Electricity Meters IEC/MID
Industrial+Commercial

ZMD405AT/CT, ZFD405AT/CT
ZMD410AT/CT, ZFD410AT/CT

E650 Series 3 (ZMD400AT/CT, ZFD400AT/CT)

Technical Data

Building on its tradition of industrial meters, Landis+Gyr is now bringing out the E650 series 3, the latest generation of ZxD400 meters. These meters feature a new hardware platform, combining modern technology with proven functions.

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The E650 transformer connected I&C meters record active and reactive energy consumption in all three-phase four-wire and three-phase three-wire networks.

Range

E650 meters are the answer to a wide range of specific needs: from the reliable commercial meter to the complex measuring device with comprehensive additional functionality for sophisticated data acquisition and flexible tariff control of large industrial customers.

Modular communication

AT/CT-type meters are equipped with modular communication units which provide the right choice for the best data channel at all times. «Plug+Play» modules also offer you full freedom of choice for deployment of new communication technologies.

Installation support

An indication of phase voltages, phase angles, rotating field and energy direction supports the installation.

E650 Series 3 – ZxD400AT/CT

General

Voltage

Nominal voltage U_n ZMD400xT	
	3 x 58/100 V to 69/120 V
	3 x 110/190 V to 133/230 V
	3 x 220/380 V to 240/415 V
extended operating voltage range	3 x 58/100 to 240/415 V

Nominal Voltage U_n ZFD400xT	
	3 x 100 to 120 V
	3 x 220 to 240 V
extended operating voltage range	3 x 100 to 415 V

Voltage range	80 to 115%

Frequency

Nominal frequency f_n	50 or 60 Hz
tolerance	± 2%

IEC-specific Data

Current

Nominal Current I_n	1 A, 2 A, 5 A, 5||1 A

Maximal Current I_{max}	
metrological 1 A	2 A, 10 A
metrological 2 A	4 A
metrological 5||1 A	6 A
metrological 5 A	200% In or 400% In
thermal 1 A, 2 A,5||1 A	12 A
thermal 5 A	12 A or 24 A
Short Circuit Current	0.5 s with 20 x I_{max}

Technical specifications

Measurement Accuracy

ZxD405xT	
active energy, to IEC 62053-22	class 0.5 S
reactive energy, to IEC 62053-23	accuracy 1%

ZxD410xT	
active energy, to IEC 62053-21	class 1
reactive energy, to IEC 62053-23	accuracy 1%

Measurement Behaviour

Starting current ZxD405xT	
according to IEC	0.1% I_n
typical	0.07% I_n
5||1 A	as 1 A meter

Starting current ZxD410xT	
according to IEC	0.2% I_n
typical	0.14% I_n
5||1 A	as 1 A meter

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

Starting power in F-circuit	all phases

nominal voltage x starting current x √3

MID-specific Data

Current (for classes B and C)

Rated current I_n	1.0 A, 2.0 A, 5.0 A
Minimum current I_{min}	0.01 A, 0.02 A, 0.05 A
Transitional current I_{tr}	0.05, 0.1 A, 0.25 A
Maximum current I_{max}	2.0 A, 4 A, 10.0 A or 20 A

Measurement Accuracy

	to EN 50470-3
ZxD400xT	classes B and C

Measurement Behaviour

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

General

Operating Behaviour

Voltage failure (Power Down)		
bridging time		0.5 s
data storage	after another	0.2 s
switch off	after approx.	2.5 s

Voltage restoration (Power Up)	
function standby 3 phases	after 2 s
function standby 1 phase	after 5 s
detection of energy direction and phase voltage	after 2 to 3 s

Power Consumption

Power consumption per phase in voltage circuit			
phase voltage	58 V	100 V	240 V
active power (typical)	0.4 W	0.5 W	0.7 W
apparent power (typical)	0.8 VA	1.0 VA	1.7 VA

Power consumption per phase in current circuit			
phase current	1 A	5 A	10 A
active power (typical)	5 mW	0.125 W	0.5 W
apparent power (typical)	5 mVA	0.125 VA	0.5 VA

Environmental Influences

Temperature range	to IEC 62052-11
operation	–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 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	IP51

Electromagnetic Compatibility

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

Electromagnetic RF fields	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	to IEC 61000-4-4
current and voltage circuits under load according to IEC 62053-21/23	4 kV
auxiliary circuits > 40 V	2 kV

Fast transient surge test	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	8 kV
auxiliary circuits	6 kV

Protection class II to IEC 62052-11	⧈

Calendar Clock

Calendar type	Gregorian or Persian (Jalaali)

Accuracy	< 5 ppm

Backup time (power reserve)	
with supercap	> 20 days
charging time for max. backup time	300 h
with battery (optional)	10 years
battery type	CR-P2

Display

Characteristics	
type	LCD liquid crystal display
digit size in value field	8 mm
number of digits in value field	up to 8
digit size in index field	6 mm
number of digits in index field	up to 8

Inputs and Outputs

Control inputs	
control voltage U_S	100 to 240 V_{AC}
input current	< 2 mA ohmic at 230 V_{AC}

Output contacts	
type	solid state relay
voltage	12 to 240 $V_{AC/DC}$
max. current	100 mA
max. switching frequency (pulse length 20 ms)	25 Hz

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	9600 bps
protocols	IEC 62056-21 and dlms

Communication Units

Exchangeable communciation units for various applications.

Additional Power Supply (optional)

On Extension Board 045x	
nominal voltage range	100 to 240 $V_{AC/DC}$
tolerance	80 to 115% U_n
frequency	50 or 60 Hz
max. power consumption	6.8 W

On Extension Board 046x	
nominal voltage range	12 to 24 V_{DC}
tolerance	80 to 115% U_n
max. power consumption	3.5 W

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
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
GSM	60 mm free space
ZxB-type 80 mm	80 mm free space
ZxB-type 110 mm	110 mm free space
ADP1 adapter	
RCR/FTY adapter	

Material housing

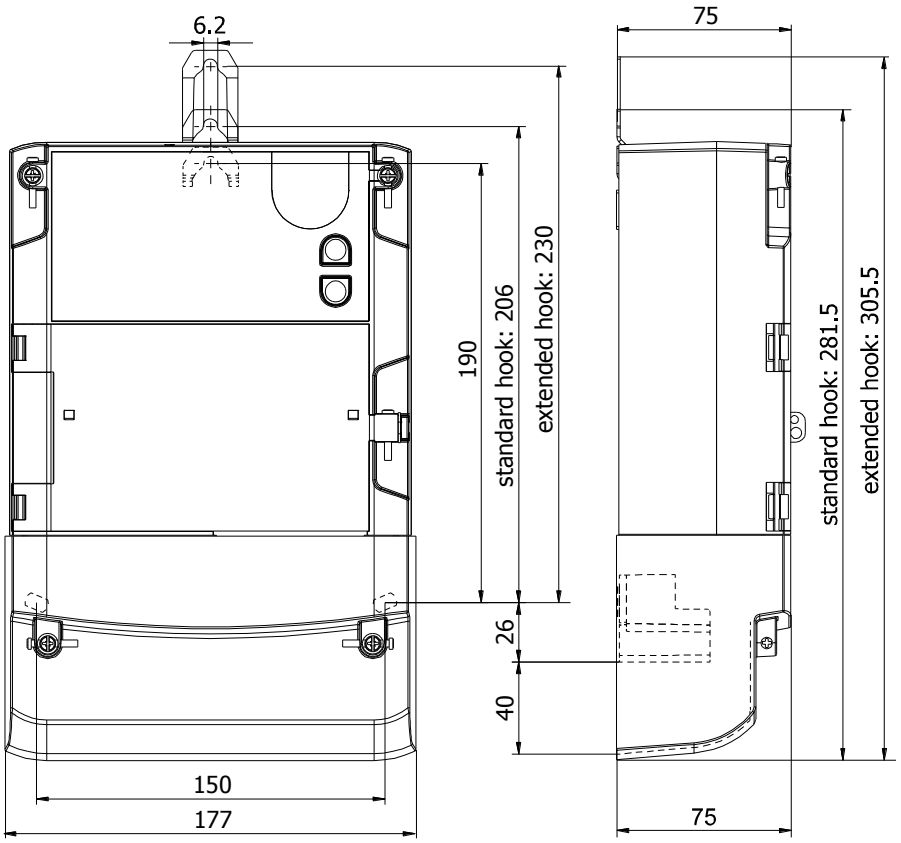
Polycarbonate, partly glass-fibre reinforced

Connections

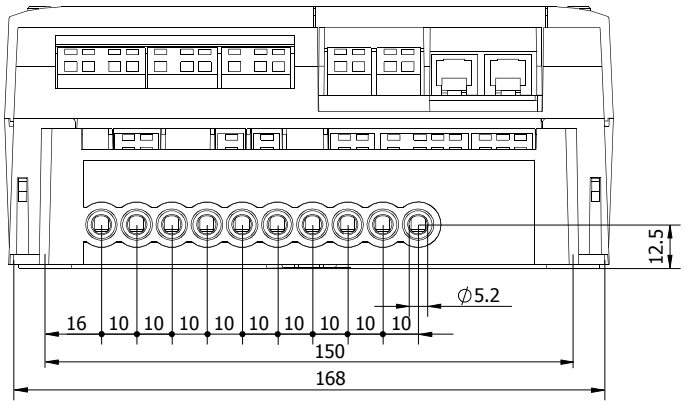
Phase connections	
type	screw type terminals
diameter	5.2 mm
recommended conductor cross section	4 to 6 mm^2
screw head	Pozidrive Combi No. 2
screw dimensions	M4 x 8
screw head diameter	≤ 5.8 mm
tightening torque	< 1.7 Nm

Other connections	
type	screwless spring-type terminal
max. current of voltage outputs	1 A
max. voltage of inputs	250 V

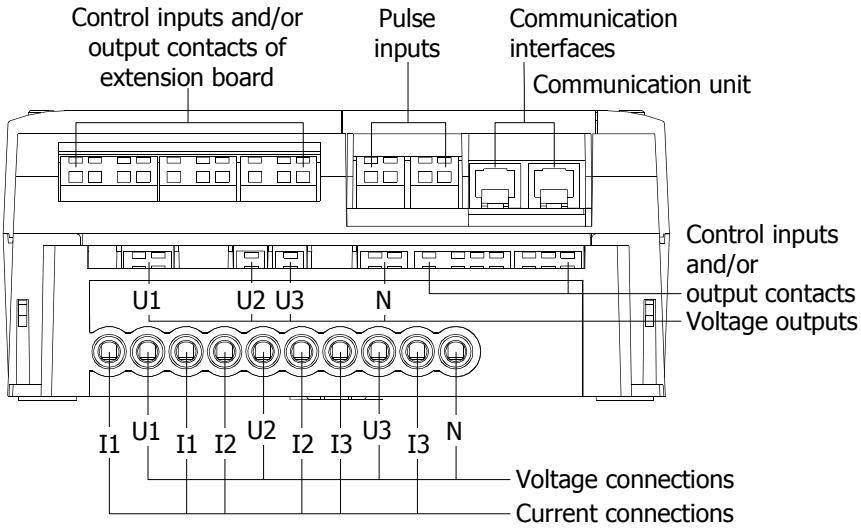
Meter Dimensions (standard terminal cover)



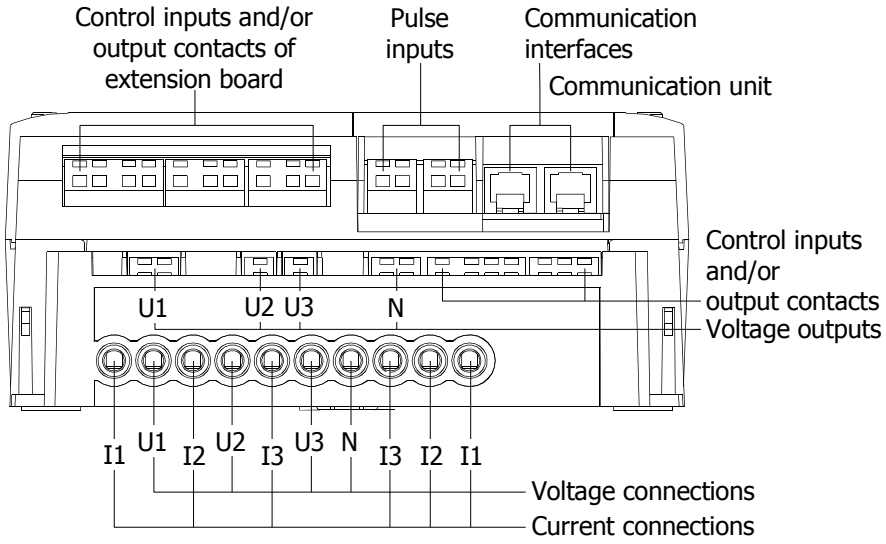
Terminal Dimensions



Terminal Layout according to DIN



Symmetrical Terminal Layout (optional, ZMD400 only)



Type designation ZMD 4 10 C T 44 4207 S3

Network Type

ZFD	3-phase 3 wire network (F-circuit)
ZMD	3-phase 4 wire network (M-circuit)

Connection Type

4	Transformer operated

Accuracy Class

10	Active energy class 1 (IEC), B (MID)
05	Active energy class 0.5s (IEC), C (MID)

Measured Quantities

C	Active and reactive energy
A	Active energy

Construction

T	With exchangeable communication units

Tariffication

21	Energy rates, external rate control via control inputs
24	Energy rates, internal rate control via time switch (additionally possible via control inputs)
41	Energy and demand rates, external rate control via control inputs
44	Energy and demand rates, internal rate control via time switch (additionally possible via control inputs)
	All versions with 3 control inputs and 2 output contacts

Additional functions

060x	6 outputs
240x	2 control inputs, 4 outputs
420x	4 control inputs, 2 outputs
045x	4 outputs, auxiliary power supply 100 to 240 VAC
046x	4 outputs, auxiliary power supply 12 to 24 VDC
xxx0	no additional functions
xxx2	DC-magnet-detection
xxx7	load profile
xxx9	DC-magnet-detection and load profile

Series 3

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Landis+Gyr
manage energy better