

## pH/ORP meter



Type 8202 neutrino can be combined with...



**Type 8203**  
pH or ORP probes



**Type 8611**  
eControl Universal  
controller



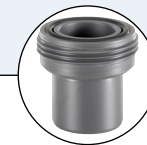
**Type 8619**  
multiCELL  
transmitter/controller



**Type 8693**  
electropneumatic  
process controller



**Type 8802**  
ELEMENT  
control valve system



**Type S022**  
Insertion adaptor

The Bürkert 8202 neutrino pH/ORP meter is a compact device designed for the measurement of:

- the pH in clean liquids or liquids containing solids, sulphides or proteins.
- or the oxidation-reduction potential in clean liquids or liquids containing solids, sulphides or proteins which may present low conductivity.

The pH/ORP meter consists of a replaceable standard 120 mm pH or ORP probe, Type 8203, which is screwed into a probe holder with integrated Pt1000 temperature sensor. This ensemble is plugged-in and screwed with a nut to an enclosure with cover, containing the electronic module. Thus, Bürkert simplifies installation and maintenance work.

The 8202 neutrino pH/ORP meter is a 2-wire device with a 4...20 mA current output. The 8202 device converts the measured signal, computes the output signal, which is provided via a free positionable M12 fixed connector or on a terminal strip via a cable gland.

- Integral blind measurement device for direct connection to a control level (PLC) with standard signal output
- Fast and easy adaptation of the device between pH and ORP measurement
- Usage of 120 mm standard PG 13.5 pH/ORP-probes with S8 connector (Type 8203 recommended)
- Easy one or two point calibration on the device directly


Technical data (Pipe + meter)	
<b>Pipe diameter</b>	DN25...DN110 (DN<25 with reduction)
<b>pH measurement</b>	
Measuring range	0...14 pH
Measurement deviation*	±0.05 pH
<b>ORP measurement</b>	
Measuring range	-2000...+2000 mV
Measurement deviation*	≤0.2 % of the full scale
<b>Temperature measurement</b>	
Measuring range	-20...+130 °C (-4...266 °F)
Measurement deviation*	±1 °C (1.8 °F)
<b>Temperature compensation</b>	automatic (integrated Pt1000) - reference temperature 25 °C (77 °F)
<b>Fluid temperature**</b>	
With PVC nut connection	0...+50 °C (+32...+122 °F) restricted by the used probe
With PVDF nut connection (on request)	-20...+130 °C (-4...+266 °F) restricted by the used adaptor or probe
	restriction with adaptor S022 in:
	- PVC: 0...+50 °C (+32...+122 °F)
	- PP: 0...+80 °C (+32...+176 °F)
	- Metal: -20...+130 °C (-4...+266 °F)
<b>Fluid pressure max</b>	PN16 (232 PSI) (see pressure / temperature** chart - depends on selected probe)
<b>4...20 mA output uncertainty</b>	±1 % of the range
<b>Environment</b>	
<b>Ambient temperature</b>	-10...+60 °C (+14...+140 °F) (operating and storage without probe)
<b>Relative humidity</b>	≤85 %, without condensation

\* ("measurement bias" as defined in the standard JCGM 200:2012)

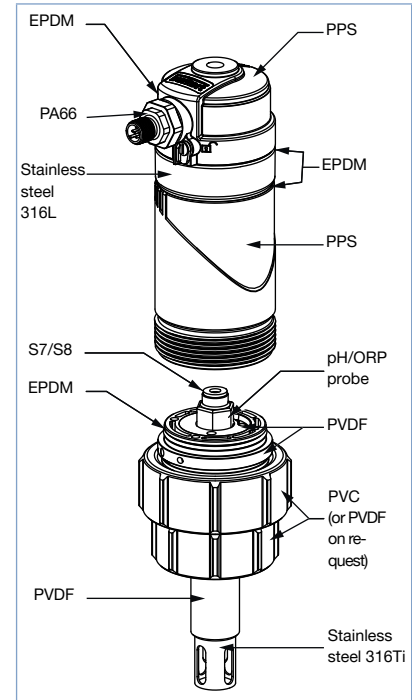
\*\* If the specific temperature limits for the probe used and the temperature limits given in the above technical data chart are different, please use the more restrictive range (see separate datasheet)

# 8202 ELEMENT neutrino

bürkert


General data	
<b>Compatibility</b>	Any pipe which are fitted out with Bürkert adaptor S022 (see separate datasheet)
<b>Materials</b>	See exploded view, opposite
Housing	Stainless steel 1.4404 (316L), PPS
Cover	PPS
Seals	EPDM
Fixed connector/cable gland	PA66
Nut	PVC (PVDF on request)
Wetted part materials	
Probe holder	PVDF, Stainless steel 1.4571 (316Ti)
Probe	See specific technical data of the used probe
<b>Probe</b>	120 mm Bürkert pH or ORP probe, Type 8203 (recommended) or any combined 120 mm pH or ORP probe, without temperature sensor, with PG 13.5 head, S7/S8 connector
<b>Temperature sensor</b>	Pt1000 integrated within the holder
<b>Electrical connections</b>	1 x 5 pin free positionable M12 male fixed connector, or terminal strip via 1x cable gland M16 x 1.5
<b>Recommended connection cable for terminal strip</b>	Shielded cable
Solid H05(07) V-U	(Measuring data acc. to CEI 664-1/VDE 0110 (4.97))
Flexible H05(07) V-K	0.25...1.5 mm <sup>2</sup>
With wire end ferrule	0.25...1.5 mm <sup>2</sup>
With plastic collar ferrule	0.25...0.75 mm <sup>2</sup>
Diameter	4...8 mm
Electrical data	
<b>Power supply</b>	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 § 9.4 of the UL61010-1 standard, second edition) or low power source (according to UL60950-1 standard) or Class 2 type power source (according to the UL1310/UL1585 standards)
<b>Current consumption with sensor</b>	≤25 mA
<b>Protection</b>	<ul style="list-style-type: none"> <li>Reversed polarity of DC: protected</li> <li>Voltage peak: protected</li> </ul>
<b>Output</b>	
Current	4...20 mA
	max. loop impedance: 1100 Ω at 36 V DC; 610 Ω at 24 V DC; 100 Ω at 12 V DC;
Response time (10%...90%)	5 s (standard)
Standards, directives and certifications	
<b>Protection class</b>	IP65, IP67, UL50E 6P, with M12 cable plug or cable gland tightened or obturated and cover properly mounted and secured
<b>Standards and directives CE</b>	The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable)
Pressure	Complying with article 4, §1 of 2014/68/EU directive*
<b>Certification</b>	
UL-Recognized for US and Canada 	UL61010-1 + CAN/CSA-C22.2 No. 61010-1
Specific technical data of UL-Recognized products for US and Canada	
<b>Intended for an inner pollution</b>	Pollution degree 2 according to EN 61010-1
<b>Installation category</b>	Category I according to UL61010-1 – indoor use

## Materials view



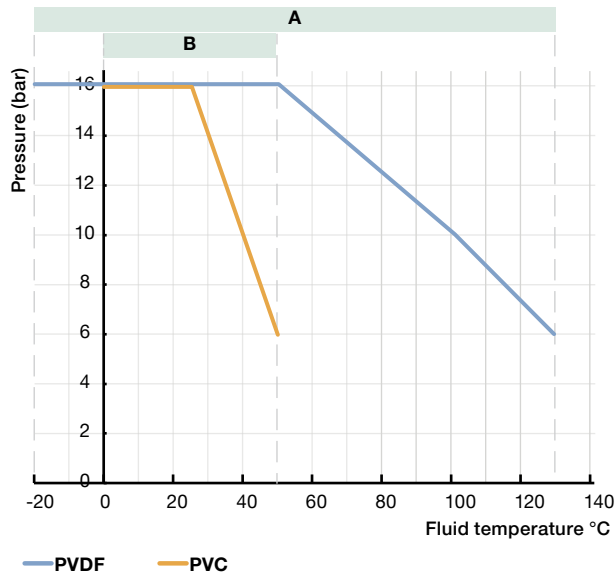
\* For the 2014/68/EU pressure directive, the device can only be used under the following conditions (depends on max. pressure, pipe diameter and fluid).

Type of Fluid	Conditions
<b>Fluid group 1, article 4, §1.c.i</b>	only DN25
<b>Fluid group 2, article 4, §1.c.i</b>	DN ≤ 32 or PN*DN ≤ 1000
<b>Fluid group 1, article 4, §1.c.ii</b>	DN ≤ 25 or PN*DN ≤ 2000
<b>Fluid group 2, article 4, §1.c.ii</b>	DN ≤ 200 or PN ≤ 10 or PN*DN ≤ 5000

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

**Pressure/temperature charts**

Application range of a 8202 ELEMENT neutrino meter:



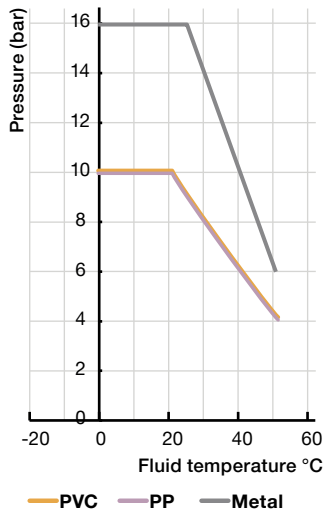
A: application range with PVDF nut (on request)

B: application range with PVC nut

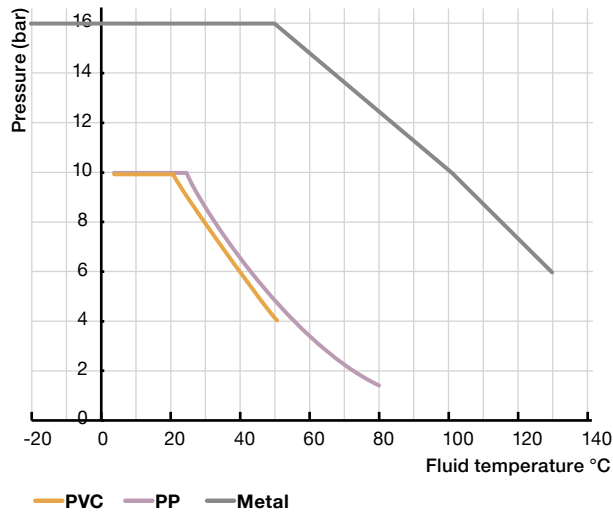
The measures have been made at an ambient temperature of 60 °C, without probe.

Application range of a 8202 ELEMENT neutrino meter (without probe):

• with PVC nut with S022 adaptor



• with PVDF nut with S022 adaptor



## Principle of operation

The 8202 ELEMENT neutrino device can be used as a pH or an ORP meter according to the 8203 probe version mounted into the holder. The 8203 pH or redox probe is a glass membrane with variable selectivity according to the pH or the redox, which must be calibrated with buffer solution before the installation of the device into the pipe.

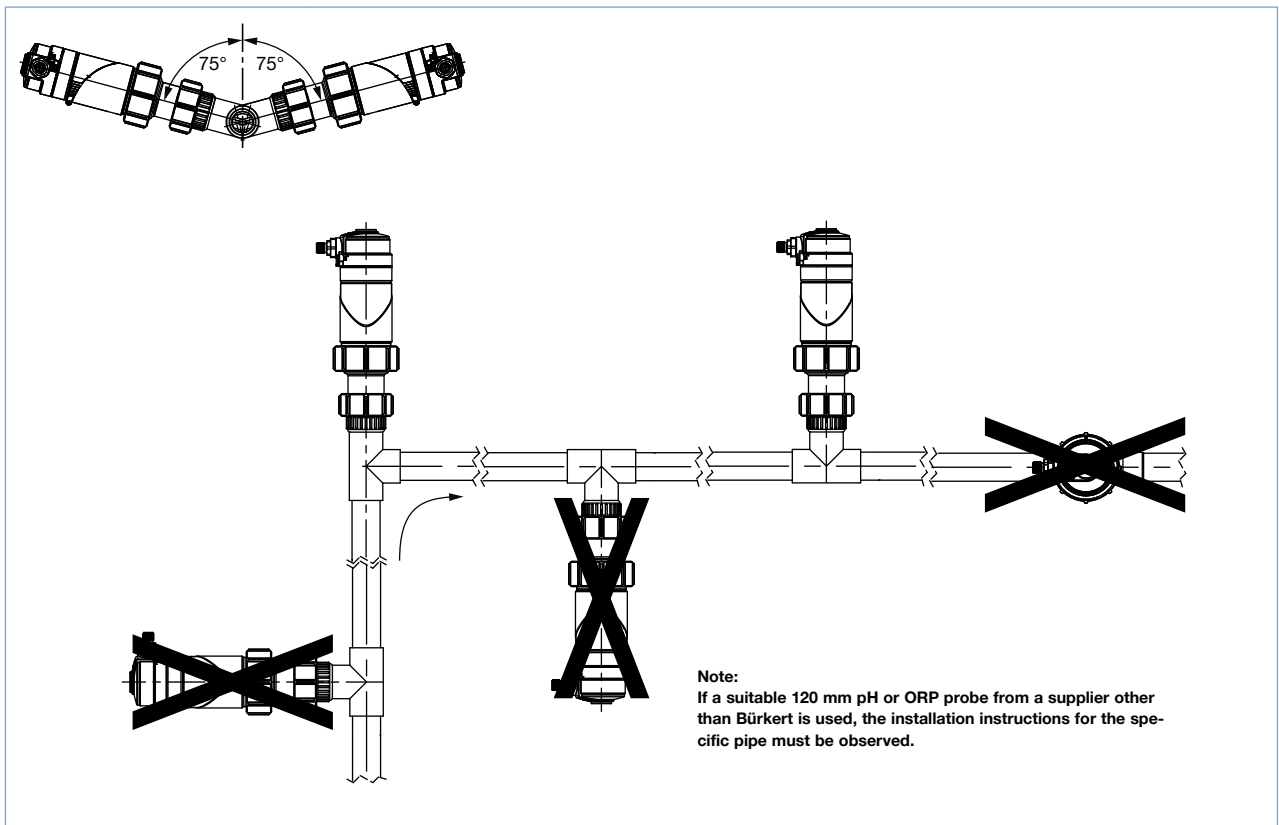
- ▶ When a pH probe is immersed into the solution a difference in potential is formed due to ions (H<sup>+</sup>) between the glass membrane and the solution. This difference in potential measured in relation to a reference electrode is directly proportional to the pH value (59.16 mV per pH unit at 25 °C).  
The pH sensor can be calibrated in 1-point (Offset at pH 7) or in 2-points (Offset at pH 7 and Span at pH 4 or pH 10).
- ▶ When a Redox probe is immersed in a solution, an exchange of electrons occurs based on the oxidizing and reducing effects of an electrolyte. The resulting voltage is the oxidation reduction potential. The ORP sensor can only be calibrated in 1-point (Offset).

The pH/ORP meter is a two-wire device, which requires a power supply of 12...36 V DC and delivers a 4...20 mA standard signal proportional to the pH or to the redox potential as output signal.

## Installation

The 8202 ELEMENT neutrino pH/ORP meter can be installed into any adaptor with G 1½" external threaded sensor connection by just fixing the main nut. Select the required adaptor, taking in account the specific requirements of the sensor and adapter material (temperature and pressure), and install it in a vertical position or with an angle of ±75° max. relative to the vertical on a horizontal pipe. For mounting on a tank or direct mounting on a pipe (DN100 or DN110), an adaptor with a G 1½" external threaded sensor connection must be used. After having connected the pH or redox sensor to the 8202 neutrino meter and having calibrated the unit, carefully install the complete unit on the fitting. In order obtain reliable measurements air bubbles must be avoided.

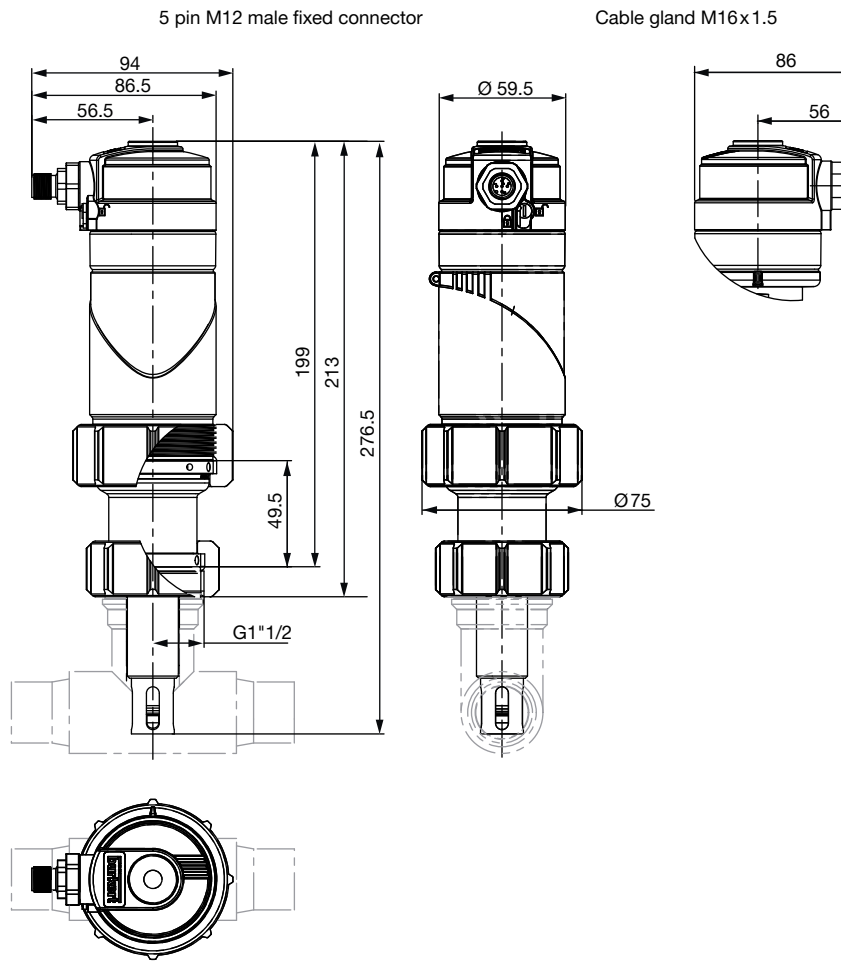
**Please ensure that the mounting location provides a continuous and complete immersion of the probe in the flow stream.**



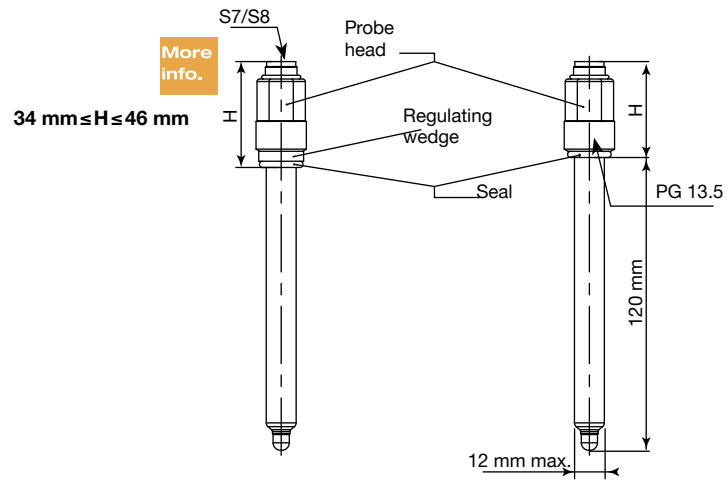
The probe must be continuously immersed into the measuring fluid in order to protect it from drying out.

The device must be protected from constant heat radiation and other environmental influences, such as direct exposure to sunlight.

**Dimensions [mm]**



**Probe**



Ordering information for compact neutrino pH/ORP meter, Type 8202

A complete 8202 ELEMENT neutrino pH or ORP meter consists of a compact 8202 ELEMENT neutrino pH or ORP meter, a 8203 pH or ORP probe and a Bürkert S022 Insertion adaptor (with G 1½" external threaded sensor connection)

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

- **Article no.** of the desired **8202** ELEMENT neutrino pH or ORP meter (see ordering chart below)
- **Article no.** of the desired **8203** pH or ORP probe (see separate datasheet) [More info.](#)
- **Article no.** of the selected **S022** Insertion adaptor with G 1½" external threaded sensor connection (see separate datasheet) [More info.](#)

→ You have to order the three components separately.

When you click on the orange box "More info.", you will come to our website for the resp. product where you can download the datasheet.



Ordering chart for ELEMENT neutrino pH/ORP meter, Type 8202

Specifications	Voltage supply	Output	Sensor version	Nut material	Electrical connection	UL Certification	Article no.
Compact meter: 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	No	561685
						UL-Recognized	562557
					Cable gland	No	561686
						UL-Recognized	562558

Note: Order separately  
- M12 female cable plug

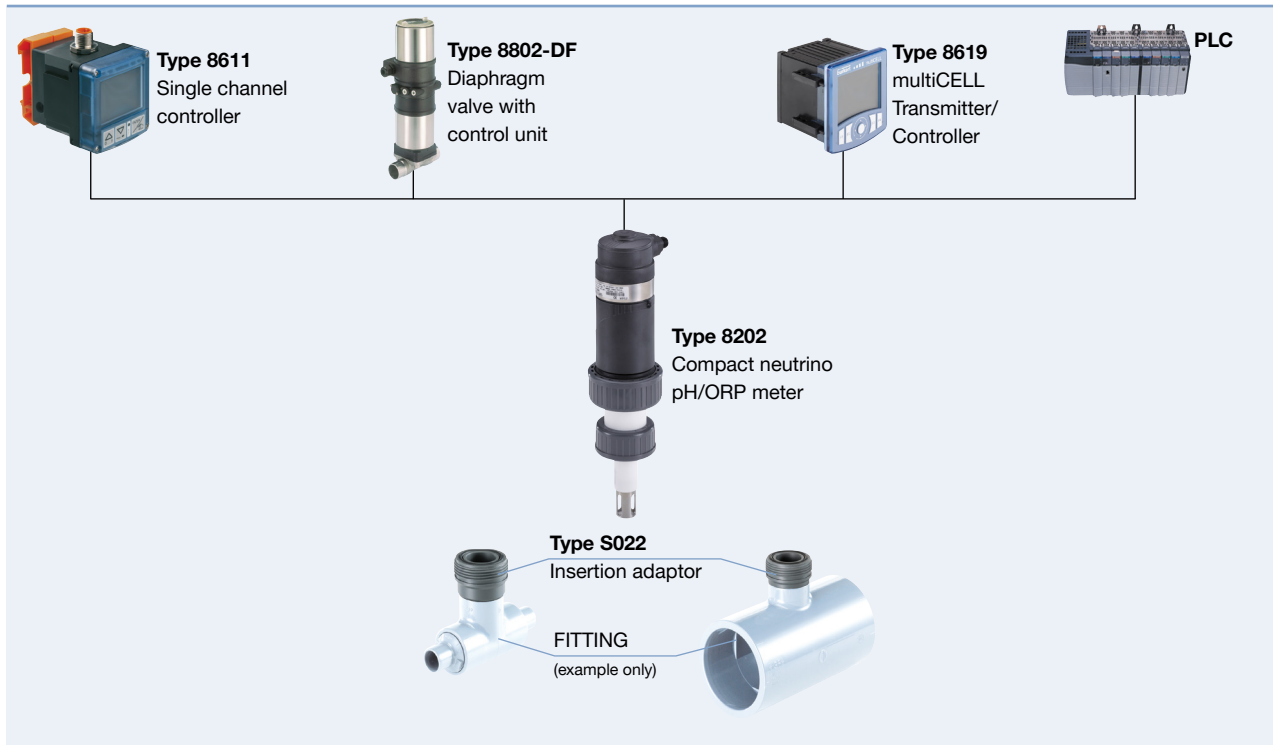
**i** Further versions on request

- Materials**  
PVDF nuts

**Ordering chart for accessories (to be ordered separately)**

Description		Article no.
One Ø 46 x 2 mm EPDM seal for 120 mm probe holder (with instruction sheet)		559169
EPDM seal for cover/housing sealing		561752
Probe holder with PVC nut		560947
	5 pin M12 female straight cable plug with plastic threaded locking ring, to be wired	917116
	5 pin M12 female straight cable plug moulded on cable (2 m, shielded)	438680

**Interconnection possibilities with other Bürkert flowmeters**



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

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