

E220-AMxD

E220 Series 3

Technical data



The E220 Series 3 standalone meter meets all the requirements set by the Digitisation Act. It is designed to meet most of the FNN requirements for base meters and suits both 3-phase 4-wire and 1-phase 2-wire applications. The E220 is an SLP meter that also delivers GRID values. Optional modules available include a dual-rate module or an LMN interface (alternatively RS-485 or wireless M-Bus).

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Revision history

Version	Date	Comments
a	15.07.2021	First release.
b	16.12.2021	Updated sections for product safety and temperature ranges.
c	19.01.2022	Updated screw head type.
d	01.03.2022	Added aluminium wire compatible option.
e	05.04.2022	Updated type designation.
f	12.05.2022	Updated cover picture.

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Residential meter

The E220 Series 3 is a standalone meter (“moderne Messeinrichtung”) according to the Digitisation Act. The meter is suitable for both 3-phase 4-wire and 1-phase 2-wire applications.

The E220 is an SLP (Standard Load Profile) meter that measures active energy (A+ and/or A-) and shows the recorded values on display. If enabled, instantaneous power is displayed on the second line of the display.

According to the Digitalisation Act, the following historical values can be accessed through the main menu by entering the PIN code:

- Daily consumption 730 days
- Weekly consumption 104 weeks
- Monthly consumption 24 months (30 days)
- Annual consumption 2 years (365 days)

GRID functions

GRID values are available in each meter.

Configuration

The E220 can be ordered in four measurement mode configurations:

- +A with return stop
- -A with return stop
- +A/-A
- -A balanced

Options

The E220 has a module slot for options. There are several optional modules:

- Dual-rate module
- RS-485 LMN interface
- Wireless M-Bus LMN interface

Aluminium wire compatible terminal clamps are available as an option.

E220-AMxD Series 3 – Technical data

General

Functions

Measurement

E220-AM1D direct connected meter, 60A
Measurement system shunt

Control/operation

Optical interface / flashlight operation
according to FNN requirements

Push button

Operation according to FNN requirements

Outputs

Optical information and customer interface
INFO DSS unidirectional data push every second

Optical pulse output according to DIN EN 62056-21
E220-AM1D, 60 A 10,000 imp/kWh

Display

LCD display according to FNN
Number of lines 2 lines
Height of characters (values) 8 mm

FNN compliance

Meets the FNN requirements regarding display and operation, INFO-DSS interface, terminals and terminal cover.

Voltage and frequency

Nominal voltage U_n

E220-AM1D 3x230/400 VAC

Applicable to 230V alternating current networks

E220-AM1D L1, L2, L3

Extended operating voltage range

E220-AM1D 80% – 115% U_n

Nominal frequency f_n

E220-AM1D 50 Hz ($\pm 2\%$)

MID-specific data

Current

Reference current I_{ref}

E220-AM1D 5 A

Minimum current I_{min}

E220-AM1D $\leq 0.05 \times I_{ref}$

Maximum current I_{max}

E220-AM1D 60 A

Measurement accuracy

E220-AM1D according to EN 50470-3
Active energy class A, optionally class B

General data**Power consumption****Power consumption**

Voltage path per phase	< 0.7 W
Current path per phase at I_{ref}	< 0.01 VA

Environmental influences**Specified temperature range (ambient)**

Operating range	-25 °C ... +70 °C
Limit operating range	-40 °C ... +70 °C
Transport and storage range	-40 °C ... +70 °C

Ingress protection	according to IEC 60529 IP54
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Environmental conditions according to Measuring Instruments Directive (2014/32/EU)**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	acc. to IEC/CISPR 22 class B
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Fast transient burst test	according to IEC 61000-4-4
Current and voltage circuits under load	
according to IEC 62053-21	4 kV

Surge immunity test	according to IEC 61000-4-5
Current and voltage circuits	4 kV


Insulation strength**Insulation strength**

4 kV AC at 50 Hz during 1 min.

Impulse voltage 1.2/50 μ s	according to EN 50470-1
	4 kV

Rated impulse voltage	according to IEC 62052-31
	6 kV

Impulse voltage 0.1/2000 μ s	
	7 kV

Protection class	according to IEC 62052-11
Isolation	 II

Product safety	according to IEC 62052-31
Overvoltage category	III
Utilisation category	UC2
Extended environmental conditions	3K6
Pollution degree	2
Operating altitude	< 2,000 m

External phase connections

E220-AM1D	Using cable	Using pins
Minimum torque	> 2 Nm	
Maximum torque	\leq 3 Nm	\leq 2 Nm

Phase connections

Type	Cage clamp
Diameter E220-AM1D	7.3 mm
Screw head	Pozidriv no. 2 PlusMinus

Auxiliary voltage connections

Type	Screw terminal
Diameter E220-AM1D	3.0 mm
Screw head	Pozidriv no. 1

Permitted cable cross-sections**Massive wires**

E220-AM1D	1.5 to 25 mm ²
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Flexible wires must always be fitted with ferrules.

Material**Case**

Case material	polycarbonate (GF)
UV stabilised, fire retardant and self-extinguishing	
Housing	class V0
Terminal block	class V0

Weight and dimensions**Weight**

0.770 kg

Dimensions

Width	170 mm
Height including terminal cover	203.5 mm
Depth	52 mm

Options**Hardware options****RS-485 LMN (Local Metrological Network) interface**

Wired LMN (RS-485)	LMN-1
Transmission speed	921.6 kBits/s
Connector	RJ-12 / 6p6c

RS-485 interface isolation

Inputs	SELV
Open circuit voltage	12 VDC
Maximum circuit current	100 mA
Outputs	SELV
Voltage	12 VDC

Maximum current for each output 10 mA

Dual-rate modules

Terminals 13/15
Control voltage $U_s=230\text{ V}$

Module B2T/L2T 230 V (x.8.1)

Import 2-rates, export 2-rates (B2T/L2T);
 $U_s = 230\text{ V}$ for 1.8.1 and 2.8.1
 $U_s = 0\text{ V}$ for 1.8.2 and 2.8.2

Module B2T/L2T 230 V (x.8.2)

Import 2-rates, export 2-rates (B2T/L2T);
 $U_s = 230\text{ V}$ for 1.8.2 and 2.8.2
 $U_s = 0\text{ V}$ for 1.8.1 and 2.8.1

Module B2T/L1T 230 V (1.8.1)

Import 2-rates, export 1-rate (B2T/L1T);
 $U_s = 230\text{ V}$ for 1.8.1 and 2.8.0
 $U_s = 0\text{ V}$ for 1.8.2 and 2.8.0

Module B2T/L1T 230 V (1.8.2)

Import 2-rates, export 1-rate (B2T/L1T);
 $U_s = 230\text{ V}$ for 1.8.2 and 2.8.0
 $U_s = 0\text{ V}$ for 1.8.1 and 2.8.0

Dual-rate module interface isolation

Inputs HLV
Reinforced isolation by optocoupler
Passive inputs; external voltage required for activation
Control voltage 230 VAC
Maximum input current 0.8 mA

Wireless M-Bus module

Antenna internal antenna
Applicable standards EN 13757-4, T1
Open Meter System specification (Issue 4)
Frequency 868.95 MHz (868.7 MHz – 869.2 MHz)
Application layer protocol EN 13757-3
Security profile encryption mode 7
Transmission power
3.16 mW (5 dBm) – 25 mW (13.9 dBm)
Range in open area* up to 400 meters
Readout frequency every 16 seconds
* Actual range may vary depending on terrain and building structure.

Terminal cover

60 mm

80 mm

80 mm with auxiliary mounting

Optional aluminium compatible terminals

Firmware options

Measurement modes

+A with return stop; active plus only

-A with return stop; active minus only

+A / -A; active plus and active minus

-A balanced without return stop; active totalised

PIN protection

With PIN protection

Without PIN protection

Instantaneous power display

Displayed on 2nd line

Not displayed

Customer settings at power fail

Keep customer settings

Reset to factory settings

License declarations

Third-party / open source modules

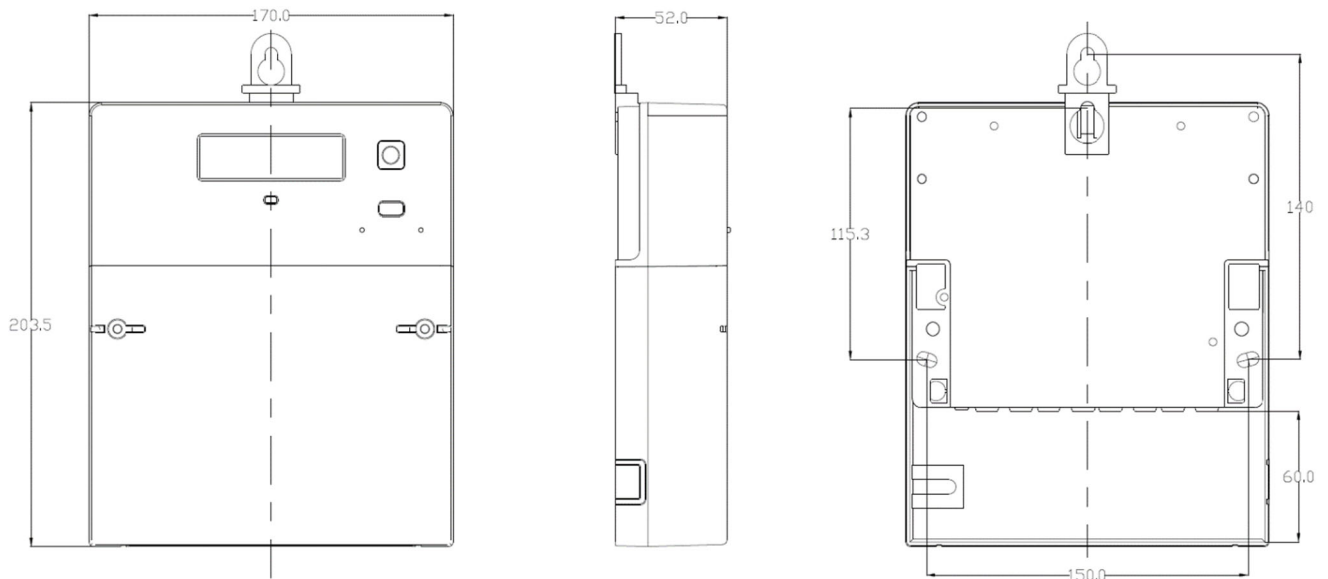
Components and copyright

Mbed TLS Package V2.4.2

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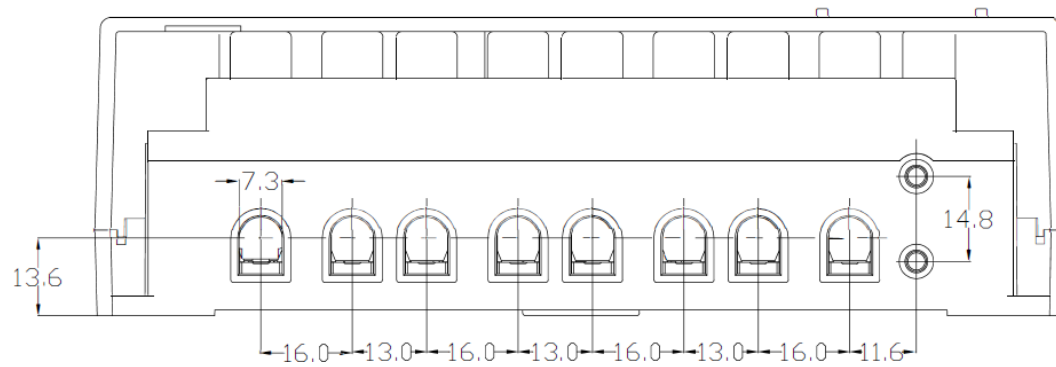
Case dimensions (with terminal cover and module cover)

E220-AM1D 60 A direct connected



Dimensions of connection terminals

E220-AM1D 60 A direct connected



Type designation

Example	E	220	-	A	M	1	D.	A	3	A.	A	0	-	S	0	0	-	S3
Brand name	E220 Residential smart meter																	
Product family	A Product family residential																	
Network and mechanical standard	M 3-phase, 4-wire DIN																	
Maximum current	1 Maximum current 60 A																	
Voltage level	D 230 V phase – neutral / 400 V phase – phase																	
Measurement modes	A Active, no reactive; vector value measurement																	
Measurement modes 2	1 +A with return stop; active plus only 2 -A with return stop; active minus only 3 +A / -A; active plus and minus 4 -A balanced without return stop; active totalised																	
Additional quantities	A Energy only																	
Accuracy active measurement	A Class A (MID) B Class B (MID)																	
Accuracy reactive measurement	0 No reactive measurement																	
Basic meter measurement	S SLP Standard Load Profile																	
Tariffication	0 Optional 2 Yes (Dual-Tarif module)																	
LMN interface	0 Optional B RS-485 module C Wireless M-Bus module																	
Hardware series	S1 Series 1 S2 Series 2 S3 Series 3 A3 Series 3 with aluminium wire compatible terminals																	

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