

## Conductivity sensor for hygienic process applications



Type 8221 can be combined with...



**Type 8285**

Modular analysis  
Transmitter



**Type 8619**

multiCELL  
Transmitter/Controller

The 8221 Hygienic conductivity sensors are used to determine electrical conductivity in solutions.

Due to their hygienic design and the robust layout, these conductivity sensors are suitable for use under demanding conditions in food & beverage, pharmaceutical, biotechnology and the general chemical industry.

The sensors are based on the 4-electrode principle which excludes polarization phenomena normally observed with 2-electrode sensors.

The engineered design guarantees an excellent linearity over a wide conductivity range of more than 6 decades.

An integrated temperature sensor (Pt1000) is a standard feature of all versions.

- 4-electrode technology for extended measuring range 0.1  $\mu\text{S/cm}$ ...500 mS/cm
- Process connections, materials, surface finish designed for use in hygienic applications
- Suitable for steam sterilization, CIP (Clean in place)
- All wetted parts FDA approved

### Technical data - Electrode

<b>Measuring range</b>	
Insertion version	0.1 $\mu\text{S/cm}$ ... 500 mS/cm
Flush version	1 $\mu\text{S/cm}$ ... 500 mS/cm
<b>Linearity <sup>1)</sup> (relative)</b>	$\pm 0.5 - 5 \%$
<b>Cell constant <sup>2)</sup></b>	
Insertion version	0.147 $\text{cm}^{-1}$
Flush version	0.360 $\text{cm}^{-1}$
<b>Temperature range</b>	
Insertion version	-20°C to 135°C (-4°F to 275°F)
Flush version	-20°C to 150°C (-4°F to 302°F)
<b>Pressure range</b>	
Insertion version	Refer to pressure/temperature diagram, on next page. Max. 6 bar (87.06 PSI) at 135°C (275°F), higher pressure possible at lower temperature: max. 10 bar (145.1 PSI) at 25°C (77°F)
Flush version	Max. 10 bar (145.1 PSI) at 150°C (302°F), higher pressure possible at lower temperature: max. 20 bar (290.2 PSI) at 135°C (275°F) or at 25°C (77°F).
<b>Temperature sensor</b>	Pt1000
<b>Materials</b>	
Electrode	Stainless steel 1.4435/316L
Shaft	PEEK with FDA approval (CFR 177.2415), Stainless steel 1.4435
<b>Surface quality</b>	0.4 $\mu\text{m}$ , electro-polished
<b>Process connection</b>	
Insertion version	Clamp 1.5"
Flush version	Clamp 2" or Varivent® DN50/40
<b>Electrical connections</b>	
Insertion version	High temperature cable, length 5 m, instrument side with open wire.
Flush version	VarioPin (VP 6.0)
<b>Standard</b>	EHDG approved design: Varivent® DN50/40 Design according to EHDG: Clamp 1.5" and 2"

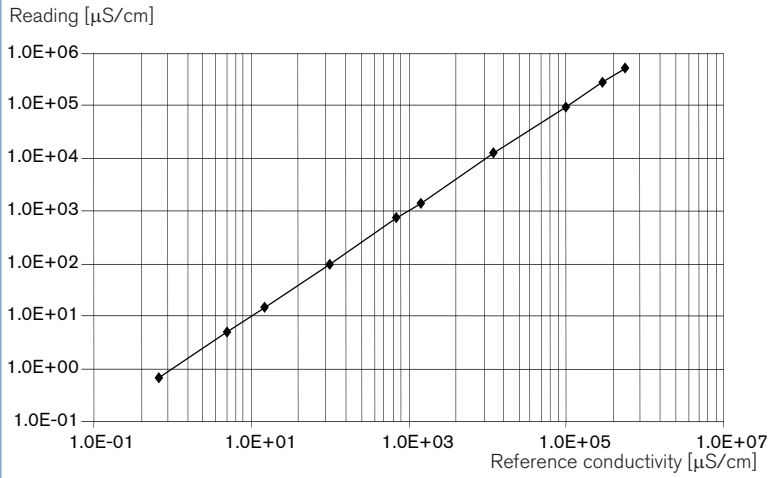
<sup>1)</sup> Deviations of  $\pm 5\%$  arise when using only ONE single cell constant for the full range.  $\pm 0.5\%$  accuracy can be achieved when calibration is performed in a conductivity range close to that of the used solution.

<sup>2)</sup> Individual cell constant measured with the Bürkert standard procedure. The cell constant can be influenced by the assembly situation.

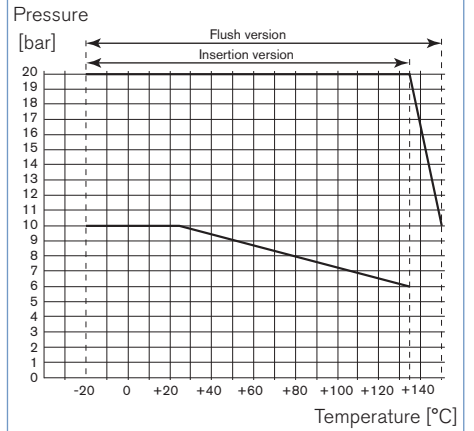
Varivent® is a registered Trademark of GEA Tuchenhausen.

Technical data (continued)

Unique linearity of the 8221 conductivity sensor

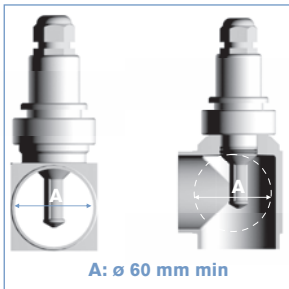


Pressure/temperature diagram

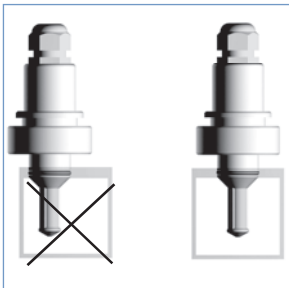


Installation

The process connection must be sufficiently clean. Install the conductivity sensor following the instructions mentioned below.



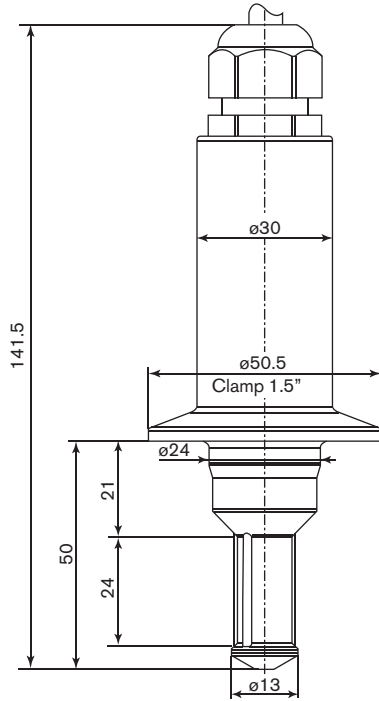
The cell constant and the linearity of the sensor can vary with the fitting situation. A symmetrical setup is recommended. Leave an open space of 60 mm minimum diameter. Partitions made of non-conductive material should preferably be used.



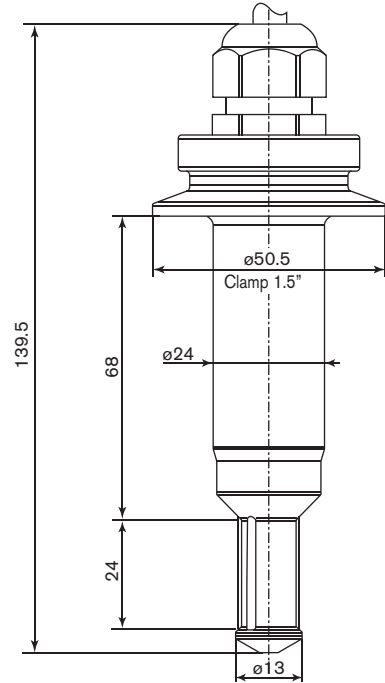
A symmetrical setup is recommended in order to ensure a high degree of linearity. To achieve high precision the cell constant should be calibrated in the final setup. Make sure that all the 4 electrodes are completely and continuously immersed in the measuring sample.

Dimensions [mm]

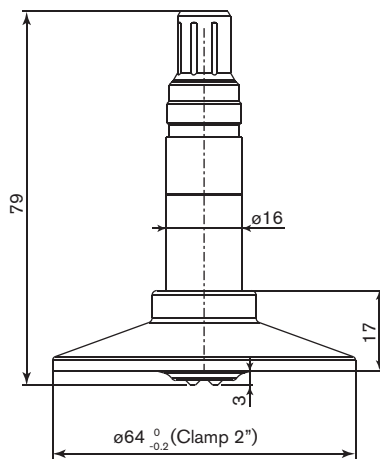
**Short Insertion 4-electrode sensor version  
with 1.5" Clamp connection  
Design according to EHEDG**



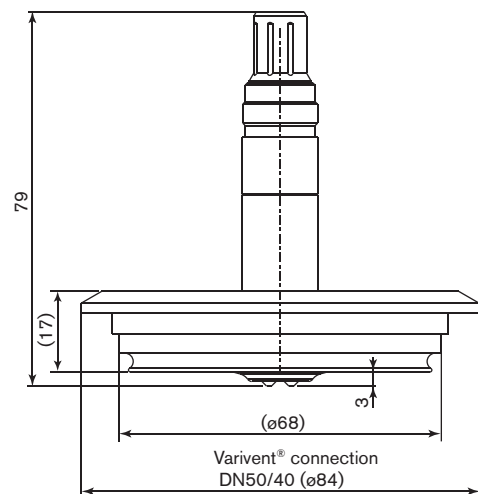
**Long Insertion 4-electrode sensor version  
with 1.5" Clamp connection  
Design according to EHEDG**



**Flush 4-electrode sensor version  
with 2" Clamp connection  
Design according to EHEDG**



**Flush 4-electrode sensor version  
with 2" (DN50/40) Varivent® connection  
EHEDG approved design**



## Ordering chart for conductivity sensor Type 8221

Specifications	Technology	Measuring range	Process connection	Electrical connection	Item no.
Conductivity sensor	Insertion 4-electrode, short	0.1 ... 500 000 $\mu\text{S}/\text{cm}$	1.5" Clamp	Cable 5 m open wires	557 719
	Insertion 4-electrode, long	0.1 ... 500 000 $\mu\text{S}/\text{cm}$	1.5" Clamp	Cable 5 m open wires	558 884
	Flush 4-electrode	1 ... 500 000 $\mu\text{S}/\text{cm}$	2" Clamp	VarioPin male connector	559 120
	Flush 4-electrode	1 ... 500 000 $\mu\text{S}/\text{cm}$	2" (DN50/40) Varivent®	VarioPin male connector	559 121

 Further versions on request

 Port connection  
Others...

## Ordering chart for accessories for conductivity sensor Type 8221

Description	Item no.
Buffer solution, 5 $\mu\text{S}/\text{cm}$ conductivity standard, $\pm 1\%$ accuracy, 300 ml	440 015
Buffer solution, 15 $\mu\text{S}/\text{cm}$ conductivity standard, $\pm 5\%$ accuracy, 300 ml	440 016
Buffer solution, 100 $\mu\text{S}/\text{cm}$ conductivity standard, $\pm 3\%$ accuracy, 300 ml	440 017
Buffer solution, 706 $\mu\text{S}/\text{cm}$ conductivity standard, $\pm 2\%$ accuracy, 300 ml	440 018
Buffer solution, 1413 $\mu\text{S}/\text{cm}$ conductivity standard, $\pm 1\%$ accuracy, 300 ml	440 019
Buffer solution, 100 $\text{mS}/\text{cm}$ conductivity standard, $\pm 1\%$ accuracy, 300 ml	440 020
Connection cable VarioPin (VP 6.0) female connector, 3 meters	554 855
Connection cable VarioPin (VP 6.0) female connector, 5 meters	554 856
Connection cable VarioPin (VP 6.0) female connector, 10 meters	554 857

To find your nearest Bürkert facility, click on the orange box →

[www.burkert.com](http://www.burkert.com)In case of special application conditions,  
please consult for advice.Subject to alteration.  
© Christian Bürkert GmbH & Co. KG

1109/3\_EU-en\_00895020