ECM01
Multifunction Measurement Device 96x96 RS485
OP020 V07

6LE005432Aa

OVERVIEW

Modbus RTU over RS485

Pulse Output

CE RoHS

X 1

X 2

X 1

SPECIFICATIONS

Wiring input	3 Phase 4 wire / 1 Phase 2 wire
Rated input voltage	100 - 240V AC (L-N), 173 - 415V AC (L-L)
Frequency range	45 - 65Hz
CT primary	5A - 10,000A
CT secondary	330mV / Max 396mV (nominal x1.2)
VT primary	100V - 500kV
VT secondary	173 - 415V AC (L-L)
Auxiliary	Self supplied (L1)
Voltage rated burden	<6VA (L1 - supply), <0.2VA (L2 & L3)
Operating temperature	-10...+55°C
Storage temperature	-20...+70°C
Humidity	0...85% non-condensing
Weight	230g
Pulse output	5-27V DC / Imax = 100mA
Pulse width	0.1 - 2.0 sec
Installation category	III

ACCURACY

Voltage V_{L-N}	± 0.5% of full scale
Voltage V_{L-L}	
Current	
Frequency	± 0.1% (L-N >20V / L-L >35V)
Active power	± 1% of full scale
Reactive power	
Apparent power	
Active energy	Class 1 (IEC/EN62053-21)
Reactive energy	Class 2 (IEC/EN62053-23)
MAX / MIN (Active power / Reactive power / Apparent power)	± 1% of full scale
Power factor	± 0.01 of Unity
THD	3%

SAFETY PRECAUTIONS

Safety related notification, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of personnel as well as the instrument.

- Hager ECM01 shall only be used with CTs and RJ45 cables references from Hager
- If the equipment is not used in a manner specified by the manufacturer it may impair the protection provided by the equipment
- Do not use the equipment if there are mechanical damage
- Do not exceed the stated maximum ratings of the device
- No repairs, maintenance or adjustments are possible
- Read the complete instruction manual prior to installation or operating the unit
- The equipment in its installed state must not come into close proximity to any heating sources, oils, steam, caustic vapours or other unwanted process by-products
- Do not use in hazardous or classified location where explosion or other dangers can be triggered by the device

WIRING GUIDELINES

Risk of electric shock!
Installation process must be performed by qualified and trained personnel only.

- To prevent the risk of electrocution, always isolate and lock-off the power supply to the equipment prior to undertaking any work
- Always confirm absence of electricity prior to starting work using appropriate voltage detection equipment
- Wiring shall be done strictly according to the terminal layout
- Confirm that all connections are correct before energizing the equipment
- Routing of cables shall be way from any internal EMI source
- Copper cable should be used
- All wiring to be in accordance with applicable local standards

RESOLUTION

VT Ratio x CT Ratio	kWh / kVAh / kVArh	⎍
< 15	0.01k	0.01k
< 150	0.1k	0.1k
< 1500	1k	1k
< 15000	0.01M	0.01M
< 150000	0.1M	0.1M
≥ 1500000	1M	1M

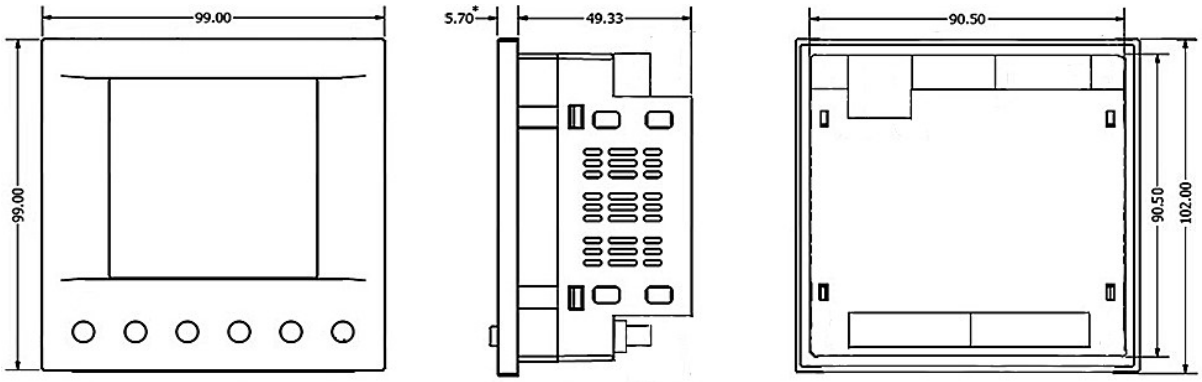
1. V / A / W / VA / VAr = auto adjust
2. PF = 0.001

SERIAL COMMUNICATION

Standard & Protocol	RS485 & Modbus RTU
Communication address	1 to 255
Transmission mode	Half duplex
Data types	Float & Integer
Transmission distance	500 m (max)
Transmission speed	300,600, 1200, 2400, 4800, 9600, 19200 bps
Parity	None, Odd, Even
Stop bits	1 or 2
Response time	100 mS (Max and independent of baud rate)

Modbus Register Address List available for download at www.hager.co.uk, alternatively contact Customer Service.

MECHANICAL DIMENSIONS

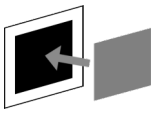


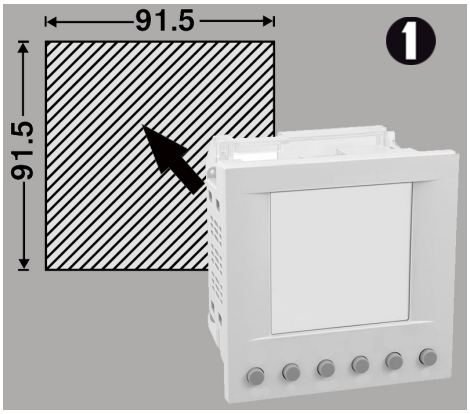
FRONT VIEW SIDE VIEW BACK VIEW

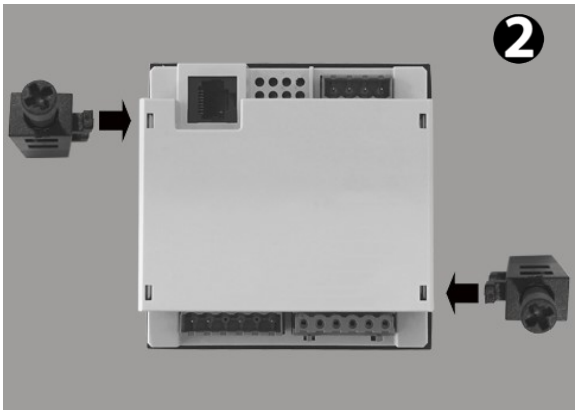
*8.50 with rubber gasket

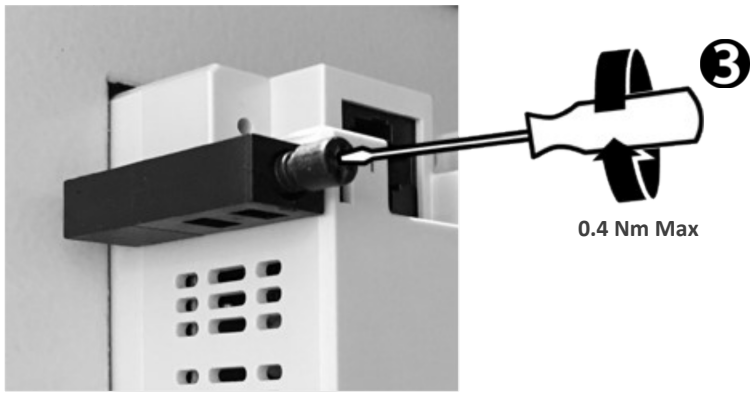
All dimensions in mm

MECHANICAL INSTALLATION

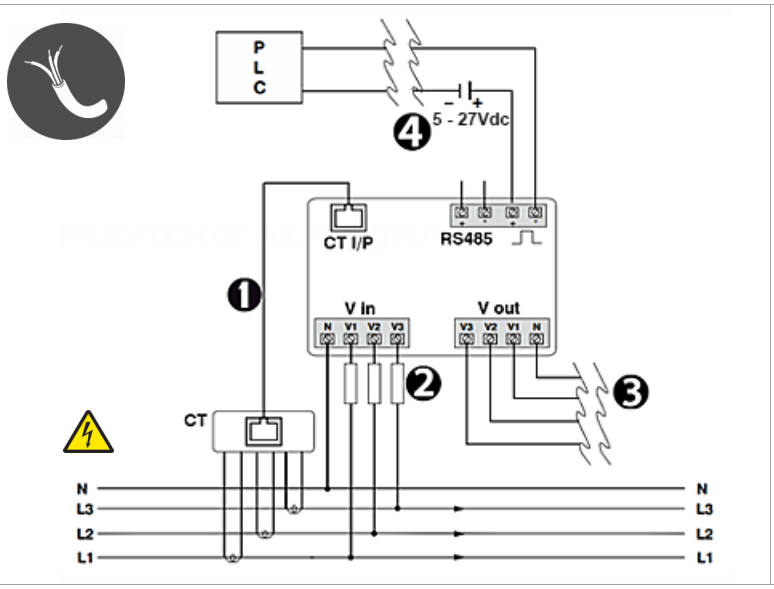




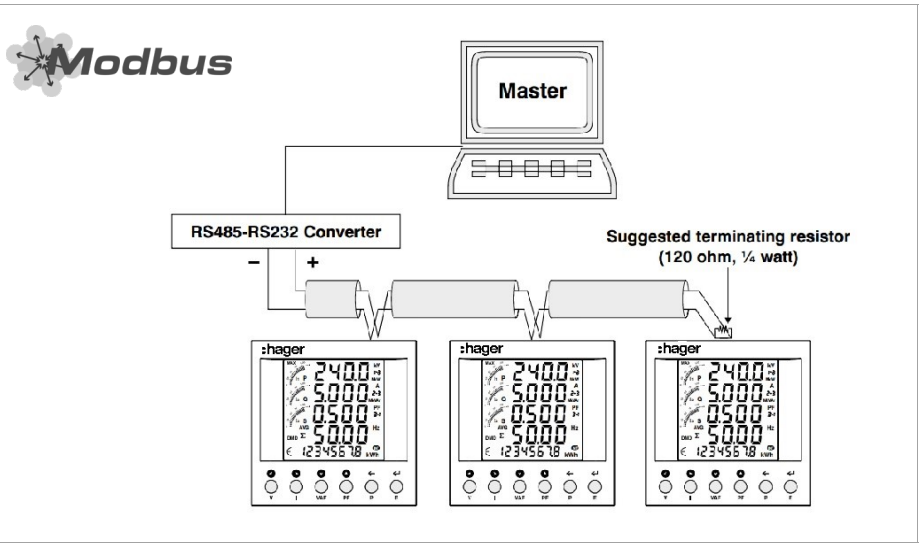


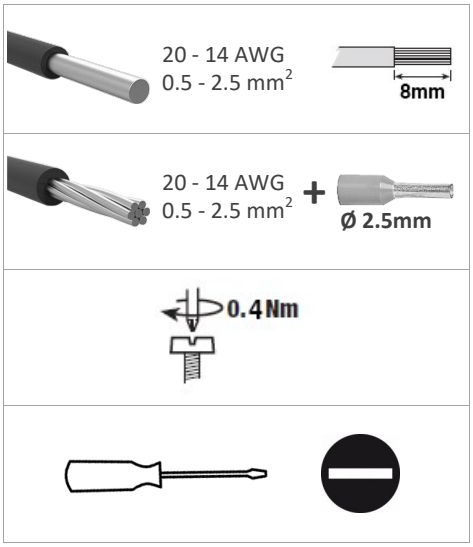


WIRING DIAGRAM



1. Hager RJ45 cable
2. Fuse class CC UL / fast acting 600V - fuse rating is determined by the burden (see Specifications on page 1) and the total number of meters linked by Voltage-to-Voltage cables, plus all other devices connected in series with the voltage supply.
3. Supply 31 additional meters (32 total)
4. Voltage must be provided except for PLC's that has self-excited digital input





CONFIGURATION

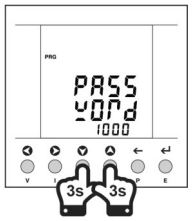
Buttons

- Left
- Right
- Decrease
- Increase
- Go back
- Enter and next

Symbols

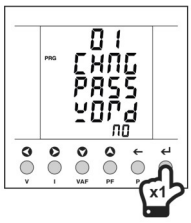
- Press x times
- Sub-menu
- Hold x sec
- Factory default
- Adjustment options

Password or Exit Config



1	2	3
Select digit	Change digit	→ 1
1000	0000 - 9999	

1 Change password



1	2	3
Select option	Change option	NO → 2 YES → 1.1
NO	NO / YES	

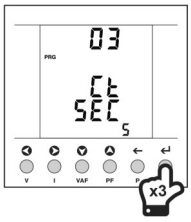
1.1 New password

1	2	3
Select digit	Change digit	→ 2
1000	0000 - 9999	

2 Network selection

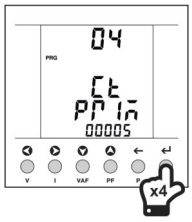
1	2	3
Select option	Change option	→ 3
3P4W	3P4W / 1P2W-P1 / 1P2W-P2 / 1P2W-P3	

3 CT secondary



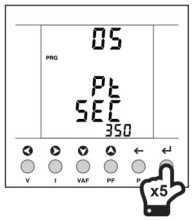
		1
X	X	→ 4
5	Preset	

4 CT primary



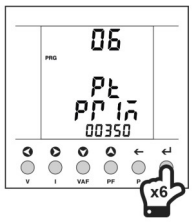
1	2	3
Select digit	Change digit	→ 5
160	5A - 10000A (10kA)	

5
VT secondary



1	2	3
Select digit	Change digit	→ 6
350	173V - 415V	

6
VT primary

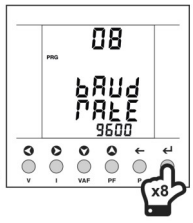


1	2	3
Select digit	Change digit	→ 7
350	100V - 500kV	

7
Slave ID

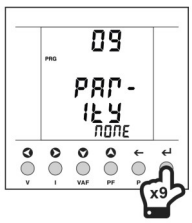
1	2	3
Select digit	Change digit	→ 8
1	1 - 255	

8
Baud rate



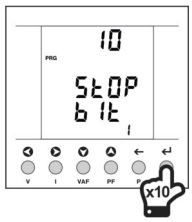
1	2	3
Select option	Change option	→ 9
9600	300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200	

9
Parity



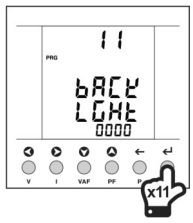
1	2	3
Select option	Change option	→ 10
None	None / Even / Odd	

10
Stop bits



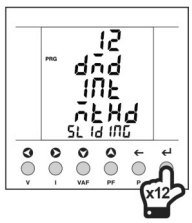
1	2	3
Select option	Change option	→ 11
1	1 / 2	

11
Backlight Duration



1	2	3
Select digit	Change digit	→ 12
0000	0 - 7200 Sec	

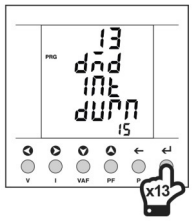
12
Demand interval method



1	2	3
Select option	Change option	→ 13
Sliding	Sliding / Fixed	

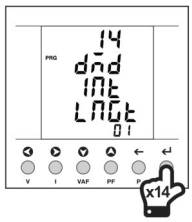
CONFIGURATION

13
Demand interval duration



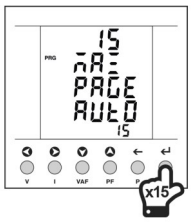
1	2	3
Select digit	Change digit	→ 14
15	1 - 30	

14
Demand interval length



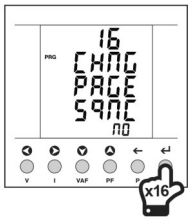
1	2	3
Select digit	Change digit	→ 15
1	1 - 30 min	

15
Max page auto



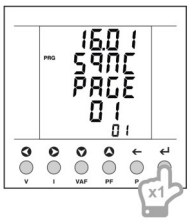
1	2	3
Select digit	Change digit	→ 16
21	1 - 21	

16
Change page sequence



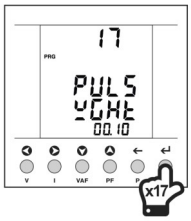
1	2	3
Select option	Change option	NO → 17 YES → 16.01
No	No / Yes	

16.01 - 16.21
Page sequence (1 - 21)



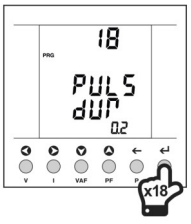
1	2	3
Select digit	Change digit	→ 16.02 - 16.21 → 17
1 - 21	1 - 21	

17
Pulse weight



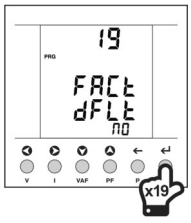
1	2	3
Select digit	Change digit	→ 18
0.10	00.01 - 99.99KW	

18
Pulse duration



1	2	3
Select digit	Change digit	→ 19
0.1	0.1 - 2.0 S	

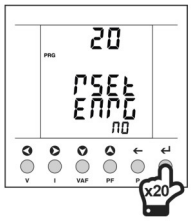
19
Factory default



1	2	3
Select option	Change option	→ 20
No	No / Yes	

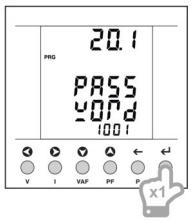
CONFIGURATION

20
Reset energy and max demand



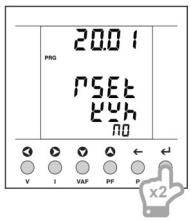
1	2	3
Select option	Change option	NO → 1 YES → 20.01
No	No / Yes	

20.1
Password (Reset only)



1	2	3
Select digit	Change digit	→ 20.01
Password + 1 (1001)		

20.01
Reset active energy

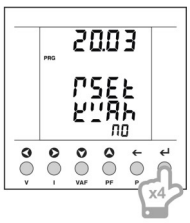


1	2	3
Select option	Change option	→ 20.02
No	No / Yes	

20.02
Reset reactive energy

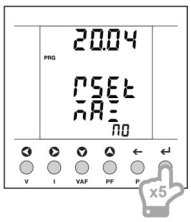
1	2	3
Select option	Change option	→ 20.03
No	No / Yes	

20.03
Reset apparent energy



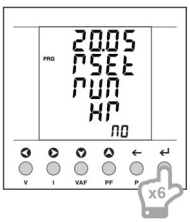
1	2	3
Select option	Change option	→ 20.04
No	No / Yes	

20.04
Reset max power



1	2	3
Select option	Change option	→ 20.05
No	No / Yes	

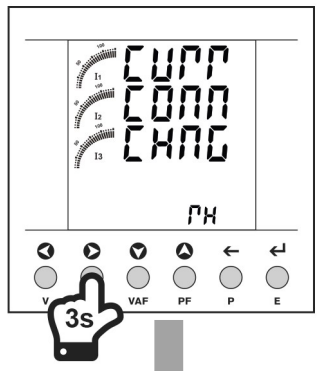
20.05
Reset run hour

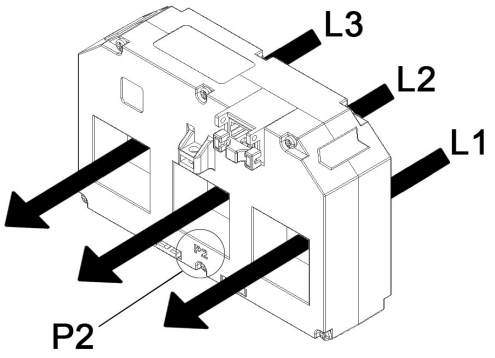


1	2	3
Select option	Change option	→ 1
No	No / Yes	

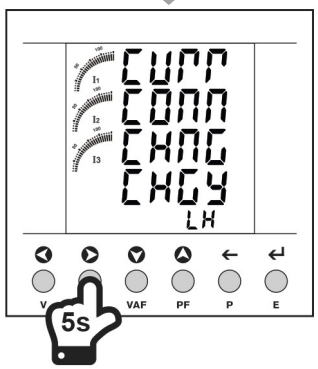
CT Rotation

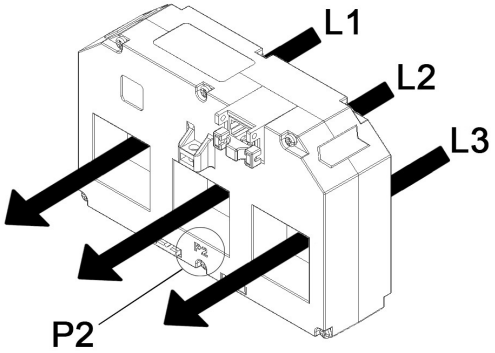
Right Hand





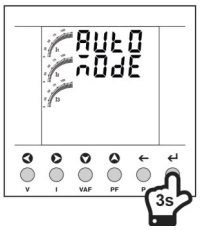
Left Hand

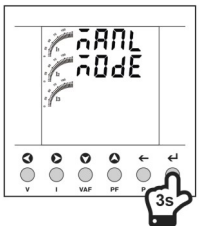




Page Scroll (Auto/Manual)

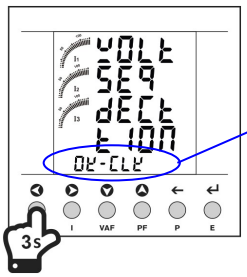
Auto



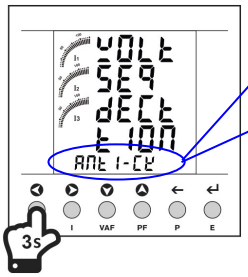


Manual

Voltage phase sequence

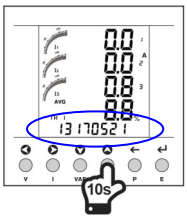


= L1→L2→L3 ✓

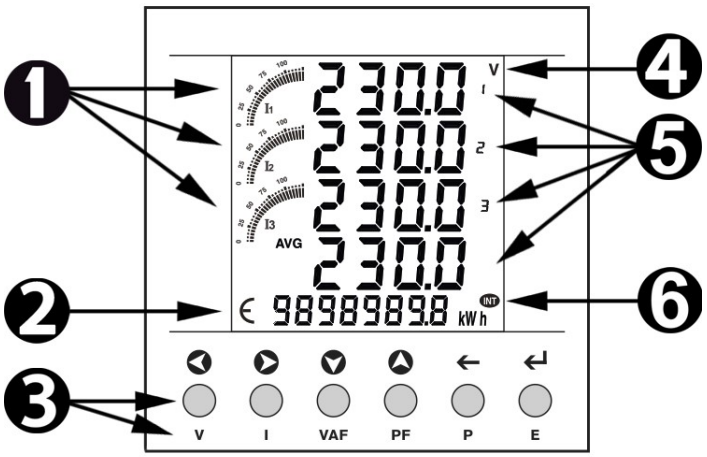


= L1→~~L2~~→L3?
(Missing phase?)
= L3→L2→L1?
(Reverse sequence?)
✗

Serial Number

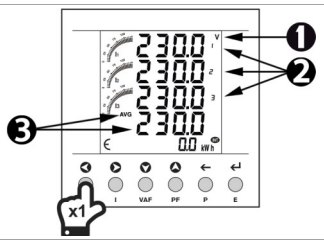
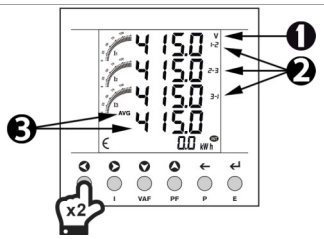
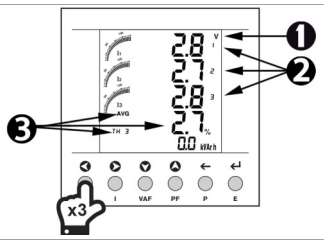
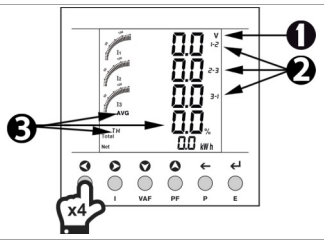
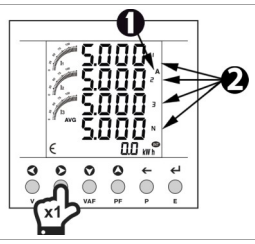


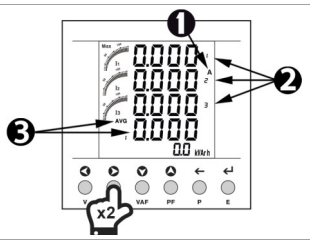
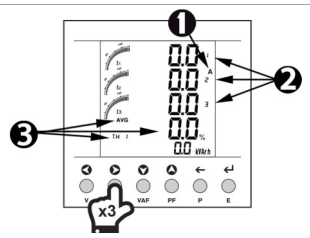
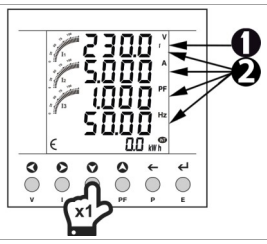
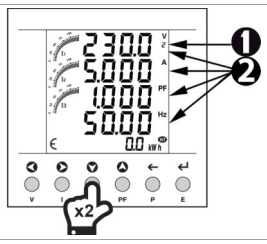
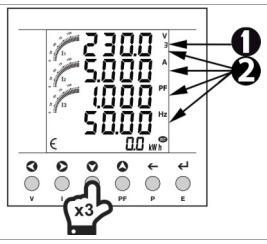
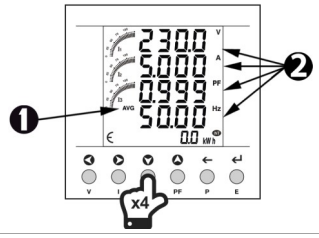
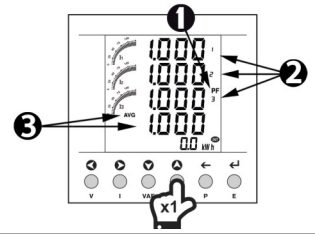
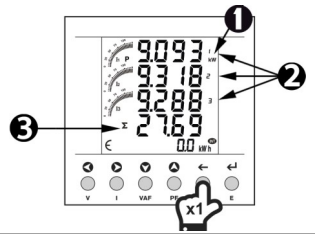
OPERATION

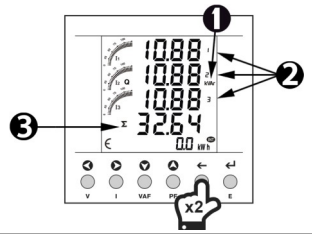
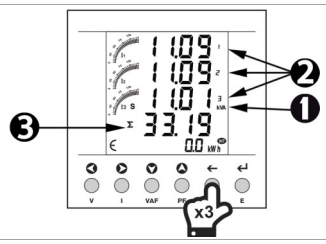
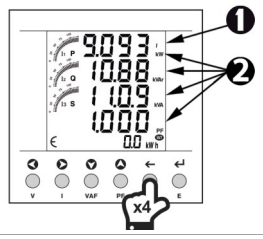
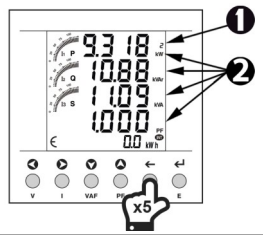
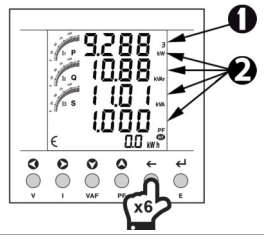
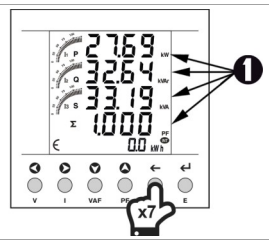
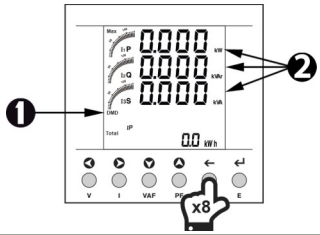
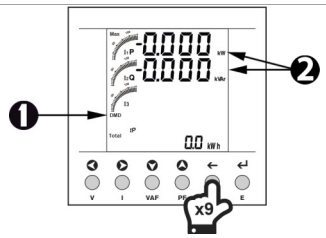


Press x times

1. Current level bar graph
2. Accumulative Energy Reading - **change using E button**
3. Function buttons and Symbols
4. Measurement Parameter (V, A, PF, Hz, kW, kVAr, kVA)
5. Multifunction Parameters - **change using V/I/VAF/PF/P buttons**
6. Energy accumulation indication

V1 **Line to Neutral Voltage**		1. V 2. V L1/L2/L3 3. 3P Average 3P4W ✓ 1P2W ✓
V2 **Line to Line Voltage**		1. V 2. V(L-L) 3. V(L-L) Average 3P4W ✓ 1P2W ✖
V3 **% Harmonics (L-N)**		1. V 2. % Harmonics 3. 3P Average Harmonics 3P4W ✓ 1P2W ✓
V4 **% Harmonics (L-L)**		1. V 2. % Harmonics 3. 3P Average Harmonics 3P4W ✓ 1P2W ✖
I1 **Phase Current**		1. A 2. L1/L2/L3/N Ampere 3P4W ✓ 1P2W ✓

I2 **Current Max Demand**		1. A 2. L1/L2/L3/N Max Ampere 3. 3P Average 3P4W ✓ 1P2W ✓
I3 **% Harmonic of Current**		1. A 2. % Harmonic 3. 3P Average Harmonic 3P4W ✓ 1P2W ✓
VAF1 **V / I / PF / Hz** **Phase 1**		1. L1 2. V / A / PF / Hz 3P4W ✓ 1P2W ✓
VAF2 **V / I / PF / Hz** **Phase 2**		1. L2 2. V / A / PF / Hz 3P4W ✓ 1P2W ✖
VAF3 **V / I / PF / Hz** **Phase 3**		1. L3 2. V / A / PF / Hz 3P4W ✓ 1P2W ✖
VAF4 **V / I / PF / Hz** **Average of 3 Phase**		1. 3P Average 2. V / A / PF / Hz 3P4W ✓ 1P2W ✖
PF **Power Factor**		1. PF 2. PF L1/L2/L3 3. Average PF 3P4W ✓ 1P2W ✓
P1 **Active Power**		1. kW 2. kW L1/L2/L3 3. 3P kW 3P4W ✓ 1P2W ✓

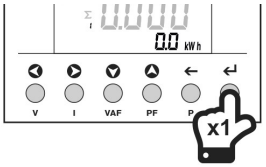
P2 **Reactive Power**		1. kVAr 2. kVAr L1/L2/L3 3. 3P kVAr 3P4W ✓ 1P2W ✓
P3 **Apparent Power**		1. kVA 2. kVA L1/L2/L3 3. 3P kVA 3P4W ✓ 1P2W ✓
P4 **Phase 1 Power**		1. L1 2. kW / KVAr / kVA / PF 3P4W ✓ 1P2W ✓
P5 **Phase 2 Power**		1. L2 2. kW / KVAr / kVA / PF 3P4W ✓ 1P2W ✖
P6 **Phase 3 Power**		1. L3 2. kW / KVAr / kVA / PF 3P4W ✓ 1P2W ✖
P7 **Total Power**		1. 3P kW/kVAr/kVA/PF 3P4W ✓ 1P2W ✖
P8 **Power Max Demand**		1. DMD: Demand 2. Max kW/kVAr/kVA 3P4W ✓ 1P2W ✓
P9 **Power Min Demand**		1. DMD: Demand 2. Min kW/kVAr 3P4W ✓ 1P2W ✓

OPERATION

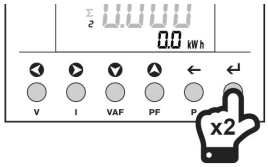
E1 / E2 / E3

L1 / L2 / L3 kWh: Import active energy

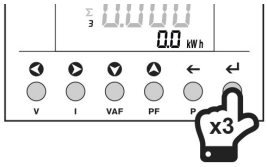
E1



E2



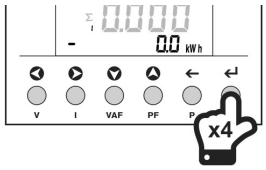
E3



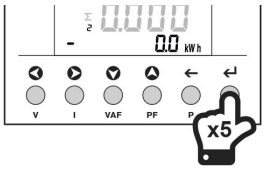
E4 / E5 / E6

L1 / L2 / L3 - kWh: Export active energy

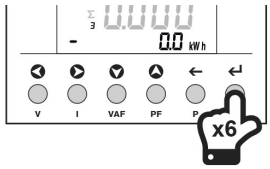
E4



E5



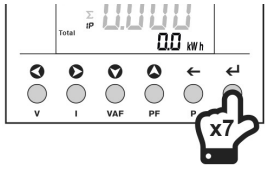
E6



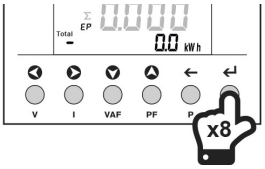
E7 / E8 / E9

Import/Export/Net kWh - 3 Phase total active energy

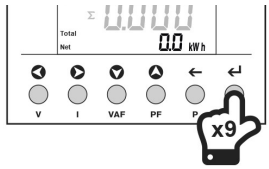
E7



E8



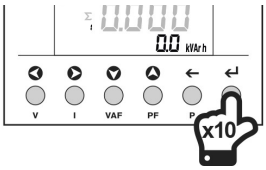
E9



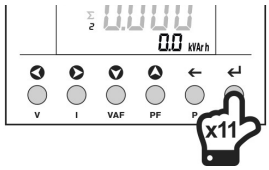
E10 / E11 / E12

L1 / L2 / L3 kVArh - Import reactive energy

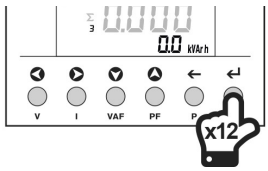
E10



E11



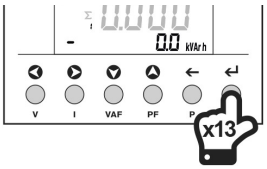
E12



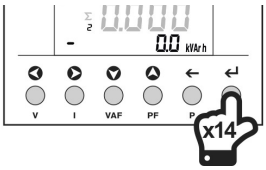
E13 / E14 / E15

L1 / L2 / L3 - kVArh - Export reactive energy

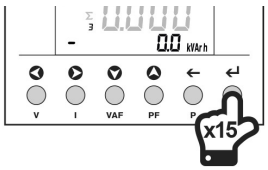
E13



E14



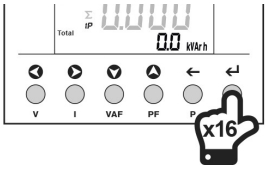
E15



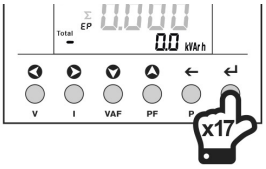
E16 / E17 / E18

Import/Export/Net kVArh - 3 Phase total reactive energy

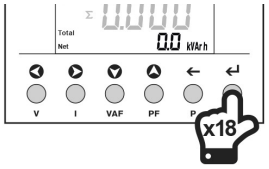
E16



E17



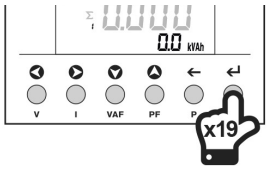
E18



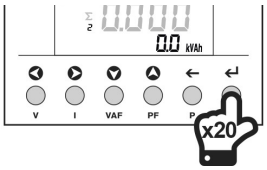
E19 / E20 / E21

L1 / L2 / L3 kVAh - Apparent energy

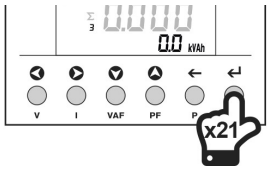
E19



E20

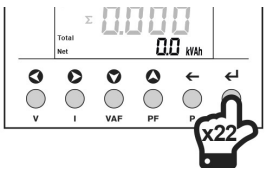


E21



E22

3 Phase net kVAh



E23

Run hour