

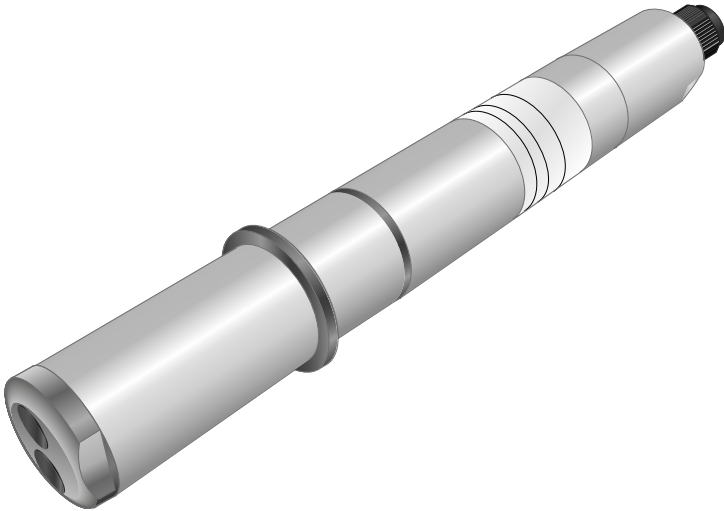
Assembly and operating instructions

Sensor for conductivity

Type: CCT 1-20 mS/cm-mA

ProMinent®

EN



A2499


**Please carefully read these operating instructions before use. · Do not discard.
The operator shall be liable for any damage caused by installation or operating errors.
The latest version of the operating instructions are available on our homepage.**

Supplemental directives

General non-discriminatory approach

In order to make it easier to read, this document uses the male form in grammatical structures but with an implied neutral sense. It is aimed equally at both men and women. We kindly ask female readers for their understanding in this simplification of the text.

Supplementary information


 Please read the supplementary information in its entirety.

Information



This provides important information relating to the correct operation of the unit or is intended to make your work easier.

Warning information

Warning information includes detailed descriptions of the hazardous situation, see  *Chapter 2.1 „Labelling of Warning Information“ on page 6.*

The following symbols are used to highlight instructions, links, lists, results and other elements in this document:

Tab. 1: More symbols





Symbol	Description
1. 	Action, step by step.
	Outcome of an action.
	Links to elements or sections of these instructions or other applicable documents.
	List without set order.
[Button]	Display element (e.g. indicators). Operating element (e.g. button, switch).
„Display /GUI“	Screen elements (e.g. buttons, assignment of function keys).
CODE	Presentation of software elements and/or texts.

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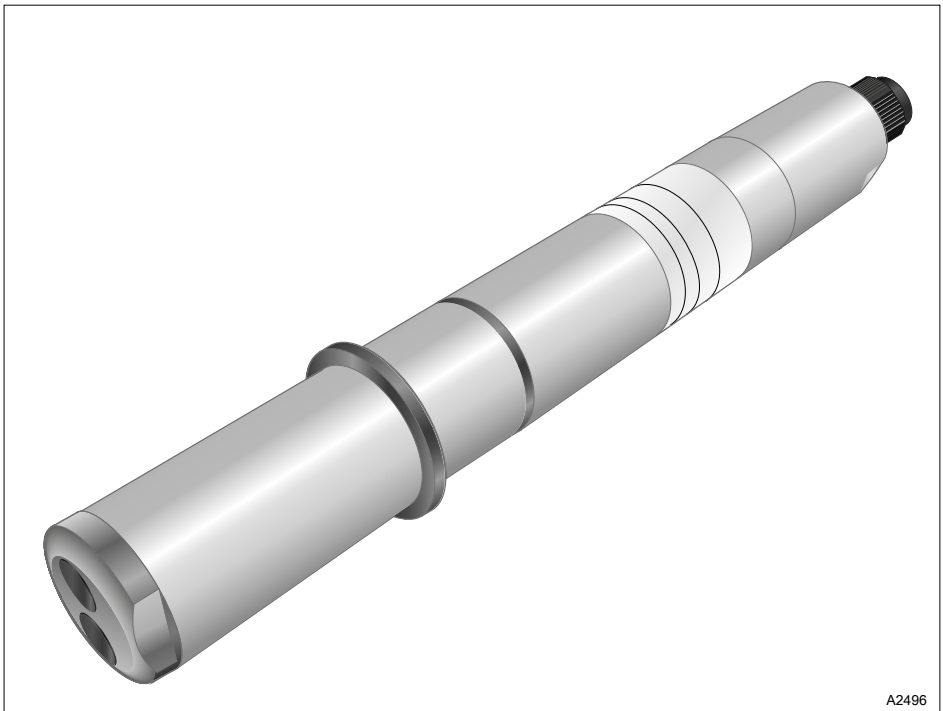
1 General

The sensor CCT 1 is a sensor for measuring electrolytic conductivity in aqueous sample media. The sensor CCT works on the conductive measuring principle. Using the conductive measuring principle, two measuring electrodes measure the ions in the sample media as electric current. The two measuring electrodes are in direct contact with the sample media. Integrated temperature measurement and compensation mean that the sensor signal is not dependent on changes in temperature in the sample media.

Typical applications include water with a very high salt content of up to 20mS/cm, such as cooling, industrial and process water.

The sensor can be fitted in ProMinent GmbH DGMa or DLG III type bypass fittings.

The sensor signal is a galvanically isolated passive 4 ... 20 mA signal, which can be connected directly to ProMinent GmbH controllers for conductivity with the appropriate 4 ... 20 mA input.



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Fig. 1: Conductivity sensor CCT 1

2 Safety and qualification

2.1 Labelling of Warning Information

Introduction

These operating instructions provide information on the technical data and functions of the product. These operating instructions provide detailed warning information and are provided as clear step-by-step instructions.

The warning information and notes are categorised according to the following scheme. A number of different symbols are used to denote different situations. The symbols shown here serve only as examples.



DANGER!

Nature and source of the danger

Consequence: Fatal or very serious injuries.

Measure to be taken to avoid this danger.

Description of hazard

- Denotes an immediate threatening danger. If the situation is disregarded, it will result in fatal or very serious injuries.



WARNING!

Nature and source of the danger

Possible consequence: Fatal or very serious injuries.

Measure to be taken to avoid this danger.

- Denotes a possibly hazardous situation. If the situation is disregarded, it could result in fatal or very serious injuries.



CAUTION!

Nature and source of the danger

Possible consequence: Slight or minor injuries. Material damage.

Measure to be taken to avoid this danger.

- Denotes a possibly hazardous situation. If the situation is disregarded, it could result in slight or minor injuries. May also be used as a warning about material damage.



NOTICE!

Nature and source of the danger

Damage to the product or its surroundings.

Measure to be taken to avoid this danger.

- Denotes a possibly damaging situation. If the situation is disregarded, the product or an object in its vicinity could be damaged.



Type of information

Hints on use and additional information.

Source of the information. Additional measures.

- *Denotes hints on use and other useful information. It does not indicate a hazardous or damaging situation.*

2.2 General safety information

Unauthorised access

Ensure that there can be no unauthorised access to the device.

Only trained personnel may fit, install, maintain and operate this sensor.

The sensor must be dry

Do not allow the conductivity sensor to come into contact with liquid. Only allow the conductivity sensor to come into contact with liquid once the conductivity sensor has been connected, configured and calibrated. The sensor parameter (zero point) of a moist or wet conductivity sensor can no longer be sensibly calibrated.

There is a possibility of drying the conductivity sensor, if it has come into contact with liquid before calibration. A dried conductivity sensor can be successfully recalibrated to the sensor parameters.

Functional limitations

Regularly check the sensor for dirt.

Check the sensor regularly for air bubbles adhering to it (visual check). Observe the applicable national guidelines relating to maintenance, service and calibration intervals.

Operational prerequisites

Only use the sensor in bypass fittings, which ensure the correct flow parameters (l/h, see Technical Data).

Ensure that there is a free flow or at most a back pressure of 1 bar at the outlet of the bypass fitting. Note the maximum operating pressure for the individual components.

2.3 User qualification

 **WARNING!****Danger of injury with inadequately qualified personnel**

The operator of the plant / device is responsible for ensuring that the qualifications are fulfilled.

If inadequately qualified personnel work on the unit or loiter in the hazard zone of the unit, this could result in dangers that could cause serious injuries and material damage.

- All work on the unit should therefore only be conducted by qualified personnel.
- Unqualified personnel should be kept away from the hazard zone.

The pertinent accident prevention regulations, as well as all other generally acknowledged safety regulations, must be adhered to!

Training	Definition
Instructed personnel	An instructed person is deemed to be a person who has been instructed and, if required, trained in the tasks assigned to him/her and possible dangers that could result from improper behaviour, as well as having been instructed in the required protective equipment and protective measures.
Trained user	A trained user is a person who fulfils the requirements made of an instructed person and who has also received additional training specific to the system from ProMinent or another authorised distribution partner.
Trained, qualified personnel	A trained, qualified employee is deemed to be a person who is able to assess the tasks assigned to him and recognize possible hazards based on his/her training, knowledge and experience, as well as knowledge of pertinent regulations. A trained, qualified employee must be able to perform the tasks assigned to him/her independently with the assistance of drawing documentation and parts lists. The assessment of a person's technical training can also be based on several years of work in the relevant field.

Training	Definition
Electrical technician	An electrical technician is able to complete work on electrical systems and recognise and avoid possible dangers independently based on his/her technical training and experience as well as knowledge of pertinent standards and regulations. An electrical technician must be able to perform the tasks assigned to him/her independently with the assistance of drawing documentation, parts lists, terminal and circuit diagrams. The electrical technician must be specifically trained for the working environment in which the electrical technician is employed and be conversant with the relevant standards and regulations.
Service	The Service department refers to service technicians, who have received proven training and have been authorised by ProMinent to work on the system.

3 Storage and transport of the sensor

User qualification: instructed user ↗ *Chapter 2.3 „User qualification“ on page 8*



Original packaging

Damage to the product.

- *Only transport, ship and store the sensor in its original packaging.*
- *Retain the packaging including the polystyrene inserts.*

3.1 Storage

Permissible ambient temperature: -10 °C ... +60 °C.

Humidity: maximum 90 % relative air humidity, non-condensing.

Other: No dust, no direct sunlight.

Maximum storage period of the sensor in its original packaging and normal atmosphere: 2 years.

3.2 Transport

The sensor should be transported in its original packaging and in compliance with the permissible environmental conditions. No further special conditions have to be observed in relation to transport.

3.3 Packaging material

Dispose of packaging material in an environmentally responsible way. All packaging components carry the corresponding recycling code



4 Assembly and installation

4.1 Installing sensor in the bypass fitting

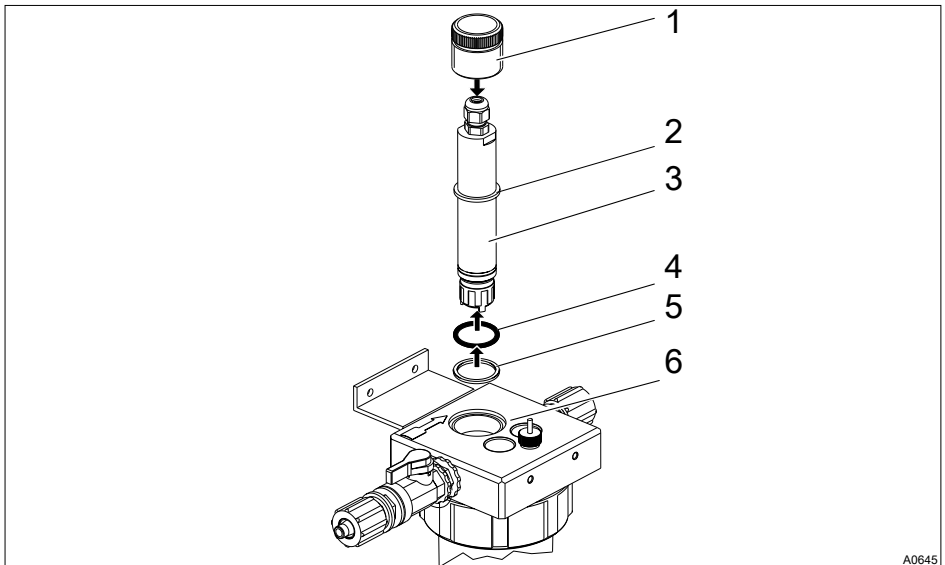
User qualification: trained qualified personnel, ↗ Chapter 2.3 „User qualification“ on page 8



Air bubbles in the sample water

- Only install the sensor in bypass fittings of type DLG III A, DLG III B or DGM (25 mm module). Use appropriate measuring methods to check the measured results before commissioning if using other bypass fittings.
- Avoid installations that allow air bubbles to form in the sample water.

Also observe the instructions and safety information contained in the operating instructions for the bypass fitting.



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Fig. 2: Installation situation

- | | |
|---------------------|-----------------------------|
| 1. Threaded sleeve. | 4. O-ring. |
| 2. Clamp disc. | 5. Washer. |
| 3. Sensor. | 6. Bypass fitting e.g. DLG. |

Assembly and installation

1. Close the stopcocks upstream and downstream of the bypass fitting.
2. Depressurise the bypass fitting, e.g. by opening the sampling tap.
3. Unscrew the blanking plug from the bypass fitting.
4. Push the O-ring (4) and the washer (5) included in the installation kit from below over the sensor as far as the clamp disc (2).
5. Bypass fitting DLG III: Guide the sensor into the DLG III and tighten the threaded plug.
6. Bypass fitting DGM: Insert the sensor into the DGM and tighten the clamping screw until the O-ring seals.
 - ⇒ The correct insertion depth of the sensor is defined by the clamp disc. When using a bypass fitting by another manufacturer, also refer to the operating instructions issued by the manufacturer of the bypass fitting.

4.2 Electrical installation

Electrical installation

User qualification: Electrical technician,  Chapter 2.3 „User qualification“ on page 8

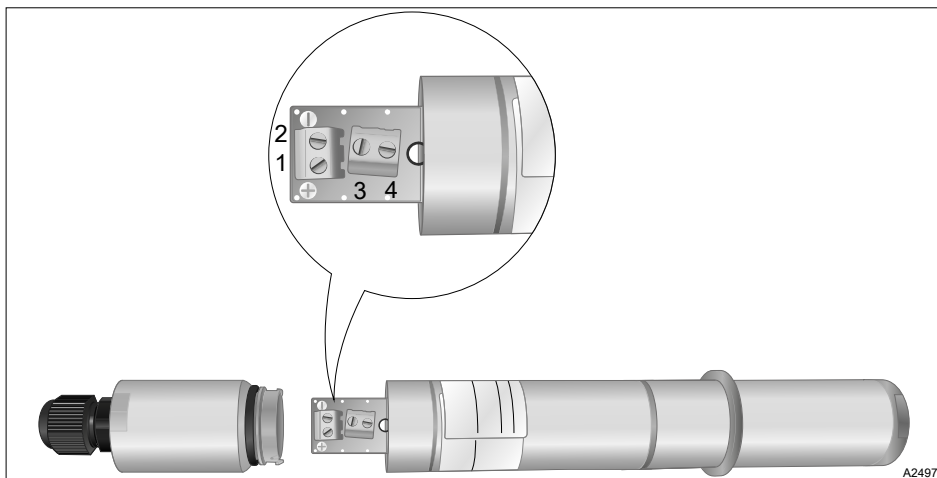





Fig. 3: Sensor terminals.

Only connect the sensor to a suitable controller. Connect the sensor to the terminals of inputs A or B on your controller AEGIS II or DACb.

You can connect a sensor to each of the inputs A and B of your controller AEGIS II or DACb. You can connect two additional sensors to the serial module, part number 734265. For all other compatible controllers, installation depends on the controller's respective terminal diagram.


1.  Remove the top part of the sensor by unscrewing the top part a 1/4 turn to the left.
2.  Loosen the PG7 threaded connector on the electric cable opening and guide the 4-wire cable (e.g. order no. 1046024) through the cable opening.

The individual leads should be approx. 5 cm in length for the internal connection in the top part of the sensor.

3.  Connect the leads of the 4-wire cable coming from the power supply to the terminals labelled: 1 and 2 as follows:
 - 1 to (+)
 - 2 to (-)

Example for connection of ProMinent GmbH controllers:



- diaLog DACb with integrated power supply: XA3 (+) and XA3 (-),
- AEGIS II needs an external 24 VDC 50 mA supply.

4.  Connect the two other leads of the 4-wire cable to the terminals of the analogue signal output labelled 3 and 4 as follows:
 - 3 to (+)
 - 4 to (-)

Examples for connection of ProMinent GmbH controllers DACb und AEGIS II:

- Module: AA: XE1_1 (-), XE1_2 (+), or XE2_1 (-), XE2_2 (+),
- Module: VA: XE5_1 (-), XE5_2 (+).

For the DACb with the identity code function extension 3 or 4, the connection is made to the extension board: XE8_1 (-), XE8_2 (+). Note that only one CCT type sensor can be connected to the diaLog DACb.

5.  Fit the top part of the sensor by screwing on the top part a 1/4 turn to the right.
6.  Firmly screw down the PG7 threaded connector to the sensor.

5 Maintenance

Calibration



Air bubbles on the sensor

The sensor measures a very low or even a 0 value if there are air bubbles on the measuring head. Adjust the flow of the measuring point so that no air bubbles form on the sensor. Refer to the operating instructions for your bypass fitting for more details.



Calibration intervals

The calibration intervals depend on the application. For orientation: in uncontaminated waters, the calibration interval is approx. 1 month.

A sensor only has to be calibrated once a year in very well set-up measuring processes.

1. ➔ Calibrate the sensor once a week to start with.
 - ⇒ You can extend the calibration interval if the measuring process is stable over several months.
2. ➔ Clean (☞ „Cleaning“ on page 15) the sensor, if required, and then recalibrate the sensor.
3. ➔ Replace the sensor if the sensor can no longer be calibrated after cleaning.

Cleaning

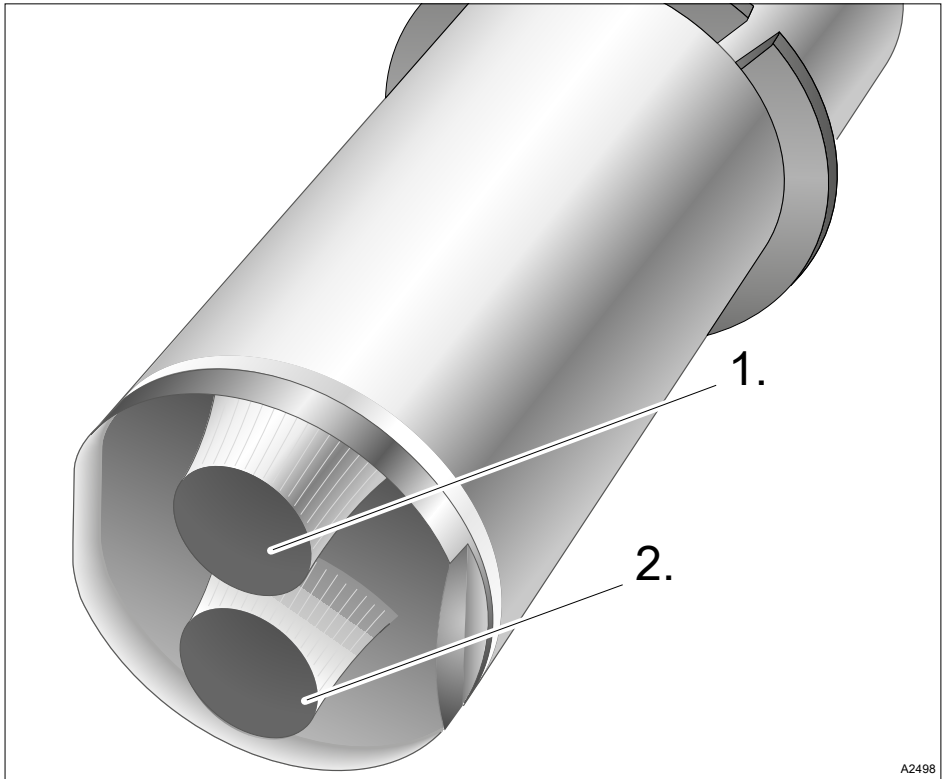


Fig. 4: Measuring electrodes (1 + 2) of sensor

1. ➤ Whitish or brown deposits (scale): Measuring electrodes (1 + 2) in diluted hydrochloric acid (1% ... 3%) for several minutes or until the scale deposits dissolve.
2. ➤ Thoroughly rinse the sensor with water.
3. ➤ Organic dirt (biofilm or oily dirt): Clean the sensor with alcohol or soapy water.
4. ➤ Thoroughly rinse the sensor with water.

6 Technical data

Property	Specification
Measuring range:	0.5 ... 20 mS/cm
Precision:	±0.2 mS/cm
Temperature measurement / correction:	internal, preset to 2.0 %/K
Medium temperature:	0 ... +50 °C (at 1 bar)
Storage temperature:	-10 ... +60 °C
Relative humidity:	90 %, non-condensing
Maximum pressure:	8 bar (+25 °C)
Measuring electrodes:	special graphite
Sensor head:	PMMA
Sensor shaft:	PVC
Installation/bypass fitting:	In the bypass with DGMa/DLG III
Supply voltage:	+12 ...+36 VDC (2-wire)
Voltage of 4 ... 20 mA loop:	+7.5 V ± 5 %
Sensor signal:	4 ... 20 mA; temperature-compensated, galvanically isolated
Electrical connection:	4-wire cable, 0,28 mm ² , cable diameter 5,7 mm
Degree of protection:	IP 65
Length of sensor:	200 mm
Diameter of sensor:	25 mm

7 Ordering information for spare parts/consumables

Ordering address for spare parts and accessories: The current address for ordering spare parts and accessories can be found on the homepage of the manufacturer ProMinent GmbH.

Sensor identifier	Order number
Conductivity sensor CCT1-mA-20 mS/cm	1081545

Tab. 2: The following spare parts/consumables and accessories are available for the sensor:

Description	Order number
4-wire measuring line (4 x 0.28 mm ² , Ø 5,7 mm), 1 m.	1046024
4-wire measuring line (4 x 0.28 mm ² , Ø 5,7 mm), 3 m.	1046025
4-wire measuring line (4 x 0.28 mm ² , Ø 5,7 mm), 5 m.	1046026
4-wire measuring line (4 x 0.28 mm ² , Ø 5,7 mm), 10 m.	1046027
Calibration solution, 12.88 mS/cm, 250 ml.	1027657
1 installation kit for DGM.	791818
1 installation kit for DLG III.	815079

8 Use Parts Disposal/Declaration of Decontamination

- **User qualification:** instructed user, see *Chapter 2.3 „User qualification“ on page 8*



WARNING!

Danger from hazardous substances!

Possible consequence: Fatal or very serious injuries.

Please ensure when handling hazardous substances that you have read the latest safety data sheets provided by the manufacture of the hazardous substance. The actions required are described in the safety data sheet. Check the safety data sheet regularly and replace, if necessary, as the hazard potential of a substance can be re-evaluated at any time based on new findings.

The system operator is responsible for ensuring that these safety data sheets are available and that they are kept up to date, as well as for producing an associated hazard assessment for the workstations affected.



NOTICE!

The used part can only be accepted with a completed Declaration of Decontamination

Printed copy also available as a download at: www.prominent.com

A completed and signed "Declaration of Decontamination" is required by law and in order to protect our staff, before your order can be processed.

Ensure that the Declaration of Decontamination is attached to the outside of the package. Otherwise we are unable to accept your delivery.



NOTICE!

Regulations governing the disposal of used parts

- Note the national regulations and legal standards that currently apply in your country when disposing of the product.

ProMinent GmbH, Heidelberg/Germany will take back clean used parts.

9 Standards and guidelines complied with, and Declaration of Conformity

The CE Declaration of Conformity is available to download on our homepage.

2014/35/EU

2014/30/EU

2011/65/EU

EN 61010-1: 2010

EN61326-1: 2013

EN 55011

EN 61000-4-2

EN 61000-4-3

EN 61000-4-4

EN 61000-4-6

EN 50581: 2013



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