BA00182C/07/EN/24.24-00
71701547
2024-09-30

Operating Instructions
Indumax CLS50D/CLS50

Inductive conductivity sensor for standard, Ex and high-temperature applications
Digital sensor with Memosens protocol or analog sensor

Endress+Hauser
People for Process Automation

Table of contents

1 About this document

1.1 Safety information

Structure of information	Meaning
DANGER **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **will** result in a fatal or serious injury.
WARNING **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **can** result in a fatal or serious injury.
CAUTION **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE **Cause/situation** If necessary, Consequences of non-compliance (if applicable) ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols

- Additional information, tips
- Permitted
- Recommended
- Not permitted or not recommended
- Reference to device documentation
- Reference to page
- Reference to graphic
- Result of an individual step

1.3 Symbols on the device

- Reference to device documentation
- Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

1.4 Documentation

The following manuals, which complement these Operating Instructions, can be found on the product pages on the Internet:

Technical Information Indumax CLS50D/CLS50, TI00182C

In addition to the Operating Instructions and depending on the relevant approval, XA "Safety instructions" are supplied with sensors for the hazardous area.

► Please follow the XA instructions when using the device in the hazardous area.

2 Basic safety instructions

2.1 Requirements for the personnel

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

Repairs not described in the Operating Instructions provided must be carried out only directly at the manufacturer's site or by the service organization.

2.2 Intended use

Indumax CLS50D or CLS50 sensor is particularly suitable for use in the chemical and process technology sectors. The six-decade measuring range and the excellent chemical resistance properties of the materials in contact with the medium (PFA or PEEK) make it possible to use this sensor in a wide range of applications, such as:

- Concentration measurement of acids and bases
- Quality monitoring of chemical products in tanks and pipes
- Phase separation of product/product mixtures

The digital sensor CLS50D is used in conjunction with the Liquiline CM44x/R or Liquiline M CM42, while the analog sensor CLS50 is used with the Liquiline M CM42 or Liquisys CLM223/253.

Any use other than that intended puts the safety of people and the measuring system at risk. Therefore, any other use is not permitted.

The manufacturer is not liable for harm caused by improper or unintended use.

2.3 Workplace safety

The operator is responsible for ensuring compliance with the following safety regulations:
- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

Electromagnetic compatibility
- The product has been tested for electromagnetic compatibility in accordance with the applicable international standards for industrial applications.
- The electromagnetic compatibility indicated applies only to a product that has been connected in accordance with these Operating Instructions.

2.4 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.

Procedure for damaged products:

1. Do not operate damaged products, and protect them against unintentional operation.
2. Label damaged products as defective.

During operation:

▶ If errors cannot be rectified,
take products out of service and protect them against unintentional operation.

2.5 Product safety

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

3 Incoming acceptance and product identification

3.1 Incoming acceptance

1. Verify that the packaging is undamaged.
   ↳ Notify the supplier of any damage to the packaging.
   Keep the damaged packaging until the issue has been resolved.
2. Verify that the contents are undamaged.
   ↳ Notify the supplier of any damage to the delivery contents.
   Keep the damaged goods until the issue has been resolved.

3. Check that the delivery is complete and nothing is missing.
   ↳ Compare the shipping documents with your order.
4. Pack the product for storage and transportation in such a way that it is protected against impact and moisture.
   ↳ The original packaging offers the best protection.
   Make sure to comply with the permitted ambient conditions.

If you have any questions, please contact your supplier or your local Sales Center.

3.2 Product identification

3.2.1 Nameplate

The nameplate provides you with the following information on your device:
- Manufacturer identification
- Extended order code
- Serial number
- Safety information and warnings

► Compare the information on the nameplate with the order.

3.2.2 Identifying the product

Product page

www.endress.com/cls50d

www.endress.com/cls50

Interpreting the order code

The order code and serial number of your product can be found in the following locations:
- On the nameplate
- In the delivery papers

Obtaining information on the product

1. Go to www.endress.com.
2. Page search (magnifying glass symbol): Enter valid serial number.
3. Search (magnifying glass).
   ↳ The product structure is displayed in a popup window.
4. Click the product overview.
   ↳ A new window opens. Here you will find information pertaining to your device, including the product documentation.

Manufacturer's address

Endress+Hauser Conducta GmbH+Co. KG
Dieselstraße 24
70839 Gerlingen
Germany

3.3 Scope of delivery

The scope of delivery includes:
- Sensor (version as ordered)
- Operating instructions
- XA, Safety instructions for electrical equipment in hazardous areas (optional)
- Final inspection report

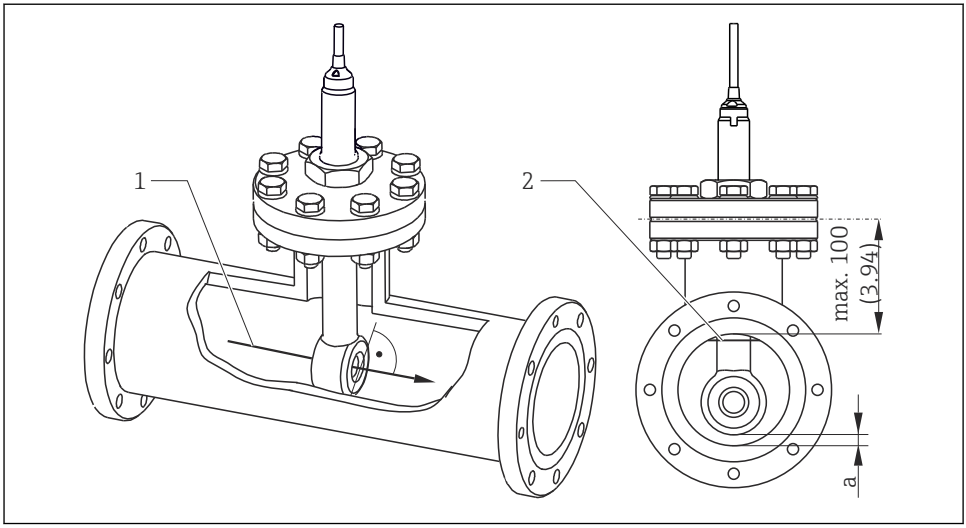
▶ If you have any queries:
Please contact your supplier or local sales center.

4 Installation

4.1 Installation requirements

4.1.1 Orientation

▶ When installing, align the sensor in such a way that the medium flows through the flow opening of the sensor in the direction of medium flow.
↳ The sensor head must be completely immersed in the medium.

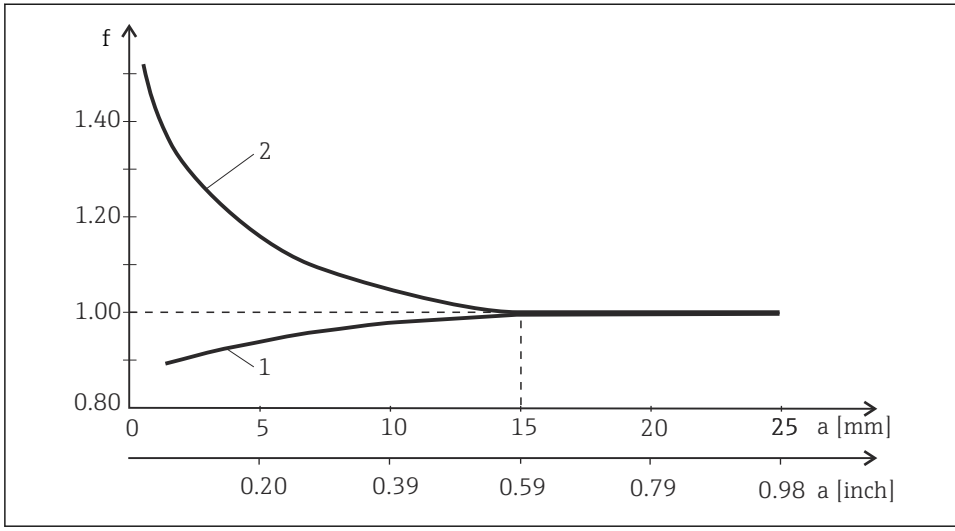


1 Sensor orientation, dimensions in mm (in)

1 Direction of medium flow
2 Minimum water level in the pipe
a Distance from pipe wall

4.1.2 Installation factor

In confined installation conditions, the conductivity measurement is affected by the pipe walls. The installation factor compensates for this effect. The transmitter corrects the cell constant by multiplying by the installation factor. The value of the installation factor depends on the diameter and the conductivity of the pipe nozzle as well as the sensor's distance to the wall. The installation factor f can be disregarded (f = 1.00) if the distance to the wall is sufficient (a > 15 mm (0.59"), from DN 80). If the distance to the wall is smaller, the installation factor increases for electrically insulating pipes (f > 1) and decreases for electrically conductive pipes (f < 1). It can be measured using calibration solutions, or a close approximation determined from the following diagram.



2 *Relationship between installation factor f and wall distance*

1 Electrically conductive pipe wall
2 Electrically insulating pipe wall

4.1.3 Air set

CLS50D

The digital sensor has already been adjusted at the factory. Onsite compensation is not required.

CLS50

To compensate residual coupling in the cable and between the two sensor coils, zero adjustment in air ("air set") must be performed before installing the sensor. Follow the instructions provided in the Operating Instructions of the transmitter used.

4.2 Installing the sensor

4.2.1 Installation with flange

The sensor is suitable for installation in T-pieces ≥ DN 80, with the outgoing diameter reduced to ≥ DN 50.

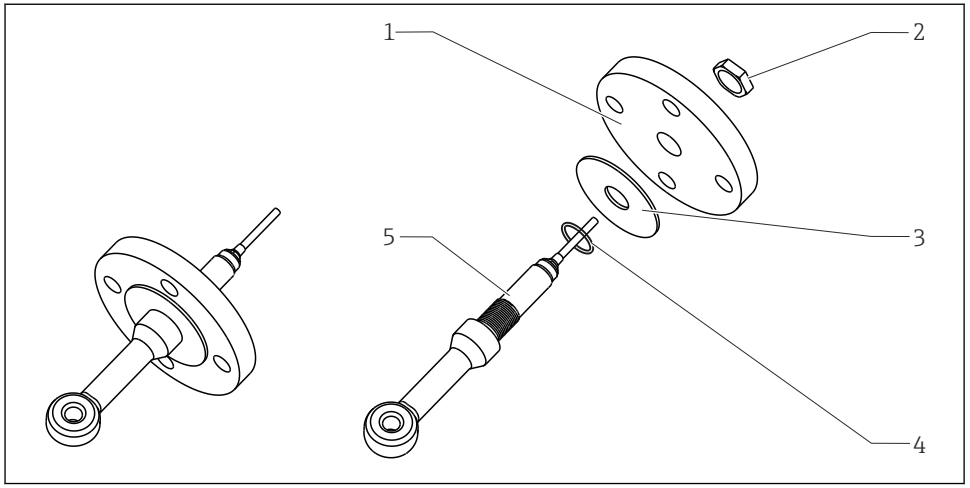
⚠ WARNING

Leakage

Risk of injury if medium escapes!

- ► Tighten sensor nut using a torque of 20 Nm.
- ► To avoid leakages, regularly check the tightness of the nut.

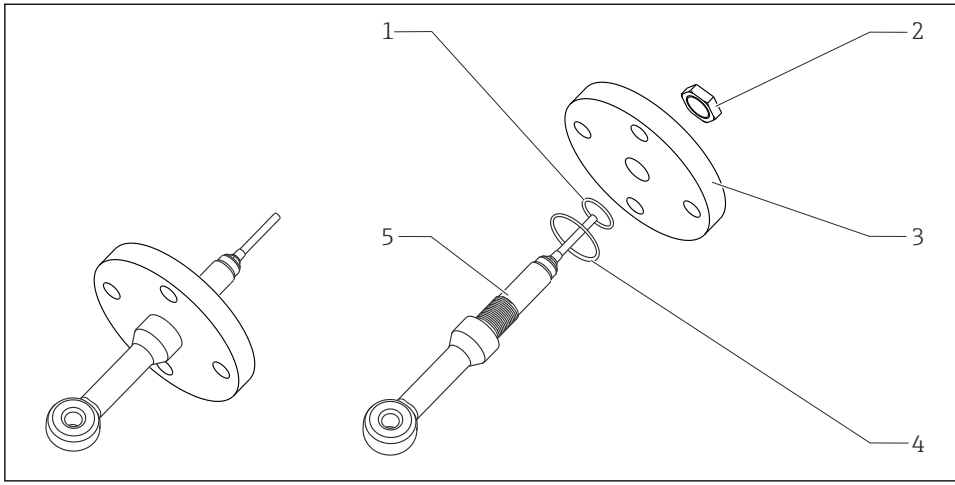
Flange, not in contact with medium



3 Fixed flange, not in contact with medium (for order option: "Process connection" = 5, 6, 7)

1 Flange (stainless steel)
2 Nut
3 Sealing disk (GYLON)
4 O-ring
5 Sensor

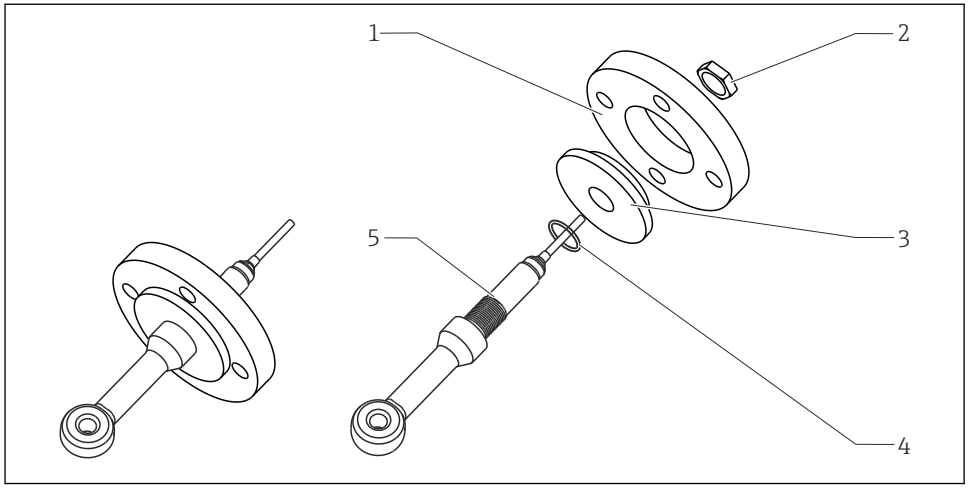
Flange, in contact with medium



4 Fixed flange, in contact with medium (for order option: "Process connection" = 3, 4, P)

1 O-ring
2 Nut
3 Flange (stainless steel)
4 Radial seal (only for version "Process connection" = P)
5 Sensor

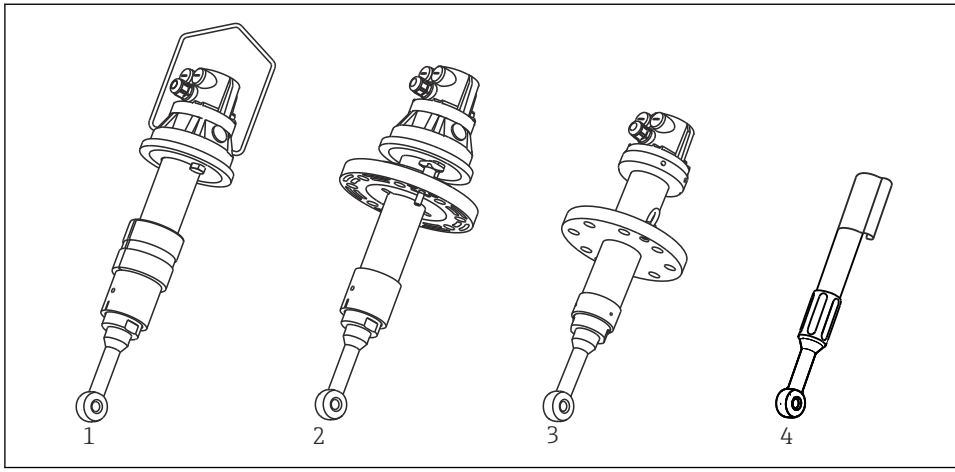
Lap joint flange, not in contact with medium



5 Lap joint flange, not in contact with medium (for order option: "Process connection" = A, B, C)

1 Lap joint flange (PP-GF)
2 Nut (stainless steel)
3 Flange (PVDF)
4 O-ring
5 Sensor

4.2.2 Installation in assembly



6 *Installation of sensor with assembly*

1 *CLA111 with suspension bracket*
2 *CLA111 with flange connection*
3 *CLA140 with flange connection*
4 *CYA112*

4.3 Post-installation check

Put the sensor into operation only if you can answer yes to the following questions:

1. Are the sensor and cable undamaged?
2. Is the orientation correct (arrow on threaded sleeve=flow direction=installation direction)?
3. Has the sensor been installed in the process connection, and does not suspend freely from the cable?

5 Electrical connection

WARNING

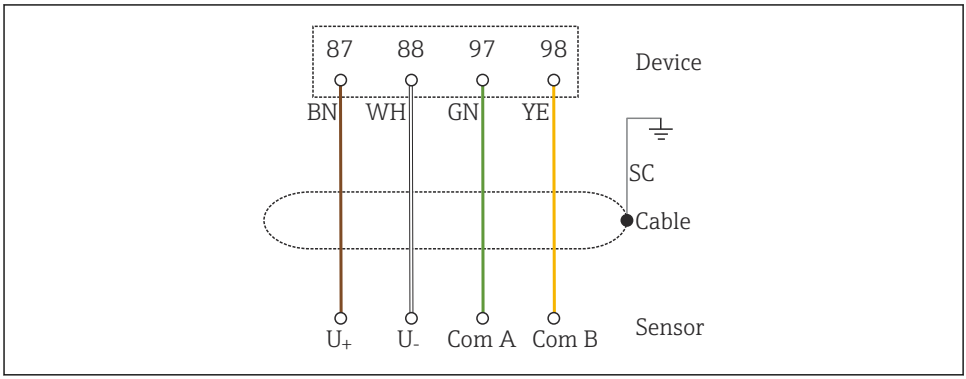
Device is live!

Incorrect connection may result in injury or death!

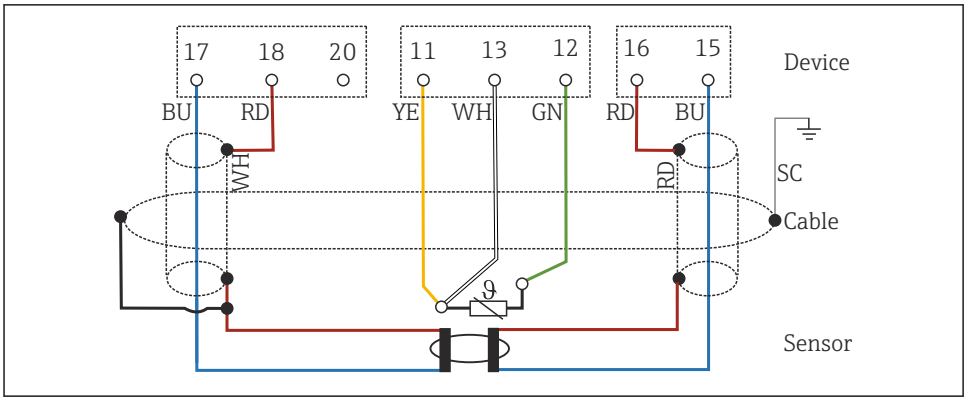
- The electrical connection may be performed only by an electrical technician.
- The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- **Prior** to commencing connection work, ensure that no voltage is present on any cable.

5.1 Connecting the sensor

5.1.1 Direct connection, e.g. CM42B



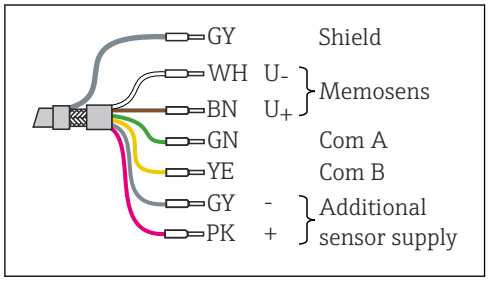
7 *CLS50D to CM42B*



8 *CLS50 to CM42B*

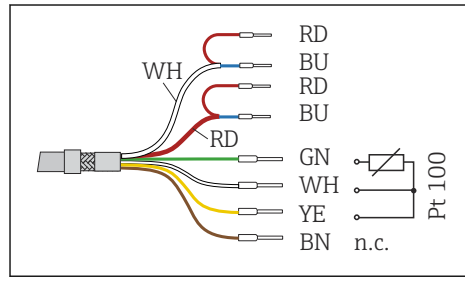
5.1.2 Cable extension

The sensor is supplied with a fixed cable. The cable between the sensor and transmitter can be extended using the measuring cable CYK11 (CLS50D) or CLK6 (CLS50) (not applicable for use in hazardous environments).



9 *CYK11 for extension of CLS50D*

Total cable length (max.): 100 m (330 ft)



10 *CLK6 for extension of CLS50*

Total cable length (max.): 55 m (180 ft)

CLS50 only:
The residual coupling of the sensor increases when the fixed cable is extended.

5.2 Ensuring the degree of protection

Only the mechanical and electrical connections which are described in these instructions, and which are necessary for the required intended use, may be established on the device delivered.

▶ Exercise care when carrying out the work.

Otherwise, the individual types of protection (Ingress Protection (IP), electrical safety, EMC interference immunity) agreed for this product can no longer be guaranteed due, for example, to covers being left off or cable (ends) that are loose or insufficiently secured.

5.3 Post-connection check

Device health and specifications	**Action**
Is the outside of the sensor, assembly or cable free from damage?	▶ Perform a visual inspection.
Electrical connection	**Action**
Are the mounted cables strain-relieved and not twisted?	▶ Perform a visual inspection. ▶ Untwist the cables.
Is a sufficient length of the cable cores stripped, and are the cores positioned in the terminal correctly?	▶ Perform a visual inspection. ▶ Pull gently to check they are seated correctly.
Are the power supply and signal lines correctly connected?	▶ Refer to the wiring diagram for the transmitter.
Are all screw terminals tightened?	▶ Tighten the screw terminals.

Device health and specifications	Action
Are all the cable entries installed, tightened and leak-tight?	▶ Perform a visual inspection. In the case of lateral cable entries: ▶ Point cable loops downward so that water can drip off.
Are all cable entries mounted on the side or pointing downwards?	

6 Commissioning

Prior to initial commissioning, ensure that:
- The sensor is correctly installed
- The electrical connection is correct

Operating Instructions of the transmitter being used, e.g. BA01245C if using Liquiline CM44x or CM44xR.

⚠ WARNING

Escaping process medium

Risk of injury from high pressure, high temperatures or chemical hazards!
- ▶ Before applying pressure to an assembly with cleaning system, ensure that the system has been connected correctly.
- ▶ If you cannot reliably establish the correct connection, do not install the assembly in the process.

If using an assembly with automatic cleaning function:

1. Check that the cleaning medium (water or air, for example) is connected correctly.
2. At the transmitter, enter all the settings specific to the parameters and measuring point.
3. Following commissioning:
   Maintain the sensor at regular intervals.
   ↳ This is the only way to ensure reliable measurements.

7 Maintenance

⚠ WARNING

Thiocarbamide

Harmful if swallowed! Limited evidence of carcinogenicity! Possible risk of harm to the unborn child! Dangerous for the environment with long-term effects!
- ▶ Wear protective goggles, protective gloves and appropriate protective clothing.
- ▶ Avoid all contact with the eyes, mouth and skin.
- ▶ Avoid discharge into the environment.

⚠ CAUTION

Corrosive chemicals

Risk of chemical burns to the eyes and skin and risk of damage to clothing and equipment!

- ▶ It is absolutely essential to protect the eyes and hands properly when working with acids, alkalis and organic solvents!
- ▶ Wear protective goggles and safety gloves.
- ▶ Clean away splashes on clothes and other objects to prevent any damage.
- ▶ Comply with instructions in the safety data sheets for the chemicals used.

Clean away fouling on the sensor as follows depending on the type of fouling:

1. Oily and greasy films:
   Clean with grease remover, e.g. alcohol, or hot water with an alkaline agent.
2. Lime and metal hydroxide buildup and low solubility (lyophobic) organic buildup:
   Dissolve buildup with diluted hydrochloric acid (3 %) and then rinse thoroughly with plenty of clear water.
3. Sulfidic buildup (from flue gas desulfurization or wastewater treatment plants):
   Use a mixture of hydrochloric acid (3 %) and thiocarbamide (commercially available) and then rinse thoroughly with plenty of clear water.
4. Buildup containing protein (e.g. in the food industry):
   Use a mixture of hydrochloric acid (0.5 %) and pepsin (commercially available) and then rinse thoroughly with plenty of clear water.
5. Readily soluble biological buildup:
   Rinse with pressurized water.

After cleaning, rinse the sensor thoroughly with plenty of water.

8 Repair

8.1 General information

The repair and conversion concept provides for the following:

- The product has a modular design
- Spare parts are grouped into kits which include the associated kit instructions
- Only use original spare parts from the manufacturer
- Repairs are carried out by the manufacturer's Service Department or by trained users
- Certified devices can only be converted to other certified device versions by the manufacturer's Service Department or at the factory
- Observe applicable standards, national regulations, Ex documentation (XA) and certificates

1. Carry out the repair according to the kit instructions.
2. Document the repair and conversion and enter, or have entered, in the Life Cycle Management tool (W@M).

8.2 Spare parts

Device spare parts that are currently available for delivery can be found on the website:

https://portal.endress.com/webapp/SparePartFinder

▶ Quote the serial number of the device when ordering spare parts.

8.3 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

www.endress.com/support/return-material

8.4 Disposal

If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

9 Accessories

The following are the most important accessories available at the time this documentation was issued.

Listed accessories are technically compatible with the product in the instructions.

1. Application-specific restrictions of the product combination are possible.
   Ensure conformity of the measuring point to the application. This is the responsibility of the operator of the measuring point.
2. Pay attention to the information in the instructions for all products, particularly the technical data.
3. For accessories not listed here, please contact your Service or Sales Center.

9.1 Measuring cable

9.1.1 For CLS50D

Memosens data cable CYK11

- Extension cable for digital sensors with Memosens protocol
- Product Configurator on the product page: www.endress.com/cyk11

Technical Information TI00118C

9.1.2 For CLS50

Measuring cable CLK6
- Extension cable for inductive conductivity sensors, for extension via VBM junction box
- Sold by the meter, order number: 71183688

VBM
- Junction box for cable extension
- 10 terminal strips
- Cable entries: 2 x Pg 13.5 or 2 x NPT ½"
- Material: aluminum
- Degree of protection: IP 65
- Order numbers
  - Cable entries Pg 13.5 : 50003987
  - Cable entries NPT ½": 51500177

9.2 Assemblies

Dipfit CLA111
- Immersion assembly for open and closed vessels with flange DN 100
- Product Configurator on the product page: www.endress.com/cla111

Technical Information TI00135C

Dipfit CLA140
- For the CLS50/CLS50D inductive sensor
- Immersion assembly with flange connection for very demanding processes
- Product Configurator on the product page: www.endress.com/cla140

Technical Information TI00196C

Flexdip CYA112
- Immersion assembly for water and wastewater
- Modular assembly system for sensors in open basins, channels and tanks
- Material: PVC or stainless steel
- Product Configurator on the product page: www.endress.com/cya112

Technical Information TI00432C

9.3 Calibration solutions

Conductivity calibration solutions CLY11
Precision solutions referenced to SRM (Standard Reference Material) by NIST for qualified calibration of conductivity measuring systems in accordance with ISO 9000

- 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, 107.00 mS/cm (reference temperature 25 °C (77 °F)), 500 ml (16.9 fl.oz)
  Order No. 50081906

Technical Information TI00162C

10 Technical data

10.1 Input

10.1.1 Measured variables

- Conductivity
- Temperature

10.1.2 Measuring range

Conductivity	2 µS/cm to 2000 mS/cm (uncompensated)
Temperature	-20 to +180 °C (-4 to +350 °F)

10.1.3 Cell constant

$k = 1.98\ cm^{-1}$

10.1.4 Temperature measurement

CLS50D

Pt1000 (Class A according to IEC 60751)

CLS50

Pt100 (Class A according to IEC 60751)

10.2 Performance characteristics

10.2.1 Conductivity response time

$t_{95} \leq 2$ s

10.2.2 Temperature response time

PEEK version:	$t_{90} \leq 7$ min
PFA version:	$t_{90} \leq 11$ min

10.2.3 Measurement error

-20 to 100 °C (-4 to 212 °F):	±(5 µS/cm + 0.5 % of reading)
> 100 °C (212 °F):	±(10 µS/cm + 0.5 % of reading)

10.2.4 Repeatability

For T < 100 °C (212 °F): 0.2 % of reading + 1 µS/cm

For T > 100 °C (212 °F): 0.2 % of reading + 2 µS/cm

10.3 Environment

10.3.1 Ambient temperature

CLS50D

-10 to +60 °C (+10 to +140 °F)

CLS50

-10 to +70 °C (+10 to +160 °F)

10.3.2 Storage temperature

-20 to +80 °C (0 to +180 °F)

10.3.3 Degree of protection

IP 68 / NEMA type 6 (sensor in installed state with genuine seal)

10.4 Process

10.4.1 Process temperature

CLS50D

Sensor material	CLS50D-**1/2 Without flange	CLS50D-**3/4/5/6/7 DN50 PN16, ANSI 2" JIS	CLS50D-**8 DN50 PN16	CLS50D-**A/B/C Lap joint flange	CLS50D-**P DN50 PN40
PEEK, PEEK adapter	−20 to 125 °C (-4 to 260 °F)	−20 to 125 °C (-4 to 260 °F)	Version not available	−20 to 125 °C (-4 to 260 °F)	Version not available
PEEK, 1.4571 adapter	−20 to 110 °C (-4 to 230 °F)	−20 to 110 °C (-4 to 230 °F)	Version not available	−20 to 110 °C (-4 to 230 °F)	−20 to 110 °C (-4 to 230 °F)
PFA	−20 to 110 °C (-4 to 230 °F)	−20 to 110 °C (-4 to 230 °F)	−20 to 110 °C (-4 to 230 °F)	−20 to 110 °C (-4 to 230 °F)	Version not available

Versions with explosion protection (→ Configurator on website, feature 020)
The maximum permitted process temperature is reduced to 120 °C (248 °F) for the versions with PEEK sensor material and PEEK adapter material. The maximum permitted process temperature in the hazardous area for all other versions is 110 °C (230 °F).

CLS50

Sensor material	CLS50-*1/2/3/4 G¾ [1], NPT1" [2] DN50 PN16 [3], ANSI 2" [3]	CLS50-*5/6/7 DN50 PN16, ANSI 2", JIS [4]	CLS50-*8 DN50 PN16 [5]	CLS50-*A/B/C Lap joint flange	CLS50-*P DN50 PN40
PEEK	−20 to 180 °C (-4 to 360 °F) [6]	−20 to 125 °C (-4 to 260 °F)	Version not available	−20 to 125 °C (-4 to 260 °F)	−20 to 125 °C (-4 to 260 °F)
PFA	−20 to 125 °C (-4 to 260 °F)	−20 to 125 °C (-4 to 260 °F)	−20 to 125 °C (-4 to 260 °F)	−20 to 125 °C (-4 to 260 °F)	Version not available

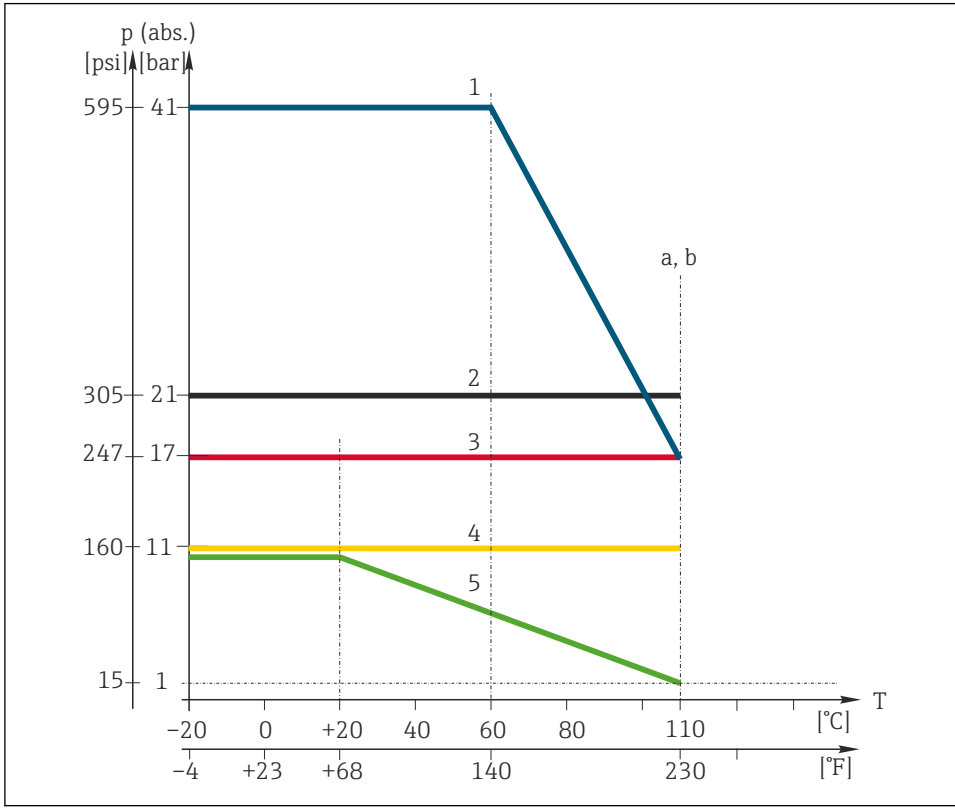
1) 316Ti
2) PEEK
3) 316L
4) PTFE>316L
5) 316L, welded sealing plate, sensor
6) Versions for the hazardous area up to 125 °C (260 °F) max.

10.4.2 Process pressure (absolute)

Max. 41 bar (595 psi), depending on sensor version, → temperature-pressure chart

10.4.3 Temperature/pressure diagram

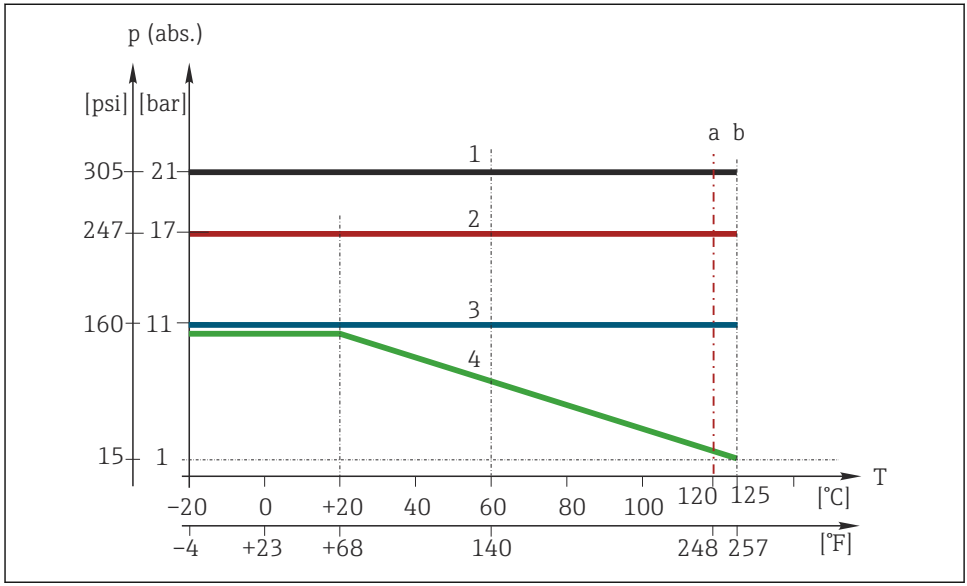
CLS50D-*E/F/G (Version with PEEK sensor material, 1.4571 adapter material)**



11 *Temperature/pressure curves*

1 *(Blue) version with flange EN 1092-1 DN50 PN40 (CLS50D-**P)*
2 *(Black) versions without flange (CLS50D-**1/2)*
3 *(Red) versions with flange DN50/ANSI 2" (CLS50D-**3/4/5/6)*
4 *(Yellow) versions with flange JIS (CLS50D-**7)*
5 *(Green) versions with lap joint flange (CLS50D-**A/B/C)*
a *Temperature limit for versions in hazardous areas*
b *Temperature limit for versions in non-hazardous areas*

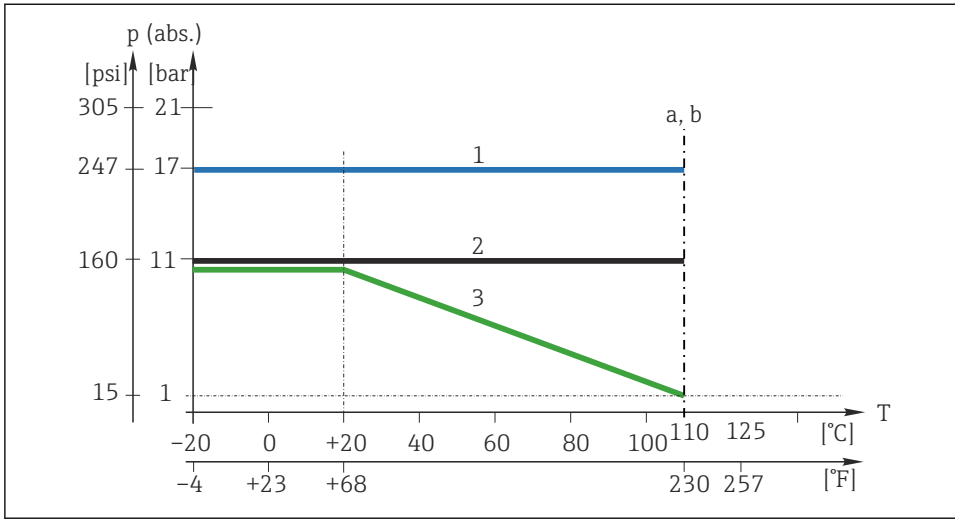
CLS50D-***B/C (Version with PEEK sensor material, PEEK adapter material)



12 Temperature/pressure curves

*1 (Black) versions without flange (CLS50D-**1/2)*
*2 (Red) versions with flange DN50/ANSI 2" (CLS50D-**3/4/5/6)*
*3 (Blue) versions with flange JIS (CLS50D-**7)*
*4 (Green) versions with lap joint flange (CLS50D-**A/B/C)*
a Temperature limit for versions in hazardous areas
b Temperature limit for versions in non-hazardous areas

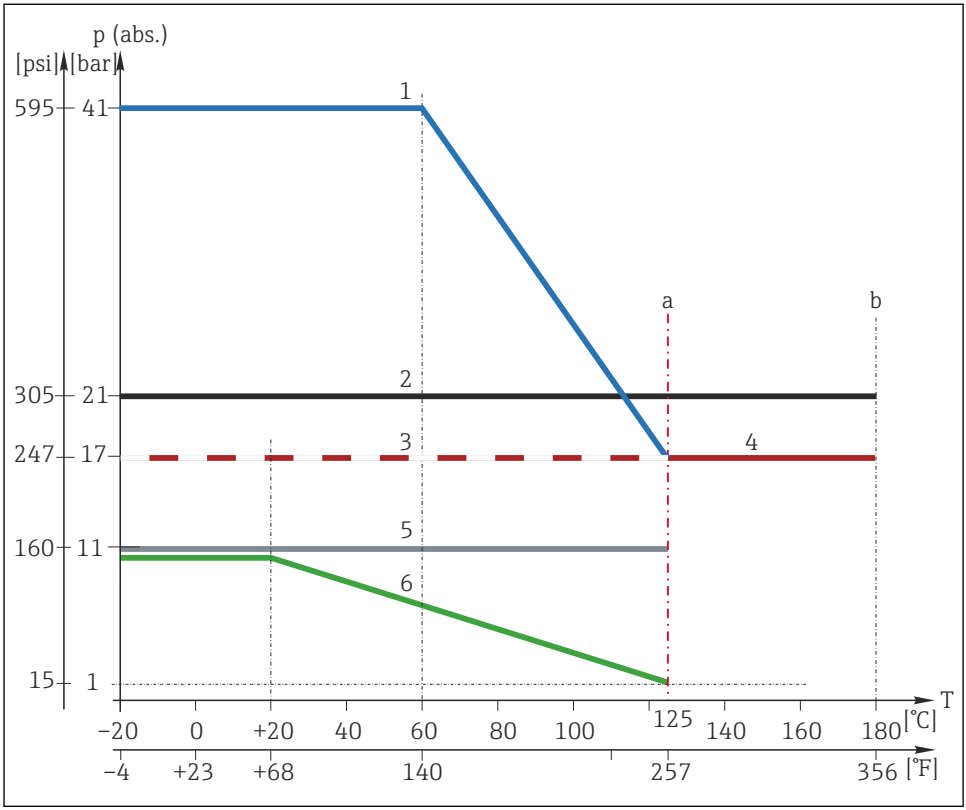
CLS50D-***D (Version with PFA sensor material)



13 Temperature/pressure curves

*1 (Blue) version without flange and with flange DN50/ANSI 2" (CLS50D-**1/3/4/5/6/8)*
*2 (Black) versions with flange JIS (CLS50D-**7)*
*3 (Green) versions with lap joint flange (CLS50D-**A/B/C)*
a Temperature limit for versions in hazardous areas
b Temperature limit for versions in non-hazardous areas

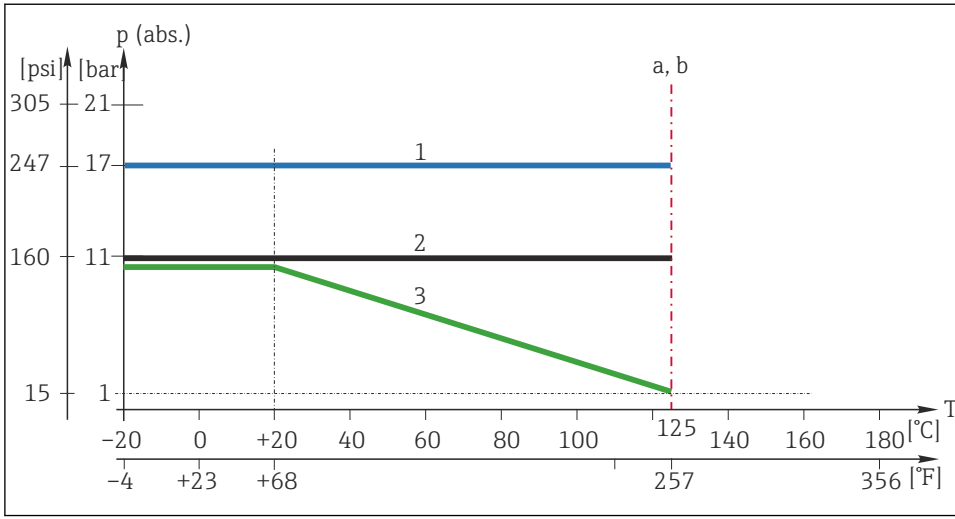
CLS50-**B/C/E/F/G (Version with PEEK sensor material)



14 *Temperature/pressure curves*

1 *(Blue) version with flange EN 1092-1 DN50 PN40 (CLS50-*P)*
2 *(Black) versions without flange (CLS50-*1/2)*
3 *(White) versions with flange DN50/ANSI 2"(CLS50)*5/6)*
4 *(Red) versions with flange DN50/ANSI 2" (CLS50-*3/4)*
5 *(Gray) version with flange JIS (CLS50-*7)*
6 *(Green) versions with lap joint flange (CLS50-*A/B/C)*
a *Temperature limit for 1, 3, 5 and 6 and for all versions in hazardous areas*
b *Temperature limit for 2 and 4 in non-hazardous areas*

CLS50-**A (version with PFA sensor material)



15 *Temperature/pressure curves*

*1 (Blue) versions without flange or with flange DN50/ANSI 2" (CLS50-*1/3/4/5/6/8)*
*2 (Black) version with flange JIS (CLS50-*7)*
*3 (Green) versions with lap joint flange (CLS50-*A/B/C)*
a Temperature limit for versions in hazardous areas
b Temperature limit for versions in non-hazardous areas

10.5 Mechanical construction

10.5.1 Weight

Approx. 0.65 kg (1.43 lbs)

10.5.2 Materials

Sensor	PEEK, PFA (depending on version)
Sensor seal	VITON, CHEMRAZ (depending on version)
Radial seal [1)]	EPDM

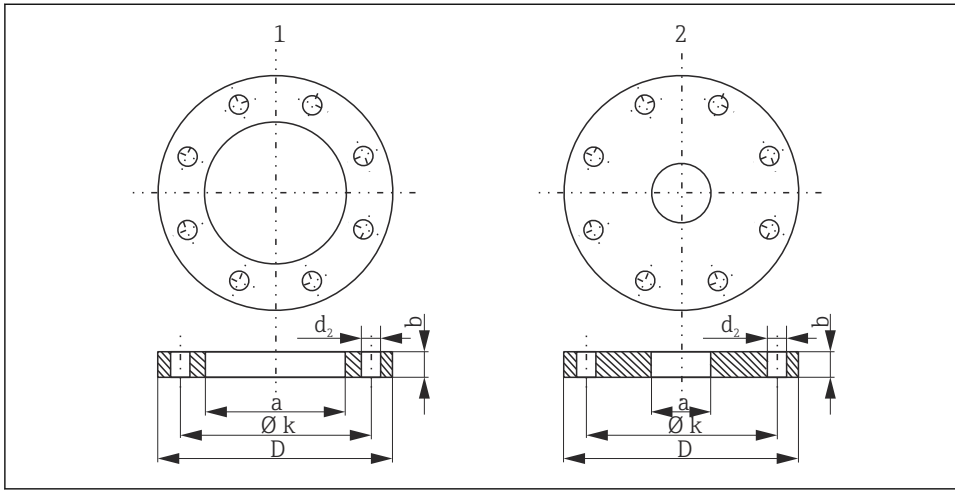
Process connections	
G¾	CLS50D-**1B/C**: PEEK GF30 CLS50D-**1D/E/F/G**: 1.4571 stainless steel (AISI 316Ti) CLS50-*1A/E/F/G*: 1.4571 stainless steel (AISI 316Ti) CLS50-*1B/C*: PEEK GF30
NPT 1"	PEEK
Fixed flange	CLS50D-**3/4/5/6/8/P***: 1.4404 stainless steel (AISI 316L) CLS50D-**7***: 1.4435 stainless steel (AISI 316L) CLS50-*3/4/5/6/8/P**: 1.4404 stainless steel (AISI 316L) CLS50-*7**: 1.4435 stainless steel (AISI 316L)
Sealing disk	GYLON (PTFE ceramic-filled)
Lap joint flange	PP-GF
Flange combined with lap joint flange	PVDF

1) Only version with "process connection" = P

10.5.3 Process connections

- Thread G¾
- NPT 1" thread
- Lap joint flange EN 1092 DN50 PN10
- Lap joint flange ANSI 2" 150 lbs
- Lap joint flange JIS 10K 50A
- Flange EN 1092-1 DN50 PN16
- Flange EN 1092-1 DN50 PN40
- Flange ANSI 2" 300 lbs
- Flange JIS 10K 50A

Flange dimensions



16 *Flange dimensions*

1 Lap joint flange (PVDF)
2 Fixed flange (stainless steel)

Dimensions in mm

Lap joint flange	DN50 PN10	ANSI 2" 150 lbs	JIS 10K 50A
D	165	165	152
Ø k	125	121	120
d_2	4 x 18	8 x 19	4 x 19
b	18	18	18
a	78	78	78
Screws	M16	M16	M16

Dimensions in mm

Fixed flange	DN50 PN16	DN50 PN40	ANSI 2" 300 lbs	JIS 10K 50A
D	165	165	165.1	155
Ø k	125	125	127	120
d_2	4 x 18	4 x 18	8 x 19	4 x 19
b	18	20	22.2	16

Fixed flange	DN50 PN16	DN50 PN40	ANSI 2" 300 lbs	JIS 10K 50A
a	27	27	27	27
Screws	M16	M16	M16	M16

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