN 350 ... DN 700 [> 14 ... 28 in.]) 775 mm (31 in.) / AISI 316Ti SST (1.4571) (> DN 700 [> 28 in.])							7) 7) 7)	1 2 3	0 0 0						
Analog Output 4 ... 20 mA, alarm < 3.5 mA 4 ... 20 mA, alarm > 22 mA 0 ... 20 mA										3) 3) 3)	1 2 3				
Number of Characteristic Curves 1 characteristic curve															1
Certificates: DKD / Material DKD certificate of calibration with air (not for process gas calibration) Material certificate acc. to EN 10204-3.1													4) 5)	310 30A	
Certificates: GOST GOST Russia - metrological approval GOST Kazakhstan - metrological approval														CG1 CG2	
Language of Documentation German English														M1 M5	

Accessories	Code
FMT Power supply unit, Housing for rail mounting 62.5 mm x 75 mm x 139 mm, Input 230 V AC, Output 24 V DC / 2.5 A	7962800
FMT200-D / FMT400 LKS Adapter, Local Communication Interface for parameterization, incl. Communication software	7962828

- 1) Not for pure oxygen
- 2) With medium H2 or He in nominal size DN 25 ... DN 50 (1 ... 2 in.): Please use pipe component design 2 with flow straightener
- 3) Changeable via LKS Adapter
- 4) PTB approved DKD calibration facility No. 05701
- 5) Only for transducer
- 6) Standard version -25 ... 150 °C (-15 ... 302 °F), ATEX Zone 2 / 22 version -20 ... 130 °C (-4 ... 266 °F)
- 7) Nominal size ranges when using pipe components or weld-on adapters without ball valve

Ordering information

	Main Code							Add. Code	
	Variant digit No.	1 - 6	7	8	9	10	11		12
FMT081 Pipe component / weld-on adapter, for Sensyflow FMT500-IG and FMT400-VTS	FMT081		X	X	X	X	X	X	XXX
Medium									
Gases and gas mixtures with max. 23.5 Vol% O2			A						
Oxygen/gas mixtures > 23.5 Vol% O2, oil and grease-free, with O2 certificate (max. 150 °C/302 °F)			B						
Natural gas, with DVGW certificate (max. 80 °C / 176 °F)			C						
Hydrogen, Helium			1) D						
Design									
Pipe component 1 in wafer flange version					1				
Pipe component 2 as partial measuring section			2)	2					
Pipe component 2 as partial measuring section with integrated flow straighteners			2)	3					
Weld-on adapter			10)	4					
Others				9					
Nominal Size									
Selection for weld-on adapter						Y			
DN 25 (1 in.)					11)	A			
DN 40 (1-1/2 in.)					3)	C			
DN 50 (2 in.)						D			
DN 65 (2-1/2 in.)					4)	E			
DN 80 (3 in.)					5)	F			
DN 100 (4 in.)					12)	G			
DN 125 (5 in.)					13)	H			
DN 150 (6 in.)					12)	J			
DN 200 (8 in.)					12)	L			
Others					6)	Z			
Flange Style and Pressure Rating									
Selection for weld-on adapter							0		
DIN PN 40, nominal pressure 40 bar (4 MPa / 580 psi)							1		
ANSI / ASME 150 lb, Schedule 40 S							2		
ANSI / ASME 300 lb, Schedule 40 S						3)	3		
Others							9		
Process Connection for Transducer									
Standard Sensyflow flange with centering pin						14)	A		
With ball valve, max. 150 °C (302 °F) and 16 bar (1.6 MPa / 232 psi)						15)	G		
With integrated hot tap fitting for max. DN 125 (5 in.). Allows gas-tight sensor removal / insertion up to 16 bar (1.6 MPa / 232 psi) or 200 °C (392 °F). For DN 65, use connection flanges PN 16 (16 bar / 1.6 MPa / 232 psi) with 4 screw holes						7)	H		
With integrated hot tap fitting above DN 125 (5 in.) to max. DN 200 (8 in.). Allows gas-tight sensor removal / insertion up to 16 bar (1.6 MPa / 232 psi) or 200 °C (392 °F)						8)	J		
Material									
Stainless steel AISI 316Ti (1.4571)								3	
Carbon steel S 235 (1.0037)								9)	1

Continued next page

Ordering information

	Main Code							Add. Code
	Variant digit No.	1 - 6	7	8	9	10	11	
FMT081 Pipe component / weld-on adapter, for Sensyflow FMT500-IG and FMT400-VTS	FMT081	X	X	X	X	X	X	XXX
Blind Flange DN 25 blind flange to close sensor connection, material stainless steel AISI 316Ti (1.4571)								F3
Certificates and Material Traceability Material certificate acc. to EN 10204-3.1 Factory certificate acc. to EN 10204-2.2								CBB CF3

- 1) Max. 8 bar / 0.8 MPa / 116 psi. With DN 25 ... DN 50 (1 ... 2 in.): Please use pipe component 2 with flow straightener
- 2) Not available with ball valve or hot-tap fitting
- 3) Not available with hot-tap-fitting
- 4) Not available with flange style ANSI / ASME
- 5) Not available with pipe component 2 in combination with flange style ANSI / ASME
- 6) Please specify exact inner pipe diameter
- 7) Not available with pipe component 2. Not available with DVGW certificate. Please apply the correct sensor length: For pipe component DN 50 ... DN 80: h = 263 mm, for pipe component from DN 100 and weld-on adapter: h = 425 mm
- 8) Not available with pipe component 2. Not available with DVGW certificate. Please apply the sensor length h = 425 mm
- 9) Only for weld-on adapter without ball-valve. Only without certificates
- 10) From DN 100 (4 in.)
- 11) Not available with pipe component 1 in wafer flange version
- 12) Not available with pipe component 2 as partial measuring section
- 13) Not available with pipe component 2 as partial measuring section. Not available with flange style ANSI / ASME
- 14) Please apply the correct sensor length: For pipe component 1 and 2 without ball valve / hot tap fitting: h = 263 mm. For weld-on adapter and pipe diameter up to 350 mm: h = 263 mm, up to 700 mm: h = 425 mm, > 700 mm: h = 775 mm
- 15) Not available with pipe component 2. Not available with DVGW certificate. Correct sensor length: For DN 50 ... DN 100: h = 263 mm, from DN 125: h = 425 mm. For weld-on adapter up to 150 mm: h = 263 mm, up to 500 mm: h = 425 mm, > 500 mm: h = 775 mm

Ordering information

	Main Code										Add. Code	
	Variant digit No.	1 - 6	7	8	9	10	11	12	13	14		
FMT400-VTCS Thermal Mass Flowmeter, Transducer, Hygienic Version	V14222	X	X	X	X	X	X	X	X	X		XXX
Sensor Unit												
Metal sensor, stainless steel	1)	1										
Version												
VTCS, Hygienic version, pipe screw connection S acc. to DIN 11851, nominal pressure PN 16 (16 bar / 1.6 MPa / 232 psi)			6									
VTCS, Hygienic version, FG flange, nominal pressure PN 10 (10 bar / 1 MPa / 145 psi)			8									
Operating Temperature												
Standard range -25 ... 150 °C (-13 ... 302 °F), hygienic version				0								
Medium												
Gases and gas mixtures with max. 23.5 Vol% O ₂					4)	0						
Oxygen/gas mixtures > 23.5 Vol% O ₂ , oil and grease-free, with O ₂ certificate (max. 150 °C/302 °F)					5)	1						
Mounting Length / Material												
120 mm (4.8 in.) / Stainless steel							4	0				
Analog Output												
4 ... 20 mA, alarm < 3.5 mA									2)	1		
4 ... 20 mA, alarm > 22 mA									2)	2		
0 ... 20 mA									2)	3		
Number of Characteristic Curves												
1 characteristic curve											1	
Certificates: DKD / Material												
DKD certificate of calibration with air (not for process gas calibration)											3)	310
Material certificate acc. to EN 10204-3.1											6)	30A
Certificates: GOST												
GOST Russia - metrological approval												CG1
GOST Kazakhstan - metrological approval												CG2
Language of Documentation												
German												M1
English												M5
Accessories												Code
FMT Power supply unit, Housing for rail mounting 62.5 mm x 75 mm x 139 mm, Input 230 V AC, Output 24 V DC / 2.5 A												7962800
FMT200-D / FMT400 LKS Adapter, Local Communication Interface for parameterization, incl. Communication software												7962828

- 1) Only for FMT400-VTCS, hygienic version
- 2) Changeable via LKS Adapter
- 3) PTB approved DKD calibration facility No. 05701
- 4) Not for pure oxygen
- 5) Not for flange FG
- 6) Only for transducer

Ordering information

	Main Code							Add. Code
	Variant digit No.	1 - 6	7	8	9	10	11	
FMT082 Pipe component, for Sensyflow FMT400-VTCS	FMT082	X	X	X	X	X	X	XXX
Medium								
Gases and gas mixtures with max. 23.5 Vol% O ₂			A					
Oxygen/gas mixtures > 23.5 Vol% O ₂ , oil and grease-free, with O ₂ certificate (max. 150 °C/302 °F)			B					
Design								
Pipe component for Sensyflow FMT400-VTCS			0					
Nominal Size								
DN 25 (1 in.)					A			
DN 40 (1-1/2 in.)					C			
DN 50 (2 in.)					D			
DN 80 (3 in.)					F			
Flange Style and Pressure Rating								
Pipe screw connection S acc. to DIN 11851, nominal pressure PN 16 (16 bar / 1.6 MPa / 232 psi)						6		
FG flange, nominal pressure PN 10 (10 bar / 1 MPa / 145 psi)						1) 8		
Process Connection for Transducer								
Standard Sensyflow flange with centering pin							A	
Material								
Stainless steel AISI 304 (1.4301), only with pipe screw connection S / nominal pressure PN 16								4
Stainless steel AISI 316L (1.4404), only with FG flange / nominal pressure PN 10								5
Certificates and Material Traceability								
Material certificate acc. to EN 10204-3.1								
Factory certificate acc. to EN 10204-2.2								F3

1) Not available for Oxygen measurement

Additional ordering information for calibration

FMT400-VTS, FMT400-VTCS		
Gas component 1	Vol. %	(clear text)
Gas component 2	Vol. %	(clear text)
Gas component 3	Vol. %	(clear text)
Gas component 4	Vol. %	(clear text)
Gas component 5	Vol. %	(clear text)
Gas component 6	Vol. %	(clear text)
Gas component 7	Vol. %	(clear text)
Gas component 8	Vol. %	(clear text)
Gas component 9	Vol. %	(clear text)
Gas component 10	Vol. %	(clear text)
		Sum 100 %
Operating temperature		(clear text)
Operating pressure		(clear text)
Nominal size, Pipe inner diameter (mm)		(clear text)
Measuring range		(clear text)
Unit		(clear text)
Standard state (e.g. 0 °C, 1013 mbar)		(clear text)
Adjusted measuring range		(clear text)

Design parameters

Measuring point parameters

Type of gas and composition (Vol %) ¹⁾			Flow rate unit ²⁾ kg/h <input type="checkbox"/> kg/min <input type="checkbox"/> kg/s <input type="checkbox"/> Nm ³ /h <input type="checkbox"/> Nl/s <input type="checkbox"/> Lb/h <input type="checkbox"/> Lb/min <input type="checkbox"/> SCFM <input type="checkbox"/> SCFH <input type="checkbox"/> SCFS <input type="checkbox"/> Other <input type="checkbox"/>	
Measuring range min..... normal max.....				
Medium temperature (°C) min..... normal max.....				
Operating pressure (bar abs.) min..... normal max.....				
Pipe: nominal size DN Nominal pressure PN .. Pipe inner Ø (mm) Wall thickness (mm)				
Corrosive components of gas	no. <input type="checkbox"/>	yes <input type="checkbox"/>	what	Material of pipe
Condensable components	no. <input type="checkbox"/>	yes <input type="checkbox"/>	what	Dew point (°C)
Solids in medium	no. <input type="checkbox"/>	yes <input type="checkbox"/>	Size of particle (µm)	Quantity (mg/m ³) ²⁾
Tag	Initial equipment <input type="checkbox"/>	Substitute <input type="checkbox"/>	Existing equipment	

¹⁾ Please specify the composition of gas, e. g. North Sea natural gas: CH₄ = 90 Vol. %; C₂H₆ = 5 Vol. %; N₂ = 3 Vol. %; CO₂ = 2 Vol. %
²⁾ Standard state related to 0 °C/1013 mbar (standard)

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