OP1029-V04

selec

EM306 / EM306-C-D

Operating Instructions

SPECIFICATION

DISPLAY
1 Row of 6 Digits to show electrical parameters
7 Segment LED Display 71*24mm
Digital integrated with parameter units

INDICATION
EXP - CT Reverse Detection
k - Kilo
M - Mega
⇌* - Communication in progress
DG * - DG sensing

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

RATED INPUT VOLTAGE
11 to 277 VAC (L-N): 19 to 480 VAC (L-L)CAT III
11 to 300 VAC (L-N): 19 to 519 VAC (L-L)CAT II
Installation Catagory 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 (Programmable for any value)

POWER CONSUMPTION
Less than 8VA

DISPLAY UPDATE TIME *
1 sec for all parameters

DISPLAY SCROLLING *
Automatic or Manual (Programmable)

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-condensingphase

PROTECTION CLASS : II

INSTALLATION CATAGORY : III

MOUNTING : Panel mounting

WEIGHT : 210gms

OUTPUT (Only for EM306)
Pulse output : Voltage range external 24V DC max
Current capacity : 100mA
Pulse width : 100ms ±5ms

DIGITAL INPUT *
Voltage(L-N): 85 to 276V AC
(Note: * = Only for EM306-C-D)

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

NOTE
1) Power resolution is automatically adjusted.
2) For power factor, resolution is 0.001.

ORDER CODE INFORMATION

Product	Supply Voltage	Certification	
		CE	cULus LISTED
EM306	85 to 276V AC, 50/60Hz	—	—
EM306-C-D	85 to 276V AC, 50/60Hz	—	—

SERIAL COMMUNICATION (Only for EM306-C-D)

Interface standard and protocol	RS485 and MODBUS RTU
Communication address	1 to 255
Transmission mode	Half duplex
Data types	Float, Integer and Hex
Transmission distance	500m maximum
Transmission Speed	300, 600,1200, 2400, 4800, 9600,19200 (in bps)
Parity	None, Odd, Even
Stop bits	1 or 2

ACCURACY

Measurement	Accuracy
Active Power*	1%
Apparent power*	1%
Reactive Power*	2%
Power factor*	±0.01 Digit
Active energy	Class 1
Reactive energy*	Class 2

(Note: * = Only for EM306-C-D)

⚠ 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.

⚠ 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 0.5mm^2 to 2.5mm^2 (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

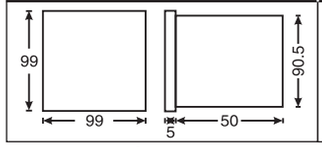
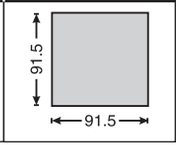
⚠ CAUTION :

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.

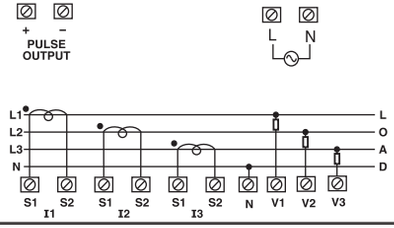
Terminal screw tightening torque:
0.68 N-m to 0.79 N-m (6.018 ln-Lb to 6.992 ln-Lb)
Screw clamp tightening torque : 0.1 N-m (0.885 Lb-inch)

OUTLINE Dimensions (in mm)	PANEL CUTOUT Dimensions (in mm)
	

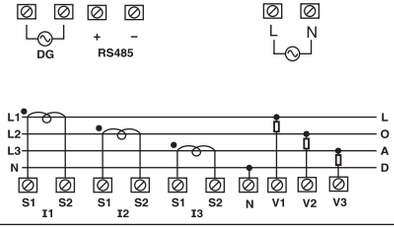
MAINTENANCE
1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean dry or damp cloth. Do not use any cleaning agent other than water.

TERMINAL CONNECTIONS

EM306 CONNECTIONS DIAGRAM



EM306-C-D CONNECTIONS DIAGRAM



FRONT PANEL DESCRIPTION

ONLINE PAGE DESCRIPTION (Only for EM306)

Display will show only kWh page.

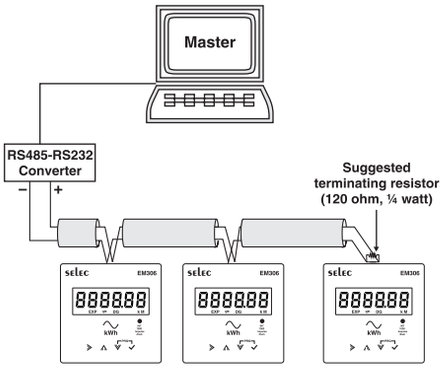
Press "▼"	Display roll-over count of kWh.	0

ONLINE PAGE DESCRIPTION (Only for EM306-C-D)

By default total kWh page will be displayed and after pressing any key,next page of last accessed page will be shown.If no key is pressed for 60 seconds in manual mode,display will go to default page i.e total kWh of mains, & if DG is on, display will go to total kWh of DG.

CONNECTION DIAGRAM FOR COMMUNICATION

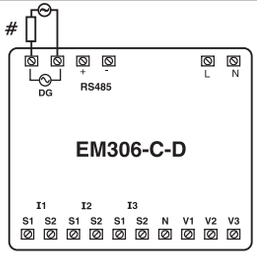
CONNECTION DIAGRAM FOR COMMUNICATION



Contact sales for PC based monitoring software to communicate with the meters.

Note: Only for EM306-C-D

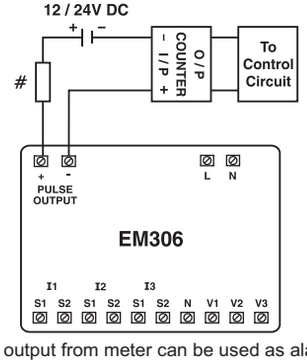
APPLICATION OF DIGITAL INPUT



Note: Only for EM306-C-D

APPLICATION OF PULSE OUTPUT

● **ENERGY CONTROLLER**



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.

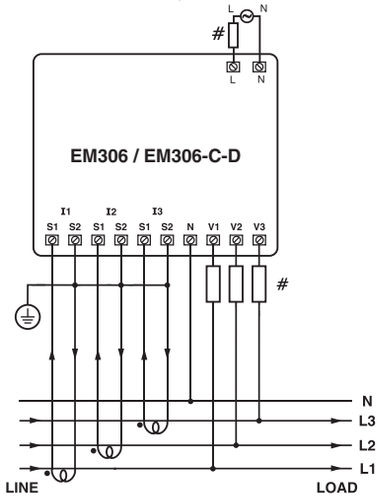
All fuse types : 0.5A class CC UL type
0.5A fast acting 600V

Note: Only for EM306

TYPICAL WIRING DIAGRAM

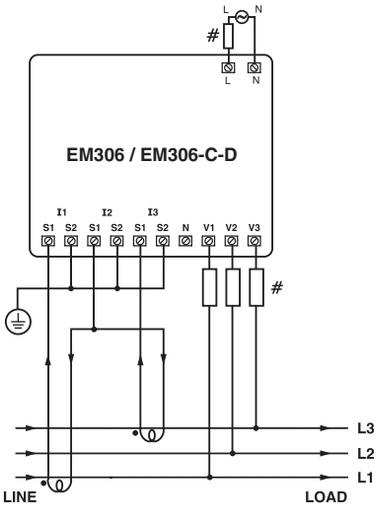
3 PHASE 4-WIRE (COMMONLY USED)

3 Ø - 4 WIRE, 3 CT'S



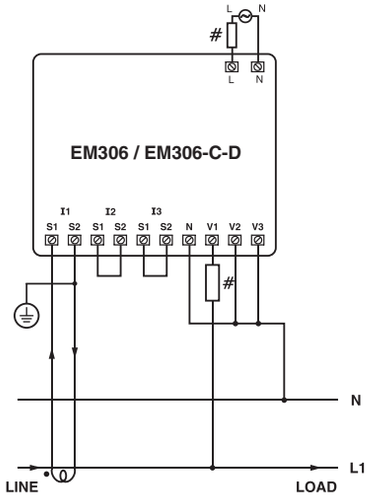
3 PHASE 3-WIRE

3 Ø - 3 WIRE, 2 CT'S

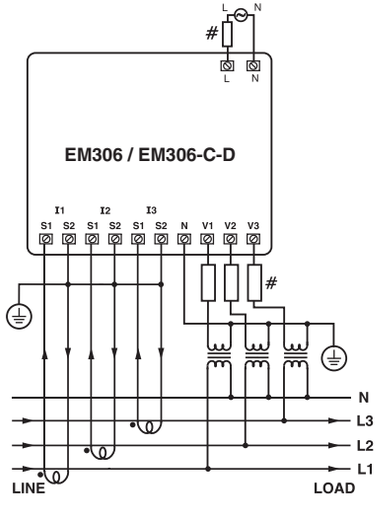


1 PHASE - 2 WIRE

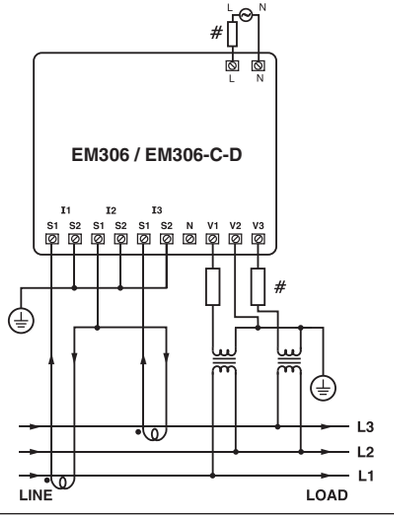
1 Ø - 2 WIRE, 1 CT



3 Ø - 4 WIRE, 3 CT'S and 3 PT'S

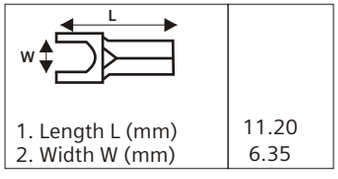


3 Ø - 3 WIRE, 2 CT'S and 2 PT'S



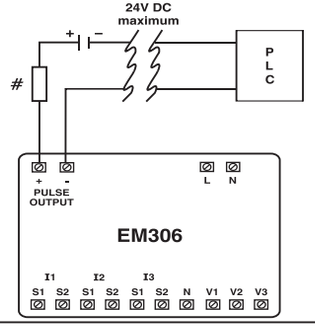
All fuse types : 0.5A class CC UL type
0.5A fast acting 600V

LUG DESCRIPTION



(NOTE : to be wired with LUG only**)**

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 device average kWh information at the PLC.

Note: Only for EM306

Specifications are subject to change, since development is a continuous process.

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