DATA SHEET

# Type 8709

## Liquid flowmeter (LFM)

- High dynamic flow measurement
- Applicable for liquid flow measurement up to 600 ml/min (36 l/h)
- No moving parts in medium
- Protection class IP65
- Option: fieldbus interface

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

### Can be combined with

**Type 8611**
eCONTROL – Universal controller

**Type 6606**
2/2 or 3/2 way Rocker-Solenoid Valve with separating diaphragm

**Type 8619**
multiCELL - multi-channel/ multi-function transmitter/ controller

### Type description

Type 8709 is a device for liquid flow measurement in process technology. The actual value supplied by the sensor is transmitted through the digital electronics and over a standard signal output or a fi eld bus interface. In the device you can save two calibration curves and you can switch between them.

Phase out

DTS 1000116945 EN Version: K Status: PO (Phase out | Phase out | Phase out) printed: 18.12.2024




Visit product website

## Table of contents





DTS 1000116945 EN Version: K Status: PO (Phase out | Phase out | Phase out) printed: 18.12.2024

## 1. General technical data

| | |
|---|---|
| **Product properties** | |
| Dimensions | 115 × 137.5 × 37 mm (width × height × depth)<br>Further information can be found in chapter "4. Dimensions" on page 5. |
| **Material** | |
| Seal | FKM, EPDM or FFKM |
| Housing | PBT |
| Base block | Stainless steel 1.4404 |
| Total weight | Approx. 1100 g |
| LED display | Status indication:<br>1. Power<br>2. Communication<br>3. Limit<br>4. Error |
| **Performance data** | |
| Nominal flow range ($Q_N$) | 1.5...36 l/h (25...600 ml/min) regarding water |
| Operating pressure [1)] | Max. 10 bar (145 psi) (depending on the nominal diameter of the proportional valve) |
| Measuring accuracy | ± 1.5 % of reading ± 0.5 % FS (under calibration conditions to achieve best measurement results) |
| Repeatability | ± 0.5 % FS |
| Measuring span | 1:10 |
| Response time ($t_{95\,\%}$) | < 500 ms |
| **Electrical data** | |
| Operating voltage | 24 V DC |
| Power consumption | Max. 2.5 W (5 W with fieldbus variant) |
| Residual ripple | < 2 % |
| Voltage tolerance | ± 10 % |
| Electrical connection | Socket, round, 8-pin<br>Socket, Sub-HD, 15-pin<br>Plug or socket, M12 5-pin (with fieldbus variant) |
| **Medium data** | |
| Operating medium | Clean and low-viscosity liquids |
| Calibration medium | Water (conversion to operating medium with correction function) |
| Medium temperature | - 10 °C...+ 40 °C |
| Viscosity | 0.4...4 cSt |
| **Process/Port connection & communication** | |
| Digital outputs | 2 relay outputs:<br>1. Limit (desired value cannot be reached)<br>2. Error (e. g. sensor break)<br>Loading capacity: max. 60 V, 1 A, 60 VA |
| Digital inputs | 3 switching inputs:<br>1. not assigned<br>2. not assigned<br>3. not assigned |
| Digital communication interface | Digitally via fieldbus:<br>• PROFIBUS DPV1<br>• CANopen |
| Analogue interfaces | 4...20 mA, 0...20 mA, 0...10 V or 0...5 V<br>Input impedance > 20 kΩ (voltage) resp. < 300 Ω (current)<br>Maximum current: 10 mA (voltage output)<br>Maximum load: 600 Ω (current output) |
| Port connection | G ⅛, NPT ⅛, G ¼, NPT ¼ |
| **Approvals and conformities** | |
| Protection class | IP65 |
| **Environment and installation** | |
| Installation position | Horizontal or vertical |
| Ambient temperature | 0 °C...+ 55 °C |

| Accessories | |
|---|---|
| Software | Mass Flow Communicator |

1.) Overpressure to atmospheric pressure

# 2. Approvals and conformities

## 2.1. General notes

- The approvals and conformities listed below must be stated when making enquiries. This is the only way to ensure that the product complies with all required specifications.
- Not all available variants can be supplied with the below mentioned approvals or conformities.

## 2.2. Conformity

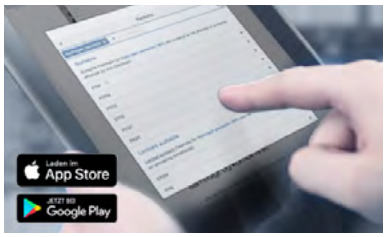
In accordance with the Declaration of Conformity, the product is compliant with the EU Directives.

## 2.3. Standards

The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU-Type Examination Certificate and/or the EU Declaration of Conformity.

# 3. Materials

## 3.1. Bürkert resistApp




**Bürkert resistApp – Chemical resistance chart**

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start chemical resistance check



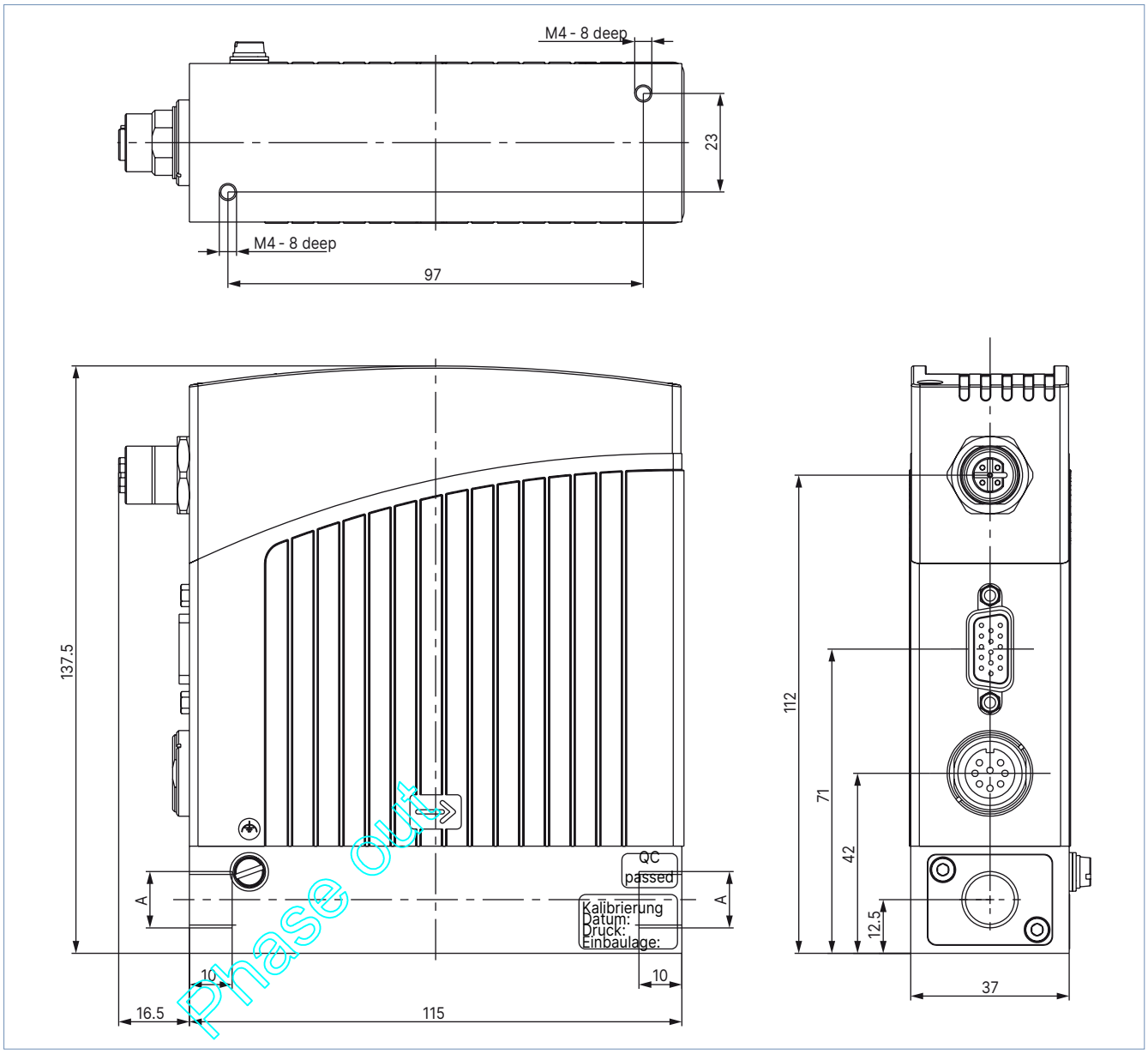
DTS 1000116945 EN Version: K Status: PO (Phase out | Phase out | Phase out) printed: 18.12.2024

# 4. Dimensions

## 4.1. Threaded variant

**Note:**

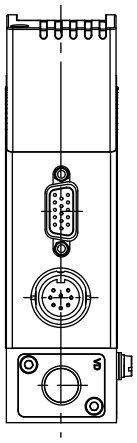
- Dimensions in mm
- In devices without fieldbus communication there is no electrical M12 connector in the upper housing part.

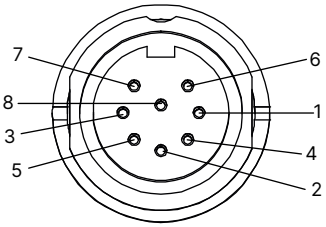



| Size A | |
|---|---|
| G ⅛ | G ¼ |
| NPT ⅛ | NPT ¼ |

# 5. Device/Process connections

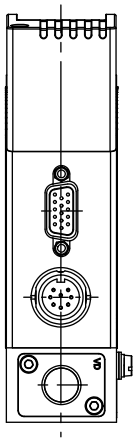
## 5.1. Analogue variant/fieldbus variant



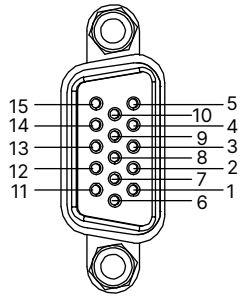
| Socket M16, round, 8-pin | Pin | Assignment |
|---|---|---|
|  | 1 | Power supply + 24 V DC |
| | 2 | Relay 1 – reference contact |
| | 3 | Relay 2 – reference contact |
| | 4 | Relay 1 – normally closed contact |
| | 5 | Relay 1 – normally open contact |
| | 6 | 24 V supply GND |
| | 7 | Relay 2 – normally open contact |
| | 8 | Relay 2 – normally closed contact |



## 5.2. Analogue variant



**Analogue variant**

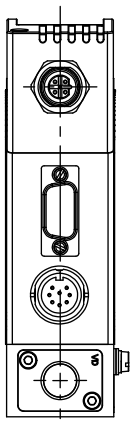
| Socket D-Sub HD15 | Pin | Assignment | |
|---|---|---|---|
| | | **Analogue control unit** | **Bus actuation** |
|  | 1 | Not connected | Not connected |
| | 2 | Not connected | Not connected |
| | 3 | Actual value output + | Not connected |
| | 4 | Binary input 2 | |
| | 5 | 12 V output (only for in-plant use) | |
| | 6 | RS232 TxD (direct connection to computer) | |
| | 7 | Binary input 1 | |
| | 8 | GND (for binary inputs) | |
| | 9 | Only for in-plant use (do not connect) | |
| | 10 | 12 V output (only for in-plant use) | |
| | 11 | 12 V output (only for in-plant use) | |
| | 12 | Binary input 3 | |
| | 13 | Actual value output GND | Not connected |
| | 14 | RS232 RxD (direct connection to computer) | |
| | 15 | DGND (for RS232-interface) | |

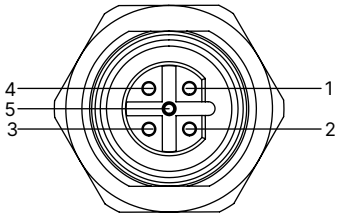


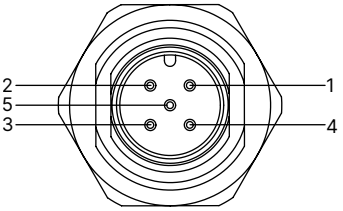


DTS 1000116945 EN Version: K Status: PO (Phase out | Phase out | Phase out) printed: 18.12.2024

### 5.3. Fieldbus variant



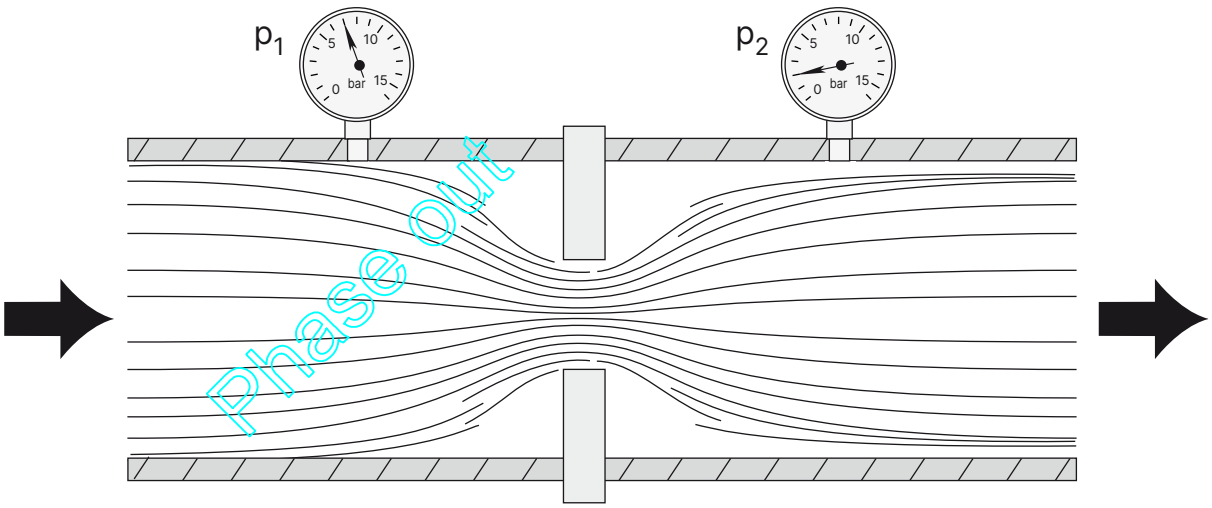
| PROFIBUS DPV1 – socket B-coded M12 (DPV1 max. 12 Mbaud) | Pin | Assignment |
|---|---|---|
|   | 1 | VDD (only for termination resistor) |
| | 2 | RxD/TxD – N (A-line) |
| | 3 | DGND |
| | 4 | RxD/TxD – P (B-line) |
| | 5 | Not connected |

| CANopen – Plug A-coded M12 | Pin | Assignment |
|---|---|---|
|   | 1 | Shielding |
| | 2 | Not connected |
| | 3 | DGND |
| | 4 | CAN_H |
| | 5 | CAN_L |

## 6. Product operation

### 6.1. Measuring 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.



# 7. Ordering information

## 7.1. Bürkert eShop

**Bürkert eShop – Easy ordering and quick delivery**

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

## 7.2. Recommendation regarding product selection

**Note:**
Contact your Bürkert partner for device design.

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 bar inlet pressure (overpressure to atmospheric pressure). The specification of the inlet pressure, $p_i$max, which can be expected is necessary for the selection of the suitable differential pressure sensor.

## 7.3. Bürkert product filter

**Bürkert product filter – Get quickly to the right product**

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter



DTS 1000116945 EN Version: K Status: PO (Phase out | Phase out | Phase out) printed: 18.12.2024

## 7.4. Ordering chart accessories

### Overview of accessories

**Note:**
The adapters serve mainly for initial operation or diagnosis. Those are not obligatory for continuous operation.

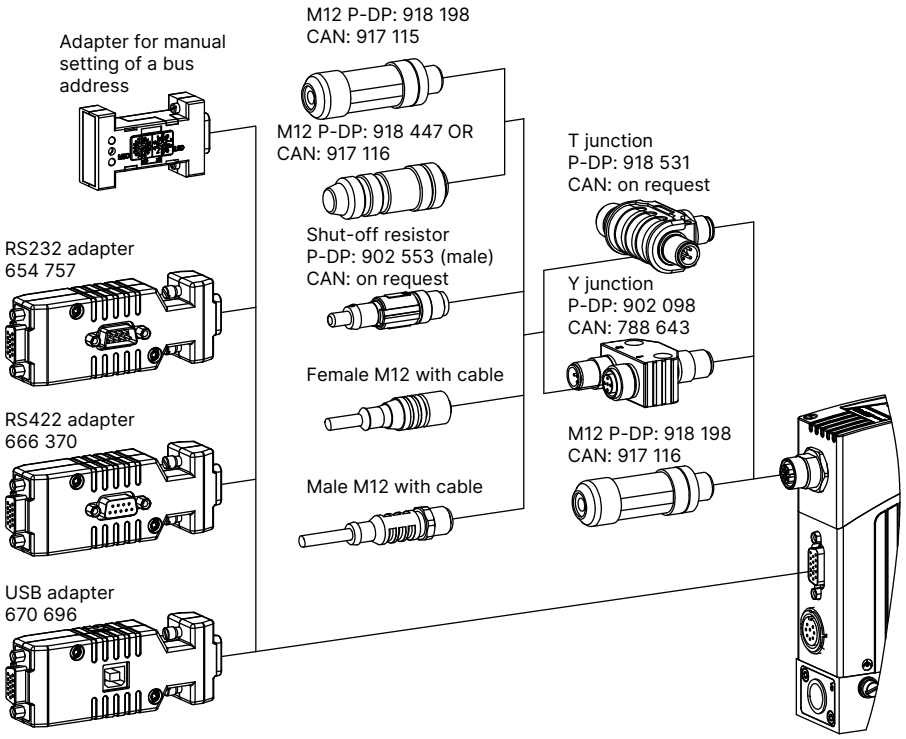
| Description | Article no. |
|---|---|
| **Connections/cables** | |
| M16 circular plug, 8-pin, soldered connection | 918299 |
| M16 circular plug with cable, 8-pin, cable length: 5 m, assembled on one side | 787733 |
| M16 circular plug with cable, 8-pin, cable length: 10 m, assembled on one side | 787734 |
| D-Sub HD15 plug with cable, 15-pin, cable length: 5 m, assembled on one side | 787735 |
| D-Sub HD15 plug with cable, 15-pin, cable length: 10 m, assembled on one side | 787736 |
| **Adapters** [1.] | |
| RS232 adapter (for connecting a PC in combination with an extension cable) | 654757 |
| Extension cable for RS232, M12 socket and/or M12 plug, 9-pin cable length: 2 m | 917039 |
| RS422 adapter | 666370 |
| USB adapter | 670696 |
| USB connection cable, cable length: 2 m | 772299 |
| Adapter for manual bus address setting (instead of via AF) | 667525 |
| **Accessories for fieldbus** | |
| **PROFIBUS DPV1 (B-coded)** | |
| M12 plug, 5-pin, straight, B-coded [2.] | 918198 |
| M12 socket (coupling), straight [2.] | 918447 |
| Y-distributor [2.] | 902098 |
| PROFIBUS T-distributor [2.] | 918531 |
| PROFIBUS terminating resistor, M12 plug, B-coded | 902553 |
| GSD file (PROFIBUS), EDS file (CANopen) | **LINK** |
| **CANopen (A-coded)** | |
| M12 plug, 5-pin, straight [2.] | 917115 |
| M12 circular socket with plastic threaded clamping ring, 5-pin, straight, to be wired [2.] | 917116 |
| Y push-in connector, M12, 5-pin, LUM [2.] | 788643 |
| T-distributor | On request |
| Terminating resistor | On request |
| GSD file (PROFIBUS), EDS file (CANopen) | **LINK** |

1.) The adapters serve mainly for initial operation or diagnosis. Those are not obligatory for continuous operation.
2.) For space reasons, M12 individual cable plugs may not be suitable for simultaneous use on the same side as a Y distributor. Use a commercially available covered cable in this case.



DTS 1000116945 EN Version: K Status: PO (Phase out | Phase out | Phase out) printed: 18.12.2024

## Adapter sketch






DTS 1000116945 EN Version: K Status: PO (Phase out | Phase out | Phase out) printed: 18.12.2024