With its numerous safety functions and record printouts at keystroke, the 703 Laboratory Conductivity Meter considerably simplifies this work for you.

Fullcheck automatically checks the device functions during power-on. Also during operation, a complete instrument check can be carried out at a single keystroke. Here, also display and keypad are checked besides the electrical characteristics.

Record printouts With record printouts of the device self-test, the calibration, and the parameter settings, it is possible (as part of quality management to ISO 9000 and GLP) to document the operability and the regular maintenance and calibration of the meter.

Sensoface Sensoface monitors the sensor and measuring equipment and provides information on sensor selection and handling. It reports clock memory loss and requests regular checks in accordance with GLP.

Calibration Unknown cell constants can easily be determined with a standard calibration. The meter automatically takes the TC of the calibration solution into consideration, calculates the cell constant and displays it. Of course, a known cell constant can also be entered directly.

Analog output The galvanic isolation of the recorder output prevents the measured values from being influenced by the connected peripherals. Measurement continues unimpaired.

EMC EMC design protects the meter from electromagnetic interferences, ensuring reliable measurement results even under unfavorable conditions. This makes the Model 703 the first laboratory conductivity meter that completely fulfills the EMC recommendations of NAMUR.

The Model 703 offers a wide range of practical features to meet the numerous requirements of everyday measuring tasks.

Standard RS 232 interface Via the standard RS 232 interface your data can be immediately processed by a computer. Even direct output to a printer is no problem.

GLP records at the press of a key Records of the parameter setting, calibration, and device diagnostics can be output directly to a printer. This provides you with comprehensive GLP-compatible documentation at the press of a key.

Automatic adjustment of display range The meter automatically selects the display range with the greatest possible resolution. Of course, the desired display range can also be specified manually.

Easy-to-read LED display for two measured values The large, bright LED display allows simultaneous readout of two measured values, such as conductivity and temperature. The 14-segment display can show alphanumeric characters.

Double insulation provides electrical safety in wet locations The well-designed enclosure has proved successful in practical use. A waterproof membrane keyboard and drain grooves protect the meter from moisture. The robust, stainless steel covered enclosure resists even strong mechanical stress.
Conductivity Measurement

- Measurement ranges from 0.000 µS/cm to 2000 mS/cm
- Records for QM documentation to ISO 9000 and GLP
- Calibrated analog recorder output, galvanically isolated
- Sensoface monitoring of sensor and measuring equipment
- Automatic calibration with standard solutions
- EMC to NAMUR
- RS 232 interface for computer and printer

Two measured value displays, simultaneous
Self-contained clock
Liquid-proof membrane keypad
Robust enclosure
IP 54 protection
3-year warranty

Warranty 3 years!
Defects occurring within 3 years from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender). Sensors and accessories: 1 year
Laboratory Meters

703 Laboratory Conductivity Meter

- **Keypad**
  - Exit function and return to measuring mode
  - Print currently measured values or function data
  - Select line, edit value or select variable
  - Select parameter or position
  - Select line, edit value or select variable

- **Record printouts**

Records of parameter setting, calibration and diagnostics are particularly helpful for QM documentation to ISO 9000 and GLP.

The records can be printed out directly to any commercially available printer with serial port.

---

**Knick 703 Calibration 19.03.03**

Serial Number: 01106329
Softare Version: 1.3
Hardware Version: 01
Options: No

Last Calibration: 19.03.03 10:03
Data Entry: 1.248/cm

---

**Knick 703 Diagnostics 19.03.03**

Serial Number: 01106329
Software Version: 1.3
Hardware Version: 01
Options: No

Last Fullcheck: 19.03.03 09:55
- ROM: -sk-
- PROM: -sk-
- EEPROM: -sk-
- Output: -sk-
- Amplifier: -sk-
- Accumulator: -sk-
- Display: -sk-
- Keys: -tested-

---

**Knick 703 Parameter Setting 19.03.03**

- Serial Number: 01106329
- Software Version: 1.3
- Hardware Version: 01
- Options: No

- Manual Temperature: 25.0°C
- Temperature Compensation: On
- Temperature Coefficient: 2.18°C/K
- Reference Temperature: 25°C
- Sensoreface: On
- Range: Fixed
- Cal-Solution: NaCl 0.1Mol
- GLP Timer: 0h
- Recorder Output: 1w/s
- Baud Rate: 9600
- Data Bits/Parity: 7 Even
- Protocol: No
- Interface: Printer
- Printer Type: 0.Main
- Time: 10:47
- Date: 19.03.
- Year: 2003

---
**Fullcheck device self-test**

For the self test the sensor is automatically switched off and the input switched over to a reference resistor. The conductivity measuring circuit is automatically checked internally. The microcontroller sends defined voltage steps to the recorder output. These are measured with the A/D converter and compared with a highly accurate reference voltage. This means, a complete test of the signal path is implemented with a conductivity meter for the first time. In addition, all memories, the display, and the keypad are tested.
703 Laboratory Conductivity Meter

Specifications

**Equipment**

Meter with power cord, without sensor

**Ranges**

Conductivity:
- 0.000 ... 9.999 µS/cm
- 0.000 ... 99.99 µS/cm
- 0.000 ... 999.9 µS/cm
- 0.000 ... 2000 mS/cm

°C:
- –50.0 ... +150.0

**Display**

Alphanumeric, 2 x 4-digit, 14-segment LED, character height 13 mm, measurement symbols: 20 °C, 25 °C, µS/cm, mS/cm, %/K, °C. Time, 3 Sensoface icons inform on sensor and measuring equipment (GLP)

**Measuring cycle**

Approx. 1.5/sec

**Measuring frequencies**

Approx. 40 Hz to 2 kHz, automatic adjustment by conductance

**Resolution**

Up to 0.001 µS/cm

**Accuracy**

Conductivity:
- < 0.5 % meas. value. ±2 counts

°C:
- ±0.3 K

**Reproducibility**

< 0.1 % meas. val.

**Temperature compensation**

–50 ... +150 °C; Pt 1000/NTC 30 kOhm (autom. selection) or manual,
Linear TC characteristic: 0.00 ... +9.99 %/K, ref. temperature 20 °C/25 °C selectable

**Adm. cell constant**

0.001 ... 199.9 cm⁻¹, adjustable

**Sensor standardization**

Operating modes – Automatic by determining the cell constant with NaCl or KCl solution
Calibration solutions: KCl 0.01 mol/l; 0.1 mol/l; NaCl 0.01 mol/l; 0.1 mol/l; saturated – Direct entry of cell constant

**Monitoring of sensor and equipment (GLP)**

Sensoface provides information:
- for selection of 2-electrode sensors
- on too great a difference between reference and measuring temperature
- for handling of 4-electrode sensors
- on clock memory loss
- in case of irregular checking of measuring equipment

Optical display: good/average/poor

**Device self-test**

Test of measuring electronics including recorder output, segment and keypad test, RAM, EPROM, and EEPROM test during diagnostics, automatic short check at power-on

**GLP records (ISO 9000)**

Parameter settings, calibration, device diagnostics

**Recorder output**

Galvanically isolated (isolation voltage: 40 V DC, 20 V AC)
Cond: 1 mV/µS · cm⁻¹; 1 mV/mS · cm⁻¹; °C: 10 mV/°C user-defined for printer control

**Interface**

RS 232 without control lines, galvanically isolated (isolation voltage: 40 V DC, 20 V AC), user-definable as printer or computer interface,
Baud rate: 600 / 1200 / 2400 / 4800 / 9600
Data bits/parity: 7/Even, 7/Odd, 8/No
Stop bits: 1

**Software**

Control of the Model 703 Laboratory Conductivity Meter is integrated in the automation software for lab meters “labworldsoft” (Fisher Scientific) for display and control of device functions for Version 4.0 or higher.
## Specifications

### 703 Laboratory Conductivity Meter

**Clock**
- Real-time clock with date, self-contained

**Calibration data storage**
- Automatic storage of cell constant and calibration procedure with time and date stamp, self-contained

**Data retention**
- Parameters, statistics, and factory settings: >10 years (EEPROM)
- Clock: reserve power >1 year (battery-backed)

**Protection against electrical shock**
- Protective separation as defined in DIN 57100 / VDE 0100 Part 410 and DIN VDE 0106 Part 101, power supply against all other inputs and outputs, in accordance with the NAMUR recommendation "Extra-low voltage circuits with protective separation"

**EMC directive**
- 89/336/EEC

**Standards**
- EN 61326 / VDE 0843 Part 20: 2002-3

**Ambient temperature**
- 0 ... +45 °C

**Storage and transport temp**
- −20 ... +70 °C

**Power supply**
- 230 V –15 % +10 %, 48 ... 62 Hz, <10 VA, Option 363: 115 V AC

**Sensor connection**
- The meter allows connection of any 2-electrode sensors with banana plug.
- Special diode plug for 4-electrode sensors.

**Enclosure**
- Glass-reinforced polyamide 12, stainless steel cover, IP 54 protection, prepared for connecting ZU 6954 attachable stand

**Dimensions (W x H x D)**
- 244 x 95 x 255 mm

**Weight**
- Approx. 2 kg

---

* User defined  
† ± 1 count  
‡ 45 °C: factor 10  
§ Good Laboratory Practice
### Specifications Accessories

**Printer**
- **Order No.:** ZU 0244
- **Type:** Matrix printer
- **Interface:** Serial RS 232 port
- **Paper:** Standard paper, width: 57.5 mm (2.25 inches)
- **Baud rate:** 4800 bauds
- **Data bits:** 7, 1 stop bit
- **Parity:** Even
- **Protocol:** No
- **Power supply:** 230 V AC ±10 %
- **Dimensions (W x H x D):** 197 x 73 x 153 mm
- **Weight:** Approx. 1.2 kg (incl. power pack)

**Stand**
- **Order No.:** ZU 6954
- **Material:** Pillar: anodized aluminum; carriage and base: polyamide 12 glass reinforced; Beaker stop, vertical stop, and electrode clasp: stainless steel
- **Carriage stroke:** 190 mm
- **Clamping possibilities:** 2 x 12 ±0.5 mm; 1 x 4 ... 14 mm; 1 x 6 ... 16 mm
- **Stop for sample beakers:** from Ø 30 ... 150 mm
- **Beaker height:** Up to 130 mm
- **Dimensions (W x H x D):** 130 x 300 x 145 mm
- **Weight:** Approx. 410 g

**Plug-in power pack for immersion stirrer**
- **Order No.:** ZU 6956
- **Power supply:** 230 V AC –15 % +6 % <8 VA
- **Cable length:** 2 m
- **Weight:** Approx. 380 g

**Immersion stirrer**
- **Order No.:** ZU 6955
- **Material:** Enclosure: PVC; impeller and shaft: stainless steel
- **Dimensions:** Unit: 250 x Ø 25/12 mm; impeller: Ø 12 mm; immersion depth: approx. 90 mm
- **Weight:** Approx. 140 g
Conductivity Measurement

Conductivity sensors for lab and portable meters

SE 202 2-electrode sensor with integrated temperature probe (NTC 30 kOhm) and flow cell. For measurement in low-conductivity solutions such as ultrapure water and boiler feed water, e.g., for monitoring water desalination plants. SE 204 4-electrode sensor with integrated temperature probe (NTC 30 kOhm). For measurement in natural waters such as surface water or drinking water, in aqueous solutions such as acid and alkaline solutions and for salinity determination of sea water.

With the ZU 6985 4-electrode sensor from Knick, a lab-quality universal conductivity sensor is available. The sensor operates reliably over a broad range from <1.00 µS/cm to >1000 mS/cm. It is equipped with a quick-reacting Pt 1000 temperature probe. It is provided with a glass/platinum measuring system with an easy-to-replace KPG tube. It is simple to clean and requires no platinization.

### Specifications Conductivity sensors

<table>
<thead>
<tr>
<th>Conductivity sensors</th>
<th>SE 202</th>
<th>SE 204</th>
<th>ZU 6985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of electrodes</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Body material</td>
<td>Stainless steel 1.4571</td>
<td>Stainless steel 1.4571</td>
<td>Glass</td>
</tr>
<tr>
<td>Electrode material</td>
<td>Stainless steel 1.4571</td>
<td>Epoxy, black</td>
<td>Platinum, bare</td>
</tr>
<tr>
<td>Body length</td>
<td>120 mm</td>
<td>120 mm</td>
<td>110 mm</td>
</tr>
<tr>
<td>Body diameter</td>
<td>12 mm</td>
<td>15.3 mm</td>
<td>Tube 16 mm</td>
</tr>
<tr>
<td>Temperature probe</td>
<td>NTC (30 kOhm): –5 ... +100 ºC</td>
<td>NTC (30 kOhm): –5 ... +100 ºC</td>
<td>Pt 1000: –20 ... +100 ºC</td>
</tr>
<tr>
<td>Immersion depth</td>
<td>Min.: 30 mm, max.: total length incl. Cable</td>
<td>Min.: 36 mm, max.: total length incl. Cable</td>
<td>Min. 60 mm Max. 80 mm</td>
</tr>
<tr>
<td>Pressure resistance</td>
<td>2 bars</td>
<td>2 bars</td>
<td>2 bars</td>
</tr>
<tr>
<td>Cell constant</td>
<td>0.100 cm⁻¹ ±2 %</td>
<td>0.475 cm⁻¹ ±1.5 %</td>
<td>1.19 cm⁻¹ ±1 %</td>
</tr>
<tr>
<td>Ranges</td>
<td>0.01 ... 200 µS/cm</td>
<td>1 µS/cm ... 500 mS/cm</td>
<td>1 µS/cm ... 1000 mS/cm</td>
</tr>
<tr>
<td>Remarks</td>
<td>Incl. flow cell</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Order No. SE 202 SE 204 ZU 6985
## Product line Laboratory conductivity meters and conductivity sensors

<table>
<thead>
<tr>
<th>Lab Conductivity Meter 703</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit with power cord, without sensor</td>
<td>703</td>
</tr>
</tbody>
</table>

### Options

| Power supply | 115 V AC | 363 |

- **2-electrode sensor**
  - With stainless steel body incl. flow cell (ZU 0298 adapter required)
  - **SE 202**

- **4-electrode sensor**
  - With epoxy body (ZU 0298 adapter required)
  - **SE 204**

- **4-electrode sensor**
  - With glass body
  - **ZU 6985**
### Conductivity Measurement

#### Product line Calibration solutions, spare parts, and further accessories

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature probe</td>
<td>Pt 1000</td>
<td>ZU 6959</td>
</tr>
<tr>
<td>Conductivity standard</td>
<td>For determination and checking of cell constants. 1 ampoule for producing 1000 ml 0.1 mol/l NaCl solution (12.88 mS/cm)</td>
<td>ZU 6945</td>
</tr>
<tr>
<td>KPG tube</td>
<td>For ZU 6985 4-electrode sensor, incl. O-ring</td>
<td>ZU 0180</td>
</tr>
<tr>
<td>Replacement flow cell</td>
<td>For SE 202 2-electrode sensor</td>
<td>ZU 0284</td>
</tr>
<tr>
<td>Adapter</td>
<td>For connecting the SE 202 and SE 204 sensors to the 703 Laboratory Conductivity Meter</td>
<td>ZU 0298</td>
</tr>
<tr>
<td>Attachable stand</td>
<td>Besides the immersion stirrer, the attachable stand can hold three sensors of any kind. The adjustable stops prevent damage of sensor and beaker glass. Time-consuming adjustment during sample changes has been eliminated. An integrated cable duct does away with the &quot;spaghetti cables&quot; on your benchtop. For ZU 6955 immersion stirrer and three sensors, directly connected to the meter.</td>
<td>ZU 6954</td>
</tr>
</tbody>
</table>
Immersion stirrer

The immersion stirrer reduces sensor response time for measurement and calibration. Precision measurements to DIN 19268 even require stirring. To prevent splattering of test liquid, the stirrer automatically stops as the carriage moves up. The stirrer is supplied via the ZU 6956 plug-in power pack.

<table>
<thead>
<tr>
<th>Product line</th>
<th>Calibration solutions, spare parts, and further accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>ZU 6955</td>
</tr>
</tbody>
</table>
Conductivity Measurement

- **Plug-in power pack**
  - For immersion stirrer
  - Order No.: ZU 6956

- **Interface cable**
  - For meter – computer connection (special EMC cable)
  - Order No.: ZU 0152

- **Lab printer**
  - With the Lab Printer, you can document your measured values either at the press of a key or timer-controlled. Also records for QM documentation to ISO 9000 and GLP can be printed out with a single keystroke. The printer is equipped with a replaceable ribbon cartridge and prints on standard paper. It is connected to the 765 Laboratory pH Meter or the 703 Laboratory Conductivity Meter via interface cable.
  - Order No.: ZU 0244

- **Interface cable**
  - For meter – printer connection
  - Order No.: ZU 0245

- **Printer paper**
  - For ZU 0244 Lab Printer, 5 rolls
  - Order No.: ZU 0249

- **Ink ribbon**
  - For ZU 0244 Lab Printer, 5 ribbons
  - Order No.: ZU 0250