The electromagnetic flowmeter 8045 is made up of an electronic module including a backlit display, operating keys and a sensor consisting of PVDF or stainless steel material. It has been designed to measure a flow rate of neutral and slightly aggressive fluids with a conductivity of more than 20 μS/cm in DN06…DN400 pipes.

It is equipped with a 4…20 mA output, a digital output (pulse output by default). Some versions are equipped with two relay outputs and one digital input. Two independent totalizers allow counting the flow rate.

The available process connections are:
- G 2" connection for the version with a PVDF sensor
- G 2" or clamp connection for the version with a stainless steel sensor.

The version with a stainless steel sensor can be used in applications with higher pressures (PN16) and higher temperatures (110 °C).

The version with Alloy C22 electrodes has been designed for applications with aggressive fluids (chemicals) and especially sea water applications.

### General data

**Compatibility**: mit Fittings S020 (siehe entsprechendes Datenblatt)

**Materials**
- Housing, cover, nut / seal
- PVDF sensor version
- Stainless steel sensor version
- Front panel foil
- Protection lid / seal
- PVDF sensor version
- Stainless steel sensor version
- Screws / Seal
- Wetted parts material
- Sensor holder
- Electrodes
- Seals
- Earth ring (PVDF sensor version)
- Electrode holder (St. Steel sensor version)

**Surface finishing quality**: Ra < 0.8 μm (Clamp connection)

**Electrical connections**: 2 cable glands M20 x 1.5

**Recommended cable**: 0.5…1.5 mm² cross-section, shielded cable, 6…12 mm diameter (if only one cable is used per cable gland) or 4 mm diameter (if two cables are used per cable gland with using the supplied multi-way seal)

**Environment**
- Ambient temperature: -10…+60 °C (+14…+140 °F) (operating) -20…+60 °C (+4…+140 °F) (storage)
- Relative humidity: < 85 %, without condensation
- Height above sea level: max. 2000 m

### Insertion magnetic inductive flowmeter

- Sensor without moving parts
- Indicates both flow rate and volume
- Simulation of all output signals
- Clean in place (CIP), FDA-compliant materials
- Version with Alloy C22 electrodes

Type 8045 can be combined with:
- Type 2030 Diaphragm valve
- Type 2712 Globe Control Valve
- Type 8802 ELEMENT continuous control valve systems
- Type 8644 Process actuation control system
- PLC
For the 2014/68/EU pressure directive, the device can only be used under following conditions (depending on max. pressure, pipe diameter and fluid).

<table>
<thead>
<tr>
<th>Fluid type</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid group 1, article 4, §1.c.i</td>
<td>Forbidden</td>
</tr>
<tr>
<td>Fluid group 2, article 4, §1.c.i</td>
<td>DN ≤ 32 or PS*DN ≤ 1000</td>
</tr>
<tr>
<td>Fluid group 1, article 4, §1.c.ii</td>
<td>DN ≤ 25 or PS*DN ≤ 2000</td>
</tr>
<tr>
<td>Fluid group 2, article 4, §1.c.ii</td>
<td>DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000</td>
</tr>
</tbody>
</table>

### Electrical data

- Power supply: 18…36 V DC filtered and regulated (3 wires)
  - Tolerance: ±0.5 %
- Reversed polarity of DC: protected
- Current consumption: ≤ 300 mA (at 18 V DC)
- Digital input (DI1):
  - Supply voltage: 18…36 V DC, input impedance 15 kΩ, min. pulse duration: 200 ms
  - Galvanic insulation, protected against polarity reversals of DC and voltage spikes
- Digital Outputs
  - Type: NPN or PNP (wiring dependent), open collector
  - Function: pulse output by default, user configurable
  - 0…250 Hz, 4…20 mA (sink or source (wiring dependent), 22 mA to indicate a fault
  - max. loop impedance: 1300 Ω at 36 V DC, 1000 Ω at 30 V DC, 700 Ω at 24 V DC, 450 Ω at 18 V DC
  - 4…20 mA output uncertainty: ± 1 % of range

### Standards, directives and certifications

<table>
<thead>
<tr>
<th>Type of fluid</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid group 1, article 4, §1.c.i</td>
<td>Forbidden</td>
</tr>
<tr>
<td>Fluid group 2, article 4, §1.c.i</td>
<td>DN ≤ 32 or PS*DN ≤ 1000</td>
</tr>
<tr>
<td>Fluid group 1, article 4, §1.c.ii</td>
<td>DN ≤ 25 or PS*DN ≤ 2000</td>
</tr>
<tr>
<td>Fluid group 2, article 4, §1.c.ii</td>
<td>DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000</td>
</tr>
</tbody>
</table>

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1) =measurement bias" as defined in the standard JCGM 200:2012
2) Under reference conditions i.e. measuring fluid=water, ambient and water temperature = 20 °C (68 °F), applying the minimum inlet and outlet pipe straights, matched inside pipe dimensions.

* F.S.= Full scale (10 m/s)

---

If the device is mounted in a humid environment or outside, then the maximum voltage allowed is 35 V DC instead of 36 V DC.
Pressure/Temperature diagram

Please be aware of the fluid pressure/temperature dependence according to the respective fitting + flowmeter material as shown in the diagrams.

8045 with a PVDF sensor
(depending on the fitting material)

8045 with a stainless steel sensor
(depending on the fitting material)

![Diagram showing pressure and fluid temperature relationship for 8045 with PVDF and stainless steel sensors.]

**Software main features**

- Choice of the display language
- International measuring units
- Teach-In for a better accuracy, or K-factor setting
- 4…20 mA current output (AO1)
- Transistor output (DO1)
- 2 relays (DO2 and DO3 - if equipped)
- Detection of flow direction possible
- ON/OFF digital input (DI1 - if equipped)
- Filter function
- Reset both totalizers (main and daily)
- Low flow “Cut-Off”
- Brightness of the display
- Password for parameter settings
- Warning and fault messages generating
- Simulation mode to adjust Zero and Span and simulate flow in dry-run condition

**Possible applications**

Flow control of conductive fluids, contaminated or not:

- Waste water treatment
- Flow control of drinking water
- Laundries: measurement and control of the water consumption
- Swimming pools: pump protection and flow control
- Food-processing industry: monitoring of the cleaning cycles (conform to FDA)
- Irrigation
- Application with sea water: desalination, fish farms
Design

The E-shaped magnetic system inside the sensor induces a magnetic field into the fluid, which is perpendicular to the direction of flow. Two electrodes are in galvanic contact with the liquid.

Based on the Faraday law a voltage can be measured between these electrodes once a liquid (min. conductivity of 20 µS/cm) flows along the pipe. This voltage is proportional to the flow velocity.

Using the K-factor for the individual pipe diameter the speed of flow is converted into volume per time.

Description of the navigation keys and the status LEDs

- Scrolling up the parameters within a level or a menu
- Increase the figure selected

(4 digital characters and 4 alphanumeric characters) indicating:
- the measured flow
- the value of the current output
- the value of the main totalizer
- the value of the daily totalizer

- Scrolling down the parameters within a level or a menu
- Selecting the figure on the left
- Reading the messages in the information menu

Device status LED: see following table

<table>
<thead>
<tr>
<th>Device status LED</th>
<th>Status of the device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>The device operates correctly</td>
</tr>
<tr>
<td>Orange</td>
<td>A warning message is generated in the information menu.</td>
</tr>
<tr>
<td>Red</td>
<td>A fault message is generated and a 22 mA current is sent on the current output.</td>
</tr>
</tbody>
</table>
| Blinking, whatever the colour | • The DI1 digital input is active  
• or a check for the correct behaviour of the outputs is running  
• or a flow zero point calibration procedure is running  
• or the daily totalizer is kept at zero |
Installation

The 8045 flowmeter can easily be installed into any Bürkert Insertion fitting system (S020) by just fixing the main nut.

**Minimum straight upstream and downstream distances must be observed.** According to the pipe’s design, necessary distances can be bigger or use a flow conditioner to obtain the best accuracy. For more information, please refer to EN ISO 5167-1.

EN ISO 5167-1 prescribes the straight inlet and outlet distances that must be complied with when installing fittings in pipe lines in order to achieve calm flow conditions. The most important layouts that could lead to turbulence in the flow are shown below, together with the associated prescribed minimum inlet and outlet distances.

These ensure calm, problem-free measurement conditions at the measurement point.

### DN = pipe diameter

- **Control valve**
  - 50 x DN 5 x DN

- **2 x 90° elbow joint**
  - 40 x DN 6 x DN
  - 25 x DN 5 x DN

- **2 x 90° elbow joint or T-piece**
  - 20 x DN 5 x DN

- **Flow direction**

- **Pipe diameter expansion**
  - 18 x DN 5 x DN

- **Pipe diameter reduction**
  - 15 x DN 6 x DN

* If the valve cannot be mounted after the measuring device, the minimal distances have to be respected.

** If an expansion cannot be avoided, the minimal distances have to be respected.

It is advisable to mount the flowmeter at a 45° angle to the horizontal centre of the pipe to avoid having deposits on the electrodes and false measurements due to air bubbles.

The device can be installed into either horizontal or vertical pipes. Mount the 8045 in the following correct ways to obtain an accurate flow measurement.

Pressure and temperature ratings must be in accordance to the selected fitting material. The suitable pipe size is selected using the diagram Flow rate/Velocity/DN.

The flowmeter is not designed for gas or steam flow measurement.
Example:

- Flow: 10 m³/h
- Ideal flow velocity: 2…3 m/s

For these specifications, the diagram indicates a pipe size of DN40 [or DN50 for (*) mentioned fittings].

* for following fittings with:
  - external thread acc. to SMS 1145
  - weld end acc. to SMS 3008, BS 4825-1/ASME BPE/DIN 11866 series C or DIN 11850 series 2/DIN 11866 series A/DIN EN 10357 series A
  - Clamp acc. to SMS 3017, BS 4825-3/ASME BPE or DIN 32676 series A
Dimensions [mm]

**G 2” connection version**

<table>
<thead>
<tr>
<th>DN</th>
<th>T-Fitting</th>
<th>H Saddle Plastic spigot</th>
<th>Metal spigot</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>182</td>
<td></td>
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<tr>
<td>08</td>
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<td>15</td>
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<td>200</td>
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<td>325</td>
<td>336</td>
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<td>350</td>
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<td></td>
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<tr>
<td>400</td>
<td></td>
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</tr>
</tbody>
</table>

**Clamp connection version**

Note: The length of the sensor finger depends on the fitting used. See data sheet Type S020 or available fitting DN diagram on page 10.
Ordering information and chart for flowmeter Type 8045

• **G 2” connection to use with S020 Fitting for flowmeter with G 2” connection.**
  
  A complete flowmeter Type 8045 with G 2” connection consists of a flowmeter Type 8045 (with G 2” connection) and a Bürkert fitting Type S020. The following information is necessary for the selection of a complete device:
  
  • **Article no.** of the desired flowmeter Type 8045 (see ordering chart, below)
  • **Article no.** of the selected fitting Type S020 for flowmeter with G 2” connection (see separate data sheet)

---

### All these versions have as minimum

- a 4…20 mA current output (AO1) and
- a digital output (DO1)

### Voltage supply | Digital input | Relay output | Housing material | Seals | Sensor version | Electrode material | Certificates | Electrical connection | Article no. | Notes
|-----------------|-------------|-------------|-----------------|------|----------------|-------------------|-------------|----------------------|-------------|--------
| 18…36 V DC     | No          | No          | PC              | FKM  | short, PVDF   | Stainless steel   |            |                       | 426498     |        |
|                 |             |             |                 |      | long, PVDF    | Stainless steel   |            | 2 cable glands M20 x 1.5 | 426499     |        |
| 1 (DI1) 2 (DO2, DO3) | PC          | FKM         | long, PVDF      | Stainless steel |            |                       | 426506     |        |
| No             | No          | PPA         | FKM             | short, stainless steel |            |                       | 449670     |        |
|                 |             |             |                 |      | long, stainless steel |                       |            | 2 cable glands M20 x 1.5 | 449672     |        |
| 1 (DI1) 2 (DO2, DO3) | PPA         | FKM         | short, stainless steel | Stainless steel |            |                       | 449671     |        |
|                 |             |             |                 |      | long, stainless steel |                       |            | 2 cable glands M20 x 1.5 | 449673     |        |
| No             | No          | PC          | FKM             | short, PVDF   | Alloy C22     |                   |            | 2 cable glands M20 x 1.5 | 558675     |        |
|                 |             |             |                 |      | long, PVDF    |                   |            |                       | 558676     |        |

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**Note:** 1 EPDM seal contained in the kit 551775 is supplied with each flowmeter.

1) if FKM seal mounted as standard at factory is replaced with the EPDM seal included in the delivery.
Ordering information and chart for flowmeter Type 8045 (continued)

- **Clamp connection to use with S020 Fitting for flowmeter with clamp connection.**

A complete flowmeter Type 8045 with clamp connection consists of a flowmeter Type 8045 (with clamp connection), a Bürkert fitting Type S020, a clamp collar and a fitting/flowmeter seal.

The following information is necessary for the selection of a complete device:

- **Article no.** of the desired flowmeter Type 8045 (see ordering chart, below)
- **Article no.** of the selected fitting Type S020 for flowmeter with clamp connection (see separate data sheet)
- **Article no.** of the selected fitting/flowmeter seal - EPDM or FEP (see ordering chart, p. 9)
- **Article no.** of the clamp collar (see ordering chart, p. 9)

All these versions have as minimum:

- a 4…20 mA current output (AO1)
- a digital output (DO1)

<table>
<thead>
<tr>
<th>Voltage supply</th>
<th>Digital input</th>
<th>Relay output</th>
<th>Housing material</th>
<th>Fitting/flowmeter seals*</th>
<th>Sensor version</th>
<th>Electrode material</th>
<th>Certificates</th>
<th>Electrical connection</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18...36 V DC</td>
<td>No</td>
<td>No</td>
<td>PPA</td>
<td>EPDM or FEP</td>
<td>Clamp, stainless steel</td>
<td>✓</td>
<td>✓</td>
<td>2 cable glands M20 x 1.5</td>
<td>564797</td>
</tr>
<tr>
<td>1</td>
<td>2 (D11)</td>
<td>2 (D02, D03)</td>
<td>PPA</td>
<td>EPDM or FEP</td>
<td>Clamp, stainless steel</td>
<td>✓</td>
<td>✓</td>
<td>2 cable glands M20 x 1.5</td>
<td>564798</td>
</tr>
</tbody>
</table>

Note: 1 Kit 565384 is supplied with each flowmeter.
* Has to be ordered separately
* Only if mounted with EPDM seal.

Ordering chart - accessories for flowmeter Type 8045 (has to be ordered separately)

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set with 2 cable glands M20 x 1.5 + 2 neoprene flat seals for cable gland or plug + 2 screw-plugs M20 x 1.5 + 2 multiway seals 2 x 6 mm</td>
<td>449755</td>
</tr>
<tr>
<td>Set with 2 reductions M20 x 1.5 /NPT ½&quot; + 2 neoprene flat seals for cable gland or plug + 2 screw-plugs M20 x 1.5</td>
<td>551782</td>
</tr>
<tr>
<td>3 points calibration certificate (device combined with a S020 fitting, only for DN ≤ 200)</td>
<td>550676</td>
</tr>
<tr>
<td>FDA declaration of conformity (for stainless steel or PVDF sensor with FKM or EPDM seal)</td>
<td>803724</td>
</tr>
<tr>
<td>For G 2&quot; connection version</td>
<td></td>
</tr>
<tr>
<td>Set with 1 stopper for unused cable gland M20 x 1.5 + 1 multiway seal 2 x 6 mm for cable gland + 1 green FKM seal for the sensor + 1 mounting instruction sheet</td>
<td>558102</td>
</tr>
<tr>
<td>Snap ring</td>
<td>619205</td>
</tr>
<tr>
<td>PC union nut</td>
<td>619204</td>
</tr>
<tr>
<td>PPA union nut</td>
<td>440229</td>
</tr>
<tr>
<td>Set with 1 green FKM and 1 black EPDM seal</td>
<td>552111</td>
</tr>
<tr>
<td>For clamp connection version</td>
<td></td>
</tr>
<tr>
<td>Set with 1 stopper for unused cable gland M20 x 1.5 + 1 multiway seal 2 x 6 mm for cable gland</td>
<td>565384</td>
</tr>
<tr>
<td>1 EPDM fitting/flowmeter seal</td>
<td>730837</td>
</tr>
<tr>
<td>1 FEP fitting/flowmeter seal</td>
<td>730839</td>
</tr>
<tr>
<td>Clamp collar</td>
<td>731164</td>
</tr>
</tbody>
</table>
### Interconnection possibilities with other Bürkert devices

**Type 8802-DF**
- Diaphragm control valve with TopControl
  - 4...20 mA current output

**Type 6213**
- Solenoid valve
  - Relay output

**Type 6027**
- Solenoid valve
  - Relay output

**Type 8045**
- Electromagnetic flowmeter
  - Relay output

**Type S020**
- Insertion fitting for flowmeter
  - with clamp connection
  - (see corresp. datasheet)

**Type S020**
- Insertion fitting for flowmeter
  - with G 2" connection
  - (see corresp. datasheet)

<table>
<thead>
<tr>
<th>Available S020 fittings for flowmeter with connection</th>
<th>DN06</th>
<th>DN08</th>
<th>DN32</th>
<th>DN50</th>
<th>DN65</th>
<th>DN100</th>
<th>DN200</th>
<th>DN350 DN400</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-fitting</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Welding socket</td>
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<tr>
<td>Fusion spigot</td>
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<td></td>
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<tr>
<td>Screw-on</td>
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<tr>
<td>Saddle</td>
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<td>Clamp</td>
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<tr>
<td>Welding socket</td>
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</tr>
</tbody>
</table>

1) DN06 and DN08 in stainless steel S020 only, 8041 with stainless steel sensor recommended

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To find your nearest Bürkert facility, click on the orange box ➔ [www.burkert.com](http://www.burkert.com)

In case of special application conditions, please consult for advice.

Subject to alteration.

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