PEM735

Universal measuring device

This reference guide does not replace the operating manual!

The manual is available on our Web site www.bender.de
Make sure that the relevant personnel has read this manual and understood all instructions relating to safety.

1. Safety instructions

DANGER

Danger of electric shock!
Follow the basic safety rules when working with electricity. Consider the data on the rated voltage and supply voltage as specified in the technical data!

2. Intended use

The universal measuring device PEM735 is suitable for

- Analysing energy and power
- Monitoring the supply voltage quality (Power Quality) in accordance with DIN EN 50160
- Recording relevant energy management data (Energy Management)

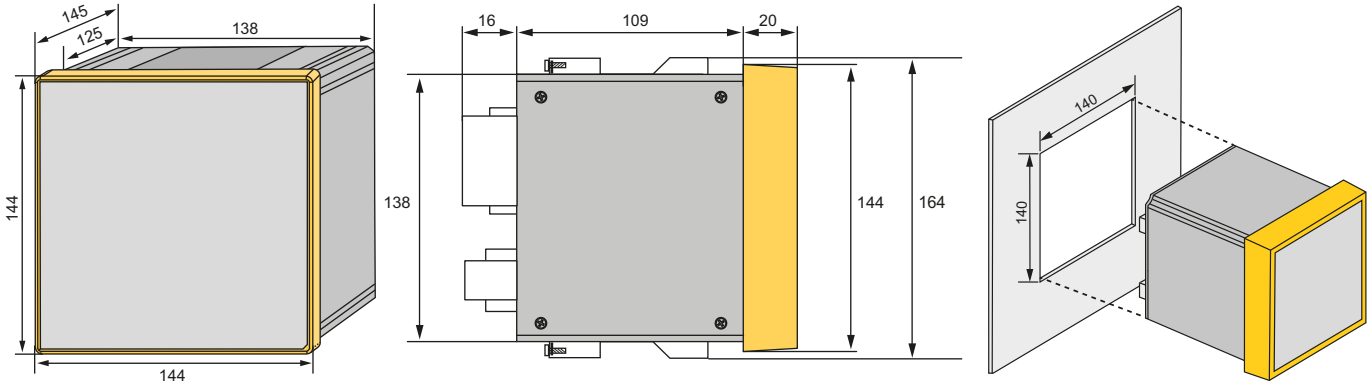
As a compact device for front panel mounting, it can replace analogue indicating instruments. The PEM575 is suitable for 3 and 4-wire systems and can be used in TN, TT and IT systems. The current measurement inputs of the PEM are connected via external ../1 A or ../5 A measuring current transformers. In principle, measurements in medium- and high-voltage systems are carried out via measurement transformers and voltage transformers. The accuracy of the active energy metering corresponds to class 0.2 S, which is in compliance with the DIN EN 62053-22 (VDE 0418 Part 3-22):2003-11.

3. Scope of delivery

- 1 PEM735
- Safety instructions
- Quick reference guide
- 1 Sealing frame with protection level IP54

4. Installing the device

Front-panel mounting (front view, side view, panel cutout)

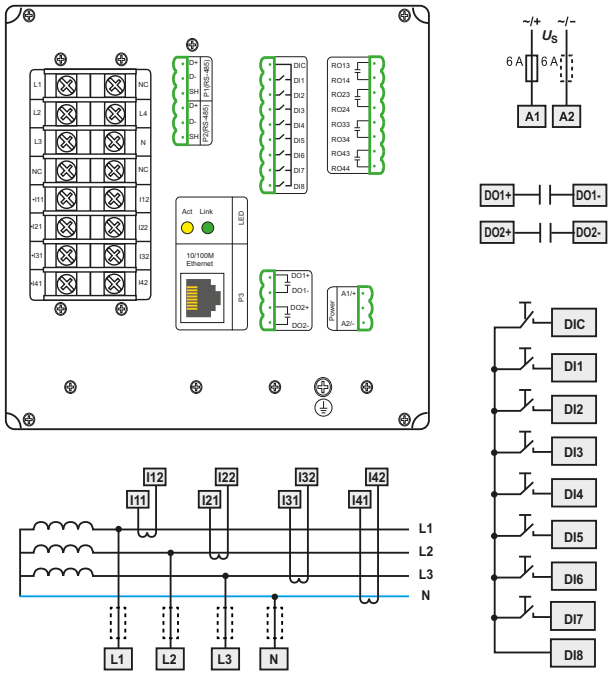


A front-panel cutout of 140 mm x 140 mm is required for the device.

1. Insert the device through the cutout in the front panel.
2. Insert the two installation clips into the equipment rail from behind.
3. Push the clips towards the front panel and tighten the associated screws by hand.
4. Check the device to ensure that it is firmly installed in the front panel.

5. Connecting the PEM735

Wiring diagram



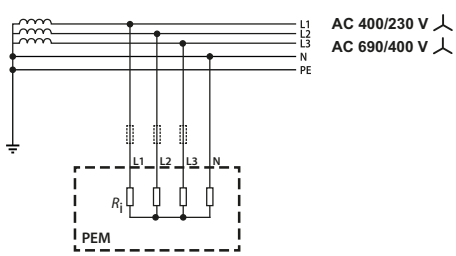
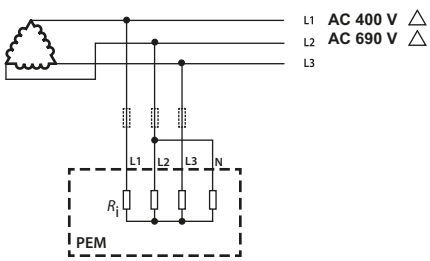
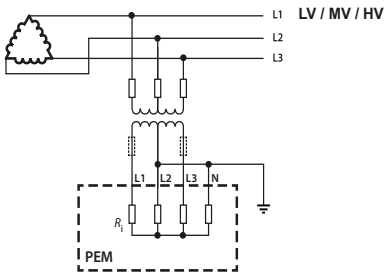
Wiring diagram legend

Terminal	Description
A1, A2, ⏚	Connection to supply voltage, 6 A fuse (when supplied by IT systems, both phase conductors have to be protected).
DI1…DI6, DIC	Digital inputs (24 V)
DO1+, DO1-, DO2+, DO2-	Digital outputs (N/O contacts, 80 V/50 mA)
RO13/RO14, RO23/RO24, RO33/RO34 RO43/RO44	Relay outputs (250 V/3 A)
I11, I12, I21, I22, I31, I32	Connection to the system to be monitored: The measuring leads should be protected with appropriate fuses (6 A).
D+, D-, SH	RS-485 bus connection
L1, L2, L3, N	Measuring voltage inputs: The measuring leads should be protected with appropriate fuses.
	**Modbus TCP: Pin assignment** 1 Transmit Data + 2 Transmit Data – 3 Receive Data + 4, 5, 7, 8 not used 6 Receive Data –

Connection

1. Connect the device according the wiring diagram. The connections are located on the back of the device. Connect the PEM735 to the supply voltage (terminals A1/+, A2/-. Connect terminal " ⏚ " to the protective conductor.
2. Line protection: A 6 A fuse is recommended for both lines if being from an IT system.
3. Connection to the RS-485 bus is made via terminals D+, D- and SH. Up to 32 devices can be connected to the bus. The maximum cable length for the bus connection of all devices is 1200 m.

6. Connecting the voltage inputs

Three-phase 4-wire system (TN, TT, IT system)	Three-phase 3-wire system	Connection via voltage transformers
The PEM can be used in three-phase 4-wire systems, independent of the type of distribution system (TN, TT, IT system).	The PEM can be used in three-phase 3-wire systems.	The measuring device can be used in medium- and high-voltage systems if coupled via voltage transformers. The transmission ratio can be adjusted in the PEM735 (primary and secondary side separately).
		

7. Commissioning the device

Check for proper connection
Observe the relevant standards and regulations for installation and connection as well as the operating manual of the respective device.

Before switching on:
consider the following:

1. Does the connected supply voltage correspond to the information on the nameplate?
2. Are you sure that the nominal insulation voltage of the measuring current transformer has not been exceeded?
3. Does the measuring current transformer's maximum current correspond to the nameplate information of the connected device?

After switching on:
proceed as follows:

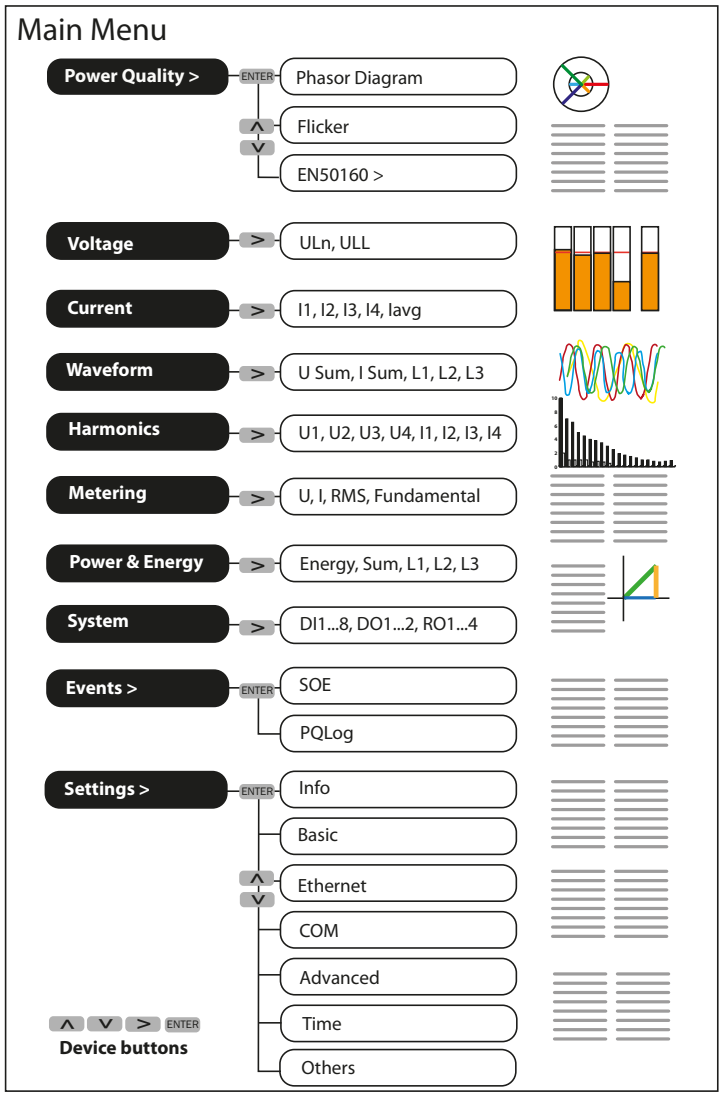
1. Connect the supply voltage.
2. Set the bus address/IP address.
3. Select wye or delta connection.
4. Set the CT transformation ratio (for each channel).
5. Change the measuring current transformer's counting direction, if required.
6. Set the nominal voltage (line-to-line voltage ULL, secondary voltage for voltage transformers)

8. Start

Basic parameters, interfaces or calculation types can be specified in the "Settings" menu.

A correct password must be entered before parameter changes are allowed. (factory setting: 0000)

The following diagram will help you to familiarise yourself with the menu:



9. Display and operating controls

Display and operating control legend

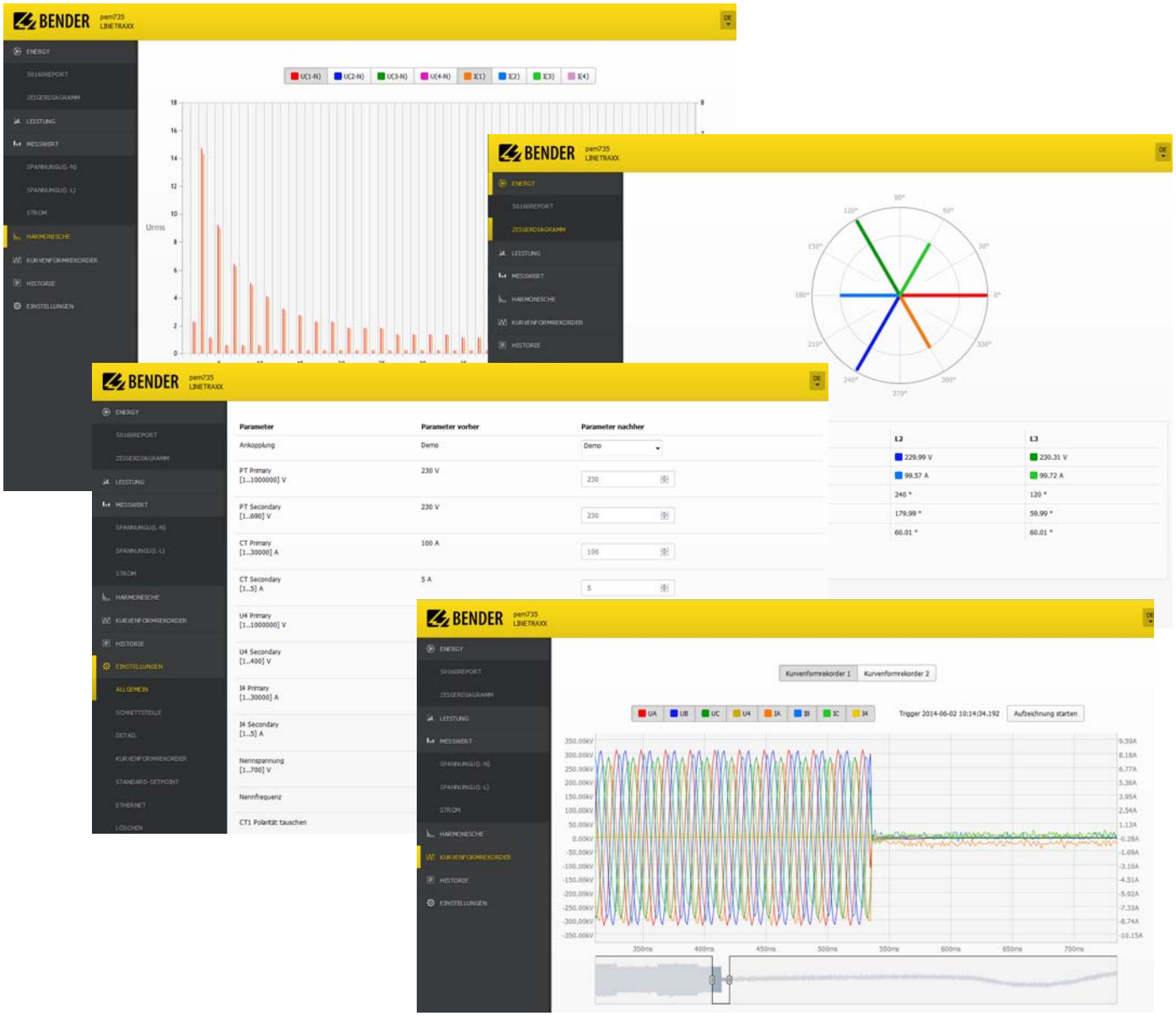
LEDs	kWh, kvarh					
Buttons	<	∧	∨	>	ENTER	ESC
	Back; Submenu: scroll; Selection left side	Main menu: move upwards in the menu; Increase number/selection	Main menu: move down in the menu; Decrease number/selection	Select menu item; Submenu: scroll; Selection right side	Ok; Enter submenu; "Freeze" waveform recorder	Leave submenu item; "Unfreeze" waveform recorder"

10. Data display via buttons

The evaluation of **a number of measured values** can be accessed directly on the device using the device buttons, without having to use the communications interface. Thus it is possible to show the phasor diagram, reports, flicker, currents and voltages, current waveforms, harmonics, … directly on the display.

11. Data display via communication interface/Web interface

All measuring values can be obtained via the communications interface. Details concerning the Modbus register assignment can be found in the operating manual.



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