



EC-TYPE EXAMINATION CERTIFICATE

Number: TCM 221/13 - 5105

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- In accordance:** with Directive 2004/22/EC of the European Parliament and of the Council as amended implemented in Czech Republic by Government Order No. 464/2005 Coll. as amended that lays down technical requirements on measuring instruments.
- Manufacturer:** Hexing Electrical Co., Ltd.
1418 Moganshan Road, Shangcheng Industrial Zone
310011 Hangzhou
China
- For:** active electrical energy meter - single phase
type: HXE110
Accuracy class: A or B
mechanical environment class: M1
electromagnetic environment class: E2
temperature range: -25 °C...+70 °C
- Valid until:** 17 October 2023
- Document No:** 0511-CS-A047-13
- Description:** Essential characteristics, approved conditions and special conditions, if any, are described in this certificate.
- Date of issue:** 18 October 2013



Certificate approved by:

RNDr. Pavel Klenovský

1. Meter Characteristics

The electricity meter HXE110 is a single-phase max. 4-tariff energy meter designed to measure residential, light industrial and commercial energy consumption. The meter is designated for direct connection to the distribution network. It measures active energy in classes A or B according to standards EN 50470-1a EN 50470-3 in both energy import and export directions. Tariffs are controlled by the internal real time clock. It is possible to set day, week and season table and even exception day table. The meter is equipped with an internal battery enabling to support the RTC in meter and to detect cover opening tampering events and ability to readout meter during power outage. Battery is under sealable door.

In addition to energy values, the meter measures reactive energy in each quadrant, apparent energy, max. demand, voltage, current, frequency and power factor. Electricity consumption can be controlled by disconnecter thru load control and artificial control. Meter provides monitoring of over- and under-voltage and failure of power grid. It also detects meter tampering: meter cover open and high magnetic field. These events are logged with time stamp.

Only measurement of active energy is subject to the approval process.

The LCD display also shows actual tariff No., energy direction flow, battery condition, disconnecter status, communication indicator, GPRS signal intensity indicator, OBIS codes and measured values with units. Data on display scroll automatically or can be listed with push-button.

The meter contains an optical interface, RS485 communication interface, plug in module, impulse output S0 type and disconnecter relay for interruption from the distribution grid.

More details, see User Manual Smart AMI Meter HXE110 (V1.1.1).

Hardware version:

PS12CSCLSPIF001-1V03

Software version:

FS1200CLDPI000101V16; CRC: DA72

2. Main Metrological Characteristics

Measurement	Active energy in both of directions in 1-phase 2-wire distribution network
Measurement Method	Static meter with shunt on phase current input and with current transformer on neutral.
Class	A or B
Display	LCD (max. 8 digits of energy value)
Tarifs	Up to 4 tariffs controlled by internal clock
Reference Voltage U_n	230V
Reference Frequency f_n	50 Hz
Reference Current I_{ref}	5 A (or 10 A)
Transitional Current I_{tr}	0.5 A (or 1 A)
Minimum Current I_{min}	0.25 A (or 0.5 A)
Starting Current I_{st}	20 mA (or 40 mA)
Maximum Current I_{max}	100 A
Constant (LED):	1000 imp/kWh
Specified Operating Temperature Range	-25°C...+70°C
Degree of Protection Against Dust and Water	IP54
Protective Class (Electrical)	II

Mechanical Environment	M1
Electromagnetic Environment	E2

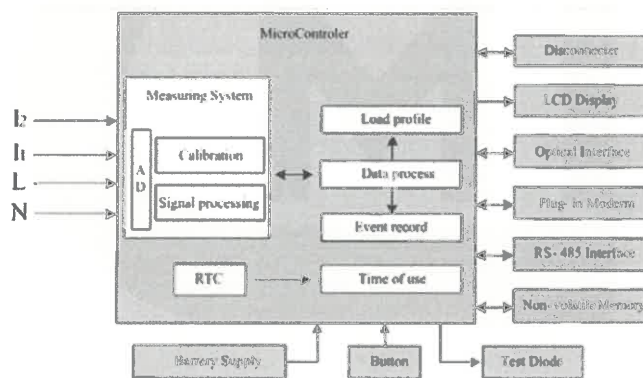
3. Interfaces

- Optical interface (as per EN 62056-21 E mode)
- RS485
- Impulse output S0 type
- Plug in module (GPRS/PLC)

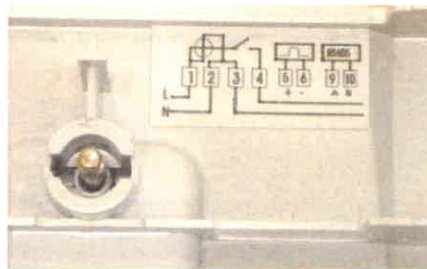
4. Main Functional Characteristics

- Up to 4 tariffs
- Universal definition of tariff switching programs
- Tampering detection and event logging (external magnetic field, meter case / terminal cover tampering)
- Disconnecter from the grid
- Ability to readout meter during power outage

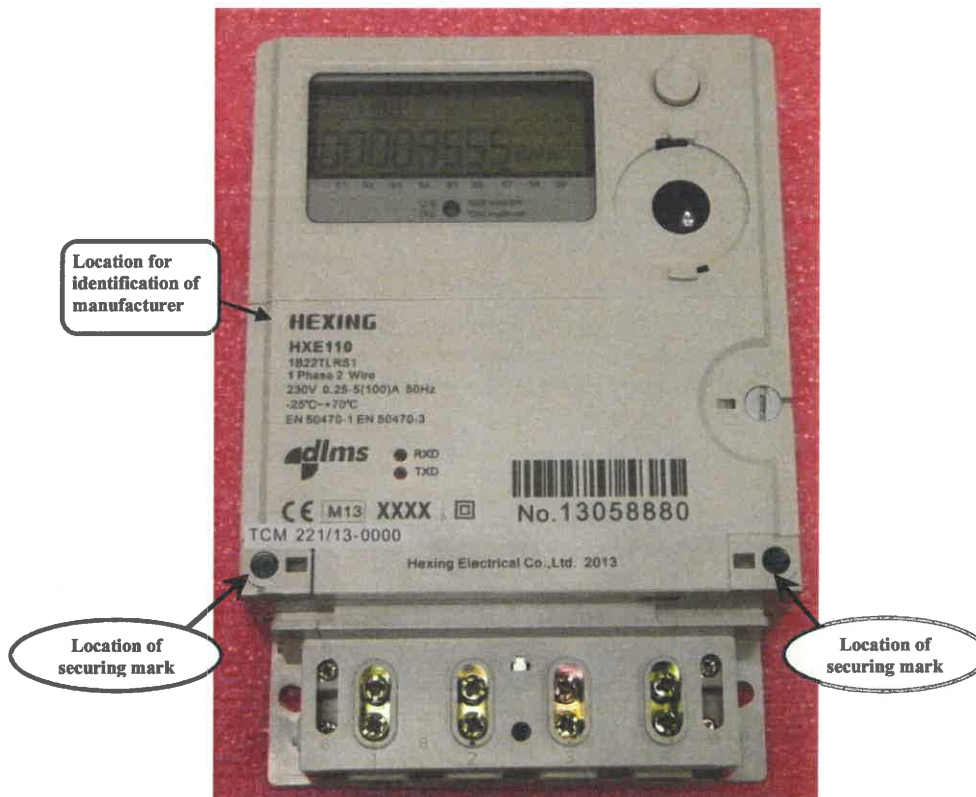
5. Meter Block Diagram



6. Wiring Diagram (photo of terminal block cover from back side)



7. Photograph of Meter



8. EC-Type Examination

The meters were tested at the Czech Metrology Institute in Brno as per EN 50470-1, EN 50470-3 standards and the WELMEC doc. 7.2. Test results are presented in the Test Report No. 6011-PT-TS029-13.

Tested meters complied with all test requirements.

9. Meter Marking

9.1 Name-plate

The following data shall be quoted on the meter name-plate:

- Manufacturer's name or his trade mark
- Type Designation
- "CE" marking and supplementary metrological marking
- Number of EC-type examination certificate
- Serial number and year of production
- Class index
- Specified operating temperature range
- Types of distribution network (graphical symbol)
- Reference voltage
- Reference (rated) current
- Maximum current
- Minimum current
- Reference frequency
- Meter constant
- Sign of double-square for meters with protective class II.

9.2 Supplementary Documentation

The meter shall be accompanied by supplementary documentation. A batch of identical meters intended for a single customer can be accompanied by a single copy of supplementary documentation only. This documentation shall as a minimum include all data listed on the name-plate (except for serial number and production year) and also the following:

- Brief description of meter, including values / data measured, data logging and display possibilities
- Wiring diagram (the wiring diagram shall be also shown on the meter case)
- Storage conditions
- EMC data
- Starting Current
- Consumption of voltage and current circuits
- Specification of impulse output S0
- Specification of optical communication port including communication modes available
- Specification of internal clock and tariff switching
- Maximum cross-section of connecting conductors
- Mass and dimensions
- Way of meter disposal

9.3 Security marks (sealing)

The meter is sealed by two manufacturer's registered securing marks or by two marks of notified body (module F of MID). Securing marks are pendent seals. For location, refer to Photograph of Meter.

10. Testing for declaration of conformity to type

The conformity assessment procedure consists of these tests (at reference conditions):

1. Test of no-load
2. Test of starting
3. Accuracy of meter (using LED test output)
4. Test of meter constant

Tests are performed in accordance with the EN 50470-1 and EN 50470-3 standards. Meter intrinsic errors $e(I, \cos\varphi)$ are measured at reference conditions with reference voltage 230 V, 50 Hz and currents and $\cos\varphi$ as given in tables below. After the test, composite errors e_c are calculated at rated meter operating conditions [adopted are values $\delta(T, I, \cos\varphi)$, $\delta(U, I, \cos\varphi)$ and $\delta(f, I, \cos\varphi)$ of table below], according to the formula as follows:

$$e_c = \sqrt{e^2(I, \cos\varphi) + \delta^2(T, I, \cos\varphi) + \delta^2(U, I, \cos\varphi) + \delta^2(f, I, \cos\varphi)}$$

where

- $e(I, \cos\varphi)$ - stands for meter intrinsic error for a given current and $\cos\varphi$
- $\delta(T, I, \cos\varphi)$ - stands for additional percentage error due to variation of temperature in rated temperature range for a given current and $\cos\varphi$
- $\delta(U, I, \cos\varphi)$ - stands for additional percentage error due to variation of voltage $\pm 10\% U_{\text{ref}}$ for a given current and $\cos\varphi$
- $\delta(f, I, \cos\varphi)$ - stands for additional percentage error due to variation of frequency $\pm 2\% f_{\text{ref}}$ for a given current and $\cos\varphi$

The meter is compliant if the composite errors are smaller than the maximum permissible errors MPE.

MPE values for class A – see Directive 2004/22/EC of the European Parliament and of the council on measuring instruments, Annex MI-03, Table 2).



Data for calculation of composite error											
Load		Additional error (%)						MPE (%) for class B in temp. ranges			
Current	cos ϕ	$\delta(T, I, \cos\phi)$				δ (U, I, cos ϕ)	δ (f, I, cos ϕ)	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>						
I_{\min}	1	0,15	0,40	0,80	0,85	0,10	0,10	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
I_{r}	1	0,15	0,40	0,80	0,85	0,10	0,10	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,5ind.	0,15	0,40	0,80	0,85	0,10	0,10				
	0,8cap.	0,15	0,40	0,80	0,85	0,10	0,10				
I_{ref}	1	0,15	0,40	0,80	0,85	0,10	0,10	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,5ind.	0,15	0,40	0,80	0,85	0,10	0,10				
	0,8cap.	0,15	0,40	0,80	0,85	0,10	0,10				
I_{\max}	1	0,15	0,40	0,80	0,85	0,10	0,10	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,5ind.	0,15	0,40	0,80	0,85	0,10	0,10				
	0,8cap.	0,15	0,40	0,80	0,85	0,10	0,10				

Temperature Range 1: 5°C thru 30°C

Temperature Range 2: -10°C thru 5°C and 30°C thru 40°C

Temperature Range 3: -25°C thru -10°C and 40°C thru 55°C

Temperature Range 4: 55°C thru 70°C