Level	Pressure	Flow	Temperature	Liquid Analysis	Registration	Systems Components	Services	Solutions

Technical Information

Mycom S CPM153

pH/redox transmitter (one or two circuit) with controller and limit value functions for Ex and non–Ex areas

Application

Thanks to its modular design, the four-wire transmitter Mycom S CPM153 is optimally suited for pH value and redox potential measurement in the following areas of process engineering and processing systems:

- Chemical processes
- Food technology
- Pharmaceuticals
- Water treatment
- Explosion hazardous areas

Your benefits

- High measurement reliability:
  - Monitoring of electrode status (SCC), impedance (SCS) and measuring signal (PCS)
  - Logbook functions and data log
  - Redundancy and differential measurement
- High user friendliness:
  - Automatic buffer recognition
  - One–touch calibration
  - Integrated cleaning function Chemoclean
  - Online help
- Individually adaptable:
  - Optional two-circuit measurement (galvanically isolated circuits)
  - Extended controller and limit value functions
  - Current and resistance inputs for feedforward control and position feedback
  - Current output for analogue actuators
  - Plug–in module to save and transfer configuration (DAT module)
  - Output contacts according to NAMUR
- Ex approval
  ATEX II (1) 2 G EEx em [ia/ib] IIC T4
- HART or PROFIBUS PA, Profile 3.0 certified

Endress+Hauser

People for Process Automation

Function and system design

Important functions

Quick setup

This function allows you to configure the necessary basic settings for the measuring point quickly and easily, so that you can begin measurement immediately.

Sensor Condition Check (SCC)

This function monitors the state of the electrodes or the degree of electrode ageing. The "Electrode OK", "Low wear" or "Replace electrode" messages inform you on the state of the electrode. The electrode state is updated after each calibration. When the "Replace electrode" message appears, an error message is displayed.

Sensor Check System (SCS)

The sensor check system alerts to deviations of the pH glass impedance or reference impedance from the normal range, thus indicating possible failure due to pH electrode blocking or damage.

Process Check System (PCS)

This function checks the measuring signal for deviations. If the measuring signal does not change for some time (several measured values), an alarm is triggered. Soiling, blockage or similar could be the cause of such behaviour.

Logbooks

There are several logbooks available. The last 30 entries are saved to an error log, an operation log and a calibration log. The entries are displayed with their date and time.

Data logs

The integrated data logs allow you to record two selectable parameters and display the results graphically in real time. You can retrieve the last 500 measured values with date and time of their recording. In this way, you can graphically display the process flow. This offers a quick way of checking the process and a good possibility of optimising pH control.
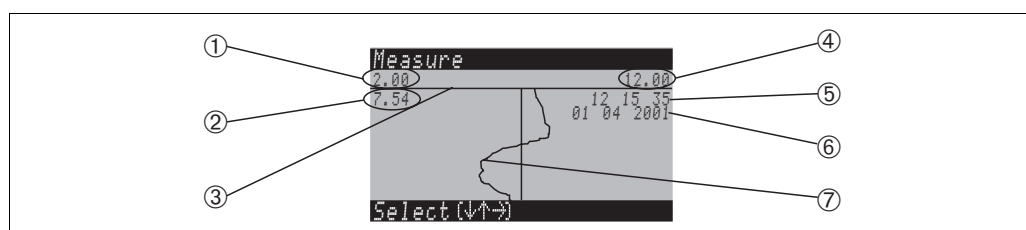
C07-CPM153xx-20-06-00-en-036.eps

Example for data log 1 (for parameter 1, pH is selected here)
1   Minimum display range (selectable to −2 pH)
2   Measured value found on the current scroll bar position
3   Scroll bar
4   Maximum display range (selectable to +16 pH)
5   Time when the measured value was recorded
6   Date of this measured value
7   Measured value curve

Cleaning functions

- The Chemoclean® spray cleaning system automatically cleans the electrode. It is controlled by two contacts (possible with basic version). Cleaning can be triggered automatically at programmed intervals, manually or by an error message. You can configure almost any error to trigger cleaning.
- In the fully automatic Topcal S and Topclean S cleaning and calibration systems, the CPM153 is used as transmitter and control device. You can automate cleaning and calbration using a retractable assembly (e.g. Cleanfit series). The superb price-perfomance ratio of the Topcal S and Topclean S systems allows you to install a complete measuring point with low maintenance requirements and thus a low cost of ownership.

Simple control

The following control functions are integrated in the CPM153:
- Limit value contact: two-point controller with hysteresis for simple temperature control for example
- PID controller:
  – For one and two-sided processes
  – With freely adjustable P, I and D components
  – Including configurable range-dependent gain (segmented curve)
  – Differentiation between batch and online processes
- Manipulated variable output
  The manipulated variable can be output either as binary signal via the relays or via the current output:
  – Binary signal via relays as PWM (pulse length), PFM (pulse frequency)
  – Current output (0/4 ... 20 mA): analogue signal to control actuator (for one or two actuator drives)

Valves for position feedback or feedforward control can also be included in the control system. For this, you can use the following optional inputs:
– Order version CPM153-xxx2xxxxx: 1 current input (Ex or non-Ex)
– Order version CPM153-xxx4xxxxx: 2 current inputs (Ex or non-Ex)
– Order version CPM153-xxx3xxxxx: 1 resistance input (non-Ex)
– Order version CPM153-xxx5xxxxx: 1 current and 1 resistance input (non-Ex)

Selection aids for control

The following selection aids for online and batch processes help you to select the suitable transmitter version for your process.
PWM = pulse length proportional
PFM = pules frequency proportional
3-point step = three-point step controller

Selection aid for online processes

Process	Path	Dosing actuators	Circuits	Relay	Current inputs	Current outputs
1-sided control	looking-ahead · 2-circuit · flow	1 PWM	2	1	1	–
		1 PFM	2	1	1	–
		1 3-point step	2	2	2	–
		1 PWM/PFM	2	2	1	–
		analogue	2	–	1	1
	not looking-ahead	1 PWM	1	1	–	–
		1 PFM	1	1	–	–
		1 3-point step	1	2	1	–
		1 PWM/PFM	1	2	–	–
		analogue	1	–	–	1

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Selection aid for online processes

Process Path		Dosing actuators	Required hardware equipment for control			
			Circuits	Relay	Current inputs	Current outputs
1-sided control	looking-ahead · 2-circuit · flow	1 PWM	2	1	1	–
		1 PFM	2	1	1	–
		1 3-point step	2	2	2	–
		1 PWM/PFM	2	2	1	–
		analogue	2	–	1	1
	not looking-ahead	1 PWM	1	1	–	–
		1 PFM	1	1	–	–
		1 3-point step	1	2	1	–
		1 PWM/PFM	1	2	–	–
		analogue	1	–	–	1

C07-CPM153xx-16-12-00-en-001.eps

Selection aid for batch processes or slow online processes

Process	Dosing actuators	Required hardware equipment for control			
		Circuits	Relays	Current inputs	Current outputs
1-sided control	1 PWM	1	1	–	–
	1 PFM	1	1	–	–
	1 3-point step	1	2	1	–
	1 PWM/PFM	1	2	–	–
	current output	1	–	–	1
2-sided control	2 PWM	1	2	–	–
	2 PFM	1	2	–	–
	1 3-point step	1	–	1	1
	1 PWM/PFM	1	3	–	–
	current output split range	1	3	–	–

C07-CPM153xx-16-12-00-en-003.eps

DAT module

The DAT module is a memory device (EEPROM) which is plugged into the terminal compartment of the transmitter.

Using the DAT module, you can:
- *save* complete settings, logbooks and the logged data of the data logs of the Mycom S
- *copy* the complete settings to other Mycom S transmitters which have identical hardware functions.

This considerably reduces the effort to install or service several measuring points.

Offline configuration with Parawin

Using the **Parawin** PC tool, you can:

1. Configure the whole measuring point on the PC in the familiar Windows environment.

2. Save the settings to the DAT module.

3. Plug the DAT module into a Mycom S and transfer the entire configuration to the transmitter (= complete transmitter setup). Then you can set up other transmitters with the same configuration.

4. You can also use the DAT module to copy logbooks and data logs from the transmitter and to your computer for documentation purposes. You can then display the logged data in graphic form on your PC.
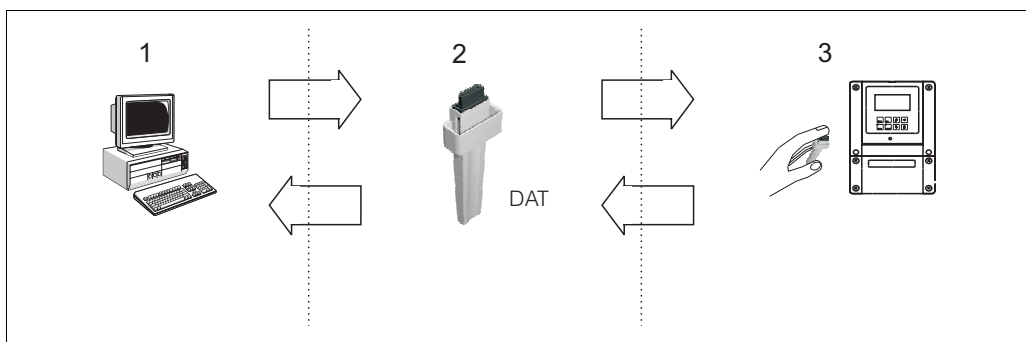
C07-CPM153xx-19-06-00-xx-001.eps

Offline configuration with Parawin (1 - 2 -3) $\Longrightarrow$

Offline data storage (3 -2 -1) $\Longleftarrow$

|	
Calibration and measurement	Calbration options: - Automatic calibration with automatic buffer recognition Several buffer tables, e.g. according to DIN, Endress+Hauser, Merck and Riedel de Haën / Ingold are saved in the transmitter. In addition, you can program further buffer tables. The transmitter automatically recognises the buffer value during calibration. - Manual calibration When calibrating manually, you can either perform a two-point calibration (zero point and slope) or a one-point calibration, i.e. zero-point calibration of the pH electrode. - Numeric calibration (data input) The electrode data are entered using the keypad. - Automatic transmission of calibration data from the sensor to the transmitter when your are using digital sensors with Memosens technology. - Calibration log The data of the last 30 calibrations are saved to a list with date and time. Accurate measurement through: - Medium temperature compensation This allows high-accuracy measurement over wide temperature ranges. This compensation type compensates the temperature influence on the pH value of the medium. - Isothermic intersection point compensation This allows high-accuracy measurement even at temperature fluctuations. This compensation type compensates the deviation betweeen isothermic intersection point and zero point of the electrode.

Measuring system

A complete measuring system comprises:
- the Mycom S CPM153 transmitter
- an immersion (e.g. CPA111), flow (e.g. CPA250) or retractable assembly (e.g. CPA475), each with or without potential matching pin
- a pH/redox combination electrode with integrated or separate temperature sensor, e.g. CPS71
- a suitable pH measuring cable, e.g. CPK9.
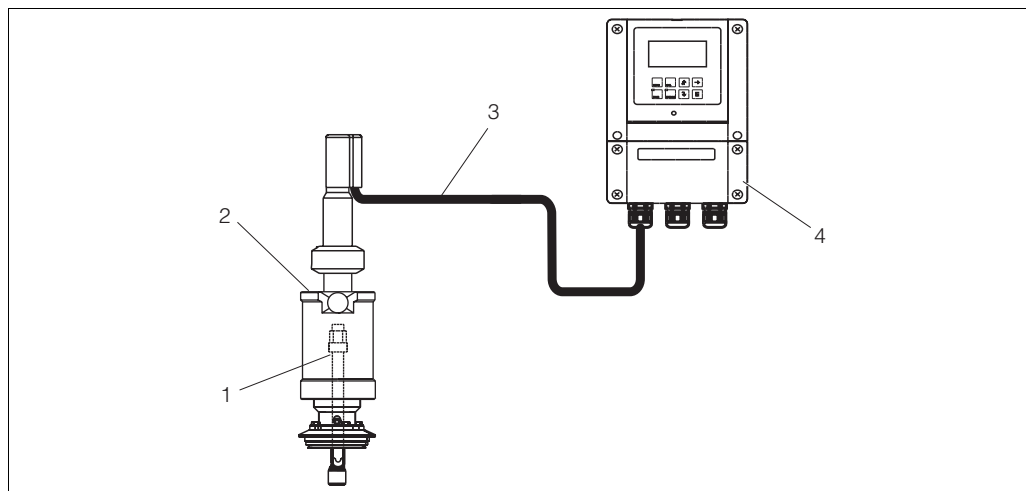
C07-CPM153xx-14-06-00-xx-001.EPS

Example of a measuring system

1   CPS71 electrode
2   CPA475 manually retractable assembly
3   CPK9 pH cable
4   CPM153 transmitter

Input

Note!
The limit values for Ex versions are specified separately and marked by ⟨Ex⟩.

Measured variables	pH (analogue or digital sensors) Redox Temperature

Measuring range	pH:	–2 ... 16 pH
	Redox:	–1500 ... +1500 mV / –300 ... +300 %
	Temperature:	–50 ... +200 °C / –58 ... 392 °F

Input resistance $> 10^{12}\ \Omega$ (at nominal operating conditions, analogue measured value transmission)

Input current $< 1.6 \cdot 10^{-12}$ A (at nominal operating conditions)

Ex connection data   ⟨Ex⟩ Sensor circuit with type of protection EEx ia IIC. This circuit may also be connected to sensors of category 1G (zone 0).

Maximum output voltage U_O:	DC 12.6 V
Maximum output current I_O:	130 mA
Maximum output P_O:	198 mW
Maximum outer capacity C_O:	50 nF (with ISFET sensors: 150 nF)
Maximum outer inductivity L_O:	100 µH

Cable specification	Cable length (analogue):	max. 50 m / 164.05 ft
	Cable length (digital):	max. 100 m / 328.10 ft

| Current inputs 1 / 2 (passive, optional) | Signal range: | 4 ... 20 mA |
| | Input voltage range: | 6 ... 30 V |

⟨Ex⟩ Intrinsically safe current inputs for connection to intrinsically safe electric circuits with type of protection EEx ia IIC or EEx ib IIC.

	Maximum input voltage U_i:	DC 30 V
	Maximum inupt current I_i:	100 mA
	Maximum input P_i:	3 W
	Maximum inner capacity C_i:	1.1 nF
	Maximum inner inductivity L_i:	24 μH

| Resistance input (active, optional, non-Ex only) | Resistance ranges (switchable via software): | 0 ... 1 kΩ |
| | | 0 ... 10 kΩ |

| Digital inputs E1 – E3 | Input voltage: | 10 ... 50 V |
| | Internal resistance: | $R_i = 5$ kΩ |

⟨Ex⟩ Intrinsically safe optoelectronic coupler for connection with intrinsically safe electric circuits with type of protection EEx ia IIC or EEx ib IIC

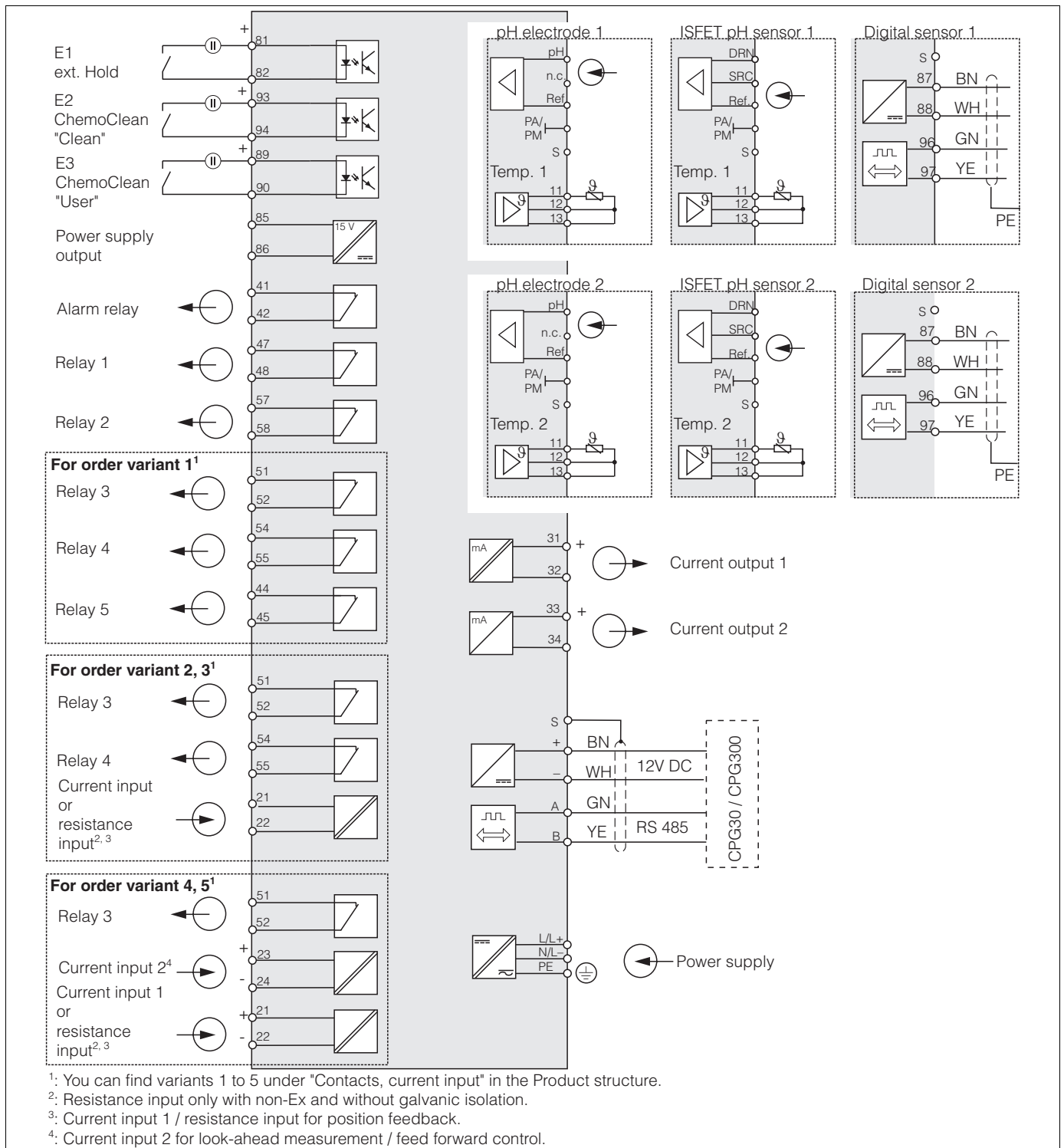| | Maximum input voltage U_i: | DC 30 V |
| | Maximum input capacity C_i: | negligible |
| | Maximum inner inductivity L_i: | negligible |

Output

Output signal	0/4 ... 20 mA
Signal on alarm	2.4 or 22 mA in case of an error
Load: active current output	max. 600 Ω (non-Ex only)

Output distribution	pH:	settable, 0 ... 18 pH
	Redox:	
	absolute:	settable, 300 ... 3000 mV
	relative:	settable, 0 ... 600 %
	Temperature:	settable, 17 ... 200 °C / 63 ... 360 °F

| Passive current output | Operating voltage range: | 6 ... 30 V |

| Ex connection data | ⟨Ex⟩ Intrinsically safe current output for connection with intrinsically safe electric circuits with type of protection EEx ib IIC. |

	Maximum input voltage U_i:	DC 30 V
	Maximum input current I_i:	100 mA
	Maximum input power P_i:	750 mW
	Maximum inner capacity C_i:	negligible
	Maximum inner inductivity L_i:	negligible

| Overvoltage protection | acc. to EN 61000-4-5:1995 |

Auxiliary voltage output	Output voltage:	15 V DC
(for digital inputs E1 – E3)	Output current:	max. 9 mA

$\langle\!\langle Ex \rangle\!\rangle$ Intrinsically safe current output circuit with type of protection EEx ib IIC.

Maximum output voltage U_O:	DC 15.8 V
Maximum output current I_O:	71 mA
Maximum output power P_O:	1.13 W
Maximum inner capacity C_O:	50 nF
Maximum outer capacity L_O:	100 µH

Interface to CPG30 / CPG300

Power supply:	
Output voltage:	11.5 ... 18 V
Output current:	max. 60 mA
Communication:	RS 485

$\langle\!\langle Ex \rangle\!\rangle$ Intriniscally safe current output circuit with type of protection EEx ib. IIC.

Relay contacts

Switching voltage:	max. 250 V AC / 125 V DC
Switching current:	max. 3 A
Switching power:	max. 750 VA
Life span:	$\geq$ 5 million switching cycles

$\langle\!\langle Ex \rangle\!\rangle$ Intrinsically safe relay contact circuits for connection with intrinsically safe electric circuits with type of protection EEx ia IIC or EEx ib IIC.

Maximum input voltage U_i:	DC 30 V
Maximum input current I_i:	100 mA
Maximum input power P_i:	3 W
Maximum inner capacity C_i:	1.1 nF
Maximum inner inductivity L_i:	24 µH

Controller

Function (selectable):	Pulse–length controller (PWM)
	Pulse–frequency controller (PFM)
	Three–point step–controller (3–point step)
	Analogue (via current output)
Controller behaviour:	P / PI / PID
Control gain K_R:	0.01 ... 20.00
Integral action time T_n:	0.0 ... 999.9 min
Derivative action time T_v:	0.0 ... 999.9 min
Max. frequency with pulse-frequency controller:	120 min^{-1}
Max. period with pulse-length controller:	1 ... 999.9 s
Minimum switch-on period with pulse-length controller:	0.4 s

Limit value and alarm functions

Setpoint adjustments:	–2.00 ... 16.00 pH
Hysteresis for switching contacts:	
pH:	0.1 ... 18 pH
Redox absolute:	10 ... 100 mV
Redox relative:	1 ... 3000 %
Alarm delay:	0 ... 6000 s

Galvanic isolation

Following circuits are at the same potential:

- Current output 1 and auxiliary voltage
- Current output 2, CPG300 supply and resistance input

The remaining circuits are galvanically isolated from each other.

Power supply

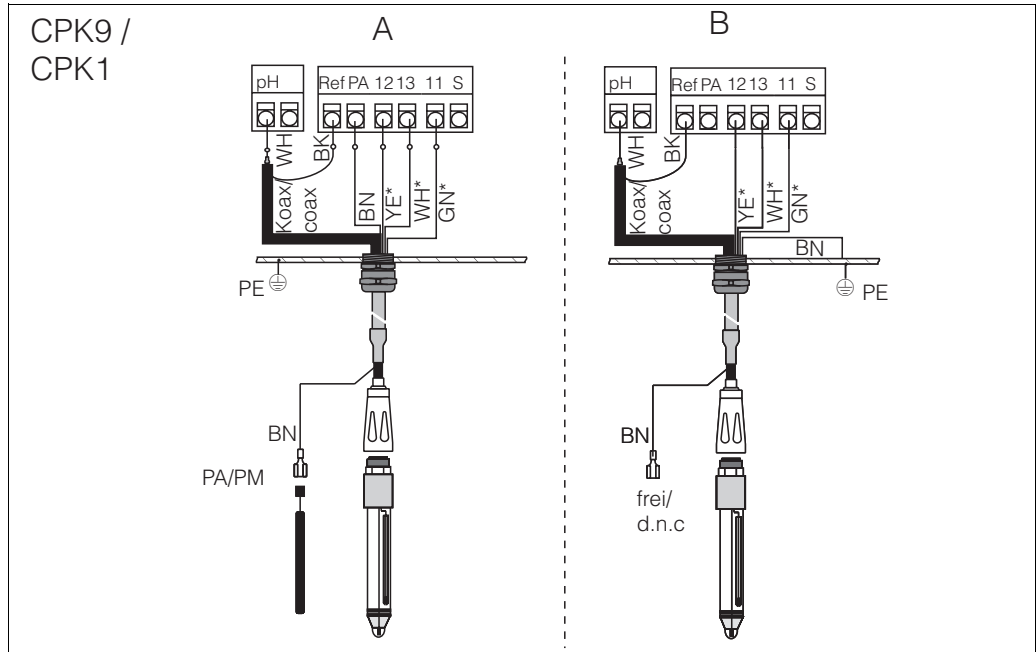**Wiring diagram**

Electrical connection of CPM153

[1]: You can find variants 1 to 5 under "Contacts, current input" in the Product structure.
[2]: Resistance input only with non-Ex and without galvanic isolation.
[3]: Current input 1 / resistance input for position feedback.
[4]: Current input 2 for look-ahead measurement / feed forward control.

C07-CPM153xx-04-06-00-en-001.eps

Connection of pH glass electrodes

CPK9 / CPK1
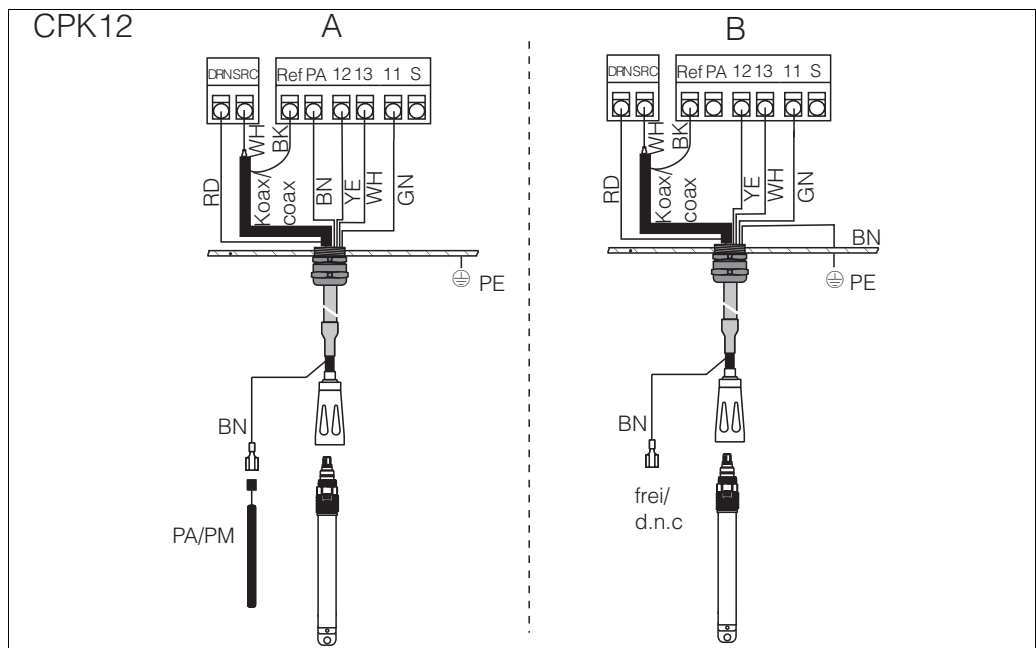
C07-CPC300xx-04-06-00-xx-013.eps

pH glass electrode connection

A   *symmetrical connection*
B   *unsymmetrical connection*
*   *not available with CPK1*
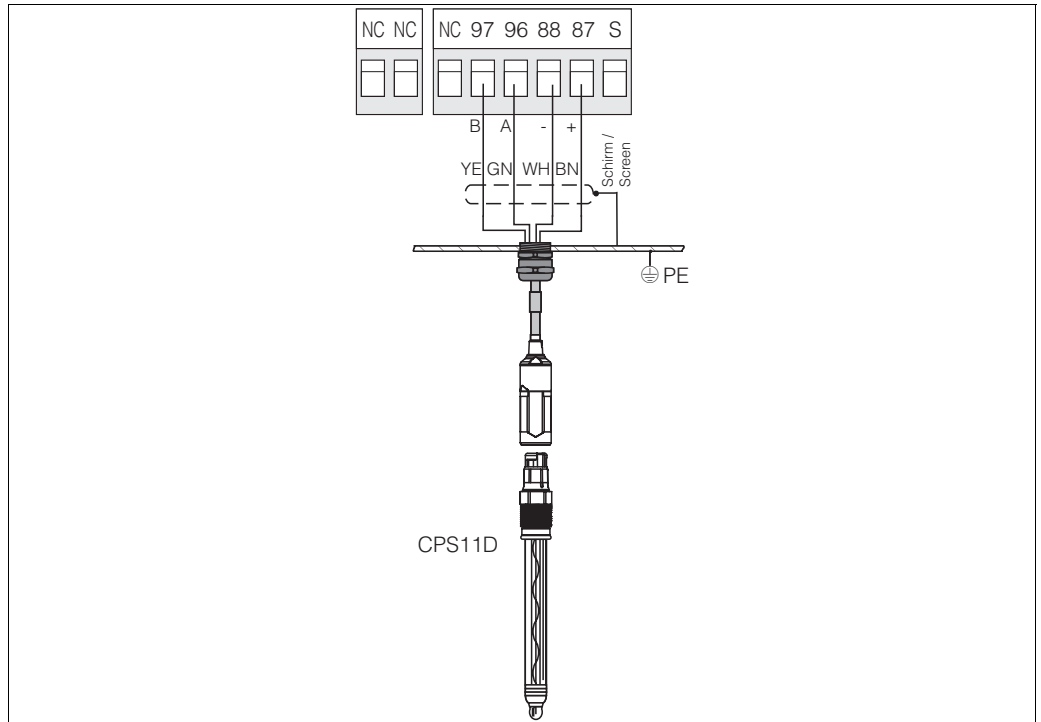
Connection of ISFET sensors

CPK12

C07-CPC300xx-04-06-00-xx-014.eps

ISFET sensor connection

A   *symmetrical connection*
B   *unsysmmetrical connection*

Connection of digital sensors

Digital sensor connection

| **Power supply** | CPM153-xxxx0xxxx: | 100 ... 230 V AC +10/-15% |
| | CPM153-xxxx8xxxx: | 24 V AC/DC +20/-15% |

| **Cable specification** | max. cable cross-section: | 2.5 mm^2 |

| **Power consumption** | max. 10 VA |

| **Separation voltage between galvanically isolated circuits** | 276 V$_{eff}$ |

Contacts

The basic version of Mycom S has one alarm and two additional contacts.

The transmitter can be upgraded with the following additional equipment:
- 3 contacts
- 2 contacts and 1 current or resistance input (the latter for non–Ex only)
- 1 contact, 1 current input and 1 current or resistance input (the latter for non–Ex only)

You can assign functions to the available contacts via the software. The "Active open" and "Active closed" contact types can also be switched by the software.
With the appropriate instrument version, you can assign up to three relays to the controller.

✎ Note!
If you use NAMUR contacts (acc. to recommendations of the association for process control engineering of the chemical and pharmaceutical industry), the contacts are set to the relays as follows:

| Relay	Assignment NAMUR on	Terminal
ALARM	Failure	41 42
RELAY 1	Warning when maintenance required	47 48
RELAY 2	Function check	57 58

Connection examples

Switching example for digital inputs
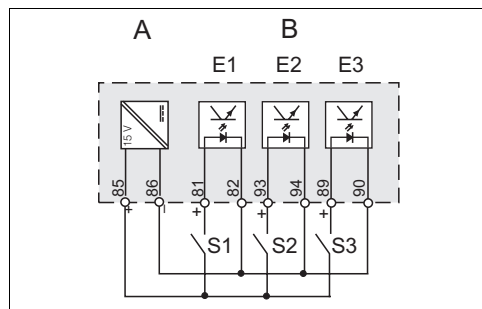
A   Auxiliary voltage output
B   Digital inputs
E1   External hold
E2   Chemoclean "Clean"
E3   Chemoclean "User"
S1   External de-energised contact
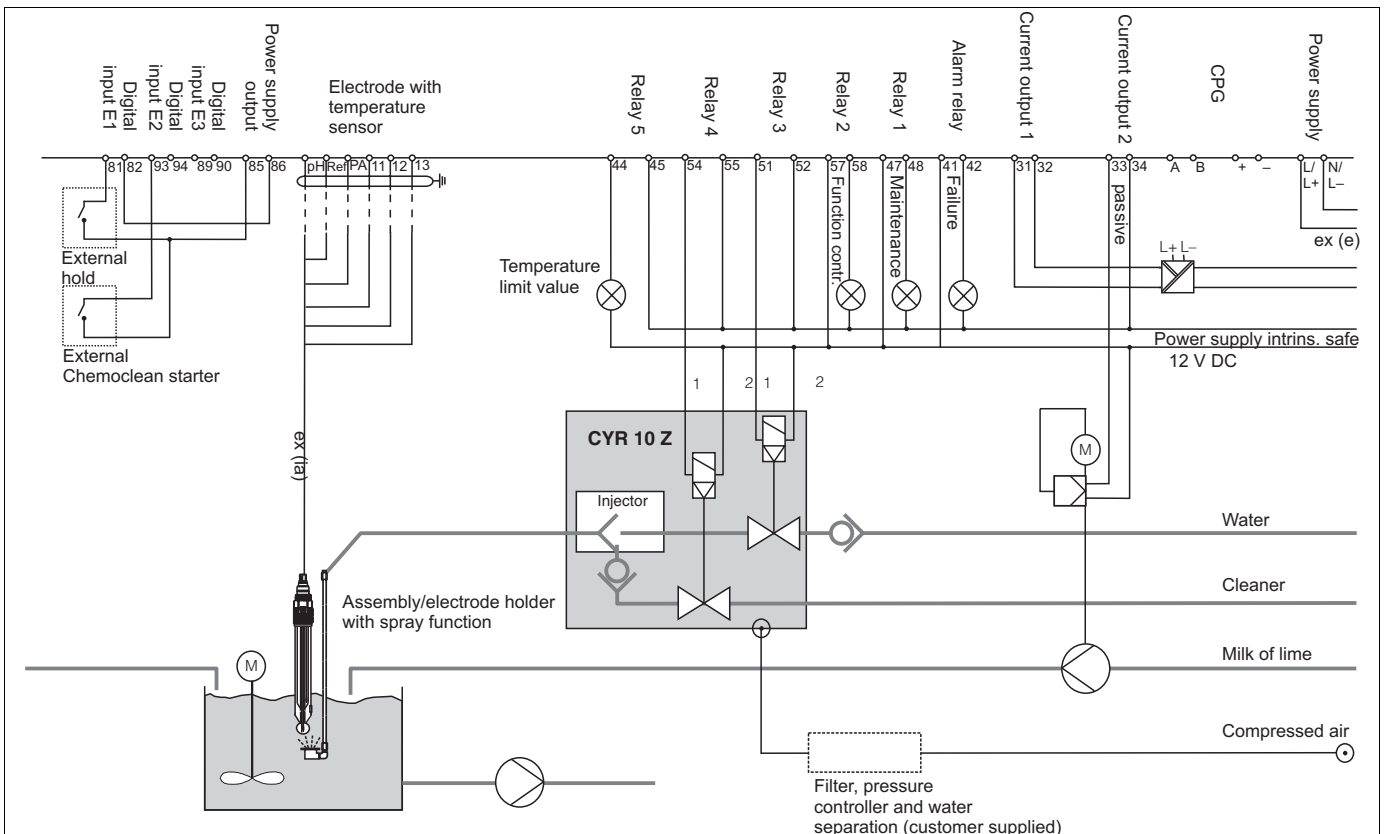*S2   External de-energised contact*
S3   External de-energised contact

C07-CPM153xx-04-06-00-xx-005.eps

Switching example digital inputs

One-circuit instrument
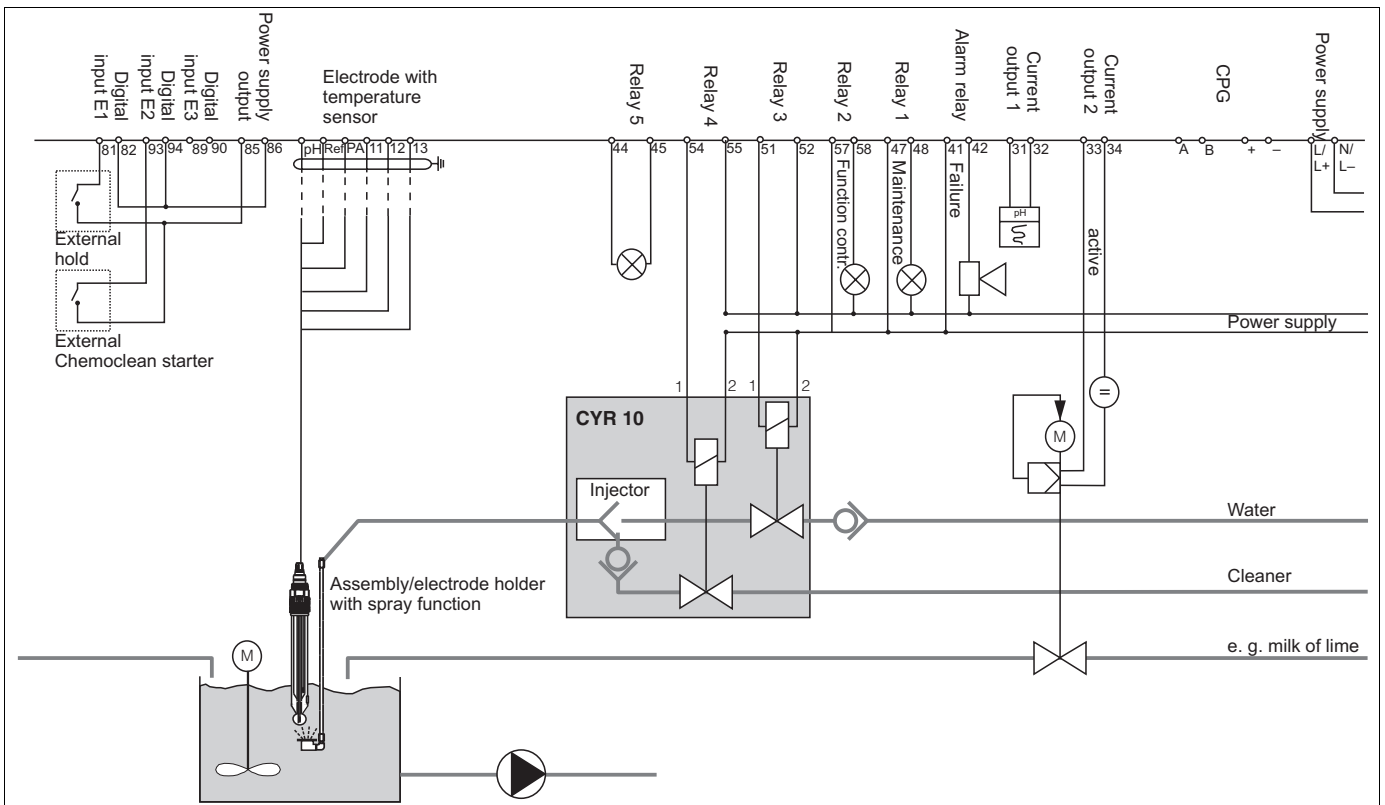
Non-Ex: One-circuit instrument, NAMUR, Chemoclean w. Injektor CYR10 and assembly w. spray head, one-sided neutralisation, temperature limit value, pH current output

Ex: One-circuit instrument, NAMUR, Chemoclean w. injector CYR10Z and assembly w. spray head, milk-of-lime neutralisation, temp. limit value, pH current output

Two–circuit difference measurement
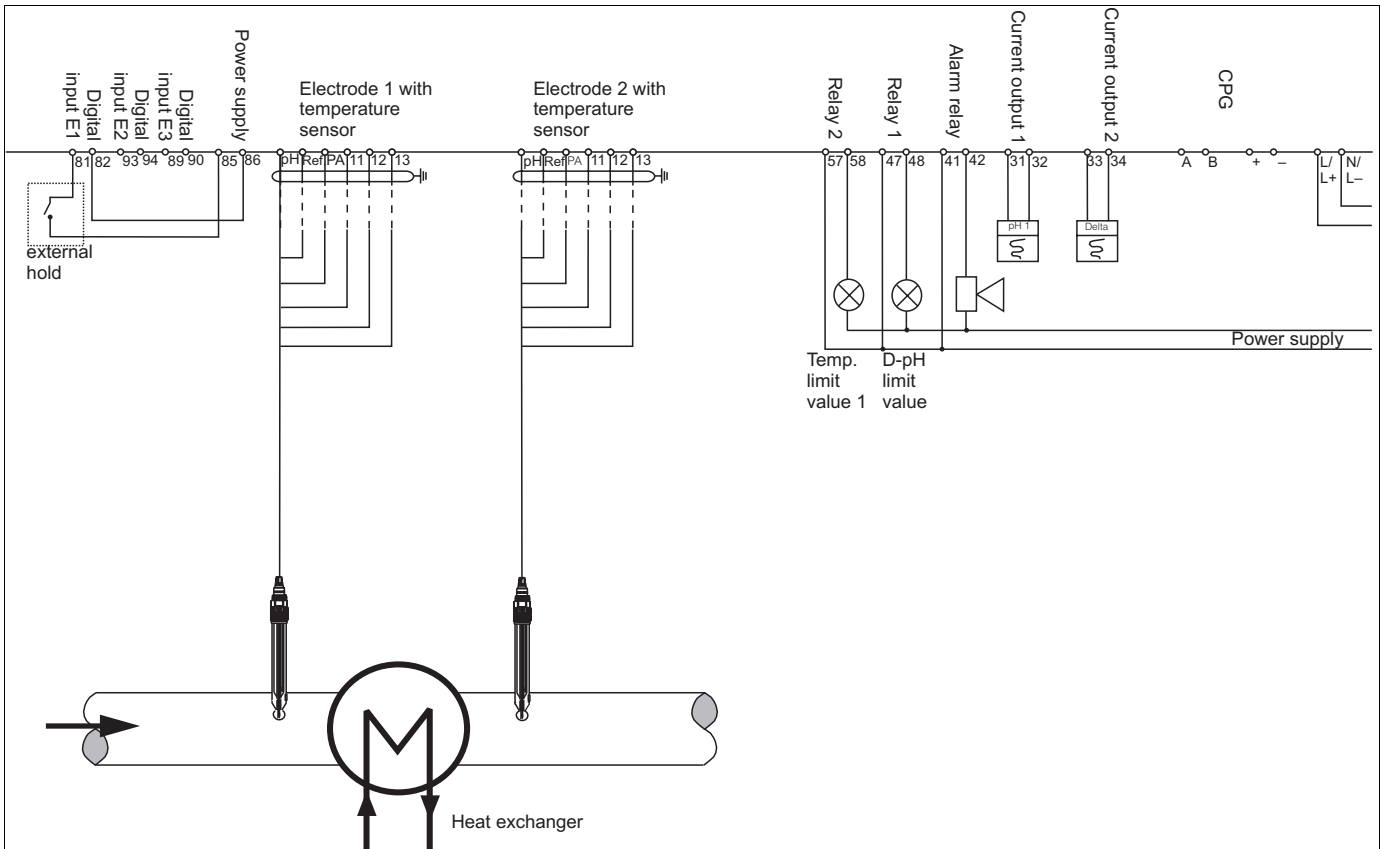
C07-CPM153xx-04-06-00-en-003.eps

Non-Ex: Two-circuit difference measurement, pH and delta pH on current outputs, limit values for Δ pH, temperature circuit 1
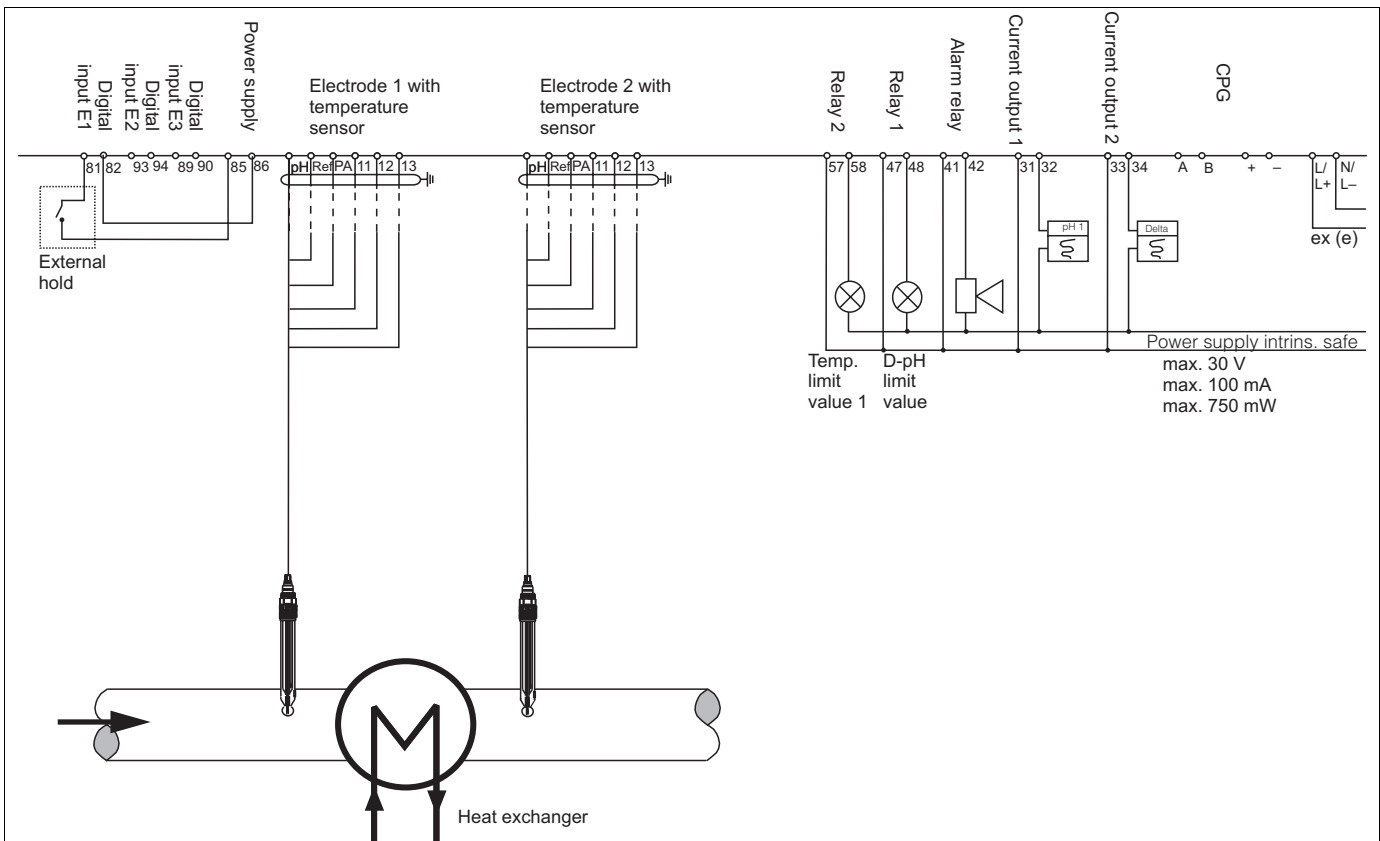
C07-CPM153xz-04-06-00-en-003.eps

Ex: Two-circuit difference measurement, pH and Delta pH on current outputs, limit value for Δ pH, temperature circuit 1

Performance characteristics

Reference temperature	25 °C / 77 °F (settable with medium temperature compensation)	
Measured value resolution	pH:	0.01 pH
	Redox:	1 mV / 1 %
	Temperature:	0.1 K
Measurement deviation[a]	Display	
	pH:	max. 0.2 % of measuring range
	Redox:	max. 1 mV
	Temperature:	max. 0.5 K
	Current outputs:	max. 0.2 % of current range end value
	Current inputs:	max. 1 % of measuring range
	Resistance input:	max. 1 % of measuring range
Repeatability[a]	max. 0.1 % of measuring range	
Zero point offset range	pH:	–2 ... +16 pH
	Redox:	–200 ... +200 mV
Slope adjustment	pH:	5 ... 99 mV/pH
Offset	Redox:	±120 mV
	Temperature:	±5 K
Assignment with Redox relative	settable, Δ for 100 % = 150 ... 2000 mV	

Installation

Wall mounting

☞ Caution!
- Check that the temperature does not exceed the maximum permitted operating temperature range (–20 ... +60 °C / –4 ... 140 °F). Install the instrument in a shady location. Avoid direct sunlight.
- Always install the transmitter so that the cable entries point downwards.

C07-CPM153xx-11-00-08-en-001.eps
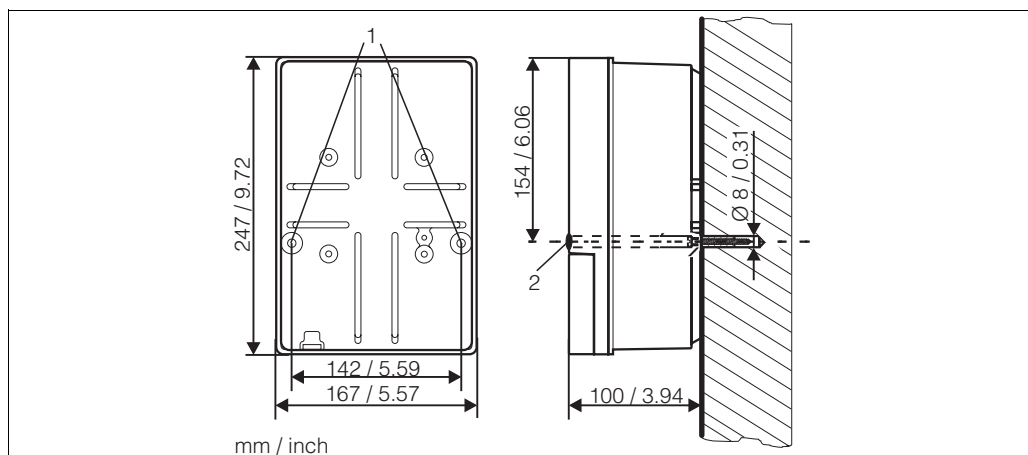
Dimensions for wall mounting, fixing screw: Ø 6 mm / 0.24", wall plug: Ø 8 mm / 0.31"

1   Fixing drill holes
2   Plastic cover cap

---

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

Post mounting and panel mounting

C07-CPM153xx-11-00-08-xx-002.eps

Mounting kit

Mount the parts of the mounting kit at the back of the housing as shown in the figure below.

Panel mounting:
    If you need to seal the front panel mounting of the Mycom S air-tight, you must use an additional flat gasket (see accessories).
    Required installation cutout: 161 x 241 mm / 6.34 x 9.41 inches
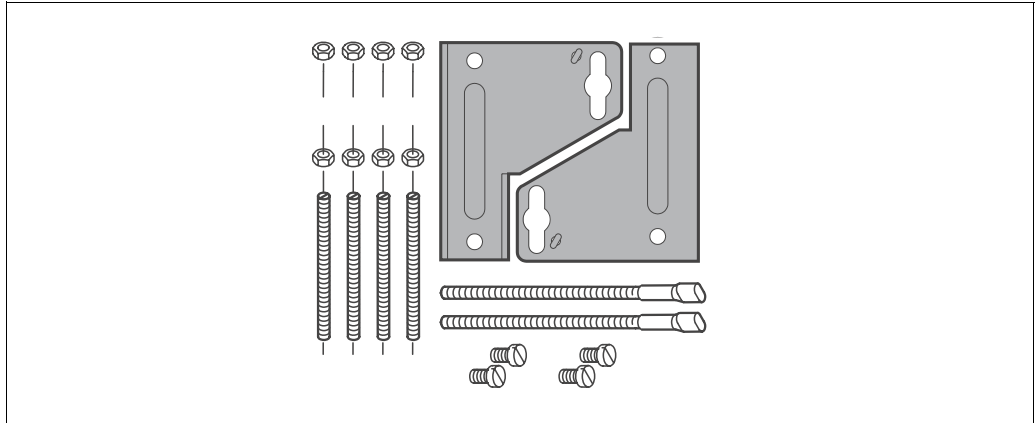   Installation depth: 134 mm / 5.28"
Post mounting:
    Post diameter: max. 70 mm / 2.76"
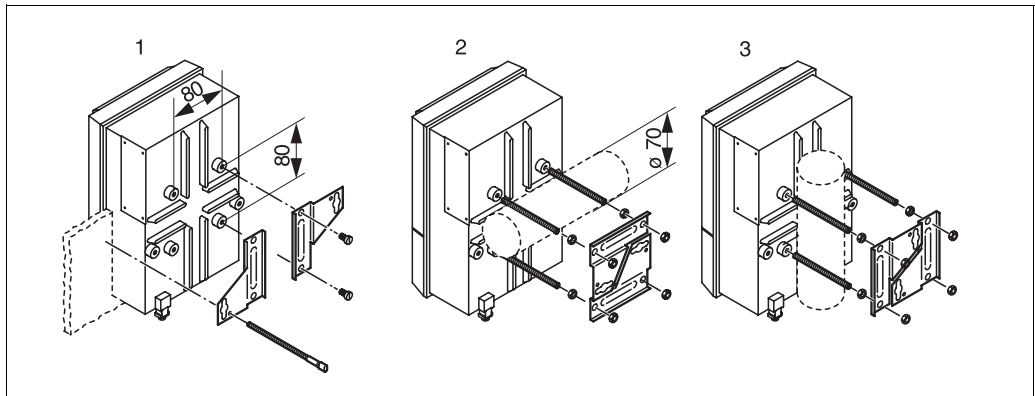
C07-CPM153xx-11-00-08-xx-003.eps

Panel mounting and post mounting

1   Panel mounting
2   Horizontal post mounting
3   Vertical post mounting

Caution!
Always use the CYY101 weather protection cover for outdoor installation (see figure below and accessories).

C07-CPM153xx-11-00-01-xx-001.eps

Post mounting with weather protection cover

Environment

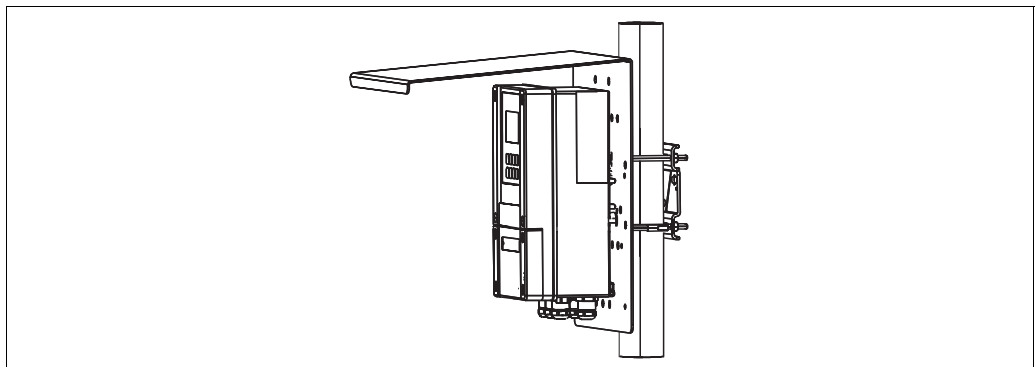|	
Ambient temperature	–10 ... +55 °C / 14 ... 131 °F (Ex: –10 ... +50 °C / 14 ... 122 °F)
Ambient temperature limit	–20 ... +60 °C / –4 ... 140 °F (Ex: –10 ... +50 °C / 14 ... 122 °F)
Storage temperature	–30 ... +80 °C / –22 ... 176 °F
Electromagnetic compatibility	Interference emission and interference immunity acc. to EN 61326: 1997 / A1: 1998
Ingress protection	IP 65
Relative humidity	10 ... 95%, non-condensing

Mechanical construction
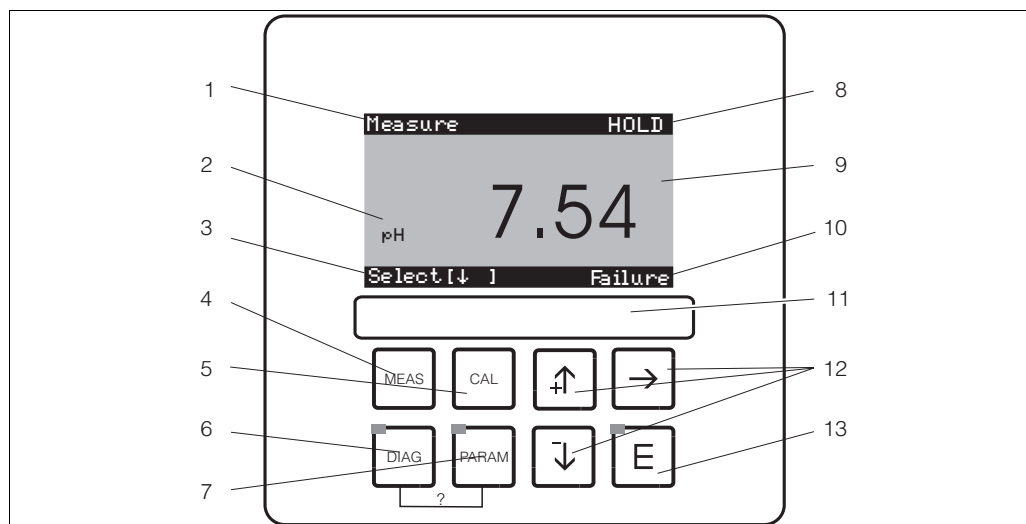
Dimensions	Length x width x depth: Installation depth:	247 mm x 167 mm x 100 mm / 9.72 x 6.57 x 3.94 inches approx. 134 mm / 5.28"
Weight	max. 6 kg / 13.2 lb.	
Material	Housing: Front:	GD-AISi 12 (Mg content 0.05 %), plastic coated Polyester, UV resistant
Terminals	max. cable cross section	2.5 mm^2

Human interface

Display and operating elements

Backlit LC display with dot matrix, 128 x 64 dots

C07-CPM153xx-19-06-00-en-002.eps

Operating elements

1	*Current menu*	*9*	*Current main measured value*
2	*Current parameter*	*10*	*"Failure" display, "Warning" if NAMUR contacts are active*
3	*Navigation bar: arrow keys for scrolling; "E" for browsing; note for cancelling*	*11*	*Labelling strip*
4	*MEAS : Measuring mode key*	*12*	*Arrow keys for scrolling and editing*
5	*CAL : Calibration key*	*13*	*Enter key*
6	*DIAG : Diagnosis menu key*	*?*	*Simultaneously pressing DIAG and PARAM opens the online help*
7	*PARAM : Configuration menu key*		
8	*HOLD display, if HOLD is active*		

The display shows the current measured value and the temperature, i.e. the most important process data, at a glance. In the configuration menu, online help pages help you to enter suitable instrument parameters.

Operating functions

Four main menus are available for instrument operation:

- Measurement
- Configuration
- Calibration
- Diagnosis

Press the MEAS, PARAM, CAL and DIAG keys to switch to the appropriate menu. The submenus are displayed in plain text and the selected elements are displayed in reverse video. Use the arrow keys to select elements and to edit numeric values.
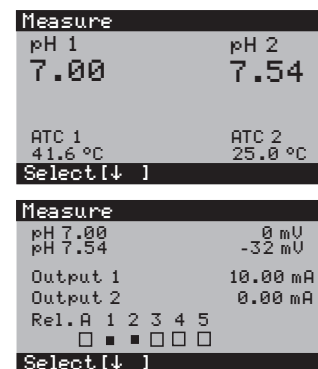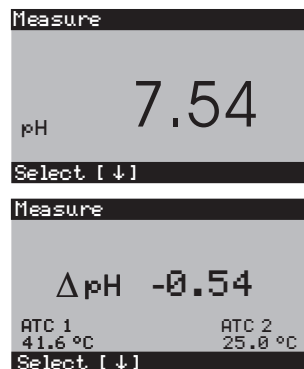
Display possibilities in measuring mode

One-circuit instrument

pH/redox value, temperature, current outputs 1 and 2, contact states, setpoints for continuous controller
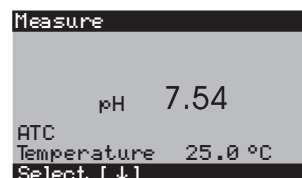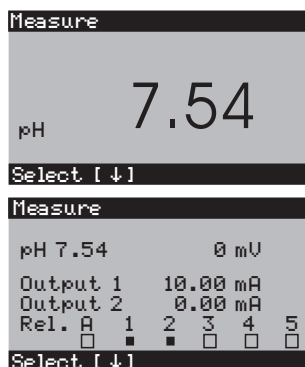
Two-circuit instrument

pH/redox values 1 and 2, temperatures 1 and 2, current outputs 1 and 2, contact states, difference between pH/redox values, setpoint for continuous controller

```
┌─────────────────────────┐    ┌─────────────────────────┐
│Measure                  │    │Measure                  │
│                         │    │pH 1          pH 2       │
│         ___             │    │7.00          7.54       │
│    pH   7.54            │    │                         │
│                         │    │ATC 1         ATC 2      │
│                         │    │41.6 °C       25.0 °C    │
│Select [ ↓ ]             │    │Select[↓  ]              │
└─────────────────────────┘    └─────────────────────────┘

┌─────────────────────────┐    ┌─────────────────────────┐
│Measure                  │    │Measure                  │
│                         │    │pH 7.00           0 mV   │
│                         │    │pH 7.54         -32 mV   │
│    △pH  -0.54           │    │Output 1       10.00 mA  │
│                         │    │Output 2        0.00 mA  │
│ATC 1         ATC 2      │    │Rel.A  1 2 3 4 5         │
│41.6 °C       25.0 °C    │    │       □ ■ ■ □ □ □       │
│Select [ ↓ ]             │    │Select[↓  ]              │
└─────────────────────────┘    └─────────────────────────┘
```

Access codes

To protect the transmitter from unintended or undesired modification of the configuration and calibration data, four-digit access codes can be defined. Access authorisation has the following levels:

- Read-only level (accessible without code)
  The complete menu can be viewed. The configuration cannot be changed. Calibration is not possible. Only the controller parameters can be changed in the "DIAG" menu branch.
- Maintenance level (can be protected by the service code)
  This code permits calibration.
  Use this code to operate the temperature compensation menu command. The test functions and the internal data can be viewed.
- Specialist level (can be protected by the specialist code)
  All menus are accessible for modification.

✎ Note!
As long as no codes are defined, all functions are freely accessible.

User interface for offline configuration via Parawin (Accessories)

C07-CPM153xx-00-00-00-en-003.tif
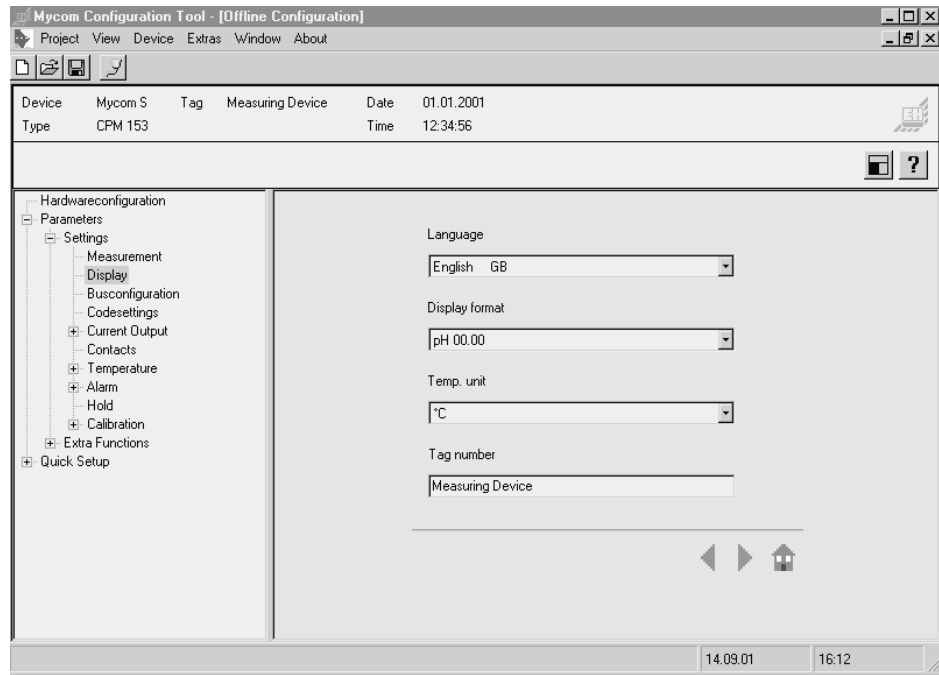
Parawin menu structure

The PC tool enables you to configure your measuring point offline on a PC using a simple and self–explaining menu structure (see window example above). Write the configuration to the DAT module using the RS232 interface of the PC. The module can then be plugged into the transmitter.

Certificates and approvals

C€ 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 C€ symbol.

Ex approval

Depending on ordered version:
- ATEX II (1) 2G, EEx em ia/ib IIC T4
- FM NI Class I, Division 2, Groups A, B, C, D; sensor IS Class I Division 1, Groups A, B, C, D
  FM DIP Class II, III, Division 1, Groups E, F, G; sensor IS Class I Division 1, Groups A, B, C, D
- FM NI Class I, Division 2, Groups A, B, C, D
  FM DIP Class II, III, Division 1, Groups E, F, G
- CSA Class I, Division 2; sensor IS Class I Division 1
- FM IS NI Cl. I, II, III, Div. 1&2, Group A–G
- TIIS

Ordering information

Product structure

Certificates		
A	Basic version for non-Ex areas	
G	With ATEX approval, ATEX II (1) 2G EEx, em ib[ia] IIC T4, only passive current outputs	
O	With FM approval, NI Cl. I, Div. 2, Sensor IS Cl. I, Div. 1, only passive current outputs	
P	With FM approval, NI Cl. I, Div. 2, only passive current outputs	
S	With CSA approval, NI Cl. I, Div. 2, Sensor IS Cl. 1, Div. 1, only passive current outputs	
T	With TIIS approval, only passive current outputs	

	Sensor inputs	
1	1 measuring circuit for glass electrodes, pH/redox and temperature	
2	1 measuring circuit for glass electrodes/ISFET sensors, pH/redox and temperature	
3	2 measuring circuits for glass electrodes, pH/redox and temperature	
4	2 measuring circuits for glass electrodes/ISFET sensors, pH/redox and temperature	
5	1 measuring circuit for digital pH sensors (Memosens), pH and temperature	
6	2 measuring circuits for digital pH sensors (Memosens), pH and temperature	

	Output signals	
A	2 current outputs 0/4 ... 20 mA, passive (Ex and non-Ex)	
B	2 current outputs 0/4 ... 20 mA, active (non-Ex)	
C	HART with 2 current outputs 0/4 ... 20 mA, passive (Ex and non-Ex)	
D	HART with 2 current outputs 0/4 ... 20 mA, active (non-Ex)	
E	PROFIBUS-PA, no current outputs	

	Contacts, current inputs	
0	no additional contacts	
1	3 additional contacts	
2	2 additional contacts, 1 current input passive (Ex and non-Ex)	
3	2 additional contacts, 1 resistance input active (non-Ex)	
4	1 additional contact, 2 current inputs passive (Ex and non-Ex)	
5	1 additional contact, 1 current input passive, 1 resistance input active (non-Ex)	

	Power supply	
0	100 ... 230 V AC	
8	24 V AC/DC	

	Languages	
A	E / D	
B	E / F	
C	E / I	
D	E / ES	
E	E / NL	
F	E / J	

	Cable entries	
0	Cable glands M 20 x 1.5	
1	Cable entry NPT ½"	
3	Cable gland M 20 x 1.5, PROFIBUS-PA-M12 plug	
4	Cable gland NPT ½", PROFIBUS-PA-M12 plug	

	Additional features	
0	Standard version	
1	DAT module	

	Configuration	
0	Factory setup	

| CPM153– | | complete order code |

Scope of delivery

The scope of delivery comprises:
- 1 CPM153 transmitter
- 1 mounting kit
- 4 cable glands
- 1 set for measuring point labelling
- 1 instrument identification card
- 1 operating instructions BA 233C/07/en
- Versions with HART communication:
  1 operating instructions Field communication with HART, BA 301C/07/en
- Versions with PROFIBUS interface
  1 operating instructions Field communication with PROFIBUS PA, BA 298C/07/en
- Ex versions
  Safety instructions for electrical equipment in explosion hazardous areas, XA 233C/07/a3

Accessories

Offline configuration with Parawin

❏ Parawin
Graphical PC software for offline configuration of the measuring point at the PC. The language is selectable.
Required operating systems: Windows NT/95/98/2000.
The offline configuration tool consists of:
- a DAT module
- DAT interface (RS 232)
- Software
Order no.: 51507133 (Mycom S only)
Order no.: 51507563 (Topcal S, Topclean S, Mycom S)

DAT module

❏ Additional memory device for saving or copying complete settings, logbooks and the data logs;
Order no.: 51507175

Flat gasket

❏ Flat gasket for sealing the front panel mounting of the Mycom S
Order no.: 50064975

Assemblies (selection)

❑ Cleanfit W CPA450
Manually operated, retractable assembly for installation of 120 mm / 4.72" pH/redox electrodes in tanks and pipes,
Ordering acc. to product structure, see Technical Information (TI 183C/07/en, order no. 50090677)
(Make sure to order the correct inner tube for your electrode version.)

❑ Cleanfit P CPA471
Compact retractable stainless steel assembly for installation in tanks and pipes, manual or pneumatic operation
Ordering acc. to product structure, see Technical Information (TI 217C/07/en, order no. 51502596)

❑ Cleanfit P CPA472
Compact retractable plastic assembly for installation in tanks and pipes, manual or pneumatic operation,
Ordering acc. to product structure, see Technical Information (TI 223C/07/en, order no. 51502645)

❑ 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/07/en, order no. 51510923)

❑ Cleanfit P CPA474
Retractable plastic process assembly, with ball valve for a particularly safe and reliable separation of the medium from the environment,
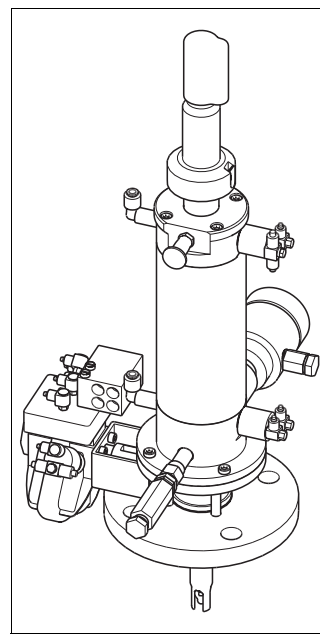Ordering acc. to product structure, see Technical Information (TI 345C/07/en, order no. 51510925)
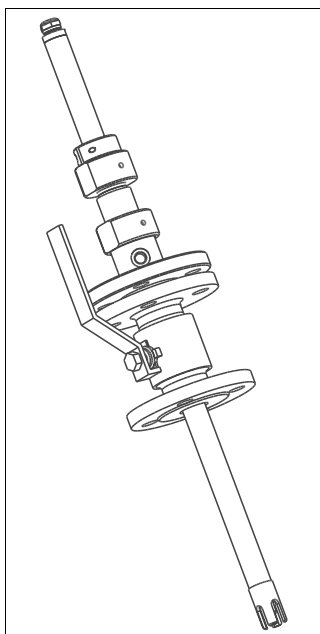
Cleanfit W CPA450
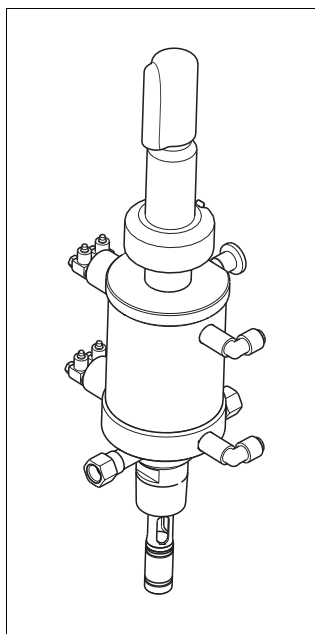
*Cleanfit P CPA471 or 472*

Cleanfit P CPA473 or 474

❑ Cleanfit H CPA475
  Retractable assembly for installation in tanks and pipes under sterile conditions,
  Ordering acc. to product structure, see Technical Information (TI 240C/07/en, order no. 51505599)
❑ Unifit H CPA442
  Process assembly for the food industry, biotechnology and pharmaceutical industry, with EHEDG and 3A
  certificates,
  Ordering acc. to product structure, see Technical Information (TI 306C/07/en, order no. 51507254)
❑ Dipfit W CPA111
  Plastic immersion and installation assembly for open and closed tanks,
  Ordering acc. to product structure, see Technical Information (TI 112C/07/en, order no. 50066450)
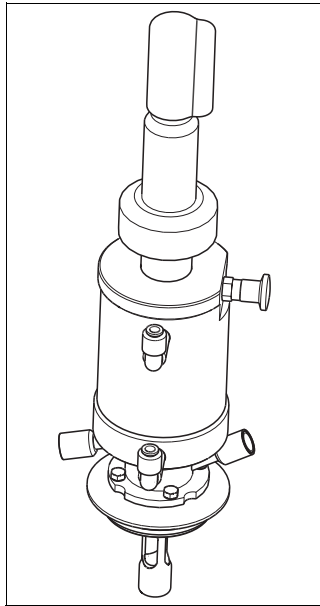
Cleanfit H CPA475
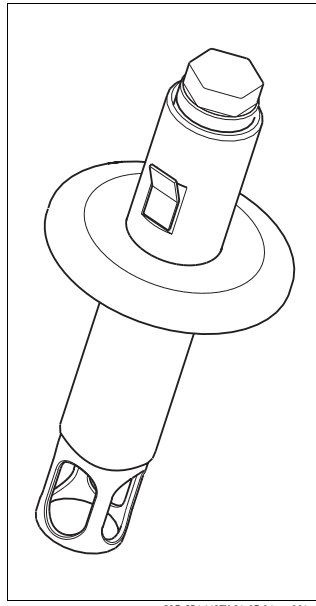
Unifit H CPA442
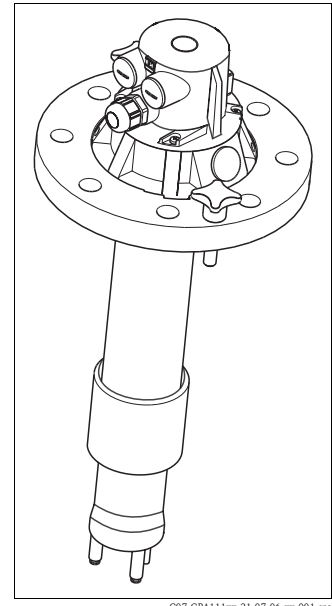
Dipfit W CPA111

❑ Dipfit P CPA140
  Immersion assembly for pH/redox electrodes for demanding processes,
  Ordering acc. to product structure, see Technical Information (TI 178C/07/en, order no. 50088968)
❑ Flowfit P CPA240
  Flow assembly for pH/redox electrodes, for demanding processes,
  Ordering acc. to product structure, see Technical Information (TI 179C/07/en, order no. 50088970)
❑ Flowfit W CPA250
  Flow assembly for pH/redox measurement,
  Ordering acc. to product structure, see Technical Information (TI 041C/07/en, order no. 50036058)
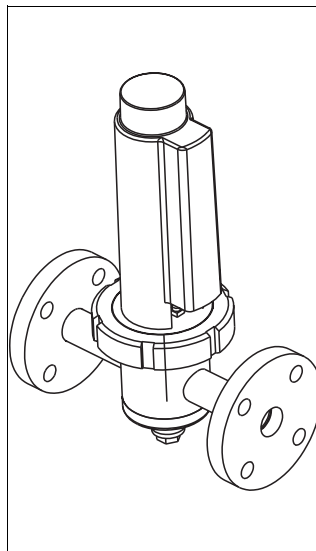
Dipfit P CPA140

Flowfit P CPA240

Flowfit W CPA250

- Probfit H CPA465
  Retractable assembly for installation in tanks and pipes under sterile conditions,
  Ordering acc. to product structure, see Technical Information (TI 146C/07/en, order no. 50076878)
- Ecofit CPA640
  Process connection adapter and cable set for 120 mm pH electrodes with TOP68 plug-in head,
  Ordering acc. to product structure, see Technical Information (TI 264C/07/en, order no. 51506405)
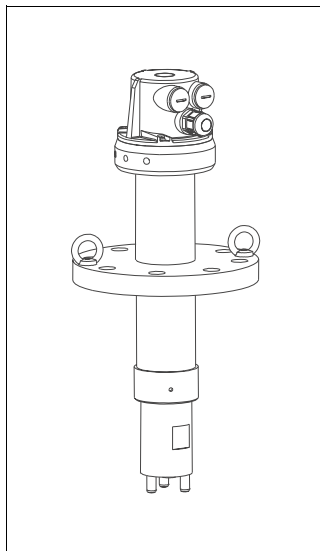

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Probfit H CPA465
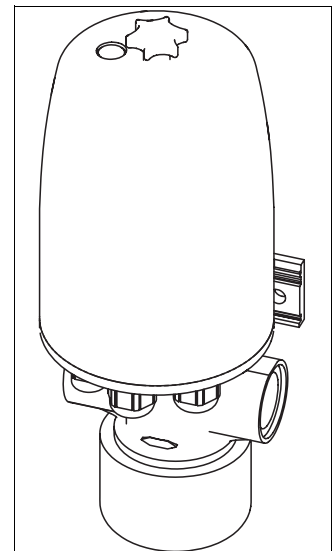
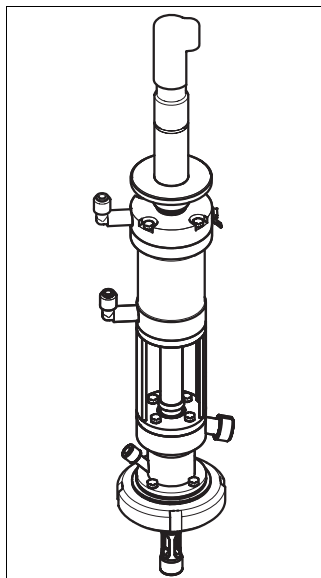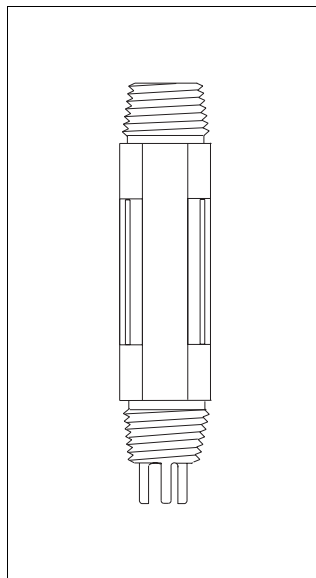C07-CPA640xx-21-07-00-xx-001.eps

Ecofit CPA640

Sensors

❑ Orbisint CPS11
pH electrode for process applications, with PTFE diaphragm;
Ordering acc. to product structure, see Technical Information (TI 028/C07/en)

❑ Orbisint CPS12
ORP electrode for process applications, with PTFE diaphragm;
Ordering acc. to product structure, see Technical Information (TI 367/C07/en)

❑ Ceraliquid CPS41
pH electrode with ceramics diaphragm and KCl liquid electrolyte;
Ordering acc. to product structure, see Technical Information (TI 079/C07/en)

❑ Ceraliquid CPS42
ORP electrode with ceramics diaphragm and KCl liquid electrolyte;
Ordering acc. to product structure, see Technical Information (TI 079/C07/en)

❑ Ceragel CPS71
pH electrode with double chamber reference system and integrated bridge electrolyte;
Ordering acc. to product structure, see Technical Information (TI 245/C07/en)

❑ Ceragel CPS72
ORP electrode with double chamber reference system and integrated bridge electrolyte;
Ordering acc. to product structure, see Technical Information (TI 374/C07/en)

❑ Orbipore CPS91
pH electrode with open aperture for media with high dirt load;
Ordering acc. to product structure, see Technical Information (TI 375C/07/en)

❑ Orbisint CPS11D
Digital pH sensor for process applications, with PTFE diaphragm;
Ordering acc. to product structure, see Technical Information (TI 028/C07/en)

❑ Ceragel CPS71D
Digital pH sensor with double chamber reference system and integrated bridge electrolyte;
Ordering acc. to product structure, see Technical Information (TI 245/C07/en)

❑ Orbipore CPS91D
Digital pH sensor with open aperture for media with high dirt load;
Ordering acc. to product structure, see Technical Information (TI 375C/07/en)

❏ Tophit CPS471
Sterilisable and autoclavable ISFET sensor for food and pharmaceuticals, process technology, water treatment and biotechnology;
Ordering acc. to product structure, see Technical Information (TI 283/C07/en)

❏ Tophit CPS441
Sterilisable ISFET sensor for media with low conductivity, with liquid KCl electrolyte;
Ordering acc. to product structure, see Technical Information (TI 352/C07/en)

❏ Tophit CPS491
ISFET sensor with open aperture for media with high dirt load;
Ordering acc. to product structure, see Technical Information (TI 377/C07/en)

Connection accessories

❏ 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)

❏ CPK9 special measuring cable
For electrodes with TOP68 plug-in head, for high-temperature and high-pressure applications, IP 68
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 Memosens data cable
For digital pH sensors with Memosens technology (CPSxxD)
Ordering according to product structure, see below

			Certificates	
			A	Standard, non Ex
			G	ATEX II 1G EEx ia IIC T6/T4
			O	FM CI.I Div. 1 AEx ia IIC T6/T4
			S	CSA IS CI.I Ex ia IIC T6/T4
			Cable length	
			03	Cable length: 3 m / 9.84 ft
			05	Cable length: 5 m / 16.41 ft
			10	Cable length: 10 m / 32.81 ft
			15	Cable length: 15 m / 49.22 ft
			20	Cable length: 20 m / 65.62 ft
			25	Cable length: 25 m / 82.03 ft
			Ready-made	
			1	Wire terminals
CYK10-				complete order code

❏ CYK12 measuring cable
Non-terminated cable for extension of sensor cables, used in combination with CPK1, CPK9 and CPK12, coax and 5 pilot wires, sold by the metre;

Non-Ex version, black: Order no. 51506598
Ex-version, blue: Order no. 51506616

❏ CYK81 measuring cable
to lengthen the fixed cable of e.g. Memosens, CUS31/CUS41,
2 wires, twisted pair with shield and PVC-sheath ($2 \times 2 \times 0.5\ mm^2$ + sheath), sold by the metre
order no. 51502543

❏ Junction box VBE Ex zone 0
for connection of up to 3 single lines of Ex zone 0 sensors
order no. 50003993

❏ 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; material: polycarbonate
order no. 50005276

❑ Junction box RM
to lengthen the cable for Memosens or CUS31/CUS41, IP 65 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
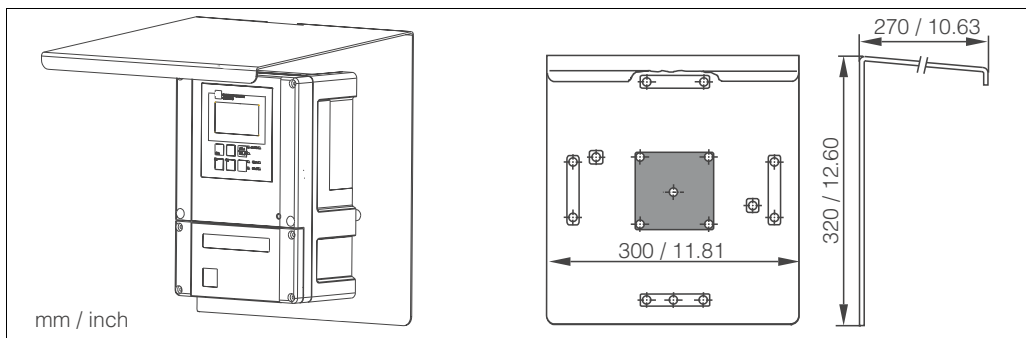
Weather protection cover for field instrument

❑ Round post fixture to fix the weather protection cover to vertical or horizontal posts with diameters of up to 70 mm / 2.76";
Order no. 50062121
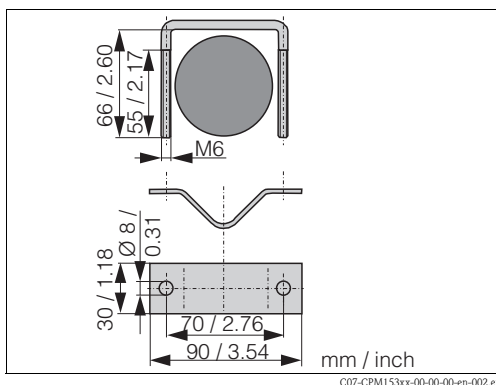
Round post fixture for CYY101

Buffer solutions

Technical buffer solutions, accuracy 0.02 pH, acc. to NIST/DIN
❑ pH 4.0 red, 100 ml (0.026 US gal.), order no. CPY 2-0
❑ pH 4.0 red, 1000 ml (0.264 US gal.), order no. CPY 2-1
❑ pH 7.0 green, 100 ml (0.026 US gal.), order no. CPY 2–2
❑ pH 7.0 green, 1000 ml (0.264 US gal.), 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 (0.005 US gal.), order no. CPY 2–D
❑ pH 7.0 20 x 20 ml (0.005 US gal.), order no. CPY 2–E

Technical buffer solutions for redox electrodes
❑ +225 mV, pH 7, 100 ml (0.026 US gal.); order no. CPY 3–0
❑ +468 mV, pH 0, 100 ml (0.026 US gal.); order no. CPY 3–1

KCl-electrolyte solutions for liquid filled electrodes
❑ 3.0 mol, T = –10 ... 100 °C (14 ... 212 °F), 100 ml (3 oz), order no. CPY4-1
❑ 3.0 mol, T = –10 ... 100 °C (14 ... 212 °F), 1000 ml (30 oz), order no. CPY4-2
❑ 1.5 mol, T = –30 ... 100 °C (–22 ... 266 °F), 100 ml (3 oz), order no. CPY4-3
❑ 1.5 mol, T = –30 ... 100 °C (–22 ... 266 °F), 1000 ml (30 oz), order no. CPY4-4

Documentation

❑ Operating Instructions Mycom S CPM153, BA233C/07/en, order no. 51503790
❑ Ex Safety Instructions, XA233C/07/a3, order no. 51506728
❑ Operating Instructions PROFIBUS-PA/-DP, BA298C/07/en, order no. 51507116
❑ Operating Instructions HART, BA301C/07/en, order no. 51507114

❑ Orbisint CPS11/CPS11D, Technical Information, TI 028C/07/en;
   order no. 50054649
❑ Orbisint CPS12/13, Technical Information, TI 367C/07/en;
   order no. 51513584
❑ Ceraliquid CPS41/42/43, Technical Information, TI 079C/07/en;
   order no. 50059346
❑ Ceragel CPS71/CPS71D, Technical Information, TI 245C/07/en;
   order no. 51505837
❑ Ceragel CPS72, Technical Information, TI 374C/07/en;
   order no. 51513591
❑ Orbipore CPS91/CPS91D, Technical Information, TI 375C/07/en;
   order no. 51513127

❑ Tophit CPS441, Technical Information, TI 352C/07/en;
   order no. 51506565
❑ Tophit CPS471, Technical Information, TI 283C/07/en;
   order no.-Nr. 51506685
❑ Tophit CPS491, Technical Information, TI 377C/07/en;
   order no. 51513174

❑ pH-measuring cables CPK1-12, Technical Information TI 118C/07/en;
   order no. 50068526

Endress+Hauser

People for Process Automation