

## Technical Information

# Liquisys M CPM223/253

## pH/ORP Measurement

Transmitter for analog sensors, digital pH sensors and ISFET sensors



The modular design of the Liquisys M CPM223/253 allows easy adaptation of the transmitter to a variety of customer requirements. Starting with the basic version for "measurement and alarm generation", the transmitter can be equipped with additional software and hardware modules for special applications. These modules can also be retrofitted as required.

### Application

- Effluent treatment
- Neutralization
- Detoxication (electroplating)
- Water treatment
- Water monitoring

### Your benefits

- Field or panel-mounted housing
- Universal application
- Simple handling
  - Logically arranged menu structure
  - Large two-line display
  - Ultrasimple two-point calibration
- Safe operation
  - Overvoltage (lightning) protection
  - Direct access for manual contact control
  - Calibration plausibility check
  - User-defined alarm configuration

The basic unit can be extended with:

- Additional 2 or 4 contacts for use as:
  - Limit contacts (also for temperature)
  - P(ID) controller
  - Timer for simple rinse processes
  - Complete cleaning with Chemoclean
  - Current input
- Plus package:
  - User defined current output characteristics
  - Automatic cleaning trigger on alarm or limit violation
  - Sensor Check System for pH glass and reference
  - Live check of sensor
  - Special neutralisation controller
- HART® or PROFIBUS®-PA/-DP
- 2<sup>nd</sup> current output for temperature, pH/ORP or continuous controller

## Function and system design

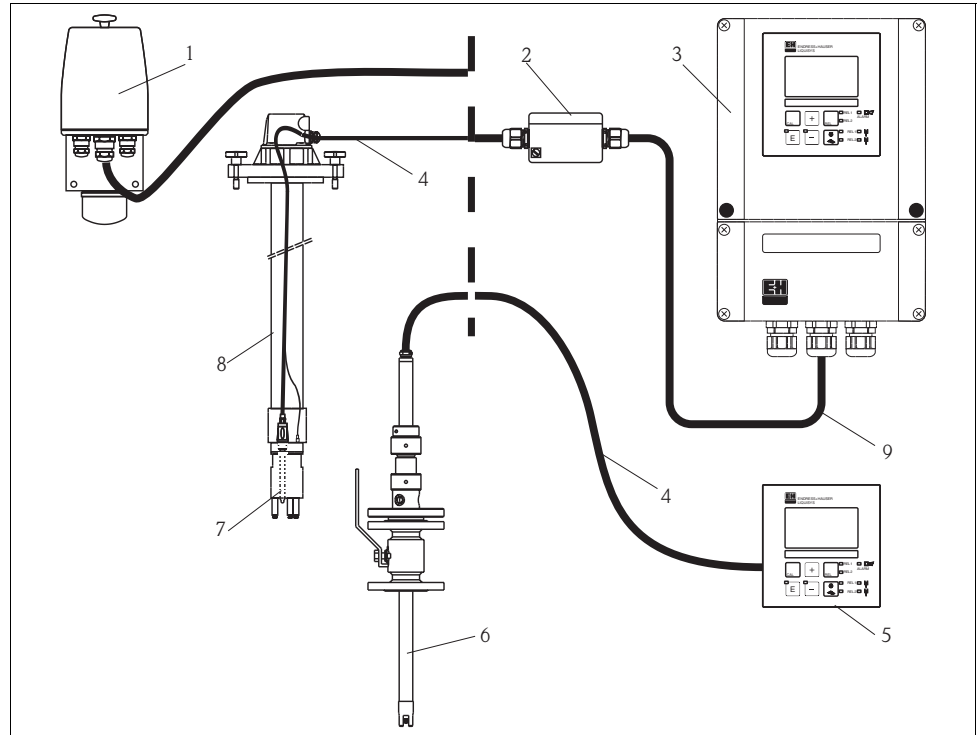
<b>Features of the basic version</b>	<b>pH and ORP value measurement</b>	
	This is selected via the menu. During measurement, the value measured can be displayed in the other measuring mode (e.g. pH - mV or ORP % - ORP mV). The temperature is displayed at the same time or, if desired, not shown at all.	
	<b>Calibration</b>	
	pH electrodes are normally calibrated with the same pH values. Therefore the transmitter presents the settings from the <b>previous</b> calibration as defaults for the next calibration. If the buffer solutions are interchanged by accident (e.g. pH 4 buffer first, then pH 7 buffer instead of pH 7 first and then pH 4) the <b>plausibility check</b> ensures that the calibration is accepted anyway.	
	<b>Configuration</b>	
	Different alarms are required depending on application and operator. Therefore the transmitter permits independent <b>configuration of the alarm contact and error current</b> for each individual error. Unnecessary or undesirable alarms can be suppressed in this manner. <b>Up to four contacts</b> can be used as limit contacts (also for temperature) to implement a P(ID) controller or for cleaning functions.	
	Direct <b>manual operation of the contacts</b> (bypassing the menu) provides quick access to limit, control or cleaning contacts, permitting speedy correction of deviations.	
<b>Additional functions of the plus package</b>	<b>Current output</b>	
	In order to output wide measuring ranges while still achieving a high resolution in specific ranges, the <b>current output</b> can be configured as required via a table. This permits <b>bilinear</b> or <b>quasi-logarithmic</b> curves, etc.	
	<b>Sensor-Check-System (SCS)</b>	
	The sensor check system alerts to deviations of the pH glass resistance or reference resistance from the normal range, thus indicating possible failure due to pH electrode blocking or damage.	
	<b>Live-check</b>	
	The live check issues an alarm when the sensor signal does not change over a defined period of time. This may be caused by blocking, passivation, separation from the process, etc.	
	<b>Neutralisation controller</b>	
	A special control response that cannot be handled adequately by a P(ID) controller is required to neutralise solutions. For this reason, the transmitter provides a special neutralisation controller function by combining two P(ID) controllers.	
	<b>Current input</b>	
	The current input of the transmitter allows two different applications: controller shut-down in case of lower flow rate violation or total failure in the main flow as well as feedforward control. Both functions are also combinable.	
<b>Explosion proof versions for zone 2</b>	Field housing CPM253 with power supply 24 V	Application of transmitter and sensor in hazardous area zone 2
	Field housing CPM253 with power supply 230 V	Application of transmitter as related electrical equipment in non-hazardous area or in simple pressurised apparatus; application of sensor in hazardous area zone 2
	Panel mounted housing CPM223 with power supply 230 V or 24 V	Application of transmitter as related electrical equipment in non-hazardous area or in simple pressurised apparatus; application of sensor in hazardous area zone 2

**Measuring system**

A complete measuring systems comprises:

- Transmitter Liquisys M CPM223 or CPM253
- pH/ORP electrode with or without an integrated temperature sensor
- An immersible, flow or retractable assembly
- Measuring cable (e.g. CPK9)

Options: extension cable, junction box VBA or VBM



C07-CPM2x3cx-14-00-00-xx-001.eps

Complete measuring system Liquisys M CPM223/253

- |   |                           |   |  |
|---|---------------------------|---|--|
| 1 | Flow assembly CPA250      | 6 | Retractable assembly Cleanfit W CPA450 |
| 2 | Junction box VBA          | 7 | Electrode, e.g. Orbisint CPS11         |
| 3 | Liquisys M CPM253         | 8 | Immersion assembly CPA111              |
| 4 | Measuring cable e.g. CPK9 | 9 | Extension cable                        |
| 5 | Liquisys M CPM223         |   |  |

**Input****Measured variables**

pH (analog or digital sensors)  
ORP  
Temperature

**Measuring range**

pH:	-2 to 16
ORP:	-1500 to +1500 mV / 0 to 100 %
Temperature:	
Pt 100, Pt 1000	-50 to +150°C (-58 to +302°F)
NTC 30K	-20 to +100°C (-4 to +212°F)

**Input resistance**

> 10<sup>12</sup> Ω (for nominal operating conditions) for standard sensors

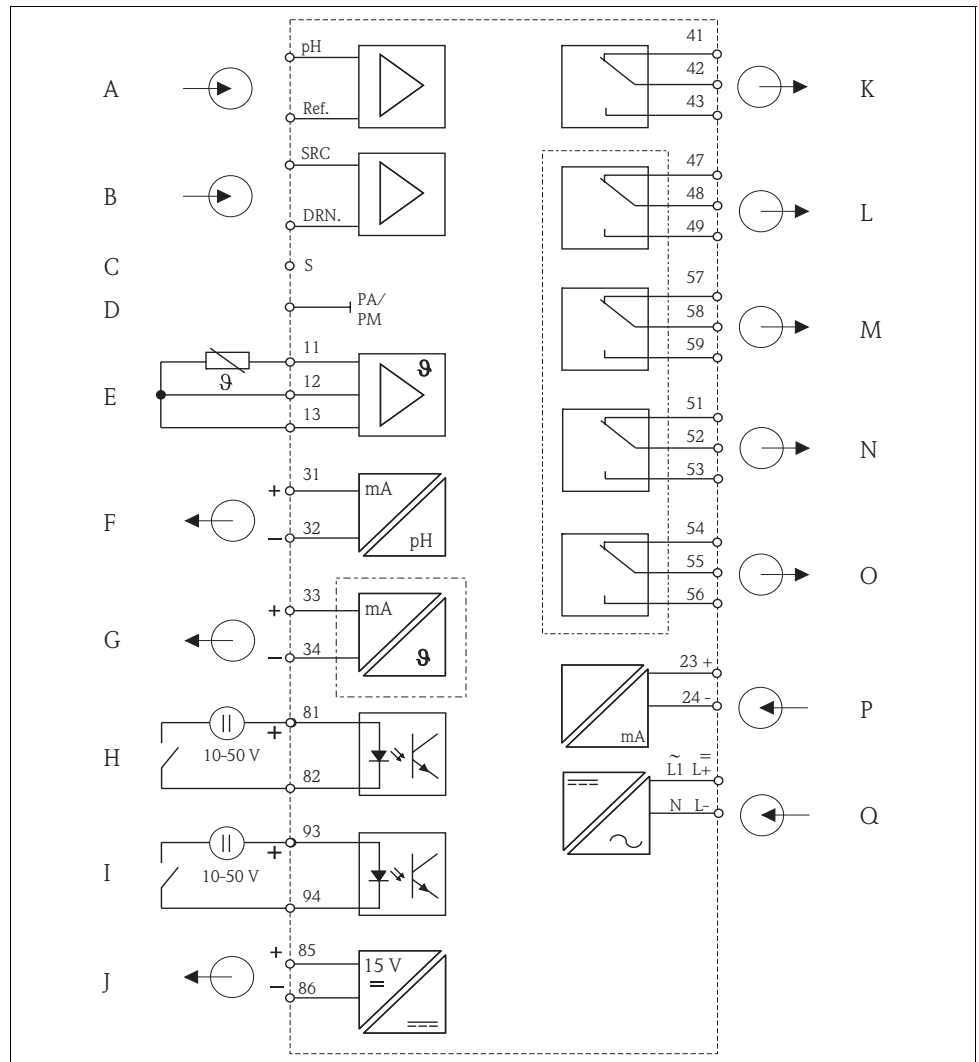
**Cable specification**

Length of cable (analogue):	max. 50 m (164 ft)
Length of cable (digital):	max. 100 m (328 ft)

<b>Binary inputs</b>	Voltage: Power consumption:	10 to 50 V max. 10 mA
<b>Current input</b>	4 to 20 mA, galvanically separated Load: 260 $\Omega$ at 20 mA (voltage drop 5.2 V)	
<b>Output</b>		
<b>Current range</b>	0 / 4 to 20 mA, galvanically separated	
<b>Error current</b>	2.4 or 22 mA	
<b>Load</b>	max. 500 $\Omega$ (depending on operating voltage)	
<b>Output range</b>	pH: ORP: absolute: relative: Temperature:	adjustable, min. $\Delta$ 1 pH  adjustable, min. $\Delta$ 50 mV fixed, 0 to 100 % adjustable, $\Delta$ 10 to $\Delta$ 100 % of upper range value
<b>Resolution</b>	max. 700 digits/mA	
<b>Min. distance for 0 / 4 to 20 mA signal</b>	10 % of measuring range	
<b>Isolation voltage</b>	max. 350 V <sub>rms</sub> / 500 V DC	
<b>Overvoltage protection</b>	acc. to EN 61000-4-5:1995	
<b>Auxiliary voltage output</b>	Output voltage: Output current:	15 V $\pm$ 0.6 max. 10 mA
<b>Contact outputs</b>	Switching current with ohmic load ( $\cos \varphi = 1$ ): Switching current with inductive load ( $\cos \varphi = 0.4$ ): Switching voltage: Switching power with ohmic load ( $\cos \varphi = 1$ ): Switching power with inductive load ( $\cos \varphi = 0.4$ ):	max. 2 A max. 2 A max. 250 V AC, 30 V DC max. 1250 VA AC, 150 W DC max. 500 VA AC, 90 W DC
<b>Limit contactor</b>	Pickup/dropout delay:	0 to 2000 s
<b>Controller</b>	Function (adjustable): Controller response: Control gain $K_p$ : Integral action time $T_n$ : Derivative action $T_v$ : Period for pulse length controller: Frequency for pulse frequency controller: Basic load:	pulse length/pulse frequency controller PID 0.01 to 20.00 0.0 to 999.9 min 0.0 to 999.9 min 0.5 to 999.9 s 60 to 180 min <sup>-1</sup> 0 to 40% of max. set value
<b>Alarm</b>	Function (selectable): Alarm threshold adjustment range: Alarm delay:	latching/momentary contact pH/temperature: complete measuring range 0 to 2000 s 0 to 2000 min

## Power supply

### Electrical connection of standard sensors and ISFET sensors

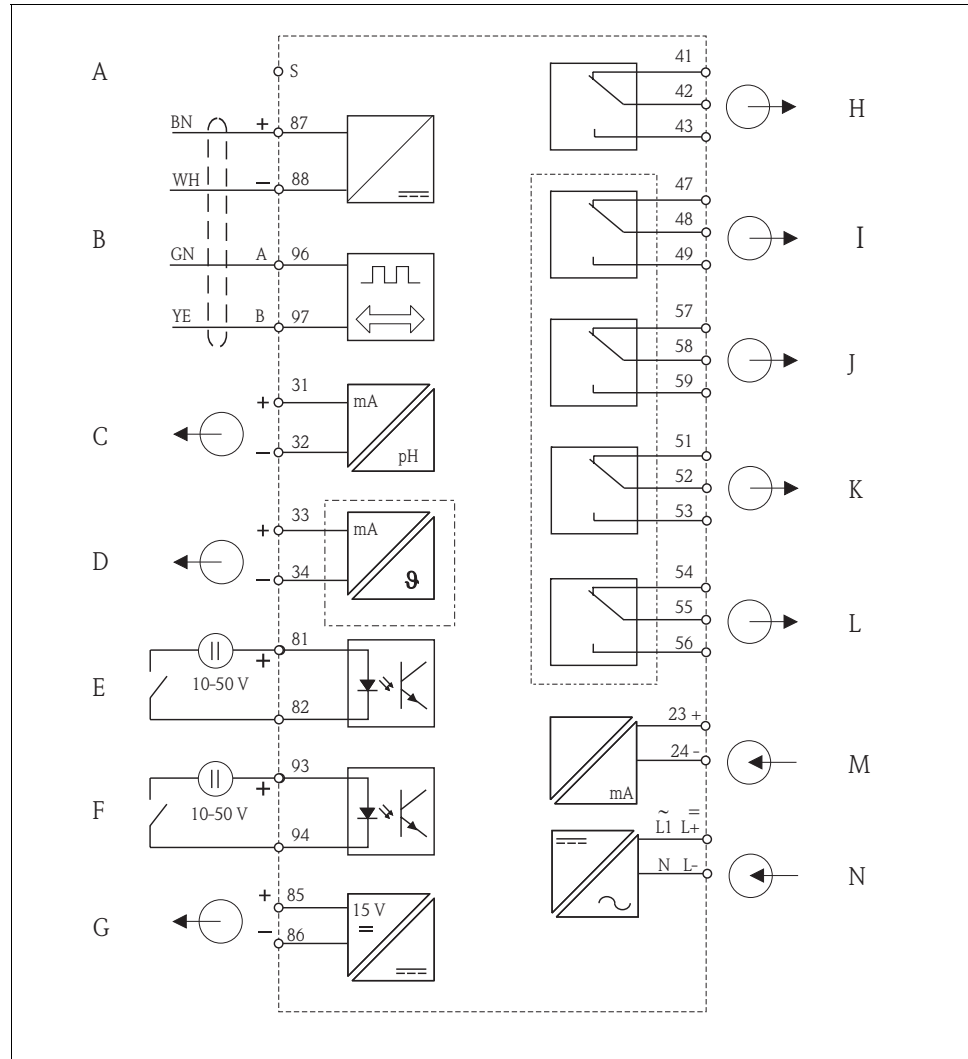


C07.CPM233xx-04-06-00-xx-001.EPS

#### Electrical connection Liquisys M

- |   |  |   |   |
|---|--|---|---|
| A | Standard sensor  | J | Aux. voltage output                     |
| B | ISFET sensor   | K | Alarm (current-free contact position)   |
| C | Shield for glass electrodes                                  | L | Relay 1 (current-free contact position) |
| D | Solution ground  | M | Relay 2 (current-free contact position) |
| E | Temperature sensor   | N | Relay 3 (current-free contact position) |
| F | Signal output 1 pH/ORP                                       | O | Relay 4 (current-free contact position) |
| G | Signal output 2 temperature, pH/ORP or continuous controller | P | Current input 4 to 20 mA                |
| H | Binary input 1 (Hold)  | Q | Power supply                            |
| I | Binary input 2 (Chemoclean)                                  |   |   |

**Electrical connection of digital sensors with Memosens technology**



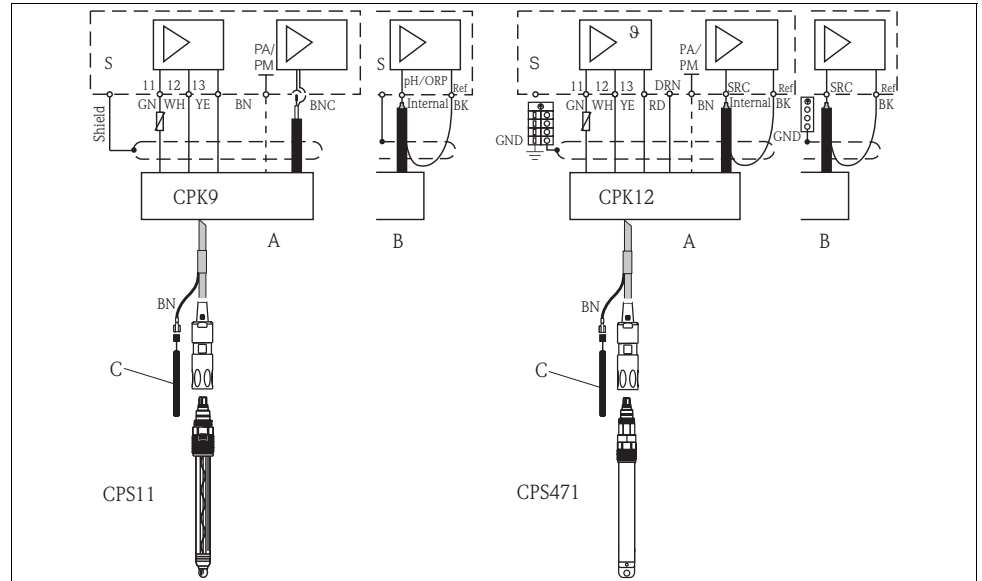
C07-CPM2x3xx-04-06-00-xx-002.EPS

**Electrical connection of the transmitter with Memosens technology**

A	Shield	H	Alarm (current-free contact position)
B	Sensor	I	Relay 1 (current-free contact position)
C	Signal output 1 pH/ORP	J	Relay 2 (current-free contact position)
D	Signal output 2 temperature, pH/ORP or continuous controller	K	Relay 3 (current-free contact position)
E	Binary input 1 (Hold)	L	Relay 4 (current-free contact position)
F	Binary input 2 (Chemoclean)	M	Current input 4 to 20 mA
G	Aux. voltage output	N	Power supply

**Connection of sensor**

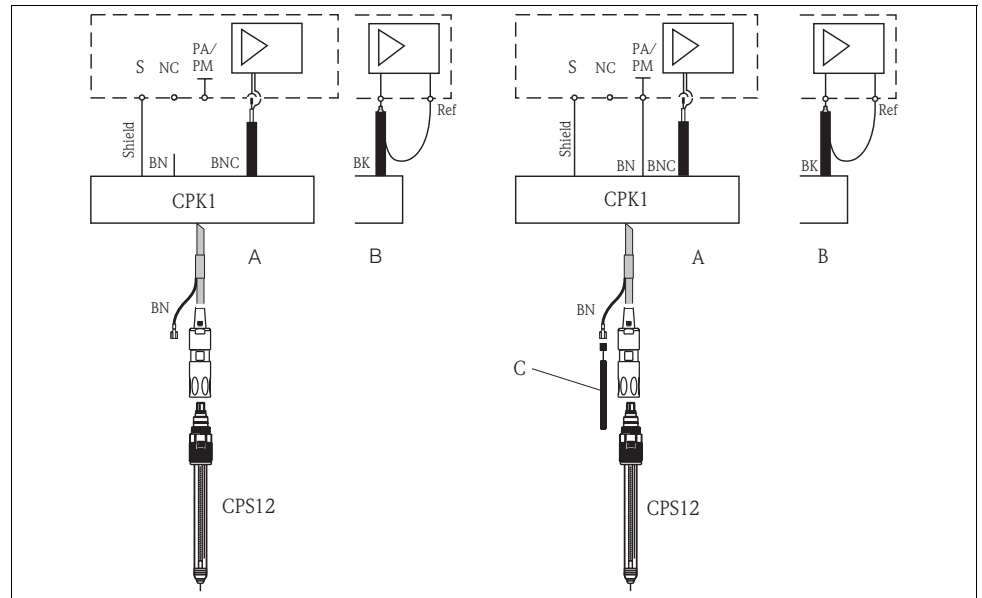
The pH and ORP electrodes are connected using special terminated and shielded multicore cables. The measuring cable can be extended with a junction box and an extension cable. Termination instructions are supplied with the measuring cable.



C07-CPM2x3xx-04-06-00-xx-010.eps

Connection CPS11 with CPK9 and CPS471 with CPK12 to Liquisys M

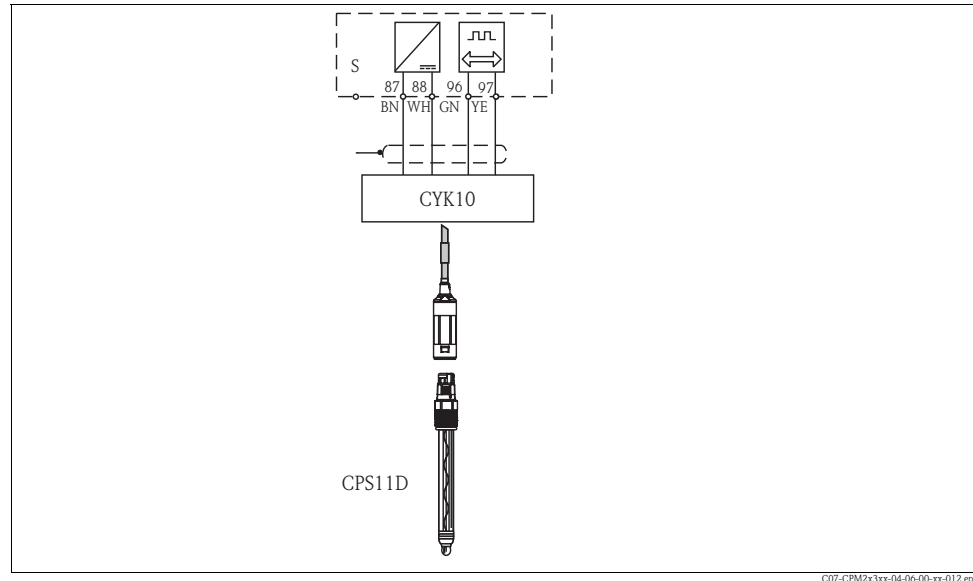
- A Panel-mounted instrument
- B Field instrument
- C Potential matching PM for symmetrical connection



C07-CPM2x3xx-04-06-00-xx-011.eps

Unsymmetrical and symmetrical connection of ORP electrodes to Liquisys M

- A Panel-mounted instrument
- B Field instrument
- C Potential matching PM for symmetrical connection



Connection of digital sensor CPS11D with CYK10

<b>Power supply</b>	depending on ordered version: 100/115/230 V AC +10/-15 %, 48 to 62 Hz 24 V AC/DC +20/-15 %
<b>Power consumption</b>	max. 7.5 VA
<b>Mains protection</b>	microfuse, medium time-lag, 250 V/3.15 A

## Performance characteristic

<b>Reference temperature</b>	25°C (77°F)	
<b>Resolution</b>	pH: ORP: Temperature:	0.01 pH 1 mV/0.1 % 0.1°C
<b>Deviation of indication<sup>a</sup></b>	Display pH: ORP: Temperature: Signal output pH: ORP: Temperature:	max. 0.5 % of measuring range max. 0.5 % of measuring range max. 1.0 % of measuring range max. 0.75 % of measuring range max. 0.75 % of measuring range max. 1.25 % of measuring range
<b>Repeatability<sup>a</sup></b>	pH: ORP:	max. 0.2 % of measuring range max. 0.2 % of measuring range

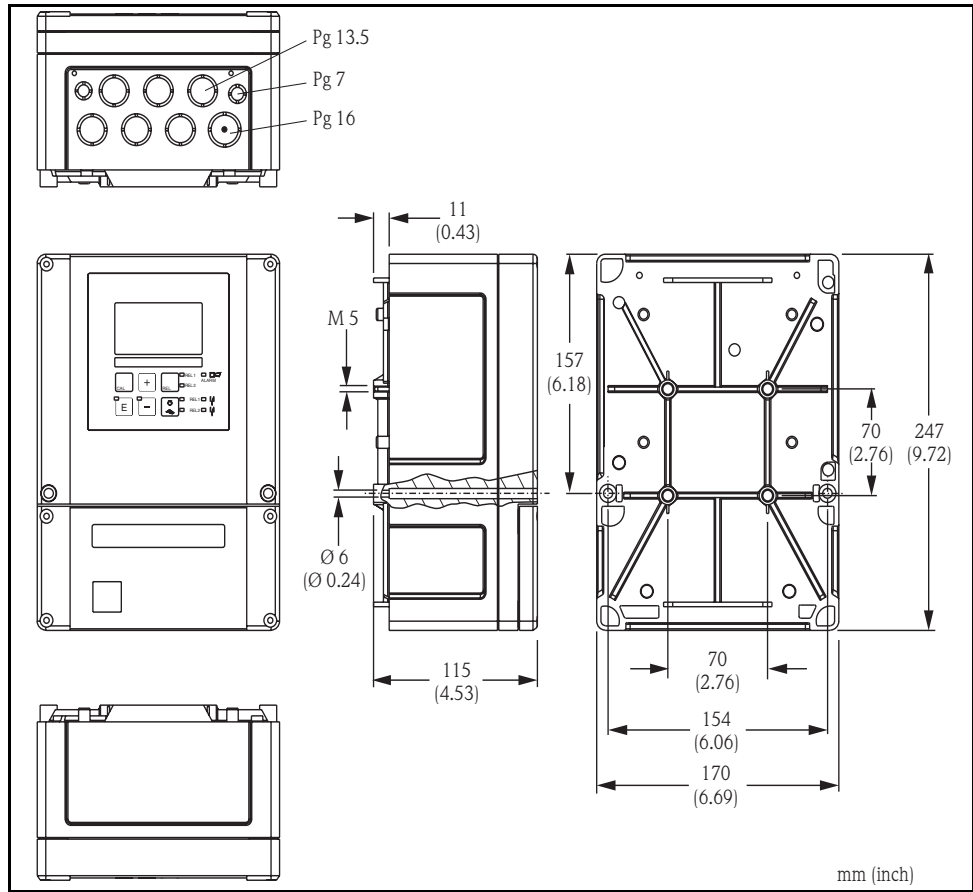
a) acc. to IEC 746-1, for nominal operating conditions



<b>Zero point</b>	Glass:	pH 5.0 to 9.0 (nominal pH 7.00)
	Antimon:	pH -1.0 to 3.0 (nominal pH 1.00)
	ISFET:	-500 to +500 mV
<b>Slope</b>	Glass:	38.00 to 65.00 mV/pH (nominal 59.16 mV/pH)
	Antimon:	25.00 to 65.00 mV/pH (nominal 59.16 mV/pH)
	ISFET:	38.00 to 65.00 mV/pH (nominal 59.16 mV/pH)
<b>Offset</b>	pH:	±2 pH
	ORP:	±120 mV/±50 %
	Temperature:	±5°C

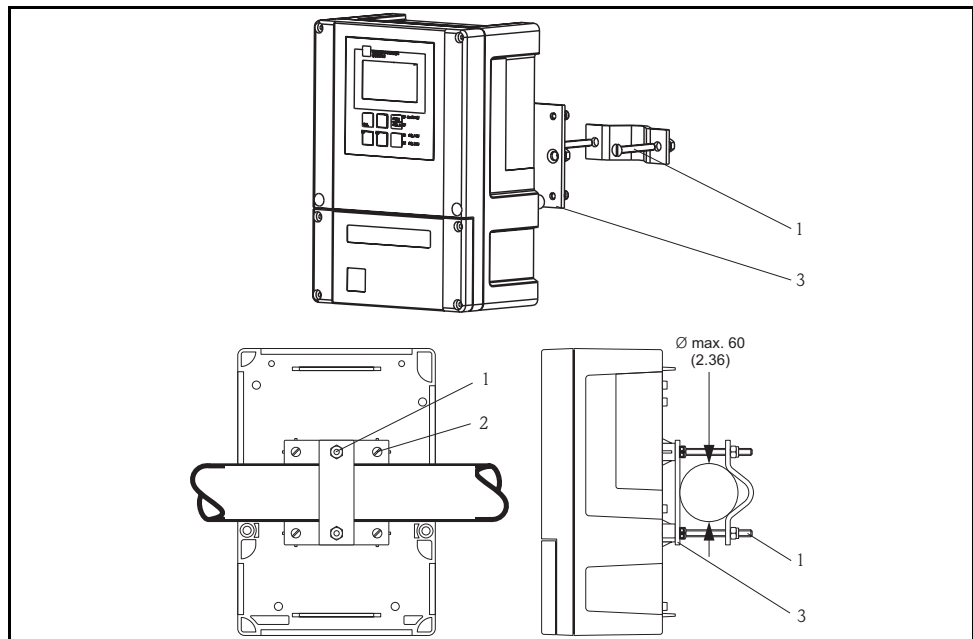
## Installation conditions

### Installation instructions



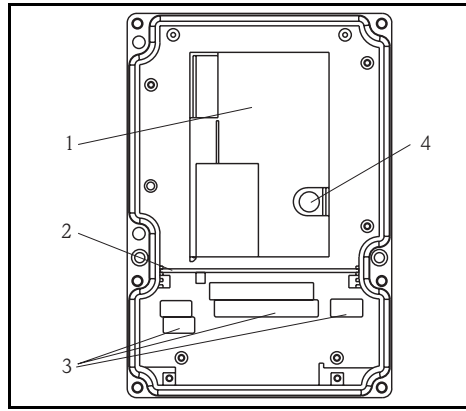
C07-CxM253xx-06-06-00-en-001.EPS

Field instrument



C07-CxM253xx-11-06-00-en-003.EPS

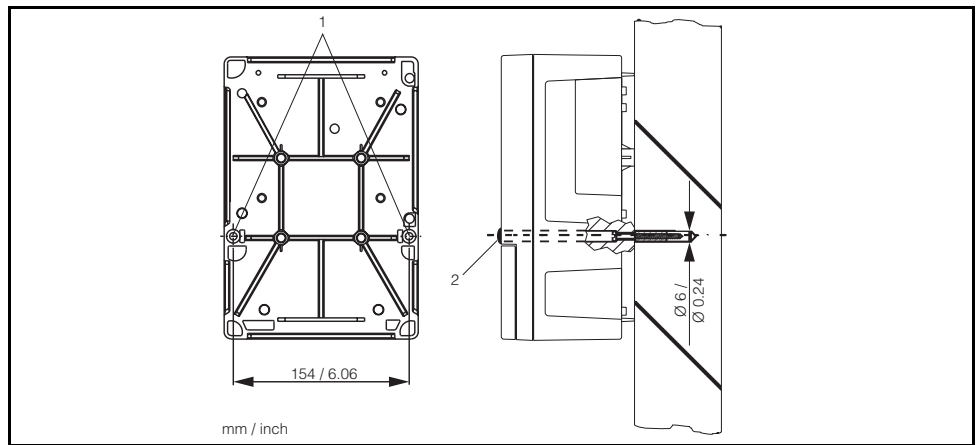
Mounting on cylindrical pipes



- 1 Removable electronics box
- 2 Partition plate
- 3 Terminal blocks
- 4 Fuse

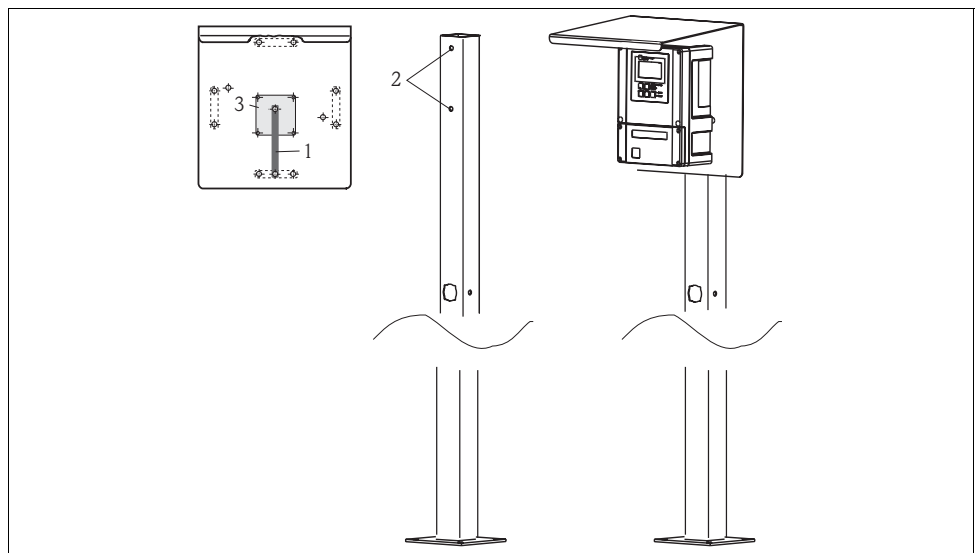
C07-CxM253xx-11-06-00-xx-001.EPS

Inside of field instrument



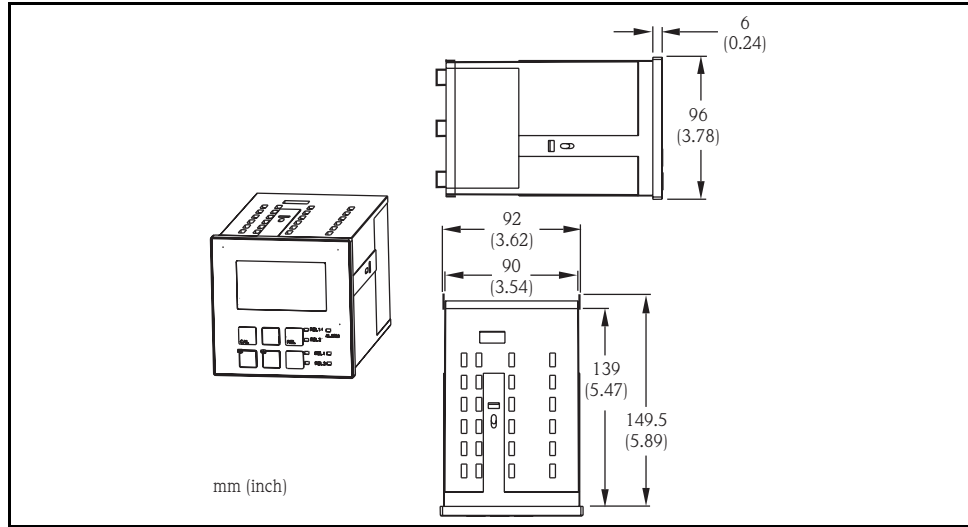
C07-CxM253xx-11-06-00-en-002.EPS

Wall mounting of the field instrument



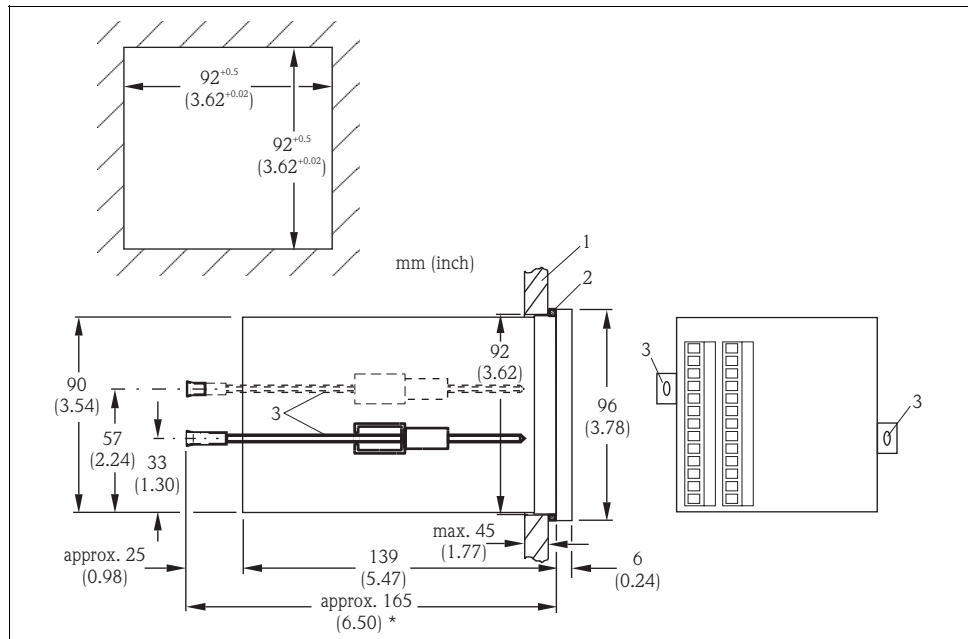
C07-CxM253xx-11-06-00-xx-004.EPS

Mounting of the field instrument with mounting post and weather protection cover



C07-CxM223xx-06-06-00-en-001.EPS

Dimensions panel-mounted instrument



C07-CxM223xx-11-06-00-en-001.EPS

Installation of the panel mounted instrument

- 1 Wall of control cabinet
- 2 Gasket
- 3 Tensioning screws

## Environment

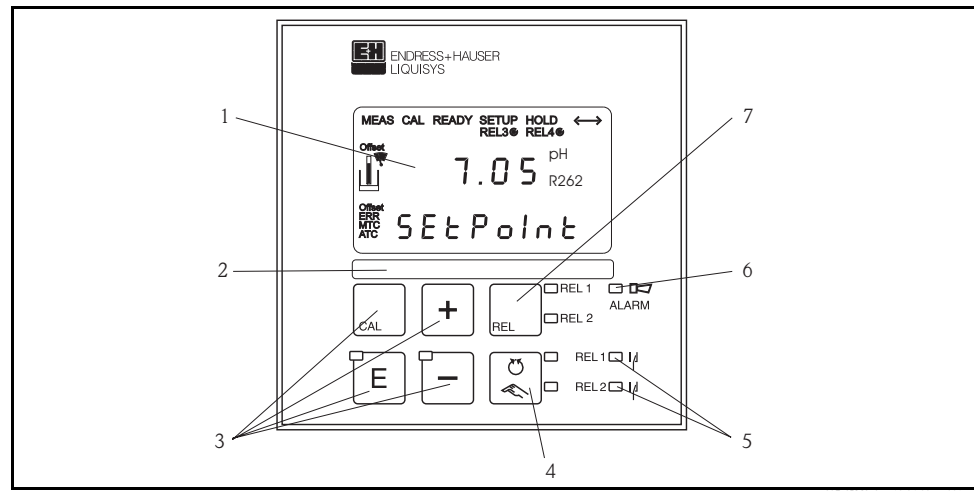
<b>Ambient temperature</b>	-10 to +55°C (+14 to +131°F)	
<b>Ambient temperature limit</b>	-20 to +60°C (-4 to +140°F)	
<b>Storage and transport temperature</b>	-25 to +65°C (-13 to +149°F)	
<b>Electromagnetic compatibility</b>	Interference emission and interference immunity acc. to EN 61326: 1997 / A1: 1998	
<b>Ingress protection</b>	Panel mounted instrument: Field instrument:	IP 54 (front), IP 30 (housing) IP 65 (NEMA 4)
<b>Relative humidity</b>	10 to 95%, non-condensing	

## Mechanical construction

<b>Dimensions</b>	Panel mounted instrument: Field instrument:	96 x 96 x 145 mm (3.78 x 3.78 x 5.71 inches) Mounting depth: approx. 165 mm (6.50") 247 x 170 x 115 mm (9.72 x 6.69 x 4.53 inches)
<b>Weight</b>	Panel mounted instrument: Field instrument:	max. 0.7 kg (1.5 lb) max. 2.3 kg (5.1 lb)
<b>Materials</b>	Housing of panel mounted instrument: Field housing: Front membrane:	Polycarbonate ABS PC Fr Polyester, UV-resistant
<b>Terminals</b>	Cross section	2.5 mm <sup>2</sup>

## Human interface

### Display elements



### Operating elements

- 1 LC display for display of measured values, configuration data and current menu field
- 2 Field for user labeling
- 3 4 main control keys for calibration and instrument configuration
- 4 Key for switching between automatic/manual operation
- 5 LED indicators for switched limit outputs
- 6 LED indicator for alarm function
- 7 Display of active contact and key for relay switching in manual mode

The display simultaneously shows the current measured value and the temperature – the essential process data. Brief information texts in the configuration menu provide assistance with parameter configuration.

### Instrument control functions

All instrument control functions are arranged in a logical menu structure. Following access code entry, the individual parameters can be easily selected and modified as needed.

## Certificates and approvals

### CE symbol

#### Declaration of conformity

The product meets the legal requirements of the harmonised European standards. The manufacturer confirms compliance with the standards by affixing the **CE** symbol.

### Ex approval for zone 2

CPM253-..6...	ATEX II 3G EEx nA[L] IIC T4
CPM253-..4...	ATEX II 3G [EEx nAL] IIC
CPM223-..4...	
CPM223-..6...	

## Ordering information

### Product structure

		Sensor input; software	
	IS	pH (glass/ISFET) / ORP; Plus package	
	MR	pH (digital sensor); basic version	
	MS	pH (digital sensor); Plus package	
	PR	pH (glass)/ORP; basic version	
	PS	pH (glass)/ORP; Plus package	
		Power supply; approval	
	0	230 V AC	
	1	115 V AC	
	2	230 V AC; CSA Gen. Purp.	
	3	115 V AC; CSA Gen. Purp.	
	4	230 V AC; ATEX II 3G [EEx nAL] IIC	
	5	100 V AC	
	6	24 V AC/DC; ATEX II 3G [EEx nAL] IIC for CPM223, EEx nA[L] IIC T4 for CPM253	
	7	24 V AC; CSA Gen. Purp.	
	8	24 V AC/DC	
		Output	
	0	1 x 20 mA, pH/ORP	
	1	2 x 20 mA, pH/ORP + selectable	
	3	PROFIBUS PA	
	4	PROFIBUS DP	
	5	1 x 20 mA, pH/ORP HART	
	6	2 x 20 mA, pH/ORP HART + selectable	
		Additional contacts; analogue input	
	05	not selected	
	10	2 x relay (limit/P(ID)/timer)	
	15	4 x relay (limit/P(ID)/Chemoclean)	
	16	4 x relay (limit/P(ID)/timer)	
	20	2 x relay (limit/P(ID)/timer); 20 mA	
	25	4 x relay (limit/P(ID)/Chemoclean); 20 mA	
	26	4 x relay (limit/P(ID)/timer); 20 mA	
CPM253-			
			complete order code
CPM223-			

### Additional functions of the Plus package

- Current output configuration via table
- Monitoring sensor and process for safe operation
- Neutralisation controller
- Automatic start of cleaning

### Scope of delivery

The delivery of the field instrument includes:

- 1 transmitter CPM253
- 1 plug-in screw terminal
- 1 cable gland Pg 7
- 1 cable gland Pg 16 reduced
- 2 cable glands Pg 13.5
- 1 operating instructions BA 194C/07/en
- Versions with HART communication:
  - 1 operating instructions Field Communication with HART, BA 208C/07/en
- Versions with PROFIBUS communication:
  - 1 operating instructions Field Communication with PROFIBUS PA/DP, BA 209C/07/en
- Versions with ex approval for hazardous area zone II (ATEX II 3G):
  - Safety instructions for use in explosion-hazardous areas, XA 194C/07/a3

The delivery of the panel mounted instrument includes:

- 1 transmitter CPM223
- 1 set of plug-in screw terminals
- 2 tensioning screws
- 1 BNC-plug (solder-free)
- 1 operating instructions BA 194C/07/en
- Versions with HART communication:
  - 1 operating instructions Field Communication with HART, BA 208C/07/en

- Versions with PROFIBUS communication:
  - 1 operating instructions Field Communication with PROFIBUS PA/DP, BA 209C/07/en
- Versions with ex approval for hazardous area zone II (ATEX II 3G):
  - Safety instructions for use in explosion-hazardous areas, XA 194C/07/a3

## Accessories

### Sensors

- Orbisint CPS11
  - pH electrode for process applications, with PTFE diaphragm;
  - Ordering acc. to product structure, see Technical Information (TI 028C/24/ae)
- Orbisint CPS12
  - ORP electrode for process applications, with PTFE diaphragm;
  - Ordering acc. to product structure, see Technical Information (TI 367C/24/ae)
- Ceraliquid CPS41
  - pH electrode with ceramics diaphragm and KCl liquid electrolyte;
  - Ordering acc. to product structure, see Technical Information (TI 079C/24/ae)
- Ceraliquid CPS42
  - ORP electrode with ceramics diaphragm and KCl liquid electrolyte;
  - Ordering acc. to product structure, see Technical Information (TI 079C/24/ae)
- Ceragel CPS71
  - pH electrode with double chamber reference system and integrated bridge electrolyte;
  - Ordering acc. to product structure, see Technical Information (TI 245C/24/ae)
- Ceragel CPS72
  - ORP electrode with double chamber reference system and integrated bridge electrolyte;
  - Ordering acc. to product structure, see Technical Information (TI 374C/24/ae)
- Orbipore CPS91
  - pH electrode with open aperture for media with high dirt load;
  - Ordering acc. to product structure, see Technical Information (TI 375C/24/ae)
- Orbisint CPS11D
  - Digital pH sensor for process applications, with PTFE diaphragm;
  - Ordering acc. to product structure, see Technical Information (TI 028C/24/ae)
- Ceragel CPS71D
  - Digital pH sensor with double chamber reference system and integrated bridge electrolyte;
  - Ordering acc. to product structure, see Technical Information (TI 245C/24/ae)
- Orbipore CPS91D
  - Digital pH sensor with open aperture for media with high dirt load;
  - Ordering acc. to product structure, see Technical Information (TI 375C/24/ae)
- Tophit CPS471
  - Sterilizable and autoclavable ISFET sensor for food and pharmaceuticals, process technology, water treatment and biotechnology;
  - Ordering acc. to product structure, see Technical Information (TI 283C/24/ae)
- Tophit CPS441
  - Sterilizable ISFET sensor for media with low conductivity, with liquid KCl electrolyte;
  - Ordering acc. to product structure, see Technical Information (TI 352C/24/ae)
- Tophit CPS491
  - ISFET sensor with open aperture for media with high dirt load;
  - Ordering acc. to product structure, see Technical Information (TI 377C/24/ae)

### Assemblies

- Cleanfit W CPA450
  - Manually operated retractable assembly for pH electrodes, for the installation of 120 mm electrodes in tanks and pipes,
  - Ordering acc. to product structure, see Technical Information (TI 183C/24/ae)
- Cleanfit P CPA471
  - Compact retractable stainless steel assembly, for the installation in tanks and pipes, manual or pneumatic operation;
  - Ordering acc. to product structure, see Technical Information (TI 217C/24/ae)
- Cleanfit P CPA472
  - Compact retractable plastic assembly, for the installation in tanks and pipes, manual or pneumatic operation;
  - Ordering acc. to product structure, see Technical Information (TI 223CC/24/ae)



- Cleanfit P CPA473  
 Retractable stainless steel process assembly, with ball valve for a particularly safe and reliable separation of the medium from the environment;  
 Ordering acc. to product structure, see Technical Information (TI 344C/24/ae)
- Cleanfit P CPA474  
 Retractable plastic process assembly, with ball valve for a particularly safe and reliable separation of the medium from the environment;  
 Ordering acc. to product structure, see Technical Information (TI 345C/24/ae)
- Dipfit W CPA111  
 Plastic immersion and installation assembly, for open and closed tanks;  
 Ordering acc. to product structure, see Technical Information (TI 112C/24/ae)
- Flowfit W CPA250  
 Flow assembly for pH and ORP measurement  
 Ordering acc. to product structure, see Technical Information (TI 041C/24/ae)
- Immersion assembly Dipfit W CYA611  
 for sensor immersion in basins, open channels and tanks, PVC;  
 Ordering acc. to product structure (Technical Information TI 166C/24/ae)

**Connection accessories**

- CPK9 special measuring cable  
 For electrodes with TOP 68 plug-in head, for high-temperature and high-pressure applications, IP 68  
 Ordering acc. to product structure, see Technical Information (TI 118C/07/en)
- CPK1 special measuring cable  
 For pH/redox electrodes with GSA plug-in head  
 Ordering acc. to product structure, see Technical Information (TI 118C/07/en)
- CPK2 special measuring cable  
 For pH/redox electrodes with GSA plug-in head, with three sensor plugs  
 Ordering acc. to product structure, see Technical Information (TI 118C/07/en)
- CPK12 special measuring cable  
 For pH/redox glass electrodes and ISFET sensors with TOP68 plug-in head  
 Ordering acc. to product structure, see Technical Information (TI 118C/07/en)
- CYK10 Data cable for digital sensors  
 For digital pH sensors with Memosens technology (CPSxxD)  
 Ordering according to product structure, see below

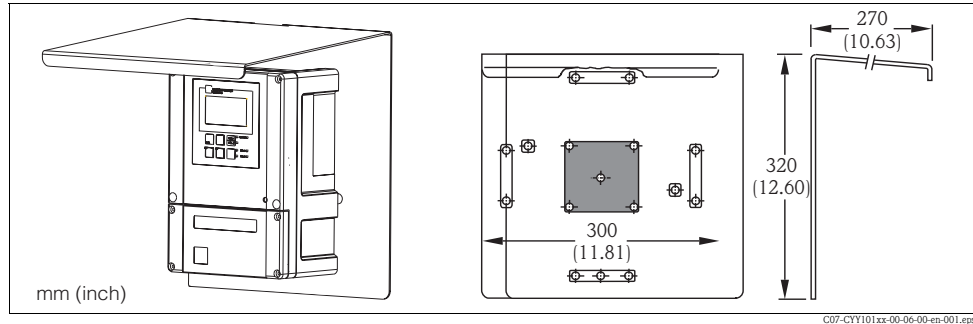
Certificates	
A	Standard, non Ex
Cable length	
03	Cable length: 3 m / 10 ft
05	Cable length: 5 m / 16 ft
10	Cable length: 10 m / 33 ft
15	Cable length: 15 m / 49 ft
20	Cable length: 20 m / 66 ft
25	Cable length: 25 m / 82 ft
Ready-made	
1	Wire terminals
<b>CYK10-</b>	complete order code

- Measuring cable CYK81  
 to lengthen the fixed cable of e.g. Memosens, CUS31/CUS41,  
 2 wires, twisted pair with shield and PVC-sheath (2 x 2 x 0.5 mm<sup>2</sup> + sheath), sold by the meter  
 order no. 51502543
- Junction box VBM  
 for cable extension, with 10 terminals, IP 65 / NEMA 4X  
 Cable entry Pg 13.5 Order no. 50003987  
 Cable entry NPT ½" Order no. 51500177
- Junction box VBA  
 with 10 high-impedance terminals, protection class: IP 65 / NEMA 4; material: polycarbonate  
 order no. 50005276

- Junction box RM  
to lengthen the cable for Memosens or CUS31/CUS41, IP 65 / NEMA 4 with 2 x PG 13.5  
order no. 51500832

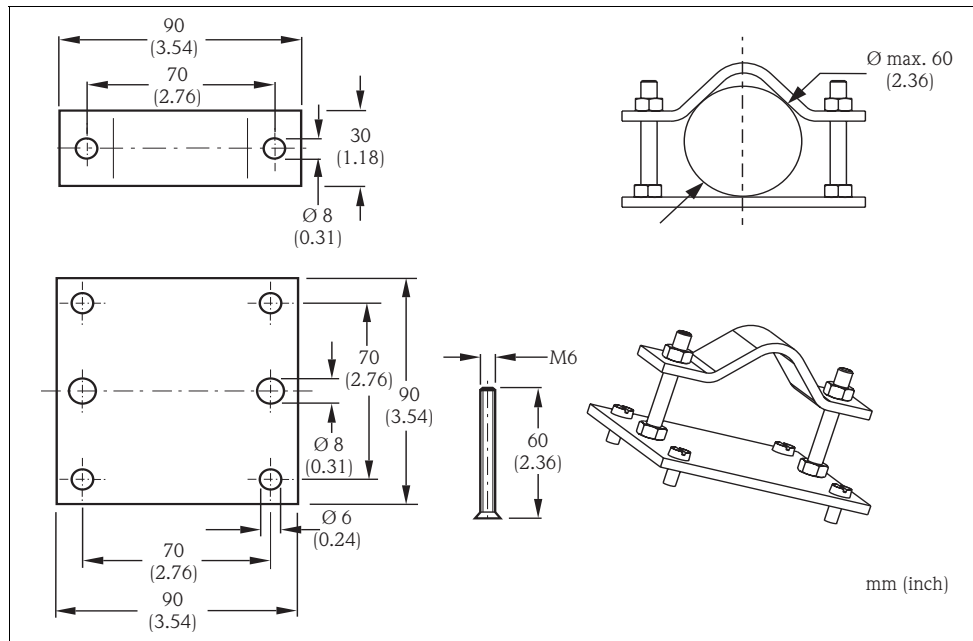
**Mounting accessories**

- Weather protection cover CYY101 for mounting of field housing, for outdoor installation  
material: stainless steel 1.4031;  
order no. CYY101-A



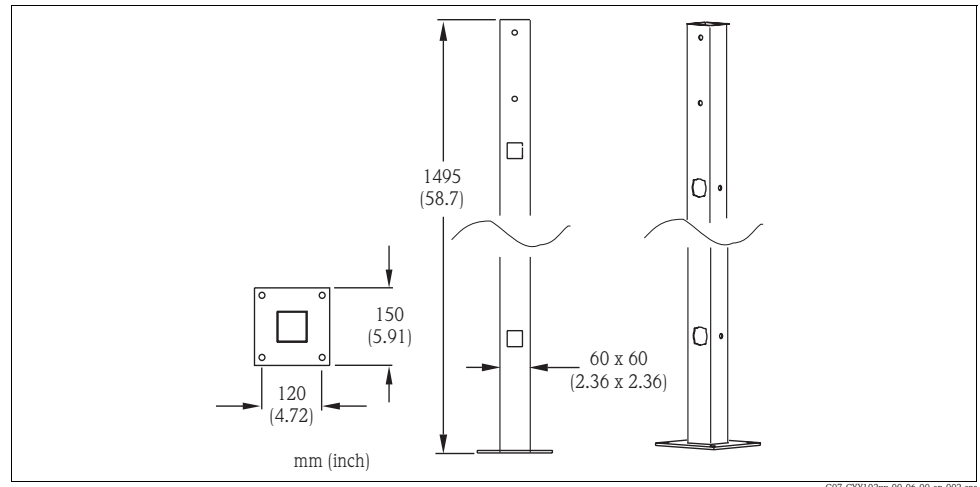
Weather protection cover for field instrument

- Kit for mounting of field housing on horizontal or vertical pipes (Ø max. 60 mm / 2.36")  
order no. 50086842



Pipe mounting kit

- Universal upright post CYY102  
Square tube for mounting of field housing, material: stainless steel 1.4301;  
order no. CYY102-AA



Square post CYY102

**Buffer solutions**

Technical buffer solutions, accuracy 0.02 pH, acc. to NIST/DIN

- pH 4.0 red, 100 ml (3 oz), order no. CPY 2-0
- pH 4.0 red, 1000 ml (30 oz), order no. CPY 2-1
- pH 7.0 green, 100 ml (3 oz), order no. CPY 2-2
- pH 7.0 green, 1000 ml (30 oz), order no. CPY 2-3

Technical buffer solutions for single use, accuracy 0.02 pH, acc. to NIST/DIN

- pH 4.0 20 x 20 ml (0.7 oz), order no. CPY 2-D
- pH 7.0 20 x 20 ml (0.7 oz), order no. CPY 2-E
- +225 mV, pH 7, 100 ml (3 oz); order no. CPY 3-0
- +468 mV, pH 0, 100 ml (3 oz); order no. CPY 3-1

KCl-electrolyte solutions for liquid filled electrodes

- 3.0 mol, T = -10 to 100°C (14 to 212°F), 100 ml (3 oz), order no. CPY4-1
- 3.0 mol, T = -10 to 100°C (14 to 212°F), 1000 ml (30 oz), order no. CPY4-2
- 1.5 mol, T = -30 to 100°C (-22 to 266°F), 100 ml (3 oz), order no. CPY4-3
- 1.5 mol, T = -30 to 100°C (-22 to 266°F), 1000 ml (30 oz), order no. CPY4-4

**Optoscope**

- Optoscope

Interface between transmitter and PC / laptop for service purposes.

The Windows software "Scopeware" required for the PC or laptop is supplied with the Optoscope. The Optoscope is supplied in a sturdy plastic case with all the accessories required.

Order no. 51500650

**Documentation**

- Operating instructions Liquisys M CPM223/253, BA194C/07/en, order no. 51500268
- Ex safety instructions, XA194C/07/a3, order no. 51515755
- Operating instructions PROFIBUS-PA/-DP, BA209C/07/en, order no. 51501839
- Operating instructions HART, BA208C/07/en, order no. 51501609

**United States**

Endress+Hauser, Inc.  
2350 Endress Place  
Greenwood, IN 46143  
Tel. 317-535-7138  
Sales 888-ENDRESS  
Service 800-642-8737  
fax 317-535-8498  
inquiry@us.endress.com  
www.us.endress.com

**Canada**

Endress+Hauser Canada  
1075 Sutton Drive  
Burlington, ON L7L 5Z8  
Tel. 905-681-9292  
800-668-3199  
Fax 905-681-9444  
www.ca.endress.com

**Mexico**

Endress+Hauser, México, S.A. de C.V.  
Av. Gustavo Baz No. 43  
Fracc. Bosques de Echegaray  
Naucalpan de Juárez, C.P. 53310, Estado  
de México  
Tel: (52) 55-5371-1110  
Fax (52) 55-5371-1128  
eh.mexico@mx.endress.com

TI194C/24/ae/08.06  
© 2006 Endress+Hauser