FINE CONTROLS (UK) LTD

Fine Controls have been supplying process controls & instrumentation equipment since 1994, & now serves an ever expanding customer base, both in the UK & globally.

We offer a full range of valve & instrumentation products & services, with our product rangerepresenting leading technologies & brands:

Flow: Flow Meters & Transmitters, Flow Switches, Flow Control Valves & Batch Control Systems

Temperature: Temperature Probes & Thermowells, Temperature ransmitters,Temperature Regulators & Temperature Displays

Level: Level Transmitters & Switches

Pressure: Pressure Gauges &Transmitters, Precision & High Pressure Regulators & I-P Converters, Volume boosters.

Precision Pneumatics: Pressure Regulators, I-P Converters, Volume Boosters, Vacuum Regulators

Valves: Solenoid & Pneumatic Valves, Control Valves & Positioners, Actuated Ball, Globe or Diaphragm Valves & Isolation Valves

Services: Repair, Calibration, Panel Build, System Design & Commissioning

FAIRCHILD
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FLUID CONTROL SYSTEMS

Mass Flow Controller (MFC) for Gases

- Inline MFC for full scale rates from 25 l_N/min to 1.500 l_N/min; 1/4" to 3/4"
- High accuracy
- Short settling time
- Fieldbus option

Type 8626 can be combined with…

Type 1150
Multi-channel program controller

Type 0330
3/2- or 2/2-way valve

Type 6013
2/2-way valve

MFC
Communications Software

The Type 8626 mass flow controller forms an integrated system, consisting of the flow sensor, control electronics and control valve. Using this controller, mass flows of gases can be kept constant or can follow a predefined set-point profile regardless of interfering influences (such as pressure or temperature variations). The sensor works according to the thermal principle (constant-temperature anemometer). The measurement is made in the main channel and provides the mass flow directly without any corrections (see description on page 2). In the digital flow controller the set point and the actual value are compared, and the control signal for the proportional valve is calculated. The direct-acting solenoid control valve works according to the well-tried plunger-type principle, and is driven by a PWM voltage signal.

In addition to its control function, the valve also provides a close-tight function. Due to making the measurement in the main flow, the MFC Type 8626 is characterized by excellent dynamics and a low sensitivity to contamination. Type 8626 can optionally be calibrated for two different gases, the user is able to switch between these two gases.
Typical application areas are gas dosing or rather the production of gas mixtures in:

- Process technology
- Heat treatment
- Environmental technology
- Material coating
- Burner controls
- Fuel cell technology

Technical data	
Full scale range [1] (Q_{nom})	25 to 1500 l_N/min N_2 equivalent
Operating medium	Neutral, non-contaminated gases (others on request)
Max. operating pressure (at inlet)	Up to max. 10 bar, independent of valve orifices
Calibration medium	Operating gas or air with correction factors
Medium temperature	-10 to +70°C
Ambient temperature	-10 to +45°C
Accuracy (after 15 min warm up time)	±1.5% o.R. ±0.3 % F.S. (o.R. : of reading; F.S. : of full scale)
Linearity	±0.25 % F.S.
Repeatability	±0.1 % F.S.
Turn-down ratio	1:50
Settling time($t_{95\%}$)	< 500 ms
Body material	Aluminium (anodized) or stainless steel
Housing	Aluminium (coated)
Seal material	FKM, EPDM (others on request)
Port connection	G 1/4, 3/8, 1/2, 3/4, NPT 1/4, 3/8, 1/2, 3/4
Control valve Valve orifice k_{Vs} value	Valve is closed when power is off 0.8 to 12 mm 0.02 to 2.8 m³/h
Electrical Connection	Round socket 8-pin, Socket Sub-HD 15-pin Additionally with fieldbus socket Sub-D 9-pin
Operating voltage	24 V DC

Technical data	
Voltage tolerance	±10%
Residual ripple	< 2 %
Power consumption	20 W – max. 50 W (depending on version)
Input signal (set point) Input impedance	0–5V, 0–10V, 0–20 mA or 4–20 mA >20 kΩ (voltage) <300 Ω (current)
Output signal (actual value) Max. current (voltage output) Max. load (current output)	0–5 V, 0–10 V, 0–20 mA or 4–20 mA 10 mA 600 Ω
Digital communication	PROFIBUS-DP, DeviceNet, CANopen, RS232, RS485
Type of protection	IP65
Dimensions [mm]	See drawing p. 4-6
Total weight (example)	1.8 kg (Al, 9 W valve) 4.0 kg (Stainless steel, 16 W valve)
Installation	Horizontal or vertical (with vertical, flow downwards, only a limited turn-down ratio possible)
Light emitting diodes (Default, other functions possible)	Indication for 1. Power, 3. Limit 2. Communication 4. Error
Binary inputs (Default, other functions possible)	Three 1. Start Autotune 2. not assigned 3. not assigned
Binary outputs (Default, other functions possible)	Two relay outputs 1. Limit (desired value can not be achieved) 2. Error (e.g. sensor failure) Capacity: max. 60 V, 1 A, 60 VA

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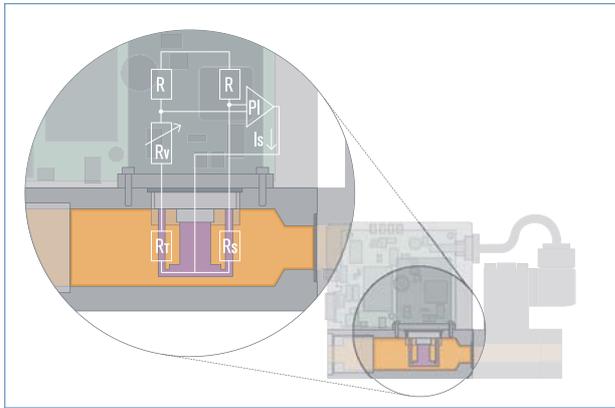
This sensor works as a hot-film anemometer in the so-called CTA operational mode (Constant Temperature Anemometer). To do this, two resistors with precisely specified temperature coefficients located directly in the media flow and three resistors located outside the flow are connected together to form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

The first resistor in the medium flow (R_T) measures the fluid temperature, while the second, low-value resistor (R_S) is heated so that it is maintained at a fixed, predefined over-temperature with respect to the fluid tempera-

ture. 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 great accuracy.

Notes regarding the selection of the unit

For the proper choice of the actuator orifice within the MFC, not only the required maximum flow rate Qnom, but also the pressure values directly before and after the MFC (p_1, p_2) at this flow rate Qnom 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. 7) 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 Qnom.

In addition, please quote the maximum inlet pressure p_{1max} 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 7 for the information about your specific requirements.

Ordering chart for accessories (connectors are not included in the delivery)

Article	Item no.
Circular connector 8-pin binder plug (solder connection)	918 299
Round 8-pin plug with prefabricated 5m cable on one side	787 733
Round 8-pin plug with prefabricated 10m cable on one side	787 734
Sub-D 15-pin plug with prefabricated 5m cable on one side	787 735
Sub-D 15-pin plug with prefabricated 10m cable on one side	787 736
RS232-Adapter with extension cable to connect to PC (Item no. 917039)	654 757
2m extension cable for RS232 9-pin socket/plug	917 039
RS485-Adapter	658 499
USB-Adapter	670 696
Communications software (Mass Flow Communicator)	Info. at www.burkert.com

Pin Assignment
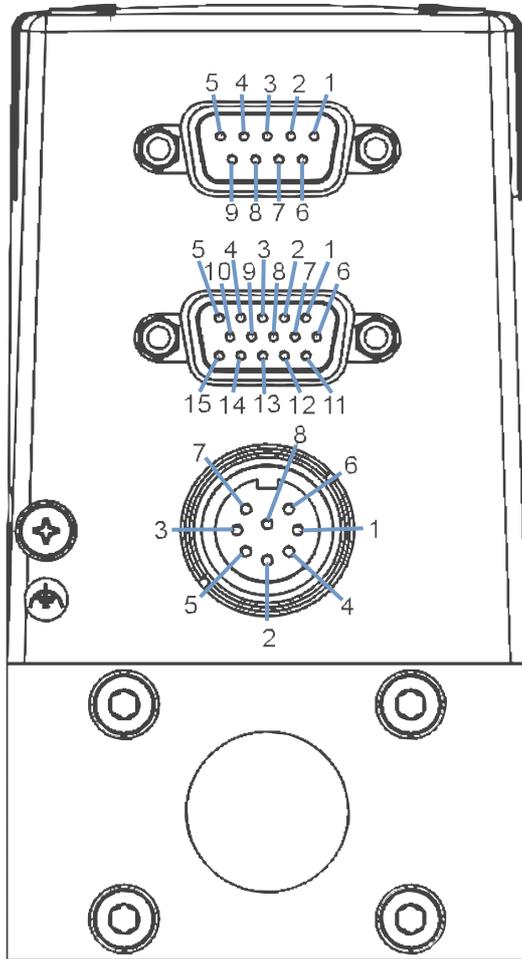
PROFIBUS-DP
Socket, Sub-D 9-pin (only with bus version)

Pin	Connection
1	Shield
2	not configured
3	RxD/ TxD − P (B-circuit)
4	RTS (control signal for repeater)
5	GND
6	VDD
7	not configured
8	RxD/ TxD − N (A-circuit)
9	not configured

DeviceNet, CANopen

Pin	Connection
1	Shield
2	CAN_L
3	GND
4	not configured
5	not configured
6	not configured
7	CAN_H
8	not configured
9	not configured

Sub-HD socket, 15-pin

Pin	Connection
1	Set value input +
2	Set value input GND
3	Actual value output +
4	Binary input 2
5	12V-output (only for internal company use)
6	RS232 TxD (direct connection to PC)
7	Binary input 1
8	DGND (for binary inputs)
9	only for internal company use (do not connect)
10	12V-output (only for internal company use)
11	12V-output (only for internal company use)
12	Binary input 3
13	Actual value output GND
14	RS232 TxD (direct connection to PC)
15	DGND (for RS232-interface)

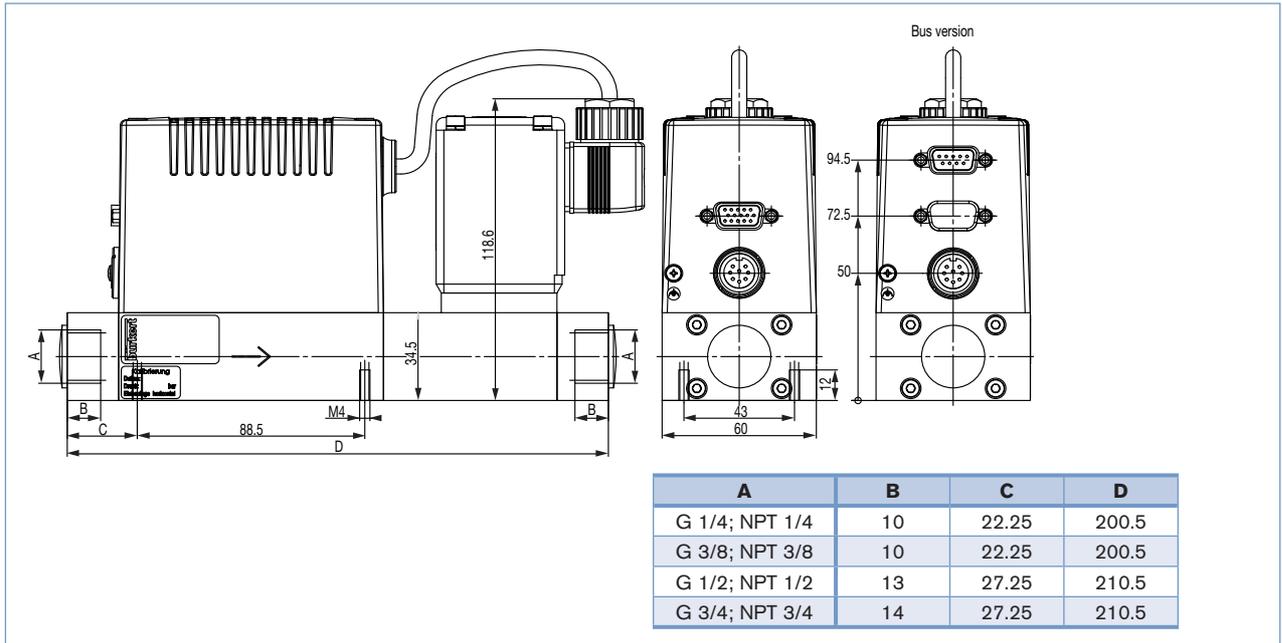(for bus version 1-3 and 13 not configured)

Round socket, 8-pin,

Pin	Connection
1	24V Supply +
2	Relay 1 - middle contact
3	Relay 2 - middle contact
4	Relay 1 - NC contact
5	Relay 1 - NO contact
6	24V-Supply GND
7	Relay 2 - NO contact
8	Relay 2 - NC contact

Dimensions [mm]

MFC 8626 with valve type 2833 (9W coil)

A	B	C	D
G 1/4; NPT 1/4	10	22.25	181.0
G 3/8; NPT 3/8	10	22.25	181.0
G 1/2; NPT 1/2	13	27.25	191.0
G 3/4; NPT 3/4	14	27.25	191.0
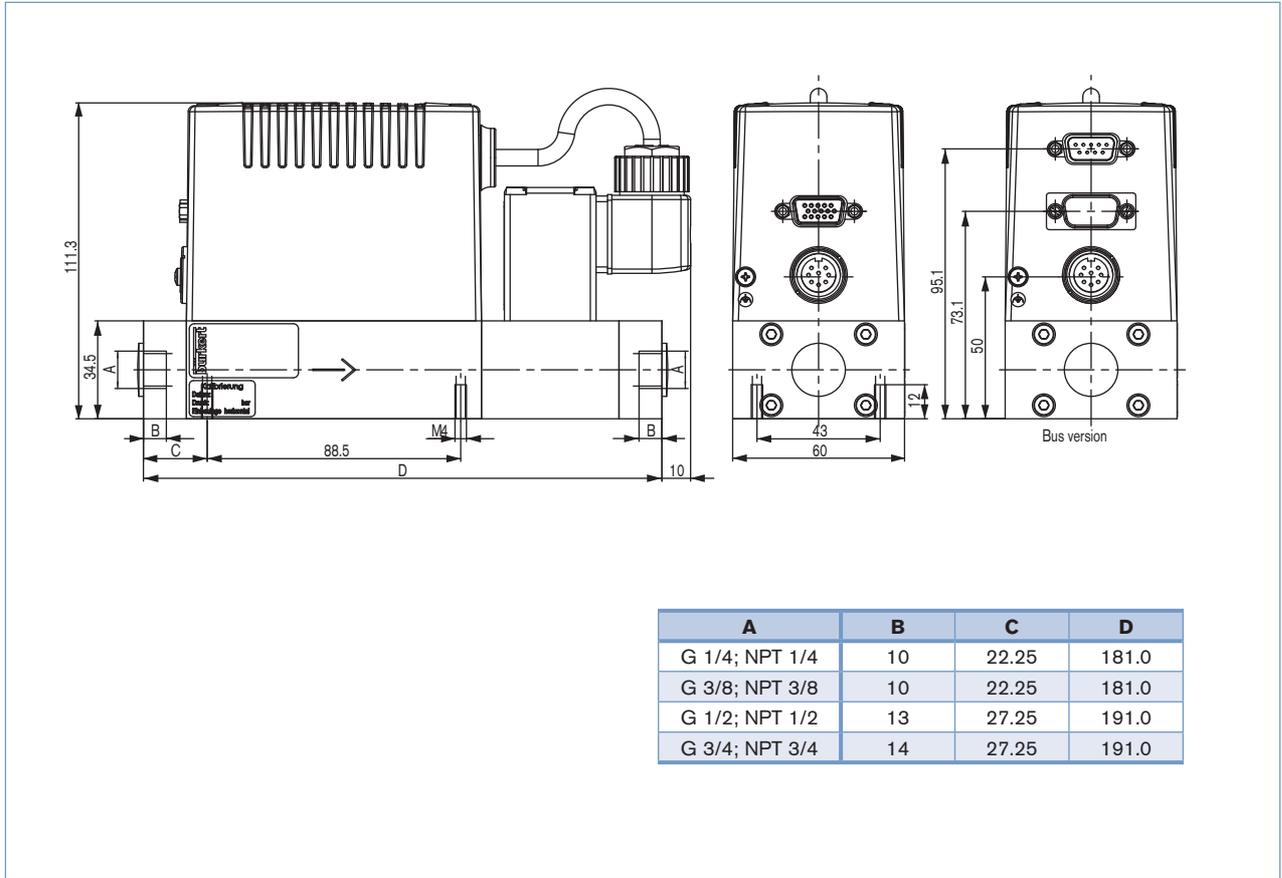
MFC 8626 with valve type 2835 (16W coil)

A	B	C	D
G 1/4; NPT 1/4	10	22.25	200.5
G 3/8; NPT 3/8	10	22.25	200.5
G 1/2; NPT 1/2	13	27.25	210.5
G 3/4; NPT 3/4	14	27.25	210.5

Dimensions [mm]

MFC 8626 with valve type 6024 (18W coil)
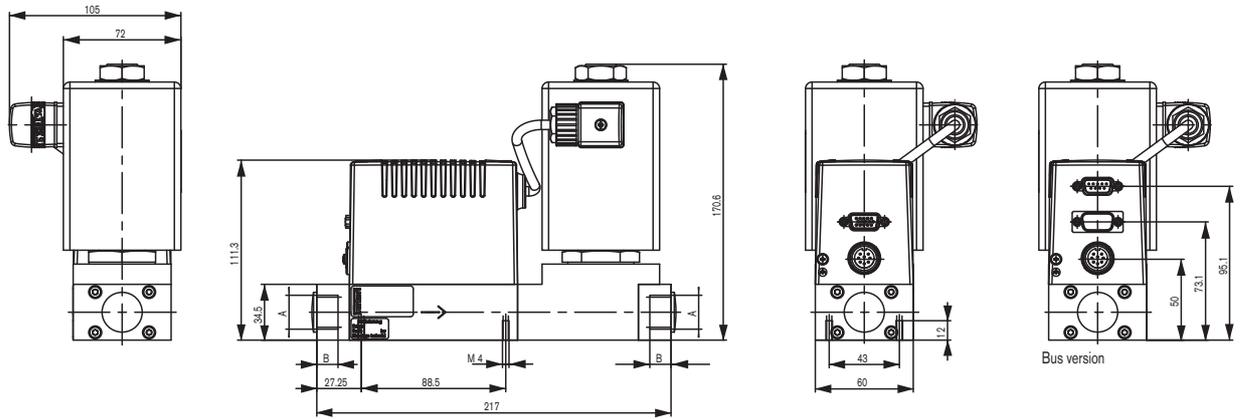

A	B
G 1/2; NPT 1/2	13
G 3/4; NPT 3/4	14
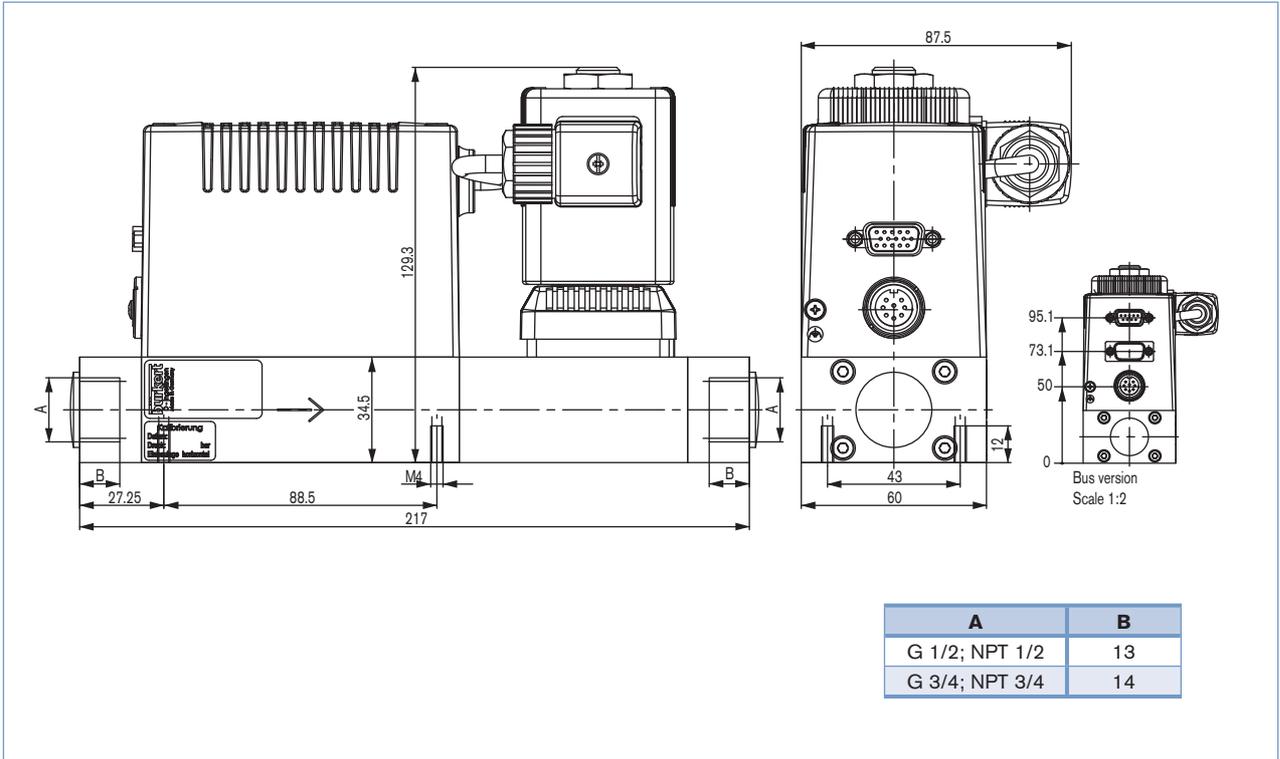
MFC 8626 with valve Type 6024 (18W coil) and base block for high flows
(also possible in combination with other valves)

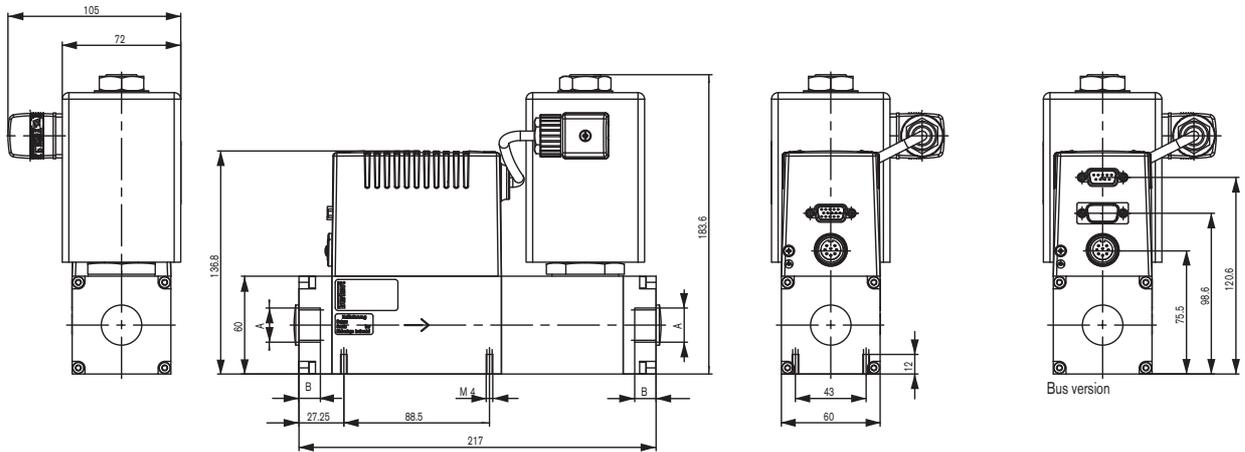| A	B
G 1/2; NPT 1/2	13
G 3/4; NPT 3/4	15
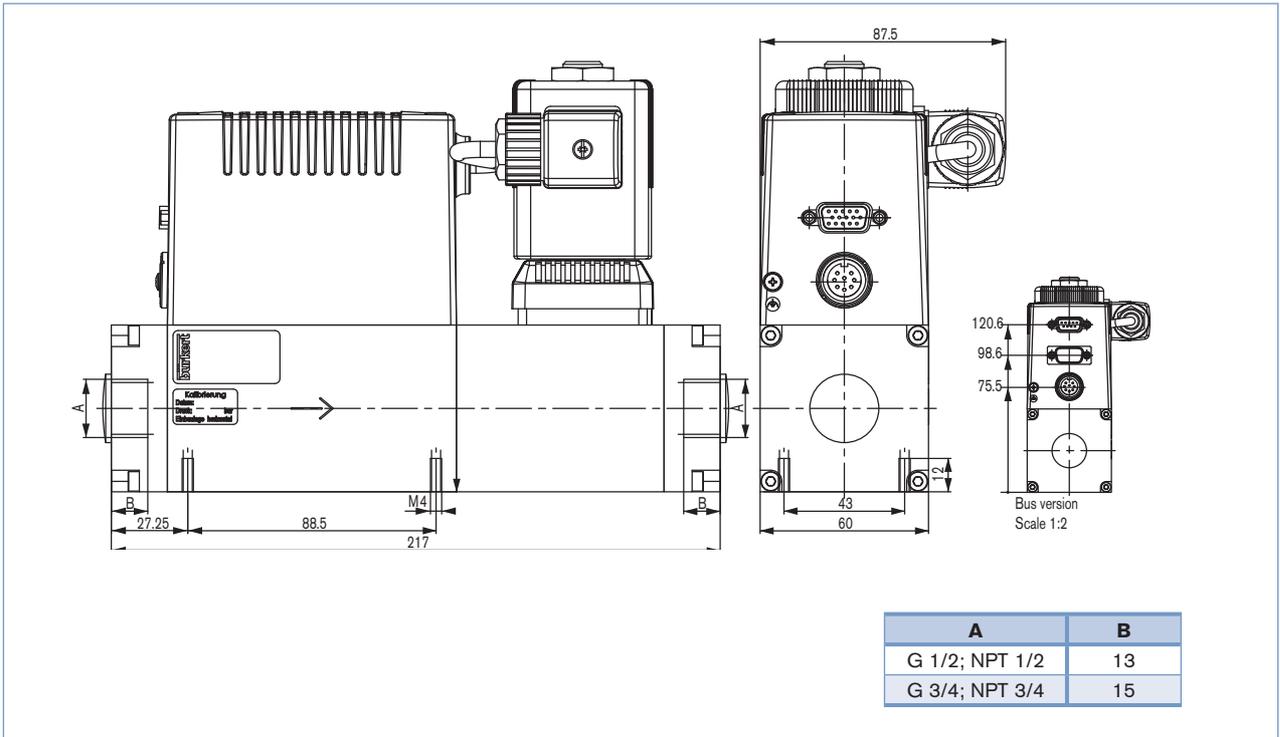
Dimensions [mm]

MFC 8626 with valve type 2836 (24W coil)

Standard unit

Bus version

A	B
G 1/2; NPT 1/2	13
G 3/4; NPT 3/4	14

Base unit for large nominal flow rates

Bus version

A	B
G 1/2; NPT 1/2	13
G 3/4; NPT 3/4	15

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MFC/MFM application - Request form

▶ **Please fill out and send to your nearest Bürkert facility with your inquiry or order**

Company	Contact person
Customer no.	Department
Street	Tel./Fax
Postcode/Town	E-Mail

☐ MFC application   ☐ MFM application   ☐ Quantity   ☐ Required delivery date

Medium data

Type of gas (or gas proportion in mixtures)	
Density [kg/m³][1]	
Medium temperature [°C or °F]	°C °F
Moisture content [g/m³]	
Abrasive components/solid particles	☐ no ☐ yes, as follows:

Fluidic data

Maximum flow Qnom
- l_N/min [1] cm_N^3/min [1]
- m_N^3/h [1] cm_S^3/min (sccm) [2]
- kg/h l_S/min (slpm) [2]

Minimum flow Q_{min}
- l_N/min [1] cm_N^3/min [1]
- m_N^3/h [1] cm_S^3/min (sccm) [2]
- kg/h l_S/min (slpm) [2]

Inlet pressure at Qnom $p_1 =$ ___ barg ■

Outlet pressure at Qnom $p_2 =$ ___ barg ■

Max. inlet pressure p_{1max} ___ barg ■

Pipeline (external-Ø) ___ metric, mm ___ imperial, inch

MFC/MFM Port connection
- ☐ without screw-in fitting
  - ☐ 1/4" G-thread (DIN ISO 228/1)   ☐ 1/4" NPT-thread (ANSI B1.2)
- ☐ with screw-in fitting

Installation
- ☐ horizontal, valve upright (standard)   ☐ horizontal, valve to the side
- ☐ vertical, Flow upwards   ☐ vertical, Flow downwards

Ambient temperature ___ °C

Material data

Body material   ☐ Aluminium (anodized)   ☐ Stainless steel

Seal material   ☐ FKM   ☐ EPDM   ☐ Other: ___

Electrical data

Output/Input Signal

	with standard signal		with fieldbus
	Output	**Input**	
	☐ 0-5 V	☐ 0-5 V	☐ PROFIBUS DP
	☐ 0-10 V	☐ 0-10 V	☐ DeviceNet
	☐ 0-20 mA	☐ 0-20 mA	☐ CANopen
	☐ 4-20 mA	☐ 4-20 mA	

■ Please quote all pressure values as overpressure with respect to atmospheric pressure [barg]

[1] at: 1.013 bar(a) and 0°C   [2] at: 1.013 bar(a) and 20°C

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