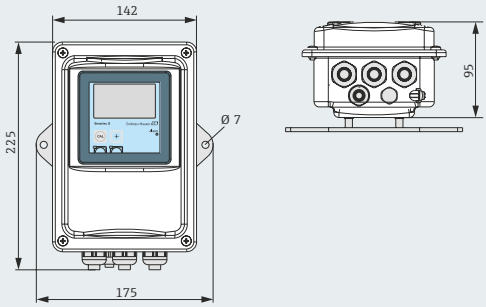
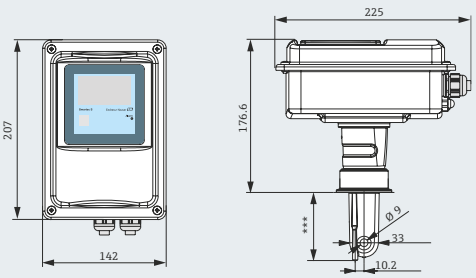
Dimensions (mm)

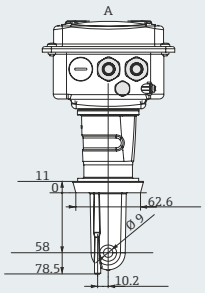
CLD134
Remote version

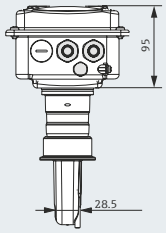


CLD134
Compact version

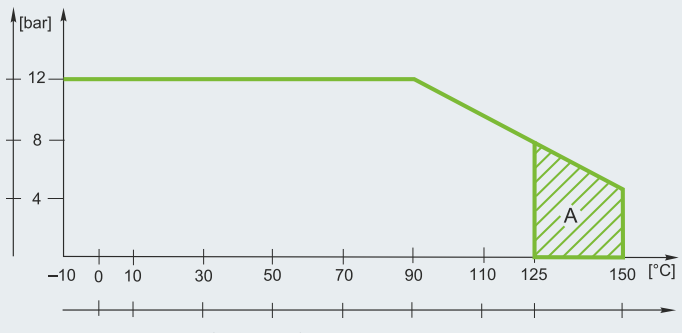


CLD134, dairy pipe fitting DIN11851, DN50





Pressure-temperature load curve



A = sterilisation time (max 60 min)

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Flexdip CYA112 and CYH112

Assembly and holder system for sensors in open basins, channels and tanks.

CYA12

CYH12

- Optimum configuration of any measuring point
- Easy to install and maintain
- Stainless steel or PVC versions

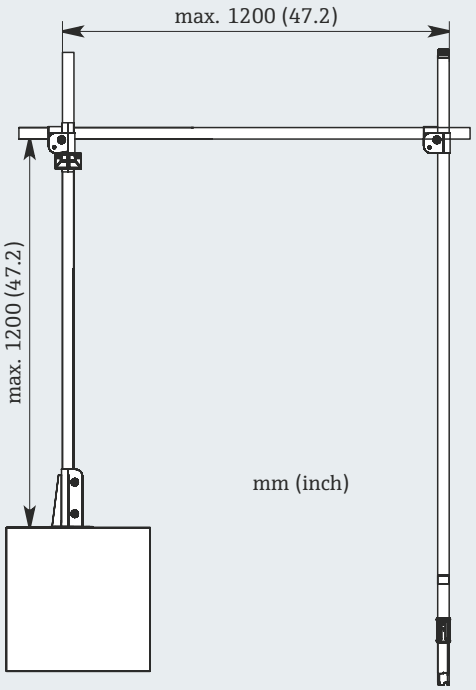
The Flexdip CYA112 assembly and CYH112 holder forms a modular holding system for sensors used in open basins, channels and tanks. For in-situ measurement in water and wastewater plants, the assembly and associated sensor are directly immersed in the medium. The flexible CYH112 holder is suitable for fixing on the floor, wall or directly on a rail.

In addition to the standard G1 sensor connection thread, adapters can be used to match to other, different sensor threads and designs. A quick screw connector allows sensors to be assembled without the need for cable twisting meaning that sensors with an inductive Memosens plug-in head can be easily installed and replaced.

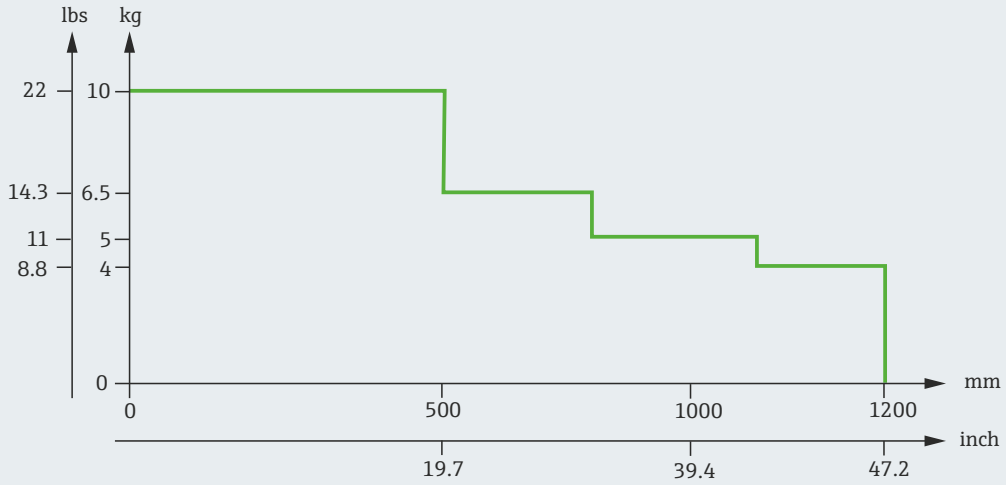
Technical data

		CYA112 assembly
Material	:	Stainless steel or PVC
Connection angle	:	0, 45°, 90°
Temperature	:	-20...+60°C
Pressure	:	Unpressurised
Length	:	600...3600mm (in 600mm steps)
Sensor connection	:	NPT¾", G1", Pg 13.5, G¾", G1½"
Immersion pipe	:	Standard, chain or floater
		CYH112 holder
Material	:	Stainless steel or plastic
Installation	:	Floor, wall or rail
Length	:	500, 1000 and 1800mm
Immersion pipe connection	:	Chain (plastic), chain (stainless steel), cross clamp, pendulum holder

Installation



Maximum extension



The given values are valid for floor, wall and rail mounting. The maximum extension depends on the load (weight of immersion pipe, assembly and cable).

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Flowfit CPA240/250

pH/redox flow-through assemblies with a maximum of three electrode locations.

CPA240-2

CPA240-3

CPA250-A

- Bypass installation
- Direct installation in pipes
- Calibration without removing electrodes from holder
- Various process connections
- Vertical inflow option prevents sedimentation of medium

Flow-through assemblies CPA240 and CPA250 are intended for direct mounting in/between process pipelines. The assemblies can be used for a wide range of temperatures and applications. Vertical inflow prevents solids from being deposited in the assembly. They are used in many applications, such as:

- water treatment plants
- artificial fertiliser production
- sugar industry
- gas scrubbers
- petrochemical plants

Benefits at a glance

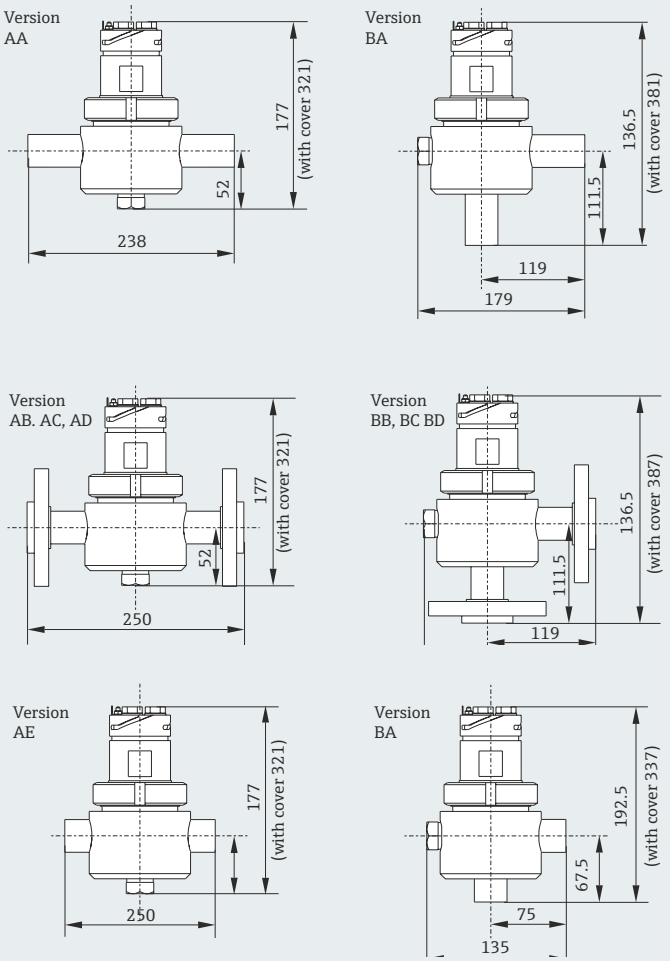
- Simple installation and removal of electrode holder
- Three electrode locations for electrodes and cleaning
- Integrated potential matching pin in Hastelloy C4 or tantalum (analogue only)
- Flexible process connections
- Usable at high pressures and temperatures (up to 10 bar and 150°C max.)
- Drain screw for sampling
- Electrode connection area protected by a cover
- Chemical cleaning may also be retrofitted

Technical data

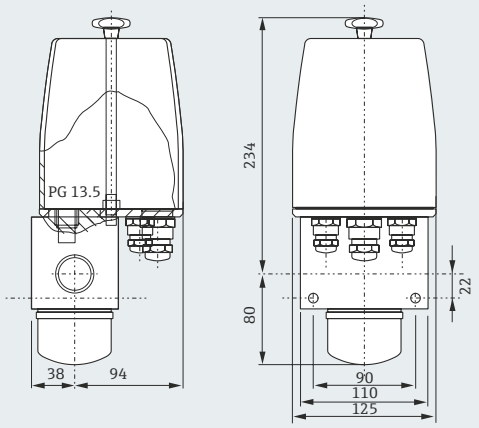
	CPA240-2x	CPA240-3x	CPA250-A
Material	: PVDF	Stainless steel 1.4404	PP
Wet sections (PM)	: HC4 or tantalum	HC4 or tantalum	1.4539
O-rings	: EPDM, Viton Chemraz or Fluoraz	EPDM, Viton Chemraz or Fluoraz	EPDM
Temperature	: 0...120°C	-15...150°C	Unpressurised/80°C
Pressure	: 8 bar/50°C	10 bar/150°C	6 bar/20°C
Electrode length	: 120mm	120mm	120mm

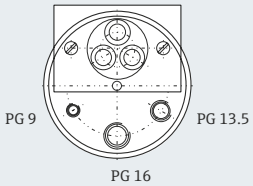
Dimensions (mm)

CPA240 (-2 or -3)



CPA250-A





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Flowfit CYA251

Flow assembly for nitrate/SAC, turbidity and oxygen sensors.

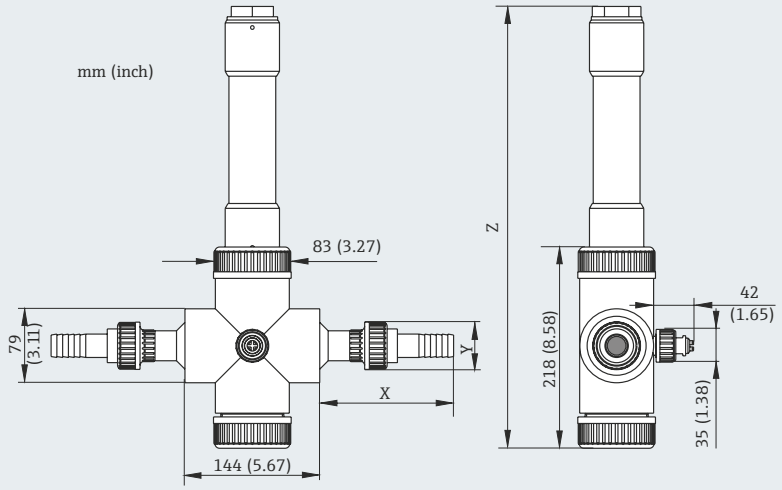
- Simple pipe or wall mounting
- Easy adaptation to your process: process connections for almost all pipe diameters available
- Short sensor response times thanks to low assembly volume
- Automatic or manual cleaning

Flowfit CYA251 is a flow assembly for nitrate/SAC, turbidity and oxygen sensors with a diameter of 40mm. It allows optimum adaption to your piping system thanks to numerous available process connections. The ruggedized material withstands even aggressive media and harsh environmental conditions and a back-pressure valve protects your process from blowing out and increases operational safety. Better still, with the automatic cleaning nozzle, you'll benefit from extended maintenance intervals.

Technical data

Compatible sensors	:	CAS51D (SAC/nitrate); COS31, COS41, COS51D, COS61(D) (oxygen); CUS31, CUS41, CUS51D (turbidity)
Temperature	:	0°C...+50°C
Pressure	:	Max 6 bar at 20°C, 4 bar at 50°C
Typical flow values	:	200l/h (oxygen), 100l/h (turbidity/UV)
Seal	:	EPDM
Weight	:	1.5kg or 1.8kg (depends on version)

Dimensions (mm)

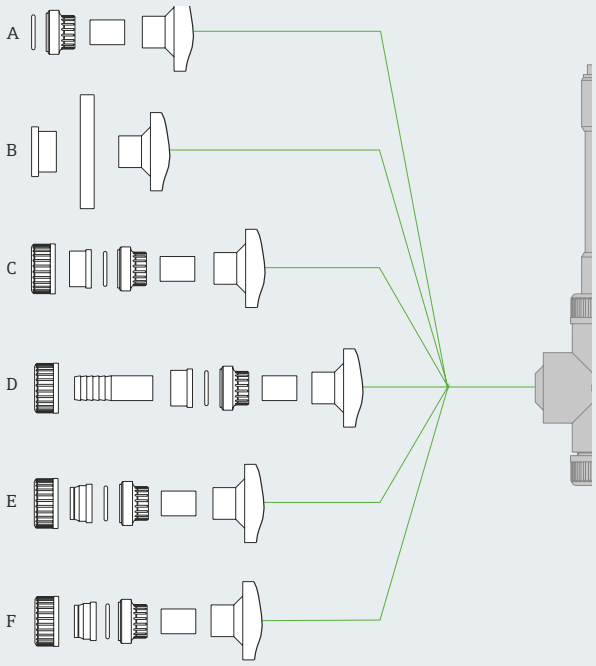


Sensor	CAS51D 2 mm	CAS51D 8 mm	CAS51D 40 mm	COS51D COS41	COS61D COS61 COS31	CUS31 CUS41	CUS51D
Z mm (inch)	468 (18.43)	471 (18.54)	477 (18.78)	284 (11.18)	326 (12.83)	625 (12.80)	332 (13.07)

Connections	NPT ¾"	Rp ¾	DN 25	ANSI 1"	Hose D20	G1¼
X mm (inch)	83 (3.27)	83 (3.27)	83 (3.27)	50.5 (1.97)	137 (5.39)	61 (2.40)
Y mm (inch)	50.5 (1.99	50.5 (1.99)	50.5 (1.99)	115 (4.53)	50.5 (1.99	44.5 (1.75)

Process connections

A. External thread G1¼, PVC
B. Flange ANSI 1", PVC
C. Glue-in port DN 25, PVC
D. Hose D20, PVC
E. Internal thread Rp ¾", PVC
F. Internal thread NPT ¾", PVC



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Cleanfit CPA450

Retractable assembly with ball valve for use with pH/ORP and DO sensors.

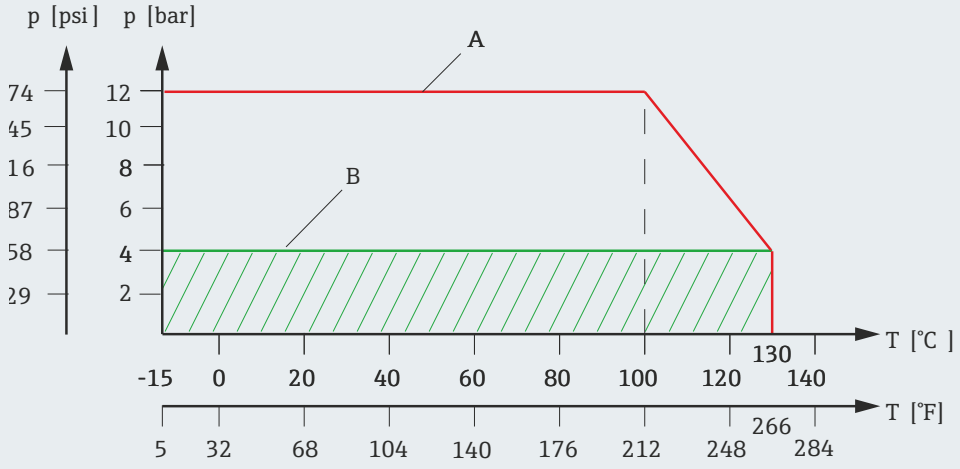
- No process downtime
- Simplified maintenance and calibration
- Integrated rinse and calibration connections

Perfect for use across industry, the Cleanfit CPA450 retractable assembly simplifies maintenance procedures by allowing the replacement of pH/ORP or oxygen sensors while the tank is full or under process conditions. Sensor cleaning and calibration can take place without any process interruption!

Technical data

Immersion depths	: Max 100mm, 250mm, 700mm (depending on process connection)
Process connection	: Full range including threaded and flanged connections
Process pressure	: Max 12 bar at 100°C (max 2 bar for manual retraction, max 6 bar at 130°C)
Process temperature	: -15...130°C
Weight	: 2-10kg depending on the version
Immersion tube	: Stainless steel
Rinse connection plugs	: PVDF
O-rings	: EPDM, Viton, Kalrez
Ball valve	: Stainless steel
Ball valve sealings	: PTFE

Pressure-temperature load curve



Pressure-temperature load curve

A. Maximum process operating pressure (static), only for completely installed assembly
B. Advised upper insertion/retraction pressure (functional)

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Cleanfit CPA871

Retractable assembly for pH/ORP, oxygen and NIR sensors.

- Clean, sterilise or calibrate/ adjust the sensors without interrupting the process.
- Optional immersion chamber eliminates problems due to sticky media.
- Wide variety of process connections and wetted materials, even for corrosive media or hazardous areas.

The Cleanfit CPA871 retractable assembly provides reliable pH/ ORP, oxygen and NIR measurement in sensors with a 12mm diameter and 225/360mm length. Manual or pneumatic, the assembly is easily installed in both vessels and pipes and you can remove, clean, sterilise or calibrate/adjust the sensors without interrupting the process.
Cleanfit CPA871 guarantees the highest operational safety in both standard and demanding applications.

Its intelligent functions prevent any leakage of medium during operation, cleaning or calibration, offering optimum protection of the process and operating personnel. The retractable assembly flexibly adapts to your application. Be it long immersion depths in sticky media, aggressive environments or hazardous areas, you choose the right material and specification to suit your application.

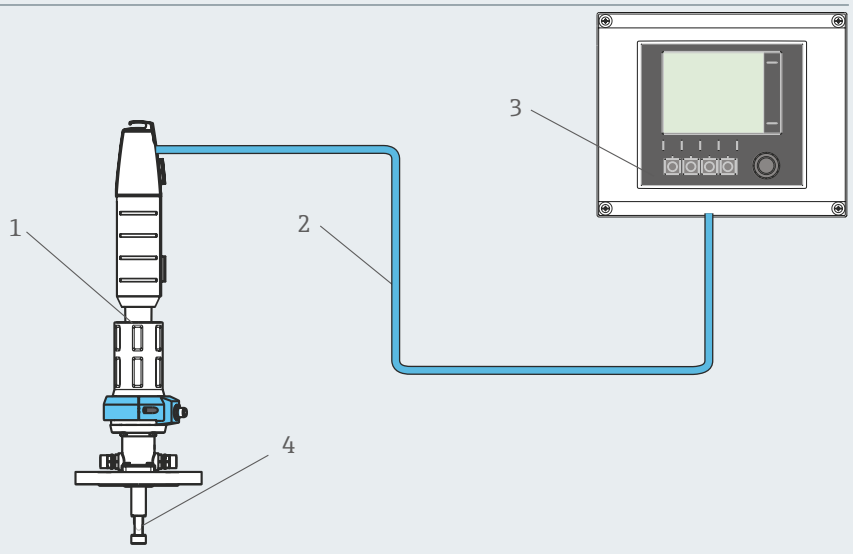
Technical data

Parameters	: pH/ORP, oxygen, NIR
Sensors	: Gel, ISFET, KCl
Version	: Standard or immersion
Drive	: Manual or pneumatic
Housing	: Stainless steel
Temperature	: -10°C...+140°C (for all materials except PVDF and conductive PVDF)
Pressure	: Manual: 8 bar up to 140°C, pnuematic: 16 bar up to 140°C

Measuring system

Measuring system (example)

1. Cleanfit CPA871 assembly
2. Measuring cable
3. Liquiline CM44x transmitter
4. Sensor



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Cleanfit CPA875

Retractable assembly to keep your process 100% sterile.

- Dynamic sealing prevents contamination.
- Remove, sterilize and calibrate the sensor while process is running.
- EHEDG-certified assembly: process connection and service chamber.

Designed to meet the food & beverage and life science industry standards, the Cleanfit CPA875 retractable assembly provides reliable pH/ORP, oxygen and NIR measurement in sensors with a diameter of 12mm and 225/360mm in length. Manual or pneumatic, the assembly is easily installed in both vessels and pipes and you can remove, clean, sterilise or calibrate/adjust the sensors without interrupting the process. Fully certified (EHEDG and ASME BPE) and made of FDA-recommended materials, the CPA875 is the right choice where hygiene counts!

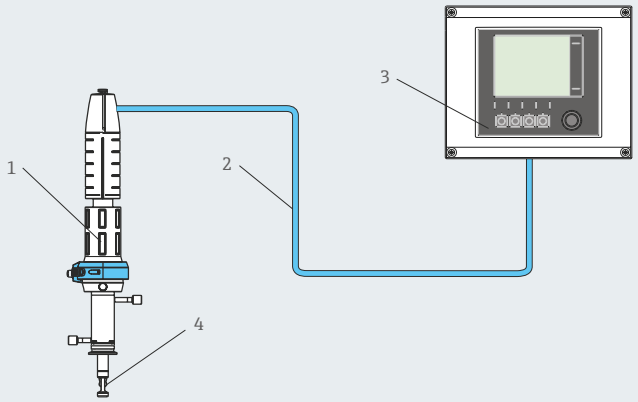
Technical data

Parameters	: pH/ORP, oxygen, NIR
Sensors	: Gel, ISFET, KCl
Chamber	: Single or double
Drive	: Manual or pneumatic
Housing	: Stainless steel
Surface roughness	: Ra < 0.76µm or Ra < 0.38µm (optional)
Temperature	: -10°C...+140°C
Pressure	: Manual: 8 bar up to 140°C, pneumatic: 16 bar up to 140°C
Certification	: Pharmaceutics CoC, EHEDG, ASME BPE, FDA, USP Class VI (optional)

Measuring system

Single chamber measuring system

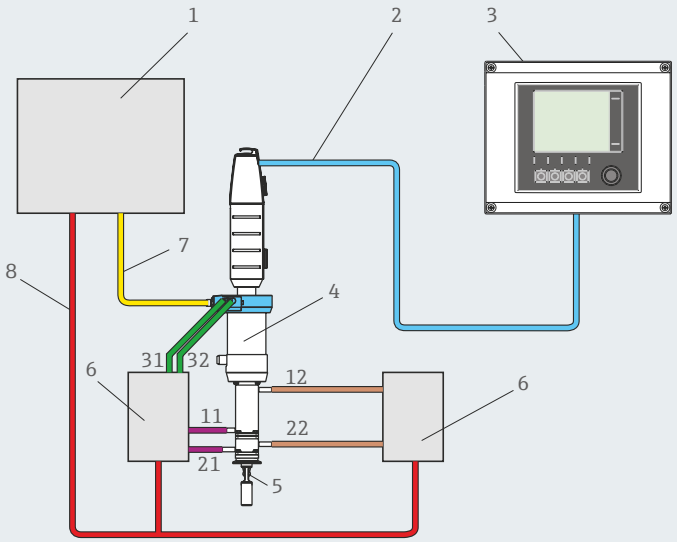
1. Cleanfit CPA875 assembly
2. Measuring cable
3. Liquiline CM44x transmitter
4. Sensor



Double chamber measuring system

1. Control unit
2. Measuring cable
3. Liquiline CM44x transmitter
4. Cleanfit CPA875 assembly
5. Sensor
6. Valve manifold
7. Limit position switch relay signal
8. Control signals (electric/pneumatic)

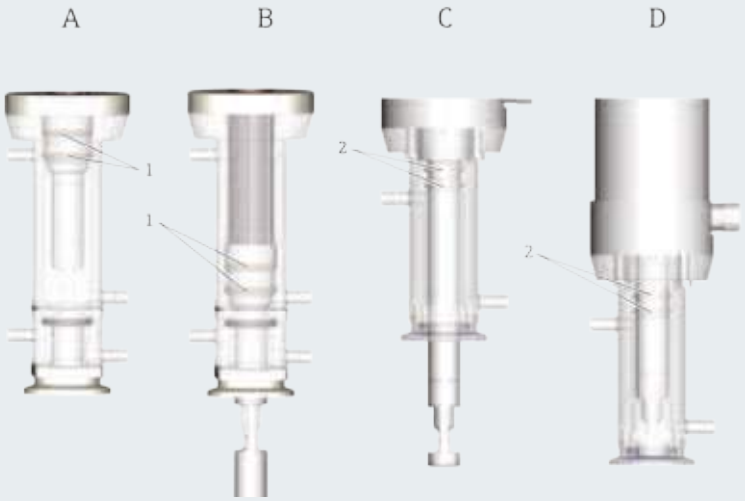
11/12. Inlet/outlet of inner service chamber
21/22. Inlet/outlet of front service chamber
31/32. Drive control



Sealing principle

Sealing principle

A. Double chamber in service position
B. Double chamber in measuring position
C. Single chamber in measuring position
D. Single chamber in service position
1. 'Moving' seals in the double chamber
2. 'Fixed' seals in the single chamber



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Topcal CPC310

Fully automatic pH/ORP measuring, cleaning and calibration system. Suitable for hazardous area use.

WirelessHART

- Low maintenance, even with heavily soiled or aggressive media
- In-process cleaning and calibration: no need to remove electrode
- High accuracy and reproducibility
- System status messages with feedback to control room
- HART and PROFIBUS compatible

Endress+Hauser's Topcal S measuring, cleaning and calibration system makes fully automatic, economical pH and ORP measurement possible even in aggressive process environments. With the CPC310, there is a significant reduction in the use of cleaning agents and buffers as these are pumped through individual pipes to the new rinsing block. In this way, all media is present front end, directly at the retractable assembly. The additional activation of two external valves for steam sterilisation or for using a spray flange at the assembly, is now available as standard, with the multi-hoses easily connectable to the retractable assembly. However, the real cost-saving bonus is the fully automatic inline cleaning and calibration without the need for electrode removal so that minimal maintenance is required.

Technical data

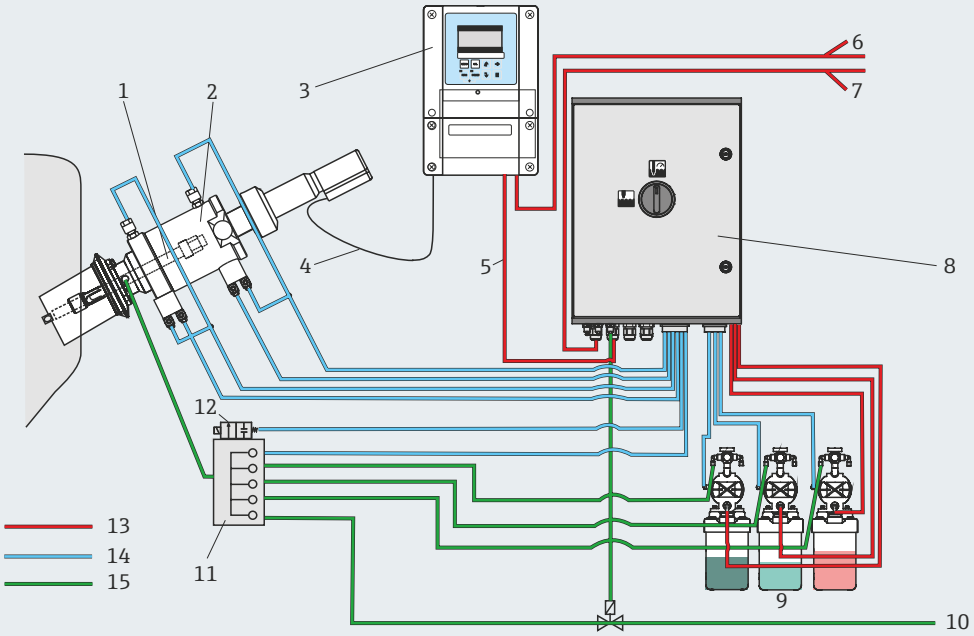
Measuring system	: CPG310 control unit, Mycom S CPM153 transmitter, rinse block, membrane pumps
Cleaning and calibration Programs	: Clean, clean sterilise, clean calibrate, clean sterilise calibrate
Measured variables	: pH (analogue or digital), ORP (analogue or digital), temperature
Measuring range	: pH: -2...16pH, ORP: -1500...+1500mV/-300...+300%, temperature: -50...+200°C
Current output	: 0/4...20mA, max load 600Ω
Repeatability	: 0.1% of measuring range

Topcal S comes complete with both fixed and user-definable programmes for process optimisation. Early warning functions guarantee reliability and system performance, even in hazardous areas, thanks to the predictive maintenance sensor condition check and medium monitoring functions.

Three independent, industry-tested double-membrane pumps replace the revolver pump from the previous generation, increasing the unit's performance particularly for heavy-duty applications and where aggressive cleaning agents are used, e.g. concentrated acids and alkalis.

Automatic cleaning and calibration functions eliminate the problem of glass breakage and contamination, whilst the high reproducibility of the calibration increases product quality. The hygienic condition of the system is maintained, as the system remains closed during calibration and sterilisation.

Connections



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

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Glass pH/redox electrodes

A wide range of digital and analogue pH, redox, reference and temperature electrodes.

Digital electrode CPS11D

Digital electrode CPS41D

Compact electrode CPF81(D)

CPS71D

CPS16D

- Memosens digital pH sensor saves process data directly in the sensor
- pH combination electrodes with integrated Pt100/Pt1000/NTC make assembly and calibration simple
- A wide range of electrodes ensures the right choice for each application

The pH or redox electrode and the reference electrode are at the heart of every pH or redox measurement. The right choice is therefore very important in achieving reliable measurement with acceptable operating time and minimum maintenance. Information is provided to help you to select the right electrode. If in doubt, we would advise you to seek advice from us when making the selection. Endress+Hauser electrodes are equipped with Memosens digital technology with inductive hermetically-sealed connectors (TOP68 also available). The benefit of this connector is that it is watertight so that failures due to moisture no longer occur. In order to simplify installation (wiring), maintenance and calibration as much as possible, we would recommend in almost every case that you use a combination electrode (pH or redox electrode and reference electrode combined). Temperature compensation is necessary for pH measurement in order to guarantee accuracy. This is why we have taken a further step towards increasing ease of use, by offering a range of combination electrodes with integrated Pt100, Pt1000 or NTC.

Application

Our range of electrodes covers virtually every pH application. There are applications in all industries; from pH measurements in yoghurt, to wastewater from flue gas scrubbing, from demin water to extremely acid or alkaline products with high conductivity. There is a pressure limit (15 bar max) and temperature limit (135°C max). A complete set-up consists of a pH/redox electrode, (usually) a temperature sensor, pH measuring cable, assembly and a measurement transmitter. Depending on the application, it is worth considering an automatic cleaning system.

Installation guidelines

In order to prevent the presence of air in front of the glass diaphragm of a pH electrode, it is necessary for the electrode to be built in with the small glass sphere at the bottom, at a minimum angle of 15° relative to the horizon (in most cases). Inflow velocity should preferably

be a maximum of approximately 0.5m/s. Higher velocities can result in discrepancies, particularly at low conductivities or with contaminated electrodes. (Process) assemblies are required for simple and correct installation.
Electrodes must always remain 'wet'. 'Standing dry' can lead to a (temporary) loss of function.
Calibration is carried out using buffers. Calibration frequency varies depending on the application and the desired accuracy. The same installation guidelines apply to redox electrodes as apply to pH electrodes.

Memosens

The Memosens digital pH sensors break new ground by enabling important process data to be saved directly in the sensor. The inductive, two-way data transfer between sensor and transmitter guarantees interference-free measuring signals and a dramatic simplification of process technology. Memosens is the first to treat the problems of plug-in systems - not just the symptoms. It successfully eliminates issues such as moisture ingress, leakages, corrosion, salt bridges, ground loops and handling via an inductive non-contact plug-in connection that offers complete galvanic isolation.

The Memosens integrated circuit board also offers a wealth of possibilities. For example, manufacturing data, current sensor properties and sensor history can all be recorded and used as the basis for predictive maintenance. Calibration data is stored, along with other key information such as overall time in operation, and minimum/maximum pH value and temperature.
Memosens sensors can be pre-calibrated under laboratory conditions and then quickly replaced at the measuring point – thus eliminating the problems of measuring points that are difficult to access. The sensors identify themselves within the application; each measuring point recognises its individual sensor, which significantly reduces downtime. Memosens also offers a longer life because sensors can be checked and regenerated by cleaning in the laboratory. The pre-calibration also means that calibration under soiled or moist conditions is unnecessary and cuts work in hazardous areas to a minimum.

Glass electrode	Pg13.5	NPT ¾"	pH	Redox	Combined	rH
CPS11D	X		X			
CPS12D	X			X		
CPS16D	X				X	X
CPS41D	X		X			
CPS42D	X			X		
CPS71D	X		X			
CPS72D	X			X		
CPS76D	X				X	X
CPS91D	X		X			
CPS92D	X			X		
CPS96D	X				X	X
CPF81D		X	X			
CPF82D		X		X		

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Tophit CPS441D/471D/491D

Glass-free IsFET pH electrodes.


CPS441


CPS471D


CPS491

- Long-term, stable pH measurement
- ATEX and FM approval
- EHEDG certified
- PEEK sensor body
- With liquid KCl reference electrode
- Available with Memosens digital technology

Following the success of Endress+Hauser's Tophit glass-free IsFET pH sensor in a wealth of applications, the range has been extended to include sensors specially optimised for extreme processes (CPS441), hygienic applications (CPS471) and for applications that are prone to build-up (CPS491).

Endress+Hauser's Tophit simplifies inline pH measurement and achieves cost savings due to its high stability and consistently fast response times, even low temperatures. Unlike most glass electrodes, Tophit with its robust PEEK design can be installed horizontally, allowing flush fitting with the vessel wall for easy cleaning. All versions feature an integrated temperature sensor providing effective temperature compensation and Tophit is even suitable for use in hazardous areas (ATEX and FM approval).

The new CPS441 electrode features a liquid KCl reference, so it is ideal for use in extreme processes e.g. products that have a high content of organic solvent and/or low conductivity applications.

The CPS471 is fully sterilisable. It is ideal for CIP processes when combined with a Cleanfit retractable assembly, offering a long service life. It conforms to 3-A, EHEDG and FDA standards and is fully autoclavable - it withstands process conditions from -15°C to 135°C, for the maximum in hygienic performance.

For media that is prone to build-up, the CPS491(D) is the ideal choice. As the first IsFET sensor on the market with an open aperture reference junction, it is perfect for water purification and wastewater

Technical data

Measuring range	: 0...14 pH, -15°C...100°C (sterilisable 135°C for 1 hour)
Pressure	: 10 bar at 100°C 3 bar at 135°C
Sensor shaft	: PEEK, FDA approved
Seals	: EPDM or perfluoro elastomer
Diaphragm	: ceramic
Process connection	: Pg 13.5
Temperature sensor	: Pt1000
Surface roughness	: Ra < 0.8µm

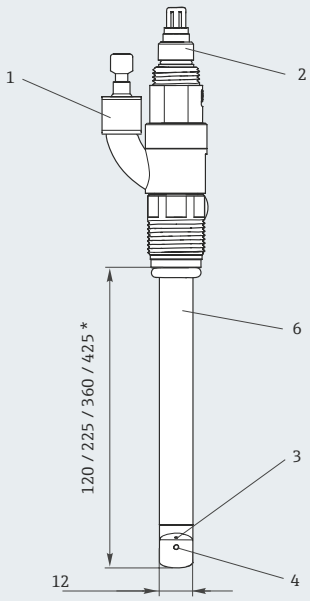
applications or in processes with quickly changing pH values and/ or alternating temperatures and pressures.

The Memosens digital pH sensors break new ground by enabling important process data to be saved directly in the sensor. The inductive, two-way data transfer between sensor and transmitter guarantees interference-free measuring signals and a dramatic simplification of process technology. Memosens is the first to treat the problems of plug-in systems - not just the symptoms. It successfully eliminates issues such as moisture ingress, leakages, corrosion, salt bridges, ground loops and handling via an inductive non-contact plug-in connection that offers complete galvanic isolation. The Memosens integrated circuit board also offers a wealth of possibilities. For example, manufacturing data, current sensor properties and sensor history can all be recorded and used as the basis for predictive maintenance. Calibration data is stored, along with other key information such as overall time in operation, and minimum/maximum pH value and temperature.

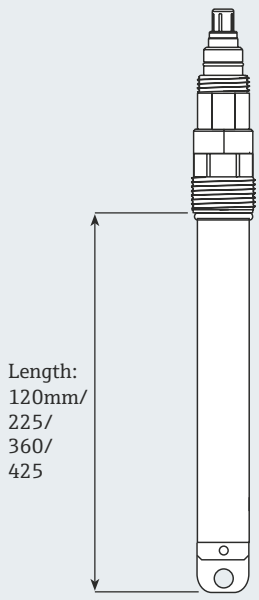
Memosens sensors can be pre-calibrated under laboratory conditions and then quickly replaced at the measuring point – thus eliminating the problems of measuring points that are difficult to access. The sensors identify themselves within the application; each measuring point recognises its individual sensor, which significantly reduces downtime. Memosens also offers a longer life because sensors can be checked and regenerated by cleaning in the laboratory. The pre-calibration also means that calibration under soiled or moist conditions is unnecessary and cuts work in hazardous areas to a minimum.

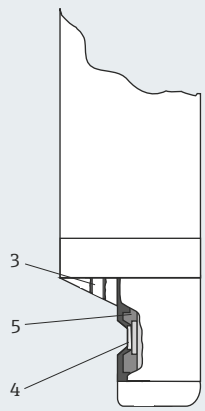
Dimensions (mm)

Tophit CPS441



Tophit CPS471/491
pH combination electrode
connects to CPK12 cable





Sensor head

1 KCl electrolyte connection
2 TOP 68 plug-in head
3 Reference electrode
4 IsFET chip
5 Seal (EPDM or perfluoro elastomer)
6 Sensor shaft

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Ceramax CPS341D

Memosens digital sensor with pH-sensitive enamel.

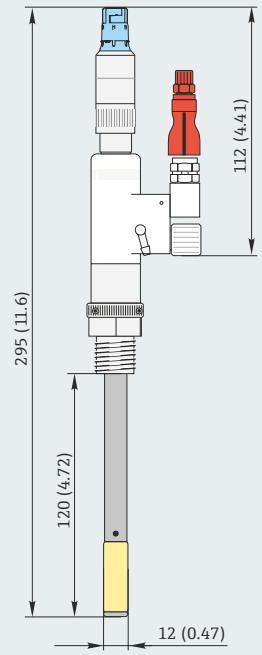
- Direct installation in container nozzles or piping
- Self-cleaning via the flowing medium
- Long-term stability
- High corrosion resistance for harsh applications

Designed for use in the food & beverage and life science sectors, the Ceramax CPS341D digital pH sensor meets highest demands of measuring accuracy, pressure, temperature, sterility and durability. Offering continuous online measurement, it can withstand the rigours of inline CIP and SIP processes. What's more, its steel substrate means it is ideal in applications with solids or agitator turbulence and the protective enamel coating offers corrosion protection – even in acids.

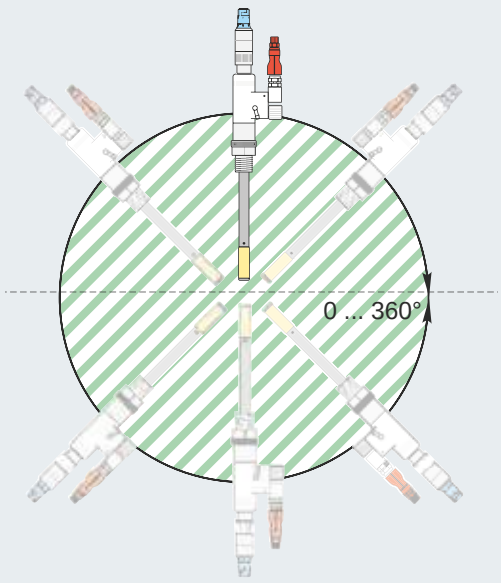
Technical data

pH range	:	-2...+14 pH (depending on application)
Minimum conductivity	:	50µs/cm
Process temperature	:	0...140°C
Temperature sensor	:	NTC 30KΩ
Process pressure	:	0...6 bar
Sensor shaft	:	Porcelain enamel metal substrate (PEMS), chemically resistant and shock resistant
Other materials	:	Stainless steel
Process connection	:	Wide range including Triclamp and dairy fittings
Protection	:	IP68

Dimensions (mm)



Installation



CPS341D can be installed in any position.

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Condumax CLS15D/16D/21D

Digital twin-electrode conductivity sensors.

CLS15D

CLS16D

CLS21D

- Hygienic process connections for installation in pipes or flow chambers
- Available with plug-in head or fixed cable
- Easy-to-clean electropolished surfaces

Condumax conductivity sensors are the ideal solution for conductivity measurement in both water and wastewater applications.

CLS15D sensors are specially designed for the measurement of pure and ultrapure water e.g. monitoring ion exchangers, reverse osmosis, chip cleaning, electro-deionising, WFI (water for injection) and distillation.

CLS16D has been specially designed for hygienic applications (particularly the life science sector) offering 3-A, EHEDG, FDA and ASME BPE approvals.

CLS21D features two coaxial electrodes made of graphite offering a large measuring range. The graphite guarantees high chemical stability and low polarisation.

All Condumax sensors are designed for use with our Liquiline CM14, CM42 and CM44x.transmitters.

Memosens digital technology

All sensors feature Memosens digital technology for improved measurement integrity and efficiency. The inductive non-contact measured value transmission of Memosens guarantees maximum process safety. An automatic error message is generated if the sensor fails or the connection between sensor and transmitter is interrupted. As a direct result, the availability of the measuring point is dramatically increased.

Technical data

	CLS15D	CLS16D	CLS21D
Measured variables	Conductivity, temperature	Conductivity, temperature	Conductivity, temperature
Measuring range	k = 0.01cm^{-1}: 0.04...20µS/cm, k = 0.1cm^{-1}: 0.1...200µS/cm	k = 0.1cm^{-1}: 0.04...500µS/cm	k = 1cm^{-1}: 10µS/cm...20mS/cm
Temperature sensor	Pt100 (CLS15), NTC (CLS15D)	Pt100 or Pt1000 (CLS16), NTC (CLS16D)	Pt100 (CLS21), NTC (CLS21D)
Temperature	-20...+100°C (CLS15, fixed cable), -20...120°C (CLS15, clamp and CLS15D)	-5°C...+120°C	-20°C...+135°C
Pressure	12 bar at 20°C	12 bar at 20°C	16 bar at 20°C
Process connection	NPT ¾" thread and clamp 1½" (CLS15, fixed cable), NPT ½" thread and clamp 1½" (CLS15, plug-in), NPT ¾" and ½" thread and clamp 1½" (CLS15D)	Clamp 1", 1½", 2" according to ISO 2852 (also suitable for TriClamp, DIN 32676), Tuchenhagen Varivent N DN50...125, Neumo BioControl D50	G1 or NPT 1" thread, DIN 11851, SMS, clamp 2"
Material	Stainless steel	Stainless steel	Graphite
Surface roughness	Ra ≤ 0.8µm (Ra ≤ 0.4µm optional)	Ra ≤ 0.8µm (Ra ≤ 0.4µm optional)	Not stated
Protection	IP67 (CLS15), IP68 (CLS15D)	IP67 (CLS16, fixed cable), IP68 (CLS16, plug-in and CLS16D)	IP65 (CLS21, 4-pole plug-in), IP67 (CLS21, fixed cable), IP68 (CLS21D)
Certification	ATEX, FM, CSA	ATEX, FM, CSA	ATEX, FM
Hygienic approvals	None	3-A, EHEDG, FDA, ASME BPE	None

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Indumax CLS50D/54D

Digital conductivity sensors for the chemical, food and life science industries.

CLS50D

CLS54D

- Non-contact: insensitive to electrode soiling and polarisation
- Fast response time for efficient phase separation
- CLS50D for high temperatures
- CLS54D for hygienic applications
- ATEX, FM, CSA and TIIS certified

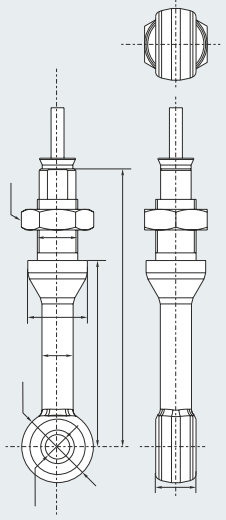
CLS50D: The chemical resistance of the PEEK or PFA sensor material means that the sensor can be used in virtually any chemical process up to 180°C, e.g. concentration measurement of acids and alkalis, product quality monitoring and phase separation applications.
CLS54D: The CLS54D conductivity sensor is specifically intended for use in hygienic applications in the food, pharmaceutical and biotechnology industries. Thanks to its food-grade virgin PEEK body, seamless design and hygienic certificates, it meets the exacting demands of these industries. The CLS54D is especially suitable for 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 pipes and bottling plants and, leakage detection.

Technical data

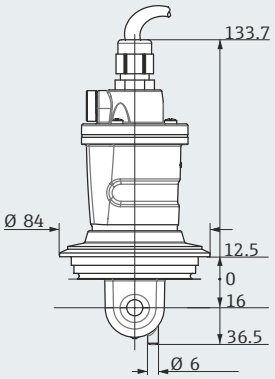
	CLS50D
Measuring range	: 2µS/cm...2000mS/cm
Temperature	: -20...180°C (CLS50), -20...+125°C (CLS50D)
Pressure	: 20 bar max (20°C)
Temperature sensor	: Pt100, class A
Min pipe diameter	: Minimum DN80
Material	: PFA or PEEK
Protection	: IP67/NEMA6 (installed with original sealing)
	CLS54D
Measuring range (recommended)	: 100µS/cm...2000mS/cm (uncompensated)
Temperature	: -10...150°C
Pressure	: 12 bar max (up to 90°C)
Temperature sensor	: Pt1000, class A complies with IEC 60751
Temperature response time	: $t_{90} \leq 26s$
Min pipe diameter	: minimum DN80
Material	: virgin PEEK
Surface finish	: Ra ≤ 0.8µm
Protection	: IP68/NEMA6P

Dimensions (mm)

CLS50D - G¾"

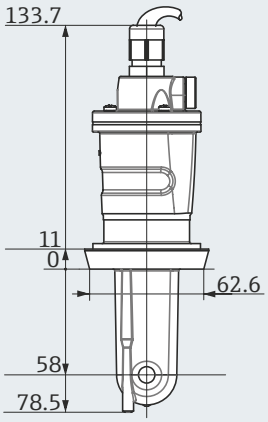


CLS54D



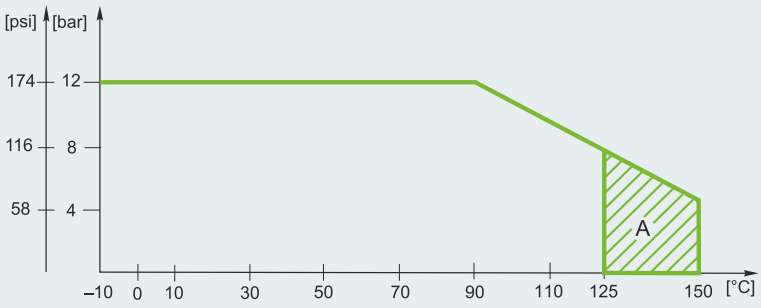
Varivent N
DN40-125

CLS54D



Dairy pipe fitting
DIN118851, DN50

CLS54D: pressure-temperature load curve



A = sterilisation time (max 60 mins)

Chemical durability

Medium	Concentration	PEEK	PFA	Chemraz	Viton
Sodium hydroxide solution NaOH	0 to 50%	20 to 100°C	20 to 80°C	0 to 150°C	Not suitable
Nitric acid HNO_3	0 to 5%	20 to 60°C	20 to 60°C	0 to 150°C	0 to 120°C
	0 to 40%	20°C	20 to 60°C	0 to 150°C	0 to 120°C
Phosphoric acid H_3PO_4	0 to 50%	20 to 60°C	20 to 60°C	0 to 150°C	0 to 120°C
Sulphuric acid H_2SO_4	0 to 2.5%	20 to 80°C	20 to 100°C	0 to 150°C	0 to 120°C
	0 to 30%	20	20 to 100°C	0 to 150°C	0 to 120°C
Hydrochloric acid HCl	0 to 5%	20 to 100°C	20 to 50°C	0 to 150°C	0 to 120°C
	0 to 10%	20 to 100°C	20°C	0 to 150°C	0 to 120°C

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Memosens CLS82D

Digital four-electrode conductivity sensor for hygienic applications.

- Wide measurement range
- EHEDG-qualified aseptic hygienic design, FDA-approved materials, certified in accordance with 3-A.
- Fully sterilizable and autoclavable
- ATEX certified for hazardous area use
- Logging of sensor-specific data for easy traceability and predictive maintenance

Memosens CLS82D is a hygienic, digital sensor for applications with widely varying conductivity values such as phase separation, chromatography, CIP monitoring in small pipes, fermentation and ultrafiltration. Its wide range of process connections and a small compact design ensures the perfect fit to your process. With Memosens digital technology, CLS82D combines maximum process and data integrity with simple operation. It resists corrosion and moisture, enables lab calibration and facilitates predictive maintenance.

Technical data

Measured variables	:	Conductivity, temperature
Conductivity range	:	1µS/cm...500,000µS/cm
Temperature	:	−5°C...+120°C
Sterilization (max 45 min)	:	Max 140°C at 6 bar
Pressure	:	17 bar at 20°C, 9 bar at 120°C
Surface roughness	:	Ra < 0.38µm
Repeatability	:	0.2% of reading
Sensor	:	Platinum and ceramic
Process connections	:	Stainless steel 1.4435 (AISI 316L)
Seal	:	EDPM
Protection	:	IP68/NEMA 6P (connector)

Ideal for life sciences

Particularly in the life sciences industry, conductivity must be measured over a wide range; from average to high values in the process to low values in rinsing processes with ultrapure water. Memosens CLS82D four-electrode conductivity sensor allows you to perform these measurements reliably with a single sensor. With its certified aseptic design, this sensor boasts exceptional reliability and precision and is also suitable for installation positions where space is restricted.

Reliable products and processes

A unique feature of the sensor is its innovative sensor element made from ceramic with platinum electrodes. The advantage of these materials is their similar temperature expansion behaviour. Even during extreme temperature changes the material bond stays tight so that no gaps occur at any time.

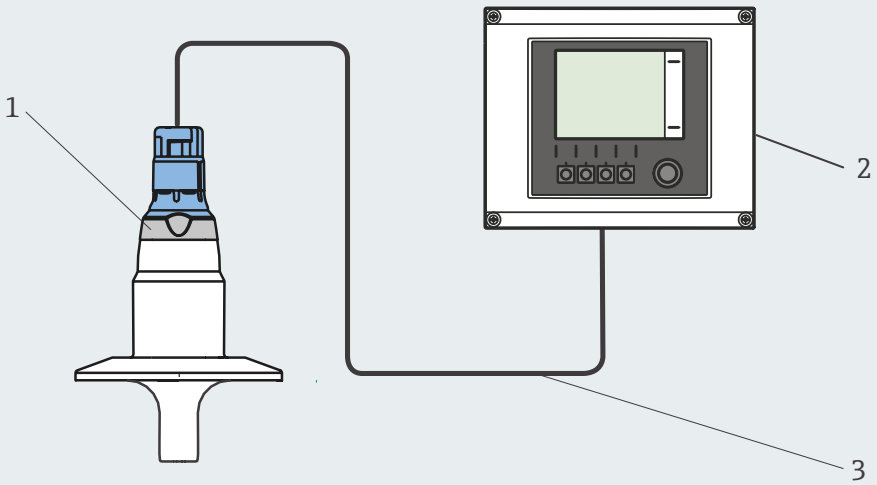
Increased plant availability

The sensor's plug & play capability means that you can integrate the Memosens CLS82D in your process in the shortest possible time, simplifying commissioning and maintenance.
In conjunction with the Memobase Plus software, you can calibrate your sensors in the laboratory under ideal conditions for improved sensor and quality management

Measuring system

A complete measuring system consists of the following components:

1. Memosens CLS82D conductivity sensor
2. Liquiline CM44x transmitter
3. Memosens CYK10 measuring cable



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Turbimax CUS51D/52D

Turbidity sensors for the measurement of drinking water, process water and wastewater.

CUS51D

CUS52D

- Simple installation
- Factory calibrated

Turbimax turbidity sensors are the ideal solution for accurate and reliable turbidity measurement in both water and wastewater applications.

Using the 90° scattered light method, the CUS31 is used mainly for drinking water and process water applications.

Thanks to the large measuring range, however, the sensor can also be used in wastewater flow. It is installed using an immersion assembly, a flow-through assembly or directly in the pipe using an inline retractable assembly and can be used effectively in applications such as checking filters in drinking water

Technical data

	CUS51D	CUS52D
Measuring principle	90° nephelometric; 135° back scattered light; four beam pulsed	Nephelometric turbidity sensor (90° scattering) according to ISO7027
Measuring range	0...4000 FNU/0...150g/l	0.000...4000 FNU/NTU
Wavelength	860 ± 30nm	860nm
Optical compensation	Using reference photodiodes	Using reference photodiodes
Accuracy	<2% of the measured value or 0.1 FNU	< 0.5% of measured value (measuring range: 0 to 10 FNU)
Temperature/pressure	-5...50°C (max 80°C short term) / 0.5 to 10 bar	-20...85°C/0.5 to 10 bar
Process connection	G1" / NPT ¾"	G1" and NPT ¾"; 2" clamp (depends on sensor version)/DIN 32676
Material	Stainless steel	Stainless steel
Protection	IP68	IP68

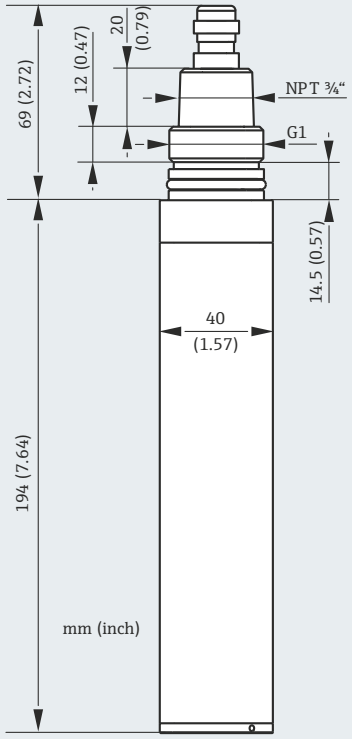
production, effluent and sediment checking in physicochemical purification processes (e.g. flocculation), filter, cooling and surface water monitoring etc.

The CUS51D is used mainly for wastewater and sludge applications such as active sludge tank, sludge return from district and industrial wastewater purification, effluent and sediment checking in physicochemical purification processes and sludge concentration measuring etc.

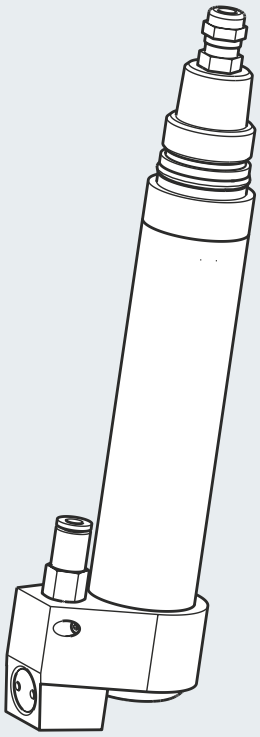
The sensor is insensitive to medium colour and daylight, thanks to the modulating IR light sources. Intelligent signal processing compensates for contamination on the windows and reduces the effect of air bubbles and coarse particles.

The CUS52D is a smart sensor with lab accuracy that allows unattended operation in all measuring points of your water production. Thanks to its hygienic, self-cleaning design, you can mount it directly into your pipeline. This way you will save on extensive bypass installations and avoid product loss. With Memosens digital technology, the CUS52D combines maximum process and data integrity with simple operation. It enables lab calibration and simplifies predictive maintenance.

Dimensions CUS51D (mm)



Cleaning system: CUS51D



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Turbimax CUS71D

Ultrasonic immersion sensor for interface measurement.

- **Three different sensor models allow optimal adaption to the measurement task.**
- **Simple commissioning thanks to predefined calculation models.**
- **Intelligent sensor: all characteristics and calibration values are stored in the sensor.**

In many instances in process engineering, suspensions are separated into their solid and liquid components via sedimentation. To do this economically and efficiently, it is necessary to continuously monitor the separation and transition zones of the clarification and settling phases.

Turbimax CUS71D is a sensor for many applications of the interface measurement:

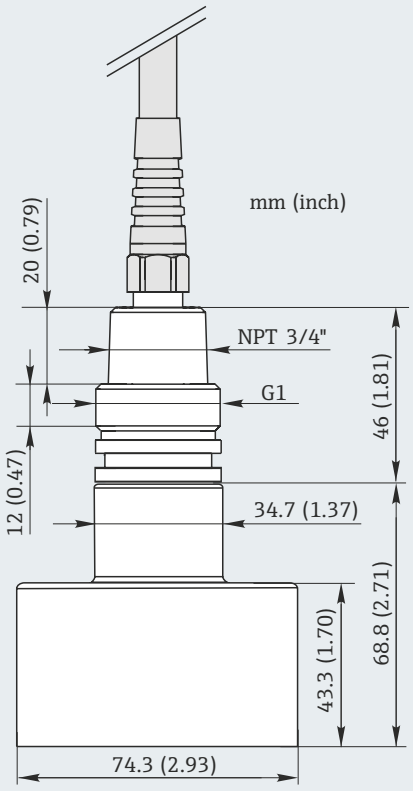
- Wastewater treatment: primary clarifier, sludge thickener, secondary clarifier
- Water purification: settling basin after flocculant dosage, sludge height in contact sludge process
- Chemical industry: static separation process

Technical data

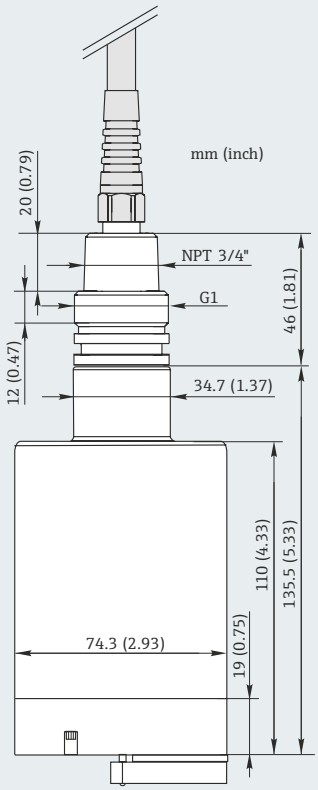
Measured variable	: Interface (turbidity optional)
Measuring range	: 0.3...10m (turbidity: 0...50 (200) NTU)
Max measured error	: 35mm at 3m (turbidity: 1% of the measuring range at 50 NTU)
Temperature	: +1°C...+50°C
Pressure	: 0...6 bar abs
Protection	: IP68
Sensor material	: ABS and epoxy plastic
Wiper material	: Rubber
Optical window	: Sapphire

Dimensions (mm)

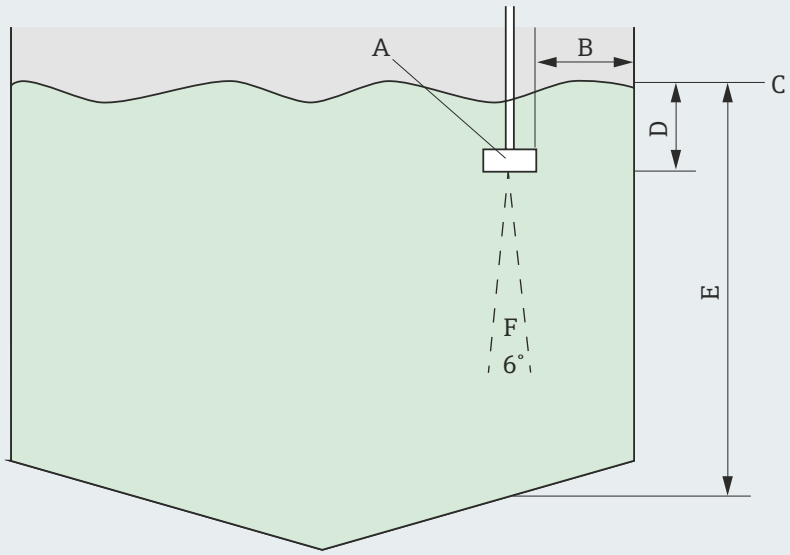
Standard sensor



Sensor with wiper



Installation



Basin configuration

A. Sensor
B. Minimum distance of sensor to basin wall: 45cm
C. Reference point e.g. water surface
D. Zero point
E. Basin depth
F. Opening angle of ultrasonic cone: 6°

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Oxymax COS22D

Digital amperometric oxygen sensor for standard, hygienic and sterile applications.

COS22D

- Maximum process safety through non-contact inductive signal transmission
- Easy handling thanks to storage of sensor-specific data
- Predictive maintenance possible thanks to registration of sensor load data

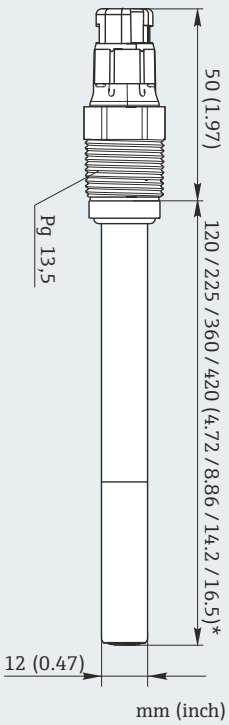
Oxymax COS22D digital sensor is specially designed for the requirements of dissolved oxygen measurement, offering long-term stability and excellent repeatability. It is robust enough to withstand frequent sterilisation and autoclaving so is ideal for use in the food & beverage and life science industries in addition to general process applications. The COS22D also has application-specific versions e.g. carbon dioxide compatible trace sensor for the beverage industry and a trace sensor for the power industry.

Technical data

Measured variable	:	Dissolved oxygen, temperature
Response time	:	t_{90} < 30s, t_{98} < 60s
Repeatability	:	±1%
Process temperature	:	-5°C...+135°C
Process pressure	:	0...12 bar
Min flow rate	:	0.02m/s (COS22D-*1), 0.10m/s (COS22D-*3)
Sensor shaft	:	Stainless steel, titanium, C22 Alloy
Electrode	:	silver/platinum
Sealing ring	:	Fluorelastomer (FDA), perfluorelastomer (USP)
Membrane	:	Silicone, PTFE
Process connection	:	Pg 13.5
Protection	:	IP68
Certification	:	ATEX, FM and CSA

Dimensions (mm)

COS22D



mm (inch)

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Oxymax COS51D/61D

Digital oxygen sensors for water, wastewater and utilities.

COS51D

COS61D

- **Maximum process safety through non-contact inductive signal transmission**
- **Easy handling thanks to storage of sensor-specific data**
- **Predictive maintenance possible thanks to registration of sensor load data**

The Oxymax range of dissolved oxygen sensors provide continuous measurement of the concentration of dissolved oxygen in water to maintain quality and ensure effective process control.

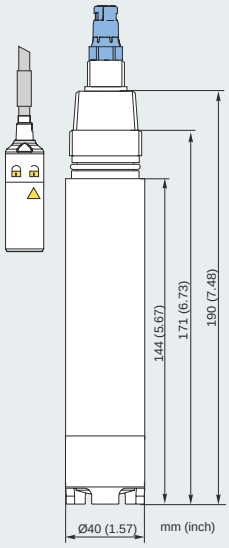
Oxymax COS51D/61D are reliable and highly accurate oxygen sensors for all kinds of water & wastewater applications (including hazardous areas). Designed to be low-maintenance with a long operating life, the sensors offer outstanding value for money. Thanks to Memosens digital technology, Oxymax COS51D/61D combine maximum process and data integrity with simple operation. They resist corrosion and moisture, enable lab calibration and facilitate predictive maintenance.

Technical data

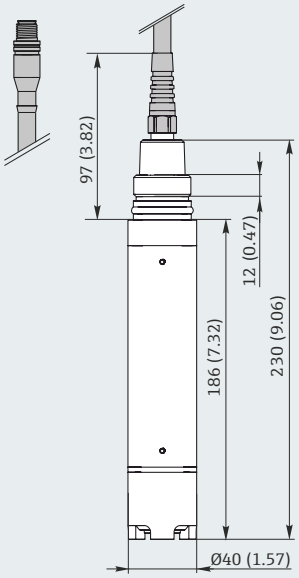
	COS51D	COS61D
Measuring principle	Amperometric sensor	Fluorescence quenching optical sensor
Measured variable	Dissolved oxygen (mg/l, µg/l, ppm, ppb, % SAT, hPa)	Dissolved oxygen (mg/l, % SAT, hPa), temperature
Measuring range	0.01...100mg/l, 0.00...1000 %SAT, 0...2000hPa	0...20mg/l (0...20ppm), 0...200 %SAT, 0...400hPa
Repeatability	±1%	±5%
Response time	t90 < 3 minutes, t98 < 8 minutes (normal response), t90 < 30s, t98 < 90s (fast response)	t90: 60s
Process temperature	-5...50°C	-5...60°C
Process pressure	Up to 10 bar	Up to 10 bar
Process connection	G1 and NPT¾"	G1 and NPT¾"
Protection	IP68	IP68
Certification	ATEX, FM and CSA	Safe area only

Dimensions (mm)

COS51D

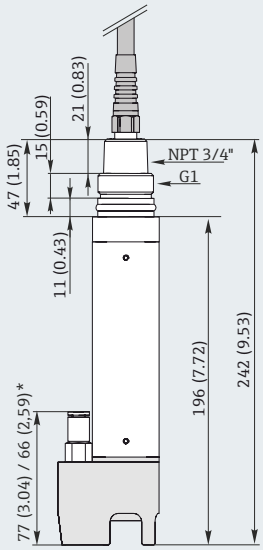


COS61D dimensions with optional M12 plug



COS61D dimensions with optional cleaning unit

* depending on cleaning unit version



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Liquiline System CA80xx

Colourimetric analysers for online monitoring in water applications.

- Easy upgrade to measuring station with up to four digital Memosens sensors.
- Advanced diagnostics with remote access for increased process safety.
- Reduced operating costs through automatic, configurable calibration and cleaning
- Long reagent shelf life with optional cooling module.
- Digital communication for remote access.

The Liquiline System CA80 range of analysers offers high-precision measurement in all critical control points. As member of the Liquiline platform, it enables plug & play and easy upgrade to a measuring station - minimising the installation effort. Automatic calibration and cleaning as well as the low consumption of reagents save on operating and maintenance costs. Advanced diagnostics with remote access ensure process safety and support you in providing process documentation to the authorities.

Technical data

Input	:	1 or 2 measuring channels, 1-4 digital sensor inputs for sensors with Memosens protocol (optional)
Output	:	2 x 0/4...20mA, MODBUS RS485/TCP (optional), Ethernet (optional), alarm relay
Process temperature	:	4...40°C
Process pressure	:	< 0.2 bar absolute
Sample requirement	:	22ml/measurement
Sample temperature	:	4...40°C
Sample flowrate	:	Min 5ml/min
Sample consistency	:	Low solid content : TS < 50mg/l (ppm)
Sample supply	:	Unpressurised
Sample pH value	:	5...9

Liquiline System CA80xx range includes:

- Liquiline System CA80AM ammonium analyser
- Liquiline System CA80PH orthophosphate analyser
- Liquiline System CA80NO nitrate analyser
- Liquiline System CA80CR chromate analyser
- Liquiline System CA80FE iron analyser
- Liquiline System CA80TP total phosphate analyser
- Liquiline System CA80COD COD analyser

Highly precise measurement at all critical control points demands suitable sample preparation. The Liquiline System CAT810, CAT820 and CAT860 are perfectly adapted to the respective sampling spots.

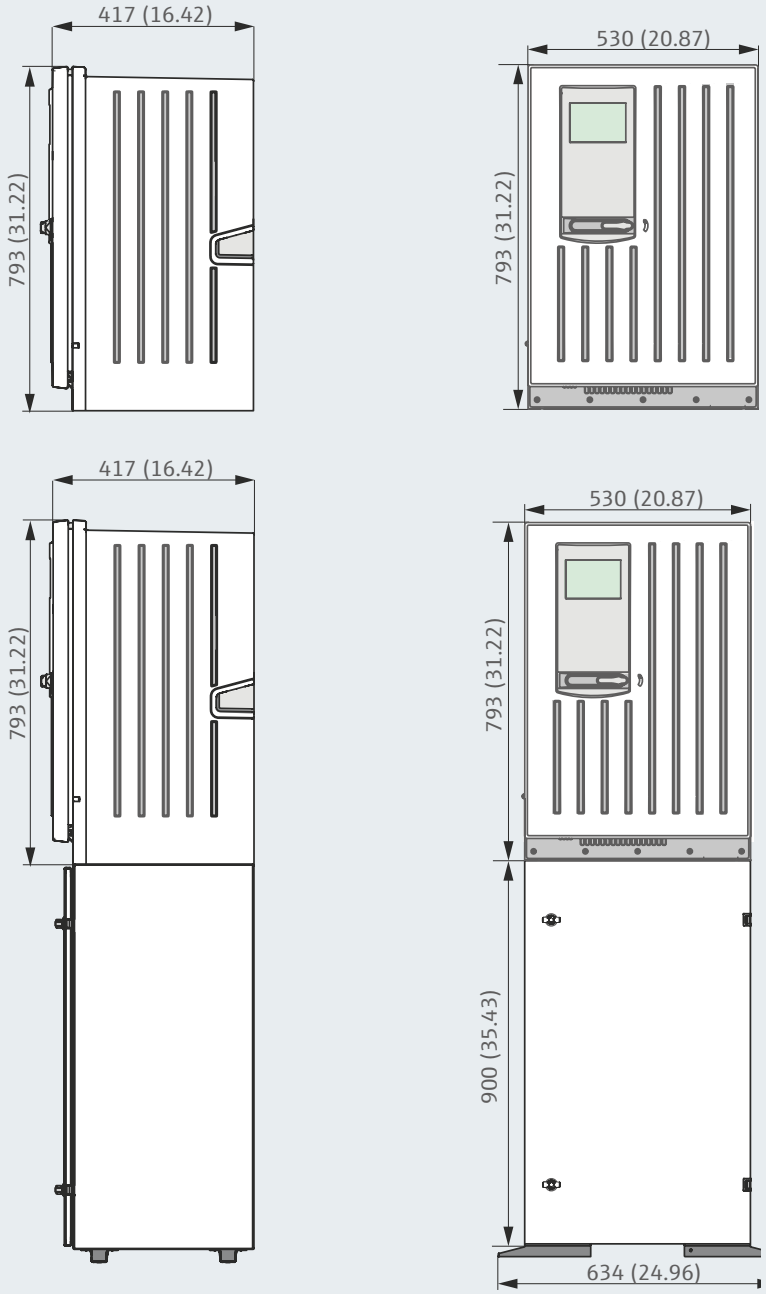
Liquiline System CAT860 is the perfect choice for demanding conditions in the inlet. Its automatic backflush function with cleaning solution and automatic air cleaning clean off fat and proteins and prevent blocking of the ceramic filter.

Liquiline System CAT820 is the flexible solution for bacteria-free sample preparation in the aeration basin or the outlet. It can be equipped with various filters and cleaning options to tailor it to the sampling situation.

Liquiline System CAT810 prepares samples in the outlet or from pressurized pipes. Thanks to its low dead volume, it reflects process changes promptly and shortens the response time of your downstream measuring devices. The system is equipped with a cross-flow filter to avoid blocking.

All sample preparations are fully controlled by the Liquiline System CA80AM analyser to guarantee a perfect synchronization of the measuring point. The filters of Liquiline System CAT860 and CAT820 can be combined with the Flexdip CYH112 holder system to fit them into any installation situation.

Dimensions (mm)



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TOCII CA72TOC

Online TOC analyser using thermal catalytic combustion.

WirelessHART

- Exchangeable furnace
- Externally triggered self-testing
- Heatable salt trap for increased service life
- pH-controlled acid dosing
- Double-batch operation

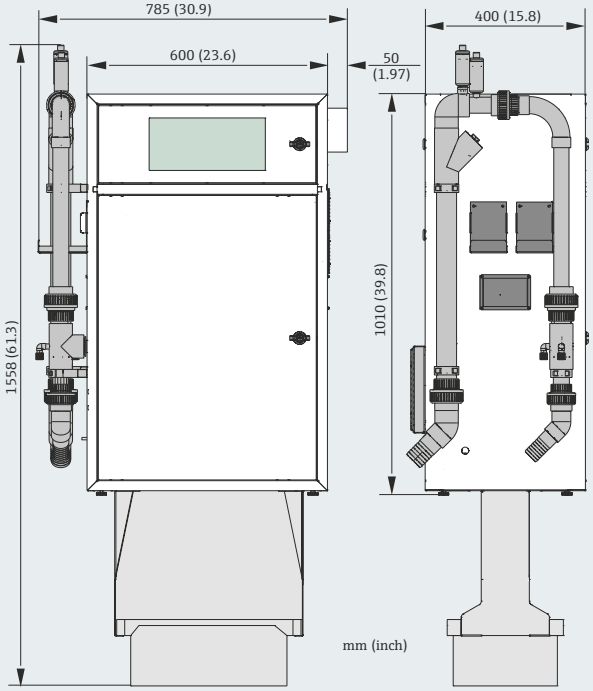
The TOCII analyser determines the TOC (total organic carbon) content of an aqueous sample. It uses thermal catalytic combustion with subsequent NDIR (non-dispersive infrared) detection of the produced carbon dioxide. As TOC indicates the total organic load of water, it is used to assess the water quality and can serve as a basis for the calculation of wastewater charges.

The heatable salt trap simplifies maintenance in applications with high salt loads. When samples with high salt loads are combusted, deposits form on the catalyst and the furnace that lead to inaccurate measurements and can result in congestion. With the heatable salt trap, salts can be removed from the furnace quickly and efficiently, significantly increasing the availability of the measuring point. It also reduces operating costs thanks to longer maintenance intervals and easy handling of the salt trap.

Technical data

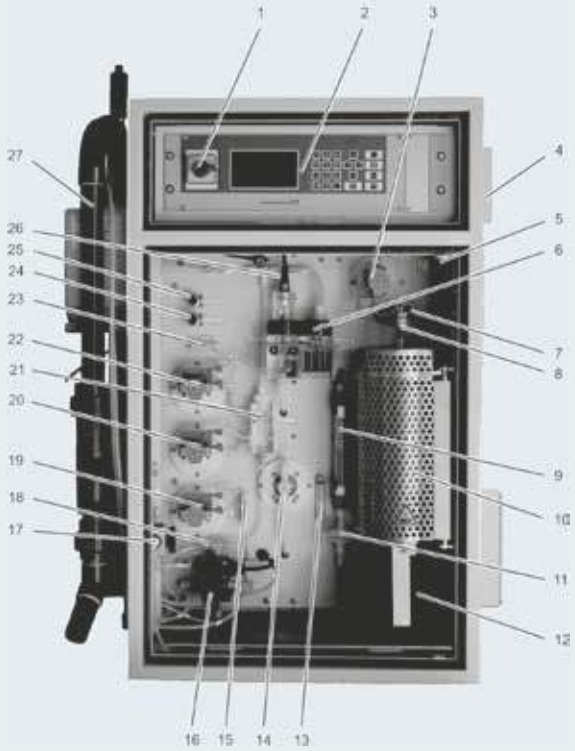
Measuring range	: 0.25...600mg TOC/l, 1...2400mg TOC/l, 2.5...6000mg TOC/l, 5...12000mg TOC/l (depending on version)
Signal inputs	: 8 signal inputs 24 V DC, active, load max. 500 Ω
Output signals	: 0/4...20mA, galvanically separated
Inorganic carbon removal	: > 95% using a pH controlled TIC scrubber
Sample temperature	: 0...40°C
Sample flow rate	: 20ml/min
Sample volume	: 90ml
Sample consistency	: Aqueous (flammable substances not allowed in ignitable concentrations - a sample preparation is required)
Protection	: IP54
Accuracy	: 0.4% for 20% of full scale, 2.4% for 80% of full scale
Repeatability	: 0.4% for 20% of full scale, 1.6% for 80% of ful scale

Dimensions (mm)



Operation

1 = Main switch
2 = Computer
3 = Pump P2 sample analysis
4 = Junction box
5 = Compressor switch
6 = Separation chamber
7 = Dosing valve
8 = Injection unit
9 = Acid filter
10 = Tube furnace with catalyst
11 = Combined filter
12 = Heated salt trap (optional)
13 = Circuit gas flowmeter
14 = Dilution water pump (optional)
15 = Acid hose connector
16 = MV4 calibration standard changeover C1/C2
17 = Valve for online sample/manual sample
18 = MV1 wastewater/calibration standard changeover
19 = Pump P3, acid dosing
20 = Pump P4, sample – dilution (optional)
21 = Mixing chamber (optional)
22 = Pump P1, sample – strip chamber/condensate extraction
23 = Condensate hose connector
24 = Stripping gas dosing valve
25 = Carrier gas dosing valve
26 = Strip chamber with pH electrode



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Liquistation CSF48

Automatic stationary sampler for liquid media.

WirelessHART

- Easily modified into a measuring station
- Integrated data logger
- Two bottle trays for simple transportation
- Can connect one or two Memosens digital sensors
- MCERTS certified
- Flow assembly option for sampling from pressurised pipes

Liquistation CSF48 stationary sampler offers the maximum in simple sampling. Based on the Liquiline-Memosens platform, the Liquistation goes above and beyond the call of duty with the option to be used as a complete measuring station - without the need for additional transmitters.

Thanks to the flexible electronics and expansion slots, inputs for digital sensors with Memosens protocol can be quickly connected – with automatic detection software, they can be operated with immediate effect.

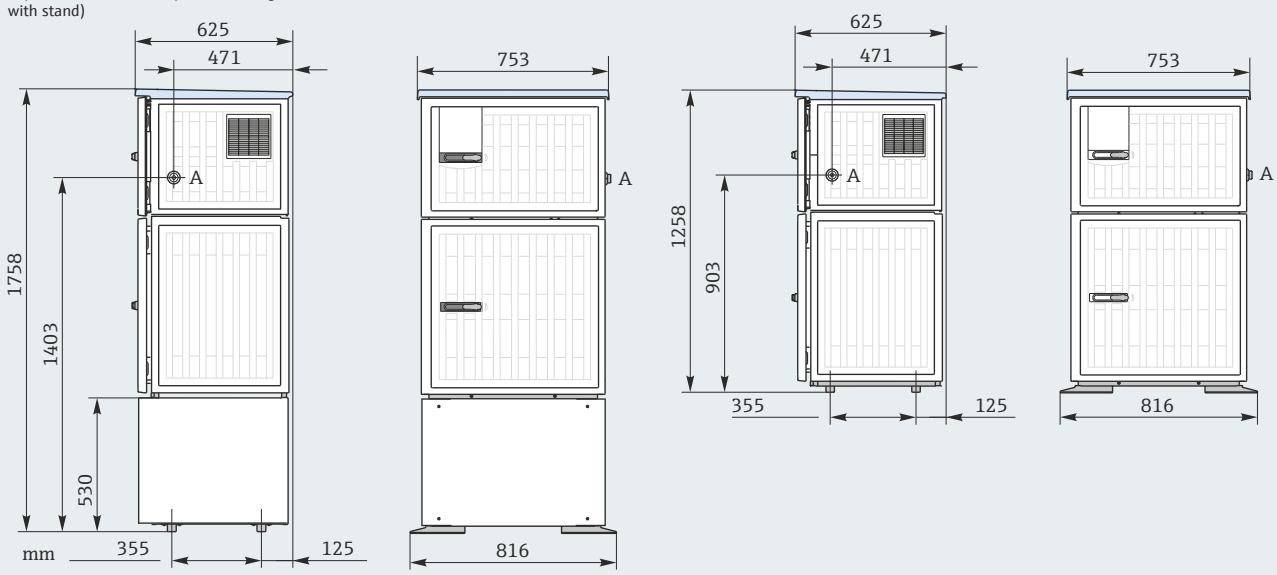
The modular housing consists of two parts with separately lockable doors to ensure that samples are always stored securely and the innovative power supply and cooling system ensure that the samples are not exposed to any fluctuations in temperature. Further protection is provided by the clever design - with no screws on the outside of the housing, once locked the sampler cannot be broken open.

Technical data

Housing	:	Plastic and stainless steel
Repeatability	:	Vacuum pump: 5%, peristaltic pump: 5%
Communication	:	One service interface accessible via front panel connection (optional); Commubox FXA291 (accessory) required for communication with the PC
Certification	:	MCERTS
Inputs	:	2 x analogue; 2 x binary; 2 x optional Memosens digital inputs
Outputs	:	2 x binary outputs; 2 x 4...20mA optional; 2 x relay (optional)
Power supply	:	100...240V AC ±10%, 50/60Hz
Datalogging capability	:	SD card
Protection	:	IP68
Suction height	:	6m or 8m
Sample detection	:	Conductive or capacitance (for heavily fouling media)

Dimensions (mm)

Liquistation CSF48 with plastic housing (without and with stand)

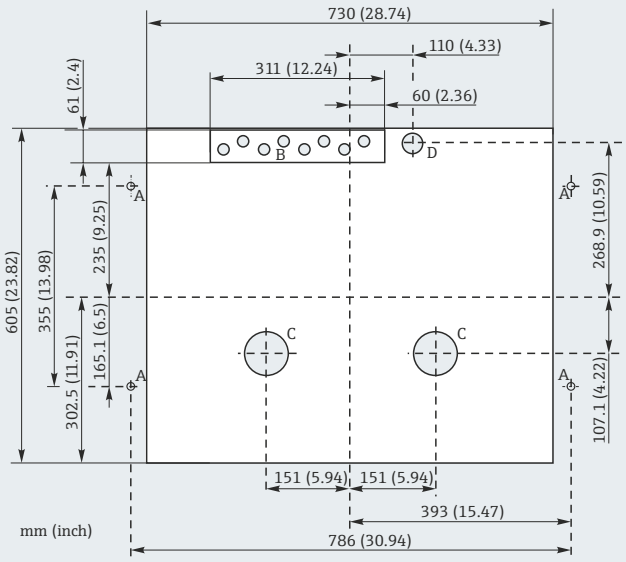


Installation

Foundation plan

A = Fasteners (4 x M10)
B = Cable inlet
C = Outlet for condensate and overflow > DN50
D = Sample supply from below > DN80

Dotted line = Dimensions of Liquistation



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Liquiport 2010 CSP44

Portable sampler for fully automatic sampling and distribution of liquid media.

WirelessHART

- **Flexible programming: time or event-controlled**
- **Uniform operation: same interface as Liquiline transmitters**
- **Lockable sample base to prevent sample manipulation**
- **Integrated data logger for recording measured values**
- **Simple cleaning and maintenance**

Liquiport 2010 CSP44 portable water sampler offers fully automated sampling and defined distribution of liquid media and is ideal the following applications:

- Municipal and industrial sewage treatment plants:
  - Self-monitoring
  - Process monitoring
  - Monitoring of indirect dischargers
  - Manhole monitoring
- Authorities and water conservation boards:
  - Water protection and water quality
  - Monitoring of indirect/direct dischargers
  - Labs and hydrological institutes

Depending on the version ordered, one or two Memosens digital sensors can be connected to the CSP44. Furthermore, two 0/4...20mA analogue outputs are available, as well as a cleaning function and an alarm relay.

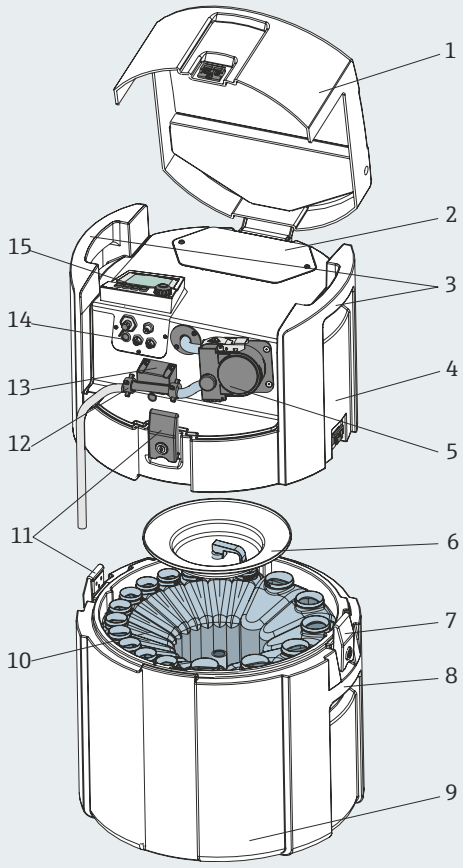
Technical data

Sampling methods	:	Event sampling, single and multiple samples, sampling table, time proportional sampling (CTCV), flow proportional sampling (VTCV), flow proportional sampling/time override (CTVV)
Input types	:	Up to 2 analogue inputs, up to 2 binary inputs, 1 or 2 digital inputs for Memosens sensors
Dosing volume	:	10ml...10000ml
Dosing accuracy	:	±5ml or 5% of the set volume
Repeatability	:	5%
Process temperature	:	+2°C...+50°C
Process pressure	:	Unpressurised
Protection	:	Entire device with closed cover: IP54, controller: IP65
Interface	:	Back-lit LCD with menu-guided operation

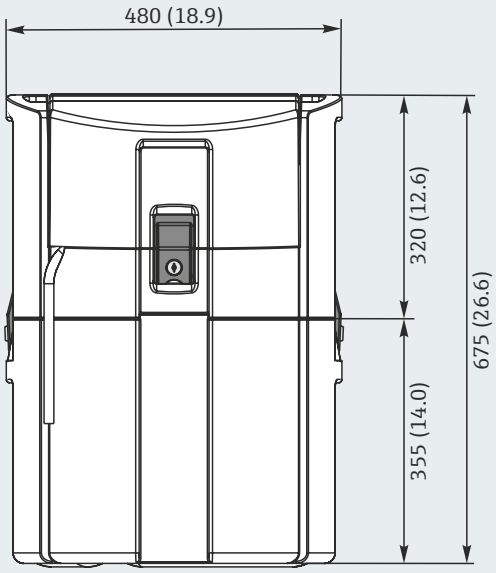
System design

System design

1. Controller cover
2. Cover of battery compartment
3. Upper carrying handles
4. Unit upper compartment
5. Peristaltic pump with pump tubing
6. Bottle retaining cover
7. Lockable latches
8. Lower carrying handles
9. Unit lower compartment
10. Bottle distribution
11. Lockable latches
12. Suction line connection
13. Medium detection
14. Electrical connections
15. Controller



Dimensions (mm)



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Recorders & System Components

For further information, visit our website at: www.uk.endress.com

Ecograph T RSG35

Cost-effective multichannel electronic recorder.

- Intuitive operation and handling via easy-to-use 'Navigator' button
- 0, 4, 8, 12 universal inputs
- Four virtual maths channels for universal calculations and flexibility
- Integrated email function
- Simple configuration via FieldCare software

The Ecograph T RSG35 electronic reorder is the cost-effective alternative to paper chart recorders. Whilst traditional recorders require continual replenishment of paper and pens, Ecograph T records process data electronically, consigning paper and pen stocks to history.

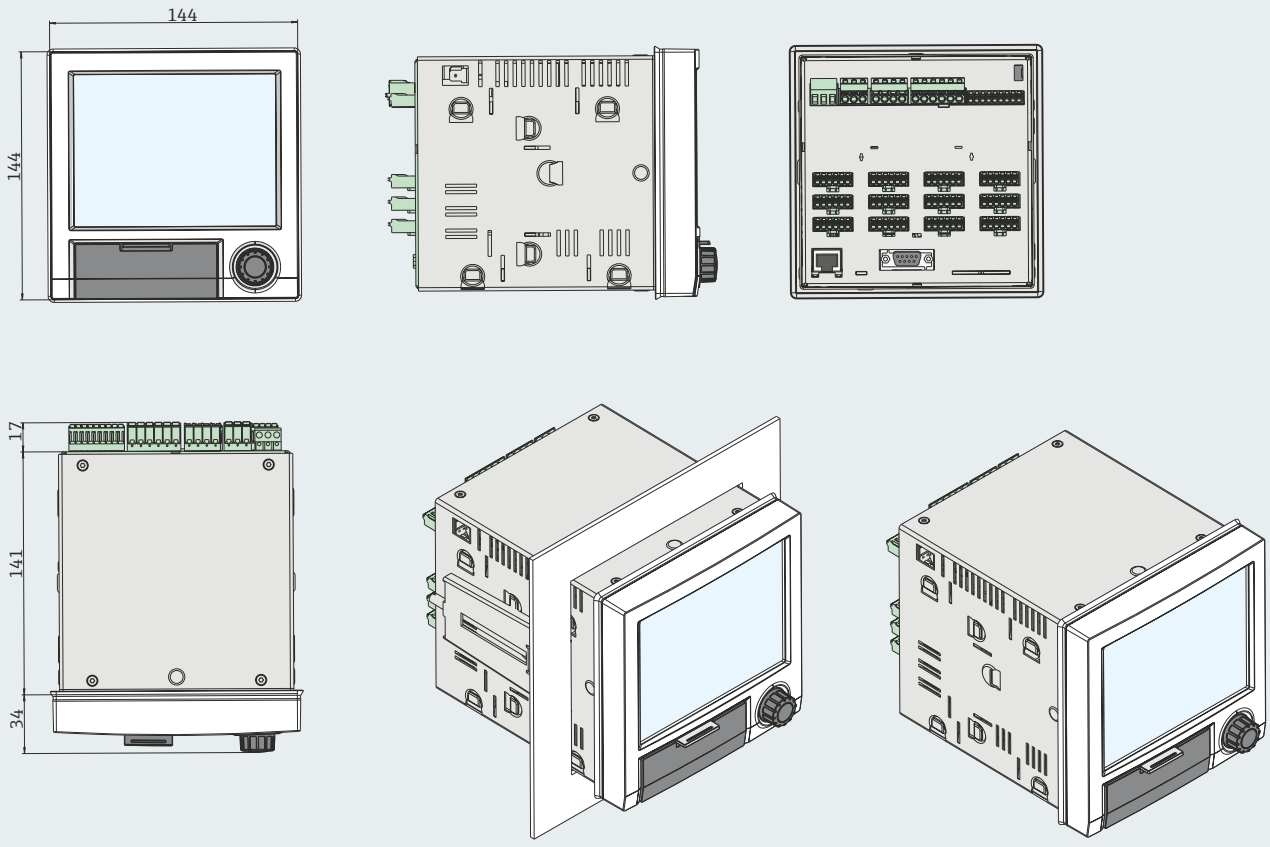
With up to 12 universal inputs, Ecograph T offers reliable data archiving by means of a mechanically-locked SD card – so there's no information loss, even in the event of a power failure. And, with direct access to archived data using MS Excel or the Field Data Manager (FDM) software, Ecograph T couldn't be easier to use! All information is clearly shown in the large full colour digital display in either numeric, bargraph, waterfall or curve format – you choose.

Ecograph T is ideal in a multitude of applications: from quality and quantity monitoring in the water industry to cold storage and transportation monitoring in the food industry. Its compact space-saving design also makes it suitable for use in applications where space is at a premium and with its loop power, no separate power supply is needed! However, Ecograph's real prowess lies in its data transmission features. System-enabled, it is perfect for network integration and remote data transmission via Ethernet, RS232/RS485 (modem), USB and optional Modbus RTU/TCP slave function. Ecograph T data is available worldwide via the integrated web server function for remote monitoring and fast information access wherever you may be!

Technical data

Input function	: Voltage, current, resistance thermometer, thermocouples, pulse input, frequency input
Number of inputs	: 0, 4, 8, 12
Digital inputs	: 6
Loop power supply	: Approx 24V, max 28V (250mA)
Relays	: 6 relays: 1 x alarm relay with changeover contact, 5 x normally open contacts
Display	: Colour LCD: 145mm
Protection	: Front panel: IP54, rear panel: IP20

Dimensions (mm)



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Memograph M RSG45

Advanced data manager.

Stainless steel front with touchscreen

- Tamper-proof data storage and personal access authorisation with electronic signature (FDA 21 CFR 11)
- Supports common fieldbuses (Modbus, PROFIBUS DP, PROFINET, EtherNet/IP) for fast integration into diverse systems
- Integrated web server

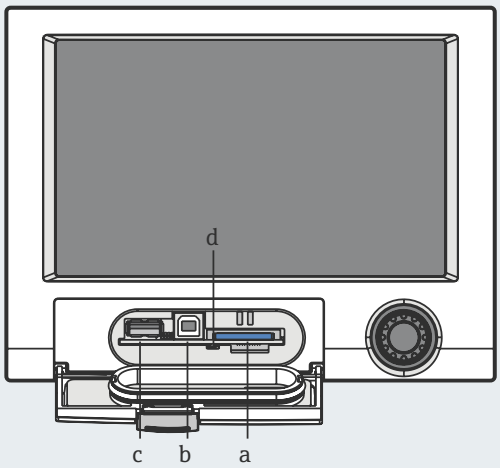
The RSG45 advanced data manager is a flexible and powerful system for organising process values. Thanks to its intuitive operation, it adapts quickly and easily to every application. The measured process values are clearly presented on the display and logged safely and limits are monitored and analysed. Measured and calculated values can be easily communicated to higher-level systems and individual plant modules can be interconnected. Wherever recording, visualisation, analysis and communication of process parameters is required, Memograph RSG45 fits the bill.

Technical data		RSG45
Analogue inputs	:	Standard version without universal inputs. Optional multifunction cards (slot 1-5) with 4 universal inputs (4/8/12/16/20) each
Input function	:	Voltage, current, resistance thernometer, thermocouple, pulse input or frequency input
Digital inputs	:	Standard: 6 digital inputs. Optional digital card (slot 5): 8 additional digital inputs, 6 additional relays and 2 analogue outputs.
Scan rate	:	Current/voltage/pulse/frequency input: 100ms per channel. Thermocouples and resistance temperature detector: 1s per channel.
Totalisation	:	Interim, daily, weekly, monthly, annual and overall value (13-digit, 64 bit).
Memory cycle	:	Off / 100ms / 1s / 2s / 3s / 4s / 5s / 10s / 15s / 20s / 30s / 1min / 2min / 3min / 4min / 5min / 10min / 15min / 30min / 1h
Communication	:	Standard: USB, Ethernet, RS232/485. Optional: Modbus, PROFIBUS DP or PROFINET I/O or EtherNet/IP.
Visual display	:	178mm (7") widescreen TFT full colour graphic display
Display modes	:	Curve, waterfall, bargraph, digital, instrument display, circular chart
Housing	:	Panel, desktop or field housings
Application packages	:	12 maths channels, telealarm, batch softaware, wastewater and rain overflow basins, energy software

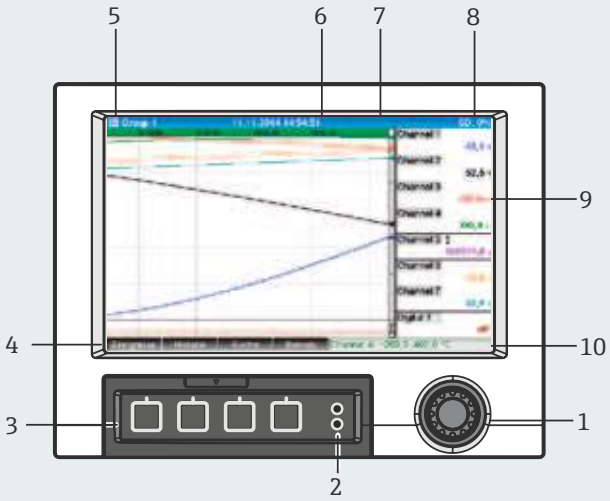
Dimensions (mm)

a. Slot for SD card
b. USB B socket 'Function' - connect to PC or laptop
c. USB A socket 'Host' - for USB memory stick, external keyboard, barcode reader or printer
d. LED at SD slot. Yellow LED lit or flashing when the device writes to the SD card or reads it.

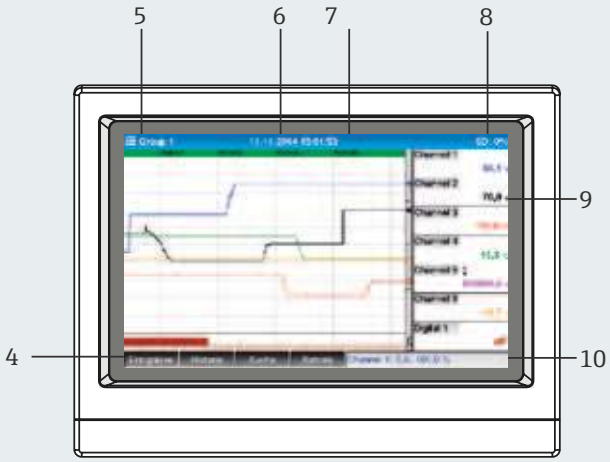
Do not remove the SD card if the LED is lit or flashing as there is risk of data loss!



RSG45 with navigator and front interfaces



RSG45 with stainless steel front and touchscreen



1. Navigator jog shuttle button for operating with additional press/hold function.
2. LED indicators (according to NAMUR NE44)
   - Green LED (top) lit: power supply OK
   - Red LED (bottom) flashing: maintenance required
3. Variable soft keys, keys 1 to 4 (from left to right)
4. Function indicator for the soft keys
5. Display mode: current group name, type of analysis. Setup mode: name of the current operating item.
6. Display mode: displays current date/time.
7. Display mode: user ID (if function is active)
8. Display mode: alternating display indicating space used on the SD card or USB stick. Setup mode: current 'direct access' operating code.
9. Display mode: window for measured value display (e.g. curve display). Setup mode: operating menu.
10. Display mode: alternating status display (e.g. set zoom range) of the analogue or digital inputs. Setup mode: information depends on the display type.

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RIA14/15/16

Loop-powered field indicator.

RIA14

RIA15

RIA16

- Clear back-lit display
- Bar graph, diagnostics symbols and plain text fields
- Digital limit switch
- Suitable for hazardous areas
- Voltage drop ≤1V (RIA15)

The RIA14/RIA16 indicator records an analogue measuring signal and shows this on the display. The display shows the current measured value digitally and as a bar graph with limit value violation signalling. Better still, the 2-wire indicator is loop-powered so no additional power source is required.

Technical data

	RIA14	RIA15	RIA16
Display	: 5-digit LCD (rotatable in 90°)	5-digit LCD	5-digit LCD
Display range	: -19999...+99999	-19999...+99999	-19999...+99999
Measured variable	: Current	Current	Current
Measuring range	: 4...20mA (reverse polarity protection)	4...20mA (scalable, reverse polarity protection)	4...20mA (reverse polarity protection)
Limit value violation	: Lower/upper limit value exceeded	Lower/upper limit value exceeded	Lower/upper limit value exceeded
Max measured error	: < 0.1% of scaled display range	± 0.1%	< 0.1% of scaled display range
Housing	: Die-cast aluminium (stainless steel as an option)	Panel or field	GRP (aluminium as an option)
Mounting location	: Wall or pipe	Wall or pipe	Wall or pipe
Operation	: 3 push-buttons (open housing)	3 push-buttons on front	3 push-buttons (open housing)
Ambient temperature	: -40...+80°C	-40°C...+60°C	-40...+80°C
Protection	: IP67 (NEMA4X)	Panel: front IP65, rear IP20; field: IP66/NEMA4x	IP67 (NEMA4X)
Certification	: ATEX, FM, CSA	ATEX, FM, CSA	ATEX, FM, CSA