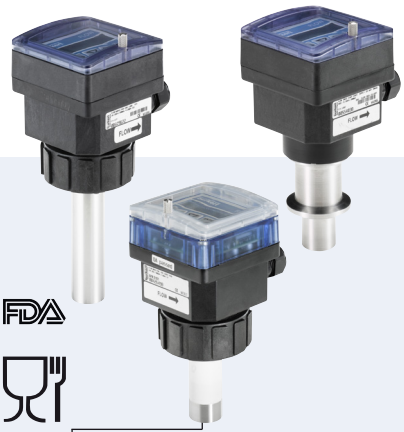
bürkert
FLUID CONTROL SYSTEMS



Insertion magnetic inductive flow-meter

- 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 CLASSIC

Type 2712
Globe Control Valve

Type 8802
ELEMENT continuous control valve systems

Type 8644
Process actuation control system AirLINE

PLC

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	PC (glass fibre reinforced for housing) / NBR
Stainless steel sensor version	Black PPA (glass fibre reinforced) / NBR
Front panel foil	Polyester
Protection lid / seal	
PVDF sensor version	PC / silicone
Stainless steel sensor version	PSU / silicone
Screws / Seal	Stainless steel / NBR
Cable glands	PA with neoprene seal
Wetted parts material	
Sensor holder	PVDF or Stainless steel 1.4404/316L
Electrodes	Stainless steel 1.4404/316L or Alloy C22
Seals	G 2" connection: FKM or EPDM (conform to FDA) Clamp connection: EPDM or FEP (to be ordered separately)
Earth ring (PVDF sensor versio)	Stainless steel 1.4404/316L or Alloy C22
Electrode holder (St. Steel sensor version)	PEEK (conform to FDA)
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

DTS 1000011093 EN Version: AE Status: RL (released | freigegeben | validé) printed: 04.09.2018

Complete device data (Fitting S020 + flowmeter)	
Pipe diameter G 2" connection Clamp connection	 DN06…DN400 DN32…DN100
Measuring range	0.2…10 m/s
Sensor element	Electrodes
Fluid temperature PVDF sensor version Stainless steel sensor version	see Pressure/Temperature diagram 0…+80 °C *(+32…+176 °F)* (depends on fitting) -15…+110 °C *(+5…+230 °F)* (depends on fitting)
Fluid pressure max. PVDF sensor version Stainless steel sensor version	see pressure/temperature diagram PN10 *(145.1 PSI)* PN10 *(145.1 PSI)* (with plastic fitting) - PN16 *(232.16 PSI)* (with metal fitting)
Conductivity	min. 20 µS/cm
Viscosity	< 1000 mPa.s
Measurement deviation[1] Teach-In Standard K-factor	 ±0.5 % of Reading[2] (at the teach flow rate value) ±3.5 % of Reading[2]
Linearity	±0.5 % of F.S.*[2]
Repeatability	±0.25 % of Reading[2]
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 Transistor (DO1) Relay (DO2 and DO3)	 Type: NPN or PNP (wiring dependent), open collector Function: pulse output (by default), user configurable 0…250 Hz, 5…36 V DC, 100 mA max., duty cycle if frequency >2 Hz: ½; min. pulse duration if frequency <2 Hz: 250 ms Galvanic insulation, protected against polarity reversals of DC and short-circuits 2 normally open relays, freely adjustable (hysteresis by default), 250 V AC/3 A or 40 V DC/3 A (resistive load), max. cutting power of 750 VA (resistive load); life span of min. 100000 cycles
Analogue output Current (AO1)	 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	
Protection class	IP65, device wired and cable glands tightened and lid screwed tight
Standard and directives CE Pressure	The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable) Complying with article 4, §1 of 2014/68/EU directive*
Certificates FDA declaration of conformity ECR1935/2004 declaration	 For stainless steel or PVDF sensor with FKM or EPDM seal Only for stainless steel sensor with EPDM seal

[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.

* For the 2014/68/EU pressure directive, the device can only be used under following conditions (depending on max. pressure, pipe diameter and fluid).

Type of fluid	Conditions
Fluid group 1, article 4, §1.c.i	Forbidden
Fluid group 2, article 4, §1.c.i	DN ≤32 or PS*DN ≤1000
Fluid group 1, article 4, §1.c.ii	DN ≤25 or PS*DN ≤2000
Fluid group 2, article 4, §1.c.ii	DN ≤200 or PS ≤10 or PS*DN ≤5000

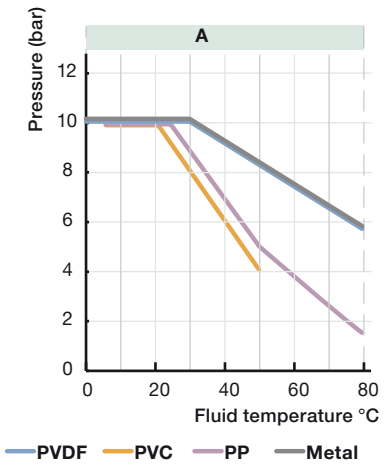
DTS 1000011093 EN Version: AE Status: RL (released | freigegeben | validé) printed: 04.09.2018

Pressure/Temperature diagram

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

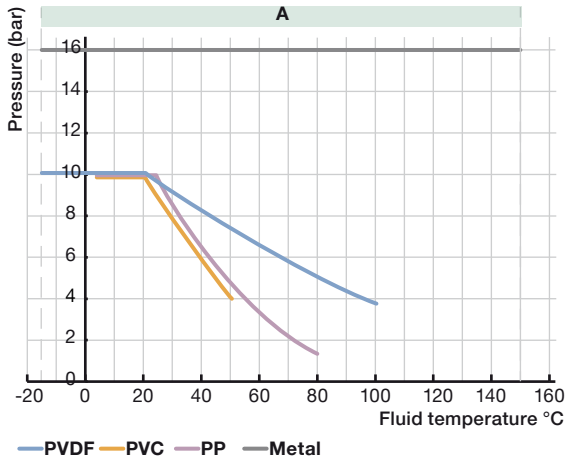
8045 with a PVDF sensor

(depending on the fitting material)



8045 with a stainless steel sensor

(depending on the fitting material)



A: Application range for complete device (fitting + flowmeter)

Sofware 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

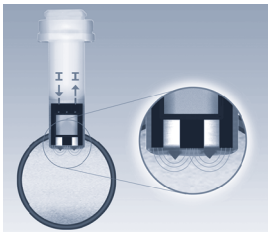
Possible applications

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

DTS 1000011093 EN Version: AE Status: RL (released | freigegeben | validé) printed: 04.09.2018

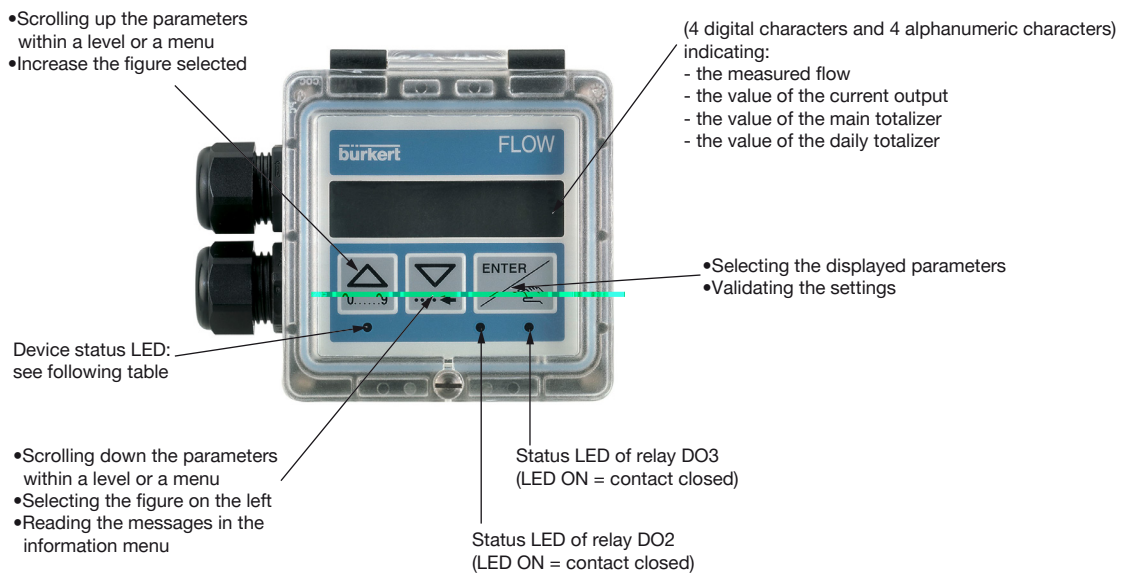
Design



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



Device status LED	Status of the device
Green	The device operates correctly
Orange	A warning messages is generated in the information menu.
Red	A fault message is generated and a 22 mA current is sent on the current output.
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

DTS 1000011093 EN Version: AE Status: RL (released | freigegeben | validé) printed: 04.09.2018

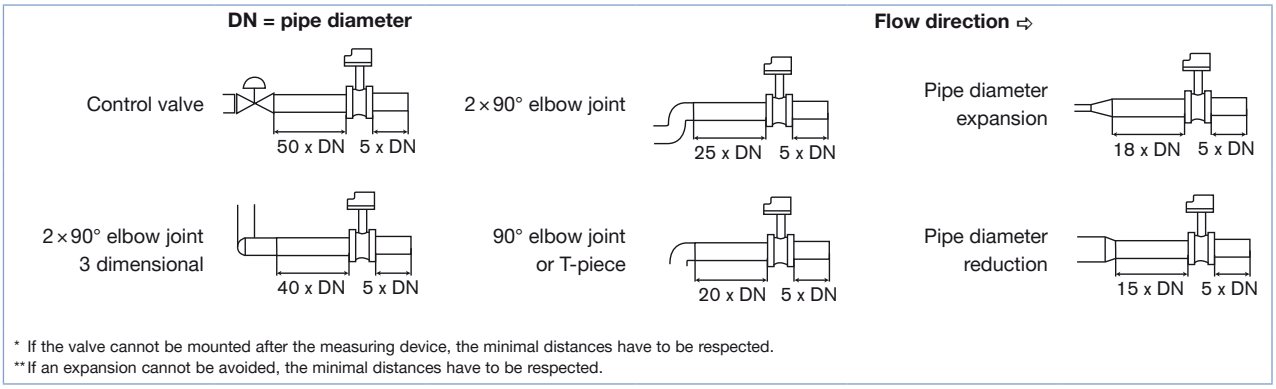
Installation

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.
Fore more information, please refer to EN ISO 5167-1.

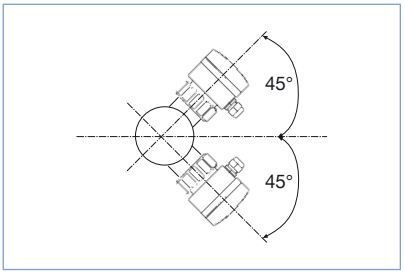
EN ISO 5167-1 prescribes the straight inlet and outlet distances that must be complied with when installing fittings in pipe lines in order to achieve calm flow conditions. The most important layouts that could lead to turbulence in the flow are shown below, together with the associated prescribed minimum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

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

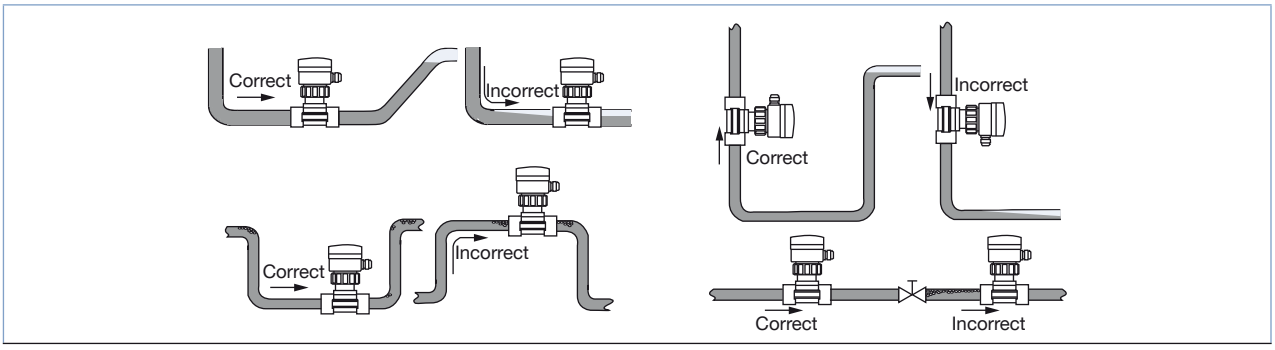


* If the valve cannot be mounted after the measuring device, the minimal distances have to be respected.
** If an expansion cannot be avoided, the minimal distances have to be respected.

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.

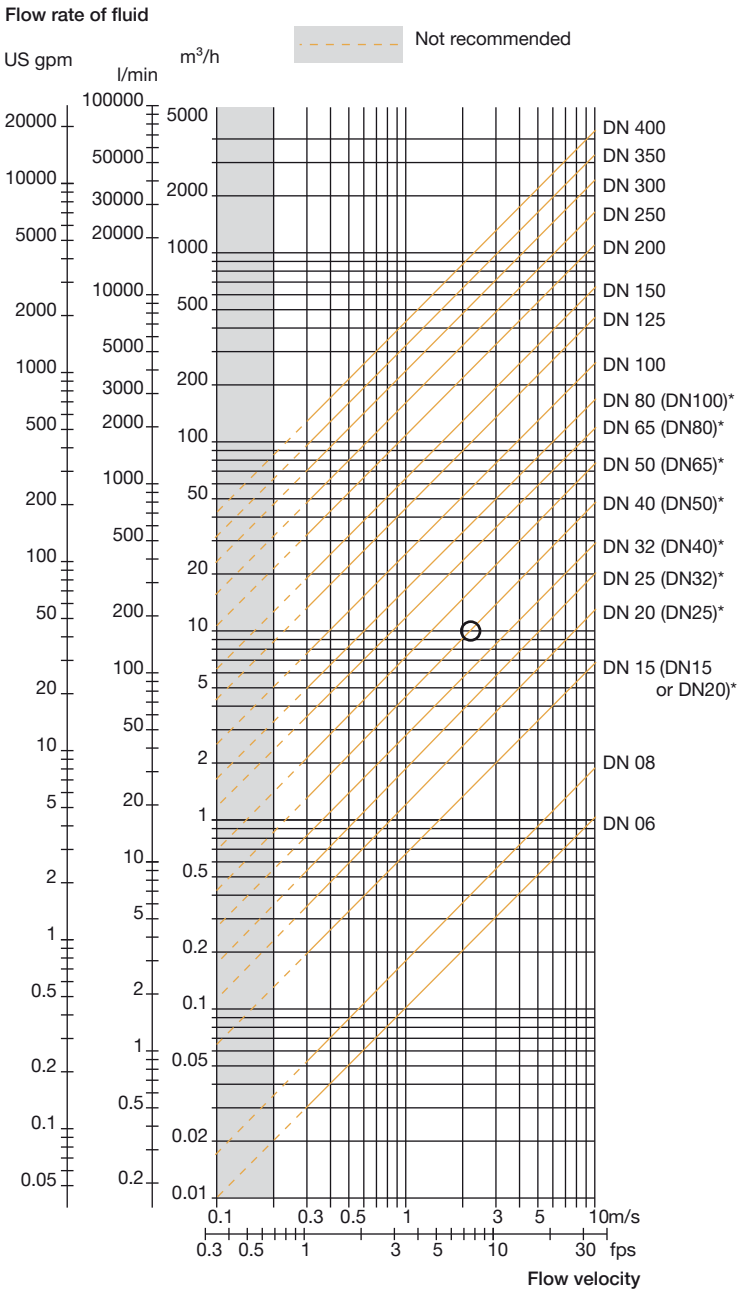
DTS 1000011093 EN Version: AE Status: RL (released | freigegeben | validé) printed: 04.09.2018

Diagram Flow rate/Velocity/DN

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]

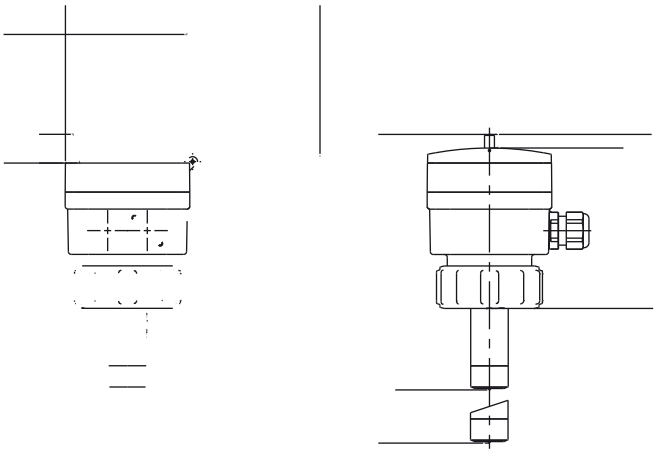


*** for following fittings with:**
- **external thread acc. to SMS 1145**
- **weld end acc. to SMS 3008, BS 4825-1/ASME BPE/DIN 11866 series C or DIN 11850 series 2/DIN 11866 series A/DIN EN 10357 series A**
- **Clamp acc. to SMS 3017, BS 4825-3/ASME BPE or DIN 32676 series A**

DTS 1000011093 EN Version: AE Status: RL (released | freigegeben | validé) printed: 04.09.2018

Dimensions [mm]

G 2" connection version



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) More info.

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.
							FDA	ECR1935/ 2004[1)]		
18…36 V DC	No	No	PC	FKM	short, PVDF	Stainless steel	✓	×	2 cable glands M20 x 1.5	426498
					long, PVDF	Stainless steel	✓	×	2 cable glands M20 x 1.5	426499
	1 (DI1)	2 (DO2, DO3)	PC	FKM	short, PVDF	Stainless steel	✓	×	2 cable glands M20 x 1.5	426506
					long, PVDF	Stainless steel	✓	×	2 cable glands M20 x 1.5	426507
	No	No	PPA	FKM	short, stainless steel	Stainless steel	✓	✓	2 cable glands M20 x 1.5	449670
					long, stainless steel	Stainless steel	✓	✓	2 cable glands M20 x 1.5	449672
	1 (DI1)	2 (DO2, DO3)	PPA	FKM	short, stainless steel	Stainless steel	✓	✓	2 cable glands M20 x 1.5	449671
					long, stainless steel	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	Alloy C22	×	×	2 cable glands M20 x 1.5	558676

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.**

DTS 1000011093 EN Version: AE Status: RL (released | freigegeben | validé) printed: 04.09.2018

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) More info.
- **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) and
- a digital output (DO1)

Voltage supply	Digital input	Relay output	Housing material	Fitting/ flow-meter seals*	Sensor version	Electrode material	Certificates		Electrical connection	Article no.
							FDA	ECR1935/ 2004[1)]		
18…36 V DC	No	No	PPA	EPDM or FEP	Clamp, stainless steel	Stainless steel	✓	✓	2 cable glands M20×1.5	564797
	1 (DI1)	2 (DO2, DO3)	PPA	EPDM or FEP	Clamp, stainless steel	Stainless steel	✓	✓	2 cable glands M20×1.5	564798

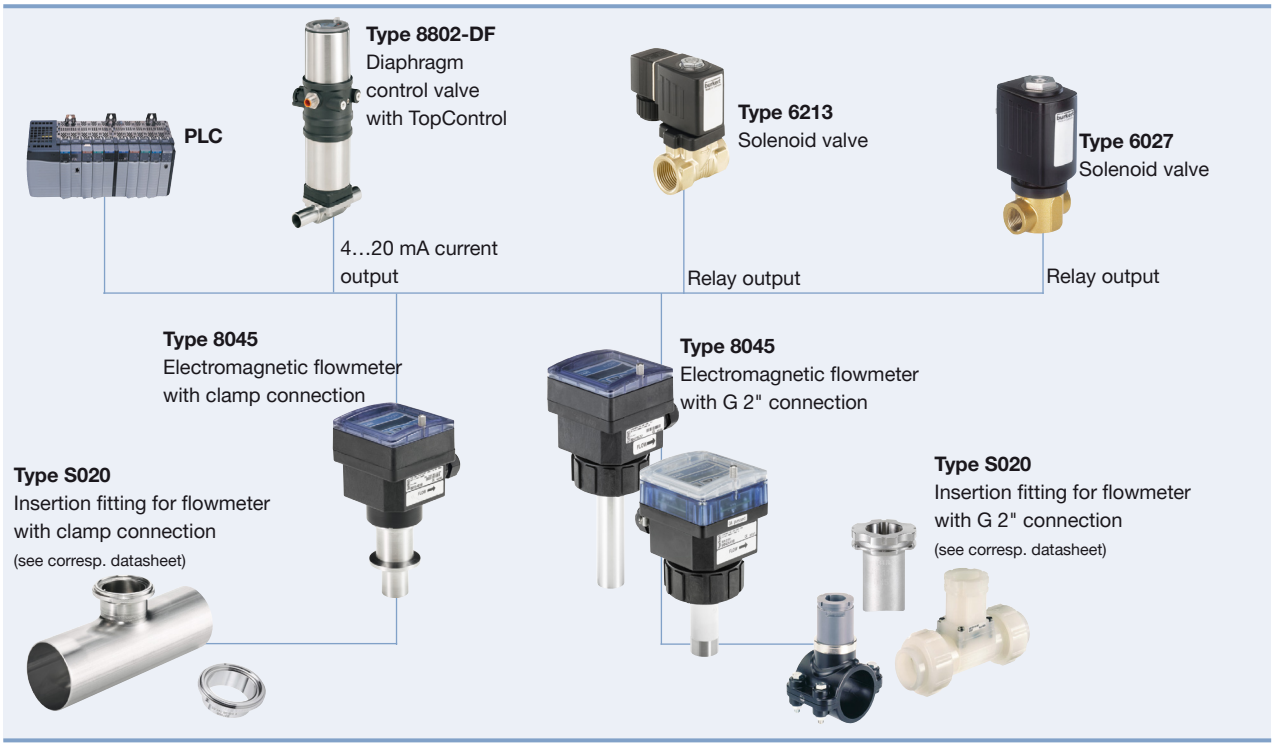
Note: 1 Kit 565384 is supplied with each flowmeter.
*** Has to be ordered separately**
[1)] Only if mounted with EPDM seal.

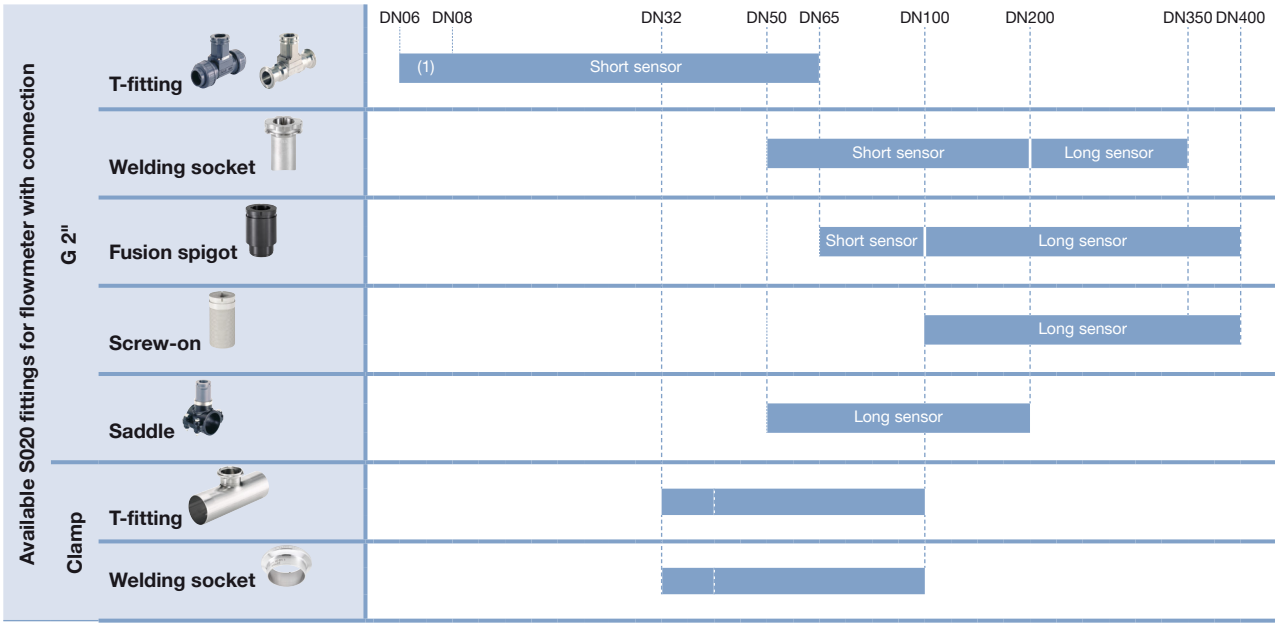
Ordering chart - accessories for flowmeter Type 8045 (has to be ordered separately)

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

DTS 1000011093 EN Version: AE Status: RL (released | freigegeben | validé) printed: 04.09.2018

Interconnection possibilities with other Bürkert devices





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

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