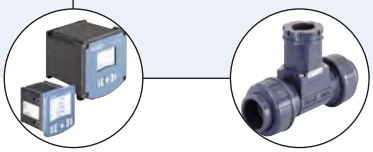
bürkert
FLUID CONTROL SYSTEMS

# Conductivity sensor

- Compact version for DN15…DN200
- Large capabilities of conductivity measurement through different cells
- Large range of process connections with various fittings

Type 8220 can be combined with…



**Type 8619**
multiCELL -
transmitter/controller

**Type S020**
Insertion fitting

The conductivity sensor is a compact probe with integrated conductivity electrodes. Four conductivity probes having different cell constants are available and offer a large measurement range. The Pt1000 for automatic temperature compensation is integrated in the sensor housing.

The sensor transmits directly a raw signal and is fitted with a standard EN 175301-803 plug connector.

The sensor has to be connected to the Bürkert transmitter/controller Type 8619 multiCELL via a 4 x 1.5 mm² shielded cable (maximal cable length of 10 m).

The conductivity sensor can be installed into a pipe by using Insertion fitting Type S020 which is available in different materials (details see data sheet Type S020). In its longer version it can also be installed in tanks or containers by using an industrial immersion fitting.

| | |
|---|---|
| **General data** | |
| **Compatibility** | With fittings S020 (see corresponding data sheet) |
| **Materials** | |
| Housing | PC |
| Screws | Stainless steel |
| Cable plug | PA |
| Wetted parts materials | |
| Fitting | Brass, Stainless steel 1.4404/316L, PVC, PP or PVDF |
| Sensor holder | PVDF |
| Pt1000 | Stainless steel 1.4571 (316Ti) |
| Seal | FKM (EPDM included in delivery) |
| **Electrode** | Stainless steel for cell constant C = 0.01 or 0.1<br>Graphite for cell constant C = 1.0 or 10 |
| **Electrical connection** | Cable plug acc. to EN 175301-803 |
| **Complete device data (fitting + sensor)** | |
| **Pipe diameter** | DN15…DN200 |
| **Conductivity measurement** | |
| Measuring range | 0.05 µS/cm…200 mS/cm (depending on cell constant) |
| Measurement deviation | typical: 3 % of measured value -<br>max.: 5 % of measured value |
| **Temperature measurement** | |
| Measuring range | -50…+150 °C *(-58...+302 °F)* |
| Resolution | 0.1 °C |
| Measurement deviation | ±1 °C |
| For temperature compensation | automatic (integrated Pt1000) - reference temperature 25 °C |
| **Fluid temperature** | With fitting in<br>PVC: 0…+50 °C *(+32...+122 °F)*<br>PP: 0…+80 °C *(+32...+176 °F)*<br>PVDF, stainless steel, brass: 0…+100 °C *(+32...+212 °F)* |
| **Fluid pressure max.** | PN10 (see pressure/temperature chart) |

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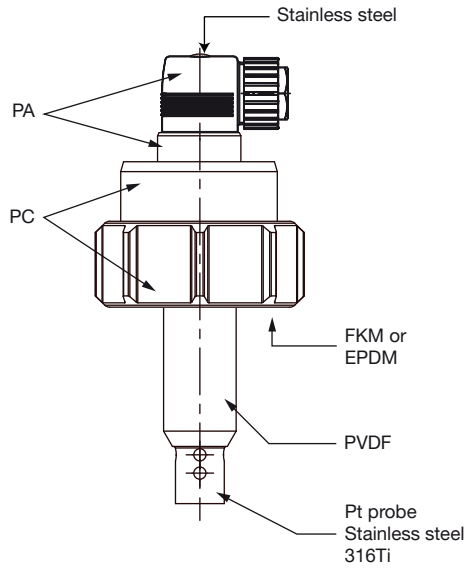
| Electrical data | |
|---|---|
| **Power supply** | none |
| **Connection cable** (between 8220 and 8619) | 4 × 0.2…1.5 mm² shielded, max. length 10 m |
| **Output** | Raw signal, to be connected to the multiCELL transmitter/controller Type 8619 |
| **Environment** | |
| **Ambient temperature**<br>Operation and storage | <br>0…+60 °C (+32...+140 °F) |
| **Relative humidity** | ≤ 80 %, without condensation |
| **Standards, directives and certifications** | |
| **Protection class acc. to EN 60529** | IP65 with cable plug mounted and tightened |
| **Standard and directives** CE<br><br><br>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)<br>Complying with article 4, §1 of 2014/68/EU directive* |

## Materials view




* * The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

- **Device used on a pipe** (PS = maximum admissible pressure; DN = nominal diameter of the pipe).

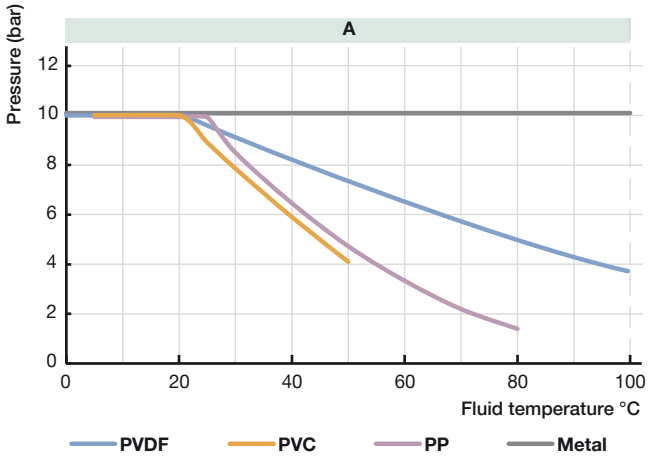
| Type of fluid | Conditions |
|---|---|
| **Fluid group 1, Article 4, Paragraph 1.c.i** | DN ≤ 25 |
| **Fluid group 2, Article 4, Paragraph 1.c.i** | DN ≤ 32 or PS*DN ≤ 1000 |
| **Fluid group 1, Article 4, Paragraph 1.c.ii** | DN ≤ 25 or PS*DN ≤ 2000 |
| **Fluid group 2, Article 4, Paragraph 1.c.ii** | DN ≤ 200 or PS ≤ 10 or PS*DN ≤ 5000 |

- **Device used on a vessel** (PS = maximum admissible pressure).

| Type of fluid | Conditions |
|---|---|
| **Fluid group 1, Article 4, Paragraph 1.a.i** | PS ≤ 200 bar |
| **Fluid group 2, Article 4, Paragraph 1.a.i** | PS ≤ 1000 bar |
| **Fluid group 1, Article 4, Paragraph 1.a.ii** | PS ≤ 500 bar |
| **Fluid group 2, Article 4, Paragraph 1.a.ii** | PS ≤ 1000 bar |

This table is independent of the chemical compatibility of the material and fluid.
Please make sure the device materials are compatible with the fluid.

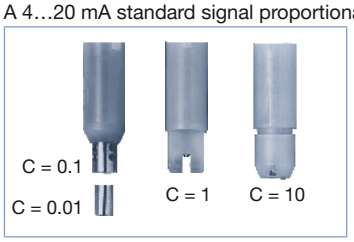
## Pressure/temperature chart




A: Application range for complete device (fitting + sensor)

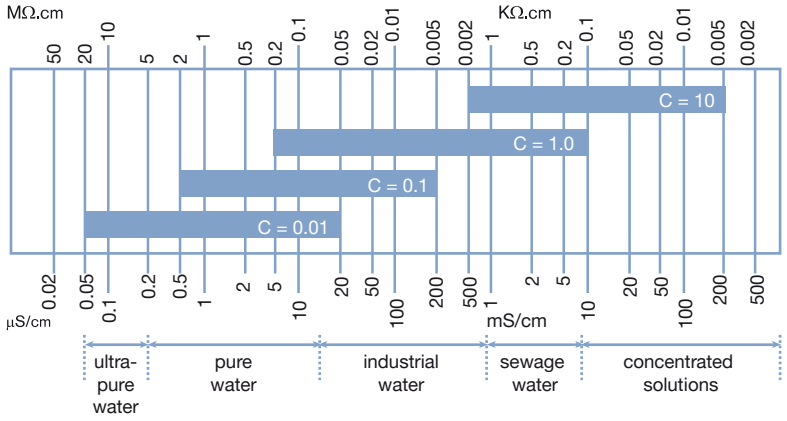
## Principle of operation - Electrodes measuring range

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 from multiCELL transmitter/controller Type 8619 is supplied to the electrodes. The measured current is a direct function of the conductivity of the solution.
A 4…20 mA standard signal proportional to the conductivity is available as output signal at the connected transmitter.



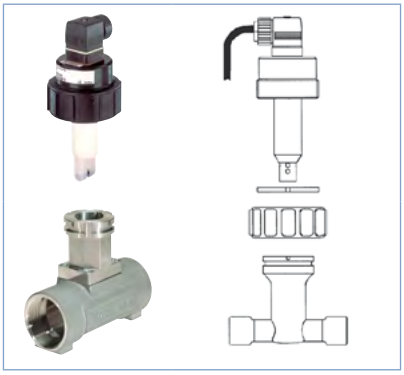

Different electrode designs are required based on selected cell constant.
The conductivity transmitter can be fitted with 4 different measuring cells with constants C = 0.01; 0.1; 1 and 10.

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




## Installation

The compact conductivity sensor 8220 can be installed into any Bürkert Insertion fitting (S020).



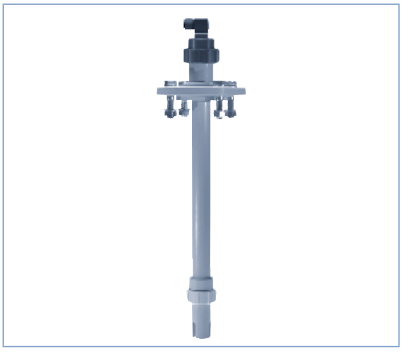
Select and install the required fitting onto the pipe, according to specific requirements of the sensor and fitting material (temperature and pressure). Then cautiously install the unit on the fitting and tighten with the nut.

**With a cell constant C = 10, the opening hole of the small channel must be located on the flow inlet side.**

The sensor can be installed in any position. In order to get a reliable measurement, air bubbles must be avoided and the mounting location must ensure that the electrode is continuously and completely immersed in the flow stream.

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

An industrial immersion kit allows installation of **the longer version of the sensor** having a cell constant C = 0.01; 0.1 or 1 into tanks or containers.
The following lengths are available: 500, 1500, 2000 mm. Special lengths on request.



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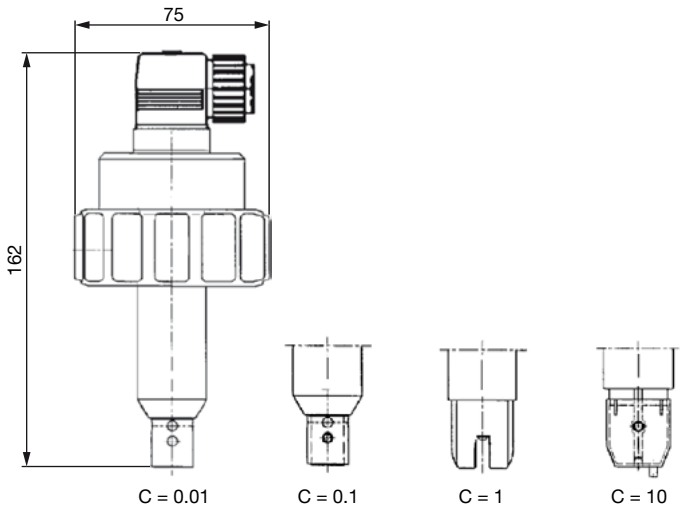
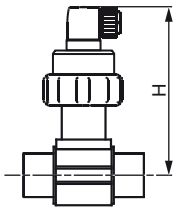
## Dimensions [mm]

**Compact version**

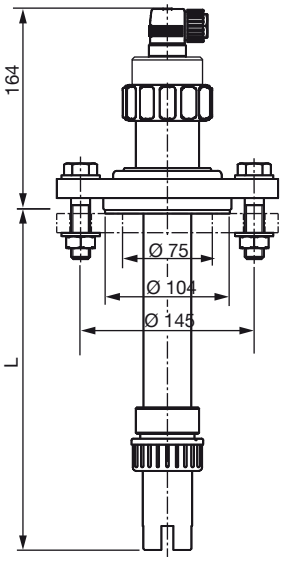


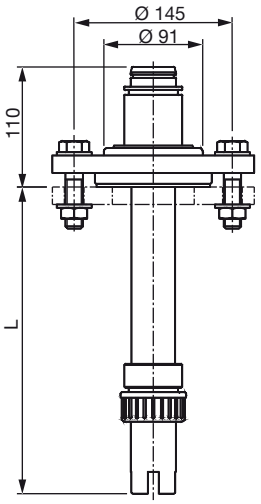

| DN [mm] | H [mm] T-Fitting | Plastic spigot* | Metal spigot |
|---|---|---|---|
| 15 | 156.0 | | |
| 20 | 153.5 | | |
| 25 | 153.5 | | |
| 32 | 157.0 | | |
| 40 | 161.0 | | |
| 50 | 167.0 | | 162.5 |
| 65 | 167.0 | 166.5 | 167.0 |
| 80 | | 174.0 | 173.0 |
| 100 | | 184.0 | 183.5 |
| 125 | | | 194.5 |
| 150 | | | 205.5 |
| 200 | | | 226.0 |

* using fusion spigot (Article no. 418652, 418660 or 418644 in PP, PVDF or PE) for orifice DN65…DN100

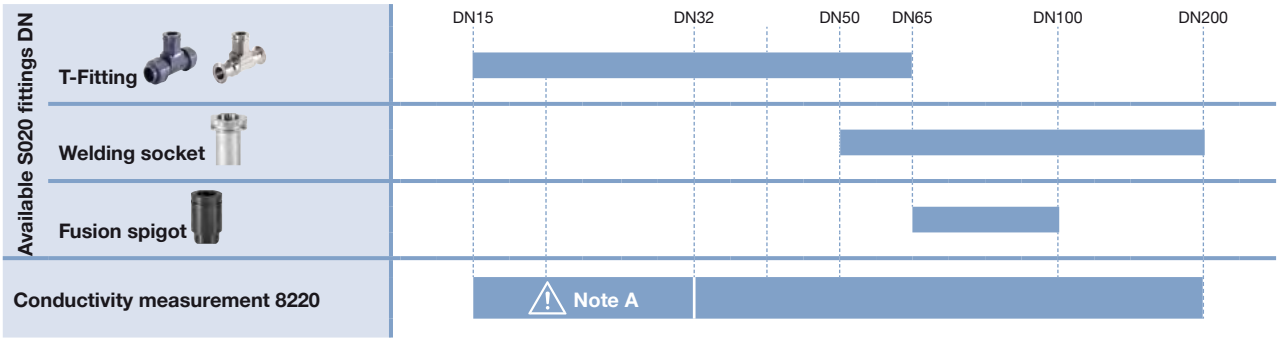
**Immersion kit for extended version of sensor**




| L |
|---|
| 500 |
| 1000 |
| 1500 |
| 2000 |




## Combining the conductivity sensor Type 8220 with fittings Type S020




Note A: Only use plastic fitting *in analytical version* with true union acc. to DIN 8063 (PVC), to DIN 16962 (PP) or to ISO 10931 (PVDF), see data sheet Type S020

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## Ordering information and chart for a complete conductivity measurement equipment

A complete conductivity measurement equipment consists of a conductivity sensor Type 8220, a multiCELL transmitter/controller Type 8619 and a Bürkert Insertion fitting Type S020.

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

- **Article no.** of the desired conductivity sensor **Type 8220** (see ordering chart, below)
- **Article no.** of the desired multiCELL transmitter/controller **Type 8619** (see separate data sheet) More info.
- **Article no.** of the selected Insertion fitting **Type S020** (DN15…DN200 - see separate data sheet) More info.

→ You have to order three components.

### Ordering chart for conductivity sensor Type 8220

| Specifications | Measuring range | Cell constant | Electrode materials | Electrical connection | Article no. |
|---|---|---|---|---|---|
| Sensor | 0.05 µS/cm…20 µS/cm | C = 0.01 | Stainless steel | Cable plug (acc. to EN 175301-803) | 426872 |
| | 0.5 µS/cm…200 µS/cm | C = 0.1 | Stainless steel | Cable plug (acc. to EN 175301-803) | 426873 |
| | 5 µS/cm…10 mS/cm | C = 1 | Graphite | Cable plug (acc. to EN 175301-803) | 426874 |
| | 0.5 mS/cm…200 mS/cm | C = 10 | Graphite | Cable plug (acc. to EN 175301-803) | 426875 |

## Ordering information for tank installation

### Tank installation with a conductivity sensor Type 8220 in an longer version.

A conductivity sensor Type 8220 for tank installation is made up of a conductivity probe, an immersion kit which is consisting of an immersion fitting, an extension cable kit for immersion fitting, a fixing kit (flange DN65 with stainless steel screws) and has to be connected to a multiCELL transmitter/controller Type 8619.

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

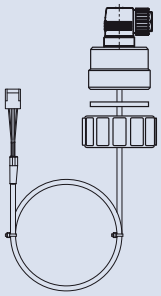
- **Article no.** of the desired conductivity probe** (see accessories ordering chart on p. 6)
- **Article no.** of the immersion fitting (see accessories ordering chart on p. 6)
- **Article no.** of the extension cable kit for the immersion fitting (see accessories ordering chart on p. 6)
- **Article no.** of the fixing kit (flange DN65 with stainless steel screws: see accessories ordering chart on p. 6)
- **Article no.** of the desired multiCELL transmitter/controller **Type 8619** (see separate data sheet) More info.

→ You have to order five components.

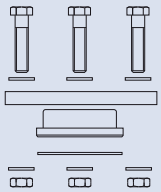
**multiCELL transmitter/controller Type 8619**

**Immersion fitting**

**Extension cable kit**



**Fixing kit**



**Conductivity probe****

** For the tank installation only probes with cell constant C = 0.01, 0.1 or 1 are available

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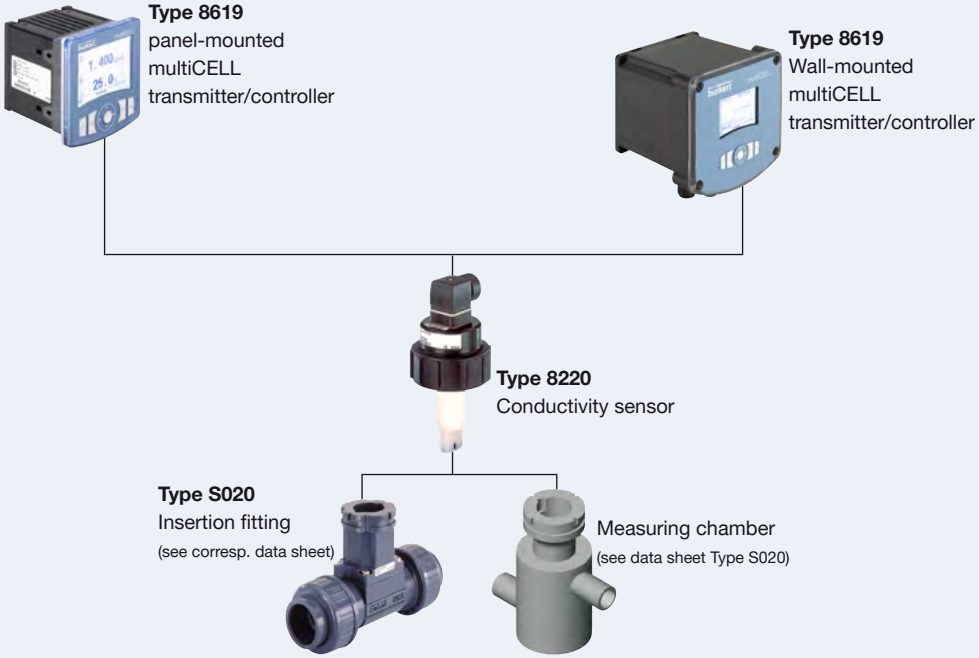
## Ordering chart for accessories for conductivity sensor Type 8220

| Description | Article no. |
|---|---|
| Set with 2 cable glands M20 × 1.5 + 2 neoprene flat seals for cable gland or plug + 2 screw-plugs M20 × 1.5 + 2 multiway seals 2 × 6 mm | 449755 |
| Cable plug EN 175301-803 with cable gland (Type 2508) | 438811 |
| Cable plug EN 175301-803 with NPT½" reduction without cable gland (Type 2509) - UR and UL certification | 162673 |
| Mounting ring (open) for S020 fitting | 619205 |
| PC - nut for S020 fitting | 619204 |
| Set with 1 green FKM + 1 black EPDM seal | 552111 |
| Conductivity probe C = 0.01 (with stainless steel electrode) for mounting with immersion kit | 633367 |
| Conductivity probe C = 0.1 (with stainless steel electrode) for mounting with immersion kit | 631647 |
| Conductivity probe C = 1 (with graphite electrode) for mounting with immersion kit | 418217 |
| Immersion fitting in PP, L = 0.5 m | 419567 |
| Immersion fitting in PP, L = 1.0 m | 419568 |
| Immersion fitting in PP, L = 1.5 m | 419569 |
| Immersion fitting in PP, L = 2.0 m | 419570 |
| Extension cable kit including a 0.7 m cable (for immersion fitting, L ≤ 0.5 m to use with 8619 multiCELL transmitter/controller) | 437615 |
| Extension cable kit including a 1.7 m cable (for immersion fitting, L ≤ 1.5 m to use with 8619 multiCELL transmitter/controller) | 437617 |
| Extension cable kit including a 2.2 m cable (for immersion fitting, L ≤ 2.0 m to use with with 8619 multiCELL transmitter/controller) | 437618 |
| Fixing kit (flange DN65 with stainless steel screws) | 413615 |
| Factory 2-point conductivity calibration certificate | 550675 |

## Interconnection possibilities with other Bürkert devices

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