Electricity meters IEC/MID

Residential

E360-AM3D/E360-AF3D Pxx.xx.xx

E360 Series 1 LTE 3-phase

Technical data

E360 LTE is the latest state-of-the-art residential smart meter from Landis+Gyr. It provides flexible local and remote communications for the IoT (Internet of Things) world. E360 is a future-proof instrument with powerful e-metering, network monitoring, multi-energy and consumer information functionalities.

Date: 30.08.2019
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Revision history

Version	Date	Comments
a.01	13.09.2018	First draft.
a.02	02.10.2018	Updated after R&D validation.
a.03	26.10.2018	Updated by the documentation team.
a.04	31.10.2018	Updated by the documentation team.
a.05	16.11.2018	Preliminary draft. Updated power consumption data and updated weight.
a.06	10.12.2018	Preliminary draft. Updated cover art, added supercapacitor charge time, updated material of terminals, added terminal tightening torque, updated dimensions, added back dimensions and updated type designation.
a.07	16.01.2019	Preliminary draft. Updated cover art, introduction, solid-state auxiliary control switch,extended operating voltage range, nominal frequency, starting current, voltage failure, voltage restoration, ingress protection, impulse voltage, optical pulse output, application protocol, minimum conductor cross-section, SIM card size, wireless M-Bus communication modes and dimension drawings. Deleted ferrules.
a.08	25.02.2019	Preliminary draft. Added maximum overload current, 2-pole supply control switch and operation temperature range for last gasp. Added notes about a three-phase/three-wire release at a later date. Updated auxiliary load control switch name, voltage failure description, rate control input description, wired M-Bus maximum unit loads and radio interference suppression standard.
a.09	27.03.2019	Preliminary draft. Added maximum tightening torque. Updated impulse voltage, minimum conductor cross-section and optical interface transmission speed.
a.10	10.05.2019	Preliminary draft. Updated power consumption and optical interface transmission speed.
a	21.05.2019	First edition. Updated operation modes, IEC starting currents, power-down voltages, power consumption, maximum tightening torque, wired M-Bus unit loads and terminal dimensions drawing. Added power reserve ambient temperature.
b	30.08.2019	Updated impulse voltages. Added contact resistance burden for auxiliary control switch and auxiliary load control switch. Added auxiliary 230 V input. Added supply control switch rated voltage. Added 1 x 5 A auxiliary load control switch and chip SIM options.

Direct-connected E360 residential smart meters record active and reactive energy consumption in all three-phase, four-wire (E360-AM) and three-phase, three-wire (E360-AF) networks. *Three-wire version will be released at a later date.

Flexible communication

The E360 is able to communicate in an LTE Cat NB1 network as well as in an LTE Cat M1 network. For optimal LTE connectivity it can be equipped with an internal or (optional) external antenna.

Multitude of features

A large, backlit LCD display is easy to read day or night. There is support for multi-energy devices via wired and wireless M-Bus (both optional), and a Consumer Information Interface (CII) enables easy and secure transfer of meter data to end-consumer applications. The E360 also comes with an integrated supply control switch, an auxiliary control switch (optional) and an auxiliary load control switch (optional).

E360 Series 1 LTE 3-phase – Technical data

General

Functions

Measurement:

- Combined bi-directional measurement
- Three-phase/four-wire (E360-AM) and three-phase/three-wire (E360-AF) *Three-wire version will be released at a later date

Integrated LTE remote communications:

- Two-way LTE Cat NB1/M1 communication to the head-end system
- Last gasp, which allows the meter to push an alarm at power-down

M-Bus interface:

- Wired and wireless M-Bus interfaces (both optional) support up to 4 multi-energy devices (e.g. gas, water and district heating)

Inputs and outputs:

- Optical interface for local reading, configuration and parameterisation
- HAN P1 (RJ-12) consumer information interface (CII)
- 0 to 2 auxiliary control switches/auxiliary load control switches (potential-free outputs)

  Output 1: 100 mA solid-state auxiliary control switch (optional)

  Output 2: 5 A potential-free mechanical auxiliary load control switch (optional)

  Output 1 & 2: 5 A potential-free mechanical auxiliary load control switch (optional)
- Rate control input (optional)
- Auxiliary 230 V input

Control buttons:

- Display button
- Reset button (sealable)
- Supply control button

Backlit LCD display:

- 14-segment clear text display
- 8 digits for register value display
- Phase, OBIS codes, energy direction, no-load mode, critical error, multi-energy units of measure, currency, active tariff, communication status and supply control switch state indicators on display
- Consumer messages (rolling display)

Internal supply control switch:

- Disconnection of energy
- Pre-defined operation modes
- Can be controlled remotely from the AMM system, manually with a push-button or via local communication interfaces

Voltage and frequency

Nominal voltage U_n	
E360-AF	3 x 230 VAC
E360-AM	3 x 230/400 VAC

Maximum voltage U_{max}	**long-term overvoltage 4h**
	440 VAC (limited time)

Extended operating voltage range
80% - 120% U_n

Nominal frequency f_n
50 Hz (value ± 5%)

IEC-specific data

Current

Basic current I_b
5 or 10 A*
*To be confirmed at a later stage.

Maximum current I_{max}	
Metrological	100 A

Maximum overload current I_{ovl}
100 A

Short-circuit ≤ 10 ms
30 x I_{max}

Measurement accuracy

E360-AM/AF	
Active energy, according to IEC 62053-21	class 1
Reactive energy, according to IEC 62053-23	class 2

Measurement behaviour

Starting current	
Active energy, according to IEC 62053-21	≤ 0.4% I_b
Reactive energy, according to IEC 62053-23	≤ 0.5% I_b

MID-specific data

Current

Reference current I_{ref}
5 or 10 A*
* To be confirmed at a later stage.

Minimum current I_{min}
0.25 A

Maximum current I_{max}
100 A

Maximum overload current I_{ovl}
100 A

Measurement accuracy

E360-AM/AF	
Active energy, according to EN 50470-1/50470-3	class B

Measurement behaviour

Starting current I_{st}
0.4 % of I_{ref} (≤ 20 mA)

General data

Operating behaviour

Voltage failure (power-down)	
Voltage (for U_n=230/400 V)	
1-phase, 2-wire and 3-phase, 3-wire operation	170 V
3-phase, 4-wire operation	100 V

Voltage restoration (power-up)	
Function standby 3-phases	< 5 s
Detection of energy direction / phase voltage	0.5 s
Voltage	> 184 V

Power consumption

Total power consumption of the meter	
Base meter without communication:	
Active power at U_n (typical)	< 0.6 W per phase
Apparent power at U_n (typical)	< 1.5 VA per phase
Base meter while communicating over LTE:	
Active power at U_n (typical)	< 1.5 W per phase
Apparent power at U_n (typical)	< 2.0 VA per phase

Environmental influences

Temperature range	
Operation (meter)	–40 °C to +70 °C
Operation (LCD display)	–25 °C to +70 °C
Operation (last gasp)	–40 °C to +60 °C
Storage	–40 °C to +80 °C

Temperature coefficient	
Range	–40 °C to +70 °C
Average value (typical)	± 0.01% per K
At cosϕ = 1 (from 0.1 I_b to I_{max})	± 0.05% per K
At cosϕ = 0.5 (from 0.2 I_b to I_{max})	± 0.07% per K

Maximum operating altitude
2000 m

Ingress protection	according to IEC 60529
IP54 (without breakouts)	
This meter is intended for indoor use only.	

Electromagnetic compatibility

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

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

Radio interference suppression according to IEC/CISPR 32
class B

Fast transient burst test	according to IEC 61000-4-4
Current and voltage circuits under load, according to IEC 62053-21	
	4 kV
Auxiliary circuits > 40 V	1 kV

Surge test	according 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 minute

Impulse voltage 1.2/50 µs	
Main circuits, according to IEC 62052-31	6 kV
Auxiliary circuits, according to IEC 62052-31	4 kV
According to SP 1618	12 kV

Protective class according to IEC 62052-11 and IEC 62052-31
class II ⧈

Calendar clock

Normal operation	
Accuracy (at +23 °C)	0.5 s/day
(EN 62054-21 requirement for time switches: 0.5 s/day)	

Reserve running	
Accuracy (at +23 °C)	< 1 s/day
(EN 62054-21 requirement for time switches: 1.0 s/day)	

Typical back-up time (power reserve)	
With supercapacitor (at +23 °C)	7 days

Supercapacitor charge time	
To full charge	72 hours

Display

Characteristics	
Type	14-segment clear text LCD
Back light for poor lighting conditions	
Digit size value field	10 mm
Number of digits value field	8
Digit size code field	8 mm
Number of digits code field	6

Inputs and outputs

Rate control input (optional)	
Type	two rates, maximum 230 VAC
	input logical “high”, when voltage above 80 VAC
	input logical “low”, when voltage below 50 VAC
Configurable as rate control	

Optical pulse output	active and reactive energy
Type	red LED
Pulse length	10 ms
Pulse constant	1000 imp/kWh class B (active)
	1000 imp/kvarh class 2 (reactive)

Consumer accessible HAN compartment with serial interface
P1 output (according to DSMR5) with power delivery of 5 V, 250 mA
Application protocol: DSMR5 P1

Output 1 (1st terminal block from left) (optional)	
Type	solid-state auxiliary control switch
Nominal voltage	230 VAC
Maximum voltage	276 VAC
Switching current	100 mA
Burden (contact resistance) (typical))	27 Ohm

Output 1 (1st terminal block from left) (optional)	
Type	
	mechanical auxiliary load control switch, non-latching
Nominal voltage	230 VAC
Maximum voltage	276 VAC
Switching current	5 A
Burden (contact resistance) (typical))	10 mOhm

Output 2 (2nd terminal block from left) (optional)	
Type	
	mechanical auxiliary load control switch, non-latching
Nominal voltage	230 VAC
Maximum voltage	276 VAC
Switching current	5 A
Burden (contact resistance) (typical))	10 mOhm

Phase connections	
Material of terminal	steel
Type (two options)	
	(1) single-screw cage-clamp terminal or
	(2) two-screw terminal
Diameter	9.5 mm

Phase connections	
Minimum conductor cross-section	4.0 mm^2
Maximum conductor cross-section	35.0 mm^2
Rotation test (IEC 60999-1 test 9.4)	
Pull test (IEC 60999-1 test 9.5)	
Type of screw:	zinc-plated steel Pozidriv 2 screw with slot
Screw dimensions	M6 x 14
Maximum screw-head diameter	7 mm
Cross-slot	type Z, size 2 (ISO 4757-1983)
Slot width	0.8 mm
Slot length	minimum 6 mm
Minimum tightening torque	3.0 Nm
Maximum tightening torque	4.5 Nm

Auxiliary 230 V input	
	230 VAC connector

Communication interfaces

Optical interface	
Type	bi-directional serial interface
Protocol	according IEC 62056-21
Maximum transmission speed	19,200 bps

LTE interface	
Integrated LTE Cat NB1 and Cat M1 modem according to 3GPP LTE release 13	
Supported LTE Bands	B3 (1800 MHz), B8 (900 MHz), B20 (800 MHz)
Maximum RF output power on all bands	23 dBm
Data transmission speed and latency depend on MCL (Maximum Coupling Loss)	
LTE Cat NB1	
	max. peak downlink speed: 250 kb/s
	max. peak uplink speed (single/multi-tone): 20/250 kb/s
LTE Cat M1	
	max. peak downlink speed: 1 Mb/s
	max. peak uplink speed: 1 Mb/s
Packet-oriented communication service	
- IPv4 protocol	
- TCP protocol	

LTE interface
- Dynamic and fixed IP address (depending on SIM card assignment)
SIM card holder for a mini-SIM card
Internal antenna
External antenna (optional) with a 50 Ohm MCX connector

Wired M-Bus interface (optional)	
Point-to-Point or Point-to-Multipoint bus system	according to EN 13757-2: 2005
Maximum transmission speed	2,400 bps
Maximum unit loads (1 unit load = 1.5 mA)	10
Maximum 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

Wireless M-Bus interface (optional)	
Frequency	868 MHz according to EN 13757-4
Communication modes	T1/T2, C1/C2
Range up to 300 metres (with internal antenna)	
Readout frequency	maximum every 8 seconds (impact on reserve energy)
Application layer protocol	EN 13757-3 and OMS 4.03

Internal supply control switch	
Rated voltage U_n	230 VAC
Contact data	IEC 62052-31
	full current range up to 100 A
Poles	3-pole
Maximum switching power	25 kVA
General load switching capacity	UC3 according to EN 62052-31

Safety requirements

Electrical safety	according to EN 62052-31

RF Exposure / SAR value
The antenna(s) must be installed such that a minimum separation distance of TBD metres is maintained between the radiator (antenna) and all people and domestic animals at all times.

Environmental compatibility
The device conforms to the European directives WEEE (2012/19/EC), ROHS2 (2011/65/EC) and REACH (2006/1907/EC).

Material

Case	
Material	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.	

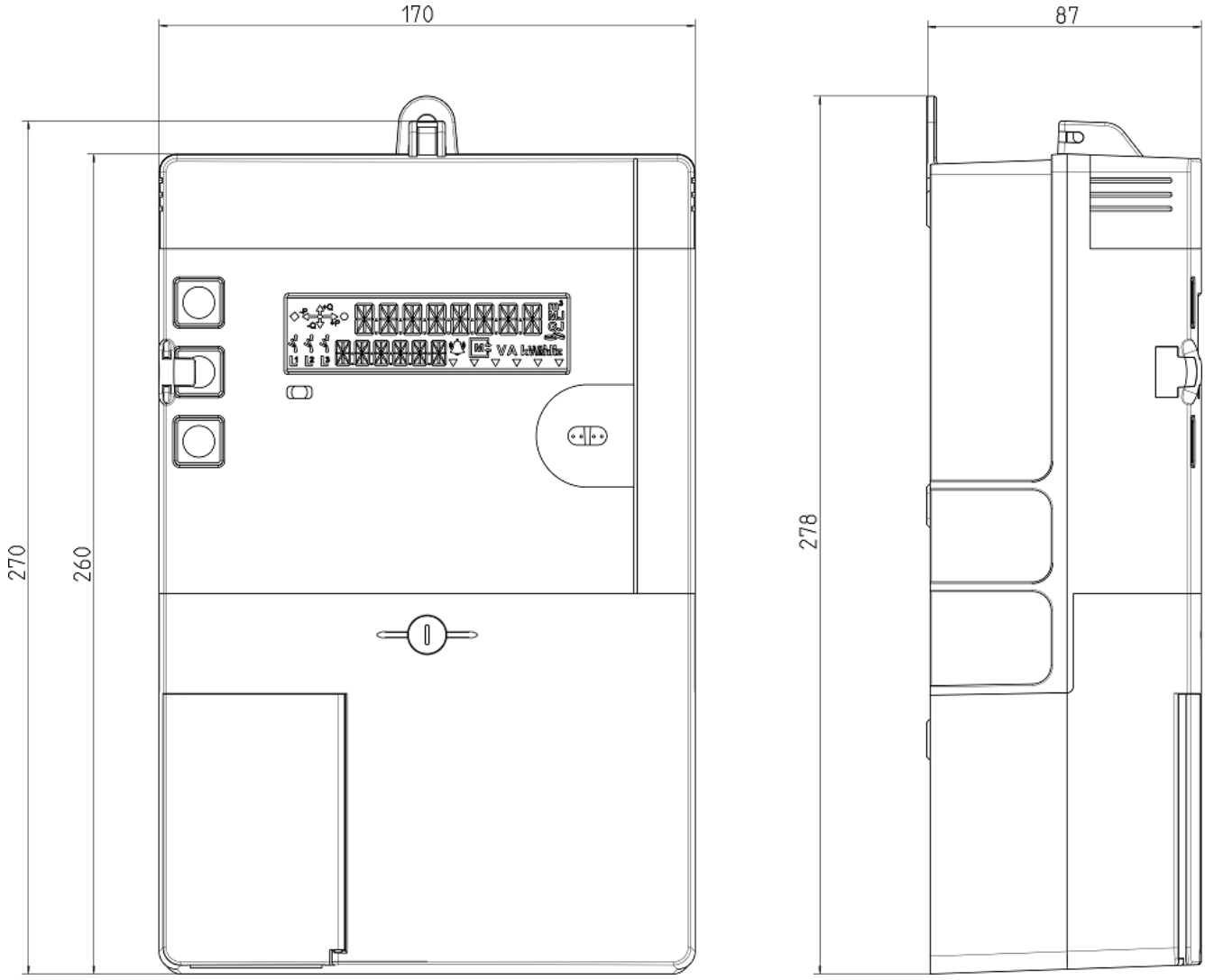
Weight and dimensions

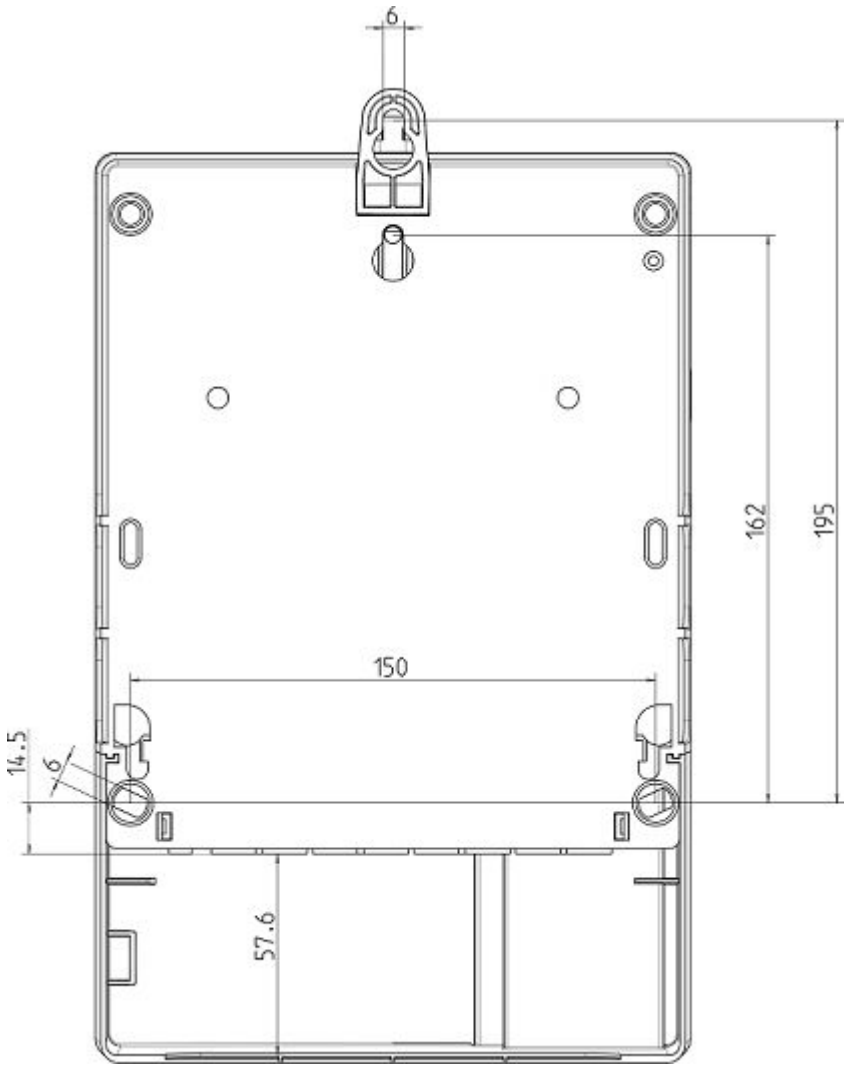
Weight	
	approximately 1.3 kg

External dimensions	
Width	170 mm
Height (with terminal cover)	270 mm
Depth	87 mm

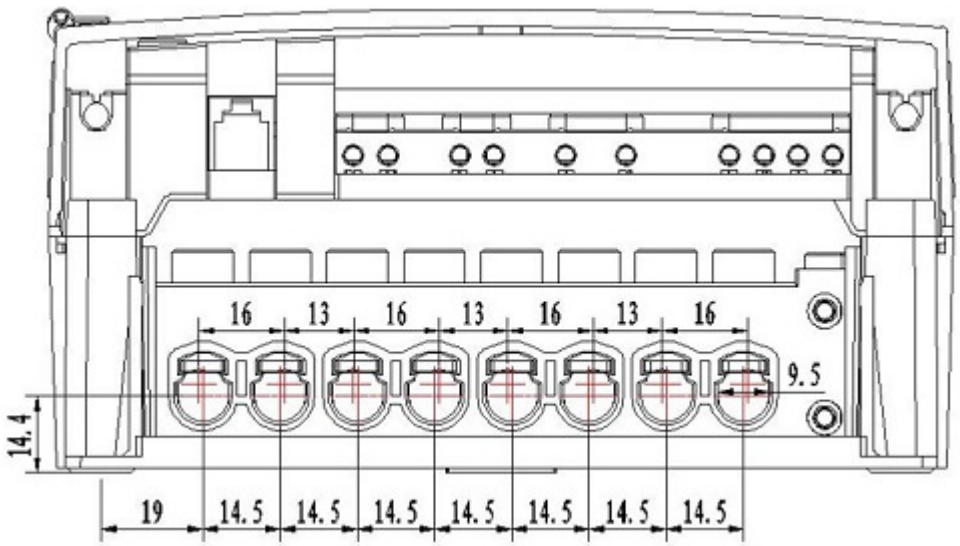
Suspension triangle	
Height (with open mounting)	195 mm
Height (with covered mounting)	162 mm
Width	150 mm

Dimensions with terminal cover



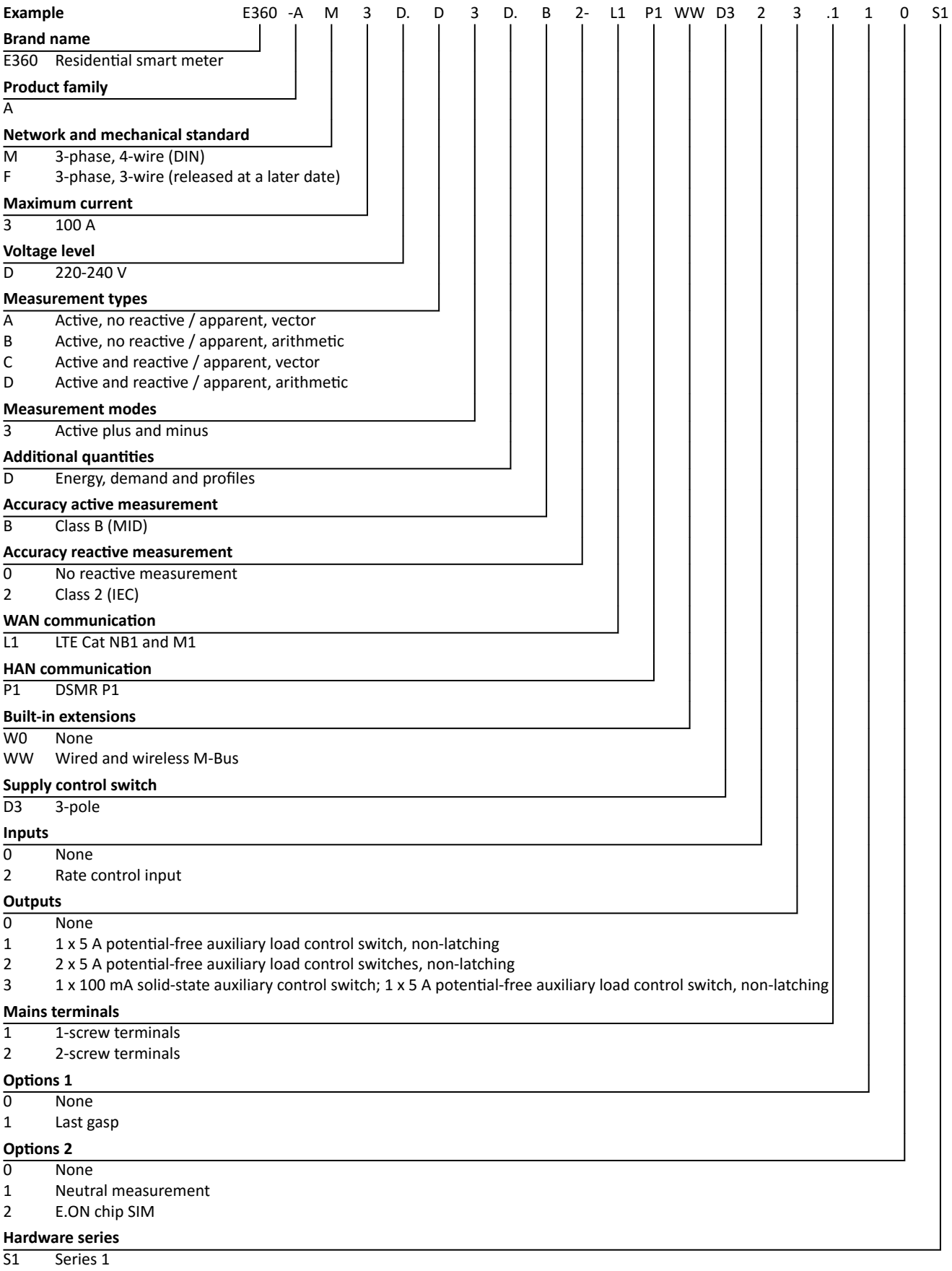


Dimensions of connection terminals



Type designation

The exact configuration of E360 meters is expressed in a type designation printed on the device faceplate.



Order options

Only the following E360 3-phase meter variants can be ordered.

Basic variant containing:

- LTE Cat NB1/M1 modem
- Last gasp
- Supply control switch
- Powered P1 port

For 4-wire networks, type designation: **E360-AM3D.x3D.B2-L1 P1 W0 D3 00.110 S1**

x = Measurement types can be freely chosen, see type designation table.

Full variant containing:

- Basic variant
- Wired M-Bus
- Wireless M-Bus
- 1 x auxiliary control switch (100 mA)
- 1 x auxiliary load control switch (5 A)
- Rate control input

For 4-wire networks, type designation: **E360-AM3D.x3D.B2-L1 P1 WW D3 23.110 S1**

x = Measurement types can be freely chosen, see type designation table.

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