OPERATING INSTRUCTIONS

MFM383/MFM383-S/MFM383-60Hz

96 x 96

FEATURES

- 3 lines, 3 digits per line
- Bar graph for current indication
- Auto / Manual page scrolling
- Universal auxiliary supply
- Measures all power parameters (RMS voltage, current, active power, apparent power, power factor, frequency and energy)
- Programmable CT primary

SPECIFICATIONS

Display

Liquid crystal display with backlight
3 lines, 3 digits per line to show all parameters
4th line, 8 digits to show energy
Bar graph for current indication

Display update time

10 sec for energy
2 sec for remaining parameters

Electrical input type

3 phase 4 wire and single phase

Rated input voltage

Line to Neutral : 350 VAC max (25 VAC min)

Rated input current

Nominal 5A AC (0.1 A min.)
(External CT required to be connected for MFM383-S model)

Auxiliary Supply

90 to 270 VAC/DC, 50/60Hz

Input Frequency

MFM383 : 50 Hz
MFM383-60Hz : 60 Hz
MFM383-S : 50/60Hz

Burden

0.2 VA max.@ 5A per phase
0.5 VA max. @5A per phase (for MFM383-S)

CT Primary

Programmable from 5 to 5000

Resolution

Parameters	CT Primary	Resolution
Current	<=10	0.01A
	>10 and <=100	0.1A
	>100 and <=1000	1A
	>1000	0.01 kA
kVA / kW	<=10	0.01k
	>10 and <=400	0.1k
	>400 and <=2800	1k
	>2800	0.01M

Parameter Measured/Calculated:

Parameters	Phase	Unit
Voltage	$V_{1N}, V_{2N}, V_{3N}, V_{12}, V_{23}, V_{31}$, $V_{avg\ L\text{-}N}$, $V_{avg\ L\text{-}L}$	V
Current	I_1, I_2, I_3, I_{avg}	I
Active Power	kW_1, kW_2, kW_3	W
Apparent Power	kVA_1, kVA_2, kVA_3	VA
Power Factor	Pf_1, Pf_2, Pf_3, Avg Pf.	Pf
Frequency	Hz	Hz
Energy	kWh	kWh

Accuracy Table:

Measurement	Accuracy
Voltage $V_{L\text{-}N}$	±0.5% of F.S. + 1 digit
Voltage $V_{L\text{-}L}$	±1% of F.S. + 1 digit
Average Voltage	±0.5% of F.S. + 1 digit
Current	±1% of F.S. + 1 digit
Average current	±1% of F.S.+ 1 digit
Frequency	± 0.1% ± 0.1Hz
Active Power	±1% of F.S. + 1 digit
Apparent power	±1% of F.S. + 1 digit
Power factor & Avg Pf	±0.01 PF + 1 digit
Energy	Class 1

NOTE:
The accuracy table is valid at respective operating frequencies only.

Temperature

Operating: 0 to 50 °C ; Storage: -20 to 75 °C

Humidity

85% non condensing

Mounting

Panel mounting

Weight

MFM383-S : 218 gms
MFM383 / MFM383-60Hz : 260 gms

SAFETY SUMMARY

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument. If the equipment is not handled in a manner specified by the manufacturer it might impair the protection provided by the equipment.

⚠ **CAUTION:** Read complete instruction prior to installation and operation of the unit.

⚠ **CAUTION:** Risk of electric shock.

WIRING GUIDELINES

⚠ **CAUTION:**

1. **To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement.**
2. **Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct.**
3. **Use lugged terminals.**
4. **To eliminate electromagnetic interference, use of wires with adequate ratings and twists of the same in equal size shall be made.**
5. **Cable used for connection to power source, must have a cross section of 1.5 mm². These wires shall have current carrying capacity of 5A.**

MAINTENANCE

1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean soft cloth . Do not use Isopropyl alcohol or any other cleaning agent.

INSTALLATION GUIDELINES

⚠ **CAUTION:**

1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Before disconnecting the secondary of the external current transformer from the equipment, make sure that the current transformer is short circuited to avoid risk of electrical shock and injury.

⚠ **CAUTION:**

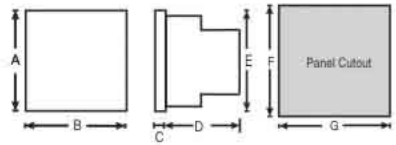
1. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
2. The equipment does not have a built-in-type fuse. Installation of external fuse of rating 275VAC/1A for electrical circuitry is highly recommended.
3. Thermal dissipation of equipment is met through ventilation holes provided on chassis of equipment. Such ventilation holes shall not be obstructed else it can lead to a safety hazard.
4. Connectors screws must be tightened after installation.

MECHANICAL INSTALLATION:

For installing the meter

1. Prepare the panel cutout with proper dimensions as shown below :

OVERALL DIMENSIONS (All dimensions in mm)



MODEL / DIM	A	B	C	D	E	F	G
MFM383	99	99	5	46	91	92	92

2.Push the meter into the panel cutout. Secure the meter in its place by pushing the clamp on the rear side. The screws of the panel of the clamp must be in the farthest forward slot.

3.For proper sealing, tighten the screws evenly with required torque.

⚠ **CAUTION:**

The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam, or other unwanted process byproducts.

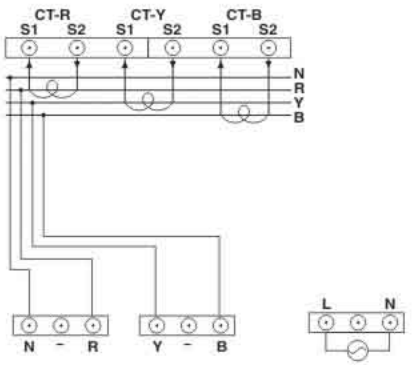
EMC Guidelines:

1.Use proper input power cables with shortest connections and twisted type.

2.Layout of connecting cables shall be away from any internal EMI source.

TERMINAL CONNECTIONS:

MFM383 / MFM383-S / MFM383-60 Hz



FRONT PANEL DESCRIPTION

Bar Graph Indication

In MFM 383, the bar graph shows the percentage of current flowing through the load. The Bar graph shows the 25, 50, 75, 100, 125 and 150% of rated input current.

Keys Description

Sr No	Functions	Key press
1	To scroll through the pages in forward direction in manual mode.	⊙+▲ to next pages
2	To scroll through the pages in reverse direction in manual mode.	⊙+▼ to previous pages
3	To toggle between auto/manual scrolling.	▼ (A/M) for three seconds
4	To enter in configuration mode.	▼(A/M) + ▲ (PRG) for 3 seconds
5	To increase and decrease all parameter	⊙ + ▲ Increase ⊙ + ▼ Decrease

NOTE :

1) Continuous operation of ⊙+▼/▲ makes update speed faster in 3 stage after 7 seconds.
2) CT updates in steps of 5 after CT setting has reached to 100, in steps of 10 after CT setting has reached 1000. Eg : After 1000, the display increments to 1.01 i.e.1010.

CONFIGURATION SCHEME

1)Continuous pressing of ▼(A/M) + ▲ (PRG) for 3 seconds initiates the programming mode.

2)Program settings are as given below.

Key press	Display	Description
1. To configure CT primary	Default setting: 5	
NOTE: External CT of rating 5A required to be connected for MFM383-S model.		
		CT Primary
Press ⊙+▼/▲	Ct 5	Range: 5 to 5000 A
*Display shows	Ct 1.00	When CT is 1000
2. Press ▼ to Reset count	Default setting: no	
		Reset
	rSt no	Reset NO
Press ⊙+▼/▲	rSt YES	Reset YES
NOTE: On selecting 'Reset YES', only energy(kWh) will be Reset.		

NOTE :

1) Press ▼ (A/M) + ▲ PRG Key for three seconds to come out of programming.

2) The unit will auto exit program mode after 60 sec. of inactivity.

DISPLAY PARAMETER PAGE DESCRIPTION

There are two methods to scroll through the different parameter pages on the display.

1) Auto mode.
2) Manual mode.

Auto mode:

In auto mode, it allows you to monitor all pages sequentially at an interval of 5 seconds without any key press. Each page contains 3 parameters.

NOTE : By default the unit works in auto mode.

Manual mode:

In manual mode, using the ⊙+▼/▲ keys different parameter pages can be viewed. In the manual mode the displayed page is seen until you manually change the page.

The parameter pages are as shown in the adjoining figures.

NOTE :

When meter turns to manual mode display shows [mAn] momentarily.

When meter turns to auto mode display shows [Aut] momentarily.

Error indications

Error	Description
Ctr	CT reverse

Ctr error occurs if

1. The CT secondary wires S1 & S2 are swapped in wiring.
2. The CT inputs are not connected to their respective phases that is CT1 to R phase, CT2 to Y phase and CT3 to B phase

NOTE: Ctr error displayed only on Active Power page and Power Factor page

PAGE 1:

Display shows Line to Neutral Voltage & Energy .

1) V_{1-N}
2) V_{2-N}
3) V_{3-N}
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 7.5$ i.e. 150%

Press ⊙ + ▲ to go in to next page

PAGE 2:

Display shows Line to Line voltage (V_{L-L})

1) V12
2) V23
3) V31
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE DESCRIPTION (CONTINUED)

PAGE 3:

Display shows Current of each Phase & Energy.

1) A1
2) A2
3) A3
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 4:

Display shows AV, AC, Frequency & Energy

1) Average voltage V_{L-N}
2) Average Current
3) Frequency
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 5:

Display shows AV, AC, APF & Energy

1) Average Voltage V_{L-L}
2) Average Current
3) Average Power factor
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 6:

Display shows Active Power & Energy

1) kW1
2) kW2
3) kW3
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 7:

Display shows Apparent Power & Energy

1) kVA 1
2) kVA 2
3) kVA 3
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 8:

Display shows Power Factor of each Phase & Energy

1) Pf1
2) Pf2
3) Pf3
4) kWh (Energy)

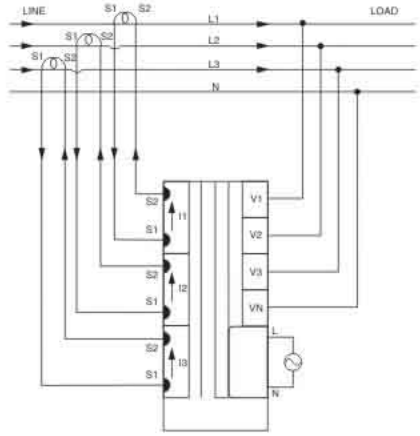
*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

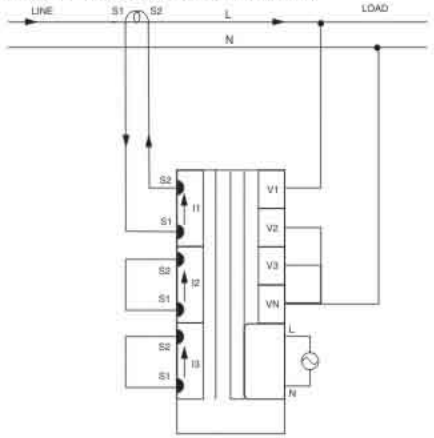
Press ⊙ + ▲ to go in to first page

WIRING DIAGRAM

3 PHASE 4-WIRE WIRING DIAGRAM



SINGLE PHASE WIRING DIAGRAM



(Specifications subject to change as development is a continuous process)

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E- mail: sales@selec.com.

OPERATING INSTRUCTIONS

MFM383-C

96 x 96

FEATURES

- 3 lines, 3 digits per line
- Bar graph for current indication
- Auto / manual page scrolling
- Universal auxiliary supply
- Measures all power parameters (RMS voltage, current, active power, apparent power, reactive power, power factor, frequency and energy)
- Programmable CT primary
- RS485 communication (MODBUS Protocol)

SPECIFICATIONS

Display

Liquid crystal display with backlight
3 lines, 3 digits per line to show all parameters
4th line, 8 digits to show energy
Bar graph for current indication

Display update time

10 sec for energy
2 sec for remaining parameters

Electrical input type

3 phase 4 wire and single phase

Rated input voltage

Line to Neutral : 350 VAC max (25 VAC min)

Rated input current

Nominal 5A AC (0.1A min.)

Auxiliary Supply

90 to 270 VAC/DC, 50Hz

Input Frequency

50Hz

Burden

0.5 VA max.@5A per phase

CT Primary

Programmable from 5 to 5000

Resolution

Parameters	CT Primary	Resolution
Current	<=10	0.01A
	>10 and <=100	0.1A
	>100 and <=1000	1A
	>1000	0.01kA
kVA / kW	<=10	0.01k
	>10 and <=400	0.1k
	>400 and <=2800	1k
	>2800	0.01M
Total kVA / kW/ kVAr	<=10	0.01k
	>10 and <=90	0.1k
	>90 and <=950	1k
	>950	0.01M

Parameter Measured/Calculated:

Parameters	Measured values	Unit
Voltage	$V_{1N}, V_{2N}, V_{3N}, V_{12}, V_{23}, V_{31}$, $V_{avg\ L\text{-}N}$, $V_{avg\ L\text{-}L}$	V
Current	I_1, I_2, I_3, I_{avg}	A
Active Power	kW_1, kW_2, kW_3 & Total kW	W
Apparent Power	kVA_1, kVA_2, kVA_3 & Total kVA	VA
Power Factor	Pf_1, Pf_2, Pf_3, Avg Pf.	-
Reactive* Power	$kVAr_1$, $kVAr_2$, $kVAr_3$ and Total kVAr	VAr
Frequency	Hz	Hz
Energy	kWh	kWh

*$kVAr_1$, $kVAr_2$, $kVAr_3$ can be viewed through MODBUS Communication only.

Accuracy Table:

Measurement	Accuracy
Voltage $V_{L\text{-}N}$	±0.5% of F.S. + 1 digit
Voltage $V_{L\text{-}L}$	±1% of F.S. + 1 digit
Average Voltage $_{L\text{-}N}$	±0.5% of F.S. + 1 digit
Average Voltage $_{L\text{-}L}$	±1% of F.S. + 1 digit
Current	±1% of F.S. + 1 digit
Average current	±1% of F.S.+ 1 digit
Frequency	±0.1% ±0.1 Hz
Active Power	±1% of F.S. + 1 digit
Apparent power	±1% of F.S. + 1 digit
Reactive Power	±1% of F. S. ±2 digits
Power factor & Avg Pf	±0.01 PF + 1 digit
Energy	Class 1

SERIAL COMMUNICATION

Interface standard & protocol

RS485 & MODBUS RTU

Communication address

1 to 255

Transmission mode

Half duplex

Data types

Float and Integer

Transmission distance

500 m maximum

Transmission speed

300, 600,1200, 2400, 9600,19200 (in bps)

Parity

None, Odd, Even

Stop bits

1 or 2

Response time

100 ms (max and independent of baud rate)

Temperature

Operating: 0 to 50 °C ; Storage: -20 to 75 °C

Humidity

85% non condensing

Weight

223 gms

SAFETY SUMMARY

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument. If the equipment is not handled in a manner specified by the manufacturer it might impair the protection provided by the equipment.

⚠**CAUTION:** Read complete instruction prior to installation and operations of the unit.

⚠**CAUTION:** Risk of electric shock.

WIRING GUIDELINES

⚠**CAUTION:**

1. **To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement.**
2. **Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct.**
3. **Use lugged terminals.**
4. **To eliminate electromagnetic interference, use wires with adequate ratings and twists of the same in equal size shall be made.**
5. **Cable used for connection to power source, must have a cross section of 1.5 mm². These wires shall have current carrying capacity of 5A.**

MAINTENANCE

1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean soft cloth . Do not use Isopropyl alcohol or any other cleaning agent.

INSTALLATION GUIDELINES

⚠**CAUTION:**

1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Before disconnecting the secondary of the external current transformer from the equipment, make sure that the current transformer is short circuited to avoid risk of electrical shock and injury.

⚠**CAUTION:**

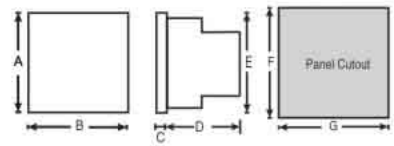
1. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
2. The equipment does not have a built-in-type fuse. Installation of external fuse of rating 275VAC/1A for electrical circuitry is highly recommended.
3. Thermal dissipation of equipment is met through ventilation holes provided on chassis of the equipment. such ventilation holes shall not be obstructed else it can lead to a safety hazard.

MECHANICAL INSTALLATION:

For installing the meter

1. Prepare the panel cutout with proper dimensions as shown below :

OVERALL DIMENSIONS (All dimensions in mm)



	A	B	C	D	E	F	G
MFM383C	99	99	5	46	91	92	92

2. Push the meter into the panel cutout. Secure the meter in its place by pushing the clamp on the rear side. The screws of the panel of the clamp must be in the farthest forward slot.
3. For proper sealing, tighten the screws evenly with required torque.

⚠**CAUTION:**

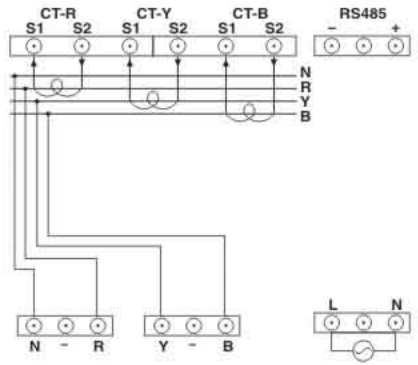
The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam, or other unwanted process byproducts.

EMC Guidelines:

1. Use proper input power cables with shortest connections and twisted type.
2. Layout of connecting cables shall be away from any internal EMI source.

TERMINAL CONNECTIONS:

MFM383-C



FRONT PANEL DESCRIPTION

Bar Graph Indication

In MFM383-C, the bar graph shows the percentage of current flowing through the load. The Bar graph shows 25, 50, 75, 100, 125 and 150% of rated input current.

KEYS DESCRIPTION

Sr No	Functions	Key press
1	To scroll through the pages in forward direction in manual mode.	⊙+Ⓐ to next pages
2	To scroll through the pages in reverse direction in manual mode.	⊙+Ⓥ to previous pages
3	To toggle between auto/manual scrolling.	Ⓥ (A/M) for three seconds
4	To enter in configuration mode.	Ⓥ(A/M) + Ⓐ (PRG) for 3 seconds
5	To increase and decrease all Parameters	⊙+Ⓐ Increase ⊙+Ⓥ Decrease

NOTE :

1) Continuous operation of ⊙+Ⓥ/Ⓐ makes update speed faster in 3 stage after 7 seconds.
2) CT updates in steps of 5 after CT setting has reached to 100, in steps of 10 after CT setting has reached 1000. Eg : After 1000, the display increments to 1.01 i.e.1010. Hence, to set CT primary as 1600, program CT as 1.60

CONFIGURATION SCHEME

1) Continuous pressing of Ⓥ(A/M) + Ⓐ (PRG) for 3 seconds initiates the programming mode.
2) Program settings are as given below.

Key press	Display	Description
1. To configure CT primary		Default setting: 5
Press ⊙+Ⓥ/Ⓐ	CT 5	**CT Primary** Range: 5 to 5000 A
Display shows	CT 1.00	When CT is 1000
2. Press Ⓐ to reset Energy count		Default setting: NO
	rSt NO	**Reset** Reset NO
Press ⊙+Ⓥ/Ⓐ	rSt YES	Reset YES
NOTE: On selecting 'Reset YES', only energy (kWh) will be Reset.		
3. Press Ⓐ to enter Slave ID		Default setting: 1
Press ⊙+Ⓥ/Ⓐ	S.Id 1	**Slave ID** Range: 1 to 255
4. Press Ⓐ to select Baud Rate		Default setting: 9.6
Press ⊙+Ⓥ/Ⓐ	bUd 300	**Baud Rate** 300
Press ⊙+Ⓥ/Ⓐ	bUd 600	600
Press ⊙+Ⓥ/Ⓐ	bUd 1.2	1200
Press ⊙+Ⓥ/Ⓐ	bUd 2.4	2400
Press ⊙+Ⓥ/Ⓐ	bUd 4.8	4800
Press ⊙+Ⓥ/Ⓐ	bUd 9.6	9600
Press ⊙+Ⓥ/Ⓐ	bUd 19.2	19200
5. Press Ⓐ to select Parity		Default setting: NO
	PAr NO	**Parity** NO
Press ⊙+Ⓥ/Ⓐ	PAr EVE	EVEN
Press ⊙+Ⓥ/Ⓐ	PAr Odd	ODD
6. Press Ⓐ to select Stop Bit		Default setting: 1
	StP 1	**Stop Bit** Stop Bit 1
Press ⊙+Ⓥ/Ⓐ	StP 2	Stop Bit 2

NOTE :

1) Press Ⓥ(A/M) + Ⓐ PRG key for 3 seconds to come out of programming.
2) The unit will auto exit program mode after 60 sec. of inactivity.

DISPLAY PARAMETER PAGE DESCRIPTION

There are two methods to scroll through different parameter pages on the display.
1) Auto mode.
2) Manual mode.

Auto mode:

In auto mode, it allows you to monitor all pages sequentially at an interval of 5 seconds without any key press. Each page contains 3 parameters.
NOTE : By default the unit works in auto mode.

Manual mode:

In manual mode, using the ⊙+Ⓥ/Ⓐ keys different parameter pages can be viewed. In the manual mode the displayed page is seen until you manually change the page.

The parameter pages are as shown below:

NOTE :

When meter turns to manual mode display shows MAn momentarily.
When meter turns to auto mode display shows Aut momentarily.

Error indications

Error	Description
Ctr	CT reverse

Ctr error occurs if

1. The CT secondary wires S1 & S2 are swapped in wiring.
2. The CT inputs are not connected to their respective phases i.e. CT1 to R phase, CT2 to Y phase and CT3 to B phase

NOTE: Ctr error is displayed only on Active Power page and Power Factor page

PAGE DESCRIPTION

PAGE 1:

Display shows Line to Neutral Voltage & Energy.

1) V_{1-N}
2) V_{2-N}
3) V_{3-N}
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 7.5$ i.e. 150%

Press ⊙ + Ⓐ to go in to next page

PAGE 2:

Display shows Line to Line Voltage (V_{L-L}) & Energy.

1) V12
2) V23
3) V31
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + Ⓐ to go in to next page

PAGE 3:

Display shows Current of each Phase & Energy.

1) A1
2) A2
3) A3
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + Ⓐ to go in to next page

PAGE 4:

Display shows Avg. V_{L-N}, Avg. I, Freq. & Energy

1) Average Voltage V_{L-N}
2) Average Current
3) Frequency
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 5:

Display shows Avg. V_{L-L}, Avg. I, APF & Energy

1) Average Voltage V_{L-L}
2) Average Current
3) Average Power factor
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 6:

Display shows Active Power & Energy

1) kW1
2) kW2
3) kW3
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 7:

Display shows Apparent Power & Energy

1) kVA 1
2) kVA 2
3) kVA 3
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 8:

Display shows power factor of each Phase & Energy

1) Pf1
2) Pf2
3) Pf3
4) kWh (Energy)

*The CT primary set at 5.

5) $I_1 \approx 2.5$ i.e. 50%
6) $I_2 \approx 5$ i.e. 100%
7) $I_3 \approx 6.25$ i.e. 125%

Press ⊙ + ▲ to go in to next page

PAGE 9:

Display shows total Active Power & Energy

1) Total kW
2) kWh (Energy)

Press ⊙ + ▲ to go in to next page

PAGE 10:

Display shows total Apparent Power & Energy

1) Total Apparent Power
2) kWh (Energy)

Press ⊙ + ▲ to go in to next page

PAGE 11:

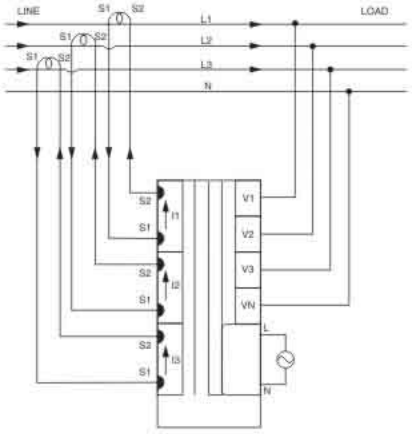
Display shows total Reactive Power & Energy

1) Total Reactive Power
2) kWh (Energy)

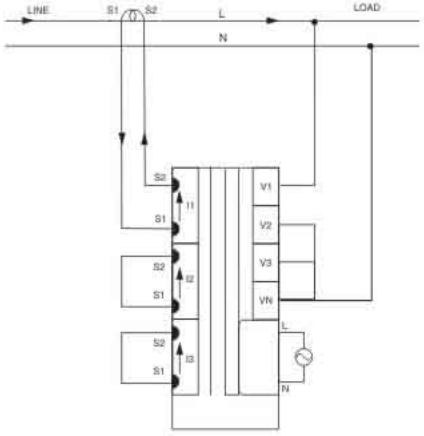
Press ⊙ + ▲ to go in to first page

WIRING DIAGRAM

3 PHASE 4-WIRE WIRING DIAGRAM



SINGLE PHASE WIRING DIAGRAM



MODBUS register addresses list					
Writable parameters from master					
Address	Parameter	Range		Length (Register)	Data Structure
		Min value	Max value		
40001	CT primary	5	5000	1	Integer
40002	Reset kWh	0	1	1	Integer

Readable parameters from master					
Address	Parameter	Range		Length (Register)	Data Structure
		Min value	Max value		
30001	Voltage V1N	0	350.0	2	Float
30003	Voltage V2N	0	350.0	2	Float
30005	Voltage V3N	0	350.0	2	Float
30007	Average Voltage LN	0	350.0	2	Float
30009	Voltage V12	0	607.0	2	Float
30011	Voltage V23	0	607.0	2	Float
30013	Voltage V31	0	607.0	2	Float
30015	Average Voltage LL	0	607.0	2	Float
30017	Current I1	0	5000.00	2	Float
30019	Current I2	0	5000.00	2	Float
30021	Current I3	0	5000.00	2	Float
30023	Average Current	0	5000.00	2	Float
30025	kW1	-1750.00	1750.00	2	Float
30027	kW2	-1750.00	1750.00	2	Float
30029	kW3	-1750.00	1750.00	2	Float
30031	kVA1	0	1750.00	2	Float
30033	kVA2	0	1750.00	2	Float
30035	kVA3	0	1750.00	2	Float
30037	PF1	-0.99	1.00	2	Float
30039	PF2	-0.99	1.00	2	Float
30041	PF3	-0.99	1.00	2	Float
30043	Average PF	-0.99	1.00	2	Float
30045	Frequency	0	65.0	2	Float
30047	kWh	0	99999999.9	2	Float
30049	kVAr1	-1750.00	1750.00	2	Float
30051	kVAr2	-1750.00	1750.00	2	Float
30053	kVAr3	-1750.00	1750.00	2	Float
30055	Total kW	-5250.00	5250.00	2	Float
30057	Total kVA	0	5250.00	2	Float
30059	Total kVAr	-5250.00	5250.00	2	Float
30061	Status Register	Value	Status	1	Integer
		0x0001	Phase 1 – CT Rev		
		0x0002	Phase 2 – CT Rev		
		0x0004	Phase 3 – CT Rev		

(Specifications subject to change as development is a continuous process)
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