EU-type examination certificate

Number **T13041** revision 1
Project number 3970532

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

Lovato Electric S.P.A
Via Don E. Mazza, 12
24020 GORLE (Bergamo)
Italy

Measuring instrument

A static **Active Electrical Energy Meter integrated in an EV Charging System**

Type	:	DMED4
Manufacturer's mark or name	:	Lovato Electric S.P.A.
Reference voltage	:	120 … 1500 V DC
Reference current	:	300 A (DMED40xxx1500)
Destined for the measurement of	:	DC active energy in a - single-phase two-wire network
Accuracy class	:	B or A
Environment classes	:	M1 / E2
Temperature range	:	-40 °C / +70 °C

Further properties are described in the annexes:
– Description T13041 revision 1;
– Documentation folder T13041-2.

Valid until

4 July 2035

Initially issued

4 July 2025

Remark

This revision replaces the earlier version, including its documentation folder.

Issuing Authority

NMi Certin B.V., Notified Body number 0122
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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 - Shunt 8 µOHM	13041/0-04	
printed circuit board - Power board o DMED403 o DMED404 - Measure board - Display board - Remote display o DMED4C1 o DMED4C2	 13041/0-09, 13041/0-14 13041/0-10, 13041/0-15 13041/0-11, 13041/0-16 13041/0-12, 13041/0-17 13041/0-13, 13041/1-01 13041/0-13, 13041/1-02	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 T13041 revision 1 and the characteristics mentioned below.
1.2.2 Approved meter types : DMED4
An explanation of all type designations is presented in document no. 13041/0-02
1.2.3 Meter constant : 100 imp./kWh
1.2.4 Number of registers : 1.8.0 (Active Import) + 2.8.0 (Active Export)
1.2.5 Error messages : An overview of all error messages is provided in document 13041/0-08.
1.2.6 Export energy : the meter is capable of measuring energy in 2 directions.
1.2.7 Software specification (refer to WELMEC 7.2):

- Software type P;
- Risk Class C;
- Extension L, T and D (DMED404) while extensions O, and S are not applicable.

Software version	Identification number (checksum)	Remarks
00 01	83FDFB7E 3A3B0CCA	Power Board (DMED404 type only)
00 01	2CDA0729 D97F47B3	Measure Board

Software version	Identification number (checksum)	Remarks
00 02	311A4F7B AC750275	Remote Display Unit (DMED4DC1)
01	3C99A696	Remote Display Unit (DMED4DC2)

The software version is displayed at start-up and in the display sequence.

1.2.8 Data communication

The following communication port is used for legally relevant data.

- RS485
- Ethernet

Transmission of measurement data is according to Welmec 7.2 extension T.

The measurement dataset comprises at least the following information:

- Active import (1.8.0) and Active Export (2.8.0) with unit
- Cable loss
- Tariff
- Meter serial number
- Meter type
- Signature

The public key is visible as a QR code on the front of the meter on the nameplate. Additionally, it can also be read through the MODBUS protocol.

1.2.9 Cable loss compensation

The meter is provided with cable loss compensation. The parameters for cable loss compensation can only be set during commissioning of the meter for an EVCS application only. This parameter has a range of 0 – 50 mΩ. The default setting of the parameter is 0.
Any change to the cable loss parameter creates an event in the event logger. the event records the old value along with the new set value.

The following formula is used for the compensation due to cable loss:

$$P_{MEAS} = I_{MEAS} \times (V_{MEAS} - I_{MEAS} \times R_P)$$

with:

P_{MEAS}	Compensated power
I_{MEAS}	Measured current
V_{MEAS}	Measured voltage
R_P	cable resistance

1.3 Essential shapes

1.3.1 The nameplate at least bores, at least, good legible, the information as mentioned in the regulations on energy meters. An example of the markings is shown in document no. 13041/0-03.

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 connection for the current terminals is with lug or busbar. The connections to the terminal block with 2 nuts (M12). can be made through different combinations. The recommended busbar dimensions are 1 x 100x10mm, 1 x 100x5mm, 2 x 100x5mm based on the type of connection used. See document no. 13041/0-05.

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 housing is presented in document no. 13041/0-01. The meter must be installed inside an enclosure IP51 (indoor) or IP54 (outdoor).

1.4.3 Terminal cover
The terminal cover of the meter and the remote display is made of synthetic material that can be sealed independently. An example of the terminal covers, and their sealing locations, is presented in document no. 13041/0-01, and 13041/0-05.

1.4.4 Register
The quantity of measured energy is presented by means of a display with a resolution of at least 0,01 kWh with at least 9 elements. The method of presentation is described in document no. 13041/0-06.

1.4.5 Remote display (Optional)
The meter can be equipped with a remote display. The display is equipped with a maximum of 4 connection ports that can support up to 4 devices at once. The connections can be made through RS485 serial port or ethernet port. An example of the remote display is presented in document no. 13041/0-01.

1.4.6 RS485 communication interface
The meter and the remote display is equipped with RS485 serial port. This serial port is used for communication of legally relevant information with other parts of an EV charging system.

1.4.7 Ethernet communication interface (Optional)
The meter (DMED404 variant) and the remote display can be equipped with ethernet port. The ethernet port can be used for communication of legally relevant information with other parts of an EV charging system.

1.4.8 Clock and time
To start a new charge session, the internal clock of the meter must be synchronized by writing an UTC timestamp value on Modbus register 4080h. The synchronization stays valid for 24 hours after which a new synchronization is required. The status of the clock and time can be checked at Modbus register 4201h.

1.5 Conditional characteristics

1.5.1 Maximum current: smaller than or equal to 1500 A, and at least 5 times higher than the reference current.

1.5.2 Minimum current: 15 A

1.6 Non-essential parts

1.6.1 Pulse output

2 Seals

There are two metrological seals present on the side of the meter. There are also 2 installation seals on the terminal block. The meter cannot be opened without breaking these seals.

The remote display also has one metrological seal on the side of the display. The remote display unit cannot be opened without breaking this seal.

An example of the sealing is presented in document no. 13041/0-07.

3 Conditions for conformity assessment according to module D or F

The influence factors for temperature 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 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:

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

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;

Uref: 1500 V DC, 1500 A

Current	Power factor	Error -40°C [%]	Error -25°C [%]	Error -10°C [%]	Error +5°C [%]	Error +30°C [%]	Error +40°C [%]	Error +55°C [%]	Error +70°C [%]
Imin	na	0,6	0,5	0,4	0,4	0,1	0,2	0,3	0,2
Itr	na	0,2	0,2	0,2	0,2	0,1	0,4	0,2	0,1
10 Itr	na	0,2	0,2	0,0	0,3	0,0	0,1	0,1	0,0
Imax	na	0,1	0,1	0,2	0,1	0,1	0,2	0,2	0,3

Uref: 120 VDC, 1500 A

Current	Power factor	Error -40°C [%]	Error -25°C [%]	Error -10°C [%]	Error +5°C [%]	Error +30°C [%]	Error +40°C [%]	Error +55°C [%]	Error +70°C [%]
Imin	na	0,5	0,4	0,3	0,2	0,1	0,2	0,4	0,6
Itr	na	0,6	0,1	0,2	0,1	0,0	0,0	0,2	0,3
10 Itr	na	0,4	0,2	0,2	0,2	0,2	0,2	0,1	0,3
Imax	na	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,2