
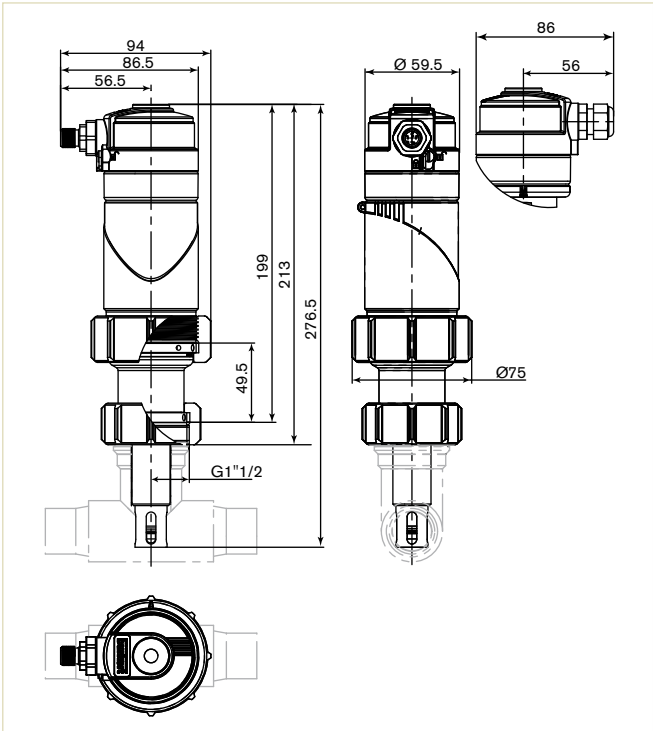


# Technical Data (continued)

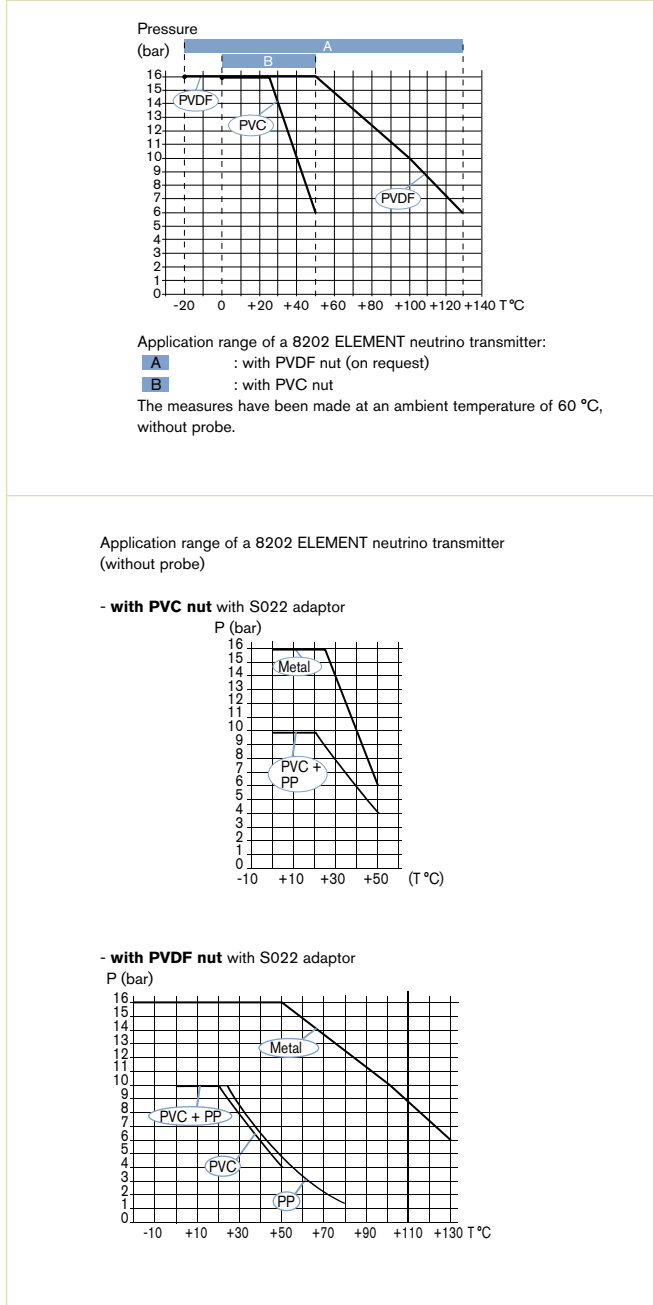
General data	
<b>Compatibility</b>	Any pipe from which are fitted out with Bürkert adaptor S022 (see separate data sheet)
<b>Materials</b>	See exploded view, opposite
Housing	Stainless steel 1.4561 (316L), PPS
Cover	PPS
Seals	EPDM
Fixed connector/cable gland	PA66
Nut	PVC (PVDF on request)
Wetted part materials	PVDF, Stainless steel 1.4571 (316Ti)
Sensor holder	
Probe	See probe specific technical data
<b>Probe</b>	120 mm Bürkert pH or ORP probe Type 8203 or any combined 120 mm pH or ORP probe, without temperature sensor, with PG13.5 head, S7/S8 connector
<b>Temperature sensor</b>	Pt1000 integrated within the holder
<b>Electrical connections</b>	1x 5-pin M12 male fixed connector, or Terminal strip via 1x cable gland M16x1.5
<b>Recommended connection cable for terminal strip</b>	Shielded cable (Measuring data acc. to CEI 664-1/VDE 0110 (4.97))
Solid H05(07) V-U	0.25 up to 1.5 mm <sup>2</sup>
Flexible H05(07) V-K	0.25 up to 1.5 mm <sup>2</sup>
With wire end ferrule	0.25 up to 1.5 mm <sup>2</sup>
With plastic collar ferrule	0.25 up to 0.75 mm <sup>2</sup>
Diameter	4 to 8 mm
<b>Standards, directives and approvals</b>	
<b>Protection class</b>	IP65, IP67, NEMA 4X and NEMA 6P, with M12 cable plug or cable gland tightened or obturated and cover properly mounted and secured
<b>Standard and directives</b> 	
EMC	EN 61000-6-2, EN 61000-6-3
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration / Shock	EN 60068-2-6 / EN 60068-2-27

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

# Envelope Dimensions [mm] (continued)



# Pressure / temperature chart



## Ordering Chart

Description	Voltage supply	Output	Sensor version	Nut material	Electrical connection	Item no.
Compact transmitter: sensor holder with integrated Pt1000 + electronic module with cover	12 - 36 V DC	1 x 4 - 20 mA	None	PVC	5-pin M12 male fixed connector	561 685
					Cable gland	561 686

## Accessories

Description	Item no.
One Ø 46x2 mm EPDM seal for 120 mm probe holder (with instruction sheet)	559 169
EPDM seal for cover/housing sealing	561 752
Probe holder with PVC nut	560 947
pH-probe -10...40 °C, 0 - 6 bar, pH 0 - 14 - PLASTRODE pH 120 mm	560 377
pH-probe 0... 80 °C, 0 - 6 bar, pH 0 - 14 - FLATRODE pH 120 mm	561 025
pH-probe -10...60 °C, 0 - 6 bar, pH 2 - 14 - LOGOTRODE pH 120 mm	427 114
pH-probe 0...130 °C, 0 - 6 bar, pH 0 - 14 - UNITRODE PLUS pH 120 mm	560 376
pH-probe 0...130 °C, 0 - 16 bar, pH 0 - 14 - CERATRODE pH 120 mm	418 319
Redox potential-probe 0...80 °C, 0 - 6 bar, -2000 ... +2000 mV - FLATRODE ORP 120 mm	561 027
Redox potential-probe -10...50 °C, 0 - 6 bar, -2000... +2000 mV - LOGOTRODE ORP 120 mm	560 379
Redox potential-probe 0...130 °C, 0 - 6 bar, -2000... +2000 mV - UNITRODE PLUS ORP 120 mm	560 378
Storage solution for probe (KCl 3M), 500 ml	418 557
Cleaning solution set for probe, 3 x 500 ml	560 949
Buffer solution, 500 ml, pH=4	418 540
Buffer solution, 500 ml, pH=7	418 541
Buffer solution, 500 ml, pH=10	418 543
Buffer solution, 500 ml, Redox potential = 475 mV	418 555
5 pin M12 female straight cable plug with plastic threaded locking ring, to be wired	917 116
5 pin M12 female straight cable plug moulded on cable (2 m, shielded)	438 680

**Note**

For a complete transmitter the following items must be ordered:

- Transmitter, Type 8202 ELEMENT neutrino
- pH or ORP probe, Type 8203
- INSERTION Adapters (see Type S022)



# IVD made simple.

Every drop counts. With TwinPower technology, high efficiency in in-vitro diagnostic is effortless. The advantages: fewer reagents are required because the internal volume of the solenoid valves has been reduced to an absolute minimum. Energy consumption is less because two smaller solenoid coils share the work in the valve, making this system more durable and reliable than previous systems.

The 6624 TwinPower: So much cleverness in such a small space. More minimum – hardly possible.

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# Conductivity transmitter with removable operating unit

- Intuitive menu structure
- Removable programming puck
- Data upload / download via puck
- Diagnostic function

Please see adapters



Conductivity transmitter with programmable outputs. Conductivity and temperature output via single or dual analog 4-20 mA. Two transistor outputs are also included. Transmitters are engineered for a wide scope of measuring ranges and can be delivered in 2-wire or 3-wire configurations. Intelligent, integrated, beautiful design fits perfectly with an assortment of easily configured fittings.

## Technical Data

### Technical data (Pipe + conductivity meter)

**Pipe diameter** DN25 to DN110 (DN<25 with reduction)

### Conductivity measurement

Measuring range 0.05 mS/cm... 10 mS/cm  
Resolution 1 nS/cm  
Accuracy  $\pm 3\%$  of measured value

### Temperature measurement

Measuring range -40 °C to +130 °C (-40 to 266 °F)  
Internal resolution 0.1 °C (0.18 °F)  
Accuracy  $\pm 1$  °C (1.8 °F)  
Minimal temperature range 10 °C (i.e. 10 °C to 20 °C (50 to 68 °F) corresponding to 4... 20 mA)

### Temperature compensation

none  
or according to a predefined graph (NaCl or ultra pure water)  
or according to a graph defined especially for your process

### Medium temperature

with G 1 1/2" PVC nut connection 0 °C to 50 °C (32 to 122 °F)  
with G 1 1/2" PVDF nut connection -20 °C to 100 °C (-4 to 212 °F) restricted by the used adaptor  
restriction with adaptor S022 in:  
- PVC: 0 °C to 50 °C (32 to 122 °F)  
- PP: 0 °C to 80 °C (32 to 176 °F)  
- Metal: -20 °C to 100 °C (-4 to 212 °F)

**Fluid pressure max** PN16 (232 PSI) (see Pressure/Temperature chart)

### Environment

**Ambient temperature** -10 °C to +60 °C (14 to 140 °F) (operating and storage)

**Relative humidity**  $\leq 85\%$ , without condensation

### Electrical data

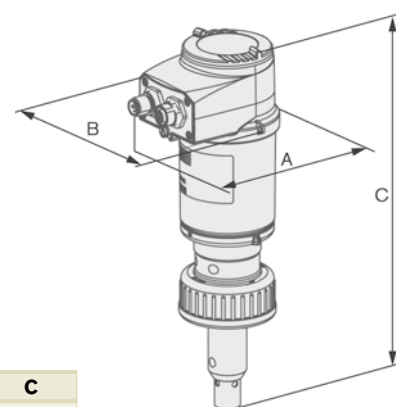
**Power supply** 12 - 36 V DC, filtered and regulated  
4 outputs meter (3-wire)

**Current consumption with sensor**  $\leq 1$  A (with the 2 transistors loads)  
 $\leq 5$  mA (at 12 V DC without transistors load, without current loop)  
4 outputs meter (3-wire)

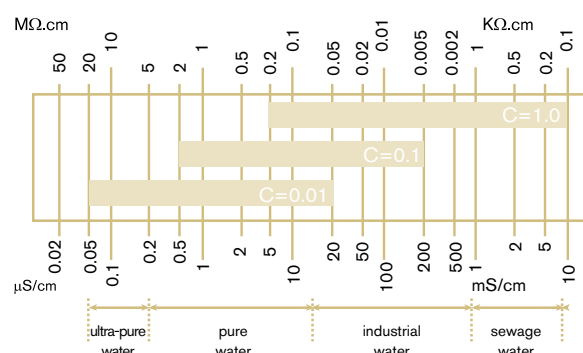
**Reversed polarity of DC** Protected

**Voltage peak** Protected

## Envelope Dimensions [mm] (see datasheet for details)



A	B	C
97	70	244



The electrode is selected according to the measuring range and medium by using this table.

<b>Short circuit</b>	Protected for transistor outputs
<b>Output</b>	
Transistor	configurable as sourcing or sinking (respectively both as PNP or NPN), open collector max. 700 mA, 0.5 A max. per transistor if the 2 transistor outputs are wired output NPN: 0.2 - 36 V DC output PNP: V+ power supply
Current	4... 20 mA programmable as sourcing or sinking,
4 outputs meter (3-wire)	configurable in the same mode as transistor: sourcing or sinking, max. loop impedance: 1100 W at 36 V DC; 610 W at 24 V DC; 100 W at 12 V DC
Response time (10% - 90%)	150 ms (standard)
<b>General data</b>	
<b>Compatibility</b>	Any pipe which are fitted out with Bürkert adaptor S022 (see separate data sheet)

#### Materials

Housing/cover	Stainless steel 1.4561, PPS / PC
Seals/Screws	EPDM / Stainless steel
Fixed connector mounting plate	Stainless steel
Fixed connector	Brass nickel plated
Display/navigation key	PC / PBT
Nut	PVC or PVDF
Wetted part materials	PVDF, stainless steel 1.4571 (316Ti)
Conductivity sensor	Stainless steel 1.4571 (316Ti) for cell constant C=0.01 or C=0.1 or graphite for cell constant C=1.0
Electrode	

<b>Temperature sensor</b>	Pt1000 (316Ti) integrated in the sensor
<b>Display (accessories)</b>	Grey dot matrix 128x64 with backlighting
<b>Electrical connections</b>	
4 outputs meter (3-wire)	1x 5-pin M12 male + 1x 5-pin M12 female fixed connectors
<b>Connection cable</b>	Shielded cable


#### Standards, directives and approvals

<b>Protection class</b>	IP65 and IP67 with M12 cable plug mounted and tightened and cover fully screwed down
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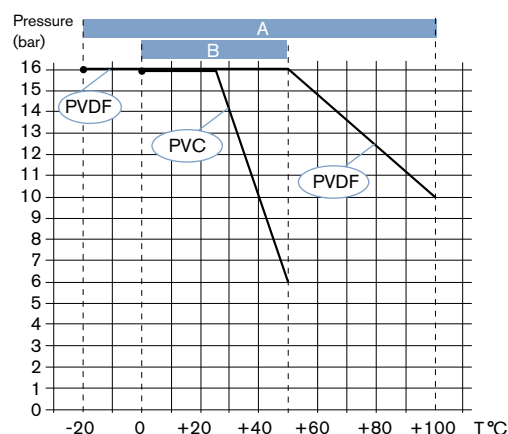
#### Standard and directives

EMC	EN 61000-6-2, EN 61000-6-3
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration / Shock	EN 60068-2-6 / EN 60068-2-27

#### Approvals

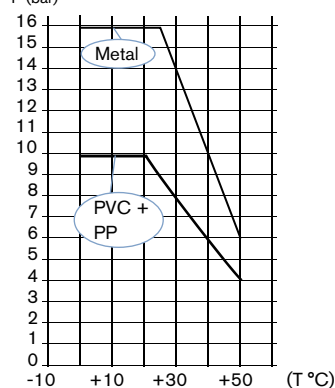
UL-Recognized for US and Canada 	61010-1 + CAN/CSA-C22 No.61010-1
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## Pressure/Temperature chart

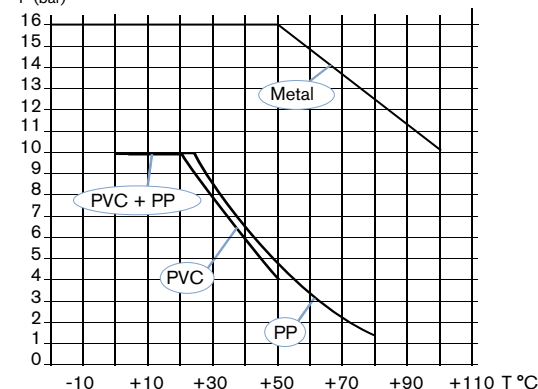


#### Application range of a 8222 ELEMENT conductivity meter

- with PVC nut with S022 adaptor  
P (bar)



- with PVDF nut with S022 adaptor  
P (bar)



## Ordering Chart

8222 ELEMENT	Nut material	Cell constant	Electrical connection	Item No
	PVC	C = 0.01	5-pin M12 male and 5-pin M12 female	559 619
		C = 0.1	5-pin M12 male and 5-pin M12 female	559 615
		C = 1.0	5-pin M12 male and 5-pin M12 female	559 611
	PVDF	C = 0.01	5-pin M12 male and 5-pin M12 female	559 621
		C = 0.1	5-pin M12 male and 5-pin M12 female	559 617
		C = 1.0	5-pin M12 male and 5-pin M12 female	559 613

## Accessories

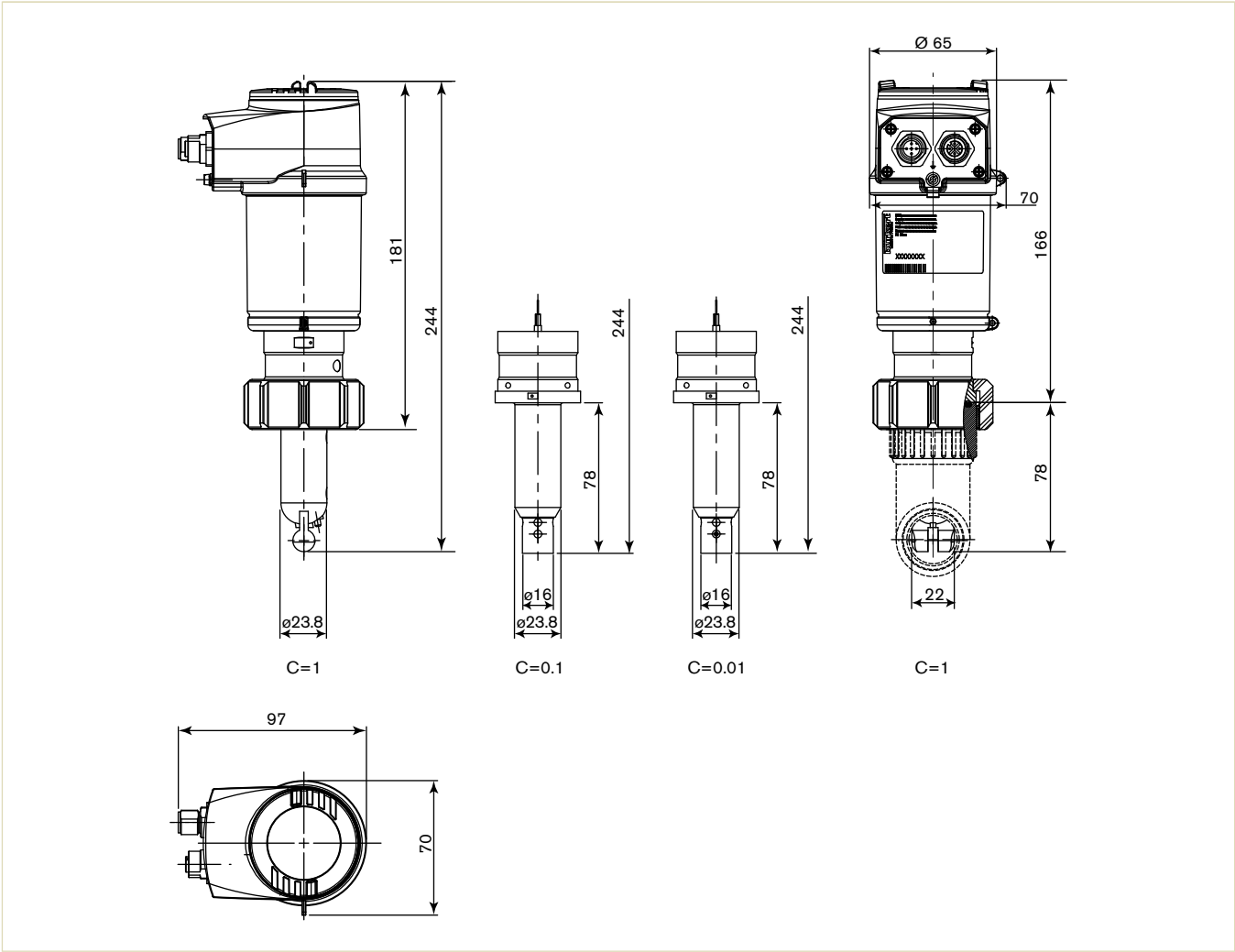
Description	Item No
Display/programming module	559 168
Electrical connector, 5-pin M12 male, plug only	560 946
Electrical connector, 5-pin M12 male, 2 m prewired	559 177
Electrical connector, 5-pin M12 female, plug only	917 116
Electrical connector, 5-pin M12 female, 2 m prewired	438 680

### Note

For a complete transmitter the following items must be ordered:

- Transmitter, Type 8222 ELEMENT
- Display/programmer module
- INSERTION Adapters (see Type S022)
- M12 cable socket, cable connector (only cable socket for a 4-20 mA current output, cable and cable connector for two 4-20mA current outputs)

Dimensions [mm] of conductivity meter Type 8222



## Conductivity meter without display and operating unit

- Analog 4-20 mA output
- Universal process connection
- Three cell constants for covering a wide measuring range
- Temperature compensated measurement

Please see adapters

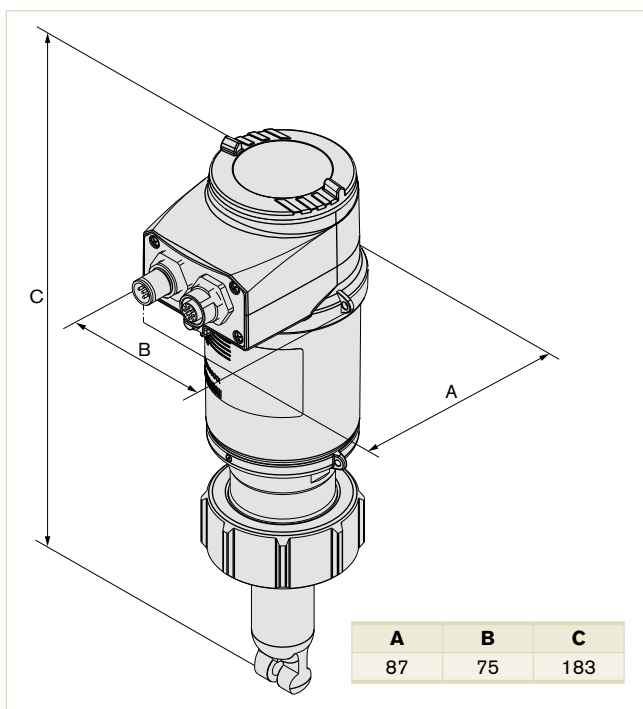


The Bürkert ELEMENT neutrino meter, Type 8222, is a compact device designed for measuring the conductivity of fluids.

### Technical Data

Pipe + conductivity meter	
<b>Pipe diameter</b>	DN25-110 mm (DN < 25 mm with reduction)
<b>Conductivity measurement</b>	
Measuring range	0.05 µS/cm to 10 mS/cm
Accuracy	± 3% of measured value
<b>Temperature measurement</b>	
Measuring range	-40 °C to +130 °C
Accuracy	± 1 °C
<b>Temperature compensation</b>	
Cell constants C = 0.1 or 1	according to a NaCl graph
Cell constants C = 0.01	according to an ultra pure water graph
<b>Medium temperature*</b>	
with G 1½" PVC connection nut	0 °C to +50 °C
with G 1½" PVDF connection nut	-20 °C to +100 °C restricted by the used adaptor
(on request)	restriction with adaptor S022 in:
	- PVC: 0 °C to +50 °C - PP: 0 °C to +80 °C
	- Metal: -20 °C to +100 °C
with G ¾" ext. threaded connection	-20 °C to +100 °C restricted by the used adaptor
	restriction with adaptor S022 in:
	- PVC: 0 °C to +50 °C
	- PVDF: 0 °C to +100 °C
	- metal: -20 °C to +100 °C
<b>Fluid pressure max</b>	PN16 (see pressure / temp. chart)
<b>4-20 mA output accuracy</b>	± 1%
Environment	
<b>Ambient temperature</b>	-10 °C to +60 °C (14 to 140°F) (operating and storage)
<b>Relative humidity</b>	≤ 85%, without condensation
Electrical data	
<b>Power supply</b>	12 - 36 V DC, filtered and regulated
<b>Current consumption with sensor</b>	≤ 25 mA
<b>Reversed polarity of DC</b>	Protected
<b>Voltage peak</b>	Protected
Output	
<b>Current</b>	4... 20 mA
	max. loop impedance: 1100 W at 36 V DC; 610 W at 24 V DC; 100 W at 12 V DC
<b>Response time (10% - 90%)</b>	5 s (standard)

### Envelope Dimensions [mm] (see datasheet for details)



### Technical data (continued)

General data	
<b>Compatibility</b>	Any pipe which are fitted out with Bürkert adaptor S022 (see separate data sheet)
<b>Materials</b>	See exploded view, opposite
Housing	Stainless steel 1.4561 (316L), PPS
Cover	PPS
Seals	EPDM
Fixed connector	PA66
Nut	PVC (PVDF on request)
Wetted part materials	
Temperature sensor	PVDF, stainless steel 1.4571 (316Ti)
Conductivity electrodes	Stainless steel 1.4571 (316Ti) for cell constant C=0.01 or C=0.1 or graphite for cell constant C=1.0
<b>Temperature sensor</b>	Pt1000 (316Ti) integrated in the sensor



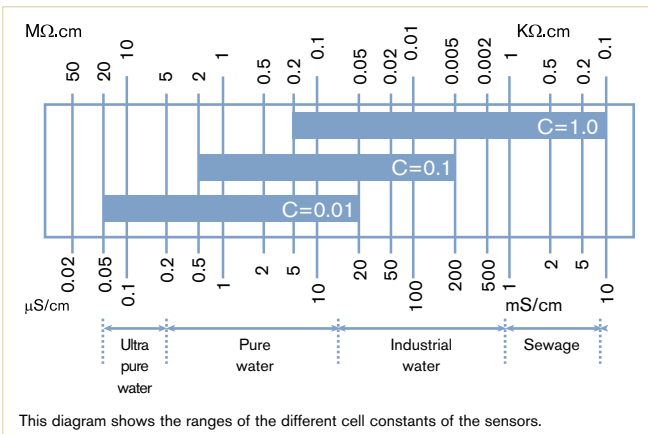
# Technical data (continued)

<b>Electrical connections</b>	1x 5-pin M12 male fixed connector, or terminal strip via 1x cable gland M16x1.5
<b>Recommended connection cable for terminal strip</b>	Shielded cable (Measuring data acc. to CEI 664-1/VDE 0110 (4.97))
Solid H05(07) V-U	0.25 to 1.5 mm <sup>2</sup>
Flexible H05(07) V-K	0.25 to 1.5 mm <sup>2</sup>
With wire end ferrule	0.25 to 1.5 mm <sup>2</sup>
With plastic collar ferrule	0.25 to 0.75 mm <sup>2</sup>
Diameter	4 to 8 mm
<b>Standards, directives and approvals</b>	
<b>Protection class</b>	IP65, IP67, NEMA 4X and NEMA 6P with M12 cable plug or cable gland tightened or obturated and cover properly mounted and secured

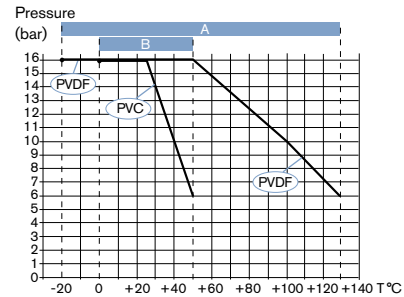
## Standard and directives

EMC	EN 61000-6-2, EN 61000-6-3
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration / Shock	EN 60068-2-6 / EN 60068-2-27

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



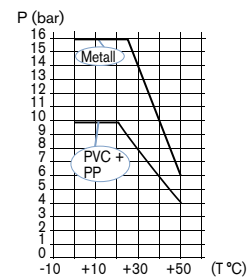
# Pressure/temperature chart



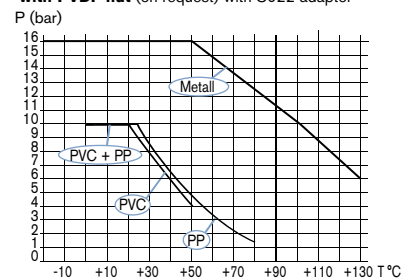
Application range of a 8222 ELEMENT neutrino conductivity meter:  
**A** : with PVDF nut (on request) or G $\frac{3}{4}$ " external threaded connection  
**B** : with PVC nut  
The measures have been made at an ambient temperature of 60 °C.

Application range of a 8222 ELEMENT neutrino conductivity meter

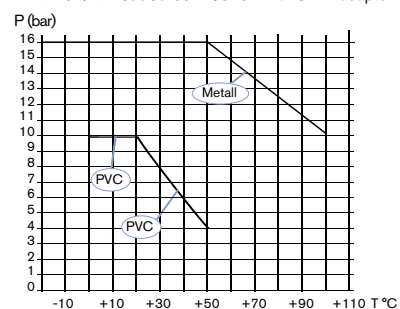
- with **PVC** nut with S022 adaptor



- with **PVDF** nut (on request) with S022 adaptor

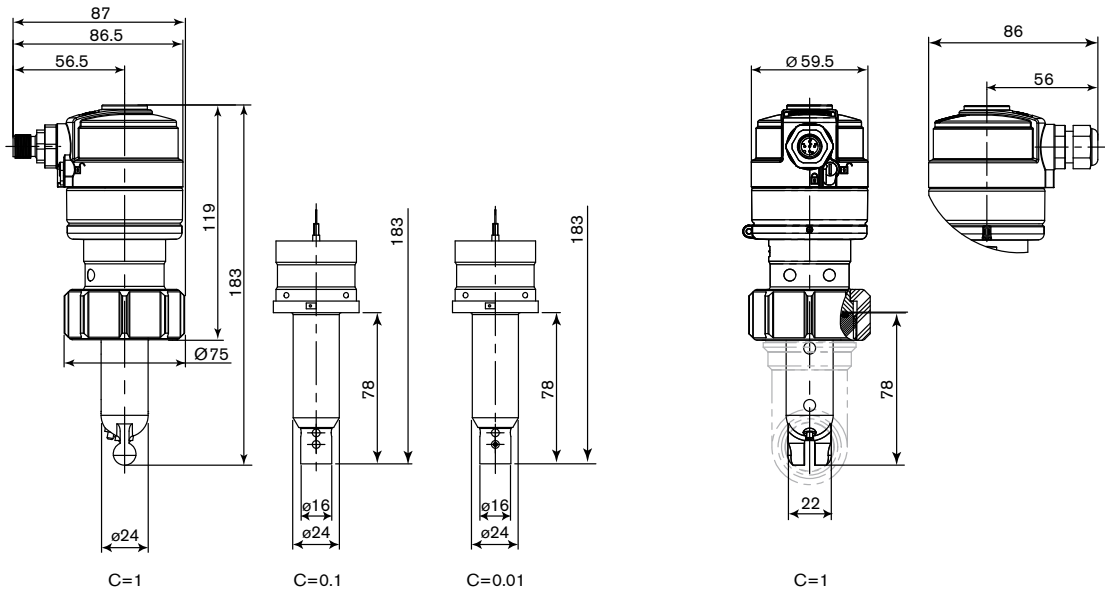


- with **G 3/4 threaded connection** with S022 adaptor



Envelope Dimensions [mm] (see datasheet for details)

with a G 1½" union connection nut



## Ordering Chart

Description	Voltage supply	Output	Sensor version	Nut material	Electrical connection	Item no.
Compact conductivity meter with a G 1½" union connection nut	12 - 36 V DC	4 - 20 mA	C = 0.01	PVC	5-pin M12 male fixed connector	561 661
					Cable glands	561 662
			C = 0.01	PVC	5-pin M12 male fixed connector	561 663
					Cable glands	561 664
			C = 0.01	PVC	5-pin M12 male fixed connector	561 665
					Cable glands	561 666

## Accessories

Description	Item no.
EPDM seal for cover/housing sealing	561 752
EPDM seal for conductivity meter with G ¾" external thread / S022 adaptor sealing*	561 955
Calibration solution, 300 ml, 5 mS	440 015
Calibration solution, 300 ml, 15 mS	440 016
Calibration solution, 300 ml, 100 mS	440 017
Calibration solution, 500 ml, 706 mS	440 018
Calibration solution, 500 ml, 1413 mS	440 019
5 pin M12 female straight cable plug with plastic threaded locking ring, to be wired	917 116
5 pin M12 female straight cable plug moulded on cable (2 m, shielded)	438 680

\* Important!

To ensure the tightness between the meter, with G ¾" thread, and the S022 INSERTION adapter, only this O-ring should be used.

### Note

For a complete transmitter the following items must be ordered:

- Transmitter, Type 8222 ELEMENT neutrino
- INSERTION Adapters (see Type S022)

# Inductive conductivity meter

8228

- Configurable outputs: up to 2 transistor and up to 2 analogue 4... 20 mA outputs
- Removable backlighted display
- Simulation of process values and diagnostic functions
- Sensor-versions available with PEEK, PVDF or PP

Please see fitting S020



The analysis gauge, Type 8228, includes a detachable display module. This is used for setup, configuration and calibration or required as a process value display. For temperature calibration, a temperature sensor is included as standard.

## Technical Data

### Complete device data (Fitting + conductivity meter)

**Pipe diameter** DN15 to 400

### Conductivity measurement

Measuring range	100 $\mu$ S/cm...2 S/cm
Resolution	0.1 $\mu$ S/cm
Measurement deviation	$\pm$ (2% of the measured value + 5 $\mu$ S/cm)
Linearity	$\pm$ 2%
Repeatability	$\pm$ (0.2% of the measured value + 2 $\mu$ S/cm)
Response time t90	from 3 s (without filter) to 40 s (with slow filter)

### Temperature measurement

Measuring range	-40 °C to +150 °C (-40 to 302 °F)
Resolution	0.1 °C (0.18 °F)
Measuring uncertainty	$\pm$ 1 °C (1.8 °F)
Response time t90	< 280 s (without filter)

### Temperature compensation

- none or
- according to a predefined graph (NaCl, NaOH, HNO<sub>3</sub> or H<sub>2</sub>SO<sub>4</sub>) or
- according to a graph defined especially for your process

### Medium temperature with conductivity sensor in

PVDF	-15 °C to +100 °C (5 to 212 °F)
PP	0 °C to +80 °C (32 to 176 °F)
PEEK	-15 °C to 130 °C (5 to 266 °F)

Temperature limits may depend on the material the S020 fitting used is made of. Refer to the relevant data sheet or instruction manual and the pressure/temperature diagram of the fluid on page 3. If the temperature ranges given for the device and the fitting are different, use the most restrictive range.

### Fluid pressure (max.)

#### with conductivity sensor in

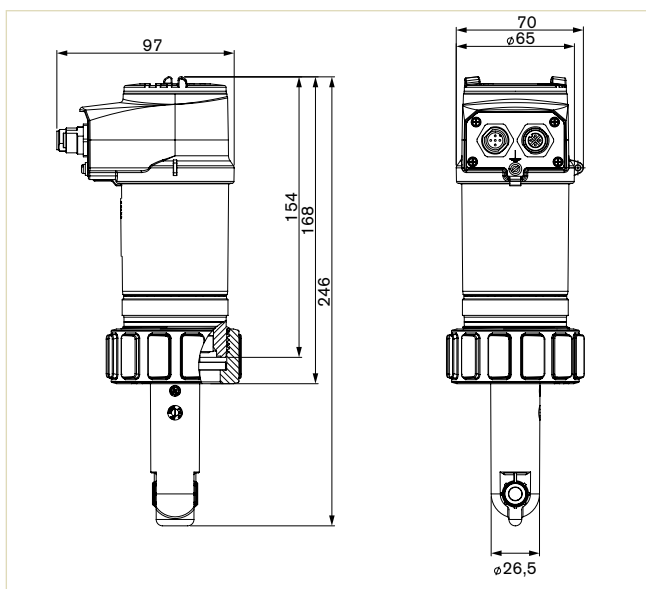
PVDF, PP	PN6 (87 PSI)
PEEK	PN10 (145 PSI)

Pressure limits may depend on the material the S020 fitting used is made of. Refer to the relevant data sheet or instruction manual and the pressure/temperature diagram of the fluid on page 3. If the temperature ranges given for the device and the fitting are different, use the most restrictive range.

### Environment

<b>Ambient temperature</b>	-10 °C to +60°C (14 to 140 °F) (operating and storage)
<b>Relative humidity</b>	$\leq$ 85%, without condensation
<b>Height above sea level</b>	Max. 2000 m

## Envelope Dimensions [mm] (see datasheet for details)



## Technical Data (continued)

### General data

**Compatibility** Any pipe which are fitted out with Bürkert INSERTION Fitting S020 (see corresponding data sheet)

### Materials

Housing / Cover	Stainless steel 1.4404, PPS / PC
Seal / Screws	EPDM / Stainless steel
Fixed connector holder	Stainless steel 1.4404 (316L)
M12 fixed connector	Brass nickel plated
Display / Navigation key	PC / PBT
Nut	PC

### Wetted part materials

Sensor holder	PP, PVDF or PEEK
Seal	FKM (standard) or EPDM (option)

### Temperature sensor

Integrated in the sensor

### Display (accessories)

Grey dot matrix 128x64 with backlighting

### Electrical connections

2 outputs meter (3-wire)	1x 5-pin M12 male fixed connector,
4 outputs meter (3-wire)	1x 5-pin M12 male + 1x 5-pin M12 female fixed connectors

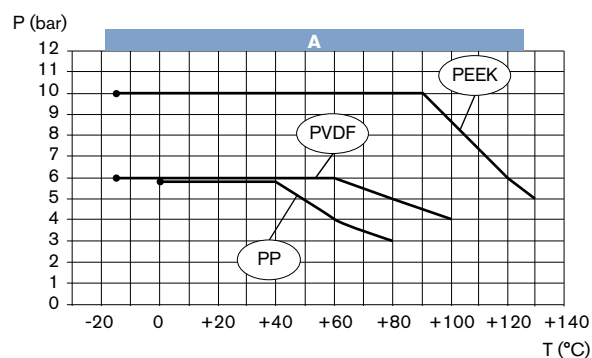
### Connection cable

Shielded cable,  $\varnothing$  3 to 6.5 mm; max. 0.75 mm<sup>2</sup> cross section

## Technical Data (continued)

Electrical data	
<b>Supply voltage</b>	12 - 36 V DC, $\pm 10\%$ oscillation rate, filtered and regulated, SELV (safety extra low voltage) circuit with a non dangerous energy level
<b>Current consumption with sensor</b>	$\leq 25$ mA (at 12 V DC and without the consumption of the 4... 20 mA output)
<b>Reversed polarity of DC</b>	Protected
<b>Voltage peak</b>	Protected
<b>Short circuit</b>	Protected
<b>Output</b>	
Transistor	Polarized, galvanically insulated configurable through wiring and through parameterizing as sourcing (PNP) or sinking (NPN) output NPN: 1 - 36 V DC, max. 700 mA (or 500 mA max. per transistor if both transistor outputs are wired) output PNP: V+ supply voltage, max. 700 mA (or 500 mA max. per transistor if both transistor outputs are wired)
Current (3-wire)	4... 20 mA configurable through wiring and through parameterizing as sourcing or sinking, 22 mA to indicate a fault (can be parameterized) max. loop impedance: 1100 $\Omega$ at 36 V DC; 610 $\Omega$ at 24 V DC; 100 $\Omega$ at 12 V DC
Uncertainty of the output value	1% of the full scale
Response time (10% - 90%)	150 ms (default value)
Standards, directives and approvals	
<b>Protection class acc. to EN 60529</b>	IP65 and IP67 with M12 connectors plugged in and tightened and electronic module cover fully screwed down
<b>Standard and directives CE</b>	
EMC	EN 61000-6-2, EN 61000-6-3 and Annex 1, EN 61326-1-7 (Table 2)
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration / Shock	EN 60068-2-6 / EN 60068-2-27

## Pressure/temperature chart



A: Application range for complete device (conductivity meter with either PP, PVDF or PEEK sensor inserted into a Stainless steel S020 fitting)

## Ordering Chart

Holder material	Output	Seal material	Electrical connection	Item No
PP	1 x transistor NPN/PNP + 1 x 4 to 20 mA	FKM	5-pin M12 connector	566 601
	2 x transistor NPN/PNP + 2 x 4 to 20 mA	FKM	5-pin M12 male connector + 5-pin M12 female connector	566 602
PVDF	1 x transistor NPN/PNP + 1 x 4 to 20 mA	FKM	5-pin M12 connector	566 603
	2 x transistor NPN/PNP + 2 x 4 to 20 mA	FKM	5-pin M12 male connector + 5-pin M12 female connector	566 604
PEEK	1 x transistor NPN/PNP + 1 x 4 to 20 mA	FKM	5-pin M12 connector	566 605
	2 x transistor NPN/PNP + 2 x 4 to 20 mA	FKM	5-pin M12 male connector + 5-pin M12 female connector	566 606

### Note for ordering chart:

For a complete conductivity unit the following items must be ordered:

- Transmitter Type 8228
- INSERTION Fitting Type S020

Further versions and information see datasheet type 8228.

## Options

- UL and CSA approvals
- Preparameterized conductivity meters

## Pressure transmitter / Switch

- Pressure measurement and switch in one device
- Switch for alarm or event logging
- Bar graph display for local monitoring
- Continuous or on/off control
- 2-wire transmitter



Programmable pressure sensor with switching and transmitting functions. It has a large display with bar graph and simple menu guided controls. Connection to the process with standard stainless steel connection. The process value can be transmitted to a PLC via a 4-20 mA signal.

### Technical Data

#### General data

##### Materials

Housing, cover	PC, +20% glass fibre
Front panel folio / Screws	Polyester / Stainless steel
Cable plug/Multipin	PA
Materials wetted parts	Stainless steel
Seal	FKM (EPDM option)

##### Sensor element

Ceramic cell ( $\text{Al}_2\text{O}_3$ )

##### Service life of pressure cell

Min. 100 million cycles

##### Electrical connections

Adjustable 5-pin M12 connector for 5-pin  
Socket (included)

##### Voltage supply cable

50 m, shielded, 0.14 up to 0.5 mm<sup>2</sup> max.

#### Complete device data (pipe + electronic module)

##### Pipe diameter

Any pipe with sensor connection 1/2"

##### Measuring range

up to 1, 2, 5, 10, 20 or 50 bar

##### Medium temperature

-20 up to 100°C  
(+100°C for an ambient temperature of max. 40°C)

#### Typical accuracy

##### Transmitter 2-wire version

for 0°C < T < 70°C	≤ ±1% of F.S.*
for -20°C < T < 0°C	≤ ±1% ± 0.03% of F.S.* / °C
for 70°C < T < 100°C	≤ ±1% ± 0.03% of F.S.* / °C

##### Switch version

≤ ±1.5% of F.S.\*

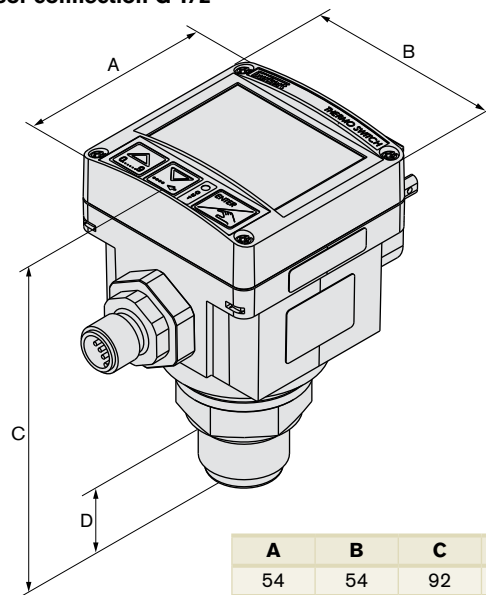
#### Typical repeatability

Transmitter 2-wire version	≤ ±0.06%
Switch version	≤ ±0.25%

\* F.S. = Full scale

### Envelope Dimensions [mm] (see datasheet for details)

#### Sensor connection G 1/2"



A	B	C	D
54	54	92	18

### Options

- Cable plug, Type 2508, acc. to EN 175301-803
- Outputs: Relay 3 A/250 or 3 A/30 V DC

## Technical Data (continued)

Electrical data	
<b>Power supply</b>	12-30 V DC, filtered and regulated
<b>Overvoltage protection</b>	Yes, for power supply and for transistor outputs
<b>Current consumption</b>	
Transmitter 2-wire version	< 30 mA (+700 mA max. per transistor output used)
Switch version	< 750 mA (with load - PNP output configuration) < 80 mA (with load - Relay version)
<b>Output</b>	
<b>Transmitter 2-wire version</b>	
Transistor (programmable)	open collector, 2 NPN or 2 PNP, 700 mA max., NPN: [(V+) minus 0.5 VDC] - 0 VDC PNP: 0.5 VDC - (V+) protected against short circuit 4-20 mA, Loop resistance: 800 Ω at 30 V DC, 550 Ω at 24 V DC, 300 Ω at 18 V DC (For more details, see instruction manual)
Process value	
<b>Switch version</b>	
Transistor (programmable)	open collector, NPN / PNP, 700 mA max., NPN: 0.2 - 30 VDC ; PNP: (V+) protected against short circuit
Optional relay (programmable)	Normally open/normally closed 3 A / 250 V AC or 3 A / 30 V DC (relay)
<b>Reversed polarity of DC</b>	Protected (for power supply and all outputs)
Environment	
<b>Ambient temperature</b>	0 up to 60°C (operating and storage)
<b>Relative humidity</b>	≤ 80%, non condensated

## Standards, directives and approvals

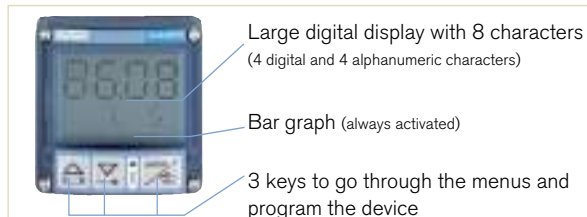
<b>Protection class</b>	IP65 with connector plug-in
<b>Standards and directives</b>	
EMC	Transmitter version: EN 50081-1, 61000-6-2 Switch version: EN 50081-1, 50082-2
Low voltage	Transmitter version: EN 61010-1 Switch version: EN 61010-1
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration	EN 60068-2-6
Shock	EN 60068-2-27

\* 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
<b>Fluid group 1, §1.3.a</b>	DN25 only
<b>Fluid group 2, §1.3.a</b>	DN≤32, or DN>32 and PN*DN ≤1000
<b>Fluid group 1, §1.3.b</b>	DN≤25, or DN>25 and PN*DN ≤2000
<b>Fluid group 2, §1.3.b</b>	DN≤200

## Main features

### Display



### Software main features

#### Switch and transmitter

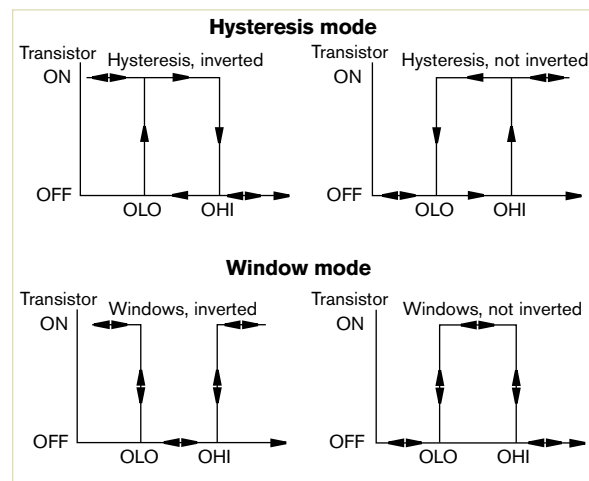
- International measuring units
- 10-segment bar graph
- Teach-In for an improved accuracy
- Simulation mode to test the programming of the switching points, in dry conditions

#### Transmitter

- Simulation mode to test the programming of 4-20 mA output, in dry conditions
- Display and storage of min/max value
- Protection by code against unauthorized access
- Reset function to default parameters
- Alarm output programmable as internal default alarm

### Working mode of alarm outputs

- 2 switching modes for the output, either hysteresis or window, inverted or not



- Programmable delay before switching
- Output available as transistor NPN or PNP, relay (up to 3A)
- Outputs can be programmed as internal default alarm.

## Ordering Chart

Pressure range	Electrical connection	Output	Burst Pressure [bar]	Max. Pressure [bar]	Item no. Sensor connection G 1/2
<b>Transmitter</b>					
0 - 1	Free positionable 5-pin, M12	4 - 20 mA + 2 NPN or 2 PNP <sup>1)</sup>	4	2	557 934
0 - 2	Free positionable 5-pin, M12	4 - 20 mA + 2 NPN or 2 PNP <sup>1)</sup>	7	4	444 507
0 - 5	Free positionable 5-pin, M12	4 - 20 mA + 2 NPN or 2 PNP <sup>1)</sup>	12	10	444 506
0 - 10	Free positionable 5-pin, M12	4 - 20 mA + 2 NPN or 2 PNP <sup>1)</sup>	25	20	444 503
0 - 20	Free positionable 5-pin, M12	4 - 20 mA + 2 NPN or 2 PNP <sup>1)</sup>	50	40	444 504
0 - 50	Free positionable 5-pin, M12	4 - 20 mA + 2 NPN or 2 PNP <sup>1)</sup>	120	100	444 505

<sup>1)</sup> PNP standard, can be change in NPN with jumpers on electronic board

## Accessories

Description	Item no.
5-pin M12 female cable connector with plastic threaded locking ring	917 116
5-pin M12 female connector moulded on cable (2 m, shielded)	438 680



# Laboratory Analysis made simple.



Every drop counts. With TwinPower technology, high efficiency laboratory analysis is effortless. Fewer reagents are required because the internal volume of the solenoid valves has been reduced to an absolute minimum. At the same time, energy consumption is less because two smaller solenoid coils share the work in the valve, making this system more durable and reliable than previous systems.

The 6624 TwinPower: So much cleverness in such a small space. More minimum – hardly possible.

**We make ideas flow.**

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## Pressure Transmitter for general applications

- Piezoresistive or thin film sensor element
- Available with flush diaphragm standard or acc. to EHEDG
- Housing and wetted parts in corrosion-resistant stainless steel
- Standard signal 4-20 mA for connection to automation-system
- Connector plug for fast installation and service



The 8323 compact pressure transmitter is designed to cover the majority of industrial applications in the field of industrial pressure measurement technology. High accuracy, compact design, robust construction and flexibility make this instrument universal and suitable for different measurement functions. For technical reasons piezoresistive sensor element is used for measuring ranges up to 16 bar and thin film sensor element for the measuring range of 25 bar. Wetted parts are made of stainless steel and completely welded. Internal seal elements, which could restrict the choice of measuring materials, are excluded.

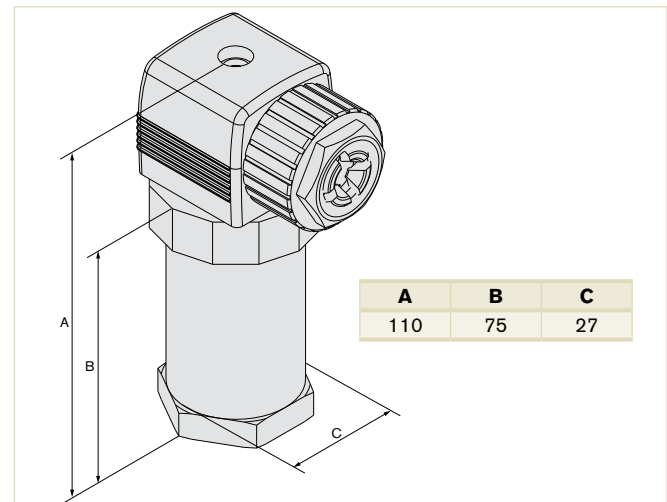
### Technical Data

<b>Pipe diameter</b>	Any pipe with sensor connection:
Standard version	G1/2" A acc. to DIN 16288
Flush diaphragm version	G1" B with O-ring (range up to 1.6 bar) G1/2" B with O-ring (range > 1.6 bar) G1" B for EHEDG (all ranges) [Weld-on socket with connection G1/2"B, G1"B]
<b>Material - Housing</b>	Stainless steel 1.4571
<b>Wetted parts</b>	
Standard version	Stainless steel 1.4571 (and 1.4542 with 25 bar)
Flush diaphragm version	Stainless steel 1.4571, FKM seal
EHEDG flush diaphragm	Stainless steel 1.4571, EPDM seal
<b>Internal transmitting liquid</b>	Synthetic oil (only for pressure range up to 16 bar or for flush diaphragm units)
<b>Electrical connection</b>	4-pin cable plug, Type 2508, acc. to DIN EN 175301-803 (included in delivery)
<b>Measurement range</b> [Pressure reference = relative pressure (atmospheric)]	0 up to 0.1, 0.16, 0.25, 0.4, 0.6, 1.0, 1.6, 2.5, 4.0, 6.0, 10.0, 16.0 or 25.0 bar
<b>Sensor element</b>	piezo ( $\leq 16$ bar) / thin film ( $\leq 25$ bar)
<b>Fluid temperature</b>	
Std. version	-20 up to +100 °C
Std flush diaphragm version	-30 up to +100 °C
Flush diaphragm EHEDG	-20 up to +150 °C
<b>Compensated T° range</b>	0 up to +80 °C
<b>Temperature coefficient</b>	in compensated T° range
<b>Average Tc of zero</b>	
Standard version	$\leq 0.2\%$ of F.S.* / 10K
Flush diaphragm version	$\leq -0.2\%$ to $+0.3\%$ of F.S.* / 10K
Average Tc of Span	$\leq 0.2\%$ of F.S.* / 10K
<b>Accuracy</b>	$\leq 0.5\%$ of F.S.* (2-point calibration) <sup>1)</sup> $\leq 0.25\%$ of F.S.* (Best fit calibration, BFSL) <sup>1)</sup>
<b>Hysteresis</b>	$\leq 0.1\%$ of F.S.*
<b>Repeatability</b>	$\leq 0.05\%$ of F.S.*
<b>1-year stability</b>	$\leq 0.2\%$ of F.S.* (at reference condition)

<sup>1)</sup> Calibrated in vertical mounting position with pressure connection bottom

\* F.S.=Full scale

### Envelope Dimensions [mm] (see datasheet for details)



### Technical Data (continued)

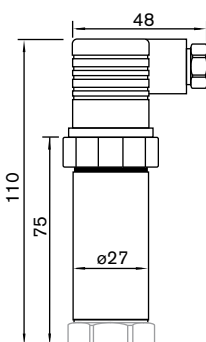
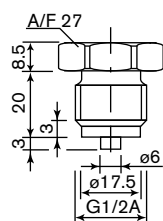
<b>Electrical data</b>	
<b>Power supply [Vs]</b>	10 -30 V DC
<b>Reversed polarity of DC</b>	Protected
<b>Overvoltage protection</b>	Yes
<b>Short circuit protection</b>	Yes
<b>Output</b>	Standard 4-20 mA signal, 2 wires
<b>Load in <math>\Omega</math></b>	$\leq (V_s [V] - 10 [V]) / 0.02 [A]$
<b>Adjustability: Zero / span</b>	$\pm 10\%$
<b>Response time</b>	$\leq 1$ ms
<b>Environment</b>	
<b>Ambient temperature</b>	
Standard version	-20 up to +80°C (-4 to 176 °F)
Standard Flush Diaphragm ver.	-20 up to +80°C (-4 to 176 °F)
EHEDG Flush Diaphragm ver.	-20 up to +80°C (-4 to 176 °F)
<b>Storage temperature</b>	
Standard version	-40 up to +100°C (-40 to 212 °F)
Standard Flush Diaphragm ver.	-40 up to +100°C (-40 to 212 °F)
EHEDG Flush Diaphragm ver.	-20 up to +100°C (-4 to 212 °F)
<b>Standards, directives and approvals</b>	
<b>Protection class</b>	IP65 with cable plug mounted and tightened
<b>Standards and directives</b>	
EMC	EN 50081-1, 50081-2, 50082-2
Shock resistance	IEC 770, 1000g (mechanical shock)
Vibration resistance	IEC 770, 2g (vibration under resonance)

## Dimensions

### Pressure connection:

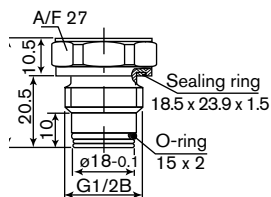
#### Standard version

##### G 1/2" A

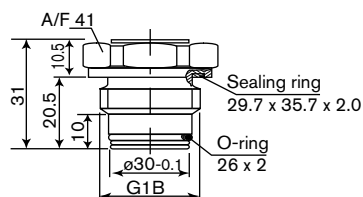


#### Flush diaphragm version

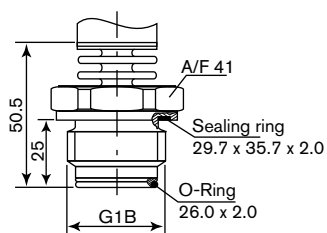
##### G 1/2" B



##### G 1" B

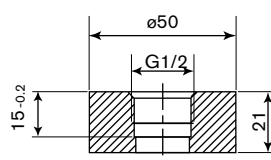


##### EHEDG G 1" B

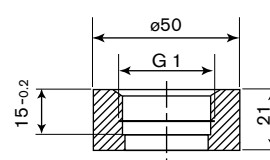


### Weld-on socket for pressure connection flush diaphragm version

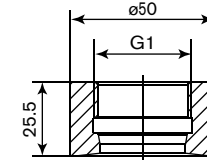
##### G 1/2" B



##### G 1" B



##### EHEDG G 1" B



## Ordering Chart

Pressure range [bar]	Max. pressure [bar]	Bursting pressure [bar]	Power supply	Output signal	Item no.			
					Standard	Standard Flush diaphragm G 1/2" B	Standard Flush diaphragm G 1" B	EHEDG Flush diaphragm G 1" B
0 - 0.10	1	2	10 - 30 V DC	4 - 20 mA	417 692	–	552 063	551 803
0 - 0.16	1.5	2	10 - 30 V DC	4 - 20 mA	417 693	–	552 064	–
0 - 0.25	2	2	10 - 30 V DC	4 - 20 mA	417 694	–	–	–
0 - 0.40	2	2	10 - 30 V DC	4 - 20 mA	417 695	–	552 065	551 675
0 - 0.60	4	4	10 - 30 V DC	4 - 20 mA	417 696	–	–	551 676
0 - 1.00	5	5	10 - 30 V DC	4 - 20 mA	417 697	–	552 066	551 677
0 - 1.60	10	10	10 - 30 V DC	4 - 20 mA	417 698	–	–	551 678
0 - 2.50	10	10	10 - 30 V DC	4 - 20 mA	417 699	–	–	551 679
0 - 4.00	17	17	10 - 30 V DC	4 - 20 mA	417 700	–	–	–
0 - 6.00	35	35	10 - 30 V DC	4 - 20 mA	417 701	552 067	–	–
0 - 10.0	35	35	10 - 30 V DC	4 - 20 mA	417 702	552 068	–	551 684
0 - 16.0	80	80	10 - 30 V DC	4 - 20 mA	417 703	552 069	–	–
0 - 25.0	50	250	10 - 30 V DC	4 - 20 mA	417 704	–	–	–

## Accessories

Description	Item no.
Weld-on socket G 1/2"	443 295
Weld-on socket G 1"	444 137
Weld-on socket EHEDG G 1"	443 296

# Temperature Transmitter / Switch with display

8400

- Menu-guided configuration
- Wide choice of connections and outputs
- Large digital display
- Bar graph display for local monitoring
- Continuous on/off control
- 2-wire transmitter



This intelligent sensor / switch with a particularly large display is designed specifically for monitoring limit values or an on/off or continuous control loop. The switching points can be programmed directly via buttons on the display or optionally externally by a PLC via a 4-20 mA standard signal input. In addition, the process value can be transmitted via a 4-20 mA signal to the PLC.

## Technical Data

### General data

#### Materials

Housing	PC, +20% glass fibre
Front panel folio / Screws	Polyester / Stainless steel
Cable plug, Multipin	PA

#### Materials wetted parts

Sensor element	Stainless steel
Seal	FKM

**Sensor element** Pt100

**Screw-in thread** G 1/2"

**Electrical connections** Cable plug: EN 175301-803  
Multipin: swivel M12, 5-pin or M12, 4-pin or 8-pin

**Voltage supply cable** max. 100 m, shielded, 0.14 up to 0.5 mm<sup>2</sup> max.  
5 Ω max. cable impedance (Wall-mounted version)

### Complete device data (pipe + electronic module)

**Pipe diameter** Any pipe with sensor connection 1/2"

**Measuring range** -40 to +125 °C (for ambient temp. between 0 and +40 °C)  
Compact version -40 to +90 °C (for ambient temp. > +40 °C)

**Medium temperature** +125 °C max.

**Fluid pressure max.** PN16

**Switching accuracy** ±0.5 °C (0 up to +80 °C)  
±1.5 °C (outside of 0 up to +80 °C)

**Repeatability** ≤ ±0.4%

### Electrical data

**Power supply** 12-30V DC, filtered and regulated

### Outputs - Compact version

Transistor (programmable)	NPN and PNP, open collector, 5 up to 30V DC, 700 mA max., protected against short circuits
Relay (programmable)	3A/250V AC or 3A/30V DC 3A/48V AC or 3A/30V DC <sup>1)</sup>

### Input external setpoint

Compact version	4-20 mA, galvanic insulation, max. input impedance: 250 Ω
-----------------	---

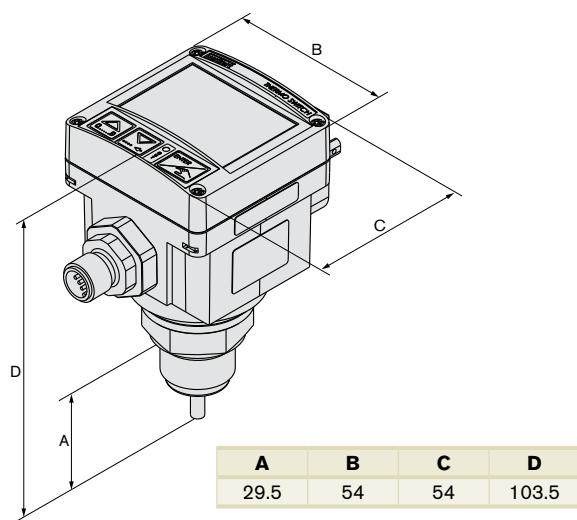
### Current consumption

Compact version	Max. 80 mA (no load)
-----------------	----------------------

**Response time (10 to 90%)** 7 s (for one step increment from 0 up to 100 °C)

**Reversed polarity of DC** Protected

## Envelope Dimensions [mm] (see datasheet for details)



### Environment

**Ambient temperature** -20 up to 60 °C

**Relative humidity** ≤ 80%, without condensation

### Standards, directives and approvals

**Protection class** IP65 with connector plug-in

### Standards and directives

EMC	EN 50081-1, 50082-2
Security	EN 61010-2
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration	EN 60068-2-6
Shock	EN 60068-2-27

\* 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
<b>Fluid group 1, §1.3.a</b>	DN25 only
<b>Fluid group 2, §1.3.a</b>	DN ≤ 50
<b>Fluid group 1, §1.3.b</b>	DN ≤ 50
<b>Fluid group 2, §1.3.b</b>	DN ≤ 50

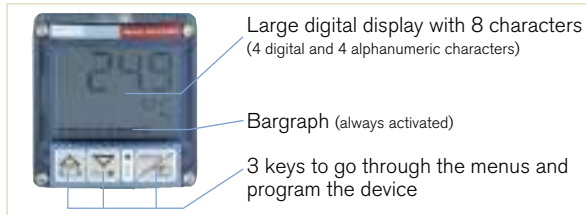
<sup>1)</sup> Valid for: external setpoint input and process value output

## Option

- 8400: Outputs : Relay 3 A/250 or 3 A/30V DC

## Main features

### Display



### Software main features

- International measuring units
- 10-segment bar graph
- Temperature adjusting for a better accuracy
- Simulation mode to test the programming of the switching points, in dry conditions

### 8400 with external setpoint

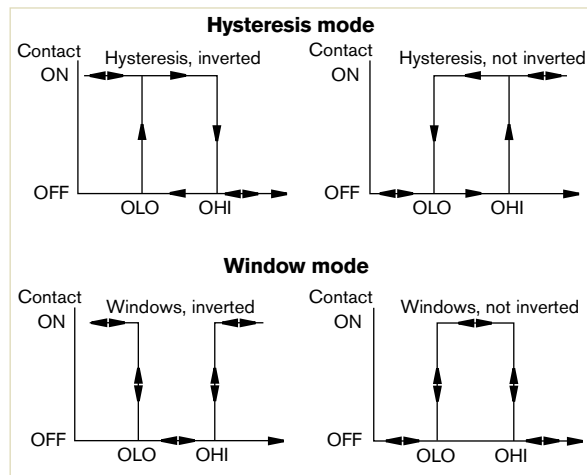
- The switching points are automatically adjusted by the 4-20 mA input signal originating from a PLC.
- On/Off relay output

### 8400 with process value option

- This version delivers a 4-20 mA electric signal whose value is the image of the measured temperature
- On/Off relay output
- 4-20 mA output
- External setpoint (4-20 mA input)

### 8400 with standard On/Off output

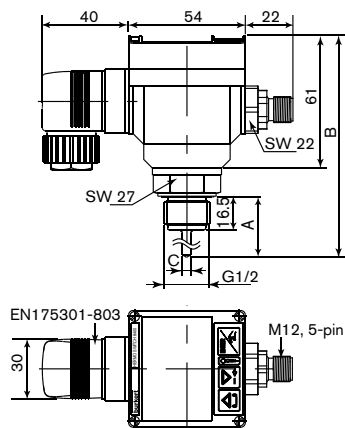
- 2 switching modes for the output, either hysteresis or window, inverted or not



- Programmable delay before switching
- Possible outputs depending on the version: relay, transistor NPN or transistor PNP

## Dimensions [mm]

### 8400 Standard



Version	A	B	C
Standard	29.5	103.5	Ø 4

## Ordering Chart

8400 Sensor/Switch for sensor connection G 1/2"	Item no.
NPN and PNP, free positionable 5-pin M12	436 501
Transmitter Version is available with 4 - 20 mA output and relay with 8-pin M12 and cable plug EN175301-803	444 696
Relay version is available, free positionable 5-pin M12 and cable plug EN175301-803	436 503

## Accessories

ON/OFF Temperature Control System 8400	Item no.
5-pin M12 female connector with moulded on cable (2 m long, shielded)	438 680

# Universal Process Controller eCONTROL

8611


## 54 x 54 x 50 mm 1/16 DIN Cut out Compact Universal controller

- For flow, pressure, pH, conductivity, level and temperature
- Continuous control: 2-point, 3-point, On/Off, ratio control
- Easy connectable to pneumatically or electrically driven systems



Thanks to its compact design, the universal 8611 controller is specially designed for compact control system applications. It is compatible with a wide range of proportional control valves and connects with an electro-pneumatic servo-system for pneumatically actuated process control valves. The PI process controller is equipped with many additional functions. The actual process value can be supplied as one of three inputs; analogue 4-20 mA/0-10V, frequency or Pt100 signal directly to the universal controller. The process switching points can be set via a 4-20 mA/0-10V signal or with the keypad.

### Technical Data

General data	
<b>Materials</b>	
Housing, cover	PC, +20% glass fibre
Front panel folio / Screws	Polyester / Stainless steel
Multipin	CuZn, nickel-plated
Wall-mounting holder	PVC
<b>Display</b>	Dual-line 8-digit LCD with backlight
<b>Electrical connections</b>	Multipin: M12-8pin, M8-3pin, Terminals Insert for direct connecting to electrical components acc. to DIN EN 175301-803
<b>Voltage supply cable</b>	0.5 mm <sup>2</sup> max. cross section, max. 100 m, shielded
<b>Environment</b>	
<b>Ambient temperature</b>	0°C to +70°C (operating and storage)
<b>Relative humidity</b>	≤ 80%, without condensation
<b>Height above sea level</b>	max. 2000 m
<b>Standards and approvals</b>	
<b>Protection class</b>	IP65
<b>Standard</b>	EMC, CE EN 61326
<b>Approvals</b>	UL-Recognized for US and Canada  61010-1 + CAN/CSA-C22 No.61010-1

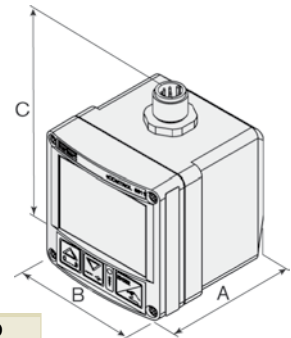
### Options (see datasheet for details)

- Mounted on flow sensor fitting
- Mounted on rail or valve

### Envelope Dimensions [mm] (see datasheet for details)

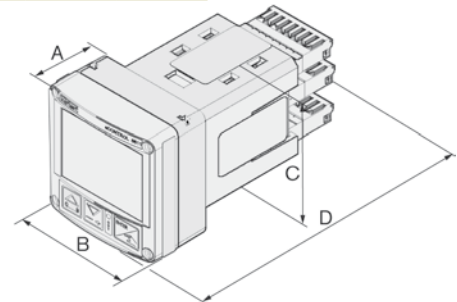
#### Valve-mounting

A	B	C
61	55	76

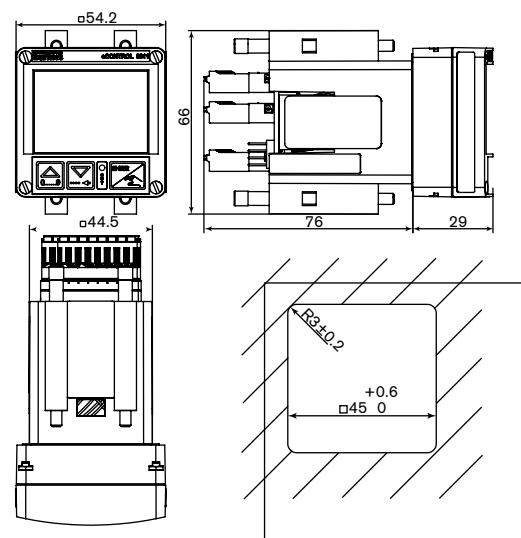


#### Panel-mounting

A	B	C	D
29	55	66	105



#### 8611 eCONTROL Panel-mounting



## Technical data (continued)

Electrical data	
<b>Operating voltage</b>	24 V DC $\pm 10\%$ , filtered and regulated
<b>Power consumption</b>	approx. 2 W (without valve-without sensor input)
<b>Input</b>	
<b>Setpoint</b>	
Standard 4 - 20 mA	<b>Sourcing mode</b> Max. input impedance: 70 $\Omega$ Resolution: 5.5 $\mu$ A
Standard 0 - 10 V	Max. input impedance: 11.5 k $\Omega$ Resolution: 2.5 mV
<b>Sensors</b>	
Standard 4 - 20 mA	Sourcing mode Max. input impedance: 70 $\Omega$ Resolution: 5.5 $\mu$ A
Standard 0 - 10 V	Max. input impedance: 11.5 k $\Omega$ Resolution: 2.5 mV
<b>Frequency</b>	
Input 1	External sensor min. 0.25 Hz / max. 1 kHz input impedance: > 1 k $\Omega$ Signal type: Sinus, square, triangle pulse (> 3000 mVpp, max. 30 Vpp)
	Internal Hall sensor min. 0.25 Hz / max. 1 kHz (only with Bürkert Type S030 flow fitting)
<b>Pt100 (2 wires)</b>	
Measuring range: 0°C to 200°C Measuring current: 1 mA Measuring error: < 0.5°C	
<b>Binary input</b>	
Input impedance: 10 k $\Omega$ Operating threshold: 3 V - 30 V Max. frequency: 1 kHz	

<b>Outputs</b>	
Continuous signal	<b>Standard signal 4 - 20 mA</b> max. loop resistance: 680 $\Omega$ accuracy: 0.5% <b>Standard signal 0 - 10 V</b> max. current: 20 mA accuracy: 0.5%
Discontinuous signal	<b>2 transistor outputs for PWM<sup>*)</sup> or PTM<sup>*)</sup> signal</b> Control frequency 1.2 kHz - 20 Hz resolution max.: 16 Bit (depend from frequency) max. current load: 1.5 A switching voltage: 24 V DC
Binary output	<b>Transistor output (PNP) (configurable)</b> max. current load: 1.5 A switching voltage: 24 V DC
Power supply sensor/actuator	24 V DC, max. 1 A
Total load of all outputs	max. 1.5 A
<b>Controller modes</b>	
PI-Control, 2 point and 3 point, cascaded Up to 2 Binary out with windows and hysteresis mode	

<sup>\*)</sup> PWM = pulse width modulation  
PTM = pulse time modulation


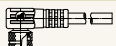
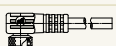
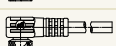
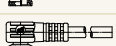








## Ordering Chart

Mounting position	Sensor Input (external)	Controller outputs	Setpoint setting	Process value output	Binary In/Out	UL Recognition	Item no.
Proportional valve	Temperature (Pt100)	1 x PWM	4 - 20 mA 0 - 10 V	4 - 20 mA 0 - 10 V	1 x Bin In 1 x Bin Out	none	204 642
	Flow rate (Frequency - NPN)	1 x PWM	4 - 20 mA 0 - 10 V	4 - 20 mA 0 - 10 V	1 x Bin In 1 x Bin Out	none	204 639
	All sensors with standard signal (4 - 20 mA / 0 - 10 V)	1 x PWM	4 - 20 mA 0 - 10 V	4 - 20 mA (*) 0 - 10 V	1 x Bin In 1 x Bin Out	none	186 289
Panel	2 x Frequency (NPN/PNP) 1 x 4 - 20 mA / 0 - 10 V 1 x RTD	1 x PWM 2 x PTM 1 x 4 - 20 mA / 0 - 10 V	4 - 20 mA 0 - 10 V	4 - 20 mA 0 - 10 V	1 x Bin In 2 x Bin Out	none	210 206
						UL-Recognized	562 655

\* Either PWM/PTM or 4-20 mA/0-10 V selectable as PI-control output. If 4-20 mA/0-10 V selected as PI-output, the process value isn't available.

## Accessories (must be ordered separately)

	Description	Item no.
	Positioning system 8810 for pneumatic actuators with rail-mount adaptor	204 458
	4-pin M8 female right angle connector with self-locking threaded joint and 2 m molded cable (valve output)	918 718
	4-pin M8 female right angle connector with self-locking threaded joint and 5 m molded cable (valve output)	919 412
	3-pin M8 female right angle connector with self-locking threaded joint and 2 m molded cable (sensor input)	918 717
	3-pin M8 female right angle connector with self-locking threaded joint and 5 m molded cable (sensor input)	919 410
	4-pin M8 female connector, straight with snap-on connection and 2 m molded cable (valve output)	919 060
	3-pin M8 female connector, straight with snap-on connection and 2 m molded cable (sensor input)	918 039
	8-pin M12 female connector, straight with screw connection and 2 m molded cable (PUR) (Power supply)	919 061
	8-pin M12 female connector, straight with screw connection, to assemble (Power supply)	918 998
	2-pin female connector, straight with 3 m cable (for connection to Positioning system 8810)	133 486
	2-pin female connector, straight with 5 m cable (for connection to Positioning system 8810)	167 494
	2-pin female connector, straight with 0,3 m wire (for connection to Positioning system 8810)	644 068
	2-pin female connector, straight with 0,6 m wire (for connection to Positioning system 8810)	162 144



# PVD made simple.

Life is complicated enough. So make it simpler — with the new solutions for surface coating from Bürkert — designed specially for the needs of the PVD industry in mind, featuring precise repeatability and multiple opportunities for field-bus connection. Perfect for optimal process yields, high quality and your peace of mind.

A star in our system:  
The MFC 8711.  
Quick to respond  
like no other.



**We make ideas flow.**

[www.burkert.com](http://www.burkert.com)



# Multi-channel, multi-functional transmitter/controller

8619

## 1/4" DIN Panel Mount

- Flexible analytical and flow transmitter
- Unique flexibility
- Intuitive programming
- SD card for data logging and upload/download



Bürkert's 8619 transmitter/controller is the latest addition to the process control program. The 1/4DIN panel mounted transmitter/controller incorporates a large backlit LCD display for adding up to 6 boards in a free mix for pH, conductivity incl. temperature, and output boards are connected to the digital inputs of the mainboard.

Optional software features can be simply activated when required by the application and an SD card is standard for data logging and up/down loading of parameterization files.

Special integrated dosing and control functions allow use in a large range of applications without the need of additional devices.

## Technical Data

### General data

<b>Mounting</b>	panel-mounted (stand. 1/4 DIN housing for 92 x 92 mm cutout) wall-mounted (with mounting plate)
-----------------	---

### Materials

Seal / Screws	Silicone / Stainless steel 316
Support plate for terminals	Stainless steel 304
Terminal blocks	PBT, contact in gold-plated copper alloy
Display / Front panel and keys	PC / Silicone

### Housing

Panel-mounted	PPO (incl. fastening element)
Wall-mounted	PA66 (incl. fastening plate, cable gland, protecting cover (display), protecting cap (free terminal place), stiffener hinge)

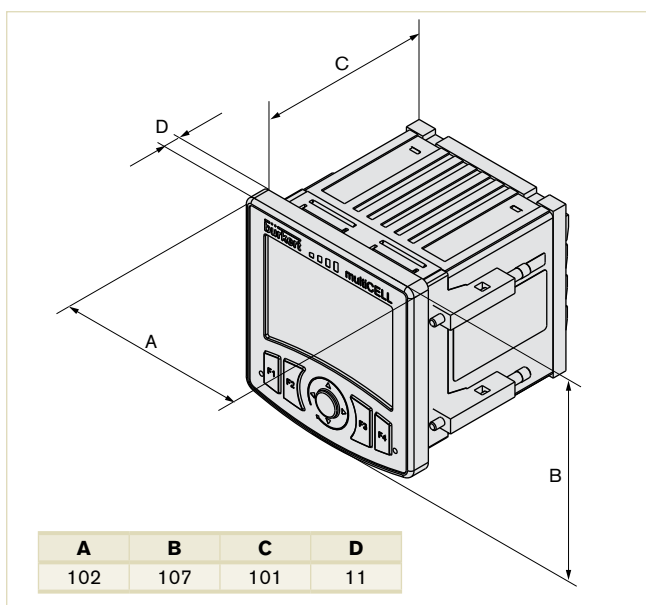
### Supply 110/240 V AC

<b>terminal protecting cover</b> (wall-mounted version)	Stainless steel 304
--	---------------------

### Cover screws (wall-mounted version)

<b>Display</b>	LC graphic display, light blue backlit; 128 x 168 pixels resolution; German, English, French languages
----------------	--

## Envelope Dimensions [mm] (see datasheet for details)



<b>Keypad</b>	4 soft keys [F1] [F2] [F3] [F4] for dynamic functions 1 central navigation key with [↑] [↓] [→] [←] assignments
<b>Data logger</b>	up to 16 values
<b>Sensor monitor</b>	Direct display and verification of measured sensor values
<b>Clock</b>	Real-time clock with date
<b>Board slots</b>	6
<b>Electrical connection</b>	Terminal blocks
<b>Recommended cable</b>	Shielded cable
<b>Solid H05(07) V-U</b>	0.2 to 1.5 mm <sup>2</sup>
<b>Flexible H05(07) V-K</b>	0.2 to 1.5 mm <sup>2</sup>
<b>With wire end ferrule</b>	0.2 to 1.5 mm <sup>2</sup>
<b>With plastic collar ferrule</b>	0.2 to 1.5 mm <sup>2</sup>

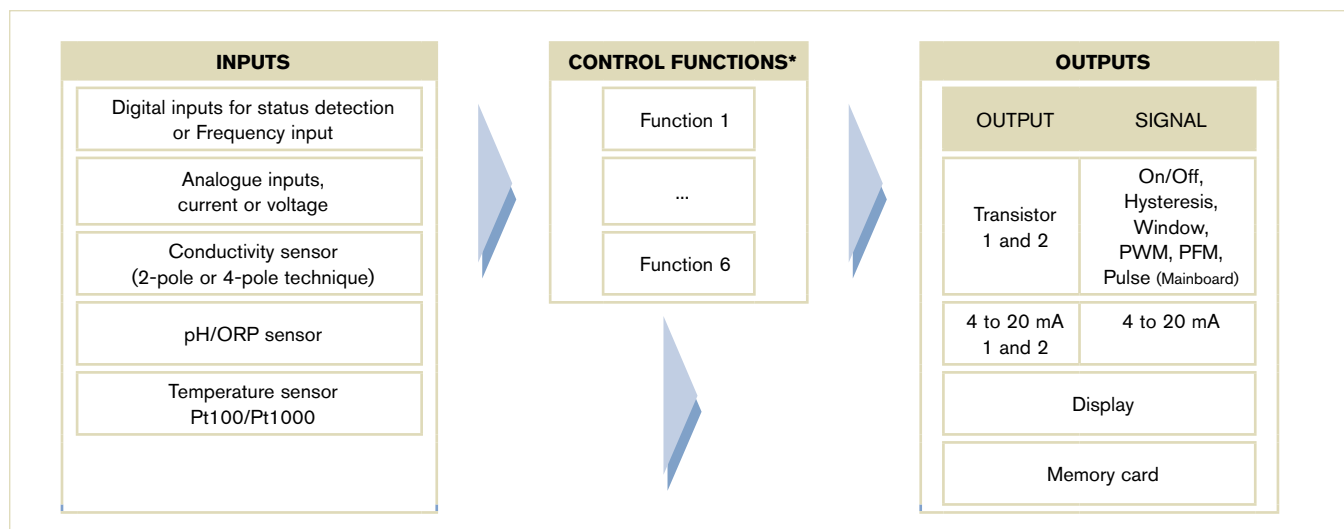
## Technische Daten (Fort.)

Electrical data		
Device version	Panel-mounted - Mainboard	Wall-mounted - Power supply board
<b>Operating voltage</b> <b>(“SUPPLY”)</b>	12 - 36 V DC, ±10%, filtered and regulated, SELV (safety extra low voltage) circuit with a non dangerous energy level	<ul style="list-style-type: none"><li>12 - 36 V DC ±10%, filtered and regulated, SELV (safety extra low voltage) circuit with a non dangerous energy level</li><li>110/240 V AC, 50/60 Hz, max. 500 mA, integrated protection: 3.15 A time delay fuse</li></ul>
<b>Power consumption</b> (of multiCELL device - without additional boards and outputs not connected)	Max. 1.5 VA	Max. 2 VA
<b>Power charges</b> (“PWR OUT” or “POWER OUT” acc. to version)	12 - 36 V DC, max 1.8 A protected against polarity reversals	<ul style="list-style-type: none"><li>12 - 36 V DC version: 12 - 36 V DC, max 1.8 A protected against polarity reversals</li><li>110 - 240 V AC version: 24 V DC±2%, filtered and regulated, SELV (safety extra low voltage) circuit with a non dangerous energy level, max 1.2 A, protected against polarity reversals The allowed max. current depends on the ambient temperature: see diagram below</li></ul>
Device version	Panel-mounted - Mainboard	Wall-mounted - Mainboard
<b>Digital inputs</b> <b>DI1, DI2</b>	Voltage: 0 - 36 V DC, input impedance 3 kΩ Switching threshold : Von = 5 - 36 V DC, Voff < 2 V DC; Frequency: 0.5 to 2500 Hz Galvanic insulation, protected against reversed polarity of DC and voltage spikes	Voltage: 0 - 36 V DC, input impedance 3 kΩ Switching threshold : Von = 5 - 36 V DC, Voff < 2 V DC; Frequency: 0.5 to 2500 Hz Galvanic insulation, protected against reversed polarity of DC and voltage spikes
<b>Digital outputs</b> <b>DO1, DO2</b>	Transistor: can be wired as PNP or NPN, galvanic insulation, protected against short circuit, max. 36 V DC, max. 700 mA per transistor output, 1 A max. in total if both transistor outputs are used; Operating modes: On/Off, Hysteresis, Window, PWM, PFM, Pulse Frequency: max. 2000 Hz	Transistor: can be wired as PNP or NPN, galvanic insulation, protected against short circuit, max. 36 V DC, max. 700 mA per transistor output, 1 A max. in total if both transistor outputs are used Operating modes: On/Off, Hysteresis, Window, PWM, PFM, Pulse Frequency: max. 2000 Hz
<b>Analogue output</b> <b>AO1, AO2</b>	4 to 20 mA, can be wired as sourcing or sinking, galvanic insulation, protected against reversed polarity of DC, max. loop impedance: 1100 Ω at 36 V DC, 610 Ω at 24 V DC, 100 Ω at 12 V DC Resolution: 6 μA	4 to 20 mA, can be wired as sourcing or sinking, galvanic insulation, protected against reversed polarity of DC, max. loop impedance: 1100 Ω at 36 V DC, 610 Ω at 24 V DC, 100 Ω at 12 V DC Resolution: 6 μA
<b>Memory card</b>		
<b>Type</b>	SD (Secure Digital) or SDHC (Secure Digital High Capacity)	
<b>Capacity</b>	max. 8 GB	
<b>Additional boards - output board</b>		
<b>Power consumption</b>	Max. 0.1 VA	
<b>Digital outputs</b> <b>DO1, DO2</b>	Transistor: can be wired as PNP or NPN, galvanic insulation, protected against short circuit, max. 36 V DC, max. 700 mA per transistor output, 1 A max. in total if both transistor outputs are used; Operating modes: On/Off, Hysteresis, Window, PWM, PFM; Frequency: max. 2000 Hz	
<b>Analogue output</b> <b>AO1, AO2</b>	4 to 20 mA, can be wired as sourcing or sinking, galvanic insulation, protected against reversed polarity of DC, max. loop impedance: 1100 Ω at 36 V DC, 610 Ω at 24 V DC, 100 Ω at 12 V DC Resolution: 6 μA	



If the unit is installed in a humid environment or outdoors, the maximum allowable voltage is **35 V DC** instead of 36 V DC

## Process diagram



\* Can be used in parallel and independently

## Ordering Chart

Description	Digital Inputs	Raw signals	RTD	Digital Outputs	Analog	Item no.
BASE unit	2	–	–	2	2	560 205
pH/ORP transmitter	2	1 (pH/ORP)	1	2	2	560 200
pH/ORP transmitter	2	2 (pH/ORP)	2	4	4	560 202
CONDUCTIVITY transmitter	2	1 (Cond.)	1	2	2	560 201
CONDUCTIVITY transmitter	2	2 (Cond.)	2	4	4	560 203
pH/ORP and CONDUCTIVITY transmitter	2	1 (pH/ORP) + 1 (Cond.)	2	4	4	560 204

### Note for ordering the above multiCELL Transmitter / Controller:

In all the above variations are arithmetic, PASS, REJECT, DEVIAT, PROP, the On/Off function standard features. In the basic model, the flow measurement function is included. When a totalizer function is needed, then a flow meter via a digital input (main or input board) must be connected. Other optional features can be ordered later, see data sheet.

# Hot Ideas for Water Chemistry.

The new Bürkert 8620 multi-parameter controller saves time and space by allowing PC configuration and data logging of a wide number of control variants via an SD card slot. With up to 8 control loops that can be run simultaneously and 23 inputs/outputs, the number of control variants is unprecedented. The addition of a digital serial bus, Ethernet, modem and USB connection further enhances the controllers application potential. No matter what your application is – cooling tower, boiler or membrane filtration – the mxCONTROL 8620 will meet all your needs.





# mxCONTROL Multifunction Controller

- Data and event logging
- One controller hardware with dozens of configuration possibilities quickly downloaded via SD card (supplied) or via USB interface
- Ethernet or modem communication with email or call event notification & numerous input/output control signals



The mxCONTROL multifunction controller, is a microprocessor controller designed to automate the control of process variables within a water treatment system (e.g. boiler, cooling tower or Reverse Osmosis system). Sophisticated electronics and state of the art control algorithms ensure that optimum process control is maintained at all times, with minimal operator intervention.

**Note:** To ease configuration and parameterization a free PC-Tool is available at [www.burkert.com](http://www.burkert.com)

## Technical Data

### General details of the device

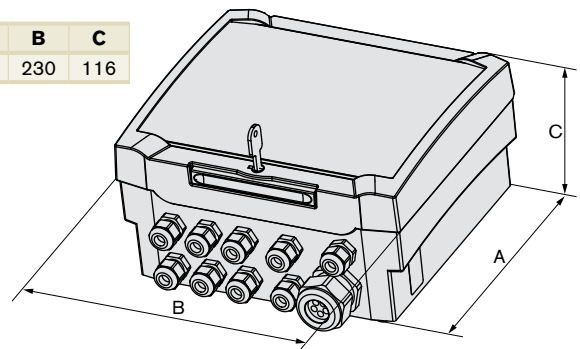
<b>Enclosure</b>	With sealed keypad and display
<b>Enclosure outer dimensions L x W x H</b>	230 x 204 x 119 mm without cable glands
<b>Enclosure material</b>	PC (UL94) with transparent door and key
<b>Weight</b>	1.8 kg
<b>Degree of protection</b>	IP65 with door closed and properly sealed cable glands, waterproof according to NEMA 4X, additional cover of USB port and SD card slot
<b>Graphic display, large and backlit</b>	128 x 64 dots, two coloured (blue and white)
<b>Keypads for manual operation</b>	5 keys for user inputs
<b>Operating temperature</b>	0 °C to +50 °C
<b>Storage temperature</b>	-20 °C to +60 °C

### Electrical details

<b>Mains voltage</b> (power supply)	100 to 240 V AC, 50/60 Hz, no adjustment necessary
<b>Power consumption</b> (of mxCONTROL device)	Max. 35 W (incl. sensor supply at Instrumentation Supply part)
<b>Total power consumption</b> (using the internal power distribution)	Max. 2400 W (at 240 V AC) or max. 1100 W (at 110 V AC) incl. connected actuators at Power Supply part
<b>Total input current <math>I_{in}</math></b> (using internal power distribution)	Max. 10 A
<b>Total output current <math>I_{out}</math></b> (using internal power distribution)	< 10 A (incl. device power consumption of 35 W)
<b>Instrumentation supply for sensors / transistor outputs</b>	24 V DC ( $\pm 5\%$ ), max. 1.04 A (25 W), short circuit and overload protected
<b>Fuse for device protection</b> (Instrumentation)	Internal: electronic fuse, recovers automatically after fault condition is removed
<b>Fuse for relays outputs</b>	Relay outputs to be fused in external installation according to actuators
<b>Inrush current (typ.)</b>	Cold start: 30 A / 230 V AC

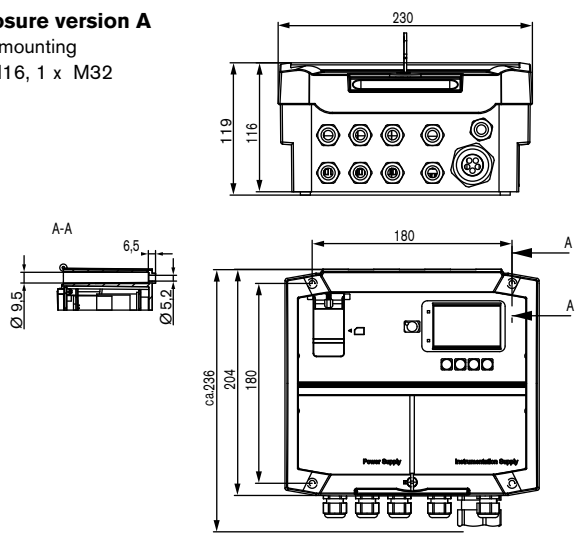
## Envelope Dimensions [mm] (see datasheet for details)

A	B	C
204	230	116



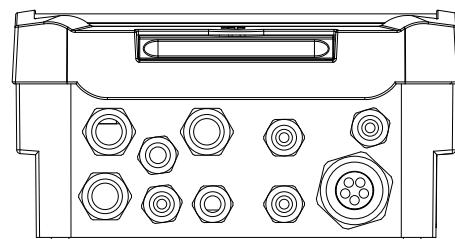
### Enclosure version A

Wall mounting  
9 x M16, 1 x M32



### Enclosure version B

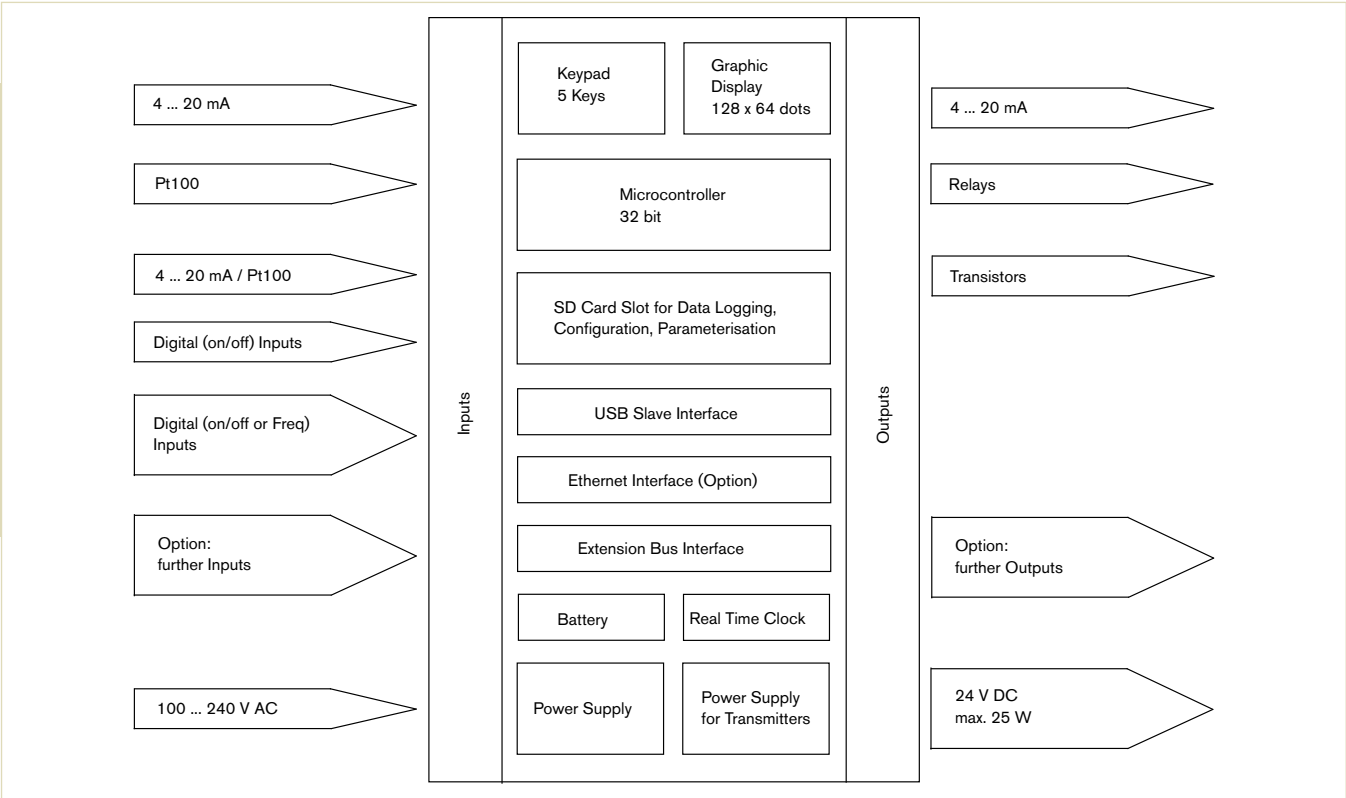
Wall mounting, 6 x M16, 3 x M20, 1 x M32



## Technical Data (continued)

<b>Electrical connections</b>	
<b>Electrical connection power supply</b>	<b>Hardware version 1:</b> Screw terminals, grid 5.08 mm, for wire gauges 0.14 to 1.5/2.5 mm <sup>2</sup> (AWG 26-14) <b>Hardware version 2:</b> Spring type terminals, grid 5.0 mm, for wire gauges 0.2 to 2.5/4.0 mm <sup>2</sup> (AWG 24-12)
<b>Electrical connection instrumentations supply</b>	<b>Hardware version 1:</b> Screw terminals, grid 3.81 mm, for wire gauges 0.14 to 1.0/1.5 mm <sup>2</sup> (AWG 26-16) <b>Hardware version 2:</b> Spring type terminals, grid 3.5 mm, for wire gauges 0.2 to 1.5 mm <sup>2</sup> (AWG 24-16)
<b>Cable glands and cables</b>	<b>Hardware version 1:</b> 9 x M16 (PG9) 5 to 6.5 mm cable 1 x M32 (PG21) 5 to 6 mm cable (5x) <b>Hardware version 2:</b> 4 x M16 (PG9) 5 to 6.5 mm cable 2 x M16 (PG9) 6 to 9.5 mm cable 3 x M20 (PG13) 9 to 13.5 mm cable 1 x M32 (PG21) 5 to 6 mm cable (5x)
Cable diameters shown above are in reference to the outer diameter. The cable glands of the bottom row are equipped with sealing bolts	
<b>Thermal stability:</b> 105 °C for cables at Power Supply part (cable material) 80 °C for cables at Instrumentation Supply part	
<b>Internal equipment - Inputs</b>	
<b>Inputs</b>	<b>Hardware version 1:</b> 4 analog inputs (4 to 20 mA or Pt100) (software-configurable) + 4 digital (on/off or Freq) inputs <b>Hardware version 2:</b> 4 analog inputs 4 to 20 mA + 2 Pt100 + 4 digital (on/off or Freq) inputs + 4 digital (on/off) inputs
<b>Analog inputs - Characteristics</b>	
<b>Input resistance of 4 to 20 mA inputs</b>	Max. 300 Ω
<b>Measuring error of 4 to 20 mA inputs</b>	< 0.2 % FS
<b>Range of Pt100 inputs</b>	-20 to +150 °C
<b>Measuring error Pt100 inputs</b>	Max. ±0.25 K 3 wire connection and software compensated wire resistance required
<b>Digital inputs - Characteristics</b>	
<b>Logical values on/off inputs</b>	1 or HIGH: 13 to 35 V; 0 or LOW: 0 to 4.5 V
<b>Input resistance of on/off inputs</b>	≥ 20 kΩ
<b>Max. frequency</b>	2 kHz
<b>Duty factor frequency</b>	1 : 1
<b>Measuring error frequency</b>	Max. 0.2 % FS
<b>Input accepts signals from</b>	Open collector; open emitter; push-pull output; hall effect; reed switch; micro switch
<b>Internal Equipment - Outputs</b>	
<b>Outputs</b>	<b>Hardware version 1:</b> 5 Relay outputs + 4 analog outputs 4 to 20 mA (optional) + 4 Transistor outputs (optional) <b>Hardware version 2:</b> 5 Relay outputs + 2 analog outputs 4 to 20 mA + 2 Transistor outputs
<b>4 to 20 mA analog outputs - Characteristics</b>	Max. 500 Ohmic load, output resolution 10 bit (effective >9 bit)
<b>Relay outputs - Characteristics</b>	Max. 250 V AC/DC, max. 10 A, potential-free, two-way SPDT contacts, max. 2500 VA (AC), max 40 W Ohmic load (DC), 3 million switching cycles at 1 A, 10 million switching cycles at 0 A
<b>Transistor outputs - Characteristics</b>	24 V DC, Switching capacity each max. 16 W, pnp, max. 2200 Hz
<b>Further internal equipment</b>	
<b>Micro-controller core</b>	32 bit with integrated flash memory
<b>Slot for SD card (memory card)</b>	Can be used for data logging, up- and download of configuration and parameter files
<b>Clock</b>	Real-time clock with calendar
<b>Battery back-up for real-time clock</b>	Lithium battery CR2032, exchangeable, approx. 10 years service life
<b>Communication</b>	
<b>SD card</b>	SD card capacity: minimum 64 MB, maximum 2 GB, formatted with FAT16 file system
<b>Up-/download of configuration data and parameters</b>	Via USB or SD card
<b>Data-logging</b>	On SD card
<b>Firmware update</b>	Via USB
<b>USB slave interface</b>	Standard USB interface for PC communication
<b>Ethernet interface</b>	Optional: Ethernet interface for easy diagnosis including Web Server and email option
<b>Extension bus interface</b>	CAN-based bus for connection of extension units (e.g. I/O extensions)
<b>Controller structure</b>	
<b>Number of control loops</b>	Max. 8 active control loops
<b>Controller outputs/Module outputs</b>	1) On/off 2) Pulse frequency modulated (fixed pulse length, variable pauses) 3) Pulse width modulated 4) Analog
<b>Sample period</b>	Approx. 50 ms (with 1 to 4 active control loops); Approx. 100 ms (more than 4 active control loops)
<b>User configuration</b>	Cascade control possible; inputs, outputs and control function designations can be changed via configuration file
<b>Norms and standards</b>	
<b>Environment standards</b>	IEC 68
<b>EMC standards</b>	EN 61000, EN 55011
<b>CE mark</b>	Applicable tests resulting in CE mark
<b>UL/CSA</b>	UL pending

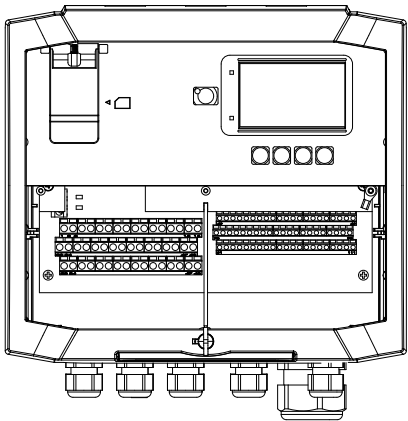
Hardware Structure



Hardware Version

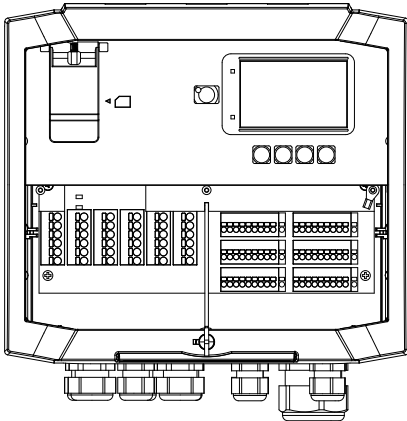
		Hardware version 1	Hardware version 2
Inputs	Analog 4 to 20 mA	–	4
	Analog Pt100	–	2
	Analog 4 to 20 mA / Pt100	4	–
	Digital (on/off)	–	4
	Digital (on/off or Freq)	4	4
Outputs	Analog 4 to 20 mA	4 (optional)	2
	Relay	5	5
	Transistor	4 (optional)	2

Hardware version 1



Screw terminals

Hardware version 2



Spring type terminals



## Control Functions

### General PID control

PID process controller for fixed value, subsequent value or cascade control

### Conductivity control

On/off or PI control - continuous dosing through pulse frequency modulation (PFM), PWM or 4-20 mA analog output, automatic or manual drain

### Corrosion display

No controller function, only display of measuring values; impact on general alarm output

### pH control

PI control - continuous dosing through pulse frequency modulation (PFM), PWM or analog output

### Module for dosing of oxygen scavenger media

Proportional dosing for flow and oxygen content depending on flow with or without temperature input

### Chlorine / Redox Control

PI control - continuous dosing through pulse frequency modulation (PFM), PWM or 4-20 mA analog output

### Batch dosing

Allows batching of a chemical based on volume of water added

### Biocide dosing

14-day program, 8 dosing events per channel / per day; Pre-bleed function to optimize biocide kill time

### Monitor module

Display of process value

### Totalizer function

Single or dual channel flow totalizer (each having two manually resettable totalizers)

## Ordering Chart

Electrical connection	Hardware version	Input					Output			Communication Ethernet	Body version	Item no.
		Analogue input 4 - 20 mA	Pt100 - Input	Analogue input 4 - 20 mA or Pt100	Digital (on/off) input	Digital (on/off or Freq) input	Analogue output 4 - 20 mA	Relay output	Transistor output			
Screw terminals	1	–	–	4	–	4	–	5	–	–	A	188 133
		–	–	4	–	4	4	5	4	X	A	188 136
Spring type terminals	2	4	2	–	4	4	2	5	2	–	B	188 137
		4	2	–	4	4	2	5	2	X	B	188 138

# Mass Flow Meter (MFM) for Gases

8701

- Direct flow measurement for nominal flow rates from 10 mlN/min to 80 lN/min (N<sub>2</sub>) in MEMS technology
- High accuracy
- Short response time
- Optional Fieldbus



Mass flow meters are used in process technology for the direct measurement of the mass flow of gases. In case of volumetric flow meters, it is necessary to measure the temperature and the pressure either the density, because gases change their density or rather their volume depending on the pressure. The measurement of the mass flow, on the other hand, is independent on pressure and the temperature.

The digital mass flow meter, Type 8701, uses a sensor on silicon chip basis (see the description on page 2) located directly in the bypass channel. Due to the fact that the sensor is directly in the bypass channel a very short response time of the MFM is reached. The actual flow is given as an analog output signal or could be read out over RS communication. Type 8701 can optionally be calibrated for two different gases, the user is able to switch between these two gases. The materials of the parts that come into contact with the medium are selected according to customer specification so that the unit can be operated with the complete range of standard process gases.

Typical application areas are gas flow measurement in

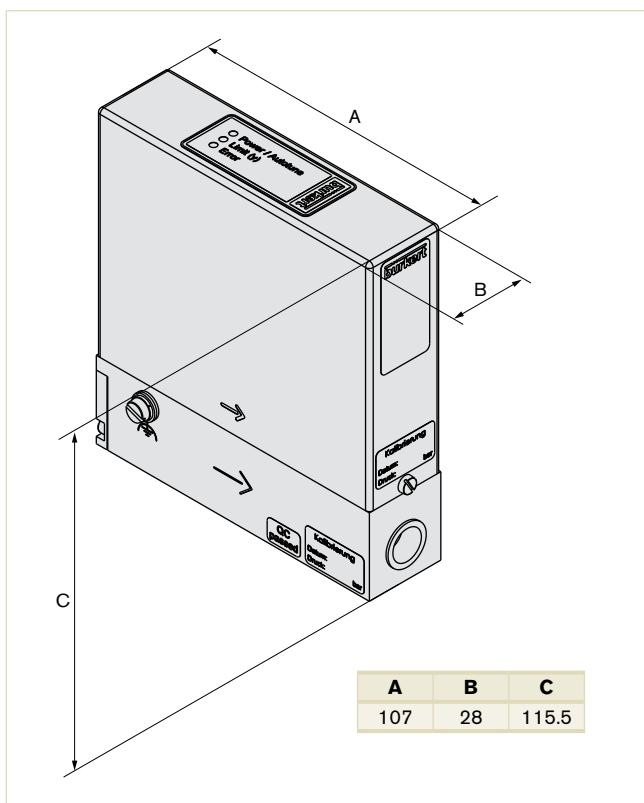
- Test benches
- Environmental technology
- Medical technology and
- Analytical instruments

**Note:** With the free downloadable communication software, numerous other functions can be programmed. To do this, the MFC / MFM should be connected via an adapter to a computer.

## Technical Data

<b>Nominal flow range<sup>1)</sup> (Q<sub>nom</sub>)</b>	10 mlN/min <sup>2)</sup> to 80 lN/min (N <sub>2</sub> ),
<b>Span</b>	1:50 (2-100%), (higher span on request)
<b>Operating medium</b>	Neutral, non-contaminated gases, (others on request)
<b>Calibration medium</b>	Operating gas or air with correction function
<b>Max. operating pressure</b> (Inlet pressure)	10 bar (145 psi)
<b>Medium temperature</b>	-10 °C to +70 °C (-10 °C to +60 °C with oxygen)
<b>Ambient temperature</b>	-10 °C to +50 °C
<b>Measuring accuracy</b> (after 1 min. warm up time)	±0.8% o. R. (of reading) ±0.3% F. S. (of full scale)
<b>Repeatability</b>	±0.1% F.S. (of full scale)
<b>Response time (t<sub>95%</sub>)</b>	< 300 ms
<b>Materials</b>	
Body	Aluminium or stainless steel
Housing	PC (Polycarbonate) or metal
Seals	FKM, EPDM
<b>Port connection</b>	G 1/4", others on request
<b>Electr. connection</b>	Plug D-Sub 15-pin
Additionally with Fieldbus:	with PROFIBUS DP: Socket M12 5-pin with DeviceNet/CANopen: Socket M12 5-pin
<b>Power supply</b>	24V DC
<b>Voltage tolerance</b>	±10%

Dimensions [mm] (see datasheet for more details)



## Technical Data (continued)

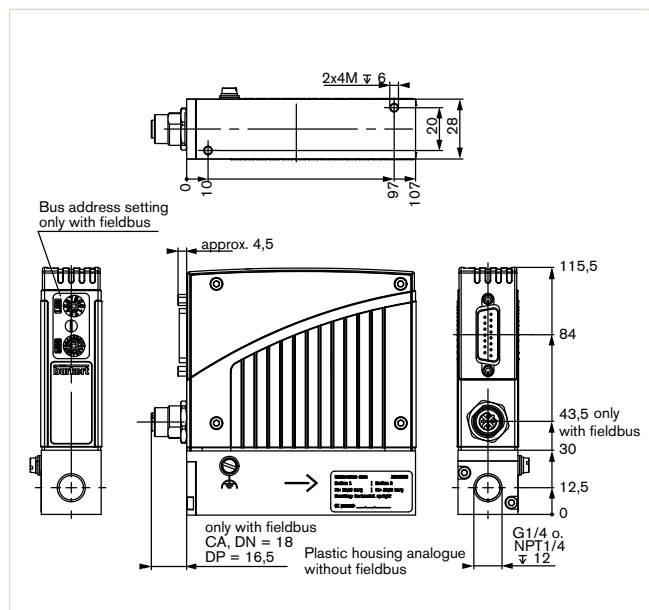
<b>Residual ripple</b>	< 2%
<b>Power consumption</b>	2.5 W
<b>Output signal</b>	0-5 V, 0-10 V, 0-20 mA or 4-20 mA
Max. current (voltage)	10 mA
Max. load (current)	600 $\Omega$
<b>Digital communication</b> via adapter possible:	RS232, Modbus RTU (via RS adapter) RS485, RS422 or USB
<b>Fieldbus option</b>	PROFIBUS DP, DeviceNet, CANopen
<b>Type of protection</b>	IP40
<b>Total weight</b>	ca. 500 g (aluminum)
<b>Installation</b>	horizontal or vertical
<b>Light emitting diodes</b> (default functions, other functions programmable)	Indication for power, Limit (with analog signals) / Communication (with Fieldbus) and error
<b>Binary inputs</b> (default functions, other functions programmable)	Two 1. not assigned 2. not assigned
<b>Binary output</b> (default functions, other functions programmable)	A relay output for: 1. Limit (actual value close to $Q_{nom}$ ) Max. Load: 25V, 1A, 25VA

<sup>1)</sup> The nominal flow value is the max. flow value calibrated which can be measured. The nominal flow range defines the range of nominal flow rates (full scale values) possible.

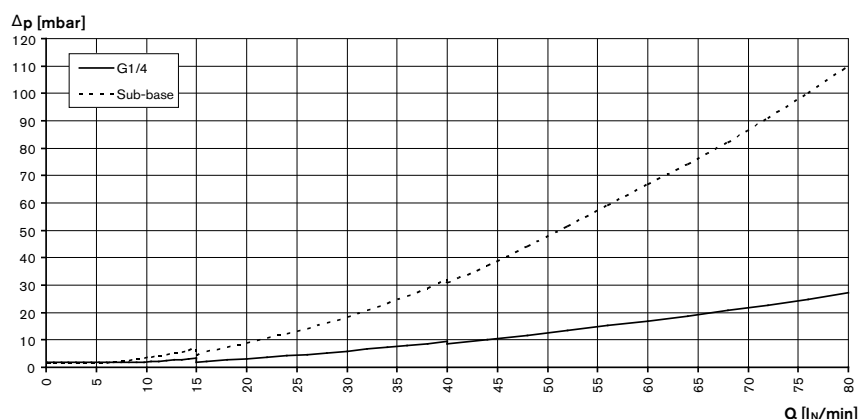
<sup>2)</sup> Index N: Flow rates referred to 1.013 bar and 0° C.

Alternatively there is an Index S available which refers to 1.013 bar and 20° C

## Dimensions [mm] (see datasheet for more details)



## Pressure Loss Diagram (ref. to air, with 250 $\mu$ m inlet filter)



The diagram shows exemplarily the pressure loss characteristics when air flowing through.

For determining the pressure loss with another gas it needs to calculate the air equivalent and respect the fluidics needed with the other gas.

## Nominal Flow Range of Typical Gases (Other gases on request)

Gas	Min. $Q_{Nenn}$ [l <sub>N</sub> /min]	Max. $Q_{Nenn}$ [l <sub>N</sub> /min]
Argon	0.01	80
Helium	0.01	500
Carbon dioxide	0.02	40
Air	0.01	80
Methane	0.01	80
Oxygen	0.01	80
Nitrogen	0.01	80
Hydrogen	0.01	500

## Ordering chart

	Operating gas	Flow rate - Full scale	Base block Aluminium	Seal material	Operating pressure [bar(ü)]	Signal actual value output	Item no.
	Type 8701						
8701	Air	100 cm³N/min	x	FKM	1	4 - 20 mA	180 866
	Air	500 cm³N/min	x	FKM	1	4 - 20 mA	219 568
	Air	1 lN/min	x	FKM	3	0 - 10 V	226 222
	Air	5 lN/min	x	FKM	1	0 - 10 V	202 858
	Air	10 lN/min	x	FKM	5	4 - 20 mA	252 074
	Air	25 lN/min	x	FKM	5	4 - 20 mA	171 006
	Air	50 lN/min	x	FKM	5	4 - 20 mA	174 412
	Air	80 lN/min	x	FKM	5	4 - 20 mA	241 884
	Hydrogen	1 lN/min	x	FKM	5	4 - 20 mA	251 554
	Hydrogen	10 lN/min	x	FKM	2	0 - 10 V	235 503
	Hydrogen	100 lN/min	x	FKM	4	4 - 20 mA	182 567
	Hydrogen	200 lN/min	x	FKM	4	4 - 20 mA	212 355
	Dioxygen	20 lN/min	x	FKM	4	4 - 20 mA	253 550
	Dioxygen	3 m³N/h	x	FKM	4	4 - 20 mA	181 207
	Argon	10 lN/min	x	FKM	5	4 - 20 mA	235 159
	Argon	30 lN/min	x	FKM	4	4 - 20 mA	174 419

### Notes regarding the selection of the unit

The decisive factors for the perfect functioning of an MFM within the application are the fluid compatibility, the normal inlet pressure and the correct choice of the flow meter range. The pressure drop over the MFM depends on the flow rate and the operating pressure.

## Accessories

Article	Item No.	
Connections/Cables		
Socket D-Sub 15-pin solder connection		918 274
Hood for D-Sub socket, with screw locking		918 408
Socket D-Sub 15-pin with 5 m cable		787 737
Socket D-Sub 15-pin with 10 m cable		787 738
Adapters <sup>1)</sup>		
RS232 adapter (for connection of a PC, in combination with the PC cable)		654 748
PC extension cable for RS232 9-pin socket/plug 2 m		917 039
RS422 adapter (RS485 compatible)		666 371
USB adapter (Version 1.1, USB socket type B)		670 639
Communication software MassFlowCommunicator		Download from www.buerkert.com
Accessories for Fieldbus	PROFIBUS DP (B-coded)	DeviceNet, CANopen (A-coded)
Plug M12 <sup>2)</sup>	918 198	917 115
Socket M12 <sup>2)</sup>	918 447	917 116
Y-junction <sup>2)</sup>	902 098	788 643
Terminating resistor	902 553	(on request)
GSD-File (PROFIBUS), EDS-File (DeviceNet, CANopen)	Download from www.buerkert.com (see Type 8701)	

<sup>1)</sup>The adapters serve mainly for initial operation or diagnosis. Those are not obligatory for continuous operation.

<sup>2)</sup> 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 an overmoulded cable which uses typically a thinner connector. A T-junction cannot be used together with this type of MFM.

# Mass Flow Meter (MFM) for Gases

8702

- Direct flow measurement with CMOS-sens® technology for nominal flow rates from 20 mLN/min to 80 lN/min
- High accuracy and quick response time
- Optional fieldbus



The digital mass flow meter, Type 8702, uses a sensor on silicon chip basis located directly in the bypass channel. Due to the fact that the sensor is directly in the bypass channel a very fast response time of the MFM is reached. The actual flow is given as an analog output signal or could be read out over fieldbus communication.

Typical application areas are gas flow measurement in

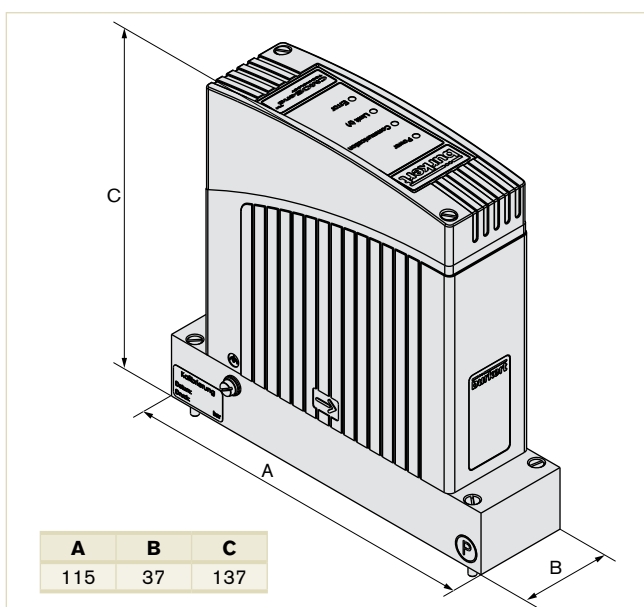
- Test benches
- Packaging and foodstuff industry
- Environmental technology
- Pharmaceutical and Biotechnology

In particular, Type 8702 fulfils the requirements of IP65 protection.

## Technical Data

<b>Nominal flow range</b> <sup>1)</sup> ( $Q_{nom}$ )	0.01 to 80 l <sub>N</sub> /min <sup>2)</sup> (ref. to N <sub>2</sub> )
<b>Turn-down ratio</b>	1:50, wider span on request
<b>Operating gas</b>	Neutral, non-contaminated gases, others available on request
<b>Calibration gas</b>	Operating gas or air with correcting function
<b>Max. operating pressure</b> (Inlet pressure)	Up to max. 10 bar (145 psi), depending on the orifice of the valve
<b>Gas temperature</b>	-10 to +70°C (-10 to +60°C with oxygen)
<b>Ambient temperature</b>	-10 to +50°C (others on request)
<b>Accuracy</b> (after 1 min warm up time)	±0.8% o.R. ±0.3% F.S. (o.R.: of reading; F.S.: of full scale)
<b>Repeatability</b>	±0.1% F.S.
<b>Settling time</b> ( $t_{95\%}$ )	<300 ms
<b>Materials</b>	
Body	Stainless steel
Housing	PC (Polycarbonate)
Seals	FKM, EPDM (others on request)
<b>Port connection</b>	G 1/4" (others on request)
<b>Electr. connection</b>	Socket M16, round, 8-pin and socket D-Sub HD15, 15-pin
Additionally with fieldbus:	With PROFIBUS-DP: Socket M12 5-pin (for IP65) or D-Sub 9-pin With DeviceNet/CANopen: Plug M12 5-pin (for IP65) or D-Sub 9-pin
<b>Operating voltage</b>	24V DC
<b>Voltage tolerance</b>	±10%
<b>Residual ripple</b>	<2%
<b>Power consumption</b>	max. 2.5 W (analog communicator) to 5 W (digital communicator)
<b>Output signal</b> (signal output)	0–5 V, 0–10 V, 0–20 mA or 4–20 mA
Max. current, volt. output	10 mA
Max. load, current output	600 Ω

Dimensions [mm] (see datasheet for more details)



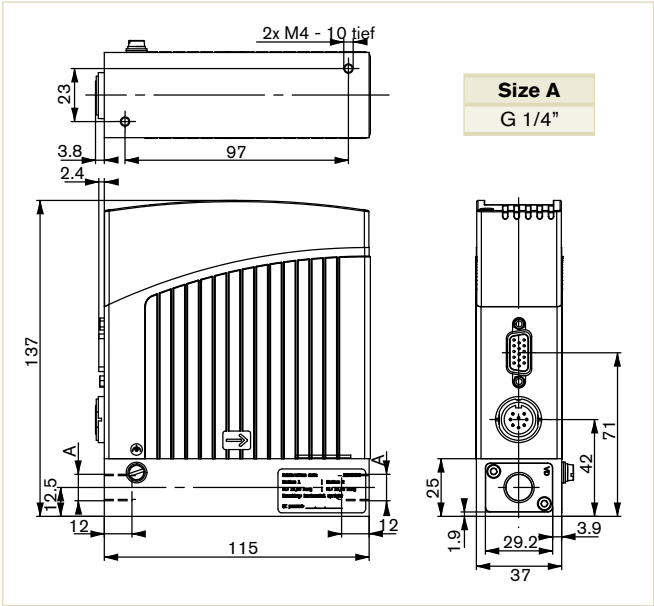
<b>Digital communication</b> via adapter possible:	RS232, Modbus RTU (via RS interface) RS485, RS422 or USB (see accessories table)
<b>Fieldbus option</b>	Profibus-DP, DeviceNet, CANopen (D-Sub HD15 covered with sealed plate with fieldbus MFC)
<b>Type of protection</b> (with connected cables)	IP65
<b>Total weight</b>	1000 g
<b>Mounting position</b>	Horizontal or vertical
<b>Light emitting diodes</b> (Default, other functions programmable)	Indication for Power, Communication, Limit, Error
<b>Binary inputs</b> (Default, other functions programmable)	Three various functions programmable
<b>Binary outputs</b> (Default, other functions programmable)	Two relay outputs 1. Limit (Q <sub>nom</sub> almost reached) 2. Error (i.e. sensor fault) Load capacity: max. 60 V, 1 A, 60 VA

<sup>1)</sup> The nominal flow value is the max. flow value calibrated which can be controlled.

The nominal flow range defines the range of nominal flow rate possible.

<sup>2)</sup> Index N: Flow rates referred to 1.013 bar(a) and 0 °C, alternatively also Index S: Flow rates referred to 1.013 bar(a) and +20 °C.

Dimensions [mm] (see datasheet for more details)



Ordering chart

Operating gas	Flow rate - Full scale	Base block Stainless steel	Seal material	Operating pressure [bar(g)]	Signal actual value output	Item no.
Type 8702						
Air	10 lN/min	yes	FKM	6	4 - 20 mA	214 514
Air	25 lN/min	yes	FKM	6	4 - 20 mA	168 115
Air	50 lN/min	yes	FKM	6	4 - 20 mA	202 678

## Accessories

8702

Article	Item No.	
Connectors/Cables		
Round plug M16 8-pin (solder connection)		918 299
Round plug M16 8-pin with 5 m cable		787 733
Round plug M16 8-pin with 10 m cable		787 734
Plug D-Sub HD15 15-pin with 5 m cable		787 735
Plug D-Sub HD15 15-pin with 10 m cable		787 736
Adapters <sup>1)</sup>		
RS232 adapter for connection to a computer, connection with an extension cable (item no. 917 039)		654 757
Extension cable for RS232 9-pin socket/plug 2 m		917 039
RS422-Adapter (RS485 compatible)		666 370
USB-Adapter (Version 1.1, USB socket type B)		670 696
USB cable 2 m, connection type A to connection type B		772 299
Adapter for manual setting of bus address		667 525
Software MassFlowCommunicator		Download at www.buerkert.com
Accessories for Fieldbus	PROFIBUS DP (B-codiert)	DeviceNet/CANopen (A-codiert)
M12-Plug <sup>2)</sup>	918 198	917 115
M12-socket (coupling) <sup>2)</sup>	918 447	917 116
Y-junction <sup>2)</sup>	902 098	788 643
T-junction	918 531	(on request)
Shut-off resistor	902 553	(on request)
GSD-Datei (PROFIBUS), EDS-Datei (DeviceNet, CANopen)	Download at www.buerkert.com	

<sup>1)</sup> The adapters serve mainly for initial operation or diagnosis. Those are not obligatory for continuous operation.

<sup>2)</sup> 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 typically a thinner connector..



# Intelligent, Integrated and Beautiful.

ELEMENT is a complete system approach to allow you to solve process problems. It encompasses the total loop: valves, sensors and controllers in one beautifully simple architecture which can be relied on to monitor and control inert fluids, steam, corrosive solvents, chemicals or abrasive fluids in a wide variety of application environments. ELEMENT meets all the requirements of the food and beverage industry, as well as the pharmaceuticals and cosmetics industry, in regard of safe process applications and easy-to-clean equipment.

Give your plant a competitive edge. The new ELEMENTs of success.



## Flow fittings

- Universal fitting for INSERTION measuring devices
- Wide range of materials and process connections
- For pipe diameters DN15 to 350 mm
- Metal up to 16 bar
- Plastic up to 10 bar

**Example  
S020 PVC**



The fitting can be used to connect any INSERTION device for a measurement in the pipe. i.e. sensors, indicators and controllers for flow, pH, oxidation reduction potential (O.R.P) and conductivity measurement. The fitting is available for flowmeter having a G 2" or a clamp connection.

### Technical Data

#### General data

##### Pipe diameter

**G 2" flowmeter connection ver.** DN06 to DN400<sup>1)</sup>

**Clamp flowmeter connection ver.** DN32 to DN100

#### Fitting process connections

Metal	Internal or external thread, weld ends, clamp or flange
Plastic	True union, spigot or external thread

#### Materials

##### G 2" flowmeter connection ver.

Seal	FKM or EPDM
Body & adapter	Brass (CuZn39Pb2) & stainless steel (316L -1.4404), all in stainless steel (316L -1.4404) or all in PVC, PP, PVDF, PE
Clamp flowmeter connection ver.	Stainless steel 316L

#### Surface finish

**Clamp flowmeter conn. ver.** Ra < 0.8 µm

#### Medium data

<b>Medium temperature</b>	0 to 50°C (32 to 122°F) for fitting in PVC
	0 to 80°C (32 to 176°F) for fitting in PP
	-15 to 100°C (5 to 212°F) for fitting in PVDF
	-15 to 160°C (5 to 320°F) for fitting in stainless steel or brass

Temperature limits may depend on the inserted device. Refer to the relevant data sheet or instruction manual and the pressure/temperature diagram of the fluid on next page. If the temperature ranges given for the adapter and the inserted device are different, use the most restrictive range

#### Medium pressure (max.)

Metal	PN16 (232.16 PSI)
Plastic	PN10 (145.1 PSI)

Pressure limits may depend on the inserted device. Refer to the relevant data sheet or instruction manual and the pressure/temperature diagram of the fluid on next page. If the pressure ranges given for the adapter and the inserted device are different, use the most restrictive range

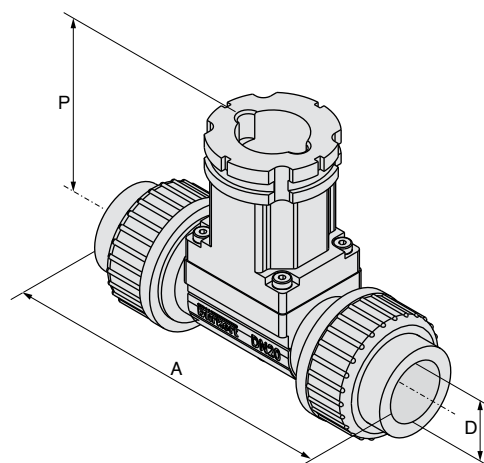
#### Environment

<b>Ambient temperature</b>	Temperature limits may depend on the inserted device. Refer to the relevant data sheet or instruction manual for more details
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#### Approvals

<b>Approval/Certificate on request</b>	3.1 certificate
	2.2 certificate
	Surface finish certificate
	Calibration certificate
	FDA (with EPDM seal) - stainless steel fitting only

Dimensions [mm] (see datasheet for more details)



#### True union process connection

DIN 8063, DIN 16962 in PP or ISO 10931 in PVDF

DN [mm]	P [mm]	A [mm]	D [mm]
15	80.4	128.0	20.00
20	77.8	144.0	25.00
25	78.0	160.0	32.00
32	81.4	168.0	40.00
40	85.2	188.0	50.00
50	91.5	212.0	63.00

**Note:** short sensor version

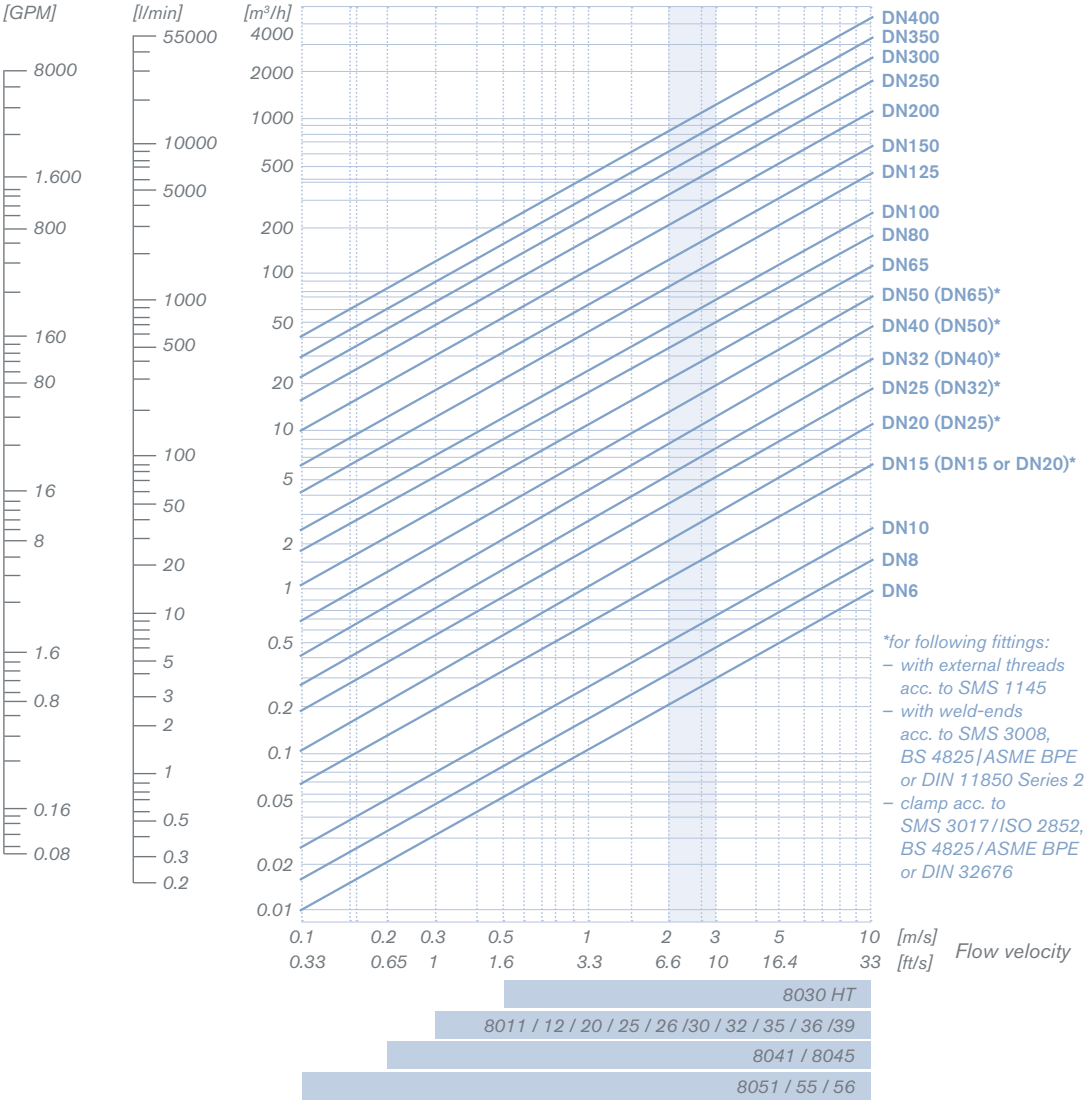
**Selection Help – Flow Velocity Considerations**

Depending on the sensor type, the right flow rate has to be chosen to get the best accuracy. The higher the flow velocity, the lower the measurement error, but the higher the pressure loss. The following chart will help

you find the correct fitting diameter for your application depending on flow velocity and sensor technology. Pipes for fluids similar to water are generally designed for an average flow velocity of approx. 2 to 3 m/s or 6-10 ft/s.

**Flow rate**

Diagram for nominal diameter selection



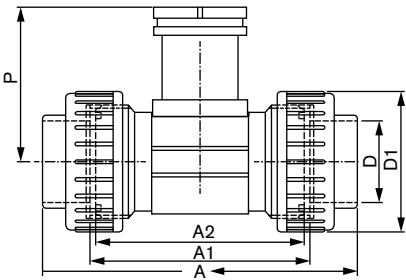
Dimensions [mm] (see datasheet for more details)

True union process connection

DIN 8063, DIN 16962 in PP or ISO 10931 in PVDF

DN [mm]	P [mm]	A [mm]	A1 [mm]	A2 [mm]	D [mm]	D1 [mm]
15	80.4	128.0	96	90	20.00	43
20	77.8	144.0	106	100	25.00	53
25	78.0	160.0	116	110	32.00	60
32	81.4	168.0	116	110	40.00	74
40	85.2	188.0	127	120	50.00	83
50	91.5	212.0	136	130	63.00	103

Note: short sensor version

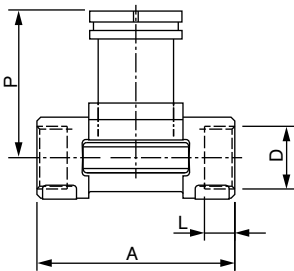


Internal thread process connection

G in stainless steel (316L - 1.4404) or brass (CuZn39Pb2)

DN [mm]	P [mm]	A [mm]	D [inch]	L [mm]
15	80.3	84.0	G 1/2	16.0
20	77.8	94.0	G 3/4	17.0
25	78.0	104.0	G 1	23.5
32	81.6	119.0	G 1 1/4	23.5
40	85.4	129.0	G 1 1/2	23.5
50	91.5	148.5	G 2	27.5

Note: short sensor version



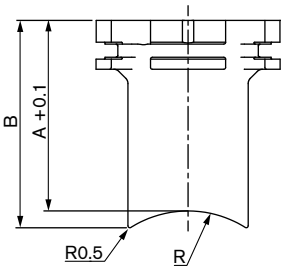
Welding socket with radius

in stainless steel (316L - 1.4404)

DN [mm]	A [mm]	B [mm]	R [mm]
50	56.6	61.6	30.2
65	54.5	58.6	36.7
80	53.1	56.4	44.5
100	50.7	53.2	57.2
125	48.2	50.3	70.7
150	45.7	47.4	84.2
200	41.0	42.3	109.6
250	73.6	74.7	136.6
300	67.8	68.7	162.0
350	63.9	64.7	177.8

Note: sensor version:

- short for DN50 - DN200
- long for DN250 - DN350

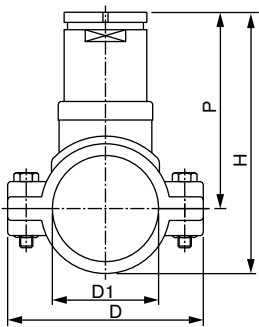


Saddle

in PP & PVC

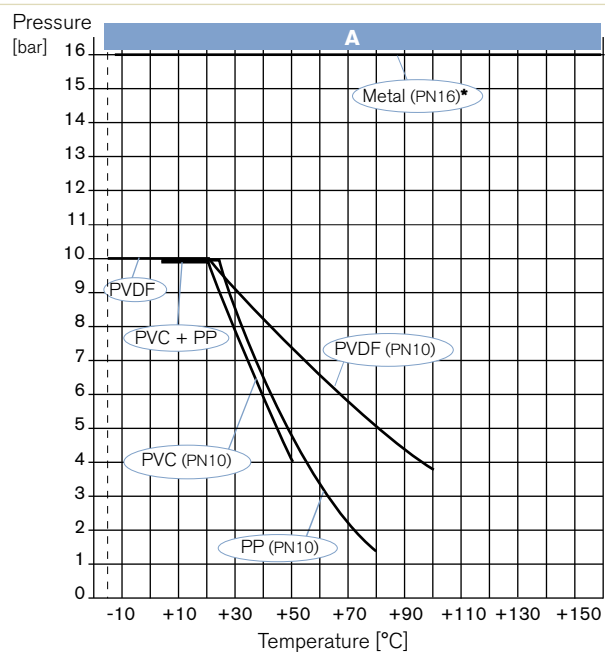
DN [mm]	P [mm]	H [mm]	D [mm]	D1 [mm]
50	116.0	155	116	63
65	115.0	160	129	75
80	119.0	171	144	90
100	124.0	187	166	110
110	120.0	191	181	125
125	127.0	205	196	140
150	137.0	225	216	160
180	161.0	271	266	200
200	173.0	291	290	225

Note: long sensor version








Body material: PP & PVC adapter  
Seal material: EPDM

# Pressure/temperature diagram



## Ordering Chart

Size DN [mm]	PVC (DIN) true union, FKM	Brass G internal thread, FKM	Item no. Stainless G internal thread, FKM	Stainless steel welding tab	PP saddle EPDM
					
<b>S020 (for 8026, 8041, 8045)</b>					
15	428 670	428 712	428 736		
20	428 671	428 713	428 737		
25	428 672	428 714	428 738		
32	428 673	428 715	428 739		
40	428 674	428 716	428 740		
50	428 675	428 717	428 741	418 111	425 138
65				418 112	425 139
80				418 113	425 140
100				418 114	425 141
125				418 115	425 143
150				418 116	425 144
200				418 117	425 416
250				418 756	
300				420 070	
350				416 637	

Short sensor Long sensor



# Fittings for Type 8202 pH-value/ORP and Type 8222 Conductivity Sensors

## DN32-110 mm adapters for pipe and tank mount fittings

- Simple installation guaranteed
- Modular concept for pH, ORP and conductivity



Fittings to connect the compact analytical transmitters to the media. Materials included are PVC-U, PP, Stainless steel, and PVC thread. For chemical resistance details please download our chemical resistance booklet from our website [www.burkert.com](http://www.burkert.com)

### Technical Data

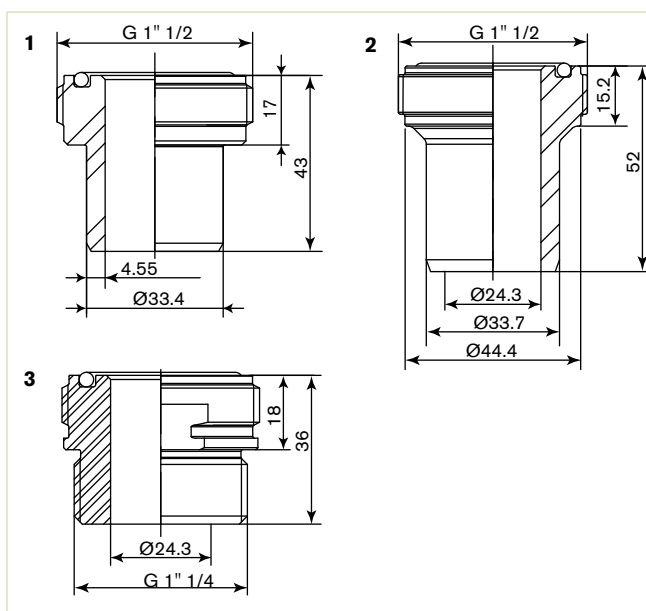
General data	
<b>Pipe diameter</b>	DN06 (with reduction) to DN110 (plastic) or bigger (stainless steel)
<b>Process connection</b>	
Adapter	Solvent, fusion, welding, threaded and to connect with screws
Fitting	Metric or ASTM True union or weld ends; saddle
<b>Materials</b>	
Adapter	PVC, PP, stainless steel - delivered with 2 seals, 1 FKM and EPDM
Fitting	
Seal	FKM, EPDM
Body & adapter	PVC&PVC, PP&PVC
Medium data	
<b>Medium temperature</b>	See pressure-temperature chart on next page. Temperature limits may depend on inserted measuring device <sup>1)</sup> .
<b>Medium pressure (max.)</b>	PN10 (plastic) or PN16 (metal). Pressure limits may depend on inserted measuring device <sup>1)</sup> .
Environment	
<b>Ambient temperature</b>	Temperature limits may depend on inserted measuring device <sup>1)</sup> .
Standards, directives and approvals	
<b>Directive - Pressure</b>	Complying with article 3 of §3 from 97/23/CE directive.*

<sup>1)</sup> Please refer to appropriate instruction manual or data sheet for more details.

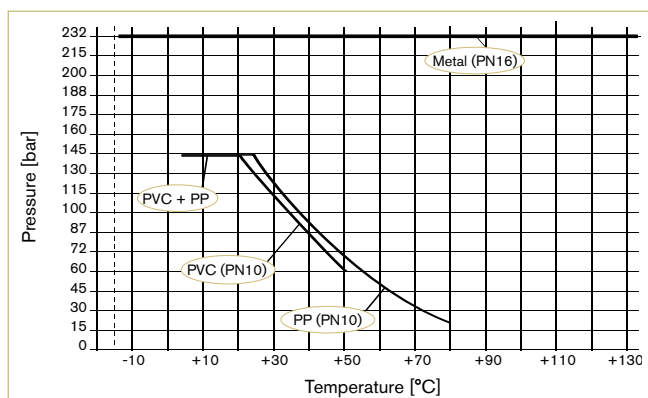
\* For the 97/23/CE pressure directive, the device can only be used under following conditions (dependent on max. pressure, pipe diameter and fluid).

Type of fluid	Conditions
<b>Fluid group 1, §1.3.a</b>	Only DN ≤ 25
<b>Fluid group 2, §1.3.a</b>	DN ≤ 32, or DN > 32 and PN*DN ≤ 1000
<b>Fluid group 1, §1.3.b</b>	DN ≤ 25, or DN > 25 and PN*DN ≤ 2000
<b>Fluid group 2, §1.3.b</b>	DN ≤ 125

### Envelope Dimensions [mm] (see datasheet for details)









### Pressure / temperature chart



**Note:** Always take lowest max. medium temp. of both adapter and chosen ELEMENT transmitter.

Ordering Chart

Adaptor S022	Piping systems	DN	Description	Materials Body / Seal	Type of Installation	Item no.
1.  PVC-U, PP metric solvent adapter		32 up to 110 (06 up to 25 with reduction)	Solvent adaptor with G 1 1/2" external threaded for ELEMENT transmitter connection	PVC-U / FKM, EPDM	Solvent weld on d32x32 and d40x32 T-fitting	560 705
2.  Stainless steel **		Respect recommendations of installation	Welding adaptor with G 1 1/2" external threaded for ELEMENT transmitter connection	Stainless steel / FKM, EPDM	To weld directly on pipe	561 232
3.  PVC-U, G or G 1 1/4" screw-on		Respect recommendations of installation	G 1 1/4" screw-on adaptor with G 1 1/2" external threaded for ELEMENT transmitter connection	PVC-U / FKM, EPDM	To screw on tank or pipe	560 707

\*\* Please ask for Material Test Reports (MTRs) at time of ordering if required.

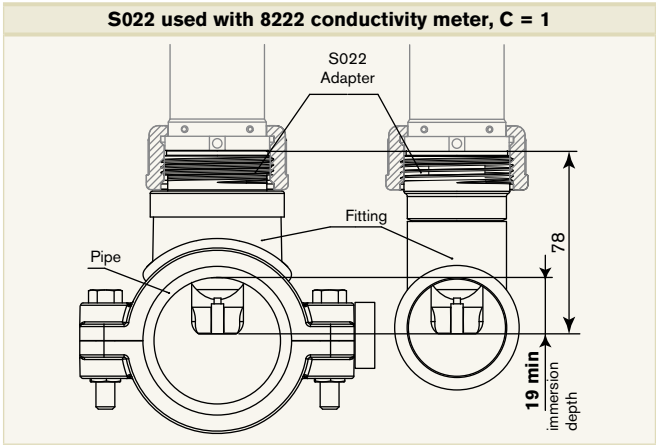
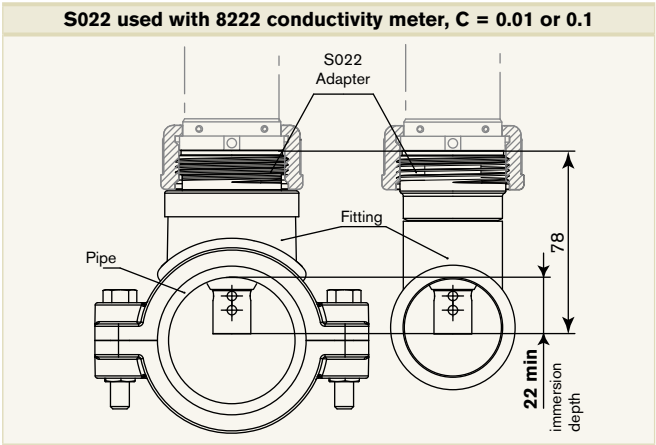
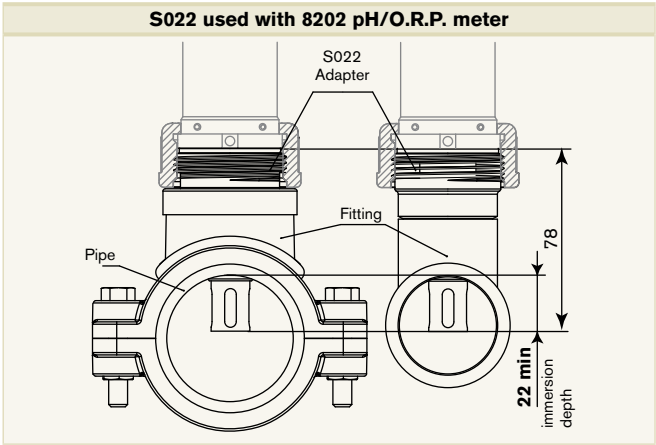
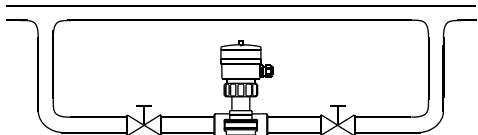
Installation and recommendations

For pH and ORP measurements, we recommend a "U"- form bypass installation to ensure that the electrode is maintained in a wet condition and enable the customer to calibrate the unit without stopping the whole process or to use the special designed measuring chamber.

The specially designed measuring chamber enables to install the measuring device in all pipe systems, either directly in the main stream or in a by-pass line. Additionally it enables to keep the electrode always wet and isolates it easily from the main stream for calibration purposes.

Pressure and temperature ratings must be respected according to the selected adapter material. Be sure that the sensor element is completely covered with liquid. Avoid dead legs which interfere the local fluid exchange.

When mounting the adapter into a T-fitting, a tank or directly into a pipe, please ensure that the minimum immersion depth of the electrode is respected (refer to the under drawing).



## Flow fittings

- Closed pipe system, i.e. sensor is integrated
- Wide range of materials and process connections
- Metal up to 16 bar
- Plastic up to 10 bar



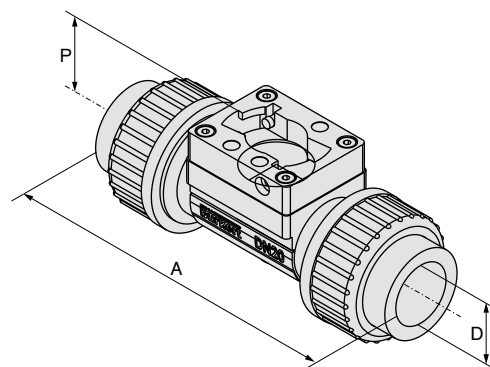
**Example  
S030 PVC**

The S030 sensor-fitting has a built-in paddle wheel to measure the flow rate. When liquid flows through the pipe, the paddle wheel is set in rotation producing pulses which frequency is proportional to the flow rate. The Bürkert special construction, called "INLINE Quarter-turn" technology, ensures leakage free operation. The paddle wheel rotation (permanent magnets included in the wheels) is detected contactless through the sensor-fitting wall. The transmitter can be snapped-on or removed without opening the pipe or interrupting the process.

### Technical Data

General data	
Pipe diameter	DN06 to DN65
Measurement range	from 0.5 to 1200 l/min
Flow velocity	0.3 to 10 m/s (see flow diagram)
Measurement error	
Teach-In	±0.1% of Reading <sup>1)</sup> (at the teach flow rate value)
(via a remote transmitter)	±2.5% of Reading <sup>1)</sup>
Standard K-factor	
Linearity <sup>1)</sup>	±0.5% of F.S.*
Repeatability <sup>1)</sup>	±0.4% of Reading
Process connections	
Metal	Internal or external thread, weld ends, Clamp or flange
Plastic	True union, spigot or external thread
Materials	
Seal	FKM or EPDM (depending on version, see ordering chart)
Body	Stainless steel (316L -1.4404), brass (CuZn <sub>39</sub> Pb <sub>2</sub> ), PVC, PP, PVDF
Screws	Stainless steel (316L -1.4404)
Paddle wheel	PVDF (PP on request or st. st., see datasheet 8030HT)
Shaft and bearings	Ceramics (Al <sub>2</sub> O <sub>3</sub> )
Medium data	
Medium temperature	0 to 50°C for sensor-fitting in PVC 0 to 80°C for sensor-fitting in PP -15 to 100°C for sensor-fitting in st. st., brass or PVDF
Medium pressure (max.)	see pressure/temperature chart
Metal	PN16 (232.16 PSI) (PN40 (580.4 PSI) on request)
Plastic	PN10 (145.1 PSI)
Fluid properties	clean, neutral or slightly aggressive, solid-free liquids
Pollution	max. 1%, size of particles 0.5 mm max.
Viscosity	300 cSt. max.
Environment	
Ambient temperature (operating and storage)	-15 to 60°C for sensor-fitting in PVC -15 to 80°C for sensor-fitting in PP -15 to 100°C for sensor-fitting in stainless steel, brass or PVDF depending on associated transmitter

### Pressure/temperature diagram



#### True union connection

DIN 8063 in PVC

DN [mm]	P [mm]	A [mm]	D [mm]
15	34.5	128.0	20.00
20	32.0	144.0	25.00
25	32.2	160.0	32.00
32	35.8	168.0	40.00
40	39.6	188.0	50.00
50	45.7	212.0	63.00

#### Standards, directives and approvals

Directive - Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Approval/Certificate on request	3.1 certificate; 2.2 certificate; surface finish certificate; calibration certificate; FDA (with EPDM seal) - stainless steel sensor-fitting only

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

<sup>1)</sup> Under reference conditions i.e. measuring fluid = water, ambient and water temperature = 20°C, applying the minimum inlet and outlet pipe straights, matched inside pipe dimensions.

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

Type of fluid	Conditions
Fluid group 1, §1.3.a	DN ≤ 25 only
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



## Diagram Flow/Velocity/DN

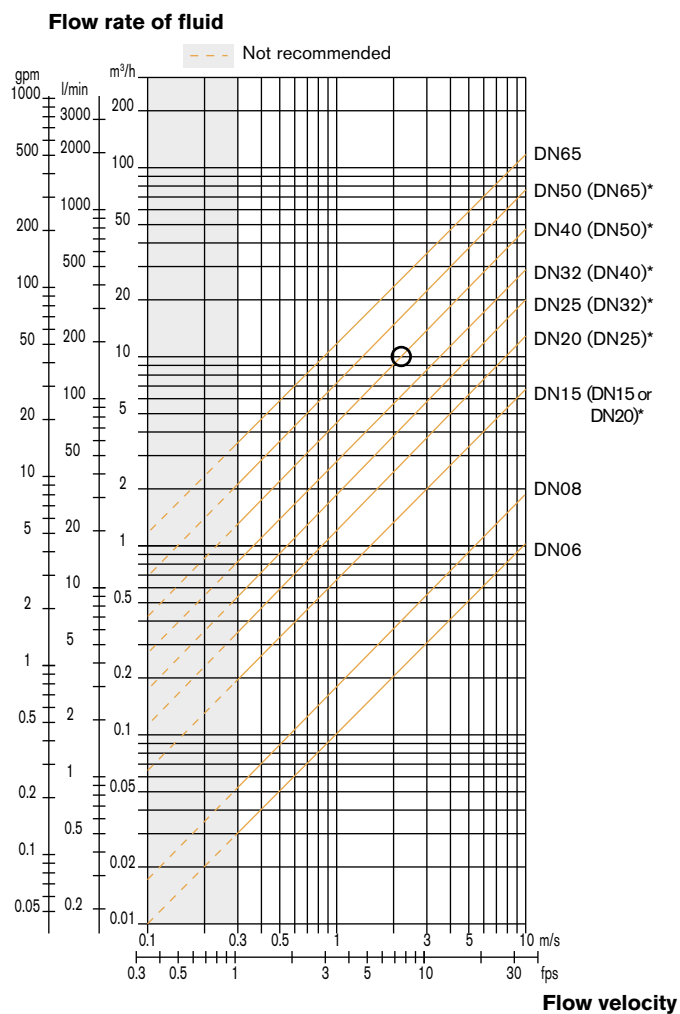
**Selection Help – Flow Velocity Considerations**

Depending on the sensor type, the right flow rate has to be chosen to get the best accuracy. The higher the flow velocity, the lower the measurement error, but the higher the pressure loss. The following chart will help you find the correct fitting diameter for your application depending on flow velocity and sensor technology. Pipes for fluids similar to water are generally designed for an average flow velocity of approx. 2 to 3 m/s or 6-10 ft/s.

**Example:**

- 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 sensor-fittings]



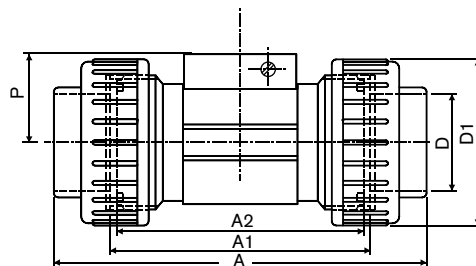
\* for following fittings with:

- external threads acc. to SMS 1145
- 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

### True union connection

DIN 8063 in PVC

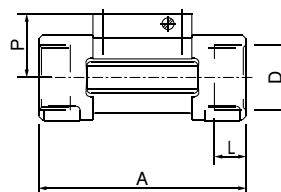
DN [mm]	P [mm]	A [mm]	Norm	A1 [mm]	A2 [mm]	D [mm]	D1 [mm]
15	34.5	128.0	DIN/ISO	96	90	20.00	43
20	32.0	144.0	DIN/ISO	106	100	25.00	53
25	32.2	160.0	DIN/ISO	116	110	32.00	60
32	35.8	168.0	DIN/ISO	116	110	40.00	74
40	39.6	188.0	DIN/ISO	127	120	50.00	83
50	45.7	212.0	DIN/ISO	136	130	63.00	103



### Internal thread connection

G in stainless steel (316L - 1.4404) or brass (CuZn39Pb2)

DN [mm]	P [mm]	A [mm]	D [Zoll]	L [mm]
15	34.5	84.0	G 1/2	16.0
20	32.0	94.0	G 3/4	17.0
25	32.2	104.0	G 1	23.5
32	35.8	119.0	G 1 1/4	23.5
40	39.6	129.0	G 1 1/2	23.5
50	45.7	148.5	G 2	27.5

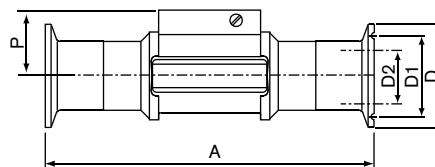


### Clamp connection

BS 4825/ASME BPE\* in stainless steel (316L - 1.4404)

\* Available with internal surface finish Ra = 0.8 µm

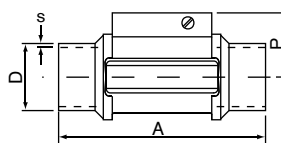
DN [mm]	P [mm]	A [mm]	Norm	D2 [mm]	D1 [mm]	D [mm]
20	34.5	119	ASME BPE	15.75	19.6	25.0
25	32.0	129	BS 4825/ASME BPE	22.10	43.5	50.5
40	35.8	161	BS 4825/ASME BPE	34.80	43.5	50.5
50	39.6	192	BS 4825/ASME BPE	47.50	56.5	64.0
65	45.7	216	BS 4825/ASME BPE	60.20	70.5	77.5



### Weld end connection

BS 4825 in stainless steel (316L - 1.4404)

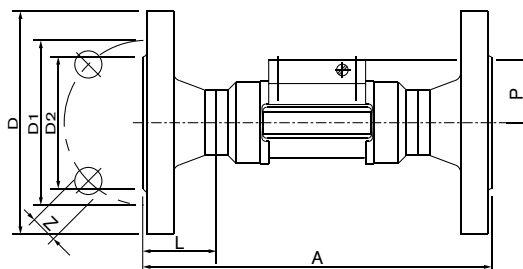
DN [mm]	P [mm]	A [mm]	Norm	D [mm]	s [mm]
20	34.5	84.0	BS 4825	19.05	1.20
25	32.0	94.0	BS 4825	25.40	1.65
40	35.8	119.0	BS 4825	38.10	1.65
50	39.6	128.0	BS 4825	50.80	1.65
65	45.7	147.0	BS 4825	63.50	1.65



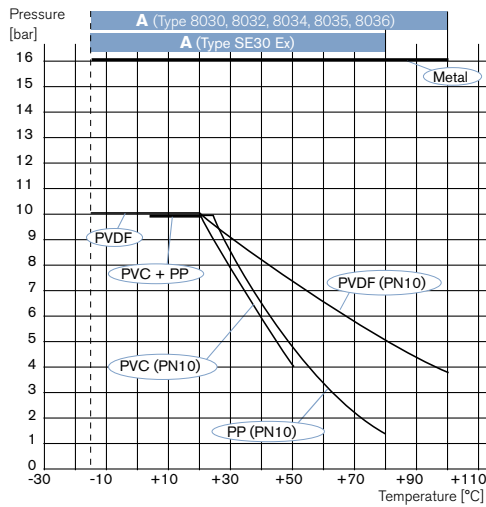
### Flange connection

EN1092-1 (ISO PN16) in stainless steel (316L - 1.4404)

DN [mm]	P [mm]	A [mm]	Norm	L [mm]	Z [mm]	D2 [mm]	D1 [mm]	D [mm]
15	34.5	130	EN	23.5	4 x 14.0	45.0	65.0	95.0
20	32.0	150	EN	28.5	4 x 14.0	58.0	75.0	105.0
25	32.2	160	EN	28.5	4 x 14.0	68.0	85.0	115.0
32	35.8	180	EN	31.0	4 x 18.0	78.0	100.0	140.0
40	39.6	200	EN	36.0	4 x 18.0	88.0	110.0	150.0
50	45.7	230	EN	41.0	4 x 18.0	102.0	125.0	165.0











## Pressure/temperature diagram



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

## Ordering Chart

Size DN [mm]	Item no.							
	PVC (DIN) true union	Brass G internal thread	Stainless G internal thread	Stainless G internal thread high temp.	PVDF ISO 10931	Stainless steel hygienic clamp	Stainless steel BS4825	DIN EN 1092-1
								
<b>S030 (for SE30, SE32, SE36)</b>								
15	423 938	423 980	424 004	449 726	423 968	–	–	424 040
20	423 939	423 981	424 005	449 727	423 969	443 395	443 369	424 041
25	423 940	423 982	424 006	449 728	423 970	443 396	443 370	424 042
32	423 941	423 983	424 007	449 729	423 971	–	443 371	424 043
40	423 942	423 984	424 008	449 730	423 972	443 397	443 372	424 044
50	423 943	423 985	424 009	449 731	423 973	443 398	443 373	424 045
65	–	–	–	–	–	443 399	443 374	–

# INLINE Flowmeter for Continuous Flow Measurement

SE30

## For use with fitting S030, DN15-50 mm

- Turn & Lock bayonet fitting isolates sensor from media
- Economic integration in pipe systems
- 3-wire frequency version for direct connection to PLC (PNP and NPN)
- Connection to Bürkert evaluators in remote versions



Please see fitting S030

Unique bayonet style flow meter constructed from an SE30 sensor and an S030 flow fitting. Perfect for neutral, solid free liquids. A hall-effect sensor produces a square wave frequency proportional to the flow rate.

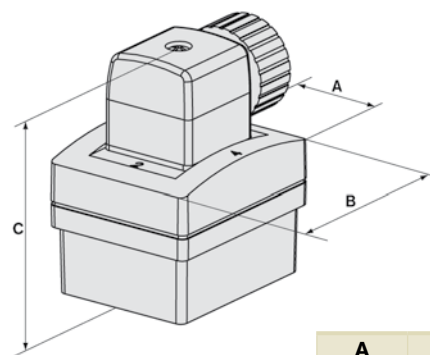
## Technical Data (Standard)

General data	
<b>Compatibility</b>	With fittings S030 (see corresp. datasheet)
<b>Materials</b>	
Housing, cover, male fixed conn.	PC
Cable plug / seal / screws	PA / NBR / Stainless steel
<b>Wetted parts materials</b>	
Fitting, sensor armature	Brass, stainless steel 1.4404/316L, PVC, PP, PVDF
Paddle wheel	PVDF
Axis, bearing / Seal	Ceramics / FKM or EPDM (depending on Sensor-Fitting version)
<b>Electrical connection</b>	Cable plug EN 175301-803 (Type 2508) (included in delivery)
<b>Connection cable</b>	max. 1.5 mm <sup>2</sup> cross section; max. 50 m length, shielded
Complete device data (fitting + electronic module)	
<b>Pipe diameter</b>	DN06 to DN65
<b>Measuring range</b>	0.3 to 10 m/s
<b>Medium temp. with fitting in</b>	
PVC / PP	0 to 50°C / 0 to 80°C
Stainless steel, brass, PVDF	-15 to 100°C
<b>Medium pressure max.</b>	PN10 (with plastic fitting) PN16 (with metal fitting) (PN40 on request, see S030 data sheet)
<b>Viscosity / Pollution</b>	300 cSt. max. / max. 1% (Size of particles 0.5 mm max.)
<b>Measurement error</b>	
Teach-In	±1% of Reading <sup>1)</sup> (at the teach flow rate value)
Standard K-factor	±2.5% of Reading <sup>1)</sup>
<b>Linearity</b>	±0.5% of F.S.* <sup>1)</sup>
<b>Repeatability</b>	±0.4% of Reading <sup>1)</sup>
Environment	
<b>Ambient temperature</b>	-15 to + 60°C (5 to 140°F) (operating and storage)
<b>Relative humidity</b>	≤ 80%, without condensation

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

<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.

## Envelope Dimensions [mm] (see datasheet for details)



A	B	C
44	54	66

Electrical data	
<b>Operating voltage</b>	12 - 36 V DC filtered and regulated (via Bürkert transmitter the device is connected for "Low Power" version)
<b>Current consumption</b>	
Hall version	with sensor ≤ 30 mA
Hall "Low power" version	≤ 0.8 mA
<b>Output: Frequency</b>	
Hall version	2 transistors NPN and PNP, open collector, max. 100 mA, frequency: 0 to 300 Hz; duty cycle 1/2 ± 10% NPN output: 0.2-36 V DC PNP output: supply voltage
Hall "Low Power" version	1 transistor NPN, open collector, max. 10 mA, frequency: 0 to 300 Hz; duty cycle 1/2 ± 10%
<b>Dielectric strength</b>	2300 V AC
<b>Reversed polarity of DC</b>	Protected
Standards and approvals	
<b>Protection class</b>	IP65 with connector plugged-in and tightened
Standard and directives	
EMC	EN 61000-6-2, 61000-6-3
Pressure	Complying with article 3 of §3 from 97/23/CE directive.*
Vibration	EN 60068-2-6
Shock	EN 60068-2-27

## Technical Data (Standard)

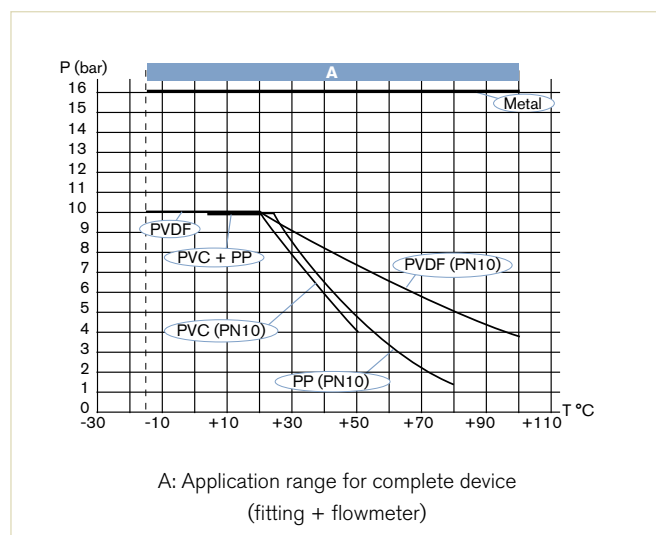
\* For the 97/23/CE pressure directive, the device can only be used under following conditions (dependent on max. pressure, pipe diameter and fluid).

Type of fluid	Conditions
Fluid group 1, §1.3.a	DN ≤ 25 only
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

## Options

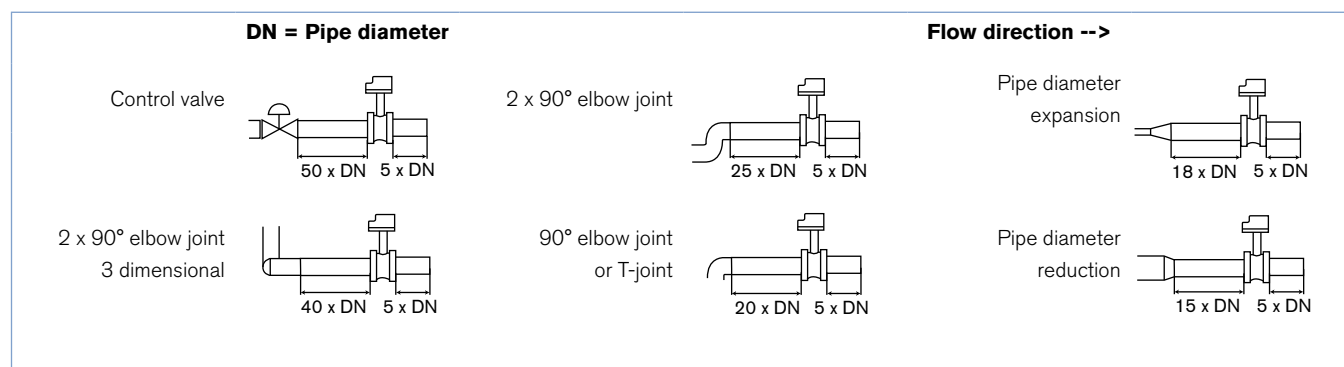
- AS-i Connection
- Hygienic clamp and ASME weld end connections
- ANSI flange connection
- PVDF and PP fittings.
- High flow fittings (8020) to DN350 mm
- Various sealing materials
- Individual calibration certificate

## Pressure/Temperature Diagram



## Installation

EN ISO 5167-1 prescribes the inlet and outlet distances that must be observed when installing fittings in pipe lines to achieve calm flow conditions. Below you will find the most important layouts that could lead to turbulence in the flow, and the associated prescribed minimum inlet and outlet distances. Make sure that the measuring point is steady, to ensure good measuring conditions



## Ordering Chart

Description	Item no.
Hall	423 913
Hall (use with 8025)	423 914
Meter for High Temperatures *	449 694

\*see separate datasheet 8030, for high temperatures

**Note:** The electronic module, SE30 and the fitting, S030 must be ordered separately

# INLINE Flowmeter for hazardous area II 1 G/D - II 3 GD - I M1

SE30 Ex

- Flowmeter with NAMUR or NPN/PNP output signal
- Mounting, dismounting of electronics by a Quarter-Turn
- Intrinsic safety approvals (see ordering chart)



The intrinsic safety flowmeter, SE30 Ex, for continuous flow measurement is especially designed for use in neutral, slightly aggressive, solid-free liquids, in hazardous environments.

The flowmeter SE30 Ex is made up of an electronic module and a measuring element, (sensor fitting S030) and is quickly and easily connected by a Quarter-Turn.

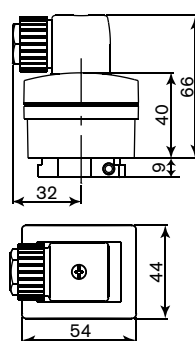
## Technical Data

General data	
<b>Compatibility</b> <sup>1)</sup>	With sensor fitting S030 (please order separately) (see relevant datasheet)
<b>Materials</b>	
Body, cover	PC (NPN/PNP version)
Cable plug	PPS (NAMUR version) glass fibre reinforced PA with silicon seal (NAMUR version), with NBR seal (NPN/PNP version)
<b>Wetted parts</b>	Selection of the appropriate sensor fittings (see datasheet)
<b>Sensor-Fitting S030</b> <sup>1)</sup>	
Body	Brass, Stainless steel, PVDF
Paddle wheel	PVDF
Axis and bearings	Ceramic
Seal	FKM
<b>Electrical connection</b>	
Namur version	Cable plug Form A acc to EN 175301-803 (supplied)
<b>Voltage supply cable</b>	0.5 to 1.5 mm <sup>2</sup> cross section, 5 to 8 mm diameter; shielded, max. 50 m length; line impedance < 50 Ω (not included in delivery)
<b>Environment</b>	
<b>Ambient temperature</b>	0 to +60°C (operating and storage)
<b>Relative humidity</b>	≤ 80%, without condensation
<b>Electrical data</b>	
<b>Power supply</b> <sup>1)</sup>	8 - 15 V DC (NAMUR version, from connected intrinsic safety barrier)
<b>Current consumption (with sensor)</b>	max. 7 mA (NAMUR version);
<b>Output</b>	Depends on the device model and application area: 2-wire current modulation acc. to Namur (0.5 or 2.5 mA)
<b>Reversed polarity (of DC)</b>	Protected

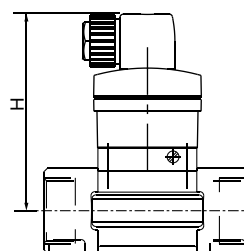
<sup>1)</sup> see datasheet overview:  
"SAFETY INSTRUCTIONS - NOTICE OF ATEX INSTRUCTIONS",  
to choose the appropriate sensor fitting for the area of application

## Envelope Dimensions [mm] (see datasheet for details)

### Electronics SE30 Ex



### Mounted on S030 sensor fitting



DN	H
06	96
08	96
15	101
20	98
25	98
32	102
40	106
50	112
65	112

## Technical Data (continued)

### Complete device data (sensor fitting + electronic module)

<b>Pipe diameter</b>	
S030 sensor fitting	DN06 to DN65
<b>Measuring range</b>	
S030 sensor fitting	0.5 to 1200 l/min (velocity 0.3 to 10 m/s)
<b>Medium temperature max.</b>	
S030 sensor fitting	80°C (176°F)
<b>Fluid pressure max.</b>	
S030 sensor fitting	PN10 (PVDF), PN16 (stainless steel, brass - PN40 on request)
<b>Viscosity</b>	
S030 sensor fitting	300 cSt. max / 1% max. pollution
<b>Accuracy</b>	
S030 + Electronics SE30 Ex	
Teach-In (via remote transmitter)	±1% of Reading <sup>2)</sup> (at the teach flow rate value)
Standard K-factor	±2.5% of Reading <sup>2)</sup>
<b>Linearity</b>	
	±0.5% of F.S.*

<b>Repeatability</b>	
S030 sensor fitting	±0.4% of Reading <sup>2)</sup>

### Standards, directives and approvals

<b>Protection class</b>	IP67 with connector plugged-in and tightened acc. to EN 60529
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### Standard and directives

ATEX	see "SAFETY INSTRUCTIONS - NOTICE OF ATEX INSTRUCTIONS"
EMC	EN 61000-6-3 EN 61000-6-2
Pressure (with S030 sensor fitting)	Complying with article 3 of Chap. 3 from 97/23/CE directive.*
NAMUR	EN 60947-5-6

<sup>2)</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)

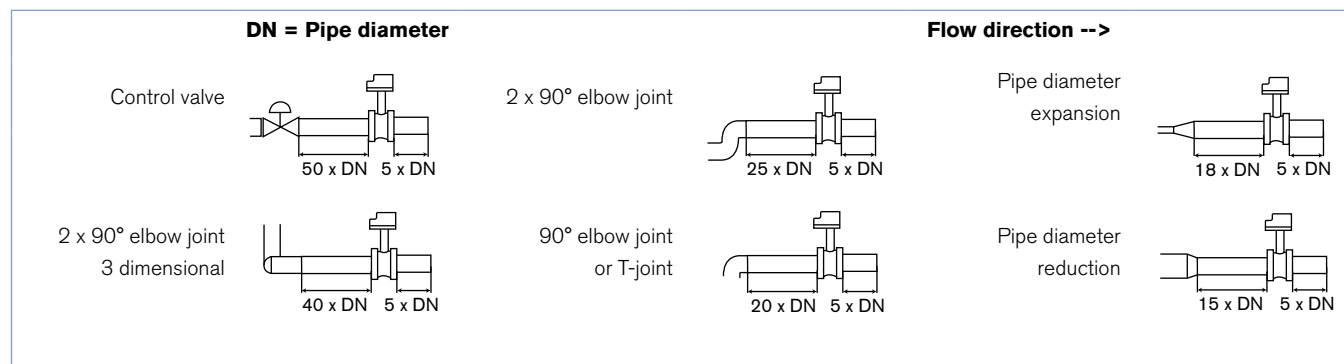
**\*\* For the 97/23/CE pressure directive, the device can only be used under following conditions (dependent on max. pressure, pipe diameter and fluid).**

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<b>Fluid group 2, §1.3.a</b>	DN ≤ 32 or DN > 32 and PN*DN ≤ 1000
<b>Fluid group 1, §1.3.b</b>	PN*DN ≤ 2000
<b>Fluid group 2, §1.3.b</b>	DN ≤ 200

## Installation

EN ISO 5167-1 prescribes the inlet and outlet distances that must be observed when installing fittings in pipe lines to achieve calm flow conditions. Below you will find the most important layouts that could lead to turbulence in the flow, and the associated prescribed minimum inlet and outlet distances.

Make sure that the measuring point is steady, to ensure good measuring conditions



## Safety Barrier

SE30 Ex



- **2 or 4 channels, intrinsic safety digital inputs: proximity detectors NAMUR, contacts...**
- **Rail mount on hat profile 35 mm**
- **All connections by removable screw terminals**

### Specifications

<b>Digital inputs</b>	Each of the 4 x intrinsic safety inputs can be configured independently for a contact or a proximity detector NAMUR as per DIN 19234
<b>Intrinsic safety inputs</b>	Proximity detector NAMUR as per DIN 19234 or free potential contacts, relays, pressure or temperature switches or push buttons in hazardous area.
<b>Non intrinsic safety recopy outputs</b>	According to the type of sensor and the chosen logic: a green LED on the front panel displays a free-potential contact for each channel without common wire.
Collector cut-off power	15 V - 60 mA - 0.9 VA - 350 Hz
<b>Selection of the sensor type</b>	Inductive / capacitive intrinsic safety certified NAMUR proximity detector or free-potential contacts.
<b>Selection of the logic</b>	By a mini-DIP choice of active proximity switches or when contact is NO (Normally Open) or NC (Normally Closed).
<b>Fault detector</b>	For all inputs configured as NAMUR, all models are provided with fault detector (broken line or short-circuit). In faulty case, the green front LED switches off, the contact of the defective channel opens and the red LED corresponding to the defective channel switches on. Other channels are not affected.
<b>Power supply</b>	24 V DC $\pm 10\%$ 230 V AC $\pm 10\%$ 1 front panel yellow LED is "ON" when supply is active
<b>Consumption</b>	5 VA
<b>Connections</b>	All connections by removable screw terminals. Supply distribution by means of a flat cable from one unit to the next one.

### Specifications (continued)

<b>Classification for explosive areas</b>	Intrinsic safety associated apparatus. It must be installed in safe area and connected to materials installed in zone 0, 1 or 2 - Gas (G) or in zone 20, 21 or 22 - Dust (D) Classification according to ATEX 94/9/CE: I/II (M1)/(1) G/D [EE <sub>ex</sub> ia] IIC Safety parameters see EC-type certificate LCIE 00ATEX 6034X
<b>Ambient Temperature</b>	
Operating	-20 to +60°C
	-20 to +50°C (recommended)
Storage	-40 to +80°C
<b>Dimensional &amp; mechanical</b>	Housing for symmetrical DIN rail (hat profile 35 mm as per standard NFC63015 / EN50022) - Depth: 120 mm ; - Height: 90 mm - 145 mm overall including space for cables ; Width on rail 29.5 mm. Minimal distance between rails: 180 mm.
<b>Installations conditions</b>	
Mounting on DIN rail:	must take into account thermal dissipation and risk of overheating generated by housings installed side by side. In case of a high concentration inherent safety barrier, we recommend to leave a free space of 10 mm between each group of 8 units (horizontal rail) and between each group of 4 units (vertical rail).
Mounting inside a cabinet:	It is recommended to close the electrical cabinet and to ensure a circulation of fresh air even by means of an air conditioner to keep the inside temperature at the level compatible with the recommended operating temperature among the units.



## Ordering Chart

Description	Voltage supply	Output	Electrical connection	Item no.
<b>Flowmeter Type SE30 Ex for sensor fitting S030</b>				
SE30 Ex - NAMUR II 1 G/D for explosive gas and dust environments: zones 0, 1 or 2 and 20, 21 or 22	8 - 15 V DC - via an intrinsic safety barrier with NAMUR input*	NAMUR current modulation - 2-wire	1 cable plug EN 175301-803	552 901

\* The open circuit voltage for the NAMUR input must be included between 8 and 15 V.

**Note** regarding the ordering of a complete sensor:

A SE30 Ex sensor consists of the Type SE30 Ex electronic module and the INLINE fitting, see datasheet for Type S030

Please order the relevant INLINE fitting and the electronics separately!

## Accessories

Description	Item no.
Cable plug EN 175301-803 with blue cable gland and silicone seal (Type 2508)	167 526

Classifications for explosive areas	Voltage supply	Output	Number of channels	Item no.
Intrinsic safety barrier				
ATEX 94/9/CE I/II (M1 )/ (1) G/D [Ex ia] IIC	24 V DC	open collector, 15 V, 60 mA	2, with NAMUR input	553 456
		open collector, 15 V, 60 mA	4, with NAMUR input	553 457
	230 V AC	open collector, 15 V, 60 mA	2, with NAMUR input	553 458
		open collector, 15 V, 60 mA	4, with NAMUR input	553 459

# In-Line Flowmeter for Monitoring, Switching and Display

SE32

## For use with fitting S030, DN15-50 mm

- Monitor, switch and transmit functions
- Large display
- Free configurable switching point

Please see fitting S030



The 8032 flowmeter consists of a SE32 transmitter and a S030 fitting. It is used for measuring clean, neutral or aggressive liquids. It is available with freely configurable switching outputs (transistor or relay) or 4-20 mA process output value.

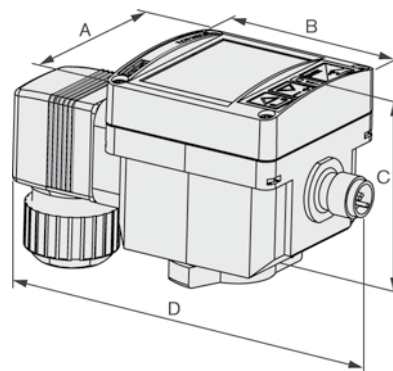
## Technical Data

General data	
<b>Compatibility</b>	With fittings S030 (see corresponding data sheet)
<b>Materials</b>	
Housing, cover	PC, glass fibre reinforced
Front panel folio/Screws	Polyester / Stainless steel
Cable plug/connector M12	PA / PA or CuZn, nickel-plated
<b>Wetted parts materials:</b>	
Fitting, sensor armature/	Brass, stainless steel, PVC, PP or
Seal	PVDF / FKM (EPDM option)
Paddle-wheel / Axis, bearings	PVDF / Ceramics
<b>Display</b>	8-digit LCD with backlighting
<b>Electrical connections</b>	Cable plug acc. to EN 175301-803, free positionable male M12 connector, 5 pins or male M12 connector, 8 pins (included in delivery)
<b>Voltage supply cable</b>	0.5 mm <sup>2</sup> max. cross section; max. 100 m long, shielded
<b>Remote sensor connection</b>	0.5 mm <sup>2</sup> max. cross section; max. 50 m long, shielded
<b>Complete device data</b> (fitting S030 + electronic module SE32)	
<b>Pipe diameter</b>	DN06 to DN65
<b>Measuring range</b>	0.3 to 10 m/s
<b>Medium temperature</b>	0 to 50°C (with PVC fitting) / 0 to 80°C (with PP fitting) / -15 to 100°C (with stainless steel, brass or PVDF fitting)
<b>Fluid pressure max.</b>	PN10 (145.1 PSI) (with plastic fitting) PN16 (232.16 PSI) (with metal fitting)
<b>Viscosity / Pollution</b>	300 cSt. max. / 1% max. (particle size 0.5 mm max.)
<b>Measurement error</b>	
Teach-In	±1% of Reading <sup>1)</sup> (at the teach flow rate value)
Standard K-factor	±3% of Reading <sup>1)</sup>
<b>Operating mode</b>	Threshold: window or hysteresis
<b>Linearity<sup>1)</sup></b>	±0.5% of F.S.*
<b>Repeatability<sup>1)</sup></b>	±0.4% of Reading

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

<sup>1)</sup> Under reference conditions i.e. measuring fluid = water, ambient and water temperature = 20°C, applying the minimum inlet and outlet pipe straights, matched inside pipe dimensions.

## Envelope Dimensions [mm] (compact version)



A	B	C	D
54	54	50	116

## Options

- Wall or cabinet mounting
- AS-i Connection (on request)
- Hygienic clamp and ASME weld end connections
- ANSI flange connection
- PVDF and PP fittings
- Various sealing materials
- Individual calibration certificate,

## Technical Data (cont.)

Electric Data	
<b>Operating voltage</b>	Filtered and regulated
Compact version	12-36 V DC $\pm 10\%$
<b>Reversed polarity of DC</b>	Protected
<b>Current consumption</b>	
Compact version	$\leq 90$ mA (without load)
<b>Input</b>	
Frequency (remote version)	Pulse signal: 2 to 400 Hz input impedance: 10 k $\Omega$
<b>Outputs</b>	
Transistor	NPN and/or PNP (selectable), open collector, max. 700 mA, 500 mA max. per transistor if both transistor outputs are wired, 0 to 300 Hz NPN-output: 0.2 - 36 V DC PNP-output: Power supply protected against short circuit.
Relay (compact version)	3 A/250 V AC or 3 A/30 V DC; [3 A/48 V AC or 3 A/30 V DC]2.
Process value (compact version)	4 to 20 mA, galvanic insulation Loop resistance: 1300 $\Omega$ at 36 V DC, 1000 $\Omega$ at 30 V DC, 700 $\Omega$ at 24 V DC, 450 $\Omega$ at 18 V DC, 200 $\Omega$ at 12 V DC
<b>4 to 20 mA measurement error</b>	$\pm 1\%$
Environment	
<b>Ambient temperature</b>	-10 to + 60 °C (operating and storage)
<b>Relative humidity</b>	$\leq 80\%$ , without condensation
Standards, directives and approvals	
<b>Protection class</b>	IP65 with connector plugged-in and tightened correctly
<b>Standard, directives</b>	
EMC	EN 610006-2, 610006-3
Security	EN 61010-1
Pressure (Fitting S030, DN06 to DN65, in PVC, PP, PVDF, stainless steel or brass)	Complying with article 3 of Chap. 3 from 97/23/CE directive.*
Vibration / Shock	EN 60068-2-6 / EN 60068-2-27

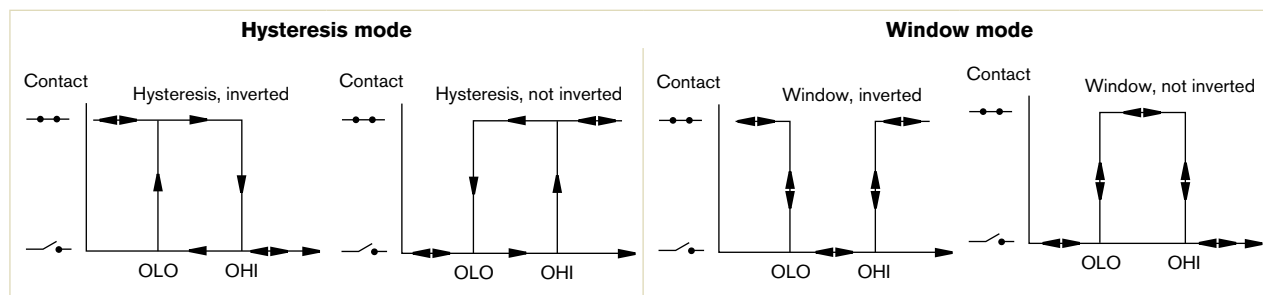
\* For the 97/23/CE pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter and fluid)

Type of fluid	Conditions
<b>Fluid group 1, §1.3.a</b>	DN $\leq 25$ only
<b>Fluid group 2, §1.3.a</b>	DN $\leq 32$ or DN > 32 and PN*DN $\leq 1000$
<b>Fluid group 1, §1.3.b</b>	PN*DN $\leq 2000$
<b>Fluid group 2, §1.3.b</b>	DN $\leq 200$

## Main Features

### 8032 with standard On/Off output

- 2 switching modes for the output, either hysteresis or window, inverted or not



- Configurable delay before switching
- Possible outputs depending on the version: relay, transistor NPN, transistor PNP

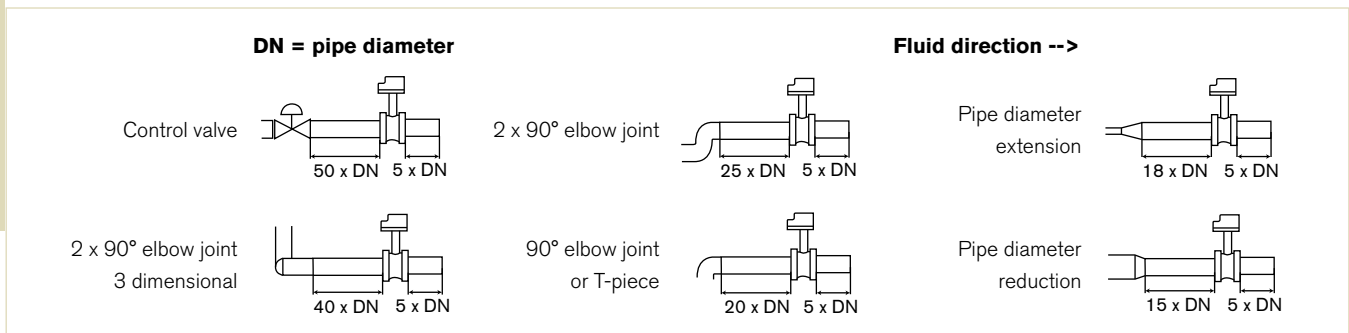
### 8032 with current output for the measurement value

- 4 to 20 mA output
- 4 to 20 mA output + relay output

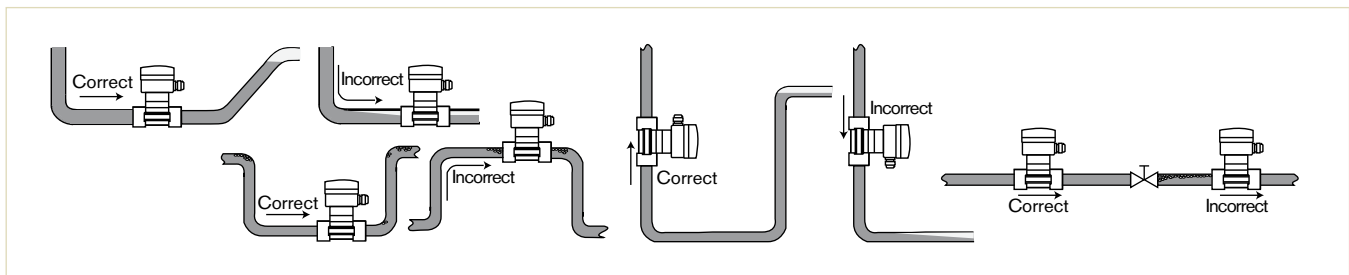
## Installation



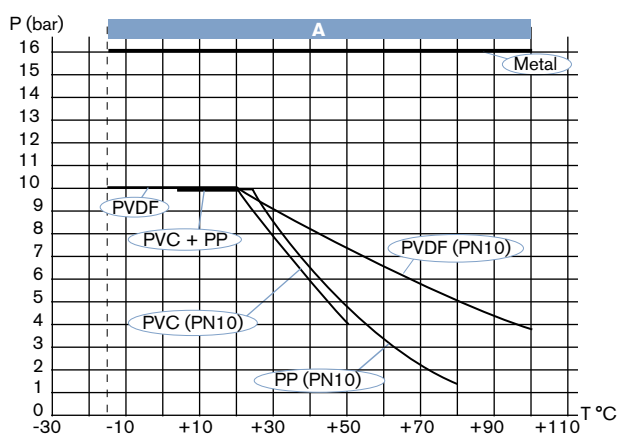
EN ISO 5167-1 specifies the straight inlet and outlet distances that must be complied with when installing fittings in pipelines in order to achieve calm flow conditions. The most important layouts that could lead to turbulence in the flow are shown below, together with the associated minimum inlet and outlet distances. These ensure calm, problem-free measurement conditions at the measurement point.



The device can be installed into either horizontal or vertical pipes.



## Pressure/temperature Chart



A: Application range for a complete device  
(fitting + electronics)

## Ordering Charts

Output	Connection	Item No.
NPN	Cable plug	436 474
PNP	Cable plug	434 871
NPN & PNP	M12 connection	436 473
Relay	Cable plug & M12	436 475
4 - 20 mA & Relay	Cable plug & M12	560 547

**Note:** other cable lengths on request

The SE32 electronic module and the S030 fitting must be ordered separately.

## Accessories

Connection	Type	Item No
5-pin M12 plug for NPN/PNP	Plug only	917 116
5-pin M12 plug for NPN/PNP	5 m, prewired	560 365
8-pin M12 plug for 4 - 20 mA	Plug only	444 799
8-pin M12 plug for 4 - 20 mA	10 m, prewired	555 675

# INLINE Flow Transmitter for continuous flow measurement

SE35

## For use with fitting DN15-50 mm

- Displays both flow rate and volume (with two totalizers)
- Automatic calibration: Teach-In
- Simulation: all output signals

See appropriate fittings S030



The flow transmitter is specially designed for use in neutral, slightly aggressive, solid free liquids. The transmitter is made up of a compact fitting with paddle-wheel (S030) and an electronic module (SE35) quickly and easily connected together by a Quarter-Turn

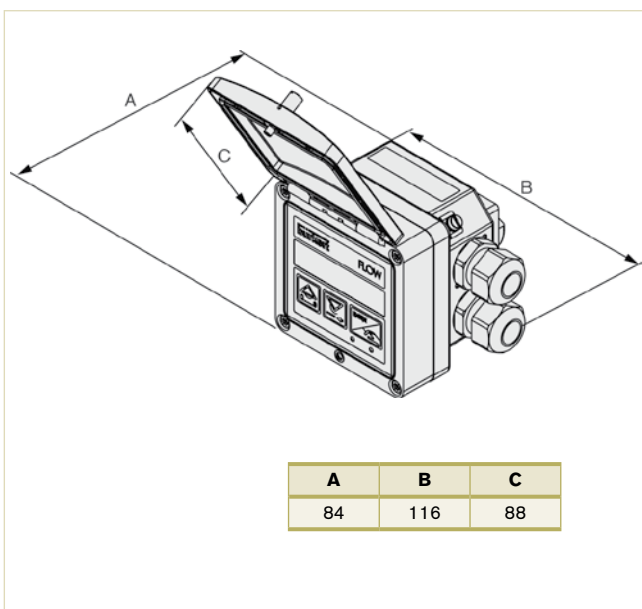
## Technical data

General data	
<b>Compatibility</b>	with fittings S030 (see corresponding data sheet)
<b>Materials</b>	
Housing, cover, lid, nut	PC
Front panel foil / Screws	Polyester / Stainless steel
Cable plug or glands	PA
<b>Wetted parts materials</b>	
Fitting, sensor armature	Brass, stainless steel 1.4404/316L, PVC, PP or PVDF
Paddle-wheel	PVDF
Axis and bearing / Seal	Ceramics / FKM (EPDM included but non-mounted)
<b>Display</b>	15x60 mm, 8-digit LCD, alphanumeric, 15 segments, 9 mm high
<b>Electrical connections</b>	Cable plug EN175301-803 or cable glands M20x1.5 or none (for battery version) max. 50 m, shielded cable with 1.5 mm <sup>2</sup> max. cross-section (cable plug included)
Complete device data (Fitting S030 + electronics)	
<b>Pipe diameter</b>	DN06 to DN65
<b>Measuring range</b>	0.5 m/s to 10 m/s (Battery ver. - Coil transducer) 0.3 m/s to 10 m/s (Hall transducer version)
<b>Fluid temperature</b> with fitting in	
PVC / PP	0°C to 50°C / 0°C to 80°C)
PVDF, brass or stainless steel	-15°C to 100°C
<b>Fluid pressure max.</b>	PN10 (145.1PSI) (with plastic fitting) - PN16 (232.16PSI) (with metal fitting - PN40 on request, see S030 data sheet) - see Pressure/Temperature diagram
<b>Viscosity / Pollution</b>	300 cSt. max. / 1% max. (size: 0.5 mm max.)
<b>Measurement error</b>	
Teach-In	±1% of Reading <sup>1)</sup> (at the teach flow rate value)
Standard K-factor	±2.5% of Reading <sup>1)</sup>
<b>Linearity</b>	±0.5% of F.S.* <sup>1)</sup>
<b>Repeatability</b>	±0.4% 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)

Dimension [mm] (see datasheet for more details)



## Options

- Electrical connection acc. to EN 75301-803 Type 2508 (Item no. 438 811) or Type 2509 (Item no. 162 673)
- PVDF or PP Fittings.
- High flow rates (8025) up to DN350 mm
- Various seal materials
- Special calibration certificate

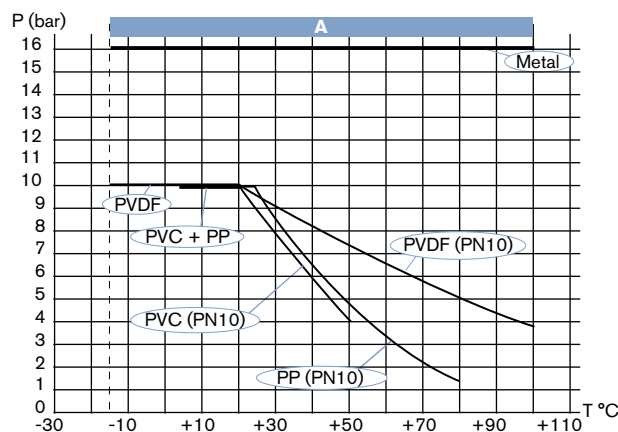
## Technical data (continued)

Electrical data	
<b>Power supply (V+)</b>	
Standard signal version	12-36 V DC $\pm 10\%$ , filtered and regulated, SELV (extra low safety voltage) circuit with a non dangerous energy level or 115/230 V AC 50/60 Hz (see tech. spec. 115/230 V AC)
Battery indicator/totalizer version	2 x 9 V DC batteries, lifetime min. 1 year at 20°C
<b>Reversed polarity of DC</b>	
protected	
<b>Current consumption</b> with sensor	
(without consumption of pulse output)	$\leq 70$ mA at 12 V DC - transmitter with relays $\leq 25$ mA at 12 V DC - transmitter without relay
<b>Output</b>	
<b>Standard signal version</b>	
Signal current	4-20 mA (3-wire with relays; 2-wire without relay) max. loop impedance: 900 $\Omega$ at 30 V DC; 600 $\Omega$ at 24 V DC; 50 $\Omega$ at 12 V DC; 800 $\Omega$ with a 115/230 V AC voltage supply
Pulse	Polarized, potential free, 5 to 36 V DC; 100 mA, protected, line drop at 100 mA: 2.5 V DC
Relay	2 relays, freely configurable, 3 A, 230 V AC
<b>Battery indicator/totalizer version</b>	
None	
<b>4 to 20 mA measurement error</b>	
$\pm 1\%$	
Environment	
<b>Height above sea level</b>	
max. 2000 m	
<b>Ambient temperature</b>	
(operation and storage)	0°C to +60°C (12-36 V DC or battery version) 0°C to +50°C (115/230 V AC version)
<b>Relative humidity</b>	
$\leq 80\%$ , without condensation	
Technical specifications 115/230 V AC	
<b>Voltage supply</b>	
available inside the device	27 V DC regulated, max. current: 125 mA Integrated protection: fuse 125 mA temporised power: 3 VA
Standard, directives and approvals	
<b>Protection class</b>	
IP65 with cable plug or gland mounted and tightened or with obturator locked if not used.	
<b>Standard</b>	
EMC	EN 61000-6-2, EN 61000-6-3
Safety	EN 61010-1
Pressure (Fitting S030, DN06 to DN65, in PVC, PP, PVDF, stainless steel or brass)	Complying with article 3 of chp. 3 from 2006/95/CE directive*
Vibration / Shock	EN 60068-2-6 / EN 60068-2-27

\* For the 2006/95/CE pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter and fluid).

Type of fluid	Conditions
<b>Fluid group 1, §1.3.a</b>	DN25 only
<b>Fluid group 2, §1.3.a</b>	DN $\leq 32$ , or DN $> 32$ and PN*DN $\leq 1000$
<b>Fluid group 1, §1.3.b</b>	PN*DN $\leq 2000$
<b>Fluid group 2, §1.3.b</b>	DN $\leq 200$

## Pressure/Temperature diagram

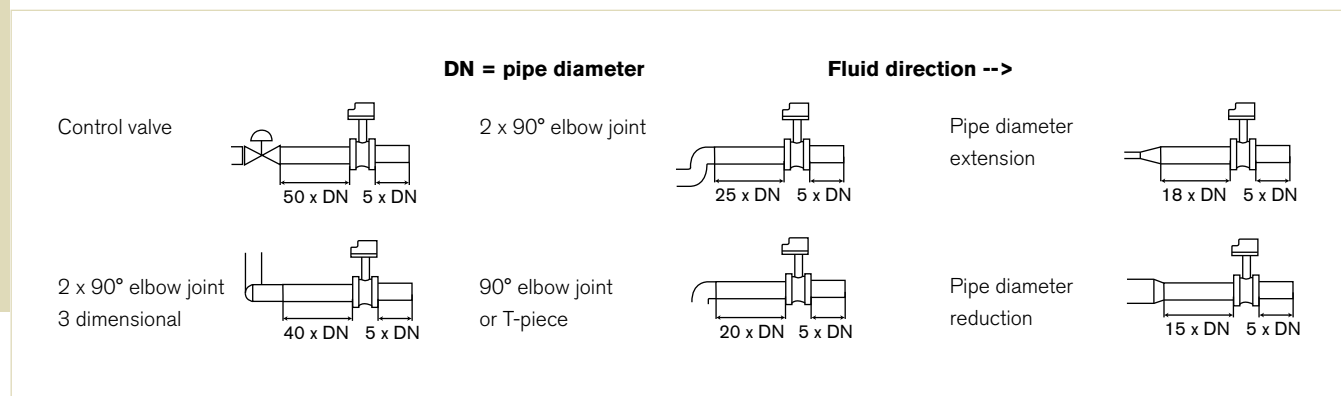


A: Application range for complete device  
(fitting + electronics)

## Installation



EN ISO 5167-1 specifies the straight inlet and outlet distances that must be complied with when installing fittings in pipelines 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 minimum inlet and outlet distances. These ensure calm, problem-free measurement conditions at the measurement point.



## Ordering chart

Supply voltage	Outputs	Electrical connection	Item no.
12 - 36 V/DC	4 - 20 mA (2 -wire) + Pulse	Cable plug	444 005
		2 cable glands	444 006
	4 - 20 mA (3 -wire) + Pulse + Relays	2 cable glands	444 007
115 - 230 V/50 Hz	4 - 20 mA (2-wire) + Pulse	2 cable glands	423 922
	4 - 20 mA (3 -wire) + Pulse + Relays	2 cable glands	423 924
2 x 9 V/ DC Batteries	-	None	423 921

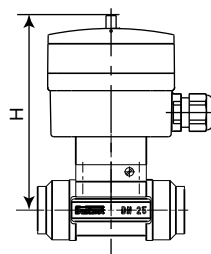
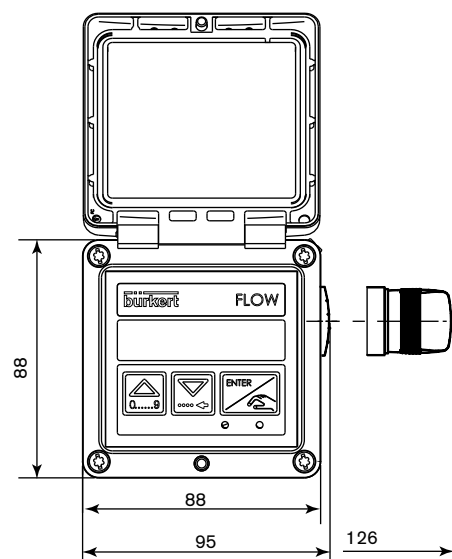
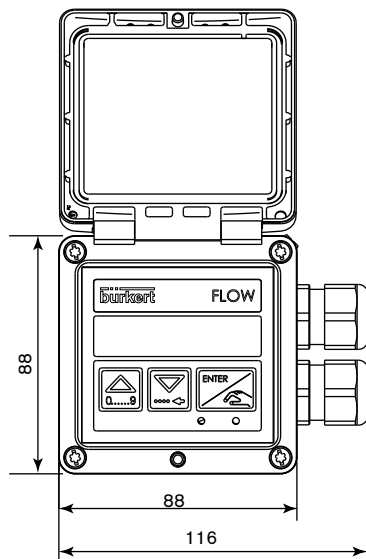
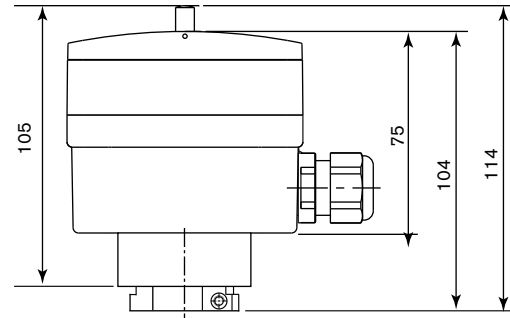
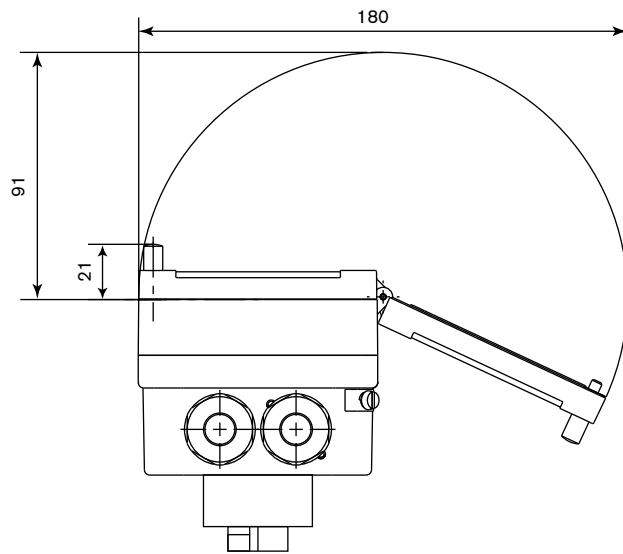
**Note:** The SE35 electronic module and the S030 fitting must be ordered separately

## Accessories

Specifications	Item no.
Set with 2 cable glands M20x1.5 + 2 neoprene flat seals for cable gland or plug + 2 screw-plugs M20x1.5 + 2 multiway seals 2x6 mm	449 755
Set with 1 stopper for unused cable gland M20x1.5 + 1 multiway seal 2x6 mm for cable gland + 1 black EPDM seal for the sensor + 1 mounting instruction sheet	551 775



## Dimensions [mm]



DN	H
06	134
08	134
15	139
20	137
25	137
32	140
40	144
50	151
65	151

# In-Line Flow Transmitter for continuous measurement

SE36

## For use with fitting S030, DN15-50 mm

- Up and download of the data through removable display
- Automatic calibration: TEACH-IN
- All output signals without presence of flow

Please see fitting S030

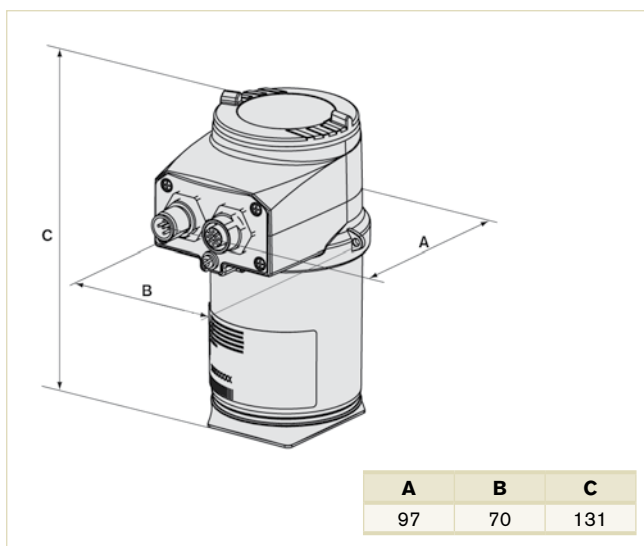


Unique bayonet style flow meter constructed from an SE36 sensor and any of the S030 fittings. This two-wire 4-20 mA INLINE flow meter is manufactured to provide true, reliable flow for neutral, solid free liquids. A backlit removable display allows the system to be flexible and adds more value.

## Technical Data

General data	
<b>Compatibility</b>	Any pipe from DN06 to 65 which are fitted out with Bürkert INLINE Fitting S030 (see corresponding data sheet)
<b>Materials</b>	See exploded view, on next page
Housing	Stainless steel 1.4561, PPS
cover	PC
Gaskets	EPDM
Screws	Stainless steel
Fixed connector mounting plate	Stainless steel 1.4404 (316L)
Fixed connector	Brass nickel plated
Display	PC
Navigation key	PBT
Quarter-Turn system	PC
<b>Display (accessories)</b>	Grey dot matrix 128 x 64 with backlighting
<b>Electrical connections</b>	
2 or 3 outputs transmitter	1 x 5-pin M12 male fixed connector,
4 outputs transmitters	1 x 5-pin M12 male and 1 x 5-pin M12 female fixed connectors
<b>Connection cable</b>	Shielded cable
Environment	
<b>Ambient temperature</b>	-10 up to +60°C (operating and storage)
<b>Relative humidity</b>	≤ 85%, without condensation
Complete device data (Pipe + transmitter)	
<b>Pipe diameter</b>	DN06 to 65
<b>Measuring range</b>	0.3 up to 10 m/s
<b>Medium temperature</b> with fitting in	
PVC	0 up to 50°C
PP	0 up to 80°C
PVDF, brass or stainless steel	-15 up to 100°C
<b>Medium pressure max.</b>	PN10 (145 PSI) (with plastic fitting) - PN16 (232 PSI) (with metal fitting) - (PN40 on request, see S030 datasheet) - see pressure/temperature chart
<b>Viscosity / Particles rate</b>	300 cSt max. / 1% max.
<b>Measurement error</b>	
Teach-In	± 1% of Reading (at Teach-In flow rate value) <sup>1)</sup>
Standard K-factor	± 2.5% of Reading <sup>1)</sup>
<b>Linearity</b>	± 0.5% of F.S.* <sup>1)</sup>
<b>Repeatability</b>	± 0.4% of Reading <sup>1)</sup>

## Envelope Dimensions [mm] (see datasheet for details)




## Options

- High flow rate (8026) to DN350 mm
- Hygienic clamp and weld end connections
- ANSI/DIN flange connection
- Various sealing materials
- Individual calibration certificate

<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)

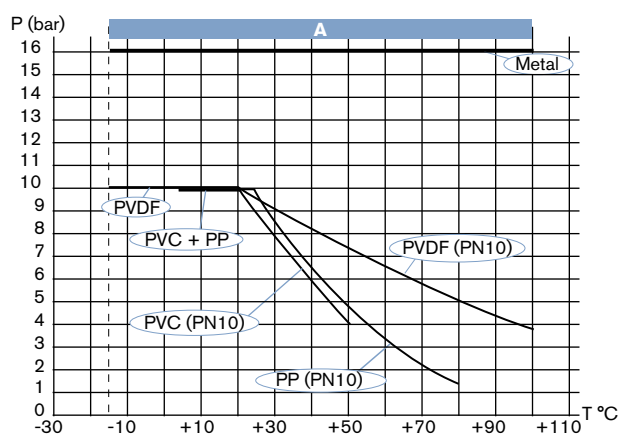
## Technical Data (continued)

Electrical data	
<b>Power supply</b>	
2 or 3 outputs transmitter (2-wire)	14-36 V DC, filtered and regulated
4 outputs transmitter (3-wire)	12-36 V DC, filtered and regulated
<b>Characteristics of the power source (not provided) of UL recognized devices</b>	Limited power source (according to § 9.3 of the UL61010-1 standard) or, Class 2 type power source (acc. to the 1310/1585 and 60950-1 standards)
Current consumption with sensor	≤ 1 A (with transistors load)
2 or 3 outputs transmitter (2-wire)	≤ 25 mA (at 14 V DC without transistors load, with current loop)
4 outputs transmitter (3-wire)	≤ 5 mA (at 12 V DC without transistors load, without current loop)
<b>Power consumption</b>	40 W max.
<b>Reversed polarity of DC</b>	Protected
<b>Voltage peak</b>	Protected
<b>Short circuit</b>	Protected for transistor outputs
<b>Output</b>	
<b>Transistor</b>	
1 Transistor output (Transmitter 2-wire)	NPN, open collector, 1 - 36 V DC, max. 700 mA
2 Transistor outputs (Transmitter 2 or 3-wire)	Configurable as sourcing or sinking (respectively both as PNP or NPN), open collector, max. 700 mA, 500 mA max. per transistor if the 2 transistor outputs are wired NPN-output: 1 - 36 V DC PNP-output: Power supply
<b>Current</b>	
1 Current output (Transmitter 2-wire)	4-20 mA programmable as sourcing or sinking (in transistor mode), max. loop impedance: 1100 Ω at 36 V DC ; 610 Ω at 24 V DC; 180 Ω at 14 V DC
2 Current outputs (Transmitter 3-wire)	max. loop impedance: 1100 Ω at 36 V DC; 610 Ω at 24 V DC; 100 Ω at 12 V DC
<b>4 to 20 mA measurement error</b>	± 1%
<b>Standards, directives and approvals</b>	
<b>Protection class</b>	IP65, IP67, NEMA 4X and NEMA 6P with M12 cable plug mounted and tightened and cover fully screwed down
<b>Standard and directives</b> 	
<b>EMC</b>	EN 61000-6-2 (2005), EN 61000-6-3 (2001)
<b>Pressure</b>	Complying with article 3 of §3 from 97/23/CE. directive*
<b>Vibration / Shock</b>	EN 60068-2-6 / EN 60068-2-27

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

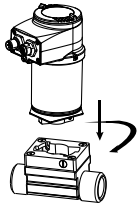
Type of fluid	Conditions
<b>Fluid group 1, §1.3.a</b>	DN ≤ 25 only
<b>Fluid group 2, §1.3.a</b>	DN ≤ 32 DN > 32 and PN*DN ≤ 1000
<b>Fluid group 1, §1.3.a</b>	PN*DN ≤ 2000
<b>Fluid group 2, §1.3.a</b>	DN ≤ 200

## Pressure / Temperature Chart



A : application range for complete device  
(Fitting + transmitter)

## Installation

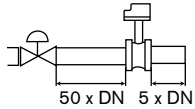


EN ISO 5167-1 prescribes the straight inlet and outlet distances that must be complied with when installing fittings in pipe lines in order to achieve calm flow conditions. The most important layouts that could lead to turbulence in the flow are shown below, together with the associated prescribed minimum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

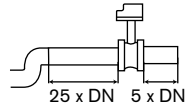
**DN = orifice**

**Fluid direction -->**

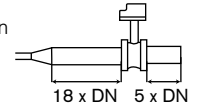
Regulating valve



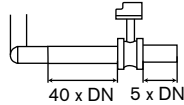
2 x 90° elbow joint



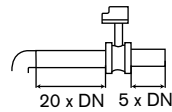
Extension



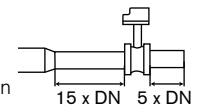
2 x 90° elbow joint  
3 dimensional



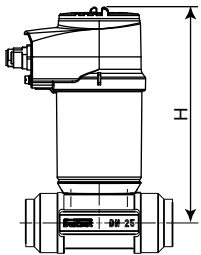
90° elbow joint  
or T-piece



Reduction



## Dimensions [mm]



DN	H with S030 Fitting
06	160
08	160
15	165
20	163
25	163
32	166
40	170
50	177
65	177

## Ordering Chart

Specifications	Output	Electrical connection	Item no.	
			without display	with display
2 outputs	1 x transistor + 1 x 4 - 20 mA (2 wire)	5-pin M12 male fixed connector	560 880	561 880
3 outputs	2 x transistor + 1 x 4 - 20 mA (2 wire)	5-pin M12 male fixed connector	560 881	561 881
4 outputs	2 x transistor + 2 x 4 - 20 mA (3 wire)	5-pin M12 male and 5-pin M12 female	560 882	561 882

### Note:

The following items must be ordered separately

- The SE36 electronic module and the S030 fitting
- M12 cable plugs (only female for single 4-20 mA, 1 male + 1 female for dual 4-20 mA transmitter)

## Accessories

Description	Item No
Display/programming module	559 168
Electrical connector, 5-pin M12 male, plug only	560 946
Electrical connector, 5-pin M12 male, 2 m prewired	559 177
Electrical connector, 5-pin M12 female, plug only	917 116
Electrical connector, 5-pin M12 female, 2 m prewired	438 680

## Electronics for electromagnetic flowmeters

SE56

- Must be equipped with sensor fitting S051, S055 or S056 (see Type 8051, 8055 and 8056)
- Continuous measurement or batch control
- High accuracy
- Data logger, PROFIBUS DP, HART available



SE56 standard  
with display,  
housing in  
stainless steel



SE56  
blind

The SE56 electronics (blind in compact version or with display in compact or remote version) connected to the magnetic flow sensor fitting, Type S051, S055 or S056, is designed for applications with liquids with a minimum conductivity of 5 mS/cm.

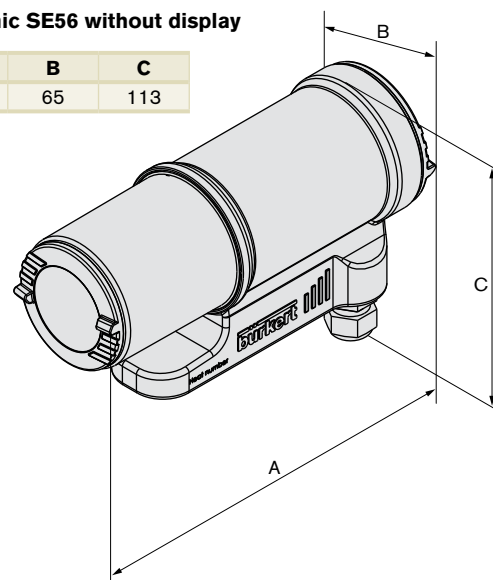
The device can be parameterize either with 3 keypads (version with display) or by computer via a serial interface.

As standard, the equipment is supplied with one or two transistor outputs and one digital input. As options, other features are available: such as high frequency output, current output, data logger 2 MB, PROFIBUS DP, HART.

Envelope Dimensions [mm] (see datasheet for details)

### Electronic SE56 without display

A	B	C
184	65	113



### Technical Data

#### Electronics SE56 standard with display

<b>Housing materials</b>	Die casting aluminium or stainless steel 304 electro-polish
<b>Display</b>	Graphic display 8 lines x 16 Characters, 128 x 64 pixels with back light
<b>Keyboard</b>	3 membrane keys
<b>Electrical connection</b>	6 cable glands PG11
<b>Environment</b>	
<b>Ambient temperature</b>	
Operating and storage	-20 to +60°C
<b>Relative humidity</b>	≤ 85%, without condensation
<b>Height above sea level</b>	-200 to 6000 m
<b>Standard</b>	
<b>Protection</b>	Class I, IP67, category of installation II
<b>Standard</b>	
EMC	EN 61326-1
Emission	EN 55011 (Group1, Class B)
Immunity	IEC 1000-4-2/3/4/5/6/11
Safety	EN 61010

#### Electrical data

<b>Power supply</b>	90 to 265 V AC - 44 Hz to 66 Hz
<b>Power consumption</b>	max. 25 VA
<b>Cable length</b>	max. 20 m (distance between sensor fitting and electronics)
<b>Input circuit</b>	1 digital, selectable function
<b>Outputs</b>	
Transistor	2 outputs, selectable open collector as pulse/frequency (1250 Hz, 100 mA, 40 V DC) or alarm (adjustable usage)
Current	1 output, 4 to 20 mA - RL = 1000 Ω (+ a second output)*
Serial interface*	RS 485, RS232, PROFIBUS DP or HART
Datalogger*	2 MB, 32 values + 64 alarm events
<b>Velocity range</b>	0.4 to 10 m/s

\* on request.

## Technical Data (continued)

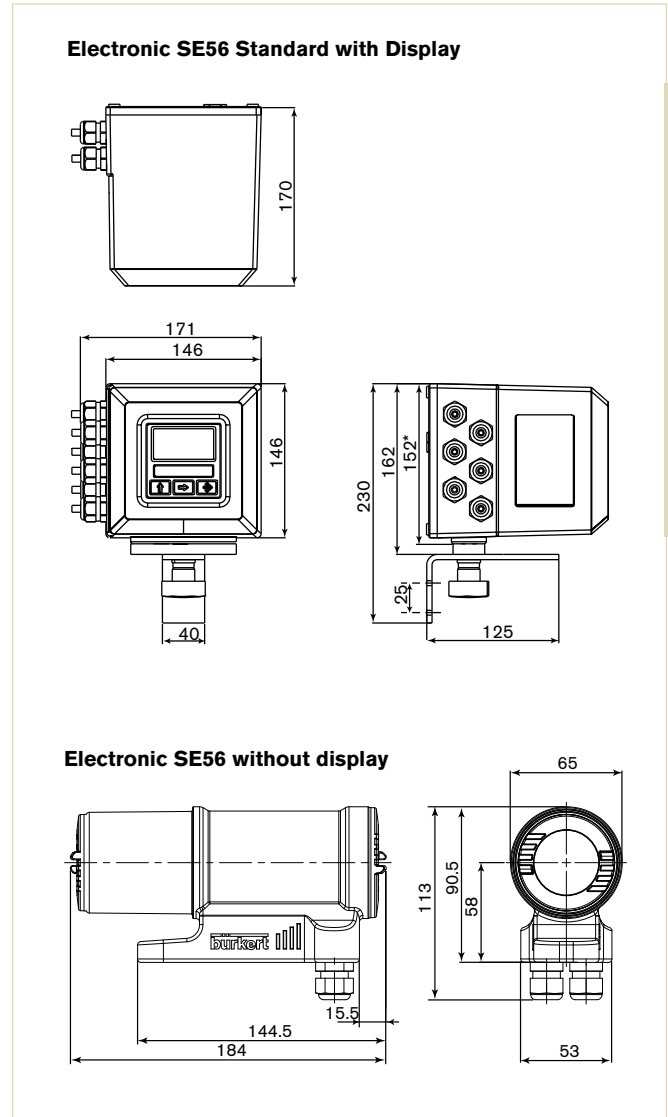
Electronics SE56 standard with display (Fort)	
<b>Measurements tolerance</b>	Flow rate (volume) = $\pm 0.05\%$ of reading Out 4/20 mA = $\pm 0.08\%$ of reading Frequency out = $\pm 0.08\%$ of reading
<b>Accuracy <sup>1)</sup></b>	$\pm 0.2\%$ of reading (see diagram)
<b>Repeatability</b>	$\pm 0.1\%$ of reading
<b>Galvanic isolation</b>	All the input/outputs are galvanically isolated from power supply
<b>Data storage</b>	An EEPROM stores the measured values (in case of power failure)
<b>Special functions</b>	Bidirectional measure Dual measurement range Diagnostic function Empty pipe detection Remote configuration (for connection to PC or hand terminal through remote configuration tool kit) Batch function

<sup>1)</sup> under reference conditions: water temperature = 20°C, ambient temperature = 25°C, constant flow rate during the test, liquid speed > 1 m/s

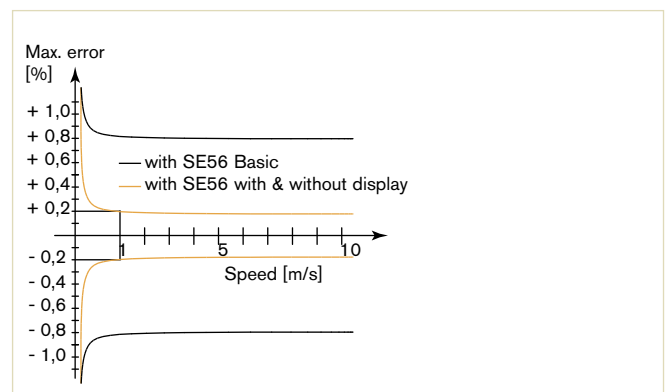
Technical data (electronics SE56 blind)	
<b>Materials</b>	Housing: Stainless steel Cover: PPS Seal: EPDM
<b>Display</b>	None
<b>Parameterization</b>	Through remote configuration tool kit (accessories Item No. 559 374)
<b>Electrical connection</b>	2 cable glands PG9
<b>Electrical data</b>	
<b>Power supply</b>	20 - 30 V DC
<b>Power consumption</b>	max. 10 W
<b>Input</b>	1 digital, selectable function
<b>Outputs</b>	
Transistor	2 outputs, selectable open collector as pulse/frequency (1250 Hz, 100 mA, 40 V DC) or alarm (adjustable usage)
Current	1 output, 4 to 20 mA - RL = 800 $\Omega$ passive
Serial interface*	RS 485 or PROFIBUS DP
<b>Accuracy <sup>1)</sup></b>	$\pm 0.2\%$ of reading (see diagram)
<b>Repeatability</b>	$\pm 0.1\%$ of reading
<b>Galvanic isolation</b>	All the input/outputs are galvanically isolated from power supply
<b>Data storage</b>	An EEPROM stores the measured values (in case of power failure)
<b>Special functions</b>	Bidirectional measure Diagnostic function Empty pipe detection Remote configuration (for connection to PC or hand terminal) Batch function
<b>Velocity range</b>	0.4 to 10 m/s
Environment	
<b>Ambient temperature</b>	Operating and storage: -20 to 40°C (-4 to 104°F)
<b>Relative humidity</b>	$\leq 85\%$ , without condensation
<b>Height above sea level</b>	-200 to 6000 m
Standard	
<b>Protection</b>	Class I, IP67, category of installation II
Standard	
EMC	EN 61326-1
Emission	EN 55011 (Group 1, Class B)
Immunity	IEC 1000-4-2/3/4/5/6/11
Safety	EN 61010

\* on request.

## Envelope Dimensions [mm] (see datasheet for details)



## Accuracy Diagram



## Ordering Chart

SE56

Description	Power supply	Output	Body material	Electrical connection	Item no.
Standard compact version with display	90 - 265 V AC	2 Transistors	Aluminium	6 cable glands	558 745
			Stainless steel	6 cable glands	559 780
Standard wall-mounting version with display	90 - 265 V AC	2 Transistors	Aluminium	6 cable glands	559 781
			Stainless steel	6 cable glands	558 310
		2 Transistors + 4 - 20 mA	Aluminium	6 cable glands	558 750
			Stainless steel	6 cable glands	558 308
Blind compact version	20 - 30 V DC	up to 4 Transistors	Stainless steel	2 cable glands	559 132
		up to 4 Transistors + 4 - 20 mA	Stainless steel	2 cable glands	559 133
		up to 4 Transistors + Profibus DP	Stainless steel	2 cable glands	559 134

### Note:

The SE35 electronic module and the S030 fitting must be ordered separately

## Accessories

Description	Item no.
USB interface cable + software for programming the flow transmitter electronics without display with PC	559 374
Kit for converting a compact design to a remote version (only transmitter electronics with display)	560 153



# Gas provides reliable.

The compact Bürkert solenoid control valves are very fine and thus provide a more stable fuel gas or air control. With an extremely low electrical energy they are extremely efficient.



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