



**INSTRUCTION SHEET**

Thank you for selecting INNO for your requirement.

This sheet describes the procedure and precautions required for installing and operating the product.

Kindly read this sheet before operating or installing the product. Store the sheet for future reference.

**CAUTION FOR SAFETY**

- ⓘ Please keep this sheet for review before use of unit.
- ⓘ Please observe the following:
- WARNING**  
Serious injury may occur if instructions are not followed
- CAUTION**  
Product failure or injury can occur if instructions are not followed
- WARNING**  
1. This is not a safety product and is not to be used with machinery that requires use of safety control.  
2. Do not disassemble or modify this unit. It may lead to electric shock/fire.  
Do not connect touch the terminals when power is on. **RISK OF ELECTRIC SHOCK!**

- CAUTION**  
1. This unit shall not be used outdoors or in places with high sunlight, humidity or other harsh conditions.  
2. Do not use the unit in places where there is flammable or explosive gas.  
3. Do not use this unit beyond rated power.  
4. Please check the unit for wrong wiring before power on.  
5. Do not use this unit in places where there is vibration or impact.  
6. Do not use water or oil based detergent for cleaning the unit.  
7. Do not use unit in places with high EM noise as it may lead to product malfunction.  
8. Do not use excessive force to tighten the unit and do not hammer the unit.  
9. Please process it as industrial waste and dispose responsibly.

**SPECIFICATIONS**

		*For details on Customized/ Special Models contact Seller	
Output Type	Indication	Indication + Communication	
*Models	DEM-N230AC	DEM-M230AC	
Power Supply	230 VAC, 50Hz		
Power Consumption	35mA at 220 VAC		
Output Type	Only Indication	Indication with Communication	
PV Display	Method	4 digit, 3 Line, 7 Segment 0.56" RED LED	
	Parameters	Phase Voltage, Line Voltage, Current, Active Power, Energy, Power Factor(PF), Apparent Power & Frequency	
	Range	Please verify Parameter Table	
CT Ratio	Selectable, upto 4000/5A		
Dielectric Strength	At power terminals 2000 VAC, 50Hz, 1 min		
Ambient Temperature	Operation: 0° ~ 50°C; Storage: -10° ~ 60°C (non-freezing; non-condensing)		
Ambient Humidity	Operation: 45 ~ 80% RH; Storage: 25 ~ 85% RH (non-condensing)		
Protection Class	IP20, Front panel IP65		
Weight	approx. 150 grams		
Material	Front Panel: PU Cladding Housing: ABS or Equiv.		

**PRECAUTION FOR SAFE USE**

- Provide sufficient space around the unit to allow for heat dissipation.
- If several units are mounted side by side or vertically, the heat dissipation will cause the internal temperature of the products to rise. Compensate for the same by provide a cooling fan.
- Install the product horizontally.
- Mount to a panel with 1~8mm thickness only.
- In order to prevent inductive noise, wire the lines connected to the product separately from the power lines.
- Allow the product to operate without load for at least 15 minutes.
- Do not connect anything to the unused terminals.
- Install an external circuit breaker or switch that conforms to IEC60947-1 and IEC60947-3 requirements and label them clearly so that the operator can quickly turn OFF power.
- Use specified size of crimp terminals: M3, width: 5.8mm max.
- Avoid use of bare wire for connection. If used length of exposed wire is to be between 6~8mm.

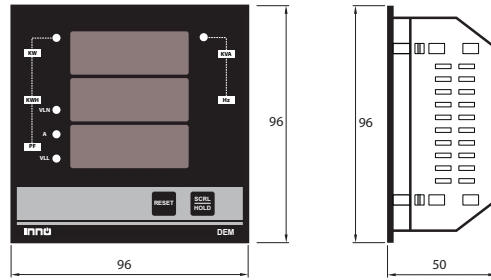
**CAUTION FOR SAFETY**

- CAUTION**  
1. Do not allow pieces of metal, wire clippings or metal shavings from installation to enter the product. Doing so may result in product failure.  
2. Do not disassemble the unit when connected to power supply.  
3. Do not use the equipment for measurements within measurement categories II, III, IV (according to IEC61010-1). Doing so may result in unexpected operation and may cause damage to equipment/personnel.  
4. Tighten the screws on the terminal block securely using the correct amount of torque. Loose screws may cause improper operation.  
Terminal Block Screws Tightening Torque = 0.43 ~ 0.58 Nm

**RANGE OF PARAMETERS**

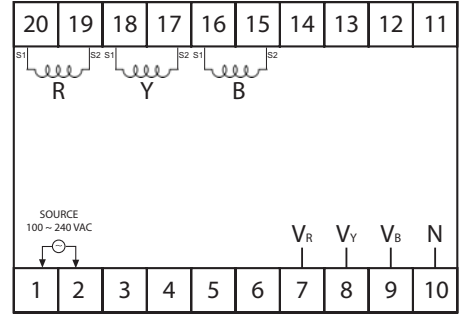
Parameter	Measurement Range
Phase Neutral Voltage (PV)	20.0 ~ 300.0V
Line Current(A)	0~5A (Direct without CT)
Line Voltage (Phase to Phase) (LV)	25~500V
Active Power (kW) Total	0.000 ~ 9999kW
Active Energy (kWh)	0.000 ~ 99999kWh
Power Factor (PF) Average	0.20 ~ 1.00PF
Apparent Power (kVA)	0.000 ~ 9999kVA
Frequency (Freq)	40 ~ 80Hz

**DIMENSIONS**

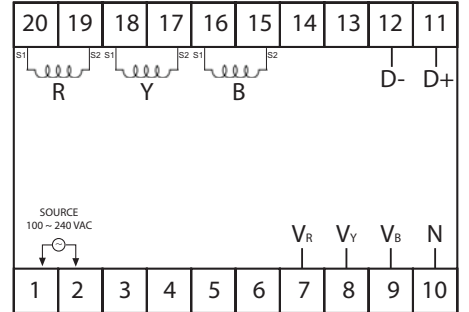


**CONNECTION DIAGRAM**

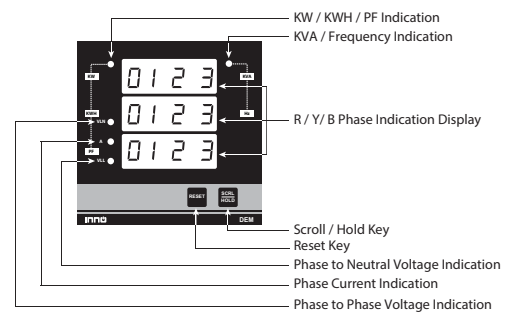
◆ DEM-N230AC



◆ DEM-M230AC



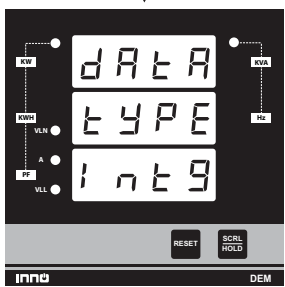
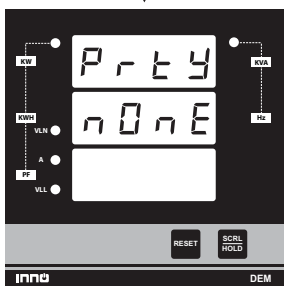
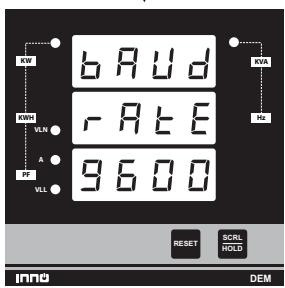
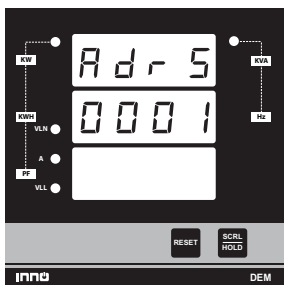
**NOMENCLATURE**



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**MODBUS COMMUNICATION SETTING**

Press and hold **SCRL/HOLD** & **RESET** Key together to scroll parameters.

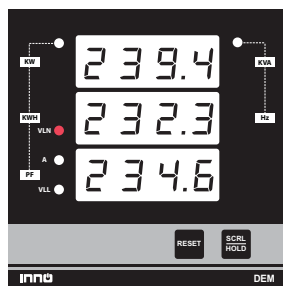
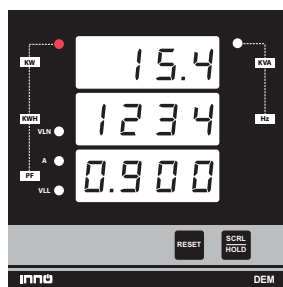
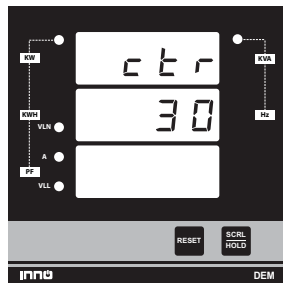


**REFERENCE PARAMETER**

S.NO	PARAMETER	DESCRIPTION
1	CT RATIO	Internal CT Value: 5 amps, External CT Value: 10/5 to 4000/5
2	ADDRESS	Specify the Identity of Instrument used for Modbus Communication (refer column - "REFERENCE TABLE FOR ADDRESS")
3	BAUDRATE	Define the Speed of Communication With Device having 9600 baud rate. Baud Rate Value: 19200/9600 (for Distance < Data Transfer), 4800 (for Environment Condition < Instrument)
4	PARITY	Error Checking at Byte Level (Even/Odd)
5	DATA TYPE	Define Storage Pattern for Data in Register Bank (refer column - "REFERENCE TABLE FOR DATA TYPE")

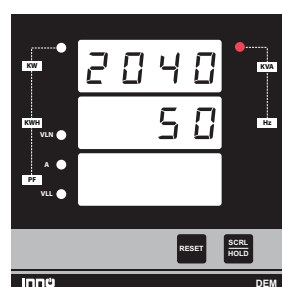
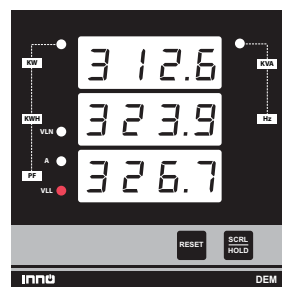
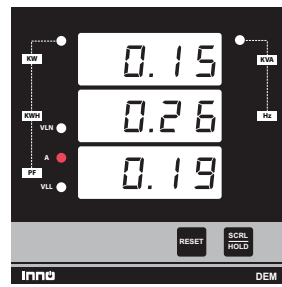
**BASIC SETTING MODE**

Display - Power On Condition



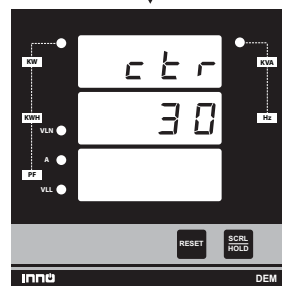
- Press **SCRL** key to switch on to next Parameter. The value of Kilowatt, Kilowatt Hour, Power Factor is displayed.
- Kilowatt / Kilowatt Hour / Power Factor Value
- Press **SCRL** key for 2 Sec to get the individual Phase Voltage Value
- Individual Line Voltage
- Press **SCRL** key for 2 Sec. To get the value of current for each individual Phase, we need to apply load to respective Phases.

**BASIC SETTING MODE (Contd 1...)**



**ADVANCED SETTING MODE**

Press **SCRL** key for 2 Sec to get CT Ratio Selection Mode (as given below)



- Phase Current Value
- Press **SCRL** key for 2 Sec. The value of Phase to Phase Voltage will be displayed.
- Phase to Phase Value
- Press **SCRL** key for 2 Sec. The value of KVA and Frequency will be displayed.
- KVA, Frequency Value
- RESET
- Press **SCRL** key for 2 Sec to RESET the whole settings.

**REFERENCE TABLE FOR ADDRESS**

ADDRESS	INTEGER
30001	Voltage R phase
30002	Voltage Y phase
30003	Voltage B phase
30004	Voltage RY phase
30005	Voltage YB phase
30006	Voltage BR phase
30007	Current R phase
30008	Current Y phase
30009	Current B phase
30010	KVA
30011	KW (Kilo Watt)
30012	Frequency
30013	PF (Power Factor)
30014	KWH (KiloWatt Hour)
30015	Version of software

◆ SWAPPED LONG / FLOAT

ADDRESS	PARAMETER
30001	Voltage R Phase (High 16 Bit)
30002	Voltage R Phase (Low 16 Bit)
30003	Voltage Y Phase (High 16 Bit)
30004	Voltage Y Phase (Low 16 Bit)
30005	Voltage B Phase (High 16 Bit)
30006	Voltage B Phase (Low 16 Bit)
30007	Voltage RY Phase (High 16 Bit)
30008	Voltage RY Phase (Low 16 Bit)
30009	Voltage YB Phase (High 16 Bit)
30010	Voltage YB Phase (Low 16 Bit)
30011	Voltage BR Phase (High 16 Bit)
30012	Voltage BR Phase (Low 16 Bit)
30013	Current R Phase (High 16 Bit)
30014	Current R Phase (Low 16 Bit)
30015	Current Y Phase (High 16 Bit)
30016	Current Y Phase (Low 16 Bit)
30017	Current B Phase (High 16 Bit)
30018	Current B Phase (Low 16 Bit)
30019	KVA (High 16 Bit)
30020	KVA (Low 16 Bit)
30021	KW (Kilo watt) (High 16 Bit)
30022	KW (Kilo watt) (Low 16 Bit)
30023	Frequency (High 16 bit)
30024	Frequency (Low 16 bit)
30025	PF (Power Factor) (High 16 Bit)
30026	PF (Power Factor) (Low 16 Bit)
30027	KWH (Kilo watt Hour) (High 16 Bit)
30028	KWH (Kilo watt Hour) (Low 16 Bit)
30029	Version No. (High 16 Bit)
30030	Version No. (Low 16 Bit)

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REFERENCE TABLE FOR ADDRESS (Contd 1...)

LONG / FLOAT

ADDRESS	PARAMETER
30001	Voltage R Phase (Low 16 Bit)
30002	Voltage R Phase (High 16 Bit)
30003	Voltage Y Phase (Low 16 Bit)
30004	Voltage Y Phase (High 16 Bit)
30005	Voltage B Phase (Low 16 Bit)
30006	Voltage B Phase (High 16 Bit)
30007	Voltage RY Phase (Low 16 Bit)
30008	Voltage RY Phase (High 16 Bit)
30009	Voltage YB Phase (Low 16 Bit)
30010	Voltage YB Phase (High 16 Bit)
30011	Voltage BR Phase (Low 16 Bit)
30012	Voltage BR Phase (High 16 Bit)
30013	Current R Phase (Low 16 Bit)
30014	Current R Phase (High 16 Bit)
30015	Current Y Phase (Low 16 Bit)
30016	Current Y Phase (High 16 Bit)
30017	Current B Phase (Low 16 Bit)
30018	Current B Phase (High 16 Bit)
30019	KVA (Low 16 Bit)
30020	KVA (High 16 Bit)
30021	KW (Kilo watt) (Low 16 Bit)
30022	KW (Kilo watt) (High 16 Bit)
30023	Frequency (Low 16 bit)
30024	Frequency (High 16 bit)
30025	PF (Power Factor) (Low 16 Bit)
30026	PF (Power Factor) (High 16 Bit)
30027	KWH (Kilo watt Hour) (Low 16 Bit)
30028	KWH (Kilo watt Hour) (High 16 Bit)
30029	Version No. (Low 16 Bit)
30030	Version No. (High 16 Bit)

REFERENCE TABLE FOR DATA TYPE

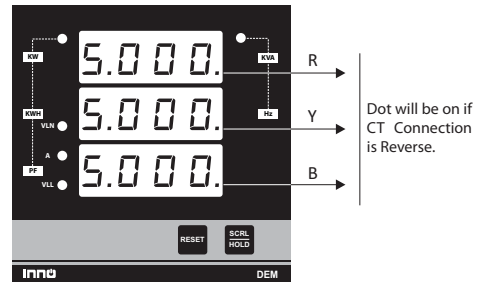
REGISTER	FLOAT & LONG
1	PV - 1 LOW
2	PV - 1 HIGH
3	PV - 2 LOW
4	PV - 2 HIGH
5	PV - 3 LOW
6	PV - 3 HIGH
	PV - 4 LOW
	PV - 4 HIGH
	PV - 5 LOW
	PV - 5 HIGH

INTEGER
PV - 1
PV - 2
PV - 3
PV - 4
PV - 5

\*PV - PROCESS VALUE

REVERSE PHASE INDICATION



\*Note:  
If the dot (as shown in above diagram) of current display is ON, that means the CT connection is reverse. To show proper value of KW & KWH, interchange the CT wires.

**INSTALLATION NOTES**

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