Technical Information

Liquiline M CM42

Memosens: pH/ORP, oxygen, conductivity
Analog sensors: pH/ORP, conductivity, concentration, resistivity

Two-wire transmitter for Ex and non-Ex areas

Application
Liquiline M CM42 is a modular two-wire transmitter for all areas of process engineering. Depending on the version ordered, Liquiline has one or two analog current outputs. In addition, it can be connected to fieldbuses in accordance with the FOUNDATION Fieldbus, PROFIBUS PA and HART protocol.
The transmitter is suitable for pollution degree 3.
The highly robust plastic version and the hygienic stainless steel version are tailored to the following applications:
• Chemical processes
• Pharmaceuticals industry
• Foodstuff technology
• Applications in hazardous areas

Your benefits
• Cost-saving:
  – Simple commissioning with Quick Setup and Navigator
  – Memosens: Plug & play laboratory-calibrated sensors
  – Predictive maintenance system detects when a sensor needs to be cleaned, calibrated or replaced.
  – Less storage thanks to modular design
  – Effective asset management using FieldCare and W@M
• Safe:
  – Memosens: Active display of cable interruption
  – User-guided commissioning, graphic display and plain text guidance for maximum operating safety
  – Approvals: ATEX, FM, CSA, NEPSI, TIIS
  – User administration: Code-protected commissioning
  – pH glass with Memosens: SIL2 measuring point with TÜV approval
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Function and system design

Measuring system

A complete measuring system consists of:
- Liquiline M CM42 transmitter with mounting plate (e.g. for wall mounting)
- sensor and suitable sensor cable
- assembly suitable for the sensor (optional)
- post retainer (optional)
- weather protection cover (optional)

Examples of a measuring system

<table>
<thead>
<tr>
<th>pH / ORP (analog)</th>
<th>Conductivity, inductive measurement (analog)</th>
<th>Conductivity, conductive measurement (analog)</th>
<th>Memosens (digital)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM42-P...</td>
<td>CM42-L...</td>
<td>CM42-C...</td>
<td>CM42-K/L/M/N/O...</td>
</tr>
<tr>
<td>Measuring cable CPK9</td>
<td>Dipfit CLA111 assembly</td>
<td>Measuring cable CPK9</td>
<td>Measuring cable CYK10</td>
</tr>
<tr>
<td>Cleanfit CPA471 assembly</td>
<td>Indumax CLS50 sensor</td>
<td>Condumax CLS16 sensor</td>
<td>(Unifit CPA442 assembly)</td>
</tr>
<tr>
<td>Orbisint CPS11 sensor</td>
<td></td>
<td></td>
<td>Sensor ¹⁾</td>
</tr>
</tbody>
</table>

¹⁾ CPS11D (pH glass), CPS471D (pH ISFET), CPS16D (pH/ORP combined), CPS341D (enamel pH), COS22D/COS51D (DO), CLS15D/CLS16D/CLS21D (LFc), CLS50D (LFi)

You can combine your measuring point with a range of assemblies and sensors. Details can be found in the "Accessories" section and in the documentation listed there. For additional information, see www.endress.com/cm42

NOTICE

Effect of climatic conditions: rain, snow, direct sun
Impaired operation to complete transmitter failure
- When installing outside, always use the weather protection cover (see accessories).
**Equipment architecture**

**Software**

You can choose from the following software packages:

- **Standard:**
  - Standard application for the most common measuring points

- **Advanced:**
  - Many additional functions that increase safety and quality

<table>
<thead>
<tr>
<th>Package</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>pH / ORP (glass/ISFET)</strong></td>
</tr>
<tr>
<td><strong>Standard</strong></td>
<td></td>
</tr>
<tr>
<td>Analog sensors</td>
<td>- Offset and two-point calibration</td>
</tr>
<tr>
<td></td>
<td>- Sample calibration</td>
</tr>
<tr>
<td></td>
<td>- Calibration with standard buffers</td>
</tr>
<tr>
<td></td>
<td>- Manual buffer specification</td>
</tr>
<tr>
<td></td>
<td>- Temperature compensation</td>
</tr>
<tr>
<td></td>
<td>- Temperature adjustment</td>
</tr>
<tr>
<td></td>
<td>- Isotherm intersection</td>
</tr>
<tr>
<td></td>
<td>- Simulation of current output</td>
</tr>
<tr>
<td></td>
<td>- Self-diagnosis</td>
</tr>
<tr>
<td></td>
<td>- Calibration stability settings</td>
</tr>
<tr>
<td></td>
<td>- Clock</td>
</tr>
<tr>
<td>Memosens sensors</td>
<td>as for analog with the addition of:</td>
</tr>
<tr>
<td></td>
<td>- Sensor information</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Advanced** | **“Standard” software package with the addition of:** |
| **Analog sensors** | - Medium compensation | - Polarization voltage setting |
| | - Calibration timer | - Calibration timer |
| | - Sensor Condition Check (SCC) | - Sensor statistics |
| | - Process Check System (PCS) | - Operated hours counter |
| Memosens sensors | as for analog with the addition of: | - Sterilization cnt. |
| | - Operated hours counter | |
| | - Sterilization cnt. | |

All devices, regardless of measurement parameter

- Logbooks
- Data logbook
- Free assignment of measured values to current outputs (optional)
- Switching on and off of diagnostic function
- Extended user administration
- Current output tables

Endress+Hauser
DAT memory modules

There are 3 different types of DAT module, which can be ordered as an optional accessory or are already included in the scope of delivery:

- **SystemDAT**
  Firmware updates (newer firmware version) or change of language pack
- **FunctionDAT**
  Extended functional range (‘Advanced’ firmware or second current output)
- **CopyDAT**
  Memory for own configuration settings

**Test the extensibility of your device**

- Before ordering a FunctionDAT, check if it is possible to extend the functional range of your device.

Suitable sensors

**pH/ORP**

- Analog and Memosens glass electrodes
- Analog and Memosens ISFET sensors
- Analog and Memosens ORP sensors
- Memosens pH/ORP combined sensors
- Analog and Memosens enamel pH electrodes
- Analog single electrodes (glass or antimony)

**Conductivity**

- Analog and Memosens, conductive sensors
  - Two-electrode sensors
  - Four-electrode sensors
- Analog and Memosens, inductive sensors

**Oxygen**

Amperometric sensors:

- with Memosens technology
- 12 and 40 mm design

Dependability

**Reliability**

Memosens makes your measuring point safer:

- No-contact, digital signal transmission allows optimum galvanic isolation
- No contact corrosion
- Completely watertight
- Sensors can be calibrated in a lab, which increases the availability of measured values
- Predictive maintenance thanks to recording of sensor data, e.g.:
  - Total hours of operation
  - Hours of operation with very high or very low measured values
  - Operating hours at high temperatures
  - Number of steam sterilizations
  - Sensor status

**Quick Setup**

To the first measured value within 1 minute

Once you have set up the few parameters in the Quick Setup menu, the measuring point is ready to measure. The first measured value is reliably displayed.
Process Check System (PCS): Life check

This function is used to check the measuring signal for stagnation. An alarm is triggered if the measuring signal does not change over a certain period (several measured values). The reason for such behavior can be contamination, clogging or similar.

Sensor Condition Check (SCC, pH only)

This function monitors the electrode status and the degree of electrode aging. The status is displayed with the messages "SCC electrode condition bad" or "SCC electrode condition sufficient". The status of the electrode is updated after every calibration.

Sensor Check System (SCS, pH only)

The Sensor Check System monitors the pH glass resistance or reference resistance (for analog and combined sensors only), thus indicating possible incorrect measurements that may occur as a result of damage to or clogging of the pH electrode.

In addition, the SCS detects glass breakage in the case of classic glass electrodes as well as leaks in the case of ISFET sensors.

Polarization monitoring (conductivity only, conductively measured)

Polarization effects in the boundary layer between the sensor and the measuring solution limit the measuring range of conductive conductivity sensors. The transmitter can detect and report polarization effects using an intelligent signal evaluation process.

United States Pharmacopeia, USP and European Pharmacopeia, EP (conductivity only)

The requirements for ultrapure water in the pharmaceutical industry are determined primarily by the American USP and European EP.

The transmitter complies with USP/EP requirements for conductivity measuring systems:

- Exact temperature measurement at the place of conductivity measurement
- Simultaneous display of uncompensated conductivity values and temperature is possible
- Display resolution 0.01 μS/cm
- Exact factory calibration of the transmitter with traceable precision resistance (optional)
- Exact adjustment of sensors in the factory as per ASTM D 1125–91 or ASTM D 5391–99 (optional)
- Temperature-dependent measured value monitoring as per USP and EP.

The limit functions for pharmaceutical water are implemented in the "Advanced" software package in accordance with USP and EP: For conductivity measurements, the limit functions for pharmaceutical water are implemented in the software in accordance with USP and EP:

- Water for Injection (WFI) as per USP <645> and EP
- Highly purified water (HPW) as per EP
- Purified water (PW) as per EP

The uncompensated conductivity value and the temperature are measured for the USP/EP limit functions. The measured values are compared with the tables set down in the standards. An alarm is triggered if the limit value is exceeded. In addition, a prealarm can be set that flags undesirable operating statuses before they occur.
Application-optimized calibration models (oxygen)

In separate functions, the transmitter allows process-adjusted zero point sensor calibration or sensor calibration via the slope. There are different calibration models for this, ranging from simple slope calibration in air that is saturated with water vapor to slope calibration with input of the absolute air pressure and relative humidity at the measuring location. The latter model allows in-process calibration during operation as well as during sterilization and cleaning. The number of calibrations and sterilizations are tracked separately for the sensor and membrane cap. The relevant counter can be reset if the membrane cap is replaced.

Maintainability

Modular design

Sensor monitor ("Advanced" only)

You will find the sensor monitor in the DIAG menu. Important sensor data incl. warning and alarm limits are displayed either graphically or numerically.

Safety

User administration ("Advanced" only)

To avoid unscheduled changes to the measuring point, the device features a user administration function. You need to log on as an Expert to switch on the user administration function. The first time you log onto the device, you will therefore be asked to enter a password (the "Admin" user name is already entered). The user administration function makes two different modes available in the Advanced version:

Roles

- There are 3 fixed user roles (Expert, Maintenance, Operator).
- "Experts" always have all the rights. "Operator" is the role with the least amount of rights.
- Each role has its own individual password. This password can be changed.
- No other user roles can be created.
User accounts
- You can create and manage a maximum of 15 user accounts.
- You need to be logged on as an 'Expert' to be able to manage accounts.
- In each user account you specify the user name and the password and assign the new user one of 3 user roles (Operator, Maintenance and Expert).
- Multiple user accounts with the 'Expert' role are possible.

SIL
A TÜV-approved SIL2 version of the Liquiline M CM42 is also available (CM42-M* only, without HART).

Safety functions
- Safe output of the digitized value at the current output
- Monitoring of the measured value for leaving a defined interval
- Safe calibration and adjustment

Additional information and Safety Manuals can be found at:
www.endress.com/SIL

Input

Measured variables
-->
Documentation of the connected sensor

Measuring ranges
-->
Documentation of the connected sensor

Binary input (Memosens):
- pH/ORP, oxygen, conductivity

Cable specification
| CYK10, CYK20 with Memosens | Max. cable length 100 m (330 ft) |
| Fixed cable with Memosens (CLS50D, CLS54D) | Max. cable length 100 m (330 ft) |

Ex specification

Intrinsically safe sensor circuit with protection type: Ex ia IIC1) or Ex ic IIC2) or Ex ib IIC3)

<table>
<thead>
<tr>
<th></th>
<th>Max. output voltage Uo</th>
<th>Max. output current Io</th>
<th>Max. output Po</th>
<th>Max. external inductance Lo</th>
<th>Max. external capacitance Co</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.04 V</td>
<td>80 mA</td>
<td>112 mW</td>
<td>2 μH</td>
<td>55 μF</td>
</tr>
</tbody>
</table>

1) CM42-*G*********, CM42-*E*********, CM42-*I*********, CM42-*J*********, CM42-*X*********, CM42-*Z*********  
2) CM42-*V*********, CM42-*F*********  
3) CM42-*T*********
Liquiline M CM42

Analog input: pH / ORP

<table>
<thead>
<tr>
<th>Cable specification</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Without SCS</td>
<td>Max. cable length 50 m (160 ft)</td>
</tr>
<tr>
<td>With SCS</td>
<td>Max. cable length 20 m (65 ft)</td>
</tr>
</tbody>
</table>

Applicable temperature sensors

- Pt100
- Pt1000
- NTC 30K

Ex specification

Intrinsically safe sensor circuit with protection type: Ex ia IIC\(^1\) or Ex ic IIC\(^2\)

<table>
<thead>
<tr>
<th></th>
<th>Glass</th>
<th>ISFET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. output voltage (U_o)</td>
<td>10.08 V</td>
<td>10.08 V</td>
</tr>
<tr>
<td>Max. output current (I_o)</td>
<td>4.1 mA</td>
<td>50.7 mA</td>
</tr>
<tr>
<td>Max. output (P_o)</td>
<td>10.2 mW</td>
<td>128 mW</td>
</tr>
<tr>
<td>Max. external inductance (L_o)</td>
<td>1 mH</td>
<td>1 mH</td>
</tr>
<tr>
<td>Max. external capacitance (C_o)</td>
<td>250 nF</td>
<td>250 nF</td>
</tr>
</tbody>
</table>

Connection class as per NE116\(^3\) SensISCO1X -

1) CM42-*G*********, CM42-*E*********, CM42-*I*********, CM42-*X*********, CM42-*Z*********
2) CM42-*V*********, CM42-*F*********
3) CM42-*G*********, CM42-*E*********, CM42-*F*********

When pH/ORP glass electrodes are connected to terminals 317, 318, 320, 111, 112 and 113, the device corresponds to connection class 1 as per NAMUR Recommendation NE116 (SensISCO). Terminals 315 and 316 may not be connected for this categorization. The device is labeled SensISCO1X.

Input impedance

\(> 1 \times 10^{12} \Omega\) (under nominal operating conditions)

Input leakage current

\(< 1 \times 10^{-13} \text{A}\) (under nominal operating conditions)
**Analog input: Conductivity**

| Conductivity/specific resistivity, conductively measured<sup>1)</sup> | Max. cable length 100 m (330 ft)  
Max. cable length 50 m (160 ft)  
Max. cable length 15 m (50 ft) |
|---|---|
| Two-electrode sensor  
10 μS/k to 20 mS/k / 0.1 MΩ/k to 50 Ω/k  
5 μS/k to 20 mS/k / 0.2 MΩ/k to 50 Ω/k  
0.1 μS/k to 20 mS/k / 20 MΩ/k to 50 Ω/k |  |
| Conductivity, measured conductively  
Four-electrode sensor  
10 μS/k to 1.5 S/k  
0.1 μS/k to 20 mS/k | Max. cable length 100 m (330 ft)  
Max. cable length 15 m (50 ft) |
| Conductivity, measured inductively<sup>2)</sup> | max. cable length 55 m (180 ft)  
(CLS50)  
max. cable length 50 m (160 ft)  
(CLS54) |

<sup>1)</sup> with cable CYK71, CPK9 or fixed cable  
<sup>2)</sup> with cable CLK5, CLK6 or fixed cable

### Applicable temperature sensors

- Pt100  
- Pt1000

### Ex specification, conductive sensors

<table>
<thead>
<tr>
<th>Intrinsicly safe sensor circuit with protection type: Ex ia IIC&lt;sup&gt;1)&lt;/sup&gt; or Ex ic IIC&lt;sup&gt;2)&lt;/sup&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. output voltage $U_o$</td>
<td>10.08 V</td>
</tr>
<tr>
<td>Max. output current $I_o$</td>
<td>23 mA</td>
</tr>
<tr>
<td>Max. output $P_o$</td>
<td>57 mW</td>
</tr>
<tr>
<td>Max. external inductance $L_o$</td>
<td>300 μH</td>
</tr>
<tr>
<td>Max. external capacitance $C_o$</td>
<td>50 nF</td>
</tr>
</tbody>
</table>

<sup>1)</sup> CM42-*G*********, CM42-*E*********, CM42-*I*********, CM42-*X*********, CM42-*Z*********  
<sup>2)</sup> CM42-*V*********, CM42-*F*********

### Ex specification, inductive sensors

<table>
<thead>
<tr>
<th>Intrinsicly safe sensor circuit with protection type: Ex ia IIC&lt;sup&gt;1)&lt;/sup&gt; or Ex ic IIC&lt;sup&gt;2)&lt;/sup&gt; or Ex ib IIC&lt;sup&gt;3)&lt;/sup&gt;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. output voltage $U_o$</td>
<td>10.08 V</td>
</tr>
<tr>
<td>Max. output current $I_o$</td>
<td>64 mA</td>
</tr>
<tr>
<td>Max. output $P_o$</td>
<td>128 mW</td>
</tr>
<tr>
<td>Max. external inductance $L_o$</td>
<td>0.1 mH</td>
</tr>
<tr>
<td>Max. external conductivity $C_o$</td>
<td>1.8 μF</td>
</tr>
</tbody>
</table>

<sup>1)</sup> CM42-*G*********, CM42-*E*********, CM42-*I*********, CM42-*J*********, CM42-*Z*********  
<sup>2)</sup> CM42-*V*********, CM42-*F*********  
<sup>3)</sup> CM42-*T*********
Output

Output signal

**Current output**

1x 4 to 20 mA, passive, potentially isolated against sensor circuit (Memosens only)  
2x 4 to 20 mA, passive, potentially isolated against sensor circuit (Memosens only) and against each other  

**HART**

<table>
<thead>
<tr>
<th>Signal coding</th>
<th>FSK ± 0.5 mA via current signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data transmission rate</td>
<td>1200 Baud</td>
</tr>
<tr>
<td>Load (communication resistor)</td>
<td>250 Ω</td>
</tr>
</tbody>
</table>

**PROFIBUS PA**

<table>
<thead>
<tr>
<th>Signal coding</th>
<th>Manchester Coding Bus Powered (MBP), compliant with IEC 61158-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data transmission rate</td>
<td>31.25 kBit/s</td>
</tr>
<tr>
<td>Bus termination</td>
<td>external</td>
</tr>
<tr>
<td>Connection to PROFIBUS-DP network</td>
<td>via segment coupler (in non-Ex mode)</td>
</tr>
</tbody>
</table>

**FOUNDATION Fieldbus**

<table>
<thead>
<tr>
<th>Signal coding</th>
<th>Manchester Coding Bus Powered (MBP), compliant with IEC 61158-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data transmission rate</td>
<td>31.25 kBit/s</td>
</tr>
<tr>
<td>Bus termination</td>
<td>external</td>
</tr>
</tbody>
</table>

**Signal on alarm**

3.6 to 21.5 mA (4.0 mA fixed value in HART multidrop mode) digitally via fieldbus  

**Load**

Max. load with supply voltage of 24 V: 500 Ω  
Max. load with supply voltage of 30 V: 750 Ω  

**Output signal range**

3.6 to 21.5 mA  

**Ex specification current output**

<table>
<thead>
<tr>
<th>Intrinsically safe supply and signal circuits, passive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. input voltage $U_i$</td>
</tr>
<tr>
<td>Max. input current $I_i$</td>
</tr>
<tr>
<td>Max. input power $P_i$</td>
</tr>
<tr>
<td>Max. internal inductance $L_i$</td>
</tr>
<tr>
<td>Max. internal capacitance $C_i$</td>
</tr>
</tbody>
</table>

---

1) Potential isolation for Memosens in sensor plug  
2) For inductive sensors with Memosens protocol CLS50D and CLS54D not potentially isolated against sensor circuit!  
3) Current output 1 and current output 2 (optional)  
4) For version with PROFIBUS PA or FOUNDATION Fieldbus
## Ex specification PROFIBUS and FOUNDATION Fieldbus

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. input voltage $U_i$</td>
<td>17.5 V</td>
</tr>
<tr>
<td>Max. input current $I_i$</td>
<td>380 mA</td>
</tr>
<tr>
<td>Max. input power $P_i$</td>
<td>5.32 W</td>
</tr>
<tr>
<td>Max. internal inductance $L_i$</td>
<td>&lt;10 μH</td>
</tr>
<tr>
<td>Max. internal capacitance $C_i$</td>
<td>&lt; 5 nF</td>
</tr>
</tbody>
</table>

Suitable for use as a field device in a FISCO system as per EN/IEC 60079-27

## Protocol-specific data

### HART

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer ID</td>
<td>11h</td>
</tr>
<tr>
<td>Device type</td>
<td>11A0h (CM42-M/N/P), 11A1h (CM42-C/I/K/L), 11A1h (CM42-O)</td>
</tr>
<tr>
<td>Device revision</td>
<td>001h</td>
</tr>
<tr>
<td>Device description files (DD/DTM)</td>
<td><a href="http://www.endress.com">www.endress.com</a></td>
</tr>
<tr>
<td>Device integration manager (DIM)</td>
<td>Device Integration Manager (DIM)</td>
</tr>
<tr>
<td>Device variables</td>
<td>7 (CM42-M/N/O/P), 3 (CM42-C/I/K/L), pre-defined device variables, dynamic variables PV, SV, TV, QV</td>
</tr>
<tr>
<td>Supported features</td>
<td>PDM DD, AMS DD, DTM, handheld DDs</td>
</tr>
</tbody>
</table>

### PROFIBUS PA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer ID</td>
<td>11h</td>
</tr>
<tr>
<td>Device type</td>
<td>1566h (CM42-C/I/K/L), 1567h (CM42-O) in compatibility mode 1543h (CM42-M/N/P), 1544h (CM42-C/I/K/L), 1545h (CM42-O), 9750h (profile identifier, analyzer PA devices)</td>
</tr>
<tr>
<td>Profile version</td>
<td>PA Profile 3.02</td>
</tr>
<tr>
<td>GSD files</td>
<td><a href="http://www.endress.com/profibus">www.endress.com/profibus</a></td>
</tr>
<tr>
<td>Device integration manager (DIM)</td>
<td>Device Integration Manager DIM</td>
</tr>
<tr>
<td>Output variables</td>
<td>6 AI blocks</td>
</tr>
<tr>
<td>Supported features</td>
<td>• 1 MSCY0 connection (cyclical communication, master class 1 to slave) • 1 MSAC1 connection (acyclical communication, master class 1 to slave) • 2 MSAC2 connections (acyclical communication, master class 2 to slave) • Addressing with DIL switches or via software • GSD, PDM DD, DTM • Status output: condensed or classic</td>
</tr>
</tbody>
</table>

### FOUNDATION Fieldbus

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer name</td>
<td>Endress+Hauser</td>
</tr>
<tr>
<td>Model name</td>
<td>Liquiline_Cond</td>
</tr>
<tr>
<td>Manufacturer ID (hex)</td>
<td>452B48</td>
</tr>
<tr>
<td>Device type (hex)</td>
<td>10A1</td>
</tr>
<tr>
<td>Device revision (hex)</td>
<td>2</td>
</tr>
<tr>
<td>Device class</td>
<td>Link master</td>
</tr>
<tr>
<td>ITK version</td>
<td>6.1.1</td>
</tr>
<tr>
<td>Function and other blocks</td>
<td>1xRB, 6xAI, 2xDI, 1xPID, 2xAALM, 1xISEL, 1xSC, 7xTB</td>
</tr>
</tbody>
</table>
Current output, passive

Span
3.6 to 21.5 mA

Signal characteristics
linear, table ('Advanced' only)

Cable specification
Cable type: shielded wire, Ø 2.5 mm (14 AWG)

Power supply

Supply voltage
Current output / HART:

![Graph showing minimum supply voltage at the transmitter depending on the output current.

Minimum supply voltage at the transmitter depending on the output current:
A  with HART communication
B  without HART communication

PROFIBUS PA / FOUNDATION Fieldbus:
- 9 to 32 V DC (non-Ex)
- 9 to 17.5 V DC (Ex)

Bus current consumption:
22 mA

Certified cable glands

<table>
<thead>
<tr>
<th>Cable gland</th>
<th>Clamping range, permitted cable diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>M16 x 1.5 mm</td>
<td>3 to 6 mm (0.12 to 0.24&quot;)</td>
</tr>
<tr>
<td>M20 x 1.5 mm</td>
<td>5 to 9 mm (0.20 to 0.35&quot;)</td>
</tr>
<tr>
<td>M20 x 1.5 mm</td>
<td>6 to 12 mm (0.24 to 0.47&quot;)</td>
</tr>
<tr>
<td>NPT 3/8&quot;</td>
<td>3 to 6 mm (0.12 to 0.24&quot;)</td>
</tr>
<tr>
<td>NPT 1/2&quot;</td>
<td>5 to 9 mm (0.20 to 0.35&quot;)</td>
</tr>
<tr>
<td>NPT 1/2&quot;</td>
<td>6 to 12 mm (0.24 to 0.47&quot;)</td>
</tr>
<tr>
<td>G3/8</td>
<td>3 to 6 mm (0.12 to 0.24&quot;)</td>
</tr>
<tr>
<td>G1/2</td>
<td>5 to 9 mm (0.20 to 0.35&quot;)</td>
</tr>
<tr>
<td>G1/2</td>
<td>9 to 12 mm (0.35 to 0.47&quot;)</td>
</tr>
<tr>
<td>Dummy plug M16</td>
<td>-</td>
</tr>
<tr>
<td>Dummy plug M20</td>
<td>-</td>
</tr>
</tbody>
</table>
**Cable cross-section**

max. cable cross-section: 2.5 mm² (14 AWG), GND 4 mm² (12 AWG)

---

**Grounding the housing**

**Plastic housing**

**WARNING**

Electric voltage at ungrounded cable mounting rail

No shock protection

- Connect the cable mounting rail to the foundation ground using a separate ≥ 2.5 mm² (14 AWG) functional ground.

---

**Stainless steel housing**

**WARNING**

Electric voltage at ungrounded housing

No shock protection

- Connect the external ground connection of the housing to the foundation ground using a separate wire (GN/YE) (≥ 2.5 mm², corresponds to 14 AWG).
Supply and signal voltage

4 to 20 mA

▷ Connect the transmitter with a shielded two-wire cable.

How the shield is connected depends on the interference influence expected. To suppress electrical fields, it suffices to ground the shield at one end. If you also want to suppress interference from a magnetic alternating field, you must ground the shield at both ends.

In the case of a SIL device, you must ground both current outputs at both ends.

The second current output can be ordered as an option (see “Ordering information”).

4 to 20 mA / HART

For safe communication via the HART protocol and for compliance with NAMUR NE 21, you must use a two-wire cable that is grounded at both ends.

▷ Connect the transmitter to a two-wire cable that is grounded at both ends.

The device is powered only via current output 1 and not via current output 2.
PROFIBUS PA and FOUNDATION Fieldbus

Use a fieldbus cable grounded at both ends (device and PCS).

There are various ways of connecting the unit:

1. Two-wire cable grounded at both ends, “hard grounding”
   (generally to be given priority over “capacitive connection to ground”)
2. If there is a risk of large potential equalization currents.
   Shielded two-wire cabling, “capacitive connection to ground” (shield grounded on device side via capacitor, “C-module” accessory required)
   **Do not use in the hazardous area!**
3. Use the fieldbus connection socket (accessories)

"Hard grounding"

1. Connect the cable shield to the cable mounting rail.
2. Connect the cable cores as per the assignment.

"Capacitive ground connection"

1. Pull back the braided shield, put the stranded extension wire of the C-module (item 1) onto the exposed shield and tighten the clip:
2. Connect the extension wire to the cable mounting rail.
3. Connect the cable cores as per the assignment.
"Fieldbus connection socket"

1. Screw the fieldbus connection socket into the housing bushing.
2. Trim the connection cores of the socket to approx. 15 cm.
3. Connect the cable cores as per the assignment. In doing so, you must connect the cable shield (GN/YE) to the cable mounting rail.

Sensor connection

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>pH signal</td>
</tr>
<tr>
<td>Ref</td>
<td>Signal from reference electrode</td>
</tr>
<tr>
<td>Src</td>
<td>Source</td>
</tr>
<tr>
<td>Drn</td>
<td>Drain</td>
</tr>
<tr>
<td>PM</td>
<td>Potential matching</td>
</tr>
<tr>
<td>U_</td>
<td>Power supply of the digital sensor</td>
</tr>
<tr>
<td>Com A</td>
<td>Communication signals of the digital sensor</td>
</tr>
<tr>
<td>Com B</td>
<td></td>
</tr>
<tr>
<td>θ</td>
<td>Signal of the temperature sensor</td>
</tr>
<tr>
<td>d.n.c.</td>
<td>Do not connect!</td>
</tr>
</tbody>
</table>

**NOTICE**

No shielding against electrical and magnetic interference

Interference can give erroneous measurement results:

- You must connect shielded connections or terminals with functional earth (⊕) (there is no protective earth in the case of the plastic housing (oun)).
- Keep magnetic interference fields away from the sensor since inductive conductivity sensors use magnetic fields.
Sensor connection: Memosens sensors

pH/ORP incl. pH/ORP combined sensors, oxygen, conductively measured conductivity

For devices with fieldbus, only new sensors (right column) may now be used.
Sensor connection:
analog pH/ORP sensors

Glass electrodes, with PAL (symmetrical)

Glass electrodes, without PAL (asymmetrical)
ISFET sensors, with PAL (symmetrical)

View in device (sensor module)

Wiring diagram

ISFET sensors, without PAL (asymmetrical)

View in device (sensor module)

Wiring diagram
**pH enamel electrodes**

**With PML (symmetrical)**
- Pfaudler electrode, absolute
  - Type 03/type 04

**With PML (symmetrical)**
- Pfaudler electrode, relative
  - Type 18/type 40

---

**With PML (symmetrical)**
- pH Reiner

---

**Without PML (asymmetrical)**
- Pfaudler electrode, absolute
  - Type 03/type 04
Individual electrodes (e.g. CPS64 glass or antimony), without PAL (asymmetrical)

For rH measurement, connect a pH combination electrode (e.g. CPS11 with sensor cable CPK9) and an ORP sensor (e.g. CPS12 with sensor cable CPK1).
Sensor connection:
- analog conductivity sensors

Conductive sensors, two-electrode sensors

Conductive sensors, four-electrode sensors
Performance characteristics

<table>
<thead>
<tr>
<th>Reference temperature</th>
<th>Standard 25 °C (77 °F) configurable from –5 to 100 °C (23 to 212 °F) 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current output response time</td>
<td>t_{90} = max. 500 ms for an increase from 4 to 20 mA</td>
</tr>
<tr>
<td>Memosens measured error</td>
<td>Thanks to digital data transmission, the measured value supplied by the sensor at the sensor input is passed on accurately. Measurement accuracy depends solely on the connected sensor and the quality of its adjustment.</td>
</tr>
<tr>
<td>Tolerance, current outputs</td>
<td>Current outputs, additional 25 μA</td>
</tr>
<tr>
<td>Repeatability</td>
<td>--&gt; Documentation of the connected sensor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature compensation conductivity</th>
<th>Types of compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Linear</td>
</tr>
<tr>
<td></td>
<td>NaCl to IEC 746-3</td>
</tr>
<tr>
<td></td>
<td>Natural waters to IEC 7888</td>
</tr>
<tr>
<td></td>
<td>Ultrapure water NaCl</td>
</tr>
<tr>
<td></td>
<td>Ultrapure water HCl (also for NH₃)</td>
</tr>
<tr>
<td></td>
<td>4 user-definable tables 1)</td>
</tr>
</tbody>
</table>

| Range                                  | α = 0.00 to 20.00 % K⁻¹                                                                |
|                                        | 0 to 100 °C (32 to 212 °F)                                                             |
|                                        | 0 to 35 °C (32 to 95 °F)                                                               |
|                                        | 0 to 100 °C (32 to 212 °F)                                                             |
|                                        | 0 to 60 °C (32 to 140 °F)                                                              |

5) with "Advanced" software package

1) with "Advanced" software package
Liquiline M CM42

Temperature adjustment

<table>
<thead>
<tr>
<th>Temperature offset</th>
<th>–5 to +5 °C (23 to 41 °F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature increase</td>
<td>0.9 ... 1.1 ¹</td>
</tr>
</tbody>
</table>

¹ with "Advanced" software package

Installation

Wall securing plate

![Wall securing plate diagram](image)

Dimensions of mounting plate in mm (inch)

Weather protection cover

**NOTICE**

Effect of climatic conditions (rain, snow, direct sun etc.)
Impaired operation to complete transmitter failure

▶ When installing outside, always use the weather protection cover (accessory).

Weather protection cover for plastic housing

![Weather protection cover diagram](image)

Dimensions of weather protection cover in mm (inch)
Weather protection cover for stainless steel housing

Dimensions of weather protection cover CY101 in mm (inch)
A  Wall mounting
B  Pipe or circular post mounting
1  Circular post attachment (accessory)

To mount the weather protection cover on pipes or circular posts, you will also require a circular post attachment, → 'Accessories' or 'Installation options'

Installation options

<table>
<thead>
<tr>
<th>Wall mounting</th>
<th>Pipe mounting</th>
<th>Panel mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wall mounting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pipe or circular post mounting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Circular post attachment (accessory)</td>
<td></td>
</tr>
</tbody>
</table>

Wall mounting
- Weather protection cover (optional)

Liquiline
2. 3  Mounting plate (1x accessory)
4  Pipe or post (circular/square)

Plastic housing

<table>
<thead>
<tr>
<th>Wall mounting</th>
<th>Pipe mounting</th>
<th>Panel mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>without weather protection cover</td>
<td>Mounting plate Standard</td>
<td>Mounting kit: 51518263</td>
</tr>
<tr>
<td>with weather protection cover</td>
<td>Protection cover 51517382</td>
<td>Mounting kit: 51518263</td>
</tr>
</tbody>
</table>

Stainless steel housing

<table>
<thead>
<tr>
<th>Wall mounting</th>
<th>Pipe mounting</th>
<th>Panel mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>without weather protection cover</td>
<td>Mounting plate Standard</td>
<td>Mounting kit: 51518286</td>
</tr>
<tr>
<td>with weather protection cover</td>
<td>Protection cover CY101-A</td>
<td>Protection cover CY101-A</td>
</tr>
<tr>
<td></td>
<td>Circular post attachment: 50062121</td>
<td></td>
</tr>
</tbody>
</table>
Installation in Ex area

**CM42-*G**

<table>
<thead>
<tr>
<th>Zone 0</th>
<th>Zone 1</th>
<th>non-hazardous area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Installation in Ex area

1. **Sensor in Ex version**
2. **Intrinsically safe sensor circuit Ex ia**
3. **Transmitter**
4. **Supply and signal circuit Ex ib (4 to 20 mA)**
5. **Active barrier, e.g. Preline RN221**
6. **Signal line HART/PROFIBUS/FF**
7. **FieldCare via PROFIBUS/FF**
8. **HART handheld terminal**

**CM42-*V**

<table>
<thead>
<tr>
<th>Zone 2</th>
<th>non-hazardous location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Installation in Ex area

1. **Sensor in Ex version**
2. **Intrinsically safe sensor circuit Ex ic**
3. **Transmitter**
4. **Supply and signal circuit Ex nA (4 to 20 mA)**
5. **Active barrier, e.g. Preline RN221**
6. **Signal line HART/PROFIBUS/FF**
7. **FieldCare via PROFIBUS/FF**
8. **HART handheld terminal**
CM42-*P/S

Installation in Ex area
1. Sensor in Ex version
2. Intrinsically safe sensor circuit
3. Transmitter
4. Supply and signal circuit (4 to 20 mA)
5. Active barrier, e.g. Preline RN221
6. Signal line HART/PROFIBUS/FF
7. FieldCare via PROFIBUS/FF
8. HART handheld terminal

CM42-*X/Z

Installation in Ex area
1. Sensor in Ex version
2. Intrinsically safe sensor circuit Ex ia
3. Transmitter
4. Supply and signal circuit Ex nA (4 to 20 mA)
5. Active barrier, e.g. Preline RN221
6. Signal line HART/PROFIBUS/FF
7. FieldCare via PROFIBUS/FF
8. HART handheld terminal
## Environment

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient temperature range</strong></td>
<td><strong>Non-Ex version</strong></td>
</tr>
<tr>
<td></td>
<td>-30 to 70 °C (–20 to 160 °F)</td>
</tr>
<tr>
<td></td>
<td><strong>Ex version: ATEX (1)2G &amp; 3D, ATEX 3G nA[ic] / NEPSI nA[ic], IECEx ib Gb [ia Ga], NEPSI ib[ia Ga]</strong></td>
</tr>
<tr>
<td></td>
<td>-20 to 50 °C (T6)</td>
</tr>
<tr>
<td></td>
<td>-20 to 55 °C (T4)</td>
</tr>
<tr>
<td></td>
<td><strong>Ex version: ATEX 3G nA[ia], NEPSI nA[ia]</strong></td>
</tr>
<tr>
<td></td>
<td>-10 to 50 °C (T6)</td>
</tr>
<tr>
<td></td>
<td><strong>Ex version: TII S ib</strong></td>
</tr>
<tr>
<td></td>
<td>-20 to 55 °C (T4)</td>
</tr>
<tr>
<td></td>
<td><strong>Ex version: CSA Class I, II, III, Div. 1&amp;2, FM Class I, Div 1&amp;2</strong></td>
</tr>
<tr>
<td></td>
<td>-20 to 50 °C (0 to 120 °F) (T6)</td>
</tr>
<tr>
<td></td>
<td>-20 to 55 °C (0 to 130 °F) (T4)</td>
</tr>
<tr>
<td><strong>Ex version: TIIS ib</strong></td>
<td><strong>–20 to 55 °C (T4)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Ex version: CSA Class I, II, III, Div. 1&amp;2, FM Class I, Div 1&amp;2</strong></td>
</tr>
<tr>
<td></td>
<td><strong>–20 to 50 °C (0 to 120 °F) (T6)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>–20 to 55 °C (0 to 130 °F) (T4)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Ex version: TIIS ib</strong></td>
</tr>
<tr>
<td></td>
<td><strong>–20 to 55 °C (T4)</strong></td>
</tr>
<tr>
<td><strong>Ex version: CSA Class I, II, III, Div. 1&amp;2, FM Class I, Div 1&amp;2</strong></td>
<td>-20 to 50 °C (0 to 120 °F) (T6)</td>
</tr>
<tr>
<td></td>
<td>-20 to 55 °C (0 to 130 °F) (T4)</td>
</tr>
</tbody>
</table>

| **Storage temperature**                | -40 to 80 °C (~–40 to 175 °F)                                          |
| **Electromagnetic compatibility**      | Interference emission and interference immunity as per EN 61326-1: 2006, Category B (residential environments) |
| **Degree of protection**               | IP66 / IP 67 / NEMA 4X                                                 |
| **Relative humidity**                  | 10 ... 95%, not condensing                                             |
| **Pollution degree**                   | The product is suitable for pollution degree 3 as per EN 61010-1.      |

## Mechanical construction

<table>
<thead>
<tr>
<th><strong>Dimensions</strong></th>
<th><strong>Plastic housing</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions in mm (inch)</strong></td>
<td>144 (5.67)</td>
</tr>
<tr>
<td></td>
<td>144 (5.67)</td>
</tr>
<tr>
<td></td>
<td>95 (3.74)</td>
</tr>
<tr>
<td></td>
<td>148 (5.83)</td>
</tr>
<tr>
<td></td>
<td>177 (6.97)</td>
</tr>
<tr>
<td></td>
<td>220 (8.66)</td>
</tr>
<tr>
<td></td>
<td>22 (0.86)</td>
</tr>
<tr>
<td></td>
<td>130 (5.12)</td>
</tr>
<tr>
<td></td>
<td>138 (5.43)</td>
</tr>
</tbody>
</table>

*Dimensions in mm (inch)*
Stainless steel housing

![Dimensions in mm (inch)](image)

**Weight**

- **Plastic housing**: 1.5 kg (3.3 lbs)
- **Stainless steel housing**: 2.1 kg (4.6 lbs)

**Material**

<table>
<thead>
<tr>
<th>Plastic housing</th>
<th>Plastic and stainless steel housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Module housing</td>
</tr>
<tr>
<td>Housing seals</td>
<td>Soft keys</td>
</tr>
<tr>
<td>PC-FR (polycarbonate, flame-retardant)</td>
<td>Stainless steel 1.4301 (AISI 304)</td>
</tr>
<tr>
<td>Foamed silicone, EPDM</td>
<td>TPE</td>
</tr>
<tr>
<td></td>
<td>Cable mounting rail</td>
</tr>
<tr>
<td></td>
<td>Display panel</td>
</tr>
<tr>
<td></td>
<td>Cable glands</td>
</tr>
<tr>
<td></td>
<td>Dummy plug M16 and M20</td>
</tr>
<tr>
<td></td>
<td>PC (polycarbonate)</td>
</tr>
<tr>
<td></td>
<td>Stainless steel 1.4301 (AISI 304)</td>
</tr>
<tr>
<td></td>
<td>PC-FR (polycarbonate, flame-retardant)</td>
</tr>
<tr>
<td></td>
<td>PA (polyamide) V0 as per UL94</td>
</tr>
<tr>
<td></td>
<td>PA (polyamide) V0 as per UL94</td>
</tr>
</tbody>
</table>
Operability

Operation concept
The unique operating concept sets new standards:
- Fewer user errors thanks to very easy operation
- Rapid configuration using the Navigator.
- Intuitive configuration and diagnosis due to plain text display

Display characteristics
LCD display: FSTN technology (FSTN = Foil Super Twisted Nematic)
Size: 94 x 76 mm (3.7 x 3.0”)
Resolution: 240 x 160 dots

Operating elements

Operation overview
1  Alarm LED
2  Display, current display: pH measuring mode
3  Navigator
4-7  Softkeys
8  Display of softkey function (menu-dependent)
Ordering information

Product page
You can create a valid and complete order code on the Internet using the Configurator tool.
Enter the following address in the browser to launch the product page:
www.endress.com/cm42

Product configurator
On the right-hand side of the product page, you will find the navigation area:

1. Under "Device Support", click "Configure your selected product".
   - The Configurator opens in a new window.
2. Configure the device according to your requirements by selecting all options.
   - This ensures that you will receive a valid and complete order code.
3. Export the order code as a PDF or Excel file. To do so, click on the relevant button at the top of the selection window.

Scope of delivery
Depending on the version, the scope of delivery comprises:

- 1 transmitter in the version ordered
- 1 mounting plate incl. 4 flat head screws
- 1 sheet of adhesive labels (nameplate, terminal connection diagrams)
- 1 test certificate to EN 10204-3.1
- 1 factory calibration certificate
- Operating Instructions Part 1 and 2, BA00381C and BA00382C, in the language ordered
- 1 manufacturer's certificate
- Safety Manual
- Maintenance Documentation SIL 2

Certificates and approvals

CE mark
Declaration of conformity
The product meets the requirements of the harmonized European standards.
It therefore complies with the statutory requirements of the EC directives.
The manufacturer confirms successful testing of the product by affixing the CE symbol.

Ex approval
Depending on the version ordered:
- ATEX II (1)2G Ex ib [ia Ga] IIC T4/T6 Gb / II 3 D Ex tc IIIc T85°C Dc
- ATEX II (1)2G Ex ib [ia Ga] IIC T4/T6 Gb
- ATEX II 3D Ex tc [ic IIC Gc] IIIc T85°C Dc
- ATEX II (2)3G Ex nA [ia Ga] IIC T6 Gc
- NEPSi Ex nA [ia Ga] IIC T6 Gc
- NEPSi Ex ib [ia Ga] IIC T4/T6 Gb
- CSA IS NI Cl.I, II, III, Div. 1&2, Grps. A-G
- FM IS NI Cl.I, Div. 1&2, Grps. A-D
- TIIS Ex ib IIC T4
## Accessories

The following is a list of the most important accessories available at the time this documentation was issued. For accessories not listed here, please contact your local service or sales center.

### Mounting kits

**Post retainer for plastic housing**
- 1 Mounting plate
- 2 Threaded rods M5x75 mm A2
- 2 Hexagonal nuts M5 A2, DIN 934
- 2 spring washers A2 DIN127, form B5 (M5)
- 2 Washers A 5.3, DIN125 A2
- Order No. 51518263

**Post retainer for stainless steel housing**
- 1 Mounting plate
- 2 Threaded rods M5x75 mm A2
- 2 Hexagonal nuts M5 A2, DIN 934
- 2 spring washers A2 DIN127, form B5 (M5)
- 2 Washers A 5.3, DIN125 A2
- Order No. 51518286

**Panel installation kit for plastic housing for panel cutout 138x138 mm (5.43x5.43 inch)**
- 1 Panel installation seal
- 2 Tensioning screws M6x150 mm
- 4 Hexagonal nuts M6, DIN934 A2
- 4 spring washers, A2 DIN127, form B6
- 4 Washers A6.4, DIN125 A2
- Order No. 51518173

**Panel installation kit for stainless steel housing for panel cutout 138x138 mm (5.43x5.43 inch)**
- 1 Panel installation seal
- 2 Tensioning screws M6x150 mm
- 4 Hexagonal nuts M6, DIN934 A2
- 4 spring washers, A2 DIN127, form B6
- 4 Washers A6.4, DIN125 A2
- Order No. 51518284

### Weather protection cover

**Weather protection cover for plastic housing**
- Order No. 51517382

**Weather protection cover for stainless steel housing**
- Order No. CYY101-A

### Active barrier

**Active barrier RN221N**
- With power supply for safe isolation of 4 to 20 mA standard signal circuits
- Technical Information TI073R/09/en

### Fieldbus accessories

**Fieldbus connection socket**
- FOUNDATION Fieldbus M20 7/8" connection
- Order No. 51517974

**M12 connector**
- Four-pole metal connector for mounting on transmitter
- For connecting to the connection box or cable jack, cable length 150 mm (5.91")
- Order No. 51502184

**C-module accessories bag**
- 1 capacitor for connecting the cable shielding to ground potential
- Kit documentation SD00108C
- Order No. 71003097
**Measuring cable**

- **Memosens data cable CYK10**
  - For digital sensors with Memosens technology
  - pH, ORP, oxygen (amperometric), chlorine, conductivity (conductive)
  - Order as per product structure (→ Online Configurator, www.endress.com/cyk10)
  - Technical Information TI00118C/07/EN

- **Memosens data cable CYK11**
  - Extension cable for digital sensors with Memosens protocol
  - Order as per product structure (→ Online Configurator, www.endress.com/cyk11)

- **Measuring cable CPK9**
  - For sensors with ESA plug-in head, for high-temperature and high-pressure applications, IP 68
  - Order as per order structure
  - Technical Information TI00501C/07/EN

- **Special measuring cable CPK12**
  - For ISFET sensors and pH/ORP glass electrodes with TOP68 plug-in head
  - Order as per order structure
  - Technical Information TI00118C/07/EN

- **Measuring cable CYK71**
  - Non-terminated cable for connecting sensors and for extending sensor cables
  - Sold by the meter, order numbers:
    - Non-Ex version, black: 50085333
    - Ex version, blue: 50085673

- **Measuring cable CLK6**
  - Extension cable for extending CLS50/52/54 and transmitter via VBM junction box, sold by the meter
  - Order No. 71183688

**Sensors**

- **pH/ORP glass sensors**

  - **Orbisint CPS11/CPS11D**
    - pH electrode for process engineering
    - Optional SIL version for connecting to SIL transmitter
    - With dirt-repellent PTFE diaphragm
    - Order as per product structure (→ Online Configurator, www.endress.com/cps11 or www.endress.com/cps11d)
    - Technical Information TI00028C/07/EN

  - **Orbisint CPS12/CPS12D**
    - ORP electrode for process engineering
    - Order as per product structure (→ Online Configurator, www.endress.com/cps12 or www.endress.com/cps12d)
    - With dirt-repellent PTFE diaphragm
    - Technical Information TI000367C/07/EN

  - **Ceraliquid CPS41/CPS41D**
    - pH electrode with ceramic diaphragm and KCl liquid electrolyte
    - Order as per product structure (→ Online Configurator, www.endress.com/cps41 or www.endress.com/cps41d)
    - Technical Information TI00079C/07/EN

  - **Ceraliquid CPS42/CPS42D**
    - Redox electrode with ceramic diaphragm and KCl liquid electrolyte
    - Order as per product structure (→ Online Configurator, www.endress.com/cps42 or www.endress.com/cps42d)
    - Technical Information TI00373C/07/EN

  - **Ceragel CPS71/CPS71D**
    - pH electrode with double-chamber reference system and integrated bridge electrolyte
    - Order as per product structure (→ Online Configurator, www.endress.com/cps71 or www.endress.com/cps71d)
    - Technical Information TI00245C/07/EN
Ceragel CPS72/CPS72D
- ORP electrode with double-chamber reference system and integrated bridge electrolyte;
- Order as per product structure (--> Online Configurator, www.endress.com/cps72 or www.endress.com/cps72d)
- Technical Information TI00374C/07/EN

Orbipore CPS91/CPS91D
- pH electrode with open aperture diaphragm for media with high contamination potential;
- Order as per product structure (--> Online Configurator, www.endress.com/cps91 or www.endress.com/cps91d)
- Technical Information TI00375C/07/EN

Orbipore CPS92/CPS92D
- ORP electrode with open aperture diaphragm for media with high contamination potential;
- Order as per product structure (--> Online Configurator, www.endress.com/cps92 or www.endress.com/cps92d)
- Technical Information TI00435C/07/EN

**pH/ORP combined sensors**

Memosens CPS16D
- pH ORP combined sensor for process engineering, with dirt-repellent PTFE diaphragm
- With Memosens technology
- Order as per product structure (--> Online Configurator, www.endress.com/cps16d)
- Technical Information TI00503C/07/EN

Memosens CPS76D
- pH ORP combined sensor for process engineering, hygiene and sterile applications
- With Memosens technology
- Order as per product structure (--> Online Configurator, www.endress.com/cps76d)
- Technical Information TI00506C/07/EN

Memosens CPS96D
- pH and ORP combined sensor for chemical processes
- With poison-resistant reference with ion trap
- With Memosens technology
- Order as per product structure (--> Online Configurator, www.endress.com/cps96d)
- Technical Information TI00507C/07/EN

**pH-ISFET sensors**

Tophit CPS471/CPS471D
- Sterilizable and autoclavable ISFET sensor for food and pharmaceuticals, process technology
- Water treatment and biotechnology
- Order as per product structure (--> Online Configurator, www.endress.com/cps471 or www.endress.com/cps471d)
- Technical Information TI00283C/07/EN

Tophit CPS441/CPS441D
- Sterilizable ISFET sensor for media with low conductivity
- Liquid KCl electrolyte
- Order as per product structure (--> Online Configurator, www.endress.com/cps441 or www.endress.com/cps441d)
- Technical Information TI00352C/07/EN

Tophit CPS491/CPS491D
- ISFET sensor with open aperture diaphragm for media with high contamination potential
- Order as per product structure (--> Online Configurator, www.endress.com/cps491 or www.endress.com/cps491d)
- Technical Information TI00377C/07/EN

**Enamel pH electrode**

Ceramax CPS341D
- pH electrode with pH-sensitive enamel
- For the toughest requirements in terms of measurement accuracy, pressure, temperature, sterility and operating life
- Order as per product structure (--> Online Configurator, www.endress.com/cps341d)
- Technical Information TI00468C/07/EN
**Inductive conductivity sensors**

Indumax P CLS50D/CLS50
- Highly-resistant inductive conductivity sensor for standard, Ex and high-temperature applications
- With or without Memosens technology
- Order as per product structure (--> Online Configurator, www.products.endress.com/cls50d or .../cls50)
- Technical Information TI00182C/07/EN

Indumax H CLS52
- Inductive conductivity sensor with fast-acting temperature sensor for applications in the food industry
- Order as per product structure (--> Online Configurator, www.endress.com/cls52)
- Technical Information TI00167C/07/EN

Indumax H CLS54D
- Inductive conductivity sensor with certified, hygienic design for foodstuffs, beverages, pharmaceuticals and biotechnology
- Order as per product structure (--> Online Configurator, www.endress.com/cls54d)
- Technical Information TI00508C/07/EN

Indumax H CLS54
- Inductive conductivity sensor with certified, hygienic design for foodstuffs, beverages, pharmaceuticals and biotechnology
- Order as per product structure (--> Online Configurator, www.endress.com/cls54)
- Technical Information TI00400C/07/EN

**Conductive conductivity sensors**

Condumax W CLS12
- For process temperatures up to 160 °C (320 °F) and process pressures up to 40 bar (580 psi)
- Order as per product structure (--> Online Configurator, www.endress.com/cls12)
- Technical Information TI00082C/07/EN

Condumax W CLS13
- For process temperatures up to 250 °C (480 °F) and process pressures up to 40 bar (580 psi)
- Order as per product structure (--> Online Configurator, www.endress.com/cls13)
- Technical Information TI00083C/07/EN

Condumax CLS15/CLS15D
- Conductive conductivity sensor for pure and ultrapure water and Ex applications
- With Memosens protocol (CLS15D) or analog (CLS15)
- Order as per product structure (--> Online Configurator, www.endress.com/cls15d)
- Technical Information TI00083C/07/EN

Condumax H CLS16/CLS16D
- Hygienic, conductive conductivity sensor for pure, ultrapure water and Ex applications
- With EHEDG and 3A approval
- Optionally available with Memosens (CLS16D)
- Order as per product structure (--> Online Configurator, www.endress.com/cls16d)
- Technical Information TI00227C/07/EN

Condumax W CLS19
- Inexpensive, conductive conductivity sensor for pure and ultrapure water applications;
- Order as per product structure (--> Online Configurator, www.endress.com/cls19)
- Technical Information TI00110C/07/EN

Condumax W CLS21/CLS21D
- Two-electrode sensor in version with plug-in head and fixed cable
- Optionally available with Memosens (CLS21D)
- Order as per product structure (--> Online Configurator, www.endress.com/cls21d)
- Technical Information TI00085C/07/EN
Amperometric oxygen sensors

Oxymax COS22D
- Sterilizable sensor for dissolved oxygen
- Order as per product structure (--> Online Configurator, www.endress.com/cos22d)
- Technical Information TI446C/07/EN

Oxymax COS51D
- Amperometric sensor for dissolved oxygen, with Memosens technology
- Order as per product structure (--> Online Configurator, www.endress.com/cos51d)
- Technical Information TI00413C/07/EN

Software update and upgrade

CY42 DAT module
- Extended functionality, update and memory module
- Ordering as per order structure

<table>
<thead>
<tr>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>CopyDAT, for saving the configuration and transferring it to other devices</td>
</tr>
<tr>
<td>F1</td>
<td>FunctionDAT for extending the function to 2 current outputs</td>
</tr>
<tr>
<td>F2</td>
<td>FunctionDAT for extending the function to advanced software</td>
</tr>
<tr>
<td>S1</td>
<td>SystemDAT, for software update, language catalog extension</td>
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CY42- Complete order code