

# Process Analysis Systems

Chem

Energy

Pharm

Food

Water

## Stratos® Eco 2405 Cond

### Conductivity Measurement

Simultaneous display of conductivity/resistance/salinity and temperature; large measurement symbols.

Icons supply operating messages and signal unusual operating states. Mode indicators show the current operating mode.



### Suitable sensors:

- all common types of 2-electrode sensors
- all known types of 4-electrode sensors
- cell constant selectable from 0.005 to 20 cm<sup>-1</sup>
- selectable temperature sensors Pt 100, Pt 1000, NTC 30 kohms, NTC 8.55 kohms

### Recommended Installation Sets

#### • Flow

SE 610

ARF 220





**Product Line**

Order No.

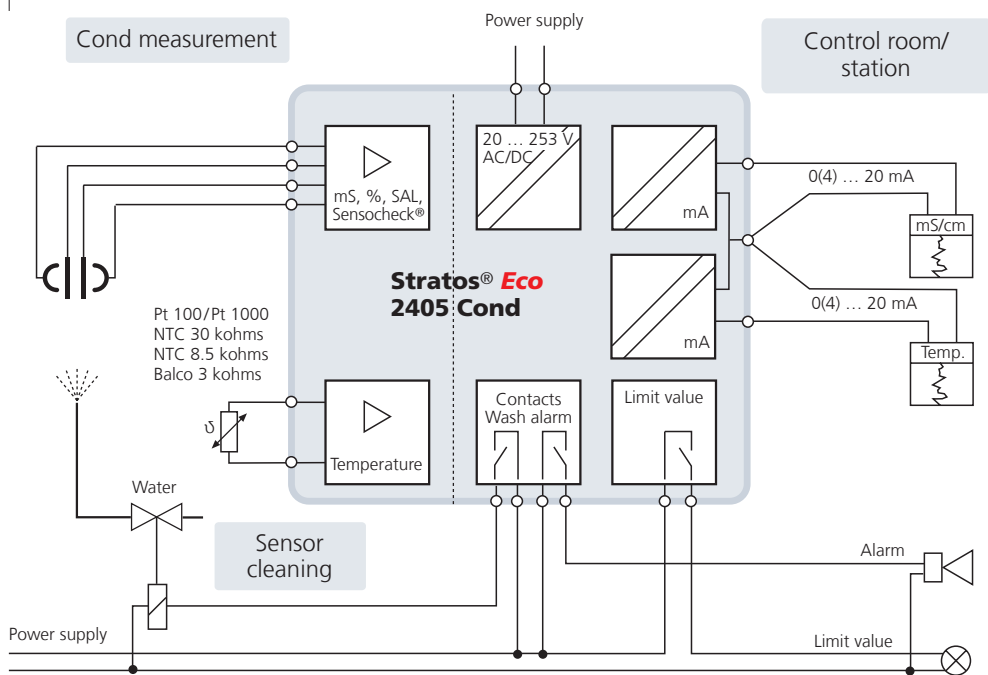
<b>Stratos® Eco 2405 Cond</b>	process analyzer for measuring conductivity using 2- and 4-electrode sensors	<b>2405 Cond</b>
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**Mounting Accessories** (see page 542)

Order No.

Pipe-mount kit	<b>ZU 0274</b>
Panel-mount kit	<b>ZU 0275</b>
Protective hood	<b>ZU 0276</b>

**Connection**



**Terminal Assignments**

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	clean	alarm	do not connect	rel. 1	+	out 2	+	out 1	do not connect	RTD E	RTD D	shield C	SG	Shield	Shield	Shield	Shield	Shield	

MAX. RELAY CONTACT RATING: AC < 250 V / < 3 A / < 750 VA, DC < 30 V / < 3 A / < 90 W, RESISTIVE

**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.**  
**WARNING -SUBSTITUTION OF COMPONENTS MAY IMPAIR SAFETY.**  
**WARNING -CLEAN ONLY WITH ANTISTATIC MOISTENED CLOTH.**  
**CAUTION -USE SUPPLY WIRES SUITABLE FOR 30°C ABOVE SURROUNDING AMBIENT AND RATED AT LEAST 250 V. USE SIGNAL WIRES SUITABLE FOR AT LEAST 250 V.**  
**AVERTISSEMENT -RISQUE D'EXPLOSION- AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.**

Ni, CL1, DIV2, GPA, B, C, D, T4  
 Ni, CL1, ZN2, GP/IC, T4  
 CL1 DIV2 GPA, B, C, D, T4  
 Ex nA IIC T4 CSA 1342049  
 Control Dwg. 194.130-330  
 ENCLOSURE TYPE 2  
 Tamb - 20 to + 55 °C

75431/0000000 F-2405COND

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### Specifications

#### Conductivity input

Effective ranges

Ranges\*)

input for 2-electrode or 4-electrode sensors

0.2  $\mu\text{S} \cdot \text{cm}$  ... 1000  $\text{mS} \cdot \text{cm}$

conductivity	0.000 ... 9.999 $\mu\text{S}/\text{cm}$
	0.00 ... 99.99 $\mu\text{S}/\text{cm}$
	0.0 ... 999.9 $\mu\text{S}/\text{cm}$
	0 ... 9999 $\mu\text{S}/\text{cm}$
	0.000 ... 9.999 $\text{mS}/\text{cm}$
	0.00 ... 99.99 $\text{mS}/\text{cm}$
	0.0 ... 999.9 $\text{mS}/\text{cm}$
	0.000 ... 9.999 $\text{S}/\text{m}$
	0.00 ... 99.99 $\text{S}/\text{m}$
resistivity	0.00 ... 99.99 Mohms $\cdot \text{cm}$
concentration	0.00 ... 9.99 %
salinity	0.0 ... 45.0 ‰ (0 ... 35 °C)

Response ( $T_{90}$ )

< 1 s (Sensocheck® off)    < 3 s (Sensocheck® on)

Measurement error<sup>1,2,3</sup>)

< 1% meas. val. + 0.4  $\mu\text{S} \cdot \text{cm}$

#### Concentration determination

1	NaCl	0.00 ... 9.99 % by wt	(0 ... 100 °C)
2	HCl	0.00 ... 9.99 % by wt	(-20 ... +50 °C)
3	NaOH	0.00 ... 9.99 % by wt	(0 ... 100 °C)
4	H <sub>2</sub> SO <sub>4</sub>	0.00 ... 9.99 % by wt	(-17 ... +110 °C)
5	HNO <sub>3</sub>	0.00 ... 9.99 % by wt	(-17 ... +50 °C)

#### Sensor standardization

- input of cell constant with simultaneous display of conductivity and temperature
- input of conductivity of calibration solution with simultaneous display of cell constant and temperature
- product calibration
- temperature probe adjustment

Permissible cell constant

0.0050 ... 19.9999  $\text{cm}^{-1}$

#### Sensocheck®

polarization detection and monitoring of cable capacitance

#### Sensoface®

provides information on the sensor condition (Sensocheck®)

#### Sensor monitor

direct display of measured values from sensor for validation (resistance/temperature)

#### Temperature input\*)

Pt 100 / Pt 1000 / NTC 30 kohms / NTC 8.55 kohms (Betatherm), 2-wire connection, adjustable

Measuring range

Pt 100 / Pt 1000	-20.0 ... +200.0 °C	(-4 ... +392 °F)
NTC 30 kohms	-20.0 ... +150.0 °C	(-4 ... +302 °F)
NTC 8.55 kohms	-10.0 ... +130.0 °C	(14 ... 266 °F)

Resolution

0.1 °C/1 °F

Measurement error<sup>1,2,3</sup>)

< 0.5 K (< 1 K bei Pt 100; < 1 K bei NTC > 100°C)

Temperature compensation\*)  
(ref. temperature 25 °C)

(OFF)	without
(LIN)	linear characteristic 00.00 ... 19.99 %/K
(NLF)	natural waters to EN 27888
(NaCl)	ultrapure water with NaCl traces (0 ... 120 °C)
(HCl)	ultrapure water with HCl traces (0 ... 120 °C)
(NH <sub>3</sub> )	ultrapure water with NH <sub>3</sub> traces (0 ... 120 °C)

**Specifications – continued**

**Output 1**

Process variable*)	0/4 ... 20 mA, max. 10 V, floating (galvanically connected to output 2)
Overrange*)	conductivity, resistivity, concentration, salinity
Output filter*)	22 mA in the case of error messages
Measurement error <sup>1)</sup>	low-pass, filter time constant 0 ... 120 s
Start/end of scale*)	< 0.3 % current value + 0.05 mA
Minimum span	as desired within range
	5 % of selected range

**Output 2**

Measured variable	0/4 ... 20 mA, max. 10 V, floating (galvanically connected to output 1)
Overrange*)	temperature
Output filter*)	22 mA in case of temp error messages
Measurement error <sup>1)</sup>	low-pass, filter time constant 0 ... 120 s
Start/end of scale*)	< 0.3 % current value + 0.05 mA
Span allowed	-20 ... +300 °C/-4 ... +572 °F
	20 ... 320 K/36 ... 576 °F

**Alarm contact**

Contact response	relay contact, floating	AC < 250 V/< 3 A/< 750 VA	DC < 30 V/< 3 A/< 90 W
Alarm delay*)	N/C (fail-safe type)		
	10 s		

**Grenzwertkontakt**

Contact response*)	relay contact, floating	AC < 250 V/< 3 A/< 750 VA	DC < 30 V/< 3 A/< 90 W
Delay*)	N/O or N/C		
Setpoints*)	0000 ... 9999 s		
Hysteresis*)	as desired within range		
	0 ... 50 % full scale		

**Cleaning contact**

Contact response*)	"clean" relay contact	AC < 250 V/< 3 A/< 750 VA	DC < 30 V/< 3 A/< 90 W
Rinsing interval*)	N/C or N/O		
Rinse duration*)	000.0 ... 999.9 h		
	(000.0 h = cleaning function switched off)		
	0000 ... 1999 s		

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### Specifications – continued

#### Display

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 face)
Mode indication	4 mode indicators "meas", "cal", "alarm", "config" further icons for configuration and messages
Alarm indication	red LED in case of alarm

#### Keypad

5 keys: [cal] [conf] [▶] [▲] [enter]

#### Service functions

Current source	current specifiable for output 1 and 2 (00.00 ... 22.00 mA)
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)

#### Data retention

parameters and calibration data > 10 years (EEPROM)

#### Protection against electric shock

protective separation of all low-voltage circuits against mains by double insulation to EN 61010-1

#### Power supply

24 (-15 %) ... 230 (+10 %) V AC/DC  
approx. 5 VA/2.5 W AC: 45 ... 65 Hz  
overvoltage category II, Class II

#### Nominal operating conditions

Ambient temperature	-20 ... +55 °C
Transport/Storage temperature	-20 ... +70 °C
Relative humidity	10 ... 95 %, not condensing

#### EMC

EN 61326-1, EN 61326-2-3  
emitted interference: Class B (residential area) Class A: for mains > 60 V DC  
immunity to interference: Industry

#### Explosion protection

FM NI, Class 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

For up-to-date information, please visit [www.knick.de](http://www.knick.de)

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings

**Knick** 

### Specifications – continued

#### Enclosure

molded enclosure made from PBT (polybutylene terephthalate)

#### Color

bluish gray, RAL 7031

#### Assembly

– wall mounting  
– pipe mounting ZU 0274, Ø 40 ... 60 mm, □ 30 ... 45 mm  
– panel mounting ZU 0275  
cutout to DIN 43 700, sealed against panel

#### Dimensions (mm)

H x W x D: 144 x 144 x 105

#### Ingress protection

IP 65/NEMA 4X

#### Cable glands

3 knockouts for cable glands M20 x 1.5  
2 knockouts for 1/2" NPT or rigid metallic conduit

#### Weight

approx. 1 kg

\*1) 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