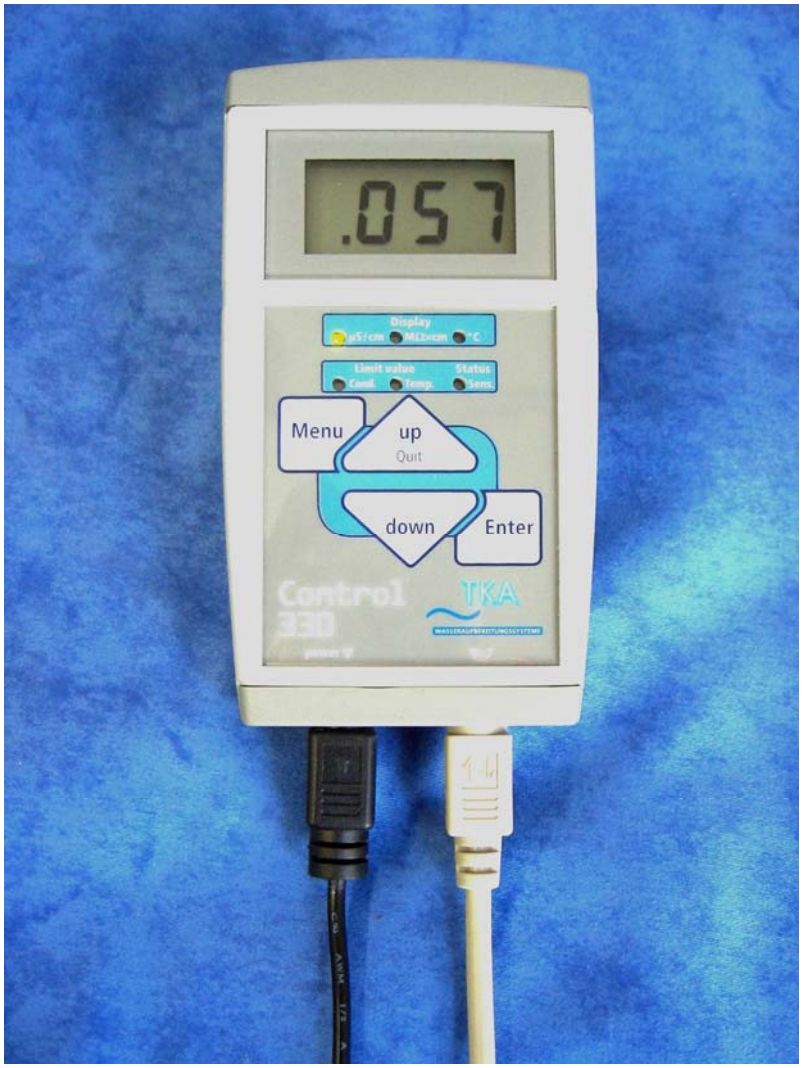
Thermo SCIENTIFIC

Operating Instructions
Control 330 Conductivity meter

[ ] **Art.-no.: 04.1805** [ ] **Art.-no.: 04.1805-SV** [ ] **Art.-no.: 04.1805-SVE**
[ ] **Art.-no.: 04.1806** [ ] **Art.-no.: 04.1806-SV** [ ] **Art.-no.: 04.1806-SVE**
[ ] **Art.-no.: 04.1807** [ ] **Art.-no.: 04.1807-SV** [ ] **Art.-no.: 04.1807-SVE**



These instructions must be read prior to assembly and first use!

EC-Declaration of Conformity

in accordance with the EEC low-voltage directive 2006/95/EC accordance with appendix III B

Hereby we explain that those corresponds to below designated products in this conception and design as well as in circulation the execution the fundamental safety and health requirements of the Community directive low-voltage brought by us. In case of a change of the product not co-ordinated with us this explanation loses its validity.

Manufacturer: Thermo Electron LED GmbH
Stockland 3
D-56412 Niederelbert

Description of the electrical equipment:

function: Conductivity meter

type: Control 330

article number: 04.1805, 04.1806, 04.1807
04.1805-SV, 04.1806-SV, 04.1807-SV
04.1805-SVE, 04.1806-SVE, 04.1807-SVE

The agreement with further valid guidelines/regulations following for the product is explained:

EMC Directive (2004/108/EC)

Reference to the harmonised standards:

DIN EN 55014-1, Electromagnetic compatibility - Emission
DIN EN 55014-2, Electromagnetic compatibility - Immunity
DIN EN 60204-1, Electrical equipment of machines
DIN EN 61000-3-2, Electromagnetic compatibility: Limits
DIN EN 61000-3-3, Electromagnetic compatibility: Limits

Year of the CE characteristic assignment: 10

Niederelbert, 18th February 2010

Detlef Opp, Head of Technical documentation

Signature

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2. Extent of delivery

2.1 Completeness and intactness

Please read these operating instructions attentively before you bring your new conductivity meter into operation.

The instructions clearly and simply lead you through the way to handle the instrument.

We wish you every success
in your work with

Conductivity meter
Control 330

The individual parts of the *Control 330* conductivity meter were assembled and packed with the greatest possible care.

Nevertheless, please check the delivery for completeness and intactness before starting on assembly.

The correct content of the delivery is given in the parts lists that follow.

Should you have reason to complain, please contact:

Thermo Electron LED GmbH
Stockland 3
D-56412 Niederelbert

Telephone: **+49 (26 02) 1 06 99-0**
Telefax: **+49 (26 02) 1 06 99-50**
E-mail: **info@tka.de**
Internet: **www@tka.de**

2.2 Parts lists

Art. no.: 04.1805

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded.
For connection to a stainless steel cartridge with R 3/4" connector

- → Conductivity meter of type Control 330 incl. wall mount
- → Plug transformer 90 - 264 V, 50-60 Hz / 12 V DC.
- → Measuring cell incl. cable and T-piece connector for connection to a water deionizing cartridge
- → Feedwater hose with R ¾“ connecting spouts
- → Purified water hose with R ¾“ connecting spouts
- → 1 x Gasket, R ¾“

Art. no.: 04.1806

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded and potential-free contact.
For connection to a stainless steel cartridge with R 3/4" connector

- → Conductivity meter of type Control 330 incl. wall mount
- → Plug transformer 230 V, 50-60 Hz / 12 V DC incl. potential-free contact.
- → Measuring cell incl. cable and T-piece connector for connection to a water deionizing cartridge
- → Feedwater hose with R ¾“ connecting spouts
- → Purified water hose with R ¾“ connecting spouts
- → 1 x Gasket, R ¾“

Art. no.: 04.1807

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded and including a plug transformer with switchbox for connection to a solenoid valve.
For connection to a stainless steel cartridge with R 3/4" connector

- → Conductivity meter of type Control 330 incl. wall mount
- → Chem. nickel-plated solenoid valve
- → Plug transformer 230 V, 50-60 Hz / 12 V DC incl. potential-free contact and switchbox for connection to a solenoid valve
- → Measuring cell incl. cable and T-piece connector for connection to a water deionizing cartridge
- → Feedwater hose with R ¾“ connecting spouts
- → Purified water hose with R ¾“ connecting spouts
- → 2 x Gasket, R ¾“

Art. no.: 04.1805-SV

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded.
For connection to a plastic cartridge with quick-connect connectors

- → Conductivity meter of type Control 330 incl. wall mount
- → Plug transformer 90 - 264 V, 50-60 Hz / 12 V DC.
- → Measuring cell incl. cable
- → Feedwater hose with R ¾“connector + quick-connect connector for connection to a water deionizing cartridge
- → Purified water hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge
- → 2 x Gasket for R 3/4" connector

Art. no.: 04.1806-SV

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded and potential-free contact.
For connection to a plastic cartridge with quick-connect connectors

- → Conductivity meter of type Control 330 incl. wall mount
- → Plug transformer 230 V, 50-60 Hz / 12 V DC incl. potential-free contact
- → Measuring cell incl. cable
- → Feedwater hose with R ¾“connector + quick-connect connector for connection to a water deionizing cartridge
- → Purified water hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge
- → 2 x Gasket for R 3/4" connector

Art. no.: 04.1807-SV

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded and including a plug transformer with switchbox for connection to a solenoid valve.
For connection to a plastic cartridge with quick-connect connectors

- → Conductivity meter of type Control 330 incl. wall mount
- → Chem. nickel-plated solenoid valve
- → Plug transformer 230 V, 50-60 Hz / 12 V DC incl. potential-free contact and switchbox for connection to a solenoid valve
- → Measuring cell incl. cable
- → Feedwater hose with R ¾“connector + quick-connect connector for connection to a water deionizing cartridge
- → Purified water hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge
- → 2 x Gasket for R 3/4" connectors

Art. no.: 04.1805-SVE

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded.
For connection to a stainless steel cartridge with quick-connect connectors

- → Conductivity meter Control 330 incl. wall mount
- → Plug transformer 90 - 264 V, 50-60 Hz / 12 V DC.
- → Measuring cell incl. cable
- → Feedwater hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge
- → Purified water hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge

Art. no.: 04.1806-SVE

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded and potential-free contact.
For connection to a stainless steel cartridge with quick-connect connectors

- → Conductivity meter Control 330 incl. wall mount
- → Plug transformer 230 V, 50-60 Hz / 12 V DC incl. potential-free contact
- → Measuring cell incl. cable
- → Feedwater hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge
- → Purified water hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge

Art. no.: 04.1807-SVE

Conductivity meter of type Control 330 with digital 3½-digit LCD measured value display in µS/cm, temperature measurement in °C, automatic temperature compensation, limiting conductivity limit switch settable up to 30 µS/cm, limiting temperature switch settable up to 40°C, acoustic and optical signals when a limiting value is exceeded and including plug transformer with switchbox for connection to a solenoid valve.
For connection to a stainless steel cartridge with quick-connect connectors

- → Conductivity meter Control 330 incl. wall mount
- → Chem. nickel-plated solenoid valve
- → Plug transformer 230 V, 50-60 Hz / 12 V DC incl. potential-free contact and switchbox for connection to the solenoid valve
- → Measuring cell incl. cable
- → Feedwater hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge
- → Purified water hose with R ¾“ connector + quick-connect connector for connection to a water deionizing cartridge
- → 1 x Gasket, R ¾“

3. Assembly and starting for the first time

1. Screw the feedwater hose (Part 2) to the cartridge inlet. With cartridges with quick-connects, plug the hose on so that there is an audible click.

2. Make contact to the water tap:
   Connect the R ¾“ connecting spout on the other end of the feedwater hose to a water tap that can be turned off.

   With instrument versions of article numbers: 04.1807(-SV and -SVE) - Control 330 with solenoid valve, plug transformer and integrated switchbox for connection to the solenoid valve:
   First connect the solenoid valve to the water tap with the R¾“ connecting spout. Following this, connect the R¾“ male thread on the other end of the hose to the solenoid valve.

3. Hold the wall mount at the selected position, mark where to bore, insert plugs and fix tightly with the screws supplied.

4. Stick the smooth Velcro strip to the holder and the rough Velcro strip to the instrument.

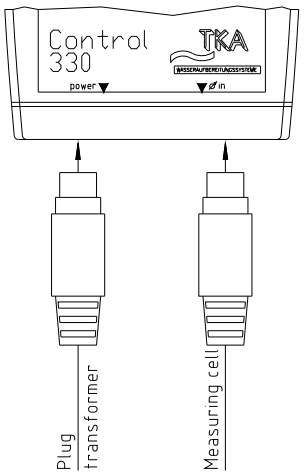
5. Hang the conductivity meter (Part 5) on.

6. Cartridges with ¾“ connector:
   Fix the measuring cell (Part 4) to the cartridge outlet with the R¾“ coupling nut, then screw the purified water hose (Part 3) to the ¾“ male thread of the measuring cell. Lead the other end of the purified water hose to the user or the storage tank.

   Cartridges with quick-connects:
   Fit the quick-connect connector of the purified water hose (with the measuring cell) onto the outlet of the cartridge so that there is an audible clicking into position. Lead the other end of the purified water hose to the user or the storage tank.

7. Connect the cable from the measuring cell (Part 4) to the lower right socket of Control 330 (Part 5).

8. Connect the plug transformer to a suitable electrical socket (see Technical (see Specifications) and to the lower left socket of Control 300.



Safety precaution

Ensure that the cable connection does not allow liquid to run into the inside of the Control 300 conductivity meter!

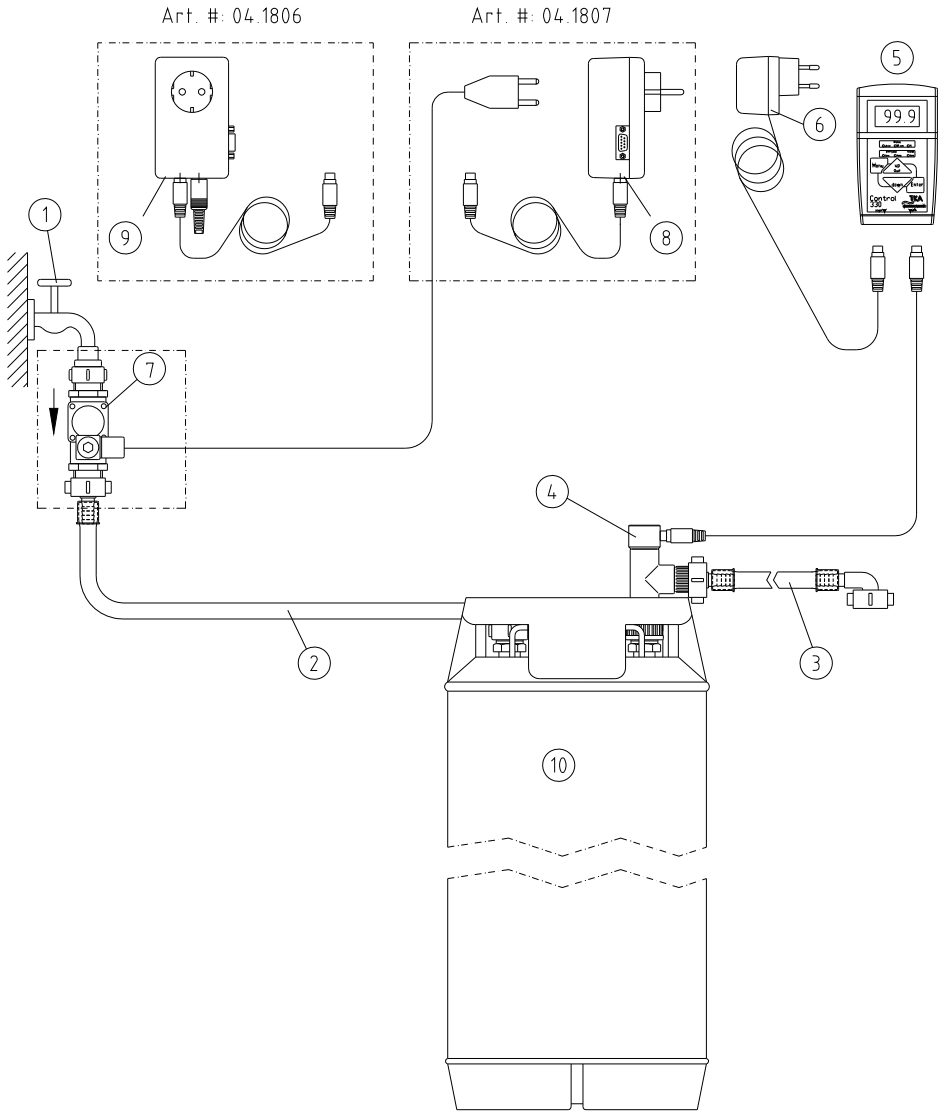
9. Set the display mode required, the limiting conductivity value and, if appropriate, the limiting temperature value.

10. Open the water tap until the water deionizing cartridge has become filled and air-vent it with the venting screw. Purified water can now be taken from the end of the purified water hose.
(Switching of decimals are automatically)

Important note: an exact conductivity value can only be read off during withdrawal.

After long downtimes (because of holidays, for example), re-ionization effects can cause the conductivity to increase and even reach the limiting value. Please then rinse the system for as long as it takes for a relevant conductivity value to be shown in the display.

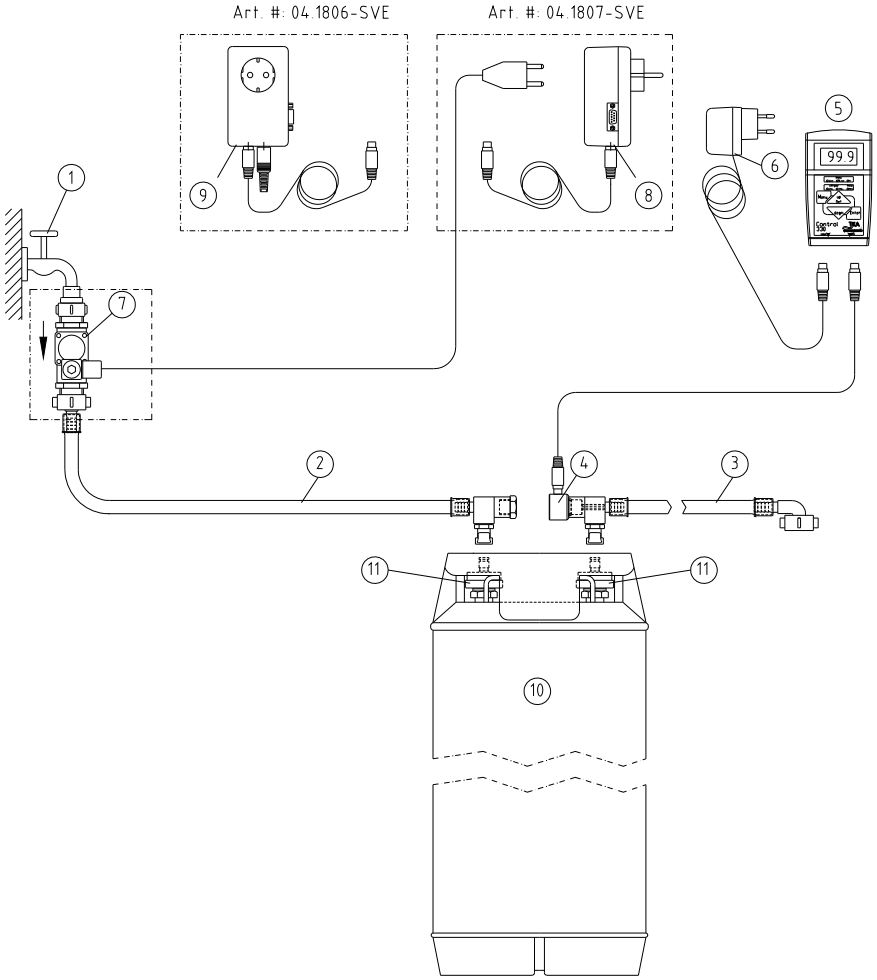
3.1 Set-up diagram - Cartridges with R ¾“ connectors (04.1805)



1	Feedwater connector, R¾“ male thread	
2	Feedwater hose, 1.5 m long; R¾“ coupling nut	
3	Purified water hose, 1.5 m long; R¾“ coupling nut	
4	Measuring cell and T-piece connector	
5	Control 330 Conductivity meter incl. wall mount	
6	Plug transformer	for Art.-no. 04.1805
7	Solenoid valve, chem. nickel-plated, with ¾“-connectors	for Art.-no. 04.1807
8	Control 330 Conductivity meter with solenoid valve, plug transformer and switching contact for solenoid valve	for Art.-no. 04.1807
9	Control 330 Conductivity meter with potential-free contact,	for Art.-no. 04.1806
10	Fits mixed-bed ion exchangers with R ¾“ male thread of type:	

Type	Ø in mm	Height	
DI 1500	240	410	Art.-no.: 02.1500
DI 2000	240	490	Art.-no.: 02.2000
DI 2800	240	600	Art.-no.: 02.2800
DI 4000	240	700	Art.-no.: 02.4000
DI 6000	240	1155	Art.-no.: 02.6000
DI 11000	363	857	Art.-no.: 02.11000
DI 15000	363	1095	Art.-no.: 02.15000

3.2 Set-up diagram - Stainless steel cartridges with quick-connects (04.1805-SVE)

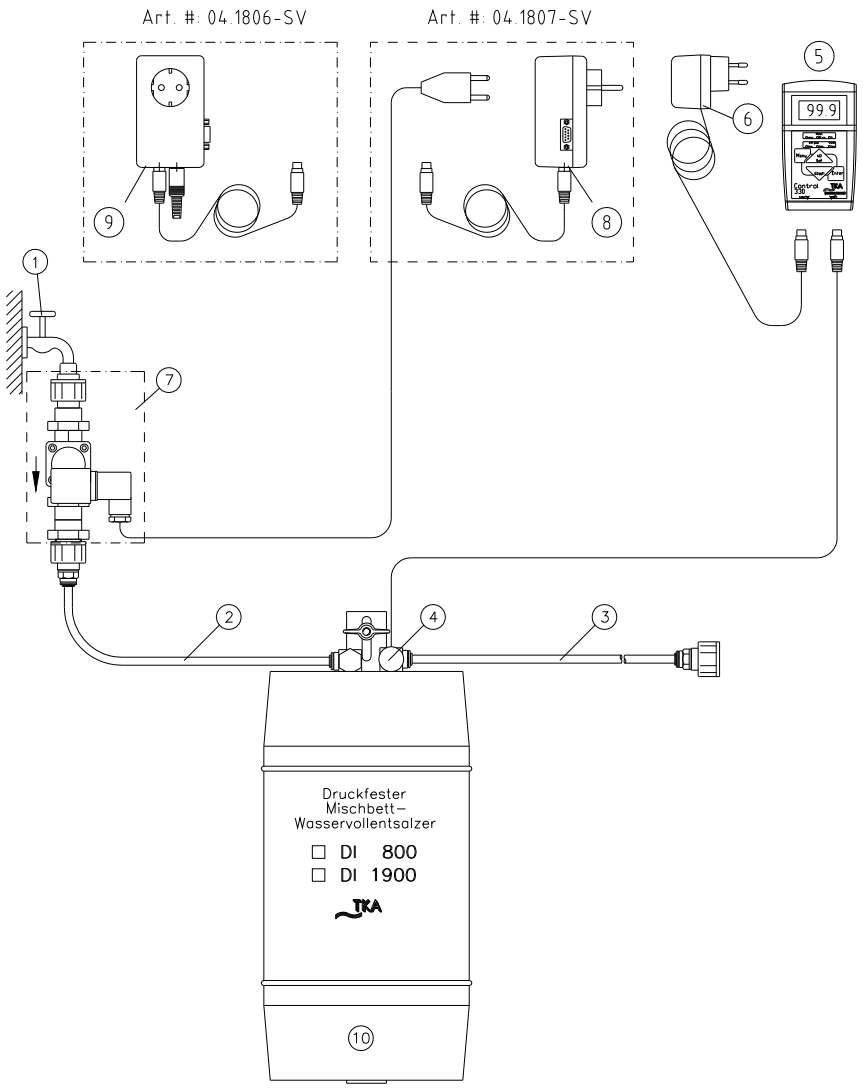


1	Feedwater connector, R¾“ male thread	
2	Feedwater hose, 1.5 m long; R¾“ coupling nut and quick-connect connector	
3	Purified water hose, 1,5 m long; R¾“ coupling nut and quick-connect connector	
4	Measuring cell incl. connecting cable	
5	Control 330 Conductivity meter incl. wall mount	
6	Plug transformer	for Art.-no.: 04.1805-SVE
7	Solenoid valve, chem. nickel-plated with ¾“ connectors	for Art.-no.: 04.1807-SVE
8	Control 330 Conductivity meter with solenoid valve, plug transformer and switching contact for Solenoid valve	for Art.-no.: 04.1807-SVE
9	Control 330 Conductivity meter with potential-free contact	for Art.-no.: 04.1806-SVE
10	Fits mixed-bed ion exchangers with quick-connects	

Type	**∅ in mm**	**Height**	
DI 1500	240	410	Art.-no.: 02.1500
DI 2000	240	490	Art.-no.: 02.2000
DI 2800	240	600	Art.-no.: 02.2800
DI 4000	240	700	Art.-no.: 02.4000
DI 6000	240	1155	Art.-no.: 02.6000
DI 11000	363	857	Art.-no.: 02.11000
DI 15000	363	1095	Art.-no.: 02.15000

11	Quick-connect adapter	Art.-no.: 03.1503

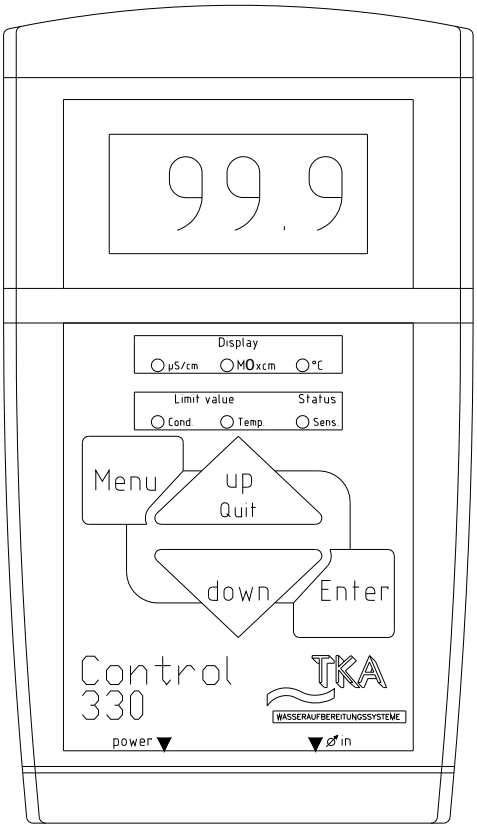
3.3 Set-up diagram - Plastic cartridges with quick-connects (04.1805-SV)



1 Feedwater connector, R¾“ male thread
2 Feedwater hose 1,5 m long; R¾“ coupling nut and quick-connect connector
3 Purified water hose, 1,5 m long; R¾“ coupling nut and quick-connect connector
4 Measuring cell incl. connecting cable
5 Control 330 Conductivity meter incl. wall mount
6 Plug transformer — for Art.-no.: 04.1805-SV
7 Solenoid valve, chem. nickel-plated, with ¾“ connectors — for Art.-no.: 04.1807-SV
8 Control 330 Conductivity meter with solenoid valve, plug transformer and switching contact for solenoid valve — for Art.-no.: 04.1807-SV
9 Control 330 Conductivity meter with potential-free contact — for Art.-no.: 04.1806-SV
10 Fits fit mixed-bed ion exchangers with quick-connects

Type	Ø in mm	Height	
DI 800 P	205	410	Art.-no.: 01.1606-SV
DI 1900 P	205	610	Art.-no.: 01.1614-SV

4. Operation



When the instrument is switched on, all segments of the 7-segment display are shown for 3 seconds. During this time, the complete measurement cycle is run through and tested.

In the basic setting, the display shows the conductivity in µS/cm. The display is automatically scaled in the range from 0.055 to 199 µS/cm.

The upper rows of LED's show the measurement mode at which the instrument is currently in. The appropriate LED lights up green to show the measurement unit (µS/cm, MΩxcm or °C).

The value ÷200 is shown in the display when the measurement range is exceeded.

Should there be an interruption between the instrument and the sensors, then the red "Status Sens." LED lights up and "---" is shown in the display instead of a measured value. A buzzer is additionally activated in the case of an interruption in the connection to the measurement sensor.

Quit-key:

The acoustic signal (buzzer) that is given when a fault occurs can be switched off with the Quit/UP-key. The acoustic signal is then no longer active until the limiting value is gone below. If a solenoid valve is attached, this is again opened.

4.1 Menu

The menu consists of three sub-prompts; switching to the dual-mode and selection of the measurement unit for the conductivity measurement, the limiting value setting for the conductivity and the limiting value setting for the temperature.

Mono/ Dual-measuring mode:

Mono-measuring mode:	In this mode only the conductivity is displayed. The temperature can be read as long as the Enter-key is pressed.
Dual-measuring mode:	In this mode the temperature and the conductivity are alternately displayed every 2 seconds. the LEDs for the measurement unit switch correspondingly with the display.

When the menu-key is pressed once, the measurement mode just set is shown. The up- and down-keys allow switching between the permanent conductivity display and the alternating conductivity/temperature display. The display shows "**c**" for conductivity or "**ct**" for conductivity/temperature.
At the same time a choice can be made between the measurement units µS/cm and MΩxcm in this menu. The unit chosen must be confirmed by pressing the Enter-key, and that chosen is shown by the corresponding LED.

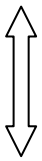
The following combinations are so possible:

ct / MΩxcm

c / MΩxcm

ct / µS/cm

c / µS/cm (default)



up/down

4.2 Setting the limiting conductivity value

Setting range:	0.06 - 199 µS/cm
Basic setting:	off

The limiting conductivity value can be set when the menu-key is pressed twice (the red “Cond." LED lights up). The setting is made with the up- and down-keys. The particular position that is to be changed can be selected with the Enter-key and flashes in the display. When the wanted value is reached, then this must again be confirmed with the Enter-key.
Should a value of <200 µS/cm be set, then the word OFF appears in the display and the evaluation of the limiting value is switched off.
When the limiting conductivity value (Limit value Conductivity) is exceeded, then the red "Cond." LED lights up and the exceeding of it is additionally signalled by a buzzer.

Only the buzzer is switched off by the quit-key, the "Cond." LED is not switched off until the limiting value is gone below or the mains plug is unplugged.

Important note: The limiting value can only be entered in µS/cm.

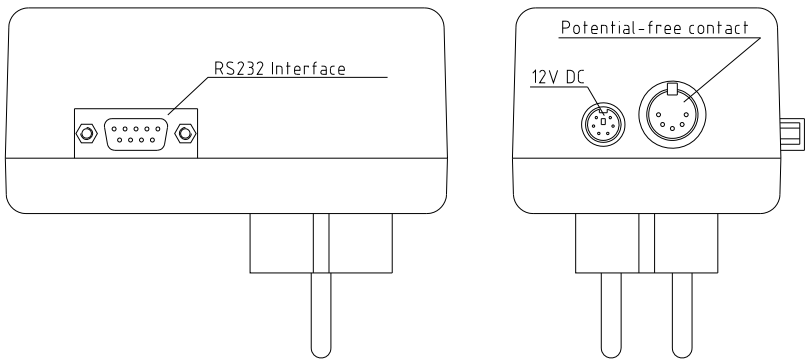
4.3 Setting the limiting value for temperature

Setting range: 10 - 40°C
Basic setting: OFF

The limiting temperature value can be set when the menu-key is pressed three times (the red “Temp." LED lights up). The setting is made with the up- and down-keys. The particular position that is to be changed can be selected with the Enter-key and flashes in the display.
When the wanted value is reached, then this must again be confirmed with the Enter-key.
Should a value of 41°C be set, then the word OFF appears in the display and the evaluation of the limiting value is switched off.
When the limiting temperature value (Limit value Temperature) is exceeded, then the red "Cond." LED lights up and the exceeding of it is additionally signalled by a buzzer.

4.4 Communication

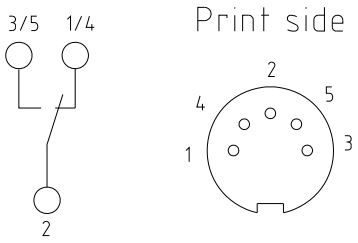
The 04.1806 and 04.1807 versions have a potential-free contact available via the plug transformer, article-no. 26.0034, as well as an RS 232 Interface.
The interface runs at a transmission rate of 9600 bits/sec., 8 data bits,
1 stop bit and no parity.



The conductivity in µS/cm and the temperature in °C are given out on the serial interface separated by a comma. The conductivity is automatically scaled to three significant figures. Output takes place once per hour.
When in operation, a press on the down-key triggers a measured value print-out on the serial interface.

The SUB-D socket has the following assignment: PIN 2: TXD
PIN 3: RXD
PIN 5: GND

Pin assignment of the DIN-socket of the potential-free contact:



5. Replacement parts and accessories

Designation	Article no.
Plug transformer 90 - 264 V, 50-60 Hz / 12 V DC:	16.0235
Plug transformer 230 V, 50 Hz / 12 V DC with pot. free contact and switchbox:	26.0034
Adapter plug for the plug transformer, for EU/US sockets:	16.0317
Measuring cell incl. connecting cable:	16.0229
Connecting cable for Control 330 with measuring cell and plug transformer:	16.0310
PVC connecting hose:	18.0045
Gasket, R 3/4":	21.5008
Solenoid valve:	03.1503
Printer for measured values print-out:	09.2207

6. Technical Specifications

Conductivity measurement error:	+/- 0,2% MBE
Temperature measurement error:	+/- 0.5°C
Conductivity measurement range:	0.001 – 199 µS/cm (Scaling takes place automatically)
Temperature measurement range:	0.1 – 99.9°C
Measurement unit display:	via LED
Temperature compensation:	automatic
Setting range of the limiting conductivity value switch:	0.06- 200 µS/cm (continuously settable)
Setting range of the limiting temperature value switch:	10- 40 °C (continuously settable)
Exceeding of the limiting value:	Exceeding is signalled when by the red LED and the buzzer. Both limiting values can be switched off
Interface:	RS 232 (only article-no. 04.1806 + 04.1807)
Electrical connection: Plug transformer for article-no. 04.1805	90 - 264 V, 50-60 Hz; 6 W
Plug transformer for article-no. 04.1806 + 04.1807 with switchbox and pot. free contact	230 V, 50-60 Hz; 1.5 W
Measuring instrument voltage:	12 Volt DC
Protection class:	IP 54
Housing dimensions in mm:	W 75 x D 30 x H 130
Positioning:	Wall mounting

Should service be required, please always contact our service department:

Thermo Electron LED GmbH
Stockland 3
D-56412 Niederelbert

Telephone: +49 (26 02) 1 06 99-0
Telefax: +49 (26 02) 1 06 99-50
E-mail: info@tka.de
Internet: www.tka.de