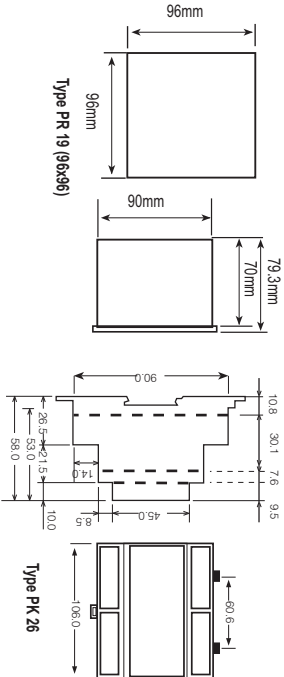
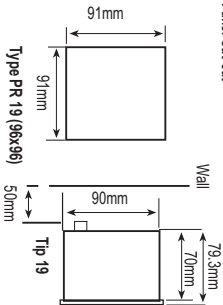


MULTIMETER EPM-04 / 04C / 04CS

Dimensions



Panel Cut-out

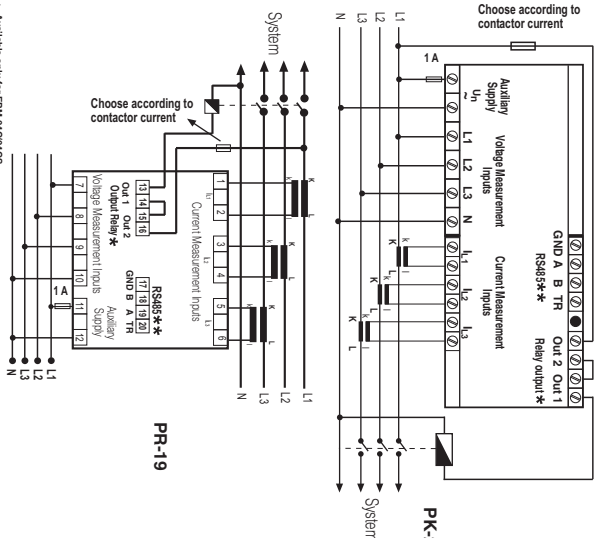


Summary of the Contact Operations *

ALTERNATIVE 1 (U-I)		ALTERNATIVE 2 (H-I)	
Current -->	Under/Over	Voltage -->	Under
Voltage -->	Under/Over	Frequency -->	Under
Frequency -->	Under/Over	Current -->	Under
Phase Seq.		Phase Seq.	

* Valid for EPM-04C/04CS

Connection Diagram



PR-19

PK-26

.. Available only for EPM-04C/04CS

.. Available only for EPM-04C/04CS

.. Available only for EPM-04C/04CS

Note: For CT-25 models:

k: When CT-25 is used, Red cable is connected to k terminal.

l: When CT-25 is used, Black cable is connected to l terminal.

A4034 / Rev/8



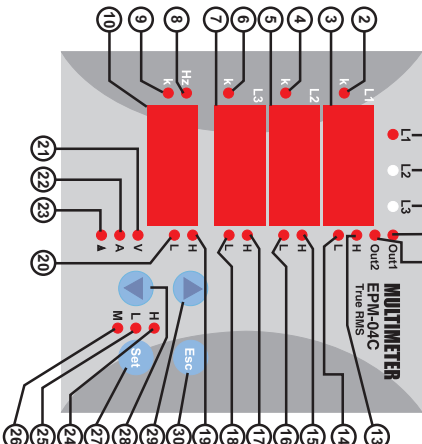
MULTIMETER EPM-04 / 04C / 04CS

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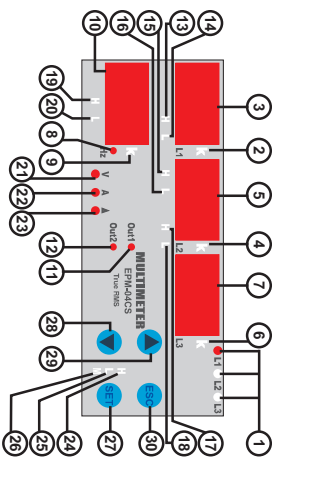
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Unit Conversion Menu (Pa / Hz / Hz / Hz)	2
Activating the User Password (Pw Act Menu)	2
Changing the User Password (Pw Chg Menu)	2
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PRECAUTIONS FOR INSTALLATION AND SAFE USE

- CT-25 (1200) compliant models, only CT-25 current transformer must be used.
- Other type of CTs have a high risk to damage to device.
- Failure to follow these instructions will result in death or serious injury.
- Disconnect all power before working on equipment.
- When the device is connected to the network, do not remove the front panel.
- Do not try to clean the device with solvent or the like. Only clean with dry cloth.
- Verify correct terminal connections when wiring.
- Electrical equipment should be serviced only by your component seller.
- Only for rack panel mounting.
- Fuse must be F type and limit value doesn't exceed 1A.
- No responsibility is assumed by manufacturer or any of its subsidiaries for any consequences arising out of the use of this material.



Z-TRAUQ INC.



- Phase LEDs: The LEDs turn on when the voltage value, which is applied to one of the current inputs, reach 30 V.
- First display's k LED (for L1): Measurement parameter is the unit of kilo when LED is turned on: ie: kA, kV.
- Display for L1.
- Second display's k LED (for L2): Measurement parameter is the unit of kilo when LED is turned on: ie: kA, kV.
- Display for L2.
- Third display's k LED (for L3): Measurement parameter is the unit of kilo when LED is turned on: ie: kA, kV.
- Display for L3.
- Displays network frequency when Hz LED is turned on.
- k LED for neutral current: Measurement parameter is displayed in unit of kilo when this LED is turned on.
- Display for neutral current and frequency (for EPM-04C/04CS).
- First warning output LED (Out1): Turned on when the output is activated.
- Second warning output LED (Out2): Turned on when the output is activated.
- Over current / voltage warning output for L1 (EPM-04C/04CS)
- Low current / voltage warning output for L1 (EPM-04C/04CS)
- Over current / voltage warning output for L2 (EPM-04C/04CS)
- Low current / voltage warning output for L2 (EPM-04C/04CS)
- Over current / voltage warning output for L3 (EPM-04C/04CS)
- Low current / voltage warning output for L3 (EPM-04C/04CS)
- Over current / frequency warning output for frequency and neutral current (EPM-04C/04CS).
- Low current / frequency warning output for frequency and neutral current (EPM-04C/04CS).
- Monitoring the L1, L2, L3 voltages values when V LED is turned on and displays the frequency in 4th display.
- Monitoring the L1, L2, L3 currents values when A LED is turned on and displays the neutral current in 4th display.
- Indicates the activating delta connection when Δ is turned on / Neutral current protection is deactivated even if it is activated.
- H LED for max. instant current and voltage: Max. instant currents and voltages are displayed when this LED is turned on.
- L LED for min. instant current and voltage: Min. instant currents and voltages are displayed when this LED is turned on.
- M LED for max. demand: Max. demand values are displayed when this LED is turned on.
- SET button: It is used to enter into the menu and to save the values. If SET button is pressed for 3 sec. in the measurement mode, you can enter into menus. This button is used for monitoring the max. (H), Min. (L) current values and max. demand values in measurement mode.
- Downward selection button.
- Upward selection button.
- ESC button: Escaping from the menu. And also used for switching off the Latch function while this function has activated.

General Information

EPM-04C/04CS is designed for measuring Phase current, frequency, neutral current, and voltages (Phase-Phase and Phase-Neutral) in a 3-phase system.

EPM-04C/04CS:

Device has 2 warning output which named as Out1 and Out2 (NO-Normally Open) Phase refer to "Output" menu for the functions of the relays.

Voltage Transformer Ratio:
In this menu, voltage transformer ratio is set between 0000,1 - 4000,0.

- Voltage Transformer Ratio:**
- In this menu, voltage transformer ratio is set between 0000.1 - 4000.0. **Note:** if the voltage transformer is not used between the system and **EMPA-04**, voltage transformer ratio is entered as '1'.
- Example:** if a voltage transformer which has a ratio of 34.5kV/100V is used between the system and device, Voltage transformer ratio is entered as 345. (34500/100)
- Selecting Connection Type :**
- Connection can be selected as Star or Delta in this menu.
- Phase-Voltage voltage monitoring can be implemented if the 'Star' connection is selected.
- Phase-Phase voltage monitoring can be implemented if the 'Delta' connection is selected.
- NOTE:** When the 'Delta' connection is selected, 'neutral current monitoring' can not be implemented even if it is activated.
- User Password Setup:**
- In the menu, user password is defined and activated.

User Password Setup:
In this menu user password is defined and activated. You must define and activate a 4 digit user password for preventing device settings from the illegal usage. There are 2 sub menu in the Pin menu.

Activating the user password :

This menu is used for activating the user password.

After the user password is activated for entering to the menus, if the button is pressed for 3 sec., while the instant values are displayed, user password is realized. If the user password

For activating the user password, in the measurement mode

Find the "Pin" menu by scrolling UP/DOWN buttons.

Press SET button (Pin ACTIVATE is displayed.)

Press SET button (Pin AC1 IUA TE is displayed).

Enter the blinking digit value by scrolling UP/DOWN buttons. Switch to the other digits by pressing SET button, use ESC button to go to previous digit. After you entered the last digit press SET button. On AQ1

UP is displayed. UP can be selected by scrolling UP/DOWN buttons. (Data is entered but is not activated yet. For activating the data, press the **ENTER** button.)

Press ESC button one by one

is displayed.

Changing of User Password: This menu is used for changing the user password.

For activating the user password in the measurement mode

For activating the user password, in the measurement mode

(SET) Press SET button 3 sec. (If A Fo menu is displayed.)

Find the "Pin" menu by scrolling UP/DOWN buttons.

Press SET button



EPM-040S COMPUTER CONNECTION

31 DEVICES CAN BE CONNECTED AT THE SAME LINE

-

EPM-QCS1		EPM-QCS2		EPM-QCS1
----------	--	----------	--	----------

Figure 1: Schematic diagram of the experimental setup. A subject is seated at a table, viewing a video screen. A horizontal line is projected onto the screen, with a vertical line intersecting it. The vertical line is labeled 'CONVE' and the horizontal line is labeled 'CONVE'. The vertical line is also labeled 'CONVE' and the horizontal line is labeled 'CONVE'.

EPMA-MCS-2/17	...			
REPEATER				
EPMA-MCS-3/1	...			
EPMA-MCS-2	...			
EPMA-MCS-1				

Operating frequency (f)	45-65 Hz
Auxiliary Supply Power Consumption	< 4 VA
Measuring Input Power Consumption	< 1 VA

Class	Voltage
1	10-300 V AC (Phase - Neutral)
2	10-500 V AC (Phase - Phase)
3	1-10% d.digit [(10% - 100%) x full scale]

Current Transformer Ratio	1 ... 2000
Turn number for CT-25 adapted models	1 ... 20
Voltage Transformer Ratio	1 ... 4000

Optic isolated, programmable
Baud Rate (for EPM-04CS) : 2400-4800-9600-19200-38400 bps

Operating Temperature	-5°C to +50°C
Ambient Temperature	-5°C to +50°C
Display Temperature	Red LED display
Dimensions	PR 49, BK 26

Terminal Protection Class	: IP 00
Box Material	: Nonflammable
Mounting	: Panel Mounted (PR-19)

Mounting Category	0.52 kg (PK-26)
Panel Size	: Class III : 91x91 mm (PR-19)

..JSA type	
Ctr - 0001	I-H L-1 - 5.000 I-L L-2 - 0.000
Out relay - U-I	

Pin Act - of	I-H Hys- 0.100	I-L ond	- 010.0	baud	- 9600
Pin	I-H ond - 010.0	I-L ofd	- 010.0	Addes	- 001
	I-H ofd - 010.0	Str Art del	- 0.000	Party	- no

U-H L-1 -250	U-L L-3	- 180	Frg H- -63
U-H L-2 -250	U-L Hys	- 010.0	F-H Hys -01.00
U-H L-3 -250	U-L and	- 003.0	Frg L- -47

U-H 0+d - 003.0	VOL INS (MP	- 0+1	Fiq 0+d - 003.0
U-L L-1 - 180			
U-L L-2 - 180			

$I-H_2$	$= 100.0$	$I-L_3$	$= 0.000$
$I-H_3$	$= 100.0$	$I-L_H$	$= 0.000$
$I-H_H$	$= 100.0$	$I-H_S$	$= 2.000$

```

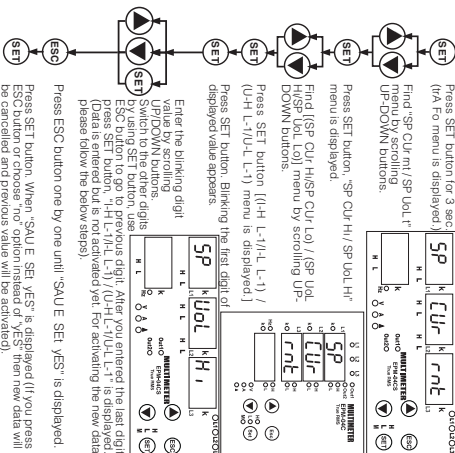
I-F OFD - 0.0.0      SU All DEL - 0.000
I-L L-1 - 0.000     Auto reset - OFF
                      Curr ms trp - OFF

```


MULTIMETER

EPM-04 / 04C / 04CS

Programming the "SP CU-H", "SP CU-L", "SP UoL-H" and "SP UoL-L"



SP Press SET button for 3 sec. (If A For menu is displayed).

CU-H Find "SP CU-H" / "SP UoL-H" menu by scrolling UP/DOWN buttons.

CU-L Press SET button. Blinking the first digit of displayed value appears.

UoL-H Enter the blinking digit value by scrolling Switch to the other digits.

UoL-L Press ESC button to go to previous digit. After you entered the last digit (Data is not activated yet). For activating the new data please follow the below steps).

ESC Press SET button one by one until "SAU.E SEI.YES" is displayed.

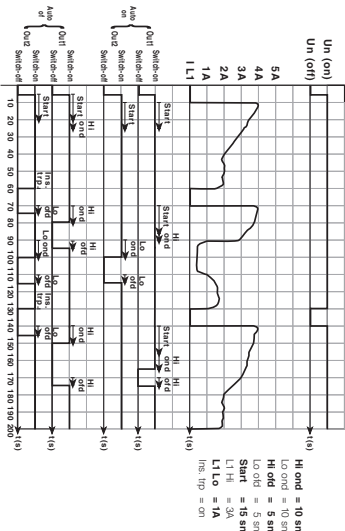
SET Press SET button. When "SAU.E SEI.YES" is displayed (If you press ESC button or choose "no" option instead of "YES" then new data will be cancelled and previous value will be activated).

Start-up delay: Start Delay Time is used to prevent from faulty switchings caused by motor start-up current (demagnetization current). UoL-H and UoL-L remain switched ON in this time period. When UoL-H and UoL-L are switched OFF, the start-up delay time is activated. The device doesn't give a warning even if the current value isn't in the setting interval. This function is used with "Auto Reset" function.

Auto Reset function: If **Auto Reset** function is selected as ON: Each time that the current decreases 50mA/KVr value, start-up delay time is reset and when the current value activates 50mA/KVr, start-up delay function is activated.

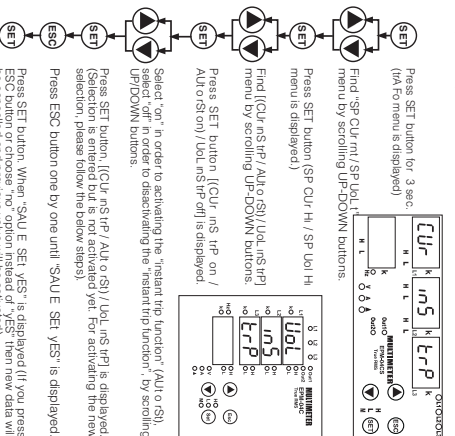
Auto Reset function is selected as OFF: If the power supply is switched off and then switched on, start-up delay function is activated.

Please refer to below graphics for the operating principle of Star / Delta and Auto rSt functions



Instant Tripping Function: At position ON, if any phase current (IL1, IL2, IL3 and IN) exceeds 1.5 times of high (I-H-L-1, I-H-L-2, I-H-L-3, I-H-L-n) values, the "current output" switches off instantly, output LED turned off and LEDs for related phases are turned on. At position OFF, if any phase current (IL1, IL2, IL3 and IN) decrease 0.5 times of low (I-L-L-1, I-L-L-2, I-L-L-3, I-L-L-n) values, the "current output" switches off instantly, output LED turned off and LEDs for related currents turned on. (Please refer to "Output") At position OFF, instant tripping function is cancelled.

Programming "CU-r ns HP", "AU-r rSt" and "UoL ns HP"



SP Press SET button for 3 sec. (If A For menu is displayed).

CU-r ns HP Find "SP CU-r ns HP" / "SP UoL-H" menu by scrolling UP/DOWN buttons.

AU-r rSt Press SET button. Blinking the first digit of displayed value appears.

UoL ns HP Enter the blinking digit value by scrolling Switch to the other digits.

ESC Press SET button one by one until "SAU.E SEI.YES" is displayed.

SET Press SET button. When "SAU.E SEI.YES" is displayed (If you press ESC button or choose "no" option instead of "YES" then new data will be cancelled and previous value will be activated).

SP In this menu, high set points for voltage values are programmed. H values for Phase-Neutral / Phase-Phase according to Star / Delta selection) can be entered one by one.

UoL If all the voltage values (Phase-Neutral / Phase-Phase) are under the H value, related relay is switched on, its LED turned on (please refer "Output") and related LEDs are turned on.

H If all the voltage values (Phase-Neutral / Phase-Phase) are over the H value, H LED blinks and related output is switched on (please refer "Output") and related LEDs are turned off (please refer "Output") and related LEDs are turned on.

Note: High voltage values are programmed for (Phase-Neutral / Phase-Phase) separately but "H" value is common for all phases. If "H" value is set to zero (0), the high voltage warning is disabled. Refer "SP UoL Lo" for details.

Example: If the connection type is selected as Star (with neutral): U-H-HYS=10V U-H-L-1=250V, U-H-L-2=250V, U-H-L-3=250V and then this connection type will change the values after (without neutral) then according to Phase-Phase values. New values: U-H-L-1 (L1-L2 Phase to phase voltage) = 433 V U-H-L-2 (L2-L3 Phase to phase voltage) = 441 V U-H-L-3 (L3-L1 Phase to phase voltage) = 450 V U-H-HYS = 10 V

There are 6 submenus: U-H-L-1, U-H-L-2, U-H-L-3, U-H-HYS, U-H-ond, U-H-ofd.

MULTIMETER

EPM-04 / 04C / 04CS

Programming the "U-H HYS", "U-L HYS", "U-L HYS"



SP Press SET button for 3 sec. (If A For menu is displayed).

UoL Find "SP UoL-H" / "SP UoL-L" menu by scrolling UP/DOWN buttons.

Lo Press SET button. Blinking the first digit of displayed value appears.

ESC Press SET button one by one until "SAU.E SEI.YES" is displayed.

SET Press SET button. When "SAU.E SEI.YES" is displayed (If you press ESC button or choose "no" option instead of "YES" then new data will be cancelled and previous value will be activated).

U-H High value for L1, when the Star is selected, high value for L1-L2, when the Delta selected can be defined in this menu.

U-L Low value for L1, when the Star is selected, low value for L1-L2, when the Delta selected can be defined in this menu.

L-1 Delay off time for activating the output for high voltage warning. It is common for all voltages (same for Phase-Neutral/Phase-Phase). The value can be programmed between 0.00 and 999.9 in terms of seconds. (Refer "SP UoL Hi" for details).

Note: L2 and L3 Phases can be programmed similarly. (Refer to Page 4 for SP CU-H, SP CU-L, SP UoL-H and SP UoL-L).

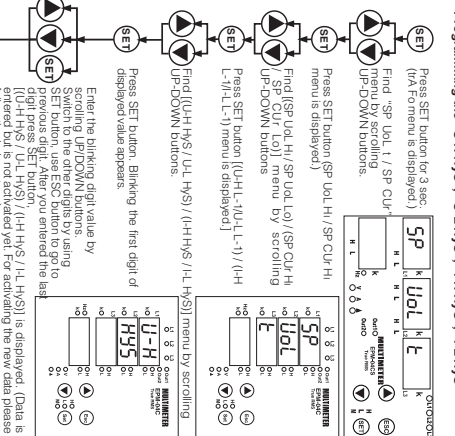
Example: If the connection type is selected as Star (with neutral): U-H-HYS=10V U-H-L-1=250V, U-H-L-2=250V, U-H-L-3=250V and then this connection type will change the values after (without neutral) then according to Phase-Phase values. New values: U-H-L-1 (L1-L2 Phase to phase voltage) = 433 V U-H-L-2 (L2-L3 Phase to phase voltage) = 441 V U-H-L-3 (L3-L1 Phase to phase voltage) = 450 V U-H-HYS = 10 V

There are 6 submenus: U-H-L-1, U-H-L-2, U-H-L-3, U-H-HYS, U-H-ond, U-H-ofd.

MULTIMETER

EPM-04 / 04C / 04CS

Programming the "U-H ofd", "U-L ofd", "U-L ofd"



SP Press SET button for 3 sec. (If A For menu is displayed).

UoL Find "SP UoL-H" / "SP UoL-L" menu by scrolling UP/DOWN buttons.

ofd Press SET button. Blinking the first digit of displayed value appears.

ESC Press SET button one by one until "SAU.E SEI.YES" is displayed.

SET Press SET button. When "SAU.E SEI.YES" is displayed (If you press ESC button or choose "no" option instead of "YES" then new data will be cancelled and previous value will be activated).

U-H Delay off time for activating the output for high voltage warning. It is common for all voltages (same for Phase-Neutral/Phase-Phase). The value can be programmed between 0.00 and 999.9 in terms of seconds. (Refer "SP UoL Hi" for details).

U-L Delay off time for activating the output for low voltage warning. It is common for all voltages (same for Phase-Neutral/Phase-Phase). The value can be programmed between 0.00 and 999.9 in terms of seconds. (Refer "SP UoL Lo" for details).

Note: L2 and L3 Phases can be programmed similarly. (Refer to Page 4 for SP CU-H, SP CU-L, SP UoL-H and SP UoL-L).

Example: If the connection type is selected as Star (with neutral): U-H-HYS=10V U-H-L-1=250V, U-H-L-2=250V, U-H-L-3=250V and then this connection type will change the values after (without neutral) then according to Phase-Phase values. New values: U-H-L-1 (L1-L2 Phase to phase voltage) = 433 V U-H-L-2 (L2-L3 Phase to phase voltage) = 441 V U-H-L-3 (L3-L1 Phase to phase voltage) = 450 V U-H-HYS = 10 V

There are 6 submenus: U-H-L-1, U-H-L-2, U-H-L-3, U-H-HYS, U-H-ond, U-H-ofd.