

# Conductivity Transmitter 7220X



## Technical Data

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<b>Inputs</b> 7220X: EEx ia IIC	1 input for conductivity sensor either 4- or 2-electrode sensors 1 input for Pt 100 / Pt 1000 / NTC 30 kΩ 2- or 3-wire connection																																				
Ranges <sup>1)</sup>	<table border="0"> <tr> <td>conductivity</td> <td>0.000 μS/cm to 2000 mS/cm</td> </tr> <tr> <td>concentration</td> <td>0.0 to 200.0 % by wt.</td> </tr> <tr> <td>resistivity (1/κ)</td> <td>0.5 Ω·cm to 100 MΩ·cm</td> </tr> <tr> <td>temperature</td> <td>-50.0 to +250.0 °C</td> </tr> <tr> <td>with NTC 30 kΩ</td> <td>-20.0 to +130.0 °C</td> </tr> </table>	conductivity	0.000 μS/cm to 2000 mS/cm	concentration	0.0 to 200.0 % by wt.	resistivity (1/κ)	0.5 Ω·cm to 100 MΩ·cm	temperature	-50.0 to +250.0 °C	with NTC 30 kΩ	-20.0 to +130.0 °C																										
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2-Channel Measurement Recorder*) (Option 448)	graphical representation of two measured values on the display user defined for conductivity, concentration, Ω·cm, °C, output 1, output 2, span and time feed user defined, recording selectable: snapshot, min, max, or average value, 500 measurements with time and date																																				
Languages*)	German, English, French, Italian, Spanish with option 477: Swedish instead of Spanish																																				
<b>Conductivity Input</b>	0.000 μS/cm to 2000 mS/cm operation with 2-electrode or 4-electrode sensors																																				
Measurement Error	< 1 % of measured value ± 4 counts																																				
Input Impedance	> 100 MΩ																																				
Permissible Cable Capacitance	< 2 nF (approx. 20 m meas. cable length)																																				
Permissible Voltage against Signal Ground	± 2 V, terminals 1, 2, 3, 4 against terminal 5 ground/shield, especially when using stray-field probes, an equipotential bonding electrode is required																																				
<b>Cell Standardization</b>	operating modes*) <ul style="list-style-type: none"> <li>• automatic, by cell constant determination with NaCl or KCl solution</li> <li>• entry of individual conductivity values for cell constant determination</li> <li>• direct entry of cell constant</li> <li>• sample calibration</li> </ul>																																				
Permissible Cell Constant	0.0091 to 200.0 cm <sup>-1</sup>																																				
<b>Concentration Determination</b> (Option 359, 360)	calculation and display of concentration [% by wt.] from the conductivity and temperature values of given substance solutions (see charts on page 4) customer-specific charts on request (option 360)																																				
<b>Temperature Input</b>	Pt 100 / Pt 1000 / NTC 30 kΩ, 2- or 3-wire connection																																				
Ranges	-50 to +250 °C with NTC 30 kΩ: -20 to +130 °C																																				

\*) user-defined

1) The effective measuring range depends on which measuring sensor is used.

Temperature Measurement Error	< 0.2 % of measured value ± 0.3 K ( ± 1 Count)
Temperature Compensation According to Medium*)	automatic with Pt 100 / Pt 1000 / NTC 30 kΩ, manual –50.0 to +250.0 °C operating modes: <ul style="list-style-type: none"> <li>• without</li> <li>• linear 0.00 to 20.00 %/K, reference temperature user defined</li> <li>• natural waters to DIN 38 404.8</li> <li>• optional: <ul style="list-style-type: none"> <li>– ultrapure water with traces of impurity NaOH, NaCl, HCl, NH<sub>3</sub> (option 392)</li> <li>– to customer specification (option 361)</li> </ul> </li> </ul>
<b>Output 1*)</b> (Current Loop)	4 to 20 mA (22 mA), floating, power supply required user defined for conductivity, concentration, °C current characteristic user defined: linear, bilinear, trilinear, function or optional: chart (option 449)
Beginning/End of Scale*)	anywhere within range
Spans*)	conductivity ≥0.20 µS/cm, min. 20 % full scale concentration 1.0 to 200.0 % by wt. temperature 10.0 to 300.0 °C
Output Current Error	< 0.3 % of measured value ± 20 µA
Current Source Mode	4.00 mA to 22.00 mA
Supply Voltage	7220X (EEx ib IIC): 16 to 30 V; I <sub>max</sub> = 100 mA, P <sub>max</sub> = 0.8 W
<b>Output 2 passive*)</b> (Option 487)	0(4) to 20 mA (22 mA), floating, power supply required user defined for conductivity, concentration, °C or as analog controller output
Beginning/End of Scale*)	anywhere within range
Spans*)	conductivity ≥0.20 µS/cm, min. 20 % full scale concentration 1.0 to 200.0 % by wt. temperature 10.0 to 300.0 °C
Output Current Error	< 0.3 % of measured value ± 20 µA
Current Source Mode	0.00 mA to 22.00 mA
Supply Voltage	7220X (EEx ib IIC): 1 to 30 V; I <sub>max</sub> = 100 mA; P <sub>max</sub> = 0,8 W
Defined as Switching Output	switching controller, limit value or alarm output
Ratings	7220X (EEx ib IIC): DC U <sub>max</sub> = 30 V; I <sub>max</sub> = 100 mA; P <sub>max</sub> = 0,8 W, voltage drop: < 1V
<b>HART® Communication</b> (Option 467)	digital communication via FSK <sup>2)</sup> modulation of loop current (output 1 only ), HART® protocol (version 6. 2), point-to-point connection or multidrop (bus)
<b>PI Controller</b> (Option 353)	quasi-continuous switching controller via output 2 (option 487) pulse duration or pulse frequency user defined  or  continuous controller via output 2 (option 487) user defined for conductivity and °C
<b>Clock</b>	real-time clock with date, self-contained, date format user defined
<b>Records</b>	for quality management documentation to DIN ISO 9000
Logbook (Option 354)	recording of function activations, appearance and disappearance of warning and failure messages, with date and time  storage capacity 200 entries available
Unit Self-Test	test of RAM, EPROM, EEPROM, display and keypad
Calibration record	all relevant data of the last calibration for documentation to GMP

\*) user-defined

2) Frequency Shift Keying

<b>Data Retention</b> in Case of Power Failure	parameters and calibration data logbook, statistics, cal record clock, reserve power no battery replacement required (according to NAMUR <sup>3)</sup> NE 32)	> 10 years (EEPROM) > 1 year (lithium battery) > 1 year (lithium battery)
<b>Explosion Protection</b> 7220X	EEx ib [ia] IIC T6, PTB No. Ex-96.D.2172	
<b>RFI Suppression</b>	to EN 50 081-1 and EN 50 081-2	
<b>Immunity to ESD</b>	to EN 50 082-1 and EN 50 082-2 and in accordance with NAMUR <sup>3)</sup> -NE 21 EMC recommendation for process and laboratory control equipment	
<b>Environmental Temperature</b>	operation <sup>4)</sup> transport and storage	-20 to +50 °C -20 to +70 °C
<b>Enclosure</b>	case with separate terminal compartment, suitable for outdoor mounting material: acrylonitrile butadiene styrene (ABS), front: polyester IP65 protection	
<b>Cable Glands</b>	5 Pg 13.5 threaded cable glands	
<b>Dimensions</b>	refer to dimension drawing	
<b>Weight</b>	approx. 1.5 kg	

3) German committee for measurement and control standards in the chemical industry.

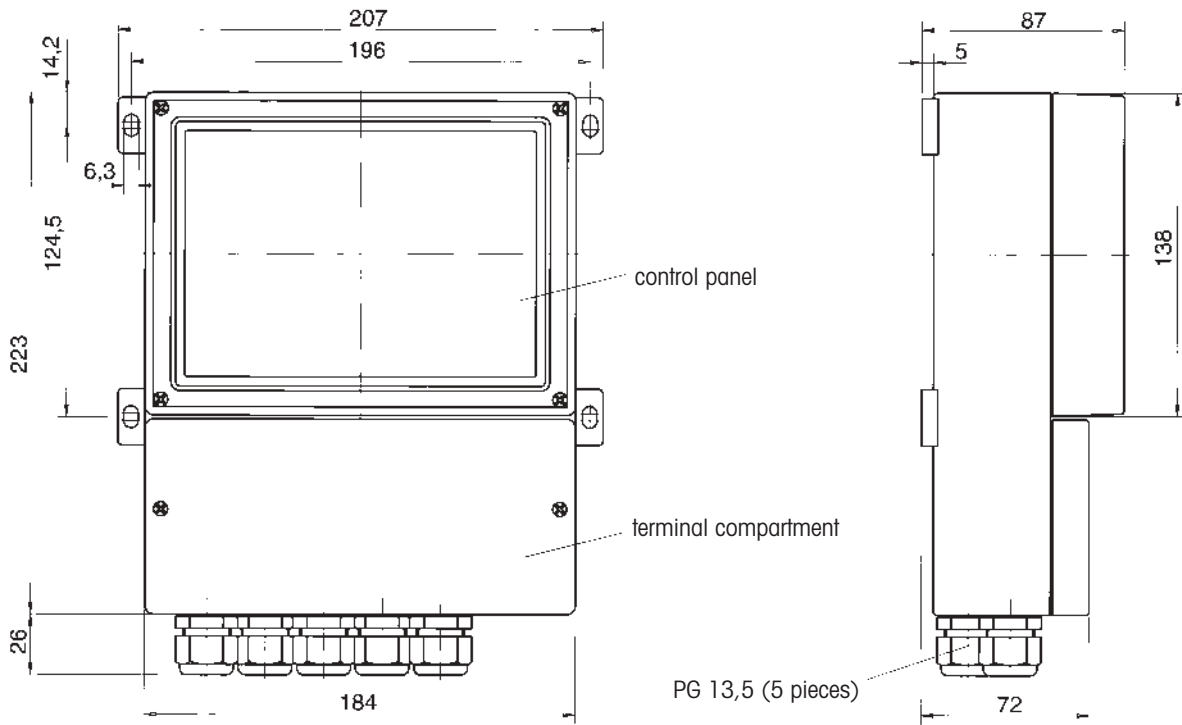
4) At ambient temperatures below 0 °C the readability of the display may be reduced, however the unit functions are not impaired.

## Concentration Chart

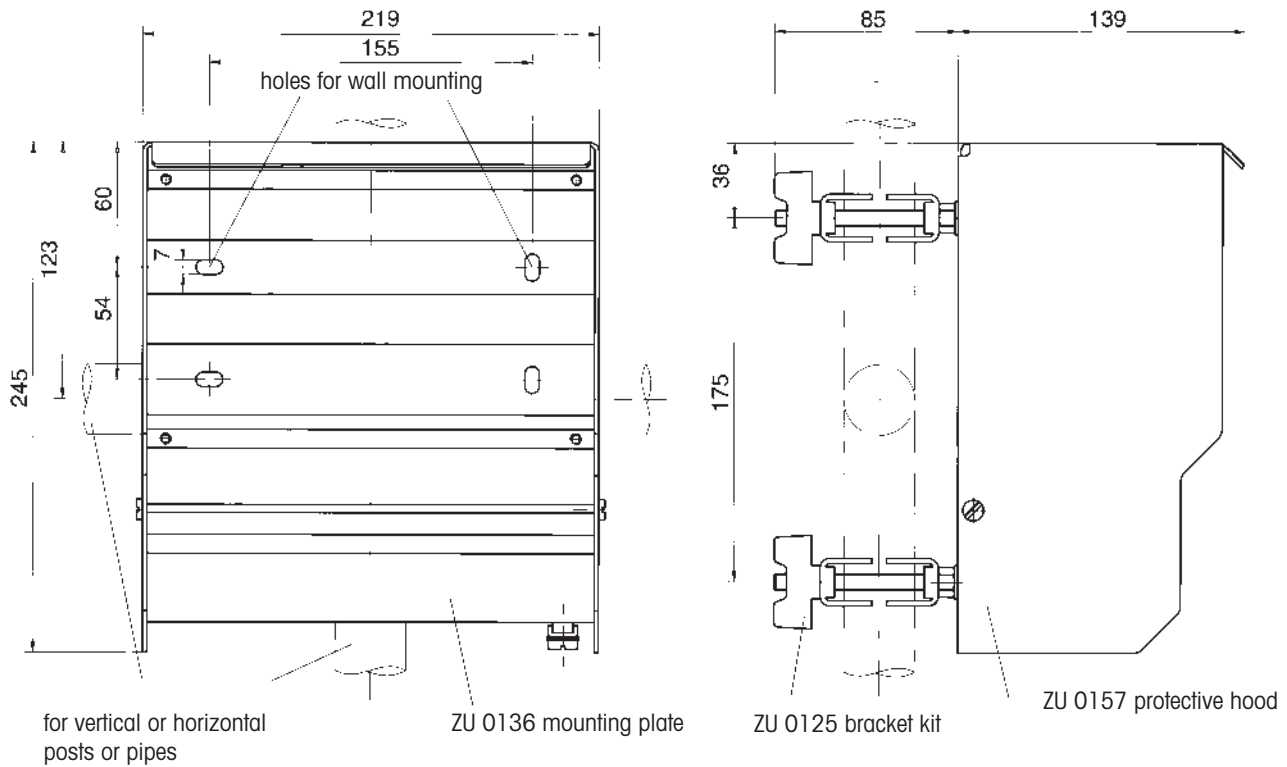
Substance	Concentration Ranges			
<b>HNO<sub>3</sub></b>	0.0 to 30.0	35.0 to 96.0		% by wt.
	-20.0 to 50.0	-20.0 to 50.0		°C
<b>HCl</b>	0.0 to 18.0	22.0 to 39.0		% by wt.
	-20.0 to 50.0	-20.0 to 50.0		°C
<b>H<sub>2</sub>SO<sub>4</sub></b> <sup>1)</sup>	0.0 to 30.0	32.0 to 84.0	92.0 to 99.0	% by wt.
	-17.8 to 110.0	-17.8 to 115.6	-17.8 to 115.6	°C
<b>NaOH</b> <sup>2)</sup>	0.0 to 14.0	18.0 to 50.0		% by wt.
	0.0 to 100.0	0.0 to 100.0		°C

1) The range limits are valid for 27 °C 2) The range limits are valid for 25 °C



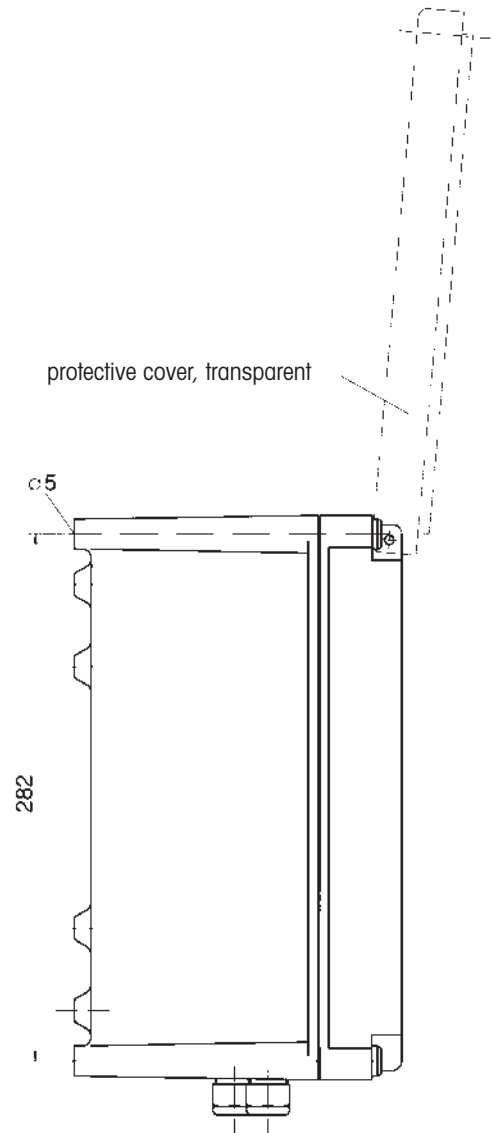
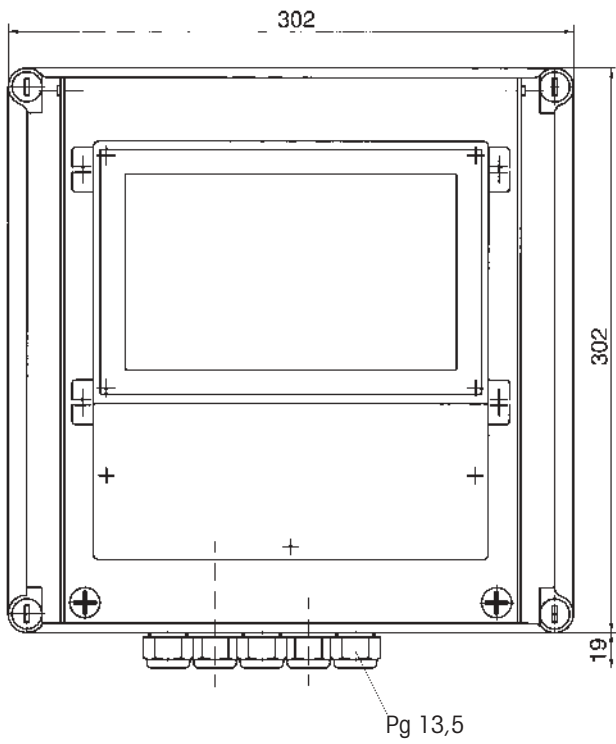
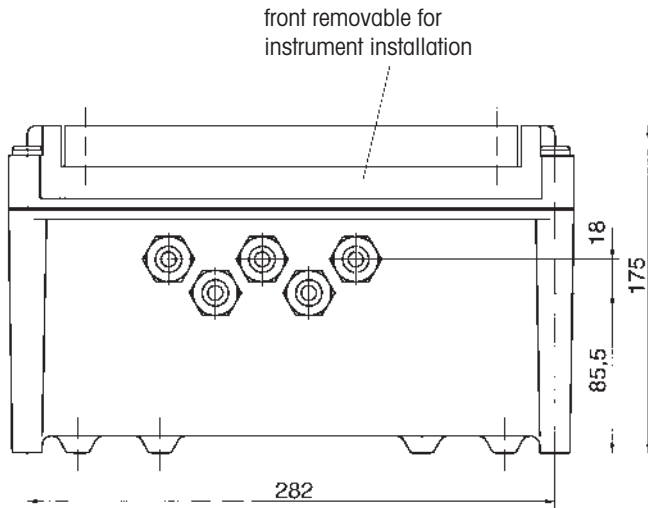


ZU 0157 protective hood, ZU 0136 mounting plate ZU 0125 bracket kit

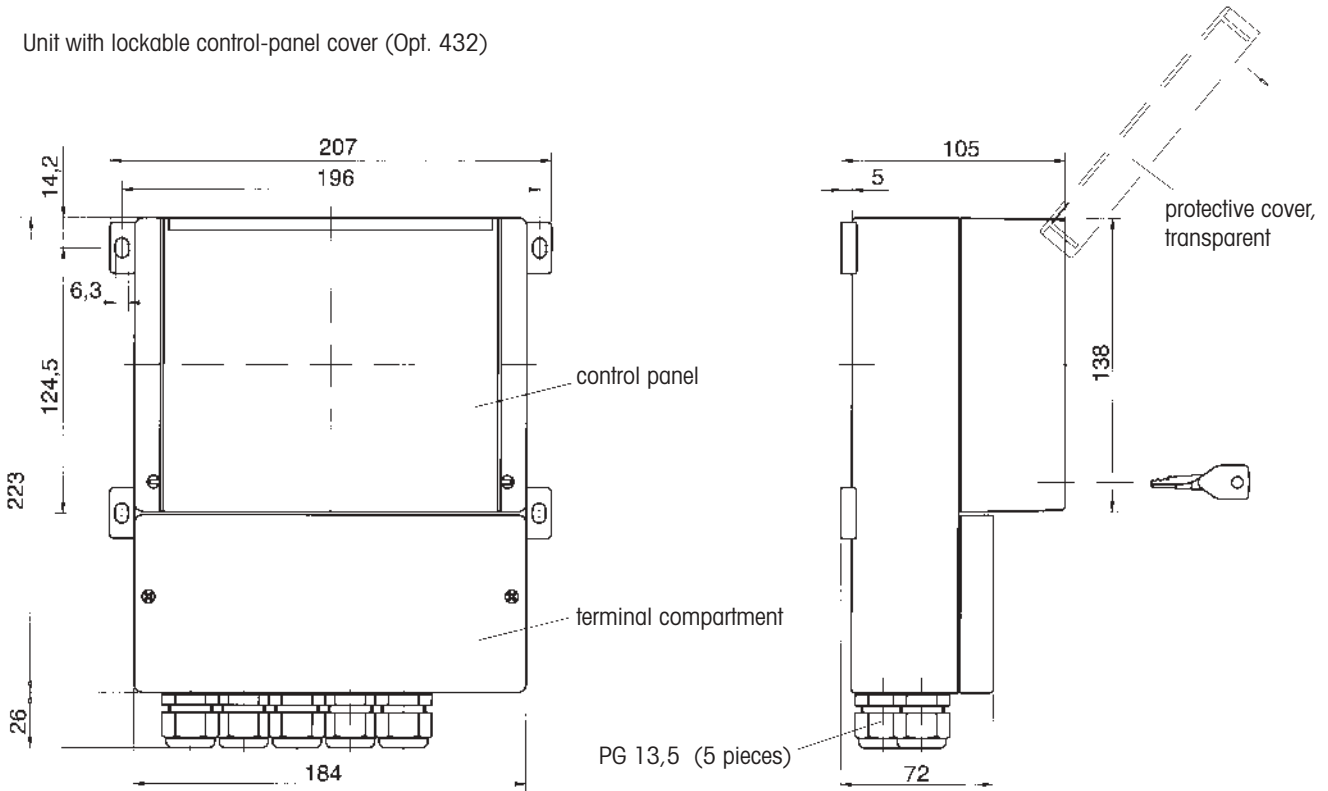


Note: all dimensions in millimeters

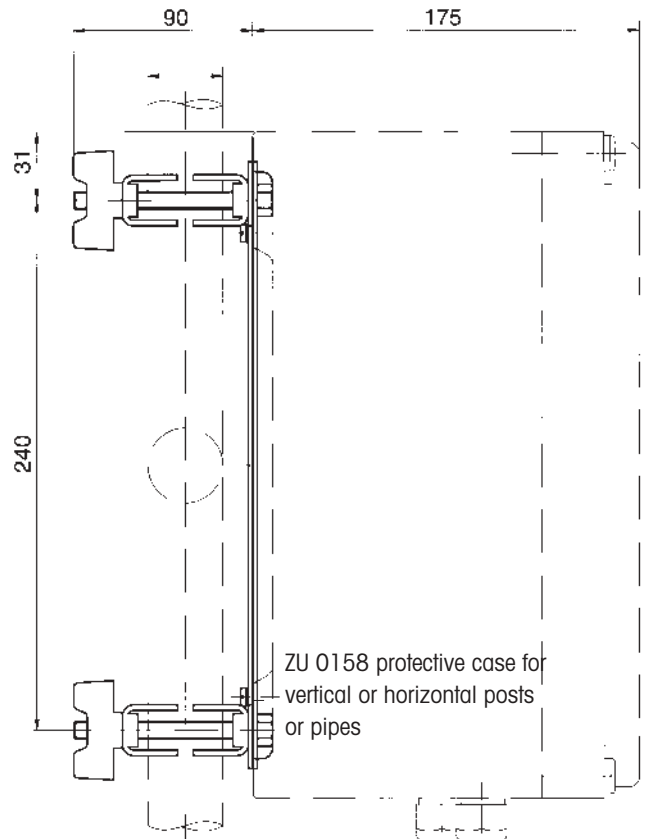
ZU 0158 protective case



Unit with lockable control-panel cover (Opt. 432)



ZU 0158 protective case with ZU 0220 bracket kit for protective case



Management System  
certified according to  
ISO 9001 / ISO 14001

**Sales and Services:**