



UFM 3030

Technical Datasheet

The universal 3-beam in-line ultrasonic flowmeter for liquids

- Independent of conductivity, viscosity, temperature, density and pressure
- No moving or intruding parts, therefore no pressure loss or wear
- Minimal operational and maintenance costs



KROHNE

Standard solution in the process industry

UFM 3030 is a 3-beam ultrasonic flowmeter for liquids. UFM 3030 measures independent of conductivity, viscosity, temperature, density and pressure.



1 Intelligent DSP software

2 No moving parts

Highlights

- Three beams generate a measurement effectively independent of flow profile
- Major performance improvement by applying innovative electronics and digital signal processing (DSP)
- Optional pressure and temperature inputs for calculation of standardised volumetric flow or mass flow according to API 2540 or customer specifics
- Over 20.000 ultrasonic flowmeters installed worldwide
- Easy to install and operate
- No moving or intruding parts, no wear, no drift, therefore no additional pressure loss
- No material build-up as unobstructed flow sensor with smooth surface finish
- No periodic re-calibration or maintenance
- Insensitive to corrosive or abrasive products
- Excellent long-term stability and reliability

Industries

- Chemicals
- Petrochemicals
- Oil & Gas
- Heating, Ventilation & Air Conditioning (HVAC)
- Power Plants
- Water

Applications

- Metering of cooling water and demineralised water
- Control of batching and blending operations
- Mass flow measurement
- Allocation measurement
- District heating
- Irrigation
- Energy measurement

In-line Ultrasonic process flowmeter family

The UFM 3030 liquid process flowmeter consists of a UFS 3000 flow sensor and a flow converter, UFC 030. A UFS 3000 flow sensor can be built together with a UFC 030 flow converter as a compact flowmeter or can be installed separately as a field version.

UFC 030 flow converter



- 1 The flowconverter is fully digital and fitted with a digital signal processor and advanced software for optimal performance
- 2 For in-depth analysis of application and evaluation of flowmeter performance, the soundcheck interface and software is available

Ultrasonic liquid flow sensor family



- 1 The UFS 3000, the universal ultrasonic flowsensor for liquids
- 2 For extreme high or low temperature applications from -170 up to 500 deg. C, the UFS 500 HT/LT flowsensor is available
- 3 For open channels or onsite welding in of sensors the UFS 800 C (for open channels) or OPTISONIC 800 W (weld in) are available. Depending on the pipe size the UFS 800 W can be fitted with 1, 2 or even 3 sensor pairs for optimal measurement performance
- 4 For piping that can not be drained, the UFM 800 HT (hot tap) is available. The UFM 800 HT can be fitted in 1, 2 or 3 path configuration depending on the pipe size, while the pipe remains filled and pressurized

The OPTISONIC 7060 C is a process gasflowmeter with a wide application range that can be used under harsh conditions.

The OPTISONIC 7060 C consists of a flow sensor, OPTISONIC 7000 and a flow converter UFC 060. Standard the OPTISONIC 7000 is built together with a UFC 060 as a compact flowmeter

OPTISONIC 7060 C process gas flowmeter



- 1 The OPTISONIC 7060 C: a robust flow sensor combined with the UFC 060 flow converter, with a digital signal processor for optimal performance
- 2 The converter provides a range of diagnostics parameters. A software package is available for configuration, visualisation and analysis of diagnostics information

Technical data

Versions

UFM 3030 K [Compact version]	UFC 030 K ultrasonic flow converter directly mounted on the UFS 3000 ultrasonic flow sensor
UFM 3030 F [Separate version]	UFC 030 F ultrasonic flow converter is remotely mounted from the UFS 3000 ultrasonic flow sensor

Performance

Measurement functionality	Actual volume with simple single stage batching function [standard]
	Corrected or standardized volume flow rate to API 2540 or customer specified [optional]
	Customer specified mass flow [requires customer data] [optional]
	Thermal energy measurement [optional]
Measuring range	$v = 0$ to 20 m/s [0 ft/s to 66 ft/s]
Measuring error (under reference conditions)	$v = 0,5$ to 20 m/s [1.5 to 60 ft/s]: $< \pm 0,5\%$ of measured value
	$v < 0,5$ m/s [1,5 ft/s]: $< \pm 2,5$ mm/s ($\pm 0,1$ inch/s) of measured value
Repeatability (under reference conditions)	$\pm 0,2\%$ of measured value
Process conditions	Maximum solid particle content $< 5\%$ [by volume]
	Maximum gas content $< 2\%$ [by volume]

Communication

HART®	Standard
Profibus PA	Optional

Approvals

EEx zone 1 [ATEX]	
- UFS F 3000/F-EEx	II 2 G EEx ib IIC T6 ...T3
- UFC 030/F-EEx	II 2 G EEx d [ib] IIC T6 or II 2 G EEx de [ib] II C T6
- UFC 030/F/I-EEx	II 2 G EEx d [ia/ib] IIC T6 or II 2 G EEx de [ia/ib] II C T6
- UFM 3030 K-EEx	II 2 G EEx d [ib] IIC T6 ...T3 or II 2 G EEx de [ib] II C T6 ... T3
- UFM 3030 K/I-EEx	II 2 G EEx d [ia/ib] IIC T6 ...T3 or II 2 G EEx de [ia/ib] II C T6 ... T3
FM	FM Class I, Div. 1 & 2, Groups A, B, C & D
	FM Class II, Div. 1, Groups E, F & G and Div. 2, Groups F & G
	FM Class III, Div. 1 & 2
CSA	CSA Class I, Div. 1 & 2, Groups A, B, C & D
	CSA Class II, Div. 1 & 2, Groups E, F & G
	CSA Class III, Div. 1
EN 1434	Germany: DIN EN1434:1997 + A1:2002, PTB-7.6-4016306
	Switzerland: SN EN1434:1997, METAS ordnungs nummer 216, class 2/3

Protection category

IP 67 eq. NEMA 6 / 6P	Standard for separate and compact versions
IP 65 eq. NEMA 4 / 4X	Optional for separate versions
IP 68 eq. NEMA 6P	Optional for separate versions
	According to IEC 529 [EN 60 529].

Temperature range	Process temp. [°C]		Ambient temp. [°C]	
	min.	max.	min.	max.
Compact	-25	140	-40	65
Separate	-25	180	-40	65

Temperature range	Process temp. [°C]		Ambient temp. [°C]	
	min.	max.	min.	max.
XT version*	-25	220	-40	65
HT version**	-170	500	-40	65
				* Up to DN 150/6" only.
				** special version on request only

Temperature range	Process temp. [°F]		Ambient temp. [°F]	
	min.	max.	min.	max.
Compact	-13	284	-40	149
Separate	-13	356	-40	149
XT version*	-13	428	-40	149
HT version**	-274	932	-40	149
				* Up to DN 150/6" only.
				** Special version on request only

Nominal diameter	1"	1 1/4"	1.5"	2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	64"	72"	80"
ASME [inch]																										
DN [mm]	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000

Nominal flange pressure

DIN 2635 - PN 40	[Shaded]												[Shaded]											
DIN 2634 - PN 25	[Shaded]												[Shaded]											
DIN 2633 - PN 16	[Shaded]												[Shaded]											
DIN 2632 - PN 10	[Shaded]												[Shaded]											
DIN 2631 - PN 6	[Shaded]												[Shaded]											
JIS 10 K	[Shaded]												[Shaded]											
JIS 20 K	[Shaded]												[Shaded]											
	ASME B16.5												ASME B16.47, A											
150 lbs RF	[Shaded]																							
300 lbs RF	[Shaded]												[Shaded]											
600 lbs RF/RTJ	[Shaded]												[Shaded]											
900 lbs RF/RTJ	[Shaded]												[Shaded]											
Other combinations of diameter/pressure class on request.																								

Materials

Flanges																										
- Stainless steel 1.4404 (AISI 316 L)	[Shaded]												[Shaded]													
- Carbon steel	[Shaded]												[Shaded]													
Measuring tube																										
- Stainless steel 1.4404 (AISI 316 L)	[Shaded]												[Shaded]													
- Carbon steel	[Shaded]												[Shaded]													
Housing																										
- Stainless steel 1.4404 (AISI 316 L)	[Shaded]												[Shaded]													
- Stainless steel 1.4404 (AISI 316 L)*	[Shaded]												[Shaded]													
- Carbon steel	[Shaded]												[Shaded]													

Nominal diameter																																										
ASME [inch]	1"	1 1/4"	1.5"	2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	64"	72"	80"																
DN [mm]	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000																
Connection box																																										
- Aluminum, polyurethane coated	■																																									
- Stainless steel	■																																									
Transducer window																																										
- Stainless steel 1.4408 (AISI 316 L)	■																																									
	* Individual external transducer housing.																																									

Finish

Standard paint, silver	■																													
Offshore paint system, silver	■																													
	Other paint systems on request.																													

Calibration

On 2 points, with water	■																													
According to RvA	■																													

Protection category

IP 67 eq. NEMA 6	■																													
IP 68 eq. NEMA 6P (UFS 3000 F)	■																													
	According to IEC 529.																													

Sensor cable

Connection																														
- M20 x 1,5	■																													
- 1/2" NPT	■																													
- PF 1/2	■																													
Cable length																														
- 5 m / 15 ft	■																													
- 10 m / 30 ft	■																													
- 15 m / 45 ft	■																													
- 20 m / 60 ft	■																													
- 25 m / 75 ft	■																													
- 30 m / 90 ft	■																													
	For separate versions only.																													

■ standard ■ optional □ on request

UFC 030 converter

General	The converter has a backlit local display with three push buttons. All operation can be done by push button or using a hand-held bar magnet, without opening the converter housing.
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Applied materials

Converter housing	
- Die-cast aluminum	Standard
- Stainless steel 316 L (1.4404)	Option

Finish

Standard paint, silver	Standard
Offshore paint system, silver	Option
	Other paints on request

Protection category

IP 67 eq. NEMA 6	Standard
	to IEC 529

Functionality

Continuous measurement of actual volume flow rate and actual volume total	Standard
HART® communication	Standard
Flow direction (forward or reverse)	Standard
Velocity of Sound (VOS)	Standard
Signal strength	Standard
Self diagnostics	Standard
Simple single stage batching	Standard
Corrected or standardized volume flow rate to API 2540 or customer specified	Option
Customer specified mass flow (requires customer data)	Option
Profibus PA	Option
Thermal energy measurement	Option

Local display

Operation		With cover removed, all display operations incl. changing settings and parameters can be done using the push buttons. With cover in place the measured values and (error) messages can be viewed. Error resetting is still possible; in this case only with the help of a hand-held bar magnet.
3-field LCD		The converter has a backlit local display with 3 push buttons. 1st line 8 character 7 segment alphanumeric display and symbols for key acknowledgement 2nd line 10 character, 14 segment text display 3rd line 5 markers to identify display in measuring mode
Parameters	Standard	Actual volume flow rate in m3, barrels, liters, US gallons or user defined volume unit per hour, minute, second, or user defined time unit
	Standard	Actual volume total in m3, barrels, liters, US gallons or user defined volume unit (positive, negative, and sum totals), minimum 1 year overflow time
	Option	Velocity of sound in m/s or ft/s
	Option	Errors (flashing display and error code)
	Option	Signal strength (in dB)
	Standard	Corrected standard volume flow rate in m3, barrels, liters, US Gallons or user defined volume unit per hour, minute, second or user-defined time unit
	Option	Calculated mass flow rate in user defined mass unit

	Option	Corrected standard volume total in m3, barrels, liters, US Gallons or user defined corrected volume unit, minimum 1 year overflow time
	Option	Calculated mass total in user defined unit, minimum 1 year overflow time
	Option	Analog input in °C, °F, bar or psig
	Option	Thermal power
	Option	Thermal energy totalized
Languages		
- English	Standard	
- German	Standard	
- French	Standard	

Galvanic isolation

Standard	All inputs and outputs are galvanically isolated from the power supply, but not from each other
Optional	Namur NE 43, pulse/status outputs and analog 4-20 mA output fully galvanically separated

Time-constant

	0.025...99 seconds [programmable in increments of 0.01; 0.1 and 1.0 seconds]
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Low-flow cut-off

cut-off active value	1...19%, programmable in increments of 1%
cut-off deactive value	2...20%

Power supply

Mains supply 100...240 V AC (48...63 Hz) +10% / -15%	Standard
Low voltage supply 24 V (AC or DC), AC: -10% / +15%, DC: 18...35 V	Option
Power consumption	10 VA / 10 W

Cable connection

M20 x 1,5	Standard
1/2" NPT	Option
PF 1/2	Option
	[for power supply and signal cables]

Current output

Function	Standard	Continuous measurement of actual volume flow rate
	Standard	Flow direction indication (forward or reverse)
	Standard	Velocity of Sound (VOS)
	Standard	Transducer signal gain [dB]
	Option	Corrected or standardized volume flow rate to API 2540 or customer specified
	Option	Corrected or standardized volume flow rate to API 2540 or customer specified
Settings		for Q = 0% 0...16 mA programmable in increments of 1 mA (Limit 20...22 mA)
		for Q=100% 4...20 mA
Connection		Active mode using internal power supply 24 V DC, load ≤ 680 Ohm
		Passive mode external voltage 18 ... 24 V DC, load ≤ 680 Ohm

Pulse output

Function		Pulse output
		Pulse per volumetric unit (m3, barrels, liters, US gallons or user defined volume unit per hour, minute, second or user defined time unit)

	Standard	Actual volume	
	Option	Corrected or standardized volume to API 2540 or customer specified	
	Option	Customer specified mass (requires customer specific density input)	
	Option	Thermal energy measurement	
		Frequency output	
		Pulse rate	
	Standard	Continuous measurement of actual volume flow rate	
	Standard	Velocity Of Sound (VOS)	
	Standard	Transducer signal gain (dB)	
	Standard	Pressure or temperature indication based on analog input (1) or (2)	
	Option	Corrected or standardized volume flow rate to API 2540 or customer specified	
	Option	Customer specified mass flow (requires customer specific density input)	
		Status output	
	Standard	Diagnostics alarm path errors, totalizer overrun, all errors, analog input	
	Standard	Flow direction indication (forward or reverse)	
	Standard	Batch volume reached	
	Standard	Alarm trip point (high and low) based on actual volume flow rate	
Settings		Pulse output	Pulse/unit (max. 2000 Hz) [example 1000 pulses/barrel] pulse duty cycle 25, 50, 100, 200, or 500 ms for frequency < 10 Hz
		Frequency output	0...2000 Hz [example Q0% - 0 Hz, Q100% - 1000 Hz] at 100% of scale value, max. frequency = 2 kHz
		Status output	On or Off
Connection		Pulse, frequency and status output	
		Active	Connection to electronic counters using internal power supply 24 V DC / I ≤ 50 mA
		Passive	Connection to electronic (EC) or electromechanical counters (EMC) external voltage 19...32 VDC / I ≤ 150 mA

Analog input

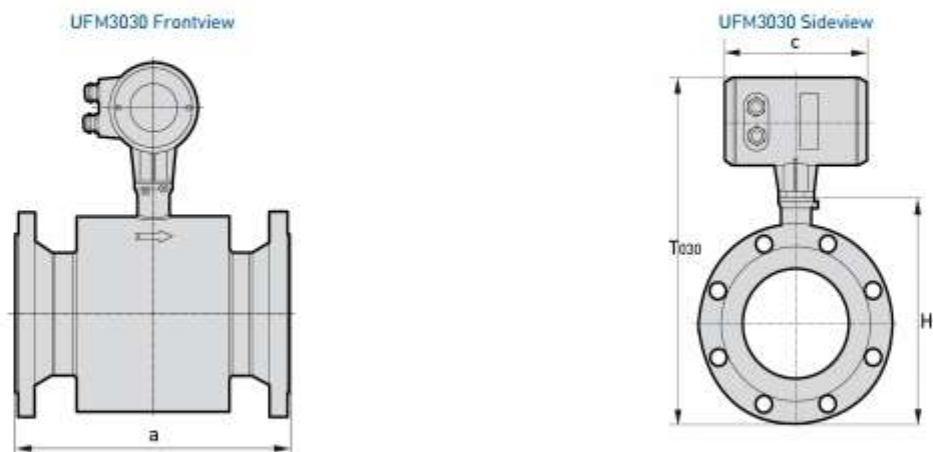
Function	Option	Corrected volume version: inputs to connect temperature and pressure signals for the corrected standard volume, acc. to API 2540, user defined volume or mass flow	
Setting	Standard	Input A1	For volume correction, unit °Celsius or °Fahrenheit Temperature for 4...20 mA, max. temperature range -50...150°C [-58...302°F]
	Option	Input A2	For volume correction (pressure), unit bar or psi Pressure for 4...20 mA, max. pressure range 100 Bar (1450 psi)
Connection		Input A1	4...20 mA for temperature sensor Active (using UFC 030 24 V DC power) or passive, Load 58 Ohm
		Input A2	4...20 mA for pressure Active (using UFC 030 24 V DC power) or passive, Load 58 Ohm
	Option	Thermal energy measurement: inputs to connect two temperature sensors for measurement of temperature difference to calculate thermal energy	
Setting	Standard	Input A1	For heat measurement (temperature), unit °C or °F Temperature for 4...20 mA, max. temperature range -50...150°C [-58...302°F]
	Standard	Input A2	For heat measurement (temperature), unit °C or °F Temperature for 4...20 mA, max. temperature range -50...150°C [-58...302°F]
Connection		Input A1	4...20 mA for temperature sensor Active (using UFC 030 24 V DC power) or passive, Load 58 Ohm

		Input A2	4...20 mA for temperature
			Active (using UFC 030 24 V DC power) or passive, Load 58 Ohm

Control input

Function	Option	Reset totalizer	
	Option	Acknowledge errors	
	Option	Force outputs to zero	
	Option	Initiate batch [see operating instructions for description of this function]	
Setting		On or Off	
Connection		Input voltage (U _{in})	Low: U _{in} < 5 V (off)
			High: U _{in} > 15 V (on)
			Max.: U _{in} = 32 V

Dimensions and weights



Nominal size DN	Dimensions [mm]				T 030	Approx. weight [kg]*
	a	c	H			

ASME 150 lbs

1"	250	206	146	331	6,5
1 1/4"	260	206	152	337	7,5
1 1/2"	270	206	157	342	8,5
2"	300	206	183	368	12,5
2 1/2"	300	206	196	381	16,5
3"	350	206	234	419	17,5
4"	350	206	266	451	23,5
5"	350	206	290	475	27,5
6"	400	206	317	502	35,5
8"	400	206	395	580	66,5
10"	500	206	451	636	74,5
12"	500	206	514	699	104,5
14"	700	206	554	739	119,5
16"	800	206	612	797	158,5
18"	800	206	656	841	175,5
20"	800	206	713	898	210,5

Inner diameters based on schedule standard.

*Approx. weight of flow sensor in separate (F) version.

For compact (K) version: add 1,8 kg (4,0 lbs).

Weight of converter in separate (F) version: 3,5 kg (7,7 lbs).

ASME 300 lbs

1"	250	206	155	340	7,5
1 1/4"	260	206	160	345	8,5
1 1/2"	270	206	170	355	10,5
2"	300	206	189	374	14,5
2 1/2"	350	206	202	387	18,5
3"	350	206	244	429	21,5

Nominal size	Dimensions [mm]				T 030	Approx. weight [kg]*
	DN	a	c	H		
4"	400	206	279	464	32,5	
5"	400	206	303	488	41,5	
6"	450	206	336	521	53,5	
Inner diameters based on schedule standard.						
*Approx. weight of flow sensor in separate (F) version.						
For compact (K) version: add 1,8 kg (4,0 lbs).						
Weight of converter in separate (F) version: 3,5 kg (7,7 lbs).						

DIN

25	250	206	150	335	6,5	
32	260	206	162	347	8,5	
40	270	206	167	352	9,5	
50	300	206	190	375	12,5	
65	300	206	200	385	15,5	
80	300	206	239	424	16,5	
100	350	206	262	447	18,5	
125	350	206	288	473	22,5	
150	350	206	320	505	27,5	
200	400	206	394	579	50,5	
250	400	206	445	630	60,5	
300	500	206	495	680	75,5	
350	500	206	540	725	68,5	
400	600	206	595	780	89,5	
500	600	206	697	882	117,5	
Inner diameters based on schedule standard.						
*Approx. weight of flow sensor in separate (F) version.						
For compact (K) version: add 1,8 kg (4,0 lbs).						
Weight of converter in separate (F) version: 3,5 kg (7,7 lbs).						

Calculations are based on using spiral wound gaskets							
Nominal diameter [inch]	Nominal pressure [lbs]	Standard material		Design pressure (bar)			
		Tube	Flange	20°C	140°C	180°C	220°C

Design pressure ASME 150 lbs

1"	150	SS 316 L	SS 316 L	19,7	16,2	14,7	13,2
1 1/4"	150	SS 316 L	SS 316 L	19,7	16,2	14,7	13,2
1 1/2"	150	SS 316 L	SS 316 L	19,7	16,2	14,7	13,2
2"	150	SS 316 L	SS 316 L	19,7	16,2	14,7	13,2
2 1/2"	150	SS 316 L	SS 316 L	19,7	16,2	14,7	13,2
3"	150	SS 316 L	Carbon steel*	19,7	16,2	14,7	13,2
4"	150	SS 316 L	Carbon steel*	19,7	16,2	14,7	13,2
5"	150	SS 316 L	Carbon steel*	19,7	16,2	14,7	13,2
6"	150	SS 316 L	Carbon steel*	19,7	16,2	14,7	13,2
8"	150	SS 316 L	Carbon steel*	19,7	16,2	14,7	
10"	150	SS 316 L	Carbon steel*	19,7	16,2	14,7	
12"	150	SS 316 L	Carbon steel*	19,7	16,2	14,7	
14"	150	Carbon steel	Carbon steel*	19,7	16,2	14,7	
16"	150	Carbon steel	Carbon steel*	19,7	16,2	14,7	

Calculations are based on using spiral wound gaskets

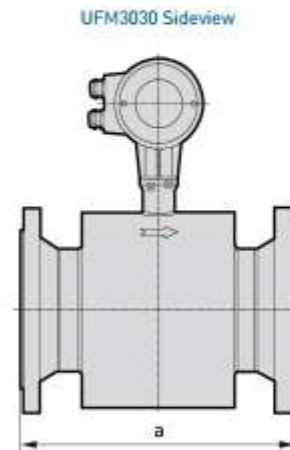
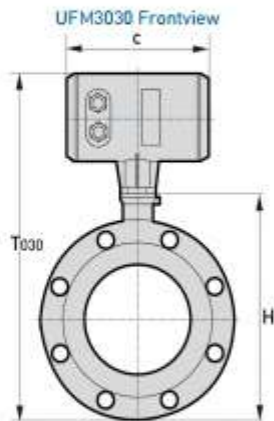
Nominal diameter	Nominal pressure	Standard material		Design pressure (bar)					
		[inch]	[lbs]	Tube	Flange	20°C	140°C	180°C	220°C
18"	150			Carbon steel	Carbon steel*	19,7	16,2	14,7	
20"	150			Carbon steel	Carbon steel*	19,7	16,2	14,7	
* With carbon steel ASME flanges please note that minimum temperature is limited to -20°C [-4°F]. For temperatures down to -25°C [-13°F] other materials are available on request.									

Design pressure ASME 300 lbs

1"	300	SS 316 L	316 L	51	45,4	44,4	43,1
1 1/4"	300	SS 316 L	316 L	51	45,4	44,4	43,1
1 1/2"	300	SS 316 L	316 L	51	45,4	44,4	43,1
2"	300	SS 316 L	316 L	51	45,4	44,4	43,1
2 1/2"	300	SS 316 L	316 L	51	45,4	44,4	43,1
3"	300	SS 316 L	Carbon steel*	51	45,4	44,4	43,1
4"	300	SS 316 L	Carbon steel*	51	45,4	44,4	43,1
5"	300	SS 316 L	Carbon steel*	51	45,4	44,4	43,1
6"	300	SS 316 L	Carbon steel*	51	45,4	44,4	43,1
* With carbon steel ASME flanges please note that minimum temperature is limited to -20°C [-4°F]. For temperatures down to -25°C [-13°F] other materials are available on request.							

Design pressure DIN

25	40	SS 316 L	SS 316	40	33,7	31,6	29,5
32	40	SS 316 L	SS 316	40	33,7	31,6	29,5
40	40	SS 316 L	SS 316	40	33,7	31,6	29,5
50	40	SS 316 L	SS 316	40	33,7	31,6	29,5
65	40	SS 316 L	SS 316	40	33,7	31,6	29,5
80	40	SS 316 L	Carbon steel*	40	33,7	31,6	29,5
100	16	SS 316 L	Carbon steel*	16	12,7	11,6	10,5
125	16	SS 316 L	Carbon steel*	16	12,7	11,6	10,5
150	16	SS 316 L	Carbon steel*	16	12,7	11,6	10,5
200	10	SS 316 L	Carbon steel*	10	7,8	7,1	
250	10	SS 316 L	Carbon steel*	10	7,8	7,1	
300	10	SS 316 L	Carbon steel*	10	7,8	7,1	
350	10	Carbon Steel	Carbon steel*	10	7,8	7,1	
400	10	Carbon Steel	Carbon steel*	10	7,8	7,1	
500	10	Carbon Steel	Carbon steel*	10	7,8	7,1	
* With carbon steel DIN flanges please note that minimum temperature is limited to -10°C. For temperatures down to -25°C other materials are available on request.							



Nominal size	Dimensions [inches]				Approx. weight [lbs]*
DN	a	c	H	T 030	
[inch]					

ASME 150 lbs

1"	9,84	8,12	5,75	13,03	14,3
1 1/4"	10,24	8,12	5,98	13,26	16,5
1 1/2"	10,63	8,12	6,18	13,46	18,7
2"	11,81	8,12	7,2	14,48	27,6
2 1/2"	11,81	8,12	7,71	14,99	36,4
3"	13,78	8,12	9,21	16,49	38,6
4"	13,78	8,12	10,47	17,75	51,8
5"	13,78	8,12	11,42	18,7	60,6
6"	15,75	8,12	12,48	19,76	78,3
8"	15,75	8,12	15,55	22,83	146,6
10"	19,69	8,12	17,76	25,04	164,2
12"	19,69	8,12	20,24	27,52	230,4
14"	27,56	8,12	21,81	29,09	263,5
16"	31,5	8,12	24,09	31,37	349,4
18"	31,5	8,12	25,83	33,11	386,9
20"	31,5	8,12	28,07	35,35	464,1
Inner diameters based on schedule standard.					
*Approx. weight of flow sensor in separate (F) version.					
For compact (K) version: add 1,8 kg [4,0 lbs].					
Weight of converter in separate (F) version: 3,5 kg [7,7 lbs].					

ASME 300 lbs

1"	9,84	8,12	6,1	13,38	16,5
1 1/4"	10,24	8,12	6,3	13,58	18,7
1 1/2"	10,63	8,12	6,69	13,97	23,1
2"	11,81	8,12	7,44	14,72	32
2 1/2"	13,78	8,12	7,95	15,23	40,8

Nominal size	Dimensions [inches]				Approx. weight [lbs]*
DN	a	c	H	T 030	
[inch]					
3"	13,78	8,12	9,61	16,89	47,4
4"	15,75	8,12	10,98	18,26	71,7
5"	15,75	8,12	11,93	19,21	91,5
6"	17,72	8,12	13,23	20,51	117,9
Inner diameters based on schedule standard.					
*Approx. weight of flow sensor in separate (F) version.					
For compact (K) version: add 1,8 kg (4,0 lbs).					
Weight of converter in separate (F) version: 3,5 kg (7,7 lbs).					

Calculations are based on using spiral wound gaskets							
Nominal diameter	Nominal pressure	Standard material		Design pressure (psi)			
[inch]	[lbs]	Tube	Flange	70°F	285°F	355°F	430°F

Design pressure ASME 150 lbs

1"	150	SS 316 L	SS 316 L	286	235	213	191
1 1/4"	150	SS 316 L	SS 316 L	286	235	213	191
1 1/2"	150	SS 316 L	SS 316 L	286	235	213	191
2"	150	SS 316 L	SS 316 L	286	235	213	191
2 1/2"	150	SS 316 L	SS 316 L	286	235	213	191
3"	150	SS 316 L	Carbon steel*	286	235	213	191
4"	150	SS 316 L	Carbon steel*	286	235	213	191
5"	150	SS 316 L	Carbon steel*	286	235	213	191
6"	150	SS 316 L	Carbon steel*	286	235	213	191
8"	150	SS 316 L	Carbon steel*	286	235	213	
10"	150	SS 316 L	Carbon steel*	286	235	213	
12"	150	SS 316 L	Carbon steel*	286	235	213	
14"	150	Carbon steel	Carbon steel*	286	235	213	
16"	150	Carbon steel	Carbon steel*	286	235	213	
18"	150	Carbon steel	Carbon steel*	286	235	213	
20"	150	Carbon steel	Carbon steel*	286	235	213	
* With carbon steel ASME flanges please note that minimum temperature is limited to -20°C (-4°F).							
For temperatures down to -25°C (-13°F) other materials are available on request.							

Design pressure ASME 300 lbs

1"	300	SS 316 L	316 L	740	658	644	625
1 1/4"	300	SS 316 L	316 L	740	658	644	625
1 1/2"	300	SS 316 L	316 L	740	658	644	625
2"	300	SS 316 L	316 L	740	658	644	625
2 1/2"	300	SS 316 L	316 L	740	658	644	625
3"	300	SS 316 L	Carbon steel*	740	658	644	625
4"	300	SS 316 L	Carbon steel*	740	658	644	625
5"	300	SS 316 L	Carbon steel*	740	658	644	625
6"	300	SS 316 L	Carbon steel*	740	658	644	625
* With carbon steel ASME flanges please note that minimum temperature is limited to -20°C (-4°F).							
For temperatures down to -25°C (-13°F) other materials are available on request.							

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