Industrial Transmitters

EtherNet/IP™

3 Year Warranty!

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

EtherNet/IP 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.

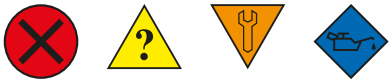
Allows for Worldwide Use

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 EtherNet/IP.



Stratos Multi
Advanced Process Control

EtherNet/IP enables easy integration in globally used process control systems and software architectures.

Stratos Multi E471N EtherNet/IP – 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 E471N can be used with process control systems from any relevant supplier, such as Honeywell or Rockwell/Allen Bradley.

EtherNet/IP

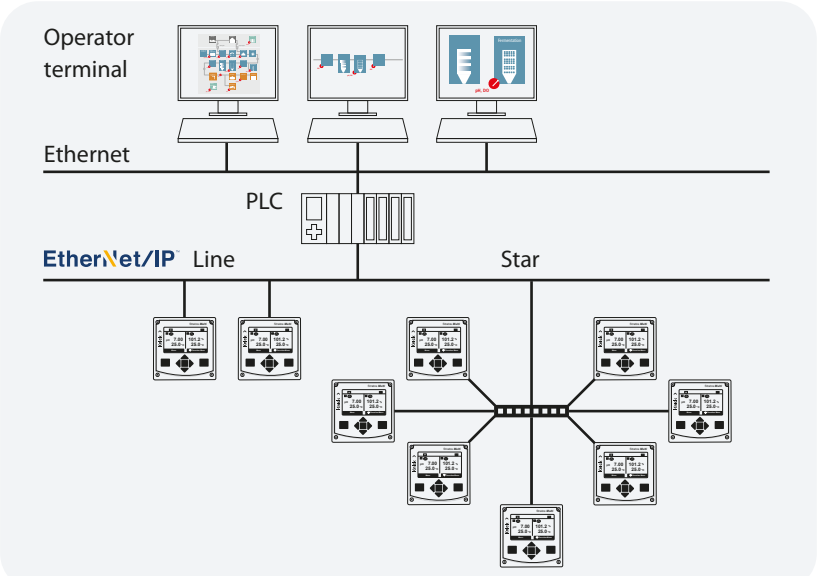
EtherNet/IP is an innovative open standard for industrial Ethernet and meets all automation engineering requirements.
Stratos Multi E471N complies with all ODVA® (Open DeviceNet Vendor Association) standards, such as IEC 61158 and IEC 61784 for EtherNet/IP communication in industrial networks.

Easy Integration

A common and integrated network for all EtherNet/IP 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 EtherNet/IP EDS file for commissioning.

Various connection technologies enable both branch 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.



Facts and Features

- Secure digital interconnection of PCS, devices, and sensors via EtherNet/IP
- 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

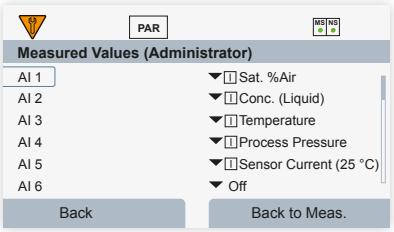
Significant time and cost savings can be achieved thanks to the reduced number of interfaces/gateways (protocol converters). This enables direct access to device and sensor data.

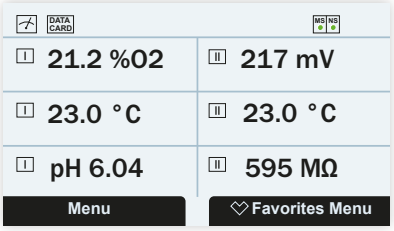
Optimized Process Control

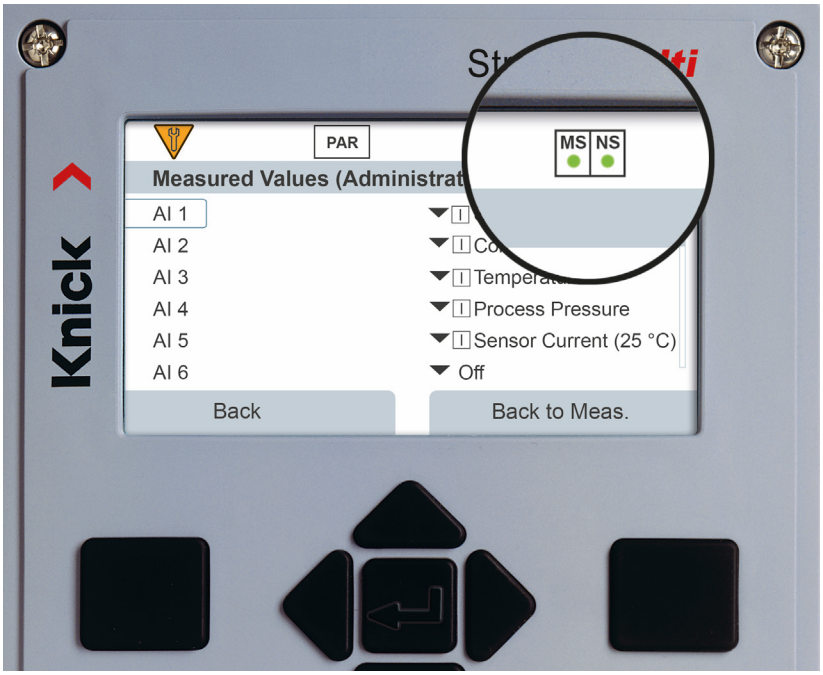
The wealth of device and sensor data can be used to determine the efficiency of the plant, at the same time allowing for comparisons with other production sites.

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.





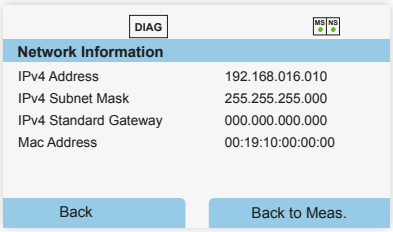


Smart Diagnostics Management

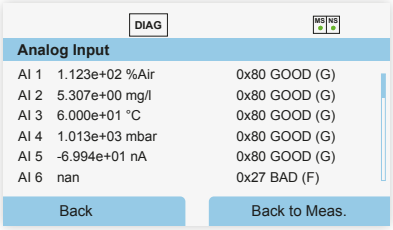
Seamless display of all messages via EtherNet/IP. Standard diagnostics data is transferred directly from the transmitter to the process control system in accordance with ODVA specifications, as is the extended diagnostics data from the sensor and transmitter (NAMUR NE 107).

Network Information

All Ethernet communication is monitored directly in the Stratos Multi transmitter via EtherNet/IP.



The EtherNet/IP 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

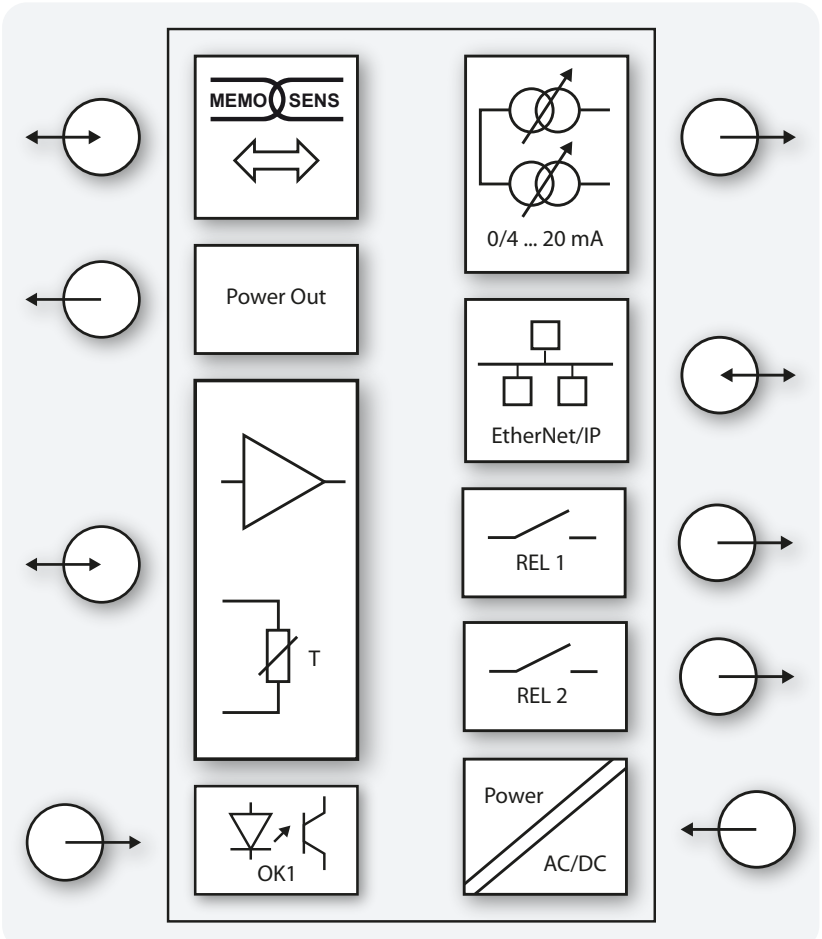


Stratos Multi
Digital Intelligence.

Easy Handling

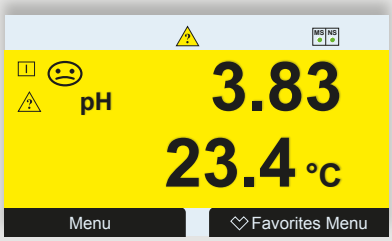
EtherNet/IP communication can be used to perform product calibration via the PCS. The sensor can therefore be safely calibrated when installed.

System Overview

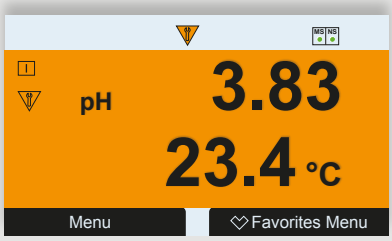


Industrial Transmitters

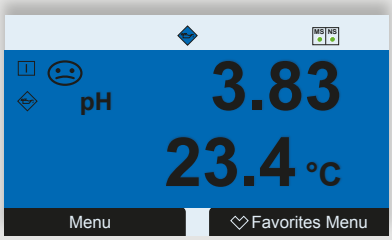
RED: NE 107 "Failure" status message



YELLOW: NE 107 "Out of Specification" status message



ORANGE: NE 107 "Function Check" status message



BLUE: NE 107 "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 NE 107 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.

MEMOSENS

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.

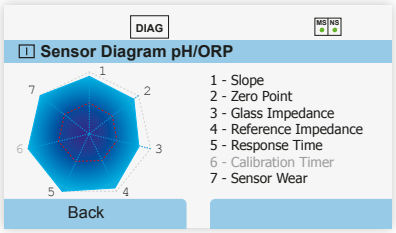
Alongside CIP, SIP, autoclaving counters, and the display elements noted above, a "sensor diagram" facilitates sensor monitoring. All the relevant sensor data, such as zero point, slope, life, calibration timer, impedance, and response times are clearly presented.

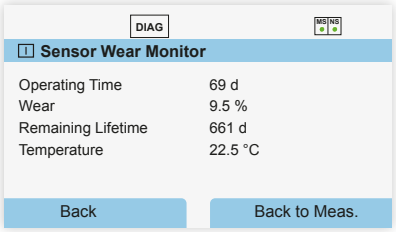
Optimized Maintenance Intervals

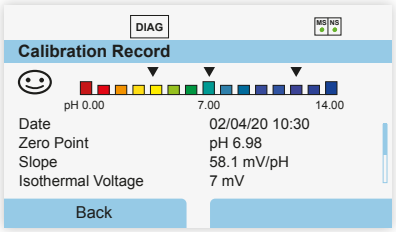
Efficient adjustment of calibration intervals using the adaptive calibration timer.

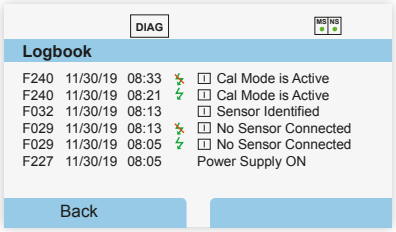
Seamless Data Recording

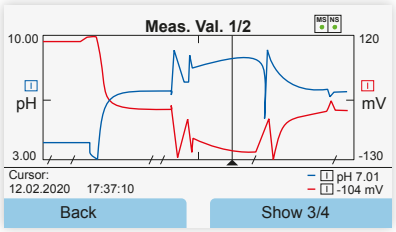
Messages and statuses can be recorded in the logbook and displayed on the screen. The measurement recorder enables full data recording, including a graphical display. All data can be stored on the Data Card.











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	Order no.
Stratos Multi 4-wire, multiparameter, digital basic unit, 1-channel with EtherNet/IP communication	E471N
Stratos Multi 4-wire, multiparameter, digital basic unit, 2-channel with EtherNet/IP communication (incl. MK-MS-095N Memosens measuring module)	E471N.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-COND025N
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	ZU 1072
Adapter cable RJ45/M12 D-type	ZU 1073

The ZU 1072 RJ45 socket makes it possible to connect an Ethernet cable to Stratos Multi E471N

The ZU 1073 adapter cable can be used to connect a network cable with M12 D-type connector to Stratos Multi E471N.

Stratos Multi

Product line

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
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)	FW-E104
Firmware update	FW-E106

Test Sockets, Connectors, Cables	Length	Order no.
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/analysis

Memory Cards for Stratos Multi

		ZU 1080– S – N –
Card version	Data Card	D
	Firmware Update Card	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		*	*	*

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[1] 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 switching	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	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[3] 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_1 filter, filter time constant 0 ... 120 s
	Measurement error[2]	< 0.25 % of current value + 0.025 mA

Specifications

Contact REL1, REL2[4]	Relay contact, floating	
	Contact rating with ohmic load	AC < 30 V_{rms} / < 15 VA DC < 30 V / < 15 W
	Max. switching current	3 A, max. 25 ms
	Max. continuous current	500 mA
	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_{rms} / < 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	Min/max contacts, floating, interconnected	
	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[3]	Current specifiable for output 1 and 2 (00.00 ... 22.00 mA)
	Relay test[4]	Manual control of relay contacts

[1] ISM with TAN option FW-E053

[2] At rated operating conditions

[3] Not if EtherNet/IP communication is enabled

[4] Only if EtherNet/IP communication is enabled

Specifications

Device		
Product name	Stratos Multi	
Product type	E471N	
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
	Protection	IP66/IP67/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

Specifications

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	Single or stranded wires up to 2.5 mm²	
	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	
	Location altitude	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	ODVA communication protocol		EtherNet/IP
	Standards	IEC 61158, IEC 61784	
	ODVA manufacturer ID	1593	
	ODVA device ID	Generic device (43)	
	ODVA device name	Stratos Multi E471N	
	Terminals	1x RJ45	
	RJ45 communication	10 Mbit/s (10BASE-T)	100 Mbit/s (100BASE-TX)
	Recommended cable	CAT 5, CAT 5e, CAT 6	
	Galvanic isolation	Shield to ground	
	Insulation strength	2250 V DC 250 V /1,5 kV AC (50/60 Hz) for 60 s	
	Addressing	IPv4 with DHCP, BootP, Custom	
	RPI (Request Packet Interval)	10 to 10000 ms	
	System integration	with EDS file	E471N-Vxxxxxx.EDS (see www.knick.de)

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

Digital 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	For analog pH and ORP sensors[1)]	
	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 Reference temperature 25 °C/77 °F	Input resistance: > 1 x 10^{12} Ω
		Input current: < 1 x 10^{-12} A
		Impedance range: 0.5 ... 1000 MΩ (± 20 %)
	Reference electrode input Reference temperature 25 °C/77 °F	Input resistance: > 1 x 10^{10} Ω
		Input current: < 1 x 10^{-10} A
		Impedance range: 0.5 ... 200 kΩ (± 20 %)
	Measurement error[2)3)]	pH value < 0.02, TC: 0.002 pH/K
		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	
	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[2)3)]	< 0.5 K (< 1 K for Pt100 < 1 K for NTC > 100 °C/212 °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 (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] ISM with TAN option FW-E053

[2] At rated operating conditions

[3] ± 1 count, plus sensor error

Specifications

Measuring Functions for Conductivity (Contacting)

Digital input	Input for Memosens sensors	
	Terminals 1 ... 5 or MK-MS095N module	
	Measurement error	Depending on sensor
Module input, analog	Input for analog 2- or 4-electrode sensors	
	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) 2)]	< 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) 2)]	< 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)
	Temperature	–20.0 ... 150.0 °C / –4 ... 302 °F
	Response time (T_{90})	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

[2)] ± 1 count, plus sensor error

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) 2)]	< 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) 2)]	< 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

[2)] ± 1 count, plus sensor error

Specifications

Measuring Functions for Conductivity (Inductive)

Digital input	Toroidal conductivity sensors: SE 670/SE 680		
	Terminals 1 ... 5 or MK-MS095N module		
	Measurement error	Depending on sensor	
Module input, analog	Toroidal conductivity sensors: SE 655/SE 656/SE 660		
	Measurement error[1)2)]	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) 2)]	< 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^{-1}	
	Permissible transfer ratio	010.0 ... 199.9	
	Permissible offset	± 0.5 mS	
	Permissible installation factor	0.100 … 5.000	

Stratos Multi

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_3	Ultrapure water with NH_3 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_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)
	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		

[1] At rated operating conditions

[2] ± 1 count, plus sensor error

Specifications

Measuring Functions for Oxygen

Digital input, Memosens	Standard measurement	Input for amperometric Memosens sensors	
	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		
	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 any oxygen measured values above 80 °C/176 °F.	
	Measurement error	Depending on sensor	
Module input, analog	Standard	Sensors:	SE 706
			InPro6800; Oxyferm
			ISM with TAN option FW-E053
	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	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[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 Resolution < 5 mV	Presetting –675 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)2)]	< 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 (analog, Memosens, SE 740)	
	Saturation[3]	0.0 ... 600.0 %
	Concentration[3] (dissolved oxygen)	0.00 ... 99.99 mg/l (ppm)
	Volume concentration in gas	0.00 ... 99.99 vol%
	Trace sensor "01" (analog, Memosens)	
	Saturation[3]	0.000 ... 150.0 %
	Concentration[3] (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[3]	0.000 ... 150.0 %
	Concentration[3] (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	

[1] At rated operating conditions

[2] ± 1 count, plus sensor error

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

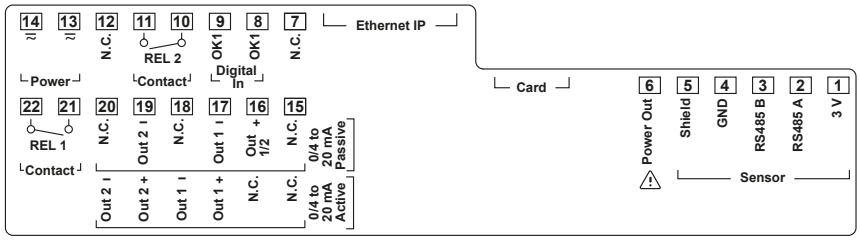
Specifications

Diagnostics and Statistics

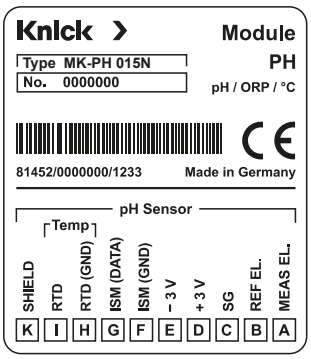
Diagnostic functions	Calibration data	Calibration record
	Device self-test	Automatic memory test (RAM, FLASH, EEPROM)
	Display test	Display of all colors
	Keypad test	Check of key functions
Sensocheck	Delay: approx. 30 s	
	pH	Automatic monitoring of glass and reference electrode (can be switched off)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

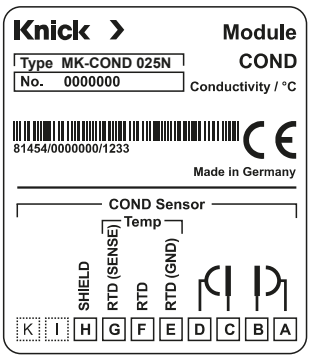
Stratos Multi E471 N Terminal Assignments



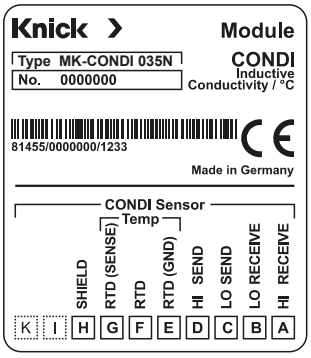
MK-PH 015N Module Terminal Assignments



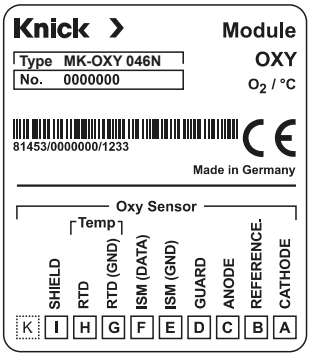
MK-COND 025N Module Terminal Assignments



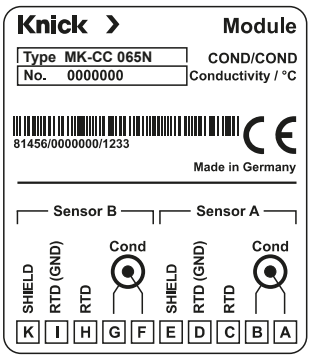
MK-CONDI 035N Module Terminal Assignments



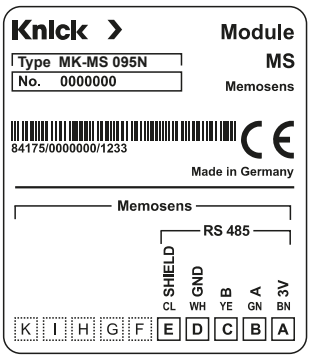
MK-OXY 046N Module Terminal Assignments



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

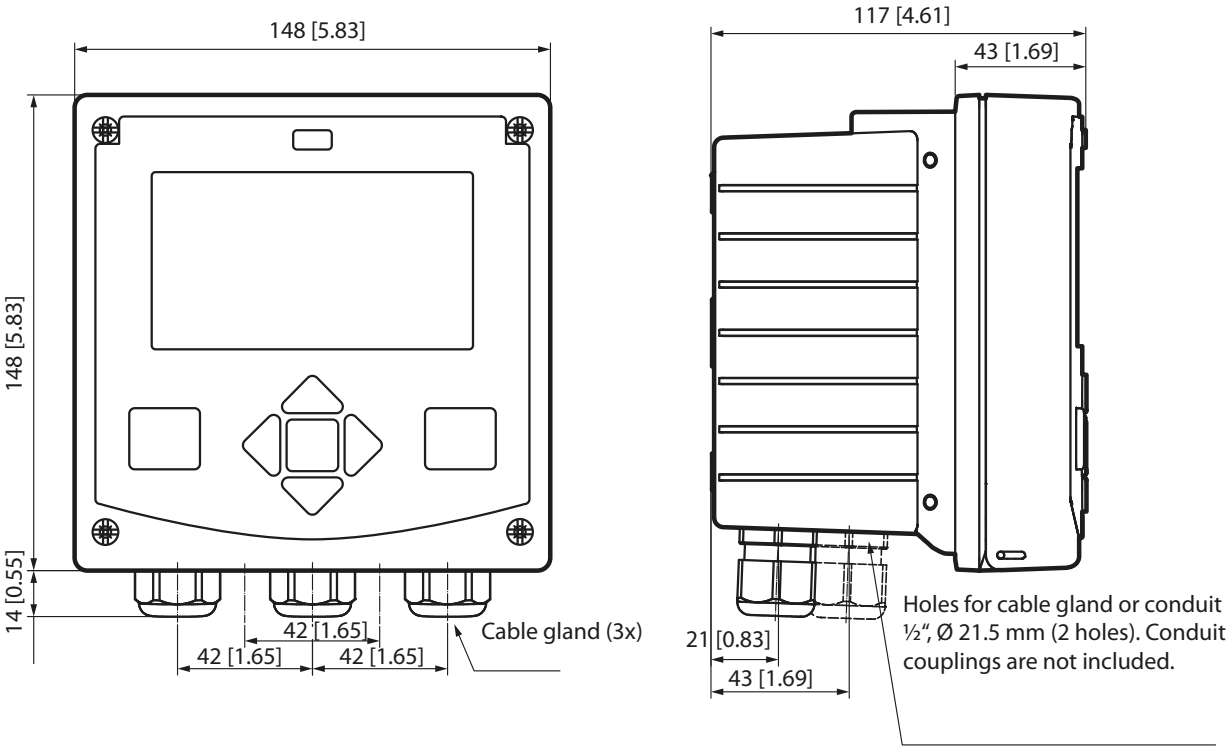
Additional protection from direct weather exposure and mechanical damage.

ZU 0738 Panel-Mount Kit

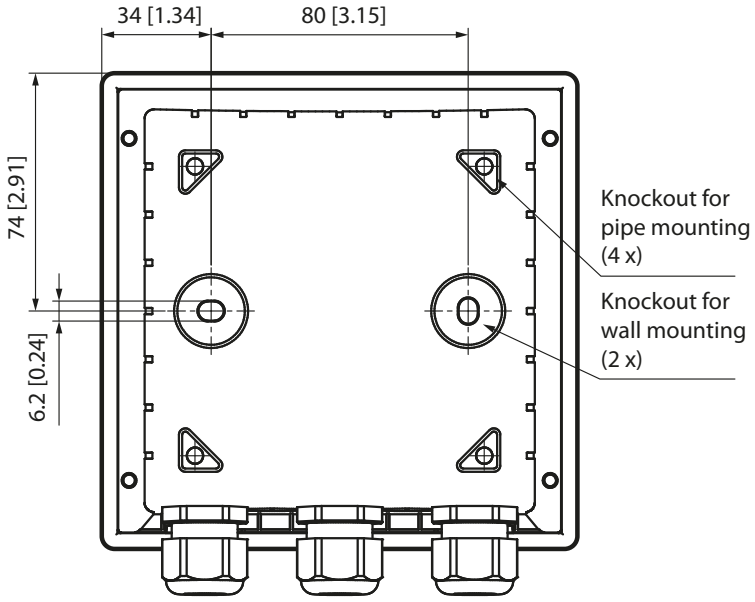
For installation in standardized panel cutout 138 x 138 mm (DIN 43700), sealed against panel.

Dimension Drawings – Wall Mounting

Front and Side View



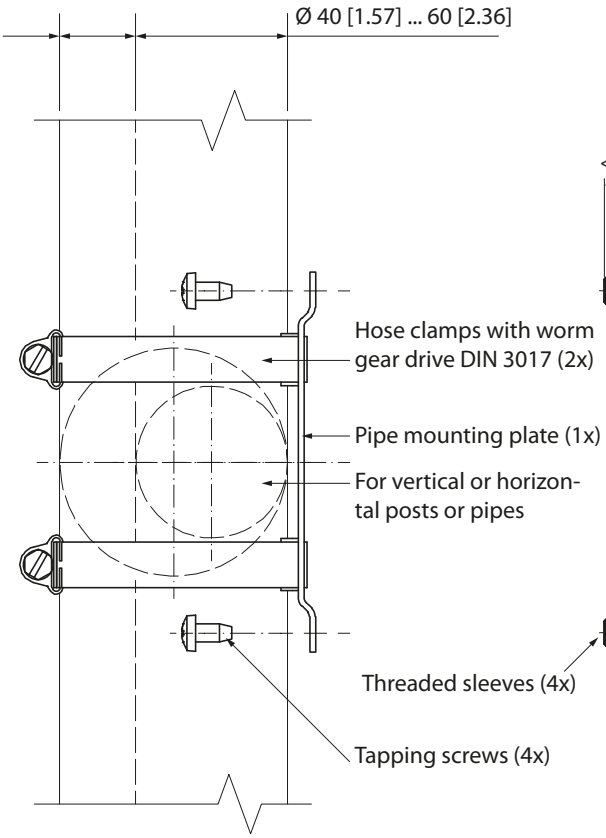
Rear View



All dimensions in mm [inches]

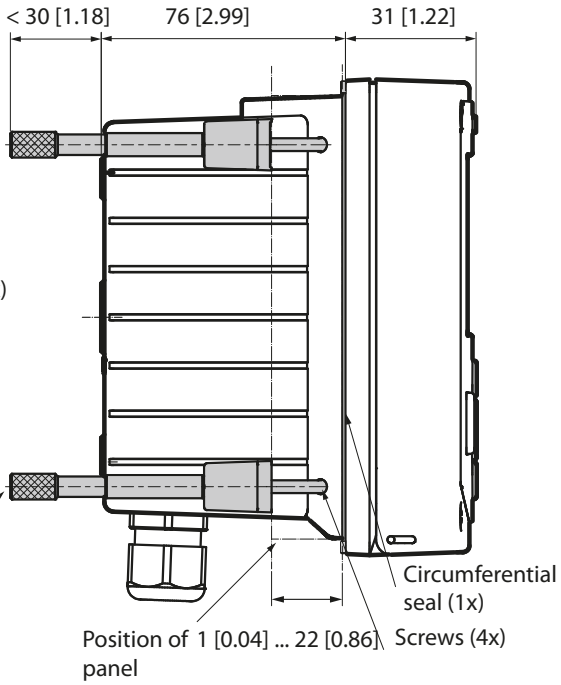
Dimension Drawings – Pipe/Panel Mounting

ZU 0274 Pipe-Mount Kit



ZU 0738 Panel-Mount Kit

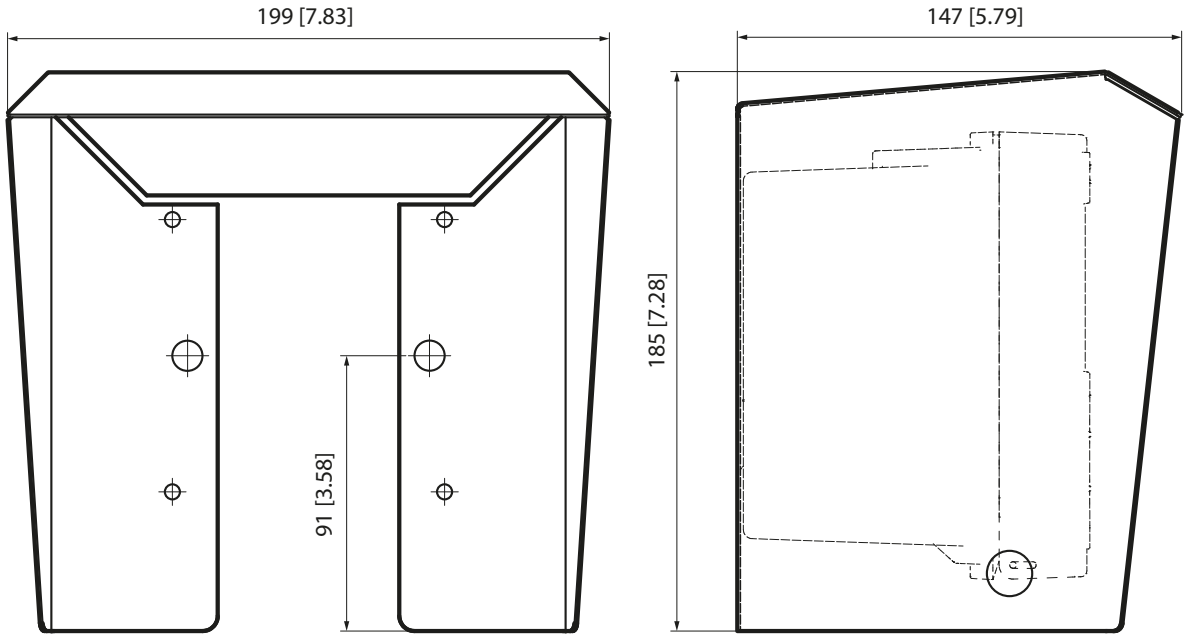
Panel cutout 138 x 138 mm (DIN 43700)



All dimensions in mm [inches]

Dimension Drawings – Protective Hood

ZU 0737 Protective Hood



All dimensions in mm [inches]