

# Transmitter x100 e Series for pH, Dissolved Oxygen and Conductivity

Advanced transmitters for reliable measurements and for harsh conditions

## Technical Data

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### Short description

The cost-effective Transmitter X100 Series are suitable designed for highly reliable and accurate measurements in a wide range of industrial applications. The instruments are easy to operate and the large-size LCD provides substantial all essential information. The measurement values are displayed in large characters and additional pictographs explain the function operation and advise any signal or functional irregularities.

### Features

- New!** – Two 0/4...20 mA current outputs
- Two limit contacts
- Alarm & wash contact
- Continuous monitoring of sensor and transmitter performance
- Sensor diagnostics
- Easy operation with help of pictographs
- New!** – PID controller
- New!** – Communication with EasyClean, the METTLER TOLEDO cleaning and calibration system

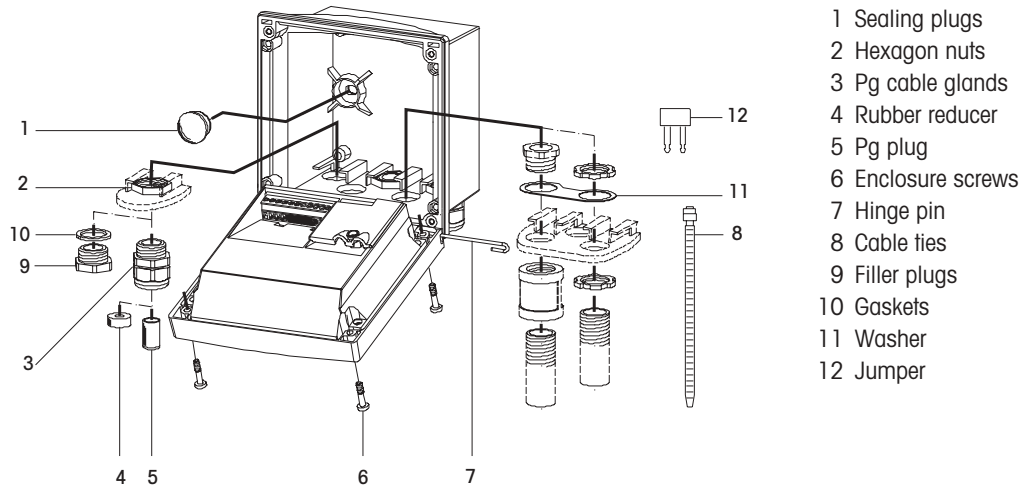
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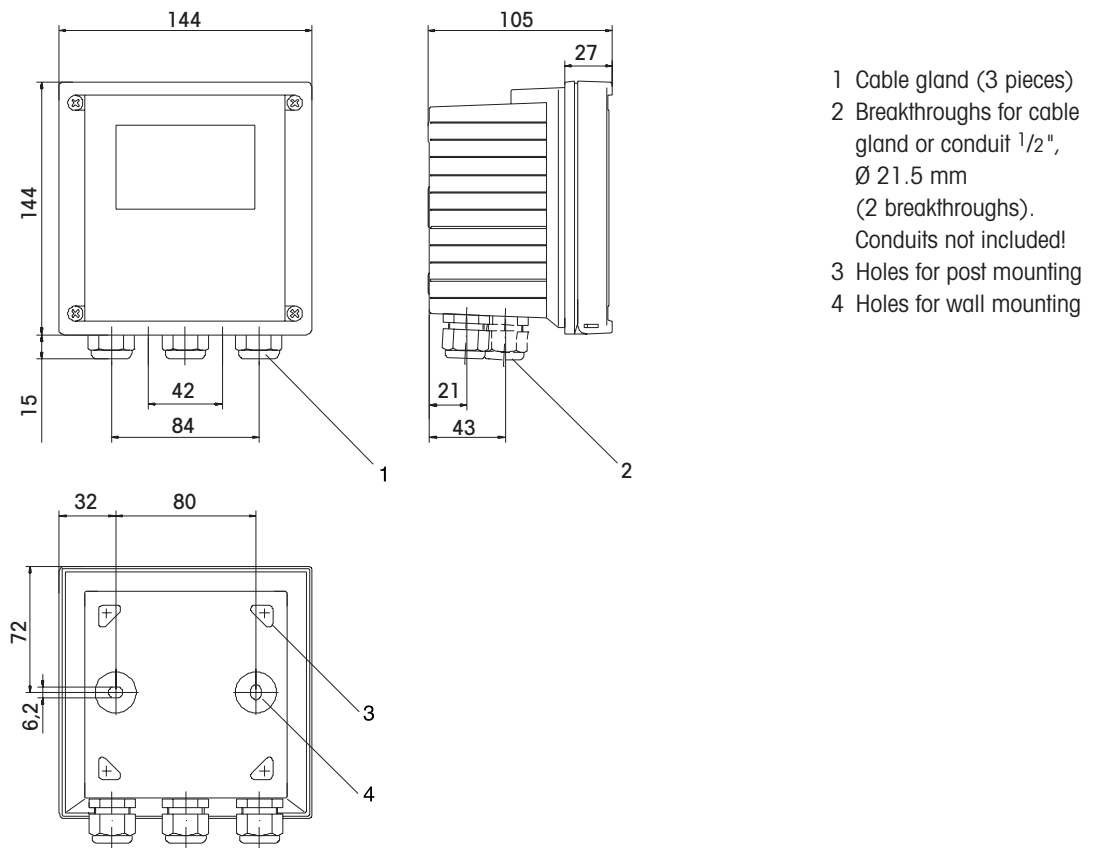
**METTLER TOLEDO**

# Drawings

## Assembly

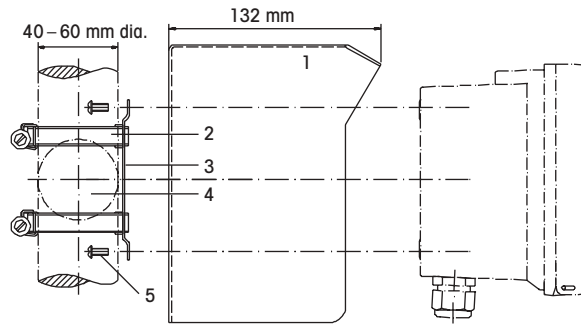


## Mounting



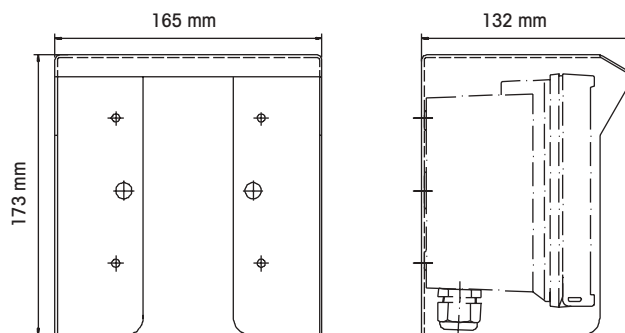
## Drawings

### Pipe mounting with ZU 0274 bracket kit

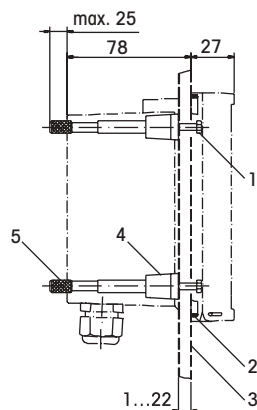


- 1 Protected hood (if required)
- 2 Hose clamps with worm gear drive to DIN 3017 (2 pieces)
- 3 Postmounting plate
- 4 For vertical or horizontal post/pipe mounting
- 5 Self-tapping screws

### Protective hood ZU 0276 for wall and pipe mounting



### Panel-mount kit ZU 0275



- 1 Screws
- 2 Seal
- 3 Control panel
- 4 Span pieces
- 5 Threaded sleeves

<b>pH/mV input</b>	Input for pH, ORP electrodes or ISFET Measurement range      -1500...+1500 mV Display range   pH value   -2.00...16.00 ORP         -1999...+1999 mV Glass electrode input <sup>1)</sup> Input resistance        > 0.5 x 10 <sup>12</sup> Ω Input current            < 2 x 10 <sup>-12</sup> A Reference electrode input <sup>1)</sup> Input resistance        > 1 x 10 <sup>10</sup> Ω Input current            < 1 x 10 <sup>-10</sup> A Meas. error <sup>1,2,3)</sup> pH value                 < 0.02 mV value                < 1 mV
<b>Electrode standardization pH*</b>	
Operating modes	-BUF Calibration with automatic buffer recognition Calimatic: Buffer sets   -01-       Mettler-Toledo 2.00/4.01/7.00/9.21 -02-       Merck/Riedel de Haen 2.00/4.00/7.00/9.00/12.00 -03-       Ciba (94) 2.06/4.00/7.00/10.00 -04-       NIST technical 1.68/4.00/7.00/10.01/12.46 -05-       NIST standard 1.679/4.006/6.865/9.180 -06-       HACH 4.00/7.00/10.18 -07-       WTW technical buffers 2.00/4.01/7.00/10.00 -Sample calibration -MAN         Calibration with manual entry of individual buffer values -DAT         Data entry of premeasured electrodes
Zero point adjustment	±200 mV
Max. calibration range	Asymmetry potential: ±60 mV Slope: 80...103 % (47.5...61 mV/pH)
<b>Sensor standardization</b>	
<b>ORP*</b>	ORP calibration
Max. calibration range	-700...+700 Δ mV
<b>Cal timer</b>	0000...9999 h
<b>Sensocheck</b>	automatic monitoring of glass and reference electrode (can be disabled)
<b>Sensoface</b>	provides information on the electrode condition. Evaluation of zero/slope, response, calibration interval, Sensocheck

<b>Temperature input*</b>	Pt 100/Pt 1000/NTC 30 kΩ/NTC 8.55 kΩ 2-wire connection, adjustable offset correction
Measurement range	Pt 100/Pt 1000:                    −20.0...+200.0 °C (−4...+392 °F)
	NTC 30 kΩ                               −20.0...+150.0 °C (−4...+302 °F)
	NTC 8.55 kΩ                           −10.0...+130.0 °C (+14...+266 °F)
Adjustment range	10 K
Resolution	0.1 °C/1 °F
Meas. error <sup>1,2,3)</sup>	< 0.5 K (< 1 K for Pt100; <1K for NTC >100 °C)
<b>Temp. compensation of process medium</b>	Linear −19.99...+19.99%/K (reference temp. 25 °C)
<b>Power output</b>	for operating an ISFET adapter +3 V/0.5 mA −3 V/0.5 mA

\* User-defined  
<sup>1)</sup> To IEC 746 Part 1, at nominal operating conditions  
<sup>2)</sup> ± 1 count  
<sup>3)</sup> Plus sensor error

**Dissolved oxygen input**

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Sensor type A:	InPro 6000...6800
Sensor type B:	InPro 6900
Measuring current	0...1800 nA
Resolution	0.05 nA (with V <sub>pol</sub> ≤ 800 mV and V <sub>ref</sub> ≤ 200 mV)
Saturation (-10...80 °C)	0...500 %
Meas. error <sup>1,2,3)</sup>	0.5 % of meas. val. +0.5 %
Concentration (-10...80 °C)	0.00...50.00 mg/l 0.00...50.00 ppm
Meas. error <sup>1,2,3)</sup>	0.5 % of meas. val. + 0.05 mg/l or 0.05 ppm
Adm. guard current	≤ 20 µA
Polarization voltage *	0...1000 mV
Process pressure*	0.000...9.999 bar (...999.9 kPa/...145.0 psi)
Salt correction *	00.00...45.00 g/kg

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**Sensor standardization**

Operating modes *	DO saturation (automatic) DO concentration (automatic) Product calibration Zero point calibration	
Calibration range Sensor type A	Zero point Slope	± 2 nA 25...130 nA (at 25 °C, 1013 mbars)
Calibration range Sensor type B	Zero point Slope	± 2 nA 200...550 nA (at 25 °C, 1013 mbars)
Calibration timer*	0000...9999 h	
Pressure correction *	0.000...9.999 bars/999.9 kPa/145.0 psi	

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**Sensocheck** Monitoring for short circuits/open circuits (can be disabled)

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**Sensoface** Provides information on the sensor condition  
Evaluation of zero/slope, response, calibration interval, Sensocheck

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**Temperature input** NTC 22 kΩ/NTC 30 kΩ\*  
2-wire connection, adjustable offset correction

Measurement range	-20.0...+150.0 °C/-4...+ 302 °F
Adjustment range	10 K
Resolution	0.1 °C/1 °F
Meas. error <sup>1,2,3)</sup>	< 0.5 K (< 1 K at >100 °C)

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\* User-defined  
<sup>1)</sup> To IEC 746 Part 1, at nominal operating conditions  
<sup>2)</sup> ± 1 count  
<sup>3)</sup> Plus sensor error

**Dissolved oxygen input**

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Sensor type A:	InPro6000...6800
Sensor type B:	InPro6900
Measuring current	0...600 nA
Resolution	0.01 nA (with V <sub>pol</sub> ≤ 500 mV and V <sub>ref</sub> ≤ 200 mV)
Saturation (-10...80 °C)	0.0...120.0 %
Meas. error <sup>1,2,3)</sup>	0.5 % of meas. val. +0.1 %
Concentration (-10...80 °C)	0000...9999 µg/l 0000...9999 ppb 0.0000...9.999 mg/l 0.0000...9.999 ppm
Meas. error <sup>1,2,3)</sup>	0.5 % of meas. val. +0.005 mg/l or 0.005 ppm
Adm. guard current	≤ 20 µA
Polarization voltage*	0...1000 mV
Process pressure*	0.000...9.999 bars (to 999.9 kPa/...145.0 psi)
Salt correction*	00.00...45.00 g/kg

---

**Sensor standardization**

Operating modes *	DO saturation (automatic) DO concentration (automatic) Product calibration Zero point calibration	
Calibration range Sensor type A	Zero point Slope	± 2 nA 25...130 nA (at 25 °C, 1013 mbars)
Calibration range Sensor type B	Zero point Slope	± 2 nA 200...550 nA (at 25 °C, 1013 mbars)
Calibration timer *	0000...9999 h	
Pressure correction *	0.000...9.999 bars/999.9 kPa/145.0 psi	

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**Sensocheck** Monitoring for short circuits/open circuits (can be disabled)

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**Sensoface** Provides information on the sensor condition  
Evaluation of zero/slope, response, calibration interval, Sensocheck

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**Temperature input** NTC 22 kΩ/NTC 30 kΩ\*  
2-wire connection, adjustable offset correction

Measurement range	-20.0...+150.0 °C/-4...+302 °F
Adjustment range	10 K
Resolution	0.1 °C/1 °F
Meas. error <sup>1,2,3)</sup>	< 0.5 K (< 1 K at >100 °C)

---

\* User-defined  
<sup>1)</sup> To IEC 746 Part 1, at nominal operating conditions  
<sup>2)</sup> ± 1 count  
<sup>3)</sup> Plus sensor error

<b>Conductivity input</b>	Input for 2- or 4-electrode conductivity sensors		
Working range	4-electrode sensor:	0.2 $\mu\text{S} \cdot \text{c}$ ... 1000 $\text{mS} \cdot \text{c}$	(c = cell constant)
	2-electrode sensor:	0.2 $\mu\text{S} \cdot \text{c}$ ... 200 $\text{mS} \cdot \text{c}$	
	(the actual range is very much depending on the sensor used, display limited to 3500 $\text{mS}$ )		
Effective ranges	Conductivity	0.000...9.999 $\mu\text{S}/\text{cm}$	
		00.00...99.99 $\mu\text{S}/\text{cm}$	
	000.0...999.9 $\mu\text{S}/\text{cm}$		
	0000...9999 $\mu\text{S}/\text{cm}$		
	0.000...9.999 $\text{mS}/\text{cm}$		
	00.00...99.99 $\text{mS}/\text{cm}$		
	000.0...999.9 $\text{mS}/\text{cm}$		
	0.000...9.999 $\text{S}/\text{m}$		
	00.00...99.99 $\text{S}/\text{m}$		
		Resistivity	00.00...99.99 $\text{M}\Omega\text{cm}$
	Concentration	0.00...9.99 % by wt.	
	Salinity	0.0...45.0 ‰ (0...35 °C)	
Measurement error <sup>1,2,3)</sup>	< 1% of measured value +0.4 $\mu\text{S} \cdot \text{c}$		
Response time (T <sub>90</sub> )	< 1 s (Sensocheck OFF), < 3 s (Sensocheck ON)		
<b>Conc. measurements</b>	-01-	NaCl	0.00...9.99 % by wt. (0 ...60°C)
	-02-	HCl	0.00...9.99 % by wt. (-20...50 °C)
	-03-	NaOH	0.00...9.99 % by wt. (0...100 °C)
	-04-	H <sub>2</sub> SO <sub>4</sub>	0.00...9.99 % by wt. (-17...110 °C)
	-05-	HNO <sub>3</sub>	0.00...9.99 % by wt. (-17...50 °C)
<b>Sensor standardization</b>	Input of cell constant with simultaneous display of conductivity value and temperature		
	Input of conductivity value with simultaneous display of cell constant and temperature		
	Sample calibration		
	Temperature probe adjustment		
Permissible cell constant	00.0050...19.9999 $\text{cm}^{-1}$		
<b>Sensocheck</b>	Monitoring of sensor polarization and cable capacitance		
<b>Sensoface</b>	Provides information on the sensor condition (Sensocheck)		
<b>Sensor monitor</b>	Display of direct measurement values for validation purpose (resistance/temperature)		
<b>USP-Function</b>	Monitoring of conductivity of water for pharmaceutical applications to USP (USP <645>) with adjustable limit values (10...100 % of USP value)		

<b>Temperature input<sup>2)</sup></b>	Pt100/Pt1000/NTC 30 kΩ / NTC 8.55 kΩ 2-wire connection, adjustable offset correction	
<b>Measuring range</b>	Pt100/Pt1000	-20...+200 °C / -4...+392 °F
	NTC 30 kΩ	-20...+150 °C / -4...+302 °F
	NTC 8.55 kΩ	-10...+130 °C / 14...+266 °F
<b>Resolution</b>	0.1 °C / 1 °F	
<b>Error<sup>1,2,3)</sup></b>	0.5 K (< 1 K with Pt100; < 1 K with NTC > 100 °C)	
<b>Temperature compensation<sup>3)</sup> (OFF)</b> (ref. temp. 25 °C)	not compensated	
	<b>(Lin)</b> linear, 0.00...19.99 %/K,	-20...130 °C
	<b>(NLF)</b> natural waters to EN 27888,	0...36 °C
	<b>(nACL)</b> ultrapure water with NaCl traces,	0...120 °C
	<b>(HCL)</b> ultrapure water with HCl traces,	0...120 °C
	<b>(nH3)</b> ultrapure water with NH <sub>3</sub> traces,	0...120 °C

\* User-defined

1) To IEC 746 Part 1, at nominal operating conditions

2) ± 1 count

3) Plus sensor error

<b>Conductivity input</b>	Input for inductive sensors	
Working range	Conductivity	0.000...1999 mS/cm
	Concentration	0.00...100 % by wt.
	Salinity	0.0...45.0 ‰ (0...35 °C)
Effective ranges	Conductivity	0.000...9.999 mS/cm
		00.00...99.99 mS/cm
		000.0...999.9 mS/cm
		0000...1999 mS/cm
		0.000...9.999 S/m
		00.00...99.99 S/m
	Concentration	0.00...99.99 %
	Salinity	0.0...45.0 ‰ (0...35 °C)
Measurement error <sup>1,2,3)</sup>	< 1% of measured value +0.005 mS	
Response time (T <sub>90</sub> )	approx. 2 s	
<b>Conc. measurements</b>	-01-	NaCl 0...26 % (0...60 °C)
	-02-	HCl 0...18 % (-20...50 °C)
	-03-	NaOH 0...14 % (0...100 °C)
	-04-	H <sub>2</sub> SO <sub>4</sub> 0...30 % (-17...110 °C)
	-05-	HNO <sub>3</sub> 0...30 % (-20...50 °C)
	-06-	H <sub>2</sub> SO <sub>4</sub> 92...99 % (-17...115 °C)
	-07-	HCl 22...39 % (-20...50 °C)
	-08-	HNO <sub>3</sub> 35...96 % (-20...50 °C)
	-09-	H <sub>2</sub> SO <sub>4</sub> 32...84 % (-17...115 °C)
	-10-	NaOH 18...50 % (0...100 °C)
<b>Sensor standardization</b>	Input of cell factor with simultaneous display of conductivity value and temperature	
	Input of conductivity value with simultaneous display of cell factor and temperature	
	Sample calibration	
	Zero point calibration	
	Temperature probe adjustment	
Permissible cell factor	00.100...19.999	
Permissible transfer ratio	01.00...199.99	
Permissible zero point deviation	± 0.5 mS/cm	
<b>Sensocheck</b>	Monitoring of sender coil and leads for short circuiting, and of the receiver coil for disruption	
<b>Sensoface</b>	Indicates sensor status (zero point, sensocheck)	
<b>Sensor monitor</b>	Display of direct measurement values for validation purpose (resistance /temperature)	

<b>Temperature input<sup>*)</sup></b>	Pt100/Pt1000/NTC 100 kΩ 2-wire connection, adjustable offset correction
Measuring range	Pt100/Pt1000    -20...+200 °C / -4... +392 °F NTC                -20...+130 °C / -4... +266 °F
Resolution	0.1 °C / 1 °F
Error <sup>1,2,3)</sup>	0.5 K (< 1 K with Pt100; < 1 K with NTC > 100 °C)
<b>Temperature compensation<sup>*)</sup> (OFF)</b> (ref. temp. 25 °C)	not compensated <b>(LIN)</b> linear, 0.00...19.99 %/K <b>(NLF)</b> natural waters to EN 27888, 0...35 °C

\* User-defined  
 1) To IEC 746 Part 1, at nominal operating conditions  
 2) ± 1 count  
 3) Plus sensor error

Transmitter pH 2100 e

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
24 to 230 V ac/dc	wash	alar m	rel.2	rel.1	+	out 2	out 1	+	+	contr.	hold	+	3 V -	3 V +	aux. el.	ref. el.	meas. el.		

power | cont. acts | output | input

MAX. REL. AY. CONT. ACT. RATING: AC < 253 V / < 3 A / < 750 VA  
 DC < 30 V / < 3 A / < 90 W, RESISTIV E

NI, C, LI, DIV2, G, PA, B, C, D, T4  
 NI, C, LI, ZN2, GP, IIC, T4

CL I DIV2 G, PA, B, C, D, T4  
 Ex nA IIC T4 CSA xxxxxxxxx

ENCLOSURE TYPE 2 Tamb -20 to +55 °C Control Dwg. 194.030-240

WARNING -EXPLOSION HAZARD- DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.  
 WARNING -BONDING BETWEEN CONDUIT IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION. SEE INSTALLATION INSTRUCTIONS.  
 AVERTISSEMENT -RISQUE D'EXPLOSION- AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QU'E L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.

Made in Germany  
 00000/0000000 F-2402PH-MT

pH 2100 e

24 to 230 V AC/DC, 45 to 65 Hz  
 5 VA, 2,5 W  
 No. 00000 / 000000 0 / 0302

Tamb  
 -20 to +55 °C

FM APPROVED SF

Transmitter O<sub>2</sub> 4100 e

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
24 to 230 V ac/dc	wash	alar m	rel.2	rel.1	+	out 2	out 1	+	+	contr.	hold	+	anode	ref. el.	guard	cathode	do not connect		

power | cont. acts | output | input

MAX. REL. AY. CONT. ACT. RATING: AC < 253 V / < 3 A / < 750 VA  
 DC < 30 V / < 3 A / < 90 W, RESISTIV E

NI, C, LI, DIV2, G, PA, B, C, D, T4  
 NI, C, LI, ZN2, GP, IIC, T4

CL I DIV2 G, PA, B, C, D, T4  
 Ex nA IIC T4 CSA xxxxxxxxx

ENCLOSURE TYPE 2 Tamb -20 to +55 °C Control Dwg. 194.030-240

WARNING -EXPLOSION HAZARD- DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.  
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 AVERTISSEMENT -RISQUE D'EXPLOSION- AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QU'E L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.

Made in Germany  
 00000/0000000 F-2402OXY

O<sub>2</sub> 4100 e

24 to 230 V AC/DC, 45 to 65 Hz  
 5 VA, 2,5 W  
 No. 00000 / 000000 0 / 0302

Tamb  
 -20 to +55 °C

FM APPROVED SF

Transmitter O<sub>2</sub> 4100 ppb

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
24 to 230 V ac/dc	wash	alar m	rel.2	rel.1	+	out 2	out 1	+	+	contr.	hold	+	anode	ref. el.	guard	do not connect	cathode		

power | cont. acts | output | input

MAX. REL. AY. CONT. ACT. RATING: AC < 253 V / < 3 A / < 750 VA  
 DC < 30 V / < 3 A / < 90 W, RESISTIV E

NI, C, LI, DIV2, G, PA, B, C, D, T4  
 NI, C, LI, ZN2, GP, IIC, T4

CL I DIV2 G, PA, B, C, D, T4  
 Ex nA IIC T4 CSA xxxxxxxxx

ENCLOSURE TYPE 2 Tamb -20 to +55 °C Control Dwg. 194.030-240

WARNING -EXPLOSION HAZARD- DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.  
 WARNING -BONDING BETWEEN CONDUIT IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION. SEE INSTALLATION INSTRUCTIONS.  
 AVERTISSEMENT -RISQUE D'EXPLOSION- AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QU'E L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.

Made in Germany  
 00000/0000000 F-2403OXY

O<sub>2</sub> 4100 ppb

24 to 230 V AC/DC, 45 to 65 Hz  
 5 VA, 2,5 W  
 No. 00000 / 000000 0 / 0302

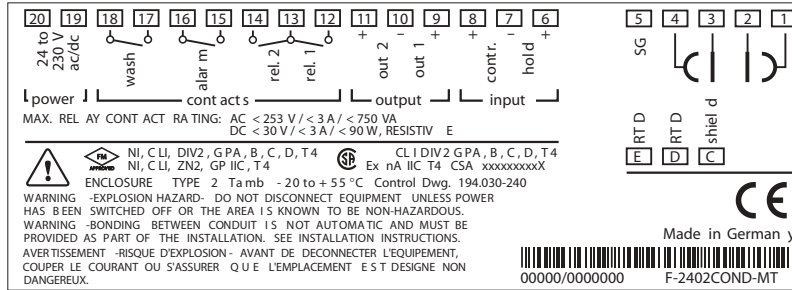
Tamb  
 -20 to +55 °C

FM APPROVED SF

# Terminal assignment

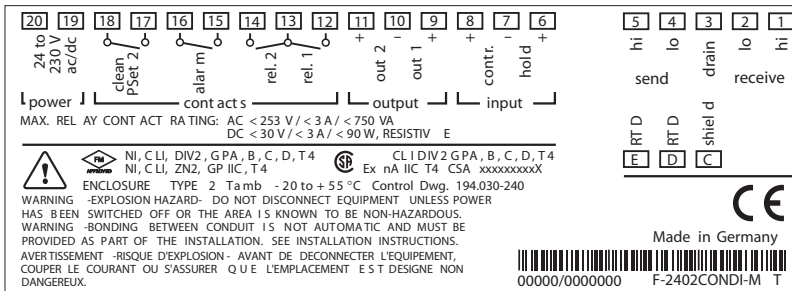
# «Advanced Line» transmitters

## Transmitter Cond 7100e



Cond 7100 e 24 to 230 V AC/DC, 45 to 65 Hz  
5 VA, 2,5 W Tamb  
No. 00000 / 000000 0 / 0302 -20 to +55 °C

## Transmitter Cond Ind 7100e



Cond Ind 7100 e 24 to 230 V AC/DC, 45 to 65 Hz  
5 VA, 2,5 W Tamb  
No. 00000 / 000000 0 / 0302 -20 to +55 °C

<b>HOLD input</b>	Galv. separated (OPTO coupler)
Function	Switches device to HOLD state
Switching voltage	0...2 V (AC/DC) inactive 10...30 V (AC/DC) active
<hr/>	
<b>CONTROL input (pH/O<sub>2</sub>)</b>	Galv. separated (OPTO coupler)
Function	Control input for automatic cleaning/calibration system
Switching voltage	0...2 V (AC/DC) inactive 10...30 V (AC/DC) active
<hr/>	
<b>CONTROL input (Cond)</b>	Galv. separated (OPTO coupler)
Function	Switches between two parameter sets
Switching voltage	0...2 V (AC/DC) set #1 active 10...30 V (AC/DC) set #2 active
<hr/>	
<b>Output 1</b>	0/4...20 mA, max. 10 V, floating (galv. connected to output 2)
Process variable*	pH 2100 e pH/mV O <sub>2</sub> 4100e DO saturation, DO concentration O <sub>2</sub> 4100 ppb DO saturation, DO concentration Cond 7100e conductivity, resistivity, concentration, salinity Cond Ind 7100e conductivity, concentration, salinity
Current characteristics*	linear or logarithmic (depends on transmitter)
Overrange*	22 mA in the case of error message
Output filter*	Low-pass, filter time constant 0...120 s
Meas. error <sup>1)</sup>	< 0.3 % of current value +0.05 mA
Start/end of scale	As desired within measuring range
Adm. span	pH 2100e 2.00...18.00/200...3000 mV O <sub>2</sub> 4100e 5...500 %, 0.5...50 mg/l O <sub>2</sub> 4100 ppb 0...500 %, 0.2...10 mg/l Cond 7100e LIN 5 % of selected measuring range LOG 1 decade Cond Ind 7100e LIN 5 % of selected measuring range LOG 1 decade
<hr/>	
<b>Output 2</b>	0/4...20 mA, max. 10 V, floating (galv. connected to output 1)
Process variable	Temperature
Overrange*	22 mA in the case of temp error messages
Output filter*	Low-pass, filter time constant 0...120 s
Meas. error <sup>1)</sup>	< 0.3 % of current value + 0.05 mA
Start/end of scale*	-20...200 °C/-4...392 °F
Adm. span	20...320 K (36...608 °F)
<hr/>	
<b>Alarm contact</b>	Relay contact, floating
Contact ratings	AC < 250 V/< 3 A/< 750 VA DC < 30 V/< 3 A/< 90 W
Contact response	N/C (fail-safe type)
Alarm delay	0000...0600 s
<hr/>	

<b>Limit values</b>	Output via relay contacts R1, R2
Contact ratings	Contacts R1, R2 floating, but inter-connected AC < 250 V/< 3 A/< 750 VA DC < 30 V/< 3 A/< 90 W
Contact response*	N/C or N/O
Delay*	0000...9999 s
Switching points*	As desired within measuring range
Hysteresis*	pH 2100e 0...5.00 pH/0...500 mV O <sub>2</sub> 4100e 0...50 %/0...5.00 mg/l (ppm) O <sub>2</sub> 4100ppb 0...50 %/0...5.00 mg/l (ppm) Cond 7100e 0...50 % of measuring range Cond Ind 7100e 0...50 % of measuring range
<b>PID process controller</b>	Output via relay contacts R1, R2 (see limit values)
Setpoint specification*	pH 2100e -02.00...16.00/-1500...+1500 mV O <sub>2</sub> 4100e 0...500 % / 0...50 mg/l O <sub>2</sub> 4100ppb 0...120% / 0...10 mg/l Cond 7100e within selected measuring range Cond Ind 7100e within selected measuring range
Neutral zone*	pH 2100e 0...5.00 pH / 0...+500 mV O <sub>2</sub> 4100e 0...50 % / 0...5 mg/l O <sub>2</sub> 4100ppb 0...50 % / 0...5 mg/l (ppm) Cond 7100e within selected measuring range Cond Ind 7100e max. 50 % of selected measuring range
P-action*	Controller gain K <sub>R</sub> : 0010...9999 %
I-action component*	Reset time Tr: 0000...9999 s (0000 s = no integral action)
D-action component*	Derivative-action time Td: 0000...9999 s (0000 s = no derivative action)
Controller type*	Pulse length controller or pulse frequency controller
Pulse period*	0001...0600 s, min. ON time 0.5 s (pulse length controller)
Max. pulse frequency*	0001...0180 min <sup>-1</sup> (pulse frequency controller)
<b>Cleaning function/ 2<sup>nd</sup> parameter set</b>	Relay contact, floating for controlling a simple rinsing system or an automatic cleaning system or to show that 2 <sup>nd</sup> parameter set is active
Contact ratings	AC < 250 V/< 3 A/< 750 VA DC < 30 V/< 3 A/< 90 W
Contact response*	N/C or N/O (cleaning function) N/O (2 <sup>nd</sup> parameter set)
Rinsing interval*	000.0...999.9 h (000.0 h = cleaning function switched off)
Cleaning time*	0000...1999 s
Calibration interval*	000.0...999.9 h
Cleaning interval*	000.0...999.9 h

\* User-defined

1) To IEC 746 Part 1, at nominal operating conditions

2) ± 1 count

3) Plus sensor error

<b>Display</b>	LC display, 7-segment with icons	
Main display	Character height 17 mm, unit symbols 10 mm	
Secondary display	Character height 10 mm, unit symbols 7 mm	
Sensoface	3 status indicators (friendly, neutral, sad Smiley)	
Mode indicators	5 status bars: «meas», «cal», «alarm», «cleaning», «config»	
Alarm indication	18 further icons for configuration and messages Red LED in case of alarm or HOLD, user defined	
<b>Keypad</b>	5 keys: [cal] [conf] [▲] [▶] [enter]	
<b>Service functions</b>		
Current source	Current specifiable for output 1 and 2 (00.00...22.00mA)	
Manual controller	Controller output entered directly (start of control process)	
Device self-test	Automatic memory test (RAM, FLASH, EEPROM)	
Display test	Display of all segments	
Last Error	Display of last error occurred	
Sensor monitor	Display of direct, uncorrected sensor signal (electrode/sensor)	
Relay test	Manual control of the four switching contacts	
<b>Parameter sets*</b>	Two selectable parameter sets for different applications	
<b>Data retention</b>	Parameters and calibration data > 10 years (EEPROM)	
<b>EMC</b>	EN 61326 EN 61326/A1	
Lightning protection	EN 61000-4-5, Installation Class 2	
<b>Protection against electrical shock</b>	Protective separation of all extra-low-voltage circuits against mains as per EN 61010	
<b>Explosion protection (USA/Canada)</b>	FM	NI, Cclass I, Div. 2, Groups A,B,C & D T4, T <sub>a</sub> = 55 °C; type 2 NI, Class I, Zone 2, Group IIC T4, T <sub>a</sub> = 55 °C; type 2
	CSA	Class I, Div. 2, Groups A, B, C and D, T4 Ex nA IIC T4
<b>Power supply</b>	24 (-15%)...230 (+10%) V AC/DC; approx. 5 VA, 2.5 W Frequency-AC: 45...65 Hz Overvoltage category II, Class II	
<b>Nominal operating conditions</b>		
Ambient temperature	-20...+55 °C	
Transport/Storage temp	-20...+70 °C	
Relative humidity	10...95 % non condensing	

<b>Enclosure</b>	molded enclosure made of PBT (polybutylene terephthalate)
Color	Bluish gray RAL 7031
Assembly	<ul style="list-style-type: none"> <li>• Wall mounting</li> <li>• Pipe mounting: Ø 40...60 mm, □ 30...45 mm</li> <li>• Panel mounting, cutout to DIN 43 700, sealed against panel</li> </ul>
Dimensions	H x W x L: 144 x 144 x 105 mm (5.67 x 5.67 x 4.13")
Ingress protection	IP 65/NEMA 4X
Cable glands	3 breakthroughs for cable glands M20 x 1.5 2 breakthroughs for NPT 1/2" or Rigid Metallic Conduit
Weight	approx. 1 kg

- \* User-defined  
 1) To IEC 746 Part 1, at nominal operating conditions  
 2) ± 1 count  
 3) Plus sensor error

**Ordering information**

Description	Designation	Order number
<b>4-wire instruments (20...253 V AC/DC)</b>		
Transmitter pH 2100e	pH 2100e	52 121 102
Transmitter O <sub>2</sub> 4100e	O <sub>2</sub> 4100e	52 121 103
Transmitter O <sub>2</sub> 4100ppb	O <sub>2</sub> 4100ppb	52 121 104
Transmitter Cond 7100e	Cond 7100e	52 121 126
Transmitter Cond Ind 7100e	Cond Ind 7100e	52 121 127
<b>Installation accessories</b>		
Bracket kit	ZU 0274	52 120 741
Panel-mount kit	ZU 0275	52 120 740
Protective hood	ZU 0276	52 120 739





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