pH/Redox Measurement
Mycom S CPM 153

pH/Redox Transmitter (one or two-circuit) with Controller and Limit Value Functions for Ex and non-Ex areas

Applications

The four-wire transmitter Mycom S CPM 153 performs pH and redox potential measurements with the highest level of reliability and accuracy in all areas of process engineering and processing systems.
Thanks to its modular structure, you can optimally adapt the device to any measurement or control task in the following applications:
- Chemical processes
- Food technology
- Pharmaceuticals
- Water treatment
- Ex applications

Your benefits

- High measurement reliability and user-friendliness:
  - Monitors electrode status (SCC), impedance (SCS) and measuring signal (PCS)
  - Logbook functions and data logger
  - Automatic buffer recognition
  - One-touch calibration
  - Integrated cleaning function "ChemoClean"
  - Redundancy and differential measurement
  - Online help pages
- Individually adaptable using:
  - Optional two-circuit measurement (galvanically isolated circuits)
  - Extended controller and limit value functions
  - Current/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 to NAMUR

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Functions and system design

Measuring system

A complete measuring system consists of the following components:
- The transmitter Mycom S CPM 153
- An immersible (e.g. CPA 140), flow (e.g. CPA 240) or retractable assembly (e.g. CPA 475), each with or without potential matching pin
- A pH/redox combination electrode with integrated or separate temperature sensor Pt 100, e.g. CPS 71
- A corresponding pH measuring cable, e.g. CPK 9
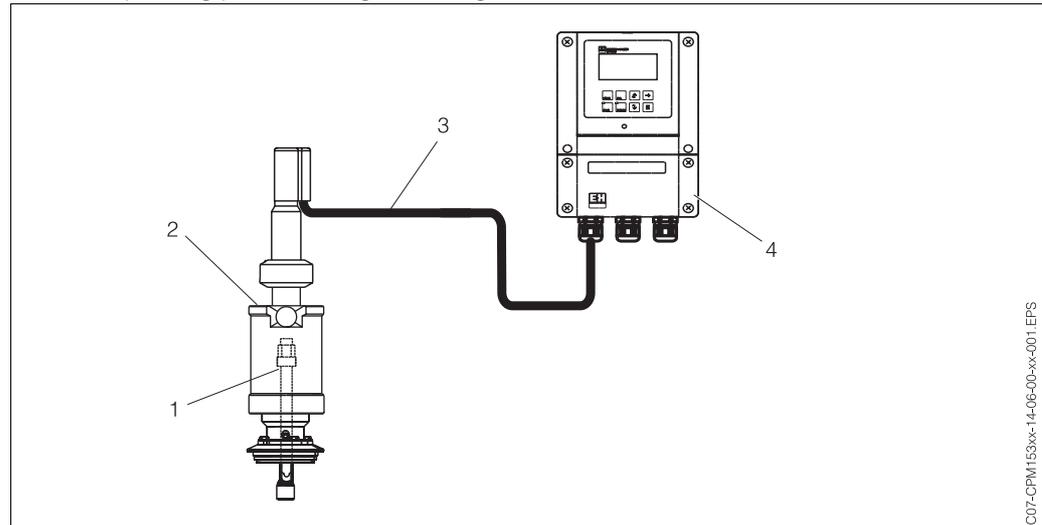
Example of a measuring system

1: CPS 71 electrode
2: CPA 475 manually retractable assembly
3: CPK 9 pH cable
4: Transmitter Mycom S CPM 153

Functions

Quick Setup
This function configures the measuring point quickly and simply with the necessary basic settings, so that you can begin measuring immediately.

SCC (Sensor Condition Check)
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 of the state of the electrode. The electrode status is updated after each calibration. When the "Replace electrode" message appears, an error message is displayed.

SCS (Sensor Check System)
The Sensor Check System informs you of deviations in pH glass resistance or the difference between the reference resistance and the normal range. This indicates that an incorrect measurement may be made due to blocking or damage to the pH electrode.

PCS (Process Check System)
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 logbook, an operation logbook and a calibration logbook. You can retrieve the entries by specifying a date and time.

Data logger

You can record two freely-selectable parameters using the integrated data loggers and then view the results graphically in real time. You can retrieve the last 500 measured values using date and time. In this way, you can graphically display the process flow. This is a quick way of checking the process and provides a good possibility of optimising pH control.
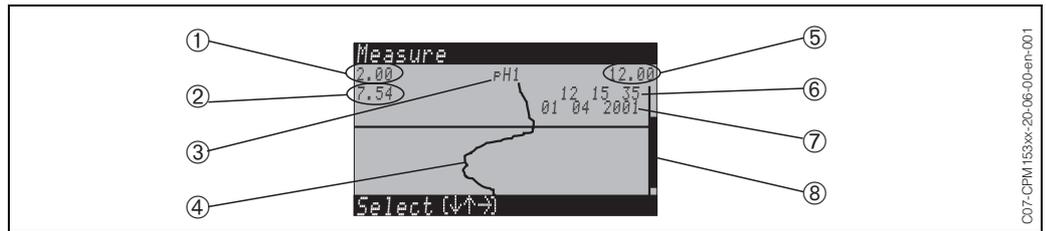
Example for data logger 1 (for Parameter 1, pH is selected here)

1: Minimum display range (selectable to −2 pH)	*5: Maximum display range (selectable to +16 pH)*
2: The measured value which is found on the scroll bar	*6: Time when this measured value was recorded*
3: Recorded measured value	*7: Date of this measured value*
4: Measured value curve	*8: Scroll bar*

Cleaning functions

The ChemoClean® spray cleaning system (s. Accessories) automatically cleans the electrode. It is controlled by two contacts (possible with basic equipment). Cleaning can be triggered automatically at programmed intervals, manually or by an error message. Cleaning can be triggered by almost any error message.

In the TopClean S and TopCal S fully automatic cleaning and calibration systems, the Mycom S CPM 153 is used as a transmitter and control device. You can automate cleaning and calibration using a retractable assembly (e.g. CleanFit or ProbFit series). The superb price-performance ratio of the TopCal S and TopClean S systems allows you to install a complete measuring point with low maintenance requirements and a low cost of ownership.

Simple to control

The follow control functions are used in the Mycom S CPM 153:
- 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
  - Includes configurable range-dependent gain (kinked curve)
  - Differentiation between batch and flow processes
- Manipulated variable output
  The manipulated variable can be output either as a binary signal via the relay or via the current output:
  - Binary signal via relay 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 with a repeater or feedforward control can also be included in the control system.
For this, you can use the following optional inputs:
  - 1 current input (Ex or non-Ex)
  - 2 current inputs (Ex or non-Ex)
  - 1 resistance input (for non-Ex)
  - 1 current and 1 resistance input (for non-Ex)

With the following selection aid for in-line and batch processes, you can select the right transmitter variant for your process.

PWM = pulse length proportional
PFM = pulse frequency proportional
Three PS = three-point step controller

Selection aid for online processes

Process	Path	Dosing actuators		Required hardware equipment for control				Ordering variants CPM 153-
				Circuits	Relay	Current inputs	Current outputs	
1-sided control	looking-ahead · 2-circuit · flow	1 PWM		2	1	1	–	x3x2xxxxx
		1 PFM		2	1	1	–	x3x2xxxxx
		1 three-PS 1 PWM/PFM	with signal	2	2	2	–	x3x4xxxxx
			without signal	2	2	1	–	x3x2xxxxx
		current output		2	–	1	1	x3x2xxxxx
	not looking-ahead	1 PWM		1	1	–	–	x1x0xxxxx
		1 PFM		1	1	–	–	x1x0xxxxx
		1 three-PS 1 PWM/PFM	with signal	1	2	1	–	x1x2xxxxx
			without signal	1	2	–	–	x1x0xxxxx
		current output		1	–	–	1	x1x0xxxxx

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Selection aid for online processes

Process	Path	Dosing actuators		Required hardware equipment for control				Ordering variants CPM 153-
				Circuits	Relay	Current inputs	Current outputs	
2-sided control	looking-ahead · 2-circuit · flow	2 PWM		2	2	1	–	x3x2xxxxx
		2 PFM		2	2	1	–	x3x2xxxxx
		1 three-PS 1 PWM/PFM	with signal	2	3	2	–	x3x4xxxxx
			without signal	2	3	1	–	x3x2xxxxx
		current output split range		2	–	1	1	x3x2xxxxx
	not looking-ahead	2 PWM		1	2	–	–	x1x0xxxxx
		2 PFM		1	2	–	–	x1x0xxxxx
		1 three-PS 1 PWM/PFM	with signal	1	3	1	–	x1x2xxxxx
			without signal	1	3	–	–	x1x0xxxxx
		current output split range		1	–	–	1	x1x0xxxxx

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Selection aid for batch processes

Process	Dosing actuators		Required hardware equipment for control				Ordering variants CPM 153-
			Circuits	Relay	Current inputs	Current outputs	
1-sided control	1 PWM		1	1	–	–	x1x0xxxxx
	1 PFM		1	1	–	–	x1x0xxxxx
	1 three-PS 1 PWM/PFM	with signal	1	2	1	–	x1x2xxxxx
		without signal	1	2	–	–	x1x0xxxxx
	current output		1	–	–	1	x1x0xxxxx
2-sided control	2 PWM		1	2	–	–	x1x0xxxxx
	2 PFM		1	2	–	–	x1x0xxxxx
	1 three-PS 1 PWM/PFM	with signal	1	–	1	1	x1x0xxxxx
		without signal	1	3	–	–	x1x2xxxxx
	current output split range		1	3	–	–	x1x0xxxxx

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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 loggers of the CPM 153 and
- *copy* the complete settings to other CPM 153 transmitters which have identical hardware functionality.

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

Offline configuration with Parawin (Accessories)

Using the PC tool Parawin, you can:
① Configure the whole measuring point on the PC in the familiar Windows environment and
② Save the settings to the DAT module.
③ Install the DAT module in a Mycom S and transfer the entire configuration to the transmitter (= complete transmitter set-up).
Then you can set up other transmitters with the same configuration.
④ Similarly, you can use the DAT to copy logbooks and data loggers from the transmitter for documentation purposes and save them to your computer. You can then display the logged data in graphic form on your PC.
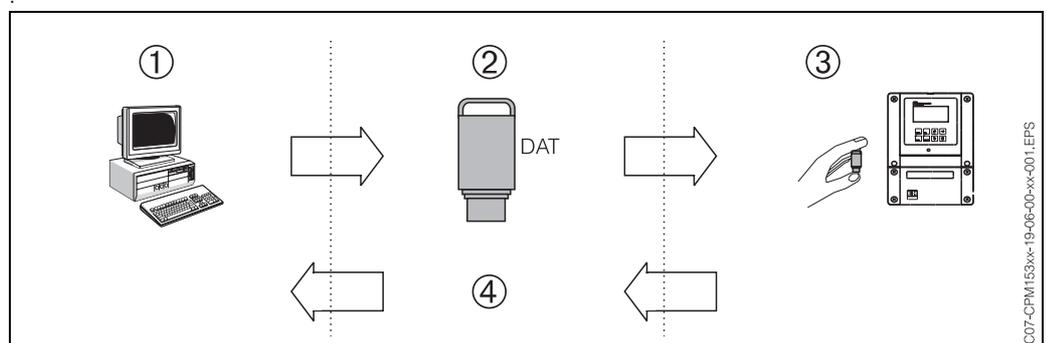
Refer to the graphic on page 19 for information on the Parawin user interface.

Calibration

Accurate calibration

The instrument allows all field-tested calibration possibilities:
- Automatic calibration through buffer self-recognition
  The buffer tables, e.g. to DIN, Endress + Hauser, Merck and Riedel de Haën/ Ingold, are saved in the instrument. Further buffer tables can also be programmed. During calibration, the instrument automatically recognises the buffer value.
- Manual calibration
  When calibrating manually, you can conduct either a two-point calibration (zero point and slope) or a single-point calibration, i.e. zero point calibration of the pH electrode.
- Numeric calibration (data input)
  The electrode data (zero point and slope) are entered using the keypad.
- Calibration logbook
  The data of the last 30 calibrations are saved to a list with date and time.

Accurate measurement
- Medium temperature compensation (alpha value compensation)
  This allows high-accuracy measurement over wide temperature ranges. In this type of compensation, the temperature influence on the medium is self-compensated.
- Isothermic intersection compensation
  This allows high-accuracy measurement even at temperature fluctuations. Compensates the deviation between electrode zero point and isothermic intersection point.

Input

✎ Note!
The limit values for Ex version are specified separately, marked with ⟨Ex⟩ and displayed in *italics*.

Measured variables	pH, redox, temperature	
pH	Measuring range	–2.00 ... +16.00
	Measured value resolution	pH 0.01
	Zero point offset range	pH –2 ... +16
	Range of automatic temperature compensation	–50 ... +150°C
	Reference temperature	25°C (settable with medium temperature compensation)
	Slope adjustment	25 ... 65 mV / pH
	Input resistance under nominal operating conditions	$> 1 \cdot 10^{12}\ \Omega$
	Input current under nominal operating conditions	$< 1.6 \cdot 10^{-12}$ A
Redox	Measuring range	–1500 ... +1500 mV –3000 ... +3000%
	Measured value resolution	0.1 mV
	Zero point offset range	+200 ... –200 mV
	Assignment with % display	Settable, Δ for 100% = 150 ... 2000 mV
	Electrode offset	±120 mV
	Input resistance under nominal operating conditions	$> 1 \cdot 10^{12}\ \Omega$
	Input current under nominal operating conditions	$< 1.6 \cdot 10^{-12}$ A
	⟨Ex⟩ *Sensor output circuit with type of protection EEx ia IIC. This circuit can be connected to sensors of category 1G (zone 0) as well.*	
	Maximum output voltage U_0	DC 12.6 V
	Maximum output current I_0	130 mA
	Maximum output P_0	198 mW
	Maximum outer capacity C_0	50 nF (with pH sensor CPS 401 IsFET: 150 nF)
	Maximum outer inductivity L_0	100 µH
Temperature	Temperature sensor	Pt 100 (three-wire circuit) Pt 1000 NTC 30
	Measuring range (can also be displayed in °F)	–50 ... +150 °C NTC: –20 ... +100 °C
	Measured value resolution	0.1 K
	Temperature Offset	± 5K

Current inputs 1 / 2 (passive, optional, terminals 21/22, 23/24)	Signal range	4 ... 20 mA
	Measured error[1]	max. 1% of measuring range
	Input voltage range	6 ... 30 V

⟨Ex⟩ *Intrinsically safe current inputs for connection with intrinscally 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

Resistance input (active, optional, only with non-Ex)	Resistance ranges (switchable using software)	0 ... 1 kΩ 0 ... 10 kΩ
	Measured error[1]	max. 1% of measuring range

Digital inputs E1-E3	Input voltage	10 ... 40 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 inner capacity C_i	negligible
Maximum inner inductivity L_i	negligible

[1]: *acc. to IEC 746-1, under nominal operating conditions*

Output parameters

Output signal	pH, redox, temperature	
Current outputs (terminals 31/32, 33/34)	Current range	0 / 4 ... 20 mA
	Error current	2.4 mA or 22 mA
	Measured error[1]	max. 0.2 % of current range end value
	Output distribution, settable	pH: $\Delta 1.8$ ... 18 pH Redox: $\Delta 300$ ... 3000 mV Temperature: $\Delta 17$ ... 170 K
	Active current output (only non-Ex): Load	max. 600 Ω
	Passive current output: Input voltage range	6 ... 30 V
	⟨Ex⟩ *Intrinsically safe current outputs for connection with intrinscally 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
Auxiliary voltage output (for digital inputs E1-E3)	Voltage	15 V DC
	Output current	max. 9 mA
	⟨Ex⟩ *Intrinsically safe current output circuit with type of protection EEx ib IIC.*	
	Maximum output voltage U_0	DC 15.8 V
	Maximum output current I_0	71 mA
	Maximum output P_0	1.13 W
	Maximum outer capacity C_0	50 nF
	Maximum outer inductivity L_0	100 µH
Interface to CPG 30 / 300	Power supply: Output voltage	11.5 ... 18 V
	Output current	max. 60 mA
	Communication (only internal)	RS 485
	⟨Ex⟩ *Intrinsically safe current output circuit with type of protection EEx ib IIC.*	
Limit value and alarm functions	Setpoint adjustments	pH –2.00 ... 16.00
	Hysteresis for switch contacts	pH: 0.1 ... 18 Redox absolute: 10 ... 100 mV Redox relative: 1 ... 3000%
	Error delay	0 ... 6000 s

Relay contacts	The NC/NO contact type can be set by software.	
	Switching voltage	max. 250 V AC / 125 V DC
	Switching current	max. 3 A
	Switching power	max. 750 VA
	Life span	≥ 5 million switching cycles
	With the maximum settable frequency in PFM	120 min^{-1}
	With the maximum settable period length in PWM	1 ... 999.9s
	With PWM minimum switch-on period	0.4 s

⟨Ex⟩ *Intrinsically safe relay contact circuits for connection with intrinscally 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

[1]*: acc. to IEC 746-1, under nominal operating conditions*

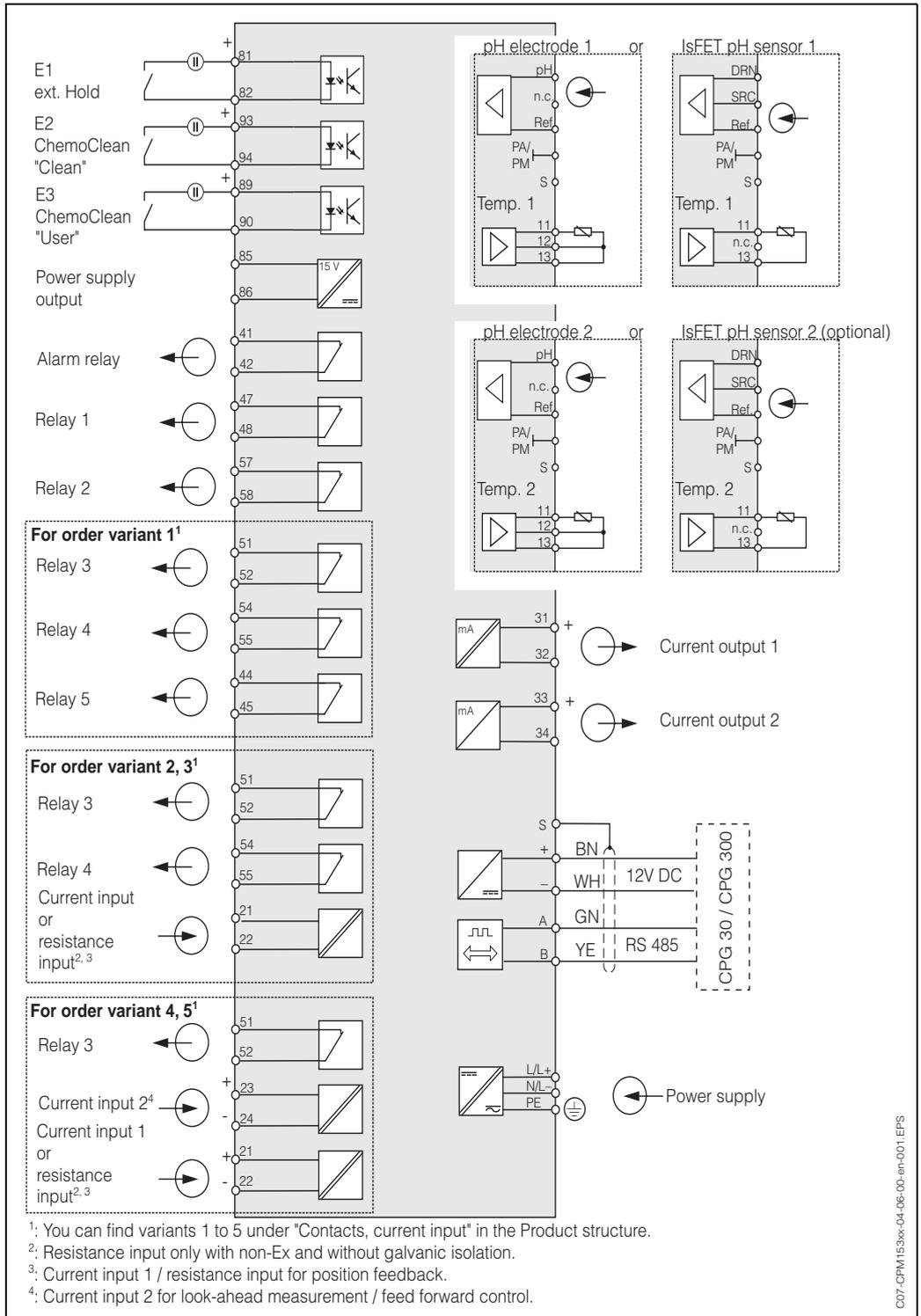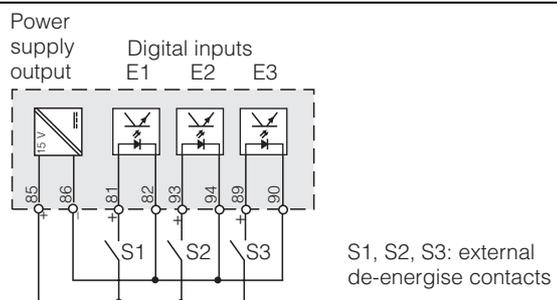|	
Galvanic isolation	At the same potential are: • Current output 1 and the auxiliary energy supply output (term. 85/86) • Current output 2, connection to interface CPG 30 / 300 and the resistance input (term. 21/22) The remaining circuits are galvanically isolated from each other.

Electrical connection

Connection diagram for Ex and non-Ex ranges

[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.

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Switching example for digital inputs

S1, S2, S3: external de-energise contacts

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Contacts

In the basic version, the Mycom S CPM 153 possesses 1 alarm and 2 additional contacts. The instrument can optionally be upgraded with the following **additional** equipment:
- 3 contacts
- 2 contacts and 1 current or resistance input (only for non-Ex)
- 1 contact, 1 current input and 1 current or resistance input (only for non-Ex)

The available contacts can be assigned with the software.

The **ChemoClean**® spray cleaning system with the CYR 10 injector automatically cleans the electrode. It is controlled by two contacts (also part of basic equipment).

The NC/NO contact type can be switched by software.

✎ Note!
- If you use NAMUR contacts (acc. to recommendations of the community of interest process control engineering of the chemical and pharmaceutical industry), the contacts are set to the relays as follows:
  – Failure to "ALARM"
  – Maintenance required to "RELAY 1" and
  – Function control to "RELAY 2".

- You can assign up to three relays to the controller, dependent on the instrument version.

Selection by software		NAMUR on	NAMUR off
ALARM	41 / 42	Alarm	Alarm
RELAY 1	47 / 48	Warning when maintenance required	Controller or ChemoClean
RELAY 2	57 / 58	Function control	Controller or ChemoClean

Electrical connection data

Power supply for CPM 153-xxxx**0**xxxx	100 ... 230 V AC +10/–15%
Frequency	47 ... 64 Hz
Power supply for CPM 153-xxxx**8**xxxx	24 V AC/DC +20/–15%
Power consumption	max. 10 VA
Separation voltage between galvanically isolated circuits	276 V_{rms}
Terminals, max. cable cross-sectional area	2.5 mm²

⟨Ex⟩ *Connection data for 12V supply:*

|	
Maximum output voltage U_O	*18.5 V*
Maximum output current I_O	*100 mA*
Maximum output power P_O	*1.53 W*
Maximum external capacity C_O	*150 nF*
Maximum external inductivity I_O	*150 µH*

Connection examples

Non-Ex: One-circuit instrument, NAMUR contact assignment, Chemoclean with CYR 10 injector and assembly with spray head, one-sided neutralisation, temperature limit value, pH current output
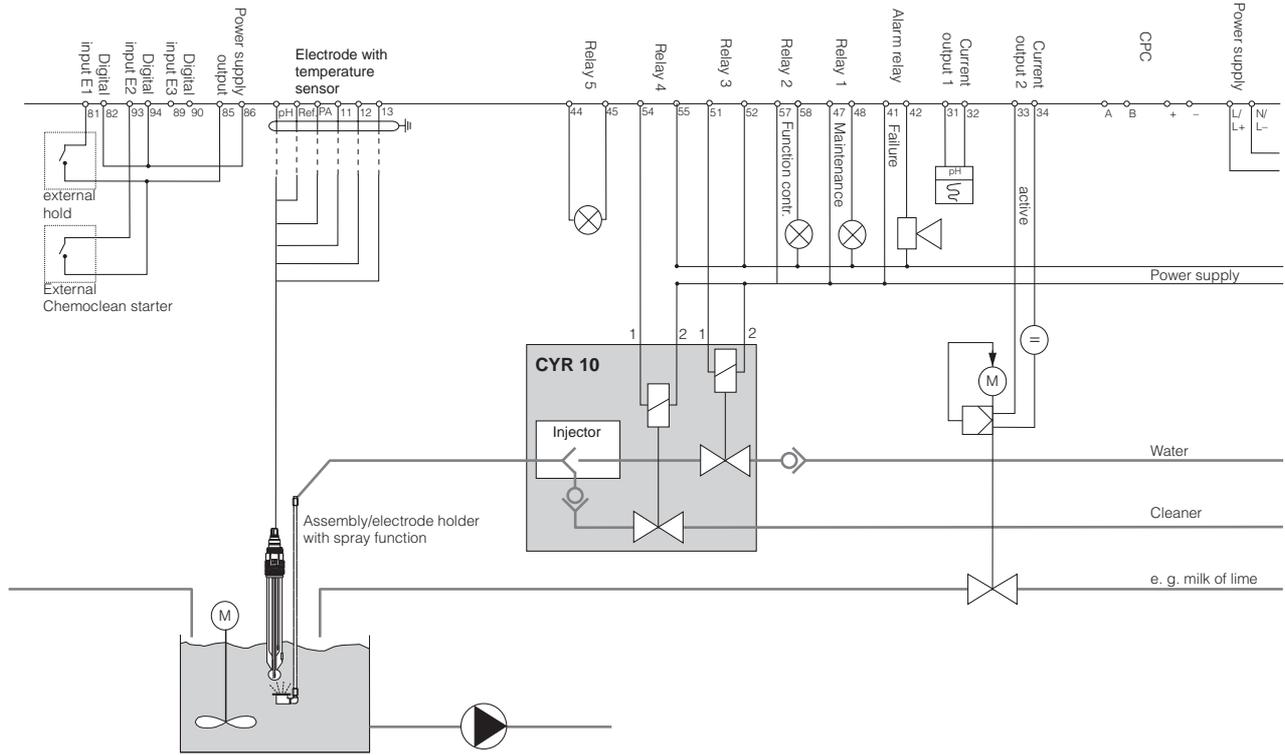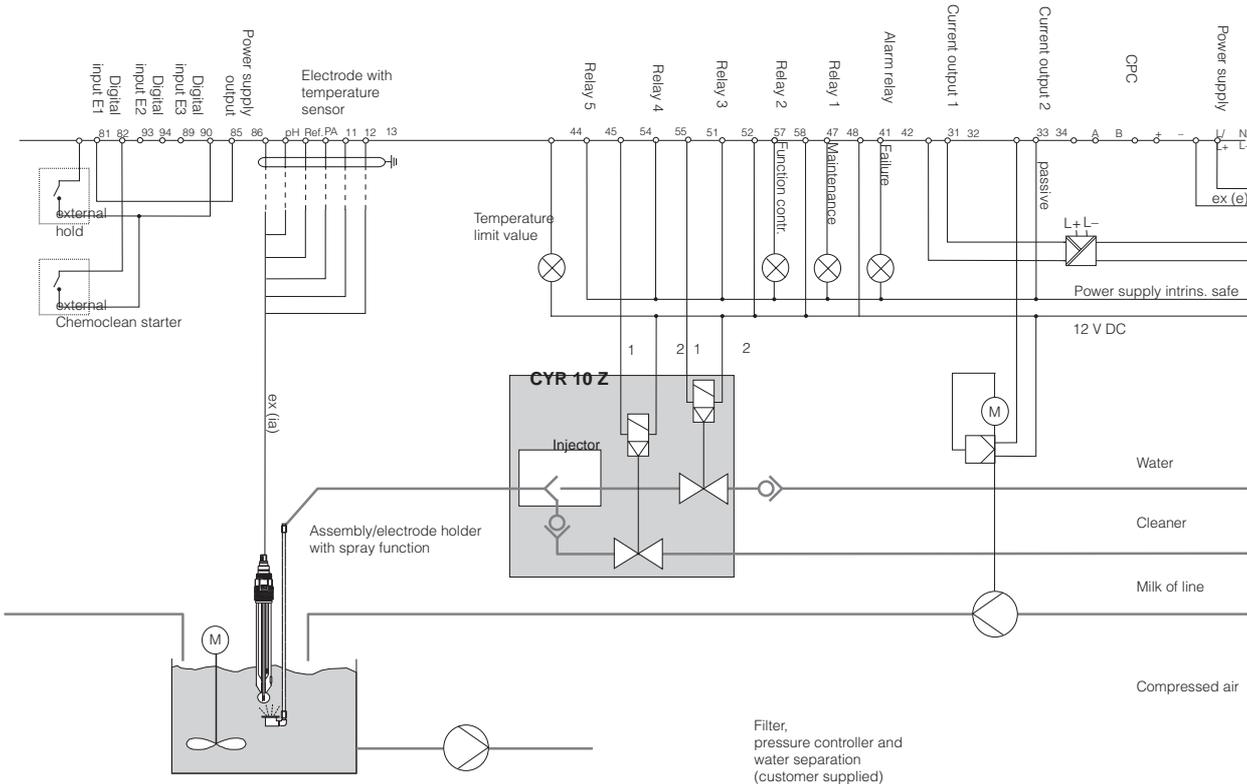

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Non-Ex: Two-circuit difference measurement, pH and delta pH on current outputs, limit values for pH, temperature circuit 1
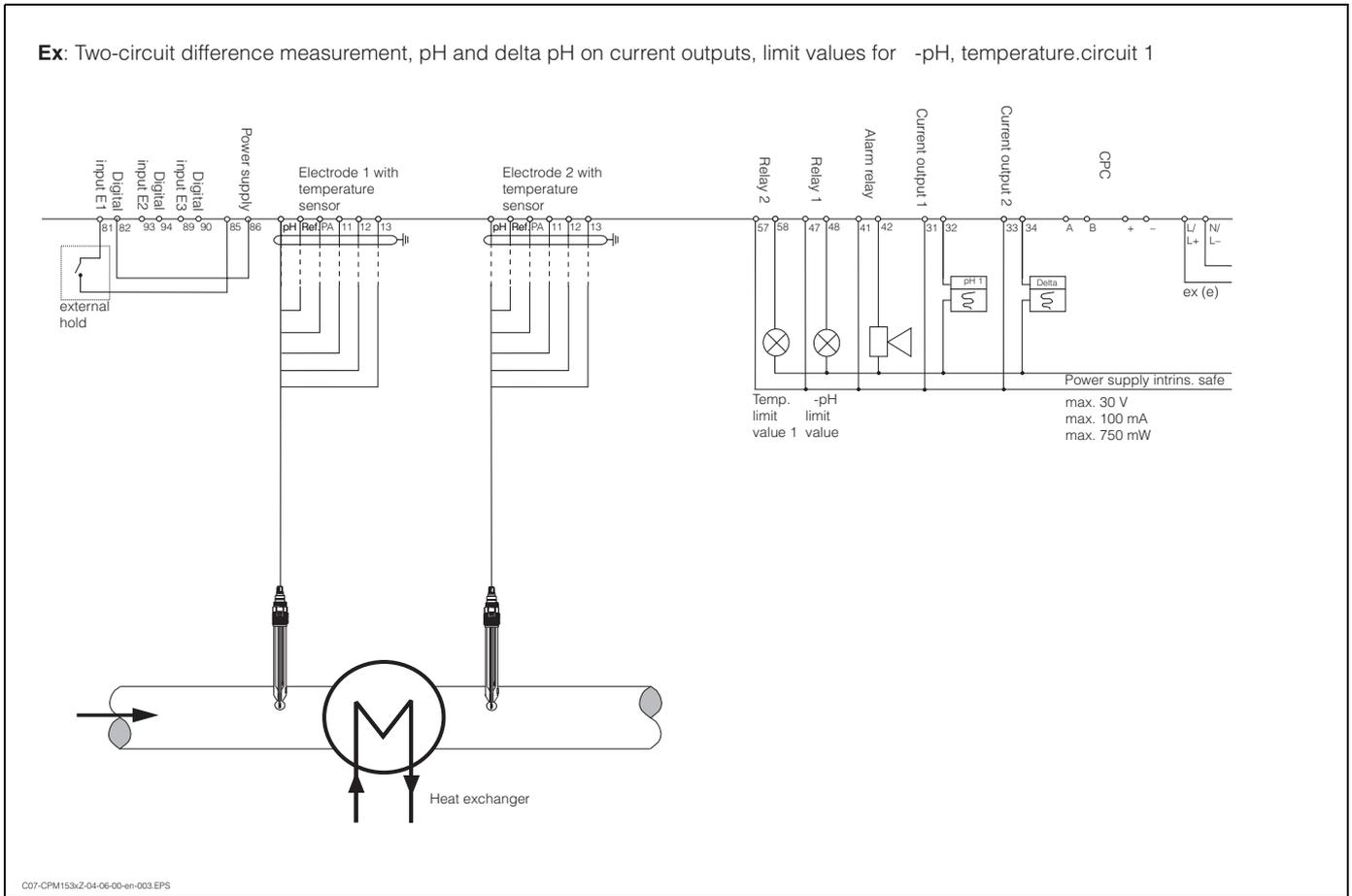

Heat exchanger
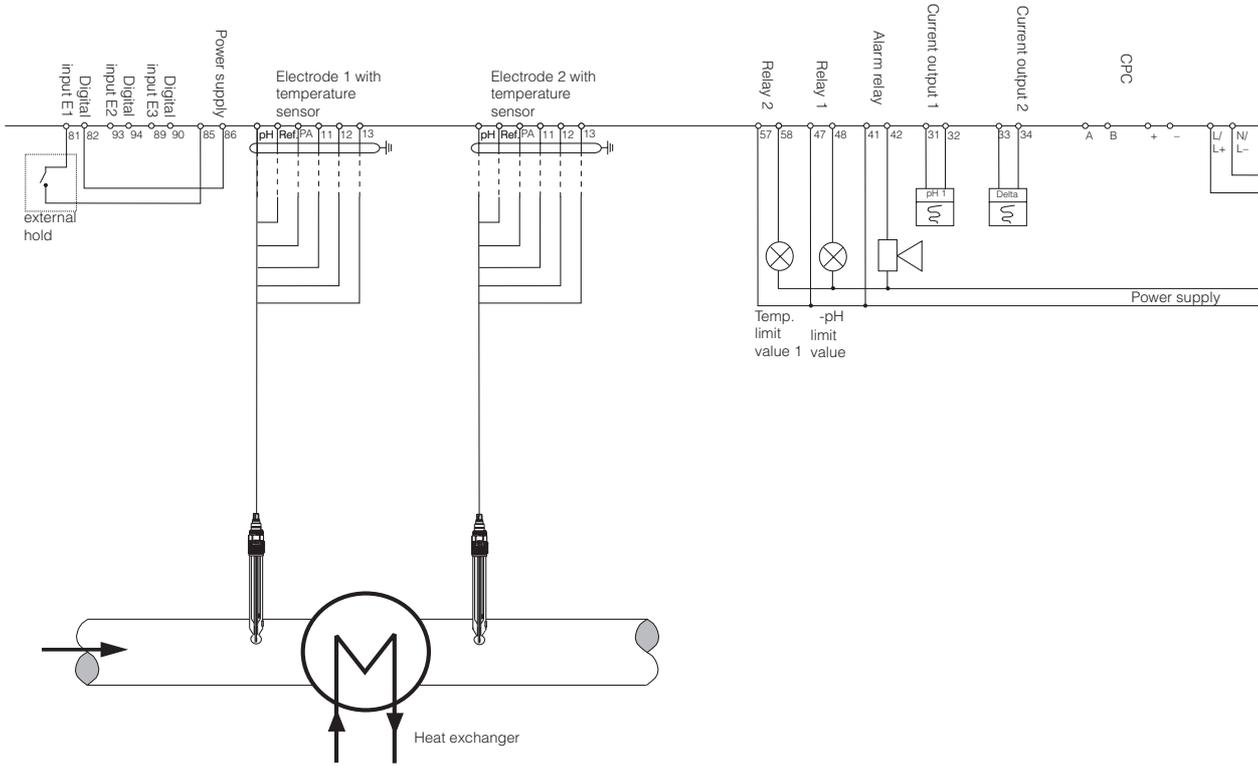
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Ex: One-circuit instrument, NAMUR, Chemoclean with CYR 10 Z injector and assembly with spray head, milk-of-lime neutralisation, temperature limit value, pH current output

CYR 10 Z

Injector

Assembly/electrode holder with spray function

Water

Cleaner

Milk of line

Compressed air

Filter, pressure controller and water separation (customer supplied)

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Ex: Two-circuit difference measurement, pH and delta pH on current outputs, limit values for -pH, temperature.circuit 1

Heat exchanger

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Performance characteristics

Measured value resolution	pH:	0.01
	Redox:	1 mV / 1%
	Temperature:	0.1 K

Measurement deviation[1] display	pH:	max. 0.2% of measuring range
	Redox:	1 mV
	Temperature:	max. 0.5 K

Measured error[1]	max. 0.2% of current range end value

Repeatability[1]	max. 0.1% of measuring range

[1]: acc. to IEC 746-1, under nominal operating conditions

Installation conditions

Installation instructions
- The Mycom S CPM 153 transmitter can be fixed to vertical or horizontal posts using the round post fixture available from Endress+Hauser (see "Accessories"). When installing the instrument outdoors, you also require the CYY 101 weather protection cover. This cover is compatible with all field instrument installations options.
- Always install the transmitter so that the cable entries point downwards.
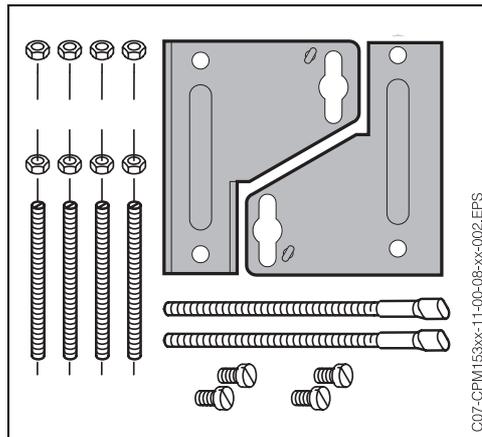
Post fixture is possible using the enclosed mounting kit (see left).
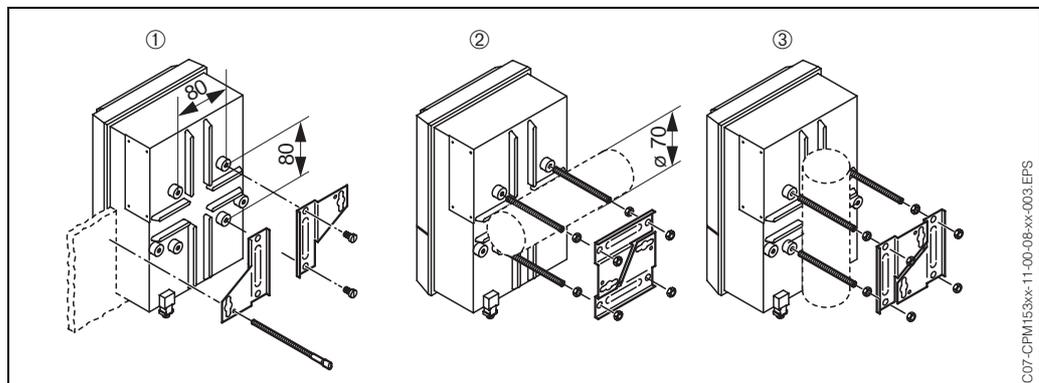
Panel mounting ① and post mounting ② for Mycom S CPM 153

If you want to mount the device on the front of an air-tight panel, you must also use a flat seal (see "Accessories").

Required installation cutout for panel mounting:	$161^{+0.5}$ x $241^{+0.5}$ mm.
The installation depth is	approx. 134 mm.
The maximum post diameter is	70 mm

For outdoor use, the CYY 101 weather protection cover is required. This is available as an accessory.

Ambient conditions

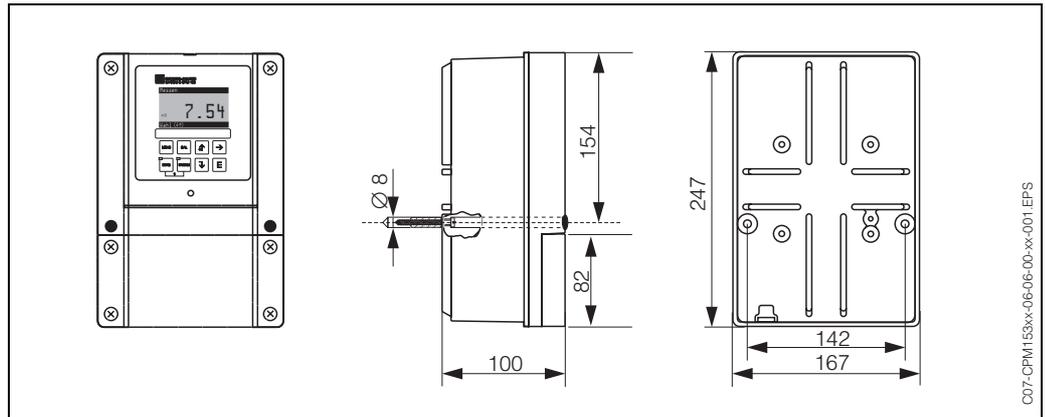|	
Ambient temperature	–10 ... +55°C (Ex: –10 ... +50°C)
Ambient temperature limit	–20 ... +60°C (Ex: –10 ... +50°C)
Storage and transport temperature	–30 ... +80°C
Relative humidity	10 ... 95%, non-condensing
Ingress protection	IP 65

Electromagnetic compatibility   Interference emission and interference immunity to EN 61326: 1997 / A1:1998

Mechanical construction

Design / dimensions

Transmitter dimensions Mycom S CPM 153.

Weight   max. 6 kg

Materials

Housing	GD-AlSi 12 (Mg content 0.05%), plastic-coated
Front	Polyester, UV-resistant

Display and operating interface

To configure the whole measuring point, you can either use the keypad on the transmitter Mycom S CPM 153 or the offline configuration. If you are using several instruments, the complete configuration of one instrument can be copied to other instruments using the DAT module.
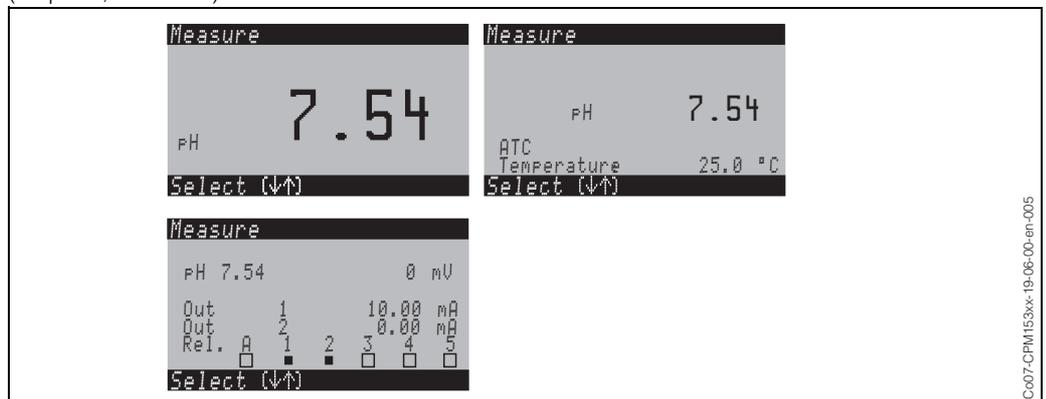
Display elements   Backlit LC display with dot matrix, 128 x 64 dots
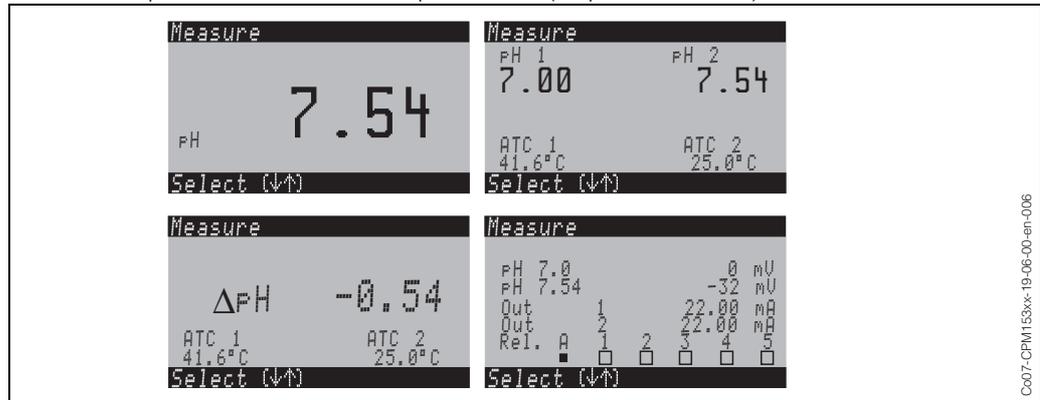
Display possibilities:

One circuit instrument:
pH/redox value, temperature, current outputs 1 and 2, contact states, control parameters (setpoint, set value)
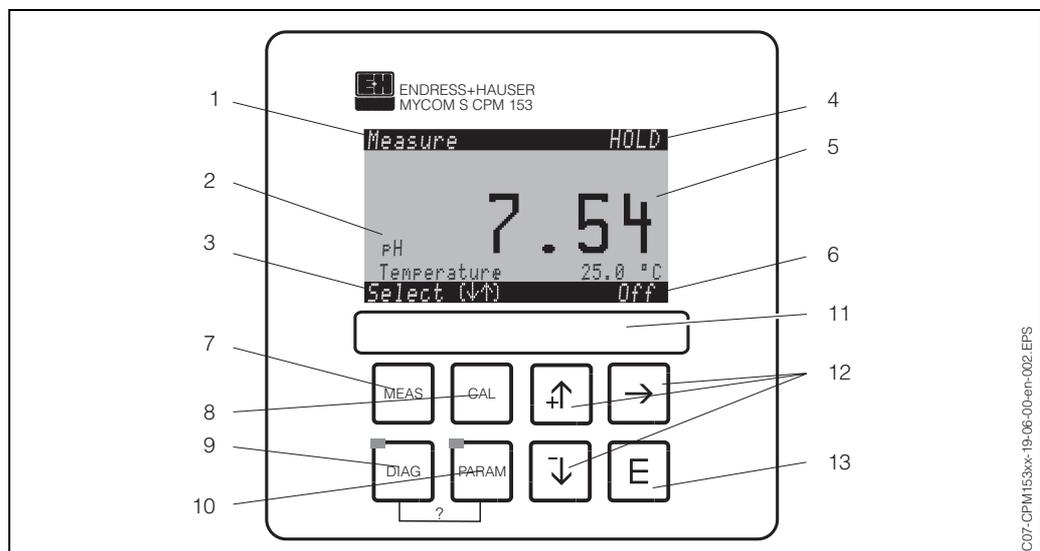
Two-circuit instrument:
pH/redox value 1 and 2, temperature 1 and 2, current outputs 1 and 2, contact states, difference between the pH/redox values, control parameters (setpoint, set value)

Mycom S CPM 153 user interface
1: Current menu
2: Current parameter
3: Navigations bar: Arrow keys for scrolling, "E" for browsing, Note for Cancel
4: HOLD display, if HOLD active
5: Current main measured value
6: "Failure" display, "Warning", if the NAMUR contacts respond
7: "Meas" (Measuring mode) key
8: "Cal" (Calibration) key
9: "Diag" (Diagnosis menu) key
10: "Param" (Parameter entry menu) key
?: Press DIAG and PARAM simultaneously to open the help pages
11: Labelling strip
12: Arrow keys for scrolling and editing
13: ENTER key

Operating elements

There are 4 main menus available for instrument operation:
• Measurement ("MEAS")
• Configuration ("PARAM")
• Calibration ("CAL") and
• Diagnostics ("DIAG").
Press the "MEAS", "PARAM", "CAL" and "DIAG" keys to switch to the appropriate selection menu. The submenus are then displayed in plain text and the selected elements are displayed in reverse video. Selections are made using the arrow keys, which are also used to edit the numeric values.

Access codes

To protect the transmitter against an unintended or undesired modification of the configuration and the calibration data, functions can be protected using four-digit access codes. Function enabling is divided into:

Display level (accessible without a code):
The complete menu can be viewed. The configuration cannot be changed. No calibration is possible. On this level, only the controller parameters for new processes can be changed in the "DIAG" menu branch.

Maintenance level (can be protected with the maintenance 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 using the specialist code):
All menus are accessible.

Offline configuration of the user interface via Parawin (Accessories)
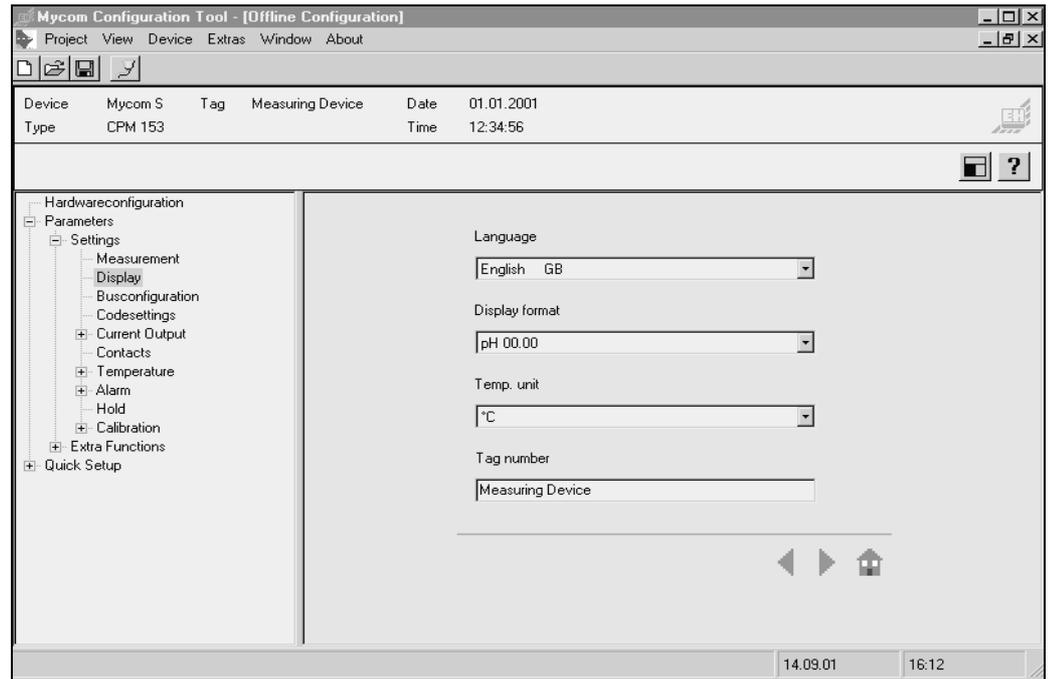
The PC tool Parawin provides you with a tool for configuring your measuring point on a PC using a simple and self-explanatory menu structure (an example window can be seen above). Write the configuration to the DAT module using the RS232 interface on the PC. The module can then be plugged into the transmitter.

Certificates and approvals

CE symbol

The transmitter complies with the legal demands of the harmonized European standards. Endress+Hauser certifies the compliance with the standards by using the $C\epsilon$ sign.

Ex approvals

- ATEX II (1) 2G EEx em ib[ia] 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
- TIIS

Ordering information

Transmitter product structure Mycom S

pH/redox transmitter in aluminium housing for wall mounting with one alarm and two output contacts for NAMUR, ChemoClean, and controller functions as well as three binary inputs, logbooks, data logger. Plain text operation. 247x167x111 mm (HxWxD). Degree of protection IP 65.

Approvals									
A	Basic equipment: non-Ex								
G	With ATEX approval, ATEX II (1) 2G EEx em ib[ia] IIC T4								
O	With FM approval; NI Cl. I, Div. 2, Sensor IS Cl. I, Div. 1								
P	With FM approval; NI Cl. I, Div. 2								
S	With CSA approval; NI Cl. I, Div. 2, Sensor IS Cl. I, Div. 1								
T	With TIIS approval								

	Measurement input	
	1	1 measuring circuit for glass electrodes pH/redox and temperature
	2	1 measuring circuits 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

	Measurement output	
	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, without current outputs

	Contacts, current input	
	0	Without additional contacts
	1	3 additional contacts
	2	2 additional contacts, 1 passive current input (Ex and non-Ex)
	3	2 additional contacts, 1 resistance input (non-Ex)
	4	1 additional contact1, 2 passive current inputs (Ex and non-Ex)
	5	1 extra contact, 1 passive current input, 1 active resistance input (non-Ex)

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

	Language versions	
	A	E / D
	B	E / F
	C	E / I
	D	E / ES
	E	E / NL
	F	E / J

	Cable connection	
	0	Cable glands M 20 x 1.5
	1	Adapter for cable gland NPT ½"
	3	Cable glands M 20 x 1,5, PROFIBUS-PA M12 plug
	4	Cable glands NPT 1/2", PROFIBUS-PA M12 plug

	Additional equipment	
	0	Without additional equipment
	1	Additional equipment: DAT module

	Configuration	
	0	Factory settings
CPM 153-		Complete order code

Accessories

Offline configuration with Parawin

The Parawin tool provides you with a graphic PC operating program for configuring your measuring point at the PC using a simple and self-explanatory menu structure. Write the configuration to the DAT module using the RS232 interface on the PC. The module can then be plugged into the transmitter. You can switch the language via software.
The offline configuration system consists of a DAT module, the software and a DAT interface (RS 232). Required operating sytem: Windows NT/95/98/2000.
Order No.: 51507133 (only Mycom S)
Order No.: 51507563 (TopCal S, TopClean S / Mycom S)

DAT module

Additional memory device for *saving/copying* complete settings, logbooks and the data loggers.
Order No.: 51507175

Flat seal

Flat seal for air-tight panel mounting of the transmitter CPM 153.
Order No.: 50064975

Assemblies

Type	Properties	Applications
CleanFit CPA 471 / 472 / 473 / 474 / 475	Retractable assembly for manual or pneumatic operation. Cleaning and calibrating the electrode is possible under process conditions. CPA 475: 3A approval, application pending with EHEDG. Technical Information: CPA 471: TI 217C/07/en, Order No.: 51502596 CPA 472: TI 223C/07/en, Order No.: 51502645 CPA 473: TI 344C/07/en, Order No.: 51510923 CPA 474: TI 345C/07/en, Order No.: 51510925 CPA 475: TI 240C/07/en, Order No.: 51505599	• Process industry (471, 472, 473 / 474) • Food, pharmaceutical applications (475) • Biotechnology (475)

pH/redox electrode

Type	Properties	Applications
OrbiSint CPS 11/12/13	Universally applicable, very easy to clean and insensitive to soiling due to PTFE diaphragm, pressures up to 6 bar, conductivity > 50 µS/cm Technical Information TI 028C/07/en, 50054649	• Process industry • Industrial wastewater • Detoxification (cyanide, chrome) • Neutralisation
CeraLiquid CPS 41/42/43	Electrodes with ceramic diaphragms and KCl liquid electrolyte, use with counterpressure, explosion-proof up to 8 bar Technical Information TI 079C/07/en, 50059346	• Process industry • Ultrapure water • Boiler feed water • Detoxification (cyanide)
CeraGel CPS 71	Gel electrode with double-chamber reference system. Long-term stability, short response time, very long toxic path, resistant to alternating temperature and pressure cycles Technical Information TI 245C/07/en, 51505837	• Process industry • Food processing • Water treatment
OrbiPore CPS 91	Gel electrode with open aperture diaphragm for heavily soiled media. Resistant to pressure and concentration fluctuations. Pressures up to 13 bar. Technical Information TI 375C/07/en, 51513127	• Process industry • Industrial wastewater
TopHit CPS 471	Rupture-proof pH sensor based on IsFET technology. Short response time, very high resistance to alternating temperature cycles, sterilisable, almost no acid or alkaline errors Technical Information TI 283C/07/en, 51506685	• Process industry • Food, pharmaceutical applications • Water treatment • Biotechnology

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Connection accessories	• *pH cable CPK 1*: Version with pilot wire and additional outer screen, sheathed in PVC, ø 7.2 mm. Extension with cable CYK 71 possible. Order No. of CYK 71: 50085333
	• *pH cable CPK 9*: For pH/redox electrodes with integrated temperature sensor and TOP68 plug-in head (version ESA, ESS). Extension with cable CYK 71 possible.
	• *pH cable CPK 12*: For IsFET pH sensors and pH/redox electrodes with integrated temperature sensor and TOP68 plug-in head. Extension with cable CYK 12 possible.
	• *Junction box VBE:* For Ex area Zone 0. Order No.: 50003993
	• *Junction box VBM:* Junction box for extending measuring cable connection between electrode and transmitter. Two screw unions for e. g. combination electrode. Material: aluminium casting, ingress protection IP 65. Order No. 50003987
	• *Junction box VBA:* Junction box for extending measuring cable connection between electrode and transmitter. Four screw unions for e. g. separate reference electrode. Material: aluminium casting, ingress protection IP 65. Order No. 50003987

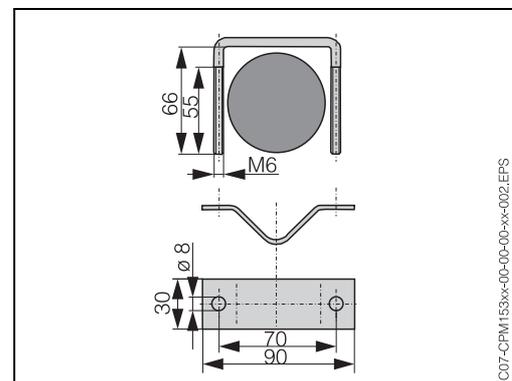|	
Weather protection cover CYY 101	For installing the transmitter outdoors, the CYY 101 weather protection cover is required. Order No.: CYY101-A

Round post fixture for weather protection cover	To fix the weather protection cover to vertical or horizontal posts with diameters of up to 70 mm. Order No.: 50062121
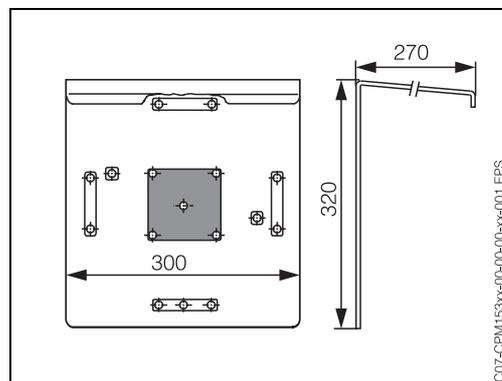
Weather protection cover CYY 101

Round post fixture for CYY 101

Documentation

Documentation
- ❑ Operating Instructions Mycom S CPM 153, BA 233C/07/en, Order No. 51503790
- ❑ Operating Instructions PROFIBUS-PA, BA 298C/07/en, Order No. 51507116
- ❑ Operating Instructions HART, BA 301C/07/en, Order No. 51507114
- ❑ Ex Safety Instructions, XA 233C/07/a3, Order No. 51506728
- ❑ Technical Information TopCal S CPC 300, TI 236C/07/en, Order No. 51504330
- ❑ Technical Information TopClean S CPC 30, TI 235C/07/en, Order No. 51504335
- ❑ Technical Information CleanFit P CPA 471, TI 217C/07/en, Order No. 51502595
- ❑ Technical Information CleanFit P CPA 472, TI 223C/07/en, Order No. 51502644
- ❑ Technical Information CleanFit P CPA 473, TI 344C/07/en, Order No. 51510923
- ❑ Technical Information CleanFit P CPA 474, TI 345C/07/en, Order No. 51510925
- ❑ Technical Information CleanFit H CPA 475, TI 240C/07/en, Order No. 51505599
- ❑ Technical Information OrbiSint CPS 11/12/13, TI 028C/07/en, Order No. 50054649
- ❑ Technical Information CeraLiquid CPS 41/42/43, TI 079C/07/en, Order No. 50059346
- ❑ Technical Information CeraGel CPS 71, TI 245C/07/en, Order No. 51505837
- ❑ Technical Information CPK 1-12, TI 118C/07/en, Order No. 50068526

Subject to modifications

Endress + Hauser

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