Electricity Meters IEC/MID

Industrial and Commercial

ZMY/ZFY405CW1, ZMY/ZFY410CW1

E570 Series 2 2G/4G Transformer Connected 3-Phase Electricity Meter

Technical Data

E570 Series 2 is a smart CT/VT 4- and 3-wire transformer connected electricity meter for the new energy markets. It offers reliable performance and versatile functionality. E570 has built-in support for multi-energy and can be optionally equipped with exchangeable communication modules, such as RS-485, 2G GSM/GPRS or 2G/4G LTE.

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Revision history

Version	Date	Comments
a.00	18.05.2017	1st draft.
a.01	16.08.2017	2nd draft.
a.02	05.09.2017	3rd draft after first R&D review.
a.03	06.02.2018	4th draft containing type designation comments and remarks.
a.04	08.02.2018	5th draft with final corrections made by HW engineering after complete testing.
a	14.02.2018	Final version completed for 1st release with latest drawings.
b	18.06.2018	Product name updated.
c	20.09.2018	Updated cover photograph.

Transformer connected E570 Series 2 electricity meter offers a flexible solution for communication between the meter and the metering system (HES, Head-End System) using exchangeable E57C communication modules, such as RS-485, 2G GPRS or 2G/4G LTE.

E570 Series 2 2G/4G Transformer Connected 3-Phase Electricity Meter (ZxY400CW1) - Technical Data

General

Functions

Measurement:
- Combined bi-directional measurement
- 3-phase/4-wire and 3-phase/3-wire

Communication:
- Two-way communication to the AMM system with 2G/GPRS or 2G/4G LTE
- IDIS-compliant except data type 64 bit

Serial interface:
- Integrated RS-485 with twin jack RJ12

Version with wired M-Bus interface:
- Wired M-Bus master supports up to 4 multi-energy devices (gas, water, district heating)
- Also used as a CII customer interface

Inputs and outputs:
- Up to 5 S0 outputs
- 1 control input
- 1 mechanical on-off latching 10 A load control switch
- 2 solid-state 100 mA auxiliary control switches
- Optical port for local reading, configuration and parameterisation

Control buttons:
- 1 scroll button for the display
- 1 sealable reset button

LCD display:
- 9 digits for displaying register values
- Phase, energy direction, no-load mode, alarm, units of measure and supply control switch state indicators on display
- Multi-energy units

External supply control switch control:
- Control for the disconnection of power
- 3 operating modes
- Can be controlled remotely from the AMM system, manually with a push-button or via local communication interfaces

Interoperability and certification
- IDIS 2 DLM, DLMS and IEC readout
- MID certification
- IEC 62052-31 safety standard compliant
- RED compliant (2G and 2G/4G)
- RoHS compliant

Voltage

Nominal voltage U_n ZMY
3 x 58/100 V to 277/480 VAC

Nominal voltage U_n ZFY
3 x 100 to 240VAC

Extended operating voltage range
80% – 115% U_n

Frequency

Nominal frequency f_n	50 Hz or 60 Hz
Tolerance	± 5%

IEC-Specific Data

Current

Nominal current I_n
1 A, 5 A

Maximum current I_{max}	
Metrological	200% I_n
	2 A, 10 A
Thermal	12 A

Short-circuit current
0.5 s with 30 x I_{max}

Measurement Accuracy

ZxY405	
Active energy, to IEC 62053-22	class 0.5 S
Reactive energy:	
ZFY to IEC 62053-23	class 2
ZMY to IEC 62053-24	class 1 S

ZxY410	
Active energy, to IEC 62053-21	class 1
Reactive energy:	
ZFY to IEC 62053-23	class 2
ZMY to IEC 62053-24	class 2

Measurement Behaviour

Starting current ZxY405	
According to IEC	0.1% I_n
Typical	0.07% I_n

Starting current ZxY410	
According to IEC	0.2% I_n
Typical	0.14% I_n

The start-up of the meter is controlled by the starting power and not by the starting current.

MID-Specific Data

Current (for Classes B and C)

Rated current I_n
1.0 A, 5.0 A

Minimum current I_{min}
0.01 A, 0.05 A

Transitional current I_{tr}
0.05 A, 0.25 A

Maximum current I_{max}
2.0 A, 10.0 A

Measurement Accuracy

ZxY400CP1	to EN 50470-3 classes B and C

Measurement Behaviour

Starting current I_{st}	
Class B: I_{st}	0.002 A, 0.01 A
Class C: I_{st}	0.001 A, 0.005 A

General Data

Operating Behaviour

Voltage failure (power-down)	
Voltage	< 46V
Bridging time	0.5 s

Voltage restoration (power-up)	
Function stand-by 3 phases	< 3 s
Function stand-by 1 phase	< 5 s
Detection of energy direction / phase voltage	< 3 s
Voltage	> 47 V

Power Consumption

Power consumption in voltage circuit	per phase
Active power (typical)	0.6 W
Apparent power (typical)	1 VA

Power consumption in current circuit	per phase
Apparent power at 5 A (typical)	0.125 VA
Apparent power at 1 A (typical)	0.005 VA

Environmental Influences

Temperature range	to IEC 62052-11
Operation meter	–40 °C to +70 °C
Operation LCD display	–20 °C to +70 °C
According to IEC62052-31	–25 °C to +55 °C
Battery	–30 °C to +60 °C
Storage	–40 °C to +85 °C

Temperature coefficient	
Range	–40 °C to +70 °C
Average value (typical)	± 0.01% per K
At cosφ=1 (from 0.05 I_b to I_{max})	± 0.02% per K
At cosφ=0.5 (from 0.1 I_b to I_{max})	± 0.03% per K

Ingress protection acc. to IEC 60529
IP54

Electromagnetic Compatibility

Electrostatic discharges according to IEC 61000-4-2	
Contact discharge	8 kV
Air discharge	15 kV

Immunity conducted disturbances	2 to 150 kHz
According to CENELEC	TR 50579

Electromagnetic RF fields	acc. to IEC 61000-4-3
80 MHz to 2 GHz	10 and 30 V/m

Radio interference suppression according to IEC/CISPR 22
class B

Fast transient burst test	acc. to IEC 61000-4-4
Current and voltage circuits under load according to IEC 62053-21	4 kV
Auxiliary circuits > 40 V	2 kV

Surge immunity	acc. to IEC 61000-4-5
Current and voltage circuits	4 kV
Auxiliary circuits > 40 V	1 kV

Insulation Strength

Insulation strength
4 kV at 50 Hz during 1 min.

Impulse voltage 1.2/50 µs	
Auxiliary circuits to IEC 62052-11	6 kV
Current and voltage circuits to IEC 62052-11	8 kV
According to SP 1618	12 kV

Protective class according to IEC 62052-11	
	II ⧈

Calendar Clock

Normal operation	
Accuracy (at +23 °C)	<5 ppm (0.5 s/day)

Back-up time (power reserve)	
With supercapacitor	14 days
With battery CR2477 (opt.)	exp.10 years life time

Display

Characteristics	
Type	LCD liquid crystal display with backlight
Digit size / number of value field	8 mm / up to 9
Digit size / number of index field	6 mm / up to 6

Inputs and Outputs

Digital input	S0
According to IEC 62053-31	class B

Control input	
Control voltage U_S	70 to 250 VAC
Input current	< 1 mA ohmic at 230 VAC

2 outputs	solid-state auxiliary control switch
Voltage range	0 to 280 VAC/DC
Maximum switching current	100 mA

1 electromechanical output	on-off latching load control switch
Voltage range	0 to 250 VAC
Max. resistive load	10 A
Max. operations with cosφ ~1	100,000 op.

Up to 5 digital pulse outputs	S0 output
Standard	IEC 62053-31
Supply voltage (nominal/max. value)	24 / 27 V
Current	on-state min. 10 mA, max. 27 mA
	off-state max. 2 mA

Test output	active (configurable as reactive)
Type	red LED
Pulse length	selectable from 2 to 40 ms
Meter constant	selectable

Communication Interfaces

Optical interface	
Type	serial, bi-directional interface
Max. transmission speed	19,200 bps
Protocol	according to DLMS or opt. IEC 62056-21

2G interface (GPRS)	E57C G10.L
Quad-band GSM	850/900/1800/1900 MHz
GPRS	Class 10 multi-slot
GPRS	Class B mobile station
CSD	Up to 14.4 kbit/s
RED compliant	

2G/4G LTE	E57C L10.L
2G bands	900/1800 MHz
4G bands	B1 (2100 MHz), B3 (1800 MHz), B7 (2600 MHz), B8 (900 MHz), B20 (800 MHz)
4G LTE FDD Category 1 up to 10Mbps with GPRS fall-back	
RED compliant	

2G/4G protocols
TCP/IPv4 protocol
DLMS communication protocol supporting:
- COSEM transport layers for IPv4 networks 62056-47 (Wrapper) used for IP connections (GPRS)
- Data Link Layer using HDLC Protocol 62056-47 used for analogue connections (CSD)
- COSEM application layer 62056-53
- COSEM application model 62056-61 (OBIS) and 62056-62 (interface classes)

Antenna	for all bands
Antenna connector	SMA

Wired M-Bus interface	EN 13757-2: 2005
“Point-to-Point” or “Point-to-Multipoint” bus system	
Max. transmission rate	2,400 bps
Max. unit loads (1 unit load = 1.5 mA)	16
Max. wiring length	≤ 50 m
Transmission from master:	
MARK:	H = SPACE voltage + ≥ 10 V but < 42 V
SPACE:	L ≥ 12 V
Transmission from slave:	
MARK:	L = 0 mA to 1.5 mA
SPACE:	H = (11 mA to 20 mA + MARK current)

RS-485 Interface	to ISO-8482
Type	serial, symmetrical, half-duplex
Nominal input voltage CMR	-7 to +12 VDC
Binary 1 state	difference voltage < –0.2 V
Binary 0 state	difference voltage > 0.2 V
Max. transmission rate	38,400 bps
Max. number of slaves	31
Protocols	IEC 62056-21 and DLMS

Material

Case	antistatic polycarbonate plastic

Case material is antistatic glass-filled polycarbonate.

Flame retardant and self-extinguishing class V0 according to IEC 60695-11-10.

High temperature deflection, UV stabilised and can withstand applicable environmental tests defined in IEC 60068.

Connections

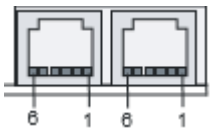
Phase connections	
Material of terminal	brass
Type	cage type terminal with one screw
Diameter	5.2 x 5.2 mm
Conductor cross-section	2.5 to 20.0 mm^2

Stranded wires must be fitted with ferrules.

Screw head	Pozidrive combi no. 2
Screw dimension	M4 x 15
Tightening torque	1.5 to 2 Nm

RS-485 interface	twin jack RJ12 type

Pin assignment



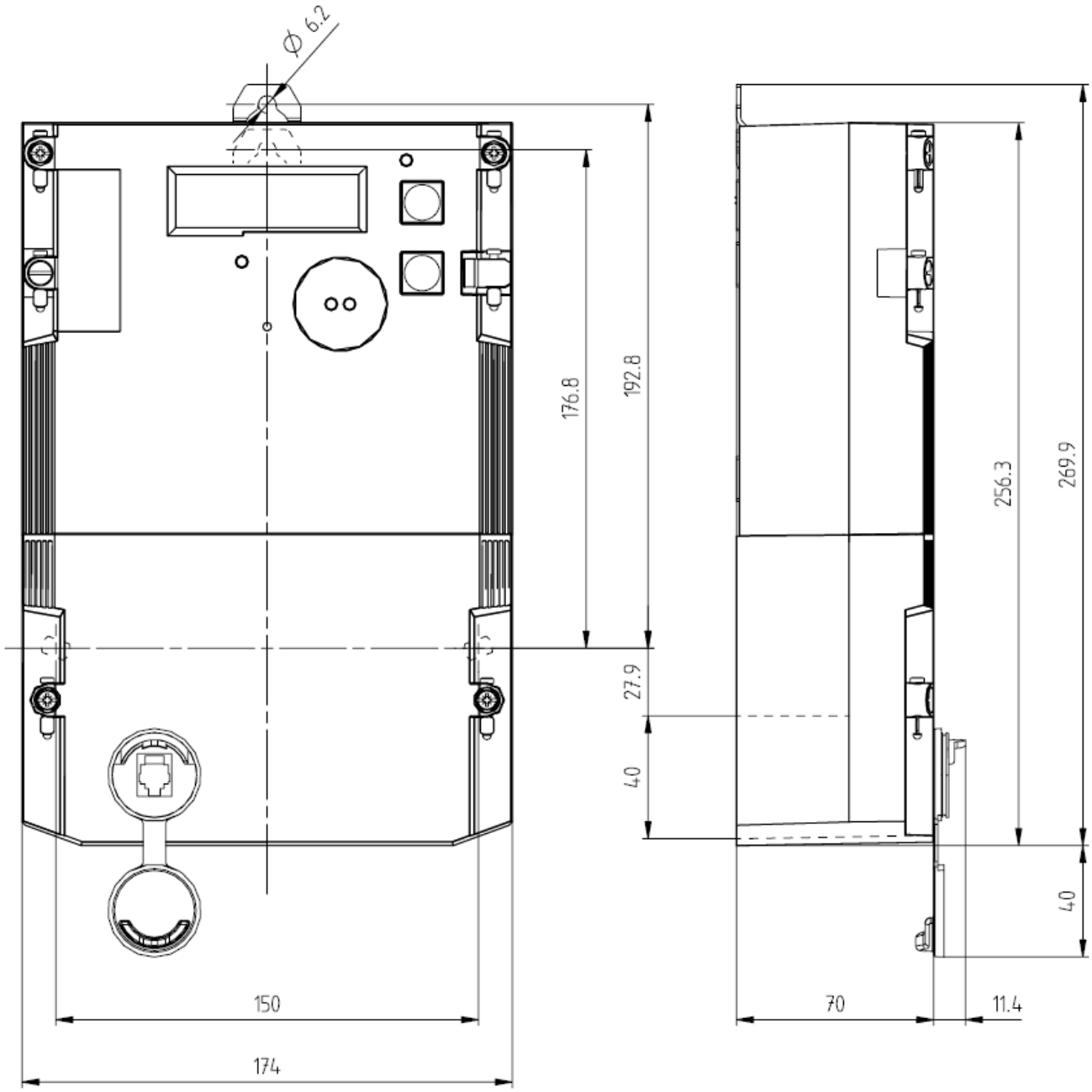
1. C (Common Ground)
2. Data A
3. Data B
4. Data B
5. Data A
6. C (Common Ground)

Weight and Dimensions

Weight
approx. 1.2 kg

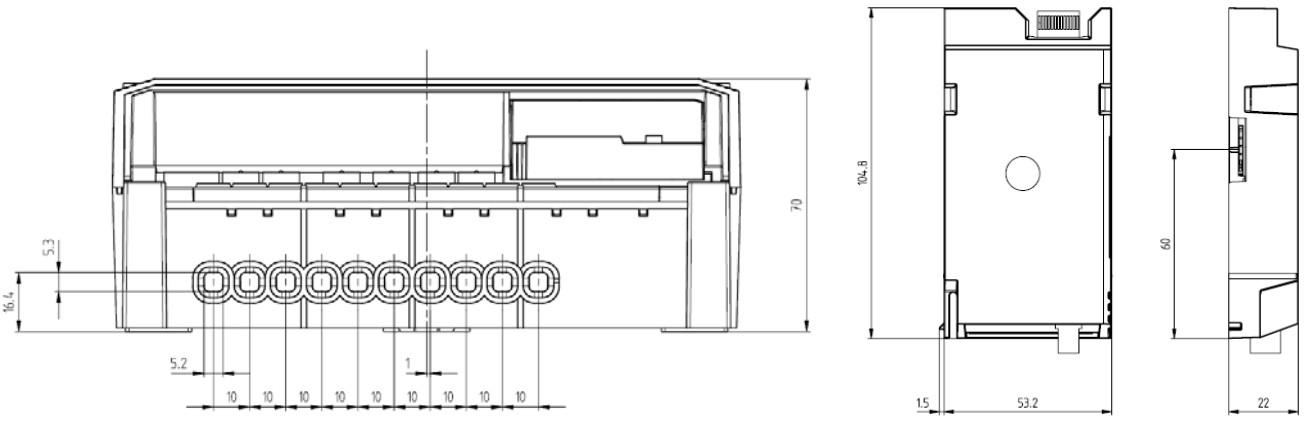
Width/Height/Depth
174/269/70 mm

Dimensions (with terminal cover)



Terminal cover image used contains CII socket. Plain version available.

Dimensions of connection terminals



E570 S2 Type Designation

Examples	**ZMY**	**4**	**05**	**C**	**W1**	**U0**	**L40**	**.11.1020**	**S2**
	ZMY	**4**	**10**	**C**	**W1**	**U0**	**L30**	**.00.0020**	**S2**

Network type

ZMY	3-phase, 4-wire (M-connected)
ZFY	3-phase, 3-wire (F-connected)

Connection type

4	Transformer connected (3-phase)

Accuracy class

10	MID class B; IEC class 1, reactive class 2
05	MID class C; IEC class 0.5 S, reactive class 1 S

Measured quantities

C	Active and reactive energy (4-quadrants)

System communication

W1	Exchangeable WAN, 2G/4G or interface module

User interface

U0	Optical interface

Built-in local communication options

L30	RS-485 only
L40	Wired M-Bus and RS-485

Input/output options

With L30

.00.0020	2 solid-state auxiliary control switches (100 mA)
.01.1025	1 control input, 1 latching load control switch (10 A), 2 solid-state auxiliary control switches

With L40

.11.1020	1 S0 input, 1 control input, 1 latching load control switch (10 A), 2 solid-state auxiliary control switches (100 mA)
.01.1021	1 control input, 1 latching load control switch (10 A), 2 solid-state auxiliary control switches (100 mA), 1 S0 output

Hardware series

S2	Series 2 (second series)

Available modules

Var 1	**A 3 0 . 0**	RS-485 module interface
Var 2	**G 1 0 . L**	2G with last gasp alarming
Var 3	**L 1 0 . L**	2G/4G with last gasp alarming

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