



OPERATION MANUAL



Made in
Germany

QNix[®] 4600

Table of Contents

1. General Information	3
1.1. Intended Use	3
1.2. Scope of Delivery	3
1.3. Safety Notes	4
1.4. Transport and Storage	4
1.5. Cleaning and Care	5
1.6. Disposal	5
2. Device Overview	5
3. Initial Operation	6
3.1. Insert Battery	6
4. Operation and Control	6
4.1. About Operation	7
4.2. Perform Adjustment	7
4.3. Measurement Display	8
4.4. Measure	9
4.5. Substrate Switch	9
4.6. Delete User's Adjustment	10
4.7. Measurement Unit Switch	10
5. Troubleshooting	11
6. Service and Repair	11
7. Appendix	12
7.1. Technical Data	12
7.1.1. Mechanical Data	12
7.1.2. Electrical Data	12
7.2. Measuring Data	13

1. General Information

These operating instructions describe the gauge QNix® 4600. Read the information carefully before use. Keep the instructions with the gauge.

1.1. Intended Use

This gauge, depending on the probe, is used to measure the thickness of coatings on metallic surfaces. For surfaces made of steel or iron (FE probe) the coating thickness can be determined for both non-conductive coatings (e.g. paint, enamel) as well as conductive, non-magnetic coatings (e.g. chrome, copper, zinc). On non-magnetic, metallic surfaces (e.g. aluminium, copper, brass), a dual probe can be used to determine the thickness of each nonconductive coating. Any other use is considered improper use. The user is liable for any damages resulting from improper use.

1.2. Scope of Delivery

- QNix® 4600
- 2 Reference Plates Fe / NFe
- 2 Mignon batteries in the Gauge (Typ Mignon AA)
- Quick Start Guide
- Plastic case for transport and storage
- Calibration certificate

1.3. Safety Notes

Please note the safety instructions, as disregarding may endanger persons or the environment or damage the gauge.

**Caution Gauge modification:**

Do not open or modify the gauge. Repairs must be performed by the manufacturer or by the authorized partners.

**Caution Electromagnetic compatibility:**

Electromagnetic influences in the surrounding area may interfere with the gauge resulting in false readings.

**Notice Handling batteries:**

Remove the batteries if the gauge is not used for extended periods to prevent battery leakage. Dispose of used batteries in compliance with local regulations.

**Notice Operating the Gauge:**

Protect the gauge from dust, dirt and moisture, chemicals and aggressive gases. Avoid direct sunlight or extreme temperature fluctuations.

1.4. Transport and Storage

Always transport the gauge in the case. If the gauge is not used for extended periods, remove the batteries and store the gauge in the case.

1.5. Cleaning and Care

Gauge: The gauge must be switched off before cleaning. Clean the gauge with a damp, lint-free cloth. Generally, mild cleaning agents should be used. For stains caused by paint and varnish, dilute solvents such as ethanol, nitro thinner or benzine should be used.

Display: Always use a damp, soft, lint-free cloth. For heavier soiling, if cleaning with water is not sufficient, please use mild cleaning agents.

1.6. Disposal

Dispose of used batteries and the gauge in compliance with local regulations, not in the household waste.

2. Device Overview



3. Initial Operation

3.1. Insert Battery

This device includes: 2 mignon batteries AA (LR6 / FR 6 / AM3). The battery compartment is located on the back of the device.

- To unlock the cover pull the latch tab down and pull outwards
- Lift off the cover
- Insert or replace batteries
- Insert the lug of the battery cover completely into the device housing;
lock the battery cover again by pressing

4. Operation and Control

Switch on the device with the button.

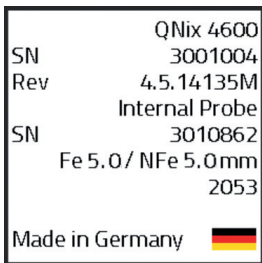
To shut down the device, press and hold the button until the power-off countdown reaches „0“.

If the device is not used for a longer period of time, the display darkens after 30 seconds.

After a further 60 seconds it will turn off in standby.

It turns on automatically by placing it on a measurement object (wake on probe).

When switching on the device a start screen with all information (model, variant, measuring range and firmware version) about the gauge is displayed.



4.1. About Operation

Please note the following instructions to ensure conclusive results:

- Hold the device by the ribbing at the grip area.
- Place the device vertically and carefully, but not too slowly, on the surface.
- Make sure the gauge is stable on the surface and avoid blur.
- Do not drag the gauge across the coated surface.

4.2 Perform Adjustment

The gauge needs a user's adjustment (zeroing) before initially using the gauge, after replacing the batteries or for different measurement jobs. Use a piece of uncoated material being tested or, alternatively, the included reference plates.

Start adjustment

- Hold the gauge far from any disturbing influence like metals or magnetic fields.
- Press the Q-Button. Then you are requested to place the gauge on the reference material.
- When requested, place the gauge either on the substrate to be tested or on a reference plate. The display shows the last measurement result.
- For control place the gauge once again on the substrate. The display shows either 0 or a very low measurement value.
- In case the adjustment is started accidentally, it can be cancelled by pressing the button again.

Notice Incorrect adjustment

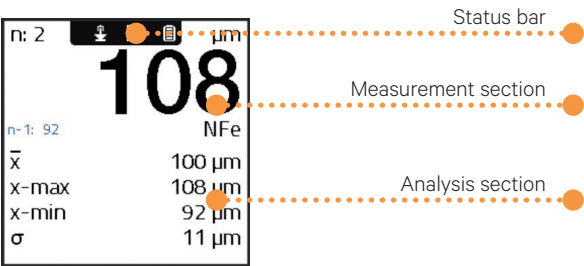
Adjustment with the incorrect reference plate can reduce accuracy.

Notice Measurement error

Rough surfaces or dirt can cause errors of measurement.

4.3 Measurement Display

The measurement display contains the sections



Depending on the context, the measurement display shows the following information:

Section	Symbol	Description
Status bar		User's adjustment done
		currently selected substrate option
		Battery level 100 % / 50 % / 25 % / empty Note! If the batteries are below 50 %, a warning screen will appear. Press „OK“ to confirm the screen and replace the batteries promptly.
		Probe status: probe connected
Measurement section	n:	Total number of recorded measurement values
	μm / mil	Unit for the coating thickness
	n-1 n-2	Last and next to last measurement value
	NFe / Fe	Substrate of the actual measurement
Analysis section	$\bar{x}$	Average
	x-max	Highest measurement value
	x-min	Lowest measurement value
	σ	Standard deviation

4.4. Perform measurement with volatile memory

Please note that it is not possible to display previous measurement values. The storage of the values is only used for statistics.

- If necessary, start zero-adjustment
- put on the probe and take a measurement.

Pressing and holding the button until the countdown for switch-off starts will delete the last measurement results from the volatile memory.

4.5. Substrate Switch

To switch the substrate the gauge has to be held upside down, that the probe shows up. Press the button and the gauge switches to the next substrate.

The following substrate settings are selectable by pressing the button again:

- Fe-Substrate (ferromagnetic metals like iron, steel, nickel)

The chosen substrate (Fe) is displayed in the status bar



- NFe-Substrate (non ferromagnetic but electrically conductive metals like aluminium, zinc and copper). The chosen substrate (NFe) is displayed in the status bar



- Automatic substrate switch (Fe/NFe). The status bar shows „Fe/NFe“



Possible substrate settings depend on the capabilities of the probe.

4.6. Delete User's Adjustment

Pressing and holding the button until the countdown for switch-off starts will delete the last measurement results. If you repeat this three times with a maximum interval of 5 seconds in between the user's adjustment will be deleted also – the gauge goes back to factory adjustment. By exceeding the 5 seconds intervall the counted repeats are set back to 0.

In case of an existing user's adjustment, the according symbol is shown in the status bar.



After deleting the user's adjustment the symbol disappears; factory adjustment is now active.



4.7. Changing Measurement Unit

Pressing and holding the button until the power-off countdown begins will clear the last readings. By repeating this procedure five times with a maximum interval of 5 seconds in between the measure-ment unit will be switched: from µm to mil or from mil to µm. If exceeding 5 seconds the counted repeats are set back to 0.



5. Troubleshooting

If the device is not responding as expected, please check the following items:

Error	Possible cause	Action
Device does not switch on	Batteries empty	Replace the batteries
Adjustment with reference plates produces implausible results.	Incorrect reference plate selected	Select the reference plate Fe/NFe according to your probe
	Incorrect adjustment	Perform a user adjustment
	Device or probe defective	Contact your service partner

6. Service and Repair

The equipment must be repaired only by a manufacturer authorised technician. If you have any questions, please contact your local retailer or our support: www.q-nix.com/en/support

Automation Dr. Nix GmbH & Co KG
Robert-Perthel-Straße 2
50739 Cologne – Germany
Phone +49 (0) 221 91 74 55-0
info@automation.de

7. Appendix

7.1. Technical Data

7.1.1. Mechanical Data

Mechanical Data	
Display	IPS-LCD, 2.4", colour,, 600 lm viewing angle 70° in all directions
Dimensions (L x W x H)	approx. 135 x 63 x 43 mm
Weight (without batteries)	approx. 100 g
Robustness / ambient conditions	
Operating temperature	0 °C to 50 °C, 10 – 90 % relative humidity, non-condensing
Storage temperature	-20 °C to +70 °C, 10 – 90 % relative humidity, non-condensing

7.1.2. Electrical Data

Electrical Data	
Protection rating	III
Power supply	2 x Batteries 1,5 V (type AA)
Battery life without operation at min. 50 % battery capacity	> 1 year
Battery life at one measurement per second	approx. 40.000 measurements

7.2. Measuring Data

Measuring Data	Fe	NFe
Principle of Measurement	magnetic: magnetic field/ Hall-effect	magnetic: eddy current
Measuring range	Varies depending on probe type	
Measuring interval	≥ 100 measurements / min.	
Units	µm / mil (switchable)	
Display resolution	1 µm	
Measurement uncertainty* (based on factory standards)	± (1 µm + 2 %*) to 2 mm ± 5 % beyond 2 mm (*) of reading	± (2 µm + 2 %) to 2 mm ± 5 % beyond 2 mm
Minimum measuring area (Ø)	28 mm	28 mm
Minimum curvature radius, convex	10 mm	50 mm
Minimum thickness of the base material	100 µm - zero point adjustment on the original substrate (accuracy checked up to 250 µm)	50 µm - zero point adjustment on the original substrate (accuracy checked up to 250 µm)



Automation Dr. Nix GmbH & Co. KG

Robert-Perthel-Str. 2

50739 Cologne – Germany

Phone +49 (0) 221 91 74 55-0

info@automation.de

www.q-nix.com