THREE-PHASE ELECTRONIC ELECTRICITY METER

CST 0410

- meters of the latest generation, multitariff, multifunctional
- active and reactive energy metering in 4 dials, class 0.2S; 0.5S; 1 (EN 62053-21; EN 62053-22; EN 62053-23)
- demand registering
- communication possibilities (EN 62056-21)
- optional: DLMS/COSEM

CST 0410 meters belong to the category of the work measuring means and are meant for active and reactive electric energy metering for residential consumers and commercial and industrial agents that use multi-tariff systems for electric energy billing on low, medium and high voltage networks.

TECHNICAL CHARACTERISTICS

Rated values

Rated voltage Un (V): 3x58/100 V...3x240/416 V;
3x100 V...3x416 V
- Rated current In (A): 1 A, 5 A for the meter with transformer connection
- Base current Ib (A): 5 A, 10 A for the meter with direct connection
- Maximum current Imax (A): 6 A, 10 A, 20 A for the meter with transformer connection
40 A, 60 A, 80 A, 100 A for the meter with direct connection
- Rated frequency fn (Hz): 50 Hz or 60 Hz
- Frequency range (Hz): 45...65
- Meter constant (imp/kWh): 1000/5000/10000

* Other variants available on request.

Accuracy characteristics and influences

- Class 0.2S, 0.5 S, for active energy, according to EN 62053-22;
- Class 1, 2, for active energy, according to EN 62053-21;
- Class 2, 3, for reactive energy, according to EN 62053-23;
- Time base accuracy: max.±0.5s/24h according to EN 62053-21

Climatic characteristics

- Operating temperature range:-40...+60℃
- Transport and storage temperature:-40...+80℃

Mechanical and constructive characteristics

- Overall dimensions: 254x178x70mm, according to figure 2;
- Dimensions for the3 point mounting: 154x171 mm, according to figure 2;
- Display: LCD custom design 80x30 mm
according to figure 1;
- Wiring diagram: L1L1L2L2L3L3NN
- Optical port and current loop: according to EN 62056-21
- Protection degree: IP 51
- Meter testing device: LED for imp/kWh + LED for imp/kvarh

Equipment options

A - Auxiliary supply voltage;
C - Load profile memory;
D - Sealable maximum demand reset button;
M* - RS232 port with DB9 connector for remote reading;
N* - RS485 port with DB9 connector for remote reading;
S - Sealable button for blocking the parameters changing
G - Pulse generator;
R - Signalling relays;
* options M and N can not be chosen together for the same meter.
At the options M and N it can be attached modems such as GSM EXT 232, respectively GSM EXT 485 produced by AEM.
All the equipment options are optional.
The 3 auxiliary outputs (G and R equipment options) can be configured as:
- pulse generators;
- signal relays;

The electrical characteristics of auxiliary outputs:
- voltage max. 40 V;
- current max. 100 mA;
- pulse length for the pulse generator: min. 30ms

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Operational characteristics

• Energy metering, as presented below:
a). 3 registers of active energy imported, exported and active unidirectional (|W+|, |W-|, |W+|+|W-|);
b). 9 registers of reactive energy in quadrants I, II, III, IV), imported (I+II), exported (III+IV), inductive (I+III), capacitive (II+IV), total reactive (I+II+III+IV)
c). Two registers of apparent imported and exported energy.
8 of the energy types, as per clauses a)...c) (programmable) can be metered in up to 4 time zones.
• Maximum demand registering
The meter is provided with:
• 8 registers for 8 demands
• 8 cumulative registers corresponding to the 8 demands
Each of the 8 demands can be programmed to be calculated from each of energy types, according to clauses a), b) and c).
The programmable time interval with 5, 10, 15, 20, 30, 60 min. using block or sliding window method .
The demand registering functions can be suspended for some time after the supply breakdown and its resuming. The time interval will be programmable from 0 to 60 minutes with one minute resolution.
For each of the 8 demands can be programmed a threshold value; if calculated power for the demand is bigger than the threshold, the meter detects and records this as an event and eventually signalised it by a signal relay contact output.
• Clock-calendar
The meter is provided with the clock-calendar function and the observance of leap years. The meter clock-calendar function enables the automatic change of the summer/winter hour according to "last Sunday in March/October" rule, with programmable changing hour and direction, and with the possibility of disabling this function.

Tariff programs

The meter enables tariffing the energy in up to 4 time zones. Up to 8 of the measured energy types, as per clauses a), b), c) can be configured to be tariffyed in time zones. There can be defined two tariffing sequences in the tariffing program for time zones; one is currently active, the other is resident (the start data is programmable).
The time zones metering program is annual. There can be defined up to 12 seasons in a year. Within each season, the weekly program will be defined, it being made up of 7 types of days chosen from the 24 types of days which can be defined. Every day there can be defined up to 12 switchings for each of the two sequences of the daily program. The programming resolution is of 30 minutes.
There can also be defined 64 more holidays groups within the tariffying program. The time length of a holidays group can be programmed for an interval of 1 to 4 days. Each holidays group of days can be defined with or without annual repetition.
The tariff program can be controlled also through an external device via inputs IN1 and IN2.

Meter self-reading (for billing purposes)

• energy indexes memorizing (46 registers);
• registered demands memorizing;
• demands summing up in cumulative registers;
• demand registers with automatic reset;
• billing time interval.
The meter memorizes the self-read values of the last 12 self-readings.

Load profile (optional)

The load profile memorizing capacity ensures for 15 min. acquisition period and a channel length of 235 days.
The number of channels of the load profile is programmable from 1 to 8. The load profile acquisition period is programmable with 1...60 min.
The load profile registers cumulative energy and time markers for any acquisition.

Events

The list of events contains 500 events.
Types of events:
1). Supply voltage drop
2). Restored supply voltage
3). Voltage drop on phase R
4). Restored voltage on phase R
5). Voltage drop on phase S
6). Restored voltage on phase S
7). Voltage drop on phase T
8). Restored voltage on phase T
9). Exceeded the threshold power M1
10). Restored below the threshold power M1
11) Exceeded the threshold power M2
12). Restored below the threshold power M2
13). Exceeded the threshold power M3
14). Restored below the threshold power M3
15). Exceeded the threshold power M4
16). Restored below the threshold power M4
17). Exceeded the threshold power M5
18). Restored below the threshold power M5
1 9). Exceeded the threshold power M6
20). Restored below the threshold power M6
21). Exceeded the threshold power M7
22). Restored below the threshold power M7
23). Exceeded the threshold power M8
24). Restored below the threshold power M8
25). Frequency exceeds -6%...+4% fn range, limits according to SR EN 50160
26). Energy direction reversing
27). Positive energy direction
28). RTS phases succession
29). RST phases succession
30). Meter programming (without clock)
31). Meter clock programming
32). Low battery
33). Measuring circuit error
34). Different energy directions per phase
35). Normal energy direction per phase restored

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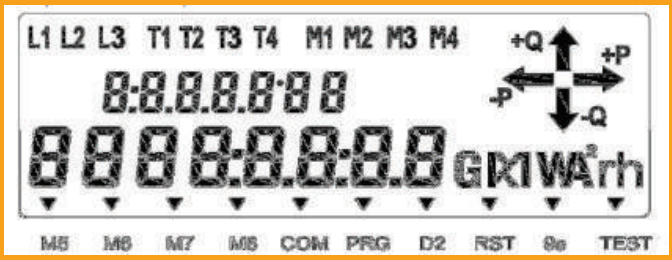
SYMBOLS

- CST 0410 - A, C, D, G, M, N, R, S (options)
3x230/400 V, 1(6) A, 50 Hz, cl. 0,5S



Display

According to figure 1, the LCD displays the folowing:
• voltage on each phase L1, L2, L3;
• active tariff (T1, T2, T3, T4);
• the programmed demand which is calculated as per programming (M1, M2, M3, M4, M5, M6, M7, M8, according to figure 1);
• code of displayed quantity according to IEC 62056-61 Electricity metering - Data exchange for meter reading, tariff and load control - Part 61 - OBIS Object Identification System;
• the measured value;
• measuring units for active, reactive, apparent energies and powers, voltages, currents, with k, M, G multiples;
• quantities measured by the meter (active power in one or two directions +P și -P and/or reactive power in one or two directions +Q and -Q);
• momentary directions of active and reactive measured energy: active imported energy →, active exported energy ←, reactive imported energy ↑, reactive exported energy ↓
• annunciators which indicate the following:
• meter operation with the second display sequence, "D2 annunciator";
• demands reset and the meter self-reading, "RST annunciator";
• the last 9 seconds for the demand calculation time interval, "9S annunciator";
• test mode meter operation, "TEST annunciator".
Meter display modes: two programmable sequences, that can be scrolled manually or automatically

Errors and warnings diagnosis

• The meter is provided with self-diagnosis facilities. If an error is detected, on the screen appears and remain the message: Err: x
x x x x x
x can be 1 for measuring circuit error
2 for energy registers error
3 for firmware memory error
4 for calibration zone error
5 for tariffing programm error

Communication

Through the optical port and current loop, according to IEC 62056-21: direct local data exchange (3rd edition of IEC 61107).
For modem communication or other possibilities, according to IEC dedicated (optional), the meter is provided with RS232 port or RS485 port. The billing and load profile data could be sent by the meter under DLMS protocol.

Supplementary functions

• Three configurable auxiliary outputs:
• 2 pulse generators outputs that can be configured for active and reactive energy (optional);
• 3 relay outputs (optional) that can be configured for: signalling out the power threshold exceeding; signalling out the interval end; load control.
• facilities concerning the energy quality, according to SR EN 50160:
• time metering with fn outside fn ± 1% range;
• time metering with Un outside Un±10% range;
• event generation at fn outside fn -6%...+4% range

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OVERALL AND MOUNTING DIMENSIONS

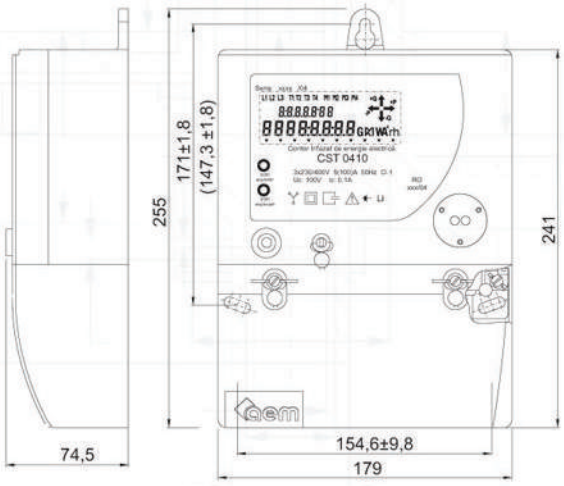
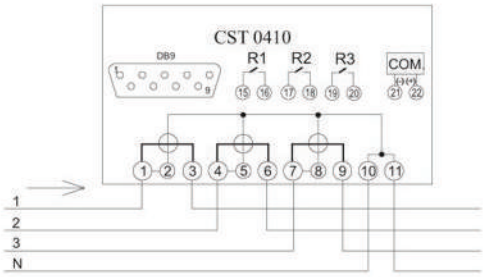
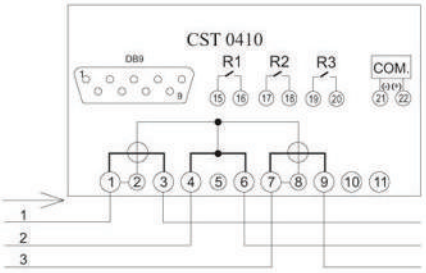
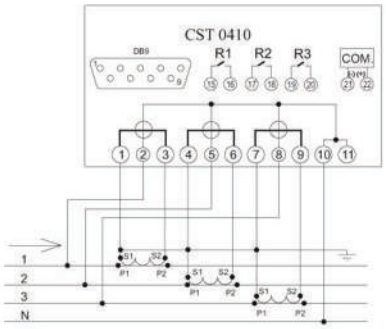


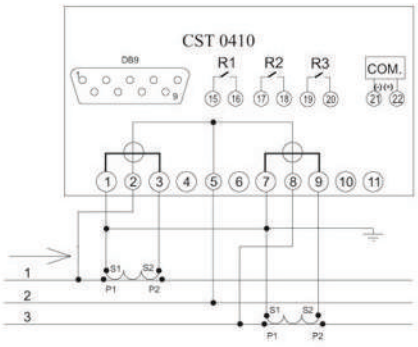
Fig. 2

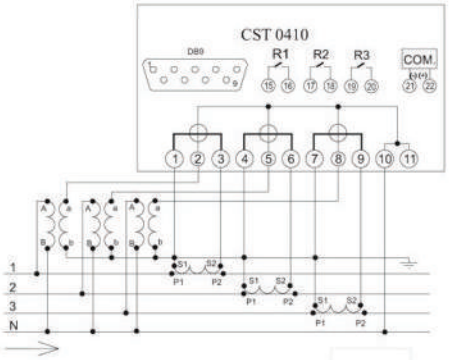
WIRING DIAGRAM

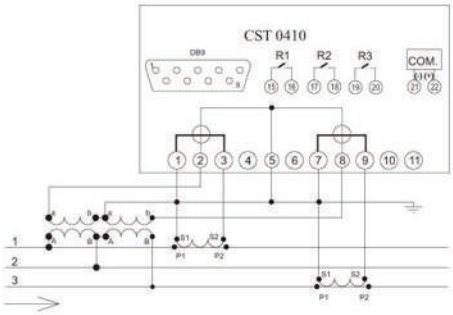


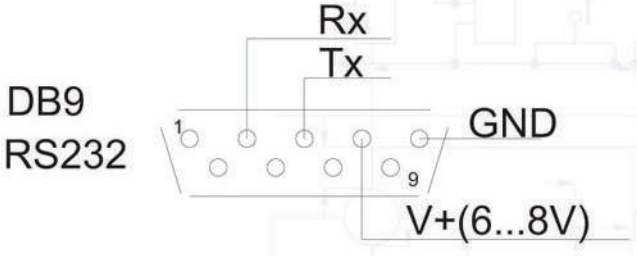


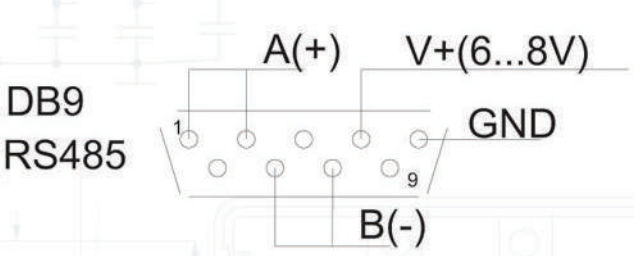












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