

## Conductivity meter



- Configurable outputs: two transistor and single or dual analog 4... 20 mA
- Removable backlighted display
- Universal process connection
- Three cell constants for covering a wide measuring range
- Diagnostic functions

Type 8222 can be combined with...



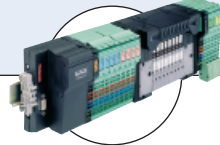
**Type 6642**  
Solenoid valve



**Type 8802-DF**  
Diaphragm valve with control unit



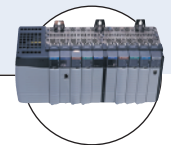
**Type 2030**  
On/Off Diaphragm valve



**Type 8644**  
Valve islands



**Type 8620**  
Cooling Tower or boiler chemistry controller



**PLC**

The Bürkert compact meter Type 8222 is 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 and a 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 (i.e. selection of sensor cell constant, language, measuring range, engineering units, calibration...) and also for visualizing continuously the measured and processed data.

The device Type 8222 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 electronics of Type 8222 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)

|                                 |  |
|---------------------------------|--|
| <b>Pipe diameter</b>            | DN25 to DN110 (DN<25 with reduction)   |
| <b>Conductivity measurement</b> |  |
| Measuring range                 | 0.05 µS/cm... 10 mS/cm   |
| Resolution                      | 1 nS/cm  |
| Accuracy                        | ±3% of measured value  |
| <b>Temperature measurement</b>  |  |
| Measuring range                 | -40 to +130°C (-40 to 266°F)   |
| Internal resolution             | 0.1°C (0.18°F)   |
| Accuracy                        | ±1°C (1.8°F)   |
| Minimal temperature range       | 10°C (i.e. 10 to 20°C (50 to 68°F) corresponding to 4... 20 mA)  |
| <b>Temperature compensation</b> | none<br>or according to a predefined graph (NaCl or ultra pure water)<br>or according to a graph defined especially for your process |
| <b>Medium temperature</b>       |  |
| with G1½" PVC nut connection    | 0 to 50°C (32 to 122°F)  |
| with G1½" PVDF nut 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)   |
|                                 | - PP: 0 to 80°C (32 to 176°F)  |
|                                 | - Metal: -20 to 100°C (-4 to 212°F)  |
| <b>Fluid pressure max</b>       | PN16 (232 PSI) (see Pressure/Temperature chart)  |

### Environment



|                            |  |
|----------------------------|--|
| <b>Ambient temperature</b> | -10 to +60°C (14 to 140°F) (operating and storage) |
| <b>Relative humidity</b>   | ≤ 85%, without condensation                        |

# 8222 ELEMENT

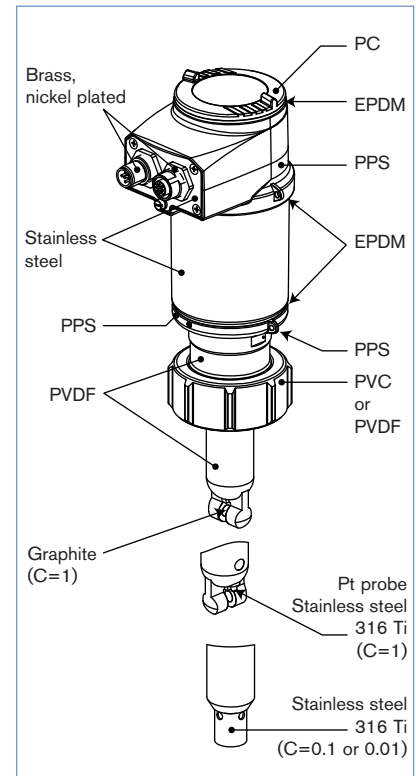
bürkert

| Electrical data                        |  |
|--|--|
| <b>Power supply</b>                    |  |
| 3 outputs meter (2-wire)               | 14 - 36 V DC, filtered and regulated   |
| 4 outputs meter (3-wire)               | 12 - 36 V DC, filtered and regulated   |
| <b>Current consumption</b> with sensor | ≤ 1 A (with the 2 transistors loads)   |
| 3 outputs meter (2-wire)               | ≤ 25 mA (at 14 V DC without transistors load, with current loop)   |
| 4 outputs meter (3-wire)               | ≤ 5 mA (at 12 V DC without transistors load, without current loop)   |
| <b>Reversed polarity of DC</b>         | Protected  |
| <b>Voltage peak</b>                    | Protected  |
| <b>Short circuit</b>                   | Protected for transistor outputs   |
| <b>Output</b>                          |  |
| Transistor                             | 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<br>output NPN: 0.2 - 36 V DC<br>output PNP: V+ power supply |
| Current                                | 4... 20 mA programmable as sourcing or sinking,  |
| 3 outputs meter (2-wire)               | max. loop impedance: 1100 Ω at 36 V DC;<br>610 Ω at 24 V DC; 180 Ω at 14 V DC  |
| 4 outputs meter (3-wire)               | configurable in the same mode as transistor: sourcing or sinking,<br>max. loop impedance: 1100 Ω at 36 V DC;<br>610 Ω at 24 V DC; 100 Ω at 12 V DC   |
| Response time (10% - 90%)              | 150 ms (standard)  |

| 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 / cover                | Stainless steel 1.4561, PPS / PC   |
| Seals / Screws                 | EPDM / Stainless steel   |
| Fixed connector mounting plate | Stainless steel  |
| Fixed connector                | Brass nickel plated  |
| Display / navigation key       | PC / PBT   |
| Nut                            | PVC or PVDF  |
| Wetted part materials          |  |
| Conductivity sensor            | PVDF, stainless steel 1.4571 (316Ti)   |
| Electrode                      | 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>Display (accessories)</b>   | Grey dot matrix 128x64 with backlighting   |
| <b>Electrical connections</b>  |  |
| 3 outputs meter (2-wire)       | 1x 5-pin M12 male fixed connector,   |
| 4 outputs meter (3-wire)       | 1x 5-pin M12 male + 1x 5-pin M12 female fixed connectors   |
| <b>Connection cable</b>        | Shielded cable   |

| Standards, directives and approvals   |  |
|---|--|
| <b>Protection class</b>   | IP65 and IP67 with M12 cable plug mounted and tightened and cover fully screwed down                                   |
| <b>Standard and directives</b>   | EN 61000-6-2, EN 61000-6-3<br>Complying with article 3 of §3 from 97/23/CE directive.*<br>EN 60068-2-6 / EN 60068-2-27 |
| <b>Approvals</b>  | 61010-1 + CAN/CSA-C22 No.61010-1   |
| UL-Recognized for US and Canada  |  |

## Materials view



\* For the 97/23/CE pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter and fluid).

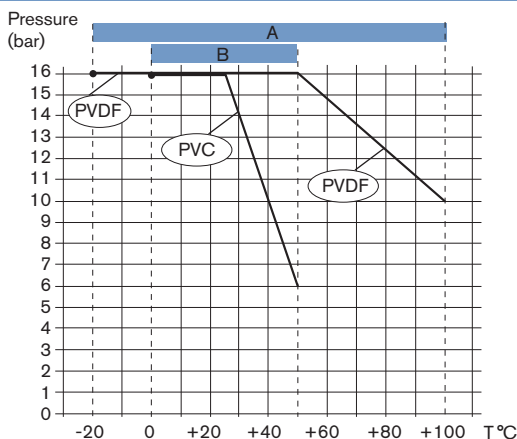
| Type of fluid         | Conditions                              |
|-----------------------|---|
| Fluid group 1, §1.3.a | Only DN ≤ 25                            |
| Fluid group 2, §1.3.a | DN ≤ 32, or<br>DN > 32 and PN*DN ≤ 1000 |
| Fluid group 1, §1.3.b | DN ≤ 25, or<br>DN > 25 and PN*DN ≤ 2000 |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

Pressure/Temperature chart

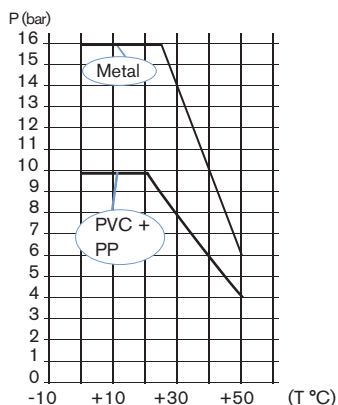
**Application range of a 8222 ELEMENT conductivity meter:**

- A**: with PVDF nut
- B**: with PVC nut

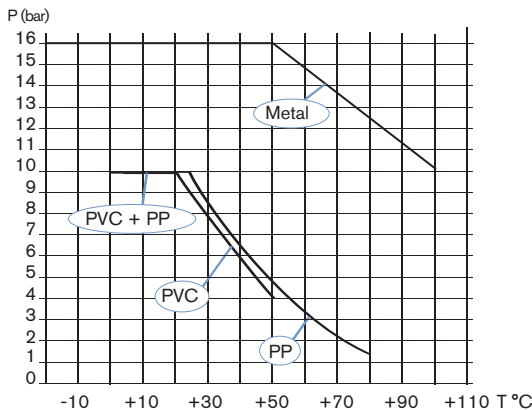
The measures have been made at an ambient temperature of 60°C.



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

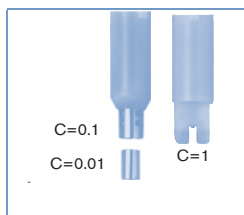


**Application range of a 8222 ELEMENT conductivity meter with PVDF nut with S022 adaptor**



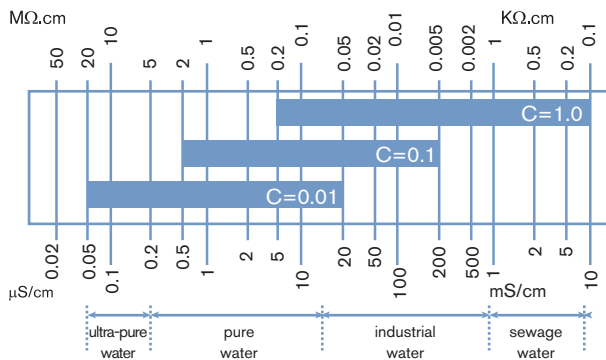
**Principle of operation**

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 two 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.

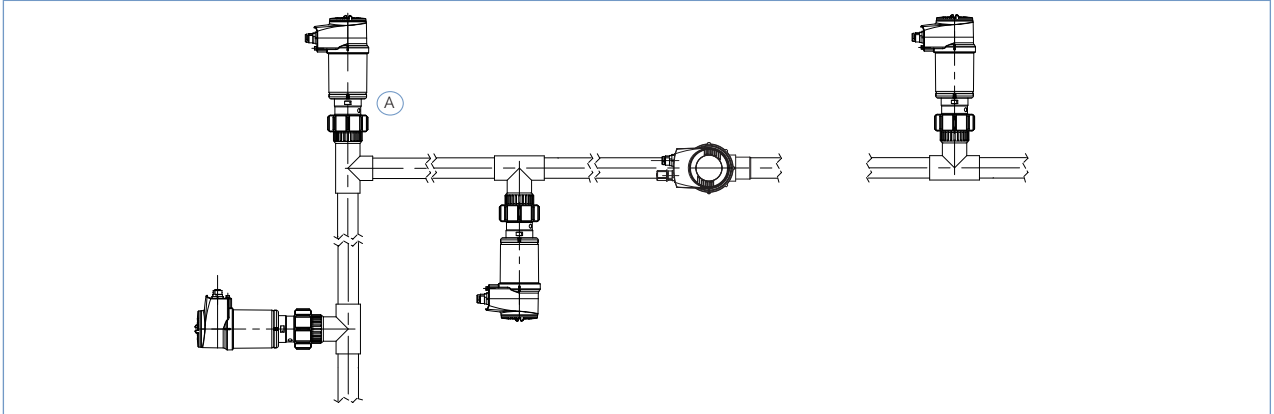


## Installation

The 8222 conductivity meter can be installed into any adaptor with G1½" external threaded sensor connection by just fixing the main nut. Select and install the required adaptor onto the pipe according to specific requirements of the sensor and material (temperature and pressure). For mounting on a tank or direct mounting on a pipe (DN100 and DN110), an adaptor with a G1½" 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**).

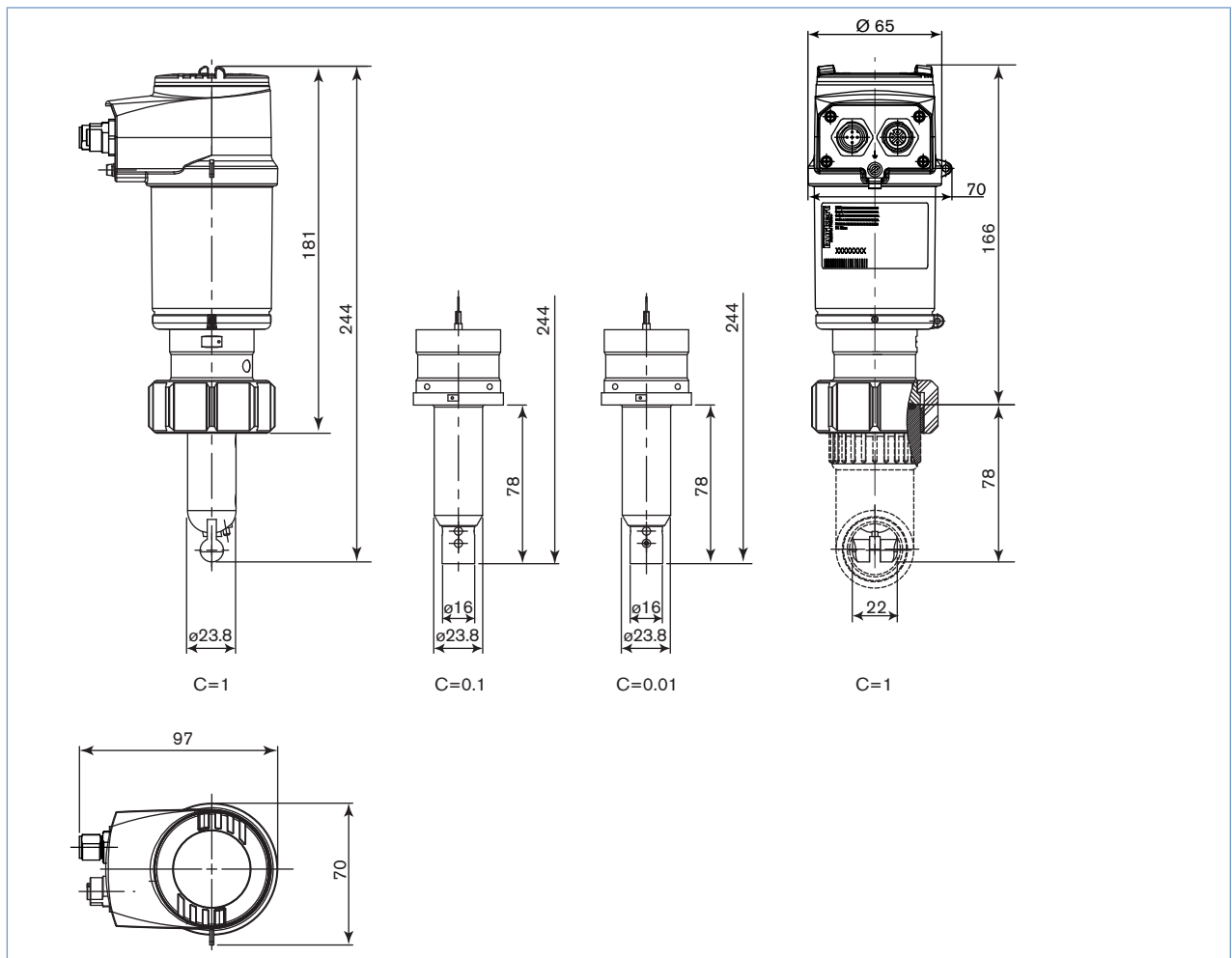
In order to get reliable measurement air bubbles must be avoided.

**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.

## Dimensions [mm] of conductivity meter Type 8222



## 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 INSERTION adaptor Type S022 (with G1½" external threaded sensor connection).

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

- **Item no.** of the desired ELEMENT conductivity meter **Type 8222** (see ordering chart on p. 6)
- **Item no.** of the a removable display/configuration module (see accessories 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 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. 7


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**

|   |   |  |
|---|---|--|
| <p><b>Compact conductivity meter Type 8222 without display</b></p>  | + | <p><b>Removable display/configuration module</b></p>  |
|---|---|--|


+

**INSERTION adaptor Type S022**



More info.













**Complete ELEMENT device for conductivity measurement Type 8222**



Fitting (example only)

Ordering chart for compact conductivity meter Type 8222

Conductivity meter Type 8222





| Specifications                             | Voltage supply | Output   | Sensor version  | Nut material  | Electrical connection   | UL Approvals  | Item 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  | 559 618  |
|  |                |  |   |   |   |  UL-Recognized   | 562 394  |
|  |                |  |   | PVDF  | 5-pin M12 male fixed connector  | No  | 559 620  |
|  |                |  |   |   |   |  UL-Recognized   | 562 396  |
|  |                |  | C=0.1   | PVC   | 5-pin M12 male fixed connector  | No  | 559 614  |
|  |                |  |   |   |   |  UL-Recognized   | 559 624  |
|  |                |  |   | PVDF  | 5-pin M12 male fixed connector  | No  | 559 616  |
|  |                |  |   |   |   |  UL-Recognized   | 559 626  |
|  | C=1.0          | PVC  | 5-pin M12 male fixed connector  | No  | 559 610   |   |          |
|  |                |  |   |  UL-Recognized | 559 638   |   |          |
|  |                | PVDF   | 5-pin M12 male fixed connector  | No  | 559 612   |   |          |
|  |                |  |   |  UL-Recognized | 559 622   |   |          |
|  | 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  | 559 619  |
|  |                |  |   |   |   |  UL-Recognized | 562 395  |
|  |                |  |   | PVDF  | 5-pin M12 male and 5-pin M12 female fixed connectors  | No  | 559 621  |
|  |                |  |   |   |   |  UL-Recognized | 562 397  |
| C=0.1                                      |                |  | PVC   | 5-pin M12 male and 5-pin M12 female fixed connectors  | No  | 559 615   |          |
|  |                |  |   |   |  UL-Recognized | 559 625   |          |
|  |                |  | PVDF  | 5-pin M12 male and 5-pin M12 female fixed connectors  | No  | 559 617   |          |
|  |                |  |   |   |  UL-Recognized | 559 627   |          |
| C=1.0                                      | PVC            | 5-pin M12 male and 5-pin M12 female fixed connectors | No  | 559 611   |   |   |          |
|  |                |  |  UL-Recognized | 559 639   |   |   |          |
|  | PVDF           | 5-pin M12 male and 5-pin M12 female fixed connectors | No  | 559 613   |   |   |          |
|  |                |  |  UL-Recognized | 559 623   |   |   |          |

**Note: Order separately** (see accessories)

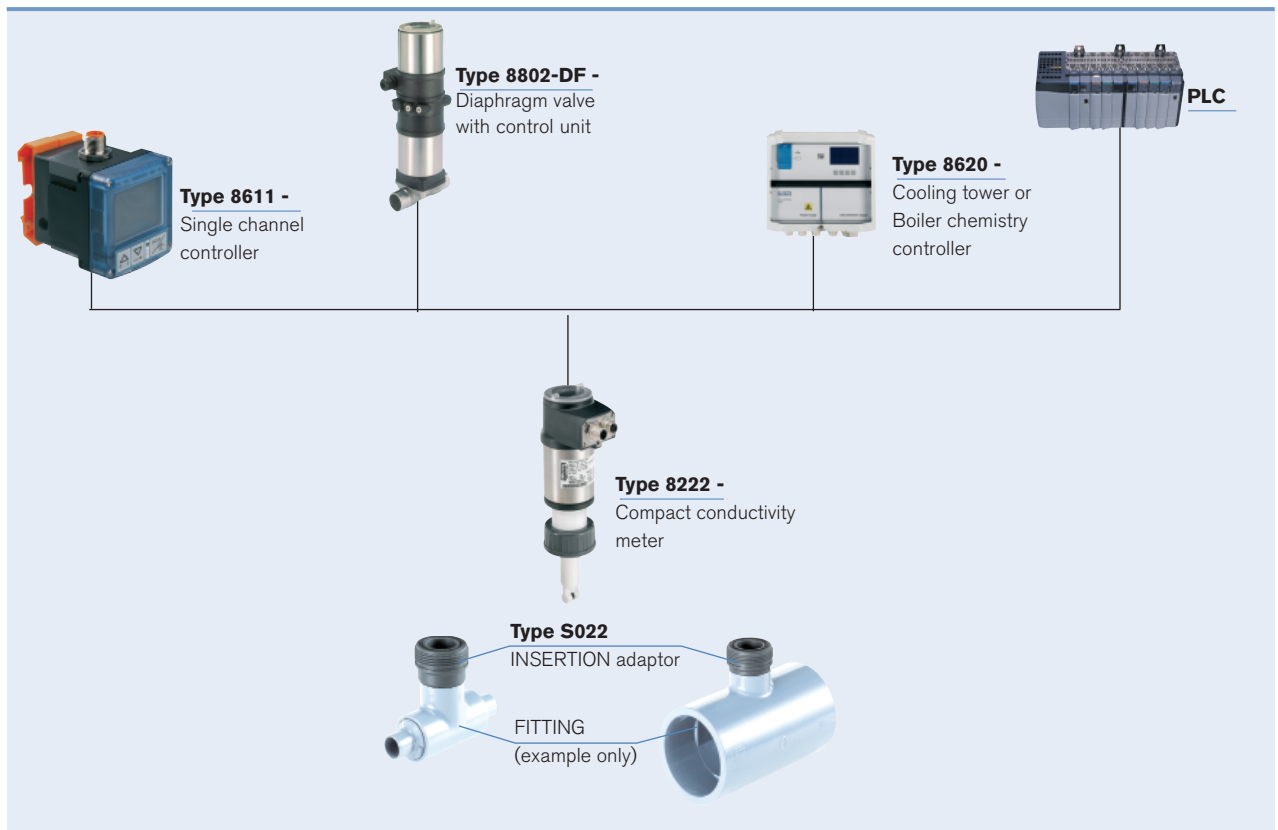
- display/configuration module

- M12 cable plugs (only female for 1 x 4... 20 mA, 1 male + 1 female for 2 x 4... 20 mA conductivity meter)

Ordering chart for accessories

| Description   |  | Item no. |
|---|--|----------|
| Removable display/configuration module (with instruction sheet)                   |  | 559 168  |
| Black blank cover with EPDM seal  |  | 560 948  |
| Transparent cover with EPDM seal  |  | 561 843  |
| 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 male straight cable plug with plastic threaded locking ring, to be wired   | 560 946  |
|  | 5-pin M12 female straight cable plug moulded on cable (2 m, shielded)                | 438 680  |
|  | 5-pin M12 male straight cable plug moulded on cable (2 m, shielded)                  | 559 177  |

Interconnection possibilities with other Bürkert devices



To find your nearest Bürkert office, 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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