FLUID CONTROL SYSTEMS

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...

Type 8620
Cooling Tower or boiler chemistry controller

Type 8802-DF
Diaphragm valve with control unit

Type 0911
Process display

Type 8644
Valve islands

PLC

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 pined 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 G1½" union nut for adaptor with G1½" external threaded sensor connection
or
a G¾" threaded holder for screwing into an adaptor with G¾" 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)	
Pipe diameter	DN25 to DN110 (DN < 25 with reduction)
Conductivity measurement	
Measuring range	0.05 µS/cm... 10 mS/cm
Accuracy	± 3% of measured value
Temperature measurement	
Measuring range	-40 to +130°C *(-40 to 266°F)*
Accuracy	±1°C *(1.8°F)*
Temperature compensation	
Cell constants C = 0.1 or 1	according to a NaCl graph
Cell constants C = 0.01	according to an ultra pure water graph
Medium temperature*	
with G1½" PVC connection nut	0 to 50°C *(32 to 122°F)*
with G1½" PVDF connection nut (on request)	-20 to 100°C *(-4 to 212°F)* restricted by the used adaptor restriction with adaptor S022 in: - PVC: 0 to 50°C *(32 to 122°F)* - PP: 0 to 80°C *(32 to 176°F)* - Metal: -20 to 100°C *(-4 to 212°F)*
with G¾" ext. threaded connection	-20 to 100°C *(-4 to 212°F)* restricted by the used adaptor restriction with adaptor S022 in: - PVC: 0 to 50°C *(32 to 122°F)* - PVDF: 0 to 100°C *(32 to 212°F)* metal: -20 to 100°C *(-4 to 212°F)*
Fluid pressure max	PN16 *(232 PSI)* (see pressure / temperature chart)
4... 20 mA output accuracy	±1%

Environment	
Ambient temperature	-10 to +60°C *(14 to 140°F)* (operating and storage)
Relative humidity	≤ 85%, without condensation

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Electrical data	
Power supply	12 - 36 V DC, filtered and regulated
Current consumption with sensor	≤ 25 mA
Reversed polarity of DC	Protected
Voltage peak	Protected
Output	
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)

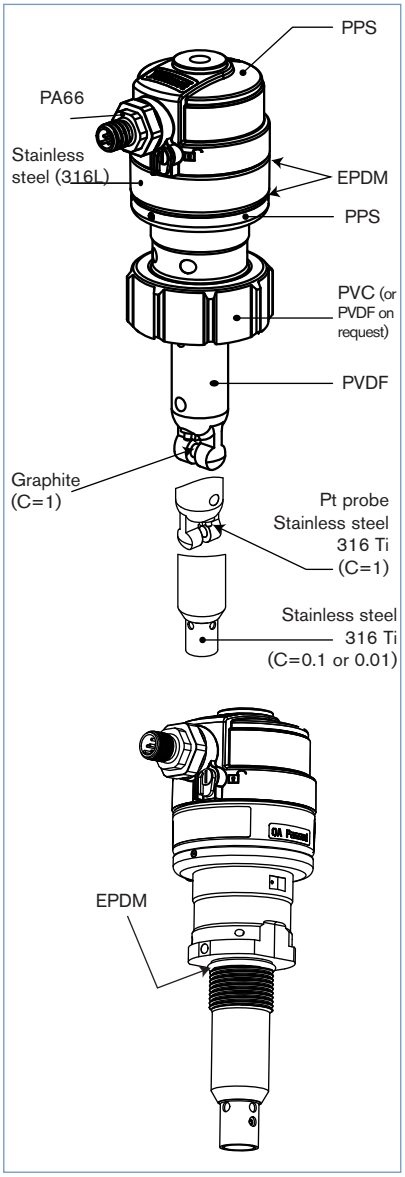
General data	
Compatibility	Any pipe which are fitted out with Bürkert adaptor S022 (see separate data sheet)
Materials	See exploded view, opposite
Housing	Stainless steel 1.4561 (316L), PPS
Cover	PPS
Seals	EPDM
Fixed connector	PA66
Nut	PVC (PVDF on request)
Wetted part materials	
Temperature sensor	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
Temperature sensor	Pt1000 (316Ti) integrated in the sensor
Electrical connections	1x 5-pin M12 male fixed connector, or terminal strip via 1x cable gland M16x1.5
Recommended connection cable for terminal strip	Shielded cable (Measuring data acc. to CEI 664-1/VDE 0110 (4.97))
Solid H05(07) V-U	0.25 to 1.5 mm²
Flexible H05(07) V-K	0.25 to 1.5 mm²
With wire end ferrule	0.25 to 1.5 mm²
With plastic collar ferrule	0.25 to 0.75 mm²
Diameter	4 to 8 mm

Standards, directives and approvals	
Protection class	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 CE	
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).

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

Materials view

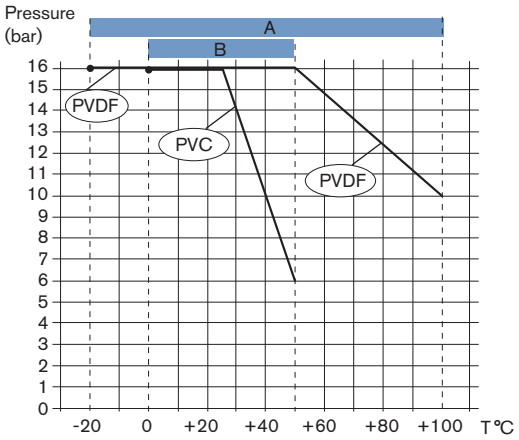


Pressure / temperature chart

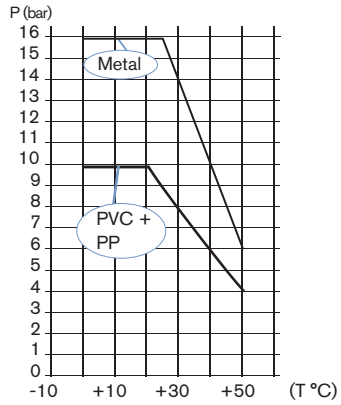
Application range of a 8222 ELEMENT neutrino conductivity meter:

A : with PVDF nut (on request) or G¾" external threaded connection
B : with PVC nut

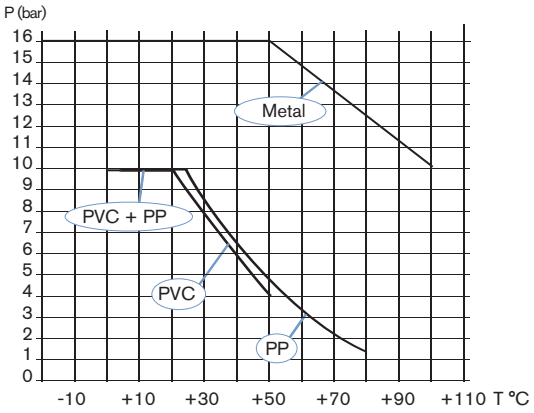
The measures have been made at an ambient temperature of 60°C.



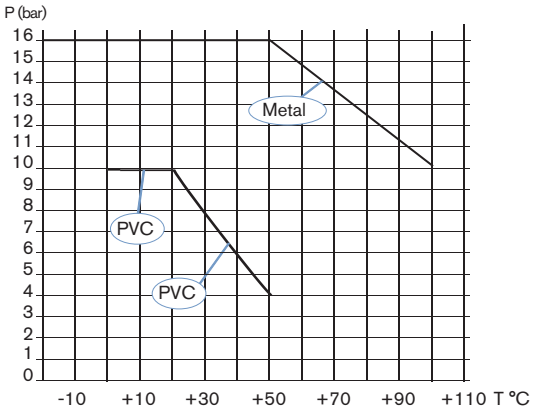
Application range of a 8222 ELEMENT neutrino conductivity meter with PVC nut with S022 adaptor



Application range of a 8222 ELEMENT neutrino conductivity meter with PVDF nut (on request) with S022 adaptor



Application range of a 8222 ELEMENT neutrino conductivity meter with G ¾ threaded connection with S022 adaptor



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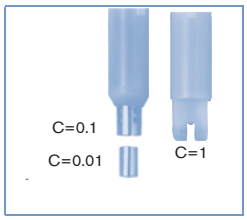
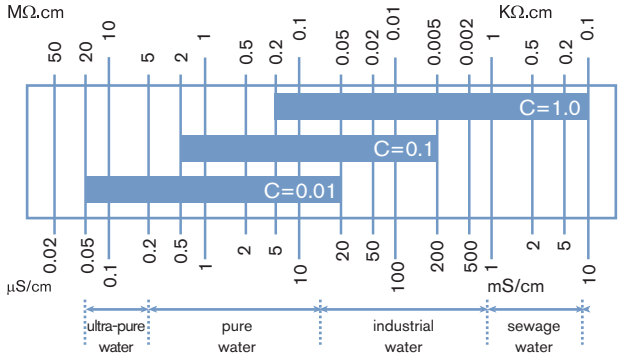
Principle of operation

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.

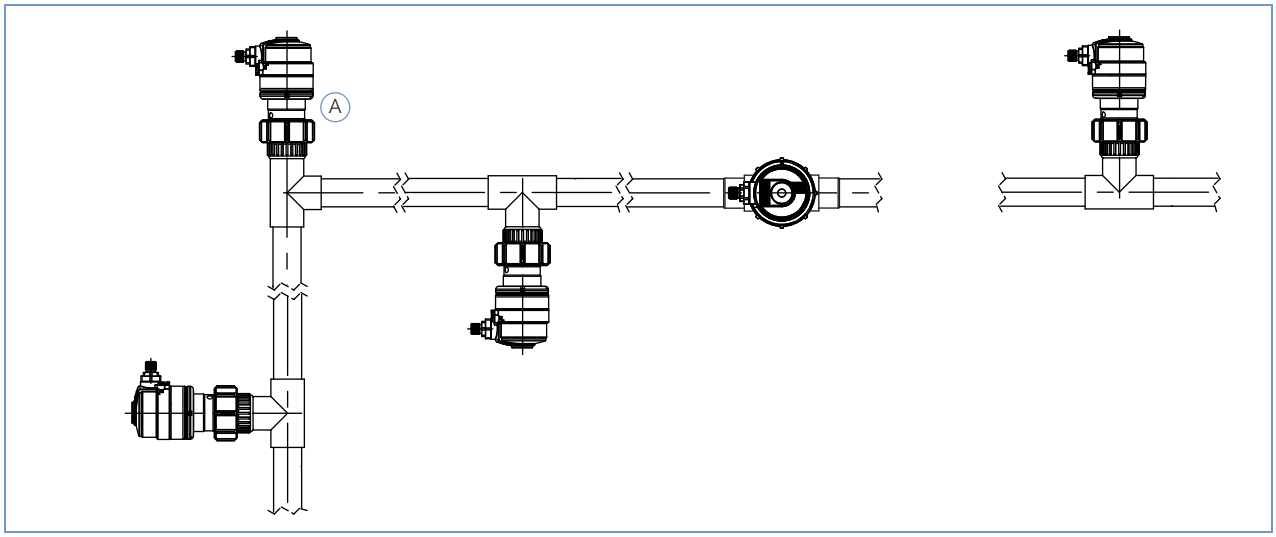


Installation

The 8222 neutrino conductivity meter with G1½" union connection nut can be installed into any adaptor with G1½" external threaded sensor connection by just fixing the main union nut. The conductivity meter with G¾" external threaded connection can be installed into any adaptator with G¾" 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 G1½" external threaded sensor connection or with a G¾" 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.

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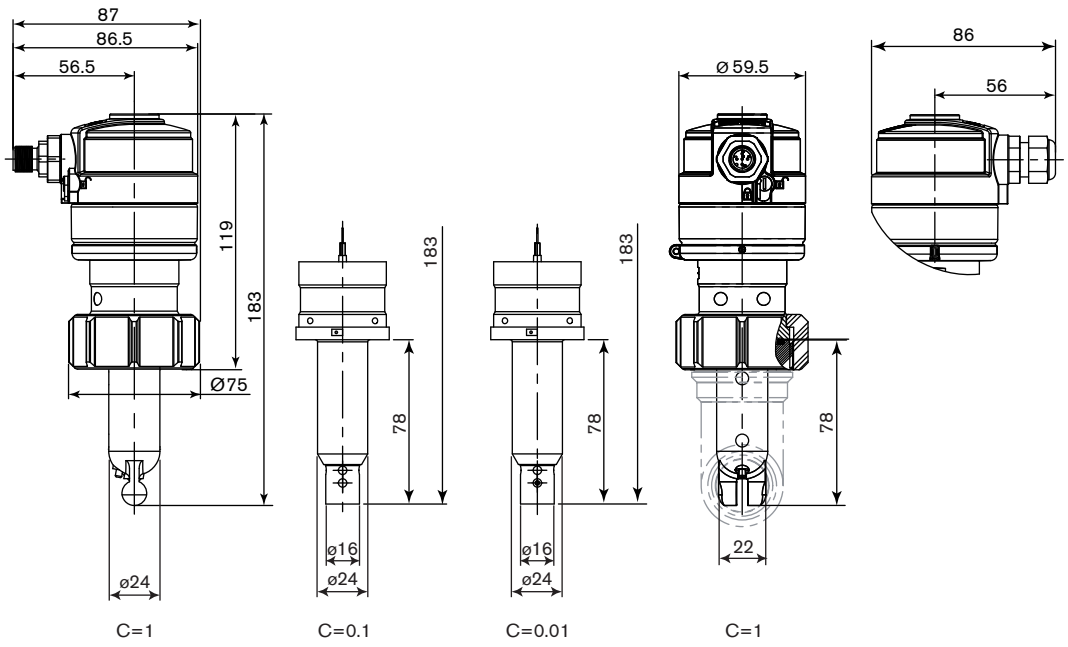
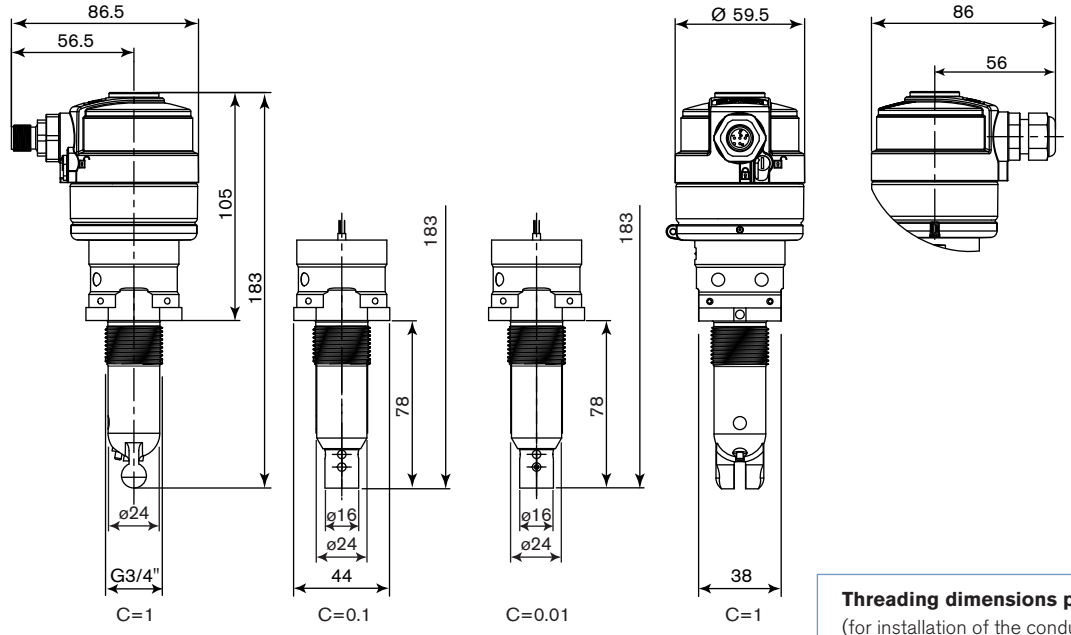
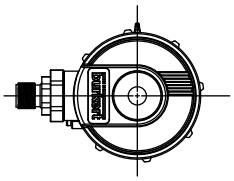
Dimensions [mm] of conductivity meter Type 8222

with a G1½" union connection nut

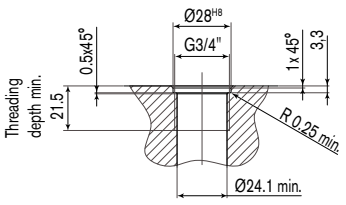


with a G¾" external threaded connection





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



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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 G1½" union connection nut)** and a Bürkert INSERTION adaptor Type S022 **(with a G1½" external threaded sensor connection).**

  The following information is necessary for the selection of a complete device:
  ▪**Item no.** of the desired ELEMENT neutrino conductivity meter **Type 8222 with a G1½" union connection nut** (see ordering chart on p. 7)
  ▪**Item no.** of the selected INSERTION adaptor **Type S022 with G1½" 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 G¾" external threaded connection).**

  The following information is necessary for the selection of a complete device:
  ▪**Item no.** of the desired ELEMENT neutrino conductivity meter **Type 8222 with a G¾" external threaded connection** (see ordering chart on p. 7)
  ▪**Item no.** of the selected INSERTION adaptor **Type S022 with G¾" 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 G1½" union connection nut

INSERTION adaptor Type S022

Complete compact conductivity meter Type 8222

Fitting (example only)

Fitting (example only)

Compact conductivity meter Type 8222 with a G¾" external threaded connection

INSERTION adaptor Type S022

DTS 1000130464 EN Version: G Status: RL (released | freigegeben | validé) printed: 29.08.2013

Ordering chart for compact conductivity meter Type 8222

Specifications	Voltage supply	Output	Sensor version	Nut material	Electrical connection	UL Approvals	Item no.
Compact conductivity meter with a G1½" union connection nut	12 - 36 V DC	4... 20 mA	C =0.01	PVC	5-pin M12 male fixed connector	No	561 661
						UL-Recognized	562 545
					Cable gland	No	561 662
						UL-Recognized	562 546
			C=0.1	PVC	5-pin M12 male fixed connector	No	561 663
						UL-Recognized	562 547
					Cable gland	No	561 664
						UL-Recognized	562 548
			C=1.0	PVC	5-pin M12 male fixed connector	No	561 665
						UL-Recognized	562 549
					Cable gland	No	561 666
						UL-Recognized	562 550
Compact conductivity meter with a G¾" external threaded connection	12 - 36 V DC	4... 20 mA	C=0.01	-	5-pin M12 male fixed connector	No	561 667
						UL-Recognized	562 551
					Cable gland	No	561 668
						UL-Recognized	562 552
			C=0.1	-	5-pin M12 male fixed connector	No	561 669
						UL-Recognized	562 553
					Cable gland	No	561 670
						UL-Recognized	562 554
			C=1.0	-	5-pin M12 male fixed connector	No	561 671
						UL-Recognized	562 555
					Cable gland	No	561 672
						UL-Recognized	562 556

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

Further versions on request

Materials
PVDF nuts

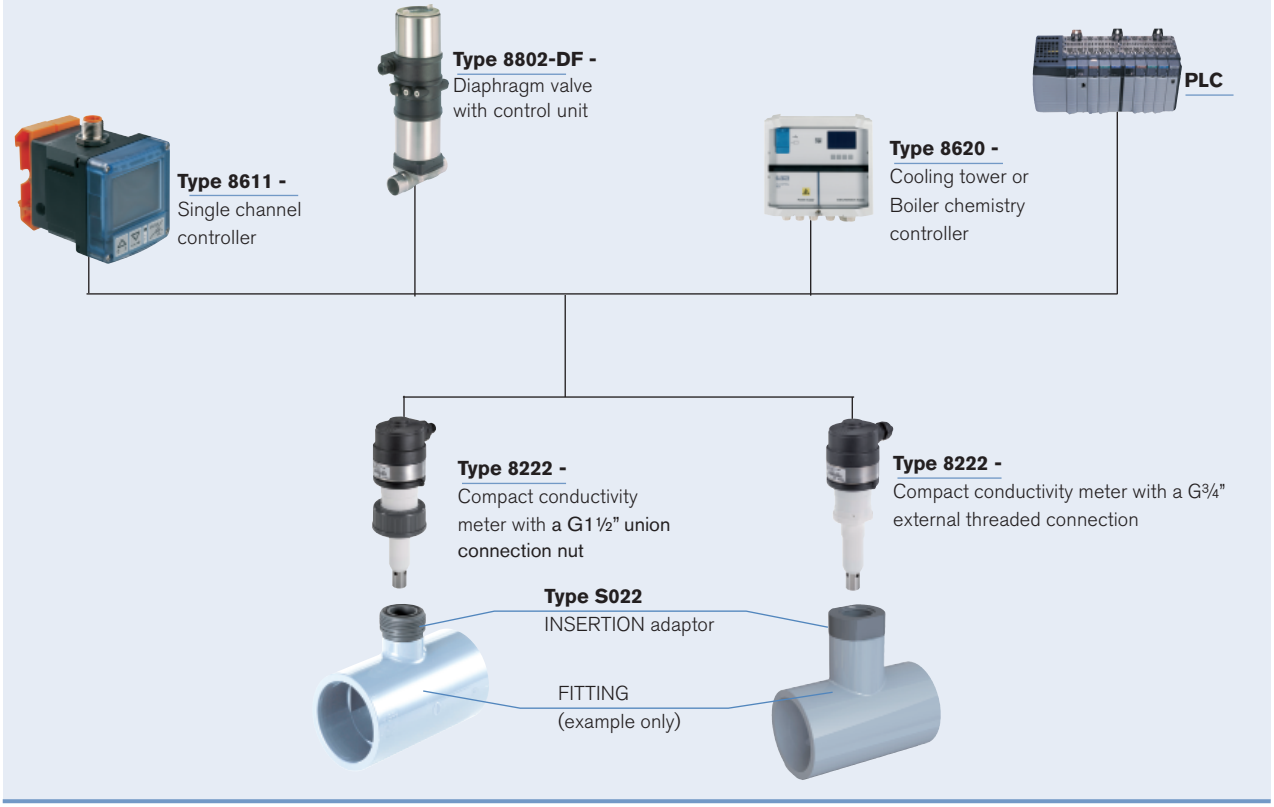
DTS 1000130464 EN Version: G Status: RL (released | freigegeben | validé) printed: 29.08.2013

Ordering chart for accessories

	Description	Item no.
	EPDM seal for cover/housing sealing	561 752
	EPDM seal for conductivity meter with G¾" external thread/S022 adaptor sealing*	561 955
	Calibration solution, 300 ml, 5 µS	440 015
	Calibration solution, 300 ml, 15 µS	440 016
	Calibration solution, 300 ml, 100 µS	440 017
	Calibration solution, 300 ml, 706 µS	440 018
	Calibration solution, 300 ml, 1413 µS	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!**
Only use this o-ring to ensure the sealing between the conductivity meter with a G¾" external threaded connection and the S022 INSERTION adaptor

Interconnection possibilities with other Bürkert devices



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