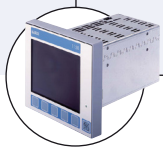**bürkert**
FLUID CONTROL SYSTEMS

LFM Liquid Flow Meter

- High dynamic flow measurement
- Applicable for liquid flow measurement up to 600 ml/min (36 l/h)
- No moving parts in medium
- Fieldbus optional
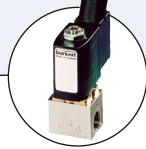- Compact version

Type 8708 can be combined with…

Type 1150
Multi-channel program controller

Type 6606
2/2 way Solenoid Valve

Type 6011
2/2 way Solenoid Valve

Type 8708 is an instrument for liquid flow control in process technology.

The actual value supplied by the sensor is transmitted through the digital electronics and over a standard signal output or a field bus interface.

In the device two calibration curves can be stored, which the user is able to switch between. The device offers a particularly compact solution. MassFlow-Communicator software can be used for parameterisation and diagnosis.

Typical application areas of liquid measurement are:

- Heat treatment,
- Machine tools,
- Fuel cell technology,
- Packaging technology,
- Material coating,
- Bio reactors.

Technical data			
Full scale range (Q_{nom})	0.9 to 36 l/h (15 to 600 ml/min) re. water	**Power consumption**	Max. 2.5 W (5 W with fieldbus version)
Operating medium	Clean and low viscous liquids	**Output signal** (actual value)	0-5 V, 0-10 V, 0-20 mA *or* 4-20 mA
Viscosity	0.4 to 4 cSt	**Max. current** (voltage output)	10 mA
Max. operating pressure (at inlet)	Up to max. 10 barg; typical max. 2 barg	**Max. burden** (current output)	600 Ω
Calibration medium	Water (conversion to operating medium with correcting function)	**Alternative output signal**	Digital with fieldbus: • PROFIBUS DP V1 • DeviceNet • CANopen
Medium temperature	10 to +40 °C		
Ambient temperature	0 to +55 °C	**Type of protection**	IP40
Accuracy	± 1.5 % o.R. ± 0.5 % F.S.	**Dimensions [mm]** (without compression fittings)	Standard version: 107 × 115.5 × 28 (BxHxT) Sub-base version: 107 × 115.5 × 43 (BxHxT)
Repeatability	± 0.5 % F.S.		
Turn-down ratio	1:10	**Total weight**	Approx. 900 g
Response time ($t_{95\%}$)	< 500 ms	**Installation**	Horizontal or vertical
Body material	Stainless steel	**Light emitting diodes** (Default functions, other functions programmable)	Indication for: 1. Power 2. Communication (only in fieldbus version) Limit (only in analogue version) 3. Error
Housing	PC (Polycarbonate)		
Sealing material	FKM, EPDM, FFKM		
Port connection	G ⅛, NPT ⅛, G ¼, NPT ¼, sub-base		
Electrical Connection	Sub-D 15 pin plug M12 (PROFIBUS) 5 pin socket M12 (DeviceNet, CANopen) 5 pin plug		
		Binary inputs (Default functions, other functions programmable)	Two: 1. not assigned 2. not assigned
Operating voltage	24 V DC ± 10 %	**Binary output** (Default functions, other functions programmable)	One relay output for: Limit (Q_{nom} almost reached) Capacity: max. 25 V, 1 A, 25 VA
Residual ripple	< 2 %		

Measurement principle

The sensor measures the flow by means of differential pressure. An orifice in the main channel causes pressure loss at liquid flow which is measured by the differential pressure sensor. The sensor feedbacks a precise and temperature compensated signal out of which the electronics calculates the corresponding flow.
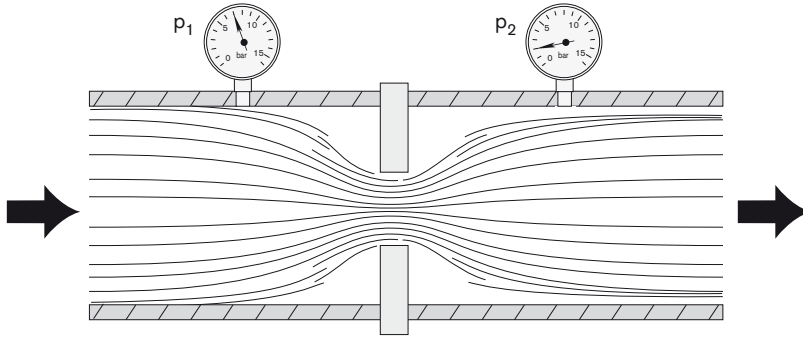
To avoid a blockage of the aperture by contaminated mediums an upstream filter is recommended.

Notes regarding the selection of the unit

The decisive factors for the perfect functioning of an LFM within the application are the fluid compatibility, the pressure range and the correct choice of the flow meter range. The pressure loss over the LFM averages in typical applications approx. 500 mbar, with up to 2 barg inlet pressure.

The specification of the inlet pressure, p_{1max}, which can be expected is necessary for the selection of the suitable differential pressure sensor.
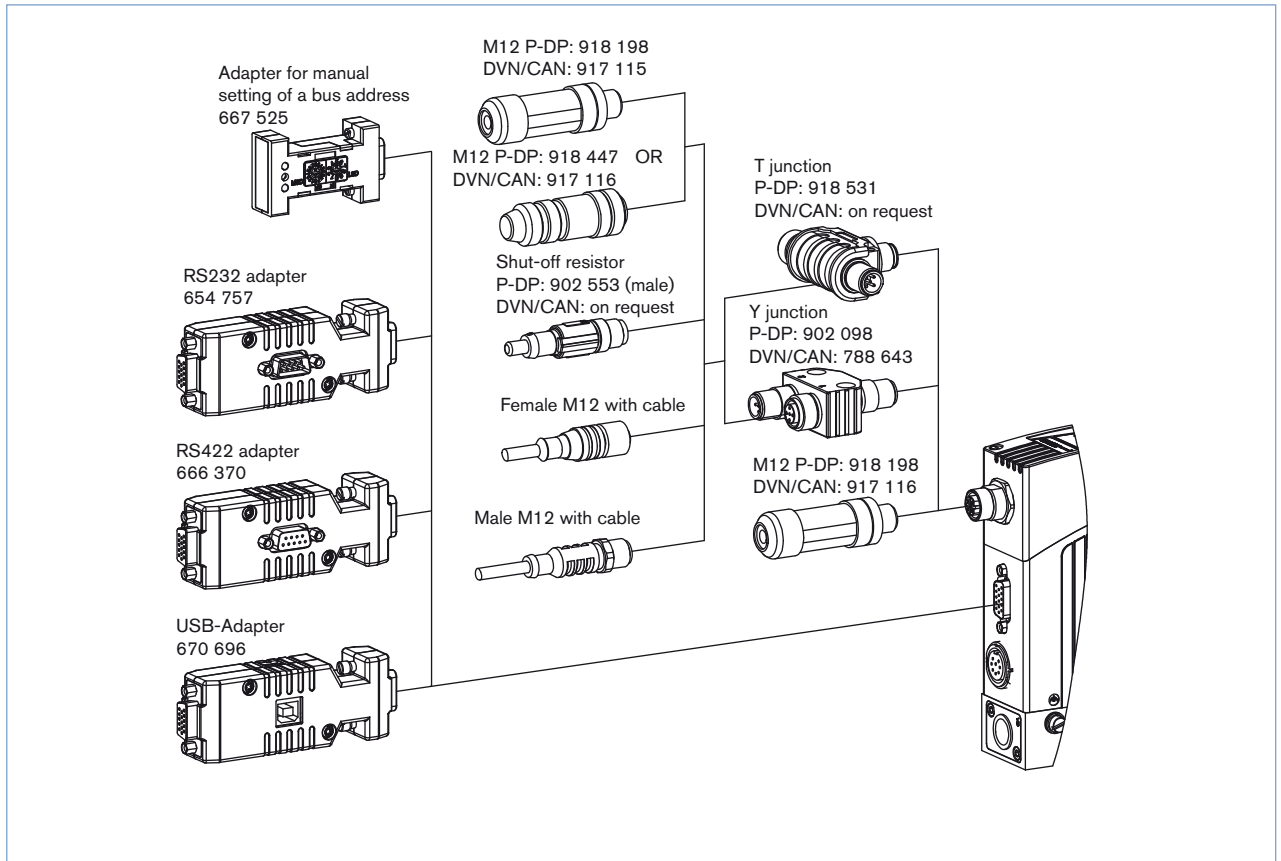
▶ **The request form on page 6 contains the relevant fluid specification. Please use the experience of Bürkert engineers already in the design phase and provide us with a copy of your request containing the necessary data together with your inquiry or order.**
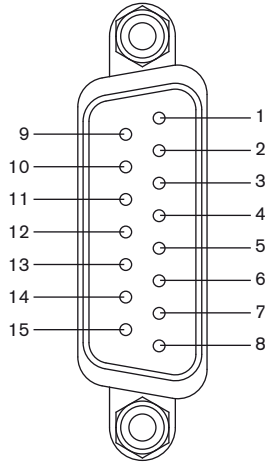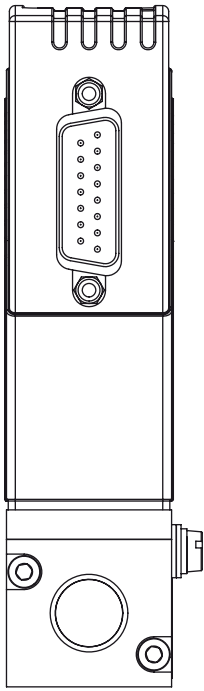
Ordering Chart for Accessories

Article	Article no.
Connectors/Cables	
Round plug M16 8 pin (solder connection)	918299 🛒
Round plug M16 8 pin with 5 m cable	787733 🛒
Round plug M16 8 pin with 10 m cable	787734 🛒
Plug D-Sub HD15 15 pin with 5 m cable	787735 🛒
Plug D-Sub HD15 15 pin with 10 m cable	787736 🛒
Adapters[3]	
RS232 adapter for connection to a computer, connection with an extension cable (item no. 917 039)	654757 🛒
USB-Adapter (Version 1.1, USB socket type B)	670696 🛒
USB connection cable 2 m	772299 🛒
Adapter for manual setting of bus address	667525 🛒
Software MassFlowCommunicator	Download unter www.buerkert.com

Accessories for Fieldbus	PROFIBUS DP (B-codiert)	DeviceNet/ CAN-open (A-codiert)
M12-Plug[4]	918198 🛒	917115 🛒
M12-socket (coupling) [4]	918447 🛒	917116 🛒
Y-junction[4]	902098 🛒	788643 🛒
T-junction	918531 🛒	(auf Anfrage)
Shut-off resistor	902553 🛒	(auf Anfrage)
GSD-Datei (PROFIBUS), EDS-Datei (DeviceNet, CANopen)	Download unter www.buerkert.com	

[3] The adapters serve mainly for initial operation or diagnosis. Those are not obligatory for continuous operation.

[4] 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 typiclly a thinner connector.

Adapter for manual setting of a bus address 667 525

M12 P-DP: 918 198
DVN/CAN: 917 115

M12 P-DP: 918 447   OR
DVN/CAN: 917 116

T junction
P-DP: 918 531
DVN/CAN: on request

RS232 adapter
654 757

Shut-off resistor
P-DP: 902 553 (male)
DVN/CAN: on request

Y junction
P-DP: 902 098
DVN/CAN: 788 643

Female M12 with cable

RS422 adapter
666 370

M12 P-DP: 918 198
DVN/CAN: 917 116

Male M12 with cable

USB-Adapter
670 696

Pin Assignment

Plug D-Sub, 15 pin	Pin	Assignment	
		Analogue Control	Bus control
	1	Relay – normally closed contact	
	2	Relay – normally open contact	
	3	Relay – reference	
	4	GND for 24 V Supply and binary inputs	
	5	24 V supply +	
	6	12 V output (only for factory use)	
	7	N.C.	N.C. [5]
	8	N.C.	N.C.
	9	Actual value output GND	N.C.
	10	Actual value output +	N.C.
	11	DGND (for RS232) [6]	
	12	Binary input 1	
	13	Binary input 2	
	14	RS232 RxD (without driver) [6]	
	15	RS232 TxD (without driver) [6]	

[5] N.C.: not connected (not used)
Note:
– Optional Pin 7 and 8 with bus version as transmitter input possible
– The cable length for RS232/ Setpoint and actual value signal is limited to 30 meters.
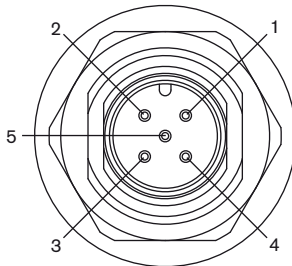[6] Driving RS232 interface only by RS232 adapter including an adaption of TTL levels

With Fieldbus Version:
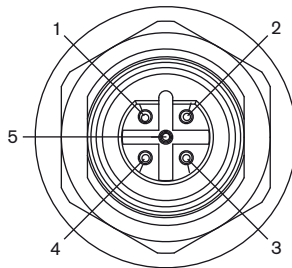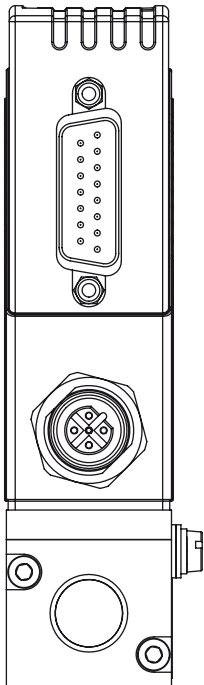
PROFIBUS DP – Socket B-coded M12 (DPV1 max. 12 MBaud)	Pin	Assignment
	1	VDD (only for termination resistor)
	2	RxD/ TxD – N (A-Line)
	3	DGND
	4	RxD/ TxD – P (B-Line)
	5	N.C.

DeviceNet, CANopen – Plug M12	Pin	Assignment
	1	Shield
	2	N.C.
	3	DGND
	4	CAN_H
	5	CAN_L

Dimensions [mm]

Standard Version
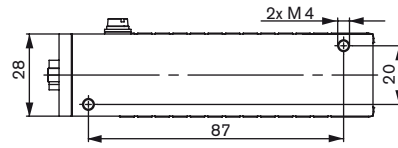
Size A	
G ⅛	G ¼
NPT ⅛	NPT ¼
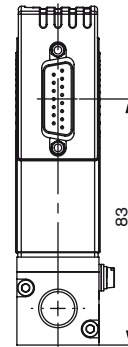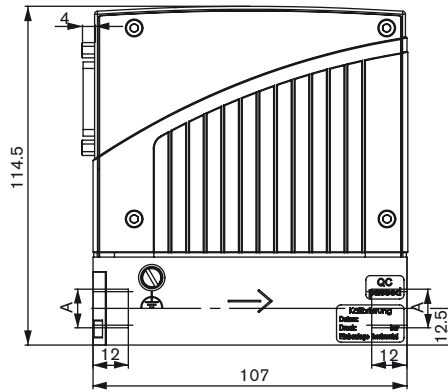
Sub-base Version
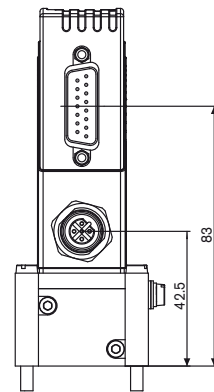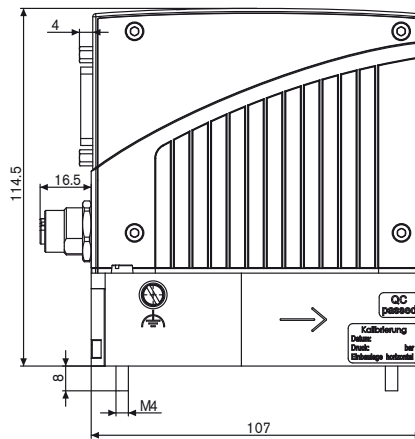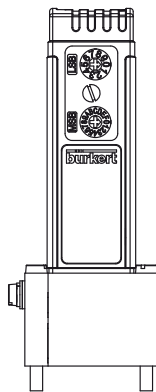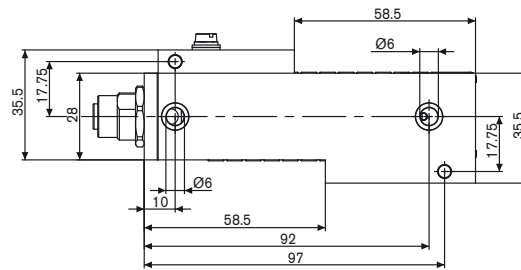
In devices without fieldbus communication there is no electrical M12 connector in the upper housing part.

bürkert

LFC/LFM applications - Request for quotation

▶ **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

☐ **LFC applications** ☐ **LFM applications** [ ] **Quantity** [ ] **Required delivery date**

Medium data

Fluids					
Density [kg/m³]			at 20 °C [ ]		at 40 °C [ ]
Viscosity [cSt]	at 5 °C [ ]		at 20 °C [ ]		at 40 °C [ ]
Medium temperature [°C or °F]	[ ] °C		[ ] °F		
Abrasive components/solid particles	☐ no		☐ yes, as follows: [ ]		

Fluidic data

Maximum flow Q_{nom}
[ ] l/h [ ] l/min
[ ] kg/h [ ] kg/min
[ ] ml/h [ ] ml/min

Minimum flow Q_{min}
[ ] l/h [ ] l/min
[ ] kg/h [ ] kg/min
[ ] ml/h [ ] ml/min

Inlet pressure at Q_{nom} $p_1 =$ [ ] barg ■

Outlet pressure at Q_{nom} $p_2 =$ [ ] barg ■

Max. inlet pressure p_{1max} [ ] barg ■

Pipeline (external-Ø) [ ] mm [ ] inch

LFC/LFM Port connection
☐ without screw-in fitting
    ☐ ⅛ G-thread   ☐ ¼ G-thread (DIN ISO 228/1)
    ☐ ⅛ NPT-thread   ☐ ¼ NPT-thread (ANSI B1.2)
☐ with screw-in fitting
☐ Sub-base

Installation of LFC/LFM
☐ horizontal, valve upright (standard)   ☐ horizontal, valve to the side

Ambient temperature
☐ vertical, flow upwards   ☐ vertical, flow downwards
[ ]

Material data

Body material ☐ Stainless steel

Seal material ☐ FKM ☐ EPDM ☐ Other: _____

Electrical data

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

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

To find your nearest Bürkert facility, click on the orange box →   www.burkert.com