bürkert
FLUID CONTROL SYSTEMS

Conductivity meter

- Perfect for clean water and slightly concentrated liquids
- Integral device for direct connection to PLC
- Simulation of process values for diagnostics
- Three cell constants to cover a wide application range e.g. reverse osmosis

Type 8222 can be combined with…

Type 8611
eCONTROL
Universal controller

Type 8619
multiCELL
Transmitter/Controller

Type 8693
Process controller

Type 8802
ELEMENT
Control valve system

Type S022
Insertion Adapter/
Fitting for ELEMENT
analytical devices

The Bürkert compact meter, Type 8222, is designed for measuring the conductivity of fluids.
The conductivity meter consists of a sensor, plugged-in and pined to the transmitter (with removable display). The sensor comprises a cell with two electrodes and a Pt1000 temperature probe. 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 those with C =1.0 are fitted with graphite electrodes.
The conductivity meter can operate independent of the display but it will be required for programming the device and also for visualizing continuously the measured and processed data.

The 8222 device is available:
- with three fully programmable outputs: two transistor and one 2-wire 4…20 mA current outputs
- with four fully programmable outputs: two transistor and two 3-wire 4…20 mA current outputs.

The transmitter converts the measured signal, displays different values in different physical units (if display mounted) and computes the output signals, which are provided via one or two M12 fixed connectors.

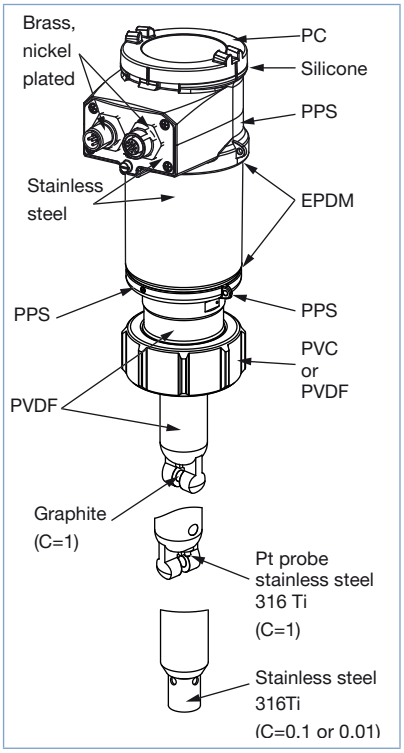
Technical data (Pipe + conductivity meter)	
Pipe diameter	DN25…DN110 (DN <25 with reduction)
Conductivity measurement	
Measuring range	0.05 µS/cm…10 mS/cm
Resolution	1 nS/cm
Measurement deviation	±3 % of measured value
Temperature measurement	
Measuring range	-20…+100 °C *(-4…+212 °F)*
Internal resolution	0.1 °C *(0.18 °F)*
Measurement deviation	±1 °C *(1.8 °F)*
Minimal temperature range	10 °C (i.e. +10…+20 °C *(+50…+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
Fluid temperature	
with G 1½ PVC connection nut	0…+50 °C *(+32…+122 °F)*
with G 1½ PVDF connection nut	-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)*
Fluid pressure max	PN16 *(232 PSI)* (see pressure / temperature chart)
Environment	
Ambient temperature	-10…+60 °C *(+14…+140 °F)* (operating and storage)
Relative humidity	≤ 85 %, without condensation

DTS 1000114221 EN Version: K Status: RL (released | freigegeben | validé) printed: 27.06.2018

bürkert

General data	
Compatibility	Any pipe which are fitted out with Bürkert adaptor S022 (see separate data sheet)
Materials Housing / cover Seals / Screws Fixed connector mounting plate Fixed connector Display / navigation key Nut Wetted part materials Conductivity sensor Electrode	See exploded view, opposite Stainless steel 1.4404, PPS / PC EPDM, silicone / Stainless steel Stainless steel 1.4404 (316L) Brass nickel plated PC / PBT PVC or PVDF PVDF, stainless steel 1.4571 (316Ti) 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
Display (accessories)	Grey dot matrix 128 × 64 with backlighting
Electrical connections 3 outputs meter (2-wire) 4 outputs meter (3-wire)	 1 × 5 pin M12 male fixed connector, 1 × 5 pin M12 male + 1 × 5 pin M12 female fixed connectors
Connection cable	Shielded cable
Electrical data	
Power supply 3 outputs meter (2-wire) 4 outputs meter (3-wire)	 14…36 V DC, filtered and regulated 12…36 V DC, filtered and regulated
Characteristics of the power source (not provided) of UL recognized devices	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)
Current consumption with sensor 3 outputs meter (2-wire) 4 outputs meter (3-wire)	 ≤ 1 A (with the 2 transistors loads) ≤ 25 mA (at 14 V DC without transistors load, with current loop) ≤ 5 mA (at 12 V DC without transistors load, without current loop)
Reversed polarity of DC	Protected
Voltage peak	Protected
Short circuit	Protected for transistor outputs
Output Transistor Current 3 outputs meter (2-wire) 4 outputs meter (3-wire) Response time (10 %…90 %)	 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 4…20 mA programmable as sourcing or sinking, max. loop impedance: 1100 Ω at 36 V DC; 610 Ω at 24 V DC; 180 Ω at 14 V DC Configurable in the same mode as transistor: sourcing or sinking, max. loop impedance: 1100 Ω at 36 V DC; 610 Ω at 24 V DC; 100 Ω at 12 V DC 150 ms (standard)
4…20 mA output uncertainty	±1 % of range
Standards, directives and certifications	
Protection class	IP65, IP67 (according to EN60529) with device wired and M12 cable plug mounted and tightened and cover fully screwed down
Standards and directives CE Pressure	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) Complying with article 4, §1 of 2014/68/EU directive*
Certificate **Certification** UL-Recognized for US and Canada	FDA declaration of conformity UL61010-1 + CAN/CSA-C22.2 No.61010-1
Specific technical data of UL-Recognized products for US and Canada	
Intended for an inner pollution	Pollution degree 2 according to UL61010-1
Installation category	Category I according to UL61010-1 – indoor use

Materials view



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.

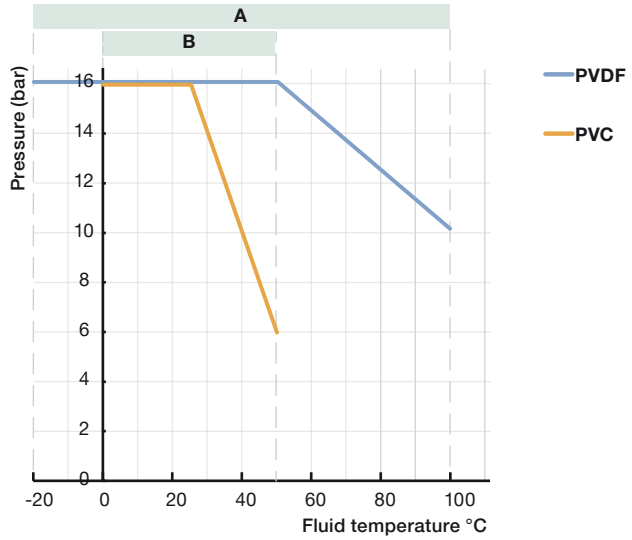
* For the 2014/68/EU pressure directive, the device can only be used under the following conditions (depends on max. pressure, pipe diameter and fluid).

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

DTS 1000114221 EN Version: K Status: RL (released | freigegeben | validé) printed: 27.06.2018

Pressure/temperature chart

Application range of a 8222 ELEMENT conductivity meter:

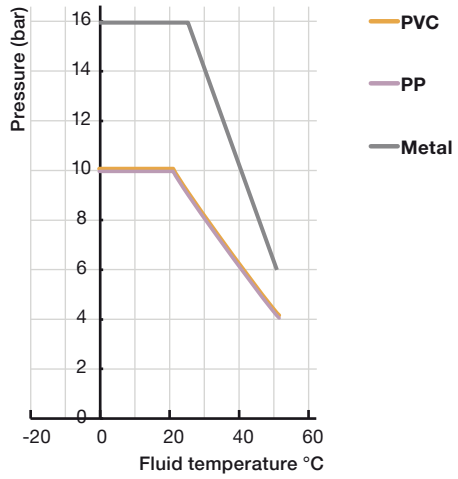


A: with PVDF nut
B: with PVC nut

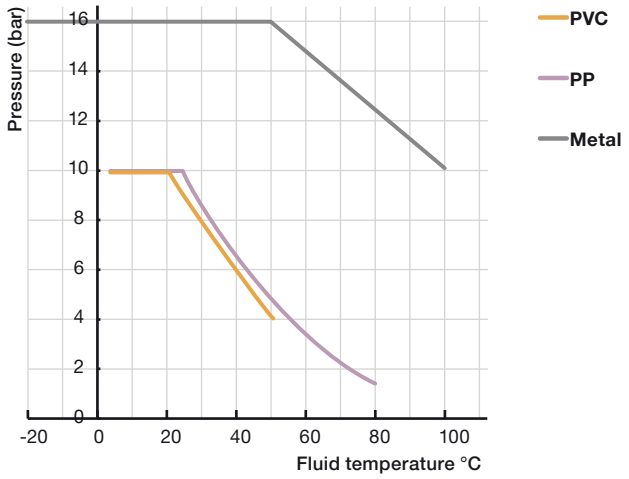
The measures have been made at an ambient temperature of 60 °C.

Application range of a 8222 ELEMENT conductivity meter

- **with PVC nut** with S022 adaptor



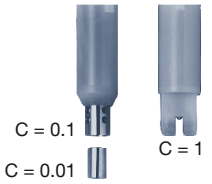
- **with PVDF nut** (on request) with S022 adaptor



DTS 1000114221 EN Version: K Status: RL (released | freigegeben | validé) printed: 27.06.2018

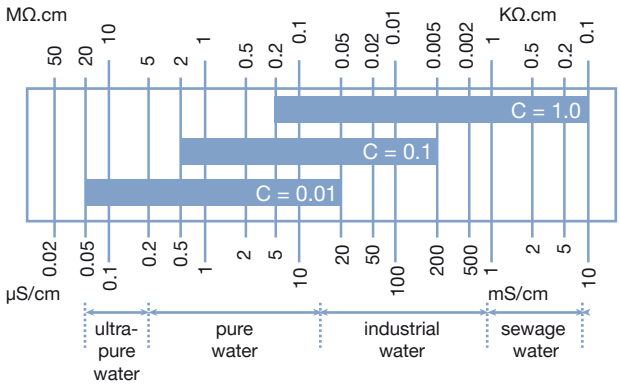
Principle of operation

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 (single meter version) or a three-wire device (dual meter version) and requires a power supply of 14 V DC (single meter version) or 12 V DC (dual meter version) up to 36 V DC.



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

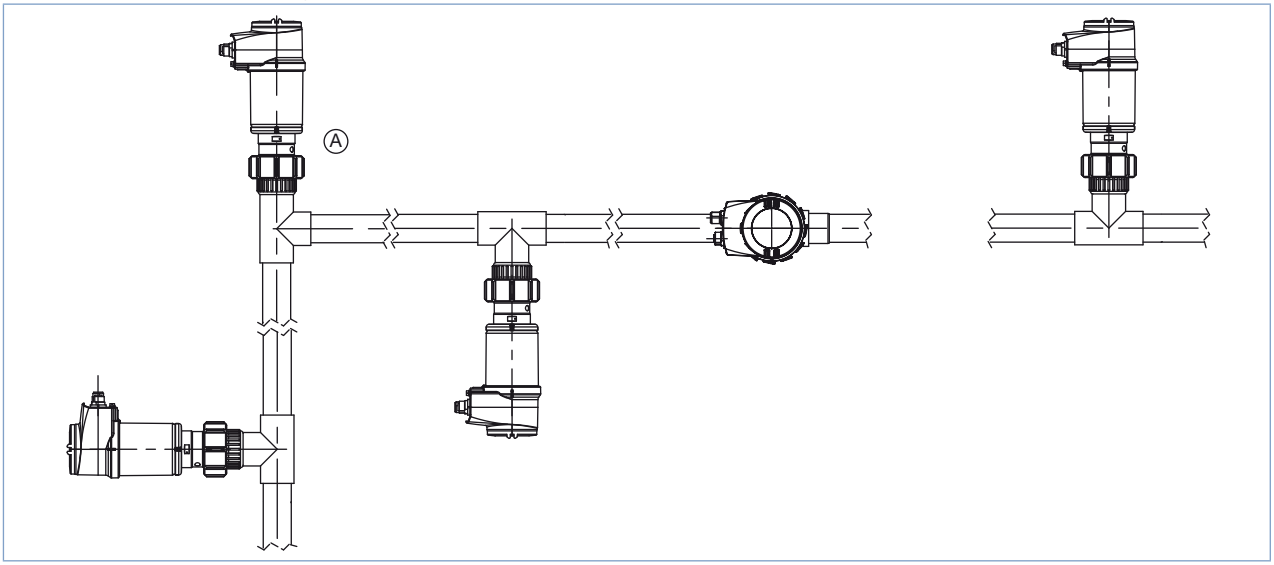
The sensor is selected according to the measuring range and medium by using the table opposite.



Installation

The 8222 conductivity meter can be installed into any adaptor with G 1½ external threaded sensor connection by just fixing the main union nut.
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 must be used. Install cautiously the device on the fitting. It can be installed in any position **(prefer "A" mounting to install a 8222 with sensor C = 0.1 or C = 0.01)**.

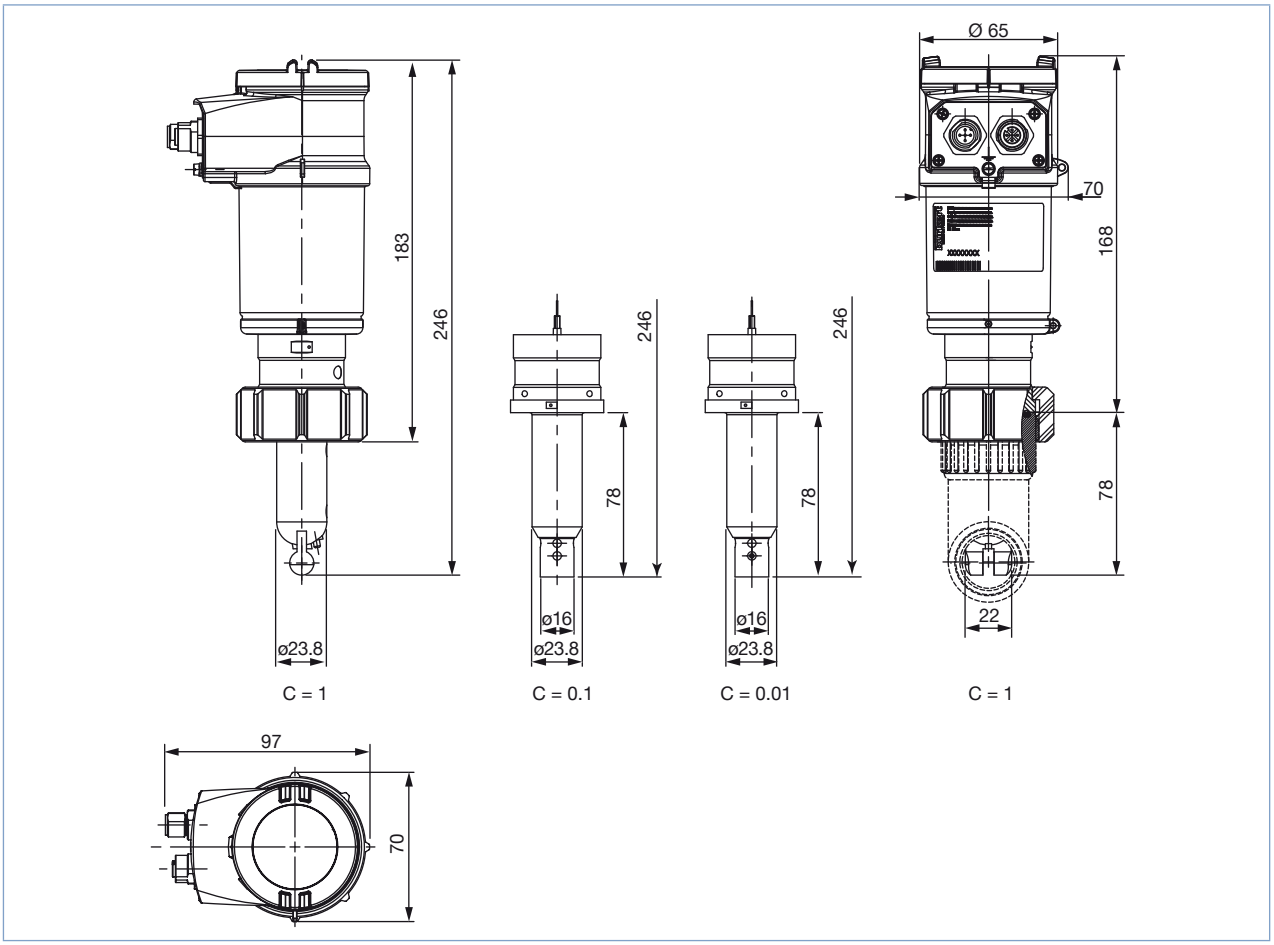
In order to get reliable measurement air bubbles must be avoided.
Please ensure that the mounting location provides a continuous and complete immersion of the sensor in the flow stream.



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

DTS 1000114221 EN Version: K Status: RL (released | freigegeben | validé) printed: 27.06.2018

Dimensions [mm] of conductivity meter Type 8222



DTS 1000114221 EN Version: K Status: RL (released | freigegeben | validé) printed: 27.06.2018

Ordering information for compact conductivity meter, Type 8222

A complete compact ELEMENT conductivity meter, Type 8222, consists of a compact ELEMENT conductivity meter, Type 8222, a removable display/configuration module 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 conductivity meter (see ordering chart on p. 7)
- **Article no.** of the a removable display/configuration module (see accessories ordering chart on p. 8)
- **Article no.** of the selected **S022** Insertion adaptor with G 1½ external threaded sensor connection (see separate data sheet)

→ You have to order two or three components.

Attention!
When you order devices without display, please take care that you also order at least one display module for the operation.
Order no. of the removable display/configuration module, see ordering chart on p. 8

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 without display

Removable display/configuration module

Insertion adaptor Type S022

Complete ELEMENT device for conductivity measurement Type 8222

Fitting (example only)

DTS 1000114221 EN Version: K Status: RL (released | freigegeben | validé) printed: 27.06.2018

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 without display	14…36 V DC	2 x transistors + 1 x 4…20 mA	C = 0.01	PVC	5 pin M12 male fixed connector	No	559618
						UL-Recognized	562394
				PVDF	5 pin M12 male fixed connector	No	559620
						UL-Recognized	562396
			C = 0.1	PVC	5 pin M12 male fixed connector	No	559614
						UL-Recognized	559624
				PVDF	5 pin M12 male fixed connector	No	559616
						UL-Recognized	559626
			C = 1.0	PVC	5 pin M12 male fixed connector	No	559610
						UL-Recognized	559638
				PVDF	5 pin M12 male fixed connector	No	559612
						UL-Recognized	559622
	12…36 V DC	2 x transistors + 2 x 4…20 mA	C = 0.01	PVC	5 pin M12 male and 5 pin M12 female fixed connectors	No	559619
						UL-Recognized	562395
				PVDF	5 pin M12 male and 5 pin M12 female fixed connectors	No	559621
						UL-Recognized	562397
			C = 0.1	PVC	5 pin M12 male and 5 pin M12 female fixed connectors	No	559615
						UL-Recognized	559625
				PVDF	5 pin M12 male and 5 pin M12 female fixed connectors	No	559617
						UL-Recognized	559627
			C = 1.0	PVC	5 pin M12 male and 5 pin M12 female fixed connectors	No	559611
						UL-Recognized	559639
				PVDF	5 pin M12 male and 5 pin M12 female fixed connectors	No	559613
						UL-Recognized	559623

Note: Order separately (see accessories)
- display/configuration module
- M12 female cable plug

Further versions on request

Additional.
Pre-parameterized devices with configuration: 2- or 4- outputs, filter, temperature compensation, threshold, etc.

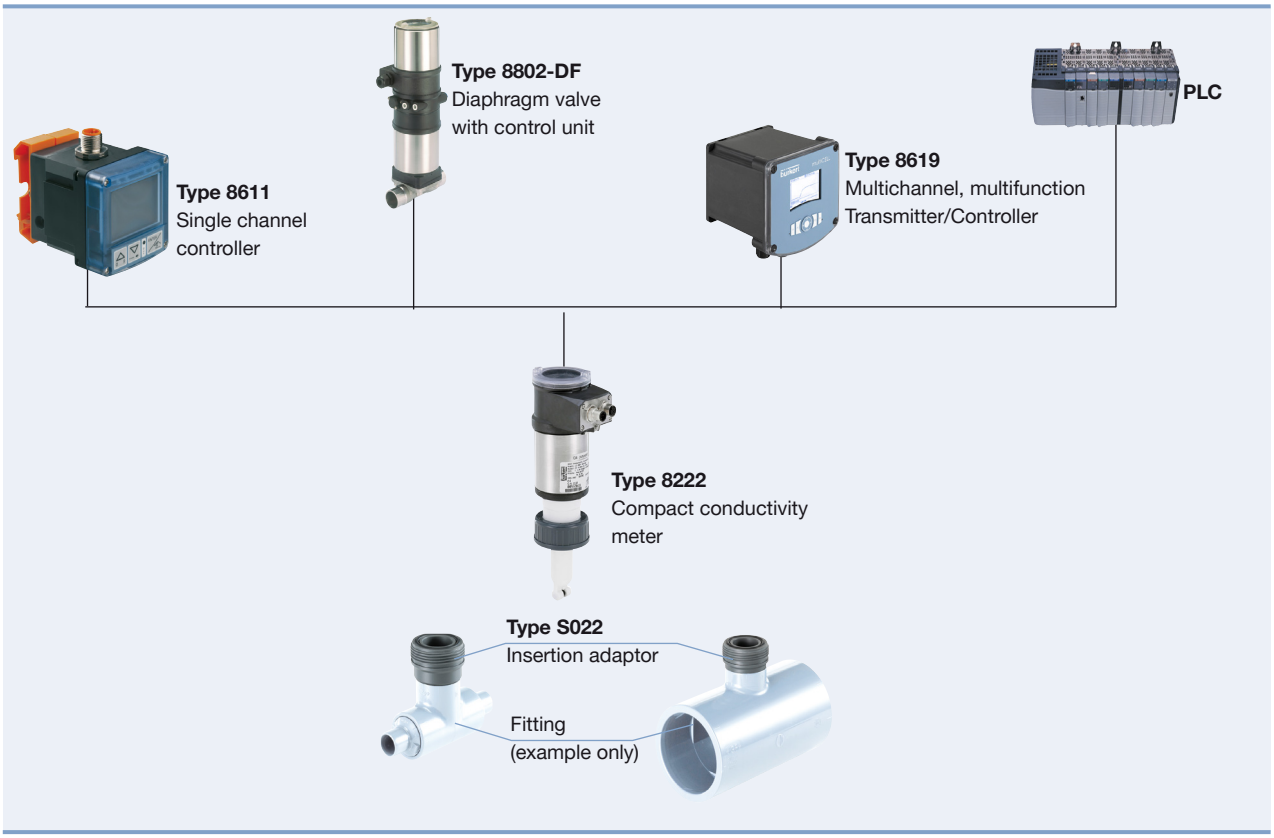
Certification and calibration.
Calibration certificates

DTS 1000114221 EN Version: K Status: RL (released | freigegeben | validé) printed: 27.06.2018

Ordering chart for accessories (to be ordered separately)

Description		Article no.
Removable display/configuration module (with instruction sheet)		559168
Blind cover with seal		560948
Transparent cover with seal		561843
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 male straight cable plug with plastic threaded locking ring, to be wired	560946
	5 pin M12 female straight cable plug moulded on cable (2 m, shielded)	438680
	5 pin M12 male straight cable plug moulded on cable (2 m, shielded)	559177

Interconnection possibilities with other Bürkert devices



To find your nearest Bürkert facility, click on the orange box → **www.burkert.com**

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

Subject to alteration.

1806/8_EU-en_00895068

DTS 1000114221 EN Version: K Status: RL (released | freigegeben | validé) printed: 27.06.2018