

## Mass Flow Controller for Gases (MFC)



Type 8626 can be combined with...



**Type 8619**

Multichannel program controller



**Type 0330**

3/2 way valve



**Type 6013**

2/2 way valve

- Nominal flow ranges from 20 l<sub>N</sub>/min up to 2500 l<sub>N</sub>/min
- High accuracy and repeatability
- Short settling times
- Protection class IP65
- Optional: Fieldbus interface

The mass flow controller (MFC) type 8626 is suited for regulating the mass flow of high gas flows. The thermal inline sensor is located directly in the gas stream and therefore reaches very fast response times. A direct-acting proportional valve from Bürkert guarantees a high sensitivity. The integrated PI controller ensures outstanding control characteristics of the MFC.

Type 8626 can optionally be calibrated for two different gases; the user can switch between these two gases. As electrical interfaces both, analog standard signals and fieldbuses are available.

The mass flow controller type 8626 is especially designed for use in harsh environments due to a low sensitivity to contamination and the high protection class. The MFC fits for various applications, like e.g. burner controls,

heat treatment, metallurgy, food and beverage industry, environmental technology, material coatings, fuel cell technology or test benches.

Technical Data			
<b>Nominal flow range<sup>1)</sup></b> (Q <sub>nom</sub> )	20...1500 l <sub>N</sub> /min <sup>2)</sup> , N <sub>2</sub> equivalent see table on page 2, higher flows on request	<b>Port connection</b>	G ¼", ⅜", ½", ¾", 1" NPT ¼", ⅜", ½", ¾", 1"
<b>Turn-down ratio</b>	1:50 <sup>3)</sup>	<b>Control valve</b>	Normally closed
<b>Operating gas</b>	Neutral, non-contaminated gases, others available on request	Valve orifice	0.8...12 mm
<b>Calibration gas</b>	Operating gas or air with correcting function	k <sub>v</sub> value	0.02...2.8 m <sup>3</sup> /h
<b>Max. operating pressure</b> (inlet pressure)	Up to max. 10 bar, depending on the orifice of the valve	<b>Electr. connection</b>	Socket M16, round, 8 pin and socket D-Sub HD15, 15 pin
<b>Gas temperature</b>	- 10 to + 70 °C (- 10 to + 60 °C with oxygen)	Additionally with:	
<b>Ambient temperature</b>	- 10 to + 45 °C (higher temperatures on request)	-PROFIBUS-DP:	Socket M12 5 pin or D-Sub 9 pin
<b>Accuracy</b> (after 15 min warm up time)	± 1.5% o.R. ± 0.3% F.S. (o.R.: of reading; F.S.: of full scale)	-CANopen:	Plug M12 5 pin or D-Sub 9 pin
<b>Repeatability</b>	± 0.1% F.S.	with RS485 version only:	Plug D-Sub 9 pin
<b>Settling time (t<sub>95%</sub>)</b>	< 500 ms	<b>Operating voltage</b>	24 V DC
<b>Materials</b>		<b>Voltage tolerance</b>	± 10%
Body	Aluminium (black anodized) or stainless steel	<b>Residual ripple</b>	< 2%
Housing	Aluminium (coated)	<b>Power consumption</b>	12.5 W-37 W (depending on version)
Seals	FKM, EPDM	<b>Type of protection</b> (with connected cables)	IP65
		<b>Dimensions</b>	See drawings on p. 6-9
		<b>Total weight</b> (examples)	2.5 kg (Al, 16 W-valve) 4.5 kg (VA, 16 W-valve)
		<b>Mounting position</b>	Horizontal or vertical
		<b>Light emitting diodes</b> (Default, other functions programmable)	Indication for
			1. Power, 3. Limit 2. Communication 4. Error

<sup>1)</sup> The nominal flow value is the max. flow value calibrated which can be controlled. The nominal flow range defines the range of nominal flow rates (full scale values) possible.

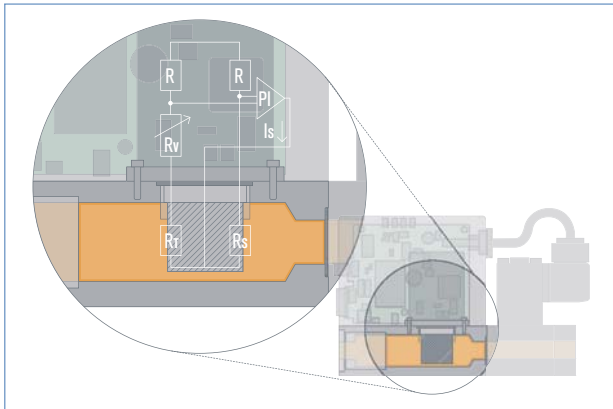
<sup>2)</sup> Index N: Flow rates referred to 1.013 bar and 0 °C.

Alternatively there is an Index S available which refers to 1.013 bar and 20 °C

<sup>3)</sup> With vertical installation and flow downwards the turn-down ratio is 1:10

Technical Data (cont.)			
Device variant	Analog signal version	Fieldbus version	RS485 version (only D-Sub, 9 pin)
<b>Analog communication</b> Input signal (set point) Input impedance  Output signal (actual flow) Max. current voltage output Max. load current output	0 – 5 V, 0 – 10 V, 0 – 20 mA or 4 – 20 mA > 20 kΩ (voltage) < 300 Ω (current) 0 – 5 V, 0 – 10 V, 0 – 20 mA or 4 – 20 mA 10 mA 600 Ω	None	None
<b>Fieldbus option</b> (D-Sub HD15 covered with sealed plate for, pins for analogue inputs/outputs not connected)	None	PROFIBUS-DP, CANopen	Modbus RTU (via RS interface)
<b>Digital communication</b> via adapter possible:	RS232 (supports Modbus RTU) RS485, RS422 or USB		RS485, RS422 USB
<b>Binary inputs</b> (Default, other functions programmable)	Three: 1. Start Autotune 2. not assigned 3. not assigned		One: Start Autotune
<b>Binary outputs</b> (Default, other functions programmable)	Two relay outputs 1. Limit (desired value cannot be achieved) 2. Error (e.g. sensor fault) Load capacity: max. 60 V, 1 A, 60 VA		One relay output 1. Limit (desired value cannot be achieved) Load capacity: max. 25 V, 1 A, 25 VA

## Measuring Principle



This sensor works as a hot-film anemometer in the so-called CTA operational mode (Constant Temperature Anemometer). To do this, two resistors with precisely specified temperature coefficients located directly in the media flow and three resistors located outside the flow are connected together to form a bridge.

The first resistor in the gas flow ( $R_1$ ) measures the fluid temperature, while the second, low-value resistor ( $R_2$ ) is heated so that it is maintained at a fixed, predefined over-temperature with respect to the fluid tem-

## Nominal Flow Ranges of Typical Gases

(other gases on request)

Gas	Min. $Q_{nom}$ [l <sub>N</sub> /min]	Max. $Q_{nom}$ [l <sub>N</sub> /min]
Acetylene	20	975
Ammonia	20	1250
Argon	20	1500
Carbon dioxide	20	800
Air	20	1500
Methane	20	750
Propane	20	400
Oxygen	20	1500
Nitrogen	20	1500

perature. The heating current required to maintain this is a measure of the heat being removed by the flowing gas, and represents the primary measurement.

An adequate flow conditioning within the MFC and the calibration with high-quality flow standards ensure that the mass of gas flowing per time unit can be derived from the primary signal with high accuracy.

## Notes Regarding the Configuration

For the proper choice of the actuator orifice within the MFC, not only the required maximum flow rate  $Q_{nom}$ , but also the pressure values directly before and after the MFC ( $p_1$ ,  $p_2$ ) at this flow rate  $Q_{nom}$  should be known. In general, these pressures are not the same as the overall inlet and outlet pressures of the whole plant, because there are usually additional flow resistors (tubing, additional shut-off valves, nozzles etc.) present both before and after the controller.

Please use the specification sheet (p. 10) to indicate the pressures directly before and after the MFC. If these should be unknown or not accessible to a measurement, estimates are to be made by taking into account the approximate pressure drops over the flow resistors before and after the MFC, respectively, at a flow rate of  $Q_{nom}$ .

In addition, please quote the maximum inlet pressure  $p_{1,max}$  to be encountered. This data is needed to make sure the actuator is able to provide a close-tight function within all the specified modes of operation.

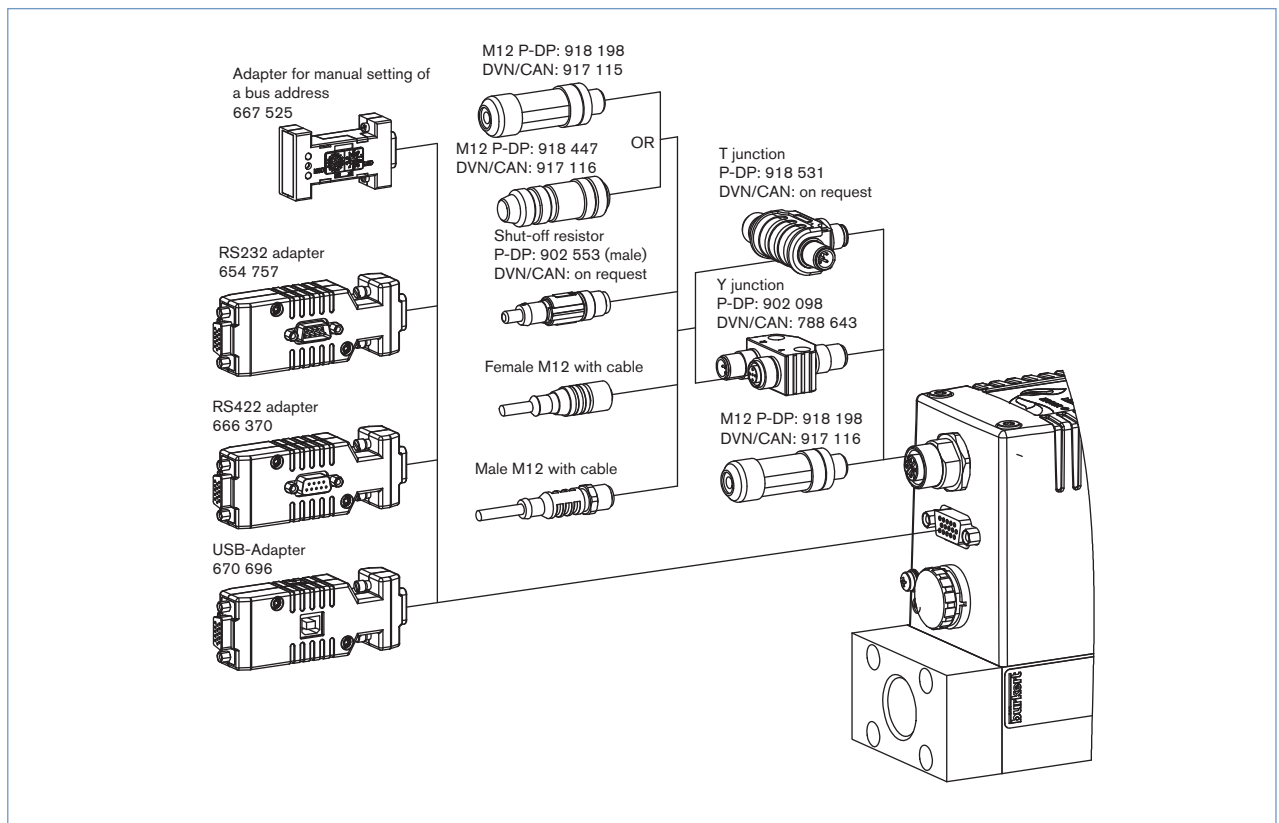
► Please use the form on page 10 for the information about your specific requirements.

## Ordering Chart for Accessories

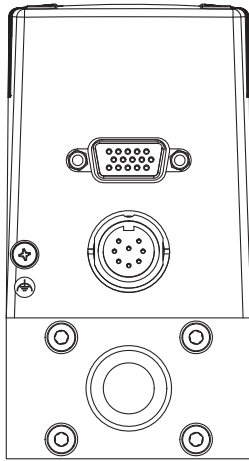
Article	Item no.	
<b>Connectors/Cables</b>		
Round plug M16 8 pin (solder connection)	918 299	
Round plug M16 8 pin with 5 m cable	787 733	
Round plug M16 8 pin with 10 m cable	787 734	
Plug D-Sub HD15 15 pin with 5 m cable	787 735	
Plug D-Sub HD15 15 pin with 10 m cable	787 736	
<b>Adapters<sup>4)</sup></b>		
RS232 adapter for connection to a computer, connection with an extension cable (item no. 917 039)	654 757	
Extension cable for RS232 9 pin socket/plug 2 m	917 039	
RS422-Adapter (RS485 compatible)	666 370	
USB-Adapter for D-Sub HD15	670 696	
USB-Adapter for D-Sub 9 pin (RS485 Version)	670 693	
USB connection cable 2 m	772 299	
Adapter for manual bus adresse settings (instead of SW)	667 525	
Software MassFlowCommunicator	Download from www.buerkert.com	
<b>Accessories for Fieldbus</b>	<b>PROFIBUS DP (B-coded)</b>	<b>CANopen (A-coded)</b>
M12-Plug <sup>5)</sup>	918 198	917 115
M12-socket (coupling) <sup>5)</sup>	918 447	917 116
Y-junction <sup>5)</sup>	902 098	788 643
T-junction	918 531	(on request)
Shut-off resistor	902 553	(on request)
GSD-File (PROFIBUS), EDS-File (CANopen)	Download from www.buerkert.com (see Type 8626)	

<sup>4)</sup> The adapters serve mainly for initial operation or diagnosis. Those are not obligatory for continuous operation.

<sup>5)</sup> The two M12 connectors as listed above cannot be used together on the same side of the Y-junction. At least one of the two M12 connection needs to be a prefabricated cable which uses typically a thinner connector.

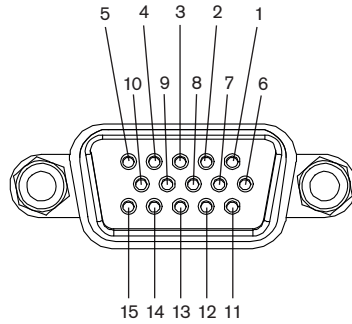


Pin Assignment



Standard

Socket D-Sub HD15



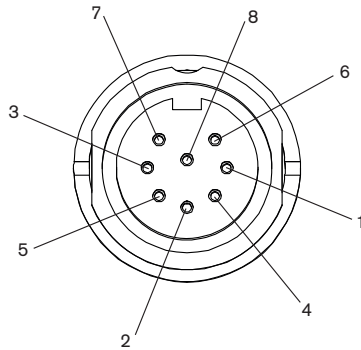
Pin	Assignment	
	Analogue Control	Bus control
1	Set value input +	N.C. <sup>9)</sup>
2	Set value input GND	N.C.
3	Actual value output +	N.C.
4	Binary input 2	
5	12 V-Output (only for internal company use)	
6	RS232 TxD (direct connection to computer)	
7	Binary input 1	
8	GND (for binary inputs)	
9	only company internal use (do not connect!)	
10	12 V-Output (only for internal company use)	
11	12 V-Output (only for internal company use)	
12	Binary input 3	
13	Actual value output GND	N.C.
14	RS232 RxD (direct connection to computer)	
15	DGND (for RS232-interface)	

<sup>9)</sup>N.C.: not connected (not used)

Note:

- Optional Pin 1 and 2 with bus version as transmitter input possible
- The cable length for RS232/ Setpoint and flow value signal is limited to 30 meters.

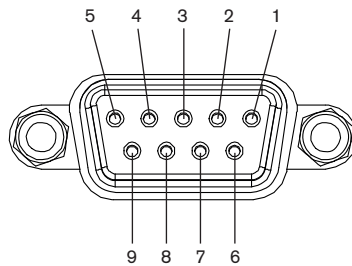
Socket M16, round, 8 pin



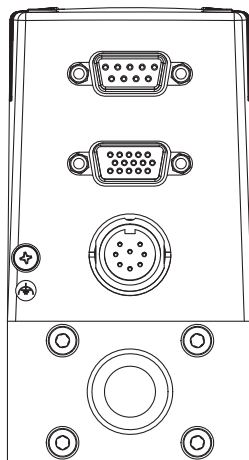
Pin	Assignment
1	24 V-Supply +
2	Relay 1 – reference contact
3	Relay 2 – reference contact
4	Relay 1 – normally closed
5	Relay 1 – normally opened
6	24 V-Supply GND
7	Relay 2 – normally opened
8	Relay 2 – normally closed

Socket D-Sub 9 pin

(only with fieldbus version)

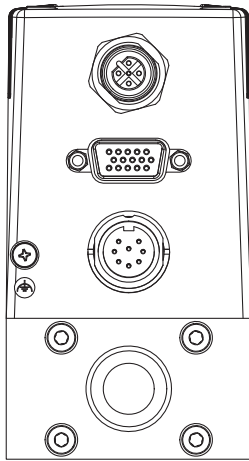


Pin	Assignment	
	PROFIBUS DP	CANopen
1	Shield	Shield
2	N.C.	CAN-L data line
3	RxD/TxD - P (B-line)	GND
4	RTS (control signal for repeater)	N.C.
5	GND	N.C.
6	VDD (only for termination resistor)	N.C.
7	N.C.	CAN-H data line
8	RxD/TxD - N (A-line)	N.C.
9	N.C.	N.C.

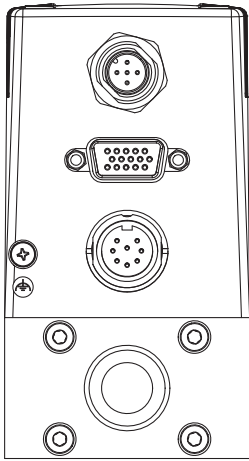


Fieldbus D-SUB

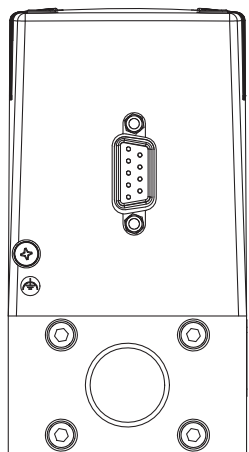
Pin Assignment (continued)



M12 Profibus

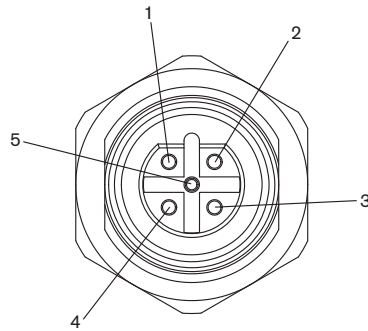


M12



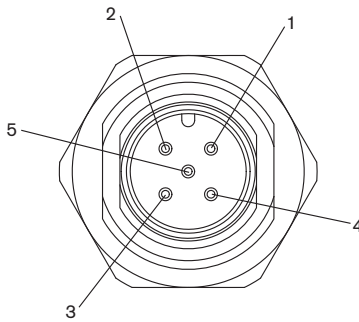
RS485 version

**PROFIBUS DP – socket B-coded M12 (DPV1 max. 12 Mbaud)**



Pin	Assignment
1	VDD (only for termination resistor)
2	RxD/TxD – N (A-line)
3	DGND
4	RxD/TxD – P (B-line)
5	N.C.

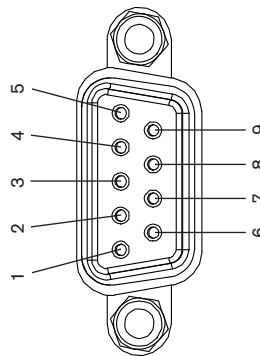
**CANopen – Plug A-coded M12**



Pin	Assignment
1	Shield
2	N.C. <sup>7)</sup>
3	DGND
4	CAN_H
5	CAN_L

<sup>7)</sup> Optional configuration with 24 V DC possible for power supply via fieldbus connector. With this no power supply connection on round M16 plug needed.

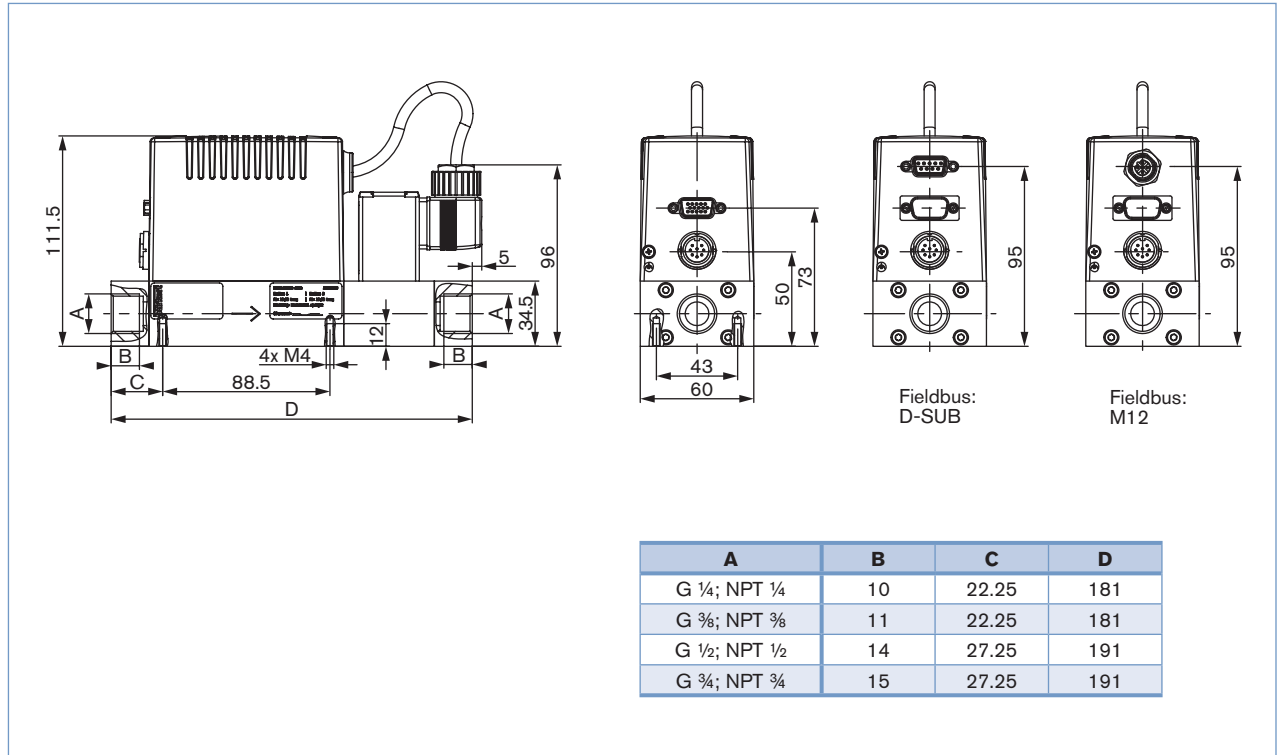
**Plug D-Sub 9 pin**



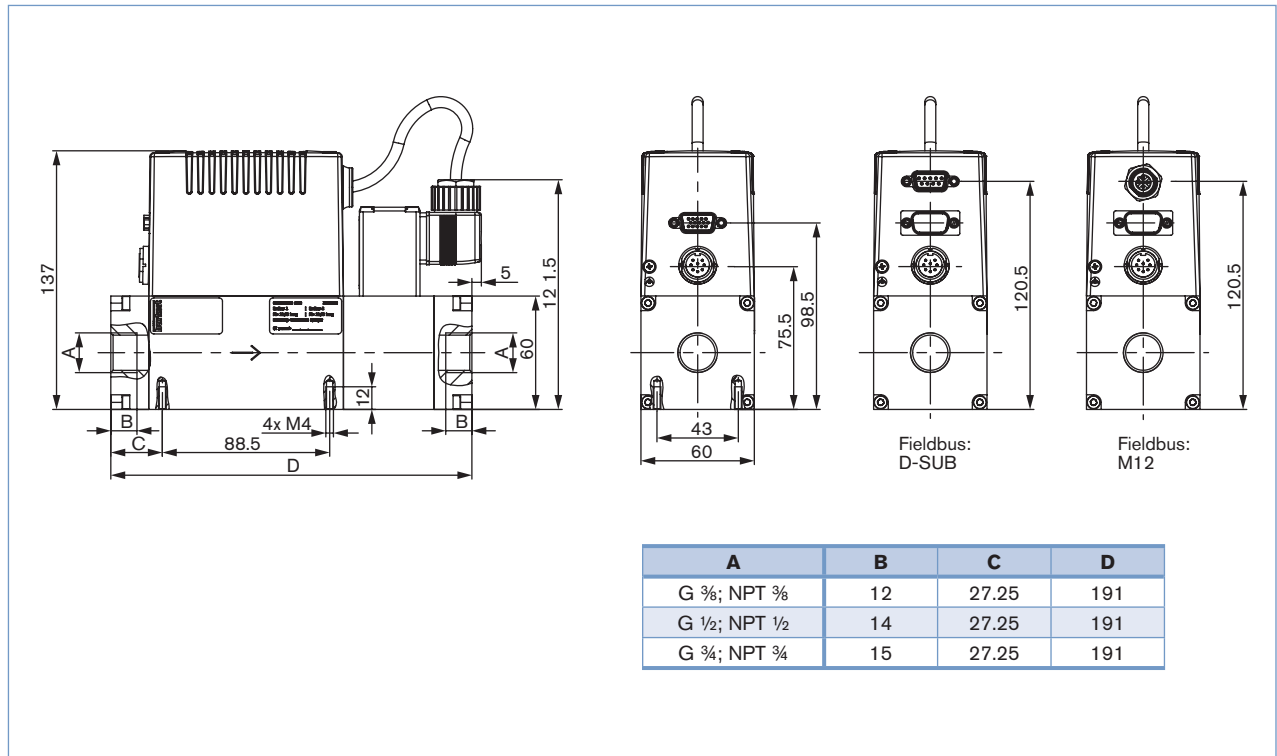
Pin	Assignment
1	Binary input (related to GND pin 2)
2	GND
3	Power supply + 24 V DC
4	Relay, normally opened
5	Relay, normally closed
6	TX+ (RS485-Y) – bridge with pin 9 at half duplex
7	TX- (RS485-Z) – bridge with pin 8 at half duplex
8	RX- (RS485-B)
9	RX+ (RS485-A)

Dimensions [mm]

MFC 8626 with valve type 2873 (9W coil)

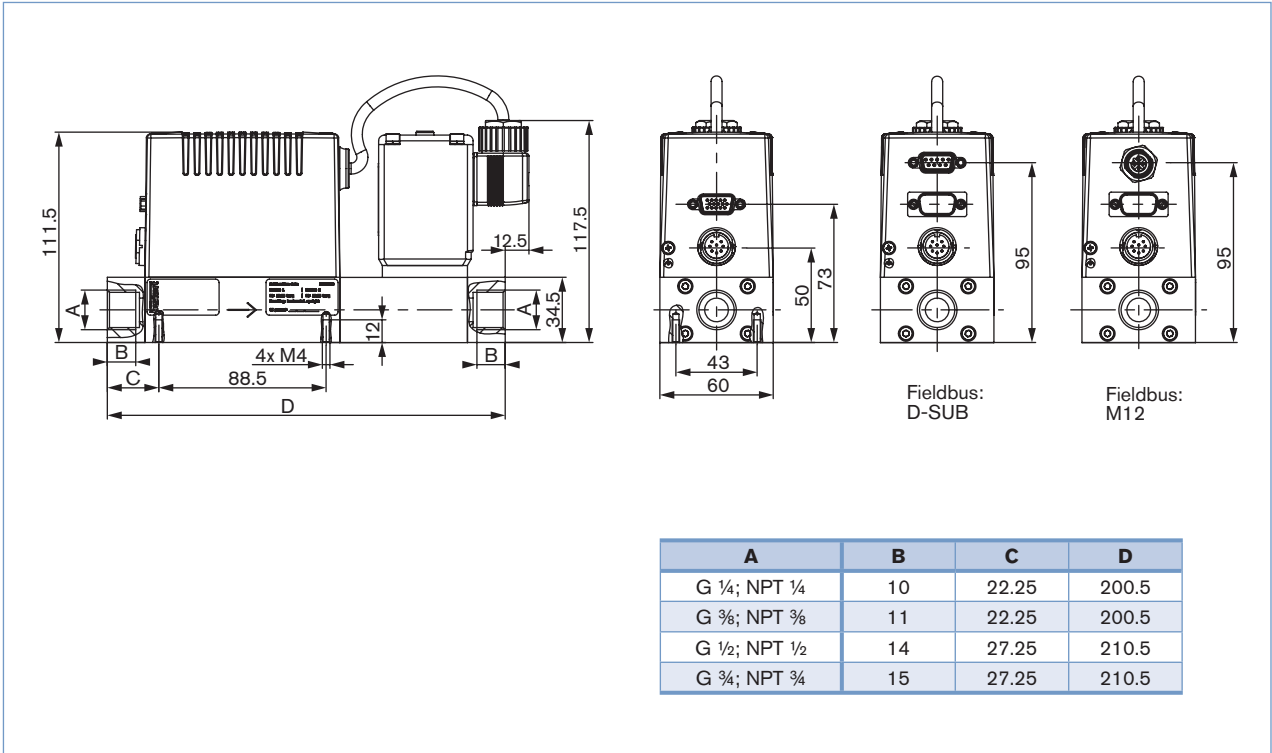


MFC 8626 with valve type 2873 (9W coil) and base block for large nominal flow rates

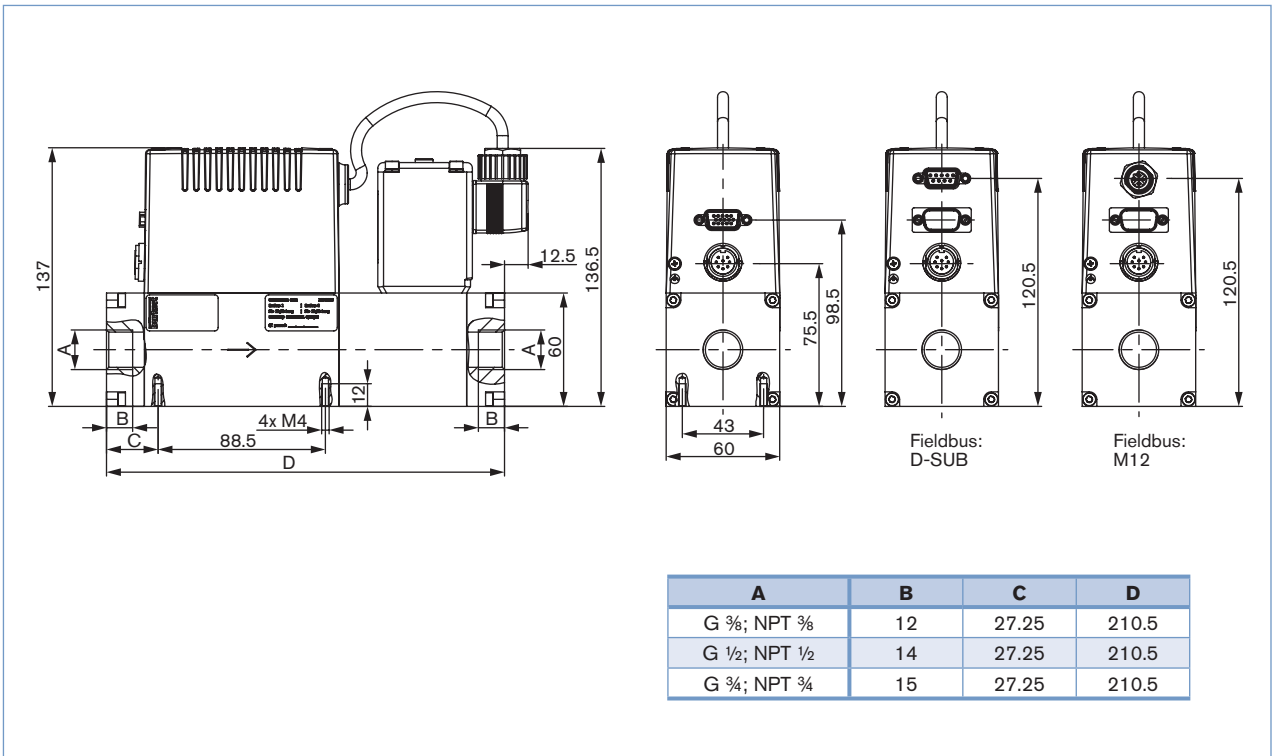


Dimensions [mm]

MFC 8626 with valve type 2875 (16W coil)

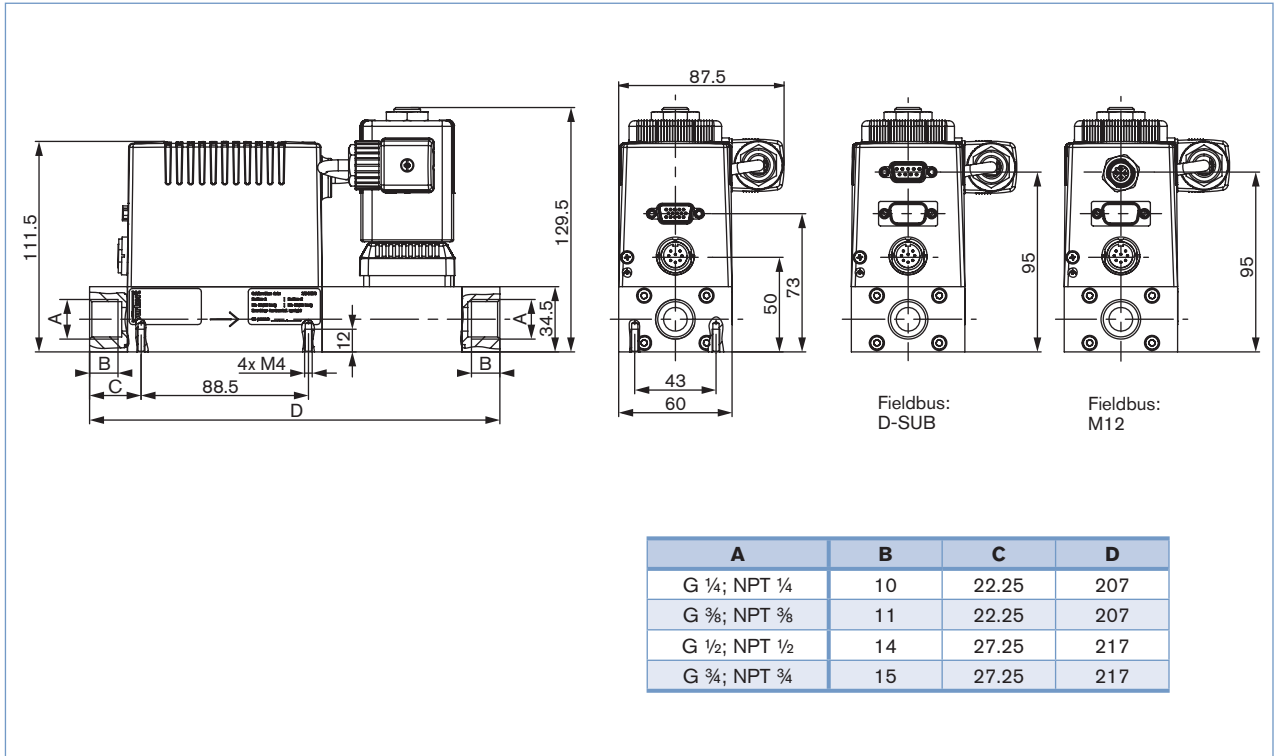


MFC 8626 with valve type 2875 (16W coil) and base block for large nominal flow rates

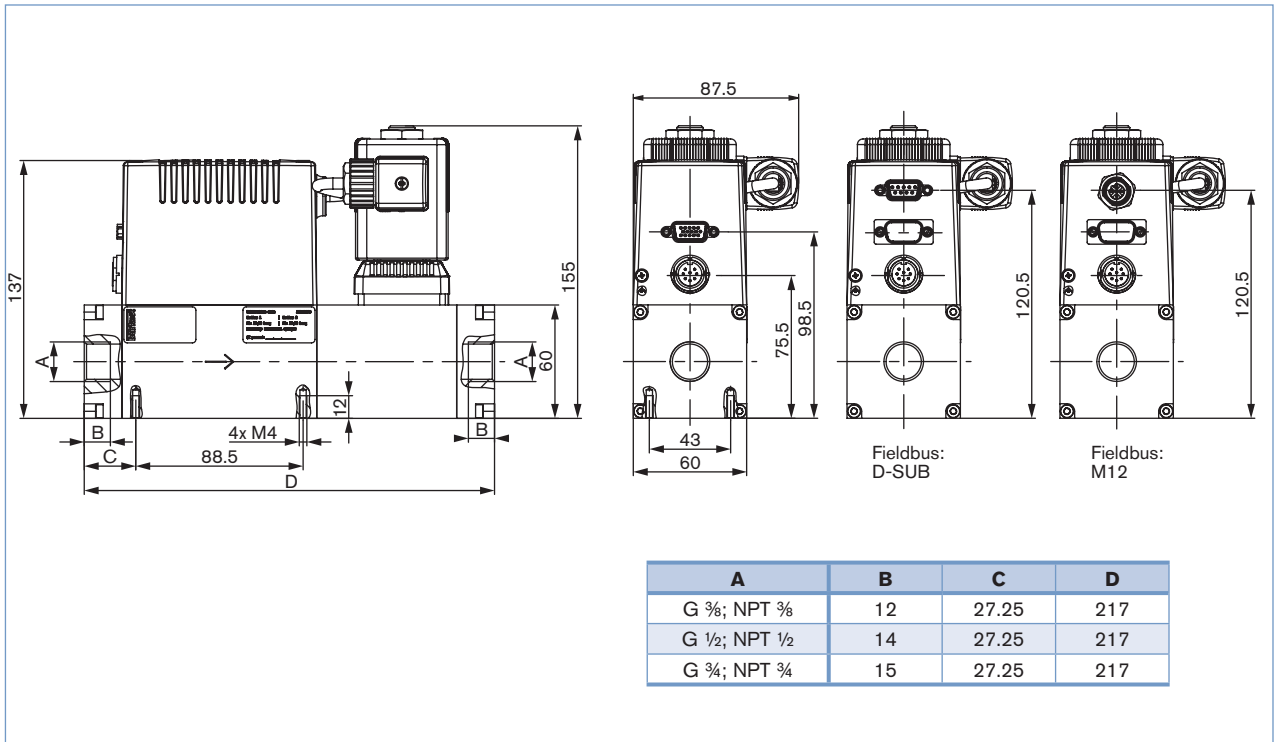


Dimensions [mm]

MFC 8626 with valve type 6024 (18W coil)



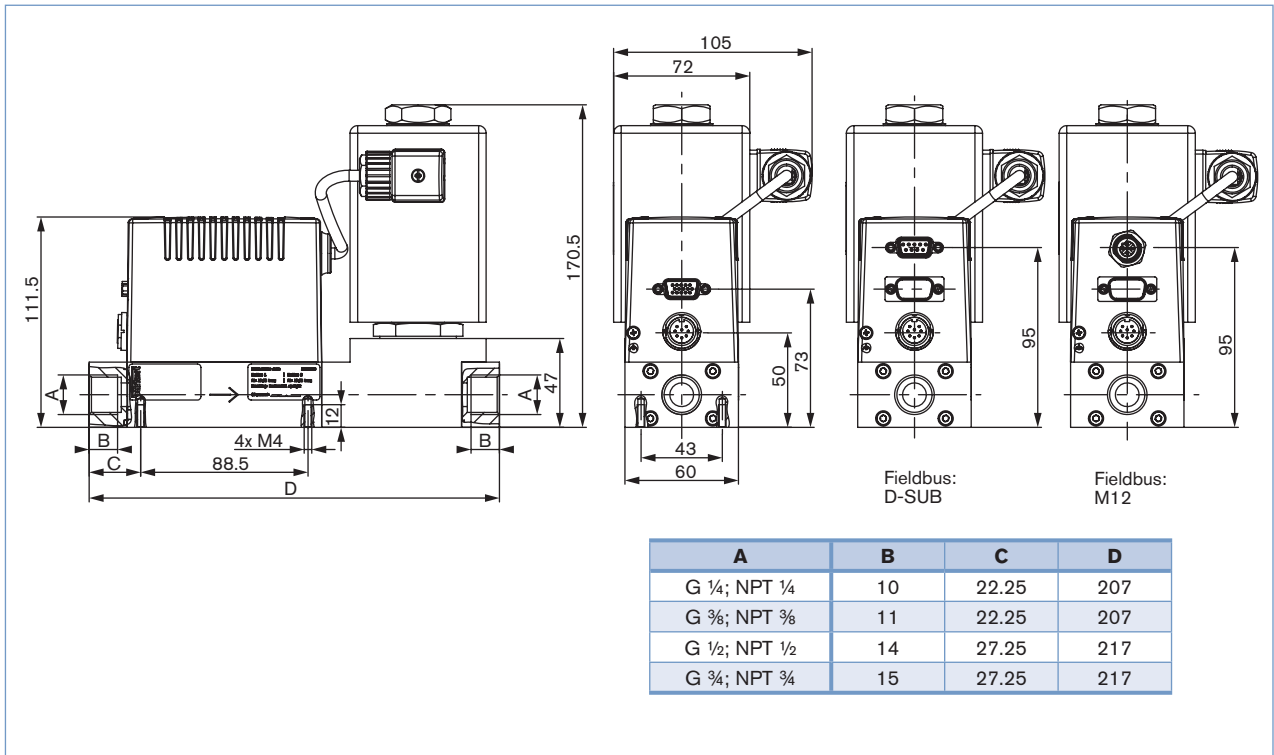
MFC 8626 with valve type 6024 (18W coil) and base block for large nominal flow rates



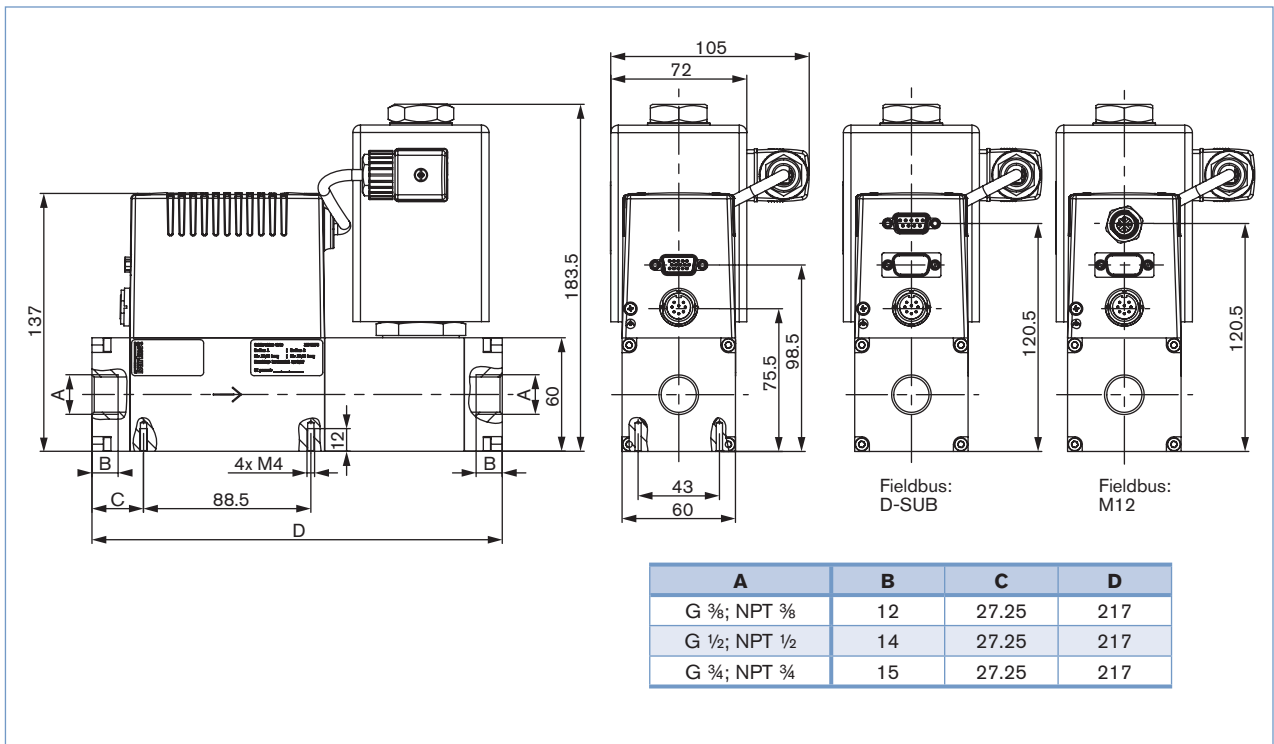


Dimensions [mm]

MFC 8626 with valve type 2836 (24W coil)



MFC 8626 with valve type 2836 (24W coil) and base block for large nominal flow rates



## MFC/MFM Applications – Request for Quotation

▶ Please complete and send to your nearest Bürkert sales centre

Company	Contact person
Customer No	Department
Address	Tel./Fax
Postcode/Town	E-mail

 MFC-Application     MFM-Application     Quantity     Required delivery date

## Fluid data

Type of gas (or gas proportion in mixtures)

Density  kg/m<sup>3</sup><sup>9)</sup>

Gas temperature  °C     °F

Moisture content  g/m<sup>3</sup>

Abrasive components/solid particles  no     yes, as follows:

## Fluidic data

Flow range  $Q_{nom}$   Min.  l<sub>N</sub>/min<sup>9)</sup>     l<sub>S</sub>/min (slpm)<sup>9)</sup>  
 Max.  m<sub>N</sub><sup>3</sup>/h<sup>9)</sup>     kg/h  
 cm<sub>N</sub><sup>3</sup>/min<sup>9)</sup>     cm<sub>S</sub><sup>3</sup>/min (sccm)<sup>9)</sup>  
 l<sub>N</sub>/h<sup>9)</sup>     l<sub>S</sub>/h<sup>9)</sup>

Inlet pressure at  $Q_{nom}$ <sup>10)</sup>     $p_1 =$   bar(g) ■

Outlet pressure at  $Q_{nom}$      $p_2 =$   bar(g) ■

Max. inlet pressure  $p_{1,max}$      bar(g) ■

MFC/MFM port connection  without screw-in fitting  
 1/4" G-thread (DIN ISO 228/1)     1/4" NPT-thread (ANSI B1.2)  
 3/8" G-thread (DIN ISO 228/1)     3/8" NPT-thread (ANSI B1.2)  
 1/2" G-thread (DIN ISO 228/1)     1/2" NPT-thread (ANSI B1.2)  
 3/4" G-thread (DIN ISO 228/1)     3/4" NPT-thread (ANSI B1.2)  
 with screw-in fitting  
 mm Pipeline (external Ø)  
 inch Pipeline (external Ø)

Installation  horizontal, valve upright (standard)     horizontal, valve on side  
 vertical, flow upwards     vertical, flow downwards

Ambient temperature  °C

## Material data

Body (base block)  Aluminium (anodised)     Stainless steel

Seal material  FKM     EPDM

## Electrical data

Signals for set point and actual value	Standard signal Setpoint / Actual value	with fieldbus	with RS485
<input type="checkbox"/> 0–5 V	<input type="checkbox"/> 0–20 mA	<input type="checkbox"/> PROFIBUS DP	<input type="checkbox"/> M12
<input type="checkbox"/> 0–10 V	<input type="checkbox"/> 4–20 mA	<input type="checkbox"/> CANopen	<input type="checkbox"/> D-Sub

■ Please quote all pressure values as overpressures with respect to atmospheric pressure [bar(ü)]

8) at: 1.013 bar(a) and 0 °C

9) at: 1.013 bar (a) and 20 °C

10) matches with calibration pressure

To find your nearest Bürkert facility, click on the orange box

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