



96 x 96mm

Features :**EM306 :**

- 3Ø Active Energy meter
- SMPS supply (85 to 276V)
- Single pulse output

EM306-C-D :

- Dual Input Meter (Mains / D.G.)
- 3Ø Energy (kWh, kVAh, kVAh)
- 3Ø Power (kW, kVA, kVA), PF
- RS485 Communication MODBUS RTU Protocol

Display specifications

Display	1 row, 7 segments LED Display
Digits	6
Digit height	0.56"
Resolution	For energy : 0.01k, 0.1k, 1k, 0.01M, 0.1M, 1M, 10M (depending upon CT ratio x PT ratio) For Power : Auto resolution, For Power factor : 0.001 (for EM306-C-D)

Input specifications

Type of measurement	TRUE RMS
Sampling rate	100 Samples / Cycle
Electrical connections	3Ø - 3 wire, 3Ø - 4 wire, 2Ø - 3 wire, 1Ø - 2 wire
Data update rate	1 sec for all the parameters*
Input-voltage	
PT primary	100V to 500V AC (L - L) (Programmable for any value)
Voltage nominal	11 to 300V AC (L - N), 19 to 519V AC (L - L)
Impedance	≥0.8MΩ
Frequency range	45 - 65Hz
VA burden	0.5VA per phase
Input-current	
CT ratings primary	1 / 5A to 10kA (Programmable for any value)
Current nominal	5A
Withstand continuous	120A for 1sec
Frequency range	45 - 65Hz
VA burden	0.5VA per phase
Measurement accuracy	
Power factor	±0.01 Digit*
Power	1%*
Frequency	±0.1% For L - N Voltage >20V, For L - L Voltage >35V*
Active energy	Class 1
Reactive energy	Class 2*

NOTE - * = Only for EM306-C-D

Output specification

For EM306 :	
Pulse output	Voltage range : External 24V DC max Current capacity : 100mA max Pulse width : 100ms ±5ms

Output specification

For EM306-C-D :	
Device ID & Parity	1 to 255 & None, Odd, Even
Protocol & Interface	RS485 and MODBUS RTU
Baud rate	9600
Transmission mode	Half duplex
Transmission distance	500 meter maximum
Transmission speed	300, 600, 1200, 2400, 4800, 9600, 19200
Stop bits	1 or 2
Response time	100ms (max and independent of baud rate)
Isolation	Yes

Mechanical specifications

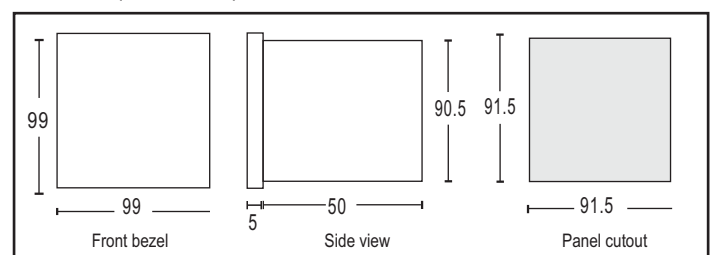
Weight	210gms
Material	MAKROLON 6557 SMOKE BLACK
IP degree of protection	IP54
Torque at terminals	0.68N-m to 0.79 N-m
Wire gauge at terminals	20 to 14AWG;75°C
Mounting position	Panel mount

Auxiliary supply specifications

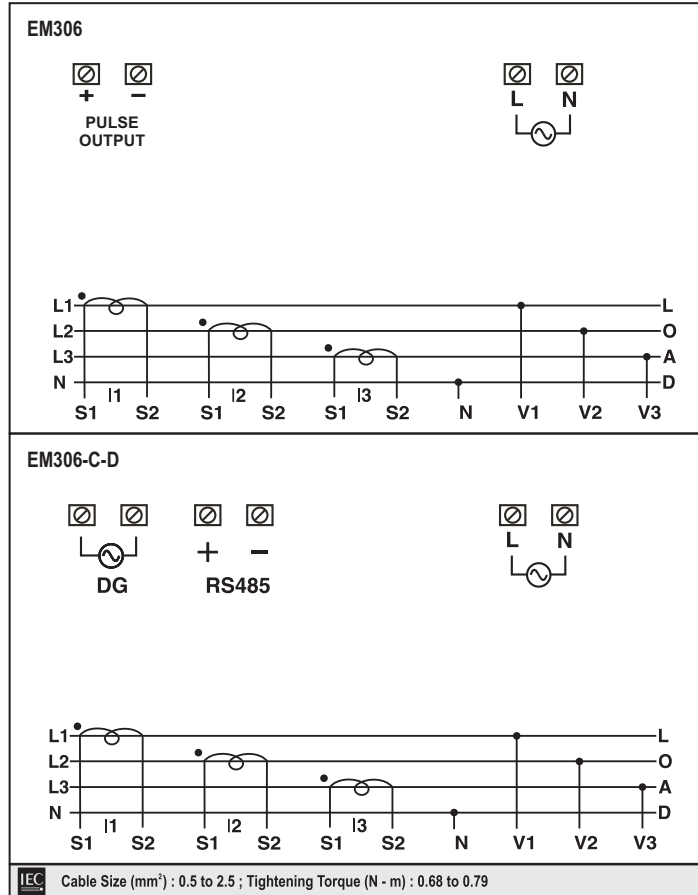
Supply voltage	85 to 276V AC, 50/60 Hz
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Environmental specifications

Operating temperature	-10°C to +55°C
Storage temperature	-20°C to 75°C
Humidity	85% (Non-Condensing)
Altitude	Up to 2000 meters
Measurement category	CAT III
Pollution degree	2

Dimensions (All are in mm)

Terminal connection



Ordering information

Product code	Supply voltage	Output		Digital input
		Pulse output	Comm. (RS485)	
EM306	100 to 240V AC (-15% to 12%)	YES	---	---
EM306-C-D		---	YES	YES

EM306**Operating Instructions****SPECIFICATIONS****DISPLAY**

- 1 row of 6 digits to show electrical parameters
- 7 segment LED display 71*24mm
- Digit integrated with parameter units

INDICATIONS

- EXP** - CT Reverse Detection
- k** - Kilo
- M** - Mega

WIRING INPUT

- 3 Ø - 4 wire, 3 Ø - 3 wire, 2 Ø - 3 wire and 1 Ø - 2 wire system

RATED INPUT VOLTAGE

- 11 to 300V AC (L-N); 19 to 519V AC (L-L); Installation Category III

FREQUENCY RANGE

- 45-65 Hz

RATED INPUT CURRENT

- Nominal 5A AC (Min-50mA, Max-6A)

BURDEN

- 0.5 VA @ 5A per phase

CT PRIMARY

- 1A / 5A to 10,000A (Programmable for any Value)
- Note** : 1A to 10,000A if CT secondary is 1 else CT primary is 5A to 10,000A

CT SECONDARY

- 1A or 5A (Programmable)

PT PRIMARY

- 100V to 500kV (Programmable for any value)

PT SECONDARY

- 100 to 500V AC (L-L) (Programmable for any value)

POWER CONSUMPTION

- Less than 8VA

ENVIRONMENTAL CONDITIONS

- Indoor use
- Altitude of up to 2000 meters
- Pollution degree II

Temperature : Operating : -10°C to 55°C

Storage : -20°C to 75°C

Humidity : Up to 85% non-condensing

PROTECTION CLASS : II**INSTALLATION CATEGORY : III**

MOUNTING : Panel mounting

WEIGHT : 210gms

OUTPUT

Pulse output : Voltage range external 24V DC max
Current capacity: 100mA

Pulse width : 100ms ± 5ms

INT : 1000 pulses / kWh

RESOLUTION

PT Ratio x CT Ratio	kWh	Pulse output kWh/pulse
<15	0.01K	0.01
<150	0.1K	0.1
<1500	1K	1
<15000	0.01M	10
<150000	0.1M	100
≥ 150000	1M	1000

ORDER CODE INFORMATION

Product	Supply	Certification	
		CE	cULUS LISTED
EM306	85 TO 276 V AC, 50/60 Hz	-	-

ACCURACY

Measurement	Accuracy
Active energy	Class 1

SAFETY PRECAUTIONS

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 used in a manner specified by the manufacturer it might impair the protection provided by the equipment.

- Do not use the equipment if there is any mechanical damage.
- Ensure that the equipment is supplied with correct voltage.

CAUTION :

1. Read complete instructions prior to installation and operation of the unit.
2. Risk of electric shock.
3. The equipment in its installed state must not come in close proximity to any heating sources, oils, steam, caustic vapors or other unwanted process by products.

WIRING GUIDELINES**WARNING :**

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 reduce electromagnetic interference use of wires with adequate ratings and twists of the same in equal size shall be made with shortest connections.
5. Layout of connecting cables shall be away from any internal EMI source.
6. Cable used for connection to power source, must have a cross section of 0.5mm² to 2.5mm² (20 to 14AWG ; 75°C (minimum)). These wires shall have current carrying capacity of 6A.

7. Copper cable should be used. (Stranded or Single core cable).
8. Before attempting work on device, ensure absence of voltages using appropriate voltage detection device.
9. Recommended CT: Measuring type.

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. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.
4. 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.
5. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
6. The equipment does not have a built-in-type fuse. Installation of external fuse of rating 275V AC / 0.5Amp for electrical circuitry / battery is highly recommended.

MECHANICAL INSTALLATION

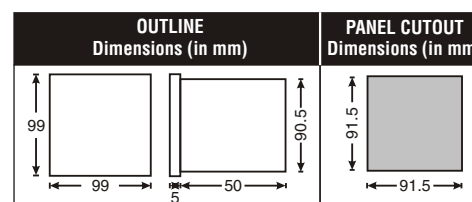
For installing the meter

1. Prepare the panel cutout with proper dimensions as shown below.
2. Push the meter into the panel cutout. Secure the meter in its place by fitting the clamp on the rear side. Fit clamps on both sides in diagonally opposite location for optimum fitting.
3. For proper sealing, tighten the screws evenly with required torque.

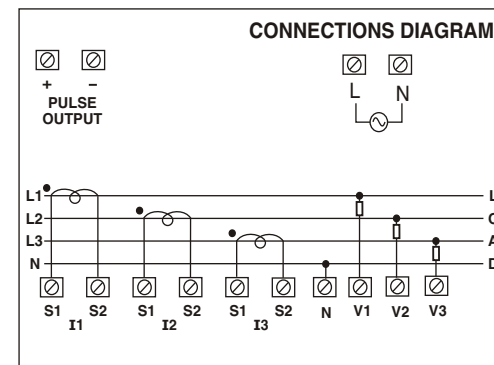
Terminal screw tightening torque :

0.68 N-m to 0.79 N-m (6.018 In-Lb to 6.992 In-Lb)

Screw clamp tightening torque : 0.1N-m (0.885 Lb-inch)

**MAINTENANCE**

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

TERMINAL CONNECTIONS**FRONT PANEL DESCRIPTION****ONLINE PAGE DESCRIPTION**

Display will show only kWh page.

SERIAL NUMBER DESCRIPTION

Press **▲** key for 10 sec. to display serial number.

CONFIGURATION

Note : Setting should be done by professional after going through this user manual and having understood the application situation.

For the configuration setting mode :

- Use **◀** **✓** key for 3 sec to enter and exit from configuration menu.
- Use **◀** key to shift the cursor for next digit and to edit. Use **▲** key to increment the configuration value. Use **▼** key to decrement the configuration.
- Use **✓** key for save parameter value & go to the next page

Config. page	Function	Range or Selection	Factory Setting	
	Password	0000 to 9998	1000	PR5YFD
1	Change Password	No / Yes	No	CN6PYD
1.1	New Password	0000 to 9998		NEYPYD
2	Network Selection	3P4W, 3P3W, 1P2W-R, 1P2W-Y and 1P2W-B	3P4W	NY SEL
3	CT Secondary	1A or 5A	5	CT SEC
4	CT Primary	1A, 5A to 10,000A	5	CT PM
5	PT Secondary	100V to 500V	350	PT SEC
6	PT primary	100V to 500kV	350	PT PM
7	Factory default	Yes / No	No	DEFAULT
8	Reset energy	Yes / No	No	RESETENB
9	Password	0001 to 9999	1001	PR5YFD
10	Reset active energy	Yes / No	No	YH

NOTE : For resetting active energy, user will be prompted the password. If correct password is entered, the user will be able to reset all energy parameters. This password will be a value which will be greater than the configuration password by 1.

NETWORK SELECTION AND WIRING INPUT	
Network selection in configuration mode	Wiring
3P4W	3P4W, 2P3W
3P3W	3P3W
1P2W (P1/P2/P3)	1P2W (P1/P2/P3)

Note : P1, P2 and P3 are Three Phase.

USER GUIDE	
LED INDICATIONS	
<ul style="list-style-type: none"> INT : The INT LED provides optical output for calibration verification as well as visual indication of energy integration. The pulse rate is 1000 Pulses/kWh. 	
<ul style="list-style-type: none"> EXP : EXP LED gives the indication of reversal of one or more CT connections or presence of negative power in any or all phases. In such cases meter may not indicate the correct energy consumption. The CT should be connected to the meter with correct polarities. 	

APPLICATION OF PULSE OUTPUT

● **PROCESS INTEGRATION**

Pulse output from meter can be interfaced into a process through a PLC for on line control of energy content in the process. If the PLC has a self excited digital input, external DC supply is not needed. The kWh pulse is also used to derive average kWh information at the PLC.

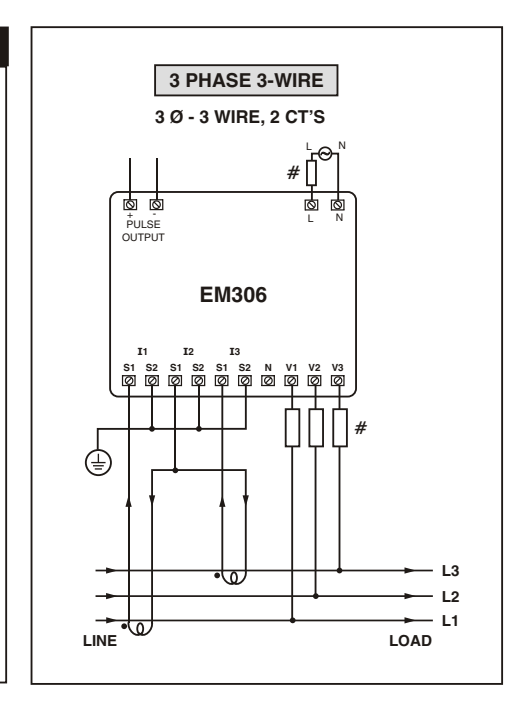
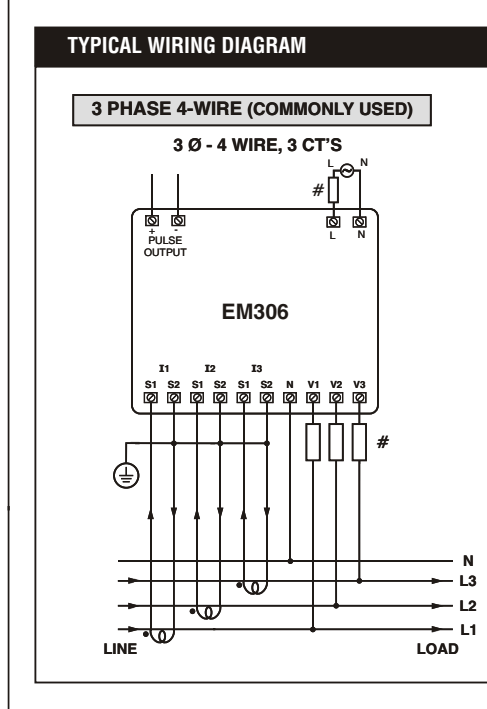
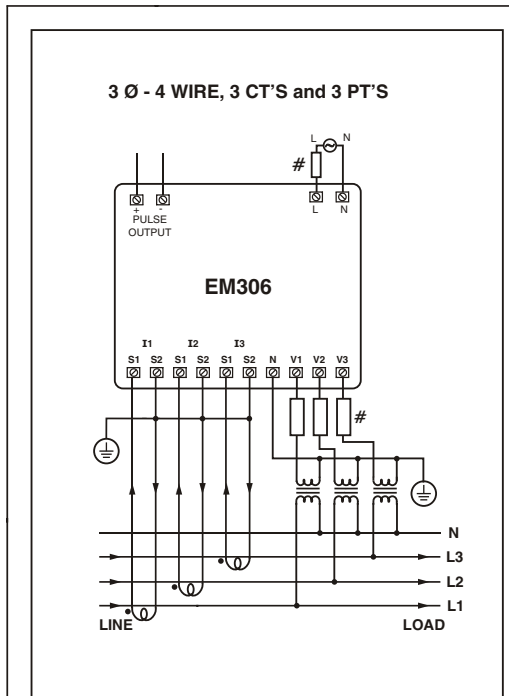
APPLICATION OF PULSE OUTPUT

● **ENERGY CONTROLLER**

12 / 24V DC

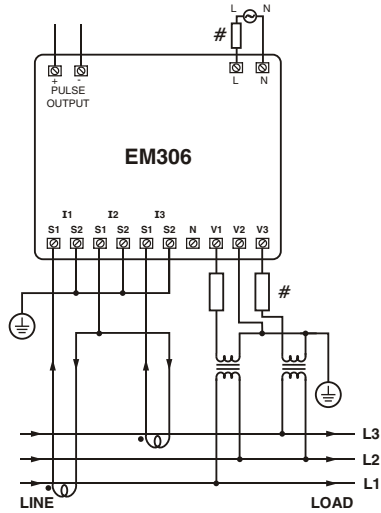
Pulse output from meter can be used as alarm generator or total energy controller by interfacing it with Pre settable counter and control circuits (Contactors, Relay, Trip Circuit). The counter is loaded with the maximum energy consumption. When count reaches setpoint it provides output to control circuit to take appropriate action.

All fuse types : 0.5A class CC UL type 0.5A fast acting 600V

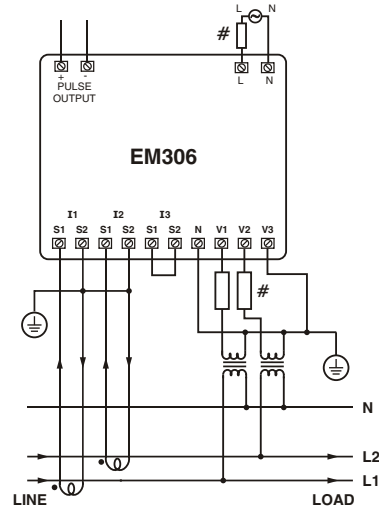


TYPICAL WIRING DIAGRAM

3 Ø - 3 WIRE, 2 CT'S and 2 PT'S

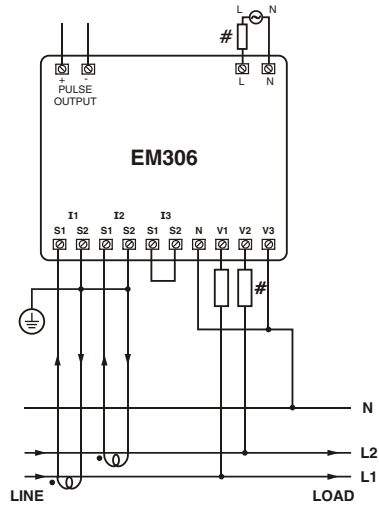


2 Ø - 3 WIRE, 2 CT'S and 2 PT'S



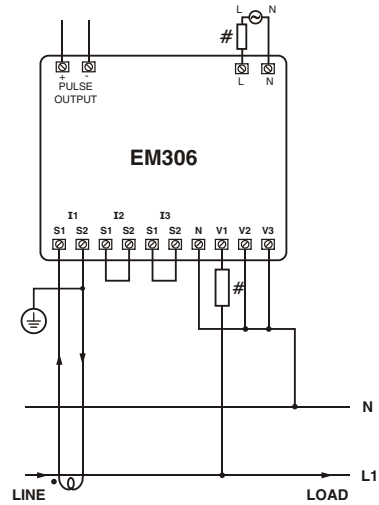
2 PHASE - 3 WIRE

2 Ø - 3 WIRE, 2 CT'S



1 PHASE - 2 WIRE

1 Ø - 2 WIRE, 1 CT



All fuse types : 0.5A class CC UL type
0.5A fast acting 600V

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

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