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Read before installation.
Keep for future use.

1 Safety

Also read the User Manual and the Safety Guide, and follow the safety instructions.

Intended Use

Stratos Multi E401X is an industrial transmitter in 4-wire technology for installation in hazardous areas up to Zone 2. Up to two separately certified Ex sensors may be connected and operated in Zone 0. The device provides a digital Memosens input and an interface for analog or digital sensors. In the field of liquid analysis, the device can measure pH values, ORP, conductivity (contacting or inductive), and oxygen content, both dissolved and in the gaseous phase.

The defined rated operating conditions must be observed when using this product. These conditions are set out in full in the Specifications chapter of the User Manual, as well as in parts of the Installation Guide.

Function Check Mode (HOLD Function)

When you open the Parameter Setting, Calibration, or Maintenance menus, Stratos Multi switches to the function check (HOLD) mode. The current outputs and relay contacts behave in accordance with the parameter settings.

Operations must not be carried out while the device is in function check (HOLD) mode, as the system may behave unexpectedly and put users at risk.

Inputs and Outputs (SELV, PELV)

The non-intrinsically safe signal input/output terminals shall only be connected to non-shock-hazard equipment or systems (for example, SELV, PELV, ES1 in compliance with IEC 62368-1).

Control Drawings

When installing the device in a hazardous location, observe the specifications given in the accompanying control drawings.

Configuration

The replacement of components may impair the intrinsic safety. Stratos Multi E401X may only be equipped with a module of type MK-...X and a memory card of type ZU1080-S-X...

Stratos Multi does not require maintenance.

If maintenance is required at the measuring point (e.g., sensor replacement), function check mode (HOLD) must be activated as follows on the device:

- Open the Calibration (the selected channel only)
- Open the Maintenance (current source, measuring points)
- Open the Parameter Setting on the operator and administrator levels

Repair

The Stratos Multi and measuring module cannot be repaired by the user. To request a repair, please contact Knick Elektronische Messgeräte GmbH & Co. KG by visiting www.knick.de.

2 Product

Package Contents

- Stratos Multi basic unit
- Bag containing small accessory parts (2x plastic sealing plugs, 1x hinge pin, 2x insertable jumpers, 1x reduction sealing insert, 1x multiple sealing insert, 2x blanking plugs, 5x cable glands and M20x1.5 hex nuts)
- Test Report 2.2 according to EN 10204
- Installation Guide
- Safety Guide
- Control Drawing 212.502-100
- EU Declaration of Conformity

Note: Check all components for damage upon receipt. Do not use damaged parts.

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Version 1

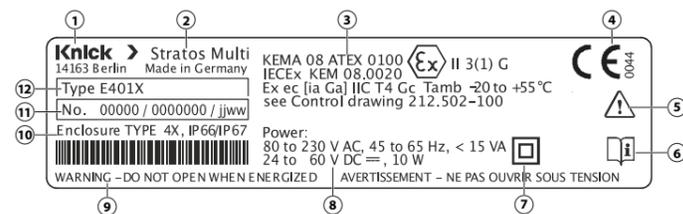
This document was published on May 04, 2021.
The latest documents are available for download on our website under the corresponding product description.



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TI-212.502-KNEN01

Nameplate

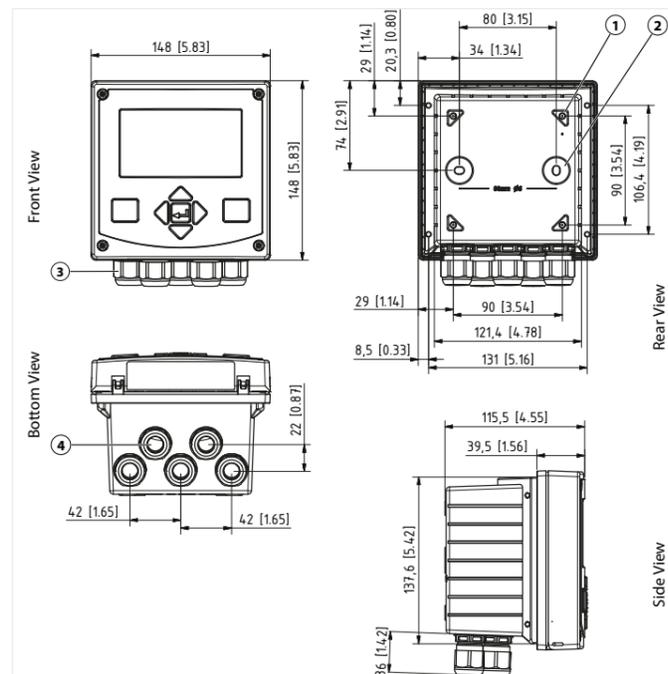


- | | |
|--|---|
| 1 Name of manufacturer | 7 Protection class II |
| 2 Product name | 8 Power rating |
| 3 ATEX and IECEx marking, specification of hazardous location, and number of Control Drawing | 9 Warning to indicate that in a hazardous location the device may only be opened when it is de-energized. |
| 4 Approval for Europe with CE mark | 10 Degree of protection |
| 5 Special conditions: Read the user manual, observe the specifications, and follow the instructions in the safety guide. | 11 Product number/Serial number/Production year and week |
| 6 Reminder to read the documentation | 12 Model designation |

3 Installation

Mounting

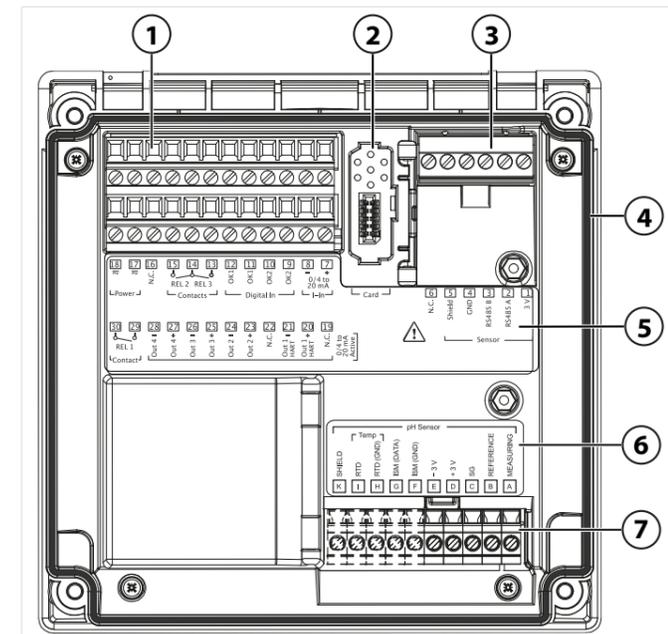
Note: All dimensions are given in millimeters [inches].



- | | |
|---|--|
| 1 Holes for pipe mounting, 4x | 3 Cable glands, 5x |
| 2 Holes for wall mounting, 2x
Sealing with plastic sealing plugs | 4 Holes for cable glands or
½" conduit, ø 21.5 mm, 2x |

Connections

Rear of front unit



- | | |
|---|--|
| 1 Terminals for inputs, outputs, relay contacts, power supply | 5 Terminal plate |
| 2 Slot for the memory card. Follow the instructions for installing the memory card. | 6 Module plate for analog sensors; example for pH module |
| 3 RS-485 interface: Sensor connection for Memosens or digital sensors | 7 Module slot for measuring modules |
| 4 Circumferential seal | |

Electrical Installation

⚠ WARNING! The transmitter does not have a power switch. An appropriately arranged and accessible disconnecting device for the transmitter must be present in the system installation. The disconnecting device must disconnect all non-grounded, current-carrying wires and be labeled such that the associated transmitter can be identified. Before commencing with the installation, make sure that all lines to be connected are de-energized.

Cable Glands

In a hazardous location, only cable glands with suitable approvals may be used. The installation instructions of the manufacturer must be observed.

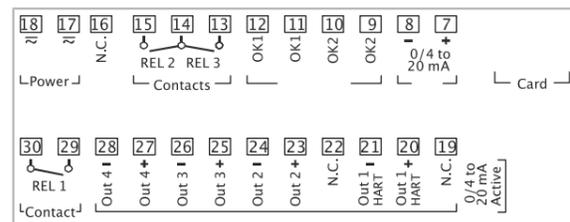
Cable glands	5 cable glands M20 x 1.5 A/F 24 mm WISKA type ESKE/1 M20
Clamping ranges	Standard sealing insert: 7 ... 13 mm Reduction sealing insert: 4 ... 8 mm Multiple sealing insert: 5.85 ... 6.5 mm
Tensile strain	Not permitted, suitable for "fixed installation" only

⚠ CAUTION! Risk of losing the specified ingress protection. Fasten the cable glands and screw together the housing correctly. Observe the permissible cable diameters and tightening torques. Only use original accessories and spare parts.

NOTICE! Strip the insulation from the wires using a suitable tool to prevent damage. For stripping length, see Specifications.

- Wire the current outputs. Deactivate unused current outputs in the parameter settings or use jumpers.
- Wire the relay contacts and inputs if necessary.
- Connect the power supply (for ratings, see Specifications).
- When measuring with analog/ISM sensors or a second Memosens sensor: Insert the measuring module into the module slot.
- Connect the sensor(s).
- Check whether all connections are correctly wired.
- Close the housing and successively tighten the enclosure screws in a diagonal pattern.
- Before switching on the power supply, make sure its voltage is within the specified range.
- Switch on the power supply.

Connecting the Power Supply



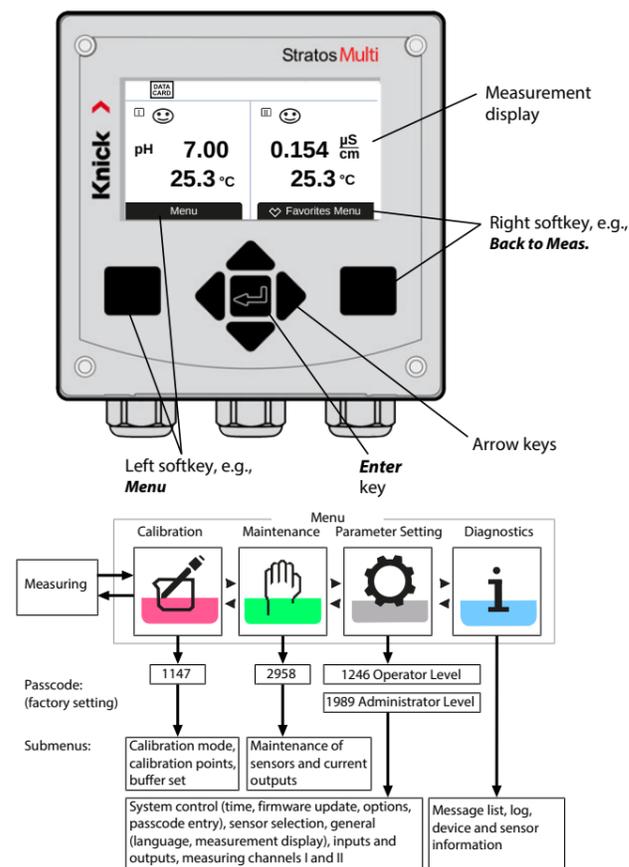
The power line may carry dangerous touch voltages. It is connected to terminals 17 and 18. Touch protection must be ensured by proper installation.

Terminal	Function
17, 18	Power supply, reverse polarity protected, see specifications

5 Operation and Use

See the user manual for detailed information.

Display, Keypad



Connecting Digital Sensors

Memosens sensors are connected to the RS-485 interface of the Stratos Multi. Next, select the relevant process variable for the connected sensor in the parameter settings.

Menu ▶ Parameter Setting ▶ Sensor Selection [I] [II] ▶ Sensor Selection [I]

Terminal	Wire color	Memosens cable	Terminal plate
1	Brown	+3V	
2	Green	RS-485 A	
3	Yellow	RS-485 B	
4	White	GND	
5	Transparent	Shield	
6	N.C.	N.C.	

Connecting Analog/Digital Sensors to Measuring Modules

Menu ▶ Parameter Setting ▶ Sensor Selection [I] [II] ▶ Sensor Selection [II]

Module	Function	Control Drawing
MK-PH015X	pH value, ORP measurement	212.002-110
MK-OXY045X	Oxygen measurement	212.002-120
MK-COND025X	Contacting conductivity measurement	212.002-130
MK-CONDI035X	Inductive conductivity measurement	212.002-140
MK-MS095X	Memosens multiparameter (for 2-channel version)	212.002-150

See Control Drawings for measuring modules terminal assignments.

Terminal Assignments for Measuring Modules

	Conductivity (Contacting)	
	4-Electrode Sensor	2-Electrode Coax Sensor
A I _{hi}	Current electrode Hi	Electrode 1
B U _{hi}	Voltage electrode Hi	
C U _{lo}	Voltage electrode Lo	Electrode 2
D I _{lo}	Current electrode Lo	
E RTD GND	Temperature probe	Temperature probe
F RTD	Temperature probe	Temperature probe
G RTD (SENSE)	Temperature probe	Temperature probe
H Shield	Cable shield	Cable shield

	Conductivity (Inductive) (SE 655 / SE 656)	
A Hi receive	Coax red	Core (blue)
B LO receive	Coax red	Shield (red)
C LO send	Coax white	Shield (red)
D HI send	Coax white	Core (blue)
E RTD GND		Green
F RTD		White
G RTD (SENSE)		Yellow
H Shield		Cable shield green/yellow

]= Insert jumper
 ⋮ = Jumper if only 2-wire temperature probe is used

		pH	ORP	Oxygen (Amperometric)		
A	Meas	Coax core		A	Cathode	Coax core transparent
B	Ref	Coax shield	Coax shield	B	Reference	
C	SG		Coax core	C	Anode	Coax shield red
D	+ 3 V source			D	Guard	Gray + green
E	+ 3 V drain			E	ISM (GND)	
F	ISM (GND)			F	ISM (DATA)	
G	ISM (DATA)			G	RTD (GND)	Green
H	RTD (GND)	Temperature probe	Temperature probe	H	RTD	White
I	RTD	Temperature probe	Temperature probe	I	Shield	Cable shield yellow/green
K	Shield	Cable shield	Cable shield			

]= Insert jumper

4 Parameter Setting and Adjustment

CAUTION! Incorrect parameter settings or adjustments can result in incorrect outputs. A system specialist must therefore commission Stratos Multi, set all its parameters, make all necessary adjustments, and protect it from unauthorized modifications.

6 Specifications (Excerpt)

Power	Power supply, terminals 17, 18	80 V (- 15 %) ... 230 (+ 10 %) V AC; approx. 15 VA; 45 ... 65 Hz 24 V (- 15 %) ... 60 (+ 10 %) V DC; 10 W
		Overvoltage category II, protection class II, pollution degree 2
	Test voltage	Type test 3 kV AC 1 min after moisture pre-treatment Routine test 1.4 kV for 2 s
Sensor Inputs (Intrinsically Safe)	Explosion protection	See control drawings for entity parameters
	Sensor input 1	For Memosens, galvanically isolated
	Data In/Out	Asynchronous interface RS-485, 9600 Bd
	Sensor input 2	For measuring module or analog/ISM ¹⁾ measuring module, galvanically isolated
	Data In/Out	Asynchronous interface RS-485, 9600 Bd
Inputs and Outputs (SELV, PELV)	Input OK1, OK2	Galvanically isolated (optocoupler) Switching between parameter sets A/B, flow measurement, function check
	Current input TAN option FW-E051	Current input 0/4 ... 20 mA at 50 Ω Input of measured pressure values from external sensors Supplied current must be galvanically isolated.
	Start/end of scale	Within range
	Characteristic	Linear
	Resolution	Approx. 0.05 mA
	Measurement error ²⁾	< 1 % of current value + 0.1 mA

1) ISM with TAN option FW-E053
 2) At rated operating conditions

Output 1, 2	0/4 ... 20 mA, floating, load resistance up to 500 Ω
Out 1, Out 2	Output 1: HART communication with 4 ... 20 mA Output 2 galvanically connected with outputs 3 and 4
Failure message	3.6 mA (with 4 ... 20 mA) or 22 mA, user-defined
Active	Max. 11 V
Output 3, 4, Out 3, Out 4	0/4 ... 20 mA, floating, galvanically connected to output 2, load resistance up to 250 Ω
TAN Option FW-E052	
Failure message	3.6 mA (with 4 ... 20 mA) or 22 mA, user-defined
Active	Max. 5.5 V
Process variable	Selection from all available process variables
Start/end of scale	Configurable within selected range
Characteristic	Linear, bi-/trilinear, or logarithmic
Output filter	PT1 filter, filter time constant 0 ... 120 s
Contact REL1, REL2, REL3	Relay contact, floating
Contact rating with ohmic load	AC < 30 V _{rms} / < 15 VA DC < 30 V / < 15 W
Max. switching current	3 A, max. 25 ms
Max. continuous current	500 mA
Device	
Display	Graphical TFT color display, 4.3", white backlighting
Resolution	480 x 272 pixels

Housing	
Molded enclosure	Glass fiber reinforced Front unit material: PBT Rear unit material: PC
Protection	IP66/IP67/TYP E 4X outdoor (with pressure compensation) when the device is closed
Flammability	UL 94 V-0 for external parts
Weight	1.2 kg (1.6 kg incl. accessories and packaging)
Terminals	
Screw terminals	For single and stranded wires 0.2 ... 2.5 mm ²
Tightening torque	0.5 ... 0.6 Nm
Wiring	
Stripping length	Max. 7 mm
Temperature resistance	> 75 °C / 167 °F
Rated Operating Conditions	
Climatic class	3K5 according to EN 60721-3-3
Location class	C1 according to EN 60654-1
Ambient temperature	-20...55 °C / -4...131 °F
Altitude of installation site	Max. 60 V DC power supply at altitudes above 2000 m (AMSL)
Relative humidity	5...95 %
Transport and Storage	
Transport/storage temperature	-30 ... 70 °C / -22 ... 158 °F
EMC	
Emitted interference	Class A (industrial applications) ³⁾
Interference immunity	Industrial applications

3) This equipment is not designed for domestic use, and is unable to guarantee adequate protection of the radio reception in such environments.