Electricity Meters IEC/MID
Industrial+Commercial

ZMG310AR/CR Series 2

E550 (ZxG310AR/CR Series 2)

Technical Data

Building on its tradition of industrial meters, Landis+Gyr is now bringing out the E550 Series 2, the latest generation of ZMG300 meters. The E550 Series 2 offers two electrical interfaces, advanced modem solution, event logging and anti-tampering functions.

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The E550 directly connected I&C meters record active and reactive energy consumption in 1-phase 2-wire, 2-phase 3-wire, 3-phase 4-wire and 3-phase 3-wire (no neutral) networks.

Basic Version

The basic version provides energy registers for tariffication, red test diodes for active and reactive energy, an optical interface for meter reading and an electrical interface.

Interfaces

The Series 2 now supports two independent electrical interfaces.

The meter supports RS232, RS485, RS422, CS and a specially powered RS232 to supply external modems.

Installation support

The monitoring of voltage, current, demand and power factor supports the installation.

E550 – ZMG310AR/CR Series 2

General

Voltage

Nominal voltage U_n	ZMG310xR
	3 x 220/380 V to 240/415 V
	3 x 110/190 V to 133/230 V
	3 x 110/190 V to 277/480 V
Voltage range	80% to 115% U_n

Frequency

Nominal frequency f_n	50 or 60 Hz
tolerance	± 2%

Application

1 phase 2 wire; 2 phase 3 wire; 3 phase 4 wire, 3-phase 3-wire (without neutral)

IEC-specific Data

Current

Base current I_b	selectable: 5, 10, 20 or 40 A
Maximum current I_{max}	
metrological	selectable: 40, 60, 80, 100 or 125 A
thermal	125 A
with aluminium wires	80 A
Short circuit ≤ 10 ms	10,000 A

Measurement Accuracy

ZMG310xR	
active energy, to IEC 62053-21	class 1
reactive energy, to IEC 62053-23	class 2

Technical specifications

Measurement Behaviour

Starting current	
according to IEC	0.4% I_b
typical	0.3% I_b

The startup of the meter is controlled by the starting power and not by the starting current.

Starting power in M-circuit	single phase

nominal voltage x starting current

MID-specific Data

Current (for class B)

Reference current I_{ref}	selectable: 5, 10, 15, 20 A
Minimum current I_{min}	≤ 0.05 x I_{ref}
Transitional current I_{tr}	0.1 x I_{ref}
Maximum current I_{max}	125 A
with aluminium wires	80 A

Measurement Accuracy to EN 50470-3

ZMG310xR	class B

Measurement Behaviour

Starting current I_{st}	≤ 0.004 x I_{ref}

General

Operating Behaviour

Voltage failure (Power Down)	
bridging time	0.5 s
data storage	after another 0.2 s
switch off (at rated voltage)	after approx. 10 s

Operating Behaviour (cont.)

Voltage restoration (Power Up)	
function standby 3 phases	after 4 s
function standby 1 phase	after 5 s
detection of energy direction and phase voltage	after 4 to 5 s

Power Consumption

Power consumption per phase in voltage circuit			
phase voltage	110 V	240 V	277 V
active power (typical)	0.8 W	1.3 W	1.5 W
apparent power (typical)	1.1 VA	2.1 VA	2.5 VA

Power consumption per phase in current circuit	
phase current	10 A
apparent power (typical)	0.03 VA

Environmental Influences

Temperature range	to IEC 62052-11
operation	–40 °C to +70 °C
storage	–40 °C to +85 °C

Temperature coefficient		
range		–25 °C to +70 °C
average value (typical)		± 0.012% 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

Impermeability to IEC 60529	IP 53

Electromagnetic Compatibility

Electrostatic discharges	to IEC 61000-4-2
contact discharge	8 kV
air discharge	15 KV

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

Radio disturbance according to IEC/CISPR 22	class B

burst immunity test	acc. to IEC 61000-4-4
current and voltage circuits	4 kV
auxiliary circuits > 40 V	2 kV

Fast transient surge test	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	to IEC 62052-11
current and voltage circuits	10 kV
auxiliary circuits > 40 V	6 kV

Protection class II to IEC 60050-131	⧈ 2

Calendar Clock

Calendar Type
Gregorian or Persian (Jalaali)

Accuracy	< 5 ppm

Backup time (power reserve)	
with supercap	> 21 days
charging time for 7 days backup time	24 h
charging time for max. backup time	300 h
with battery 1 (calendar clock, display, readout)	10 years
battery type	UM3-R6-AA
with battery 2 (calendar clock only)	10 years
battery type	CR2032

Display

Characteristics	
type	LCD liquid crystal display
digit size in value field	9 mm
number of digits in value field	up to 8
digit size in index field	8 mm
number of digits in index field	up to 7

Inputs and Outputs

Control inputs	
control voltage U_S	100 to 277 V_{AC}
max. input voltage	320V_{AC}
input current	< 2 mA ohmic at 230 V_{AC}

Output solid state	
type	solid state relay
voltage	12 to 277 $V_{AC/DC}$
max. current	100 mA
max. switching frequency (pulse length 20 ms)	25 Hz

Output electromechanical	
type	electromechanical relay
max switch voltage	277V
max. switch current	6A
rated current	5A

Inputs and Outputs (cont.)

Optical test outputs	active and reactive energy
type	red LED
number	2
meter constant	selectable

Communication Interface

Optical interface	to IEC 62056-21
type	serial, asynchronous, half-duplex
max. transmission rate	19,200 bps
protocols	IEC 62056-21 and dlms

RS232 Interface (powered and not powered)	to DIN 61393 / DIN 66259
type	serial, asymmetric, asynchr., bidirectional
operating mode	intelligent or transparent
nominal voltage	±9 V_{DC}
maximum voltage	±15 V_{DC}
minimum voltage	±5 V_{DC}
max. transmission rate	38,400 bps
protocols	IEC 62056-21 and dlms
max. conductor length depending on environment and connecting cable	30 m
insulation resistance to meter	4 kV_{AC}/50 Hz, 1 min
creep distance	≥ 6.3 mm

RS485 Interface	to ISO-8482
type	serial, symmetrical, half duplex
nominal input voltage common mode range	–7 to +12 V_{DC}
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
max. conductor length depending on environment and connecting cable	≤ 1000 m
insulation resistance to meter	4 kV_{AC}/50 Hz, 1 min
creep distance	≥ 6.3 mm

CS Interface	to IEC 62056-21 / DIN 66258
type	serial, bidirectional, current interface
nominal voltage without load	24 V_{DC}
max. voltage without load	30 V_{DC}
binary 1 state	10–30 mA
binary 0 state	≤ 2 mA
max. transmission rate	9600 bps
protocols	IEC 62056-21 and dlms
insulation resistance to meter	4 kV_{AC}/50 Hz, 1 min
creep distance	≥ 6.2 mm

RS422-Interface	to ISO-8482
type	serial, symmetric, asynchronous, bidirectional
nominal input voltage common mode range	–7 to +12 V_{DC}
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	10
protocols	IEC 62056-21 and dlms
max. conductor length depending on environment and connecting cable	1000 m
insulation resistance to meter	4 kV_{AC}/50 Hz, 1 min
creep distance	≥ 6.3 mm

Weight and Dimensions

Weight	approx. 1.5 kg
External dimensions	
width	177 mm
height (with short terminal cover)	244 mm
height (with standard terminal cover)	281.5 mm
depth	75 mm
Suspension triangle	
height (suspension eyelet open)	206 mm
height (suspension eyelet covered)	190 mm
width	150 mm

Terminal cover	
short	no free space
standard	40 mm free space
long (opaque, transparent)	60 mm free space
standard	80 mm free space
standard	110 mm free space
GSM	60 mm free space
RCR/FTY adapter	
ADP1 adapter	

Material

Housing
Polycarbonate, partly glass-fibre reinforced

Connections

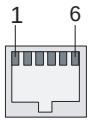
Phase connections	
type	cage type terminals
cross section	9 x 9 mm
min conductor cross section	2.5 mm^2
max. cross section cable	35 mm^2 (up to 125 A)
max. cross section strand	25 mm^2 (up to 80 A)
screw head	Pozidrive Combi No. 2
screw dimension	M6 x 14
screw head diameter	≤ 6.6 mm
tightening torque	3 to 5 Nm

RS232 Interface

type designation .0**2**/.4**2**/.6**2**

type RJ 12

pin assignment



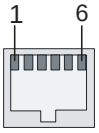
1 CTS
2 TxD
3 GND
4 DTR
5 RxD
6 DSR

RS485 Interface

type designation .0**3**/.4**3**/.6**3**/.**3**7

type RJ 12

pin assignment

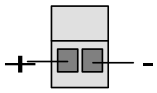


1 c (common ground)
2 a (data a)
3 b (data b)
4 b
5 a
6 c

CS Interface

type designation .**4**0/.**4**2/.**4**3

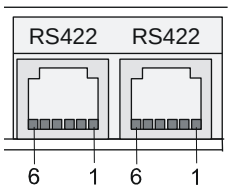
type screw type terminals



RS422-Interface

type designation .**6**0/.**6**2/.**6**3

type RJ 12



Pin allocation:
1 GND
2 U_P (Data a)
3 U_N (Data b)
4 U_N (Data z)
5 U_P (Data y)
6 GND

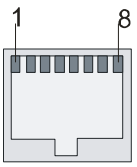
The two RJ12 jacks of the RS422-interface are looped internally to permit connection of several meters.

RS232 powered

type designation **.07/.37**

type RJ 45

pin assignment

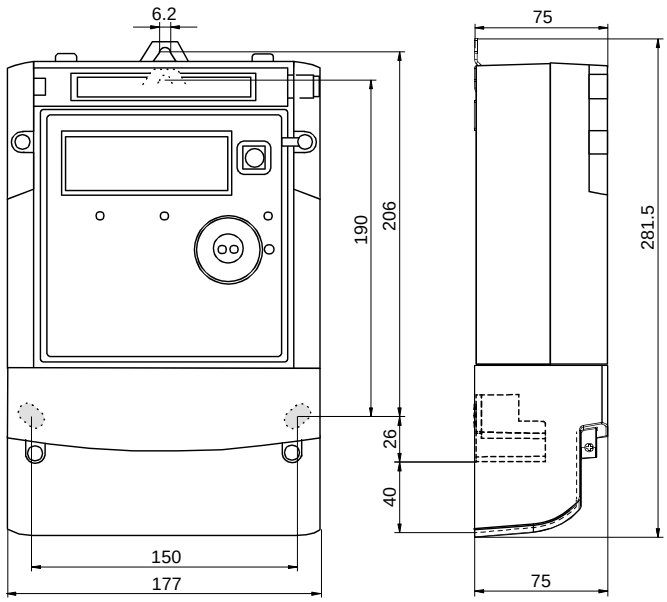


1 NC
2 CTS
3 TxD
4 GND
5 NC
6 RxD
7 NC
8 V+ (10...14 V)

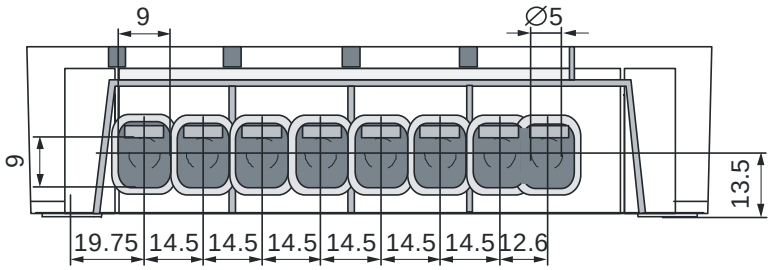
Voltage outputs U1, U2, U3, N

type	screw type terminals
max. current	1 A
max. voltage of control inputs	300 V

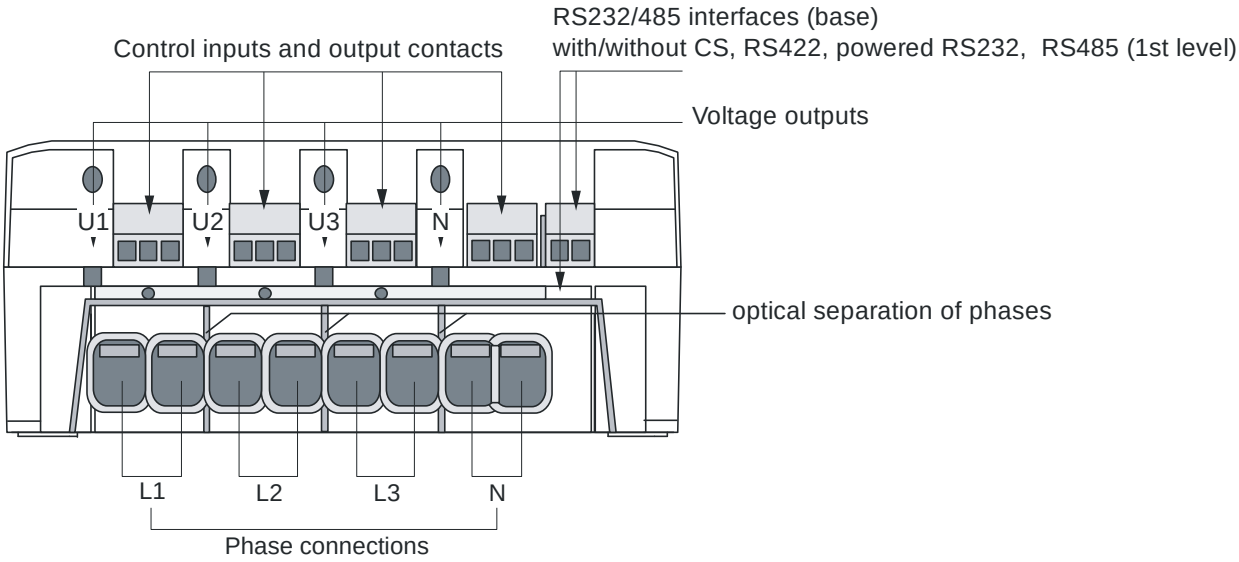
Meter Dimensions (standard terminal cover)



Terminal Dimensions



Terminal Layout



Type designation **ZMG 3 10 CR 4. 260 b. 43 S2**

Network type

ZMG 3-phase 4 wire network (M-circuit)

Connection type

3 Direct connection

Accuracy class

10 Active energy class 1 (IEC), B (MID)

Measured quantities

C Active and reactive energy
A Active energy

Tariff functions

1 Energy rates, externally controlled
2 Energy rates, internally controlled with time switch (TOU)
3 Energy and demand rates, externally controlled
4 Energy and demand rates, internally controlled with time switch (TOU)

Number of control inputs / number of output contacts / special functions

000 No control inputs, no output contacts, no special functions
020 2 output contacts
260 2 control inputs, 6 output contacts
440 4 control inputs, 4 output contacts
041 No control inputs, 4 output contacts, 1 output relay 5A

Additional functions

0 none
3 with software events
4 with hardware and software events
7 with load profile
a with load profile and software events
b with load profile, hardware and software events

Interfaces 2 (Xx) and 1 (xX**)**

00 No interfaces	40 CS***	60 RS422**	07 Powered RS232*
02 RS232	42 CS and RS232***	62 RS422 and RS232**	37 RS485 and Powered RS232*
03 RS485	43 CS and RS485***	63 RS422 and RS485**	

*) only as .020x.07 or as .041x.37
**) only as .041x.6x
***) only as .260x.4x or as .440x.4x

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