

Available only for EPM-06C/06CS
 Available only for EPM-06CS

Note: For CT-25 models:

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

I: When CT-25 is used. Black cable is connected to I terminal A3794 / Rev.5

MULTIMETER EPM-06 / 06C / 06CS

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PRECAUTIONS FOR INSTALLATION AND SAFE USE

In CT-25 (120A) compliant models, only CT-25 current transformer must be used.

Other type of CT's have a high risk to damage to device.

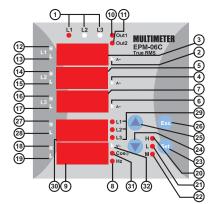
Failure to follow those instructions will result in death or serious injury.

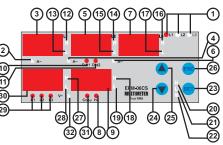
- Disconnect all power before working on equipment.
- When the device is connected to the network, do not remove the front
- Do not try to clean the device with solvent or the like. Only clean with dry
- Verify correct terminal connections when wiring
- Electrical equipment should be serviced only by your component seller.
- Only for rack panel mounting.

CE

- Fuse must be F type and limit value doesn't exceed 1A.

No responsibility is assured by the manufacturer or any of its subsidiaries for any consequences arising out of the use of this material.





- 1 Phase LEDs:The LEDs turn on when the voltage value, which is applied to one of the current inputs, reach 30 V
- 2 First display's k LED (for L1). Measurement parameter is the unit of kilo when LED is turned on. ie: kA, kV
- 4 Second display's k LED (for L2 and neutral current). Measurement parameter is the unit of kilo when LED is turned on. ie: kA, kV
- 5 Display for L2 and neutral current.
- 6 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.
- 8 Displays network frequency when Hz LED is turned on.
- 9 Display for frequency and Cosφ (forEPM-06C/06CS).
- 10 First warning output LED (Out1). Turned on when the output is activated. 11 Second warning output LED (Out2). Turned on when the output is activated.
- 12 Over current / voltage warning output for L1. (EPM-06C/06CS)
- 13 Low current / voltage warning output for L1. (EPM-06C/06CS)
- 14 Over current / voltage warning output for L2. (EPM-06C/06CS)
- 15 Low current / voltage warning output for L2. (EPM-06C/06CS)
- 16 Over current / voltage warning output for L3. (EPM-06C/06CS)
- 17 Low current / voltage warning output for L3. (EPM-06C/06CS)
- 18 Over current / frequency warning output for frequency (EPM-06C/06CS).
- 19 Low current / frequency warning output for frequency (EPM-06C/06CS).
- 20 H LED for max, instant current and voltage, Max, instant currents and voltages are displayed when this LED is turned on.
- 21 LED for min. instant current and voltage. Min. instant currents and voltages are displayed when this LED is turned on.
- 22 M LED for max, demand, Max, demand values are displayed when this
- LED is turned on. 23 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.
- 24 Downward selection button. And also switching between the phases for EDM-06C/06CS
- 25 Upward selection button. And also switching between the phases for FPM-06C/06CS
- 26 ESC button. Displaying the neutral current during the measurement mode. Escaping from the menu. And also used for switching off the Latch function while this function has activated.
- 27 Over voltage warning LED which is displayed in fourth display.
- 28 Low voltage warning LED which is displayed in fourth display.
- 29 These LEDs are used for which phase refers to measurement of voltage in 4th display.
- 30 Display for monitoring the phase voltages (According to related phase).
- 31 This LED; indicates Cosφ when L1, L2 or L3 activated for monitoring voltage values in 4th display
 - Indicates average value of inductive Cosp when L1-L2 are activated. Indicates average value of capacitive Cos when L2-L3 are activated.
- 32 k LED for monitored phase in 4th display

General information

EPM-06/06C/06CS is designed for measuring the below parameters in a 3-Phase system. Phase current, frequency, neutral current and voltages (Phase-Phase and

FPM-06C/06CS:

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

Below measurement and application can be implemented with

EPM-06/06/C/06CS.

1)Phase currents (IL), Neutral current (IN), frequency and Cosø (EPM-06C/06CS); Phase-Phase and Phase-Neutral voltages can be measured.
2) Existence of live phases can be observed by L1-L2-L3 LEDs on the device.
3)Min. and max. values for measured currents and voltages can be monitored. with only one button.

4) Max. demand values for measured current can be monitored, demand

time can be defined in "dE ti" menu.

5) A 4 digit password can be defined from pin menu in order to prevent the

change of settings by unauthorized person.

change of settings by unauthorized person.

6) Current transformer ratio is programmable. (1 2000)

Current transformer ratio is programmable in term of "turn number" between 1.....20 (for CT-25 dapted devices).

Voltage transformer ratio is programmable. (0.1 4000)

7) A user defined measurement range is used for monitoring the voltages and currents, and Out1 & Out2 outputs are used for warning the user and disconnecting the device in case of exceeding the limits of measurement

8) In case of using the device for measuring the current values of motors etc., start delay (AUto rSt) function can be used for preventing the equipment against the improper tripping, which is because of the demurrage current.

9) When a failure has occurred use the Latch function, in order to keep the device with saving its position (Latched), even if the failure conditions are

7th, 8th and 9th subjects are valid for EPM-06C/06CS.

Using the Buttons:

Some buttons and button groups are used for the below special function device is in the measurement mode (Without selecting a menu).



Used for monitoring min. / max. currents and voltages or max. demand values. Switching to the programming mode if it pressed for 3 sec. In programming mode; it is used for switching to the menu and saving changes for the parameters.

: Switching between neutral current and phase current in measurement

mode. Switching to the previous menu and place current immediatement mode. Switching to the previous menu and escaping the programming menu without saving the changes. If the Latch function is turned on (EPM-06C/06CS); output will be released when current(s) of system is exceed the defined values. When the system's current, turns back to normal values then output doesn't react. Output can be trigged by the "ESC" button.

Commissioning and menu setting

(for EPM-06/06C/06CS)

energize the device after implementing the connections respected to the user manual Enter the proper menu settings in order to correct measurements and

Current Transformer Ratio Setup: In this menu, current transformer ratio is set between 1 - 2000.

trR with CT-25.)

(This menu is not available in the devices which are adapted

Note: If the current transformer is not used between the system and device, current transformer ratio is entered as '1'. Example: If a current transformer which has a ratio of 30/5A is

used between the system and device: Current transformer ratio is entered as = 30/5 = 6. (SET) Press SET button for 3 sec. (trA Fo menu is displayed)

Press SET button; trA Fo Ctr menu is displayed (In CT-25 adapted devices, trA Fo trn is displayed instead.)
(Not: trA Fo Utr or Con nEC tio n menu can be displayed by scrolling the UP/DOWN buttons.)

Press SET button. Blinking the first digit of displayed value appears ("trA Fo Utr" or "Con nEC tio n" menu can be (SET) programmed similarly.) Enter the blinking digit value by scrolling UP/DOWN buttons. Switch to the other OP/DOWN buttons. Switch to the orner digits by using SET button, use ESC button to go to previous digit. After you entered the last digit press SET button, "trA Fo Ctr" is displayed. (Data is entered but is not activated yet. For activating the new data please follow the below steps). J SET ! F٥ [Etr (A) (E) Press ESC button one by one until

"SAU E SEt yES" is displayed.

Press SET button. When "SAU E & CR " Fo " C&C SEt yES" is displayed (If you press ESC button or choose "no" option instead of "yES" then new k + - Q Q k + ▲ ® data will be cancelled and previous value will be activated). 988

Programming the Turn Number:

This menu is available for CT-25 adapted devices. User defines the turn number, which is the number of how many tour the current cable has rounded into the CT-25. Numbers can be selected between 1-20. Greater the number of turn means greater the sensivity

trn				4																
In min.(A)	2.00	1.00	0.66	0.50	0.40	0.33	0.28	0.24	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.10
In max (A)	120	60.0	40.0	30.0	24.0	20.0	17.1	15.0	13.3	12.0	10.9	10.0	9.23	8.57	8.00	7.50	7.05	6.66	6.31	6.00

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 EPM-06, 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 the Connection Type: Lon

Connection can be selected as Star or Delta in this menu

Phase-Neutral voltage monitoring can be implemented if the "Star" connection is selected.

Phase-Phase voltage monitoring can be implemented if the "Delta"

NOTE: When the "Delta" connection is selected, "neutral current monitoring" can not be implemented even if it is activated and displaying function of ESC button will be disabled also.

E 10

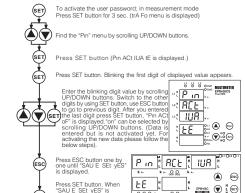
User Password Setup:

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. fter the user password is activated for entering to the menus: the (ET) button is pressed for 3 sec., while the instant values re observed user password is required. If the user password is entered wrong device does not latch.

Note: Factory default value of user password is "0000"



Changing of User Password:

displayed (If you press

This menu is used for changing the user password. Note: Factory default value for user password is "0000" CHR

888 - 65

ESC button or choose "no" option instead of "yES" then new data will be cancelled and previous value will be activated).

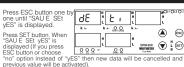
To change the user password; in measurement mode Press SET button for 3 sec. (trA Fo menu is displayed)

Find the "Pın" menu ' ın [[CHR [n9E] by scrolling UP/DOWN buttons. k 4- 000 ESC Press SFT button EPM-GGC WILL SET (Pin ACt IUA tE is displayed.)

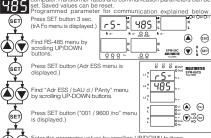
Find the "Pın CHA n9E" menu by scrolling UP/DOWN buttons.

MULTIMETER EPM-06 / 06C / 06CS

(SET)



Serial Communication (for EPM-06CS)
EPM-06CS have MODBUS RTU communication protocol which is optical isolated. All measured parameters can be transfer to the mputer. Transformer ratios and communication parameters can be



Enter the parameter values by scrolling UP/DOWN buttons (001...247 / 2400...38400 /no, EUEn, odd).

SET (ESC) Press ESC button one by one until "SAU E SEt yES" is displayed.

Press SET button, "Adr ESS / bAU d / PArity" is displayed. (Data is

entered but is not activated yet. For activating the new data please

Press SET button. When "SAU E SEt 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). SET

MODBUS RTU PROTOCOL (Available only for EPM-06CS) Standart MODBUS RTU message is shown below.

T	ADDRESS 8 BIT	FUNCTIO 8 BIT	N	DATA NX8BIT	CRCH	CRCL	T	
		ds to a time						
		allow the co						

message and the beginning of another. This time must be at least 3.5 characters at the selected baud rate. Adress range (1-247) is address of the connected device. The data field contains data sent to the slave by master or data sent to

CRC is a error check method by using MODBUS RTU protocol and consists of 2

Available Modbus Function

as i unction.							
	03H	READ HOLD REGISTERS					
	06H	PRESET SINGLE REGISTER					
	10H	PRESET MULTIPLE REGISTERS					

Read Hold (03) function is used for reading measured values and set value. If any request of reading of a register, excepted mentioned in register table, device will send an error message.

For example to read phase1 voltage by sending a message to the device. 01 03 00 00 00 02 XX XX

- 01 Device address 03 Function
- 00 MSB address
- 00 LSB address
- 00 Register number MSB 02 Register number LSB
- XX CRC MSB
- XX CRC LSB

Preset Single Register (06) function is used for writting the setting values, erasing the energy counter or resetting the min., max., max. demand values. Current transformers ratio can be set 0-2000, voltage transformer ratio can be set 1-40000.

- 1-40000. i.e. Setting CT as 100; 01 06 80 02 00 64 XX XX 01 Device address
- 06 Function
- 80 MSR address
- 02 LSB address
- 00 Data MSB 64 Data LSB XX CBC MSB
- Preset Multiple Register(10H) is used to set more then one register at same time i.e. Setting CT as 100. Ut as 20.0:

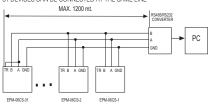
01 10 80 00 00 02 04 00 C8 00 64 XX XX 01 Device Address

- 10 Function 80 MSR address
- 00 LSB address 00 Register number MSB 02 Register number LSB
- 04 Byte count 00 Data MSB C8 Data LSB 00 Data MSB
- 64 Data LSB

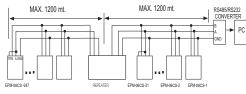
XX CRC MSB XX CRC LSB

EPM-06CS COMPUTER CONNECTION

31 DEVICES CAN BE CONNECTED AT THE SAME LINE



MAX. 247 DEVICES CAN BE CONNECTED AT SAME LINE BY USING REPEATER.



Technical Features

Operating frequency (f)
Auxiliary Supply Power Consumption
Measuring Input Power Consumption Measurement range Current

Voltage

Class
Current Transformer Ratio
Turn number for CT-25 adapted models
Voltage Transformer Ratio
Max. Ctr x Vtr ::

Communications (for EPM-06CS)

Baud Bate (for FPM-06CS) Address (for EPM-06CS) Parity (for EPM-06CS)
Output Relays (for EPM-06C/06CS)
Ambiant Temperature Display Dimensions Equipment Protection Class Box Protection Class Terminal Protection Class

Box Material Mounting

Wire Crossection (for terminals) Weight

Mounting Category

< 1 VA 0.05-5.5A~ 2 - 120 A~ for CT-25 10-300 V AC (Phase - Neutral) 10-500 V AC (Phase - Phase) 1±1% digit [(10%-100%) x full scale] ... 20 1... 4000 40.000 MODBUS RTU (RS 485) Optic isolated, programmable 2400-38400 bps No, Odd, Even, 8 Data Bits, 2 Stop Bits 2 NO, 5A 1250 VA -5°C; +50°C Red LED display PR-19, PK-26 Double Insulation - Class II (): IP 40 IP 00 Nonflamable Panel Mounted (PR-19) Panel Mounted (PR-19) Rail Mounted (PK-26) 2.5 mm² 0.56 kg (PR-19) 0.52 kg (PK-26) Class III

Please look at back side of the device.

Default Settings

/5A type			
Ctr - 0001 Utr - 0001 trn - 01 ConnEC - StAr		CUr Lo L-2 - 0.000 CUr Lo L-3 - 0.000 CUr Lo L-n - 0.000 CUr Lo HyS - 0.200 Lo on dEL - 010.0	Out relay - U-I Latch - oF Out Inverse - oFI
Pin Act - oF Pin - 0000 dt - 15	Hi on dEL - 010.0 Hi oFF dEL - 010.0	Lo off dEL - 010.0 Lo off dEL - 010.0 Str Art dEL - 0.000 Auto reset - off Cur ins trp - off	hadd - 9600 AddrES - 001 Party - no
UoL Hi L-1 - 250 UoL Hi L-2 - 250 UoL Hi L-3 - 250 UoL Hi HyS - 10 Hi off dE - 003. UoL Lo L-1 - 180 UoL Lo L-2 - 180	Lo on dEL - 003. Lo oFF dEL - 003. 0 UoL PHS SEq - oFF	.0 Frq H _I HyS - 01. .0 Frq Lo - 47 .0 Frq Lo HyS - 01. Frq on dEL - 00:	00 00 3.0

91x91 mm (PR-19) 46x107 mm (PK-26)

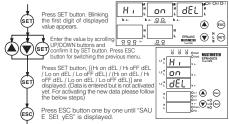
CUr Hı L-1 - 100.0 CT-25 type

CUr Hi L-2 - 100.0 CUr Hi L-3 - 100.0 CUr Lo L-n - 0.000 CUr Hi HvS - 2.000 Lo on dEL - 010 0 Hi on dEL - 010.0 Hi oFF dEL - 010.0 CUr Lo L-1 - 0.000

7

Str Art dEL - 0.000 Cur ins trp - oFF

CUr Lo L-2 - 0.000



Press SET button. When "SAU E SEt 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).

(SET)

Setpoints for Frequency : n this menu. Frequency range can be defiend ccording to High and Low values of Frequency neasurement.

If the frequency of the system decreases the Frq Hi value: outout is switched **on** and LED is turned **on**. Refer to Output menu) and H LED for frequency is urned off

If the frequency of the system exceeds the high set value, H LED relating to frequency blinks, output switched **off** at the end of defined time (Frg on dEL), LED turned **off** (Refer to Output menu) and H LED for frequency is turned **on** continuously.

If the frequency of system are under the high set value (Frg Hi) as a hysteresis (Frg Hi HyS), output is turned on at the end of defined time (Frg oFF dEL), LED is turned **on** and H LED is turned off, at the end of the adjusted time (Frq oFF dEL), output1 LED turns on and Hi LEDs turn off.

If the frequency of the system is over the low set value (Frq Lo), output is turned **on**, LED is turned **on** L LED is turned off.

If the frequency of the system decreases the low set value (Frq Lo), L LED blinks; output is turned off at the end of defined time (Frq ond), LED is turned off and LLED is turned on continuously.

If the frequency of the system is over the low set value (Frq Lo HyS) as a hysteresis (Frq Hys), output is turned on at the end of defined time (Frq oFF dEL), LED is turned on and L LED is turned off

Note: System frequency is measured for L1.

There are 6 submenus

Frq Hı, Frq Lo, Frq Hı HyS, Frq Lo HyS, Frq on dEL, Frq oFF dEL.



Max. value for system frequency, this value can be defined between 0...70.00 Hz.
If the value is set to zero (0), the high requency warning is disabled



Min. value for system frequency, this value Min. value for system frequency, this value can be defined between 0...70.00 Hz. If the value is set to zero (0), the low frequency warning is disabled.

> Note: Attention for common using of output and relay LED for voltage.



In this menu, required hysteresis value can be defined between 0...20.00 Hz. in order to switching off the "high frequency" warning.



Fr9 In this menu, required hysteresis value can be defined between 0...20.00 Hz. in order to switching off the "low frequency" warning.



F-9 Delay-on time for activation of alarm for high and low frequency value.

This value can be defined between 000.0..999.9 in term of second..



Properties Delay-off time for disactivation of alarm for high and low frequency value. This value can be defined between 000.0..999.9 in term of second..

hase sequence can be turned on/off in this menu. Inversed phase voltage which is applied to the measurement inputs (L1-L2-L3), can be monitored.

Default setting is off. In order to let the device to warn user in case of inversed phase situation please change the **off** position as **on** in "UoL PHS SEg" menu. Phase sequence function is disabled if the selection is selected **off**.

L1, L2 and L3 LEDs blink and output output released immediately when "UoL PHS SEq" is turned **on** and phase sequence is inverted with any reason.

Note: Output 2 is used if U-I is selected and Output1 is used if H-L is selected and Output1 ended in the Phase Sequence monitoring.

Instant Tripping Function.
At position ON, if any VL-L / VL-N values exceeds 1.5 times of high voltages (UoL Hı L-1/L-2/L-3) values: the "voltage output" switches **OFF** instantly, output LED turned **OFF** and H LED, for related voltage, is turned **ON**. (Please refer to "**Output**".)

fany phase voltage decrease 0.5 times low voltages (UoL L-1/L-2/L-3); the "voltage output" switches **OFF** instantly, output LED turned **OFF** and Lo LED, for related voltage, is turned ON

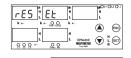
(Refer to Page-4 for "CUr inS trP", "AUt o rSt" and "UoL inS trP")

Reset function.

In this menu, values of min., max., max. demand are erased. It saves the instantaneously measured min. and max. values of the device into its memory. Please kindly look at to the section of functions of buttons for min. and max. values.

Note: Measured electrical parameters which are saved to the memory are not affected from the electric interruptions. In the rÉS Et HL or rES Et dE menu; when you choose yÉS and quit from all menus if you confirm the changes min max and max. demand values of all parameters are erased at the same





rE5

(A) (b)

(A) (6sc)

48



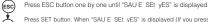
Find rES Et dE / rES Et HL menu by scrolling UP-DOWN buttons.



By using the UP-DOWN buttons, other parameters can be selected. If you want to delete the value, choose yES. f not choose no



Press SET button, rES Et dE / rES Et HL is displayed. (Data is entered but is not activated yet. Activating the new data, please follow the below steps)



Press SET button. When "SAU E SEt 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)



Demand Time.

Max. Demand time can be defined between 01-60 minute in this menu.



Find dE ti menu by scrolling UP-DOWN



Press SET button for 3 sec

(trA Fo menu is displayed.)

Press SET button. Blinking the first digit of



the new data please follow the below steps)

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Press SET button, "Pin CHA n9E" is displayed. (Data is entered but is not activated yet. For activating the new data please follow the below steps)

Press ESC button one by one until "SAU E SEt yES" is displayed.

Press SET button, When "SALLE, SET, vES" 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).

Output menu (only for EPM-06C/06CS) : In this menu, using of oUt PUt function is explained with details below.

Out Relay function:
In this menu high-low or voltage-current monitoring is etermined for Out1 and Out2 outputs.

(SET)

(ESC)

(SET)

Note: When U-I (voltage-current) is selected; Out2 is monitoring according to high or low voltage, frequency values and phase sequence, Out1 is monitoring according to high or low-current value.

When H-L (high-low) is selected; Out2 is monitoring according to high values for voltage, frequency and low-current, Out1 is monitoring according to low values for voltage or current.

Please refer to page 8 for a summary of the contact

operations

Out Latch function:

If the Latch function is turned on:

OUT1-OUT2 outputs, which are released when a failure has occured, keep remained at its position even if the failure is over. Press button in order to triggering the relay when the failure situation is removed.

If the Latch function is turned off;

Released outputs triggered at the end of delay off time when the failure situation is removed.

Out inverse function: If "oUt inU ErS" function is selected off:

Device is started with closed output contacts (out1, out2) in the normal network conditions according to settings. the normal network conditions according to settings.

Otherwise devices started with open position of the contacts.

Default setting is "off"

Press SET button for 3 secs. (trA Fo menu is displayed)



(SET)

(SET)

(ESC)

SET

Find oUt PUt menu by scrolling UP-DOWN buttons.

Press SET button oUt rEL AY / A oUt LAt CH / O oUT inU ErS (SET)

Press SET button, U-I blinks in 4th display. (oFF blinks for oUt LAt CH

Select U-I or H-L by scrolling UP/DOWN buttons. (Select on or oFF for "oUt LAt CH" and "oUT inU ErS")

> Press SET button, oUt rEL AY is displayed. (Data is entered but is not activated yet. Activating OUL FAEL FAY the new data, please follow the below steps) k ak a- O O k a-Press ESC button one by



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

▲ Esc

3



Jsing purposes of submenus of "SP CUr rnt" explained below vith details.

 \triangle In case of using the device for measuring the current values of motors etc., start delay (AUto rSt) function can be used for preventing the equipment against the improper tripping, which is because of the demurrage current. If the system current decreases 50mAxCtr then start-up delay is resetted and related output detect the system automatically. This feature must be observed in case of using this function.



n this menu, high set points for current values are programmed. Hi values for IL1, IL2, IL3 and IN can be entered one by one f all the current values are under the Hi value: Out1 output is switched on, LED of Output1 turned on and LED of H turned

any current (IL1, IL2, IL3 and IN) exceeds the high set value, H LED blinks. Output 1 output switches off at the end of the defined time (Hi on dEL), Output 1 LED turned off and H LED

turned on continuously.

If all currents (IL.1, IL.2, IL.3 and IN) are below the high set value
(H) as a hysteresis current (CUF Hi HyS), output 1 output switches
on at the end of the defined time (Hi oFF dEL), output 1 LED turned of
on and H LED turned off.

This menu has 7 sub menus CUr Hi L-1, CUr Hi L-2, CUr Hi L-3, CUr Hi L-n, CUr Hi HvS Hi on dEL. Hi oFF dEL

Note: High Current values are programmed for IL1, IL2, IL3 and IN separately but CUr Hi HyS (hysteresis), Hi on dEL (delay on time) and Hi oFF dEL (delay off time) values are common and they have same values for IL1, IL2, IL3 and IN.

this menu, low set points for current values are programmed Lo values for IL1, IL2, IL3 and IN can be entered one by one. If all the current values are over the Lo value; Out1 output is switched on, LED of Output1 turned on and LED of L turned

any current (IL1, IL2, IL3 and IN) exceeds the low set value, LED blinks and Output 1 output switches off at the end of the efined time (Lo on dEL), Output 1 LED turned off and L LED turned on continuously.

If all currents (IL1, IL2, IL3 and IN) are over the low set value (Lo) as a hysteresis current (CUr Lo HyS), output 1 output switches on at the end of the defined time (Lo oFF dEL), output 1 LED turned on and LLFD turned off

This menu has 7 sub menus.
CUr Lo L-1, CUr Lo L-2, CUr Lo L-3, CUr Lo L-n, CUr Lo HyS,
Lo on dEL, Lo oFF dEL

Note: Low Current values are programmed for IL1, IL2, IL3 and IN separately but CUr Lo HyS (hysteresis), Lo on dEL (delay on time) and Lo oFF dEL (delay off time) values are common and they have same values for IL1, IL2, IL3 and IN.

In this menu, max. current value for IL1 is programmed. The current value can be programmed between

The current value can be programmed between; 0,001....5,000 A (Ctr = 1); 000,1....120,0 A (for CT-25 adapted device trn=1). If the value is set to zero (0), the high current warning is disabled (CUr H_I L-2 and CUr H_I L-3 are programmed similarly). Refer "SP Cur H_I" for details.

In this menu, min. current value for IL1 is programmed. The current value can be programmed between; The current value can be programmed. O,001....5,000 A (Ctr = 1); 000,1....120,0 A (for CT-25 adapted device trn=1).

If the value is set to zero (0), the low current warning is disabled (CUr Lo L-2 and CUr Lo L-3 are programmed similarly). Refer "SP Cur Lo" for details.

In this menu, required hysteresis current for high current warning is programmed. (same for IL1, IL2, II 3 and IN)

Ηг e current value can be programmed between; 0,001....2,500 A (Ctr = 1) 000.1....60.00 A (for CT-25 adapted device trn=1) Refer "SP Cur Hı" for details.

In this menu required hysteresis current for low current rning is programmed. (same for IL1, IL2, IL3 and Lo

The current value can be programmed between; 0.001....2,500 A (Ctr = 1) 0.00,1....60,00 A (for CT-25 adapted device trn=1) Refer "SP Cur Lo" for details.

Delay time for activating the output for high current warning. It is common for all currents (IL1, IL2, IL3

and IN) on value can be programmed between 000,0 and

Delay time for activating the output for low current warning. It is common for all currents (IL1, IL2, IL3 and IN)

on he value can be programmed between 000,0 and 199,9 in terms of seconds.
Refer "SP Cur Lo" for details.) dEL

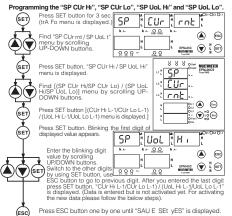
Delay time for releasing the output for high current varning. It is common for all currents (IL1, IL2, IL3

off and IN) The value can be programmed between 000,0 and 999.9 in terms of seconds. Refer "SP Cur Hı" for details.)

Delay time for releasing the output for low current warning. It is common for all currents (IL1, IL2, IL3 and IN) oFF

ne value can be programmed between 000.0 and 999.9 in terms of seconds. Refer "SP Cur Lo" for details.)

(Refer to Page-5)



Press ESC button one by one until "SAU E SEt vES" is displayed.

Press SET button. When "SAU E SEt 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).

rE

Start-up delay:
Start Delay Time is used to prevent from faulty switchings caused by motor start-up current (demurrage current).
Out1 remain switched ON in this time period (When

U-I is selected); In this time period, even if the current value exceeds the limits device doesn't sense it as a warning. 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.

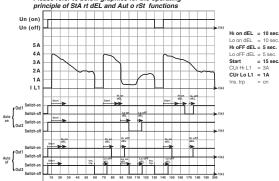
ınS

Auto Reset Function :

If Auto Reset function is selected as ON; Each time that the current decreases "50mAxCtr" value, start-up delay time is reset and when the current value increases "50mAxCtr", start-up delay function is activated

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

Please refer to below graphics for the operating

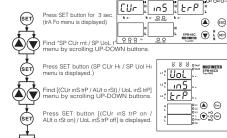


Instant Tripping Function.

At position **ON**, if any phase current (IL1, IL2, IL3 and IN) exceeds 1.5 times of high (CUr Hı L-1, L-2, L-3, L-n) values, the "current output" switches **off** instantly, output LED turned **off** and H LEDs for related currents turned on. (Please refer to "Output".)

At position OFF, if any phase current (IL1, IL2, IL3 and IN) decrease 0.5 times of low (CUr Lo L-1, L-2, L-3, L-n) values, the "current output" switches off instantly, output LED turned off and L LEDs for related currents

turned on. (Please refer to "Output".) At position **OFF**, instant tripping function is cancelled. Programming "CUr inS trP", "AUt o rSt" and "UoL inS trP"



Select "on" in order to activating the "instant trip function" (AUt o rSt) select "off" in order to disactivating the "instant trip function", by scrolling UP/DOWN buttons.

Press SET button [(CLIr inS trP / ALIt o rSt) / HoL inS trPl is displayed (Selection is entered but is not activated yet. For activating the new selection, please follow the below steps).

Press ESC button one by one until "SAU E SEt yES" is displayed.

Press SET button. When "SAU E SEt 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).

UoL,

(ESC)

rogramming "SP UoL t" :

sing purposes of submenus of "SP UoL t" explained below with letails

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

f all the voltage values (Phase-Neutral / Phase-Phase) are under the HI value; releated relay is switched on, its LED turned on (please refer "Output") and releated H I FDs are turned off

If all the voltage values (Phase-Neutral / Phase-Phase) are over the Hi value, H LED blinks and releated output is switched off at the end of "delay on time (Hi on dEL), its LED turned off (please refer "Output") and releated H I FDs are turned on

If all voltage (Phase-Neutral / Phase-Phase) are below the high set value (Hi) as a hysteresis voltage (UoL Hi HyS), releated output is switched on at the end of the "delay off time" (Hi oFF dEL), its LED turned on (please refer "Output") and H I FD is turned off.

Note: High Voltage values are programmed for (Phase-Neutral / Phase-Phase) separately but "UoL Hi HyS" (hysteresis) and "Hi on dEL" (delay on time) and "Hi oFF dEL" (delay off time) values are common these parameters have same values for Phase-Neutral

When Connection type (Star/Delta) is selected (refer to Connection menu), device will change the UoL Hi L-1, L-2 and L-3 values automatically according

Example: If the connection type is selected as Star (with neutral); UoL HI HyS=10V UoL HI L-1=250V, UoL Hi L-2=255V, UoL Hi L-3=260V

and then this connection type is selected as Delta (without neutral), device will change the values after calculated them according to Phase-Phase values. New values:

UoL Hi L-1 (L1-L2 Phase to phase voltage) = 433 V UoL Hi L-2 (L2-L3 Phase to phase voltage) = 441 V UoL Hi L-3 (L3-L1 Phase to phase voltage) = 450 V UoL Hı HyS = 10 V.

There are 6 submenus. UoL Hi L-1, UoL Hi L-2, UoL Hi L-3, UoL Hi HyS, Hi on dEL, Hi oFF dEL.

MULTIMETER EPM-06 / 06C / 06CS



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

If all the voltage values (Phase-Neutral / Phase-Phase) are over the Lo value: releated output is switched on its LED turned on (please refer "Output") and releated L LEDs are turned off.

If any of the voltage valueses (Phase-Neutral / Phase-Phase) decrease the Lo value, L LED blinks and releated output is switched off at the end of "delay on time" (Lo on dEL), its LED turned off (please refer "Output") and releated L LED is turned on continuously. If all voltage (Phase-Neutral / Phase-Phase) values increase the low set value (Lo) as a hysteresis voltage (UoL Lo HyS), releated relay is switched **on** at the end of the "delay off time" (Lo oFF dEL), its LED turned **on** (please refer "Output") and L LED is turned off.

Note: Low Voltage values are programmed for (Phase-Neutral / Phase-Phase) separately but "UoL Lo HyS" (hysteresis), "Lo on dEL" (delay on time) and "Lo oFF dEL" (delay off time) values are common; these parameters have same values for Phase-Neutral / Phase-Phase

When Connection type (Star/Delta) is selected (refer to Connection menu) device will change the UoL Lo L-1, L-2 and L-3 values automatically according

Example: If the connetion type is selected as Star (with neutral): UoL Lo Hvs=10V

UoL Lo L-1=180V, UoL Lo L-2=175V, UoL Lo L-3=170V and then this connection type is selected as Delta (without neutral), device will change the values after calculated them according to Phase-Phase values. New values:

UoL Lo L-1 (L1-L2 Phase to phase voltage) = 311 V UoL Lo L-2 (L2-L3 Phase to phase voltage) = 303 V UoL Lo L-3 (L3-L1 Phase to phase voltage) = 294 V UoL Lo HvS = 10 V.

There are 6 submenus

UoL Lo L-1, UoL Lo L-2, UoL Lo L-3, UoL Lo HvS.Lo on dEL, Lo oFF dEL.

High value for L1, when the Star is elected; high value for L1-L2, when the Delta selected can be defined in this nenu. 300 for Star connection and

Uol Hı" for details.

...500 for Delta connection can be If the value is set to zero (0), the high voltage warning is disabled. Refer "SP

Note: L2 and L3 phases can be programmed similarly

Lo

ow value for L1, when the Star is elected; low value for L1-L2, when the Delta selected can be defined in this nenu. J....300 for Star connection and

..500 for Delta connection can be defined.

If the value is set to zero (0), the high voltage warning is disabled. Refer "SP Uol Lo" for details.

Note: 12 and 13 phases can be

(Refer to Page-4 for SP CUr Hi. SP CUr Lo. SP UoL HI ve SP UoL Lo)

this menu, required hysteresis voltage UoL or high voltage warning is programmed ame for Phase-Neutral/Phase-Phase.) ...200V for Star connection and ...200V for Delta connection can Refer "SP UoL Hi" for details.

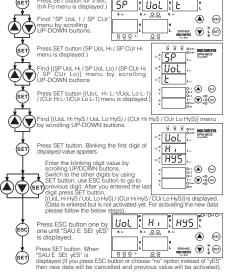
UOL Lo

this menu, required hysteresis voltage or low voltage warning is programmed same for Phase-Neutral/Phase-Phase.)200V for Star connection and ...200V for Delta connection can

tefer "SP UoL Lo" for details.

Programming the "U-H HyS", "U-L HyS", "I-H HyS", "I-L HyS"

Press SFT button for 3 sec





Refer "SP Uol 1 o" for details.)

"HI on dEL", "HI oFF dEL", "Lo on dEL", "Lo oFF dEL" settings are

explaine	ed for SP UoL t and SP CUr	rnt	
SET	Press SET button for 3 sec. (trA Fo menu is displayed.)	SP LUOL	_ E E C C C C C C C
	Find "SP UoL t / SP CUr" menu by scrolling UP-DOWN buttons.	H L Q Q V- Q Q	H EPM-SEC W L SET
SET	Press SET button (SP UoL Hı / menu is displayed.)	SP CUr Hi	SP Court MULTIMETER
	Find [(SP UoL Hı/SP UoL Lo). /SP CUr Lo)] menu by scrolli UP-DOWN buttons.		UoL
SET	Press SET button [(UoL Hi L-1, /(CUr Hi L-1 / CUr Lo L-1) menu		012 (A) (66) 013 (N) (10) 014 (N) (10) 015 (N) (10) 016
	Find [(Hı on dEL / Hı oFF dEL Hı oFF dEL / Lo on dEL / Lo oF buttons.		