# Industrial Transmitters

## Stratos Multi

**The latest generation of our proven Stratos process analyzers for Memosens, digital, and analog sensors. Multiparameter functionality provides flexibility. High-resolution display for an intuitive, self-explanatory user interface.**

### Intuitive

Large widescreen display for a quick overview of all relevant measurement data. Self-explanatory user interface with intuitive icons and multi-color display.

### Multiparameter

Freely combinable process variables pH, ORP, conductivity, and oxygen, also in 2-channel mode.

Analog sensors can of course continue to be used for all parameters.

### Use in Hazardous Locations

Stratos Multi E401X is also ideal for installation and operation in hazardous locations up to Zone 2. Equipped with intrinsically safe sensor inputs, the sensors can be installed in Zone 0/1.

**Intuitive operation with full-text menu navigation in several languages. Icons help you to quickly ascertain the device's condition. Guided automatic calibration provides greater reliability.**
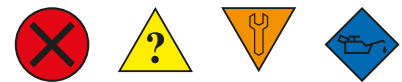
### Allows for Worldwide Use

Menu navigation in several languages to assist the user in correct operation. Detailed information on all operating states simplifies usage.

Available languages: German, English, French, Italian, Spanish, Portuguese, Chinese, Swedish, Korean. Easy to expand.
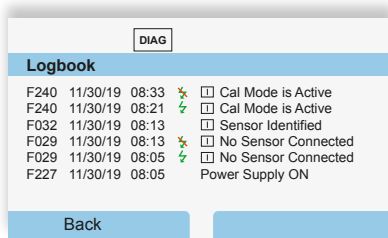
### Status Messages According to NE 107

Standardized icons reduce the risk of confusion. All status messages for required maintenance, failure, out of specification, and function check (HOLD) are output as specified in NE 107.

Knick

# Stratos Multi
# The Multiparameter Transmitter

**DIAG**

**Logbook**

| | | | | | |
|---|---|---|---|---|---|
| F240 | 11/30/19 | 08:33 | | Cal Mode is Active |
| F240 | 11/30/19 | 08:21 | | Cal Mode is Active |
| F032 | 11/30/19 | 08:13 | | Sensor Identified |
| F029 | 11/30/19 | 08:13 | | No Sensor Connected |
| F029 | 11/30/19 | 08:05 | | No Sensor Connected |
| F227 | 11/30/19 | 08:05 | | Power Supply ON |

Back

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**Meas. Val. 1/2**

10.00     120

pH     mV

3.00     -130

Cursor:
12.02.2020    17:37:10     pH 7.01   -104 mV

Back     Show 3/4

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**DIAG**

**Sensor Diagram pH/ORP**

1 - Slope
2 - Zero Point
3 - Glass Impedance
4 - Reference Impedance
5 - Response Time
6 - Calibration Timer
7 - Sensor Wear

Back

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**DIAG**

**Sensor Wear Monitor**

| | |
|---|---|
| Operating Time | 69 d |
| Wear | 9.5 % |
| Remaining Lifetime | 661 d |
| Temperature | 22.5 °C |

Back     Back to Meas.

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**DIAG**

**Calibration Record**

pH 0.00    7.00    14.00

| | |
|---|---|
| Date | 02/04/20 10:30 |
| Zero Point | pH 6.98 |
| Slope | 58.1 mV/pH |
| Isothermal Voltage | 7 mV |

Back

## Seamless Data Recording

Messages and statuses can be recorded in the logbook and displayed on the screen. The measurement recorder enables full data recording, including a graphical display. All data can be stored on the Data Card.
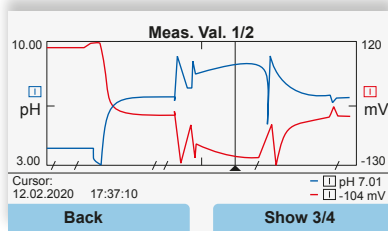
## Smart Diagnostics Management

At a glance, users receive information on the sensor's condition and the remaining lifetime of the connected sensors.
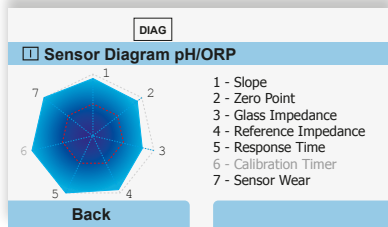
Alongside CIP, SIP, autoclaving counters, and the display elements noted above, a "sensor diagram" facilitates sensor monitoring. All the relevant sensor data, such as zero point, slope, life, calibration timer, impedance, and response times are clearly presented.
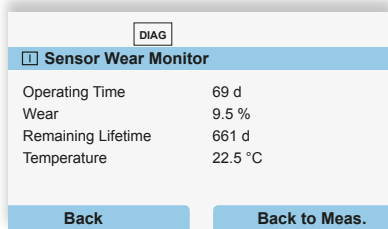
## Optimized Maintenance Intervals

Efficient adjustment of calibration intervals using the adaptive calibration timer. Another new feature, the load matrix, delivers information on which extreme values each sensor was exposed to.
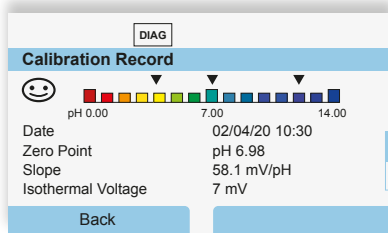
## Facts and Features

– 1- and 2-channel version with 4 current outputs and 3 freely configurable relay contacts

– Multiparameter for pH/ORP/conductivity/oxygen

– Self-explanatory, multi-lingual user interface

– TFT display with full-text menu

– 4-wire transmitter with broad-range power supply 24 ... 230 V AC/DC

– Predictive maintenance for optimal process management:
  • CIP/SIP and autoclaving counter
  • Sensor diagram
  • Remaining sensor service life

– Measurement with Memosens, digital, and analog sensors

– HART communication

– Memory cards for data recording or firmware update

– Access control
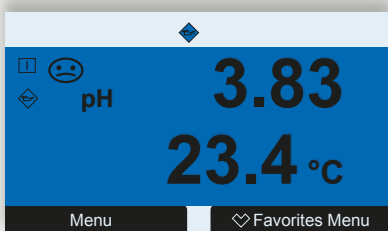
# Industrial Transmitters



RED: NE 107 "Failure" status message
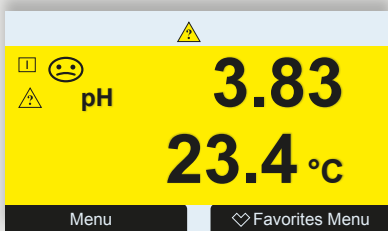


YELLOW:
NE 107 "Out of Specification"
status message
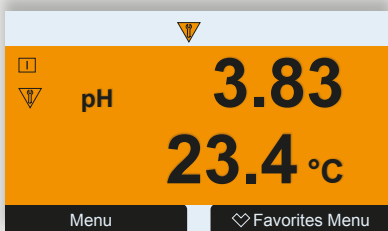


ORANGE:
NE 107 "Function Check"
status message



BLUE:
NE 107 "Maint. Required"
status message

**Reliable operation in all industrial environments with premium EPDM keypad. More dependable than a touchscreen. Rugged and UV-resistant housing. No protruding control elements.**

### Compact Housing and Rugged Keypad

Safe and shock-hazard-protected electronics, even with open housing. The large terminal compartment makes it easy to commission the device. Since all of the electronics are integrated into the front element, the rear unit can easily be removed for direct installation in the enclosure.

The specially sealed, premium EPDM keys, a high UV resistance, and IP66/ IP67/ TYPE 4X protection make installation possible in complex ambient conditions, even outdoors. Scratch-resistant display cover made of hardened 3-mm safety glass.

### Visual Display of Sensor and Device Conditions

The color-coded user interface allows you to quickly ascertain the sensor condition. The display fields have different background colors based on the NE107 status messages, so users can identify sensor conditions and device modes at a glance. The sensor monitoring system indicates the sensor's maintenance needs using the established Sensoface and can also be configured with messages to that effect.



### Memosens Sensors

Memosens sensors can easily be used with sensor cables up to 100 meters long. Since Memosens converts measured values and sensor data into digital signals in the sensor head, their transmission is not subject to the attenuation that typically affects analog signals over distance. Electromagnetic interference cannot distort the transmitted values, either.

**Knick** ›

# Stratos Multi

## Memory Cards with USB

Quick and easy data transfer between device and PC via standardized USB interface.

This makes it easy to distribute and manage measured value records, firmware updates, and device configurations.

The card slot inside the housing makes it possible to connect a range of memory cards

– Data Card:
  Memory card for measured values and device configurations

– FW Update Card:
  Firmware update

– Firmware Repair Card:
  Easy on-site update of the device firmware for troubleshooting in case of warranty claims.
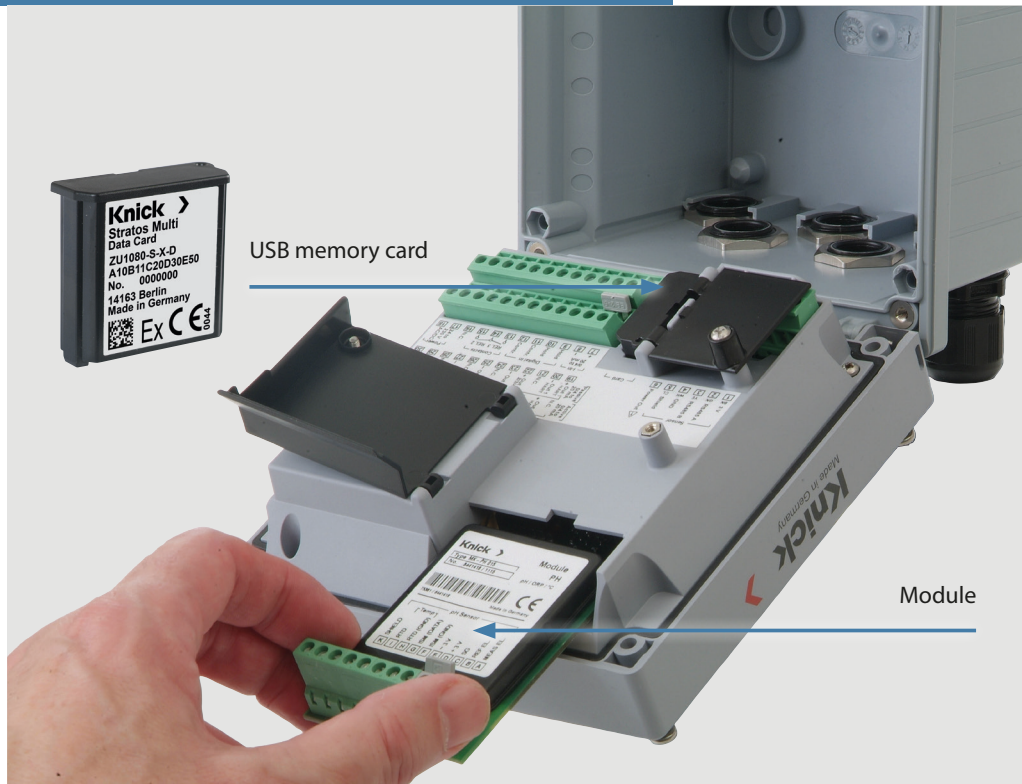
## System Integration

Proven HART communication enables integration in process control systems for communication and remote maintenance. Seamless transmission of diagnostics and measurement data, and configurations



USB memory card

Module



Measuring modules for use in hazardous and non-hazardous locations

**Stratos E401N System Overview**



MEMO SENS

0/4 ... 20 mA
HART

Power Out

T

0/4 ... 20 mA

REL 1

OK1 / OK 2

REL 2/3

I-In
0/4 ... 20 mA

Power

AC/DC
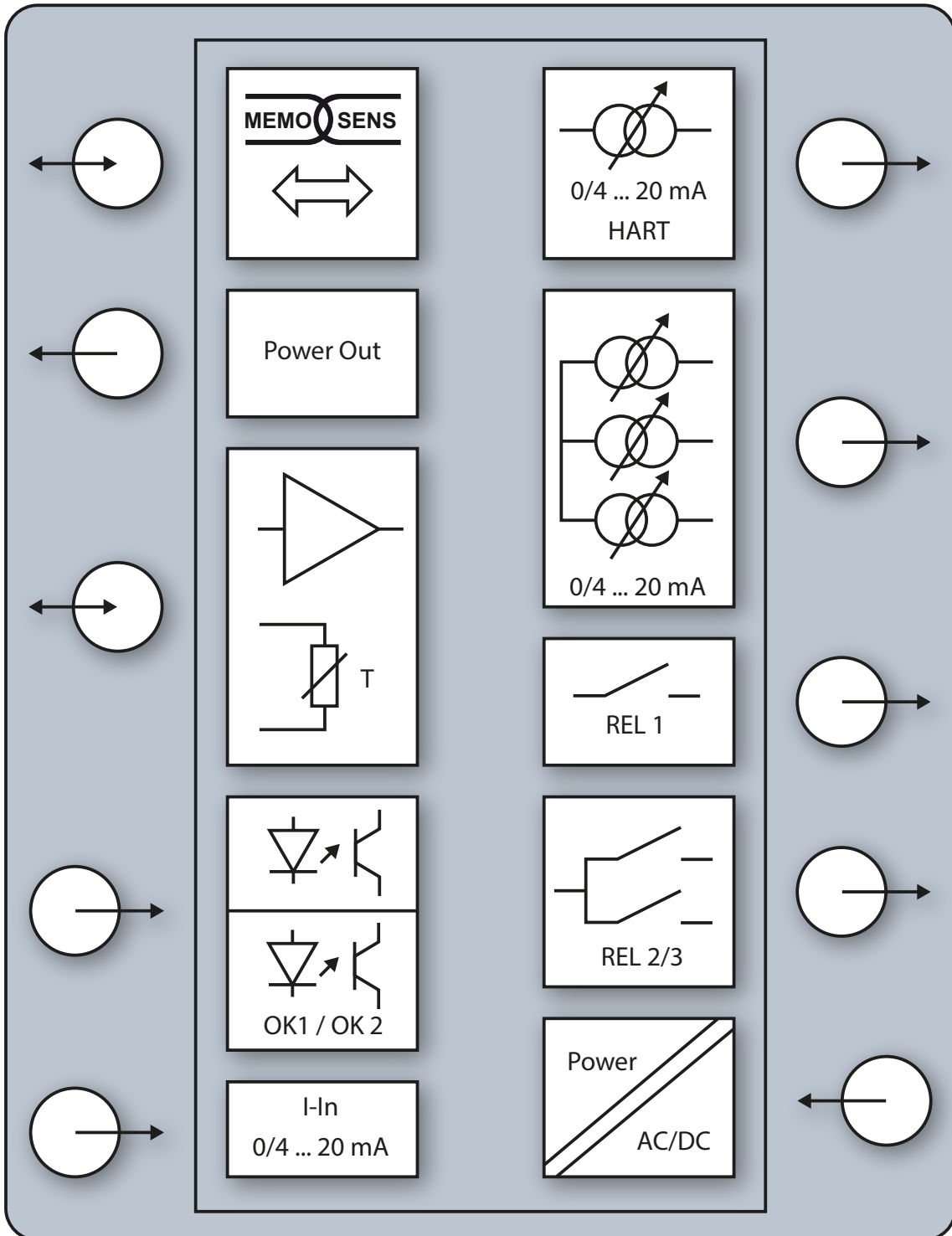
# Stratos Multi

**Stratos E401X System Overview**



| | |
|---|---|
| MEMO SENS ⟷ | 0/4 ... 20 mA HART |
| T | 0/4 ... 20 mA |
| OK1 / OK 2 | REL 1 |
| | REL 2/3 |
| I-In 0/4 ... 20 mA | Power AC/DC |
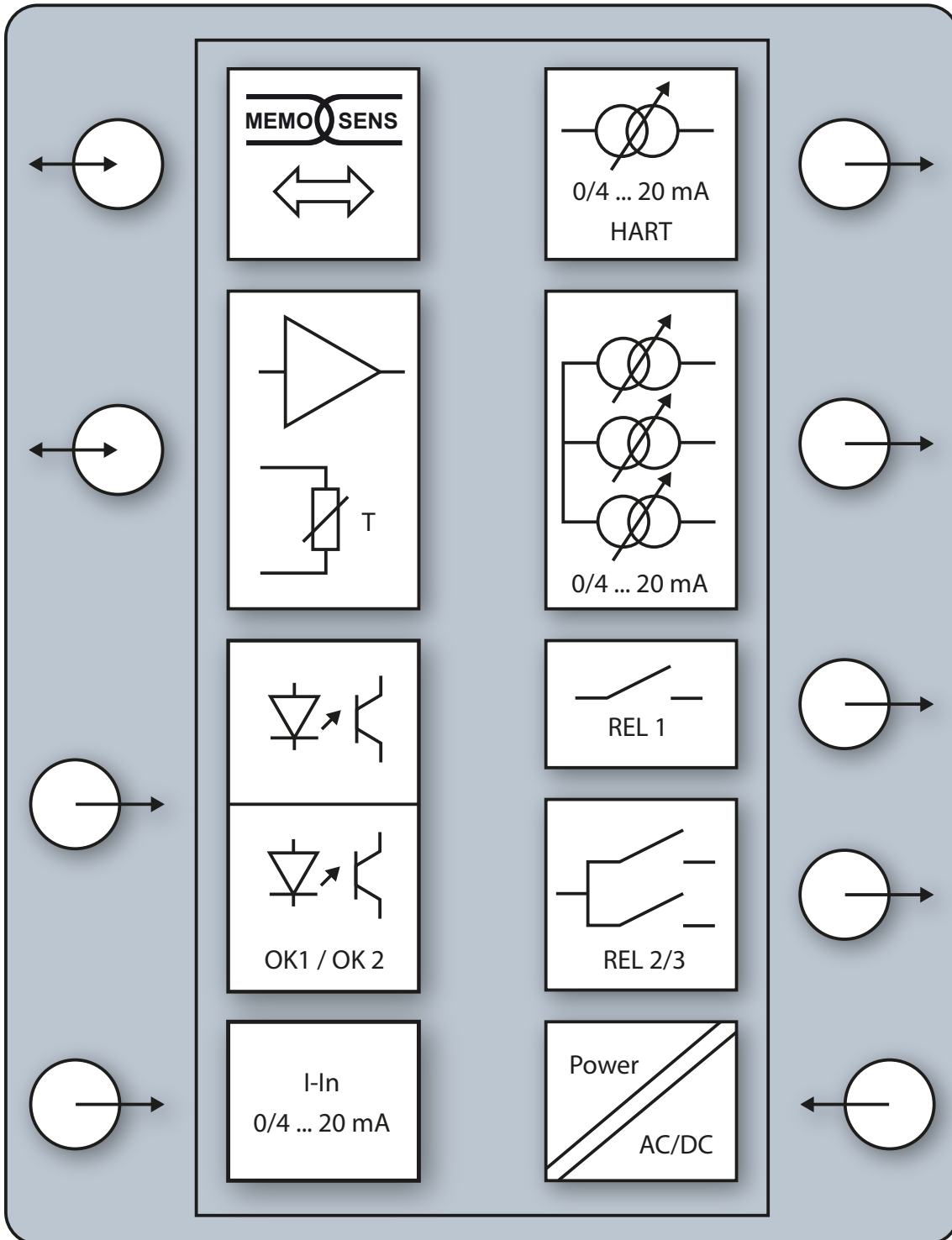
**Product Line**

| Stratos Multi | Order No. |
|---|---|
| Stratos Multi 4-wire, multiparameter, digital basic unit, 1-channel | E401N |
| Stratos Multi 4-wire, multiparameter, digital basic unit, 1-channel with HART communication | E401N.010 |
| Stratos Multi 4-wire, multiparameter, digital basic unit, 2-channel with 4 current outputs | E401N.020 |
| Stratos Multi 4-wire, multiparameter, digital basic unit, 2-channel with HART communication | E401N.030 |

| Stratos Multi Ex | Order No. |
|---|---|
| Stratos Multi 4-wire, multiparameter, digital basic unit, 1-channel, Ex Zone 2 | E401X |

| Measuring Module for 2-Channel Version Memosens | Order No. |
|---|---|
| Memosens measuring module, 2nd channel multiparameter | MK-MS095N |
| Ex Memosens measuring module, 2nd channel multiparameter | MK-MS095X |

| Analog Measuring Modules (Non-Ex) | Order No. |
|---|---|
| pH/ORP measuring module | MK-PH015N |
| Module for contacting conductivity measurement | MK-COND025N |
| Module for toroidal conductivity measurement | MK-CONDI035N |
| Oxygen measuring module | MK-OXY046N |
| Dual conductivity measuring module, 2-channel | MK-CC065N |

| Analog Measuring Modules (Ex Zone) | Order No. |
|---|---|
| pH/ORP measuring module | MK-PH015X |
| Module for contacting conductivity measurement | MK-COND025X |
| Module for toroidal conductivity measurement | MK-CONDI035X |
| Oxygen measuring module | MK-OXY045X |

| Mounting Kits | Order No. |
|---|---|
| Pipe-mount kit | ZU 0274 |
| Panel-mount kit | ZU 0738 |
| Protective hood | ZU 0737 |

| Add-On Functions (Firmware via TAN) | Order No. |
|---|---|
| pH buffer table: Entry of individual buffer set | FW-E002 |
| Current characteristic | FW-E006 |
| Concentration determination for use with conductivity sensors | FW-E009 |
| Trace oxygen measurement | FW-E016 |
| Operation with double high-impedance pH sensors/Pfaudler sensors | FW-E017 |
| Calculation blocks | FW-E020 |
| HART communication | FW-E050 |
| Current input | FW-E051 |
| Current outputs 3 and 4 | FW-E052 |
| Digital ISM pH/ORP and amperometric ISM oxygen sensors | FW-E053 |
| Parameter sets 1–5[*] | FW-E102 |
| Measurement recorder[*] | FW-E103 |
| Logbook, in conjunction with Data Card[*] | FW-E104 |
| Firmware update[1] | FW-E106 |

# Stratos Multi

**Product Line**

| Test Sockets, Connectors, Cables | Length | Order No. |
|---|---|---|
| HART test socket, integrated in cable gland | | ZU 0287 |
| VP8 connector | | ZU 0721 |
| M12 socket, 8-pin | | ZU 0860 |
| VP8 ST cable (both ends with VP socket) | 3 m | ZU 0710 |
| | 5 m | ZU 0711 |
| | 10 m | ZU 0712 |
| M12 extension cord, 8-pin | 10 m | CA/M12-010M12-8 |
| Inspection certificate 3.1 | | ZU0268/ANALYSE01 |
| Inspection certificate 3.1 for custom specification | | ZU0268/analysis |

**Memory Cards for Stratos Multi E401N**

ZU 1080– | S | – | N | –

| Card version | Data Card | D |
|---|---|---|
| | Firmware Update Card (in conjunction with FW-E106) | U |
| | Firmware Repair Card | R |

ZU 1080– | S | – | N | – | | – | | | |

| Card version | Custom Firmware Update Card (in conjunction with FW-E106) | S | | | |
|---|---|---|---|---|---|
| | Custom Firmware Repair Card | V | | | |
| Firmware versions | Device firmware | | * | * | * |

**Memory Cards for Stratos Multi E401X**

ZU 1080– | S | – | X | –

| Card version | Data Card | D |
|---|---|---|
| | Firmware Update Card (in conjunction with FW-E106) | U |
| | Firmware Repair Card | R |

ZU 1080– | S | – | X | – | | – | | | |

| Card version | Custom Firmware Update Card (in conjunction with FW-E106) | S | | | |
|---|---|---|---|---|---|
| | Custom Firmware Repair Card | V | | | |
| Firmware versions | Device firmware | | * | * | * |

*) Expanded functionality with Data Card ZU1080; Data Card not included with FW option
1) Firmware version for firmware update available with FW Update Card ZU1080-S-*-U/V; see memory cards

**Specifications**

**Power**

| | |
|---|---|
| Power supply | 80 V (– 15 %) ... 230 (+ 10 %) V AC; approx. 15 VA; 45 ... 65 Hz |
| Terminals 17, 18 | 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 |

**Inputs and Outputs (SELV, PELV)**

| | | |
|---|---|---|
| Sensor input 1 | for Memosens/optical sensors (SE740), galvanically isolated | |
| | Data in/out | Asynchronous interface, RS-485, 9600/19200 Bd |
| | Power supply | 3.08 V (3.02 ... 3.22 V)/10 mA, Ri < 1 Ω, short-circuit-proof |
| Input 2 | for Memosens module or analog/ISM[1] measuring module, galvanically isolated | |
| | Data in/out | Asynchronous interface RS-485, 9600 Bd |
| Input OK1, OK2 | Galvanically isolated (optocoupler) | |
| | Switching between parameter sets A/B, flow measurement, function check | |
| | Parameter set selection (OK1) | Relay input 0 ... 2 V (AC/DC) parameter set A |
| | | Relay input 10 ... 30 V (AC/DC) parameter set B |
| | | Control current 5 mA |
| | Flow (OK1) | Pulse input for flow measurement |
| | | 0 ... 100 pulses per second |
| | | Display, 00.0 ... 99.9 l/h |
| | | Message via 22 mA, alarm contact or limit contacts |
| Current input | Current input 0/4 ... 20 mA at 50 Ω | |
| TAN option FW-E051 | Input of measured pressure values from external sensors | |
| | Supplied current must be galvanically isolated. | |
| | Characteristic | Linear |
| | Resolution | approx. 0.05 mA |
| | Measurement error[3] | < 1 % of current value + 0.1 mA |
| Power out | Power output, short-circuit-proof, 0.5 W, for operating the SE740 sensor | |
| | Off; 3.1 V (2.99 ... 3.25 V); 14 V (12.0 ... 16.0 V); 24 V (23.5 ... 24.9 V) | |
| Output 1, 2 | 0/4 ... 20 mA, floating, load resistance up to 500 Ω | |
| Out 1, Out 2 | Output 1 | HART communication at 4 ... 20 mA |
| | Output 2 | Galvanically connected with outputs 3 and 4 |
| | Failure message | 3.6 mA (at 4 ... 20 mA) or 22 mA, adjustable |
| | Active | max. 11 V |
| | Passive | Supply voltage 3 ... 24 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 | PT$_1$ filter, filter time constant 0 ... 120 s |
| | Measurement error[3] | < 0.25 % of current value + 0.025 mA |
| Output 3, 4 | 0/4 … 20 mA, floating, galvanically connected to output 2, | |
| Out 3, Out 4 | Max. load resistance up to 250 Ω | |
| TAN option FW-E052 | Failure message | 3.6 mA (at 4 ... 20 mA) or 22 mA, adjustable |
| | Active | max. 5.5 V |
| | Passive | Supply voltage 3 … 24 V |
| | Process variable | Selection from all available process variables |
| | Start/end of scale | Configurable within selected range |

# Stratos Multi E401N

## Specifications

|  | Characteristic | Linear, bi-/trilinear, or logarithmic |
|---|---|---|
|  | Output filter | $PT_1$ filter, filter time constant 0 ... 120 s |
| Contact K1, K2, K3 | Contact rating with ohmic load | AC < 30 $V_{rms}$ / < 15 VA<br>DC < 30 V / < 15 W |
|  | Max. switching current | 3 A, max. 25 ms |
|  | Max. continuous current | 500 mA |
|  | User-definable: | Failure, maintenance required, function check, min/max limit, PID controller, rinse contact, parameter set B signaling, USP output, Sensoface |
| Alarm contact | Contact response | N/C (fail-safe type) |
|  | Response delay | 0000 ... 0600 s |
| Rinse contact | To control a simple cleaning system | |
|  | Contact rating with ohmic load | AC < 30 $V_{rms}$ / < 15 VA<br>DC < 30 V / < 15 W |
|  | Contact response | N/C or N/O |
|  | Interval | 000.0 ... 999.9 h<br>(000.0 h = cleaning function disabled) |
|  | Cleaning time/<br>relax time | 0000 ... 1999 s |
| Limit values | Min/max contacts, floating, interconnected | |
| Min/Max | Contact response | N/C or N/O |
|  | Response delay | 0000 ... 9999 s |
|  | Setpoints | Within selected range |
|  | Hysteresis | User-defined |
| PID process controller | Output via limit contacts | |
|  | Setpoint specification | Within selected range |
|  | Neutral zone | Depending on the process variable<br>pH: pH 0 ... 5/0 ... 500 mV / 0 ... 50 K |
|  | P action | Controller gain Kp: 0010 ... 9999 % |
|  | I action | Reset time Tr: 0000 ... 9999 s<br>(0000 s = no integral action) |
|  | D action | Rate time Td: 0000 ... 9999 s<br>(0000 s = no derivative action) |
|  | Controller type | Pulse length controller or pulse frequency controller |
|  | Pulse period | 0001 ... 0600 s, minimum turn-on time 0.5 s<br>(pulse length controller) |
|  | Max. pulse frequency | 0001 ... 0180 $min^{-1}$ (pulse frequency controller) |
| Service functions | Current source | Current specifiable for output 1 ... 4 (00.00 ... 22.00 mA) |
|  | Manual controller | Controller output directly specifiable (start control processes) |
|  | Sensor monitor | Direct display of measured values<br>(mV, temperature, resistance, ...) |
|  | Relay test | Manual control of relay contacts |

[1] ISM with TAN option FW-E053

[3] At rated operating conditions

**Specifications**

### Device

| | |
|---|---|
| Product name | Stratos Multi |
| Product type | E401N |

| Measurements | pH |
|---|---|
| | ORP |
| | Amperometric/optical oxygen |
| | Contacting/toroidal conductivity measurement |
| | Dual conductivity measurement |

| 2 parameter sets | Parameter set A and B |
|---|---|
| | Switchover via digital control input OK1 or manually |

| Memory card | Accessory for additional functions (firmware update, measurement recorder, logbook) | |
|---|---|---|
| | Memory size | 32 MB |
| | Logbook | For exclusive use: min. 20,000 entries |
| | Measurement recorder | For exclusive use: min. 20,000 entries |
| | Computer ports | Micro USB |
| | Connection to device | Plug |
| | Communication | USB 2.0, high-speed, 12 Mbits/s |
| | | Data Card: MSD (mass storage device) |
| | | FW Update Card, FW Repair Card: HID (human interface device) |
| | Dimensions | L 32 mm x W 12 mm x H 30 mm |

| Display | Graphical TFT color display, 4.3", white backlighting | |
|---|---|---|
| | Resolution | 480 x 272 pixels |
| | Language | German, English, French, Spanish, Italian, Portuguese, Chinese, Korean, Swedish |
| | Sensoface | Sensor condition indicators: Happy, neutral, sad smileys |
| | Status indicators | Icons for parameter setting and messages |

| Keypad | Softkey 1 left, softkey 2 right, arrow keys (cursor), entry (enter) |
|---|---|
| Door contact | When door is open: electric signal and logbook entry |
| Real-time clock | Different time and date formats selectable |

| Housing | Molded enclosure | Glass fiber reinforced |
|---|---|---|
| | | Front unit material: PBT |
| | | Rear unit material: PC |
| | Ingress protection | IP66/ 67/TYPE 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) |
| | Mounting | Wall, pipe/post or panel mounting |
| | Color | Gray RAL 7001 |
| | Dimensions | H 148 mm, W 148 mm, D 117 mm |
| | Control panel cutout | 138 mm x 138 mm acc. to DIN 43 700 |

# Stratos Multi E401N

## Specifications

| | | |
|---|---|---|
| Cable glands | 5 knockouts for M20 x 1.5 cable glands<br>2 of 5 knockouts for NPT ½"<br>or rigid metallic conduit | |
| Terminals | Screw terminals for single or stranded wires 0.2 ... 2.5 mm$^2$<br>Tightening torque 0.5 … 0.6 Nm | |
| Wiring | Stripping length max. 7 mm<br>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 ... 60 °C/-4 ... 140 °F |
| | Altitude of installation site | Power supply max. 60 V DC from 2000 m altitude (AMSL) |
| | Relative humidity | 5 ... 95 % |
| Transport and storage | Transport / storage temperature | -30 ... 70 °C/-22 ... 158 °F |
| Conformity | EMC | EN 61326-1, NAMUR NE 21 |
| | Emitted interference | Class A (industrial applications)[1] |
| | Immunity to interference | Industrial applications |
| | RoHS conformity | According to EU directive 2011/65/EU |
| | Electrical safety | EN 61010-1 |
| | | Protection against electric shock by reinforced insulation of all extra-low-voltage circuits against mains |
| Interfaces | HART communication | TAN option FW-E050 |
| | HART version 7.x | Digital communication via FSK modulation of current output 1, device identification, measured values, status, and messages, HART certified: Out 1 passive |
| | Conditions | Output current ≥ 3.8 mA and load resistance ≥ 250 Ω |

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

**Specifications**

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**pH Measuring Functions**

| Memosens input | Input for Memosens sensors (pH, ORP, pH/ORP)<br>Terminals 1 ... 5 or MK-MS095N module | | |
|---|---|---|---|
| | Display ranges | Temperature | -20.0 ... 200.0 °C/-4 ... 392 °F |
| | | pH value | -2.00 ... 16.00 |
| | | ORP | -1999 ... 1999 mV |
| | | rH value (with pH/ORP sensor) | 0 ... 42.5 |
| | Measurement error | Depending on sensor | |

| Module input, analog or ISM[2] | Input for pH and ORP sensors with MK-PH015N | | |
|---|---|---|---|
| | Measuring ranges | Temperature | -20.0 ... 200.0 °C/-4 ... 392 °F |
| | | pH value | -2.00 ... 16.00 |
| | | ORP | -1999 ... 1999 mV |
| | | rH value<br>(with pH/ORP sensor) | 0 ... 42.5 |
| | Glass electrode input<br>Ref. temperature<br>25 °C/77 °F | Input resistance | $> 1 \times 10^{12}$ Ω |
| | | Input current | $< 1 \times 10^{-12}$ A |
| | | Impedance range | 0.5 ... 1000 MΩ (± 20 %) |
| | Ref. electrode input<br>Ref. temperature<br>25 °C/77 °F | Input resistance | $> 1 \times 10^{10}$ Ω |
| | | Input current | $< 1 \times 10^{-10}$ A |
| | | Impedance range | 0.5 ... 200 kΩ (± 20 %) |
| | Measurement error[1][3] | pH value < 0.02, TC: 0.002 pH/K<br>mV value < 1 mV, TC: 0.1 mV/K | |

| Temperature input via module | Pt100/Pt1000/NTC 30 kΩ/NTC 8.55 kΩ/Balco 3 kΩ<br>2-wire connection, adjustable | | |
|---|---|---|---|
| | Measuring ranges | Pt100/Pt1000 | -20.0 ... 200.0 °C/-4 ... 392 °F |
| | | NTC 30 kΩ | -20.0 ... 150.0 °C/-4 ... 302 °F |
| | | NTC 8.55 kΩ (Mitsubishi) | -10.0 ... 130.0 °C/14 ... 266 °F |
| | | Balco 3 kΩ | -20.0 ... 130.0 °C/-4 ... 266 °F |
| | Adjustment range | 10 K | |
| | Resolution | 0.1 °C / 0.1 °F | |
| | Measurement error[1][3] | < 0.5 K (< 1 K for Pt100<br>< 1 K for NTC > 100 °C/212 °F) | |

| Temperature compensation | | Off<br>Linear characteristic 00.00 ... 19.99 %/K<br>Ultrapure water<br>Table: 0 ... 95°C, user-defined in 5 K steps |
|---|---|---|
| | Ref. temperature | 25 °C / 77 °F |

# Stratos Multi E401N

## Specifications

| | |
|---|---|
| pH calibration and adjustment | Calibration with automatic buffer recognition (Calimatic) |
| | Manual calibration with entry of individual buffer values |
| | Product calibration |
| | Data entry of premeasured sensors |
| | ISFET zero point (with ISFET sensors) |
| | Temperature probe adjustment |
| | Calculation of nominal zero point |

| | | |
|---|---|---|
| | Max. calibration range Asymmetry potential (zero point) | ±60 mV |
| | Slope | 80 ... 103 % (47.5 ... 61 mV/pH) |
| | Zero offset | ±750 mV for Memosens ISFET |

| | | |
|---|---|---|
| Buffer sets | Knick CaliMat | 2.00/4.00/7.00/9.00/12.00 |
| | Mettler-Toledo | 2.00/4.01/7.00/9.21 |
| | Merck/Riedel | 2.00/4.00/7.00/9.00/12.00 |
| | DIN 19267 | 1.09/4.65/6.79/9.23/12.75 |
| | NIST Standard | 1.679/4.005/6.865/9.180 |
| | NIST technical | 1.68/4.00/7.00/10.01/12.46 |
| | Hamilton | 2.00/4.01/7.00/10.01/12.00 |
| | Kraft | 2.00/4.00/7.00/9.00/11.00 |
| | Hamilton A | 2.00/4.01/7.00/9.00/11.00 |
| | Hamilton B | 2.00/4.01/6.00/9.00/11.00 |
| | HACH | 4.01/7.00/10.01 |
| | Ciba (94) | 2.06/4.00/7.00/10.00 |
| | WTW techn. buffers | 2.00/4.01/7.00/10.00 |
| | Reagecon | 2.00/4.00/7.00/9.00/12.00 |
| | Specifiable buffer set | TAN Option FW-E002 |

| | |
|---|---|
| ORP calibration and adjustment | ORP data entry |
| | ORP adjustment |
| | ORP check |
| | Temperature probe adjustment |
| | Max. calibration range -700 ... 700 ΔmV |

| | | |
|---|---|---|
| Adaptive calibration timer | Interval | 0000 ... 9999 h |

[1] At rated operating conditions

[2] ISM with TAN option FW-E053

[3] ± 1 count, plus sensor error

**Specifications**

**Measuring Functions for Conductivity (Cond)**

| | |
|---|---|
| Memosens input | Input for 2-/4-electrode Memosens sensors |
| | Terminals 1 ... 5 or MK-MS095N module |
| | Measurement error      Depending on sensor |
| Module input, analog | Input for analog 2-/4-electrode sensors with MK-COND025N module |
| | Measuring ranges (conductance limited to 3500 mS) |
| |        2-electrode sensors: 0.2 µS * c ... 200 mS * c |
| |        4-electrode sensors: 0.2 µS * c ... 1000 mS * c |
| | Measurement error[1)3)] < 1 % of measured value + 0.4 µS * c |
| Temperature input via module | Pt100/Pt1000/Ni100/NTC 30 kΩ/NTC 8.55 kΩ (Betatherm) |
| | 3-wire connection, adjustable |

| | | |
|---|---|---|
| Measuring ranges | Pt100/Pt1000 | -50.0 ... 250.0 °C/-58 ... 482 °F |
| | Ni100 | -50.0: ... 180.0 °C/-58 ... 356 °F |
| | NTC 30 kΩ | -20.0 ... 150.0 °C/-4 ... 302 °F |
| | NTC 8.55 kΩ (Mitsubishi) | -10.0 ... 130.0 °C/14 ... 266 °F |
| Resolution | 0.1 °C / 0.1 °F | |

Measurement error[1) 3)] < 0.5 K (< 1 K for Pt100; < 1 K for NTC > 100 °C/212 °F)

| | | |
|---|---|---|
| Display ranges | Conductivity | 0.000 ... 9.999 µS/cm |
| | | 00.00 ... 99.99 µS/cm |
| | | 000.0 ... 999.9 µS/cm |
| | | 0.000 ... 9.999 mS/cm |
| | | 00.00 ... 99.99 mS/cm |
| | | 000.0 ... 999.9 mS/cm |
| | | 0.000 ... 9.999 S/m |
| | | 00.00 ... 99.99 S/m |
| | Resistivity | 00.00 ... 99.99 MΩ cm |
| | Concentration | 0.00 ... 99.99 % |
| | Salinity | 0.0 ... 45.0‰      (0 ... 35 °C/32 ... 95 °F) |
| | TDS | 0 ... 5000 mg/l      (10 ... 40 °C/50 ... 104 °F) |
| | Response time (T90) | Approx. 1 s |
| USP Function | Water monitoring in the pharmaceutical industry (USP<645>) with additional specifiable limit value (%) | |
| | Output via a relay contact | |
| Calibration and adjustment | Automatic with standard calibration solution | |
| | Calibration by entry of cell constant | |
| | Product calibration | |
| | Temperature probe adjustment | |
| | Permissible cell constant | 00.0050 ... 19.9999 cm$^{-1}$ |

[1)] At rated operating conditions

[3)] ± 1 count, plus sensor error

# Stratos Multi E401N

## Specifications

### Measuring Functions for Conductivity (Condl)

| | | | |
|---|---|---|---|
| Digital input | Toroidal conductivity sensors: SE670/SE680 | | |
| | Terminals 1 ... 5 or MK-MS095N module | | |
| | Measurement error | Depending on sensor | |
| Module input, analog | Input for SE655/SE656/SE660 toroidal conductivity sensors with MK-CONDI035N module | | |
| | Measurement error[1)3)] 1 % of measured value + 0.005 mS/cm | | |
| Temperature input via module | Pt100/Pt1000/NTC 30 kΩ | | |
| | 3-wire connection, adjustable | | |
| | Measuring ranges | Pt100/Pt1000 | -50.0 ... 250.0 °C/-58 ... 482 °F |
| | | NTC 30 kΩ | -20.0 ... 150.0 °C/-4 ... 302 °F |
| | Resolution | 0.1 °C / 0.1 °F | |
| | Measurement error[1) 3)] < 0.5 K (< 1 K for Pt100; < 1 K for NTC > 100 °C/212 °F) | | |
| Display ranges | Conductivity | 000.0 … 999.9 µS/cm (not with SE660/SE670) | |
| | | 0.000 ... 9.999 mS/cm (not with SE660/SE670) | |
| | | 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 ... 9.99 % / 10.0 ... 100.0 % | |
| | Salinity | 0.0 ... 45.0‰ | (0 ... 35 °C/32 ... 95 °F) |
| | TDS | 0 ... 5000 mg/l | (10 ... 40 °C/50 ... 104 °F) |
| | Response time (T90) | Approx. 1 s | |
| USP Function | Water monitoring in the pharmaceutical industry (USP<645>) with additional specifiable limit value (%) | | |
| | Output via a relay contact | | |
| Calibration and adjustment | Automatic with standard calibration solution | | |
| | Calibration by input of cell factor | | |
| | Product calibration | | |
| | Installation factor | | |
| | Zero correction | | |
| | Temperature probe adjustment | | |
| | Permissible cell factor | 00.0050 ... 19.9999 cm$^{-1}$ | |
| | Permissible transfer ratio | 010.0 ... 199.9 | |
| | Permissible offset | ± 0.5 mS | |
| | Permissible installation factor | 0.100 … 5.000 | |

[1)] At rated operating conditions

[3)] ± 1 count, plus sensor error

**Specifications**

Temperature compensation (conductivity)

| | | |
|---|---|---|
| Off | None | |
| Linear | Linear characteristic | 00.00 ... 19.99 %/K |
| | Adjustable reference temperature | |
| NLF [4] | Natural waters acc. to EN 27888 | |
| NaCl [4] | NaCl from 0 (ultrapure water) to 26 wt% (0 ... 120 °C/32 ... 248 °F) | |
| HCl [4] | Ultrapure water with HCl traces (0 ... 120 °C/32 ... 248 °F) | |
| $NH_3$ [4] | Ultrapure water with $NH_3$ traces (0 ... 120 °C/32 ... 248 °F) | |
| NaOH [4] | Ultrapure water with NaOH traces (0 ... 120 °C/32 ... 248 °F) | |

Concentration determination (conductivity) TAN option FW-E009

| | | |
|---|---|---|
| NaCl | 0 ... 28 wt% | (0 ... 100 °C/32 ... 212 °F) |
| HCl | 0 ... 18 wt% | (-20 ... 50 °C/-4 ... 122 °F) |
| | 22 ... 39 wt% | (-20 ... 50 °C/-4 ... 122 °F) |
| NaOH | 0 ... 24 wt% | (0 ... 100 °C/32 ... 212 °F) |
| | 15 ... 50 wt% | (0 ... 100 °C/32 ... 212 °F) |
| | The range limits apply to 25 °C/77 °F. | |
| $H_2SO_4$ | 0 ... 37 wt% | (-17.8 ... 110 °C /–0.04 ... 230 °F) |
| | 28 ... 88 wt% | (–17.8 ... 115.6 °C /–0.04 ... 240.08 °F) |
| | 89 ... 99 wt% | (-17.8 ... 115.6 °C /–0.04 ... 240.08 °F) |
| | The range limits apply to 27 °C/80.6 °F. | |
| $HNO_3$ | 0 ... 30 wt% | (-20 ... 50 °C/-4 ... 122 °F) |
| | 35 ... 96 wt% | (-20 ... 50 °C/-4 ... 122 °F) |
| $H_2SO_4 \cdot SO_3$ (Oleum) | 12 ... 45 wt% | (0 ... 120 °C/32 ... 248 °F) |

Specifiable concentration table

[4] Reference temperature 25 °C/77 °F

# Stratos Multi E401N

## Specifications

### Measuring Functions for Conductivity (Dual)

| Digital input | Input for Memosens sensors | |
|---|---|---|
| | Terminals 1 … 5 and MK-MS095N module | |
| | Measurement error | Depending on sensor |

| MK-CC05N module input, analog | Input for two analog 2-electrode sensors | |
|---|---|---|
| | Measuring range | 0 … 30000 µS * c |
| | Measurement error[1] [3] | < 1 % of measured value + 0.4 µS * c |
| | Connection length | Max. 3 m |

| Temperature input via module | Pt1000, 2-wire connection, adjustable | |
|---|---|---|
| | Measuring range | -50.0 ... 200.0 °C/-58 ... 392 °F |
| | Resolution | 0.1 °C / 0.1 °F |
| | Measurement error[1] [3] | < 0.5 K (< 1 K at > 100 °C / 212 °F) |

| Display ranges | Conductivity | 0.000 ... 9.999 µS/cm |
|---|---|---|
| | | 00.00 ... 99.99 µS/cm |
| | | 000.0 ... 999.9 µS/cm |
| | | 0000 ... 9999 µS/cm |
| | Resistivity | 00.00 … 99.99 MΩ cm |
| | Response time (T90) | Approx. 1 s |

| Calibration and adjustment | Automatic with standard calibration solution | |
|---|---|---|
| | Calibration by entry of cell constant | |
| | Product calibration | |
| | Temperature probe adjustment | |
| | Permissible cell constant | 00.0050 ... 19.9999 cm$^{-1}$ |

[1] At rated operating conditions

[3] ± 1 count, plus sensor error

**Specifications**

**Measuring Functions for Oxygen**

| | | |
|---|---|---|
| Memosens input | Standard measurement | Input for amperometric Memosens sensors |
| | Trace measurement | Input for amperometric Memosens sensors with TAN option FW-E016 |
| | Terminals 1 ... 5 or MK-MS095N module | |
| | Display range | Temperature: -20.0 ... 150.0 °C/-4 ... 302 °F |
| | Measurement error | Depending on sensor |
| Digital input | Input for SE740 optical oxygen sensor | |
| | Terminals 1 ... 6 | |
| | Measuring range | 0 ... 300 % air saturation |
| | Detection limit | 0.01 vol% |
| | Response time T98 | < 30 s (at 25 °C/77 °F, from air to nitrogen) |
| | Display range | Temperature: -10.0 ... 130.0 °C/14 ... 266 °F |
| | | The sensor does not supply measured oxygen values above 80 °C/176 °F. |
| | Measurement error | Depending on sensor |
| Module input, analog or ISM[2] | Standard | Sensors with MK-OXY046N module: SE706; InPro 6800; Oxyferm, ISM |
| | Input range | Measuring current -600 ... 2 nA, resolution 10 pA |
| | Measurement error[1] | < 0.5 % of measured value + 0.05 nA + 0.005 nA/K |
| | Trace measurement | Sensors with MK-OXY046N module: SE707; InPro 6900; Oxyferm/Oxygold |
| | TAN option FW-E016 | |
| | Input range I | Measuring current -600 ... 2 nA, resolution 10 pA Automatic range selection |
| | Measurement error[1] | < 0.5 % of measured value + 0.05 nA + 0.005 nA/K |
| | Input range II | Measuring current -10000 ... 2 nA, resolution 166 pA Automatic range selection |
| | Measurement error[1] | < 0.5 % of measured value + 0.8 nA + 0.08 nA/K |
| | Polarization voltage | -400 ... -1000 mV          Presetting –675 mV Resolution < 5 mV |
| | Permissible guard current | ≤ 20 µA |
| Temperature input via module | NTC 22 kΩ/NTC 30 kΩ | |
| | 2-wire connection, adjustable | |
| | Measuring range | -20.0 ... 150.0 °C/-4 ... 302 °F |
| | Adjustment range | 10 K |
| | Resolution | 0.1 °C / 0.1 °F |
| | Measurement error[1][3] | < 0.5 K (< 1 K for Pt100; < 1 K for NTC > 100 °C/212 °F) |
| Operating modes | Measurement in gases Measurement in liquids | |

# Stratos Multi E401N

## Specifications

| | |
|---|---|
| Measuring ranges | **Standard sensor (Memosens, analog, ISM, SE740)** |
| | Saturation[5]  0.0 ... 600.0 % |
| | Concentration[5]  0.00 ... 99.99 mg/l (ppm) (dissolved oxygen) |
| | Volume concentration 0.00 ... 99.99 vol% in gas |
| | **Trace sensor "01" (Memosens, analog, ISM)** |
| | Saturation[5]  0.000 ... 150.0 % |
| | Concentration[5]  0000 ... 9999 µg/l / 10.00 ... 20.00 mg/l (dissolved oxygen)  0000 ... 9999 ppb/10.00 ... 20.00 ppm |
| | Volume concentration 000.0 ... 9999 ppm / 1.000 ... 50.00 vol% in gas |
| | **Trace sensor "001" (analog)** |
| | Saturation[5]  0.000 ... 150.0 % |
| | Concentration[5]  0000 ... 9999 µg/l / 10.00 ... 20.00 mg/l (dissolved oxygen)  0000 ... 9999 ppb/10.00 ... 20.00 ppm |
| | Volume concentration 000.0 ... 9999 ppm / 1.000 ... 50.00 vol% in gas |
| Input correction | Pressure correction  0.000 ... 9999 bar/999.9 kPa/145.0 psi (adjustable)  manually or externally (via current input 0(4) ... 20 mA) |
| | Salinity correction  0.0 ... 45.0 g/kg |
| Calibration and adjustment | Automatic calibration in air-saturated water<br>Automatic calibration in air<br>Saturation product calibration (with offset in SE740)<br>Zero correction<br>Temperature probe adjustment |
| Calibration ranges | **Standard sensor "10"** |
| | Zero point  ± 2 nA |
| | Slope  25 ... 130 nA (at 25 °C / 77 °F, 1013 mbar) |
| | **Trace sensor "01"** |
| | Zero point  ± 2 nA |
| | Slope  200 ... 550 nA (at 25 °C / 77 °F, 1013 mbar) |
| | **Trace sensor "001"** |
| | Zero point  ± 3 nA |
| | Slope  2000 ... 9000 nA (at 25 °C / 77 °F, 1013 mbar) |
| Calibration timer | 0000 ... 9999 h |

[1] At rated operating conditions

[2] ISM with TAN option FW-E053

[3] ± 1 count, plus sensor error
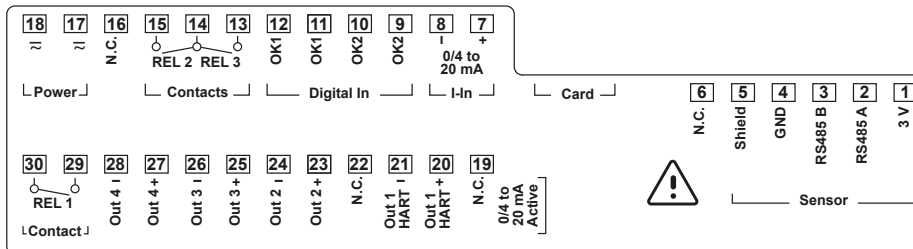
[5] For temperature range -10 ... 80 °C/14 ... 176 °F
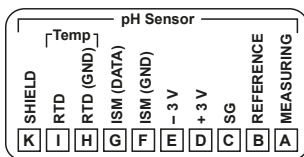
**Specifications**

**Diagnostics and Statistics**

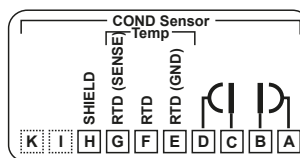| Diagnostic functions | Calibration data | Calibration record |
| --- | --- | --- |
| | Device self-test | Automatic memory test (RAM, FLASH, EEPROM) |
| | Display test | Display of all colors |
| | Keypad test | Check of key functions |
| Sensocheck | Delay: approx. 30 s | |
| | pH | Automatic monitoring of glass and reference electrode (can be switched off) |
| | Cond | Polarization detection and monitoring of cable capacitance |
| | CondI | Monitoring of primary and secondary coils and lines for open circuit and of primary coil and lines for short circuit |
| | Oxygen | With amperometric sensors only, monitoring of membrane and electrolyte and the sensor wires for short circuits and open circuits (can be switched off) |
| Sensoface | Provides information on the sensor condition (can be switched off; happy, neutral, or sad smileys) | |
| | pH | Evaluation of zero/slope, response, calibration interval, Sensocheck, wear |
| | Cond | Evaluation of Sensocheck |
| | CondI | Evaluation of zero point, cell factor, installation factor, Sensocheck |
| | Oxygen | Evaluation of zero point/slope, response time, calibration interval, Sensocheck, and sensor wear for digital sensors |
| Sensor monitor | Display of direct sensor measured values: | |
| | pH | pH/voltage/temperature |
| | Cond | Resistance/temperature |
| | CondI | Resistance/temperature |
| | Oxygen | Sensor current/temperature |
| Measurement recorder TAN option FW-E103 | 4-channel measurement recorder with marking of events (failure, maintenance required, function check, limits) | |
| | 1 measured value per second | |
| | Storage capacity | 100 entries in device memory, at least 20,000 entries in conjunction with Data Card |
| | Recording | Process variables and span freely adjustable |
| | Type of recording | Current value |
| | Time base | 10 s ... 10 h |
| Logbook | Recording of function activations, appearance and disappearance of warning and failure messages, with date and time, 100 events with date and time, viewable on display | |
| | TAN option FW-E104 | At least 20,000 entries in conjunction with Data Card |

## Stratos Multi E401N Terminal Assignments

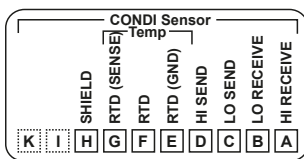| 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | | | 6 | 5 | 4 | 3 | 2 | 1 |
|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| ≈ | ≈ | N.C. | REL 2 | REL 3 | | OK1 | OK1 | OK2 | OK2 | – | + | | | N.C. | Shield | GND | RS485 B | RS485 A | 3 V |
| └ Power ┘ | | | └ Contacts ┘ | | | └ Digital In ┘ | | | | └ I-In ┘ | | └ Card ┘ | | | | └ Sensor ┘ | | |

0/4 to 20 mA (terminals 8/7)

| 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 |
|----|----|----|----|----|----|----|----|----|----|----|----|
| REL 1 | | Out 4 I | Out 4 + | Out 3 I | Out 3 + | Out 2 I | Out 2 + | N.C. | Out 1 HART I | Out 1 HART + | N.C. |
| └ Contact ┘ | | | | | | | | | 0/4 to 20 mA Active | | |

### MK-PH 015N Module Terminal Assignments

pH Sensor — Temp

| K | I | H | G | F | E | D | C | B | A |
|---|---|---|---|---|---|---|---|---|---|
| SHIELD | RTD | RTD (GND) | ISM (DATA) | ISM (GND) | – 3 V | + 3 V | SG | REFERENCE | MEASURING |

### MK-COND 025N Module Terminal Assignments

COND Sensor — Temp

| K | I | H | G | F | E | D | C | B | A |
|---|---|---|---|---|---|---|---|---|---|
| SHIELD | RTD (SENSE) | RTD | RTD (GND) | | | | | | |

### MK-CONDI 035N Module Terminal Assignments

CONDI Sensor — Temp

| K | I | H | G | F | E | D | C | B | A |
|---|---|---|---|---|---|---|---|---|---|
| SHIELD | RTD (SENSE) | RTD | RTD (GND) | HI SEND | LO SEND | LO RECEIVE | HI RECEIVE | | |

### MK-OXY 046N Module Terminal Assignments

Oxy Sensor — Temp

| K | I | H | G | F | E | D | C | B | A |
|---|---|---|---|---|---|---|---|---|---|
| SHIELD | RTD | RTD (GND) | ISM (DATA) | ISM (GND) | GUARD | ANODE | REFERENCE | CATHODE | |

### MK-CC 065N Module Terminal Assignments

Sensor B — Sensor A

| K | I | H | G | F | E | D | C | B | A |
|---|---|---|---|---|---|---|---|---|---|
| SHIELD | RTD (GND) | RTD | | SHIELD | RTD (GND) | RTD | | | |

### MK-MS 095N Module Terminal Assignments

Memosens — RS 485

| K | I | H | G | F | E | D | C | B | A |
|---|---|---|---|---|---|---|---|---|---|
| | | | SHIELD | GND | | B | A | 3V | |

**Specifications**

**Power**

| | |
|---|---|
| Power supply<br>Terminals 17, 18 | 80 V (– 15 %) ... 230 (+ 10 %) V AC; approx. 15 VA; 45 ... 65 Hz<br>24 V (– 15 %) ... 60 (+ 10 %) V DC; 10 W<br>Overvoltage category II, protection class II, pollution degree 2 |
| Test voltage | Type test 3 kV AC 1 min after moisture pre-treatment<br>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<br>RS-485, 9600 Bd |
| | Power supply: | 3.08 V (3.02 ... 3.22 V)/ 6 mA<br>Ri < 1 Ω, short-circuit-proof |
| Sensor input 2: | for Memosens module or analog/ISM[1] measuring module, galvanically isolated | |
| | Data in/out: | Asynchronous interface<br>RS-485, 9600 Bd |
| | Power supply: | 3.08 V (3.02 ... 3.22 V)/ 6 mA<br>Ri < 1 Ω, short-circuit-proof |

**Inputs and Outputs (SELV, PELV)**

| | | |
|---|---|---|
| Input OK1, OK2 | Galvanically isolated (optocoupler)<br>Switching between parameter sets A/B, flow measurement, function check | |
| | Parameter set selection (OK1) | Relay input 0 ... 2 V (AC/DC) parameter set A |
| | | Relay input 10 ... 30 V (AC/DC) parameter set B<br>Control current 5 mA |
| | Flow (OK1) | Pulse input for flow measurement<br>0 ... 100 pulses per second<br>Display, 00.0 ... 99.9 l/h<br>Message via 22 mA, alarm contact or limit contacts |
| Current input<br>TAN option FW-E051 | Current input 0/4 ... 20 mA at 50 Ω<br>Input of measured pressure values from external sensors<br>Supplied current must be galvanically isolated. | |
| | Start/end of scale | Within range |
| | Characteristic | Linear |
| | Resolution | approx. 0.05 mA |
| | Measurement error[3] | < 1 % of current value + 0.1 mA |
| Output 1, 2<br>Out 1, Out 2 | 0/4 ... 20 mA, floating, load resistance up to 500 Ω | |
| | Output 1 | HART communication at 4 ... 20 mA |
| | Output 2 | Galvanically connected with outputs 3 and 4 |
| | Failure message | 3.6 mA (at 4 ... 20 mA) or 22 mA, adjustable |
| | Active | max. 11 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 | $PT_1$ filter, filter time constant 0 ... 120 s |
| | Measurement error[3] | < 0.25 % of current value + 0.025 mA |

## Specifications

| | | |
|---|---|---|
| Output 3, 4 | 0/4 … 20 mA, floating, galvanically connected to output 2, | |
| Out 3, Out 4 | Max. load resistance up to 250 Ω | |
| TAN option FW-E052 | Failure message | 3.6 mA (at 4 … 20 mA) or 22 mA, adjustable |
| | 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 | $PT_1$ 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<br>DC < 30 V / < 15 W |
| | Max. switching current | 3 A, max. 25 ms |
| | Max. continuous current | 500 mA |
| | User-definable: | Failure, maintenance required, function check, min/max limit, PID controller, rinse contact, parameter set B signaling, USP output, Sensoface |
| Alarm contact | Contact response | N/C (fail-safe type) |
| | Response delay | 0000 … 0600 s |
| Rinse contact | To control a simple cleaning system | |
| | Contact rating with ohmic load | AC < 30 $V_{rms}$ / < 15 VA<br>DC < 30 V / < 15 W |
| | Max. switching current | 3 A, max. 25 ms |
| | Max. continuous current | 500 mA |
| | Contact response | N/C or N/O |
| | Interval | 000.0 … 999.9 h<br>(000.0 h = cleaning function disabled) |
| | Cleaning time/ relax time | 0000 … 1999 s |
| Limit values | Min/max contacts, floating, interconnected | |
| Min/Max | Contact response | N/C or N/O |
| | Response delay | 0000 … 9999 s |
| | Setpoints | Within selected range |
| | Hysteresis | User-defined |
| PID process controller | Output via limit contacts | |
| | Setpoint specification | Within selected range |
| | Neutral zone | Depending on the process variable<br>pH: pH 0 … 5/0 … 500 mV / 0 … 50 K |
| | P action | Controller gain Kp: 0010 … 9999 % |
| | I action | Reset time Tr: 0000 … 9999 s<br>(0000 s = no integral action) |
| | D action | Rate time Td: 0000 … 9999 s<br>(0000 s = no derivative action) |
| | Controller type | Pulse length controller or pulse frequency controller |
| | Pulse period | 0001 … 0600 s, minimum turn-on time 0.5 s<br>(pulse length controller) |
| | Max. pulse frequency | 0001 … 0180 min$^{-1}$ (pulse frequency controller) |

**Specifications**

| Service functions in the Maintenance menu | Current source | Current specifiable for output 1 ... 4 (00.00 ... 22.00 mA) |
|---|---|---|
| | Manual controller | Controller output directly specifiable (start control processes) |
| | Sensor monitor | Direct display of measured values (mV, temperature, resistance, ...) |
| | Relay test | Manual control of relay contacts |

1) ISM with TAN option FW-E053

3) At rated operating conditions

**Device**

| Product name | Stratos Multi | |
|---|---|---|
| Product type | E401X | |
| Measurements | pH | |
| | ORP | |
| | Amperometric/optical oxygen | |
| | Contacting/toroidal conductivity measurement | |
| | Dual conductivity measurement | |
| 2 parameter sets | Parameter set A and B | |
| | Switchover via digital control input OK1 or manually | |
| Memory card | Accessory for additional functions (firmware update, measurement recorder, logbook) | |
| | Memory size | 32 MB |
| | Logbook | For exclusive use: min. 20,000 entries |
| | Measurement recorder | For exclusive use: min. 20,000 entries |
| | Computer ports | Micro USB |
| | Connection to device | Plug |
| | Communication | USB 2.0, high-speed, 12 Mbits/s |
| | | Data Card: MSD (mass storage device) |
| | | FW Update Card, FW Repair Card: HID (human interface device) |
| | Dimensions | L 32 mm x W 12 mm x H 30 mm |
| Display | Graphical TFT color display, 4.3", white backlighting | |
| | Resolution | 480 x 272 pixels |
| | Language | German, English, French, Spanish, Italian, Portuguese, Chinese, Korean, Swedish |
| | Sensoface | Sensor condition indicators: Happy, neutral, sad smileys |
| | Status indicators | Icons for parameter setting and messages |
| Keypad | Softkey 1 left, softkey 2 right, arrow keys (cursor), entry (enter) | |
| Door contact | When door is open: electric signal and logbook entry | |
| Real-time clock | Different time and date formats selectable | |

## Specifications

| | | |
|---|---|---|
| Housing | Molded enclosure | Glass fiber reinforced |
| | | Front unit material: PBT |
| | | Rear unit material: PC |
| | Ingress protection | IP66/IP67/NEMA 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) |
| | Mounting | Wall, pipe/post or panel mounting |
| | Color | Gray RAL 7001 |
| | Dimensions | H 148 mm, W 148 mm, D 117 mm |
| | Control panel cutout | 138 mm x 138 mm acc. to DIN 43 700 |
| Cable glands | 5 knockouts for M20 x 1.5 cable glands | |
| | 2 of 5 knockouts for NPT ½" | |
| | or rigid metallic conduit | |
| Terminals | Screw terminals for single or 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: | Power supply max. 60 V DC from 2000 m altitude (AMSL) |
| | Relative humidity | 5 ... 95 % |
| Transport and storage | Transport / storage temperature | -30 ... 70 °C / -22 ... 158 °F |
| Conformity | EMC | EN 61326-1, NAMUR NE 21 |
| | Emitted interference | Class A (industrial applications)[1] |
| | Immunity to interference | Industrial applications |
| | RoHS conformity | According to EU directive 2011/65/EU |
| | Electrical safety | EN 61010-1 |
| | | Protection against electric shock by reinforced insulation of all extra-low-voltage circuits against mains |
| Interfaces | HART communication | TAN option FW-E050 |
| | HART version 7.x | Digital communication via FSK modulation of current output 1, device identification, measured values, status, and messages, HART certified: Out 1 passive |
| | Conditions | Output current ≥ 3.8 mA and load resistance ≥ 250 Ω |

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

## Specifications

### pH Measuring Functions

| Memosens input | Input for Memosens sensors (pH, ORP, pH/ORP)<br>Terminals 1 … 5 or MK-MS095X module | | |
|---|---|---|---|
| | Display ranges | Temperature | -20.0 … 200.0 °C / –4 … 392 °F |
| | | pH value | -2.00 … 16.00 |
| | | ORP | -1999 … 1999 mV |
| | | rH value (with pH/ORP sensor) | 0 … 42.5 |
| | Measurement error | Depending on sensor | |

| Module input, analog or ISM[2] | Input for pH and ORP sensors with MK-PH015X module | | |
|---|---|---|---|
| | Measuring ranges | Temperature | -20.0 … 200.0 °C / –4 … 392 °F |
| | | pH value | -2.00 … 16.00 |
| | | ORP | -1999 … 1999 mV |
| | | rH value (with pH/ORP sensor) | 0 … 42.5 |
| | Glass electrode input<br>Ref. temperature<br>25 °C/77 °F | Input resistance | $> 1 \times 10^{12}\ \Omega$ |
| | | Input current | $< 1 \times 10^{-12}$ A |
| | | Impedance range | 0.5 … 1000 MΩ (± 20 %) |
| | Ref. electrode input<br>Ref. temperature<br>25 °C/77 °F | Input resistance | $> 1 \times 10^{10}\ \Omega$ |
| | | Input current | $< 1 \times 10^{-10}$ A |
| | | Impedance range | 0.5 … 200 kΩ (± 20 %) |
| | Measurement error[1][3] | pH value < 0.02, TC: 0.002 pH/K<br>mV value < 1 mV, TC: 0.1 mV/K | |

| Temperature input via module | Pt100/Pt1000/NTC 30 kΩ/NTC 8.55 kΩ/Balco 3 kΩ<br>2-wire connection, adjustable | | |
|---|---|---|---|
| | Measuring ranges | Pt100/Pt1000 | -20.0 … 200.0 °C / –4 … 392 °F |
| | | NTC 30 kΩ | -20.0 … 150.0 °C / –4 … 302 °F |
| | | NTC 8.55 kΩ (Mitsubishi) | -10.0 … 130.0 °C / 14 … 266 °F |
| | | Balco 3 kΩ | -20.0 … 130.0 °C / –4 … 266 °F |
| | Adjustment range | 10 K | |
| | Resolution | 0.1 °C / 0.1 °F | |
| | Measurement error[1][3] | < 0.5 K (< 1 K for Pt100<br>< 1 K for NTC > 100 °C/212 °F) | |

| Temperature compensation | | Off<br>Linear characteristic 00.00 … 19.99 %/K<br>Ultrapure water<br>Table: 0 … 95°C, user-defined in 5 K steps |
|---|---|---|
| | Ref. temperature | 25 °C / 77 °F |

## Specifications

| pH calibration and adjustment | Calibration with automatic buffer recognition (Calimatic) | | |
|---|---|---|---|
| | Manual calibration with entry of individual buffer values | | |
| | Product calibration | | |
| | Data entry of premeasured sensors | | |
| | ISFET zero point (with ISFET sensors) | | |
| | Temperature probe adjustment | | |
| | Calculation of nominal zero point | | |
| | Max. calibration range | Asymmetry potential (zero point) | ±60 mV |
| | | Slope | 80 ... 103 % (47.5 ... 61 mV/pH) |
| | Zero offset | ±750 mV for Memosens ISFET | |
| Buffer sets | Knick CaliMat | 2.00/4.00/7.00/9.00/12.00 | |
| | Mettler-Toledo | 2.00/4.01/7.00/9.21 | |
| | Merck/Riedel | 2.00/4.00/7.00/9.00/12.00 | |
| | DIN 19267 | 1.09/4.65/6.79/9.23/12.75 | |
| | NIST Standard | 1.679/4.005/6.865/9.180 | |
| | NIST technical | 1.68/4.00/7.00/10.01/12.46 | |
| | Hamilton | 2.00/4.01/7.00/10.01/12.00 | |
| | Kraft | 2.00/4.00/7.00/9.00/11.00 | |
| | Hamilton A | 2.00/4.01/7.00/9.00/11.00 | |
| | Hamilton B | 2.00/4.01/6.00/9.00/11.00 | |
| | HACH | 4.01/7.00/10.01 | |
| | Ciba (94) | 2.06/4.00/7.00/10.00 | |
| | WTW techn. buffers | 2.00/4.01/7.00/10.00 | |
| | Reagecon | 2.00/4.00/7.00/9.00/12.00 | |
| | Specifiable buffer set | TAN Option FW-E002 | |
| ORP calibration and adjustment | ORP data entry | | |
| | ORP adjustment | | |
| | ORP check | | |
| | Temperature probe adjustment | | |
| | Max. calibration range | -700 ... 700 ΔmV | |
| Adaptive calibration timer | Interval | 0000 ... 9999 h | |

[1] At rated operating conditions

[2] ISM with TAN option FW-E053

[3] ± 1 count, plus sensor error

## Specifications

### Measuring Functions for Conductivity (Cond)

| | |
|---|---|
| Memosens input | Input for 2-/4-electrode Memosens sensors |
| | Terminals 1 ... 5 or MK-MS095X module |
| | Measurement error    Depending on sensor |
| Module input, analog | Input for analog 2-/4-electrode sensors with MK-COND025X module |

| | |
|---|---|
| | Measuring ranges (conductance limited to 3500 mS) |
| | 2-electrode sensors: 0.2 µS * c ... 200 mS * c |
| | 4-electrode sensors: 0.2 µS * c ... 1000 mS * c |

Measurement error[1)3)] < 1 % of measured value + 0.4 µS * c

| | |
|---|---|
| Temperature input via module | Pt100/Pt1000/Ni100/NTC 30 kΩ/NTC 8.55 kΩ (Betatherm) |

3-wire connection, adjustable

| | | |
|---|---|---|
| Measuring ranges | Pt100/Pt1000 | -50.0 ... 250.0 °C / -58 ... 482 °F |
| | Ni100 | -50.0: ... 180.0 °C / -58 ... 356 °F |
| | NTC 30 kΩ | -20.0 ... 150.0 °C / –4 ... 302 °F |
| | NTC 8.55 kΩ (Mitsubishi) | -10.0 ... 130.0 °C / 14 ... 266 °F |
| Resolution | 0.1 °C / 0.1 °F | |

Measurement error[1) 3)] < 0.5 K (< 1 K for Pt100; < 1 K for NTC > 100 °C/212 °F)

| | | |
|---|---|---|
| Display ranges | Conductivity | 0.000 ... 9.999 µS/cm |
| | | 00.00 ... 99.99 µS/cm |
| | | 000.0 ... 999.9 µS/cm |
| | | 0.000 ... 9.999 mS/cm |
| | | 00.00 ... 99.99 mS/cm |
| | | 000.0 ... 999.9 mS/cm |
| | | 0.000 ... 9.999 S/m |
| | | 00.00 ... 99.99 S/m |
| | Resistivity | 00.00 ... 99.99 MΩ cm |
| | Concentration | 0.00 ... 99.99 % |
| | Salinity | 0.0 ... 45.0‰    (0 ... 35 °C / 32 ... 95 °F) |
| | TDS | 0 ... 5000 mg/l    (10 ... 40 °C / 50 ... 104 °F) |
| | Response time (T90) | Approx. 1 s |

| | |
|---|---|
| USP Function | Water monitoring in the pharmaceutical industry (USP<645>) with additional specifiable limit value (%) |
| | Output via a relay contact |
| Calibration and adjustment | Automatic with standard calibration solution |
| | Calibration by entry of cell constant |
| | Product calibration |
| | Temperature probe adjustment |
| | Permissible cell constant    00.0050 ... 19.9999 cm$^{-1}$ |

[1)] At rated operating conditions

[3)] ± 1 count, plus sensor error

## Specifications

### Measuring Functions for Conductivity (Condl)

| | | |
|---|---|---|
| Digital input | Input for Memosens or SE680X_*K toroidal conductivity sensors | |
| | Terminals 1 ... 5 or MK-MS095X module | |
| | Measurement error   Depending on sensor | |
| Module input, analog | Input for SE655X/SE656X toroidal conductivity sensors with MK-CONDI035X module | |
| | Measurement error[1)3)] 1 % of measured value + 0.005 mS/cm | |
| Temperature input via module | Pt100/Pt1000/NTC 30 kΩ | |
| | 3-wire connection, adjustable | |
| | Measuring ranges   Pt100/Pt1000 | -50.0 ... 250.0 °C / -58 ... 482 °F |
| | NTC 30 kΩ | -20.0 ... 150.0 °C / –4 ... 302 °F |
| | Resolution   0.1 °C / 0.1 °F | |
| | Measurement error[1) 3)] < 0.5 K (< 1 K for Pt100; < 1 K for NTC > 100 °C/212 °F) | |
| Display ranges | Conductivity   000.0 … 999.9 µS/cm | |
| | 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 ... 9.99 % / 10.0 ... 100.0 % | |
| | Salinity   0.0 ... 45.0‰ | (0 ... 35 °C / 32 ... 95 °F) |
| | TDS   0 ... 5000 mg/l | (10 ... 40 °C / 50 ... 104 °F) |
| | Response time (T90)   Approx. 1 s | |
| USP Function | Water monitoring in the pharmaceutical industry (USP<645>) with additional specifiable limit value (%) | |
| | Output via a relay contact | |
| Calibration and adjustment | Automatic with standard calibration solution | |
| | Calibration by input of cell factor | |
| | Product calibration | |
| | Installation factor | |
| | Zero correction | |
| | Temperature probe adjustment | |
| | Permissible cell factor  00.0050 ... 19.9999 cm$^{-1}$ | |
| | Permissible transfer ratio   010.0 ... 199.9 | |
| | Permissible offset   ± 0.5 mS | |
| | Permissible installation factor   0.100 … 5.000 | |

[1)] At rated operating conditions

[3)] ± 1 count, plus sensor error

**Specifications**

Temperature compensation (conductivity)

| | | |
|---|---|---|
| Off | None | |
| Linear | Linear characteristic | 00.00 ... 19.99 %/K |
| | Adjustable reference temperature | |
| NLF [4] | Natural waters acc. to EN 27888 | |
| NaCl [4] | NaCl from 0 (ultrapure water) to 26 wt% (0 ... 120 °C / 32 ... 248 °F) | |
| HCl [4] | Ultrapure water with HCl traces (0 ... 120 °C / 32 ... 248 °F) | |
| $NH_3$ [4] | Ultrapure water with $NH_3$ traces (0 ... 120 °C / 32 ... 248 °F) | |
| NaOH [4] | Ultrapure water with NaOH traces (0 ... 120 °C / 32 ... 248 °F) | |

Concentration determination (conductivity) TAN option FW-E009

| | | |
|---|---|---|
| NaCl | 0 ... 28 wt% | (0 ... 100 °C / 32 ... 212 °F) |
| HCl | 0 ... 18 wt% | (-20 ... 50 °C / -4 ... 122 °F) |
| | 22 ... 39 wt% | (-20 ... 50 °C / -4 ... 122 °F) |
| NaOH | 0 ... 24 wt% | (0 ... 100 °C / 32 ... 212 °F) |
| | 15 ... 50 wt% | (0 ... 100 °C / 32 ... 212 °F) |
| | The range limits apply to 25 °C/77 °F. | |
| $H_2SO_4$ | 0 ... 37 wt% | (-17.8 ... 110 °C /–0.04 ... 230 °F) |
| | 28 ... 88 wt% | (–17.8 ... 115.6 °C /–0.04 ... 240.08 °F) |
| | 89 ... 99 wt% | (-17.8 ... 115.6 °C /–0.04 ... 240.08 °F) |
| | The range limits apply to 27 °C/80.6 °F. | |
| $HNO_3$ | 0 ... 30 wt% | (-20 ... 50 °C / -4 ... 122 °F) |
| | 35 ... 96 wt% | (-20 ... 50 °C / -4 ... 122 °F) |
| $H_2SO_4 \cdot SO_3$ (Oleum) | 12 ... 45 wt% | (0 ... 120 °C / 32 ... 248 °F) |

Specifiable concentration table

[4] Reference temperature 25 °C/77 °F

## Specifications

**Measuring Functions for Conductivity (Dual)**

| | | |
|---|---|---|
| Digital input | Input for Memosens sensors | |
| | Terminals 1 ... 5 and MK-MS095X module | |
| | Also possible: | Memosens sensor and analog sensor via MK COND025X module |
| | Measurement error | Depending on sensor |
| Display ranges | Conductivity | 0.000 ... 9.999 µS/cm |
| | | 00.00 ... 99.99 µS/cm |
| | | 000.0 ... 999.9 µS/cm |
| | | 0000 ... 9999 µS/cm |
| | Resistivity | 00.00 … 99.99 MΩ cm |
| | Response time (T90) | Approx. 1 s |
| Calibration and adjustment | Automatic with standard calibration solution | |
| | Calibration by entry of cell constant | |
| | Product calibration | |
| | Temperature probe adjustment | |
| | Permissible cell constant | 00.0050 ... 19.9999 cm$^{-1}$ |

[1] At rated operating conditions

[3] ± 1 count, plus sensor error

## Specifications

### Measuring Functions for Oxygen

| Memosens input | Standard measurement | Input for amperometric Memosens sensors |
|---|---|---|
| | Trace measurement | Input for amperometric Memosens sensors with TAN option FW-E016 |
| | Terminals 1 ... 5 or MK-MS095X module | |
| | Display range | Temperature: -20.0 ... 150.0 °C / –4 ... 302 °F |
| | Measurement error | Depending on sensor |
| Module input, analog or ISM[2] | Standard | Sensors with MK-OXY045X module: SE706X; InPro 6800; Oxyferm, ISM |
| | Input range | Measuring current -600 ... 2 nA, resolution 10 pA |
| | Measurement error[1] | < 0.5 % of measured value + 0.05 nA + 0.005 nA/K |
| | Trace measurement | Sensors with MK-OXY045X module: SE707X; InPro 6900; Oxyferm/Oxygold, ISM |
| | TAN option FW-E016 | |
| | Input range I | Measuring current -600 ... 2 nA, resolution 10 pA Automatic range selection |
| | Measurement error[1] | < 0.5 % of measured value + 0.05 nA + 0.005 nA/K |
| | Input range II | Measuring current -10000 ... 2 nA, resolution 166 pA Automatic range selection |
| | Measurement error[1] | < 0.5 % of measured value + 0.8 nA + 0.08 nA/K |
| | Polarization voltage | -400 ... -1000 mV    Presetting –675 mV Resolution < 5 mV |
| | Permissible guard current | ≤ 20 µA |
| Temperature input via module | NTC 22 kΩ/NTC 30 kΩ | |
| | 2-wire connection, adjustable | |
| | Measuring range | -20.0 ... 150.0 °C / –4 ... 302 °F |
| | Adjustment range | 10 K |
| | Resolution | 0.1 °C / 0.1 °F |
| | Measurement error[1,3] | < 0.5 K (< 1 K for Pt100; < 1 K for NTC > 100 °C/212 °F) |
| Operating modes | Measurement in gases Measurement in liquids | |

# Stratos Multi E401X

## Specifications

| Measuring ranges | Standard sensor (Memosens, analog, ISM) | |
|---|---|---|
| | Saturation[5] | 0.0 ... 600.0 % |
| | Concentration[5] (dissolved oxygen) | 0.00 ... 99.99 mg/l (ppm) |
| | Volume concentration in gas | 0.00 ... 99.99 vol% |

| | Trace sensor "01" (Memosens, analog, ISM) | |
|---|---|---|
| | Saturation[5] | 0.000 ... 150.0 % |
| | Concentration[5] (dissolved oxygen) | 0000 ... 9999 µg/l / 10.00 ... 20.00 mg/l<br>0000 ... 9999 ppb/10.00 ... 20.00 ppm |
| | Volume concentration in gas | 000.0 ... 9999 ppm / 1.000 ... 50.00 vol% |

| | Trace sensor "001" (analog) | |
|---|---|---|
| | Saturation[5] | 0.000 ... 150.0 % |
| | Concentration[5] (dissolved oxygen) | 0000 ... 9999 µg/l / 10.00 ... 20.00 mg/l<br>0000 ... 9999 ppb/10.00 ... 20.00 ppm |
| | Volume concentration in gas | 000.0 ... 9999 ppm / 1.000 ... 50.00 vol% |

| Input correction | Pressure correction | 0.000 ... 9999 bar/999.9 kPa/145.0 psi (adjustable)<br>manually or externally (via current input 0(4) ... 20 mA) |
|---|---|---|
| | Salinity correction | 0.0 ... 45.0 g/kg |

| Calibration and adjustment | Automatic calibration in air-saturated water<br>Automatic calibration in air<br>Product calibration, saturation<br>Zero correction<br>Temperature probe adjustment | |
|---|---|---|

| Calibration ranges | Standard sensor | |
|---|---|---|
| | Zero point | ± 2 nA |
| | Slope | 25 ... 130 nA (at 25 °C / 77 °F, 1013 mbar) |
| | Trace sensor "01" | |
| | Zero point | ± 2 nA |
| | Slope | 200 ... 550 nA (at 25 °C / 77 °F, 1013 mbar) |
| | Trace sensor "001" | |
| | Zero point | ± 3 nA |
| | Slope | 2000 ... 9000 nA (at 25 °C / 77 °F, 1013 mbar) |

| Calibration timer | 0000 ... 9999 h |
|---|---|

[1] At rated operating conditions

[2] ISM with TAN option FW-E053

[3] ± 1 count, plus sensor error

[5] For temperature range -10 ... 80 °C / 14 ... 176 °F

**Specifications**

**Diagnostics and Statistics**

| Diagnostic functions | Calibration data | Calibration record |
|---|---|---|
| | Device self-test | Automatic memory test (RAM, FLASH, EEPROM) |
| | Display test | Display of all colors |
| | Keypad test | Check of key functions |

| Sensocheck | Delay: approx. 30 s | |
|---|---|---|
| | pH | Automatic monitoring of glass and reference electrode (can be switched off) |
| | Cond | Polarization detection and monitoring of cable capacitance |
| | CondI | Monitoring of primary and secondary coils and lines for open circuit and of primary coil and lines for short circuit |
| | Oxygen | With amperometric sensors only, monitoring of membrane and electrolyte and the sensor wires for short circuits and open circuits (can be switched off) |

| Sensoface | Provides information on the sensor condition (can be switched off; happy, neutral, or sad smileys) | |
|---|---|---|
| | pH | Evaluation of zero/slope, response, calibration interval, Sensocheck, wear |
| | Cond | Evaluation of Sensocheck |
| | CondI | Evaluation of zero point, cell factor, installation factor, Sensocheck |
| | Oxygen | Evaluation of zero point/slope, response time, calibration interval, Sensocheck, and sensor wear for digital sensors |

| Sensor monitor | Display of direct sensor measured values: | |
|---|---|---|
| | pH | pH/voltage/temperature |
| | Cond | Resistance/temperature |
| | CondI | Resistance/temperature |
| | Oxygen | Sensor current/temperature |

| Measurement recorder TAN option FW-E103 | 4-channel measurement recorder with marking of events (failure, maintenance required, function check, limits) | |
|---|---|---|
| | 1 measured value per second | |
| | Storage capacity | 100 entries in device memory, at least 20,000 entries in conjunction with Data Card |
| | Recording | Process variables and span freely adjustable |
| | Type of recording | Current value |
| | Time base | 10 s ... 10 h |

| Logbook | Recording of function activations, appearance and disappearance of warning and failure messages, with date and time, 100 events with date and time, viewable on display | |
|---|---|---|
| | TAN option FW-E104 | At least 20,000 entries in conjunction with Data Card |

# Stratos Multi E401X

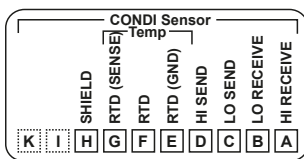## Stratos Multi E401X Terminal Assignments
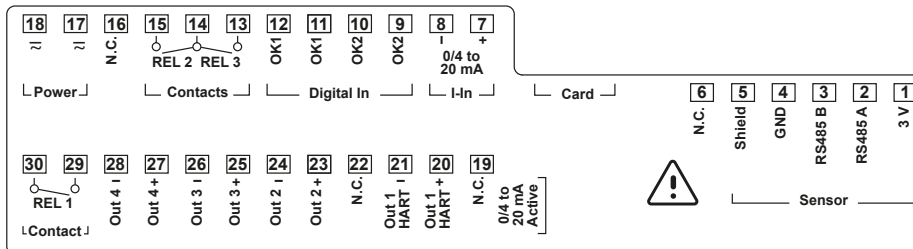


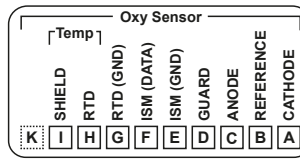## MK-PH 015X Module Terminal Assignments
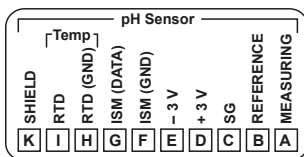


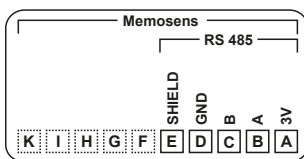## MK-COND 025X Module Terminal Assignments
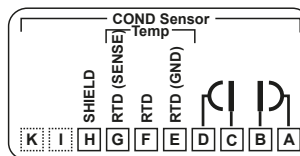


## MK-CONDI 035X Module Terminal Assignments



## MK-OXY 045X Module Terminal Assignments



## MK-MS 095X Module Terminal Assignments

## Easy Installation

- Wall-, pipe-, or panel-mount installation
- All parts are easily accessible
- Large terminal compartment

- Rear unit can be pre-installed
- Also suitable for rigid metallic conduits

- Replaceable plug-in terminals
- Replacement of electronics without new cabling

**ZU 0274 Pipe-Mount Kit**

For mounting on vertical or horizontal posts or pipes.

**ZU 0737 Protective Hood**

Additional protection from direct weather exposure and mechanical damage.
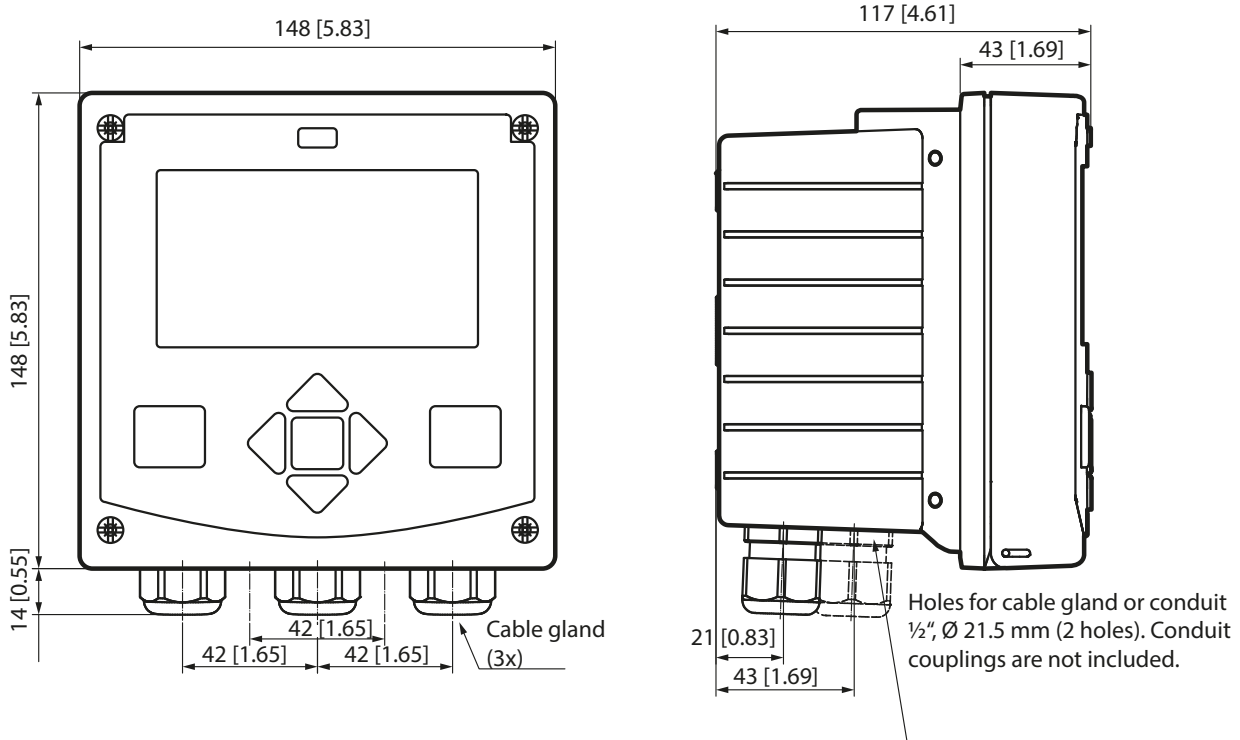
**ZU 0738 Panel-Mount Kit**

For installation in standardized panel cutout 138 x 138 mm (DIN 43700), sealed against panel.
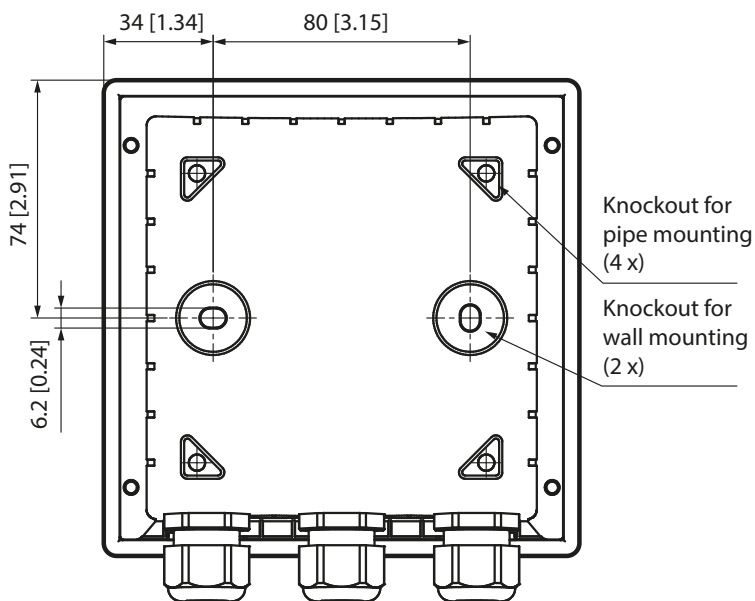
# Stratos Multi

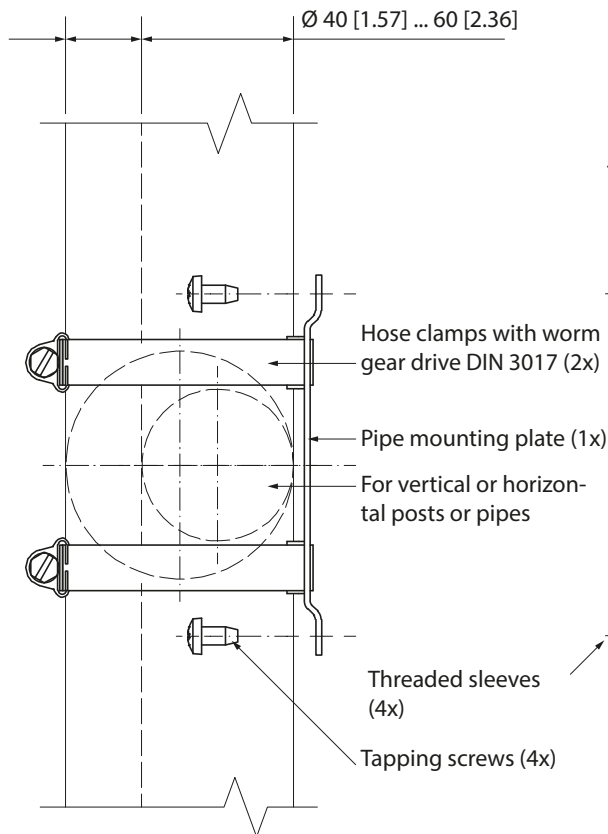**Dimension Drawings – Wall Mounting**

**Front and Side View**

148 [5.83]

148 [5.83]

14 [0.55]

42 [1.65]

42 [1.65]

42 [1.65]

Cable gland (3x)

117 [4.61]

43 [1.69]

21 [0.83]

43 [1.69]

Holes for cable gland or conduit ½", Ø 21.5 mm (2 holes). Conduit couplings are not included.

**Rear View**

34 [1.34]

80 [3.15]

74 [2.91]

6.2 [0.24]

Knockout for pipe mounting (4 x)

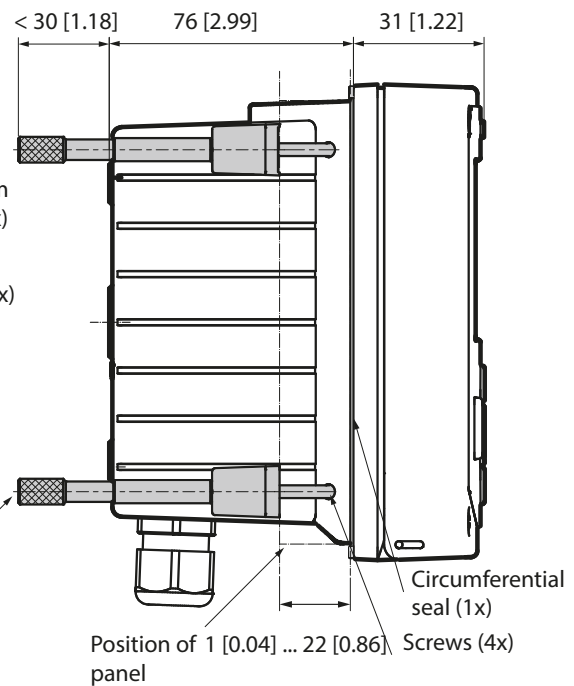Knockout for wall mounting (2 x)

All dimensions in mm [inches]

**Dimension Drawings – Pipe/Panel Mounting**

**ZU 0274 Pipe-Mount Kit**

**ZU 0738 Panel-Mount Kit**
Panel cutout 138 x 138 mm (DIN 43700)

Ø 40 [1.57] ... 60 [2.36]

< 30 [1.18]    76 [2.99]    31 [1.22]

Hose clamps with worm gear drive DIN 3017 (2x)

Pipe mounting plate (1x)

For vertical or horizontal posts or pipes

Threaded sleeves (4x)

Tapping screws (4x)

Position of 1 [0.04] ... 22 [0.86] panel

Circumferential seal (1x)

Screws (4x)

All dimensions in mm [inches]

# Stratos Multi

**Dimension Drawings – Protective Hood**

**ZU 0737 Protective Hood**

199 [7.83]

147 [5.79]

185 [7.28]

91 [3.58]

Stratos Multi

All dimensions in mm [inches]