

# Landis+Gyr Qualigrid ZMQ205, ZFQ205, ZCQ205

## Technical data



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## ZMQ205, ZFQ205, ZCQ205 Technical Specifications

### Voltage

#### Nominal Voltage $U_n$

$$3 \times \frac{100}{\sqrt{3}} V, 3 \times \frac{110}{\sqrt{3}} V, 3 \times \frac{115}{\sqrt{3}} V, 3 \times \frac{200}{\sqrt{3}} V, \\ 3 \times \frac{190}{\sqrt{3}} \dots \frac{230}{\sqrt{3}} V \text{ (user defined)}$$

#### Voltage Range

measurement	70 to 115 % $U_n$
functional	65 to 130 % $U_n$
measurement shut down	45% $U_n$ for ZMQ lower thresholds possible

### Current

Nominal Current	1 A, 5 A
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#### Maximum Current $I_{max}$

standard	120 % $I_n$
metrological	up to 170 % $I_n$
for -1/2, -5/10	200 % $I_n$
metrological	up to 240 % $I_n$
thermal	12 A (at least 1.5 x $I_{max}$ )

#### Influence of short-time overcurrents

20 $I_{max}$ during 0.5 s according IEC	< 0.05 %
typical 100 A during 1 s possible	

#### Starting Load (standard)

120 % / 150 % $I_{max}$	active energy < 0.05 % $P_n$ reactive energy < 0.1 % $Q_n$
200 % $I_{max}$	active energy < 0.1 % $P_n$ reactive energy < 0.2 % $Q_n$

On request the starting threshold can be multiplied by 2, 4 or 8 but may not exceed 0.4 %.

### Frequency

nominal frequency $f_n$	50 or 60 Hz (selectable)
range	90 to 110 % $f_n$
range for primary values:	(50) 100 to 40'000 A 400 V to 1000 kV

### Measuring Accuracy

Load Dependency	Class 0.5 Active
1 % $I_n$ , $\cos \varphi = 1$	$\pm 0.60$ %
5 % $I_n$ to $I_{max}$ , $\cos \varphi = 1$	$\pm 0.30$ %
2 % $I_n$ , $\cos \varphi = 0.5$	$\pm 0.60$ %
10 % $I_n$ to $I_{max}$ , $\cos \varphi = 0.5$	$\pm 0.40$ %
deviations between the individual phases at 100 % $I_n$	< 0.40 %
losses	< 1 %

### Additional Power Supply

nominal voltage ranges $U_n$	
	100 to 230 V AC/DC 24 to 125 V AC/DC
functional range	70 to 115 % $U_n$
frequency	50 or 60 Hz
max. power consumption	6 VA

### Operating Behaviour

#### Voltage Failure (Power Down)

block inputs and outputs	immediate
transmitting contacts	after 100 ms
standby operation	after 0.5 s
data storage	after a further 0.2 s
switch off	after approx. 2.5 s

#### Voltage Restoration (Power Up)

	3 phase
function standby	after 1 to 3 s
detection of energy direction + phase voltage	after 1 s

### Power Consumption

#### General

all values are typical values at $3 \times \frac{100}{\sqrt{3}} V$	
maximum values	1.5 x typical values
all values are voltage dependant	

Current Circuit (only for measurement)	< 0.1 VA
1 A	0.004 VA
5 A	0.09 VA

## Power Consumption

<b>Power supply connected to the voltage circuits</b>	
voltage circuit without transmitting contacts and communication unit	(0.5 W) 0.9 VA
additional power supply with transmitting contacts and communication unit	(0.8 W) 1.4 VA
<b>Power supply not connected to the voltage circuits</b>	
voltage circuit	0.05 VA
additional power supply type	0.1 VA
additional power supply without transmitting module and communication unit	3 VA
additional power supply with transmitting module and communication unit	4.5 VA

## Environmental Influences

<b>Temperature Range</b> according to IEC 62052-11	
metrological	-10 °C to 45 °C
operation	-25 °C to 55 °C
storage and transportation with battery	-25 °C to 55 °C
storage and transportation without battery	-25 °C to 70 °C

<b>Temperature Coefficient</b>	
range	-10 °C to 45 °C
at $\cos\varphi = 1$ (5 % $I_n$ to $I_{max}$ )	< $\pm 200$ ppm/K
at $\cos\varphi = 0.5$ (10 % $I_n$ to $I_{max}$ )	< $\pm 300$ ppm/K

<b>Relative Humidity</b> according to IEC 62052-11	
annual average	< 75 %
for 30 days in year	95 %
on other days	85 %
with the exception of condensation and formation of ice	

<b>Vibration</b> according to IEC 68-2-6	
frequency	10 to 500 Hz
frequency < 60 Hz	$h_{const} = 0.375$ mm
frequency > 60 Hz	$a_{const} = 5$ g
velocity	1 octave/min
duration	10 cycles

<b>Half-wave sinusoidal shock</b> acc. to IEC 68-2-27	
Three shocks in six directions	
$a_{max}$	80 g
$t_i$	11 ms

## Environmental Influences

<b>Impermeability</b>	according to IEC 60529
f6 and f9 housing	IP51

<b>Flammability</b>	according to IEC 695-2-1
(f6 housing only)	
contact force of heating wire	1 N
duration	30 s
test temperature = 960°C (terminal block)	
test temperature = 650°C (housing)	

## Electromagnetic Compatibility

<b>Electrostatic Discharges</b>	acc. to IEC 61000-4-2
contact discharge	8 kV

<b>Immunity to Electromagnetic RF Fields</b>	
according to IEC 61000-4-3	
80 to 2000 MHz	10 V/m
measuring deviation	< 2 %


<b>Radio Interference Suppression</b>	according to IEC/CISPR 22
	class B

<b>Fast Transient Burst Test</b>	to IEC 61000-4-4
current and voltage circuits not under load	4 kV
current and voltage circuits under load	2 kV
auxiliary circuits > 40 V	2 kV

## Insulation Strength

<b>Insulation Test (Security)</b>	
all circuits to earth	4 kV 50 Hz
measurement circuits against all other circuits	4 kV 50 Hz
outputs against all other circuits	2 kV 50 Hz
tariff inputs against all other circuits	2 kV 50 Hz

<b>Impulse Voltage (Surge)</b>	
surge 1.2 / 50 $\mu$ s – 8 / 20 $\mu$ s differential mode	
- current and voltage circuits	4 kV @ 2 $\Omega$
- auxiliary circuits > 40 V	1 kV @ 42 $\Omega$
surge 1.2 / 50 $\mu$ s – 8 / 20 $\mu$ s common mode	
- current and voltage circuits	4 kV @ 12 $\Omega$ 9 $\mu$ F

For f6: Protection Class II acc. to IEC 62052-11 

## Calendar Clock

<b>Accuracy at 23 °C</b>	< 5 ppm
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<b>Backup Time (Power Reserve)</b>	
with supercap	> 20 days
loading 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 positions in value field	up to 8
digit size in index field	6 mm
number of positions in index field	up to 8

## Inputs and Outputs

### Optical Test Output Active and Reactive Energy

pulse width	40 ms
maximum pulse frequency	12 Hz

### Control Inputs

voltage ranges	100 to 125 V AC/DC
	200 to 230 V AC/DC
	24 V DC
	48 to 60 V DC

The control voltage range is set by jumpers in the hardware.

input current	≤ 3 mA
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### Transmitting Contacts

type	solid state relay
max. switching voltage	125 V AC/230 V DC
min. switching voltage	24 V DC
max. continuous switching current	55 mA AC/DC
min. switching current	0.1 mA
electrical lifetime	> 15 x 10 <sup>9</sup> pole changes
contact resistance	≤ 50 Ω
insulation between the contacts and other current circuits	3.75 kV AC/1 min
insulation between contact groups	2 kV AC/1 min
pulse length r4	20, 40, 80 ms

### Alarm Contacts

type	monostable with switchover contact
max. switching voltage	250 V AC/DC
normal switching voltage	24 V DC
min. switching voltage	5 V DC at min. 10 mA
max. switching current	100 mA AC/DC at 250 V
min. switching current	5 mA DC
electrical lifetime	10 <sup>5</sup> switching operations with ohmic load
insulation	4 kV AC/1 min

## Communication Interfaces

### Optical Interface for Automatic Meter Reading

Standard	IEC62056-21
status binary 1	IR LED off
status binary 0	IR LED on
max. bit rate	9600 bps
transmission mode	serial, half duplex, asynchronous start/stop
protocol	dlms (IEC 62056-42/46/53/61/62)

### RS485 Interface to Other Meters (Daisy Chain)

standard	ISO 8482
max. current consumption (with 1 transmitter and 8 receivers)	15 mA
max. current per unit	0.8 mA to 1 mA
status binary 1	differential voltage < -0.2 V
status binary 0	differential voltage > -0.2 V

Max. bus length	bit rate	no. of meters
1200 m	19.2 kbps	16 meters
550 m	38.4 kbps	32 meters
250 m	57.6 kbps	32 meters

insulation	4 kV AC
transmission mode	serial, bidirectional, asynchronous start/stop
protocol	dlms (IEC 62056-42/46/53/61/62)
connections	2-wire, not exchangeable (twisted pair shielded cable)

No termination resistor is needed for the described line data. If required by the system, an external load of 1.2 kΩ can be used.

## Connections

### Current and Voltage Connections f6

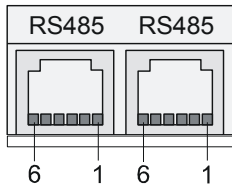
type	screw type terminals
diameter	5.2 mm
recommended conductor cross-section	4 to 6 mm <sup>2</sup>
screw type	Pozidriv Kombi No. 1
screw dimensions	M4 X 8
max. head diameter	5.8 mm
tightening torque	≤ 1.7 Nm

### Input and Output Connections f6

auxiliary power supply, tariff inputs, alarm output, synchronisation input and transmitting contacts	
type	spring type terminal

### RS485-Interface Connections f6

type	RJ-12
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Pin allocation RS485:

- 1 GND
- 2 U<sub>P</sub> (Data a)
- 3 U<sub>N</sub> (Data b)
- 4 U<sub>N</sub> (Data b)
- 5 U<sub>P</sub> (Data a)
- 6 GND

The two RJ12 jacks of the RS485-interface are looped internally to permit a connection of several meters.

### Connections f9

direct plug-in Essaillec connectors with automatic short circuit for current transformers

Standard data						
Un 3x.../√3	I <sub>n</sub>	Load	P <sub>max</sub>	R [imp/ kWh/kvarh]	r4 Pulse value [Wh, varh / imp]	Energy register kWh, kvarh, kVA
100 V	1 A	120 %	208 W	100 000	0.02	0,0000
100 V	1 (2) A	200 %	346 W	50 000	0.02	0,000
100 V	5 A	120 %	1039 W	20 000	0.1	
100 V	5 (7,5) A	150 %	1299 W	50 000	0.1	
100 V	5 (10) A	200 %	1732 W	50 000	0.1	
200 V	1 A	120 %	416 W	25 000	0.05	
200 V	1 (2) A	200 %	693 W	10 000	0.05	
200 V	5 A	120 %	2078 W	25 000	0.2	

### Memory capacity

per profile for profile 1 and profile 2

for t <sub>m</sub> = 15 min	4 register	e.g. ±A, ±R	681 days
	10 register	e.g. ±A, ±R, 3x U, 3x I	336 days
	36 register		100 days

## Housing Material

### f6

The meter housing is made of polycarbonate which is partly glass-fibre reinforced.

### f9

The meter housing is made of lacquered sheet steel. The transparent meter cover is made of polycarbonate.

## Weight and Dimensions f6

Weight

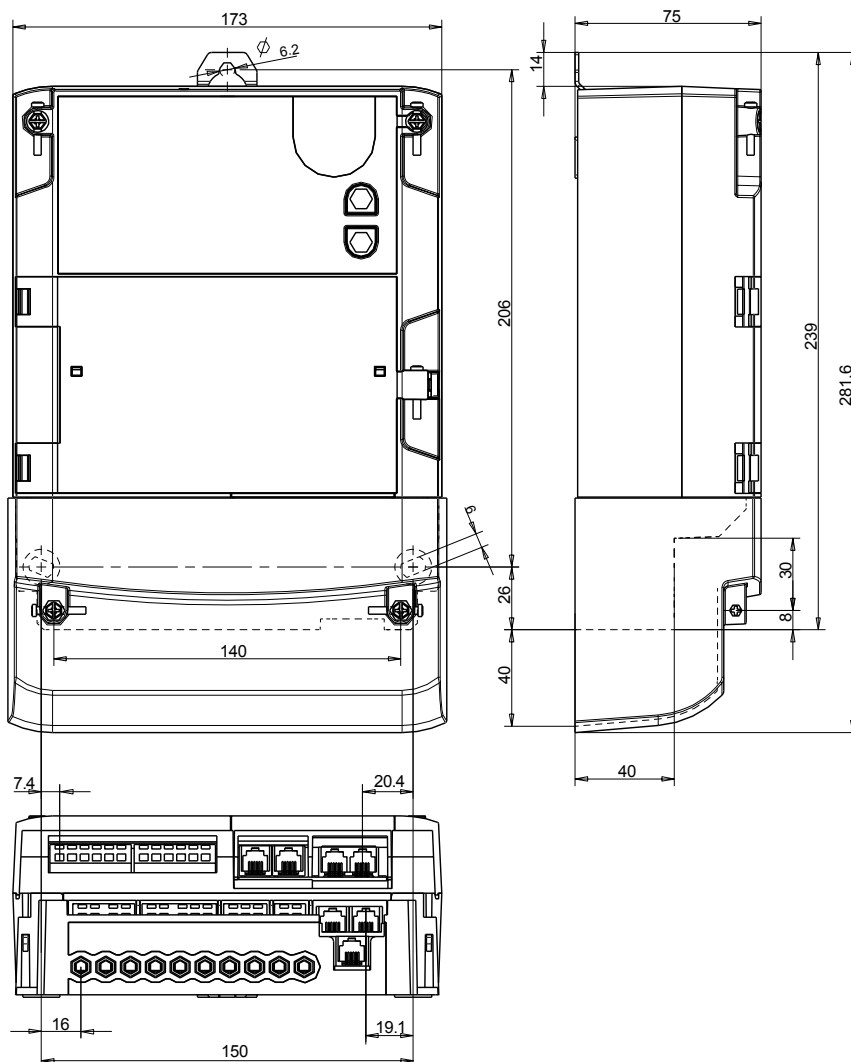
1.6 kg

### Terminal Cover

short  
standard  
long  
special

no free space  
40 mm free space  
60 mm free space  
110 mm free space

### Meter Dimensions (Standard Terminal Cover)

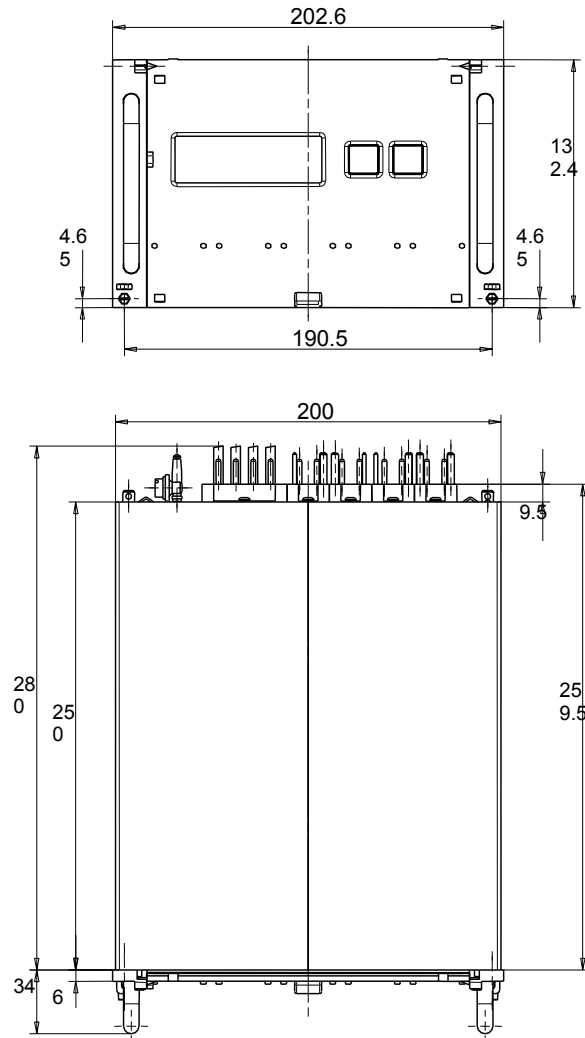


## Weight and Dimensions f9

Weight

4.4 kg

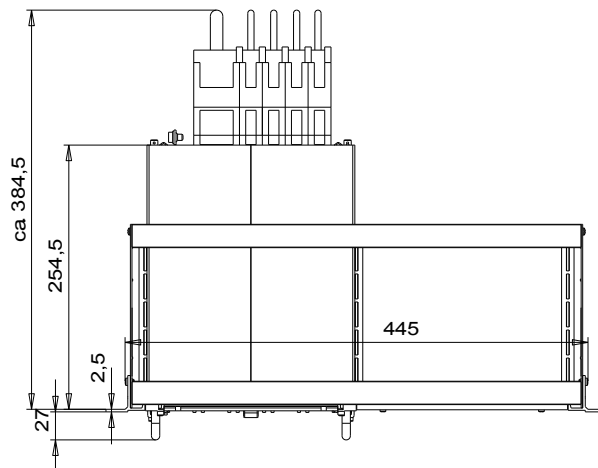
Rack Mounting



earth screw for cable connection; earth pin for chassis f9.11 and f9.12

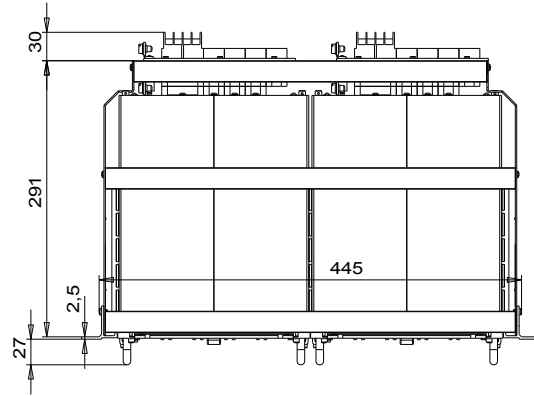
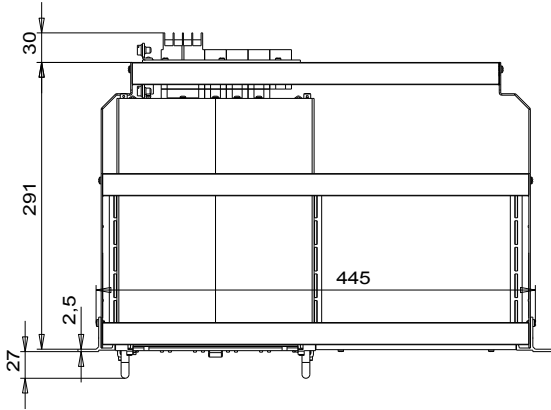
Chassis

f9.10 (meter with cable connections)

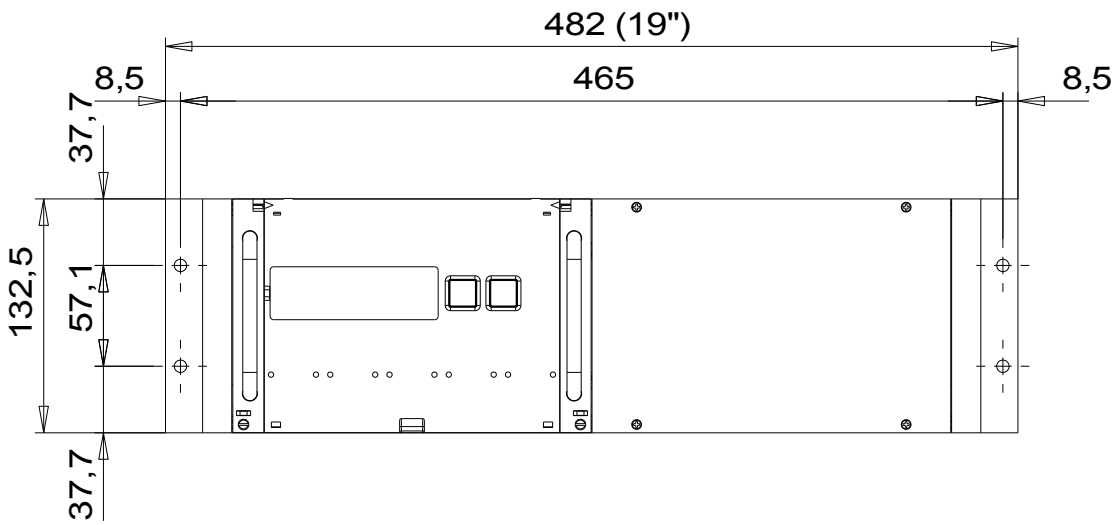


Chassis f9.11 (direct plug-in meter)

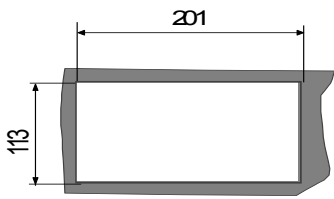
Chassis f9.12 (two direct plug-in meters)



Front



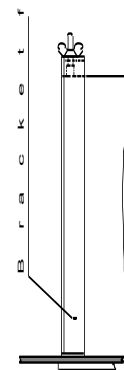
Flush Mounting for f9



Cut-out for panel flush mounting



Cut-out for 19\"/>





	ZMQ	2 05	C.8	r4	f6
<b>Network type</b>					
ZMQ	3-phase 4-wire network (M-circuit)				
ZFQ	3-phase 3-wire network (F-circuit)				
ZCQ	1-phase 2-wire network (C-circuit)				
<b>Accuracy class</b>					
02	Class 0.2 S for active energy according to IEC				
05	Class 0.5 S for active energy according to IEC				
<b>Software configuration</b>					
C.4	basic measurement functions				
C.6	additionally losses, harmonic distortion and CT/VT correction				
C.8	additionally apparent energy and single phase measurement, max. demand, power factor, monthly billing values				
<b>Transmitting contacts</b>					
r4	4 changeover contacts for +A, -A, +R, -R with fixed pulse width (4 x u)				
r4a	8 normally open contacts with fixed pulse width (8 x u)				
r4aa	4 normally open contacts for +A, -A, +R, -R in 2 groups with fixed pulse width (2 x 4 x u)				
r3	4 changeover contacts for +A, -A, +R, -R with symmetric mark/space ratio (4 x u) and storage of contact position in case of power outage				
<b>Casing</b>					
f6	Wall mounted housing (Plastic housing for wall mounting)				
f9	Rack mounted housing (Metal housing equipped with ESSAILEC connectors) – for flush mounting in 19" rack with counter connectors – for flush mounting in 19" rack with cable connectors – for switchboard mounting with cable connectors				

### Customer specific versions

- C.2: for serial connection to FAG/FBC (only with H90 and former hardware)
- C.7: specific functionality for India with Availability Based Tariff
- 16.7 Hz version
- Current ranges 1 (4) A; 1.5 (6) A; 2 A 120% I<sub>n</sub>
- 3 x 400/230 V for direct connection to low voltage network

## Revision History

Version	Date	Comments
a	05.11.2008	Document splitting and renumbering from H 71 0200 0214 en to D000028634
b	22.02.2010	Amendment of revision history

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