EU-type examination certificate

Number **T13146** revision 0
Project number 4040528

Issued by

NMi Certin B.V.,
designated and notified by the Netherlands to perform tasks with respect to conformity asssessment procedures mentioned in article 17 of Directive 2014/32/EU, after having established that the measuring instrument meets the applicable requirements of Directive 2014/32/EU, to:

Manufacturer

F&F Filipowski sp.k
ul. Konstatntynowska 79/81
95-200 Pabianice
Poland

Measuring instrument

A static **Active Electrical Energy Meter**

Type	:	LE-03d v.2, WZE-3RST, LE-03-FPV-RST-M2, LE-03-FPV-RST-2T, LE-03-FPV-RST
Manufacturer's mark or name	:	F&F Filipowski sp.k
Reference voltage	:	3x230/400 V; 230 V
Reference current	:	10 A
Destined for the measurement of	:	electrical energy, in a - three-phase four-wire network - single-phase two-wire network
Accuracy class	:	A or B
Environment classes	:	M1 / E2
Temperature range	:	-40 °C / +70 °C

Further properties are described in the annexes:
– Description T13146 revision 0;
– Documentation folder T13146-1.

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Certification Board

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Description

1 General information about the instrument

All properties of the static active electrical energy meter, whether mentioned or not, shall not be in conflict with the legislation.

1.1 Essential parts

Description	Document	Remarks
measuring sensor	13146/0-02, 13146/0-03	ZR-FL-200B-009A / ZR-FL-200C-009B
printed circuit board	13146/0-13, 13146/0-14 13146/0-15, 13146/0-16 13146/0-17, 13146/0-18	All parts of the printed circuit boards are essential, except the components which are related to parts as described in paragraph 1.4 or 1.6.

1.2 Essential characteristics

1.2.1 See EU-Type examination certificate T13146 revision 0 and the characteristics mentioned below.

1.2.2 Approved meter types : LE-03d v.2, WZE-3RST, LE-03-FPV-RST-M2, LE-03-FPV-RST-2T, LE-03-FPV-RST.
An explanation of all type designations is presented in document no. 13146/0-07.

1.2.3 Frequency : 50 Hz

1.2.4 Meter constant : 1000 imp./kWh

1.2.5 Number of registers : 2 registers

1.2.6 Error messages : See in document no. 13146/0-12

1.2.7 Registration method : The following registration methods are allowed:

1.2.8 Phase sequence : the meter is not sensitive to the direction of the applied phase sequence.
A specific symbol is stated on the nameplate.

1.2.9 Export energy : the meter is capable of measuring energy in 2 directions.

1.2.10 Software specification (refer to WELMEC 7.2):

- Software type P;
- Risk Class C;
- Extension L, T while extensions O, D and S are not applicable.

Software version	Identification number (checksum)	Remarks
1.04	7C58B369	LE-03-FPV-RST-M2
1.04	A2FCE045	LE-03-FPV-RST-2T
1.04	3B79F82F	LE-03d v.2
1.04	C7A62BBC	WZE-3RST

Software version	Identification number (checksum)	Remarks
1.04	54E453DF	LE-03-FPV-RST

1.3 Essential shapes

1.3.1 The nameplate is bearing at least, good legible, the information as mentioned in the regulations on energy meters. An example of the markings is shown in document no. 13146/0-04.

1.3.2 Sealing: see chapter 2.

1.3.3 The registration observation is executed by means of a LED.

1.4 Conditional parts

1.4.1 Terminal block
The connections for the current cables on the terminal block have a diameter of at least 7 mm. The cables are connected with the terminal block via 1 screw. See documents no. 13146/0-01, 13146/0-08, 13146/0-09 and 13146/0-10.

1.4.2 Housing
The meter has got a dustproof housing, which has sufficient tensile strength. The cover is made of synthetic material. An example of the housing is presented in document no. 13146/0-01 and 13146/0-05.

1.4.3 Terminal cover
The terminal cover is made of synthetic material.

1.4.4 Register
The quantity of measured energy is presented by means of a display with at least 6 elements. The way of presentation is described in document no. 13146/0-11.
For test purposes an indication with a least significant element of at least 0,01 kWh, can be arranged via RS485 Modbus.

1.4.5 RS485 Modbus communication
The meter is provided with RS485 Modbus communication. Via the communication no legally relevant data can be altered.

1.5 Conditional characteristics

1.5.1 Maximum current:
smaller than or equal to 100 A, and at least 5 times higher than the reference current.

Terminal block:

Maximum current	Document no.	Remarks
100 A	13146/0-01, 13146/0-08, 13146/0-09, 13146/0-10	

1.5.2 Minimum current: 0.5 A

1.6 Non-essential parts

1.6.1 Pulse output

2 Seals

Both screws of the meter cover are sealed.
An example of the sealing is presented in document no. 13146/0-06.

3 Conditions for conformity assessment according to module D or F

The influence factors for temperature, frequency and voltage, which are necessary to perform the conformity assessment according to module D or F, are presented in Annex 1, belonging to this EU-Type examination certificate.
Based on the WELMEC 11.1, section 2.4.6, the sum of the square values is presented

Annex 1

Influence factors for temperature, frequency and voltage

During the type approval examination the influence factors for temperature, frequency and voltage are determined per load point. The values depicted in the table below present the root sum square values per load point, determined via the following formula:

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

with:

- $\delta e(T, I, \cos\varphi)$ = the additional percentage error due to the variation of the temperature at a certain load;
- $\delta e(U, I, \cos\varphi)$ = the additional percentage error due to the variation of the voltage at the same load;
- $\delta e(f, I, \cos\varphi)$ = the additional percentage error due to the variation of the frequency at the same load.

Current	Power factor	-40°C [%]	-25°C [%]	-10°C [%]	+5°C [%]	+23°C [%]	+40°C [%]	+55°C [%]	+70°C [%]
Imin	1	1,1	0,8	0,6	0,4	0,3	0,3	0,5	0,6
Itr	1	1,0	0,8	0,5	0,3	0,1	0,2	0,4	0,6
	0,5 ind.	1,0	0,8	0,5	0,3	0,2	0,2	0,4	0,6
	0,8 cap.	1,1	0,8	0,5	0,3	0,1	0,2	0,4	0,5
Itr phase R	1	1,1	0,8	0,5	0,3	0,2	0,3	0,4	0,6
	0,5 ind.	0,9	0,7	0,5	0,3	0,3	0,3	0,4	0,6
Itr phase S	1	1,1	0,8	0,6	0,4	0,2	0,3	0,4	0,6
	0,5 ind.	1,1	0,9	0,6	0,4	0,3	0,3	0,5	0,6
Itr phase T	1	0,9	0,7	0,4	0,3	0,2	0,2	0,4	0,5
	0,5 ind.	1,1	0,9	0,6	0,4	0,2	0,3	0,4	0,6
10 Itr	1	1,0	0,8	0,5	0,3	0,0	0,2	0,4	0,6
	0,5 ind.	1,0	0,7	0,5	0,3	0,1	0,2	0,4	0,6
	0,8 cap.	1,0	0,8	0,5	0,3	0,0	0,2	0,4	0,5
10 Itr phase R	1	1,1	0,8	0,6	0,4	0,2	0,3	0,4	0,6
	0,5 ind.	1,0	0,7	0,5	0,4	0,3	0,3	0,4	0,5
10 Itr phase S	1	1,1	0,8	0,5	0,4	0,2	0,3	0,4	0,6
	0,5 ind.	1,1	0,8	0,5	0,4	0,2	0,3	0,4	0,6
10 Itr phase T	1	0,9	0,6	0,4	0,3	0,0	0,1	0,3	0,5
	0,5 ind.	1,1	0,8	0,6	0,4	0,2	0,3	0,5	0,6
Imax	1	1,0	0,8	0,6	0,4	0,3	0,4	0,5	0,6
	0,5 ind.	1,0	0,8	0,6	0,5	0,4	0,4	0,5	0,7
	0,8 cap.	1,1	0,9	0,7	0,6	0,5	0,5	0,6	0,7
Imax phase R	1	0,9	0,8	0,7	0,7	0,7	0,8	0,9	1,0
	0,5 ind.	1,1	1,0	0,9	0,8	0,8	0,9	0,9	1,0
Imax phase S	1	1,0	0,8	0,7	0,6	0,6	0,7	0,8	0,9
	0,5 ind.	1,1	1,0	0,9	0,8	0,8	0,8	0,9	1,0
Imax phase T	1	0,8	0,7	0,6	0,5	0,4	0,5	0,6	0,7
	0,5 ind.	1,0	0,8	0,7	0,6	0,5	0,6	0,7	0,8

Note: relevant values can be taken in case of single-phase two-wire applications.