

Conductivity Measurement *mycom CLM 152*

Conductivity transmitter for conductive or inductive systems with limit contactor functions



Areas of application

The analytical transmitter Mycom CLM 152 is intended for highly reliable and accurate conductivity or resistance measurement in all areas of process control and engineering. Modular instrument design and compatibility with a variety of sensors permit optimal adaptation to any measuring and control task.

- Chemical industry
- Foodstuffs industry
- Power plants
- Pharmaceutical industry
- Water conditioning
- Also suitable for Ex areas



Benefits at a glance

- High reliability is assured by:
 - comprehensive self-monitoring functions
 - polarisation compensation
 - log function
 - calibration history
- Adaptability due to modular design:
 - conductive conductivity measurement, resistance measurement or inductive conductivity measurement
 - one-circuit or difference measurement
 - limit functions and output contacts according to NAMUR
- Special features for ultrapure water:
 - ultrapure water temperature compensation
 - measurement and monitoring according to USP 23
- Concentration measurement
- Remote measuring range switching
- EEx em [ia/ib] IIC T4 approval
- Optional PROFIBUS-PA interface



Endress+Hauser

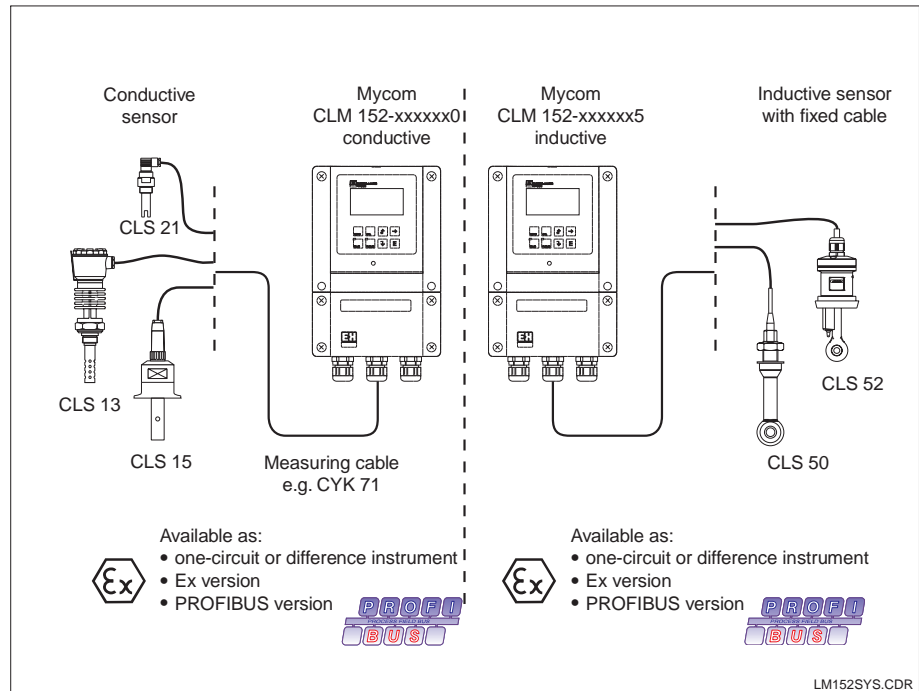
The Power of Know How



Measuring and control system

A measuring system generally comprises:

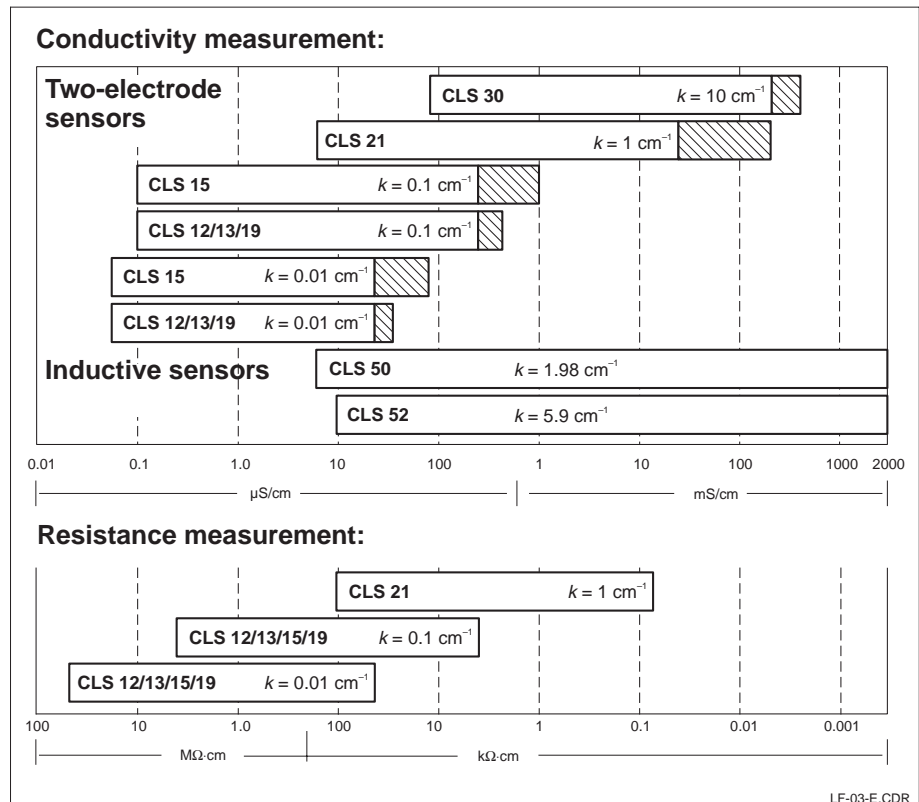
- a conductive two-electrode sensor or an inductive sensor with integrated Pt 100 temperature sensor
- a welded fitting or an assembly for installation in a pipeline or tank
- the corresponding measuring cable and
- the Mycom CLM 152 transmitter.



Examples of possible measuring systems

Conductivity sensors

The correct sensor for every measuring range



The hatched areas designate the measuring range expansion achieved with polarisation compensation.

For further information on the sensors refer to the corresponding Technical Information brochures.

General information

Precise calibration and measurement

The instrument supports two types of calibration:

- *Wet calibration*
Cell adaptation by entry of conductivity values of known calibration solutions.
- *Data entry*
Entry of exact cell constant.

Temperature compensation

The electrolytic conductivity strongly depends on temperature. The conductivity display value is related to a reference temperature using a temperature coefficient specific to each solution.

The instrument supports:

- Linear compensation 0 ... 10 %/K with user-definable reference temperature
- Compensation acc. to IEC 746, part 3 for NaCl
- Temperature compensation for ultrapure water with trace impurities
- User-programmable T_c curves.

The temperature can either be measured continuously or programmed as a constant.

Polarisation compensation

Polarisation effects in the boundary layer between the electrode and measuring solution limit the measuring range of conductive conductivity sensors.

The Mycom CLM 152 transmitter can detect and compensate for polarisation effects using an innovative, intelligent signal evaluation procedure.

This results in a very significant expansion of the measuring range of a measuring cell (cf. overview of conductivity sensors).

Difference measurement

The "2-circuit" variant permits the connection of two identical sensors for measurement and monitoring of a difference in conductivity, e.g. for:

- Media separation
- Monitoring of heat exchangers
- Monitoring of ion exchangers.

Concentration measurement

The Mycom CLM 152 has the ability to directly display and output substance concentration values.

The concentration values of four substances are stored in the instrument:

NaOH (sod. hydrox. sol.) 0 ... 15 %
HNO₃ (nitric acid) 0 ... 20 %
H₂SO₄ (sulphuric acid) 0 ... 20 %
H₃PO₄ (phosphoric acid) 0 ... 12 %

Four additional concentration curves for user-specific media can be programmed.

Contacts according to NAMUR

Switching contacts for output of function check, warning and failure messages as recommended by the measuring and control engineering standards committee (NAMUR).

Simple control

In the basic version, the instrument is equipped with two potential-free output contacts (non-Ex: relays, Ex: optocouplers). One of them serves as a failure contact, the other can be programmed by the user to function as a limit contact or fault signalling contact. By adding a plug-in module, the instrument can be expanded to a total of five output contacts.

The table below shows the configuration of these five output contacts according to NAMUR.

Output contact				
1	2	3	4	5
Failure	Mainten. required	Function check	Limit 1	Limit 2

Cleaning functions

(conductive measuring systems only)

The contact outputs can be switched to control spray cleaning systems, e.g. the injector CYR 10 (Chemoclean). Cleaning can be initiated manually or automatically by programmed cleaning cycles.

Clever service and start-up functions

The instrument provides a number of useful service functions, such as log, current output simulation and relay switching simulation, plus some additional selective checking functions, e.g. keyboard, display or RAM test. The user is guided through the setup procedure, assuring quick selection of appropriate basic settings.

USP 23

The USP (United States Pharmacopeia) is instrumental in defining the requirements for ultrapure water in the pharmaceutical industry.











The Mycom CLM 152 fulfills all USP requirements for conductivity measuring systems:

- Exact temperature measurement at the same point where the conductivity is measured
- Simultaneous display of uncompensated conductivity value and temperature
- Display resolution of 0.001 $\mu\text{S}/\text{cm}$
- Exact factory adjustment of transmitter with traceable laboratory resistances
- Precise factory calibration of sensors according to ASTM D 1125-91
- Temperature-dependent monitoring according to USP 23 stage 1.

Instrument equipment

The modular design of the CLM 152 measuring transmitter allows optimum adaptation to specific requirements.

- There are maximum 4 module slots available.

	Basic version	Expansion possibilities/ Additional modules
Measuring inputs	on MODULE: conductivity 1 temperature 1  	on MODULE: conductivity 2 temperature 2 (for difference measurement)  
Current outputs	on MOTHERBOARD (Non-Ex), resp. on MODULE (Ex): conductivity temperature  	
Output contacts	on MOTHERBOARD (Non-Ex: as relays; Ex: as optocouplers): 1x Failure contact, 1x free selectable as: maintenance need or controller or limit value 	on MODULE: 3 relays (Non-Ex) resp. 3 optocouplers (Ex): Cleaning / NAMUR and controller contacts necessary for Chemoclean and for Autoclean (CPC 20) 
Analogue / contact input		on MODULE: Feedback/Hold input (active analogue input; 2 binary Hold contacts)  necessary for Autoclean (CPC 20) 
Communication		on MODULE: PROFIBUS

Internal / external remote measuring range switching

When the analog/contact input expansion module is added, the instrument has up to four externally switchable measuring ranges with parameters to be chosen by the user. Inductive measuring systems in particular are used with measuring range switching due to the wide range span encountered. For these applications, the inductive Mycom CLM 152 transmitter offers the benefit

of automatic internal measuring range switching: the instrument automatically switches the instrument parameters, e.g. the current output, to the next range depending on user-definable switching thresholds and signals the currently valid measuring range via relay contacts. Switching affects the measuring range, the temperature coefficient and the limits.

	Measuring range (parameter settings)			
	1	2	3	4
Medium	Beer	Water	Cleaning 1	Cleaning 2
Conductivity range	800 ... 1200 µS/cm	300 ... 700 µS/cm	100 ... 200 mS/cm	10 ... 100 mS/cm
Temperature coefficient	2.0 %/K	2.1 %/K	1.6 %/K	2.8 %/K
Limits	1000 µS/cm MAX	500 µS/cm MAX	120 mS/cm MIN	80 mS/cm MIN
Contact state	1	open	closed	open
	2	open	open	closed

Example for remote measuring range switching: control of a CIP system

Operation

Menu-guided operation

The functions of the Mycom CLM 152 transmitter are arranged in four main groups:

- Parameter settings
- Measurement
- Calibration
- Diagnosis.

Pressing the PARAM, MEAS, CAL and DIAG keys accesses the associated selection menus where the available options are shown in plain text. The currently selected element is displayed in reverse video.

Functions are selected with the arrow keys which are also used to edit numerical values.

Everything at a glance

The eight-line display has plenty of space for auxiliary information:

- Secondary measured values
- Temperature compensation setting
- Options available for selection
- Range of the currently edited value

No unauthorised access

Configuration and calibration are effectively protected against undesirable changes by three access code levels.

• No code entered

The following can be accessed:

- Measurement displays
- Error list
- Info list
- Log
- Calibration data history.

• The operator code

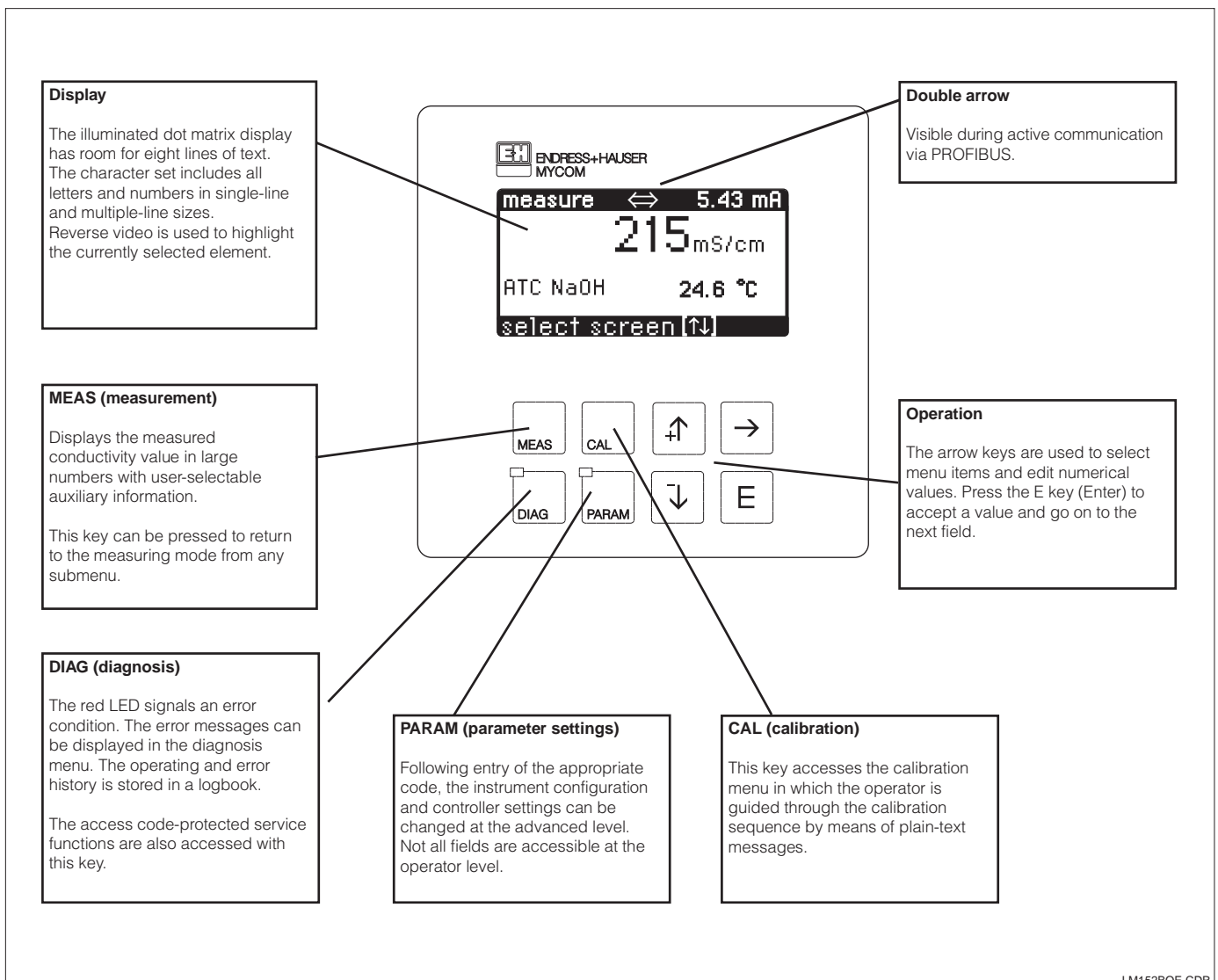
provides access to:

- Shortcut menu
- Calibration type settings
- Calibration functions
- Temperature compensation
- Cleaning functions.

• The advanced code

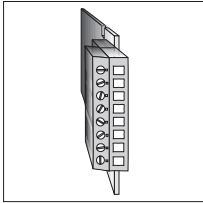
provides access to all menus and functions.

Display and operating elements of Mycom CLM 152

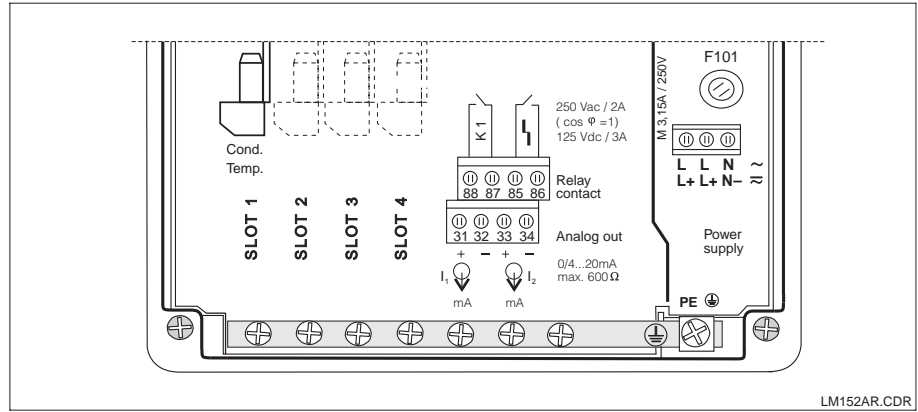


Electrical connection of CLM 152-A in non-Ex area

Connection compartment of Mycom CLM 152-A for non-Ex area



Terminal block of optional modules



LM152AR.CDR

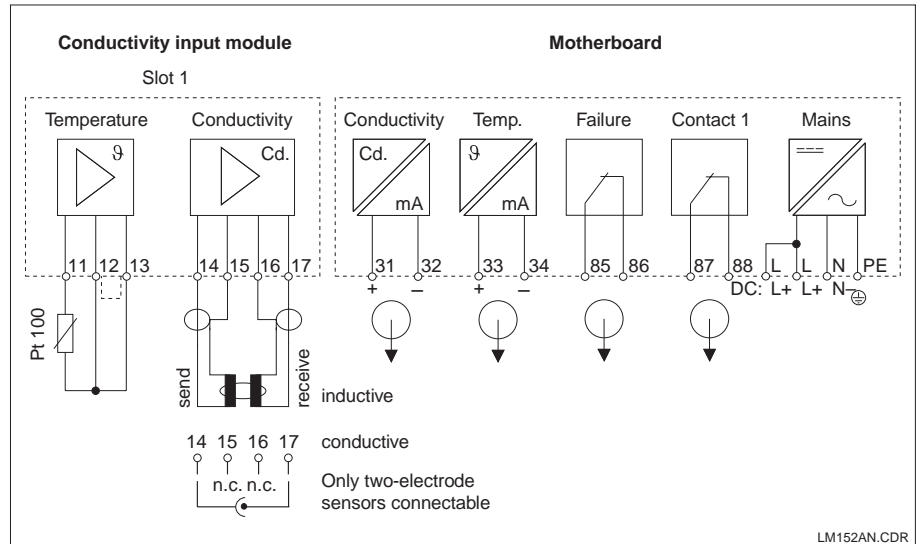
Connections are established in a separate connection compartment which holds the power connection, the signal and contact outputs of the motherboard (basic assembly) and a connection module for conductivity measurement.

The plug-in terminal blocks of up to three additional plug-in modules

(depending on expansion; slots 2–4) are also located in this compartment:

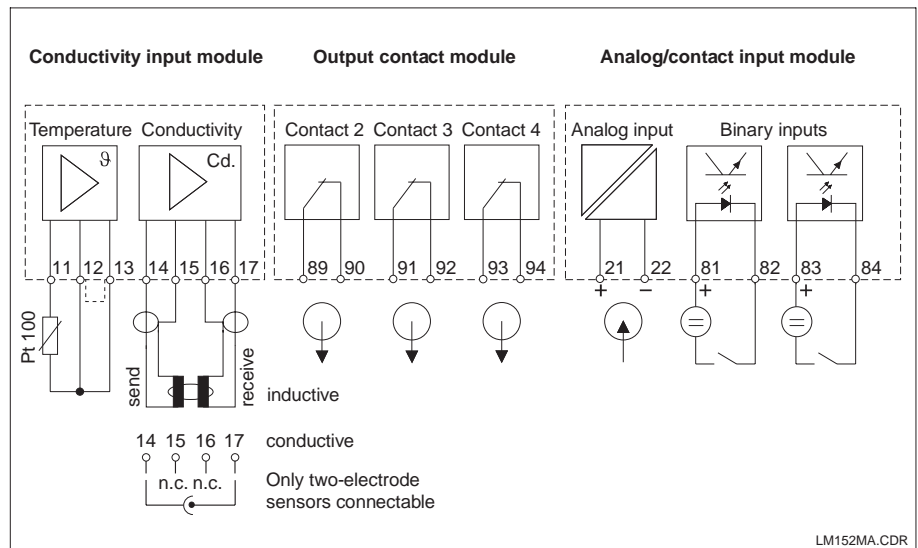
- Second conductivity input for two-circuit measurement
- Three additional output contacts for controller or Chemoclean functions
- Two binary input contacts (hold) and one active 0 / 4 ... 20 mA current input (transmitter power supply).

Connection diagram of Mycom CLM 152-A (basic version)



LM152AN.CDR

Connection diagrams of plug-in modules

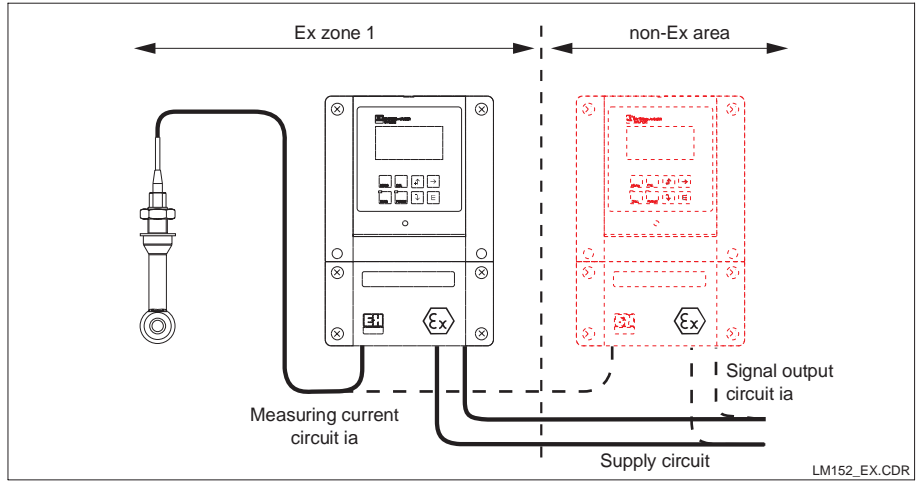


LM152MA.CDR

Electrical connection of CLM 152-Z in Ex area



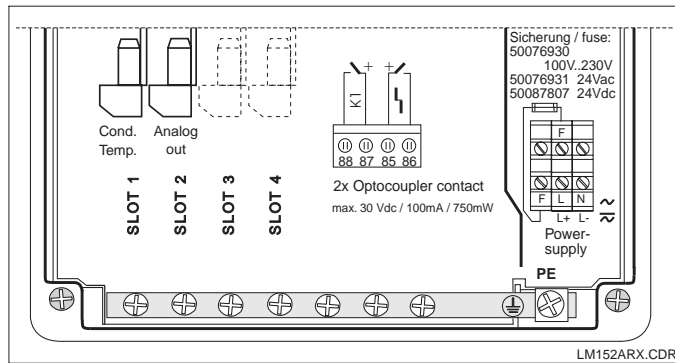
Inductive sensor and transmitter in Ex area



The Mycom CLM 152-Z is certified for operation in explosive atmospheres (EEx em [ia/ib] IIC T4, BVS 95.D.2098 and Swiss Electrotechnical Association (SEA) 96.1 10489 test certificates). This transmitter may be operated in zone 1 or 2. Conductive conductivity sensors by Endress+Hauser can be used in zone 1 without requiring a special approval. For the inductive sensor CLS 50, an approval for applications in Ex zone 1 is available.

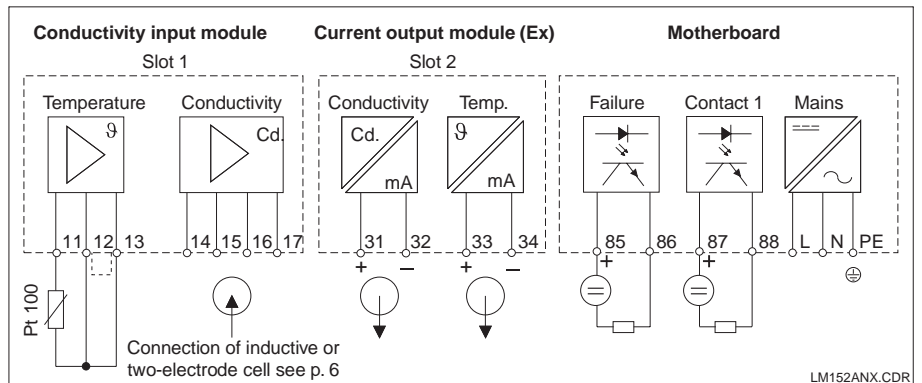
The Endress+Hauser basic information publication GI 003/11/de "Explosionsschutz von elektrischen Betriebsmitteln und Anlagen" ("Explosion protection of electric equipment and systems") contains helpful information on the installation and operation of electric equipment in explosive atmospheres. This brochure may be obtained from all Endress+Hauser sales offices.

Connection compartment of Mycom CLM 152-Z (Ex)

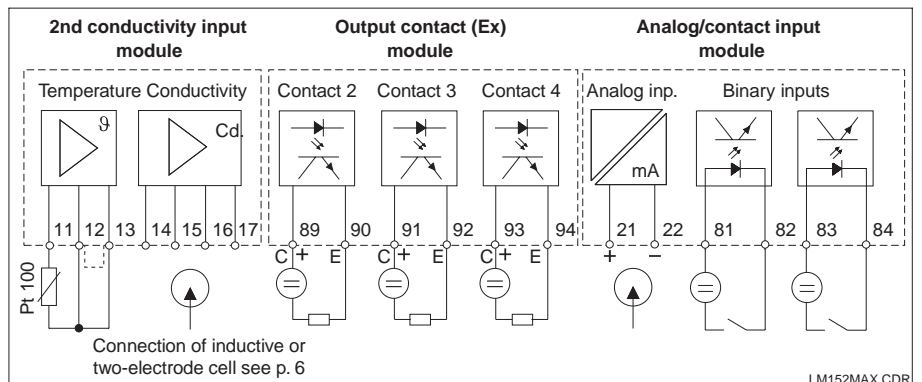


An Ex instrument version may contain up to two plug-in modules in addition to the standard equipment.

Connection diagram of basic Ex version CLM 152-Z (Ex)



Connection diagrams of plug-in modules (Ex)



Electrical connection of CLM 152-Z in Ex area



External wiring of output contacts on motherboard:

Only one intrinsically safe contact circuit (ia or ib) with

① linear

$$P_a = \frac{1}{4}(U_0 \cdot I_k)$$

② trapezoidal

$$1) U_z > 0.5 U_0:$$

$$P_a = \frac{1}{4}(U_0 \cdot I_k)$$

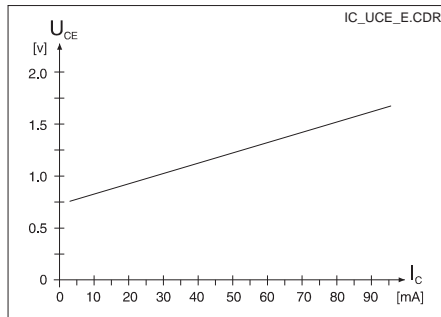
$$2) U_z < 0.5 U_0:$$

$$P_a = (U_0 - U_z) \cdot U_i / R_i$$

③ or square

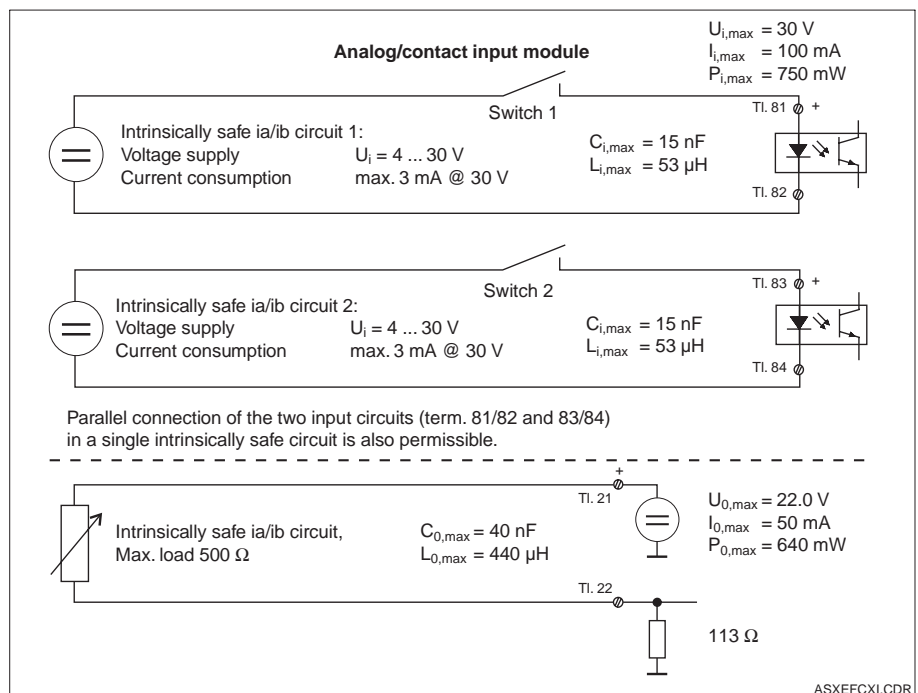
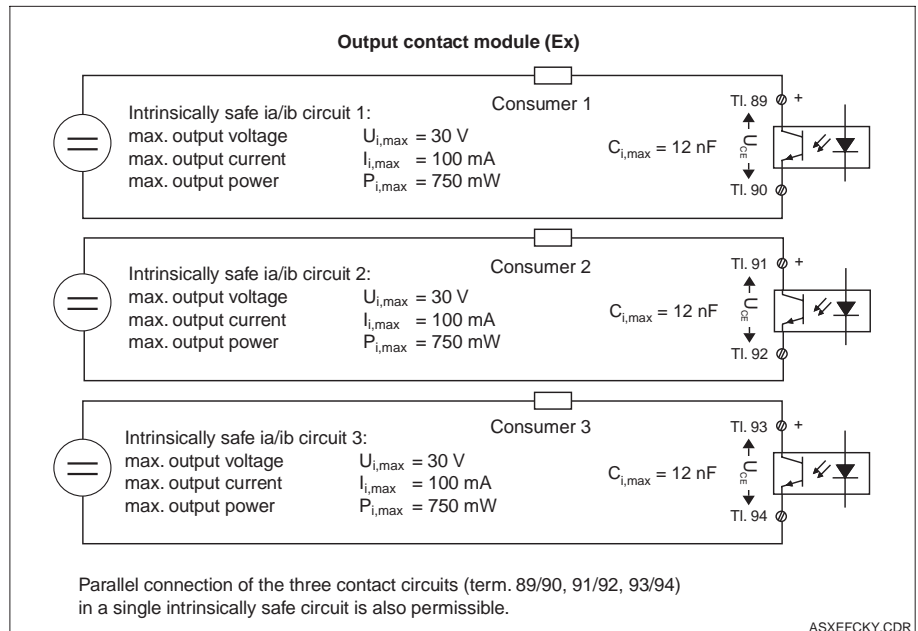
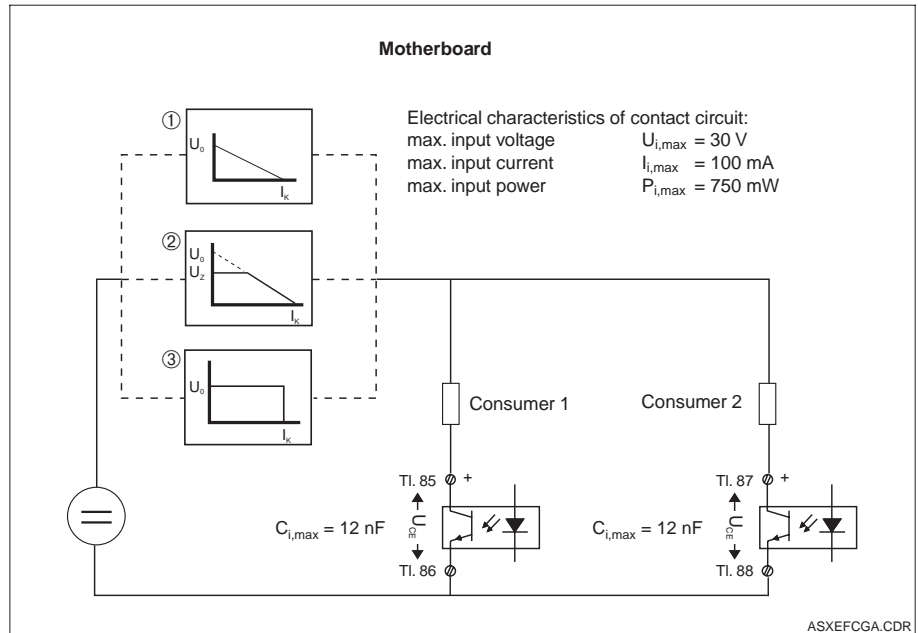
$$P_a = U_0 \cdot I_k$$

output characteristic



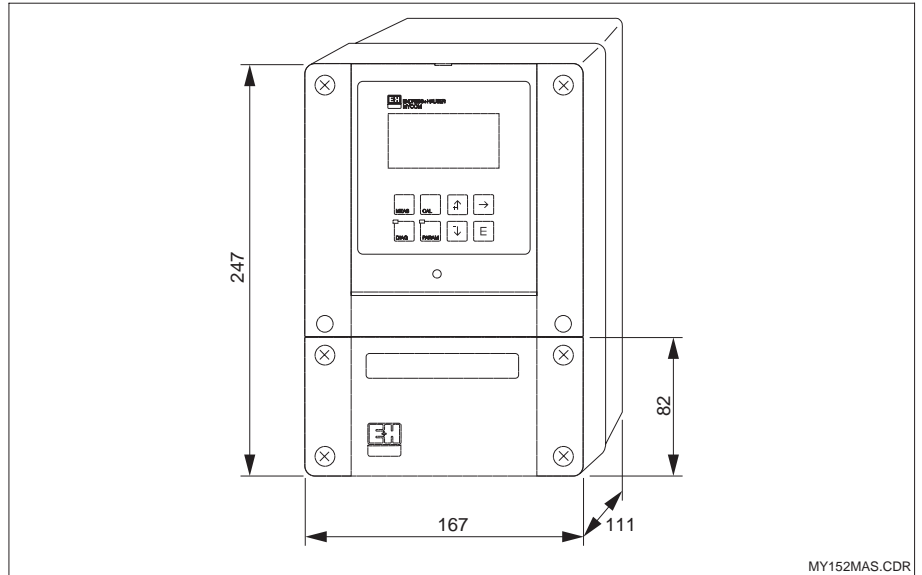
Characteristic of switching transistors on motherboard and output contact module

External wiring of output contacts on output contact module



External wiring of input circuits on FCXI module (analog/contact input)

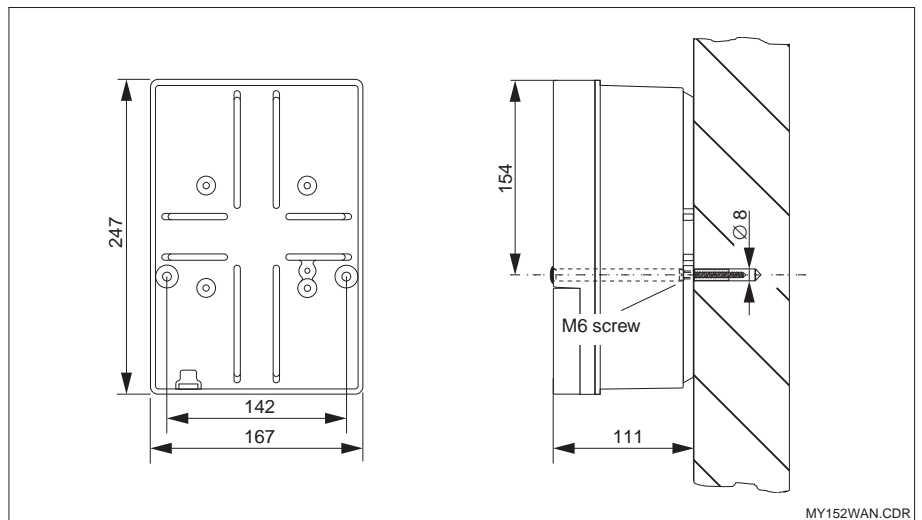
Dimensions



Dimensions of Mycom CLM 152

MY152MAS.CDR

Mounting

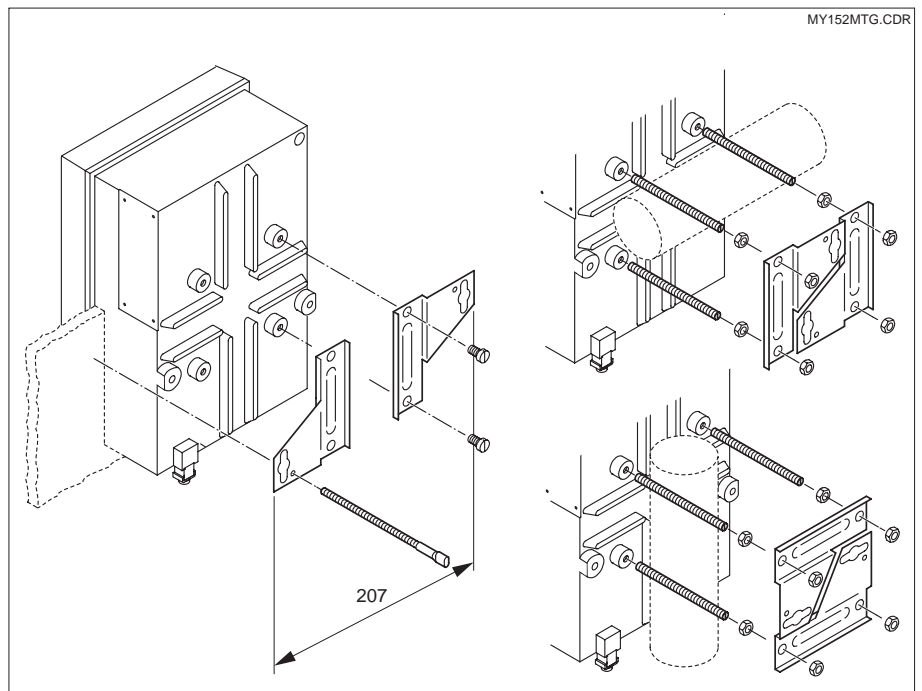


Wall mounting of Mycom CLM 152

MY152WAN.CDR

Mounting version B is supplied with mounting elements to be used for panel or post mounting.

Mounting cutout: $161^{+0.5} \times 241^{+0.5}$ mm
 Installation depth: approx. 134 mm
 Maximum pipe diameter: 70 mm



Panel mounting (left) and post mounting (right).

Weather protection cover CYY 101, available as an accessory, is recommended for outdoor installation

MY152MTG.CDR

Technical data, inductive

Data independent of sensor

Measuring range uncompensated	0 ... 2000 mS/cm
Measuring range compensated	0 ... 1000 mS/cm
Measurement deviation ¹	±0.5 % of measured value ± 3 digits
Reproducibility ¹	±0.2 % of measured value ± 3 digits
Max. cable length	55 m (with junction box VBM)
Current output transfer characteristic	linear, bilinear

Subject to modifications.

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

Data of sensor CLS 50

General data

Measuring range	5 µS/cm ... 2000 mS/cm
Cell constant	approx. 1.98 cm ⁻¹
Storage temperature	-20 ... +80 °C
Ingress protection (DIN 40050)	IP 67 (sensor in mounted state)
Measurement deviation (-20 ... +100 °C)	±(5 µS/cm + 0.5 % of measuring range)
Measurement deviation (> 100 °C)	±(10 µS/cm + 0.5 % of measuring range)

Temperature measurement

Temperature sensor	Pt 100, class A acc. to IEC 751
Temperature response time t_{90}	90 % of final temperature display (acc. to IEC 746-1):
– PEEK version	approx. 7 min.
– PFA version	approx. 26 min.

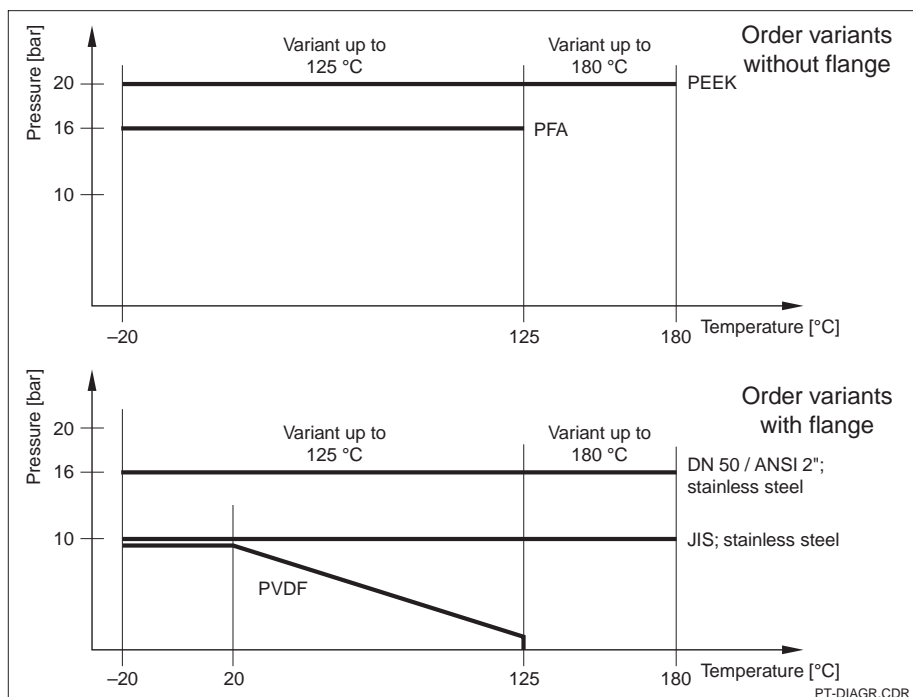
Installation

Required pipe cross-section	> DN 80 (for pipe diameters < DN 110, note adaptation factor)
Installation in reduced outflow	≥ DN 50

Supplementary documentation

Technical Information CLS 50	order no. 50090385
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Subject to modifications.



Pressure-temperature curves as a function of material and flange variant

Technical data, inductive (cont.)

Data of sensor CLS 52

General data

Measuring range (uncompensated)	10 $\mu\text{S/cm}$... 2000 mS/cm
Measurement deviation (-5 ... +100 °C)	$\pm(10 \mu\text{S/cm} + 0.5 \%$ of measuring range)
Measurement deviation (+100 ... +140 °C)	$\pm(30 \mu\text{S/cm} + 0.5 \%$ of measuring range)
Cell constant k (measurement deviation $\pm 0.5 \%$)	5.9 cm^{-1}
Storage temperature	-25 ... +80 °C
Ingress protection (DIN 40050)	IP 67
Medium temperature	-5 ... +125 °C
for sterilisation	+140 °C (max. 30 min)
Ambient temperature	-10 ... +70 °C
Pressure	max. 16 bar (90 °C)
Sensor material	PEEK
Surface roughness R_a	$\leq 0.5 \mu\text{m}$

Temperature measurement

Temperature sensor	Pt 100, class A acc. to IEC 751
Temperature response time t_{90}	< 5 s
Heat transfer bushing with Pt 100	
Material	stainless steel 316L
Seal	O-ring, CHEMRAZ™ (FDA permitted)

Installation

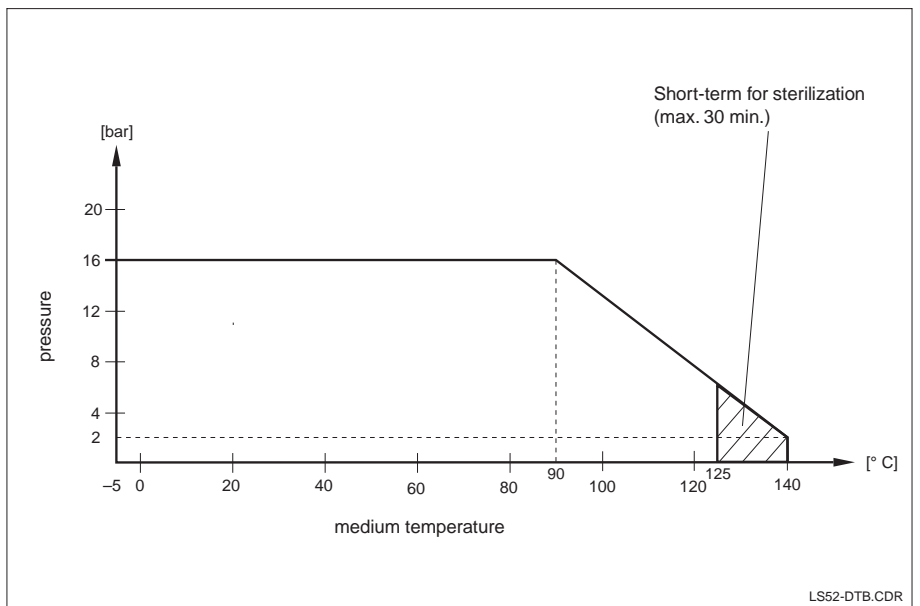
Required pipe cross-section	
Dairy pipe fitting, clamp connection, G 1½, SMS 2"	min. DN 50
APV, Varivent connection	min. DN 40

Supplementary documentation

Technical Information CLS 52	order no. 50086110
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Subject to modifications.

Permissible pressure
and temperature ranges
of the sensor CLS 52



LS52-DTB.CDR

Technical data, conductive

Conductivity / resistance / concentration measurement

Measuring and display ranges for conductivity		
Cell constant <i>k</i>	Measuring range (MR) ¹	Display range (DR)
0.01 cm ⁻¹	0.0 nS/cm ... 600.0 μS/cm	0.0 μS/cm ... 200.0 μS/cm
0.1 cm ⁻¹	0.000 μS/cm ... 6000 μS/cm	0.000 μS/cm ... 2000 μS/cm
1 cm ⁻¹	0.00 μS/cm ... 400.0 mS/cm	0.00 μS/cm ... 200.0 mS/cm
10 cm ⁻¹	0.0 μS/cm ... 600.0 mS/cm	0.0 μS/cm ... 200.0 mS/cm

Measuring and display ranges for resistance		
Cell constant <i>k</i>	Measuring range (MR)	Display range (DR)
0.01 cm ⁻¹	20.0 kΩ·cm ... 20.00 MΩ·cm	20.0 kΩ·cm ... 37.99 MΩ·cm
0.1 cm ⁻¹	2.00 kΩ·cm ... 2000 kΩ·cm	2.00 kΩ·cm ... 3799 kΩ·cm
1 cm ⁻¹	0.200 kΩ·cm ... 200.0 kΩ·cm	0.020 kΩ·cm ... 379.9 kΩ·cm

Measurement deviation ² in display	±0.5 % ± 2 digits of measured value
Reproducibility ²	±0.2 % ± 2 digits of measured value
Reference temperature	adjustable -35 ... +250 °C, typ. +25 °C
Measuring frequency	128 ... 1024 Hz
Measuring voltage	≤ 300 mV
Max. cable length for resistance	approx. 20 m
Max. cable length for conductivity/concentration	approx. 100 m

Supplementary documentation

Technical Information CLS 12	order no. 50059349
Technical Information CLS 13	order no. 50059350
Technical Information CLS 15	order no. 50065950
Technical Information CLS 19	order no. 50065951
Technical Information CLS 21	order no. 50059352
Technical Information CLS 30	order no. 50059353

Subject to modifications.

¹The instrument has four internal switching stages in each measuring range. This achieves maximum precision and resolution automatically.

²acc. to IEC 746-1, for nominal operating conditions

Technical data of PROFIBUS-PA

Output parameters

Output signal	digital communication signal, PROFIBUS-PA
PA function	slave
Response time Slave	approx. 20 ms
PLC	approx. 600 ms at approx. 30 instruments
Alarm signal	PROFIBUS-PA: signal status bit is set, last valid measured value is retained
Integration time	0 ... 99 s, default 0 s
Communication resistor	none, separate PROFIBUS-PA terminating resistor
Physical layer	IEC 1158-2
Integrated overvoltage protection	25 V AC / 250 A

Display and user interface

Remote control	via PC using operating program Commuwin II
Communication point	PROFIBUS-PA

Power supply

Supply voltage	9 ... 32 V DC
Current consumption	10 ± 1 mA
Inrush current	corresponds to Table 4, IEC 1158-2

Subject to modifications.

General technical data

General data

Manufacturer	Endress+Hauser
Product designation	Mycom CLM 152

Limit and alarm functions

Function	Limit contactor
Function type	MIN or MAX
Set point settings (in absolute values)	0 ... 100 % of display range
Hysteresis for switching contacts (in absolute values)	1 ... 10 % of display range
Pickup / dropout delay	0 ... 7200 s
Alarm threshold	0.5 ... 100 % of display range
Alarm delay	0 ... 6000 s

Electrical connection data

Power supply AC	24 / 100 / 115 / 200 / 230 V +10 / -15 %
Frequency	47 ... 64 Hz
Power supply DC	24 V +20 / -15 %
Power consumption	max. 10 VA
Contact outputs	potential-free contacts (Ex version: optocouplers), switchable as NO or NC contacts
Switching current	max. 3 A
Switching voltage	max. 250 V AC / 125 V DC
Switching power	max. 750 VA
Signal outputs	2 × 0 / 4 ... 20 mA, electrically isolated from other circuits, but not between outputs
Separation voltage	276 V _{rms}
Current output	
Current range	0 / 4 ... 20 mA
Measurement deviation	≤ 0.2 % of current end value
Load	max. 600 Ω
Terminals, max. cable cross-section	2.5 mm ²

Temperature measurement

Temperature sensor	Pt 100 (three-wire circuit)
Measuring range (also displayable in °F and K)	-35 ... +250 °C
Measured value resolution	0.1 °C
Measurement deviation ¹ at temperature signal output	0 ... 100 °C: ±0.5 K; remaining range: ±1 K
Reproducibility ¹	max. 0.1 % of measuring range
Temperature signal output transfer range	adjustable Δ 28.5 ... Δ 285 °C

Concentration measurement

Selection	Conductivity range	Concentration
NaOH	0.0 mS/cm ... 410 mS/cm	0 ... 15 %
HNO ₃	0.0 mS/cm ... 781 mS/cm	0 ... 20 %
H ₂ SO ₄	0.0 mS/cm ... 723 mS/cm	0 ... 20 %
H ₃ PO ₄	0.0 mS/cm ... 73 mS/cm	0 ... 12 %
USER 1 ... 4	0.0 μS/cm ... 2000 mS/cm	0 ... 99.99 %

Temperature compensation

Range for linear and freely programmable T_c values	-35 ... 250 °C
Range for NaOH	0 ... 85.0 °C
HNO ₃	0 ... 75.0 °C
H ₃ PO ₄	0 ... 75.0 °C
H ₂ SO ₄	0 ... 80.0 °C

General technical data (cont.)

Ambient conditions

Electromagnetic compatibility (EMC)	
Interference emission	acc. to EN 50081-1:1992
Interference immunity	acc. to EN 50082-2:1995
Nominal operating conditions	
Ambient temperature	-10 ... +55 °C (Ex: -10 ... +50 °C)
Relative humidity	10 ... 95 %, non-condensing
Limit operating conditions	
Ambient temperature	-20 ... +60 °C (Ex: -10 ... +50 °C)
Storage and transport temperature	-25 ... +85 °C (Ex: -25 ... +75 °C)
Ex permit	EEx em [ia/ib] IIC T4
Ex conformity certificates	BVS 95.D.2098; SEA 96.1 10489

Mechanical data

Dimensions (H × W × D)	247 × 167 × 111 mm
Weight	max. 6 kg
Ingress protection	IP 65
Materials	
Housing	GD-AISI 12 (Mg content < 0.05 %), plastic-coated
Front panel	polyester, UV-resistant

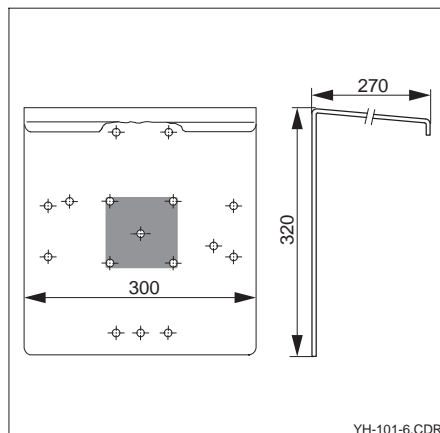
Subject to modifications.

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

Accessories

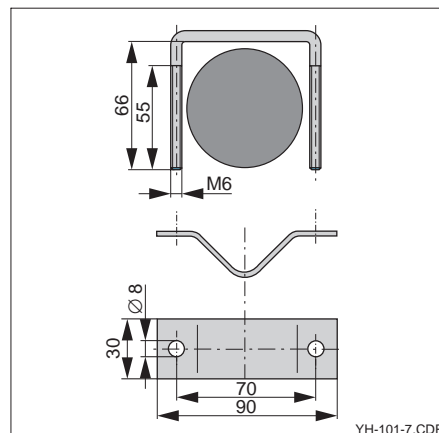
Weather protection cover CYY 101

Weather protection cover CYY 101 is to be used for outdoor installation.
Order no. CYY 101-A



Round post mounting for CYY 101

For attachment of weather protection cover to vertical or horizontal pipes with diameters of up to 70 mm.
Order no. 50062121



Calibration solutions

Precision calibration solutions for conductivity, accuracy 0.5 % at 25 °C, related to SRM by NIST.
Bottle containing 500 ml.

Type	Conductivity at 25 °C ¹	Order number
CLY 11-A	74.0 µS/cm	50081902
CLY 11-B	149.6 µS/cm	50081903
CLY 11-C	1.406 mS/cm	50081904
CLY 11-D	12.64 mS/cm	50081905
CLY 11-E	107.00 mS/cm	50081906

¹Values may vary due to manufacturing tolerances. The accuracy is given for the value specified on the bottle.

Pure water calibration system ConCal

Low-conductivity calibration solutions are unstable. For this reason, they are only permissible above 74 µS/cm acc. to DIN/IEC. The alternative is to use the factory-calibrated ConCal comparison measuring system (factory calibration traceable to ASTM by NIST).



Conductivity and resistance measuring transmitter Mycom CLM 152

Field housing, ingress protection IP 65, for wall mounting
Signal outputs 0 / 4 ... 20 mA for conductivity / resistance and temperature, 2 output contacts

Equipment and certificate

1-circuit version for non-Ex areas

- A1A Basic version
- A1B 3 relays (Chemoclean)
- A1C feedback/hold contact / remote MR switching
- A1D 3 relays / feedback/hold contact (Autoclean) / remote MR switching
- A1E PROFIBUS
- A1F 3 relays (Chemoclean), PROFIBUS
- A1G feedback/hold contact / remote MR switching, PROFIBUS
- A1H 3 relays / feedback/hold contact (Autoclean) / remote MR switching, PROFIBUS

2-circuit version for non-Ex areas

- A2A Basic version
- A2B 3 relays (Chemoclean)
- A2C feedback/hold contact / remote MR switching
- A2D 3 relays / feedback/hold contact (Autoclean) / remote MR switching
- A2E PROFIBUS
- A2F 3 relays (Chemoclean), PROFIBUS
- A2G feedback/hold contact / remote MR switching, PROFIBUS

1-circuit version for Ex areas (CENELEC)

- Z1A Basic version, EEx em [ia/ib] IIC T4
- Z1B 3 optocouplers (Chemoclean), EEx em [ia/ib] IIC T4
- Z1C feedback/hold contact / remote MR switching, EEx em [ia/ib] IIC T4
- Z1D 3 optocouplers / feedback/hold contact (Autoclean) / remote MR switching, EEx em [ia/ib] IIC T4
- Z1E PROFIBUS, EEx em [ia/ib] IIC T4
- Z1F 3 optocouplers (Chemoclean), PROFIBUS, EEx em [ia/ib] IIC T4
- Z1G feedback/hold contact / remote MR switching, PROFIBUS, EEx em [ia/ib] IIC T4

2-circuit version for Ex areas (CENELEC)

- Z2A Basic version, EEx em [ia/ib] IIC T4
- Z2B 3 optocouplers (Chemoclean), EEx em [ia/ib] IIC T4
- Z2C feedback/hold contact / remote MR switching, EEx em [ia/ib] IIC T4
- Z2E PROFIBUS, EEx em [ia/ib] IIC T4

1-circuit version for Ex areas (CSA)

- C1A Basic version, NI with IS outputs Cl. I-III Div. 2, Group A-G
- C1B 3 optocouplers (Chemoclean), NI with IS outputs Cl. I-III Div. 2, Group A-G
- C1D 3 optocouplers / feedback/hold contact (Autoclean), remote MR switching, NI with IS outputs Cl. I-III Div. 2, Group A-G
- C1G feedback/hold contact / remote MR switching, PROFIBUS, NI with IS outputs Cl. I-III Div. 2, Group A-G

2-circuit version for Ex areas (CSA)

- C2B 3 optocouplers (Chemoclean), NI with IS outputs Cl. I-III Div. 2, Group A-G

1-circuit version for Ex areas (FM)

- F1A Basic version, NI outputs Cl. I Div. 2, Cl. II/III Div. 1, Cl. I Zone 2
- F1B 3 optocouplers (Chemoclean), NI outputs Cl. I Div. 2, Cl. II/III Div. 1, Cl. I Zone 2
- F1D 3 optocouplers / feedback/hold contact (Autoclean), remote MR switching, NI outputs Cl. I Div. 2, Cl. II/III Div. 1, Cl. I Zone 2
- F1G feedback/hold contact / remote MR switching, PROFIBUS, NI outputs Cl. I Div. 2, Cl. II/III Div. 1, Cl. I Zone 2

2-circuit version for Ex areas (FM)

- F2B 3 optocouplers (Chemoclean), NI outputs Cl. I Div. 2, Cl. II/III Div. 1, Cl. I Zone 2

1-circuit version for Ex areas (FM AIS)

- G1A Basic version, AIS NI Cl. I-III Div. 1&2, Group A-G
- G1B 3 optocouplers (Chemoclean), AIS NI Cl. I-III Div. 1&2, Group A-G
- G1D 3 optocouplers / feedback/hold contact (Autoclean), remote MR switching, AIS NI Cl. I-III Div. 1&2, Group A-G
- G1G feedback/hold contact, remote MR switching, PROFIBUS, AIS NI Cl. I-III Div. 1&2, Group A-G

2-circuit version for Ex areas (FM AIS)

- G2B 3 optocouplers (Chemoclean), AIS NI Cl. I-III Div. 1&2, Group A-G



(p.t.o.)

Product structure (continued)

Conductivity and resistance measuring transmitter Mycom CLM 152

(Equipment and certificate, see above)

Power supply

- 0 230 V, 50 / 60 Hz
- 1 115 V, 50 / 60 Hz
- 2 200 V, 50 / 60 Hz
- 3 24 V, 50 / 60 Hz
- 5 100 V, 50 / 60 Hz
- 8 24 V DC

Language

- A D, E, F, I switchable
- C D, E, F, NL, J switchable

Measuring method / equipment

- 10 conductive
- 15 inductive
- 20 conductive with moisture protection lacquering
- 25 inductive with moisture protection lacquering
- 30 Pg cable glands, conductive and inductive
(not C, F, G certificate)
- 31 NPT 1/2" cable entry, conductive and inductive
(not Z certificate)
- 40 Pg cable glands, conductive and inductive with
moisture protection (not C, F, G certificates)
- 41 NPT 1/2" cable entry, conductive and inductive
(not Z certificates)

Attachment

- A without additional attachment
- B post mounting kit

CLM 152- [] [] [] [] [] []

complete order code

Endress+Hauser GmbH+Co.
- Instruments International -

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