

# 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 range representing leading technologies & brands:

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

**Temperature:** Temperature Probes & Thermowells, Temperature transmitters, 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

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## Electromagnetic Flow Transmitter

- Sensor in solid state technology
- Working as a transmitter and/or as an On/Off controller
- Automatic-calibration of full scale: Teach-In
- Clean in place (CIP)
- FDA approved

Type 8041 can be combined with...



**Type S020**  
INSERTION  
T-fitting



**Type S020**  
Spigot



**Type 8025**  
Universal transmitter /  
batch controller (remote v.)



**Type 8802-GD**  
Globe control valve



**Type 8644**  
Valve islands with  
electronic I/O



**PLC**

The electromagnetic flow transmitter 8041 has been designed for pipes with diameters ranging from DN 06 to DN 400 and liquids having a conductivity > 20 µS/cm.

The transmitter is a magmeter made up of an electronic module and a sensor which armature is in PVDF or stainless steel.

It is fitted with a 4-20 mA output, a pulse rate output and a relay output. The different parameters can be programmed by means of 5 switches, a push-button and a 10 led bargraph. The version with a stainless steel sensor can be used in applications with higher pressures (PN16) and higher temperatures (150°C).

### Technical data

#### General data

##### Compatibility

with fittings S020 (see corresp. datasheet)

##### Materials

Housing, cover, nut  
PVDF sensor version  
St.St. sensor version  
Screws / Seal / Cable glands  
Wetted parts materials  
Sensor armature  
Electrodes  
Gaskets  
Earth ring (PVDF sensor version)  
Electrode holder (St.St. sensor version)

PC (glass fibre reinforced for housing)  
PPA (glass fibre reinforced)  
Stainless steel / EPDM / PA

PVDF or Stainless steel 1.4404/316L  
Stainless steel 1.4404/316L  
FKM (FDA agreements)  
Stainless steel 1.4404/316L  
PEEK (FDA agreements)

##### Electrical connections

Cable glands M20 x 1.5 - 1.5 mm<sup>2</sup> cross-section, shielded

#### Complete device data (Fitting S020 + transmitter)

<b>Pipe diameter</b>	DN 06 to 400
<b>Measuring range</b>	0.2 to 10 m/s
<b>Sensor element</b>	Electrodes
<b>Fluid temperature</b> PVDF sensor version St.St. sensor version	0 up to 80°C (32 to 176°F) (depends on fitting) -15 up to 150°C (5 to 302°F) (depends on fitting)
<b>Fluid pressure max.</b> PVDF sensor version St.St. sensor version	see pressure/temperature diagram PN10 (145.1 PSI) PN10 (145.1 PSI) (with plastic fitting) - PN16 (232.16 PSI) (with metal fitting)
<b>Conductivity</b>	min. 20 µS/cm
<b>Accuracy</b>  Teach-In Standard K-factor	(for measured value from 1 to 10 m/s and -15°C (5°F) < T° < 130°C (266°F) for st. st. sensor, or 0°C (32°F) < T° < 80°C (176°F) for PVDF sensor) ±2% of Reading <sup>1)</sup> ±4% of Reading <sup>1)</sup>
<b>Linearity</b>	±(1% of Reading + 0.1% of F.S.*) <sup>1)</sup>
<b>Repeatability</b>	≤0.25% of Reading <sup>1)</sup>

<sup>1)</sup> 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)

Electrical data	
<b>Power supply</b>	18-36 V DC filtered and regulated (3 wires)
<b>Reversed polarity of DC</b>	protected
<b>Current consumption</b>	≤ 220 mA
<b>Output</b>	
Signal current	4-20 mA, 100 ms refresh rate; max. loop impedance: 1100 Ω at 36 V DC; 330 Ω at 18 V DC.
Frequency	0-240 Hz, duty cycle = 50%±1%; 100 mA max., protected against short-circuits and polarity reversals.
Relay	Normally open or normally closed (depending on wiring), 3A, 250 V AC
<b>Alarm</b>	
Full scale exceeding	22 mA and 256 Hz
Fault signalling	22 mA and 0 Hz
<b>User parameter</b>	Saved in EEPROM
Environment	
<b>Ambient temperature</b>	-10 up to +60°C (14 to 140°F) (operating) -20 up to +60°C (-4 to 140°F) (storage)
<b>Relative humidity</b>	< 80%, without condensation
<b>Altitude max. for operating</b>	2000 m
Standards, directives and approvals	
<b>Protection class</b>	IP65
<b>Standards and directives</b>	
<b>EMC</b>	EN 50081-1, EN 61000-6-2
<b>Low voltage</b>	EN 61010-1
<b>Pressure</b>	Complying with article 3 of §3 from 97/23/CE directive.*
<b>Vibration</b>	EN 60068-2-6
<b>Shock</b>	EN 60068-2-27
<b>Approval</b>	FDA

\* For the 97/23/CE pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter and fluid).

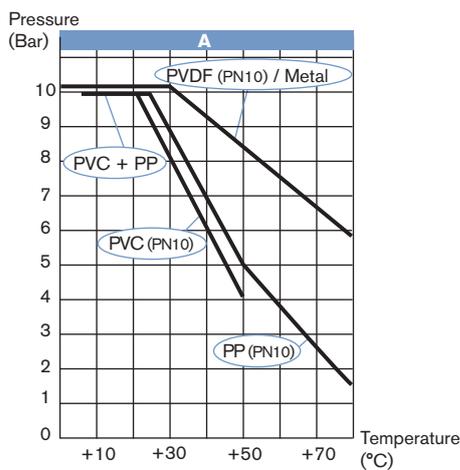
Type of fluid	Conditions
Fluid group 1, §1.3.a	Forbidden
Fluid group 2, §1.3.a	DN ≤ 32, or DN > 32 and PN*DN ≤ 1000
Fluid group 1, §1.3.b	PN*DN ≤ 2000
Fluid group 2, §1.3.b	DN ≤ 200 or PN ≤ 10 or PN*DN ≤ 5000

### Pressure / Temperature diagram

Please be aware of the fluid pressure-temperature dependance according to the respective fitting+transmitter material as shown in the diagrams.

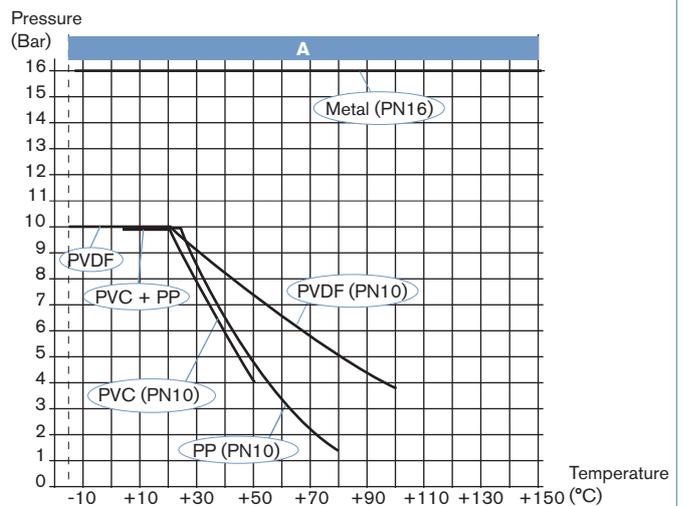
#### 8041 with a PVDF sensor

(depending on the fitting material)



#### 8041 with a stainless steel sensor

(depending on the fitting material)



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

**Main features and programming**

**Using as a transmitter**

- Programming of the full scale
  - selection of a predefined measuring range: 0 to 2, to 5 or to 10 m/s
  - selection by Teach-In: with the actual max. flow velocity of the application
- 4-20 mA current output
- 0-240 Hz frequency output
- Relay output: switching mode either window or hysteresis, on low or high switching threshold
- Relay time-out
- Filter
- Alarm:
  - for full scale exceeding with 22 mA and 256 Hz
  - for fault signalling with 22 mA and 0 Hz

**Using as an ON/OFF control**

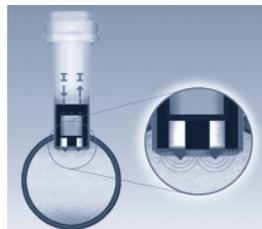
- Flow detection with switching thresholds, defined as a percentage of max. flow rate.  
Teach-In of the full scale with an unknown max. flow rate.

**Possible applications**

Flow control of fluids, contaminated or not:

- ▶ Waste water treatment
- ▶ Flow control of drinking water (FDA approval)
- ▶ Laundries: measurement and control of the water consumption
- ▶ Swimming pools: pump protection and flow control
- ▶ Food-processing industry: monitoring of the cleaning cycles (FDA approval)
- ▶ Irrigation

**Design**



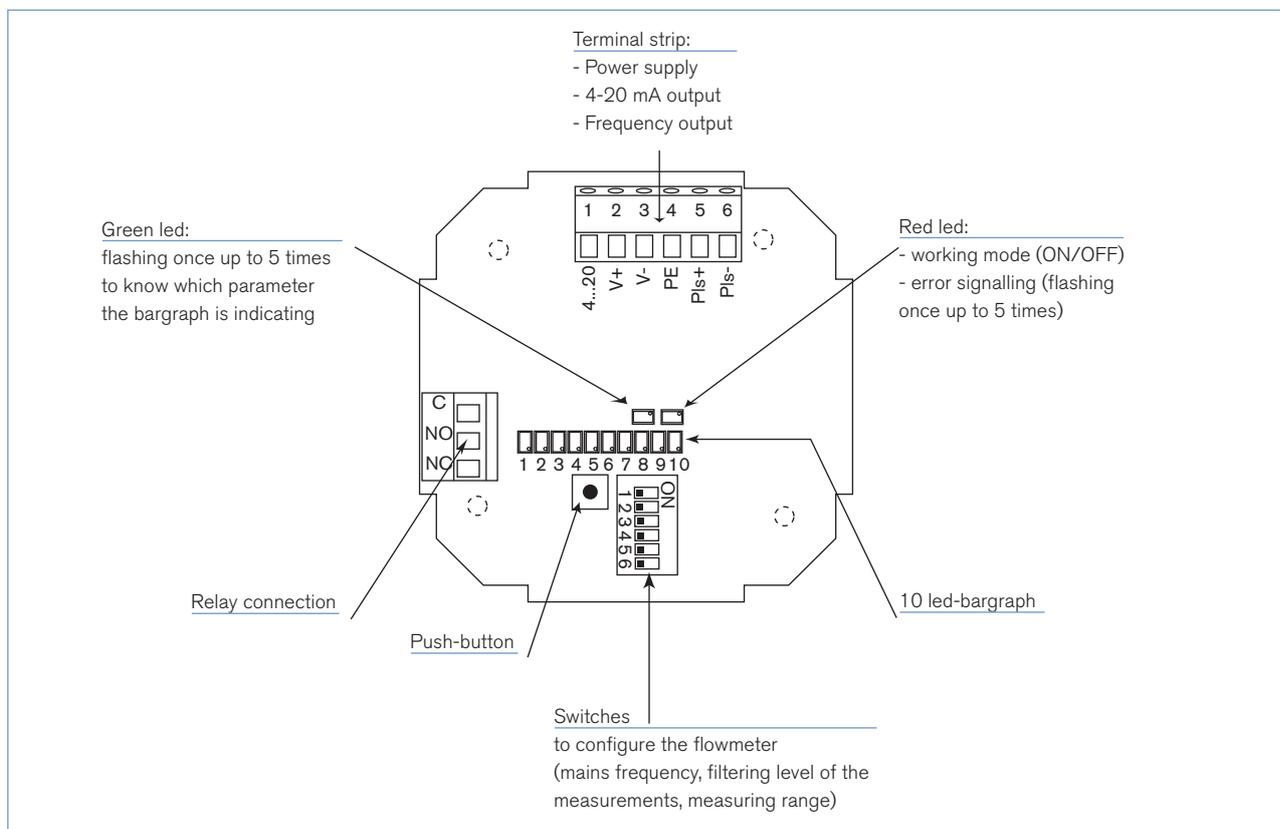
The E-shaped magnetic system inside the sensor induces a magnetic field into the fluid, which is perpendicular to the direction of flow.

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)

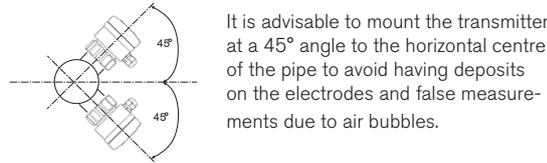
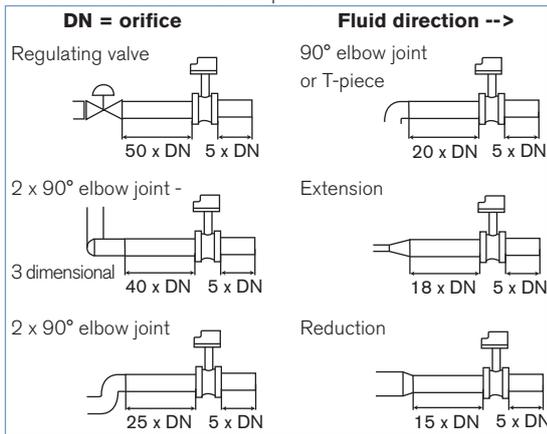
flows along the pipe. This voltage is proportional to the flow velocity. Using the K-factor for the individual pipe diameter the speed of flow is converted into volume per time.

**Display on PCB**

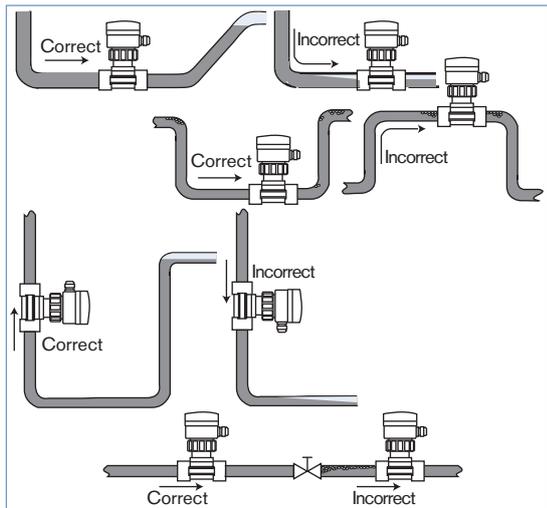


**Installation**

The 8041 transmitter 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.



The flow rate transmitter can be installed into either horizontal or vertical pipes. Mount the 8041 transmitter in these correct ways to obtain an accurate flow measurement.



Pressure and temperature ratings must be respected according to the selected fitting material.

The suitable pipe size is selected using the diagram Flow / Velocity / DN.

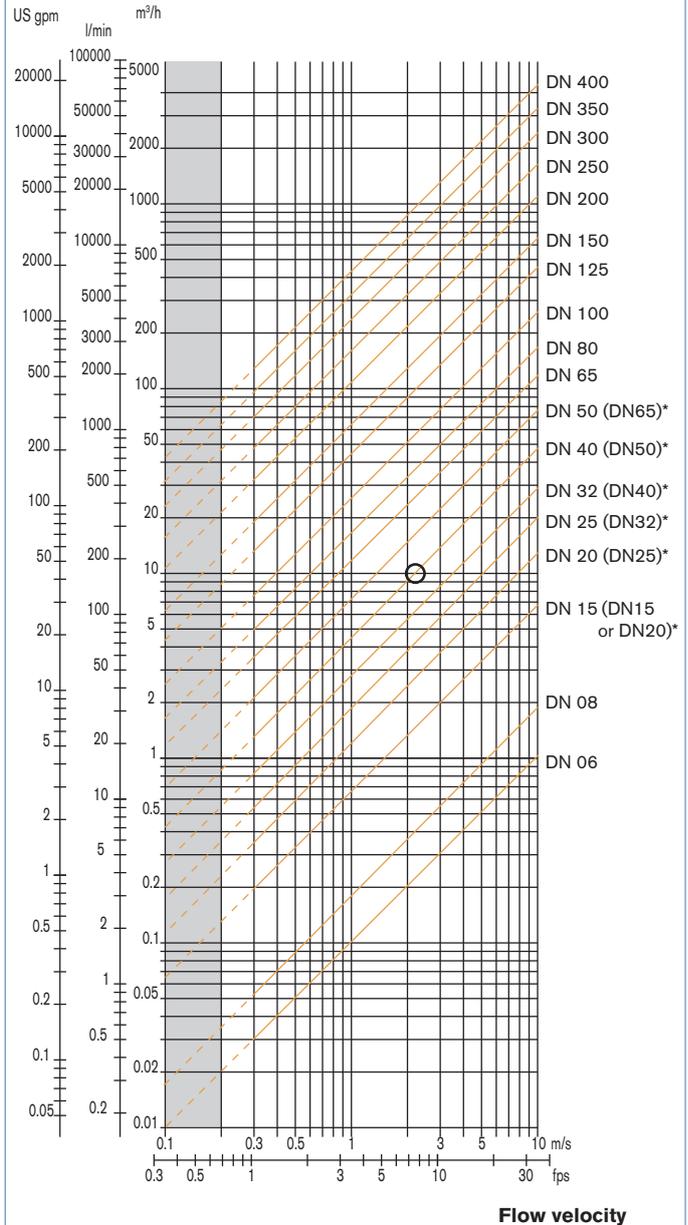
The flow transmitter is not designed for gas flow measurement.

**Selection of fitting / pipe size**

**Example:**

- Specification of nominal flow: 10 m<sup>3</sup>/h
- Ideal flow velocity: 2..3 m/s
- For these specifications, the diagram indicates a pipe size of DN40 [or DN50 for (\*) mentioned fittings]

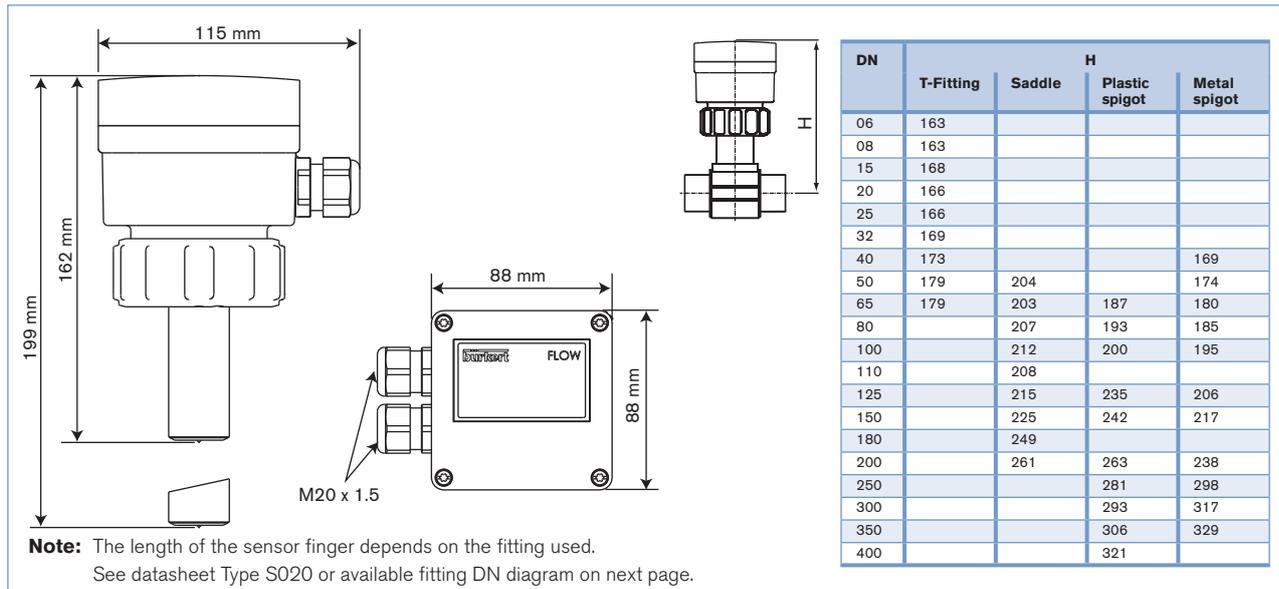
**Flow rate**



\* for following fittings:

- with external threads acc. to SMS 1145
- with weld-ends acc. to SMS 3008, BS 4825 / ASME BPE or DIN 11850 Series 2
- Clamp acc. to SMS 3017 / ISO 2852, BS 4825 / ASME BPE or DIN 32676

## Dimensions [mm]



## Ordering chart for transmitter Type 8041 - for fitting S020 (see corresp. data sheet)

Voltage supply	Output	Relay	Housing material	Gaskets	Sensor version	Electrical connection	Item no.
18-36 V DC	4-20 mA, frequency	1	PC	FKM	short, PVDF	2 cable glands	558 064
					long, PVDF	2 cable glands	558 065
			PPA	FKM	short, stainless steel (FDA)	2 cable glands	552 779
					long, stainless steel (FDA)	2 cable glands	552 780

**Note:** 1 Kit 558 102, 1 relay connection kit 552 812 and 1 EPDM gasket are supplied with each transmitter.

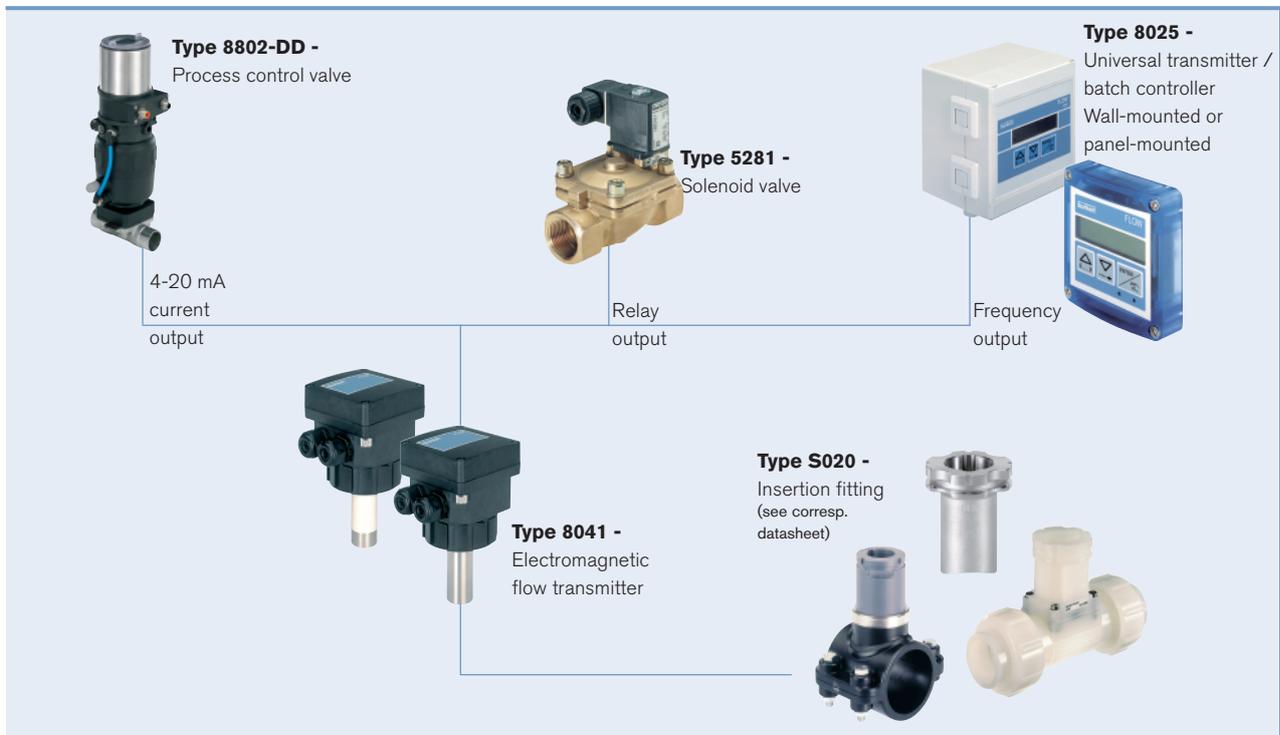
## Ordering chart - accessories for transmitter Type 8041 (has to be ordered separately)

Specifications	Item no.
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	449 755
Set with 2 reductions M20 x 1.5 /NPT1/2" + 2 neoprene flat seals for cable gland or plug + 2 screw-plugs M20 x 1.5	551 782
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 gasket for the sensor + 1 mounting instruction sheet	558 102
Ring	619 205
PC union nut	619 204
PPA union nut	440 229
Set with 1 green FKM and 1 black EPDM gasket	552 111
Relay connection kit with 1 screw terminal strip + 1 protection cap + 1 rilsan + 1 mounting instruction sheet	552 812
3 points calibration certificate (device combined with a S020 fitting, only for DN ≤ 200)	550 676
FDA - Approval (only stainless steel sensor version)	449 788

Ordering chart for remote electronics Type 8025 which can be connected to the 8041

Version	Description	Voltage supply	Output	Relays	Sensor version	Electrical connection	Item no.
Panel	Type 8025 "Universal", 2 totalizers	18-30 V DC	4-20 mA, pulse	None	8041	Terminal strip	419 538
	Type 8025 "Batch", 2 totalizers, 1 flowrate	18-30 V DC	-	2	8041	Terminal strip	419 537
Wall	Type 8025 "Universal", 2 totalizers	18-30 V DC	4-20 mA, pulse	None	8041	3 cable glands	419 541
		115-230 V AC	4-20 mA, pulse	2	8041	3 cable glands	419 540
	Type 8025 "Batch", 2 totalizers, 1 flowrate	18-30 V DC	-	None	8041	3 cable glands	419 544
		18-30 V DC	-	2	8041	5 cable glands	433 740

Interconnection possibilities with other Bürkert flow sensors



Available S020 Fitting DN	DN 06	Short sensor		DN65
	T-fitting S020	(1)		
Welding tab S020				DN50
			Short sensor	DN200 DN350 Long sensor
Fusion spigot S020			DN65	DN100
			Short sensor	Long sensor
Screw-on S020				DN100
				Long sensor
Saddle S020			DN50	DN200
			Long sensor	

(1) DN 06 and DN 08 in stainless steel S020 only, 8041 with stainless steel sensor recommended

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

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