



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Topcal S CPC310

Automation of pH and ORP measurement

Fully automatic measuring, cleaning and calibration system in hazardous and non-hazardous areas



Application

Topcal S is a fully automatic measuring, cleaning and calibration system for pH and ORP measurement in the following areas:

- Process industry
- Water treatment
- Food industry
- Pharmaceutical industry

Your benefits

- Very high degree of safety
 - system status messages with feedback to the control room
 - in-process cleaning and calibration, no need to remove electrode
 - automatic cleaning on detection of electrode soiling
 - industry-proven double-membrane pumps for transport of buffer and cleaning solutions
- High measuring quality
 - highest measuring accuracy
 - optimum reproducibility of measurement results
 - low tolerances in calibration

- High availability
 - long electrode life thanks to interval measuring
 - offline setup (optional): very simple setup on PC
 - DAT module: very easy copying of setup to other devices
- Fast amortisation
 - low purchase price
 - low maintenance costs thanks to fully automatic cleaning and calibration
 - easy installation thanks to modular design
- Low maintenance even with heavily soiled and aggressive media
- Communication via PROFIBUS PA (Profile 3.0) and HART

Function and system design

Measuring principle

CPG310 control unit

The CPG310 control unit converts the commands of CPM153 into pneumatic signals and provides feedback such as assembly position, bottle level and monitoring of compressed air. Buffer solutions and cleaner are conveyed to the assembly by membrane pumps. The control unit has two additional freely configurable output contacts. These contacts can be used to control pneumatic valves for conveyance of hot or aggressive media.

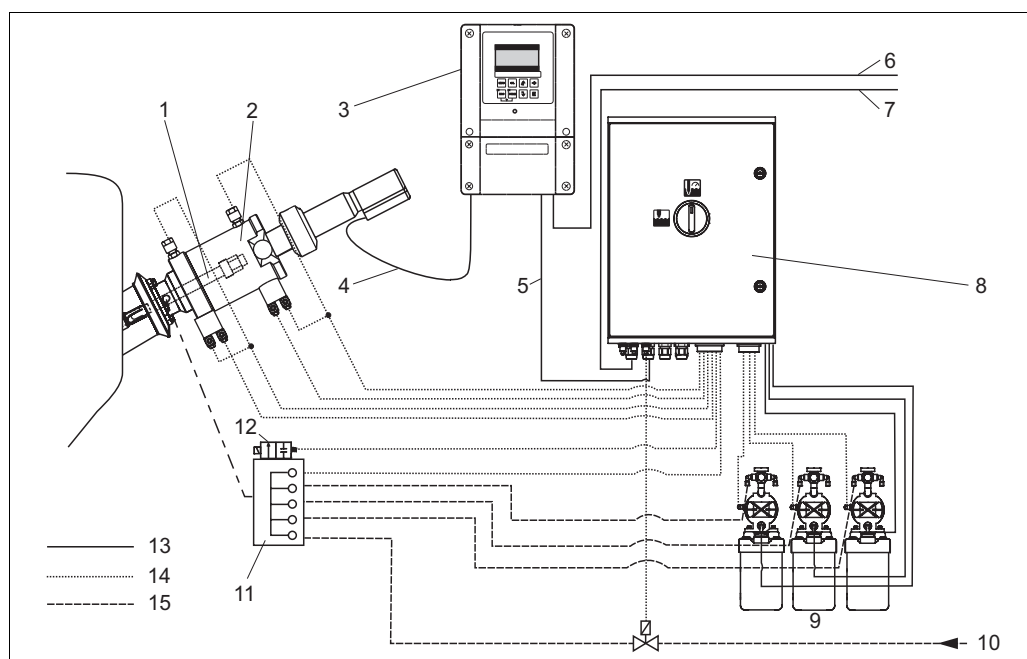
Mycom S CPM153 transmitter

The CPM153 transmitter is the central unit of the measuring system. It processes the measured values, acts as the communication center and controls processes. It also controls the processes in the CPG310 and processes its feedback via an interface.

Measuring system

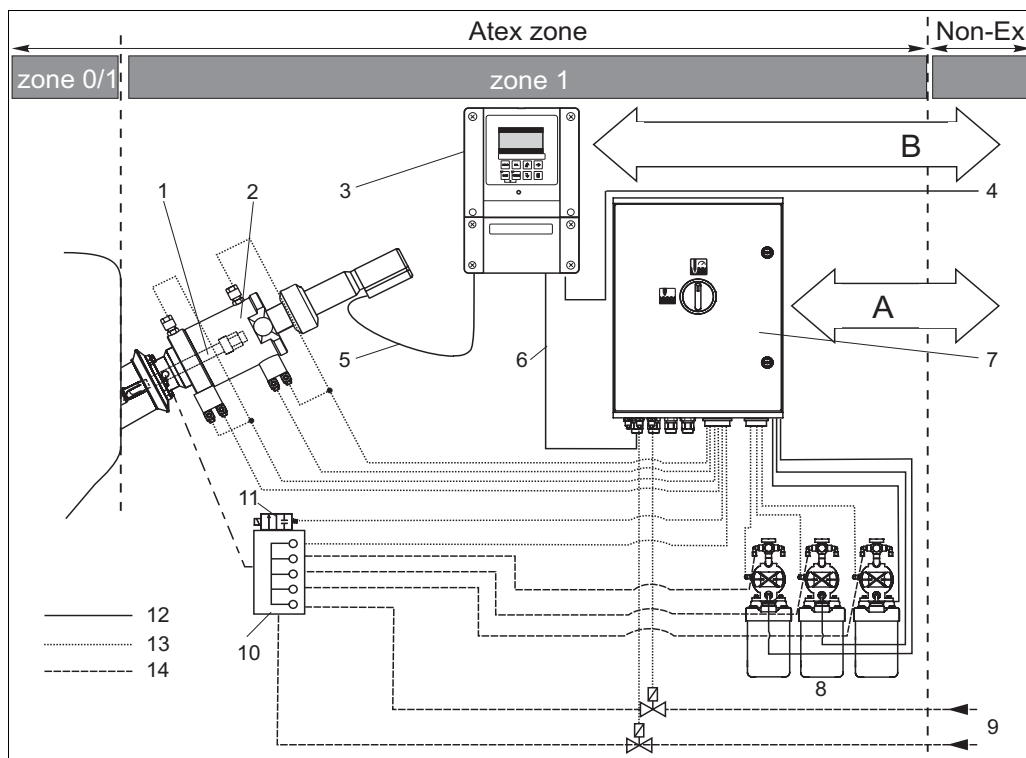
A complete measuring system consists of:

- Topcal S CPC310 including
 - CPG310 control unit
 - Mycom S CPM153 transmitter
 - Rinse block
 - Membrane pumps for transport of buffer and cleaning solutions
- Pneumatically controlled retractable assembly (e.g. Cleanfit series) with pneumatic or inductive limit position switches
- pH/ORP sensor
- Measuring cable
- Buffer solutions and cleaner



Complete measuring system (non-Ex area)

- | | | | |
|---|--------------------------------------|----|--|
| 1 | pH/ORP sensor | 9 | Membrane pumps with cleaner and buffer bottles |
| 2 | Cleanfit P assembly | 10 | Superheated steam / water / cleaner (optional) |
| 3 | Mycom S CPM153 transmitter | 11 | Rinse block |
| 4 | Special pH measuring cable | 12 | Valve for rinse water control |
| 5 | Power supply / control cable | 13 | Electrical wiring |
| 6 | Power supply for Mycom S CPM153 | 14 | Compressed air |
| 7 | Power supply for CPG310 control unit | 15 | Media (cleaner, buffer, superheated steam, etc.) |
| 8 | CPG310 control unit | | |



Complete measuring system (Ex area)

- A Message and control signals: assembly position, move assembly, program stop
 B Hold input, six relay contacts, two current outputs 0/4 to 20 mA
- | | |
|---|---|
| 1 pH/ORP electrode | 8 Membrane pumps with cleaner and buffer bottles |
| 2 Cleanfit P assembly | 9 Superheated steam, water, cleaner (optional) |
| 3 Mycom S CPM153-G transmitter | 10 Rinse block |
| 4 Power supply for Mycom S CPM153-G | 11 Valve for rinse water control |
| 5 Special pH measuring cable | 12 Electrical wiring |
| 6 Power supply / control cable for CPG310-G | 13 Compressed air |
| 7 CPG310-G control unit | 14 Media (cleaner, buffer, superheated steam, etc.) |

Connections of the measuring system

To set up the complete measuring system, the following connections are required:

Electrical power supply

Mycom S CPM153:

Non-hazardous areas:

100 to 230 V AC or 24 V AC/DC (depending on ordered version)

Hazardous areas:

100 to 230 V AC or 24 V AC/DC (depending on ordered version)

CPG310 control unit:

Non-hazardous areas:

100 to 230 V AC or 24 V AC/DC (depending on ordered version)

Hazardous areas:

Power supplied via Mycom S

Compressed air

Specification:

4 to 6 bar (58 to 87 psi), filtered, 50 µm, free of oil and condensate

Connection:

Bulkhead fitting OD 6 mm (0,24"), connection to the CPG310 control unit via supplied pressure reducing valve

Rinse water

Specification:

Tap water, 3 to 6 bar (43,5 to 87 psi), filtered, 100 µm

Connection:

Bulkhead fitting OD 6 mm (0,24"), connection to rinse block via supplied water filter

Assembly

Process connection: depending on the ordered assembly version, see Operating Instructions of the assembly

Rinse block

Connection to rinse chamber of the assembly: G $\frac{1}{4}$ or NPT $\frac{1}{4}$ " male thread (depending on ordered version)



Note!

For a detailed description of the required line connections, see the Operating Instructions of Topcal S CPC310.

Cleaning and calibration

Topcal S offers the following cleaning and calibration programs:

- Clean: Preset program for sensor cleaning
- Clean S: Preset program for cleaning and sterilisation of the sensor
- Clean C: Preset program for cleaning and calibration of the sensor
- Clean CS: Preset program for cleaning, calibration and sterilisation of the sensor
- User 3: Preset program for a fast system check
- User 1/2: Free program positions without preset program steps

All programs are freely configurable for optimum adaptation to your requirements. The preset programs serve for faster configuration. You can include additional external valves in the programs for any medium, e.g. superheated steam, cooling air, organic cleaner, etc.

Control of cleaning and calibration programs

You can choose between the following control types of the cleaning and calibration programs:

- Automatic:
Weekly program that automatically starts the cleaning or calibration programs selected for each weekday. You can select any programs for any weekday.
- Cleaning:
Selection of program that is automatically started if an SCS alarm or a correspondingly configured error message is triggered.
- Power failure program:
Selection of the program that is started after a failure of the power supply, the compressed air, the rinse water or the communication.
- External control:
Programs are started via an external process control system.

Interval program

This program allows you to start any cleaning or calibration program within defined intervals over a specified period of time (max. 1 day).

Validation function

The validation function allows you to check if the currently measured value deviates from the set value and if a calibration might be necessary.

Sealing water

This function allows you to start conveyance of sealing water into the rinse chamber. In processes with fibrous or adhesive media, assemblies with ball valves, e.g. Cleanfit CPA473 or Cleanfit CPA475 are applied to block the medium. To keep the rinse chamber free of medium, the sealing water valve opens automatically before the assembly emerges from the process. The counterpressure in the rinse chamber caused by the sealing water prevents the ingress of medium into the chamber. For this to work, the sealing water pressure must be greater than the pressure of the medium.

Other functions

Quick setup

To the first measuring value within 1 minute

After setting up the few parameters in the Quick Setup menu, the measuring point is ready to measure. The first measured value is reliably displayed.

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 on the state of the electrode. The electrode state is updated after each calibration. When the "Replace electrode" message appears, an additional error message is triggered.

SCS (= Sensor Check System)

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. In addition, the SCS detects possible breakage of glass electrodes and leakages of ISFET sensors.

PCS (= Process Check System)

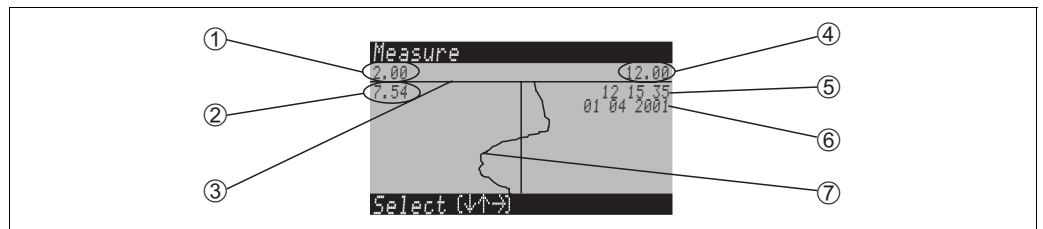
This function checks the measuring signal for stagnation. If the measuring signal does not change for some time (several measured values), an alarm is triggered. Soiling, blockage or similar could be the cause of such behaviour.

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 log

The integrated data logs allow you to record two selectable parameters and display the results in real time. You can retrieve the last 500 measured values with date and time of their recording. In this way, you can create a graphic display of the process flow. This offers a quick way of checking the process and a good possibility of optimizing pH control.



Example for data log 1 (for parameter 1, pH is selected here)

- | | |
|---|---|
| 1 Minimum display range (selectable to -2 pH) | 5 Time when the measured value was recorded |
| 2 Measured value found on the current scroll bar position | 6 Date of this measured value |
| 3 Scroll bar | 7 Measured value curve |
| 4 Maximum display range (selectable to +16 pH) | |

Easy control

The following control functions are implemented in the CPC310:

- Limit 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, D components
 - includes configurable range-dependent gain (segmented curve)
 - Distinction between batch and flow processes
- Manipulated variable output
 - The manipulated variable can be output as binary signal via the relays or via the current output:
 - Binary signal via relays as PWM (pulse width modulation), PFM (pulse frequency modulation)
 - Current output (0/4 to 20 mA): analog signal to control the actuator (for one or two actuator drives)

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:

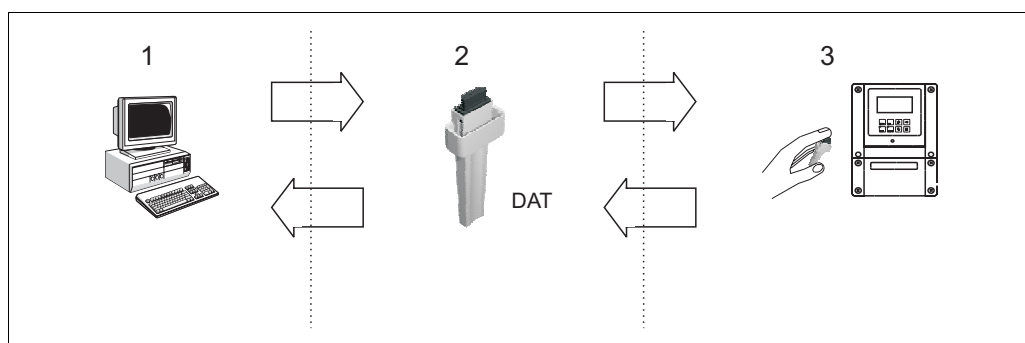
- save complete settings, logbooks and the logged data of the data logs of the Mycom S
- copy the complete settings to other Mycom S transmitters which have identical hardware functions.

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

Off-line setup using the Parawin PC tool (Accessories)¹⁾

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 to your computer for documentation purposes. You can then display the logged data in graphic form on your PC.



Offline configuration with Parawin (1 - 2 - 3) ⇒ Mycom

Offline data storage (3 - 2 - 1) ⇐ Mycom

Calibration and measurement

Calibration 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 recognizes 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 you 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 with temperature fluctuations. This compensation type compensates the deviation between isothermic intersection point and zero point of the electrode.

1) available from September 2006

Input

Mycom S CPM153

Measured variables	pH (analog or digital sensors) ORP (analog or digital sensors) Temperature	
Measuring range	pH:	-2 to 16 pH
	ORP:	-1500 to +1500 mV / -300 to +300 %
	Temperature:	-50 to +200 °C (-58 to 392 °F)
Input resistance	> $10^{12} \Omega$ (under nominal operating conditions, analog measured value transmission)	
Input current for sensor circuit	< $1.6 \cdot 10^{-12} \text{ A}$ (under nominal operating conditions)	
Ex connection data		Sensor circuit with type of protection EEx ia IIC (optional). This circuit can be connected to sensors of category 1G (zone 0) as well. Maximum output voltage U_O : 12.6 V DC 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 for sensor circuit	Cable length (analog):	max. 50 m (164 ft.)
	Cable length (digital):	max. 100 m (328 ft.)
Current inputs 1 / 2 (passive, optional)	Signal range:	4 to 20 mA
	Input voltage range:	6 to 30 V
		Intrinsically safe current inputs for connection to intrinsically safe electric circuits with type of protection EEx ia IIC or EEx ib IIC (optional) Maximum input voltage U_i : 30 V DC Maximum input 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 (selectable by the software):	0 to 1 k Ω 0 to 10 k Ω
Digital inputs E1 - E3	Input voltage:	10 to 50 V
	Internal resistance:	$R_i = 5 \text{ k}\Omega$
		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 : 30 V DC Maximum inner capacity C_i : negligible Maximum inner inductivity L_i : negligible

CPG310 control unit

Digital inputs

Input voltage	10 to 40 V
Internal resistance:	$R_i = 5 \text{ k}\Omega$
Minimum duration of start signal:	500 ms



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 :	30 V DC
Maximum inner capacity C_i :	negligible
Maximum inner inductivity L_i :	negligible

Cable spec. for inductive limit position switches

Cable length:	max. 100 m (328 ft.)
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Output

Mycom S CPM153

Output signal

0/4 to 20 mA

Signal on alarm

2.4 or 22 mA in case of an error

Load active current output

maximum 600 Ω (depending on operating voltage)

Output distribution

pH:	settable, 0 to 18 pH
ORP:	
absolute:	settable, 300 to 3000 mV
relative:	settable, 0 to 600 %
Temperature:	settable, 17 to 200 °C (62.6 to 392 °F)

Passive current output

Operating voltage range: 6 to 30 V

Ex connection data



Intrinsically safe current output for connection with intrinsically safe electric circuits with type of protection EEx ib IIC

Maximum input voltage U_i :	30 V DC
Maximum input current I_i :	100 mA
Maximum input 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 (for digital inputs E1 - E3)

Output voltage:	15 V DC
Output current:	max. 9 mA



Intrinsically safe current output circuit with type of protection EEx ib IIC

Maximum output voltage U_o :	15.8 V DC
Maximum output current I_o :	71 mA
Maximum output P_o :	1.13 W
Maximum outer capacity C_o :	50 nF
Maximum outer inductivity L_o :	100 μH

Interface to CPG310

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



Intrinsically 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:	≥ 5 million switching cycles



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 :	30 V DC
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) Analog (via current output)
Controller behavior:	P / PI / PID
Control gain K_p :	0.01 to 20.00
Integral action time T_n :	0.0 to 999.9 min
Derivative action time T_v :	0.0 to 999.9 min
Max. frequency with pulse-frequency controller:	120 min ⁻¹
Max. period with pulse-length controller:	1 to 999.9 s
Minimum switch-on period with pulse-length controller:	0.4 s

Limit and alarm functions

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

Galvanic isolation

Following circuits are at the same potential:

- Current output 1 and auxiliary voltage
- Current output 2 and resistance input

The remaining circuits are galvanically isolated from each other.

CPG310 control unit**Digital outputs**

Optocoupler, max. switching voltage:	30 V
Max. switching current:	100 mA
Max. switching power:	3 W

Intrinsically safe optoelectronic control outputs for connection of intrinsically safe electric circuits with type of protection EEx ia IIC or EEx ib IIC

Maximum input voltage U_i :	30 V DC
Maximum input current I_i :	100 mA
Maximum input power P_i :	1 W
Maximum inner capacity C_i :	negligible
Maximum inner inductivity L_i :	negligible

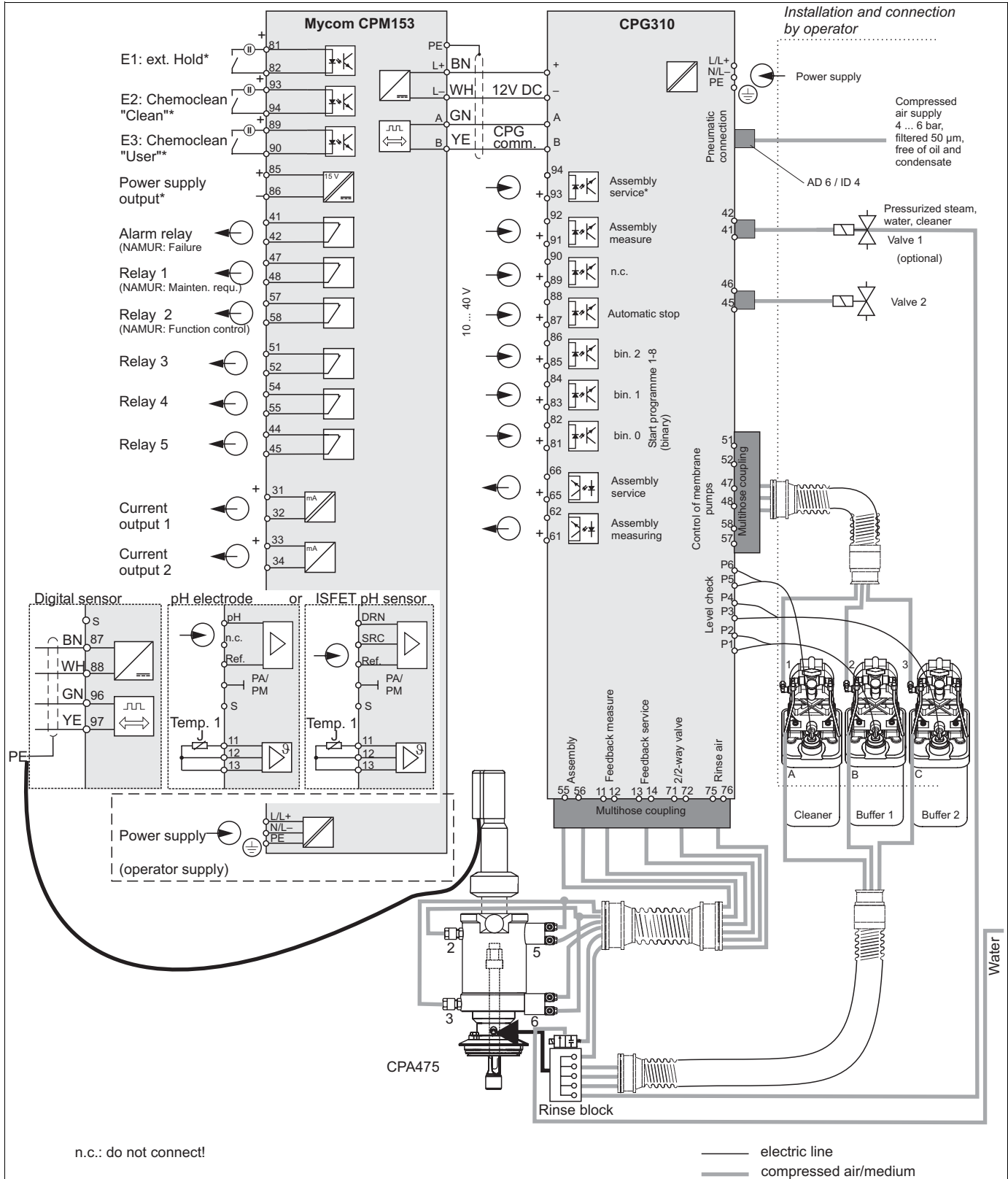
Control for external valves

Switched compressed air output:
Max. pressure:

as supply pressure

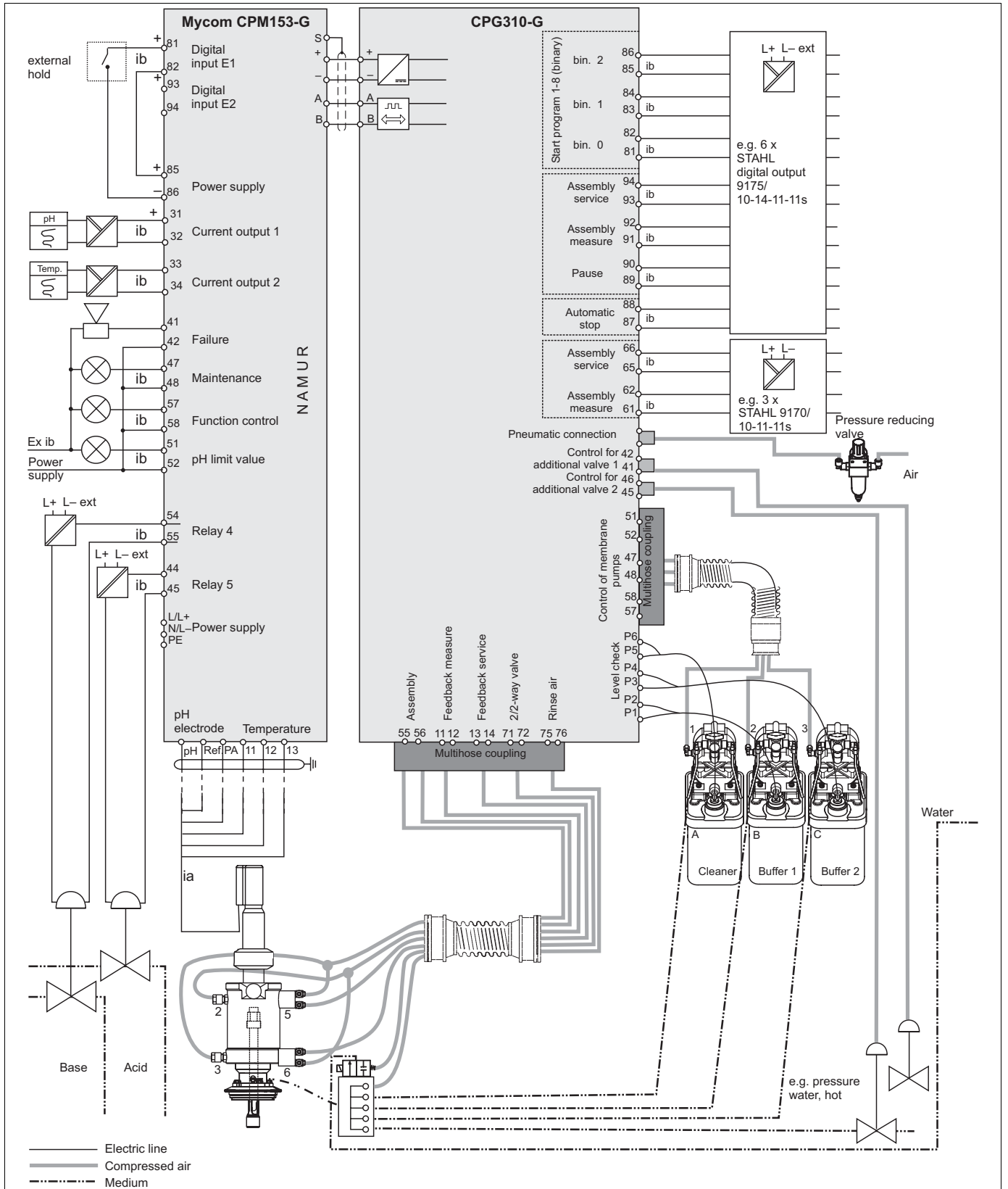
Power supply

Wiring diagram



Wiring in non-Ex areas

30005789-01



Wiring in Ex areas

a0005/89-en

Mycom S CPM153

Supply voltage	Version CPM153-xxxx0xxxx	100 to 230 V AC +10/-15 %
	Version CPM153-xxxx8xxxx	24 V AC/DC +20/-15 %

Cable specification	Maximum cable cross-section:	2.5 mm ² (≅ 14 AWG)
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Power consumption	maximum 10 VA
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Separation voltage between galvanically isolated circuits	276 V _{rms}
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Interface connection data Mycom S has one alarm and five additional contacts. 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. You can assign up to three relays to the controllers.



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	Assignment NAMUR off	Terminal
ALARM	Failure	Alarm	41 42
RELAY 1	Warning when maintenance required	free connectable	47 48
RELAY 2	Function check	free connectable	57 58

Frequency	47 to 64 Hz
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Ex connection data



Connection data for 12 V 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 outer capacity C _O :	150 nF
Maximum outer inductivity L _O :	150 μH

CPG310 control unit


Supply voltage	Version CPC310-xxxxx0xxxxx:	230 V AC +15/-15 %
	Version CPC310-xxxxx1xxxxx:	110 to 115 V AC +15/-15%
	Version CPC310-xxxxx8xxxxx:	24 V AC/DC +20/-15 %

Cable specification	Maximum cable cross-section:	2.5 mm ² (≅ 14 AWG)
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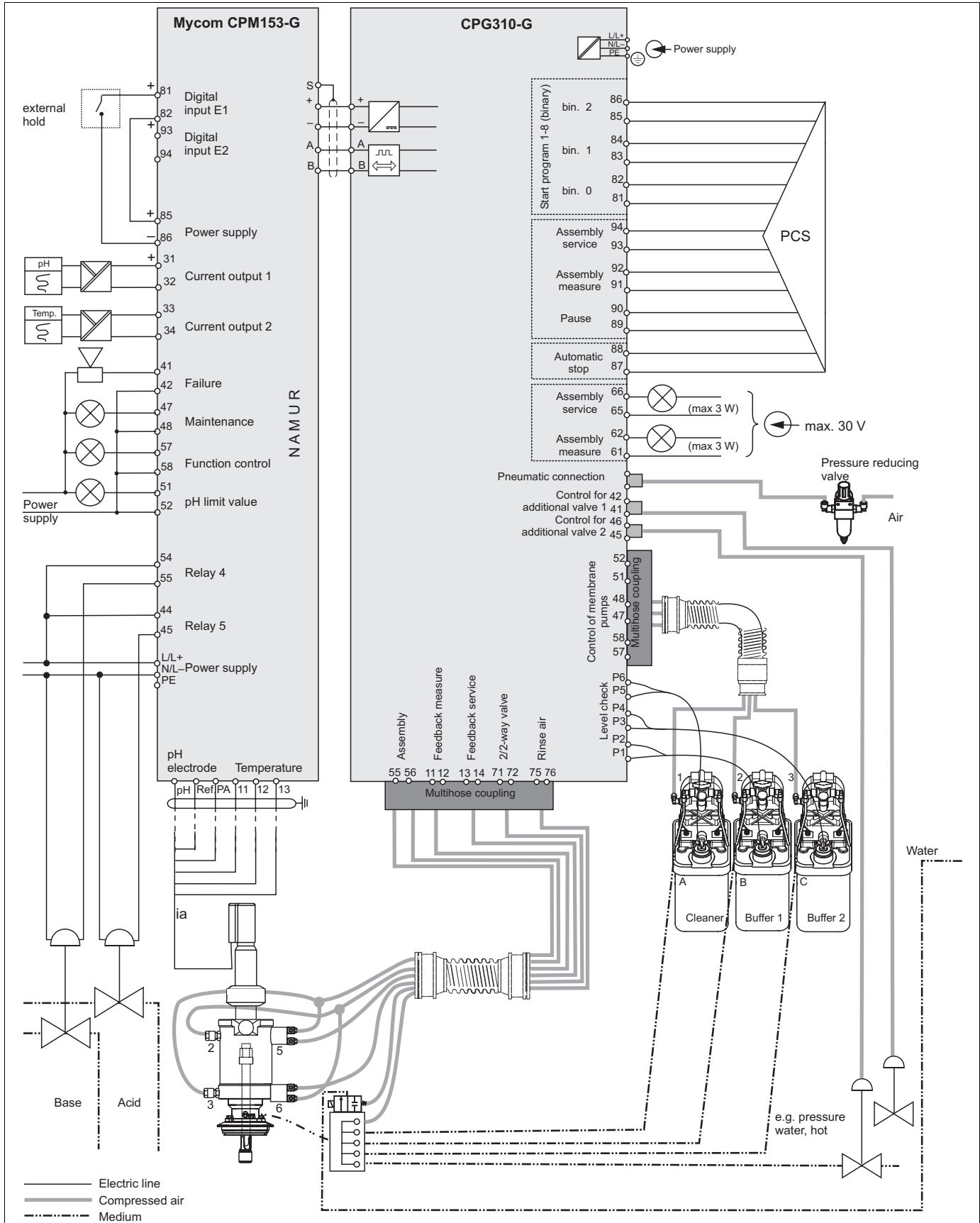
Power consumption	max. 12 VA
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Separation voltage between galvanically isolated circuits	276 V _{rms}
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Frequency	47 to 64 Hz
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Ex connection data	 Ex versions are powered by the CPM153 transmitter (see data above).
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Connection examples



Connection example, double-sided neutralisation, pH limit value, NAMUR pin assignment, pH and temperature at current outputs, 2 additional valves, external control via PCS, assembly status display

Performance characteristics

Reference temperature	25 °C (77 °F), settable with medium temperature compensation	
Measured value resolution	pH: ORP: Temperature:	0.01 pH 1 mV / 1 % 0.1 K
Measurement deviation²⁾	Display pH: ORP: Temperature: Current output: Current inputs: Resistance input:	max. 0.2 % of measuring range max. 1 mV max. 0.5 K max. 0.2 % of current range end value in addition to display deviation max. 1 % of measuring range max. 1 % of measuring range
Repeatability	max. 0.1 % of measuring range	
Zero point offset range	pH: ORP:	-2 to +16 pH -200 to +200 mV
Slope adjustment	pH:	5 to 99 mV/pH
Offset	ORP: Temperature:	±120 mV ±5 K
Assignment with ORP relative	settable, Δ for 100 % = 150 to 2000 mV	

Installation

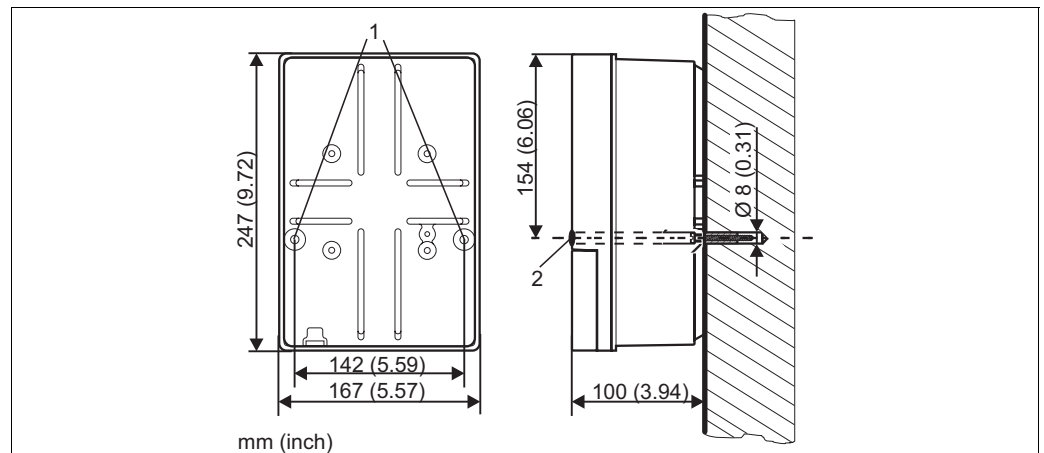
Installation instructions CPM153

Wall mounting



Caution!

- Check that the temperature does not exceed the maximum permitted temperature range (-20 to +60 °C (-4 to +140 °F)). Install the device in a shady location. Avoid direct sunlight.
- Install the field instrument so that the cable entries always point downwards.



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 caps

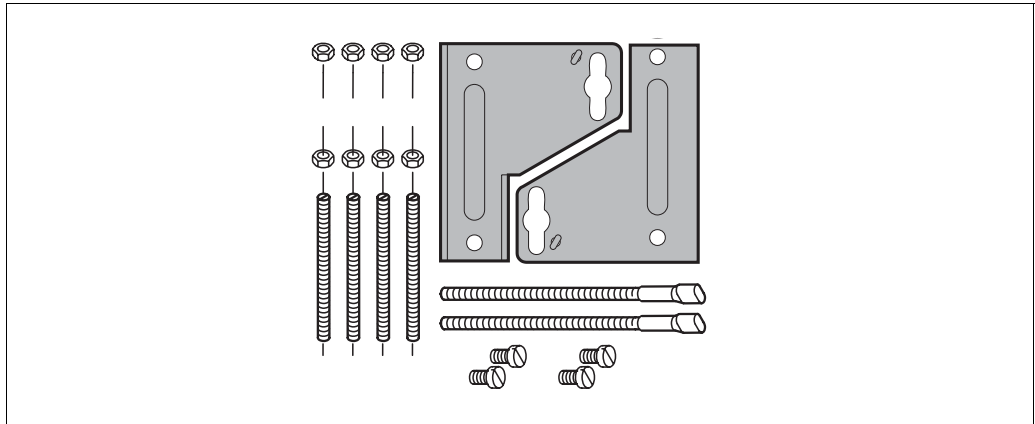
2) acc. to DIN IEC 746-1, under nominal operating conditions

Panel and post mounting



Note!

To mount the transmitter to horizontal and vertical posts or pipes (max. $\text{Ø } 70 \text{ mm (2.76")}$) and for panel mounting, use the supplied mounting kit.



Mounting kit

a0003955

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

Panel mounting:

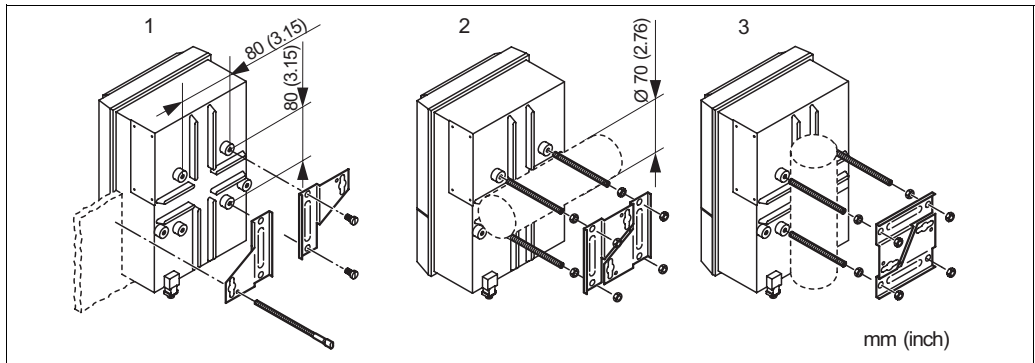
To achieve airtight panel mounting, you need to use an additional flat gasket (see "Accessories").

Required installation cutout: 161 x 241 mm (6.34" x 9.49")

Installation depth: 134 mm (5.28")

Post or pipe mounting:

Post / pipe diameter: max. 70 mm (2.76")



Panel mounting and post or pipe mounting

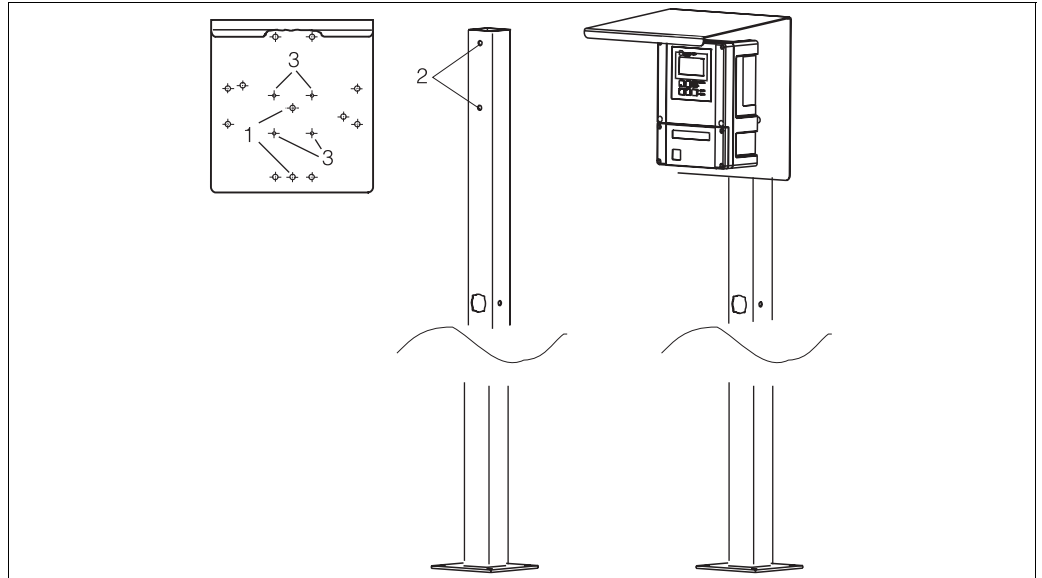
a0005508

- 1 Panel mounting
- 2 Post mounting horizontal
- 3 Post mounting vertical



Caution!

For outdoor use, the weather protection cover CYY101 is always required (see figure below and accessories).

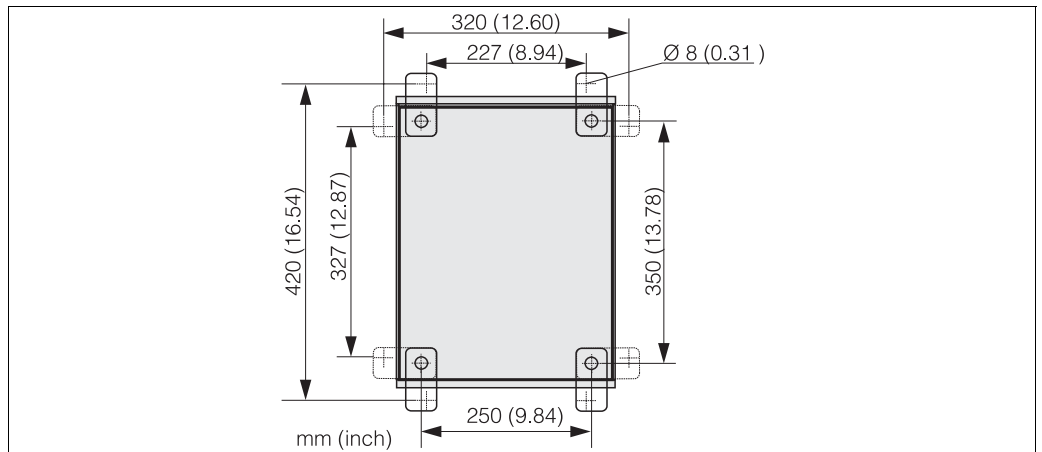


Post mounting with weather protection cover

- 1 Drill holes for mounting the weather protection cover to the square post
- 2 Drill holes for mounting of weather protection cover
- 3 Drill holes for mounting transmitter to weather protection cover

Installation instructions CPG310

Wall mounting



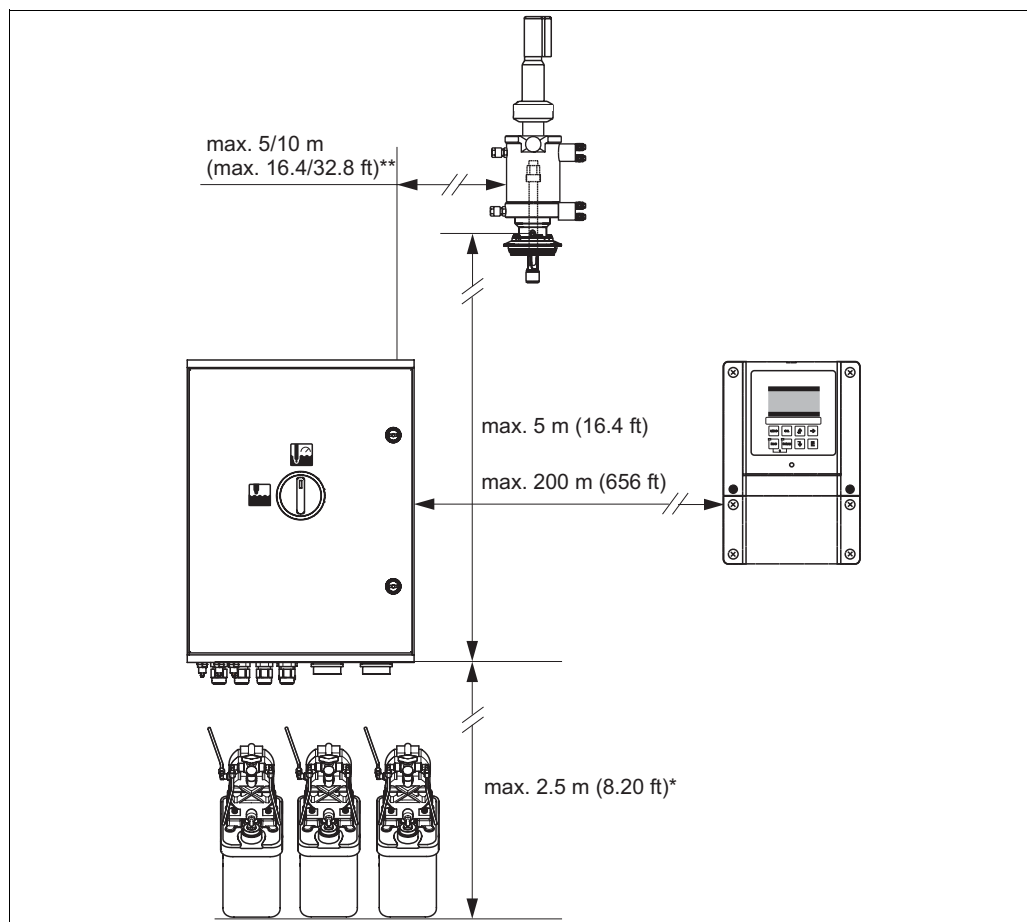
Dimensions for wall mounting with the wall mounting kit (included in scope of delivery)

To mount the control unit to a wall proceed as follows:

1. Make sure that the maximum suction height for buffer and cleaner of 2 m is not exceeded. Drill bores as shown in the figure above.
2. Screw the elements of the supplied wall mounting kit onto the back panel of the device housing.
3. Fix the housing at the wall.

Maximum line and hose lengths

The figure below shows the maximum permissible distances between Topcal S system components.



Maximum distances between system components

* when using the supplied standard multihoses

** depending on ordered multihose version

Environment

Ambient temperature range -10 to +55 °C (14 to 131 °F)
-10 to +50 °C (14 to 122 °F) (Ex)

Ambient temperature limits -20 to +60 °C (-4 to +140 °F)
-10 to +50 °C (+14 to +122 °F) (Ex)

Storage temperature -30 to +80 °C (-22 to +176 °F)

Electromagnetic compatibility Interference emission acc. to EN 61326: 1997 / A1: 1998; class B resources (housing sector)
Interference emission acc. to EN 61326: 1997 / A1: 1998; appendix A (industrial sector)

Ingress protection

CPM153

IP 65

CPG310

IP 54

Relative humidity

10 to 95%, non condensing

Safety requirements

Complies with general safety requirements acc. to EN 61010.
Complies with NAMUR recommendations NE 21: 08/1998.

Process

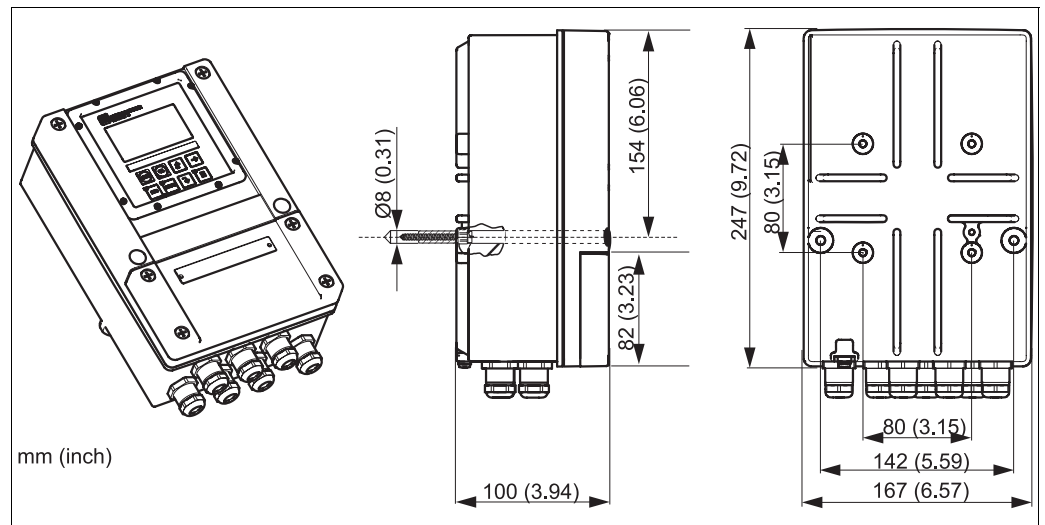
Process temperature range

0 to 50 °C (32 to 122 °F)

Mechanical construction

Design, dimensions

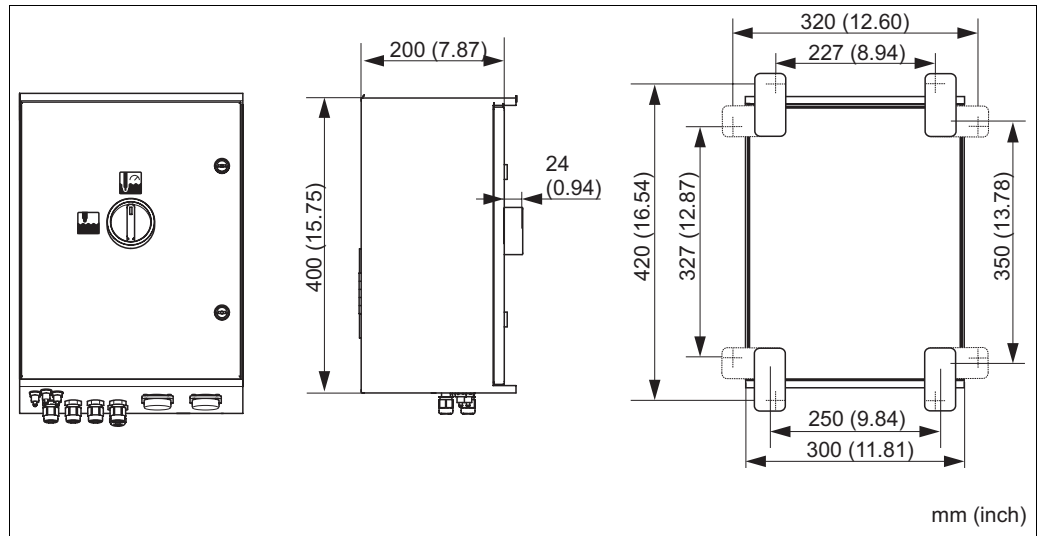
CPM153



Mycom S dimensions

cxm153-dim.cdr

CPG310



Dimensions of CPG310 control unit

Weight

CPM153

maximum 6 kg (13.2 lb)

CPG310

approx. 15 kg (33.1 lb.)

Material

CPM153

Housing:
Front:

GD AlSi 12 (Mg content 0.05 %), plastic coated polyester, UV resistant

CPG310

Housing:
Hoses:
Pump:
Level sensors:
Bottles:

Polyester GF
PU, PTFE (in contact with medium)
PVC, Viton®, PP, PVDF (in contact with medium)
Polypropylene
HDPE



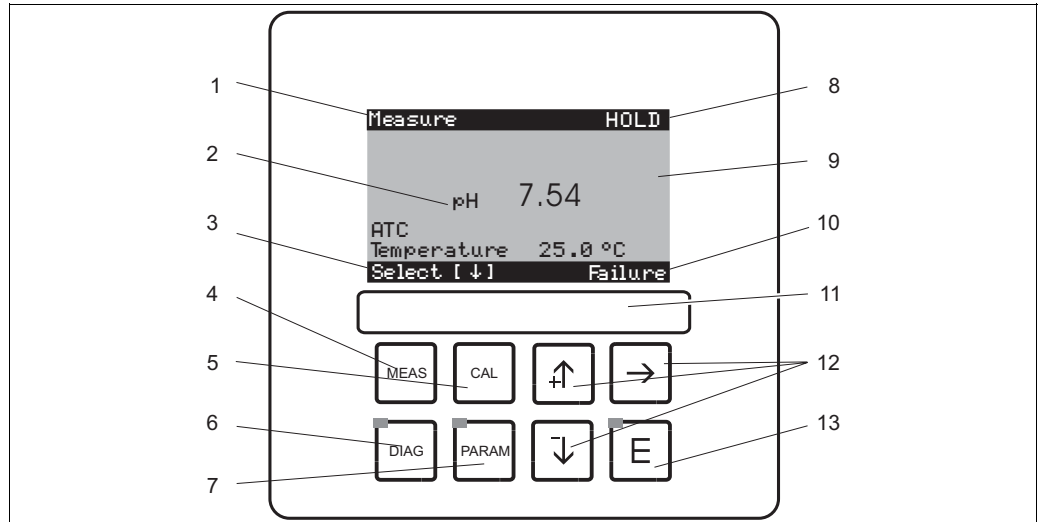
Caution!
Do not fill organic cleaners into the bottles.

Human interface

Display and operating elements CPM153

Backlit LC graphic display with dot matrix, 128 x 64 dots

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 configuration parameters.



- | | | | |
|---|--|----|--|
| 1 | Current menu | 8 | HOLD display, if HOLD is active |
| 2 | Current measured variable | 9 | Current main measured value |
| 3 | Select: Arrow keys for scrolling through the menu; "E" for browsing; note for cancelling | 10 | "Failure", "Warning", if NAMUR contacts are active |
| 4 | Measuring mode key | 11 | Labeling strip |
| 5 | Calibration mode key | 12 | Arrow keys for selection and enter |
| 6 | Diagnosis mode key | 13 | Enter key |
| 7 | Configuration mode key | | |

a0004120-en

Operating functions

Four main menus are available for instrument operation:

- Measurement
- Configuration
- Calibration
- Diagnosis

Press the , , and 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.

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 authorization 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. It also permits to operate the temperature compensation menu command and to view test functions and internal data.
- Specialist level (can be protected by the specialist code)
All menus are accessible for modification.

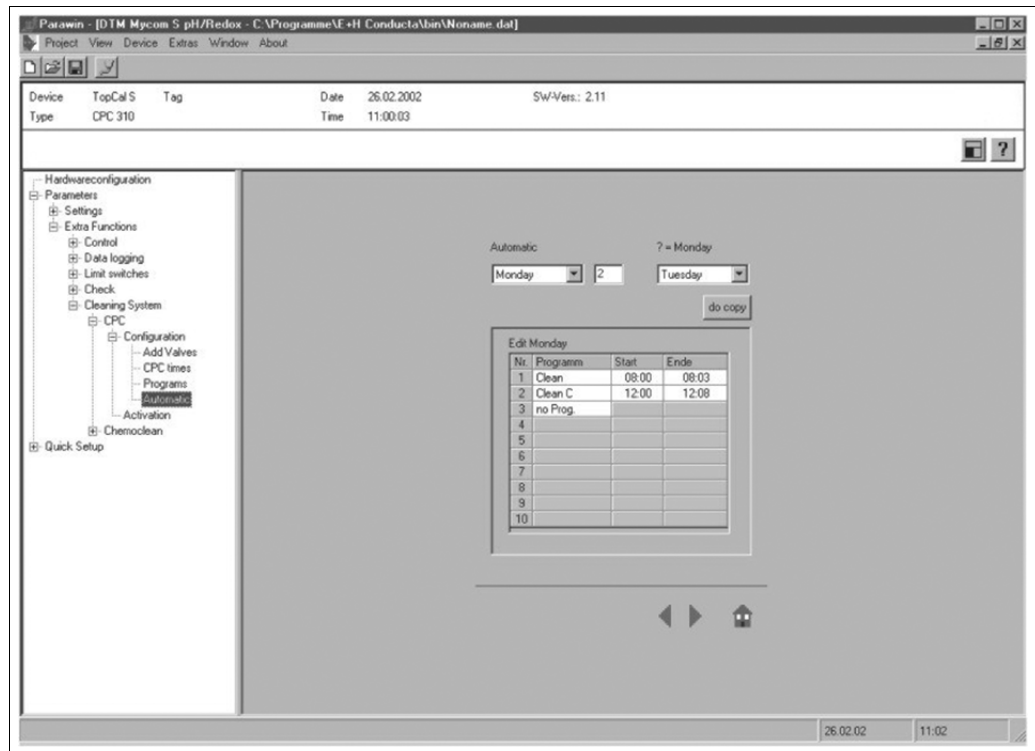


Note!

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

Offline configuration using Parawin (Option)³⁾

The PC tool Parawin enables you to configure your measuring point offline on a PC using a simple, self-explaining menu structure (see example below). Write the configuration data to the DAT module via the RS 232 interface of the PC and then plug the DAT module into the transmitter.



Parawin menu structure

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Certificates and approvals

CE symbol

Declaration of conformity

The product meets the legal requirements of the harmonized European standards.
The manufacturer confirms compliance with the standards by affixing the CE 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
- EC system approval

3) available from September 2006

Ordering information

Product structure

		Approvals	
A		Basic equipment: non-Ex	
G		With ATEX approval, ATEX II (1) 2G EEx, em ib[ia] IIC T4	
O		With FM approval Cl. I, Div. 2, with NI input and output circuits, sensor IS Cl. I, Div. 1	
P		With FM approval Cl. I, Div. 2, with NI input and output circuits	
S		With CSA approval Cl. I, Div. 2, sensor IS Cl. 1, Div. 1	
		Materials: rinse block, O-ring, connection	
00		PVDF, Viton, G¼ male	
01		PVDF, Viton, NPT ¼", male	
02		PVDF, Kalrez, G¼, male	
03		PVDF, Kalrez, NPT ¼", male	
10		Stainless steel 1.4404 (AISI 316L), Viton, G¼, male	
11		Stainless steel 1.4404 (AISI 316 L), Viton, NPT ¼", male	
12		Stainless steel 1.4404 (AISI 316 L), Kalrez, G¼, male	
13		Stainless steel 1.4404, (AISI 316 L) Kalrez, NPT ¼", male	
		Measurement input Mycom S	
1		1 measuring circuit for glass electrodes, pH/ORP and temperature	
2		1 measuring circuit for glass electrodes / ISFET sensors, pH/ORP and temperature	
5		1 measuring circuit for digital Memosens sensors, pH/ORP and temperature	
		Measurement output Mycom S	
A		2 current outputs 0/4 to 20 mA, passive (Ex and non-Ex)	
B		2 current outputs 0/4 to 20 mA, active (non-Ex)	
C		HART with 2 current outputs 0/4 to 20 mA, passive	
D		HART with 2 current outputs 0/4 to 20 mA, active	
E		PROFIBUS PA without current outputs	
		Power supply	
0		230 V AC	
1		110 to 115 V AC	
8		24 V AC/DC	
		Language versions	
A		English / German	
B		English / French	
C		English / Italian	
D		English / Spanish	
E		English / Dutch	
		Cable connection	
0		Cable glands M 20 x 1.5	
1		Threads NPT ½"	
3		Cable glands M 20 x 1.5, PROFIBUS-PA M12 plug	
4		Threades NPT ½", PROFIBUS-PA M12 plug	
		Multihose length	
0		5 m (16.4 ft.)	
1		5 m (16.4 ft.) with electrical heating	
2		10 m (32.8 ft.)	
3		10 m (32.8 ft.) with electrical heating	
		Additional options	
0		Standard version	
1		Preparation for CYC310 housing	
9		Special version acc. to customer specifications	
		Adjustment	
A		Factory setup	
B		IQ/OQ template, German	
C		IQ/OQ template, English	
D		Standard FAT, German	
E		Standard FAT, English	
CPC310-			complete order code

Scope of delivery

The scope of delivery comprises:

- 1 transmitter Mycom S CPM153
- 1 control unit CPG310
- 1 rinse block with brackets for assembly mounting
- 4 multihoses
- 3 double-membrane pumps with canisters, for buffer and cleaner conveyance
- 2 technical buffer solutions pH 4.00 and 7.00
- 1 communication / supply cable CPG310 / Mycom S CPM153
- 3 level sensors, complete with cables from CPG310 to bottles
- 1 pressure reduction valve with manometer
- 1 water filter
- 1 device identification card
- 1 Operating Instructions, English
- Accessories, if ordered

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)
 - SoftwareOrder no.: 51507133 (Mycom S only)
Order no.: 51507563 (Topcal S, Topclean S, Mycom S)

DAT module

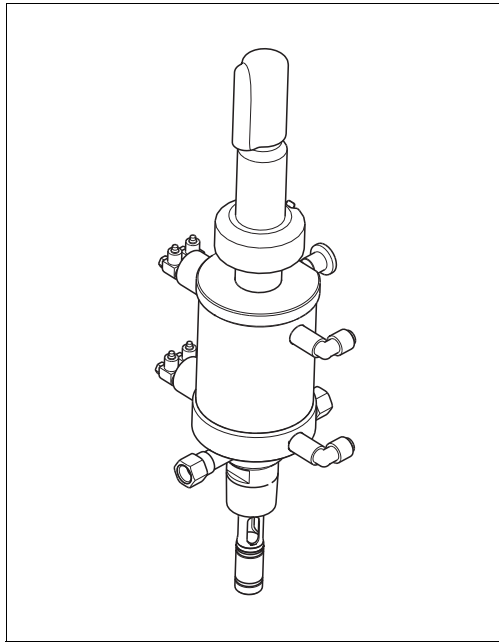
- Additional memory device for saving or copying complete settings, logbooks and the data logs;
Order no.: 51507175

Flat gasket

- Flat gasket for air-tight panel mounting of the Mycom S
Order no.: 50064975

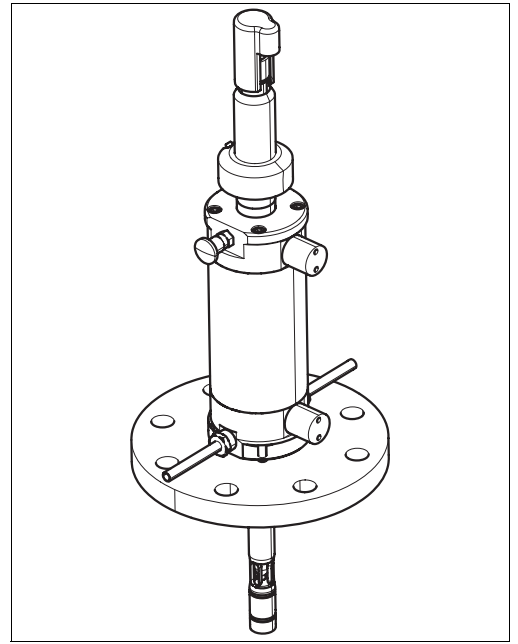
Assemblies (selection)

- Cleanfit P CPA471, version CPA471-xxxxxx3/4
Compact retractable stainless steel assembly for installation in tanks and pipes, manual or pneumatic operation
Ordering acc. to product structure, see Technical Information (TI217C/07/en)
- Cleanfit P CPA472, version CPA472-xxxxxx3/4
Compact retractable plastic assembly for installation in tanks and pipes, manual or pneumatic operation
Ordering acc. to product structure, see Technical Information (TI223C/07/en)
- Cleanfit P CPA472D, version CPA472D-xxxxxx3/4/5
Retractable assembly for pH/ORP measurement in tanks and pipes, manual or pneumatic operation, heavy-duty version made of highly resistant materials, see Technical Information (TI403C/07/en)



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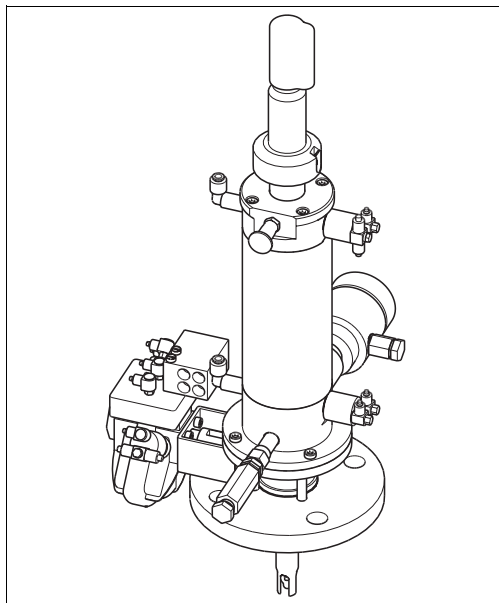
Cleanfit P CPA471 or 472



a0006247

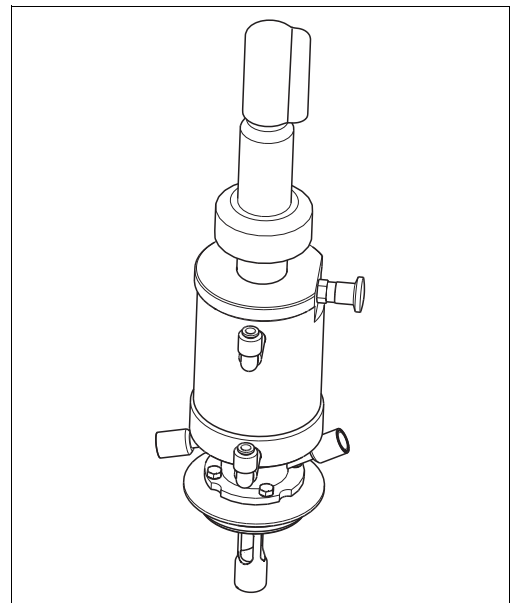
Cleanfit P CPA472D

- Cleanfit P CPA473
 Retractable stainless steel process assembly, with ball valve for a particularly safe separation of the medium from the environment
 Ordering acc. to product structure, see Technical Information (TI344C/07/en)
- Cleanfit P CPA474
 Retractable plastic process assembly, with ball valve for a particularly safe separation of the medium from the environment
 Ordering acc. to product structure, see Technical Information (TI345C/07/en)
- Cleanfit H CPA475
 Retractable assembly for pH/ORP measurement in tanks and pipes under sterile conditions
 Ordering acc. to product structure, see Technical Information (TI240C/07/en)



a0003138

Cleanfit P CPA473 or 474



a0003136

Cleanfit H CPA475

Sensors

Glass electrodes

- Orbisint CPS11/CPS11D
pH electrode for process applications, with PTFE diaphragm, Memosens technology as option;
Ordering acc. to product structure, see Technical Information (TI028/C07/en)
- Orbisint CPS12/CPS12D
ORP electrode for process applications, with PTFE diaphragm, Memosens technology as option;
Ordering acc. to product structure, see Technical Information (TI367/C07/en)
- Ceraliquid CPS41/CPS41D
pH electrode with ceramics diaphragm and liquid KCl electrolyte, Memosens technology as option;
Ordering acc. to product structure, see Technical Information (TI079/C07/en)
- Ceraliquid CPS42/CPS42D
ORP electrode with ceramics diaphragm and liquid KCl electrolyte, Memosens technology as option;
Ordering acc. to product structure, see Technical Information (TI079/C07/en)
- Ceragel CPS71/CPS71D
pH electrode with double chamber reference system and integrated bridge electrolyte,
Memosens technology as option;
Ordering acc. to product structure, see Technical Information (TI245/C07/en)
- Ceragel CPS72/CPS72D
ORP electrode with double chamber reference system and integrated bridge electrolyte, Memosens
technology as option;
Ordering acc. to product structure, see Technical Information (TI374/C07/en)
- Orbipore CPS91/CPS91D
pH electrode with open aperture for media with high dirt load, Memosens technology as option;
Ordering acc. to product structure, see Technical Information (TI375C/07/en)

ISFET sensors

- Tophit CPS471/CPS471D
Sterilizable and autoclavable ISFET sensor for food and pharmaceuticals, process technology, water
treatment and biotechnology;
Ordering acc. to product structure, see Technical Information (TI283/C07/en)
- Tophit CPS441/CPS441D
Sterilizable ISFET sensor for media with low conductivity, with liquid KCl electrolyte;
Ordering acc. to product structure, see Technical Information (TI352/C07/en)
- Tophit CPS491/CPS491D
ISFET sensor with open aperture for media with high dirt load;
Ordering acc. to product structure, see Technical Information (TI377/C07/en)

Connection accessories

- CPK1 special measuring cable
For pH/ORP electrodes with GSA plug-in head
Ordering acc. to product structure, see Technical Information (TI118C/07/en)
- CPK9 special measuring cable
For pH/ORP sensors with TOP68 plug-in head, for high-temperature and high-pressure applications, IP 68
Ordering acc. to product structure, see Technical Information (TI118C/07/en)
- CPK12 special measuring cable
For pH/ORP glass electrodes and ISFET sensors with TOP68 plug-in head
Ordering acc. to product structure, see Technical Information (TI118C/07/en)

- CYK10 Memosens data cable
For digital sensors with Memosens technology
Ordering according to product structure, see below

Certificates	
A	Standard, non Ex
G	ATEX II 1G EEx ia IIC T6/T4
Cable length	
03	Cable length: 3 m (9.8 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)
88	... m length
89	... ft length
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 meter:
 - Non-Ex version, black: order no. 51506598
 - Ex-version, blue: order no. 51506616

CYK81 measuring cable

- To lengthen the cable of e.g. Memosens, CUS31/CUS41
- 2 wires, twisted pair with shield and PVC-sheath (2 x 2 x 0.5 mm² + shield)
- Sold by the meter, 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
- Material: aluminum
- Order numbers:
 - cable entry Pg 13.5: 50003987
 - cable entry NPT ½": 51500177

Junction box VBA

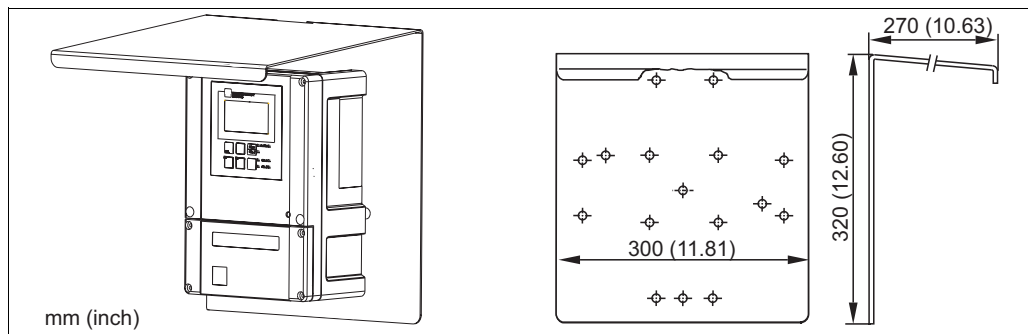
- With 10 high-impedance terminals, protection class: IP 65 (≅ NEMA 4X)
- Material: polycarbonate
- Order no. 50005276

Junction box RM

- To lengthen the cable for Memosens or CUS31/CUS41
- With 2 x PG 13.5
- IP 65 (≅ NEMA 4X)
- Order no. 51500832

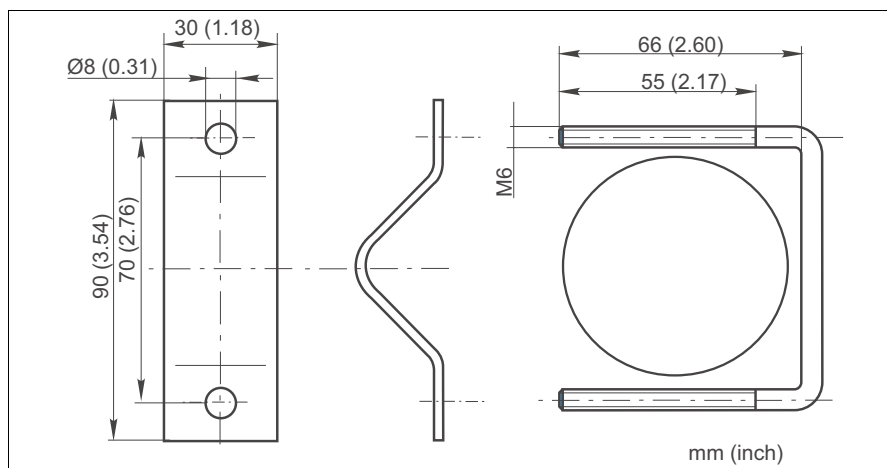
Mounting accessories

- 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 stainless steel weather protection cover CYY101 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 (3.4 fl.oz.), order no. CPY2-0
- pH 4.0 red, 1000 ml (34 fl.oz.), order no. CPY2-1
- pH 7.0 green, 100 ml (3.4 fl.oz.), order no. CPY2-2
- pH 7.0 green, 1000 ml (34 fl.oz.), order no. CPY2-3

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

- pH 4.0 20 x 20 ml (0.68 fl.oz.), order no. CPY2-D
- pH 7.0 20 x 20 ml (0.68 fl.oz.), order no. CPY2-E

Technical buffer solutions for ORP electrodes

- +220 mV, pH 7.0, 100 ml (3.4 fl.oz.); order no. CPY3-0
- +468 mV, pH 0.1, 100 ml (3.4 fl.oz.); order no. CPY3-1

KCl-electrolyte solutions for liquid filled electrodes

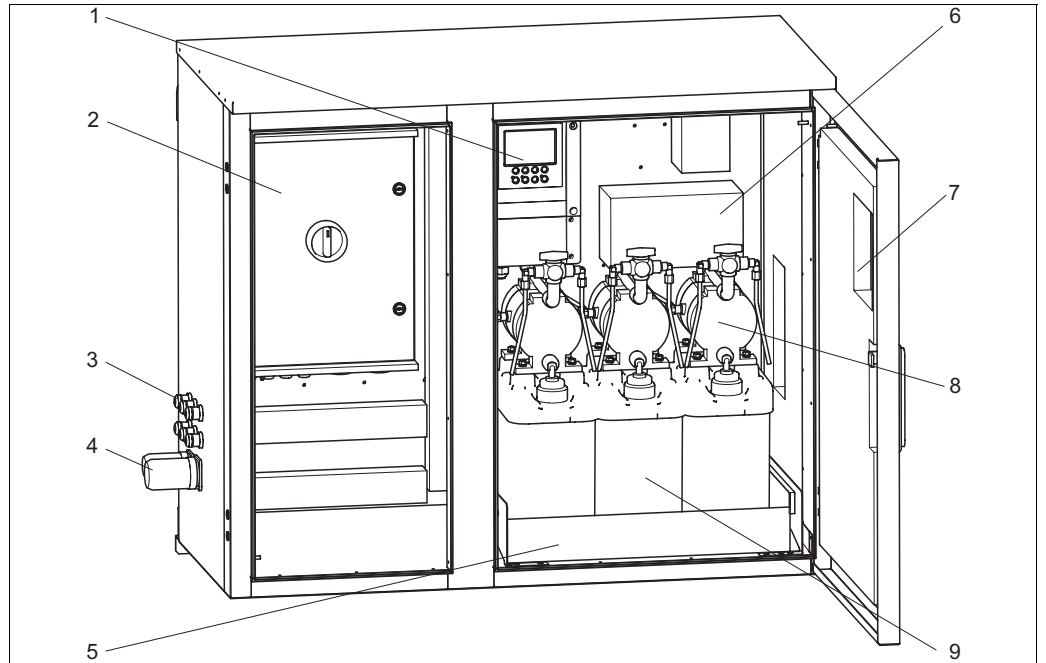
- 3.0 mol, T = -10 ... 100 °C (14 ... 212 °F), 100 ml (3.4 fl.oz.), order no. CPY4-1
- 3.0 mol, T = -10 ... 100 °C (14 ... 212 °F), 1000 ml (34 fl.oz.), order no. CPY4-2
- 1.5 mol, T = -30 ... 100 °C (-22 ... 266 °F), 100 ml (3.4 fl.oz.), order no. CPY4-3
- 1.5 mol, T = -30 ... 100 °C (-22 ... 266 °F), 1000 ml (34 fl.oz.), order no. CPY4-4

CYC310 housing

Housing for Topcal S CPC310, with rack for buffer and cleaner solutions. Operating panel with alarm LED and lock for program start and assembly moving. For application in hazardous and non-hazardous areas.

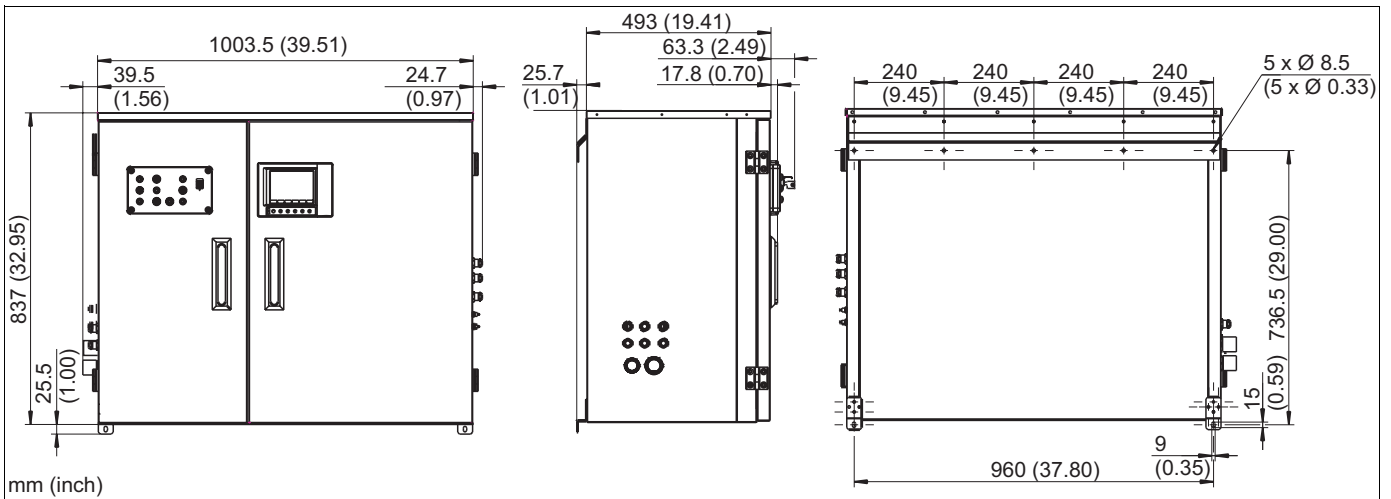
Material: Plastic or stainless steel

- Plastic version: Window for Mycom S and Memograph S
- Stainless steel version without Memograph S: Window for Mycom S
- Stainless steel version with Memograph S: Window for Memograph S

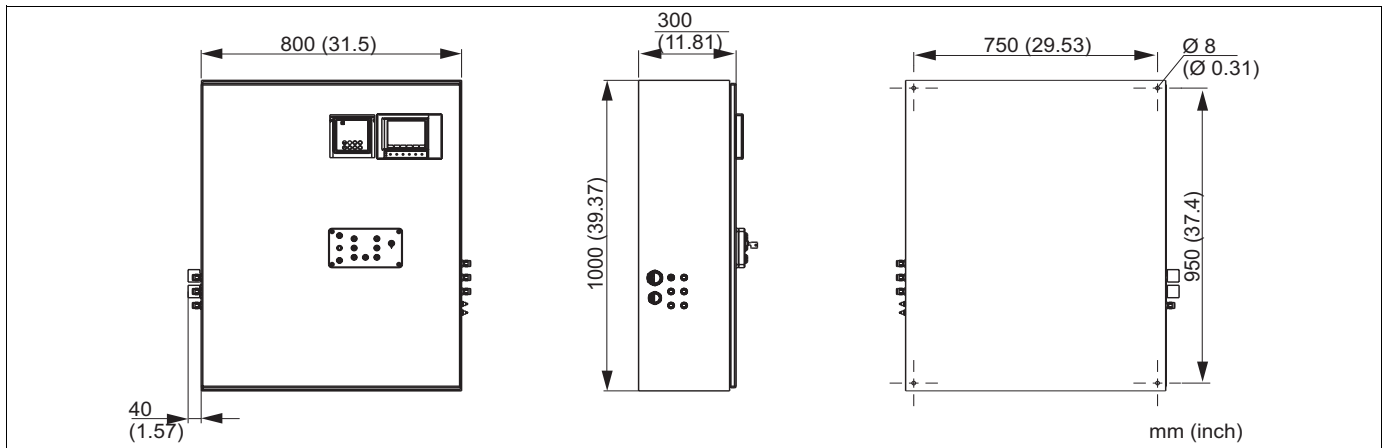


Interior view of CYC310 housing, stainless steel version

- | | |
|-------------------------|---|
| 1 Mycom S CPM153 | 6 Distributing box |
| 2 Control unit | 7 Window for display |
| 3 Cable glands | 8 Membrane pumps f. buffer and cleaner conveyance |
| 4 Multihose connections | 9 buffer and cleaning solutions |
| 5 Rack | |



Dimensions of CYC310 housing, stainless steel version



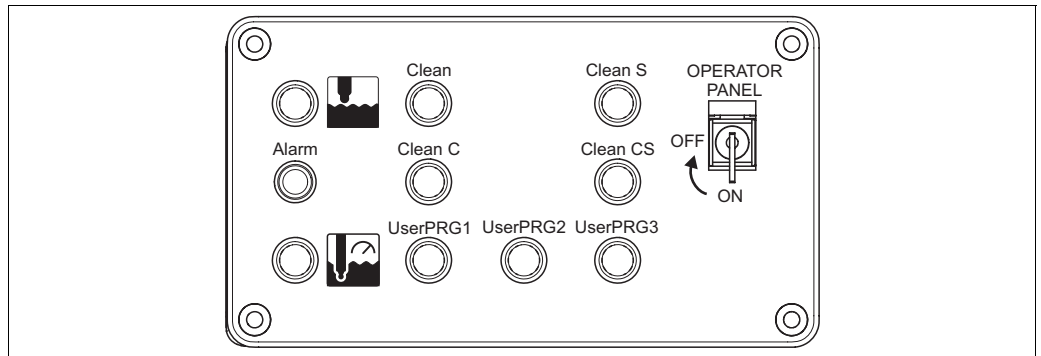
Dimensions of CYC310 housing, plastic housing

Ordering information

Certificates	
A	Basic version: non-hazardous area
G	With ATEX approval, ATEX II (1) 2G EEx, em ib[ia] IIC T4
O	With FM approval Cl. I, Div. 2, with NI input and output circuits, sensor IS Cl. I, Div. 1
P	With FM approval Cl. I, Div. 2, with NI input and output circuits
S	With CSA approval Cl. I, Div. 2, sensor IS Cl. I, Div. 1
Power supply	
1	230 V AC
2	110 to 115 V AC
3	24 V AC/DC
Materials	
A	Plastic
B	Stainless steel 1.4301 (AISI 304)
Heating	
1	Without electrical heating
2	With electrical heating
Data log function	
A	Without Memograph S
B	With Memograph S
Allocation	
1	Empty housing, without CPC310
2	Separate item of CPC310
Additional options	
1	Basic version
CYC310-	complete order code

Operating panel

Operating panel with alarm LED and key switch, used to start programs and move the assembly
Order no.: 51512891



Operating panel

International Head Quarters

Endress+Hauser
GmbH+Co. KG
Instruments International
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79576 Weil am Rhein
Deutschland

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