Evaluation Certificate

Number **TC12273** revision 2
Project number 3808370

Issued by	NMi Certin B.V.
In accordance with	WELMEC 8.8 2017, EN 45501:2015, OIML R 76-1 (2006).
Producer	KERN & SOHN GmbH Ziegelei 1 72336 Balingen-Frommern Germany
Measuring instrument	An **Indicator**, tested as a part of a weighing instrument. Type : TKFC-TM-C, TKXC-TM-A, TKXC-TM-EX2-A Further properties are described in the annexes: - Description TC12273 revision 2; - Documentation folder TC12273-2. An overview of performed tests is given in the annex: - Description TC12273 revision 2.
Initially issued	19 December 2023
Remark	This revision replaces the earlier version, including its documentation folder.

Issuing Authority

NMi Certin B.V.
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Certification Board

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PRODUCTS RvA C 681

Description

1 General information about the indicator

All properties of the indicator, whether mentioned or not, shall not be in conflict with the standard mentioned in the certificate.

This certificate is the positive result of the applied voluntary, modular approach, for a component of a measuring instrument, as described in WELMEC 8.8. The complete measuring instrument must be covered by relevant metrological certification that is valid in the country where the instrument is put into use.

1.1 Essential parts

Number	Pages	Description	Remarks
12273/0-01	2	Block diagram	-
12273/2-01	1	Block diagram KXC and KXC-EX2	-
12273/0-02	4	Main board 5.50.52.08520300REV.0D1 Including parts list	Only for TKXC-TM-A
12273/0-03	4	Main board 5.50.52.08540100REV.0D1 Including parts list	Only for TKXC-TM-A
12273/2-02	4	Main board 5.50.52.08540100REV.0D2/0D3 Including parts list	0D2 only for TKXC-TM-A

EMI protection measures for TKFC-TM-C:
- Ferrite on the cable between load cell and ADC;
- Ferrite on the cable between DC power input and main board;
- Ferrite on the cable between battery power input and main board;
- Ferrite on the cable between Real Time Clock battery input and main board.

EMI protection measures for TKXC-TM-A and TKXC-TM-EX2-A:
- Ferrite on the cable between load cell and ADC;
- Ferrite on the cable between power supply board and main board;
- Ferrite on power supply cable;
- Ferrite on RS232 cable;
- Ferrite on USB cable;
- Ferrite on Ethernet cable;
- Ferrite on the cable between battery power input and main board.

1.2 Essential characteristics

Configuration		Analog load cells
Accuracy class		(III)
Weighing ranges		Single interval Multi-interval Multiple range
Maximum number of scale intervals (per (partial) weighing range)		$n \leq 3000$
Maximum number of (partial) weighing ranges		2
Load cell excitation voltage		5 V DC
Minimum signal input voltage		U_{min} = 0 mV
Minimum input voltage per verification scale interval		1 µV
Minimum load cell resistance		87 Ω
Maximum load cell resistance		1227 Ω
Fraction of the maximum permissible error		0,5
Load cell interface		6-wire with sense technology, may be configured as 4-wire
Maximum value of the cable length per cross wire section between the indicator and the junction box or load cells		3759,9 m/mm^2 In case sense technology is not used the load cells are connected directly without junction box or extension cable
Temperature range		-10 °C / +40 °C
Electromagnetic environment class		E2
Power supply voltage	TKFC-TM-C	3,5 V – 6,5 V DC supplied by an AC/DC adapter Optional: 3,7 V DC rechargeable battery
	TKXC-TM-A	100-240 V AC 50/60 Hz Optional: 3,7 V DC rechargeable battery
	TKXC-TM-EX2-A	100-240 V AC 50/60 Hz or Optional: 3,7 V DC rechargeable battery
Software identification (version number)		A.1.0.00 (legally relevant) b.x.x.xx (non-legally relevant) (x= 0..9)

Software:
- The identification numbers will be displayed at start-up, after pressing any button during display check;
- The indicator has embedded software.

List of legally relevant functions:
- Determination stability of equilibrium;
- Zero indicating;
- Semi-automatic zero-setting;
- Initial zero-setting;
- Zero-tracking;
- Semi-automatic subtractive tare balancing;
- Preset tare;
- Gravity compensation;
- Adjustment / set-up mode via a push button on the main board;
- Checking the display;
- Weight unit selection (kg, g);
- Linearity compensation: the linearity can be compensated to a maximum of 3 points;
- Extended indicating, resolution 1/10 e for a period not exceeding 5 seconds after a manual command;
- Data Storage Device that complies with OIML R 76 (2006) clause 5.5.3 and EN 45501:2015 clause 5.5.3.

1.3 Essential shapes

Number	Pages	Description	Remarks
12273/0-04	1	Exploded view TKFC-TM-C	-
12273/0-05	1	Exploded view TKXC-TM-A	-
12273/2-03	1	Exploded view TKXC-TM-EX2-A	
12273/0-06	1	Outline drawing TKFC-TM-C	-
12273/0-07	1	Outline drawing TKXC-TM-A	-
12273/2-04	1	Outline drawing TKXC-TM-EX2-A	

The descriptive markings plate is secured against removal by sealing or will be destroyed when removed and contains at least the following information:
- This certificate number TC12273;
- Producers name or mark.

1.4 Conditional parts

1.4.1 TKFC-TM-C

The indicator may be equipped with one or more of the following protective interfaces that have not to be secured:
- KERN interface allowing the following interfaces to be connected:
  - Extension box with three KERN interfaces (KUP);
  - Ethernet;
  - RS232;
  - USB host;
  - USB device;
  - Analog out;
  - Bluetooth;
  - WiFi.

Power supply: Any CE marked AC/DC plug-in power supply may be used.

1.4.2 TKXC-TM-A, TKXC-TM-EX2-A

Number	Pages	Description	Remarks
12273/0-08	2	Power supply board with parts list	Only for TKXC-TM-A
12273/2-05	2	Power supply board with parts list	Only for TKXC-TM-EX2-A

The indicator may be equipped with one or more of the following protective interfaces that have not to be secured:
- WiFi (KERN interface module KUM-05);
- RS232 (KERN interface module KUM-01 or KUM-01-EX2);
- Ethernet (KERN interface module KUM-04 or KUM-04-EX2);
- USB (KERN interface module KUM-03 or KUM-03-EX2);
- Analog out (KERN interface module KUM-08 or KUM-08-EX2);
- Bluetooth (KERN interface module KUM-06).

For the TKXC-TM-EX2-A optional battery power supply:
- Li-Ion rechargeable battery: KERN, TYKR-04-EX2-A.

1.5 Non-essential parts

Display;
Keyboard;
Battery (not applicable for TKXC-TM-EX2-A)

2 Seals

To secure components that may not be dismantled or adjusted by the user, the indicator has to be secured in a suitable manner on the locations indicated in the drawings:

Number	Pages	Description	Remarks
12273/0-09	1	Sealing drawing TKFC-TM-C	-
12273/0-10	1	Sealing drawing TKXC-TM-A and TKXC-TM-EX2-A	-

The connecting cable of the load cell or the junction box is provided with possibility to seal.

Inside the cabinet is an adjustment push button, located on the main board. This adjustment button has to be pressed once to set the indicator in adjustment mode, which is active until the indicator is powered off.

3 Conditions for conformity assessment

The compatibility of load cells and indicator is established by the manufacturer by means of the compatibility of modules form, contained in EN 45501:2015 clause F.4, at the time of putting into use.

Other parties may use this Evaluation Certificate only with the written permission of the producer.

4 Reports

An overview of performed tests is given in the evaluation report ER12273 revision 2.