Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Smartec S CLD134

Hygienic measuring system for conductivity and concentration for applications in the food, beverage and pharmaceutical industries as well as in biotechnology

HART® FIELD COMMUNICATION PROTOCOL

PROFIBUS® PROCESS FIELD BUS





3-A® Standard Number 74-03

With quality certificate

TI401C/07/en/01.08
71066351

Application

The inductive conductivity measuring system is specifically intended for use in hygienic applications in the food, beverage and pharmaceutical industries and in biotechnology. Thanks to its food-grade virgin PEEK body, its jointless and creviceless design and its hygienic certificates, it meets the extremely exacting demands of these industries. Compact versions and separate versions are available. The CLD134 is especially suitable for the following applications:

- Phase separation of product/water and product/product mixtures in pipe systems
- Control of CIP (cleaning in place) processes in the return channel
- Concentration control in remaking of CIP cleaning agents
- Product monitoring in pipe systems, bottling plants, quality assurance
- Leakage monitoring

in the following industries

- Dairies
- Breweries
- Beverages (water, juices, soft drinks)
- Pharmaceuticals and biotechnology

Your benefits

- Unique hygienic design, thus no risk of recontamination
- With all hygienic certificates required in hygienic applications
- Transmitter housing made of stainless steel
- Durable thanks to encapsulated, jointless design
- Fast measurement with temperature response time t_{90} under 26 s enables safe and efficient phase separations
- Various operating possibilities:
  - Keys
  - HART® hand-held terminal
  - PROFIBUS PA/DP
  - PC with software FieldCare (with FDT/DTM technology)
- Standard version extendable by function extension with remote parameter set switching (measuring range switching)

Endress+Hauser

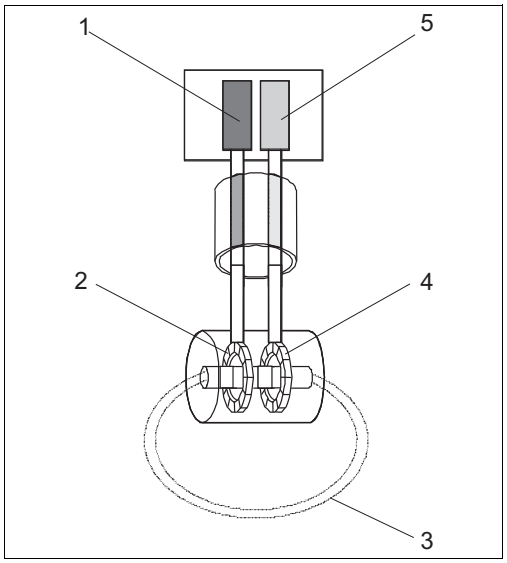
People for Process Automation

Function and system design

Measuring principle

Inductive conductivity measurement

A generator (1) generates an alternating magnetic field in the primary coil (2) which induces a current in the medium (3). The strength of the induced current depends on the conductivity and thus the ion concentration of the medium. The current flow in the medium generates another magnetic field in the secondary coil (4). The resulting current induced in the coil is measured by the receiver (5) and processed to determine the conductivity.



Inductive conductivity measurement
1 Generator
2 Primary coil
3 Current flow in the medium
4 Secondary coil
5 Receiver

Benefits of inductive conductivity measurement
- No electrodes, therefore no polarization
- Accurate measurement in media or solutions with a high soiling degree and a tendency to deposition
- Complete galvanic separation of measurement and medium

Important properties of Smartec S CLD134

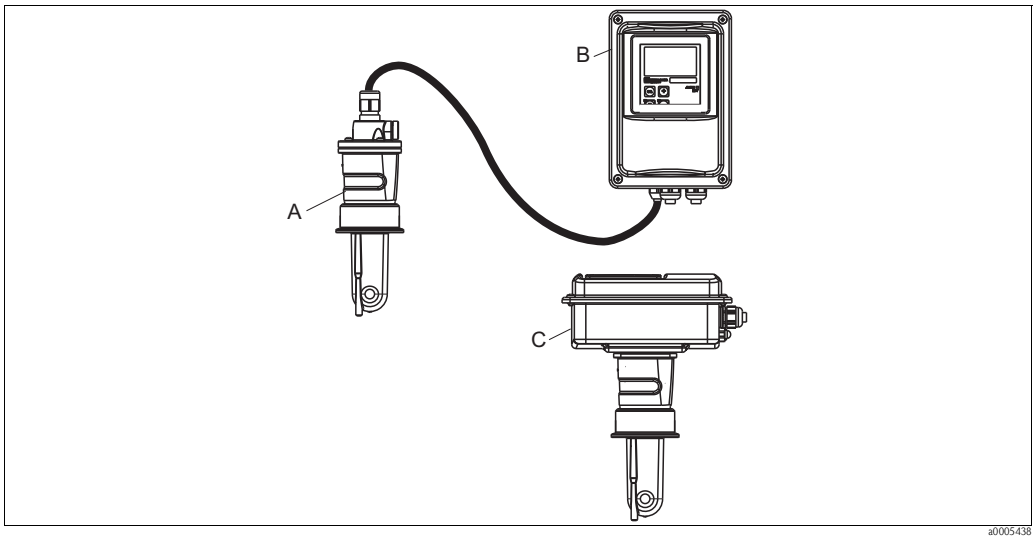
- **Hygiene**
  The injection-molded sensor is made of highly chemically, mechanically and thermally resistant PEEK. It does not have joints or crevices and is therefore hygienically safe. The exclusive use of virgin PEEK as material in contact with medium guarantees highest biological safety for the food, beverage and pharmaceutical areas. The sensor has been designed according to the effective guidelines of ASME BPE (The American Society of Mechanical Engineers – Bioprocessing Equipment).
- **Certified hygiene**
  The sensor has all necessary listings and approvals for hygienic areas, such as exclusive use of FDA-listed materials for surfaces in contact with medium and certification from 3-A. The sensor CLS54 has been certified by EHEDG (European Hygienic Engineering and Design Group) regarding in-place cleanability. A certificate on the biological reactivity test according to USP part <87> and <88> class VI including lot tracing back to compounding is available as option.
- **Process connections**
  The sensor is available with all process connections commonly used in hygienic applications. The most common connections are available as standard. Further process connections can be ordered as special versions.
- **Process temperature, process pressure**
  The use of special components and materials makes the sensor suitable for continuous exposure to temperatures of +125 °C (275 °F). Short-time (max. 60 min.), it may be exposed to +150 °C (300 °F) for sterilisation. The sensor is pressure-resistant up to 12 bar (174 psi) up to 90 °C (194 °F). At higher temperatures, its pressure resistance is always higher than the respective steam pressure. The sensor is suitable for underpressure applications.
- **Temperature measurement**
  The sensor has an integrated temperature sensor with a temperature response time $t_{90} < 26$ s. This enables economically efficient phase separations at varying and quickly changing process temperatures. The temperature sensor is embedded into the PEEK body eliminating the need for seals which ensures a long service life.
- **Temperature compensation**
  Smartec S CLD134 offers the following types of temperature compensation:
  – Linear compensation with freely selectable temperature coefficient α
  – Compensation according to IEC 746-3 for NaCl
  – Compensation with freely programmable coefficient table with 10 elements maximum

- **Concentration measurement**
  The transmitter can be switched from conductivity operating mode to concentration operating mode. The concentration operating mode provides one freely programmable as well as various predefined concentration curves, especially for common CIP solutions. This enables a direct display of the concentration in %.
- **Remote parameter set switching**
  Smartec S CLD134 can be ordered with remote parameter set switching (measuring range switching, MRS) enabling you
  – to cover a wide measuring range
  – to adjust temperature compensation when changing the product
  – to switch between concentration curves.
- **Models**
  The measuring system Smartec S CLD134 is available as:
  – compact version for simple installation
  – separate version (sensor and transmitter are connected via cable)
  Furthermore the transmitter can be ordered separately without sensor.

Measuring system

A complete measuring system comprises:
- the Smartec S CLD134 transmitter (separate version)
- the CLS54 conductivity sensor with integrated temperature sensor and fixed cable
  or
- the CLD134 compact version with integrated CLS54 conductivity sensor

Optional for the separate version: CLK5 extension cable, VBM junction box, mounting kit for pipe mounting



Complete measuring systems Smartec S CLD134 as separate transmitter and compact version

A CLS54 conductivity sensor
B Smartec S CLD134 transmitter
C Smartec S CLD134 compact version with integrated CLS54

Input

Measured variables

Conductivity
Concentration
Temperature

Measuring range

Conductivity:	recommended range: 100 µS/cm to 2000 mS/cm (uncompensated)
Concentration:	
NaOH:	0 to 15 %
HNO_3:	0 to 25 %
H_2SO_4:	0 to 30 %
H_3PO_4:	0 to 15 %
User 1 (to 4):	(4 tables available in versions with remote parameter set switching)
Temperature:	–35 to +250 °C (-31 to +482 °F)

Temperature measurement

Pt 1000 switchable to Pt 100

Sensor cable

max. cable length 55 m (180.46 ft) with CLK5 cable (separate version)

Binary inputs 1 and 2

Voltage:	10 to 50 V DC
Current consumption:	max. 10 mA at 50 V

Output

Output signal

Conductivity, concentration:	0 / 4 to 20 mA, galvanically isolated
Temperature (optional second current output)	

Signal on alarm

2.4 mA or 22 mA error current

Load

max. 500 Ω

Output range

Conductivity:	adjustable
Temperature:	adjustable

Signal resolution

max. 700 digits/mA

Separation voltage

max. 350 V_{RMS} / 500 V DC

Minimum distance of output signal

Conductivity:	
Measured value 0 to 19.99 µS/cm:	2 µS/cm
Measured value 20 to 199.9 µS/cm:	20 µS/cm
Measured value 200 to 1999 µS/cm:	200 µS/cm
Measured value 0 to 19.99 mS/cm:	2 mS/cm
Measured value 20 to 200 mS/cm:	20 mS/cm
Measured value 200 to 2000 mS/cm:	200 mS/cm
Concentration:	no minimum distance
Temperature:	15 °C (27 °F)

Overvoltage protection

acc. to EN 61000-4-5:1995

Auxiliary voltage output

Output voltage:	15 V ± 0.6 V
Output current:	max. 10 mA

Contact outputs

Switching current with ohmic load (cos φ = 1):	max. 2 A
Switching current with inductive load (cos φ = 0.4):	max. 2 A
Switching voltage:	max. 250 V AC, 30 V DC
Switching power with ohmic load (cos φ = 1):	max. 500 VA AC, 60 W DC
Switching power with inductive load (cos φ = 0.4):	max. 500 VA AC

Limit contactor

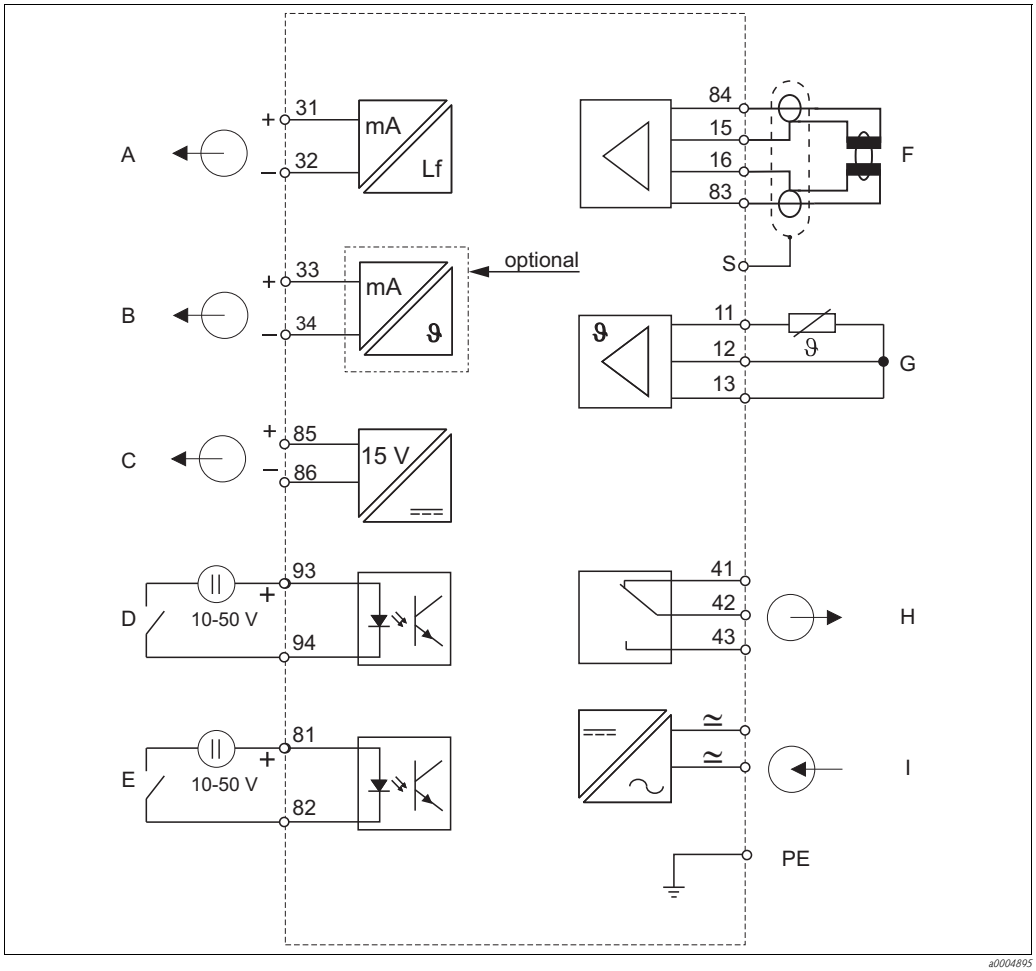
Pickup / dropout delay: (versions with remote parameter set switching only)	0 to 2000 s

Alarm

Function (switchable):	steady / fleeting contact
Alarm delay:	0 to 2000 s (min)

Power supply

Electrical connection

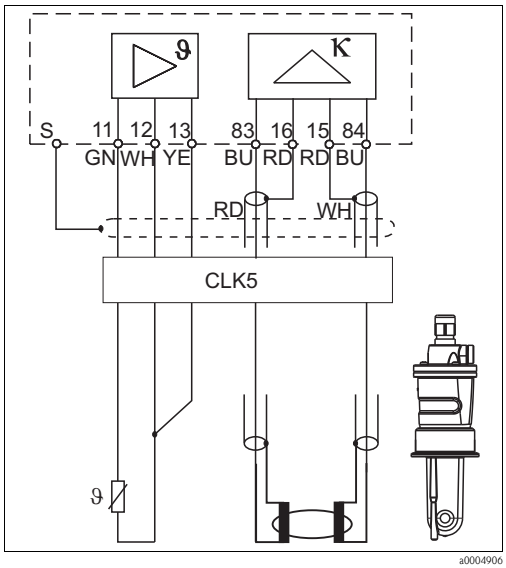


Electrical connection of CLD134

A Signal output 1 conductivity
B Signal output 2 temperature
C Auxiliary voltage output
D Binary input 2 (MRS 1+2)
E Binary input 1 (hold / MRS 3+4)
F Conductivity sensor
G Temperature sensor
H Alarm (contact position: no current)
I Power supply
MRS: Remote parameter set switching (measuring range switching)

Sensor connection

The conductivity sensor of the separate version is connected using the shielded multi-core fixed cable. Use the junction box VBM and the CLK5 extension cable (see Accessories) to extend the cable length.

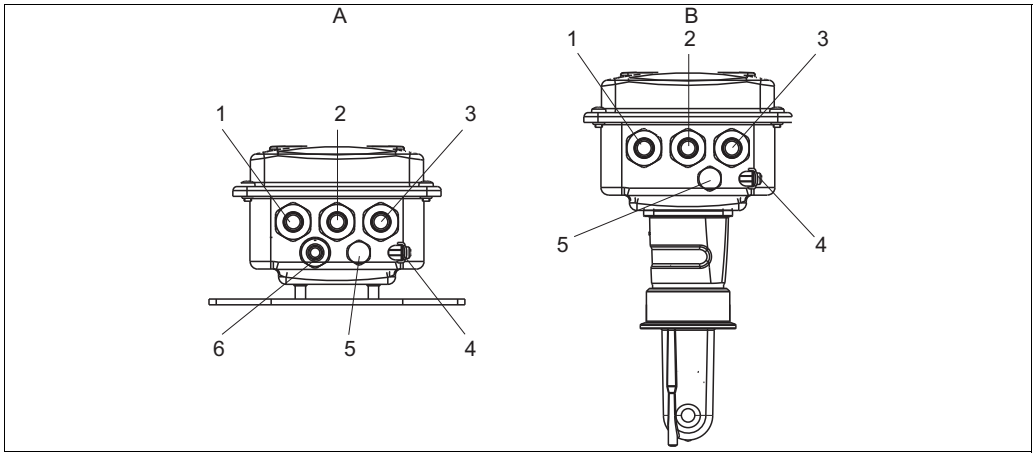


Electrical connection of CLS54

Supply voltage

Depending on ordered version:
100 / 115 / 230 V AC +10 / -15 %, 48 to 62 Hz
24 V AC/DC +20 / -15 %

Cable entries



Terminal assignments of cable glands on Smartec S CLD134

A	*Separate version*	*B*	*Compact version*
1	*Plug, analog output, binary input*	*1*	*Plug, analog output, binary input*
2	*Cable gland for alarm contact*	*2*	*Cable gland for alarm contact*
3	*Cable gland for power supply*	*3*	*Cable gland for power supply*
4	*Housing ground*	*4*	*Housing ground*
5	*Pressure comp. element PCE (Goretex® filter)*	*5*	*Pressure comp. element PCE (Goretex® filter)*
6	*Cable gland for sensor connection, M16x1.5*		

Power consumption

max. 7.5 VA

Mains fuse

Fine-wire fuse, medium time lag, 250 V / 3.15 A

Performance characteristics

Measured value resolution	Temperature:	0.1 °C (0.18 °F)
Temperature response time	t_{90} ≤26s	
Measured error of the sensor[1)]	Conductivity	± (0.5 % of measured value + 10 µS/cm) after calibration (plus inaccuracy of the conductivity of the calibration solution)
	Temperature:	Pt 1000 class A acc. to IEC 751
Measured error of the transmitter[1)]	Conductivity:	
	– Display:	max. 0.5 % of measured value ± 4 digits
	– Conductivity signal output:	max. 0.75 % of current output range
	Temperature	
	– Display:	max. 0.6 % of measuring range
	– Temperature signal output:	max. 0.75 % of current output range
Repeatability[1)]	Conductivity:	max. 0.2 % of measured value ± 2 digits
Cell constant	6.3 cm^{-1}	
Measuring frequency (oscillator)	2 kHz	
Temperature compensation	Range:	–10 to +150 °C (14 to 302 °F)
	Compensation types:	– none – linear with freely selectable temperature coefficient α – one freely programmable coefficient table (four tables available in versions with remote parameter set switching) – NaCl acc. to IEC 746-3
	Minimum distance for table:	1 K
Reference temperature	25 °C (77 °F)	
Temperature offset	adjustable, ± 5 °C (9 °F), for temperature display adjustment	

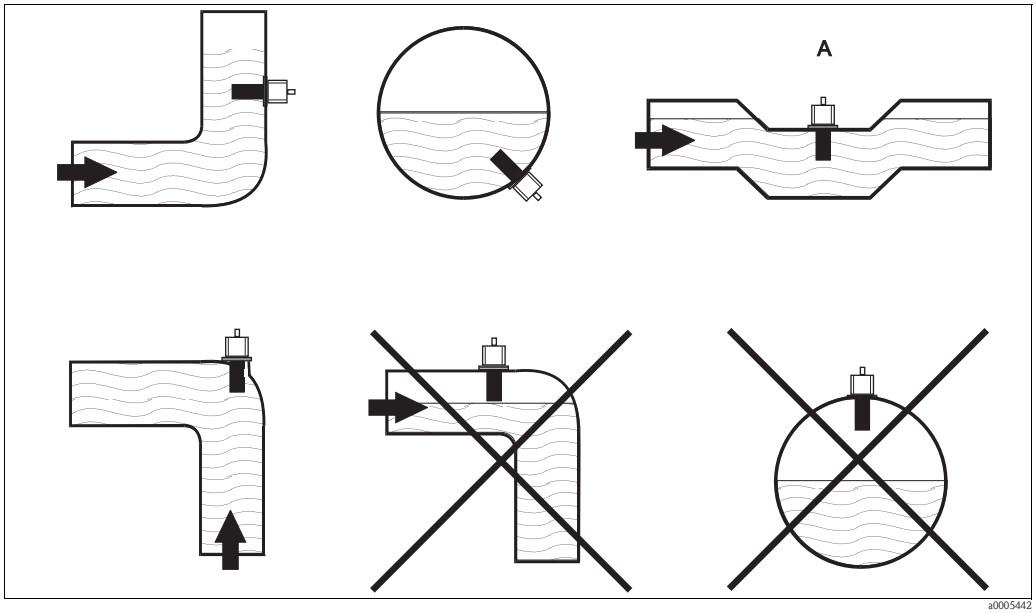
1) acc. to IEC 60746 part 1, at nominal operating conditions

Installation

Installation instructions

Note!
For use in hygienic applications only use materials that comply with 3-A standards 74-03 and the FDA requirements. The cleanability of a sensor also depends on the way of installation. To install the sensor in a pipe system use the appropriate and EHEDG certified flow assembly for the respective process connection.

The sensor has to be immersed completely into the media. Avoid bubbles in the area of the sensor.

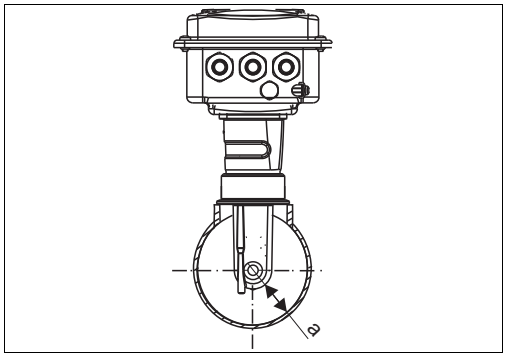


Installation positions of conductivity sensors

A Installation position is not useable for hygienic applications.

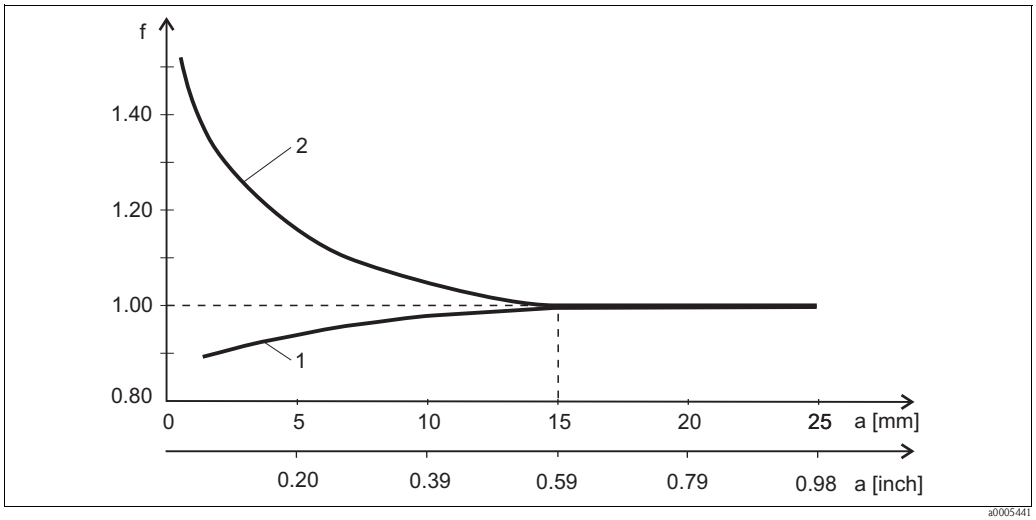
The media should flow through the bore of the sensor (see indicator arrow of the sensor body). The symmetrical measuring channel allows a flow in both directions.

In narrow installation conditions, the ion flow in the medium is affected by the pipe walls. This effect is compensated by the so-called installation factor. The installation factor can be entered in the transmitter or the cell constant can be corrected by multiplication with the installation factor to ensure correct measurement.
The value of the installation factor depends on the diameter and the conductivity of the pipe as well as the sensor's distance from the wall.
If the distance from the wall is sufficient (a > 15 mm, from DN 65), it is not necessary to consider the installation factor (f = 1.00).
If the distance from the wall is smaller, the installation factor increases in case of electrically insulating pipes (f > 1) and decreases in case of electrically conductive pipes (f < 1).
The installation factor can be measured using calibration solutions or it can be approximately determined from the diagram below.



Installation of CLS54

a Wall distance



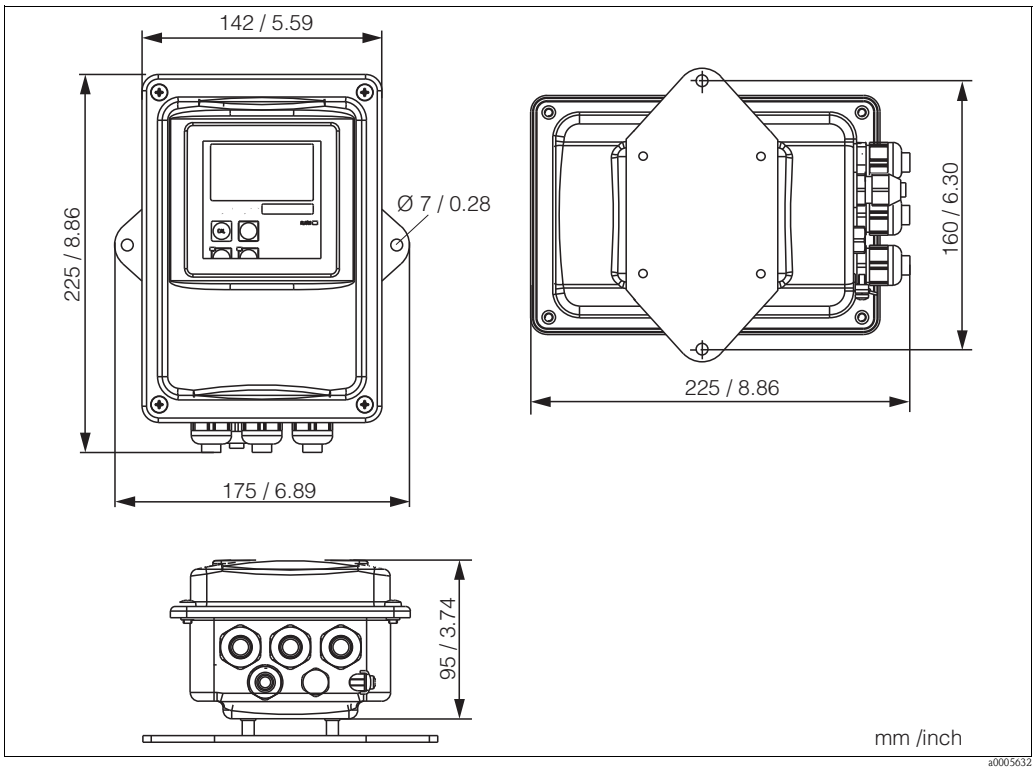
Dependance of installation factor f on wall distance a

1 Conductive pipe
2 Insulating pipe

Air set

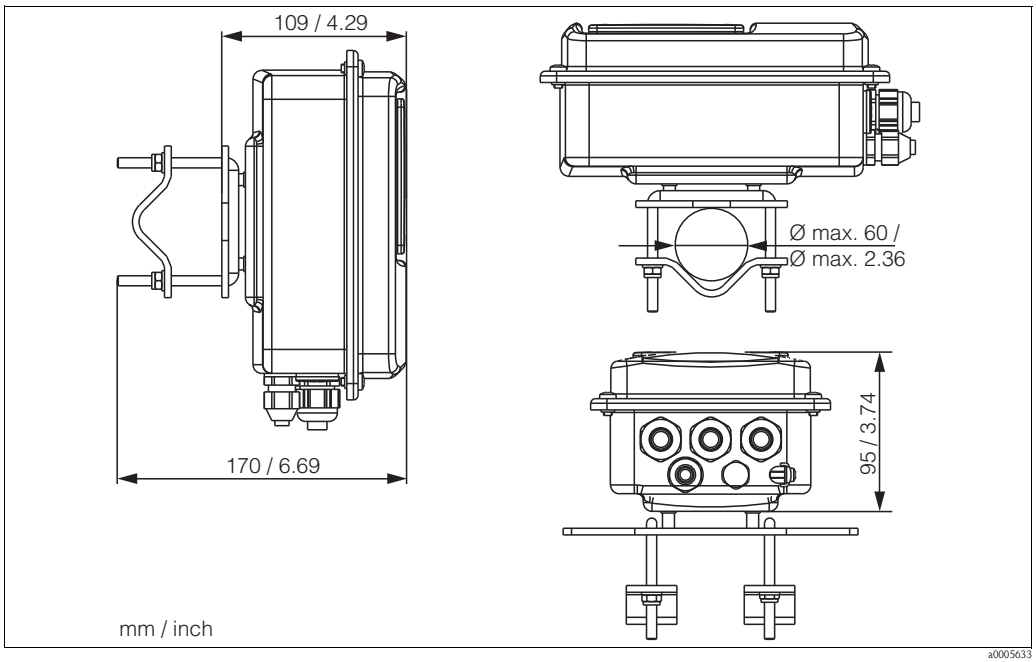
To compensate residual coupling in the cable and between the two sensor coils, you must perform a zero calibration in air ("air set") before installing the sensor.

Mounting CLD134 separate version



CLD134 wall mounting

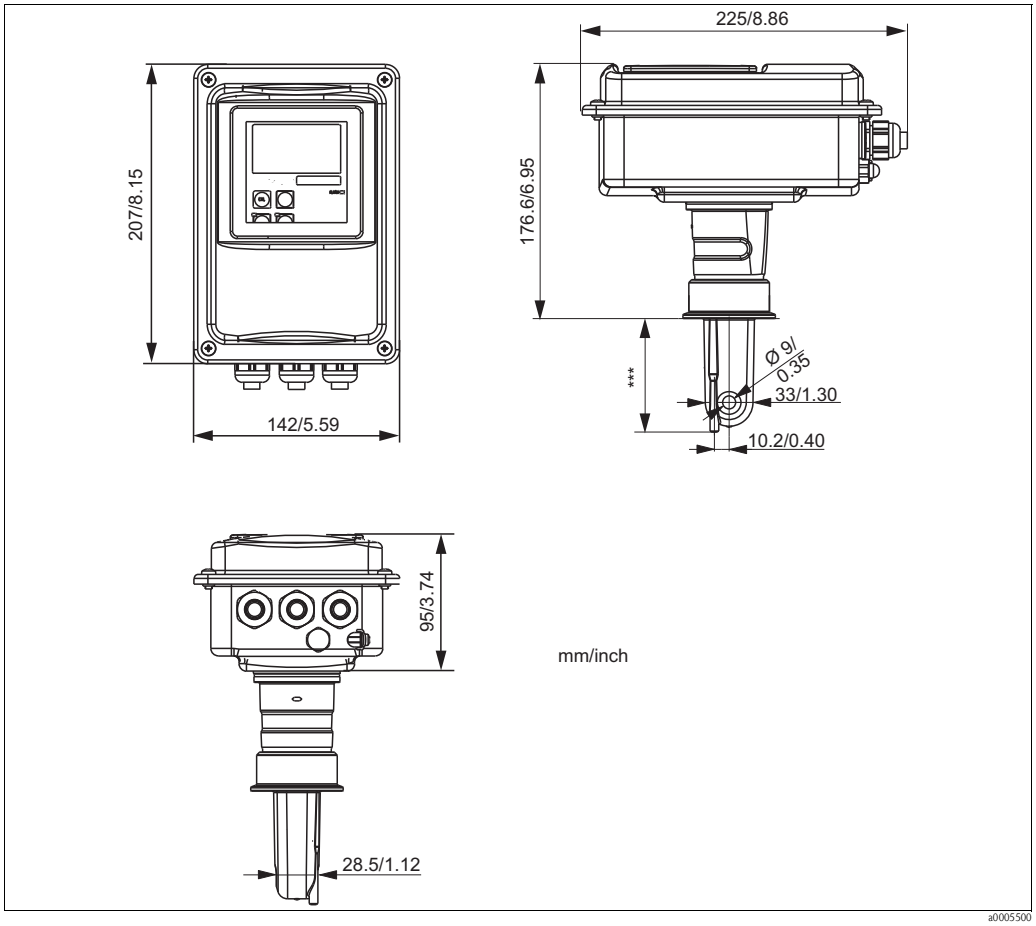
Note!
Wall mounting is not recommended for hygienic sensitive areas.



CLD134 mounting on pipes (Ø 60 mm / 2.36") using the pipe mounting kit (see Accessories)

Note!
For use in hygienic sensitive areas, shorten the threads as much as possible.

Mounting CLD134 compact version



Dimensions of CLD134 compact version

**** depending on ordered process connection*

The symmetrical measuring channel allows a flow in both directions.

Note!
The housing can be rotated against the sensor to allow comfortable viewing of the display in any mounting position.

Environment

Ambient temperature

Compact version or electronics box: 0 to +55 °C (32 to 131 °F)
Sensor separately: -20 to +60 °C (-4 to +140 °F)

Ambient temperature limits

–10 to +70 °C (14 to 158 °F) (separate version and separate transmitter)
–10 to +55 °C (14 to 131 °F) (compact version)
See figure "Permissible temperature ranges of Smartec S CLD134".

Storage temperature

–25 to +70 °C (-13 to 158 °F)

Electromagnetic compatibility

Interference emission and interference resistance acc. to EN 61326: 1997 / A1: 1998

Ingress protection

IP 67

Relative humidity

10 to 95%, non-condensing

Vibration resistance acc. to IEC 60770-1 and IEC 61298-3

Oscillation frequency: 10 to 500 Hz
Deflection (peak value): 0.15 mm (0.01")
Acceleration (peak value): 19.6 m/s^2 (64.3 ft/s^2)

Impact resistance

Display window: 9 J

Process

Process temperature

CLS54 sensor with separate version: max. 125 °C (257 °F) at 70 °C (158 °F) ambient temperature
Compact version: max. 125 °C (257 °F) at 35 °C (95 °F) ambient temperature
max. 55 °C (131 °F) at 55 °C ambient temperature

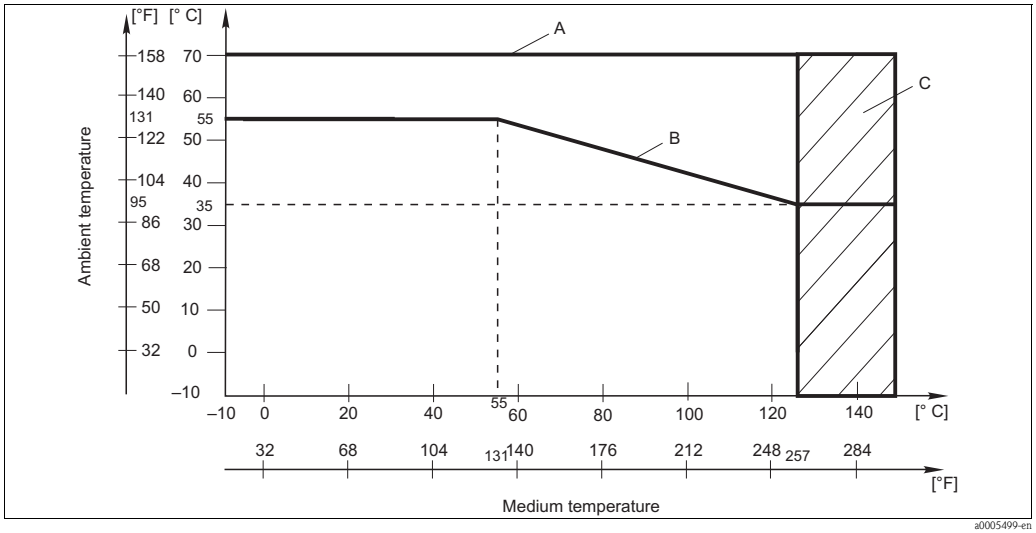
Sterilization

CLS54 sensor with separate version: 150 °C (302 °F) at 70 °C (158 °F) ambient temperature, 5 bar (72.5 psi), max. 60 min
Compact version: 150 °C (302 °F) at 35 °C (95 °F) ambient temperature, 5 bar (72.5 psi), max. 60 min

Process pressure

max. 12 bar (174 psi) up to 90 °C (194 °F)
8bar (116 psi) at 125 °C (257 °F)
0 to 5 bar (0 to 72.5 psi) when in CRN-applicable areas (tested with 50 bar (725 psi))
underpressure down to 0.1 bar (1.45 psi) absolute

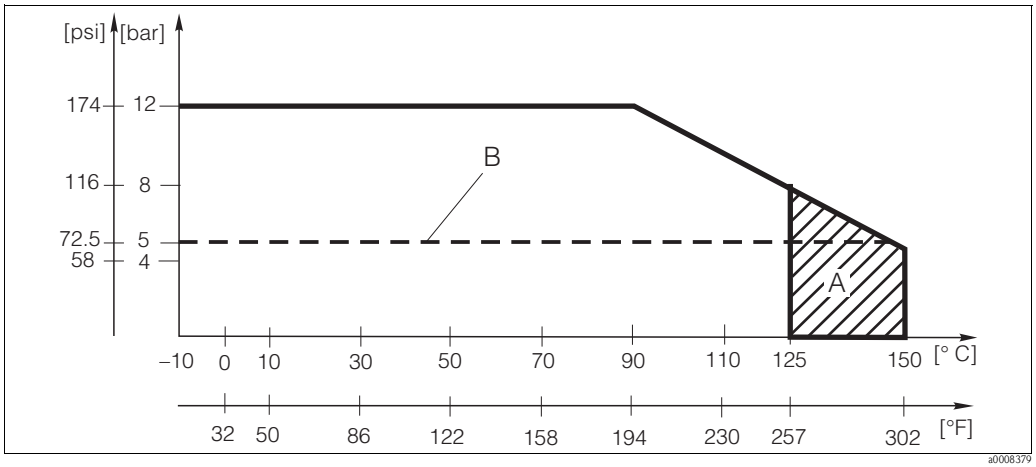
Permissible temperature ranges of Smartec S CLD134



Permissible temperature ranges of Smartec S CLD134

A CLS54 sensor with separate version
B Compact version
C Short-term for sterilization (< 60 min)

Pressure-temperature load curve of CLS54 sensor



Pressure / temperature load curve

A Short-term for sterilization (< 60 min)
B MAWP (maximum allowable working pressure) according to ASME-BPVC Sec. VIII, Div 1, UG101 for CRN registration

Mechanical construction

Dimensions

Separate transmitter with mounting plate:	L x W x D: 225 x 142 x 109 mm (8.86 x 5.59 x 4.29 ")
Compact transmitter:	
MV5, CS1, AA5, SMS versions:	L x W x D: 225 x 142 x 255 mm (8.86 x 5,59 x 10.04 ")
VA4, BC5 versions:	L x W x D: 225 x 142 x 213 mm (8.86 x 5.59 x 8.39 ")

Weight

Separate version:	
Transmitter:	approx. 2.5 kg (5.5 lb.)
CLS54 sensor:	depending on version 0.3 to 0.5 kg (0.66 to 1.1 lb.)
Compact version with CLS54 sensor:	approx. 3 kg (6.6 lb.)

Surface roughness

$R_a \leq 0.8$ µm (smooth, injection-molded PEEK surface) for the surface in contact with medium

Materials of the sensor

In contact with medium:	Virgin PEEK
Not in contact with medium:	PPS-GF40
	Stainless steel 1.4404 (AISI 316L)
	Screws: 1.4301 (AISI 304)
	FKM, EPDM (seal)
	PVDF (cable gland – separate version only)
	TPE (cable – separate version only)

Materials of the transmitter

Housing:	stainless steel 1.4301
Front window:	polycarbonate

Chemical durability of the sensor

Medium	Concentration	PEEK
Caustic soda NaOH	0 to 15 %	20 to 90 °C (68 to 194 °F)
Nitric acid HNO_3	0 to 25 %	20 to 90 °C (68 to 194 °F)
Phosphoric acid H_3PO_4	0 to 15 %	20 to 80 °C (68 to 176 °F)
Sulphuric acid H_2SO_4	0 to 30 %	20 °C (68 °F)
Peracetic acid H_3C-CO-OOH	0.2 %	20 °C (68 °F)

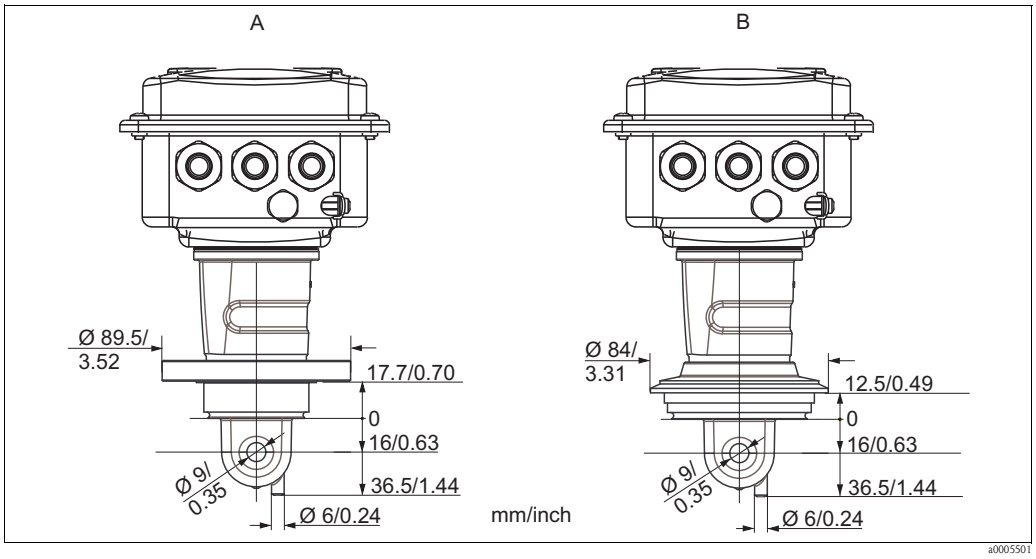
No responsibility is taken for the correctness of this information.

Process connections

- Dairy pipe fitting DIN 11851, DN 50 a)
- Aseptic fitting DIN 11864-1 form A, for pipe according to DIN 11850, DN 50
- Clamp ISO 2852 (also for TriClamp®, DIN 32676), 2"
- SMS 2" b)
- Varivent N DN 40 - 125
- NEUMO BioControl D50, DN 40.2"

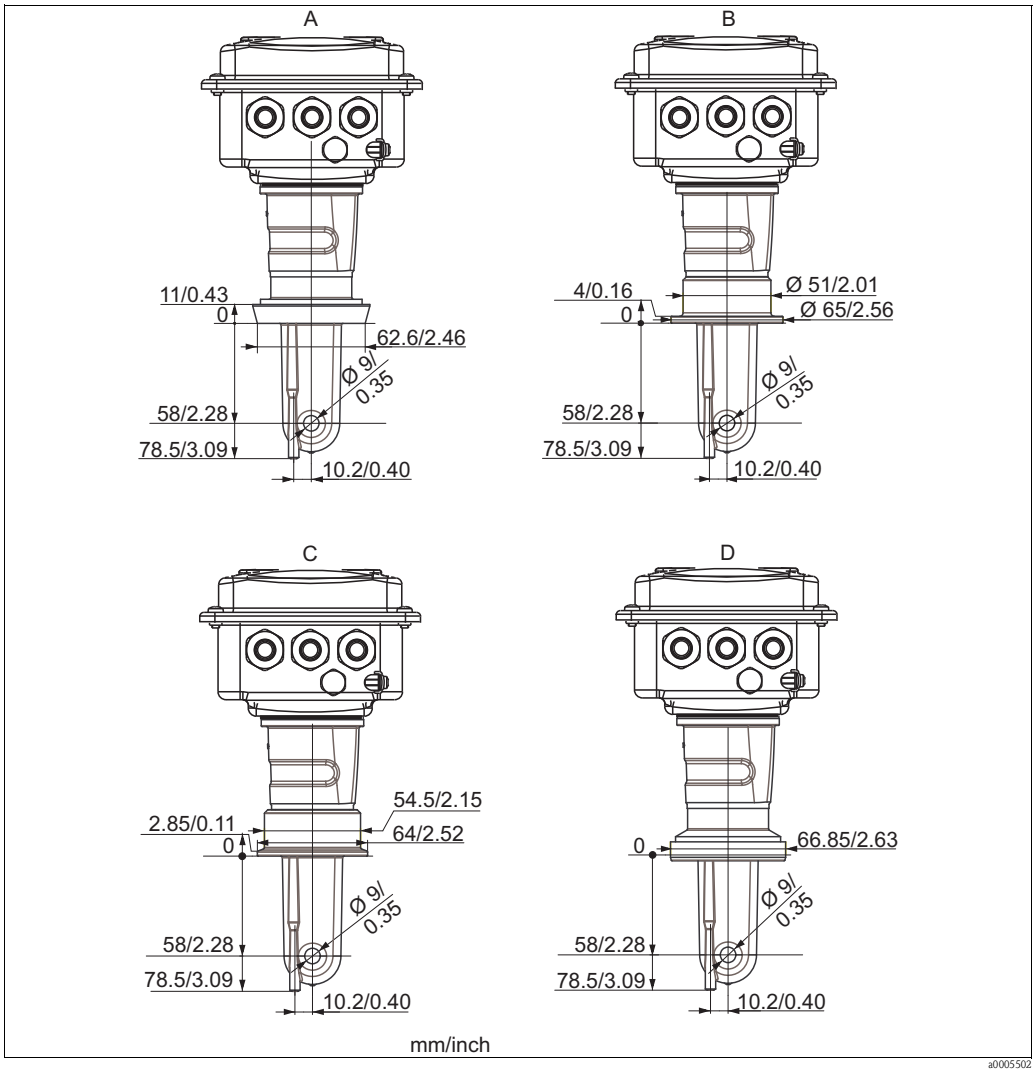
Additional process connections are available on request.

a) Dairy pipe fitting DIN 11851 is generally not considered hygienic. With the adapter SKS Siersma, it meets the 3-A standards requirements.
b) Process connection is not considered hygienic according to the requirements of EHEDG.



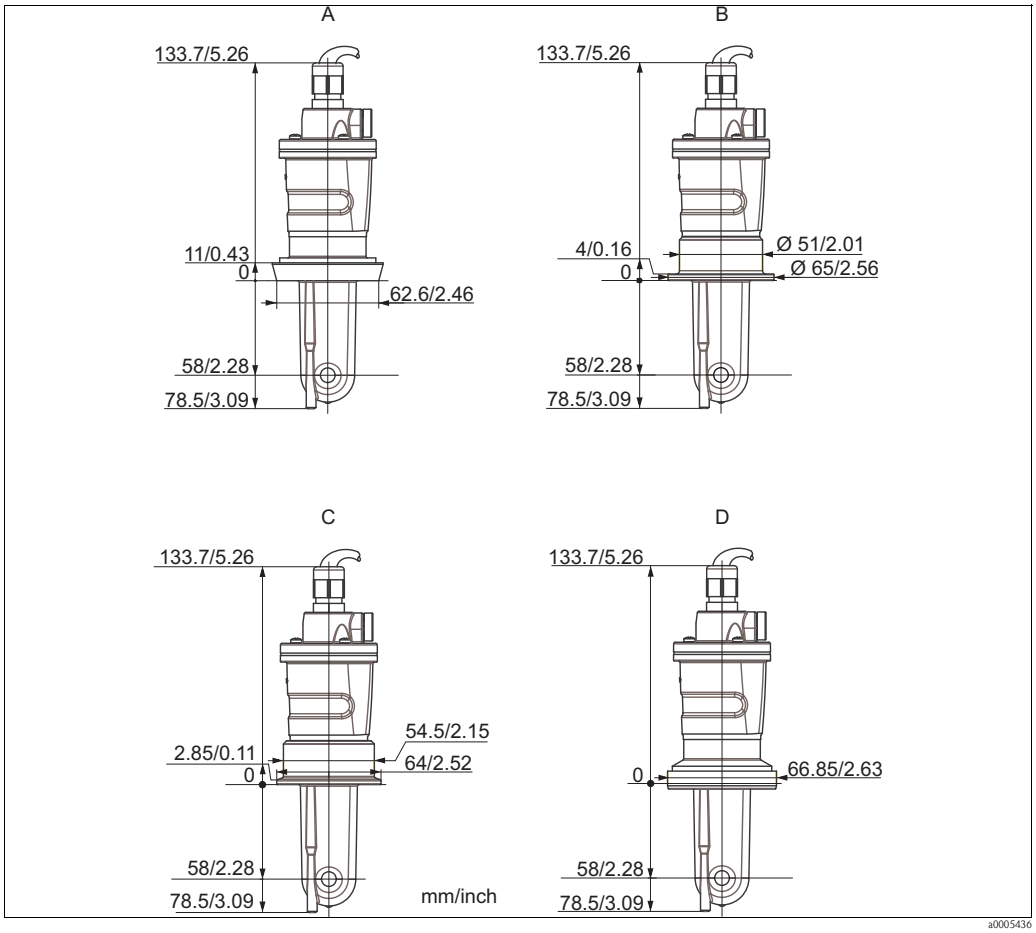
Process connections of CLD134 compact version (short)

A NEUMO BioControl D50
for pipe connection: DN 40 (DIN 11866 series A, DIN 11850)
DN 42.4 (DIN 11866 series B, DIN EN ISO 1127)
2" (DIN 11866 series C, ASME-BPE)
B Varivent N DN 40 to 125



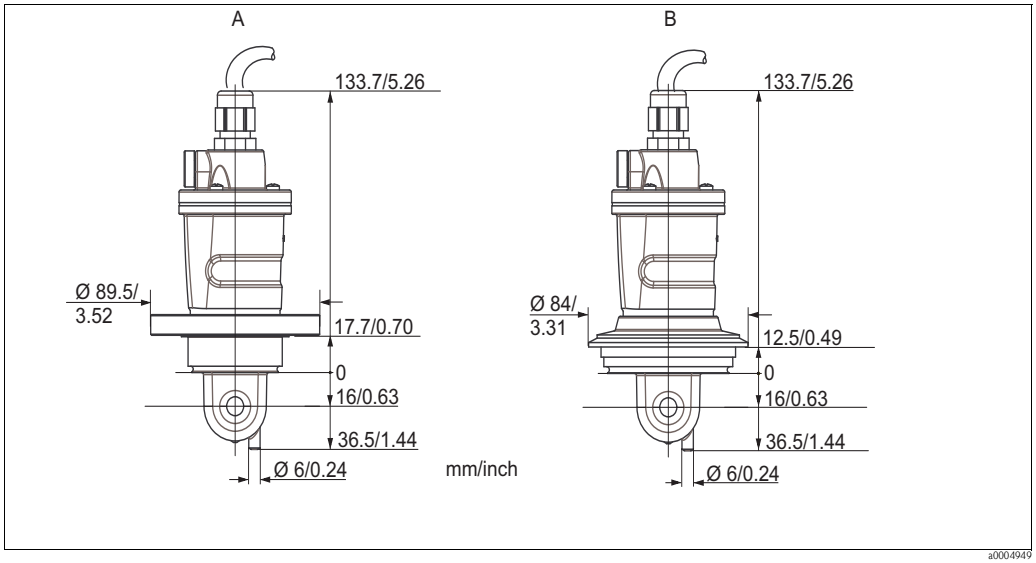
Process connection of CLD134 compact version (long)

A Dairy pipe fitting DIN 11851, DN 50 (union nut is included, but not shown)
B SMS 2" (union nut is included, but not shown)
C Clamp ISO 2852, 2"
D Aseptic fitting DIN 11864-1 form A, for pipe according to DIN 11850, DN 50



Process connections CLS54 (long)

A Dairy pipe fitting DIN 11851, DN50 (union nut is included, but not shown)
B SMS 2" (union nut is included, but not shown)
C Clamp ISO 2852 , 2"
D Aseptic fitting DIN 11864-1 form A, for pipe according to DIN 11850, DN 50

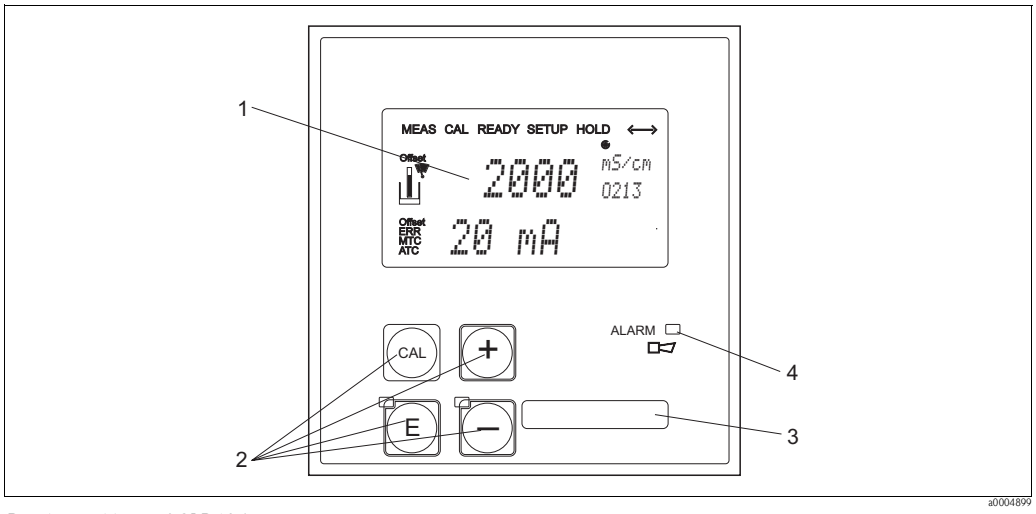


Process connections CLS54 (short)

A NEUMO BioControl D50
for pipe connection: DN 40 (DIN 11866 series A, DIN 11850)
DN 42,4 (DIN 11866 series B, DIN EN ISO 1127)
2" (DIN 11866 series C, ASME-BPE)
B Varivent N DN 40 to 125

Human interface

Display and operating elements



Display and keys of CLD134

1 LC display showing measured values and configuration data
2 Four operating keys for calibration and instrument configuration
3 Field for user labeling
4 LED indicator for alarm function

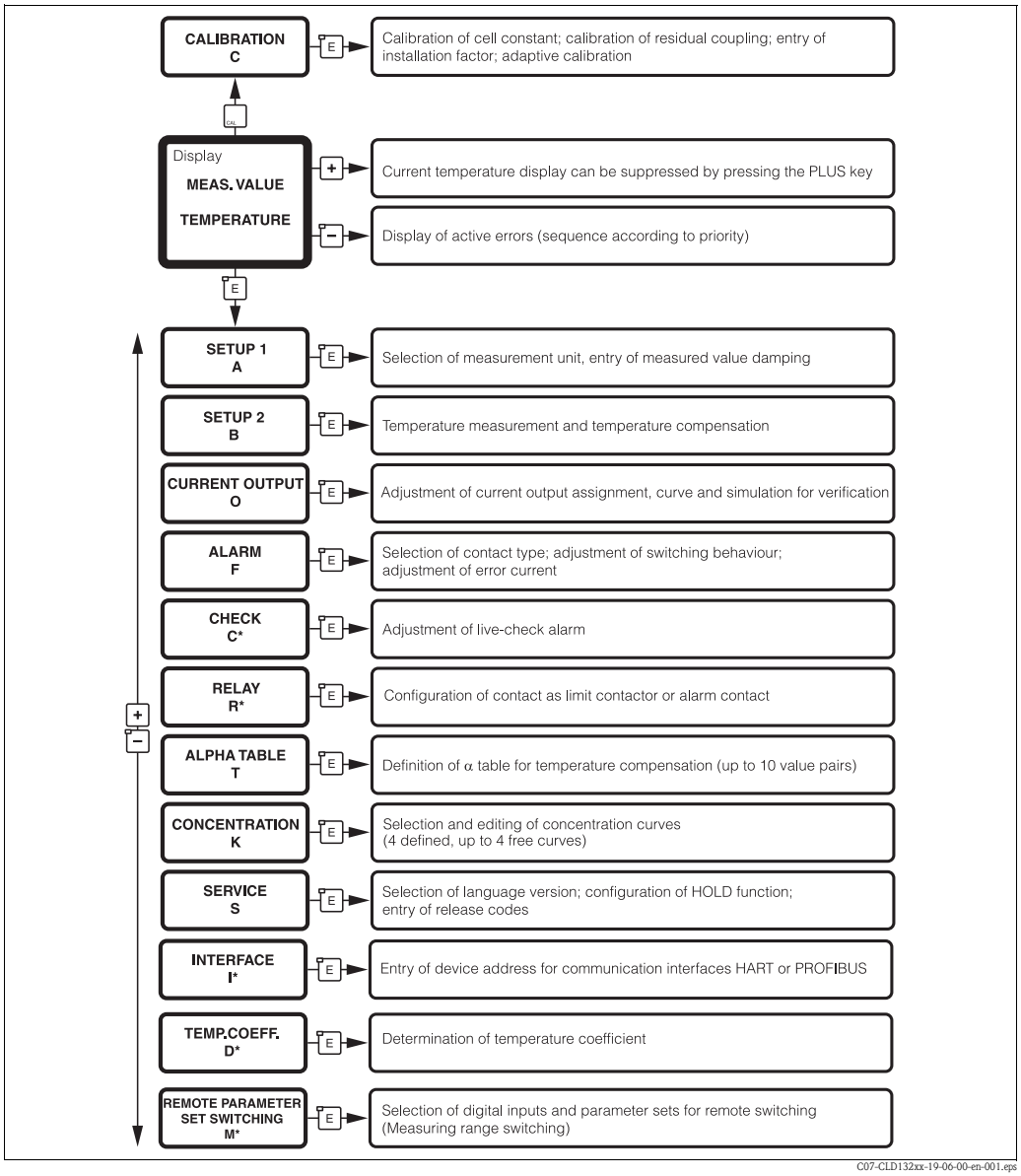
Operation

You have the following options of operating Smartec S CLD134:

- Local operation via operating keys
  The four keys are located underneath the housing cover. For operation, open the housing cover by removing the four screws.
- Via HART® interface
  – HART hand-held terminal
  – PC with HART modem and the FieldCare software (with FDT/DTM technology)
- Via PROFIBUS PA/DP using a PC with a corresponding interface and the FieldCare software (with FDT/DTM technology) or via programmable logical controller (PLC)

Calibration and configuration functions

All calibration and configuration functions are arranged in a logical menu structure. The individual parameters can only be modified after entering the access code. The current position within the menu structure is displayed.



Overview of the Smartec S CLD134 menu, showing all options that can be installed

* *Menus not available in standard version*

Certificates and approvals

Hygienic certificates

FDA
All materials in contact with medium are listet at FDA.

EHEDG
The sensor CLS54 has been certified for in-place cleanability according to EHEDG document 2.



Note!
The cleanability of a sensor also depends on the way of installation. To install the sensor in a pipe system use the appropriate and EHEDG certified flow assembly for the respective process connection.

3-A
Certified according to 3-A Standard 74-03 ("3-A Sanitary Standards for Sensor and Sensor Fittings and Connections Used on Milk and Milk Products Equipment").

Biological reactivity (USP class VI) (optional)
Certificate on biological reactivity tests according to USP (United States Pharmacopeia) part <87> and part <88> class VI with traceability of the materials in contact with medium.

Pressure approvals

Canadian pressure approval for pipes according to ASME B31.3

Ordering information

Product structure

Housing							
E	Transmitter only (without sensor)						
P	Compact version						
W	Separate transmitter, cable length 5 m / 16.41 ft						
X	Separate transmitter, cable length 10 m / 32.81 ft						
S	Separate transmitter, cable length 20 m / 65.62 ft						
	Process connection						
	000	Not selected (transmitter only)					
	MV5	Dairy fitting DIN 11851, DN 50[a]					
	AA5	Aseptic fitting DIN 11864-1 form A, pipe DIN 11850, DN 50					
	CS1	Clamp ISO 2852, 2" (long)					
	SMS	SMS 2"[b]					
	VA4	Varivent® N DN 40 to 125					
	BC5	NEUMO BioControl® D50					
		Cable entry					
		3	Cable gland M 20 x 1.5				
		5	Conduit adapter NPT ½ "				
			Power supply				
			0	230 V AC			
			1	115 V AC			
			5	100 V AC			
			8	24 V AC / DC			
				Current output / communication			
				AA	Current output conductivity, without communication		
				AB	Current output conductivity and temperature, without communication		
				HA	HART, current output conductivity		
				HB	HART, current output conductivity and temperature		
				PE	PROFIBUS-PA, no current output		
				PF	PROFIBUS-PA, M 12 connector, no current output		
				PP	PROFIBUS-DP, no current output		
						Additional features	
						1	Basic version
						2	Remote parameter set switching
						3	Biological reactivity tests according to USP <87>, <88> class VI
						4	Remote parameter set switching and biological reactivity tests according to USP <87>, <88> class VI
						5	CRN approval (according to ASME B31.3)[c]
						6	CRN approval (according to ASME B31.3)[c] + Biological reactivity tests according to USP <87>, <88> class VI
CLD134-							complete order code

[a] Dairy pipe fitting DIN 11851 is generally not considered hygienic. With the adapter SKS Siersma, it meets the 3-A standards requirements.

[b] Process connection is not considered hygienic according to the requirements of EHEDG.

[c] CRN approval only valid for process connections MV5, CS1 and VA4.

Scope of delivery

The scope of delivery of the compact version inlcudes:
- Smartec S CLD134 compact measuring system with integrated sensor
- Terminal strip set
- Operating Instructions BA401C/07/en
- Versions with HART communication only:
  Operating Instructions Field communication with HART, BA212C/07/en
- Versions with PROFIBUS interface only:
  – Operating Instructions Field communication with PROFIBUS, BA213C/07/en
  – M12 connector (-******PF* versions only)

The scope of delivery of the separate version includes:
- Smartec S CLD134 transmitter
- CLS54 inductive sensor with fixed cable
- Terminal strip set
- Operating Instructions BA401C/07/en
- Versions with HART communication only:
  Operating Instructions Field communication with HART, BA212C/07/en
- Versions with PROFIBUS interface only:
  – Operating Instructions Field communication with PROFIBUS, BA213C/07/en
  – M12 connector (-******PF* versions only)

The scope of delivery of version "transmitter without sensor" includes:
- Smartec S CLD134 transmitter
- Terminal strip set
- Operating Instructions BA401C/07/en
- Versions with HART communication only:
  Operating Instructions Field communication with HART, BA212C/07/en
- Versions with PROFIBUS interface only:
  – Operating Instructions Field communication with PROFIBUS, BA213C/07/en
  – M12 connector (-******PF* versions only)

Basic version and function extensions

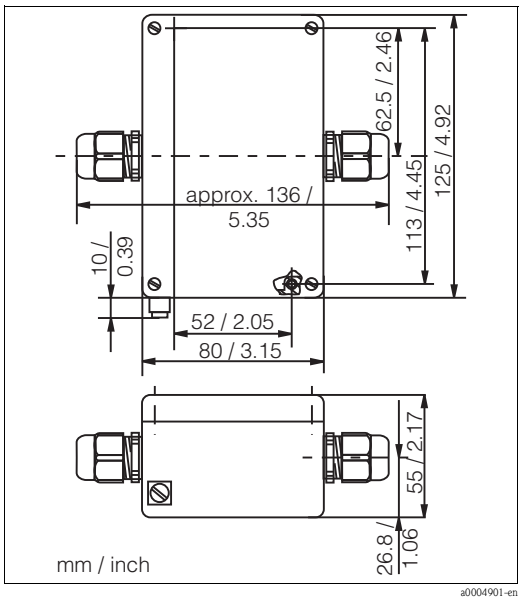
Functions of the basic version	Options and their functions
■ Measurement ■ Calibration of cell constant ■ Calibration of residual coupling ■ Calibration of installation factor ■ Read instrument parameters ■ Linear current output ■ Current output simulation ■ Service functions ■ Temperature compensation selectable (e.g. 1 free coefficient table) ■ Concentration measurement selectable (4 defined curves, 1 free table) ■ Relay as alarm contact	■ Second current output for temperature (hardware option) ■ HART communication ■ PROFIBUS communication **Remote parameter set switching (software option):** ■ Remote switching of max. 4 parameter sets (measuring ranges) ■ Temperature coefficients can be determined ■ Temperature compensation selectable (e.g. 4 free coefficient tables) ■ Concentration measurement selectable (4 defined curves, 4 free tables) ■ Check of measuring system by PCS alarm (live check) ■ Relay can be configured as alarm or limit contact **Biological reactivity according to USP <87>, <88> class VI**

Accessories

Cable extension

- CLK5 measuring cable
  Extension cable for connecting CLS52/54 and transmitter via the VBM junction box, sold by the meter;
  order no. 50085473
- Junction box VBM
  for extension of measuring cable connection between sensor and instrument, material cast aluminium, ingress protection 65;
  order no.: 50003987

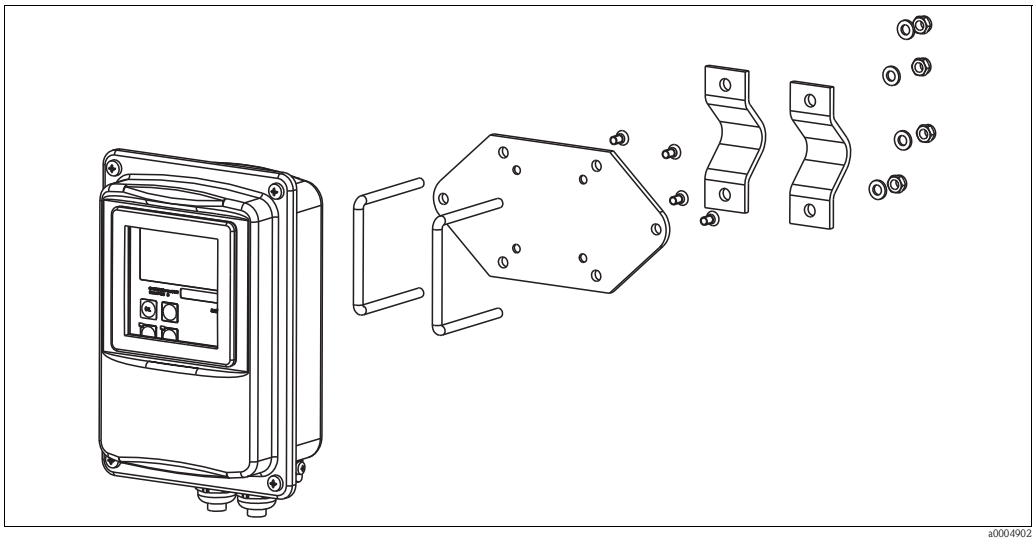
  ✎ Note!
  The desiccant bag must be checked and replaced at regular intervals which depend on ambient conditions in order to prevent inaccurate measurement due to moisture bridges in the measuring line.



- Desiccant bag with color indicator for VBM junction box;
  order no. 50000671

Pipe mounting kit

- Mounting kit for installation of Smartec S CLD132/CLD134 on horizontal or vertical pipes and posts (max. Ø 60 mm (2.36")), material stainless steel 1.4301;
  order no.: 50062121



Mounting kit for installing CLD132/CLD134 separate version on posts or pipes (base plate belongs to the scope of delivery of the transmitter)

Software upgrade

- Software upgrade
  Remote parameter set switching (measuring range switching, MRS) and determination of temperature coefficient;
  order no.: 51501643
  Serial number of instrument must be specified with order.

Optoscope

- Optoscope
  Interface between transmitter and PC / laptop for service purposes.
  The Windows software "Scopeware" required for the PC or laptop is supplied with the Optoscope. The Optoscope is supplied in a sturdy plastic case with all the accessories required.
  Order no. 51500650

Calibration solutions

Precision solutions, traceable to SRM (standard reference material) by NIST, for qualified calibration of conductivity measurement systems according to ISO 9000, with temperature table

- CLY11-B
  149.6 µS/cm (reference temperature 25 °C / 77 °F), 500 ml / 16.9 fl.oz
  Order no. 50081903
- CLY11-C
  1.406 mS/cm (reference temperature 25 °C / 77 °F), 500 ml / 16.9 fl.oz
  Order no. 50081904
- CLY11-D
  12.64 mS/cm (reference temperature 25 °C/ 77 °F), 500 ml / 16.9 fl.oz
  Order no. 50081905
- CLY11-E
  107.0 mS/cm (reference temperature 25 °C / 77 °F), 500 ml / 16.9 fl.oz
  Order no. 50081906

Documentation

- Smartec S CLD134, Operating Instructions BA401C/07/en
- Indumax H CLS54, Technical Information TI400C/07/en

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