

Basics

Warranty

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 Subject to change

Return of products under warranty

Please contact our Service Team before returning a defective device. Ship the cleaned device to the address you have been given. If the device has been in contact with process fluids, it must be decontaminated/ disinfected before shipment. In that case, please attach a corresponding certificate, for the health and safety of our service personnel.



Disposal

Please observe the applicable local or national regulations concerning the disposal of "waste electrical and electronic equipment".

Registered trademarks

The following names are registered trademarks. For practical reasons they are shown without trademark symbol in this manual.

- Calimatic[®]
- Memosens[®]
- Paraly[®]
- Portavo[®]
- Sensocheck[®]
- Sensoface[®]

Package Contents	5
Documentation	6
Overview of the Portavo 902 PH	7
Value-Added Features	8
Protective Cover	9
Hook	9
Display	10
Keypad	11
Start-Up	12
Inserting the Batteries	12
Connecting a Sensor	
Switching On the Meter	
ICONS	14
Configuring	15
Calibrating	16
Measuring	20
Switching the Measured Value Display	
Adjusting the Temperature	
Clock	21
Error Codes and Device Messages	22
"Sensoface" Messages	23
Error Messages	24
Product Line	25
Accessories	25
Sensors	
Knick CaliMat Buffer Solutions	
Specifications	28
Index	31

Package Contents

Check the shipment for transport damage and completeness. The package of the Portavo 902 PH includes:

- The Portavo 902 PH incl. 4 AA batteries and premounted quiver
- Carrying strap
- Quickstart instructions in various languages
- Specific test report
- Safety instructions
- Data carrier with detailed user manuals

Documentation

Specific Test Report

CD-ROM

Complete documentation:

- User manuals in different languages
- Safety instructions
- Certificates
- Quickstart guides

Safety Instructions

In official EU languages and others.

• EC Declarations of Conformity

Quickstart Guides

Installation and first steps:

- Operation
- Menu structure
- Calibration
- Error messages and recommended actions

Various languages on CD-ROM and on our website: www.knick.de







Overview of the Portavo 902 PH



The Portavo 902 PH is a portable pH meter. A plain-text line on the high-contrast LCD screen makes operation virtually selfexplanatory.

The meter stands out by the following features:

- Use of digital Memosens sensors
- Memosens sensors and DIN pH sensors can be used on one device.
- A detachable quiver protects the sensor and prevents it from drying out. Furthermore, it can be used for calibration.
- The rugged housing is made of a highperformance polymer. It provides high impact resistance and dimensional stability even when exposed to extreme moisture.
- Scratch-proof clear glass display, perfectly readable even after years
- Very long operating times with one set of batteries (4 x AA)
- Sensoface icons provide single-glance information on the sensor condition (page 23)
- Calibration with "Calimatic" automatic buffer recognition (page 16)
- Manual calibration by entering individual buffer values
- Real-time clock and indication of battery charging level
- At measuring temperatures from -20 to +100 °C the temperature detector can be automatically identified.

Value-Added Features

Memosens

The Portavo 902 can communicate with Memosens sensors. When these digital sensors are connected to the meter, they are automatically identified and indicated by the logo shown on the right. Furthermore, Memosens allows the storage of calibration data, which will be available and can still be used when the sensor is connected to another Memosens-capable device.



Sensoface provides quick information on the sensor condition. The three "smiley" faces as shown on the right represent the sensor condition during measurement and after a calibration. When the condition deteriorates, an "INFO ..." message gives a hint to the cause.

Automatic calibration with Calimatic

Calimatic is a very convenient method for pH calibration with automatic buffer recognition. You only have to select the buffer set with the buffers used. The buffers can then be used in any order.

As delivered, this calibration method is preset. It can be adjusted or disabled in the configuration menu.







Protective Cover

The front of the meter is protected by a cover, which can be completely flipped over and secured to the back for operation. A label on the inner side of the cover explains the control functions and device messages.



Hook

A fold-out hook on the back allows suspending the meter. This leaves your hands free for the actual measurement. The **rating plate** is located beneath the hook.



Protective Cover and Hook Combined

Cover and hook can be joined together to form a benchtop stand allowing comfortable and fatigue-free working at a lab bench or desk.

Display

The meter has a three-line display for representing alphanumeric information such as measurement and calibration data, temperatures and date/time.

Additional information is provided by means of icons (Sensoface, battery icon, etc.). Some typical displays are shown below.





Measuring

(display of measured value, temperature, date and time)

Clock

(display of hours and minutes, seconds and date).



Calibration - step 1

End of calibration (display of slope)

Overview of the Portavo 902 PH



on/off

Keypad

The keys of the membrane keypad have a noticeable pressure point.

They have the following functions:

on/off	Switches the meter on and displays the device and calibration data (see Start-Up)
meas	Switches the meter on / Activates measuring mode
cal	Starts calibration
set	Activates configuration/ Confirms entries
clock	Displays time and date, allows setting the clock using set
▲	When this icon is displayed, you can use the arrow keys for navigation.

Check the shipment for transport damage and completeness (see Package Contents).



Caution!

Do not operate the device when one of the following conditions applies:

- the device shows visible damage
- the device fails to perform the intended function
- prolonged storage at temperatures above 70 °C
- severe transport stresses

In this case, a professional routine test must be performed. This test should be carried out by the manufacturer.

Inserting the Batteries



With four AA batteries, the Portavo has an operating time of over 1000 h. Open the battery compartment on the rear of the device. Be sure to observe the correct polarity when inserting the batteries (see markings in the battery chamber). Close the battery compartment cover and screw it handtight.

A battery icon in the display indicates the battery power level:

Icon fully filled	Batteries at full capacity
Icon partially filled	Battery capacity is sufficient
lcon empty	Battery capacity not sufficient; calibration is possible
Icon blinks	Max. 10 operating hours remaining, measurement is still possible Caution! It is absolutely necessary to replace the batteries.

Connecting a Sensor

The Portavo 902 PH provides several connections so that many types of sensors can be used for measurement. Note that only **one** sensor may be connected to the meter at a time. The meter automatically recognizes a connected Memosens sensor and switches accordingly. Memosens is signaled in the display.

Separate temperature probe

After power-on, a separate temperature probe is automatically recognized. When you want to replace the temperature probe, you must switch off the meter and then switch it on again.



Caution!

Always make sure that a sensor is connected to the meter before starting measurement.

Explanation: The analog pH input of the Portavo is an electrometer amplifier with an extremely high-impedance. When the sensor is not in contact with the medium or not connected to the meter, electric charges on the input can generate arbitrary, stable pH or mV values which will be shown in the display.



Connections

- a M8, 4 pins for Memosens sensors
- b Temperature probe GND
- c Temperature probe
- d pH socket (DIN 19 262)

Memosens sensors have a **cable coupling**, which allows convenient replacement of sensors while the cable remains connected to the meter. The connecting cable is connected to socket **a** (M8, 4 pins for Memosens sensors).







When you have connected the sensor, you can switch the meter on by pressing the **on/off** or **meas** key.



When the meter is switched on with the **on/off** key, first a self test is performed and then the calibration data and settings are displayed before the meter switches to measuring mode.

When the meter is switched on with the **meas** key, it immediately switches to measuring mode.

Depending on the connected sensor and the specific measuring task, several steps for configuration and calibration must be performed as described on the following pages.

lcons

Important information about the state of the device:





pH Configuration

Prior to measurement, a configuration should be performed to match the connected sensor and the desired measurement performance. Furthermore, you can select the suitable calibration method. The following table gives you an overview. Factory settings are shown in **bold print**.

Measurement



"Setup" display

Select using arrow keys, confirm by pressing set.

♠	Display 1		pH x.xx / pH x.xxx / mV / (°C for analog pH only)		
	Display 2		OFF ,	/ date + time / date / t	ime
	CAL Timer		OFF /	/ 1 99 days	
	CAL		CALI	MATIC/Manual/DATA	NPUT/(ISFET-Zero)/FREE CAL
	CAL POINTS		1/2	/ 3 / 1-2-3 (for CALIMA	ATIC, Manual, FREE CAL)
			-01-	Mettler Toledo	2.00/4.01/7.00/9.21
			-02-	Knick CaliMat	2.00/4.00/7.00/9.00/12.00
			-03-	Ciba (94)	2.06/4.00/7.00/10.00
	RI IEEED SET	4	-04-	NIST technical	1.68/4.00/7.00/10.01/12.46
CALIMATIC, FREE CAL)	set	-05-	NIST standard	1.679/4.006/6.865/9.180	
	(CALIMATIC,	$ \longrightarrow $	-06-	HACH	4.01/7.00/10.01/12.00
	FREE CAL)		-07-	WTW techn. buffers	2.00/4.01/7.00/10.00
			-08-	Hamilton	2.00/4.01/7.00/10.01/12.00
			-09-	Reagecon	2.00/4.00/7.00/9.00/12.00
			-10-	DIN 19267	1.09/4.65/6.79/9.23/12.75
	Auto OFF		OFF/	0.1h / 1h / 6h / 12h	
	Temp Unit		°C / °	F	
	Time Format		24h /	′ 12h	
	Date Format		dd.m	m.yy / mm.dd.yy	
¥	Default		NO /	YES (reset to factory s	ettings)



▲ This icon prompts you to select a menu item using the arrow keys –

the selection is confirmed by pressing set.



CALIMATIC Calibration

(Calibration with automatic buffer recognition)

The calibration method is selected in the configuration menu. Calibration is required to adjust the sensor to the meter. It is indispensable for achieving comparable and reproducible measurement results.



Then the meter switches to measuring mode.

Note: To abort calibration, you can press **meas** at any time. This will be confirmed by the display message "CAL ABORTED". Exception: When you have selected "CAL POINTS 1-2-3" and the first calibration step has been completed, the calibration process cannot be stopped any more.



DATA INPUT Calibration

(Calibration by entering known sensor values) The calibration method is selected in the configuration menu.

	_
Measurement	
↓ cal	
CAL DATA INPUT	
¥	
ZERO POINT	Use $\blacktriangle \nabla$ to select the value for the zero point.
↓ cal	
SLOPE	Use $\blacktriangle igvee$ to select the value for the slope.
↓ cal	
The calibration data will be displ Date and time ZERO POINT SLOPF	ayed successively:

Then the meter switches to measuring mode.

Note: To abort calibration, you can press meas at any time.



MANUAL Calibration

(Manual calibration)

The calibration method is selected in the configuration menu.

	_
Measurement	
↓ cal	-
CAL	The number of calibration points has been
MANUAL	selected in the configuration menu.
¥	-
CAL 1/2/3	
PRESS CAL	
↓ cal	
pH display blinks	Use AV to set the temperature-corrected pH
PRESS CAL	value taken from the buffer table.
↓ cal	
mV display blinks]
	Depending on the number of calibration points,
¥	the procedure described above for CAL 1/2/3 is repeated.
mV value blinks until calibration	is completed, then successive display of:
CAL DATA	
1/2/3 CAL POINTS	
SLOPE	

Then the meter switches to measuring mode.

Note: To abort calibration, you can press **meas** at any time. This will be confirmed by the display message "CAL ABORTED". Exception: When you have selected "CAL POINTS 1-2-3" and the first calibration step has been completed, the calibration process cannot be stopped any more.



FREE CAL Calibration

(Free selection of calibration method)

FREE CAL calibration is selected in the configuration menu.

Measurement	
↓ cal	
CAL CALIMATIC blinks	Use V to select the required calibration method (CALIMATIC, DATA INPUT or MANUAL).
cal	

ᡟ

Perform the selected calibration (see CALIMATIC, DATA INPUT or MANUAL calibration).

Measuring

Once you have completed all preparations, you can start with the actual measurement.

- 1) Connect the desired sensor to the meter. Some sensors require a special preparation. Please proceed according to the operating instructions for the sensor.
- 2) Switch the meter on using the **on/off** or **meas** key.
- 3) Depending on the measurement method and the sensor used, immerse the sensing part of the sensor in the medium to be measured.
- 4) Watch the display and wait for the reading to stabilize.



During measurement, you can switch between pH and mV display by pressing the **meas** key.

Adjusting the Temperature

When you connect a sensor without temperature detector, you can manually adjust the temperature for measurement or calibration:

- 1) Press **meas** to access measuring mode. The adjusted temperature will be displayed.
- Set the desired temperature value using the ▼ or ▲ arrow. Holding the key depressed changes the temperature value at high speed.









Press the **clock** key to access the clock mode. Date and time will be displayed in the format as set in the configuration menu. To set the clock, proceed as follows:



Error messages are indicated as "ERROR ..." on the display. Information on the sensor condition is indicated by the "Sensoface" icon (friendly, neutral, sad) possibly accompanied by an info message ("INFO ...").



Example of an error message: ERROR 8 (identical calibration media)

Sensoface (the "smiley" icon) provides information on the sensor condition (maintenance request). Measurement can still be performed. After a calibration, the corresponding Sensoface icon (friendly, neutral, sad) is shown together with the calibration data. Otherwise, Sensoface is only visible in measuring mode.

The most important error messages and "Sensoface" info messages are shown on the inside of the protective cover.

A complete list of messages and their meanings is provided in the following tables.



Example of a "Sensoface" message: INFO 1 (cal timer expired)



"Sensoface" Messages

The "Sensoface" icon provides information on the sensor condition:

Sensoface	Meaning
	Sensor is okay
	Calibrate the sensor soon
$\overline{\bullet}$	Calibrate or replace the sensor

The "neutral" and "sad" Sensoface icons are accompanied by an "INFO ..." message to give a hint to the cause of deterioration.

Sensoface	Message	Cause
	INFO 1	Calibration timer
	INFO 3	Sensocheck
\sim	INFO 5	Zero / Slope
	INFO 6	Response time
\smile \bigcirc	INFO 7	ISFET: Operating point (asymmetry potential)
	INFO 8	ISFET: Leakage current
	INFO 9	ORP offset

Error Messages

The following error messages can be shown in the display.

Message	Cause	Remedy
blinks	Battery empty	Replace batteries
ERROR 1	pH value out of range	
ERROR 2	ORP value out of range	Check whether the measurement
ERROR 3	Temperature value out of range	measuring range.
ERROR 4	Sensor zero point too high/low	Thoroughly rinse the sensor and re- calibrate. If this does not help, replace
ERROR 5	Sensor slope too high/low	the sensor.
ERROR 8	Calibration error: Identical buffers	Use a buffer solution with a different nominal value before starting the next calibration step.
ERROR 9	Calibration error: Buffer unknown	Make sure that you use the same buffer set as configured.
ERROR 10	Cal media interchanged	Repeat calibration.
ERROR 11	Measured value unstable Drift too high	Leave the sensor in the liquid until the temperature is stable. If this does not help, replace the sensor.
ERROR 14	Time and date invalid	Set time and date
ERROR 18	Configuration invalid	Restart,reset to factory settings (Setup: DEFAULT YES), configure and calibrate. If this does not help, send in the device for repair.
ERROR 19	Factory settings error	Device defective, send it in.
ERROR 21	Sensor error (Memosens)	Connect operational Memosens sensor.

Product Line

Accessories

Item	Order No.
Robust field case (for meter, sensor, various small parts and user manual)	ZU 0934
Adapter for BNC pH sensors to DIN socket	ZU1190
Replacement quiver (5 units)	ZU 0929
Memosens lab cable, M8, 4 pins	CA/MS-001XFA-L

Please visit our website for more information on our product range: <u>www.knick.de.</u>

Sensors

Analog pH-sensors	Order No.
pH/Pt1000 sensor (plastic body, length 120 mm)	SE 101 N
pH/Pt1000 sensor (plastic body, length 110 mm)	SE 102 N
pH puncture sensor (plastic body, length 65/25 mm)	SE 104 N
Pt1000 temperature detector	ZU 6959
Pt 1000 temperature detector with tilted tip	ZU 0156
Digital pH sensors	Order No.
pH/temp sensor (plastic body, length 120 mm)	SE 101 NMS
pH/temp sensor (glass body, length 110 mm)	SE 102 NMS

Memosens sensors have a **cable coupling**, which allows convenient replacement of sensors while the cable remains connected to the meter.



Knick CaliMat Buffer Solutions

Ready-to-use quality pH buffer solutions

pH value (20 °C)	Quantity	Order No.	
2.00 ± 0.02	250 ml	CS-P0200/250	
4.00 ± 0.02	250 ml	CS-P0400/250	
	1000 ml	CS-P0400/1000	
	3000 ml	CS-P0400/3000	
7,00 ± 0,02	250 ml	CS-P0700/250	
	1000 ml	CS-P0700/1000	
	3000 ml	CS-P0700/3000	
9.00 ± 0.02	250 ml	CS-P0900/250	
	1000 ml	CS-P0900/1000	
	3000 ml	CS-P0900/3000	
12.00 ± 0.05	250 ml	CS-P1200/250	
Buffer sets			
Set 4.00	3 x 250 ml	CS-PSET4	
Set 7.00	3 x 250 ml	CS-PSET7	
Set 9.00	3 x 250 ml	CS-PSET9	
Set 4.00, 7.00, 9.00	250 ml each CS-PSET479		

pH/mV input	pH socket, DIN 19 262 (13/4 mm)		
pH range	-2 16		
Decimal places *)	2 or 3		
	Input resistance	1 x 10 ¹² Ω (0 35 °C)	
	Input current	1 x 10 ⁻¹² A (at RT, doubles every 10 K)	
Measuring cycle	Approx. 1 s		
Measurement error ^{1,2,3)}	< 0.01 pH, TC < 0.001 pH/K		
mV range	-1300 +1300 mV		
Measuring cycle	Approx. 1 s		
Measurement error ^{1,2,3)}	< 0.1 % meas. val. + 0.3 mV, TC < 0.03 mV/K		
Temperature input	2 x 4 mm dia. for integrated or separate temperature detector		
Measuring ranges	NTC30 temp detector	-20 +120 °C	
	Pt1000 temp detector	-40 +250 °C	
Measuring cycle	Approx. 1 s		
Measurement error ^{1,2,3)}	< 0.2 K (Tamb = 23 °C); TC < 25 ppm/K		
Memosens pH input	M8 socket, 4 pins, for Memosens lab cable		
Display ranges 4)	рН	-2.00 +16.00	
	mV	-2000 +2000 mV	
	Temperature	-50 +250 °C	
Momosons pH input	Me cocket 4 pipe for Mor	morons lab cabla	
ISFET	ind socket, 4 pins, for inemosens iad cable		
Display ranges ⁴⁾	рН	-2.00 +16.00	
	mV	-2000 +2000 mV	
	Temperature	-50 +250 °C	
Memosens ORP input	M8 socket, 4 pins, for Memosens lab cable		
Display ranges 4)	mV	-2000 +2000 mV	
	Temperature	-50 … +250 ℃	
Sensor standardization *)	ORP calibration (zero adjustment)		
Permissible calibration range	ΔmV (offset) -700 +700 mV		

*) User-defined

1) According to EN 60746-1,

at nominal operating conditions

3) Plus sensor error4) Ranges depending on Memosens sensor

Specifications

Sensor standardization *)	pH calibration		
Operating modes *)	CALIMATIC	Calibration with automatic buffer recognition	
	MANUAL	Manual calibration with entry of individual buffer values	
	DATA INPUT	Data entry of zero and slope	
Calimatic buffer sets *)	 -01- Mettler-Toledo -02- Knick CaliMat -03- Ciba (94) -04- NIST technical -05- NIST standard -06- HACH -07- WTW techn. buffers -08- Hamilton -09- Reagecon -10- DIN 19267 	2.00/4.01/7.00/9.21 2.00/4.00/7.00/9.00/12.00 2.06/4.00/7.00/10.00 1.68/4.00/7.00/10.01/12.46 1.679/4.006/6.865/9.180 4.01/7.00/10.01 /12.00 2.00/4.01/7.00/10.00 2.00/4.01/7.00/10.01/12.00 2.00/4.00/7.00/9.00/12.00 1.09/4.65/6.79/9.23/12.75	
Permissible calibration range	Zero point With ISFET: Operating point (asymmetry) Slope (possibly restricting notes	pH 6 8 -750 +750 mV approx. 74 104 % s from Sensoface)	
Calibration timer *)	Interval 1 99 days, can be switched off		
Sensoface	Provides information on the sensor condition		
Evaluation of	zero/slope, response, calibration interval		

*) User-defined

Connections	1 x pH socket, DIN 19 262 2 x 4-mm socket for separate temperature detector 1 x M8 socket, 4 pins, for Memosens lab cable	
Display	LCD STN 7-segment display with 3 lines and icons	
Sensoface	Status indication (friendly, neutral, sad)	
Status indicators	Battery power level	
Notices	Hourglass	
Keypad	[on/off], [cal], [meas], [set], [▲], [▼], [clock]	
Diagnostics functions		
Sensor data (Memosens only)	Manufacturer, sensor type, serial number, operating time	
Calibration data	Calibration date, zero, slope	
Device self-test	Automatic memory test (FLASH, EEPROM, RAM)	
Device data	Device type, software version, hardware version	
Data retention	Parameters, calibration data > 10 years	
EMC	EN 61326-1 (General Requirements)	
Emitted interference	Class B (residential area)	
Immunity to interference	Industry	
	EN 61326-2-3	
	(Particular Requirements for Transmitters)	
RoHS conformity	According to directive 2011/65/EC	
Power supply		
Portavo 902	4 x AA alkaline batteries	
Operating time	Approx. 1000 h (alkaline)	
Nominal operating conditions		
Ambient temperature	-10 +55 °C	
Transport/	-25 +70 °C	
Storage temperature		
Relative humidity	0 95 %, short-term condensing allowed	
Housing		
Material	PA12 GF30 (silver gray RAL 7001) + TPE (black)	
Protection	IP 66/67 with pressure compensation	
Dimensions	Approx. (132 x 156 x 30) mm	
Weight	Approx. 500 g	

Index

A

AA batteries 12 Accessories 25 Analog pH input 13 Arrow keys 11 Automatic calibration (Calimatic) 16

В

Battery capacity 12 Battery charge indicator 12 Battery compartment 12 Battery icon 12 Battery replacement 12 Benchtop stand 9 Buffer sets 27 Buffer solutions (Knick CaliMat) 27 Buttons 11

C

Calibration (pH), Calimatic 16 Calibration (pH), data input 17 Calibration (pH), manual 18 Calibration (pH), method selected in measuring mode 19 CaliMat buffer solutions 27 Calimatic automatic calibration 16 Calimatic, description 8 cal key 11 Carrying case (accessory) 25 CD-ROM 6 Charge level of batteries 12 Clock 21 clock key 11 Configuration (pH) 15 Connecting a sensor 13 Connecting cable for Memosens 13 Connections 13 Control elements 11

32

D

Data input (pH calibration) 17 Data of the meter 28 Date 21 Device configuration 15 Device messages 22 Device properties 7 Digital sensors, product line 26 Display 10 Display icons 14 Displaying the time and date 21 Display, switching between measured values 20 Disposal 3 Documentation 6

E

EC Declarations of Conformity 6 ERROR (error codes) 24 Error messages 22 Error messages, overview 24

F

Features 8 Field case (accessory) 25 FREE CAL 19

Η

Hanging up the meter 9 Hook 9 Hours, display 21

L

Icons in display 14 INFO messages 23 Inserting the batteries 12 Introduction 7

Κ

Keypad 11 Knick CaliMat buffer solutions 27

Index

Μ

Manual calibration 18 meas key 11 Measuring 20 Memosens 8 Memosens connecting cable 13 Memosens lab cable (accessory) 25 Memosens sensors, product line 26 Menu structure of configuration 15 Messages 22 Minutes, display 21

0

on/off key 11 Order numbers (accessories) 25 Overview 8 Overview of configuration 15 Overview of error messages 24

Ρ

Package contents 5 Parameter settings (configuration) 15 pH buffer solutions 27 pH configuration 15 pH input, analog 13 pH sensors, product line 26 pH socket, DIN 19 262 13 Ports 13 Power-on 14 Product features 7 Product line 25 Product presentation 7 Protective cover 9

Q

Quickstart guides 6

34

R

Rating plate 9 Real-time clock 7 Reference numbers (accessories) 25 Registered trademarks 3 Replacement quiver (accessory) 25 Replacing the batteries 12 Return of products under warranty 3

S

Safety instructions 6 Scope of delivery 25 Seconds, display 21 Sensoface messages 23 Sensor connection 13 Sensors, product line 26 Sensor without temperature detector 20 set key 11 Setting the configuration data 15 Setting the time and date 21 Setup (configuration) 15 Smiley face (icon) 8 Specifications 28 Specific test report 6 Start-up 12 Suspending the meter 9 Switching on the meter 14 Switching the measured value display 20 Symbols in the display 14

Т

Table of error messages 24 Table view of configuration 15 Technical data 28 Temperature, manual adjustment 20 Trademarks 3 Triangle icons 11

V

Value-added features 8

w

Warranty 3

Knick Elektronische Messgeräte GmbH & Co. KG

CE

Beuckestr. 22 14163 Berlin Germany

 Phone:
 +49 (0)30 - 801 91 - 0

 Fax:
 +49 (0)30 - 801 91 - 200

 Web:
 www.knick.de

 Email:
 knick@knick.de

085112

Software version: 1.x