Inline positive displacement (PD) flowmeter or flow threshold detector

- Indication, monitoring, transmitting and On/Off control in one device
- Selectable outputs (transistor or relay)
- Automatic calibration via teach-in
- Process value output: 4...20 mA

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

Can be combined with

Typ 8792
Digitaler elektropneumatischer Stellungsregler: Positioner SideControl

Typ 2300
Pneumatisch betätigtes 2-way-Schrägsitz-Regelventil ELEMENT

Typ 8644
Elektropneumatisches Automatisierungssystem AirLINE

Type description

The device Type SE32 + S077 is specially designed for continuous flow measurement of highly viscous fluids like glue, honey or oil. The device is provided as positive displacement (PD) flowmeter or flow threshold detector.

The device is made up of a compact Inline sensor-fitting with oval gears (Type S077) and a transmitter with display (Type SE32). The device is quickly and easily assembled thanks to a bayonet mounting and locking system. The Bürkert “Inline quarter-turn” technology ensures a leakage-free operation.

The Bürkert designed sensor-fitting system ensures simple installation of the devices into all pipelines from DN 15...DN 100.

The device is available with freely configurable switching outputs (transistor or relay) or with 4...20 mA process value output. The switching outputs enable the direct switching of valves and the establishment of a simple On/Off control circuit within a monitoring system. The switching points can be configured with the 3 keys directly at the display.

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Visit product website

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1. General technical data

Note:
If the device is mounted in a humid environment or outside, then the maximum voltage allowed is **35 V DC** instead of 36 V DC.

Product properties	
Material	
Make sure the device materials are compatible with the fluid you are using. Further information can be found in chapter "3.1. Bürkert resistApp" on page 7. Further information on the materials can be found in chapter "3.2. Material specifications" on page 7.	
Non-wetted parts	
Front panel film	Polyester
Cover	PC, glass fibre reinforced
Housing	PC, glass fibre reinforced
Screw	Stainless steel
Bayonet system	PC
Female cable plug/male fixed plug	• Body, contact holders and cable gland in PA • Cable gland seal and flat seal in NBR
Fixed connector	PA or PA and nickel-plated brass (CuZn)
Wetted parts	
Axis	Stainless steel 316L (1.4401)
Oval gear	Stainless steel 316L (1.4401)
Sensor-fitting body	Aluminium, stainless steel 316L (1.4401)
Cover	Aluminium, stainless steel 316L (1.4401)
Seal	FKM or FEP/PTFE encapsulated
Display	8-digit LCD with backlighting
Compatibility	Any pipe from DN 15...DN 100 which is fitted with Bürkert S077 Inline sensor-fitting. For the selection of the nominal diameter of the Inline sensor-fittings, see **data sheet Type S077** ▶.
Pipe diameter	DN 15...DN 100
Dimensions	Further information can be found in chapter "4. Dimensions" on page 8.
Measuring principle	Oval gear
Measuring range	• Viscosity > 5 mPa.s: 2...1200 l/min (0.53...320 gpm) • Viscosity < 5 mPa.s: 3...616 l/min (0.78...320 gpm)
Performance data	
Measurement deviation	• With K-factor determined with a teach-in procedure or with the specific K-factor marked on the sensor-fitting: ± 0.5 % of the measured value at teach-in flow rate value • With standard K factor: ± 1 % of the measured value
Repeatability	± 0.03 % of the measured value
4...20 mA output uncertainty	± 0.5 % of current range
Operating mode	Threshold: window or hysteresis
Electrical data	
Operating voltage	12...36 V DC ± 10 %, filtered and regulated Connection to main supply: permanent, through external SELV (Safety Extra Low Voltage) and LPS (Limited Power Source) power supply
Power source (not supplied)	Limited power source according to UL/EN 62368-1 standards or limited energy circuit according to UL/EN 61010-1 paragraph 9.4
Protection against DC polarity reversal	Yes
Current consumption	≤ 80 mA (no load)

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Output	• Transistor – NPN and/or PNP, open collector – 700 mA max. (500 mA max. per transistor if both transistor outputs are wired) – frequency: 0...300 Hz – operation and thresholds can be parameterised – NPN-output: 0.2...36 V DC – PNP-output: power supply – protection against short circuits • Relay – operation and thresholds can be parameterised – non UL device: – single relay output: 250 V AC/3 A or 30 V DC/3 A – relay output and 4...20 mA current output: 48 V AC/3 A or 30 V DC/3 A – UL device: 30 V AC/42 V_{peak}/3 A or 60 V DC/1 A • Process value – 4...20 mA, galvanic insulation – loop impedance max.: 1300 Ω at 36 V DC, 1000 Ω at 30 V DC, 700 Ω at 24 V DC, 450 Ω at 18 V DC, 200 Ω at 12 V DC – response time (10...90 %): 3 s with filter 2 (default setting)
Voltage supply cable	Max. 100 m length, shielded • For female cable plug (supplied): – external diameter of wire: 6...7 mm – cross section of wires: 0.25...1.5 mm² • For 5-pin M12 female connector (not supplied): – external diameter of wire: 3...6.5 mm – cross section of wires: max. 0.75 mm² • For 8-pin M12 female connector (not supplied): – external diameter of wire: 5.9 mm – cross section of wires: 0.25 mm²
Medium data	
Fluid temperature	With Inline sensor-fitting Type S077 in: • Aluminium: - 20...+ 80 °C (- 4...+ 176 °F) • Stainless steel: - 20...+ 120 °C (- 4...+ 248 °F) See **data sheet Type S077** ▶ for more information.
Fluid pressure	With Inline sensor-fitting Type S077 with: • DN 15: max. 55 bar (798.05 PSI) (threaded process connection) • DN 25: max. 55 bar (798.05 PSI) [1,)] • DN 40 or DN 50: max. 18 bar (261.18 PSI) • DN 80: max. 12 bar (174.12 PSI) • DN 100: max. 10 bar (145.1 PSI) See **data sheet Type S077** ▶ for more information.
Dynamic viscosity η	Max. 1 Pa.s (higher on request)
Maximum particle size	250 µm To prevent damage from dirt or foreign matter, we strongly recommend the installation of a 250 µm (60 mesh) strainer as close as possible to the inlet side of the meter.
Product connections	
Pipe connection	With Inline sensor-fitting Type S077 with: • Thread: ½", 1", 1½", 2", 3" (G or NPT) • Flange: – 25, 40, 50, 80 or 100 mm DIN PN 16 flange – 1", 1½", 2", 3" or 4" ANSI 150LB flange See **data sheet Type S077** ▶ for more information.
Electrical connection	Cable plug according to DIN EN 175301-803, free positionable 5-pin M12 male connector or 8-pin M12 male connector

Approvals and conformities	
Directives	
CE directive	Further information on the CE Directive can be found in chapter "2.3. Standards" on page 6.
Pressure equipment directive	Complying with article 4, paragraph 1 of 2014/68/EU directive Further information on the pressure equipment directive can be found in chapter "2.4. Pressure Equipment Directive (PED)" on page 6.
North America (USA/Canada)	UL Recognized for the USA and Canada
Environment and installation	
Ambient temperature	Operation and storage: 0...+ 60 °C (+ 32...+ 140 °F)
Relative air humidity	≤ 80 %, without condensation
Height above sea level	Max. 2000 m
Operating condition	Continuous
Equipment mobility	Fixed
Application range	Indoor and outdoor Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions.
Degree of protection [2.)] according to IEC/EN 60529	IP65 under the following simultaneous conditions: • device wired • cable plug mounted and tightened
Installation category	Category I according to UL/EN 61010-1
Pollution degree	Degree 2 according to UL/EN 61010-1

1.) Or in accordance to the value of the used flanges
2.) Not evaluated by UL

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2. Approvals and conformities

2.1. General notes

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

2.2. Conformity

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

2.3. Standards

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

2.4. Pressure Equipment Directive (PED)

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

Device used on a pipe

Note:

- The data in the table is independent of the chemical compatibility of the material and the fluid.
- PS = maximum admissible pressure, DN = nominal diameter of the pipe

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

2.5. North America (USA/Canada)

Approval	Description
c UL us	**Optional: UL Recognized for the USA and Canada** The products are UL Recognized for the USA and Canada according to: • UL 61010-1 (ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE – Part 1: General Requirements) • CAN/CSA-C22.2 No. 61010-1

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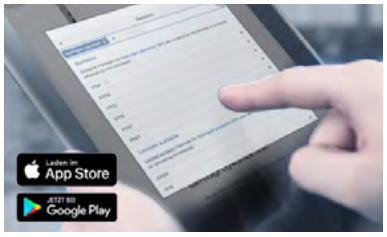
3. Materials

3.1. Bürkert resistApp

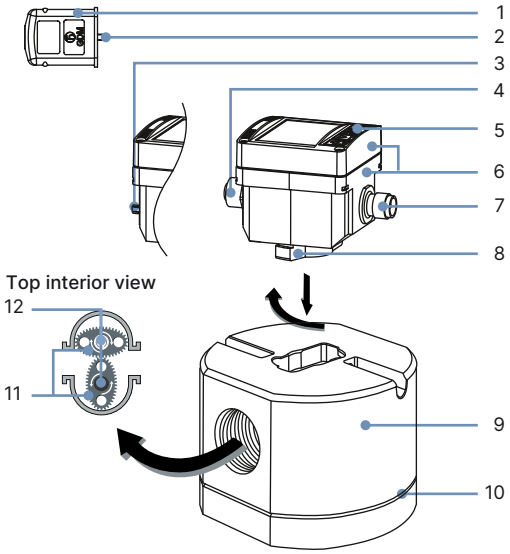


Bürkert resistApp – Chemical resistance chart

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

Start chemical resistance check

3.2. Material specifications



No.	Element	Material
1	Female cable plug (DIN EN 175301-803)	• Body, contact holders and cable gland in PA • Cable gland seal and flat seal in NBR
2	Screws	Stainless steel
3	Electrical contact	Sn
4	M12 male connector	PA and nickel-plated brass
5	Front panel folio	Polyester
6	Housing, cover	PC, glass fibre reinforced
7	M12 male connector	PA
8	Quarter turn system	PC
9	Sensor-fitting body	Aluminium or stainless steel (316L)
10	Seal	FKM or FEP/PTFE encapsulated
11	Oval gear	PPS, aluminium or stainless steel (316L)
12	Axis	Stainless steel (316L)

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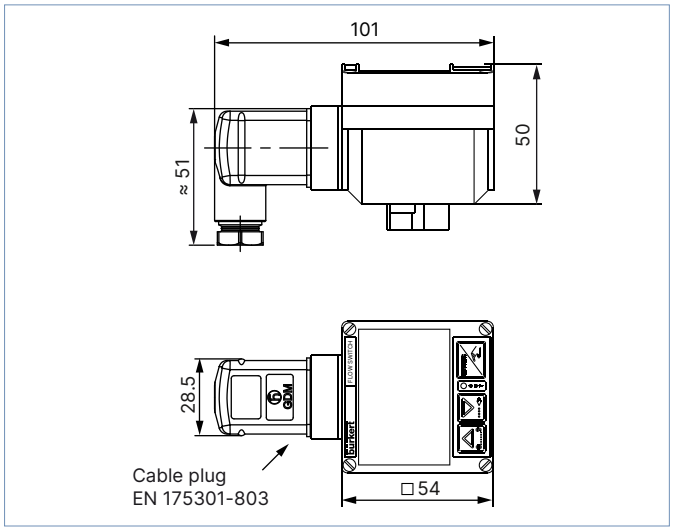
4. Dimensions

4.1. Transmitter SE32

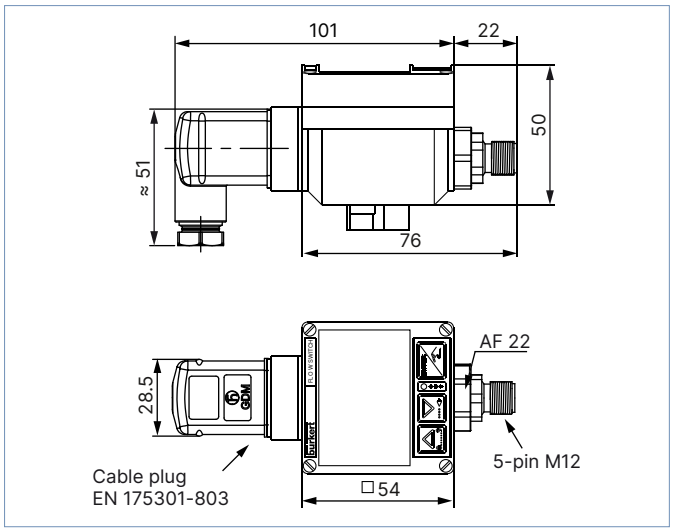
With cable plug (DIN EN 175301-803)

Note:
Dimensions in mm, unless otherwise stated



With Cable plug (DIN EN 175301-803) and free positionable 5-pin M12 male connector

Note:
Dimensions in mm, unless otherwise stated



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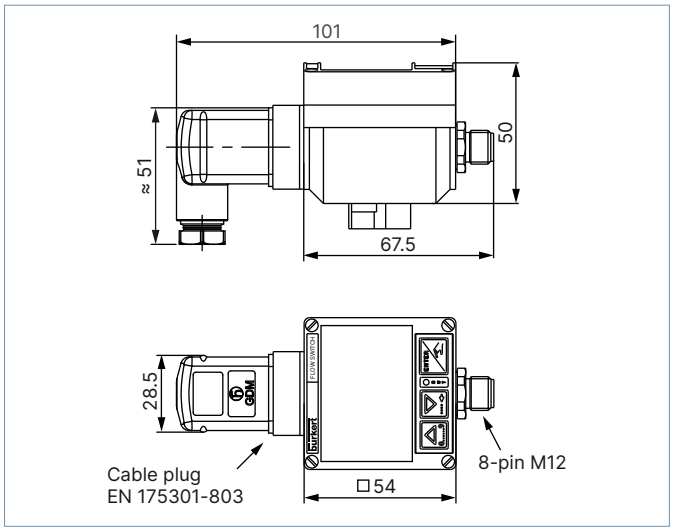
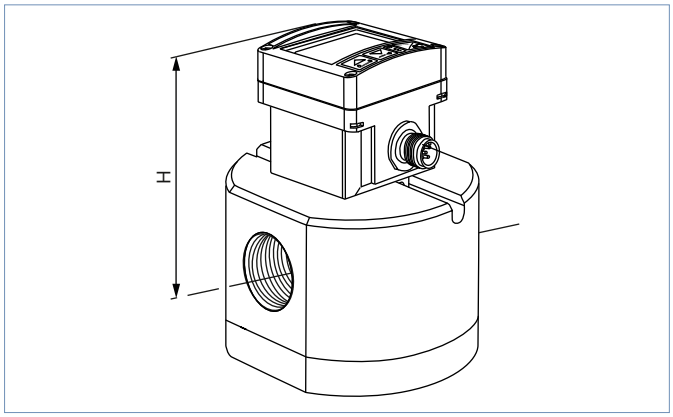
With cable plug (DIN EN 175301-803) and 8-pin M12 male connector

Note:
Dimensions in mm, unless otherwise stated



4.2. Transmitter Type SE32 mounted in an Inline sensor-fitting Type S077

Note:
Dimensions in mm, unless otherwise stated



DN	H
15	71
25	80
40	82
50	102
80	152
100	168

DN 15 DN 25 DN 40 DN 50 DN 80
Threaded connection

DN 25 DN 40 DN 50 DN 80 DN 100
Flanged connection

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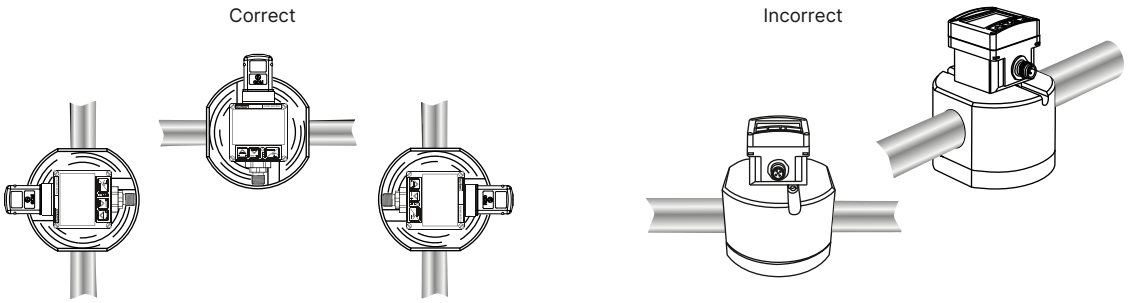
5. Product installation

5.1. Installation notes

Flow measurement

Note:
The device is not suitable for use in gaseous media and steam.

The sensor fitting can be installed in any orientation as long as **the rotor shafts are always in a horizontal plane**.



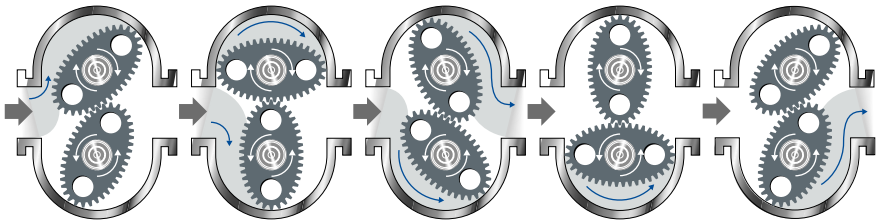
The following installation conditions must also be observed:

- The pipe always has to be filled with fluid at all times near the device.
- The pipe design must be such that no air bubbles or cavitation can form within the medium near the device at any time.
- We recommend the installation of a 250 µm strainer as close as possible to the inlet side of the meter, to prevent damage from particles,
- Air purges can damage the appliance and should therefore be avoided.

6. Product operation

6.1. Measuring principle

When liquid flows through the pipe, the rotors turn. This rotation produces a measuring signal in the associated Hall sensor. The rotation frequency of this signal is proportional to the flow velocity of the fluid. The volume of the fluid being transferred in this way is exactly determined through the sensor geometry.



A conversion coefficient, specific to each meter size, enables the conversion of this frequency into a flow rate. The standard K factor depending on the meter size is available in the flowmeter's operating instructions, see **Type S077** ▶. To improve the measurement deviation, a device-specific K factor is given on the device label.

The electrical connection is provided via a cable plug according to DIN EN 175301-803 and/or a M12 multipin plug.

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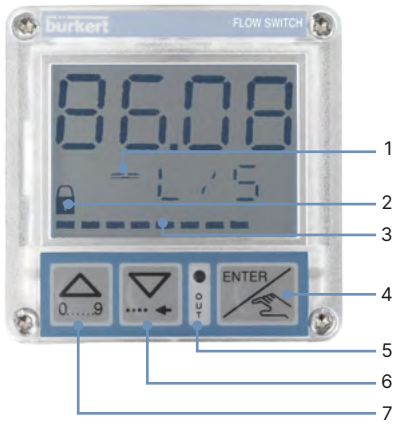
6.2. Functional overview

The display is used to:

- read the value of certain parameters such as the measured flow rate
- parameterize the device by means of 3 keys
- read the configuration of the device
- get notification of some events.

Display and operating keys	No.	Description
	**1**	Shows if the relay is open or closed
	2	Means that the access to the parameters and test menus is protected through a code
	3	Bar graph is running in each mode, except during a teach-in procedure
	4	"Confirm" key: • to confirm the function displayed • to confirm the parameters set
	5	Shows the status of the on/off output (red LED)
	6	"Next" key: • to select the digit at the left • to go to the next function
	7	"Back" key: • to change the value (0...9) of the selected digit • to go back to the previous function

The device can be calibrated by means of the K factor (proportionality factor) of the fitting, or via the teach-in function. User adjustments, such as engineering units, output, filter and bar graph are carried out on site.

Operating levels

The device has 2 operating levels:

- the process level
- the configuration level, which comprises the parameters and the test menus

Operating level	Functions
Process	• Indication of – the value of the measured flow rate – switching thresholds (high and low value) – the value of the 4...20 mA output (flowmeter only) • Access to the parameters and test menus of the configuration level
Configuration - parameters menu	• To make the settings needed for operation: – engineering units (international measuring units) – K-factor/Teach-in function – 4...20-mA-current output (flowmeter only) – selection of switching mode: window, hysteresis (see chapter "6.3. Function modes" on page 12) – selection of threshold value (see chapter "6.3. Function modes" on page 12) – delay – filter – 10-segment bargraph (select min. and max. value) • Additional parameter definition – backlighting – password protects the access to the parameters and test menus
Configuration - test menu	• To test the configuration made in the parameters menu with entering of a theoretical value • To read the frequency of the measured signal • To adjust the 4...20 mA current output

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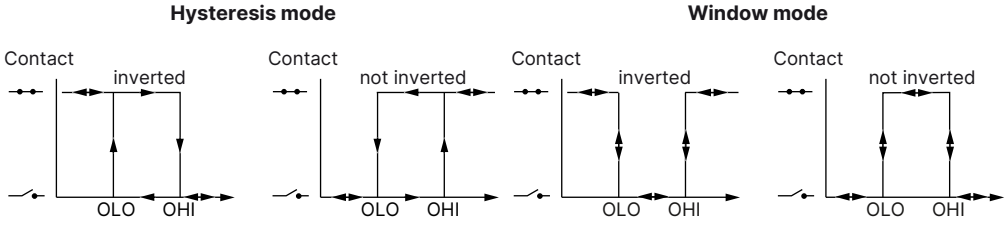
6.3. Function modes

Flow threshold detector 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 variant: relay, transistor NPN, transistor PNP

Flow transmitter with current output for the measurement value

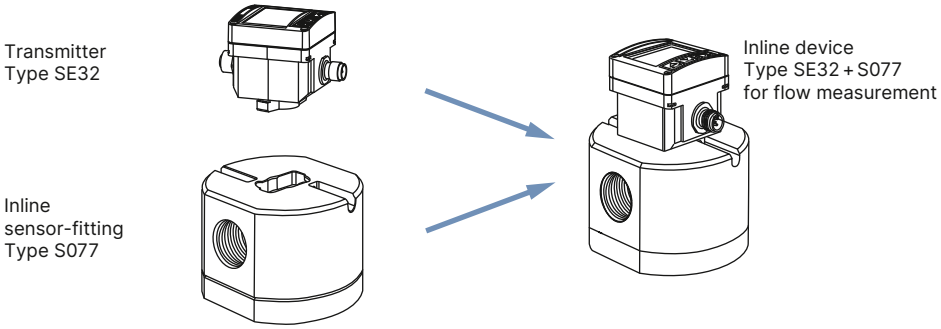
- 4...20 mA output
- 4...20 mA output + relay output

7. Product design and assembly

7.1. Product assembly

Note:

- The device Type SE32 + S077 is made up of a Bürkert Inline sensor-fitting Type S077 equipped with a sensor with oval gears and a transmitter Type SE32.
- The Inline sensor-fitting Type S077 ensures simple installation into pipes from DN 15...DN 100. The transmitter Type SE32 can be mounted on any Inline sensor-fitting Type S077 and fastened with a bayonet catch, see **data sheet Type S077** ▶ for more information.



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8. Networking and combination with other Bürkert products

Example:

Type SE32 + S077

4...20 mA output	Transistor output	Relay output
Type 8802 ▶ **(2301 and 8693)** ELEMENT Continuous control valve systems	**Type 6212** ▶ Servo-assisted 2/2-way diaphragm valve	**Type 6281** ▶ Servo-assisted 2/2-way diaphragm valve

9. Ordering information

9.1. Bürkert eShop

Bürkert eShop – Easy ordering and quick delivery

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

Order online now

9.2. Recommendation regarding product selection

A complete flowmeter Type SE32 + S077 consists of a flow transmitter Type SE32 and an Inline sensor-fitting Type S077.

See **data sheet Type S077** ▶ for more information.

Two different components must be ordered to obtain a complete device. The following information is required:

- **Article no.** of the compact Type SE32 flow transmitter (see chapter "9.4. Ordering chart" on page 14)
- **Article no.** of the selected Type S077 Inline sensor-fitting (see **data sheet Type S077** ▶)

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9.3. Bürkert product filter

Bürkert product filter – Get quickly to the right product

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

Try out our product filter

9.4. Ordering chart

Threshold detector Type SE32

Operating voltage	Output	UL approval	Electrical connection	Article no.
12...36 V DC	1 x transistor NPN	No	Female cable plug DIN EN 175301-803	436474
		UL Recognized		570475
	1 x transistor PNP	No		434871
		UL Recognized		570474
	2 x transistors NPN/PNP	No	Free positionable 5-pin M12 male connector	436473
		UL Recognized		553431
	Relay	No	Free positionable 5-pin M12 male connector and female cable plug DIN EN 175301-803	436475
		UL Recognized		570476

Transmitter Type SE32

Operating voltage	Output	UL approval	Electrical connection	Article no.
12...36 V DC	4...20 mA + relay	No	8-pin M12 male connector and female cable plug DIN EN 175301-803	560547
		UL Recognized		570488
		No	Free positionable 5-pin M12 male connector and female cable plug DIN EN 175301-803	560402
		UL Recognized		570486
	4...20 mA	No	Free positionable 5-pin M12 male connector	560403
		UL Recognized		570487

9.5. Ordering chart accessories

Description	Article no.
Electrical connection	
M12 female connector with plastic threaded clamping ring, 5-pin, straight, to be wired	917116
M12 female connector with moulded cable (shielded), 5-pin, straight, cable length: 2 m	438680
M12 female connector with metal threaded clamping ring, 8-pin, straight, to be wired	918998
M12 female connector with moulded cable, 8-pin, straight, cable length: 2 m	444800
Female cable plug, 4-pin (3 conductors + protective conductor), form A according to DIN EN 175301-803, with cable gland (**Type 2518** ▶)	572264
Female cable plug 32 mm, 4-pin (3 conductors + protective conductor), form A according to DIN EN 175301-803, with NPT ½" reduction without cable gland (**Type 2509** ▶)	162673

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