



## 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. Advanced Process Control with Ethernet interfaces.

### Communicative

PROFINET can be used to transmit comprehensive process and diagnostic data directly to the process control system. Twenty AIs (analog input blocks) are available for this purpose.

### 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. For greater flexibility in use and easy storage.

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

**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.**

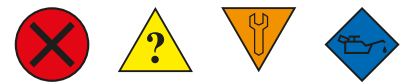
### Allows for Worldwide Use

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.

### 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. They can also be directly transmitted via PROFINET.



# Stratos Multi Advanced Process Control

**PROFINET enables easy integration in globally used process control systems and software architectures.**

**Stratos Multi E461N PROFINET**  
– easy connection to industrial Ethernet networks.

Industrial Ethernet networks enable smart communication via standardized communication interfaces, thereby optimizing process control and value creation throughout a plant system. All that is required is for the PCS, devices, and sensors to be securely interconnected.

**Worldwide, Flexible Use**

Stratos Multi E461N can be used with process control systems from any relevant supplier, such as Siemens, Honeywell, or Rockwell/Allen Bradley.

**PROFINET**

PROFINET is an innovative open standard for Industrial Ethernet and meets all automation engineering requirements.

Stratos Multi E461N complies with all the standards of the PI organization\*) such as IEC 61158 and IEC 61784 for PROFINET communication in industrial networks.

**Easy Integration**

A common and integrated network for all PROFINET devices makes integration easy. Potential sources of errors during installation are minimized thanks to the small number of interfaces. Integration into the process control system is also a quick and easy affair when using the PROFINET GSDML file (device master file).

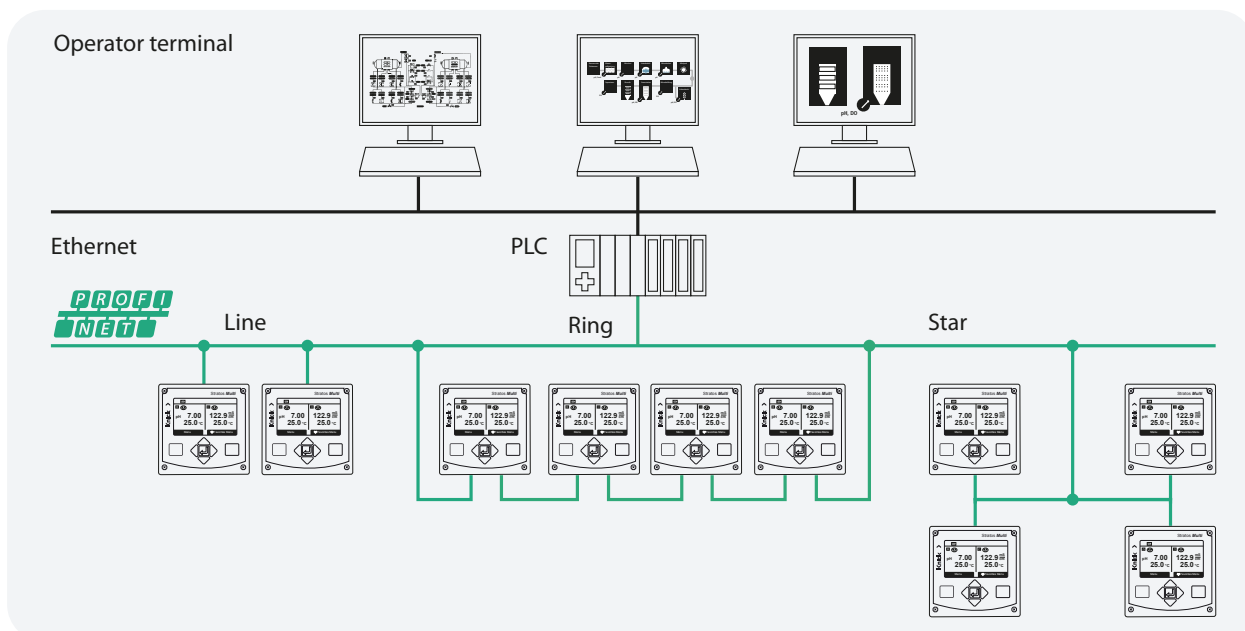
Various connection technologies enable branch, ring, and star wiring.

The device's Ethernet configuration is stored in the IO controller (PLC). If the system is expanded or a device fails, a new transmitter can be incorporated; the configuration is uploaded directly. The device configuration of the measuring point can be stored on the Data Card and uploaded to identical new devices.

\*) Profibus & Profinet International

**Facts and Features**

- Secure digital interconnection of PCS, devices, and sensors via PROFINET
- 1- and 2-channel version
- 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
- Memory cards for data recording or firmware update
- Passcode-controlled access to different levels



### Uninterrupted Data Transmission in Real Time

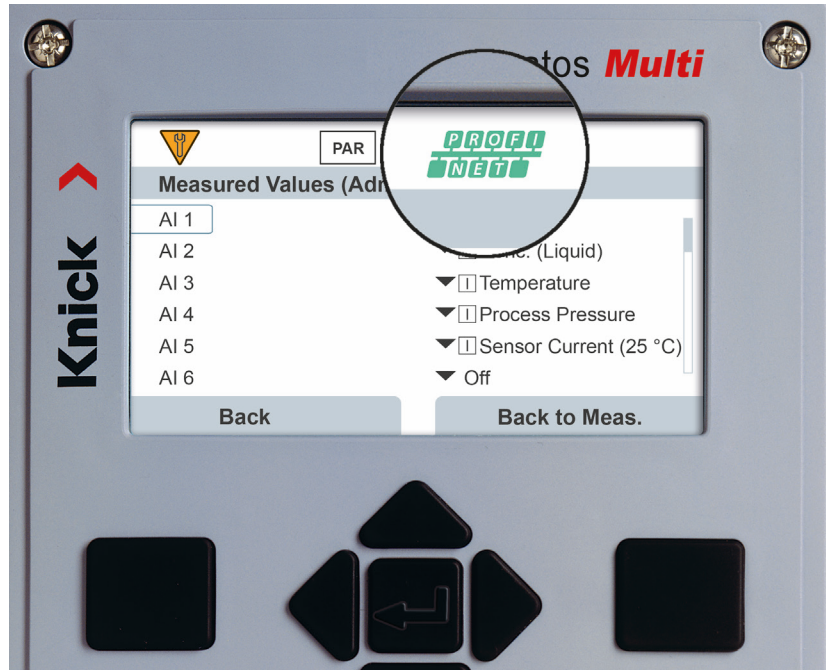
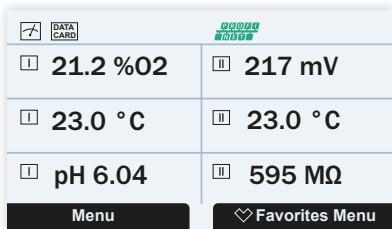
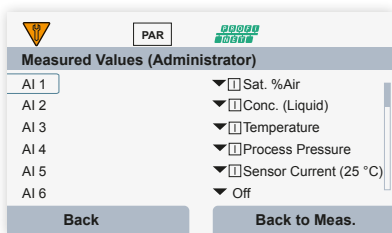
Significant time and cost savings can be achieved thanks to the reduced number of interfaces/gateways (protocol converters). This enables direct access to device and sensor data.

### Optimized Process Control

The wealth of device and sensor data can be used to determine the efficiency of the plant, at the same time allowing for comparisons with other production sites.

### Transfer of up to 20 values, freely configurable measured or diagnostics data as AI 1-20 (analog input blocks), also in multi-channel mode

Example of pH/ORP measurement: Measured values such as pH value, pH voltage, ORP voltage, etc. Calibration values such as zero point, slope, ORP offset, etc. Diagnostics data such as Sensoface, wear, remaining lifetime, operating time, calibration timer, SIP counter, CIP counter, etc.



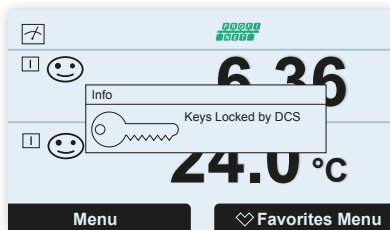
### Smart Diagnostics Management

Seamless display of all messages via PROFINET. Standard diagnostics data is transferred directly from the transmitter to the process control system in accordance with the specifications of the PI organization<sup>\*)</sup>, as is the extended diagnostics data from the sensor and transmitter (NAMUR NE 107).

### Increased Safety

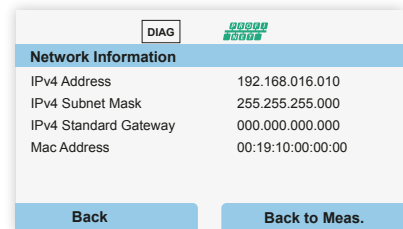
Access is controlled directly within the device on the basis of different passcode levels.

Local operation can be disabled using the key lock function, which can also be used for access control directly via the PLC.



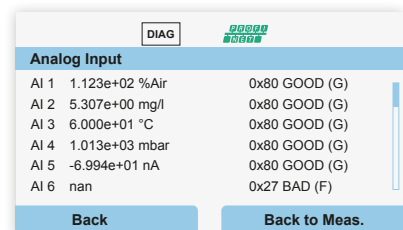
### Network Information

All Ethernet communication is monitored directly in the Stratos Multi transmitter via PROFINET.



The PROFINET Monitor supplies a summary of all values from cyclic data exchange. All analog inputs and outputs are shown.

AIs: Values from transmitter to PCS  
AOs: Values from PCS to transmitter



<sup>\*)</sup> Profibus & Profinet International

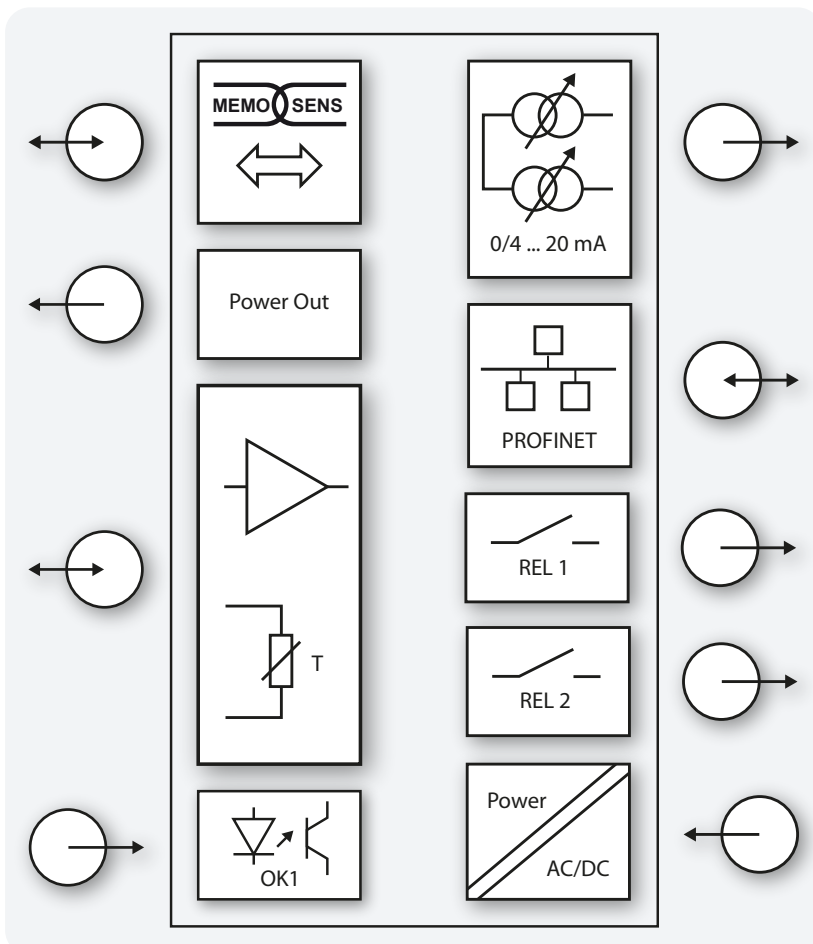
# Stratos Multi Digital Intelligence.



### Easy Handling

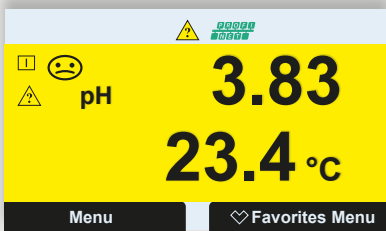
PROFINET communication can be used to perform product calibration via the PCS. The sensor can therefore be safely calibrated when installed.

### System Overview

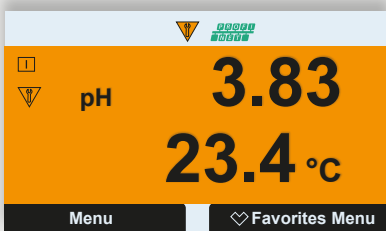




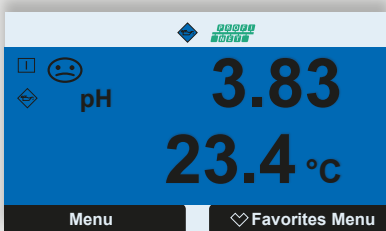
RED: NE 107 "Failure" status message



YELLOW: NE 107 "Out of Specification" status message



ORANGE: NE 107 "Function Check" status message



BLUE: NE 107 "Maintenance Required" status message

**Reliable operation in all industrial environments with premium EPDM keypad. More dependable than a touchscreen. Rugged and UV-resistant housing with IP67. 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 IP66/67, 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.





# Stratos Multi

## The Multiparameter Transmitter

### Smart Diagnostics Management

At a glance, users receive information on the sensor's condition and the remaining lifetime of the connected sensors.

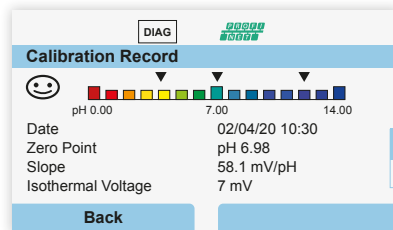
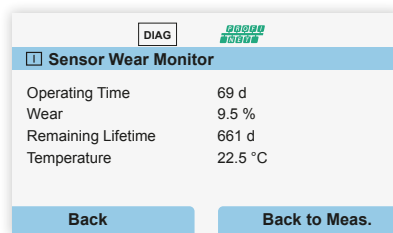
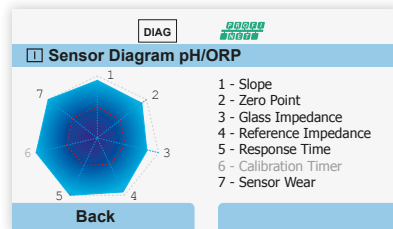
Alongside CIP, SIP, autoclaving counters, and the display elements noted above, a "sensor diagram" facilitates sensor monitoring. All the relevant sensor data, such as zero point, slope, life, calibration timer, impedance, and response times are clearly presented.

### Optimized Maintenance Intervals

Efficient adjustment of calibration intervals using the adaptive calibration timer.

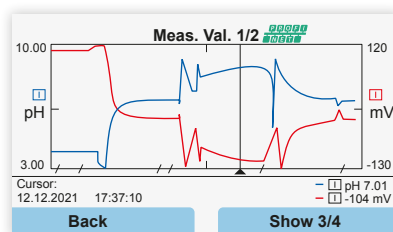
### Seamless Data Recording

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.



**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



### 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, logbook, and device configurations
- FW Update Card: Firmware update with new features
- Firmware Repair Card: Easy on-site update of the device firmware for troubleshooting in case of warranty claims.



**Product Line**

**Stratos Multi**

Stratos Multi 4-wire, multiparameter, digital basic unit, 1-channel with PROFINET communication

Order no.

E461N

Stratos Multi 4-wire, multiparameter, digital basic unit, 2-channel with PROFINET communication (incl. MK-MS-095N Memosens measuring module)

E461N.010

**Measuring Module for 2-Channel Version Memosens**

Order no.

Memosens measuring module, 2nd channel multiparameter

MK-MS095N

**Analog Measuring Modules**

Order no.

pH/ORP measuring module

MK-PH015N

Module for contacting conductivity measurement

MK-CONDO25N

Module for toroidal conductivity measurement

MK-CONDI035N

Oxygen measuring module

MK-OXY046N

Dual conductivity measuring module, 2-channel

MK-CC065N

**Ethernet Connection**

Order no.

RJ45 socket

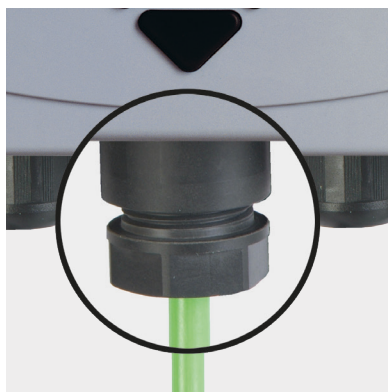
ZU1072

Adapter cable RJ45/M12 D-type

ZU1073

Y cable RJ45/M12 D-type

ZU1139



The ZU1072 RJ45 socket makes it possible to connect an Ethernet cable to Stratos Multi E461N



The ZU1073 adapter cable can be used to connect a network cable with M12 D-type connector to Stratos Multi E461N.



The Y cable connects an RJ45 socket on the Stratos Multi E461N to two D-coded M12 sockets and is used for PROFINET data transmission.

# Stratos Multi

## Product Line

<b>Mounting Kits</b>		Order no.
Pipe-mount kit		ZU0274
Panel-mount kit		ZU0738
Protective hood		ZU0737
<b>Add-On Functions (Firmware via TAN)</b>		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/Pfaunder sensors		FW-E017
Calculation blocks		FW-E020
Digital ISM sensors		FW-E053
Parameter sets 1 to 5		FW-E102
Measurement recorder		FW-E103
Logbook, in conjunction with Data Card (Data Card ZU1080-S-N-D not included in FW-E104)		FW-E104
Firmware update (FW Update Card ZU1080S-N-U not included in FW-E106)		FW-E106
<b>Test Sockets, Connectors, Cables</b>	Length	Order no.
VP8 connector		ZU0721
M12 socket, 8-pin		ZU0860
VP8 ST cable (both ends with VP socket)	3 m	ZU0710
	5 m	ZU0711
	10 m	ZU0712
M12 extension cord, 8-pin	10 m	CA/M12-010M12-8
Inspection certificate 3.1		ZU0268/analysis

## Memory Cards for Stratos Multi

		ZU 1080-	S	-	N	-	
Card version	Data Card Firmware Update Card Firmware Repair Card						D U R
		ZU 1080-	S	-	N	-	
Card version	Custom Firmware Update Card Custom Firmware Repair Card						S V
Firmware versions	Device firmware						* * *



**Specifications**

**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

**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

Sensor input 2

for Memosens module or analog/ISM<sup>1</sup> measuring module, galvanically isolated  
Data in/out Asynchronous interface RS-485, 9600 Bd  
Power supply 3.08 V (3.02 ... 3.22 V)/10 mA, Ri < 1 Ω, short-circuit-proof

Input OK1

Galvanically isolated (optocoupler)  
Switching between parameter sets A/B, flow measurement, function check  
Parameter set Relay input 0 ... 2 V (AC/DC) parameter set A  
switching Relay input 10 ... 30 V (AC/DC) parameter set B  
Control current 5 mA

Flow Pulse input for flow measurement  
0 ... 100 pulses per second  
Display, 00.0 ... 99.9 l/h  
Message via 22 mA or relay contact

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<sup>3</sup>  
Out 1, Out 2

0/4 ... 20 mA, floating, load resistance up to 500 Ω  
Galvanically connected  
When using the current outputs, neither Ethernet nor the relay contacts can be used.  
Failure message 3.6 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<sub>1</sub> filter, filter time constant 0 ... 120 s  
Measurement error<sup>2</sup> < 0.25 % of current value + 0.025 mA

# Stratos Multi

## Specifications

Contact REL1, REL2 <sup>4)</sup>	Relay contact, floating
	Contact rating with ohmic load AC < 30 V <sub>rms</sub> / < 15 VA 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, 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 <sub>rms</sub> / < 15 VA 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 (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
Service functions in the Maintenance menu	Sensor monitor Direct display of measured values (mV, temperature, resistance, ...)
	Current source <sup>3)</sup> Current specifiable for output 1 and 2 (00.00 ... 22.00 mA)
	Relay test <sup>4)</sup> Manual control of relay contacts

<sup>1)</sup> ISM with TAN option FW-E053

<sup>2)</sup> At rated operating conditions

<sup>3)</sup> Not if PROFINET communication is enabled

<sup>4)</sup> Only if PROFINET communication is enabled

## Specifications

### Device

Product name	Stratos Multi	
Product type	E461N	
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	If used exclusively: At least 20,000 entries
	Measurement recorder	If used exclusively: At least 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 status display: 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, power reserve approx. 1 day	
Housing	Molded enclosure	Glass fiber reinforced Front unit material: PBT Rear unit material: PC
	Ingress 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)
	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

## Specifications

Cable glands	5 knockouts for M20 x 1.5 cable glands 2 of 5 knockouts for NPT 1/2" or rigid metallic conduit (RMC)	
Terminals	Screw terminals	Single or stranded wires up to 2.5 mm <sup>2</sup>
	Tightening torque	min. 0.5 Nm / max. 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 ... 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) <sup>1)</sup>
	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	Communication interface	RJ45
	Number of Ethernet interfaces	2, via RJ45 to Y cable 2x M12 (ZU1139)
	Device type	IO device
	IO specification	V2.3
	Conformance class	Class B
	Network load class	2
	Recommended cable	CAT 5, CAT 5e, CAT 6
	Vendor ID	97 (= Knick)
	Device ID	0x0003
	Min. cycle times	1 ms
	Identification & maintenance	I&M1-3, 0
	Number of AIs	20
	Number of AOs	1
Number of DOs	2	

<sup>1)</sup> 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)

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<sup>1)</sup>

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 (with pH/ORP sensor)	0 ... 42.5

Glass electrode input	Input resistance	$> 1 \times 10^{12} \Omega$
	Input current	$< 1 \times 10^{-12} \text{ A}$
	Impedance range	0.5 ... 1000 M $\Omega$ ( $\pm 20 \%$ )

Reference electrode input	Input resistance	$> 1 \times 10^{10} \Omega$
	Input current	$< 1 \times 10^{-10} \text{ A}$
	Impedance range	0.5 ... 200 k $\Omega$ ( $\pm 20 \%$ )

Measurement error<sup>2)3)</sup> pH value  $< 0.02$ , TC: 0.002 pH/K  
 mV value  $< 1 \text{ mV}$ , TC: 0.1 mV/K

Temperature input via module

Pt100/Pt1000/NTC 30 k $\Omega$ /NTC 8.55 k $\Omega$ /Balco 3 k $\Omega$ 

2-wire connection, adjustable

Measuring ranges	Pt100/Pt1000	-20.0 ... 200.0 °C / -4 ... 392 °F
	NTC 30 k $\Omega$	-20.0 ... 150.0 °C / -4 ... 302 °F
	NTC 8.55 k $\Omega$ (Mitsubishi)	-10.0 ... 130.0 °C / 14 ... 266 °F
	Balco 3 k $\Omega$	-20.0 ... 130.0 °C / -4 ... 266 °F

Adjustment range 10 K

Resolution 0.1 °C / 0.1 °F

Measurement error<sup>2)3)</sup>  $< 0.5 \text{ K}$  ( $< 1 \text{ K}$  for Pt100)  
 $< 1 \text{ K}$  for NTC  $> 100 \text{ °C}/212 \text{ °F}$ )

Temperature compensation Off  
 Linear characteristic 00.00 ... 19.99 %/K  
 Ultrapure water  
 Table: 0 ... 95°C, user-defined in 5 K steps

Ref. temperature 25 °C / 77 °F

# Stratos Multi

## 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 $\pm 60$ mV
		(zero point)
		Slope 80 ... 103 % (47.5 ... 61 mV/pH)
	Zero offset $\pm 750$ 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 $-700 \dots 700$ $\Delta$ mV	
Adaptive calibration timer	Interval	0000 ... 9999 h

<sup>1)</sup> ISM with TAN option FW-E053

<sup>2)</sup> At rated operating conditions

<sup>3)</sup>  $\pm 1$  count, plus sensor error



**Specifications**

**Measuring Functions for Conductivity (Contacting)**

Memosens input	Input for Memosens sensors Terminals 1 ... 5 or MK-MS095N module Measurement error Depending on sensor	
Module input, analog	Input for analog 2-electrode or 4-electrode sensors with MK-COND025N module Measuring ranges 2-electrode sensors: 0.2 $\mu\text{S} \cdot \text{cm}$ ... 200 $\text{mS} \cdot \text{cm}$ (conductance limited to 3500 mS) 4-electrode sensors: 0.2 $\mu\text{S} \cdot \text{cm}$ ... 1000 $\text{mS} \cdot \text{cm}$ Measurement error <sup>1) 2)</sup> < 1 % of measured value + 0.4 $\mu\text{S} \cdot \text{cm}$	
Temperature input via module	Pt100/Pt1000/Ni100/NTC 30 k $\Omega$ /NTC 8.55 k $\Omega$ (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 k $\Omega$ -20.0 ... 150.0 °C / -4 ... 302 °F NTC 8.55 k $\Omega$ (Mitsubishi) -10.0 ... 130.0 °C / 14 ... 266 °F Resolution 0.1 °C / 0.1 °F Measurement error <sup>1) 2)</sup> < 0.5 K (< 1 K for Pt100; < 1 K for NTC > 100 °C/212 °F)	
Display ranges	Conductivity 0.000 ... 9.999 $\mu\text{S}/\text{cm}$ 00.00 ... 99.99 $\mu\text{S}/\text{cm}$ 000.0 ... 999.9 $\mu\text{S}/\text{cm}$ 0.000 ... 9.999 $\text{mS}/\text{cm}$ 00.00 ... 99.99 $\text{mS}/\text{cm}$ 000.0 ... 999.9 $\text{mS}/\text{cm}$ 0.000 ... 9.999 S/m 00.00 ... 99.99 S/m Resistivity 00.00 ... 99.99 M $\Omega$ 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) Temperature -20.0 ... 150.0 °C / -4 ... 302 °F Response time (T <sub>90</sub> ) 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 $\text{cm}^{-1}$	

<sup>1)</sup> At rated operating conditions

<sup>2)</sup> ± 1 count, plus sensor error

# Stratos Multi

## Specifications

### Measuring Functions for Conductivity (Inductive)

Digital input	Input for Memosens or SE670/SE680K toroidal conductivity sensors
	Terminals 1 ... 5 or MK-MS095N module
	Measurement error Depending on sensor
Module input, analog	Input for SE655/656/660 toroidal conductivity sensors with MK-CONDI035N module
	Measurement error <sup>1)2)</sup> 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 <sup>1)2)</sup> < 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)
	Temperature -20.0 ... 150.0 °C / -4 ... 302 °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 <sup>-1</sup>
	Permissible transfer ratio 010.0 ... 199.9
	Permissible offset ± 0.5 mS
	Permissible installation factor 0.100 ... 5.000

**Specifications**

Temperature compensation (conductivity)	Off	None
	Linear	Linear characteristic 00.00 ... 19.99 %/K Adjustable reference temperature Reference temperature 25 °C/77 °F
	NLF	Natural waters acc. to EN 27888
	NaCl	NaCl from 0 (ultrapure water) to 26 wt% (0 ... 120 °C / 32 ... 248 °F)
	HCl	Ultrapure water with HCl traces (0 ... 120 °C / 32 ... 248 °F)
	NH <sub>3</sub>	Ultrapure water with NH <sub>3</sub> traces (0 ... 120 °C / 32 ... 248 °F)
	NaOH	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)
	H <sub>2</sub> SO <sub>4</sub>	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)
	HNO <sub>3</sub>	0 ... 30 wt%	(-20 ... 50 °C / -4 ... 122 °F)
		35 ... 96 wt%	(-20 ... 50 °C / -4 ... 122 °F)
H <sub>2</sub> SO <sub>4</sub> • SO <sub>3</sub> (Oleum)	12 ... 45 wt%	(0 ... 120 °C / 32 ... 248 °F)	

Specifiable concentration table

<sup>1)</sup> At rated operating conditions

<sup>2)</sup> ± 1 count, plus sensor error

# Stratos Multi

## Specifications

### Measuring Functions for Conductivity (Dual)

Memosens input	<p>Input for Memosens sensors</p> <p>Terminals 1 ... 5 and MK-MS095N module</p> <p>Also possible: Memosens sensor and analog sensor via MK-COND025N module</p> <p>Measurement error Depending on sensor</p>
MK-CC05N module input, analog	<p>Input for two analog 2-electrode sensors</p> <p>Measuring range 0 ... 30000 <math>\mu\text{S} \cdot \text{cm}</math></p> <p>Measurement error<sup>1) 2)</sup> &lt; 1 % of measured value + 0.4 <math>\mu\text{S} \cdot \text{cm}</math></p> <p>Connection length Max. 3 m</p>
Temperature input via module	<p>Pt1000, 2-wire connection, adjustable</p> <p>Measuring range -50.0 ... 200.0 °C / -58 ... 392 °F</p> <p>Resolution 0.1 °C / 0.1 °F</p> <p>Measurement error<sup>1) 2)</sup> &lt; 0.5 K (&lt; 1 K at &gt; 100 °C / 212 °F)</p>
Display ranges	<p>Conductivity 0.000 ... 9.999 <math>\mu\text{S}/\text{cm}</math></p> <p>00.00 ... 99.99 <math>\mu\text{S}/\text{cm}</math></p> <p>000.0 ... 999.9 <math>\mu\text{S}/\text{cm}</math></p> <p>0000 ... 9999 <math>\mu\text{S}/\text{cm}</math></p> <p>Resistivity 00.00 ... 99.99 <math>\text{M}\Omega \cdot \text{cm}</math></p> <p>Response time (T90) Approx. 1 s</p>
Calibration and adjustment	<p>Automatic with standard calibration solution</p> <p>Calibration by entry of cell constant</p> <p>Product calibration</p> <p>Temperature probe adjustment</p> <p>Permissible cell constant 00.0050 ... 19.9999 <math>\text{cm}^{-1}</math></p>

<sup>1)</sup> At rated operating conditions

<sup>2)</sup>  $\pm 1$  count, plus sensor error

**Specifications**

**Measuring Functions for Oxygen**

Digital input, Memosens

Standard Input for amperometric Memosens sensors measurement

Trace measurement 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, SE 740

Input for SE 740 optical oxygen sensor

Trace measurement TAN option FW-E016

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<sup>1)</sup>

Standard Sensors SE 706  
InPro6800; Oxyferm

Input range Measuring current -600 ... 2 nA, resolution 10 pA

Measurement error<sup>2)</sup> < 0.5 % of measured value + 0.05 nA + 0.005 nA/K

Trace measurement Sensors SE 707

TAN option FW-E016 InPro 6900

Oxyferm/Oxygold

Input range I Measuring current -600 ... 2 nA, resolution 10 pA  
Automatic range selection

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

## Specifications

Measuring ranges	Standard sensor (Memosens, SE740, digital, analog)	
	Saturation <sup>4)</sup>	0.0 ... 600.0 %
	Concentration <sup>4)</sup> (dissolved oxygen)	0.00 ... 99.99 mg/l (ppm)
	Volume concentration in gas	0.00 ... 99.99 vol%
	Trace sensor "01" (Memosens, SE740, digital, analog)	
	Saturation <sup>4)</sup>	0.000 ... 150.0 %
	Concentration <sup>4)</sup> (dissolved oxygen)	0000 ... 9999 µg/l / 10.00 ... 20.00 mg/l 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 <sup>4)</sup>	0.000 ... 150.0 %
	Concentration <sup>4)</sup> (dissolved oxygen)	0000 ... 9999 µg/l / 10.00 ... 20.00 mg/l 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) 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 Automatic calibration in air Saturation product calibration (with offset in SE740) Zero correction 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	

<sup>1)</sup> ISM with TAN option FW-E053

<sup>2)</sup> At rated operating conditions

<sup>3)</sup> ± 1 count, plus sensor error

<sup>4)</sup> For temperature range -10 ... 80 °C / 14 ... 176 °F



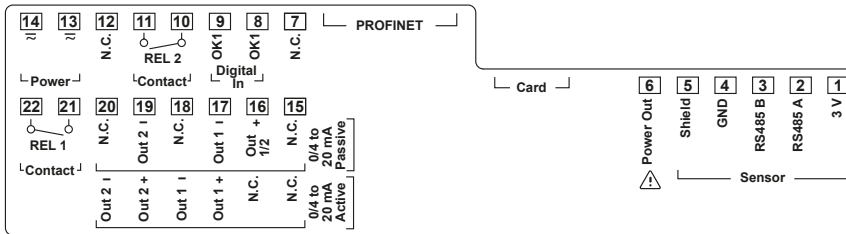
**Specifications**

**Diagnostics and Statistics**

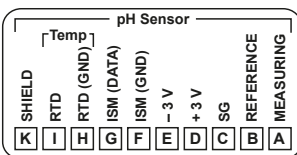
Diagnostic functions	Calibration data	Calibration record
	Device self-test	Automatic memory test (RAM, FLASH, EEPROM)
	Display test	Display of all colors
	Keypad test	Check of key functions
Sensocheck	Delay: approx. 30 s	
	pH	Automatic monitoring of glass and reference electrode (can be switched off)
	Cond	Polarization detection and monitoring of cable capacitance
	Condl	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
	Condl	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
	Condl	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, limit values)	
	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

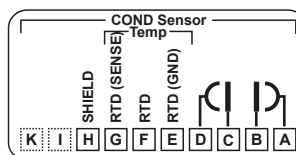
## Stratos Multi E461 N Terminal Assignments



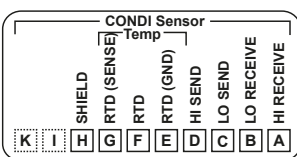
## MK-PH 015N Module Terminal Assignments



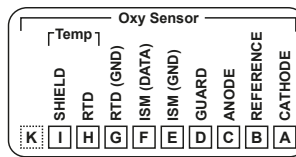
## MK-COND 025N Module Terminal Assignments



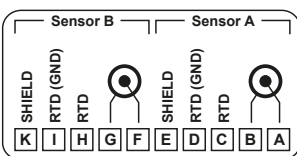
## MK-CONDI 035N Module Terminal Assignments



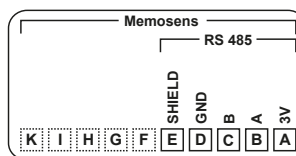
## MK-OXY 046N Module Terminal Assignments



## MK-CC 065N Module Terminal Assignments



## MK-MS 095N 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

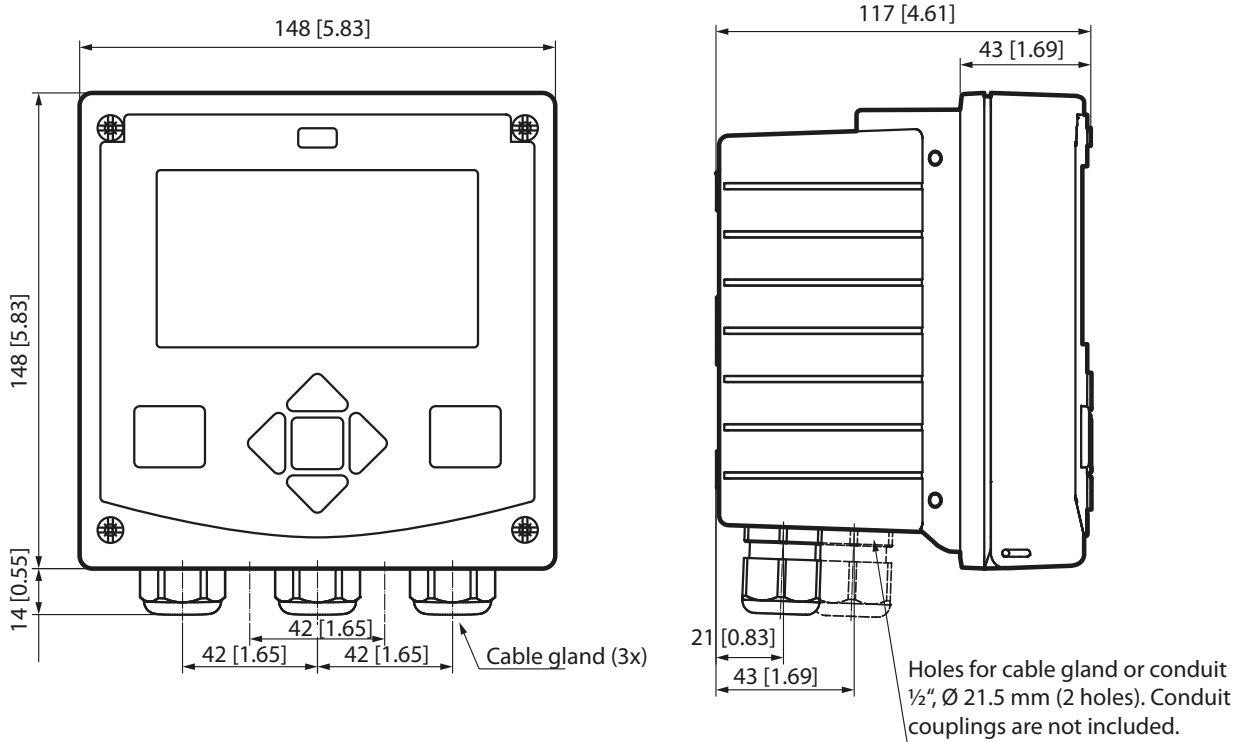
For installation in standardized panel cutout 138 x 138 mm (DIN 43700), sealed against panel.



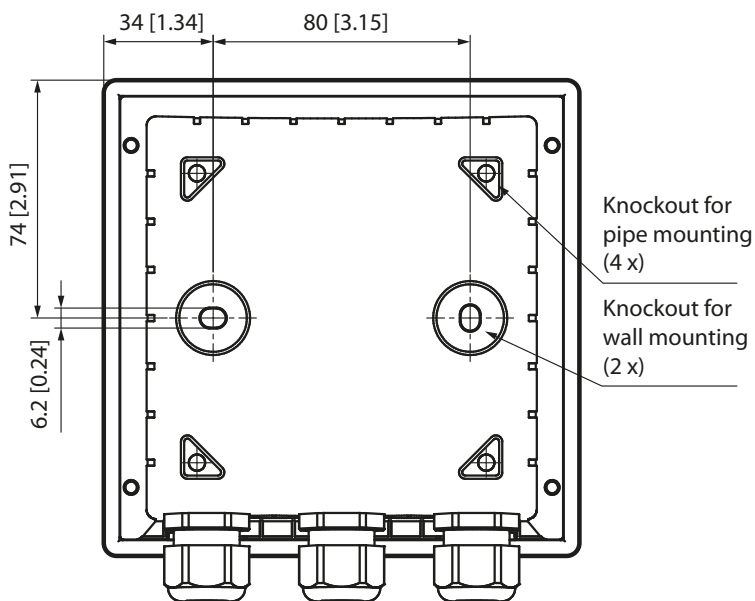
# Stratos Multi

## Dimension Drawings – Wall Mounting

### Front and Side View



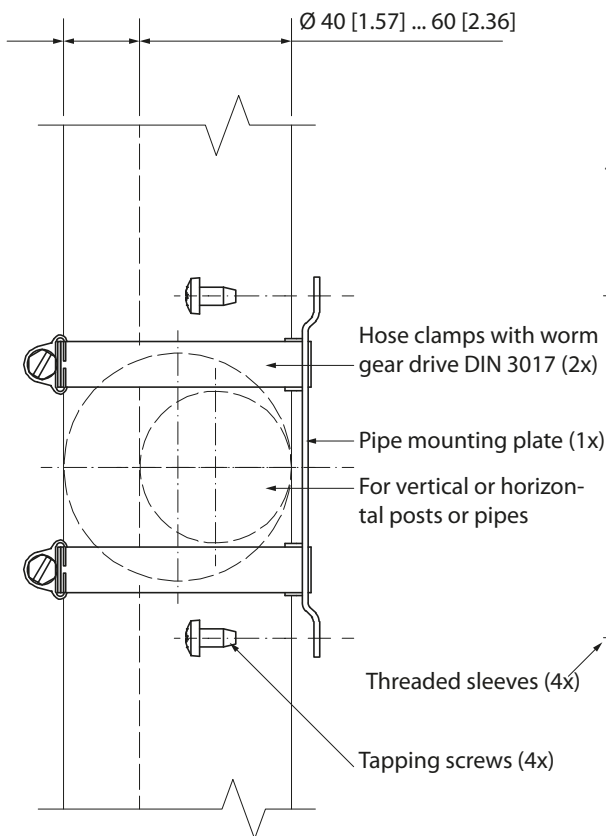
### Rear View



All dimensions in mm [inches]

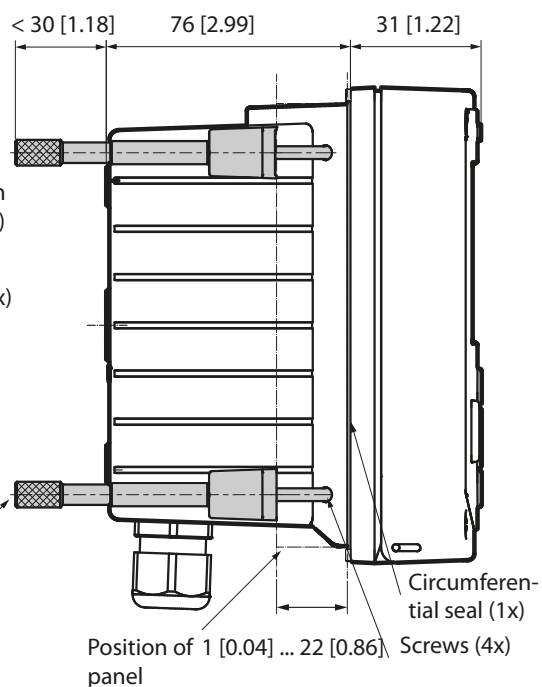
Dimension Drawings – Pipe/Panel Mounting

ZU 0274 Pipe-Mount Kit



ZU 0738 Panel-Mount Kit

Panel cutout 138 x 138 mm (DIN 43700)



All dimensions in mm [inches]

# Stratos Multi

## Dimension Drawings – Protective Hood

### ZU 0737 Protective Hood

