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) Max. load (current output)	4 – 20 mA <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)

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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 Nm³/h	velocity	up to Nm³/h	velocity	up to Nm³/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.

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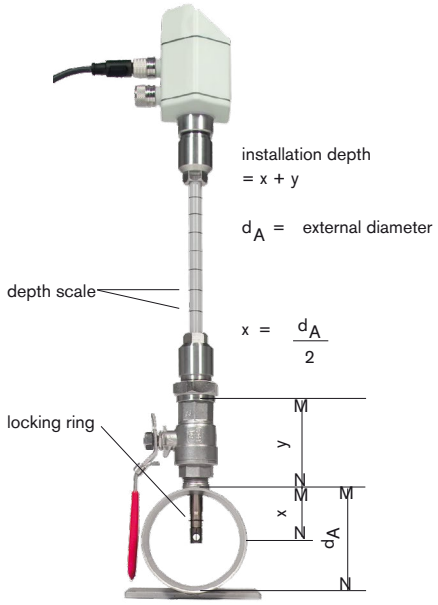
Determining the Point of Installation

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.

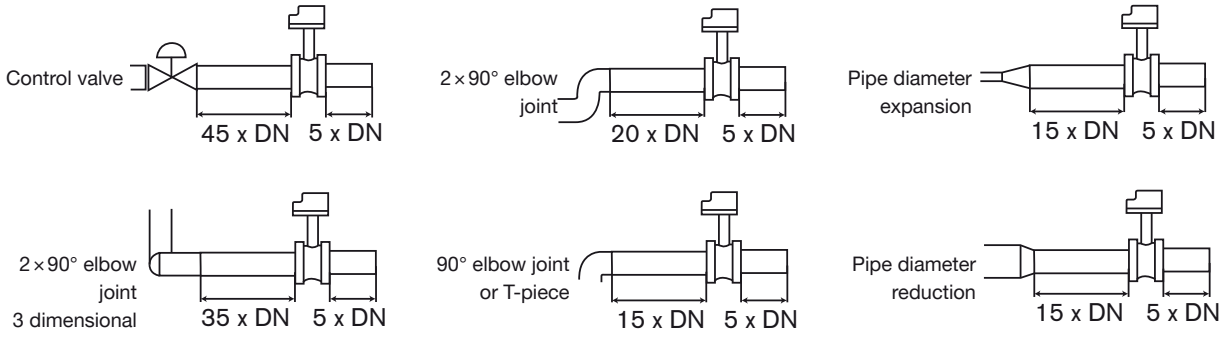
Careful attention must be paid to the design of the outlet section as obstructions can cause counter-flow turbulences as well as turbulences in the direction of the flow.

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.

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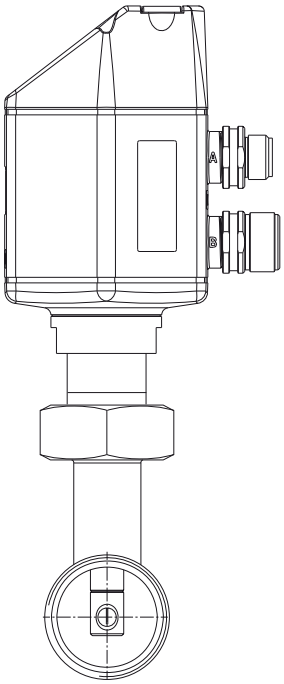
Pin Assignment - standard version

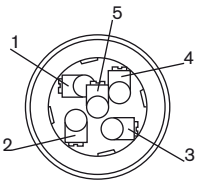
Attention: The Pin assignment was changed with the new device generation. For questions, please contact the responsible Bürkert facility.



Connector A

Connector B

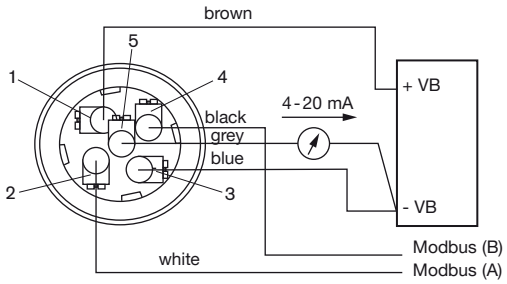
M12 connector



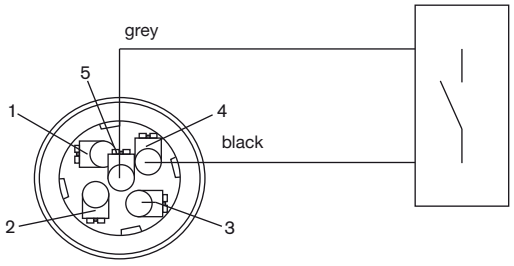
Pin	Connector A (connection port)	Connection cable A	Connector B (pulse port)	Connection cable B
1	**VB +** Positive voltage supply 12 - 36 V DC	br	*	br
2	**RS 485 (A)** Modbus-RTU A	wh	**GND**	wh
3	**VB-** Negative voltage supply 12 - 36 V DC	bl	**DIR** Direction input	bl
4	**RS 485 (B)** Modbus-RTU 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.

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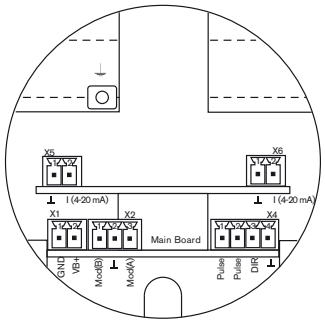
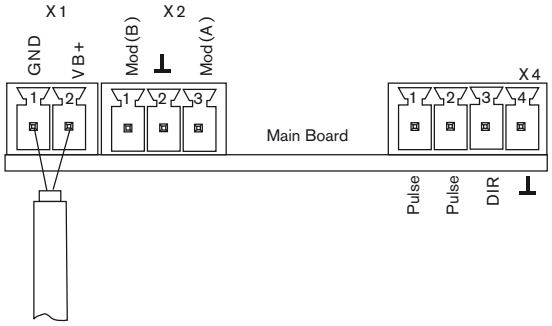
Pin assignment - heavy duty version

Electrical connection

Plug layout



Voltage supply

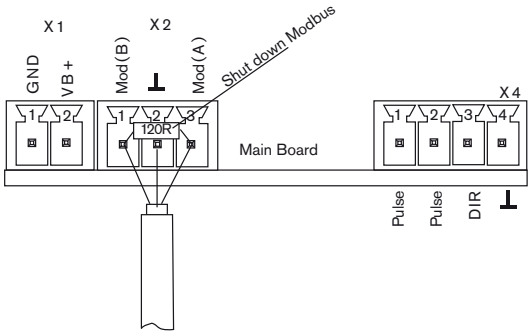


Plug	Pin	Description
X1 Voltage supply	1	VB - (negative voltage supply GND)
	2	VB + (positive voltage supply 12 V – 36 V DC)
X2 Modbus	1	Modbus (B)
	2	Modbus shield
	3	Modbus (A)
X4 Direction / impulse	1	Pulse / Alarm*
	2	Pulse / Alarm*
	3	Direction input
	4	GND
X5 Power output 1	1	I- Active*
	2	I+ Active*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

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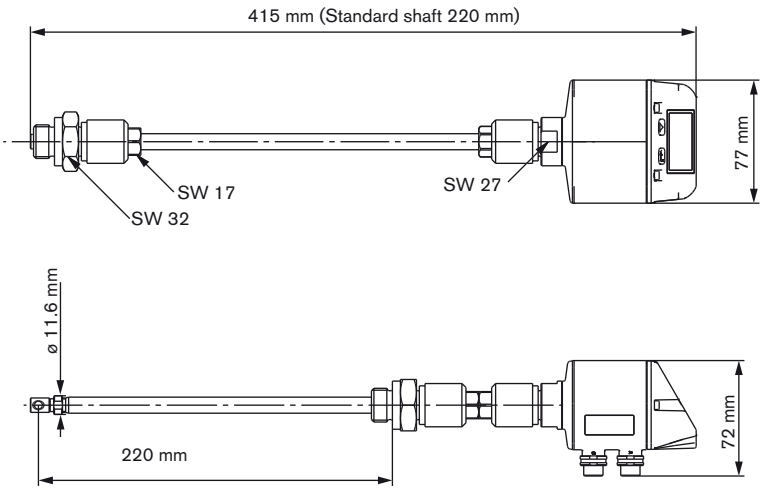
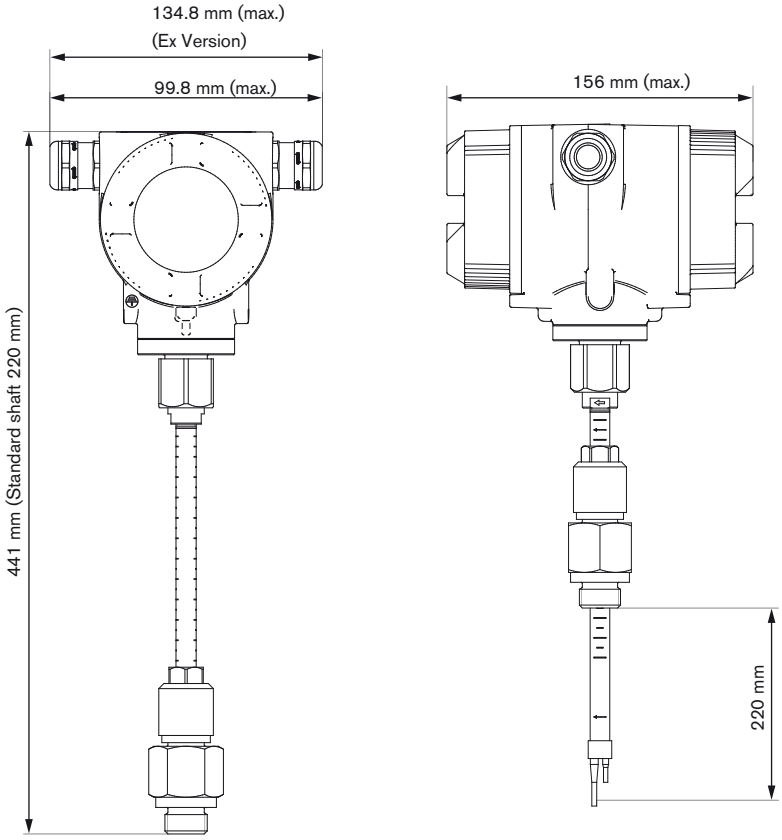
Dimensions [mm]

Standard version



Heavy duty version



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Note

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Request for Quotation

Please complete and send to your nearest Bürkert sales centre

Company	Contact person
Customer no.	Department
Address	Phone/Fax
Postcode/Town	E-mail

☐ Quantity ☐ required delivery date

Version ☐ Standard ☐ Heavy duty

Operating Data

Gas: ☐ Air ☐ Argon ☐ Nitrogen ☐ Methane ☐ Oxygen ☐ Natural gas ☐ Other gas: ☐

Max. flow rate: ☐ ☐ m^3/h Referenzbedingungen: ☐ N: 0 °C, 1013 mbar(a)
(Add-on price for special flow range) ☐ l/min ☐ S: 20 °C, 1000 mbar(a)
Other unit _____

Operating pressure: ☐ bar(g)
Ambient temperature: ☐ °C ☐ °F
Gas temperature: ☐ °C ☐ °F

Options: ☐ High pressure safety device (for installation in pipes >10 bar)
☐ Free of oil and fat, without O_2 certificate
☐ Free of oil and fat, with O_2 certificate
☐ Other probe length _____mm (see page 3, note ordering chart)

Comments / Sketch

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