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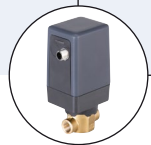
РАСХОДОМЕРЫ ЖИДКОСТИ И ГАЗА



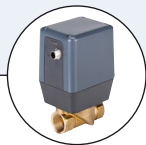
Flowmeter for gases

- Depth scale for accurate installation in existing pipes
- Usable in pipes from ½" up to 12" (DN300)
- Easy installation under pressure
- Integrated Display
- Standard and Heavy Duty version available

Type 8007 can be combined with...



Type 3280
Proportional valve



Type 3285
Proportional valve



Type 8611
eCONTROL



Type 8802
ELEMENT



Type BUPLUS

This flowmeter series is made for the measurement of especially large flow rates and use the calorimetric measuring principle. A heated sensor element is cooled down by the gas flow. This cooling effect which depends on the flow velocity and the gas characteristics serves as a flow indication, the kind of cooling directly depends on the flow velocity and the kind of gas. This kind of mass flow measurement is independent of pressure and temperature. The flowmeter can be used for monitoring air supplies, but also qualifies for the measurement of other gases, see technical data.

Type 8007 is available in two versions:

- Standard
- Heavy Duty (with a robust aluminium die casting electronics housing).

In the Heavy Duty version the sensor is encapsulated in stainless steel.

Technical Data	
Full scale ranges (Q_{nom})¹⁾	up to 44030 Nm ³ /h (air), see page 2
Operating gases	air, nitrogen, oxygen, natural gas, methane, argon
Max. operating pressure	Up to 16 bar; optional up to PN40 (Standard) Up to 50 bar (Heavy Duty)
Calibration gas	Air, zero point adjustment with operating gas
Gas temperature	-30 up to +110 °C (higher temperatures on request)
Ambient temperature (Electronics)	-30 up to +80 °C (higher temperatures on request)
Accuracy	± 1.5 % o.R. ²⁾ ± 0.3 % F.S. ³⁾ (based on air and in consideration of the inlet and outlet sections; only when properly installed)
Span	1:50
Body material	Stainless steel 1.4301 (standard) Stainless steel 1.4571 (heavy duty)
Electronics housing material	Polycarbonate (standard), Aluminium die casting (heavy duty)
Sealing material	NBR, FKM (for oxygen)
Assembling screw	G ½" (others on request)
Electrical connection	see pages 4 – 5
Power supply	18 – 36 V DC, 5 W
Output signal (actual value output)	4 – 20 mA
Max. load (current output)	<500 Ω
Digital output	RS 485 interface, Modbus-RTU
Pulse output	1 pulse per m ³
Protection class	IP65
Dimensions [mm]	See drawing on page 6
Options	- Other probe lengths - Oxygen conformity declaration - Cleaned, free of oil and fat

¹⁾ At ref. conditions acc. to DIN 1343 (0 °C and 1013 mbar)

²⁾ o.R.: of reading

³⁾ F.S.: full scale (full scale values see page 2: "Flow range" table)

Flow Ranges (for Air) ⁴⁾acc. to DIN 1343: 0 °C and 1013 mbar(a)⁵⁾

Type 8007							
Pipe [inches]	Inner diameter of pipe [mm]	DIN 1343 (0 °C, 1013 mbar(a))					
		Basic		Extended		Maximum	
		velocity	up to Nm ³ /h	velocity	up to Nm ³ /h	velocity	up to Nm ³ /h
½"	16.1	92.7 m/s	41	185 m/s	80	224 m/s	100
¾"	21.7		81		160		195
1"	27.3		136		270		325
1¼"	36.0		244		485		590
1½"	41.9		335		665		810
2"	53.1		550		1100		1330
2½"	71.1		1005		2010		2435
3"	84.9		1440		2880		3485
4"	110.0		2430		4850		5875
5"	133.7		3595		7180		8690
6"	159.3		5110		10200		12355
8"	200.0		8075		16120		19520
10"	250.0	12635	25220	30540			
12"	300.0	18220	36360	44030			

Note: For other internal pipe diameters [mm] see instruction manual

⁴⁾ Flow ranges depend on the version of type 8007 (Basic, Extended, Maximum) and the internal pipe diameter.

Type 8007 is adjustable to different internal diameters through the mechanical depth scale.

⁵⁾ Standard DIN 1945 (ISO 1217), at 20 °C and 1000 mbar = Standard DIN 1343, at 0 °C and 1013 mbar, multiplied by coefficient 1.087.

The sensor can be installed in every given pipe size. The default sensor setting is for a 2" pipe (53.1 mm inner pipe diameter).

Every version is calibrated for a velocity range:

- Basic version up to 92.7 m/s
- Extended version up to 185 m/s
- Maximum version up to 224 m/s

The 20 mA output is equivalent to this highest velocity, which is assigned to a maximum flow depending on pipe diameter.

1) Type 8007 without display:

The scaling of the 4 – 20 mA output is done in the signal receiver, for example the PLC, according to the table of flow ranges.

2) Type 8007 with display:

For scaling of the 4 – 20 mA output it is possible to adjust the specific pipe size (internal diameter) by the display and the buttons. Furthermore, you can choose your desired units of flow.

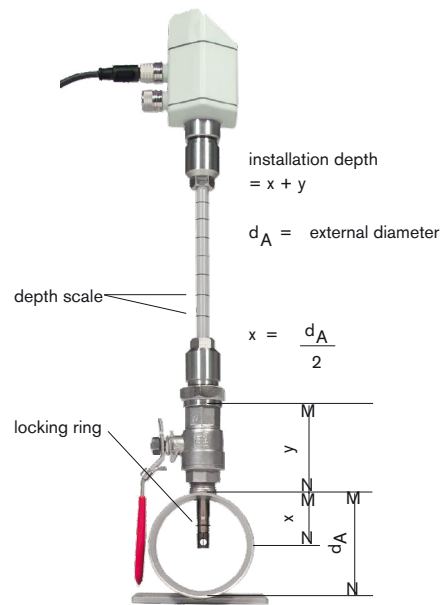
Determining the Point of Installation

In order to get the accuracy specified in the data sheets, the sensor must be inserted in the centre of a straight pipe section with an undisturbed gas stream.

To obtain an undisturbed gas stream the sections in front of and behind the sensor must be straight, long enough and without any obstructions such as edges, seams, curves etc.

Careful attention must be paid to the design of the outlet section as obstructions can cause counter-flow turbulences as well as turbulences in the direction of the flow.

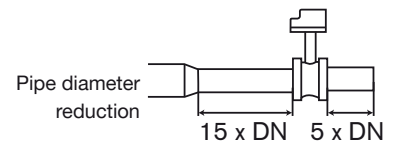
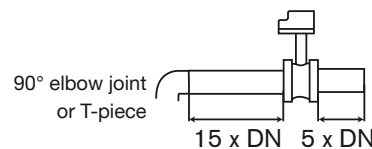
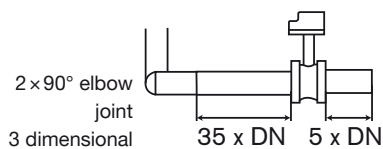
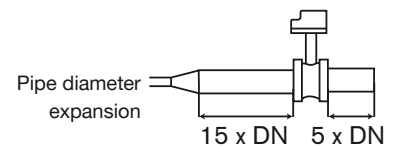
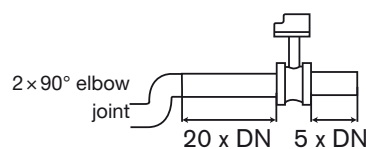
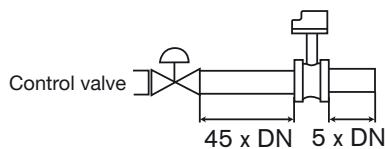
Installation in pipes at pressures > 10 bar requires a high pressure safety device.



Installation

DN = pipe diameter

Flow direction ►



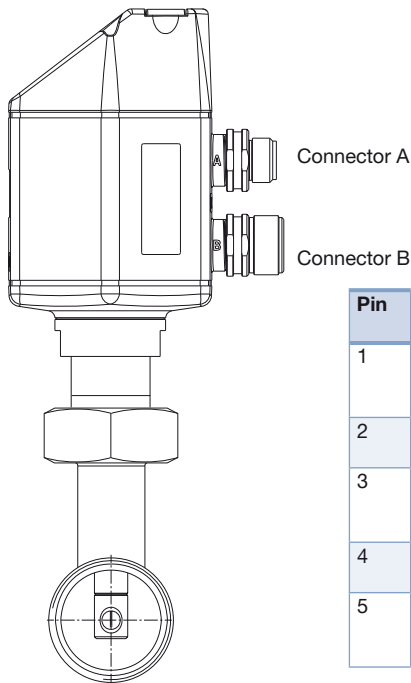
Ordering chart for air with operating pressure of 6 barg - standard version

Item	Article no.
Type 8007 with integrated display, Basic [92.7 m/s], probe length 220 mm	773498
Type 8007 with integrated display, Extended [185 m/s], probe length 220 mm	773499
Type 8007 with integrated display, Maximum [224 m/s], probe length 220 mm	773500

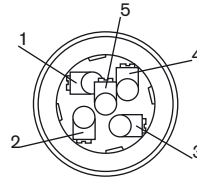
Calibration for other gases on request; probe lengths 120 mm, 160 mm, 300 mm, 400 mm on request.

Pin Assignment - standard version

Attention: The Pin assignment was changed with the new device generation. For questions, please contact the responsible Bürkert facility.



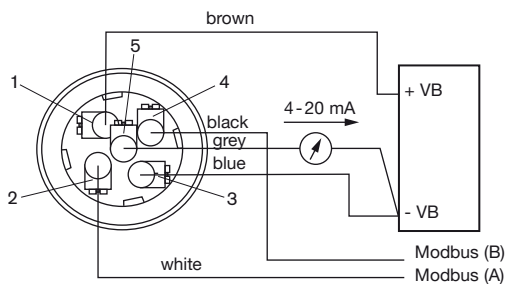
M12 connector



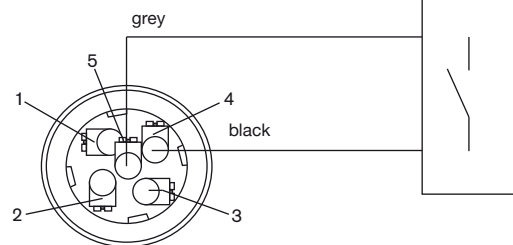
Pin	Connector A (connection port)	Connection cable A	Connector B (pulse port)	Connection cable B
1	VB + Positive voltage supply 12-36 V DC	br	*	br
2	RS 485 (A) Modbus-RTU A	wh	GND	wh
3	VB- Negative voltage supply 12-36 V DC	bl	DIR Direction input	bl
4	RS 485 (B) Modbus-RTU b	sw	P Pulse for usage	sw
5	I+ Current signal 4-20 mA, selected measurement signal	gr	P Pulse for usage	gr

* Not connected. It is not allowed to put to potential and/or earth.

M12 connector A



M12 connector B

**Note:**

If the sensor is placed at the end of the Modbus system a termination is required. The sensors have an internal switchable termination. To use that the 6 fastening screws from the lid must be released and the internal DIP Switch must be set to "On". Please ensure that the connection plugs are still plugged and the gasket is installed correctly. Alternatively, a 120R resistor can be installed in the plug between pin 2 and pin 4.

Ordering Chart for Accessories - standard version

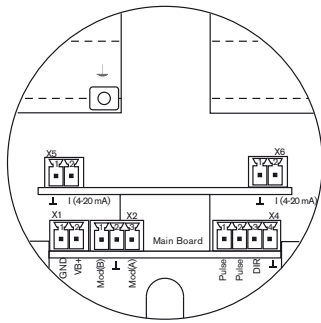
Item	Article no.
5 m cable, with 5 pin M12 plug at one end	770217
10 m cable, with 5 pin M12 plug at one end	770795
Power supply Type 1573 for rail mounting, 100-240 V AC/ 24 V DC, 1.25A, NEC Class 2 (UL 1310)	772438
Power supply Type 1573 for rail mounting, 100-240 V AC/ 24 V DC, 1A, NEC Class 2 (UL 1310)	772361
Power supply Type 1573 for rail mounting, 100-240 V AC/ 24 V DC, 2A, NEC Class 2 (UL 1310)	772362
Power supply Type 1573 for rail mounting, 100-240 V AC/24 DC, 3.8A NEC Class 2 (UL60950-1)	772898

Without ordering cables, the flowmeter comes with M12-connector for port A.

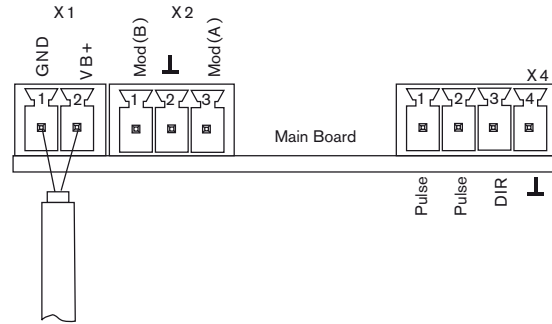
Pin assignment - heavy duty version

Electrical connection

Plug layout



Voltage supply

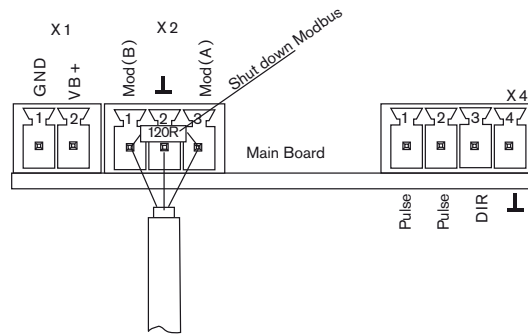


Plug	Pin	Description
X1 Voltage supply	1	VB - (negative voltage supply GND)
	2	VB + (positive voltage supply 12 V – 36 V DC)
X2 Modbus	1	Modbus (B)
	2	Modbus shield
	3	Modbus (A)
X4 Direction / impulse	1	Pulse / Alarm*
	2	Pulse / Alarm*
	3	Direction input
	4	GND
X5 Power output 1	1	I- Active*
	2	I+ Active*
X6 Power output 2	1	I- Active*
	2	I+ Active*

* All analog outputs are galvanically isolated.

Modbus

If the sensor is used at the end of the Modbus system a bus termination is required. Please connect the enclosed 120R resistor to the terminals, Pin 1 and 3 of "X2" connector.

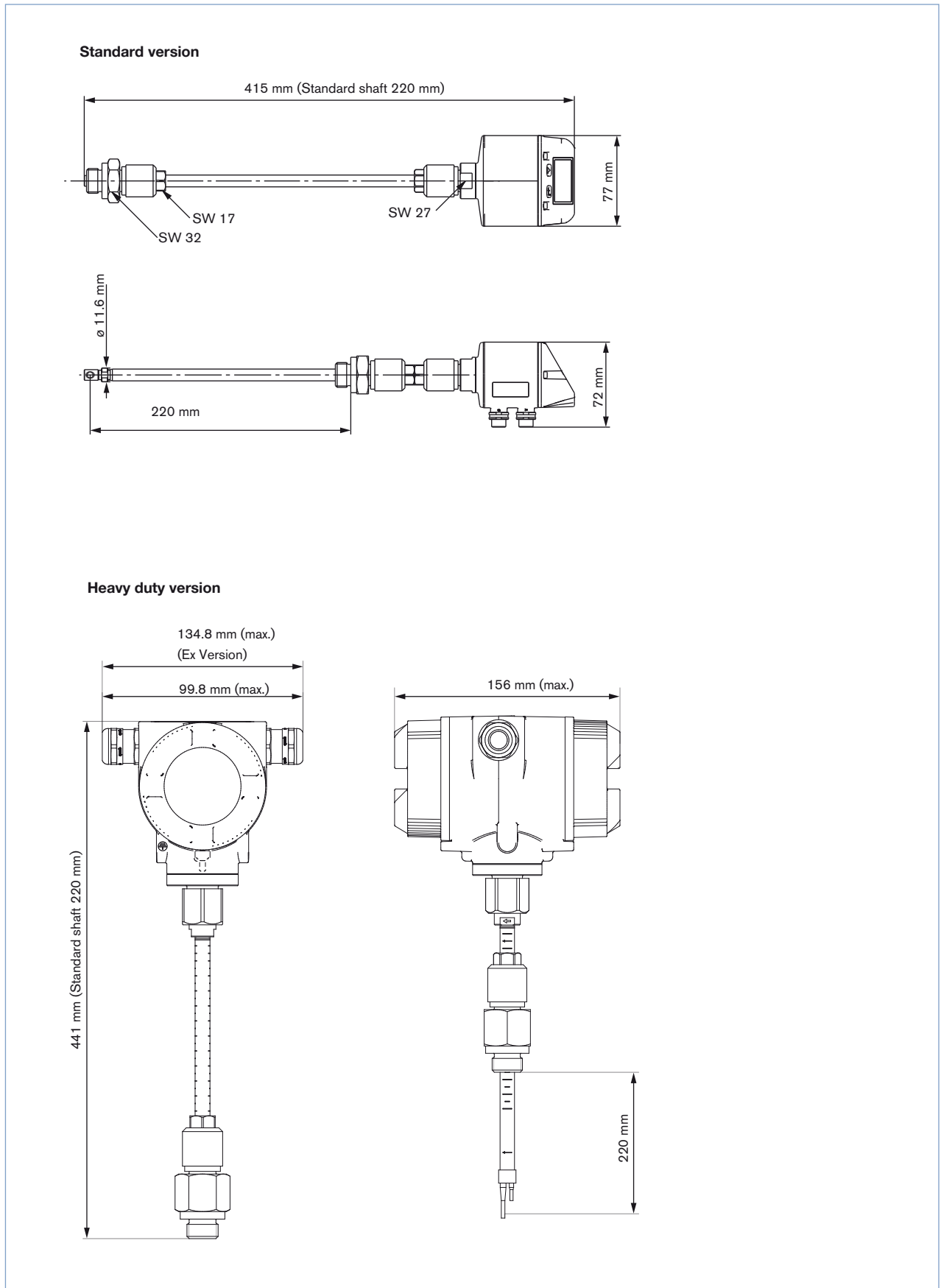


Ordering chart for air with operating pressure of 6 barg - heavy duty version

Item	Article no.
Type 8007 with integrated display, Basic [92.7 m/s], probe length 220 mm	773508
Type 8007 with integrated display, Extended [185 m/s], probe length 220 mm	773509
Type 8007 with integrated display, Maximum [224 m/s], probe length 220 mm	773510

Calibration for other gases on request; probe lengths 120 mm, 160 mm, 300 mm, 400 mm on request.

Dimensions [mm]





Flowmeter for gases

- Thermal mass flow measurement
- Integrated inlet and outlet pipes for flow conditioning
- Pipe sizes up to 2"
- Integrated display
- Standard and Heavy Duty version available

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

	Type 3280 2-way motor valve	▶
	Type 3285 2/2 way Proportional Valve (motor-driven)	▶
	Type 8611 eCONTROL - Universal controller	▶
	Type 8802 ELEMENT continuous control valve systems - overview	▶

Type description

This flowmeter series is made for measuring of especially large flow rates and uses the calorimetric measuring principle. A heated sensor element is cooled down by the gas flow. This cooling effect which depends on the flow velocity and the gas characteristics is the measure for the mass flow rate. This kind of mass flow measurement is independent of pressure and temperature. The flowmeter can be used for monitoring air supplies, but also qualifies for measuring other gases - given the corresponding calibration.

The display can be rotated by 180°. Further there is a totaliser integrated which counts the gas volume flowing through the pipe. It can be reset by the console. The flowmeter's pressure drop is negligibly low, the measurement works without any moving parts.

In combination with a solenoid control valve or an air operated process control valve decentralized flow control loops up to DN50 are possible.

Type 8008 is available in two versions: - Standard - Heavy Duty (with a robust aluminium die casting electronics housing).

In the Heavy Duty version the sensor is encapsulated in stainless steel.

1. General technical data

Product properties	
Dimensions	Detailed information can be found in chapter “2. Dimensions” on page 4.
Materials	
Body	Stainless steel 1.4301 (Standard), Stainless steel 1.4571 (Heavy Duty)
Electronics housing	Polycarbonate (Standard), Aluminium die casting (Heavy Duty)
Sealing	NBR, FKM (for oxygen)
Full scale ranges (Q_{Nom}) ^{1.)}	Up to 1100 Nm ³ /h (air) Detailed information can be found in chapter “5.1. Flow Ranges” on page 8.
Electrical data	
Output signal	Actual valve output: 4...20 mA Max. load (current output): <500 Ω
Pulse output	1 pulse per m ³
Digital output	RS 485 interface, Modbus-RTU
Power supply	18...36 V DC, 5 W
Performance data	
Operating pressure (max.)	Up to max. 16 bar; optional up to PN40 (Standard) Up to max. 50 bar (Heavy Duty)
Accuracy	± 1.5 % v. M. ^{2.)} ± 0.3 % v. E. ^{3.)} (related to air and in consideration of the specified inlet and outlet distances); absolute accuracy is guaranteed during conversion from – exhaled – operating media impaired
Span	1:50
Medium data	
Operating medium	Air, nitrogen, oxygen, natural gas, methane, argon, carbon dioxide, biogas (on request), LPG (on request)
Calibration medium	Air
Gas temperature	-30 °C...+80 °C (higher temperatures on request)
Approvals and certificates	
Protection class	IP65
Approval & Conformity	O ₂ -certificate (optional) Oil and grease free cleaned (optional)
Product connections	
Pipe connection	R1½", R¾", R1", R1¼", R1½", R2" (all connections as external thread) acc. to DIN EN 10226 (ISO 7–1) or or flange connections acc. to DIN EN 1092–1 (Stainless steel 1.4404), other connections on request
Electrical connection	Detailed information can be found in chapter “3. Device / Process connections” on page 6.
Environment and installation	
Ambient temperature (max.)	-30 °C...+80 °C (higher temperatures on request)

1.) For 1.013 bar(ü) and 0 °C (acc. to DIN 1343)

2.) o.R.: of reading

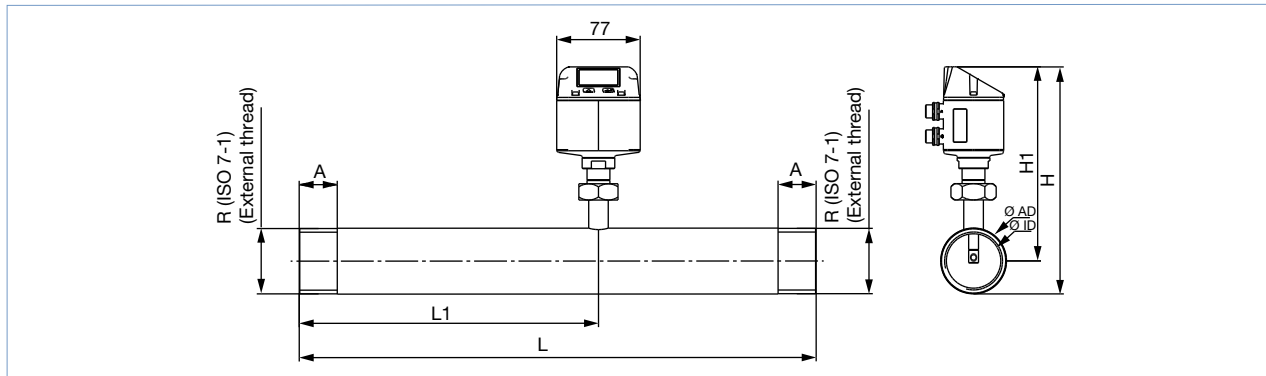
3.) F.S.: full scale (full scale values see [“5.1. Flow Ranges” on page 8](#))

2. Dimensions

2.1. Standard version threaded

Note:

Dimensions in mm

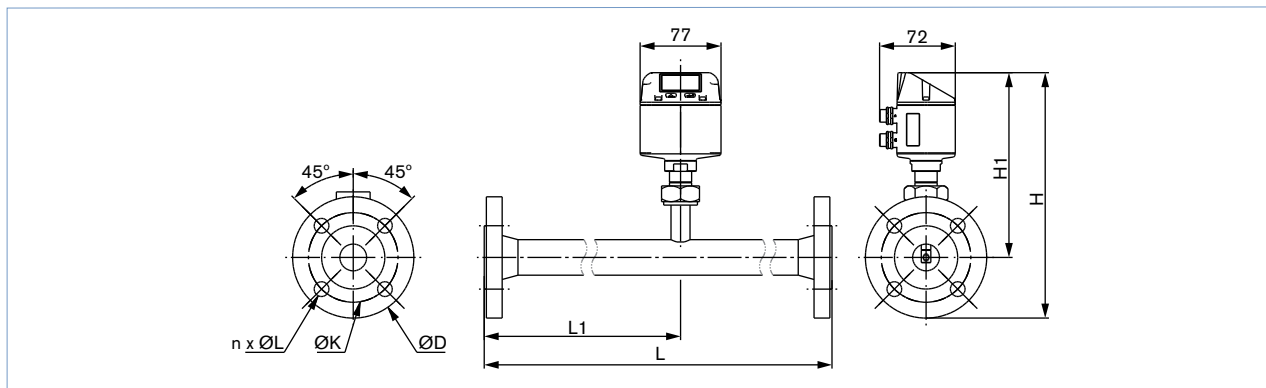


Measuring distance		Ø AD Pipe	Ø ID Pipe	L	L1	H	H1	A
[Inch]	[DN]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
½	15	21.3	16.1	300	210	176.4	165.7	20
¾	20	26.9	21.7	475	275	179.2	165.7	20
1	25	33.7	27.3	475	275	182.6	165.7	25
1¼	32	42.4	36	475	275	186.9	165.7	25
1½	40	48.3	41.9	475	275	186.9	165.7	25
2	50	60.3	53.1	475	275	186.9	165.7	30

2.2. Standard version flange

Note:

Dimensions in mm

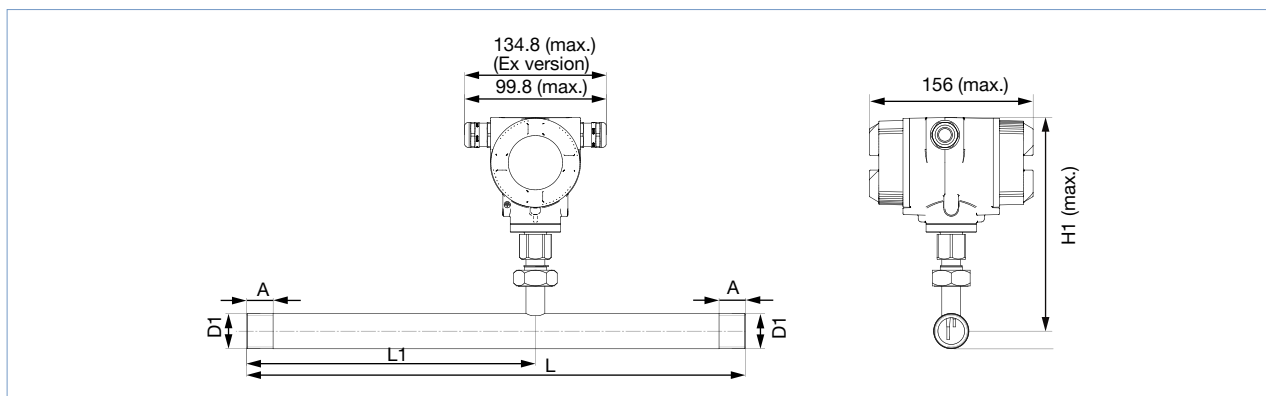


Measuring distance		Ø AD Pipe	Ø ID Pipe	L	L1	H	H1	Ø D	Ø K	n x Ø L
[Inch]	[DN]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
½	15	21.3	16.1	300	210	213.2	165.7	95	65	4 x 14
¾	20	26.9	21.7	475	275	218.2	165.7	105	75	4 x 14
1	25	33.7	27.3	475	275	223.2	165.7	115	85	4 x 14
1¼	32	42.4	36	475	275	235.7	165.7	140	100	4 x 18
1½	40	48.3	41.9	475	275	240.7	165.7	150	110	4 x 18
2	50	60.3	53.1	475	275	248.2	165.7	165	125	4 x 18
2½	65	76.1	68.9	475	275	268.2	175.7	185	145	8 x 18
3	80	88.9	81.9	475	275	275.7	175.7	200	160	8 x 18

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2.3. Heavy Duty version threaded

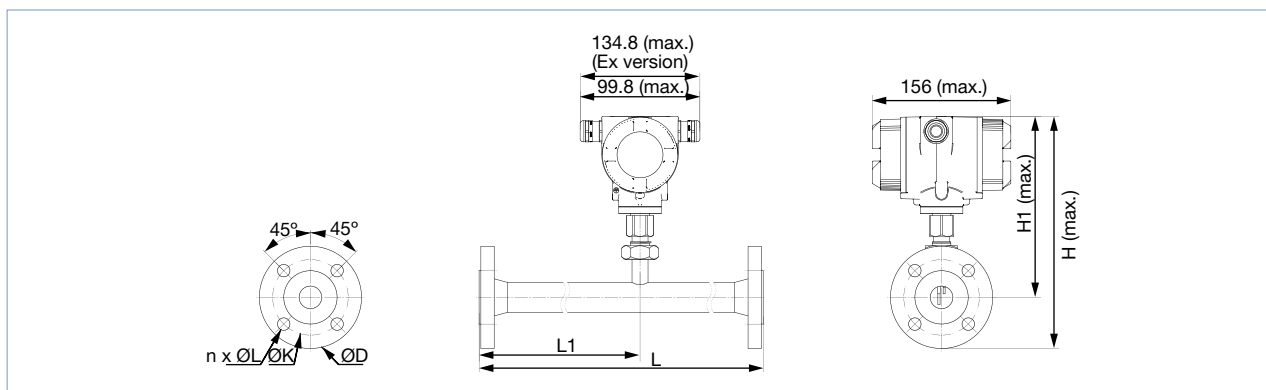
Note:
Dimensions in mm



Connection thread [Inch]	Ø AD Pipe [mm]	Ø ID Pipe [mm]	L [mm]	L1 [mm]	H [mm]	H1 [mm]	A [mm]
R ½	21.3	16.1	300	210	176.4	165.7	20
R ¾	26.9	21.7	475	275	179.2	165.7	20
R 1	33.7	27.3	475	275	182.6	165.7	25
R 1¼	42.4	36	475	275	186.9	165.7	25
R 1½	48.3	41.9	475	275	186.9	165.7	25
R 2	60.3	53.1	475	275	186.9	165.7	30

2.4. Heavy Duty version flange

Note:
Dimensions in mm



Measuring distance [DN]	Ø AD Pipe [mm]	Ø ID Pipe [mm]	L [mm]	L1 [mm]	H [mm]	H1 [mm]	Flange DIN EN 1092-1		
							[Ø D mm]	[Ø K mm]	[n x Ø L mm]
15	21.3	16.1	300	210	213.2	165.7	95	65	4 x 14
20	26.9	21.7	475	275	218.2	165.7	105	75	4 x 14
25	33.7	27.3	475	275	223.2	165.7	115	85	4 x 14
32	42.4	36	475	275	235.7	165.7	140	100	4 x 18
40	48.3	41.9	475	275	240.7	165.7	150	110	4 x 18
50	60.3	53.1	475	275	248.2	165.7	165	125	4 x 18

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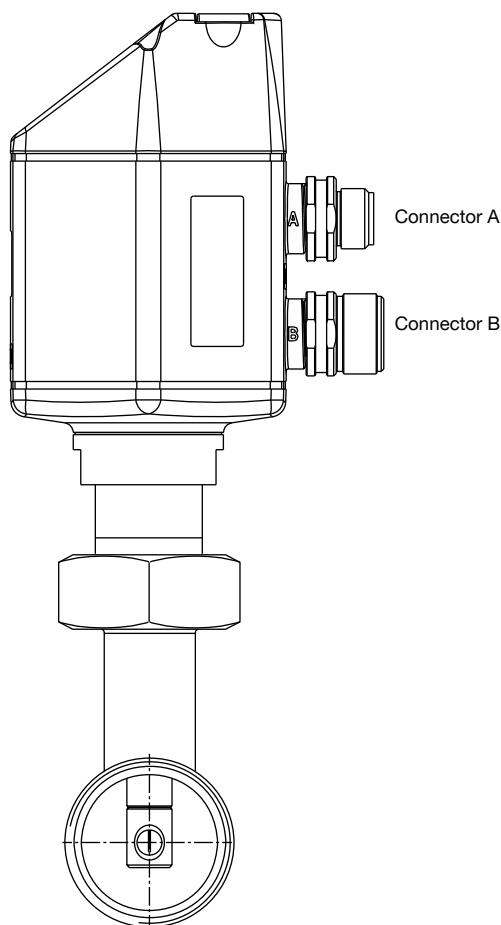
3. Device / Process connections

3.1. Connection details standard version

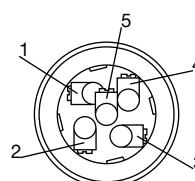
Pin Assignment

Note:

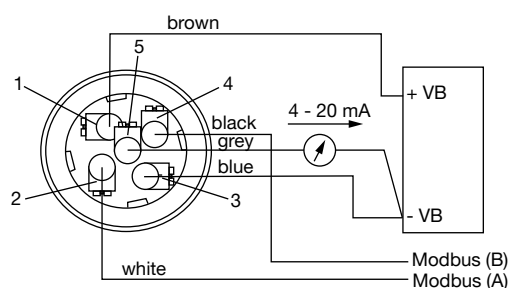
- The Pin assignment was changed with the new device generation. For questions, please contact the responsible Bürkert facility.
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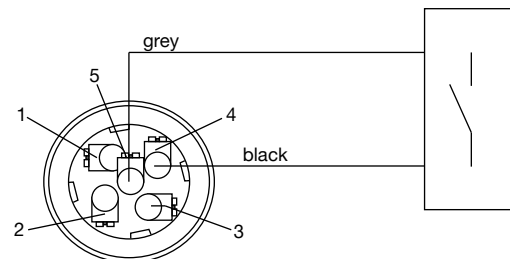
M12 connector



M12 connector A



M12 connector B



Pin	Connector A (Anschlussleitung)	Connection cable A	Connector B (pulse port)	Connection cable B
1	VB + Positive voltage supply 12...36 V DC smoothed	Brown	Not assigned, just for internal use only ^{1.)}	Brown
2	RS 485 (A) Modbus-RTU A	White	GND	White
3	VB - Negative voltage supply 12...36 V DC smoothed	Blue	DIR Direction input	Blue
4	RS 485 (B) Modbus-RTU b	Black	P Pulse for usage	Black
5	I + Current signal 4...20 mA - selected measurement signal	Grey	P Pulse for usage	Grey

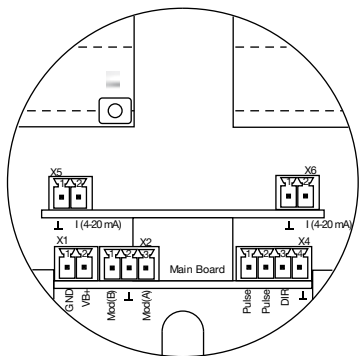
1.) Do not connect Pin 1 (Connector B) with an electrical potential and/or ground.

3.2. Connection details Heavy Duty version

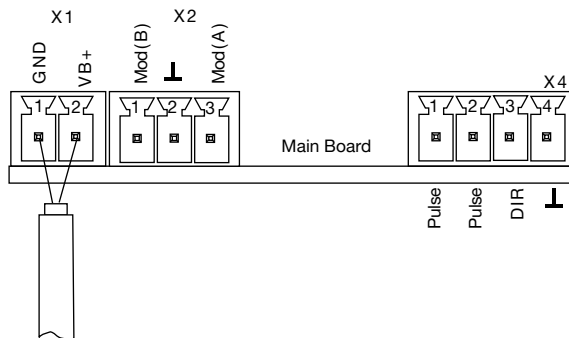
Note:

Electrical connection Modbus:
 If the sensor is used at the end of the Modbus system a bus termination is required. Please connect the enclosed 120R resistor to the terminals, Pin 1 and 3 of "X2" connector.

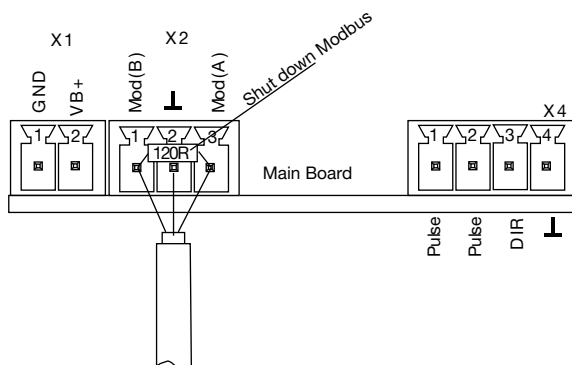
Plug layout



Voltage supply



Modbus



Plug	Pin	Description
X1 Voltage supply	1	VB - (negative voltage supply GND)
	2	VB + (positive voltage supply 12 V...36 V DC)
X2 Modbus	1	Modbus (B)
	2	Modbus shield
	3	Modbus (A)
X4 Direction/impulse	1	Pulse/Alarm ^{1.)}
	2	Pulse/Alarm ^{1.)}
	3	Direction input
	4	GND
X5 Power output 1	1	I- Active ^{1.)}
	2	I+ Active ^{1.)}
X6 Power output 2	1	I- Active ^{1.)}
	2	I+ Active ^{1.)}

1.) All analog outputs are galvanically isolated.

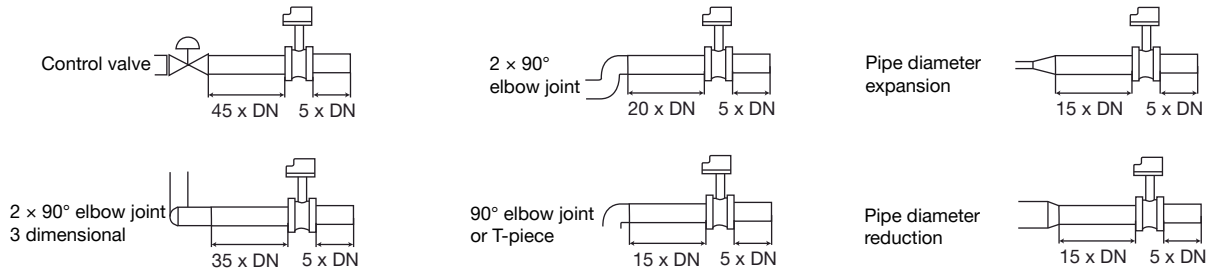
DTS 1000196002 EN Version: N Status: RL (released | freigegeben | validé) printed: 18.06.2019

4. Product installation

4.1. Installation notes

Note:

- DN corresponds to pipe diameter
- The flow direction in the following illustrations is always from left to right.



5. Product operation

5.1. Flow Ranges

Note:

- The table below lists the final flow rate value for flow velocities up to 185 m/s. Lower/higher final flow values relative to pipe diameter can be achieved by adjusting the maximum flow velocity during calibration. The optimal design of the devices is done automatically when the order is placed.
- Article no. for a flow meter calibrated on other gases like air and other flow ranges are on request. Detailed information can be found in forms at the end of this document.

Operating medium	Formula	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
		[m ³ /h]	[m ³ /h]	[m ³ /h]	[m ³ /h]	[m ³ /h]	[m ³ /h]
Ref. acc. to DIN 1945/ISO 1217: 20 °C and 1000 mbar							
Air	-	90	170	290	530	730	1195
Ref. acc. to DIN 1343: 0 °C and 1013.25 mbar							
Air	-	80	160	270	490	670	1100
Argon	Ar	140	275	460	830	1140	1870
Carbon dioxide	CO ₂	90	175	290	525	720	1185
Nitrogen	N ₂	80	160	270	485	670	1100
Oxygen	O ₂	85	165	280	505	695	1140
Natural gas, methane	NG	50	105	170	310	430	705







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6. Ordering information

6.1. Ordering chart standard version

Note:

- Air with operating pressure of 6 bar(ü)
- The total length of the device is not enough to condition the flow. Please refer to the design notes.
- Calibration for another flow range, other gases and/or operating pressure are available on request.







Pipe connection [Inch]	Inner diameter of pipe [mm]	Flow range [Nm ³ /h] ^{1.)}	Overall length [mm]	Article no.
R ½	16.1	Up to 80	300	773501 
R ¾	21.7	Up to 160	475	773502 
R 1	27.3	Up to 270	475	773503 
R 1¼	36.0	Up to 485	475	773504 
R 1½	41.8	Up to 670	475	773505 
R 2	53.1	Up to 1100	475	773506 

1.) Index N: Standard condition, flow rate referred to 0 °C and 1.013 bar(a)

6.2. Ordering chart Heavy Duty version

Note:

- Air with operating pressure of 6 bar(ü)
- Calibration for another flow range, other gases and/or operating pressure are available on request.

Pipe connection [Inch]	Inner diameter of pipe [mm]	Flow range [Nm ³ /h] ^{1.)}	Overall length [mm]	Article no.
R ½	16.1	Up to 80	300	773511 
R ¾	21.7	Up to 160	475	773512 
R 1	27.3	Up to 270	475	773513 
R 1¼	36.0	Up to 485	475	773514 
R 1½	41.8	Up to 670	475	773515 
R 2	53.1	Up to 1100	475	773516 

1.) Index N: Standard condition, flow rate referred to 0 °C and 1.013 bar(a)

