EN

Universal measuring device

This quick-start guide does not replace the operating manual. The manual is available in the download area of our homepage (https://www.bender.de/en/service-support/downloads).
Make sure that the personnel has read the operating manual and understood all instructions relating to safety.

Scope of delivery

1 x PEM353, 1 x rubber seal, 4 x retaining clips, 1 x safety instructions for Bender products (multilingual), 1 x quick-start guide

Intended use

The PEM353 is suitable for use in 2-, 3- and 4-wire systems and in their respective versions as TN, TT and IT systems. The current measurement inputs of the PEM353 are always connected via external …/1A or …/5A measuring current transformers. In principle, measurements in medium and high-voltage systems are carried out via voltage transformers.
Use for the intended purpose also includes:

- Device-specific settings compliant with local equipment and operating conditions
- Adhering to the manual

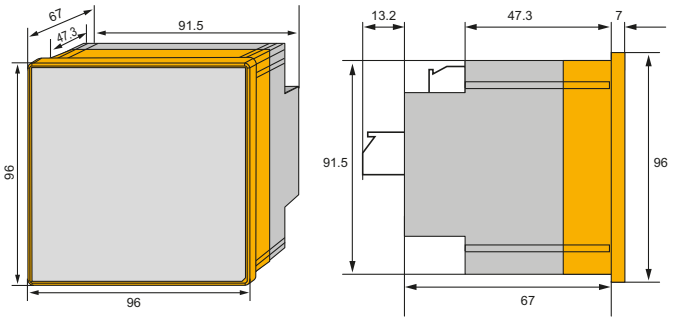
Any other use than that described in this manual is regarded as improper.

Safety instructions

DANGER

Risk of fatal injury due to electric shock!
Touching live parts of the system carries the risk of an electric shock, damage to the electrical installation or destruction of the device.
***Before installing and connecting the device, make sure** that the **installation** has been **de-energised**.*
Observe the rules for working on electrical installations.
***Refer to the rated and supply voltage values** as specified in the technical data!*

Installation



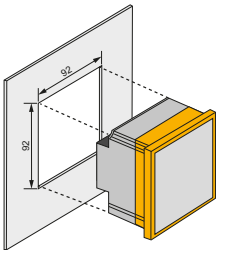
Dimensions in mm

Mounting in a front panel

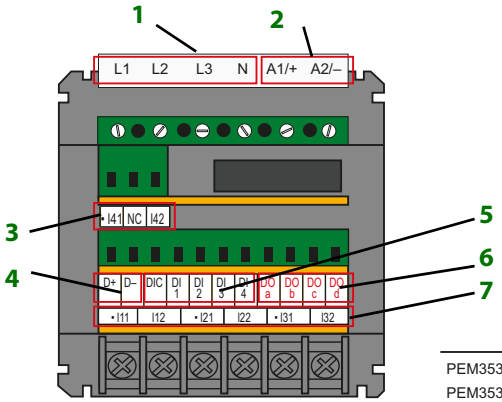
Mounting opening 92 mm x 92 mm (max. 92.8 x 92.8 mm).

1. Mount the rubber seal on the back of the device.
2. Insert the device into the mounting opening of the front panel.
3. Place the four retaining clips over the device corners from behind.
4. Push the retaining clips tightly against the front plate.
5. Check the device to ensure that it is firmly installed.

The device is installed.



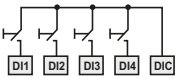
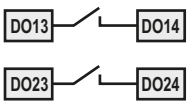
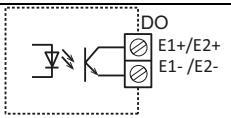
Connection



Overview of the terminals:
The connections are located on the back of the device

	DO a	DO b	DO c	DO d
PEM353(-N)	DO13	DO14	DO23	DO24
PEM353-P	E1+	E1-	E2+	E2-

Legend

No.	Connections
1	**Measuring voltage inputs**: The measuring leads should be protected with 2 A fuses.
2	**Supply voltage**: Power protection by a 6 A fuse, quick response. If being supplied from an IT system, both lines have to be protected by a fuse.
3	Measuring current inputs I_4 (PEM353-N only)
4	**RS-485 bus** connection; Up to 32 devices can be connected to the bus. The maximum cable length for the bus connection of all devices is 1200 m.
5	4 **Digital inputs**, galvanically isolated, 24 V; An external circuit providing at least a current I_{min} of 1 mA is required for triggering the inputs. 
6	**Digital outputs**  **PEM353(-N)** features 2 configurable outputs (N/O relay)  **PEM353-P** features 2 pulse outputs ("Solid State Relay")

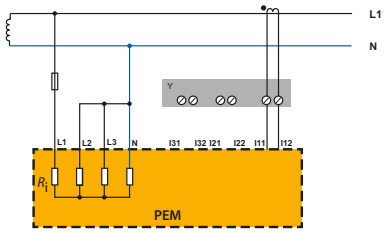
7	**Measuring current inputs $I_{1...3}$** Current measurement inputs must not be "protected" by fuses. Provide a shorting block for each current measurement input as described in IEC 60364-5-55 (edition 2.2) chapter 557.5.3 (wiring diagrams: disconnect terminal of the measuring current transformers "Y"). The current measurement inputs must not be earthed in low-voltage applications.

Connection diagrams

Connect the device according to the connection diagram. Please observe the technical data.

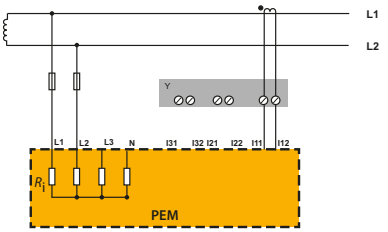
1P2W L-N

Source **Load**



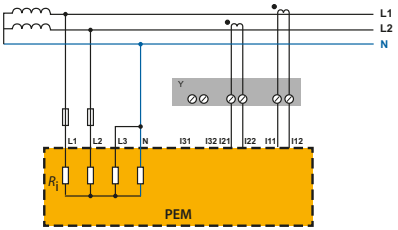
1P2W L-L

Source **Load**



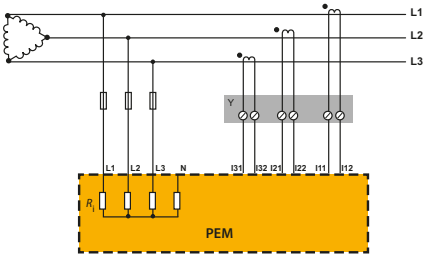
1P3W with 2 measuring current transformers

Source **Load**



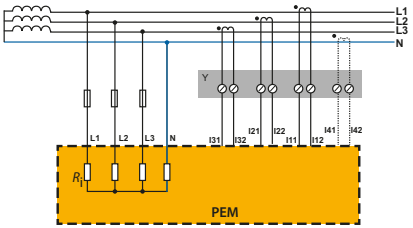
3P3W with 3 measuring current transformers

Source **Load**



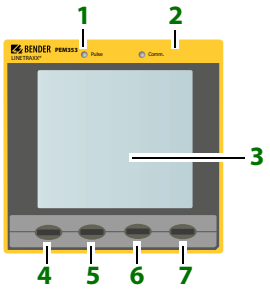
3P4W with 3 (4) measuring current transformers

Source **Load**



In principle, measurements in **medium and high-voltage systems** are carried out via voltage transformers. Please refer to the manual for wiring diagram examples.

Operating elements



No.	Element	Description
1	Pulse LED (red)	Indication of energy pulsing
2	Comm. LED (green)	Indication of communication activity
3	Display	LCD graphic display
4	Button 1	The function of the buttons varies depending on the context. The meaning of the buttons is always shown on the display above the corresponding button.
5	Button 2	
6	Button 3	
7	Button 4	

Setup menu overview

Browse: View configuration

Enter Password: The configuration can be changed after entering the correct password. (Factory setting: 0000)

- Setup
  - Browse / Enter Password
    - Basic: Wiring Mode, PT Primary, PT Secondary, CT Primary, CT Secondary, I4 Primary, I4 Secondary, PF convention, kVA calculation, CT1...3 polarity, THD calculation method, Demand Period, No. of windows, Predicted response, EN pulse constant, LED EN pulse, EN Period, kvarh Calc., On Time Threshold
    - Comm.: COM1...2: Protocol, Unit ID, Baud rate, Data format
    - Setpoints: Group 1...9: Type, Parameter, OverLimit, UnderLimit, ActiveDelay, InactiveDelay, Trigger 1...2
    - I/O: Digital Input: Function, Debounce, Pulse weight; DO Pulse width: DO1, DO2; DO Function
    - Display: Timeout, Contrast, Language, Delimiter, Main 1...4, Setpoint LCD Alarm
    - Clock: Time, Date, Date format
    - Maintenance: Password Setup, Clear registers, Clear all data, DO control
    - Information: Firmware, Update, Modbus, BACnet MSTP, DNP, Serial number

Bender GmbH & Co. KG
Postfach 1161 • 35301 Grünberg • Germany
Londorfer Str. 65 • 35305 Grünberg • Germany
Tel.: +49 6401 807-0 • Fax: +49 6401 807-259
E-Mail: info@bender.de • www.bender.de
Manual: www.bender.de/manuals