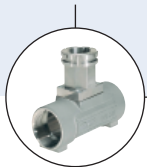


Inductive conductivity meter



- Configurable outputs: up to 2 transistor and up to 2 analog 4... 20 mA outputs
- Removable backlighted display
- Simulation of process values
- Diagnostic functions
- Sensor-versions available with PEEK, PVDF or PP

Type 8228 can be combined with...



Type S020
INSERTION fitting



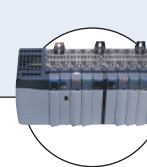
Type 8802-DF
Diaphragm valve with control unit



Type 2030
On/Off Diaphragm valve



Type 8619
multiCELL Transmitter/Controller



PLC

Bürkert's analytical meter Type 8228 is designed for measuring the conductivity in industrial and water treatment applications (i.e. aggressive fluids, CIP, ...).

The conductivity meter consists of a sensor, plugged-in and pinned to an enclosure with cover, containing the transmitter module and a removable display. The sensor component consists of a pair of magnetic coils in a PP, PVDF or PEEK holder. The cell constant is an average value over the whole measuring range. It can be re-adjusted depending on application. The integrated temperature probe (without direct contact to the fluid) for automatic compensation is a standard feature in the conductivity sensor holder.

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 8228 is available:



- with two fully configurable outputs: one transistor and one 3-wire 4... 20 mA current outputs
- with four fully configurable outputs: two transistor and two 3-wire 4... 20 mA current outputs.

The electronics of Type 8228 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.

| Complete device data (Fitting + conductivity meter) | |
|---|---|
| Pipe diameter | DN15 to 400 |
| Conductivity measurement | |
| Measuring range | 100 µS/cm...2 S/cm |
| Resolution | 0.1 µS/cm |
| Measurement deviation ("measurement bias" as defined in the standard JCGM 200:2012) | ±(2% of the measured value + 5 µS/cm) |
| Linearity | ±2% |
| Repeatability | ±(0.2% of the measured value + 2 µS/cm) |
| Response time t90 | from 3 s (without filter) to 40 s (with slow filter) |
| Temperature measurement | |
| Measuring range | -40 to +150°C (-40 to 302°F) |
| Resolution | 0.1°C (0.18°F) |
| Measuring uncertainty | ±1°C (1.8°F) |
| Response time t90 | < 280 s (without filter) |
| Temperature compensation | - none or - according to a predefined graph (NaCl, NaOH, HNO ₃ or H ₂ SO ₄) or - according to a graph defined especially for your process |
| Medium temperature with conductivity sensor in | |
| PVDF | -15 to +100 °C (5 to 212°F) |
| PP | 0 to +80 °C (32 to 176°F) |
| PEEK | -15 to 130°C (5 to 266°F) |
| Temperature limits may depend on the material the S020 fitting used is made of. Refer to the relevant data sheet or instruction manual and the pressure/temperature diagram of the fluid on page 3. If the temperature ranges given for the device and the fitting are different, use the most restrictive range. | |
| Fluid pressure max with conductivity sensor in | |
| PVDF, PP | PN6 (87 PSI) |
| PEEK | PN10 (145 PSI) |
| Pressure limits may depend on the material the S020 fitting used is made of. Refer to the relevant data sheet or instruction manual and the pressure/temperature diagram of the fluid on page 3. If the temperature ranges given for the device and the fitting are different, use the most restrictive range. | |

**8228
ELEMENT**

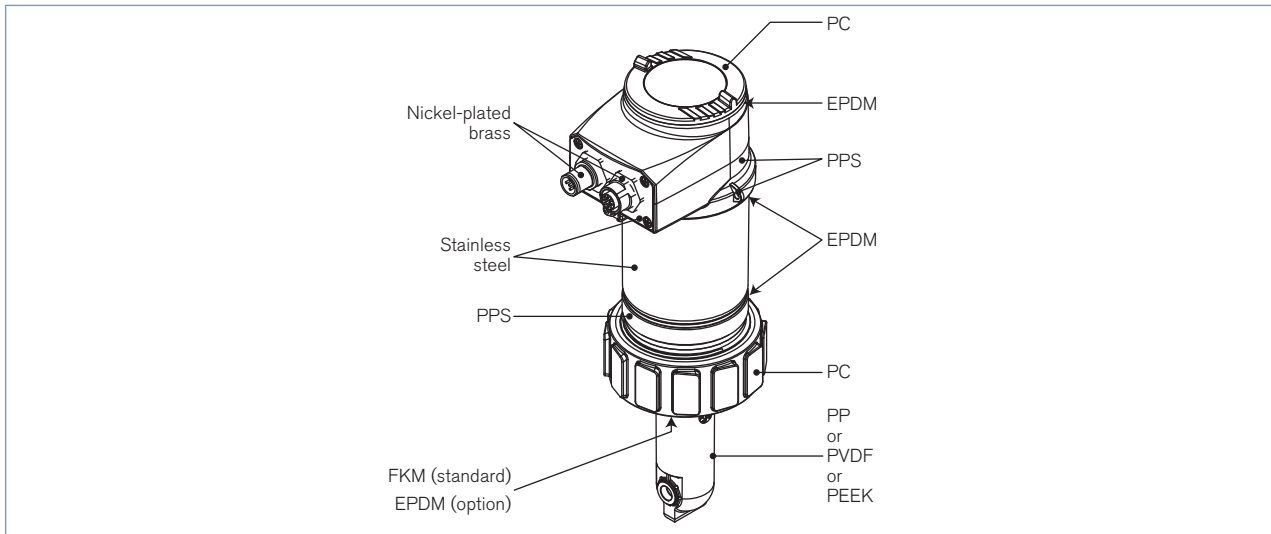
bürkert

| Environment | |
|---|---|
| Ambient temperature | -10 to +60°C (14 to 140°F) (operating and storage) |
| Relative humidity | ≤ 85%, without condensation |
| Height above sea level | Max. 2000 m |
| General data | |
| Compatibility | Any pipe which are fitted out with Bürkert INSERTION Fitting S020 (see corresponding data sheet) |
| Materials | See materials view, on next page |
| Housing / Cover | Stainless steel 1.4404, PPS / PC |
| Seal / Screws | EPDM / Stainless steel |
| Fixed connector holder | Stainless steel 1.4404 (316L) |
| M12 fixed connector | Brass nickel plated |
| Display / Navigation key | PC / PBT |
| Nut | PC |
| Wetted part materials | |
| Sensor holder | PP, PVDF or PEEK |
| Seal | FKM (standard) or EPDM (option) |
| Temperature sensor | Integrated in the sensor |
| Display (accessories) | Grey dot matrix 128x64 with backlighting |
| Electrical connections | |
| 2 outputs meter (3-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 |
| Connection cable | Shielded cable, ø 3 to 6.5 mm; max. 0.75 mm ² cross section |
| Electrical data | |
| Supply voltage | 12 - 36 V DC, ±10% oscillation rate, filtered and regulated, SELV (safety extra low voltage) circuit with a non dangerous energy level |
| Current consumption with sensor | ≤ 25 mA (at 12 V DC and without the consumption of the 4... 20 mA output) |
| Reversed polarity of DC | Protected |
| Voltage peak | Protected |
| Short circuit | Protected |
| Output | |
| Transistor | Polarized, galvanically insulated configurable through wiring and through parameterizing as sourcing (PNP) or sinking (NPN) output NPN: 1 - 36 V DC, max. 700 mA (or 500 mA max. per transistor if both transistor outputs are wired) output PNP: V+ supply voltage, max. 700 mA (or 500 mA max. per transistor if both transistor outputs are wired) |
| Current (3-wire) | 4... 20 mA configurable through wiring and through parameterizing as sourcing or sinking, 22 mA to indicate a fault (can be parametered) max. loop impedance: 1100 Ω at 36 V DC; 610 Ω at 24 V DC; 100 Ω at 12 V DC |
| Uncertainty of the output value | 1% of the full scale |
| Response time (10% - 90%) | 150 ms (default value) |
| Standards, directives and approvals | |
| Protection class acc. to EN 60529 | IP65 and IP67 with M12 connectors plugged in and tightened and electronic module cover fully screwed down |
| Standard and directives  | |
| EMC | EN 61000-6-2, EN 61000-6-3 and Annex1, EN 61326-1-7 (Table 2) |
| Pressure | Complying with article 3 of §3 from 97/23/CE directive.* |
| Vibration / Shock | EN 60068-2-6 / EN 60068-2-27 |
| Approvals | |
| UL-Recognized for US and Canada  | 61010-1 + CRN/CSA-C22 No.61010-1 |
| Specific technical data of UL-recognized products for US and Canada | |
| Intended for an inner pollution | Grade of pollution 2, according to EN61010-1 |
| Installation category | Category I, according to UL61010-1 |

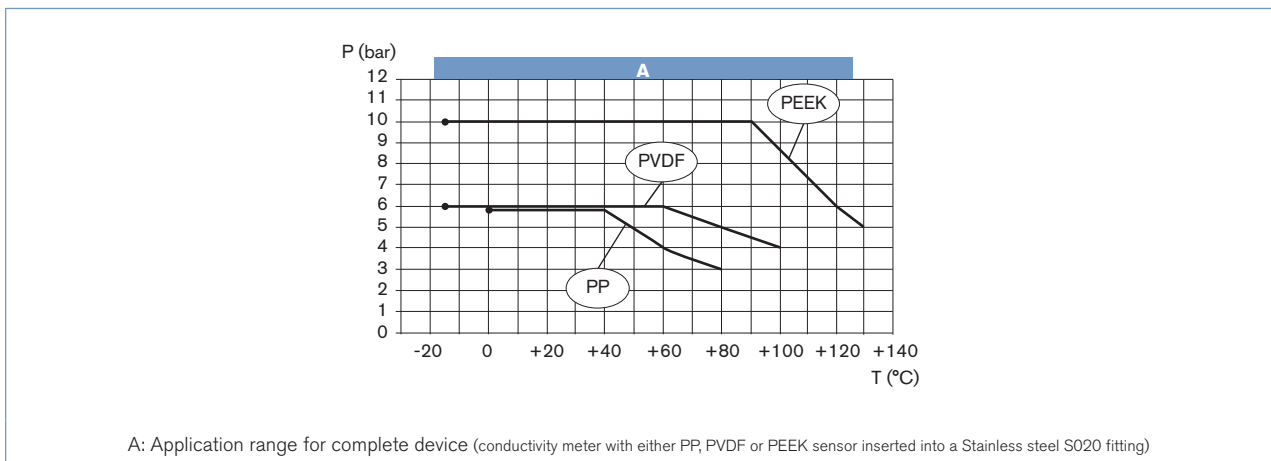
* For the 97/23/CE pressure directive, the device can only be used under following conditions (depend on max. pressure, pipe diameter and fluid).

| Type of fluid | Conditions |
|-----------------------|---|
| Fluid group 1, §1.3.a | Forbidden |
| Fluid group 2, §1.3.a | DN ≤ 32, or DN > 32 and PN*DN ≤ 1000 |
| Fluid group 1, §1.3.b | PN*DN ≤ 2000 |
| Fluid group 2, §1.3.b | DN ≤ 200 or PN ≤ 10 |

Materials view



Pressure/temperature chart



Principle of operation

The 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, an AC voltage source is connected to the primary magnetic coil. The magnetic field induced generates a current in the secondary magnetic coil. The intensity of this induced current is a direct function of the conductivity of the solution.

Up to two 4... 20 mA standard signal are available as output signals, proportional to the conductivity and/or to the temperature of the fluid.

The conductivity meter is a three-wire device and requires a power supply of 12 V DC up to 36 V DC.

In-line installation



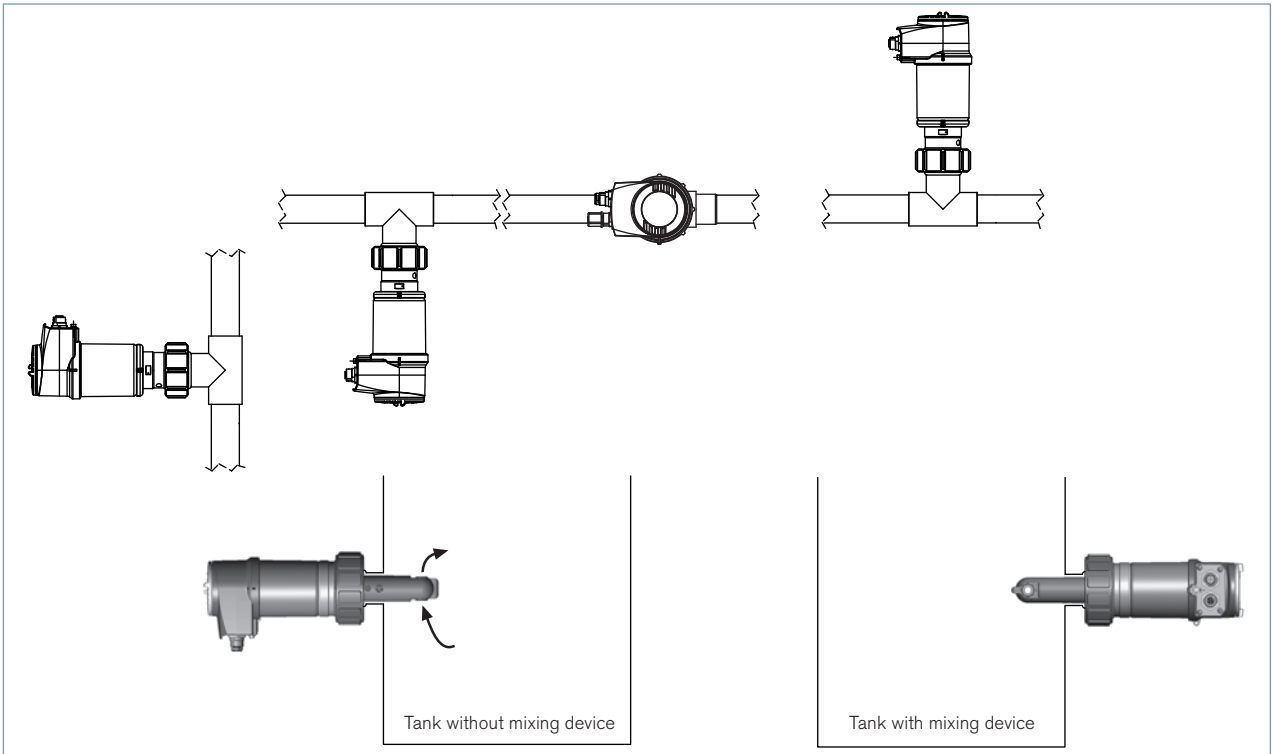
The 8228 conductivity meter can be installed into any Bürkert INSERTION fitting (S020),, by just fixing the main nut.

Select and install the required fitting onto the pipe, according to specific requirements of the sensor and fitting material (temperature and pressure).

Then, carefully install the device on the fitting, and tighten with the nut. It can be installed in any position.




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.



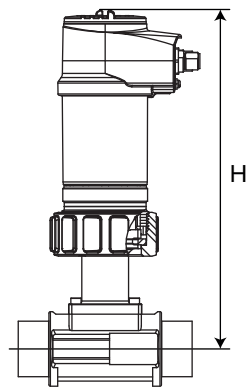
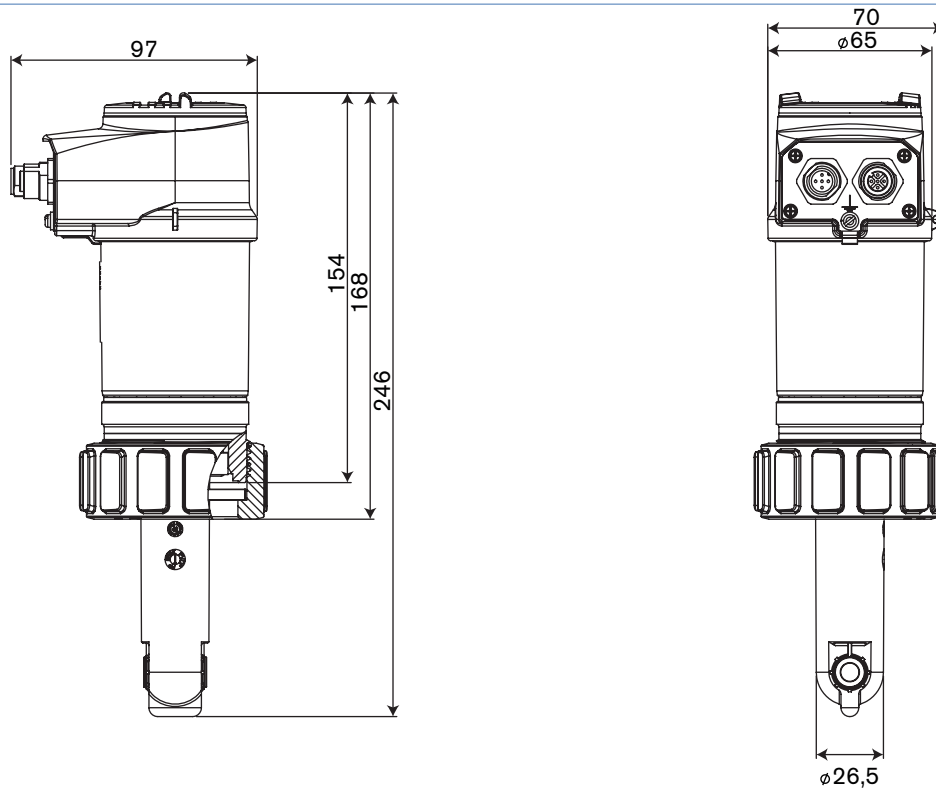
The device must be protected from constant heat radiation and other environmental influences, such as direct exposure to sunlight.

Combining the S020 with a measuring device for conductivity measurement

| | DN06 | DN15 | DN32 | DN50 | DN65 | DN350 | DN400 | |
|--|-------------|-------------|------|------|-------------|-------|-------|--|
| Available S020 fittings T-fitting  for measuring device with G2" c connection | [Available] | | | | | | | |
| Welding socket  | | | | | [Available] | | | |
| Fusion spigot  | | | | | [Available] | | | |
| Conductivity measuring device 8228 | | [Available] | | | | | | |

*** Only use plastic fitting in analytical version with true union acc. to DIN 8063 (PVC), to DIN 16962 (PP) or to ISO 10931 (PVDF)

Dimensions [mm] of conductivity meter Type 8228



| Orifice | H | | |
|---------|-----------|----------------|--------------|
| | T-Fitting | Plastic spigot | Metal spigot |
| 15 | 233* | | |
| 20 | 233* | | |
| 25 | 233* | | |
| 32 | 233 | | |
| 40 | 237 | | |
| 50 | 243 | | 238 |
| 65 | 243 | 264** | 244 |
| 80 | | 264** | 249 |
| 100 | | 264** | 259 |
| 125 | | 299 | 270 |
| 150 | | 306 | 281 |
| 200 | | 327 | 302 |
| 250 | | 345 | 362 |
| 300 | | 357 | 381 |
| 350 | | 370 | 393 |
| 400 | | 385 | |

* Only use plastic fitting in analytical version with true union acc. to DIN 8063 (PVC), to DIN 16962 (PP) or to ISO 10931 (PVDF)

** use analytical fusion spigot (Item no. 418652, 418660 or 418644 in PP, PVDF or PE) for orifice DN65-DN100

Ordering information for compact conductivity meter Type 8228

A complete compact ELEMENT conductivity meter Type 8228 consists of a compact ELEMENT conductivity meter Type 8228, a removable display/configuration module and a Bürkert INSERTION adaptor Type S020.

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

- **Item no.** of the desired ELEMENT conductivity meter **Type 8228** available with or without display/configuration module (see ordering chart on p. 7)
- **Item no.** of the selected INSERTION fitting **Type S020** (see separate data sheet)



Attention!

When you order devices without display/configuration module, please take care that you also order at least one display/configuration 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

Compact conductivity meter Type 8228 + **Removable display/configuration module (included or separately available)**

INSERTION fitting Type S020







Complete ELEMENT device for conductivity measurement Type 8228

More info.

Fitting (example only)

Ordering chart for compact conductivity meter Type 8228





Conductivity meter Type 8228

| Specifications | Voltage supply | Output | Sensor holder material | Sensor seal material* | Electrical connection | UL Approvals | Item no.** without display | Item no.** with display |
|----------------------------|----------------|--|------------------------|-----------------------|--|---|----------------------------|-------------------------|
| Compact conductivity meter | 12 - 36 V DC | 1 x transistor NPN/PNP + 1 x 4... 20 mA | PP | FKM | 5-pin M12 male fixed connector | No | 565 601 | 566 601 |
| | | | | | |  UL-Recognized | 565 611 | 566 611 |
| | | | PVDF | FKM | 5-pin M12 male fixed connector | No | 565 603 | 566 603 |
| | | | | | |  UL-Recognized | 565 613 | 566 613 |
| | | | PEEK | FKM | 5-pin M12 male fixed connector | No | 565 605 | 566 605 |
| | | | | | |  UL-Recognized | 565 615 | 566 615 |
| | | 2 x transistors NPN/PNP + 2 x 4... 20 mA | PP | FKM | 5-pin M12 male and 5-pin M12 female fixed connectors | No | 565 602 | 566 602 |
| | | | | | |  UL-Recognized | 565 612 | 566 612 |
| | | | PVDF | FKM | 5-pin M12 male and 5-pin M12 female fixed connectors | No | 565 604 | 566 604 |
| | | | | | |  UL-Recognized | 565 614 | 566 614 |
| | | | PEEK | FKM | 5-pin M12 male and 5-pin M12 female fixed connectors | No | 565 606 | 566 606 |
| | | | | | |  UL-Recognized | 565 616 | 566 616 |

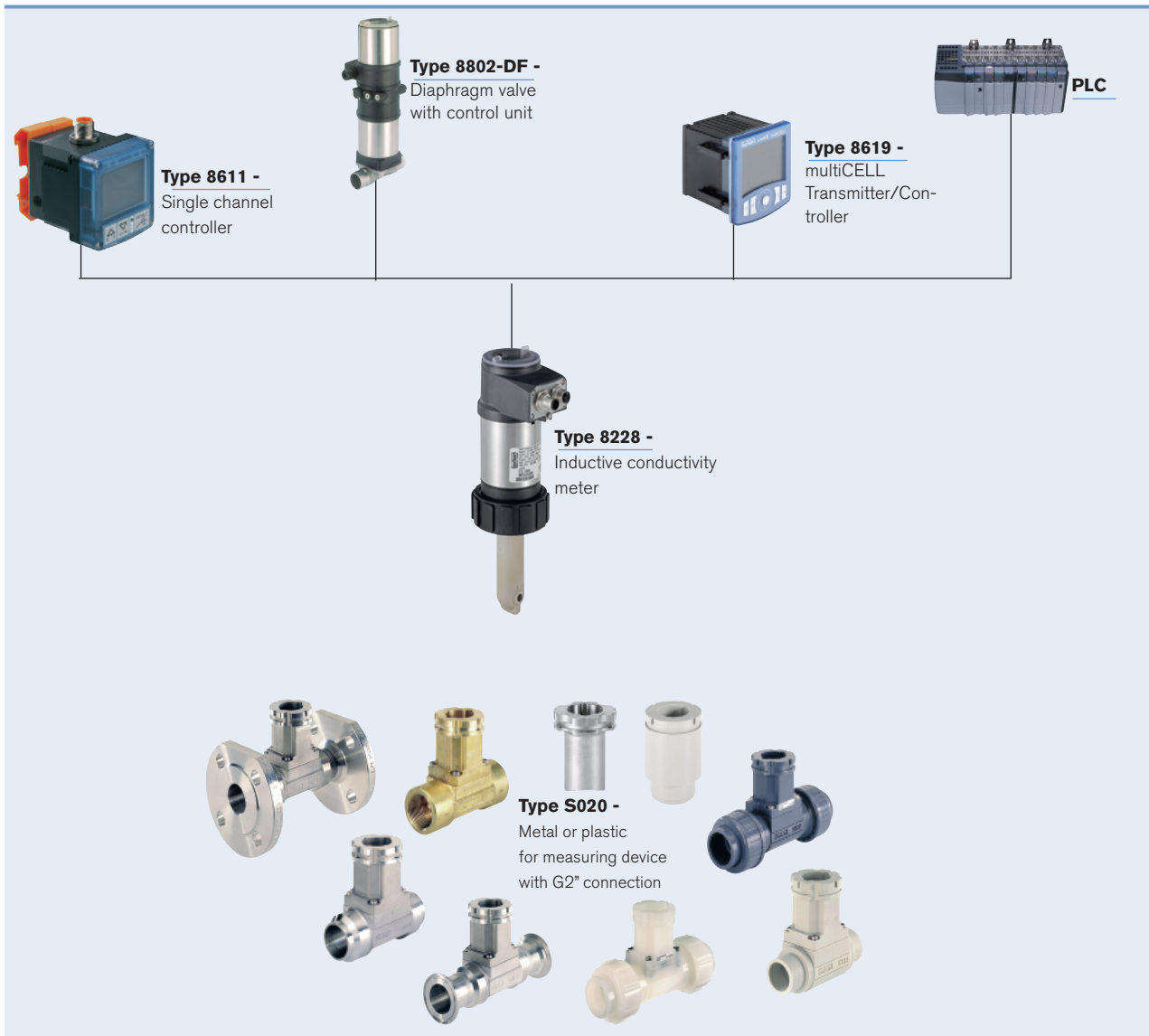
* **FKM seal in standard;** 1 set including a green FKM and a black EPDM seals for the sensor, is supplied with each conductivity meter

** **Transparent cover** in standard

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 (standard) | 561 843 |
| Ring | 619 205 |
| PC - nut | 619 204 |
| Calibration solution, 300 ml, 706 µS/cm | 440 018 |
| Calibration solution, 300 ml, 1413 µS/cm | 440 019 |
| Calibration solution, 500 ml, 12880 µS/cm | 565 741 |
| Calibration solution, 300 ml, 100 mS/cm | 440 020 |
|  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



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please consult for advice.

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