

## Conductivity meter



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

Type 8222 neutrino can be combined with...




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

The conductivity meter consists of a sensor plugged-in and pinned to an enclosure with cover, containing the electronic module. The sensor holder comprises a cell with two electrodes and a Pt1000 temperature sensor. The sensor itself is available with three different cell constants C, these with C=0.01 or 0.1 are fitted with stainless steel electrodes and this with C=1.0 is fitted with graphite electrodes.

The neutrino conductivity meter Type 8222 is available with one 2-wire 4...20 mA current output and with two different connections:  
either  
a G 1½ union nut for adaptor with G 1½ external threaded sensor connection  
or  
a G ¾ threaded holder for screwing into an adaptor with G ¾ internal thread sensor connection.

The electronics of Type 8222 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.

Technical data (Pipe + conductivity meter)	
<b>Pipe diameter</b>	DN25...DN110 (DN <25 with reduction)
<b>Conductivity measurement</b>	
Measuring range	0.05 µS/cm...10 mS/cm
Measurement deviation	±3 % of measured value
<b>Temperature measurement</b>	
Measuring range	-20...+100 °C (-4...+212 °F)
Measurement deviation	±1 °C (1.8 °F)
<b>Temperature compensation</b>	according to a predefined graph (none, NaCl, ultra pure water), selectable via a switch
<b>Fluid temperature</b>	
with G 1½ PVC connection nut	0...+50 °C (+32...+122 °F)
with G 1½ PVDF connection nut (on request)	-20...+100 °C (-4...+212 °F) restricted by the used adaptor;
	restriction with adaptor S022 in:
	- PVC: 0...+50 °C (+32...+122 °F)
	- PP: 0...+80 °C (+32...+176 °F)
	- Metal: -20...+100 °C (-4...+212 °F)
with G ¾ external threaded connection	-20...+100 °C (-4...+212 °F) restricted by the used adaptor;
	restriction with adaptor S022 in:
	- PVC: 0...+50 °C (+32...+122 °F)
	- PVDF: 0...+100 °C (+32...+212 °F)
	- Metal: -20...+100 °C (-4...+212 °F)
<b>Fluid pressure max</b>	PN16 (232 PSI) (see pressure / temperature chart)
<b>Environment</b>	
<b>Ambient temperature</b>	-10...+60 °C (+14...+140 °F) (operating and storage)
<b>Relative humidity</b>	≤85 %, without condensation

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 1.4404 (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
<b>Electrical connections</b>	1 x 5 pin free positionable M12 male fixed connector, or terminal strip via 1 x 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)) 0.25...1.5 mm <sup>2</sup>
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), 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>Reversed polarity of DC</b>	Protected
<b>Voltage peak</b>	Protected
<b>Output</b>	
Current	4...20 mA, 22 mA to indicate a fault 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)
<b>4...20 mA output uncertainty</b>	±1 % of range
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 UL61010-1
<b>Installation category</b>	Category I according to UL61010-1 – indoor use

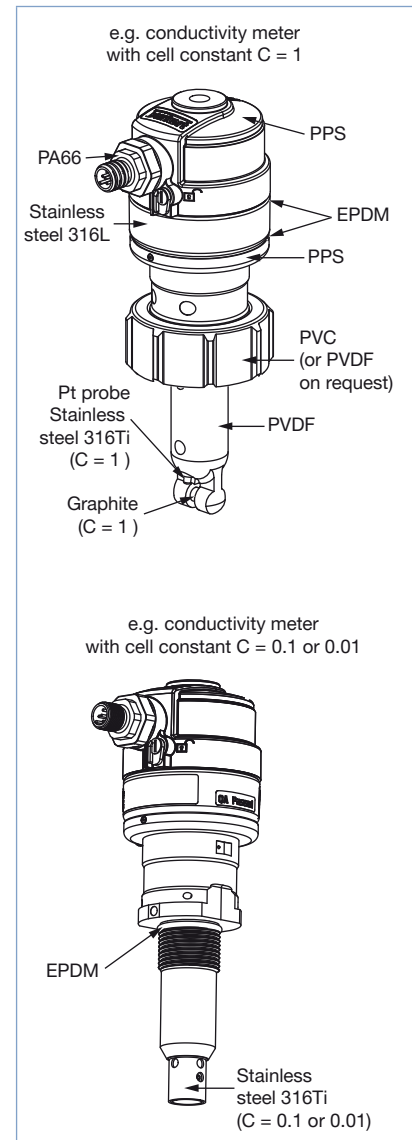
\* For the 2014/68/EU pressure directive, the device can only be used under the following conditions (depends on max. pressure, pipe diameter and fluid).

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



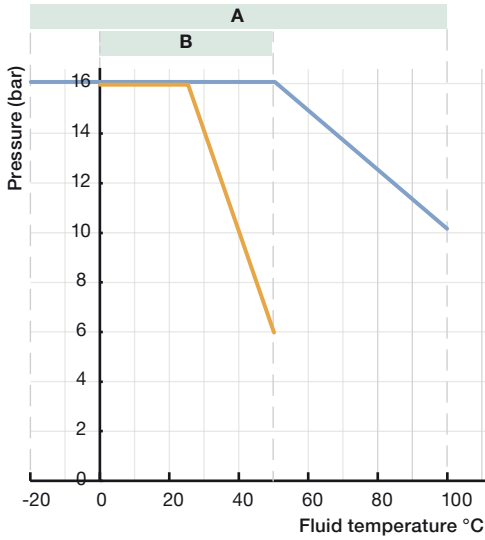
If the device is mounted in a humid environment or outside, then the maximum voltage allowed is **35 V DC** instead of 36 V DC.

## Materials view



Pressure/temperature chart

Application range of a 8222 ELEMENT neutrino conductivity meter:

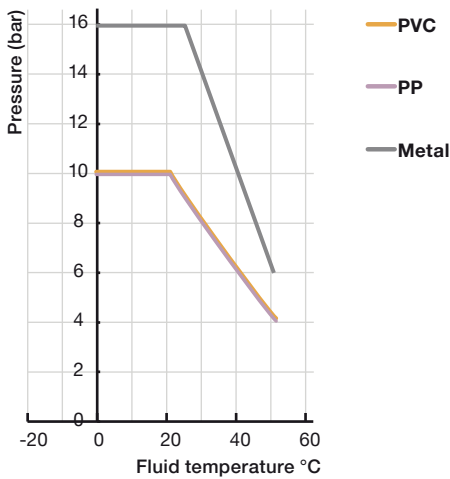


A: with PVDF nut (on request) or G 3/4 external threaded connection  
 B: with PVC nut

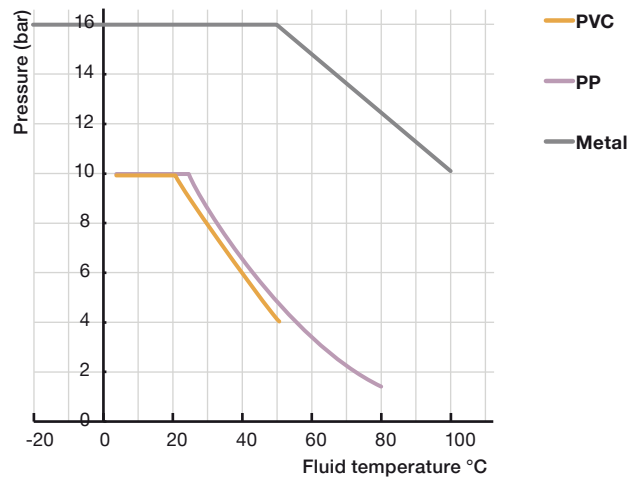
The measures have been made at an ambient temperature of 60 °C.

Application range of a 8222 ELEMENT neutrino conductivity meter

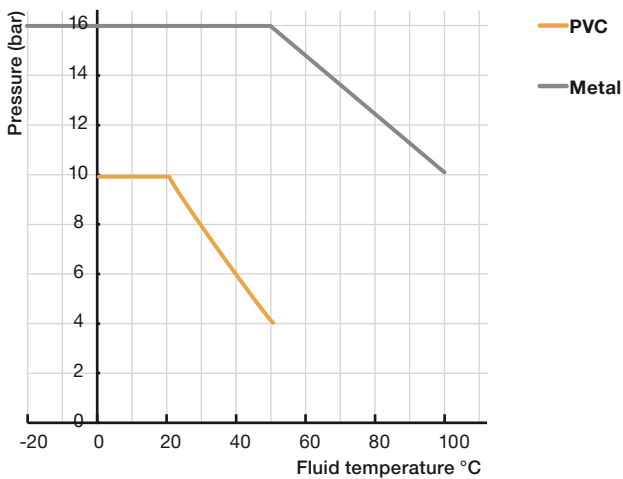
• with PVC nut with S022 adaptor



• with PVDF nut (on request) with S022 adaptor

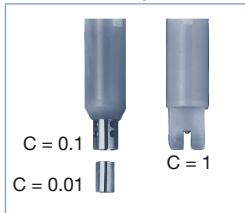


• with G 3/4 threaded connection with S022 adaptor



## Principle of operation

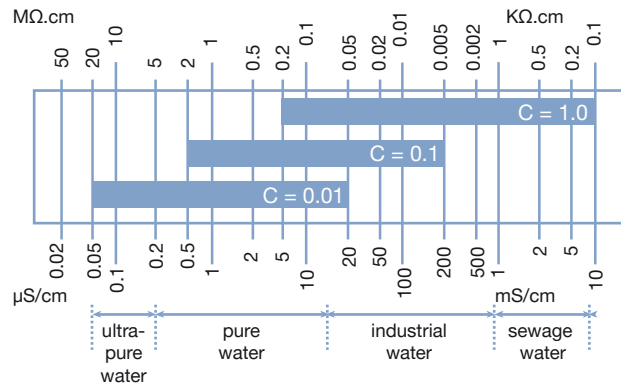
Conductivity is defined as the ability of a solution to conduct electrical current. The load carriers are ions (E.G. dissolved salt or acids). In order to measure conductivity 2 electrodes are used which are set at a fixed distance apart and with a known specified surface. An AC voltage source is connected to the electrodes. The measured current is a direct function of the conductivity of the solution. The conductivity meter is a two-wire device, which requires a power supply of 12...36 V DC.



The conductivity meter can be fitted with 3 different sensors with cell constants 0.01, 0.1 or 1.0.

The sensor is selected according to the measuring range and medium by using the table opposite.

The measurement range on which the 4...20 mA output must match is selectable for each sensor through a rotary switch. This measurement range can also be customized on request (please contact your nearest Bürkert office).



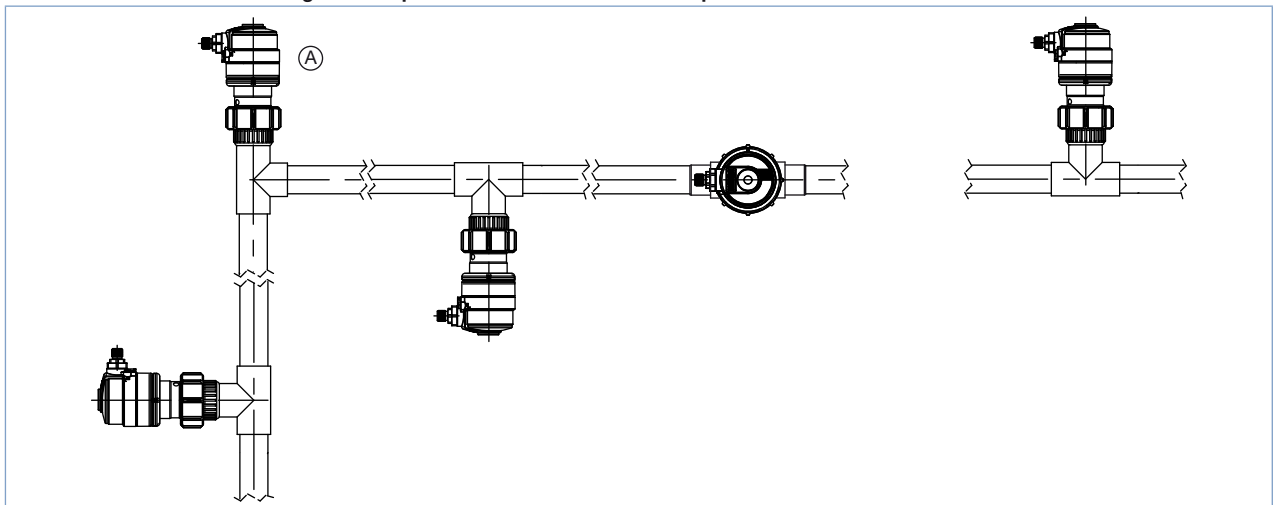
## Installation

The 8222 neutrino conductivity meter with G 1½ union connection nut can be installed into any adaptor with G 1½ external threaded sensor connection by just fixing the main union nut. The conductivity meter with G ¾ external threaded connection can be installed into any adaptor with G ¾ internal threaded (see threading dimensions plan) by just screwing.

Select and install the required adaptor onto the pipe according to specific requirements of the sensor and material (temperature and pressure). For a mounting on a tank or a direct mounting on a pipe (DN100 or DN110), an adaptor with a G 1½ external threaded sensor connection or with a G ¾ internal threaded sensor connection (depending on conductivity meter version) must be installed. Install cautiously the device on the fitting. It can be installed in any position (prefer "A" mounting to install a 8222 neutrino with sensor C=0.1 or C=0.01).

In order to get reliable measurement air bubbles must be avoided.

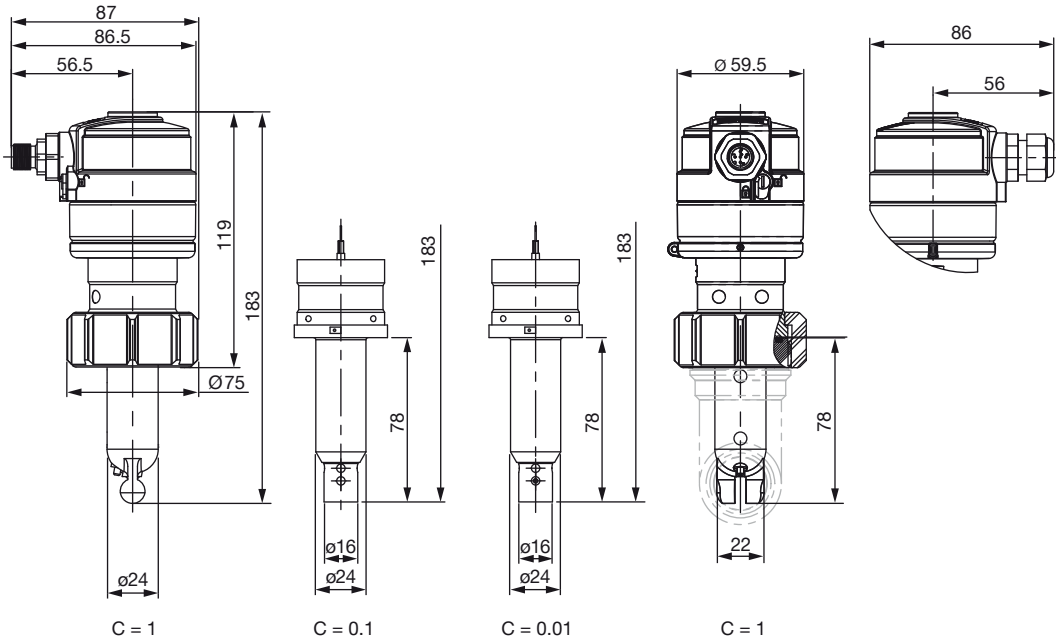
**Please ensure that the mounting location provides a continuous and complete immersion of the sensor in the flow stream.**



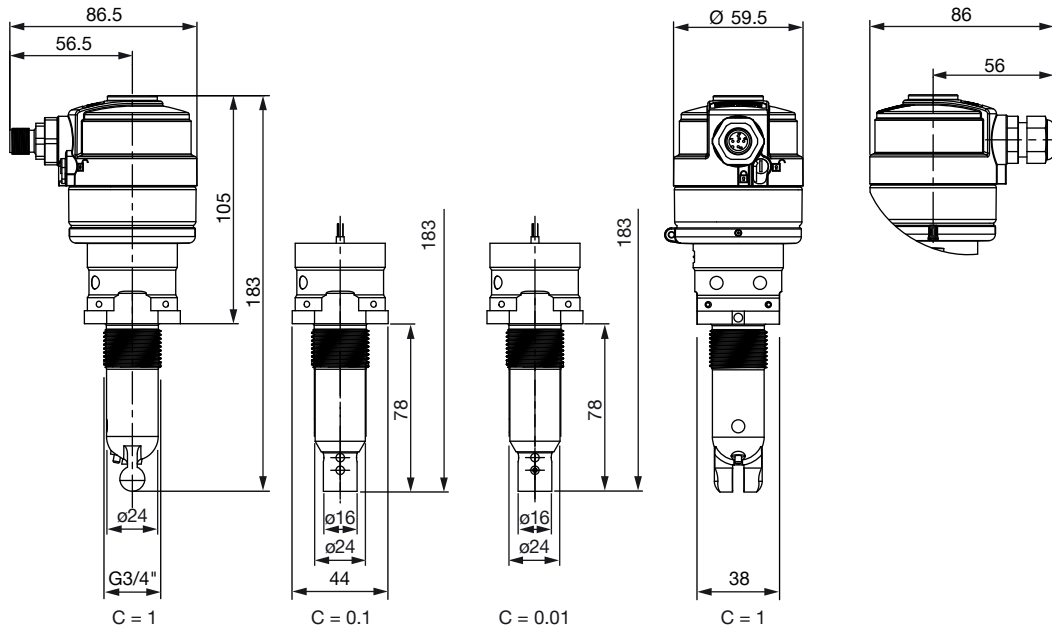
The device must be protected from constant heat radiation and other environmental influences, such as direct exposure to sunlight.

Dimensions [mm] of conductivity meter Type 8222

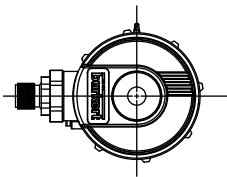
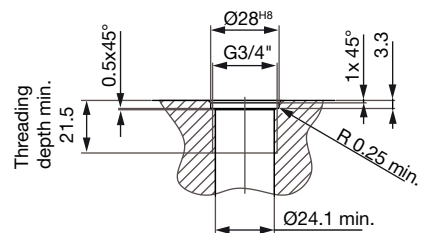
with a G 1½ union connection nut



with a G ¾ external threaded connection



Threading dimensions plan  
(for installation of the conductivity meter  
with a G¾" external threaded connection)



## Ordering information for compact conductivity meter, Type 8222

A complete compact ELEMENT neutrino conductivity meter, Type 8222, consists of:

- a compact ELEMENT neutrino conductivity meter, Type 8222, with a G 1½ union connection nut and a Bürkert S022 Insertion adaptor with a G 1½ external threaded sensor connection.

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

- **Article no.** of the desired **8222** ELEMENT neutrino conductivity meter with a G 1½ union connection nut (see ordering chart on p. 7)
- **Article no.** of the selected **S022** Insertion adaptor with G 1½ external threaded sensor connection (see separate data sheet)

→ You have to order two components.

or

- a compact ELEMENT neutrino conductivity meter, Type 8222, with a G ¾ external threaded connection.

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

- **Article no.** of the desired **8222** ELEMENT neutrino conductivity meter with a G ¾ external threaded connection (see ordering chart on p. 7)
- **Article no.** of the selected **S022** Insertion adaptor with G ¾ internal threaded conductivity meter connection (see separate data sheet)

→ You have to order two components.

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

### Example

Compact conductivity meter Type 8222  
with a G 1½ union connection nut



Compact conductivity meter Type 8222  
with a G ¾ external threaded connection



## Ordering chart for compact conductivity meter Type 8222



Specifications	Voltage supply	Output	Sensor version	Nut material	Electrical connection	UL certification	Article 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	No	561661		
						UL-Recognized	562545		
					Cable gland	No	561662		
						UL-Recognized	562546		
					C=0.1	PVC	5 pin M12 male fixed connector	No	561663
								UL-Recognized	562547
			Cable gland	No	561664				
				UL-Recognized	562548				
			C=1.0	PVC	5 pin M12 male fixed connector	No	561665		
						UL-Recognized	562549		
			Cable gland	No	561666				
				UL-Recognized	562550				
Compact conductivity meter with a G ¾ external threaded connection	12...36 V DC	4...20 mA	C=0.01	-	5 pin M12 male fixed connector	No	561667		
						UL-Recognized	562551		
					Cable gland	No	561668		
						UL-Recognized	562552		
					C=0.1	-	5 pin M12 male fixed connector	No	561669
								UL-Recognized	562553
			Cable gland	No	561670				
				UL-Recognized	562554				
			C=1.0	-	5 pin M12 male fixed connector	No	561671		
						UL-Recognized	562555		
			Cable gland	No	561672				
				UL-Recognized	562556				

Note: Order separately (see accessories)  
- M12 female cable plug

### Further versions on request

Materials  
PVDF nuts

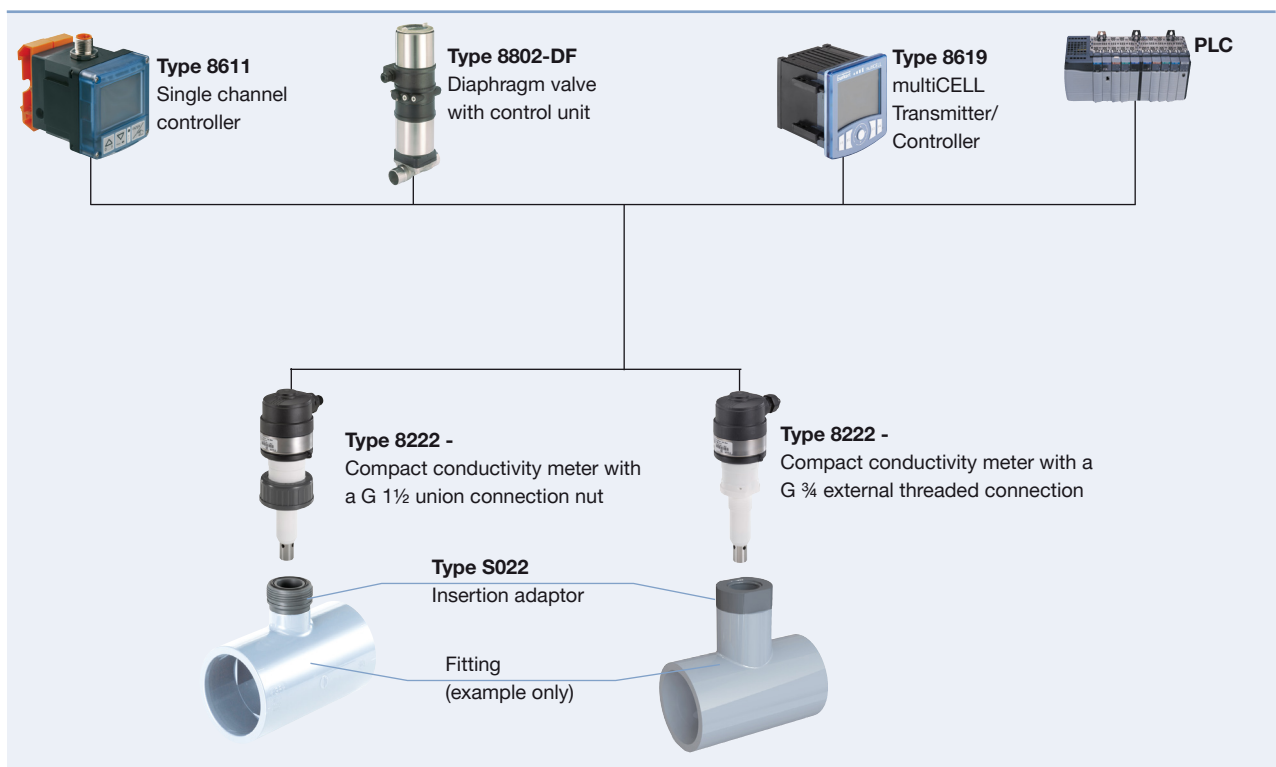
## Ordering chart for accessories (to be ordered separately)

Description	Article no.
EPDM seal for cover/housing sealing	561752
EPDM seal for conductivity meter with G 3/4 external thread/S022 adaptor sealing*	561955
Calibration solution, 300 ml, 5 µS	440015
Calibration solution, 300 ml, 15 µS	440016
Calibration solution, 300 ml, 100 µS	440017
Calibration solution, 300 ml, 706 µS	440018
Calibration solution, 300 ml, 1413 µS	440019
 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

**\* Important!**

Only use this o-ring to ensure the sealing between the conductivity meter with a G 3/4 external threaded connection and the S022 Insertion adaptor

## Interconnection possibilities with other Bürkert devices



To find your nearest Bürkert facility, click on the orange box →

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

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

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