



## Operating instructions



Electronic

Three-phase meter

# DD3



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**1 Safety instructions**

The DD3 meter may only be used to measure electrical energy. Before connecting the meter, the conductors must be de-energized.

***Touching live parts can be life-threatening!***

Installation and assembly may only be carried out by a qualified electrician.

**2 Maintenance and warranty**

The DD3 meter is maintenance-free. If it is damaged (e.g., during transport), no repairs may be performed. Opening the meter or damaging it due to external influences will void the warranty.

**3 General description**

The DD3 meter operates as a direct-measuring three-phase or single-phase meter.

The installation takes place in meter panel systems with meter rooms according to DIN VDE 0603-1.

**4 Product description**

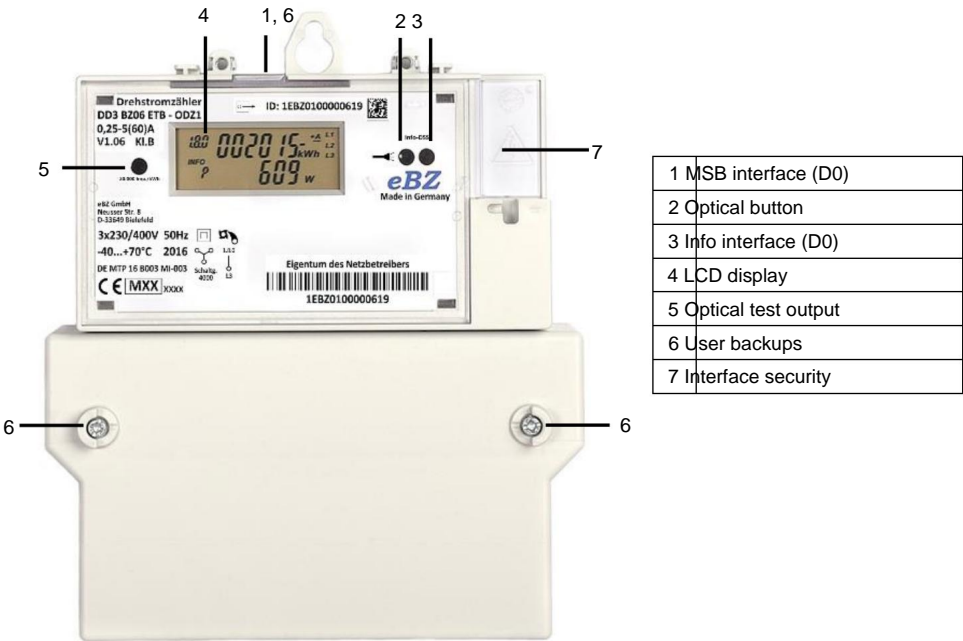


Fig. 1: Features of the DD3 meter

## 4.1 Meter types

The DD3 meter has a descriptive meter designation to illustrate the different variants. The factory configuration allows for 32 variants to be available. A separate type list is available, listing additional options.

**DD3** Three-point mounting, direct measurement, **3** phases

**Counting type, I<sub>max</sub>:**

**BZ06** **Reference meter** with backstop, I<sub>max</sub>=60A

**2R10** 2-way meter, sum of individual energies, I<sub>max</sub>=100A

**LZ06** **Delivery meter** with backstop, I<sub>max</sub>=60A

**LO10** Delivery meter without backstop, I<sub>max</sub>=100A

**Tariff register, accuracy class:**

**ETA** single tariff, class **A**

**DTB** double fare, class **B**

**Options:**




- **ODZ1:** OBIS-unidir., MODE-D (IEC 1107) **Z1:** with flashlight function

- **SMZ1:** SML bidirectional, **Z1:** with flashlight function

- **ODZ1W0:** additionally with integrated wireless M-Bus module

- **SMZ1W0:** additionally with integrated wireless M-Bus module

The DD3 meters with integrated wireless M-Bus module include additional operating instructions.

Counting type	Meter type	Symbols on the Nameplate	Value formation
<b>BZXX</b>	Three-phase reference meter (with backstop)	 1.8.0	$P\ddot{y} = PL1 + PL2 + PL3$ $P\ddot{y} > 0$ ; $P\ddot{y}^* \ddot{y} t \ddot{y} 1.8.0$
<b>2RXX</b>	Three-phase Bidirectional meter	 1.8.0 2.8.0	$P\ddot{y} = PL1 + PL2 + PL3$ $P\ddot{y} > 0$ ; $P\ddot{y}^* \ddot{y} t \ddot{y} 1.8.0$ $P\ddot{y} < 0$ ; - $P\ddot{y}^* \ddot{y} t \ddot{y} 2.8.0$
<b>LZXX</b>	Three-phase delivery meter (with backstop)	 2.8.0	$P\ddot{y} = PL1 + PL2 + PL3$ $P\ddot{y} < 0$ ; - $P\ddot{y}^* \ddot{y} t \ddot{y} 2.8.0$
<b>LOXX</b>	Three-phase delivery meter (without backstop)	2.8.0	$P\ddot{y} = PL1 + PL2 + PL3$ - $P\ddot{y}^* \ddot{y} t \ddot{y} 2.8.0$

Tab. 1 : Counting types and symbols on the nameplate (examples)

## 4.2 Circuit diagrams

The circuit for connecting the DD3 meter is indicated on the rating plate (see 4.3). The meter connection terminals are marked on the meter with the numbers from the following circuit diagrams:

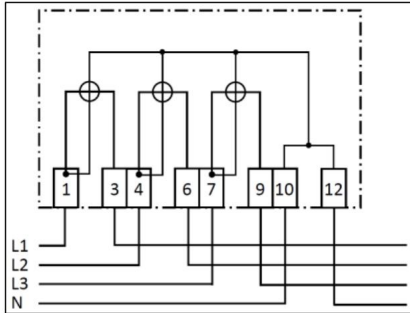


Fig. 2: Circuit 4000 (single tariff)

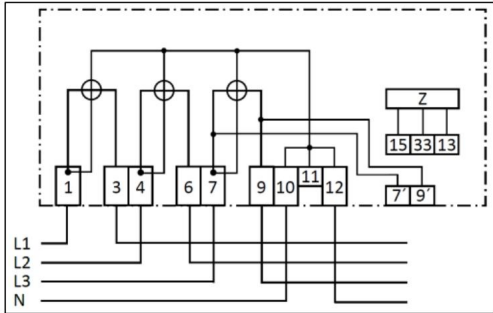


Fig. 3: Circuit 4102 (double tariff)

## 4.3 Internal rating plate

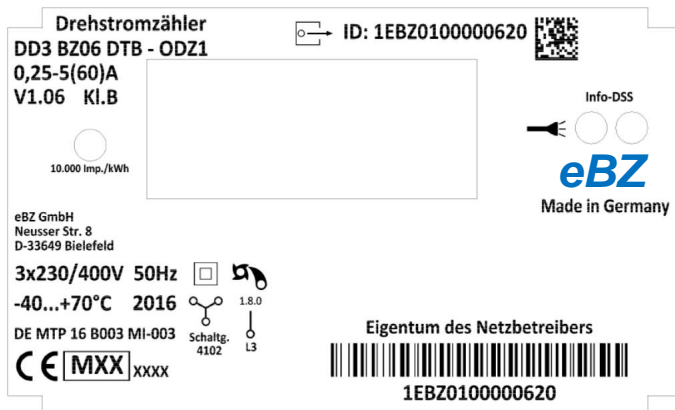


Fig. 4: Rating plate of the DD3 (example)

4.4 Display functions The

display is a liquid crystal display (LCD) with the following characters and symbols:

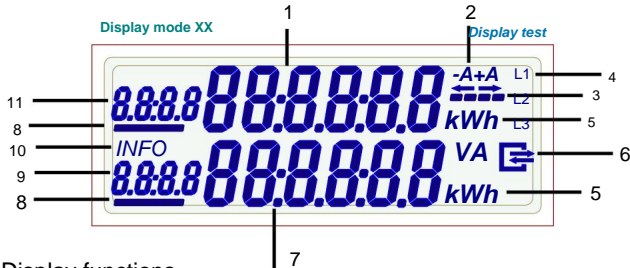


Fig. 5: Display functions

1	Energy display in kWh (meter reading): 6 digits, no decimal places	2	Display of energy direction +A (consumption) or -A (supply)
3	bar display of the measurement (symbols rolling = above the start-up threshold)	4	Display of conductor voltages (symbol on = conductor voltage present)
5	Unit of the displayed value	6	Communication
7	6-digit numeric keypad for: -		
8	Display of the active tariff (symbols on = active tariff register)		
9	Additional information (e.g. OBIS code of the energy register)		
10	Display of the info mode in the second line		
11	Additional information (e.g. OBIS code of the energy register)		

Tab. 2: Explanation of the display functions

5 Display of operating states

5.1 Power-On Reset



Fig. 6: Display test

as well as firmware and checksum

For all meter types described below, the power display can be deactivated, for example to ensure data protection.

5.2 Reference counter

Display of the energy value and the instantaneous power of the connected conductors

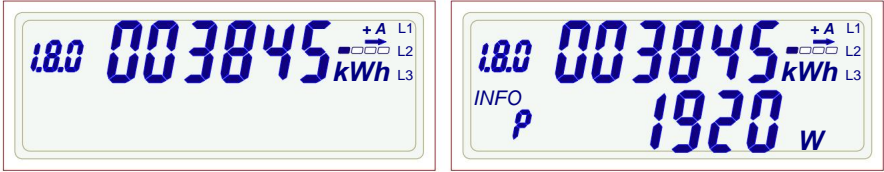


Fig. 7: Display of consumption meter without (left) and with (right) power display

5.3 Bidirectional meter

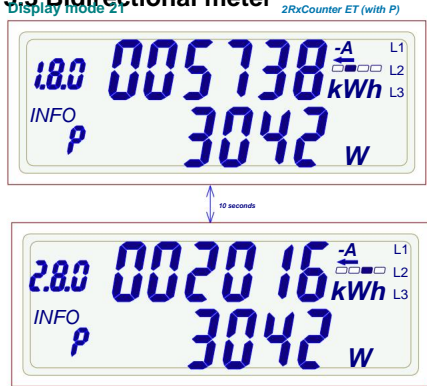


Fig. 8: Display 2-direction counter

The display switches every 10s between imported (1.8.0) and exported (2.8.0) Energy. The current counting direction is indicated by the symbol -A or +A

In this case, the current state is -A supply (export) of energy and the instantaneous power is 3042 W.

5.4 Delivery meters with or without backstop

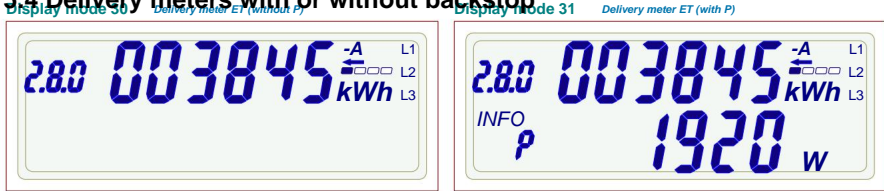


Fig. 9: Display of delivery meter without (left) and with (right) power display

The level of exported energy (-A, 2.8.0) is always displayed in kWh in the top line of the single-tariff delivery meter.

When the energy direction changes from export to import, the display changes from -A to +A. For a delivery meter with a backstop, no energy is counted in this case; for a meter without a backstop, the energy is subtracted from register 2.8.0.



Display mode 12      Reference counter DT (without P)      Display mode 13      Reference counter DT (with P)

**5.5 Dual-tariff meters** All meter

types described above are also available as dual-tariff meters with additional **kWh kWh** terminals 13 (230V) and 15 (N), the tariff registers can be switched. In addition, terminal P33 must be connected to 230V to switch the display to dual-tariff mode. The display switches every 10 seconds between

the tariff registers. The currently active tariff register is underlined.

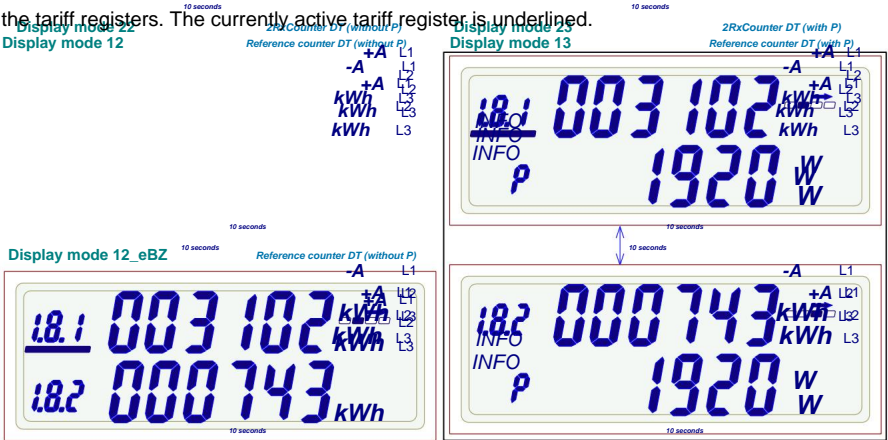


Fig. 10: Dual tariff consumption meter without (left) and with (right) power display

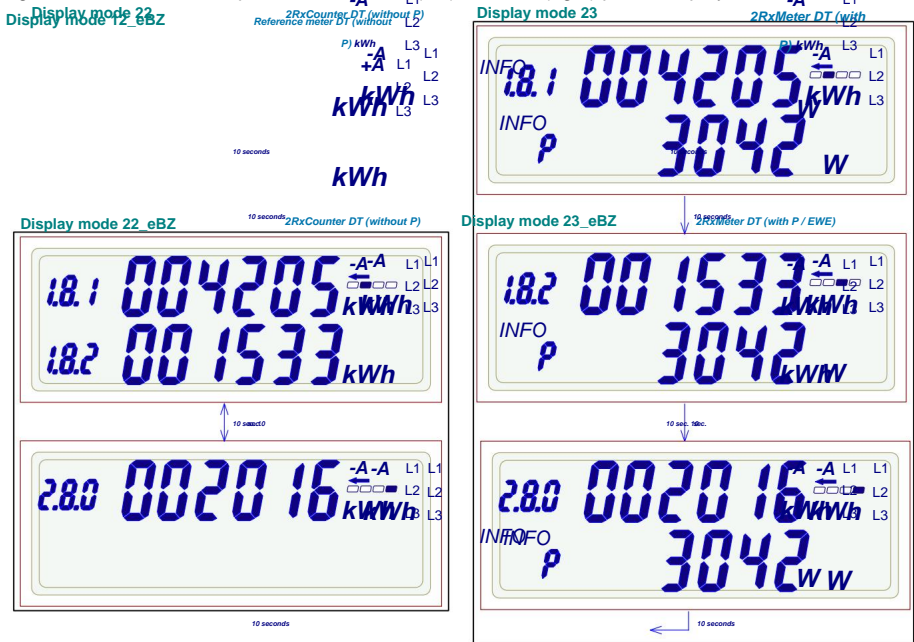


Fig. 11: Dual tariff 2-way meter without (left) and with (right) power display

Display mode 22\_eBZ      2RxCounter DT (without P)      Display mode 23\_eBZ      2RxMeter DT (with P / EWE)

**eBZ**

10 seconds

10 seconds

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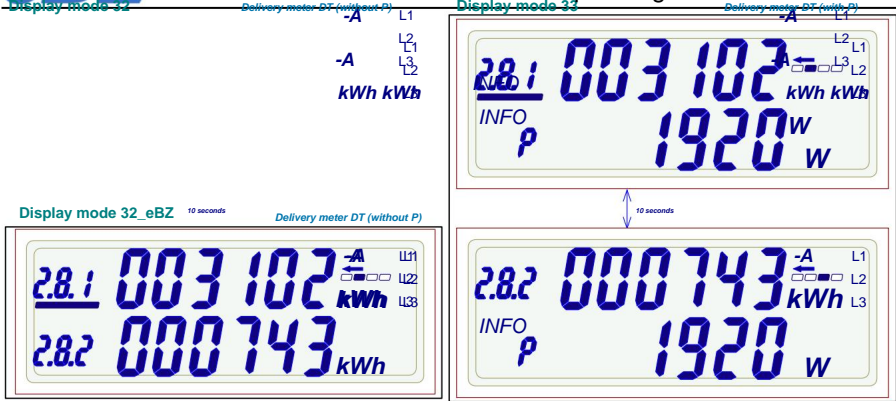


Fig. 12: Dual-tariff delivery meter without (left) and with (right) power display

Display mode 32\_eBZ

Delivery meter DT (without P)

## 6 Data Interfaces The DD3 meter has two

optical communication interfaces (MSB and Info, both infrared). Depending on the meter type, the MSB interface is unidirectional (OBIS) or bidirectional (SML, then sealed). The following measured values ( kWh) are output:

designation	OBIS code / SML identifier	Comment / Example
Manufacturer identification	Not required 81 81 C7 82 03 FF	Manufacturer identification and device type with software version: /EBZ5DD3BZ06ETA_107 Ownership
Ownership number	1-0:0.0.0*255 01 00 00 00 00 FF	number according to customer request, otherwise according to DIN 43863-5.
Device identification (cross-manufacturer identification number)	1-0:96.1.0*255 01 00 00 00 09 FF	According to DIN 43863-5 e.g.: 1EBZ0100000024
Meter reading to +A, tariff-free	1-0:1.8.0*255 01 00 01 08 00 FF	Resolution 10 $\mu$ W*h (6 digits before and 8 digits after the decimal point)
Meter reading to -A, tariff-free	1-0:2.8.0*255 01 00 02 08 00 FF	Resolution 10 $\mu$ W*h (6 digits before and 8 digits after the decimal point)
Meter reading for +A, tariff 1	1-0:1.8.1*255 01 00 01 08 01 FF	Resolution 1 W*h (6 digits before and 3 digits after the decimal point)
Meter reading for +A, tariff 2	1-0:1.8.2*255 01 00 01 08 02 FF	Resolution 1 W*h (6 digits before and 3 digits after the decimal point)
Meter reading for -A, tariff 1	1-0:2.8.1*255 01 00 02 08 01 FF	Resolution 1 W*h (6 digits before and 3 digits after the decimal point)
Meter reading for -A, tariff 2	1-0:2.8.2*255 01 00 02 08 02 FF	Resolution 1 W*h (6 digits before and 3 digits after the decimal point)
Sum of instantaneous power in all phases	1-0:16.7.0*255 01 00 10 07 00 FF	Resolution 0.01W (5 digits before and 2 digits after the decimal point)
Instantaneous power in phase L1	1-0:36.7.0*255 01 00 24 07 00 FF	Resolution 0.01W (5 digits before and 2 digits after the decimal point)
Instantaneous power in phase L2	1-0:56.7.0*255 01 00 38 07 00 FF	Resolution 0.01W (5 digits before and 2 digits after the decimal point)

designation	OBIS code / SML identifier	Comment / Example
Instantaneous power in phase L3	1-0:76.7.0*255 01 00 4C 07 00 FF	Resolution 0.01W (5 digits before and 2 digits after the decimal point)
Voltage in phase L1	1-0:32.7.0*255 01 00 20 07 00 FF	Resolution 0.1V ( <i>only via MSB</i> )
Voltage in phase L2	1-0:52.7.0*255 01 00 34 07 00 FF	Resolution 0.1V ( <i>only via MSB</i> )
Voltage in phase L3	1-0:72.7.0*255 01 00 48 07 00 FF	Resolution 0.1V ( <i>only via MSB</i> )
Status word	1-0:96.5.0*255	4 bytes of information about the Operating status
Seconds index	0-0:96.8.0*255 <i>actSensorTime</i>	Time of operation, 4 bytes (hex) <i>E.g.: 00017A9F (96927 sec)</i>

Tab. 2: Content of the data telegrams

The protocol is implemented according to EN62056-21 and EN62056-61 or SML 1.04.

The counter sends one data set per second in push mode.

Access to the MSB interface is described in Chapter 7.1.7 of the EDL21 Specification 1.2. The meter's reactions and responses to all listed parameters are thus defined and correspond to the SML protocols of versions 1.03 and 1.04. DD3 electricity meters only support the SML commands according to EDL21, not those according to EDL40.

## 6.1 Structure of the data telegrams

### for OD types:

Telegram Mode D: Format:                   according to DIN EN 625056-21 (for OD types)  
9600 baud (Z=5); (7, even, 1)

### for SM types:

Format:                                       9600 baud; (8, none, 1)

## 6.2 Structure of the info telegrams

The content of the INFO telegrams is configurable (ex works or with an optical button as described in Chapter 12). A distinction is made between "reduced" and "complete" data sets. With the "reduced data set," only counter readings without decimal places, status word, and second index are transmitted.

## 6.3 Interfaces for supplying expansion modules

Hidden at the top right of the meter housing is an interface for supplying additional devices with 230 VAC. To access this interface, the sealing cap (user protection) must be removed. L3 and N are provided directly from the input terminals. A connector allows the expansion module to be operated with either utility or customer power. On dual-tariff meters, the additional terminals 7' (utility power), 8' (utility power), and 9' (power supply) are also used to supply expansion modules.

9' (customer flow) and 11 (N) are offered.

## 7 Optical pulse output

The DD3 features an optical test output (pulse output) in accordance with EN50470-1. The pulse constant is 10,000 pulses/kWh with a pulse width of 2 ms. The infrared LED does not transmit any further signal states and remains continuously lit below the start-up threshold.

## 8 Technical data of the meters

Accuracy class:	Class A or Class B according to EN50470-1
Reference current Iref:	5A
Limiting current I <sub>max</sub> :	60A, 100A
Starting current actual :	≤ 20mA
Minimum current I <sub>min</sub> :	250mA
Transition current I <sub>tr</sub> :	500mA
Reference voltage U <sub>n</sub> :	230V
Reference frequency f <sub>n</sub> :	50 Hz
Counter constant:	LED output (infrared) with 10,000 pulses/kWh
LCD display:	6 decimal places, 0 decimal places, 2 lines
Terminal block: 8 terminals, each with Ø 8.5 mm,	Screws 2 x M6 per clamp, drive PZ2 combination slot
Additional terminals,	5 tension clamps: 7', 9', 13, 15, 33 with screw M3
only for dual tariff:	1 N terminal 11 with screw M2.5
Outputs:	Optical test output according to EN50470-1 MSB and info interface (see above)
Power consumption:	≤ 0.005 W at 5A / ≤ 1.0 W at 60A in the current path ≤ 0.65 W / 3.5 VA in the voltage path
Temperature range:	-40° C...+70° C (-20°C...+70°C for W0 types)
Humidity:	max. 95%, non-condensing
Mechanical / EMC	
Requirement class:	M1 / E2
Use of the counter:	Interior
Weight:	approx. 0.6 kg
Protection class:	II
Protection class (housing):	IP51

## 9 Instructions for assembly

The recommended conductor cross-sections for connecting the meters are:

Meter DD3XX06XTX (I<sub>max</sub> = 60A): 16mm<sup>2</sup>

Meter DD3XX10XTX (I<sub>max</sub> = 100A): 25mm<sup>2</sup>

Recommended tightening torque of the terminal screws: 3 Nm.

Conductor cross-sections of the dual-tariff additional terminals:

Meter DD3XXXXTX only: 0.5 to 1.5mm<sup>2</sup>

Recommended tightening torque of the auxiliary terminal screws: 0.5 Nm.

The standard terminal cover covers the connection area and provides 60mm of clearance for the connecting cables (see Chapter 12). Terminal covers with 40, 80, or 100mm clearance are also available for special cases.

## 10 functional errors

The DD3 is equipped with internal error monitoring to monitor for malfunctions.

If an error is detected that causes the meter to measure outside the permissible accuracy, the energy registers and the second index are saved along with the current meter readings. The meter stops measuring in all three phases and must be removed. The error code is shown on the display alternating with the energy registers and is

cannot be erased. The occurrence of the error can then be precisely timed using the stored second index and the installation date.

Display error	description
<b>FF01</b>	Hardware error
<b>FF02</b>	Parameter error
<b>FF03</b>	Energy storage (EEPROM) faulty

## 11 Reading the energy registers in the absence of Conductor voltages

The DD3 meter can be powered by applying a protective extra-low voltage near the terminal block using the eBZ Checker, allowing meter readings to be viewed on the display. Furthermore, in this operating mode, the data telegrams from the info interface can be read using a probe, and historical data can be displayed using an optical button. This allows meter readings to be displayed even when line voltages are not present (e.g., during stock removal, in deactivated customer systems, or after the meter has been removed). The eBZ Checker is available separately upon request.

## **12 Optical button and display of additional information**

The meter has a so-called optical button (light sensor) that can be operated using a standard flashlight.

It is possible to activate or change the information display (second line) on the screen. This is done with a light pulse of >1 second on the sensor next to the flashlight symbol.

After the first light pulse, the display shows "all segments" (first and second lines alternating). Then, the 4-digit PIN can be entered. The first digit shows a "zero"; short light pulses (<2s) determine the number of the first digit. After a short pause (>2s), the second digit shows a "zero", so

that the number can be entered here, etc. After the PIN has been entered correctly and another short light pulse is given, the difference (E) between the current value and the last reset is displayed in kWh ("trip meter").

This display is reset with a long light pulse (>2s).

A short light pulse displays the daily value (1d). This value is based on the difference between the current value and the value from 24 hours ago (hourly based).

A long light pulse displays the daily values (day-based) -1, -2, -3, up to -730. If no value is displayed, no value is available yet.

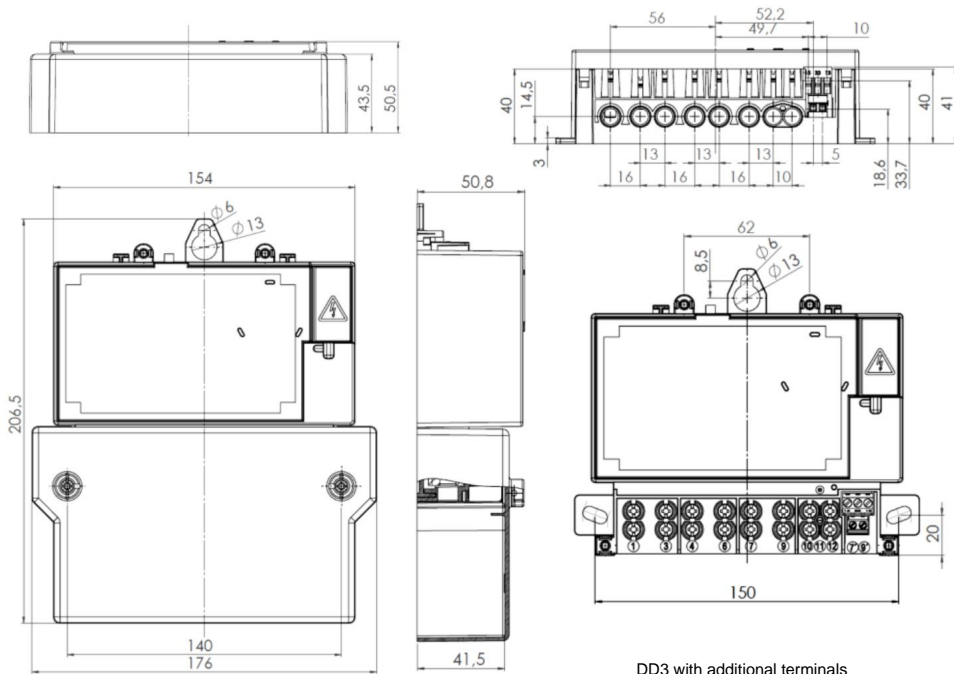
The following information values 7d (-1, -2, to -104), 30d (-1, -2, to -24) and 365d (-1, -2) can be used equivalently.

Afterwards, all historical information values can be deleted with a long light pulse and the internal calculation time starts again at zero.

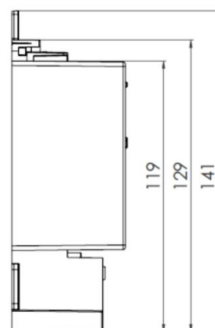
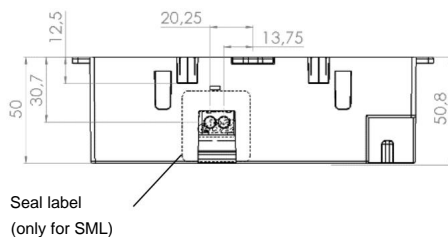
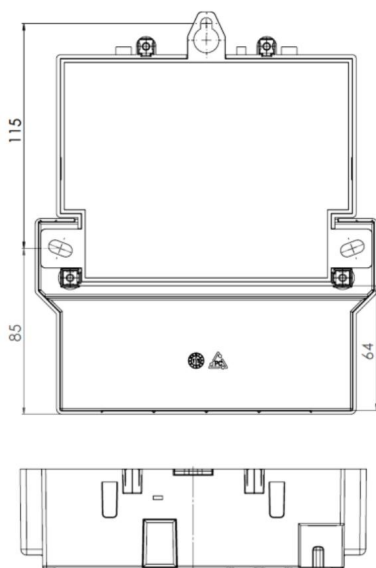
## **13 functions subject to conformity assessment**

The conformity of the DD3 meters was assessed with regard to the displayed energy registers, and the DD3...W0 (wireless M-Bus internal) was also assessed according to PTB 50.8. The power display and historical data are not part of the conformity assessment.

# 14 Dimensions of the DD3 meter



DD3 with terminal cover 60 mm



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