

Conductivity measurement *Mycom S CLM 153*

Conductivity transmitter (one or two-loop with controller and limit functions for conductive or inductive systems (hazardous and nonhazardous versions))



Applications

The Mycom S CLM 153 four-wire transmitter measures conductivity and resistance in all areas of process engineering with a high degree of reliability and accuracy.

Thanks to its modular structure, you can configure the device for any measuring or control task in the following applications:

- Chemical
- Food and beverage
- Pharmaceutical
- Water treatment
- Hazardous areas

Your benefits

- High measurement reliability and user-friendly:
 - Polarization monitoring and compensation
 - Monitoring of the measuring signal
 - Logbook functions and data logger with calibration history
 - "Chemoclean" integrated cleaning function
 - Redundancy and differential measurement
 - Online help
- Individually configurable due to:
 - Two-loop measurement (galvanically isolated circuits)
 - Extended controller and limit value functions
 - Current/resistance inputs for feedforward control and position feedback
 - Current output for analog adjusters
 - Plug-in module for saving and transferring configuration (DAT module)
 - Output contacts to NAMUR
 - USP limit function
- Hazardous area approvals:
 - FM
 - CSA
 - ATEX

Endress + Hauser

The Power of Know How

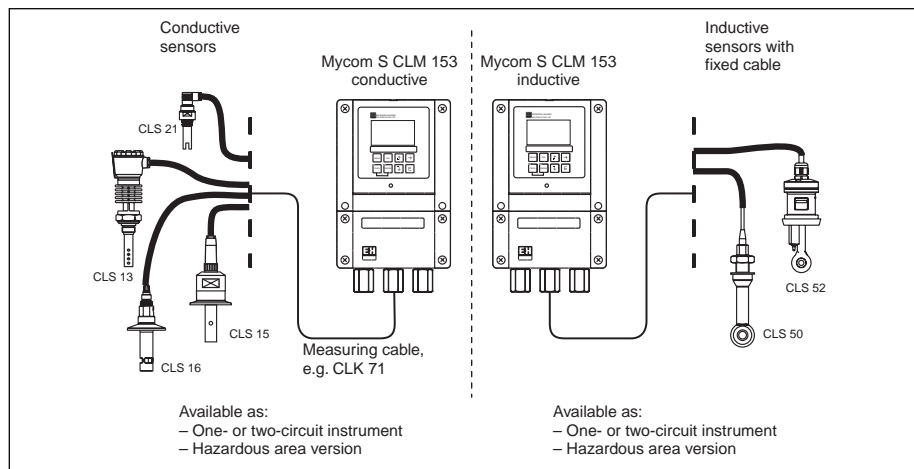


Function and system design

Measuring system

A complete measuring system consists of the following components:

- The Mycom S CLM 153 transmitter
- A conductive sensor (e.g. CLS 21, CLS 16) or an inductive sensor (e.g. CLS 50, CLS 52) with integrated Pt 100 temperature sensor
- A weld-on socket or holder assembly for pipe or tank installation
- An appropriate measuring cable (e.g. CPK 9, CLK 5, or CLK 71)



Example of possible measuring system

Functions

Quick setup

This function configures the measuring point quickly and simply with basic settings required to allow you to begin measurement immediately.

Polarization compensation

Polarization effects in the boundary level between the sensor and the solution to be measured, limiting the measuring range of conductive sensors. The CLM 153 transmitter can detect polarization effects using an intelligent signal evaluation process, and compensate for these effects. This extends the useful measuring range of a sensor considerably.

PCS (Process Check System)

This function checks the measuring signal for deviations. An alarm is triggered if the measuring signal does not change for a period of time (several measured values). A soiled sensor or blocked flow at the sensor will cause this alarm.

Logbooks

There are several logbooks available. The most recent 30 entries are saved to an error logbook, an operation logbook and a calibration logbook. This information can be retrieved by date and time.

Measuring range switching (MRS)

Inductive measuring systems in particular are equipped with measuring range switching devices because of the wide spans they cover. The CLM 153 inductive transmitter provides the additional benefit of separate internal measuring range switching in such applications. The device automatically switches the measuring device parameters (the current output in particular) to the next range in accordance with variably switching thresholds. It signals the currently valid measuring range using relay contacts.

Two-circuit: differential measurement

A two-circuit device allows you to connect two sensors of the same type to measure and monitor differential conductivity. This is necessary for:

- Media separation
- Monitoring heat exchangers
- Monitoring ion exchangers

Two-circuit: efficiency

The two-circuit device allows you to display the two measured values (“A”) according to their efficiency.

- A - B
- B - A
- A/B
- B/A
- (A - B)/A
- (B - A)/A
- (A - B)/B
- (B - A)/B

In the following units: $\mu\text{S/cm}$, mS/cm , S/cm , $\mu\text{S/m}$, mS/m , S/m or auto, $\text{k}\Omega\cdot\text{cm}$, $\text{M}\Omega\cdot\text{cm}$, $\text{k}\Omega\cdot\text{m}$, $\text{M}\Omega\cdot\text{m}$.

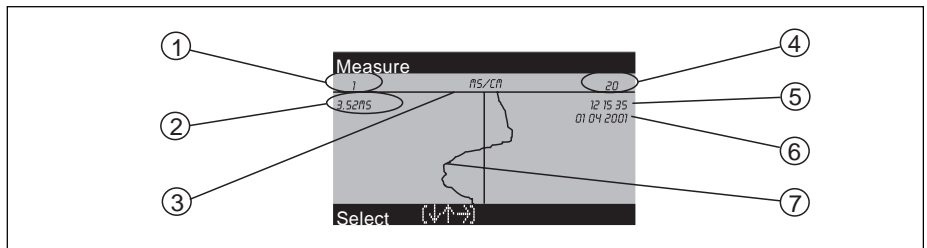
USP (United States Pharmacopeia)

The requirements on Ultrapure water in the pharmaceutical industry are specified by the American USP. The Mycom S CLM 153 meets the USP requirements on conductivity measuring systems:

- Precise temperature measurement at point of conductivity measurement
- Simultaneous display of uncompensated conductivity values and temperature
- Display resolution $0.001 \mu\text{S/cm}$
- Exact adjustment of the transmitter in the factory with traceable precision resistances.
- Exact adjustment of the sensors in the factory in accordance with ASTM D 1125-91
- Temperature-dependent measurement value monitoring in accordance with USP

Data log

You can record two freely selectable parameters using the integrated data logs and then display the results graphically in real time. You can retrieve the 500 most recently 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 opportunity for optimizing conductivity control.



Example for data log (for parameter 1)

- | | |
|---|--|
| <p>1 Minimum display range (selectable to $0 \mu\text{S/cm}$)</p> <p>2 The measured value at the scroll bar (3) is located</p> <p>3 Scroll bar</p> | <p>4 Maximum display range (selectable to 2000mS/cm)</p> <p>5 Time when this measured value was recorded</p> <p>6 Date of this measured value</p> <p>7 Measured value curve</p> |
|---|--|

Cleaning functions

The Chemoclean® spray cleaning system automatically cleans the sensor. 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.

Simple to control

The following control functions are implemented in the CLM 153

- 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 and D components
 - including configurable range-dependent amplification (segmented 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 to 20 mA): analog signal to control the actuator (for one or two actuator drives)

Valves with a repeater or feedforward control can also be incorporated in the control system. For this, you can use the following optional inputs:

- for order versions CLM 153-xxx2xxxx: 1 current input (hazardous or nonhazardous)
- for order versions CLM 153-xxx4xxxx: 2 current inputs (hazardous or nonhazardous)
- for order versions CLM 153-xxx3xxxx: 1 resistance input (for nonhazardous)
- for order versions CLM 153-xxx5xxxx: 1 current and 1 resistance input (for nonhazardous)

You can use the following selection guides for in-line and batch processes to choose the right transmitter version for your process.

PWM = Pulse Length Proportional
 PFM = Pulse Frequency Proportional
 Three PS = Three-point Step Controller

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 three-PS 1 PWM/PFM	with signal	2	2	2	-
			without signal		2	2	1	-
			analog	2	-	1	1	
	not looking-ahead	}	1 PWM	1	1	-	-	
			1 PFM	1	1	-	-	
			1 three-PS 1 PWM/PFM	with signal	1	2	1	-
			without signal		1	2	-	-
			analog	1	-	-	1	

Selection aid for inline processes

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

Selection aid for batch 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 three-PS 1 PWM/PFM	with signal without signal	1	2	1	–
			1	2	–	–
	current output	1	–	–	1	
2-sided control	2 PWM	1	2	–	–	
	2 PFM	1	2	–	–	
	1 three-PS 1 PWM/PFM	with signal without signal	1	–	1	1
			1	3	–	–
	current output split range	1	3	–	–	

DAT module

The DAT module is a memory device (EEPROM) which is plugged into the connection compartment of the transmitter. Using the DAT module, you can:

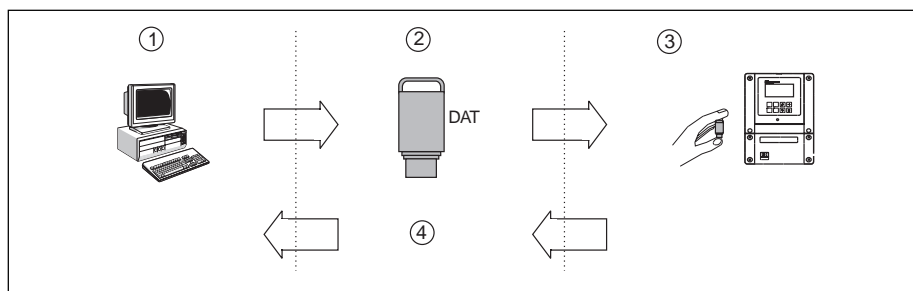
- Save the complete settings, the logbooks and the data log of the transmitter
- Copy the complete settings to other CLM 153 transmitters with identical hardware functionality.

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

Offline set up (accessories)

You can use the PC tool for offline configuration to:

- ① configure the entire measuring point on the PC in a familiar Windows environment, and
- ② save the settings to the DAT module.
- ③ Then you should install the DAT module in a CLM 153 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 download logbooks and data logs from the transmitter for documentation purposes and save them to your computer. You can then display the data log data in graphical form on your PC.



Calibration

Accurate calibration and measurement

The instrument allows all field-tested calibration options:

- Airset: inductive sensors can be calibrated to air
- Calculation: the conductivity of the calibration solution (with precisely determined conductivity) is entered and the cell constant of the sensor is thus calculated
- Installation factor: in tight installation conditions, the inductive sensor can be influenced by the pipe wall. This means that measuring differences may occur. These are compensated for in the calibration process by entering the installation factor.
- Data entry: the cell constant of the sensor is entered via the key pad.
- Calibration logbook: the data relating to the 30 most recent calibrations is saved to a list with date and time.
- Fluid 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.

Input

Measured variables

Conductivity, temperature

Conductivity, inductive

Measuring range, non-compensated
Measuring range, compensated

0.04 $\mu\text{S/cm}$ to 2000 mS/cm
0.04 $\mu\text{S/cm}$ to 1000 mS/cm

Conductivity, conductive

Cell constant k	Measuring range
0.01/cm	0.0 $\mu\text{S/cm}$ to 600.0 $\mu\text{S/cm}$
0.1/cm	0.000 $\mu\text{S/cm}$ to 6000 $\mu\text{S/cm}$
1/cm	0.00 $\mu\text{S/cm}$ to 60.00 mS/cm
10/cm	0.0 $\mu\text{S/cm}$ to 600.0 mS/cm

Display range
0.0 $\mu\text{S/cm}$ to 200.0 $\mu\text{S/cm}$
0.000 $\mu\text{S/cm}$ to 2000 $\mu\text{S/cm}$
0.00 $\mu\text{S/cm}$ to 20.00 mS/cm
0.0 $\mu\text{S/cm}$ to 200.0 mS/cm

Resistance measurement	Cell constant k	Measuring range	Display range
	0.01/cm	20.0 k Ω -cm to 80.0 M Ω -cm	20.0 k Ω -cm to 37.99 M Ω -cm
	0.1/cm	2.00 k Ω -cm to 2000 k Ω -cm	2.00 k Ω -cm to 3799 k Ω -cm
	1/cm	0.200 k Ω -cm to 200.0 k Ω -cm	0.200 k Ω -cm to 379.9 k Ω -cm
Concentration measurement	Selection	Conductivity range	Concentration
	NaOH	0.0 mS/cm to 410 mS/cm	0 to 15%
	HNO ₃	0.0 mS/cm to 781 mS/cm	0 to 20%
	H ₂ SO ₄	0.0 mS/cm to 723 mS/cm	0 to 20%
	H ₃ PO ₄	0.0 mS/cm to 73 mS/cm	0 to 12%
User 1 to 4	0.0 μ S/cm to 2000 mS/cm	0 to 99.99%	
Temperature	Temperature sensor	Pt 100 (3-wire circuit) Pt 1000 NTC 30k	
	Measuring range	-31° to +482°F (-35° to +250°C), displayed in °F or °C	
Current inputs 1 / 2 (passive, optional)	Signal range	4 to 20 mA	
	Measured error	< 1% of current input range (according to IEC 746-1, under nominal operating conditions)	
	Input voltage range	6 to 30 V	
Resistance input (active, optional, only with nonhazardous)	Resistance ranges (software switchable)	0 to 1 k Ω 0 to 10 k Ω	
	Measured error	< 1% of resistance range (according to IEC 746-1, under nominal operating conditions)	
Digital inputs	Input voltage	10 to 50 V	
	Internal resistance	R _i = 5 k Ω	

Output

Output signal	Conductivity, resistance, concentration, difference, efficiency, temperature	
Current outputs	Current range	0 / 4 to 20 mA
	Error current	2.4 mA or 22 mA
	Measured error	< 0.2% of current range end value, under nominal operating conditions
	Transmission characteristic	Linear, bilinear
	Output span temperature	63° to 338°F (17° to 170°C)
	Output span, minimum (maximum up to 100% of the measuring range):	
	In conductivity measured	0 to 19.99 μ S/cm: 2 μ S/cm
	values in the range from:	20 to 199.9 μ S/cm: 20 μ S/cm
		200 to 1999 μ S/cm: 200 μ S/cm
		2 to 19.99 mS/cm: 2 mS/cm
		20 to 2000 mS/cm: 20 mS/cm
	In resistance measurement for	0 to 199.9 k Ω -cm: 20 k Ω -cm
	values in the range from:	200 to 1999 k Ω -cm: 200 k Ω -cm
	2 to 19.99 M Ω -cm: 2.0 M Ω -cm	
	20 to 200 M Ω -cm: 20 M Ω -cm	
In concentration measurement	No minimum interval	
Active current output (only non-hazardous areas): Load:	Maximum 600 Ω	
Passive current range output:	Input voltage range, 6 to 30 V	

Auxiliary voltage output (for digital inputs E1 - E3)	Voltage	15 VDC
	Output current	Maximum 9 mA

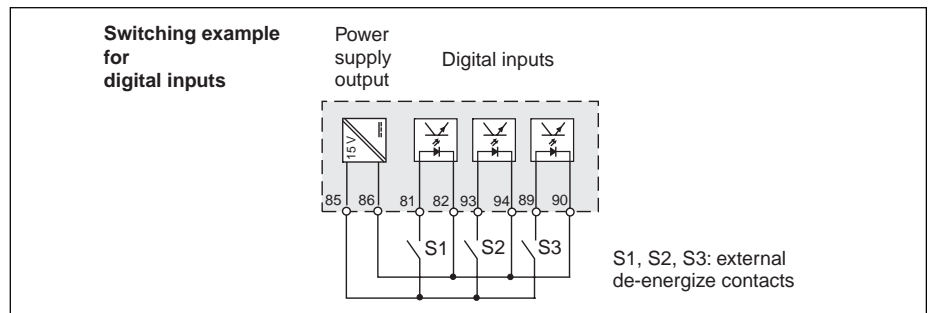
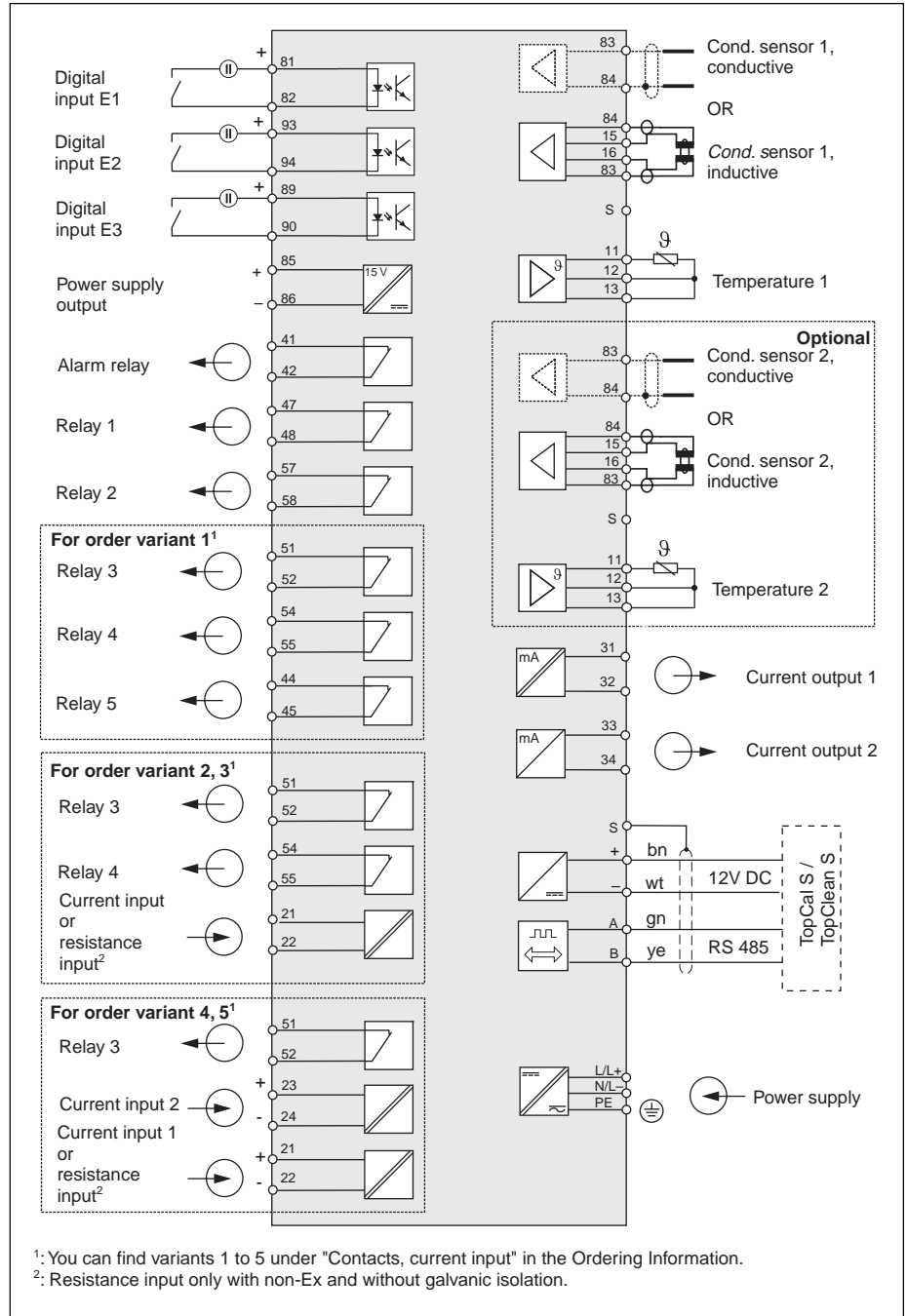
Limit value and alarm functions	Setpoint adjustments	0 to 100% of display range
	Hysteresis for switch contacts	1 to 10% of display range
	Alarm delay	0 to 6000 seconds

Relay contacts	NC or NO contact type can be selected in the software	
	Switching voltage	Maximum 250 VAC / 125 VDC
	Switching current	Maximum 3 A
	Switching power	Maximum 750 VA
	Service life	≥ 5 million switching cycles
	With the maximum settable frequency in PFM: 120/min	
With the maximum settable period length in PWM: 0.5 to 999.9 seconds		

Galvanic isolation	At the same potential	Current output 1 and power supply Current output 2 and the resistance input The remaining circuits are galvanically isolated from each other.
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Electrical connection

Connection diagram for hazardous and nonhazardous areas



Relay contacts




The Mycom S CLM 153 basic version includes 1 alarm and 2 additional relay contacts. The instrument can be upgraded with the following additional equipment:

- 3 relay contacts
 - 2 relay contacts and 1 current or resistance input (only for nonhazardous areas)
- The available relays can be assigned with the software. Up to three relays can be assigned to the controller.

You can configure the Alarm relay, Relay 1 or Relay 2 contacts according to NAMUR recommendations for outputting function control, maintenance requirements, and failure messages.

The Chemoclean spray cleaning system with the CYR 10 injector automatically cleans the electrode. It is controlled by two relay contacts (also part of the basic configuration).

Each NC/NO relay contact type can be switched by the software.

Selection by software		NAMUR on	NAMUR off
ALARM 1	41 42 	Failure	Alarm
RELAY 1	47 48 	Warning when maintenance required	Freely selectable
RELAY 2	57 58 	Function check	Freely selectable

Electrical connection data

Power supply for CLM 153-xxxx0xxxx	100 to 230 VAC, +10 / -15%
Frequency	47 to 64 Hz
Power supply for CLM 153-xxxx8xxxx	24 VAC / VDC, +20 / -15%
Power consumption	Maximum 10 VA
Separation voltage	Between galvanically isolated circuits, 276 V _{eff}
Maximum cable size	14 AWG (2.5 mm ²)

Performance characteristics

Measured value resolution

Conductivity	0.001 μ S/cm
Temperature	0.1 K

Measured error display

Conductivity, resistance, concentration	$\pm 0.5\% \pm 2$ digits of measured value
Temperature	Maximum 0.1% of measuring range

Measured error

Maximum 0.2% of current range maximum

Repeatability

Conductivity, resistance, concentration	$\pm 0.2\% \pm 2$ digits of measured value
Temperature	Maximum 0.1% of measuring range

NOTE: Measured error display, measured error and repeatability are in accordance with IEC 746-1, under nominal conditions

Operating conditions

Installation instructions

The CLM 153 transmitter is normally mounted as a panel mounted unit. The unit can be mounted to a vertical or horizontal pipe using the supplied mounting kit. For outdoor installation, a weather protection cover (CYY 101) is required. The cover can be mounted in the field using various types of fixtures (refer to Accessories). Always mount the CPM 153 with the conduit entries pointed downwards to avoid ingress of moisture, and within the ambient temperature limits.

If the CPM 153 is mounted on the front of an air-tight panel, you must provide a flat seal.

Panel cutout: 6.34^{+0.12} x 9.49^{+0.12} (161^{+0.5} x 241^{+0.5} mm)

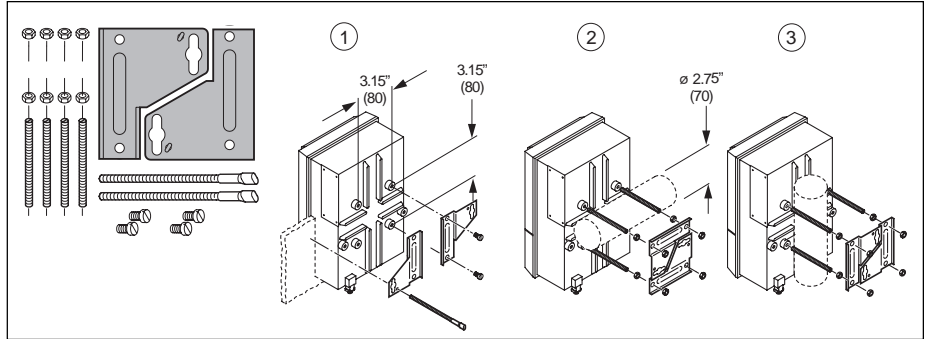
Installation depth, approximately 5.38" (134 mm)

Maximum pipe diameter, 2.75" (70 mm)

Mounting

Mounting hardware supplied with the CLM 153 transmitter.

- ① Panel mounting
- ② Horizontal pipe mounting
- ③ Vertical pipe mounting

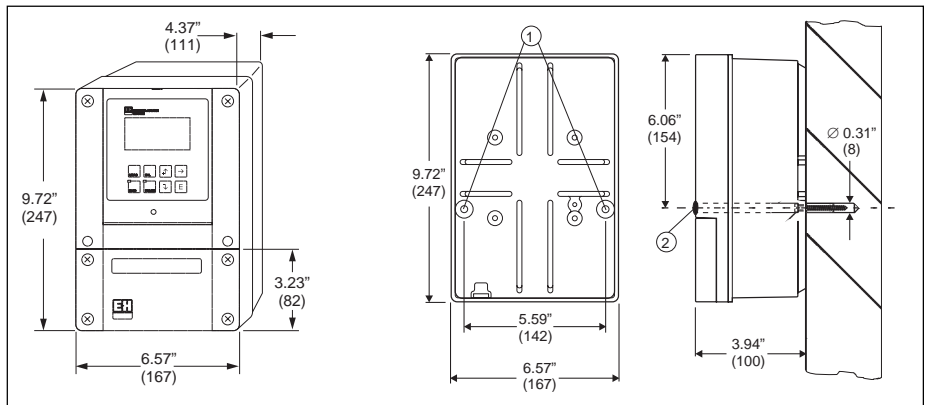


Environment

Ambient temperature range	14° to 131°F (-10 to +55°C); hazardous versions, 14° to 122°F (-10° to +50°C)
Ambient temperature limits	-4° to +140°F (-20° to +60°C); hazardous versions, 14° to 122°F (-10° to +50°C)
Storage and transport temperature	-22° to +176°F (-30° to +80°C)
Relative humidity	10 to 95%, non-condensing
Ingress protection	NEMA 4 (IP 65)
Electromagnetic compatibility	Interference emission and interference immunity to EN 61326: 1997 / A1: 1998

Mechanical construction

Design / dimensions inches (mm)



Wall mounting dimensions
 Mounting screw: 6 mm diameter
 Rawl plug: 8 mm diameter
 ① Mounting drill holes
 ② Plastic cover caps

Weight Maximum 13 lb (6 kg)

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

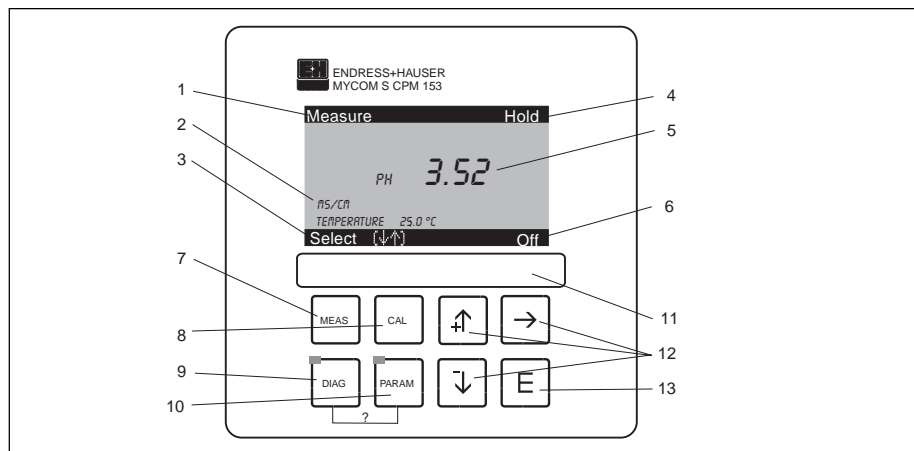
Human interface

Measuring point setup

The complete measuring point can be set up using the operating panel on the CLM 153 or using the offline setup function with the PC tool. If you are using several devices, the entire set up can be copied from one device to another using the DAT module.

Display elements

Illuminated LCD with dot matrix, 128 x 64 dots



User interface CIM 153

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

Operating elements

There are 4 main menus available for instrument operation:

- Measurement ("MEAS")
- Configuration ("PARAM")
- Calibration ("CAL")
- Diagnosis ("DIAG")

Press the MEAS, PARAM, CAL and DIAG keys to switch directly to the appropriate selection menu. The submenus are then displayed in plain text and the elements selected 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 change in the configuration and 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 altered. No calibration is possible. On this enabling level, only the controller parameters for new processes can be changed in the DIAG menu branch.

Maintenance level (can be protected with a personal service technician's code):

This code permits calibration. Use this code to operate the temperature compensation item. The test functions and the internal data can be viewed.

Specialist level (can be protected using a personal specialist code):

All menus are accessible.

User interface for offline configuration using the PC tool

The PC tool provides you with a tool for configuring your measuring point on a PC using a simple and self-explanatory menu structure. Record the configuration to the DAT module using the RS 232 interface on the PC. The module can then be plugged into the transmitter.

Certificates and approvals

CE approval

By attaching the CE mark, Endress+Hauser confirms that the instrument fulfills all the requirements of the relevant CE directives.

Hazardous area approvals

FM approved, non-incendive Class I, Div. 2, Sensor intrinsically safe Class I, Div. 1
CSA approved, non-incendive Class 1, Div. 2, Sensor intrinsically safe Class I, Div. 1
Atex approved Atex II (1) 2G EEx em (ib / ia) IIc T4

Accessories

Offline PC configuration tool

The PC tool provides you with a tool for configuring your measuring point on a PC using a simple and self-explanatory menu structure. Record the configuration to the DAT module using the RS 232 interface on the PC. The module can then be plugged into the transmitter. The offline configuration system consists of a DAT module, software, and a DAT interface (RS 232). **PN: 51507134**

DAT module

Additional saving module for saving/copying configuration, data logs and logbooks.
PN: 51507176

Conductivity sensor

Type	Properties	Applications
ConduMax W CLS 12 / 13	Optimal adaption to the process thanks to different designs. Mounting in pipe or flow vessel at temperatures up to 482°F (250°C) and pressures up to 580 psi (40 bar). Sensor shaft made of diecast aluminum, electrodes of 316Ti SS	<ul style="list-style-type: none"> • Industry • Power stations (e.g. condensation) • Low conductivity at high pressures and temperatures
ConduMax W CLS 15	Sterilizable up to 302°F (150°C), polished 316L SS shaft. High accuracy due to individually measured cell constants. Mounting in pipe or flow vessel	<ul style="list-style-type: none"> • Monitoring ion exchangers • Water for injection • Chip cleaning
ConduMax W CLS 16	Pure and ultrapure water sensor. Measuring range from 0.04 to 500 $\mu\text{S}/\text{cm}$ Water-tight connection TOP 68 or fixed cable. Sterilizable up to 302°F (150°C), 3-A and EHEDG certification	<ul style="list-style-type: none"> • Pure water • Ultrapure water • Deionization • Distillation • Water for injection
ConduMax W CLS 21	High chemical, thermal and mechanical resistance. PES sensor shaft.	<ul style="list-style-type: none"> • Monitoring of low concentration salt solutions • Drinking water • Wastewater
InduMax P CLS 50	Sensor with high chemical resistance due to PFA coating. PEEK version for temperatures up to 356°F (180°C). Total cable length 180 ft (55 m)	<ul style="list-style-type: none"> • Chemical industry - acids and alkali measurement - product monitoring • Phase separation of product/product mixtures
InduMax H CLS 52	Sensor shaft of PEEK suitable for contact with foodstuffs. Very short temperature response ($t_{90} < 5\text{s}$). Measuring range from 10 $\mu\text{S}/\text{cm}$ to 2000 mS/cm	<ul style="list-style-type: none"> • Foodstuff industry • Control/monitoring of CIP systems

Sensor holder assemblies

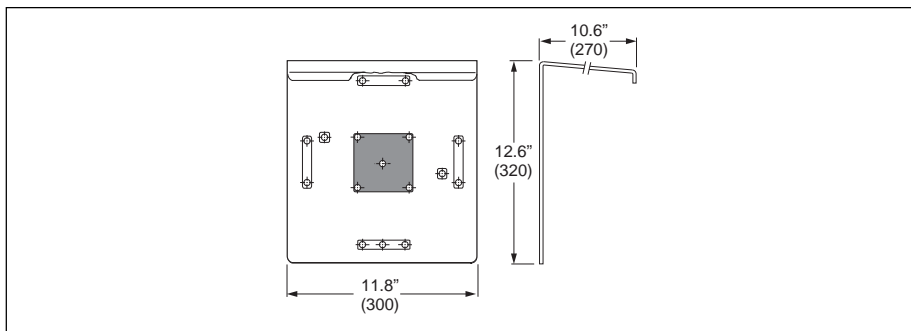
Type	Properties	Applications
DipFit W CLA 111	Immersion holder and installation assembly with DN 100 flange. Chemoclean sensor cleaning can be integrated without need for conversion	<ul style="list-style-type: none"> • Water • Wastewater • Process industry
DipFit W CYA 611	Immersion holder with 3/4" NPT, G 1 and G 3/4 threads	<ul style="list-style-type: none"> • Water • Wastewater
DipFit P CLA 140	Immersion holder with ANSI 3" Class 150 flange, DN 80 PN 16 flange, JIS 10K 80A, Bayonet type sensor holder.	<ul style="list-style-type: none"> • Wastewater, paper industry

Sensor measuring cable

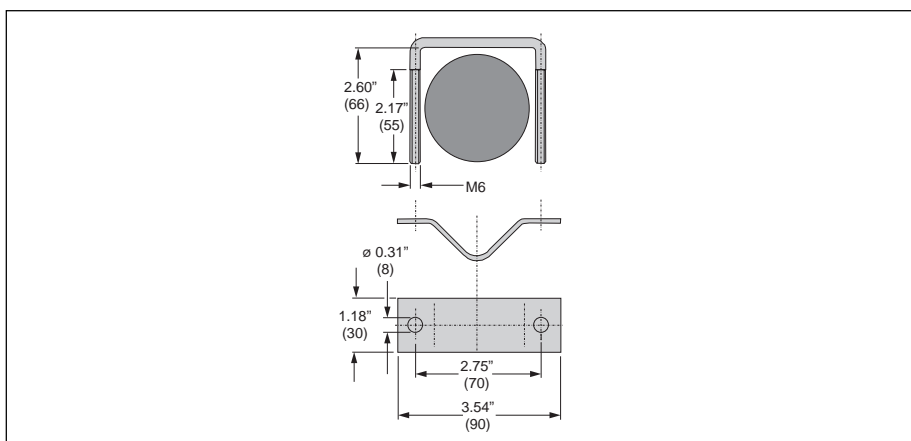
- CPK 9 measuring sensor cable with TOP 68 plug-in head (for high temperature applications), NEMA 6P (IP 68), also for potentially explosive atmospheres
- CLK 5 measuring cable for inductive sensors
- CLK 71 measuring cable for conductive sensors

Weather protection cover

The CYY 101 weather protection cover is required for open-air mountings
PN: CYY101-A



Pipe fixture for mounting the CYY 101 weather protection cover, vertical or horizontal mounting. PN: 50062122

**Supplemental documentation****Operation Manual**

CLM 153 Installation / Operation Manual

BA 234C/07/en

Conductivity sensors

ConduMax W CLS 12 Technical Information

TI 082C/24/ae

ConduMax W CLS 13 Technical Information

TI 083C/24/ae

ConduMax W CLS 15 Technical Information

TI 109C/24/ae

ConduMax H CLS 16 Technical Information

TI 227C/24/ae

ConduMax W CLS 21 Technical Information

TI 085C/24/ae

ConduMax W CLS 30 Technical Information

TI 086C/24/ae

InduMax P CLS 50 Technical Information

TI 182C/24/ae

InduMax H CLS 52 Technical Information

TI 167C/24/ae

Sensor holder assemblies

DipFit W CLA 111 Technical Information

TI 135C/24/ae

DipFit P CLA 140 Technical Information

TI 196C/24/ae

DipFit W CYA 611 Technical Information

TI 166C/07/en

Ordering information

Mycom S CLM 153 transmitter

CLM 153 -

- 1 Approvals
 - A Basic equipment, nonhazardous areas
 - G ATEX II (1) 2G EEx em (ia/ib) IIC T4
 - O FM NI CL. I, Div. 2, Sensor IS CL. I, Div. 1
 - P FM NI CL. 1, Div. 2
 - S CSA NI CL. I, Div. 2, Sensor IS CL. I, Div. 1 (pending, consult factory)
 - T TIIS
- 2 Sensor inputs
 - 1 1 circuit for conductive sensors, conductivity / resistance / temperature
 - 2 1 circuit for inductive sensors, conductivity / resistance / temperature
 - 3 2 circuits for conductive sensors, conductivity / resistance / temperature
 - 4 2 circuits for inductive sensors, conductivity / resistance / temperature
- 3 Output signals
 - A 2 current outputs, 0/4 to 20 mA, passive (hazardous and nonhazardous)
 - B 2 current outputs, 0/4 to 20 mA, active (nonhazardous only)
 - C 2 current outputs, 0/4 to 20 mA HART, passive (hazardous and nonhazardous)
 - D 2 current outputs, 0/4 to 20 mA HART, active (nonhazardous only)
 - E PROFIBUS-PA, no current outputs
 - F PROFIBUS-DP, no current outputs (nonhazardous only)
- 4 Contacts, current inputs
 - 0 Without additional contacts
 - 1 3 additional contacts
 - 2 2 additional contacts, 1 passive current input (hazardous and nonhazardous)
 - 3 2 additional contacts, 1 resistance input (nonhazardous only)
 - 4 1 additional contact, 2 current inputs, passive (hazardous and nonhazardous)
 - 5 1 additional contact, 1 passive current input, 1 active resistance input (nonhazardous only)
- 5 Power supply
 - 0 100 to 230 VAC
 - 8 24 VAC/VDC
- 6 Language versions
 - A E / D
 - B E / F
 - C E / I
 - D E / ES
 - E E / NL
 - F E / J
- 7 Cable connections
 - 0 M20 x 15 cable glands
 - 1 1/2" NPT adapter
 - 3 PROFIBUS-PA-M12 connector
 - 4 PROFIBUS-DP-M12 connector
- 8 Additional features
 - 0 Without additional features
 - 1 DAT module
- 9 Configuration
 - 0 Factory settings

For application and selection assistance,
in the U.S. call 888-ENDRESS

For total support of your installed base, 24 hours
a day, in the U.S. call 800-642-8737

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