

EU-type examination certificate

Number **T10629** revision 23
Project number 3824159
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designated and notified by the Netherlands to perform tasks with respect to
conformity assessment 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 METER&CONTROL d.o.o.
Veljka Dugoševića 54
11050 Belgrade
Serbia

Measuring instrument A static **Active Electrical Energy Meter**

Type : ST40xD (direct connected meter)
ST40xC (transformer connected meter)

Manufacturer's mark or name : METER&CONTROL d.o.o.

Reference voltage : 3x230/400 V

Reference current : 5 A

Destined for the measurement of : electrical energy, in a
- three-phase four-wire network

Accuracy class : ST40xD: A or B
ST40xC: B or C

Environment classes : M1 / E2

Temperature range : -40 °C / +70 °C

Further properties are described in the annexes:
– Description T10629 revision 23;
– Documentation folder T10629-13.

Initially issued 18 September 2015

Valid until 18 September 2025

Remark This revision replaces the earlier versions, excluding its documentation
folder.

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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: - DCT105W1 (ST40xD) or - PQDCT-3016 (ST40xD) - PQDCT-3019 (ST40xC) - Shunt (with SCS) - Shunt (without SCS)	10629/0-05 10629/0-06 10629/0-07 10629/0-08, 10629/9-04, 10629/9-07 and 10629/12-01 10629/1-13 and 10629/2-02	
Main board: DC meter - ST401D 2.11.0 (PLC) - ST401D 2.12.0 (PLC) - ST402D 2.11.0 (GSM/GPRS) - ST405D 2.11.0 (RS485) - ST402D 2.11.0_Q (GSM/GPRS/3G) - ST401D 1.3.0 (G3-PLC) - ST402 V2.12.0_485_QLTE 3GR1OS00010 - ST401D V2.12.1 (PLC) - ST402D V2.12.1 (GSM/GPRS/3G) - ST401D V1.3.2 (G3-PLC) - ST402D V1.1.1 - ST402D V1.1.2 - ST402D V2.0.3	10629/0-16, 10629/0-19 10629/1-01, 10629/1-02 10629/6-01, 10629/6-02 10629/0-17, 10629/0-20 10629/1-03, 10629/1-04 10629/0-18, 10629/0-21 10629/1-05, 10629/1-06 10629/2-04, 10629/2-05 10629/7-07, 10629/7-08 10629/6-05, 10629/6-06 10629/10-01, 10629/10-02 10629/12-02, 10629/12-03 10629/14-01, 10629/14-02 10629/15-01, 10629/15-02 10629/19-01, 10629/19-02 10629/21-01, 10629/21-02	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.
Main board: CT meters - ST401C 2.11.0 (PLC)	10629/0-22, 10629/0-25 10629/1-07, 10629/1-08	

- ST402C 2.11.0 (GSM/GPRS)	10629/0-23, 10629/0-26 10629/1-09, 10629/1-10	
- ST405C 2.11.0 (RS485)	10629/0-24, 10629/0-27 10629/1-11, 10629/1-12	
- ST402C 2.11.0_Q (GSM/GPRS/3G)	10629/2-06, 10629/2-07	
- ST401C V1.3.2 (G3-PLC)	10629/16-01, 10629/16-02	

1.2 Essential characteristics

- 1.2.1 See EU-type examination certificate T10629 revision 23 and the characteristics mentioned below.
- 1.2.2 Approved meter types : ST401x (PLC), ST402x (GSM/GPRS/3G/LTE), ST405x (RS485)
An explanation of all type designations is presented in document no. 10629/0-03 and 10629/7-01
- 1.2.3 Frequency : 50 Hz
- 1.2.4 Meter constant : 1.000 imp./kWh (ST40xD) or 10.000 imp./kWh (ST40xC)
- 1.2.5 Number of registers : up to 4 time-of-use (TOU) tariff registers
- 1.2.6 Error messages : errors are indicted with FF on the display with an error code. An overview of all error codes is presented in document no. 10629/0-09.
- 1.2.7 Phase sequence : the meter is not sensitive to the direction of the applied phase sequence.
- 1.2.8 Export energy : the meter is capable of measuring energy in 2 directions.
The meter can also be used with 2 phases loaded with import energy and 1 phase loaded with export energy.
- 1.2.9 Registration methods:
The following registration methods are allowed:
- Measurement of import and export energy by means of summation by sign (sum of import energy per phase and sum of export energy per phase);
 - Measurement of energy as the sum of import and export (absolute import + absolute export energy);
- 1.2.10 Software specification (refer to WELMEC 7.2):
- Software type P;
 - Risk Class C;
 - Extensions L and D while extension T and S are not applicable.

Software version	Identification number (checksum)	Remarks
V030433	D7BC0347	ST401D HW2.11 (PLC)
	881918A7	ST401C HW 2.11 (PLC)
	6A16B175	ST402D HW2.11 (GSM/GPRS)

Software version	Identification number (checksum)	Remarks
	85AFAA4F	ST402C HW2.11 (GSM/GPRS)
	50740EE0	ST405D HW2.11 (RS485)
	11EAEBD6	ST405C HW2.11 (RS485)
V030456	83BC7BA6	ST402D HW2.11.0_Q (GSM/GPRS/3G)
	A122B5DA	ST402C HW2.11.0_Q (GSM/GPRS/3G)
V030458	4BB23F1C	ST402D HW2.11.0_Q (GSM/GSPR/3G)
	E255172F	ST402C HW2.11.0_Q (GSM/GSPR/3G)
V030475	13C8C403	ST402D HW2.11.0_Q (GSM/GPRS/3G)
V030605	F3653153	ST402D HW2.11.0_Q (GSM/GPRS/3G)
V030526	B8F7C0AA	ST401D HW 2.12.0 (PLC)
V030610	CD503243	ST402D HW 2.11.0_Q (GSM/GPRS/2G)
V030536	FA893474	ST401D HW V2.12.0 (PLC)
V030484	184236D2	ST402D HW V2.12.0_RS485_QLTE (GSM/GPRS)
		ST402D HW V2.12.1 (GSM/GPRS/3G)
V030539	3674BFAA	ST401D HW V2.12.1 (PLC)
V030540	08BC2931	ST401D HW V2.12.1 (PLC)

Software specification (refer to WELMEC 7.2):

- Software type P;
- Risk Class C;
- Extensions L, D and S while extension T is not applicable.

Software version	Identification number (checksum)	Remarks
V010313	C6E16390	ST401D HW 1.3.0 (G3-PLC)
V010329	E224F5AE	ST401D HW V1.3.2 (G3-PLC)
	4DBD6030	ST402D HW V1.1.1 (LTE)
	EB8F67B3	ST401C HW V1.3.2 (G3-PLC)
V010330	FD07A457	ST401D HW V1.3.2 (G3-PLC)
V080003	E434D368	ST402D HW V1.1.1 (LTE)
V080004	72BF1229	ST402D HW V1.1.1 (LTE)

Software specification (refer to WELMEC 7.2):

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

Software version	Identification number (checksum)	Remarks
V040001	1AC6F17A	ST402D HW V1.1.2 (LTE)
V040002	E27A8265	ST402D HW V1.1.2 (LTE)
V0403	D382C915	ST402D (LTE/NB-IoT) HW: 2.0.3
V0404	2B13C633	ST402D (LTE/NB-IoT) HW: 2.0.3

The software version (OBIS 0.2.0) and checksum (OBIS 0.2.8) are presented in the display sequence.

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. 10629/0-04, 10629/2-01 and 10629/7-02.

1.3.2 Sealing: see chapter 2.

1.3.3 The registration observation is executed by means of an 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 (ST40xD) or 5 mm (ST40xC). The cables are connected with the terminal block via 2 screws.

Maximum current	Document no.	Remarks
80A	10629/0-10, 10629/0-11, 10629/7-05, 10629/7-06	ST401D(Steel)
85 A	10629/0-10, 10629/0-11	ST40xD (steel)
100 A	10629/0-10, 10629/0-12, 10629/2-03, 10629/4-02, 10629/4-03	ST40xD (brass, steel)
6 A	10629/0-13, 10629/2-08	ST40xC

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. 10629/0-01 (ST40xD), 10629/0-02 (ST40xC), 10629/4-01, 10629/7-03 and 10629/7-04.

1.4.3 Terminal cover

The terminal cover is made of synthetic material. An example of the terminal cover is presented in document no. 10629/0-01 (ST40xD) and 10629/0-02 (ST40xC).

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. 10629/0-15.
For test purposes an indication with a least significant element of at least 0,01 kWh is by default available.

1.4.5 Tariff control

When the meter is provided with more than one register, a tariff control is available by means of tariff inputs, build-in Time-of-use (TOU) calendar or communication, the EMC-requirements are fulfilled as described in Annex V of Directive 2014/32/EU.

1.4.6 Optical communication

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

- 1.4.7 Electrical communication and I/O
When the meter is provided with M-BUS, PLC (ST401x), GSM/GPRS/3G (ST402x), RS485 (ST405x), GPRS/LTE (ST402D), Pulse output, Pulse input (S0), whereby the EMC-requirements are fulfilled as described in Annex V of Directive 2014/32/EU. Via the communication no legally relevant data can be altered.

- 1.4.8 Supply Control Switch (SCS) (optional)
Optionally the meter can be equipped with a supply control switch. See documentation no. 10629/0-08, 10629/9-04, 10629/9-07 and 10629/12-01.

1.5 Conditional characteristics

- 1.5.1 Maximum current:
- | | |
|---------|--|
| ST40xD | smaller than or equal to 100 A (steel or brass terminals), and at least 5 times higher than the reference current. |
| ST40xC: | smaller than or equal to 6 A, and at least 1,2 times higher than the reference current. |
- 1.5.2 Minimum current:
- | | |
|---------|--------|
| ST40xD: | 0,25 A |
| ST40xC: | 0,05 A |

1.6 Non-essential parts

- 1.6.1 Auxiliary relay

2 Seals

Both screws of the meter cover are sealed.
An example of the sealing is presented in document no. 10629/0-14

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 Guide 11.1, section 2.5.6, the sum of the square values is presented.

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.

ST40xD (direct connected meter)

Current	Power factor	-40°C [%]	-25°C [%]	-10°C [%]	+5°C [%]	+23°C [%]	+40°C [%]	+55°C [%]	+70°C [%]
$I_{\min}$	1	0,5	0,4	0,3	0,2	0,1	0,2	0,3	0,4
I_{tr}	1	0,5	0,4	0,3	0,2	0,0	0,2	0,3	0,5
	0,5 ind. 0,8 cap.	0,5 0,5	0,4 0,4	0,3 0,3	0,2 0,2	0,1 0,0	0,2 0,2	0,3 0,3	0,5 0,4
I_{tr} phase R	1	0,5	0,4	0,3	0,2	0,0	0,1	0,3	0,4
	0,5 ind.	0,5	0,4	0,2	0,2	0,0	0,2	0,3	0,5
I_{tr} phase S	1	0,6	0,5	0,4	0,2	0,0	0,2	0,3	0,5
	0,5 ind.	0,6	0,5	0,4	0,2	0,1	0,2	0,3	0,5
I_{tr} phase T	1	0,3	0,3	0,2	0,1	0,1	0,2	0,3	0,4
	0,5 ind.	0,2	0,3	0,2	0,2	0,1	0,2	0,2	0,4
$10 I_{tr}$	1	0,5	0,4	0,3	0,2	0,0	0,1	0,3	0,5
	0,5 ind.	0,4	0,4	0,3	0,2	0,1	0,1	0,3	0,4
	0,8 cap.	0,5	0,4	0,3	0,2	0,0	0,2	0,3	0,4
$10 I_{tr}$ phase R	1	0,5	0,4	0,3	0,2	0,0	0,1	0,3	0,5
	0,5 ind.	0,5	0,4	0,3	0,2	0,0	0,1	0,3	0,5
$10 I_{tr}$ phase S	1	0,6	0,5	0,4	0,2	0,0	0,2	0,3	0,5
	0,5 ind.	0,6	0,5	0,4	0,2	0,1	0,2	0,3	0,5
$10 I_{tr}$ phase T	1	0,4	0,4	0,3	0,2	0,1	0,1	0,3	0,4
	0,5 ind.	0,3	0,3	0,2	0,2	0,1	0,1	0,2	0,3
$I_{\max}$	1	0,5	0,4	0,3	0,2	0,0	0,1	0,3	0,4
	0,5 ind.	0,5	0,5	0,4	0,3	0,2	0,2	0,3	0,5
	0,8 cap.	0,5	0,4	0,3	0,2	0,1	0,2	0,3	0,4
$I_{\max}$ phase R	1	0,5	0,4	0,3	0,2	0,0	0,2	0,3	0,5
	0,5 ind.	0,5	0,4	0,4	0,3	0,1	0,2	0,3	0,5
$I_{\max}$ phase S	1	0,6	0,5	0,4	0,2	0,0	0,2	0,3	0,5
	0,5 ind.	0,6	0,5	0,4	0,2	0,1	0,2	0,4	0,5
$I_{\max}$ phase T	1	0,4	0,3	0,3	0,2	0,0	0,1	0,2	0,4
	0,5 ind.	0,4	0,4	0,4	0,3	0,2	0,3	0,3	0,5

ST40xC (transformer connected meter)

Current	Power factor	-40°C [%]	-25°C [%]	-10°C [%]	+5°C [%]	+23°C [%]	+40°C [%]	+55°C [%]	+70°C [%]
$I_{\min}$	1	0,4	0,3	0,2	0,1	0,0	0,1	0,1	0,1
I_{tr}	1	0,4	0,3	0,2	0,1	0,0	0,1	0,1	0,1
	0,5 ind.	0,4	0,3	0,2	0,1	0,0	0,1	0,2	0,1
	0,8 cap.	0,4	0,3	0,2	0,1	0,0	0,1	0,2	0,1
I_{tr} phase R	1	0,5	0,4	0,3	0,1	0,1	0,1	0,2	0,1
	0,5 ind.	0,5	0,4	0,3	0,1	0,1	0,1	0,2	0,1
I_{tr} phase S	1	0,3	0,2	0,2	0,1	0,0	0,1	0,1	0,0
	0,5 ind.	0,3	0,3	0,2	0,1	0,1	0,1	0,1	0,1
I_{tr} phase T	1	0,4	0,3	0,2	0,0	0,0	0,1	0,2	0,1
	0,5 ind.	0,4	0,3	0,2	0,1	0,0	0,2	0,2	0,1
20 I_{tr}	1	0,4	0,3	0,2	0,1	0,1	0,1	0,1	0,1
	0,5 ind.	0,4	0,3	0,2	0,1	0,0	0,1	0,1	0,1
	0,8 cap.	0,4	0,3	0,2	0,1	0,1	0,1	0,1	0,1
20 I_{tr} phase R	1	0,4	0,4	0,3	0,1	0,1	0,1	0,1	0,1
	0,5 ind.	0,5	0,4	0,3	0,1	0,0	0,1	0,2	0,1
20 I_{tr} phase S	1	0,3	0,2	0,2	0,1	0,1	0,1	0,1	0,1
	0,5 ind.	0,3	0,2	0,2	0,1	0,1	0,1	0,1	0,1
20 I_{tr} phase T	1	0,4	0,3	0,2	0,1	0,0	0,1	0,2	0,1
	0,5 ind.	0,4	0,3	0,2	0,1	0,1	0,1	0,1	0,1
$I_{\max}$	1	0,4	0,3	0,2	0,1	0,1	0,1	0,1	0,1
	0,5 ind.	0,4	0,3	0,2	0,1	0,0	0,1	0,1	0,1
	0,8 cap.	0,4	0,3	0,2	0,1	0,0	0,1	0,1	0,1
$I_{\max}$ phase R	1	0,5	0,3	0,3	0,1	0,0	0,1	0,1	0,1
	0,5 ind.	0,5	0,4	0,3	0,1	0,1	0,1	0,1	0,1
$I_{\max}$ phase S	1	0,3	0,2	0,2	0,1	0,1	0,1	0,1	0,1
	0,5 ind.	0,3	0,2	0,2	0,1	0,1	0,1	0,1	0,1
$I_{\max}$ phase T	1	0,4	0,3	0,2	0,1	0,1	0,1	0,2	0,1
	0,5 ind.	0,4	0,3	0,2	0,1	0,1	0,1	0,1	0,1