

ZMG310AR/CR
E550 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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Revision history

Version	Date	Comments
a	17.02.2010	First edition
b...e	23.07.2010	Continuous improvement
f	01.12.2011	Corrected error in solid state output (DC deleted)
g	02.12.2011	Corrected error in electromechanical output (DC deleted)
h	20.01.2012	New extension boards 060 with 6 output contacts and 240 with 2 control inputs and 4 output contacts.
k	29.05.2013	Battery Mode update in Environmental Influences table.

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The E550 direct 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 Series 2 ZMG310AR/CR – Technical specifications

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

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 or 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
In Battery Mode	-25 °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 $\cos\varphi=1$ (from 0.05 I_b to I_{max})	± 0.02% per K
At $\cos\varphi=0.5$ (from 0.1 I_b to I_{max})	± 0.03% per K

Impermeability to IEC 60529	IP 53
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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
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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.
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Impulse voltage 1.2/50 μ s	to IEC 62052-11
Current and voltage circuits	10 kV
Cuxiliary circuits > 40 V	6 kV

Protection class II	to IEC 60050-131	□ 2
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Calendar Clock

Calendar Type	
Gregorian or Persian (Jalaali)	

Accuracy	< 5 ppm
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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	320 V_{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	277 V_{AC}
Max. switch current	6 A
Rated current	5 A

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	$\pm 9 V_{DC}$
Maximum voltage	$\pm 15 V_{DC}$
Minimum voltage	$\pm 5 V_{DC}$
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	≥ 6.3 mm

RS422-Interface to ISO-8482

Type	serial, symmetric, asynchronous, bidirectional
Nominal input voltage common mode range	-3 to +3 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
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External dimensions

Width	177 mm
Height (with short terminal cover)	244 mm
Height (with standard terminal cover)	281.5 mm
Height (with extended hook)	305.5 mm
Depth	75 mm

Suspension triangle

Height (with extended hook)	230 mm
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

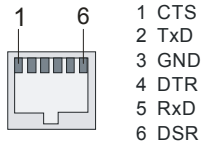
Connections

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

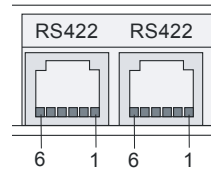
Connections (cont.)

RS232 Interface
 Type designation .02/.42/.62
 Type RJ 12
 Pin assignment



RS422-Interface

Type designation .60/.62/.63
 Type RJ 12
 Pin assignment

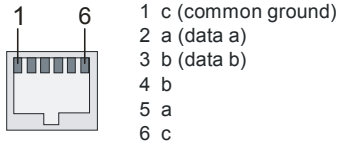


- 1 GND
- 2 U_p (Data a)
- 3 U_N (Data b)
- 4 U_N (Data z)
- 5 U_p (Data y)
- 6 GND

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

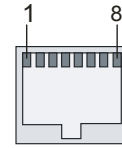
RS485 Interface

Type designation .03/.43/.63/.37
 Type RJ 12
 Pin assignment



RS232 powered

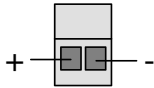
Type designation .07/.37
 Type RJ 45
 Pin assignment



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

CS Interface

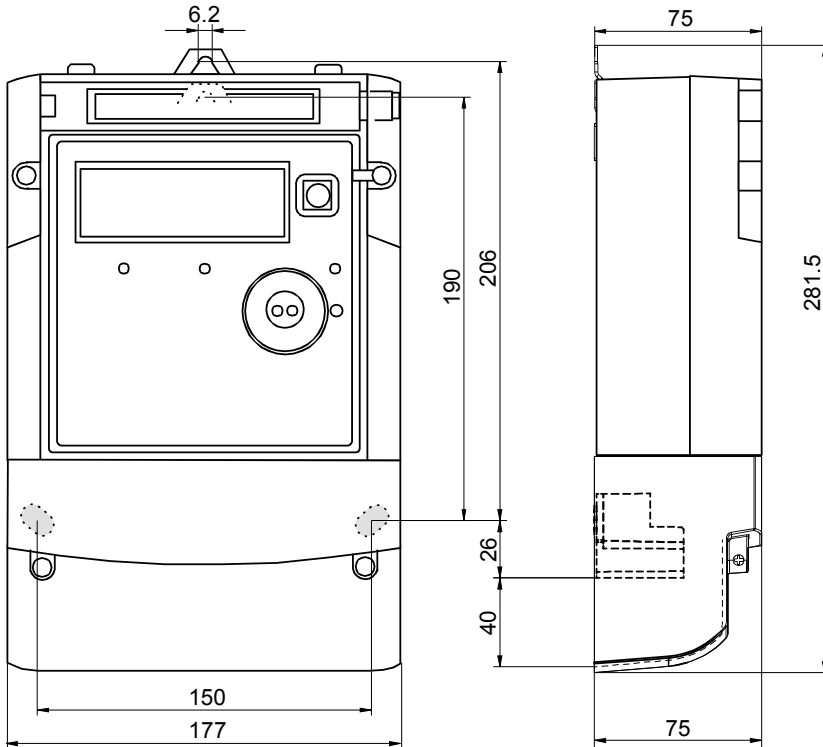
Type designation .40/.42/.43
 Type screw type terminals



Voltage outputs U1, U2, U3, N

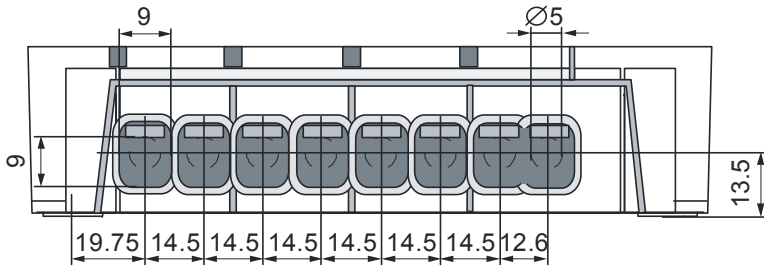
Type screw type terminals
 Max. current 1 A
 Max. voltage of control inputs 300 V

Meter Dimensions (standard terminal cover, suspension eyelet open)

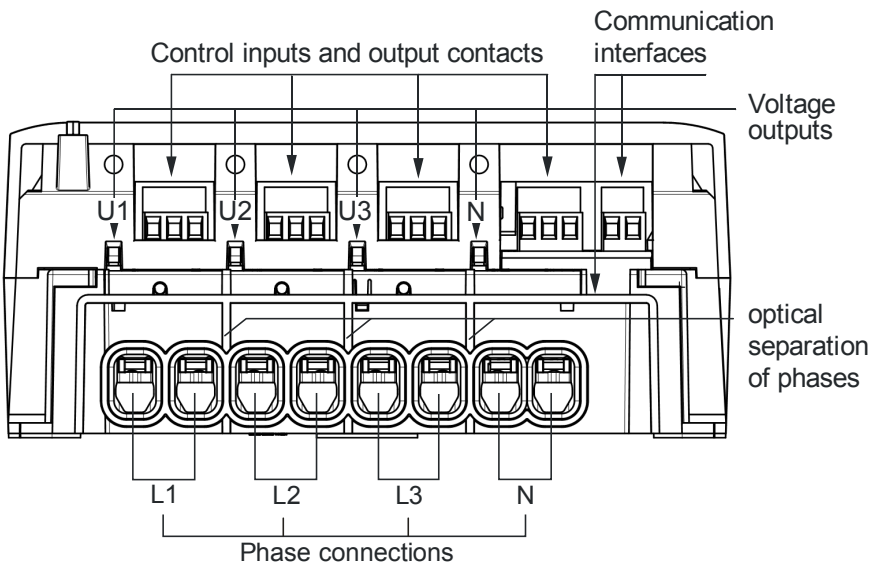
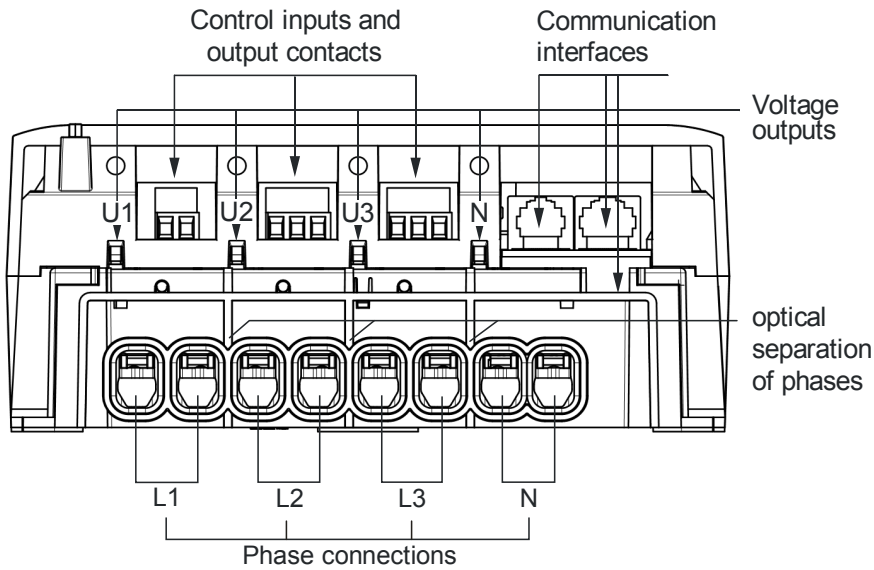


The height of the suspension triangle with extended hook is 230 mm. See also User Manual.

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	CR Active and reactive energy AR 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 060 6 output contacts 240 2 control inputs, 4 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) (S2 = Series 2)	00 No interfaces 40 CS* 60 RS422** 07 Powered RS232*** 02 RS232 42 CS and RS232* 62 RS422 and RS232** 37 RS485 and 03 RS485 43 CS and RS485* 63 RS422 and RS485** Powered RS232***								

*) only as .260x.4x or as .440x.4x

**) only as .041x.6x

***) only as .020x.07, .041x.37, .240x.37 or as .060x.37

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