



## 2160-A Advanced Energy Meter

Masibus 2160-A is an easy-to-use, cost effective electrical energy meter that offers all the basic measurement capabilities required for monitoring an electrical installation. It offers Class 0.5s accuracy as per IS14697/ IEC 62053-22. This meter also measures accurately all three energies, and ON (working) hour, thus helping to measure and control energy cost.

More than basic metering, it optionally provides RS485 port supporting Modbus-RTU protocol, THD measurements and Maximum Demand.

The CT/PT ratio and installation type are site selectable, making it possible to use the meter in various types of three phase installations.

Meter stores energy and programmed parameters into non-volatile memory.

### Features

- Accuracy class 0.5s or 0.2s as per IS14697/ IEC 62053-22
- Field programmable CT/PT primary & secondary values
- True RMS, Microcontroller based
- More than 100 Electrical parameters
- Aux powered & uses Switch mode power supply
- 4x16 LCD with back-lit to display various parameters
- Isolated RS485 (Modbus-RTU protocol)
- Digital pulse output for energy
- Auto Scaling from Kilo to Mega to Giga watt
- Auto Scrolling feature for easy readability for all parameters
- Favorite page Store feature even after Power On-Off
- Store energy register efficiently during power failure
- Four Quadrant measurement for PF, Power & Energy (Active & Reactive)
- ON Hour, LOAD HOUR & IDLE HOUR register in Non-Volatile Memory
- Power Interruption count with (Last Power OFF & Latest Power ON)Time & Date

### Applications

- Control & Relay Panels
- Motor Control Center Panels
- Power Control Center Panels
- Process Control
- DG Set panels
- Original Equipment Manufacturers (OEMs)
- HVAC & Building Management System
- Energy Management System (EMS)
- HV & LV Switchgear Panels

## Technical Specifications

Meter Type	
3Ph4W/ 3Ph3W (Site selectable)	
Input	
Voltage	
Direct Voltage	20 to 650V L-N
PT Secondary (Nominal Voltage)	63.5V L-N, 110V L-N or 240V L-N (Site selectable) Configurable for 3Ph3W or 3Ph4W system
Burden	<0.2VA per phase
PT Ratio	1 to 9999.999 Programmable
Overload	1.2 x Nominal Voltage (Continuous)
Current	
Secondary Current	1 or 5A (Site selectable)
Burden	<0.2VA per phase
CT Ratio	1 to 9999.999 Programmable
Overload	For 5A CT: 8A Continuous/ 20A for 1Sec For 1A CT: 2A Continuous/ 20A for 1Sec
Starting current	
0.1% of Nominal Current (class 0.5)	
Frequency	
45 to 65Hz	
Display	
4x16 Backlit LCD	

Measured Parameters	
Voltage	L1-L2, L2-L3, L1-L3 and Average (3Ph3W & 3Ph4W) L1-N, L2-N, L3-N & average (1Ph & 3Ph4W)
Current	All phase currents & their average
Frequency	System Frequency
Power Factor	Phase wise PF & Average PF
Power (Phase wise & Total)	Active Power (W, KW & MW) Reactive Power (VAR, KVAR & MVAR) Apparent Power (VA, KVA & MVA)
Energy (Phase wise & Total)	Active Energy for Import & Export (Separate) (WH, KWh, MWh & GWh) Reactive Energy for Import & Export (Separate) (VARh, KVARh, MVARh & GVARh) Apparent Energy (VAh, KVAh, MVAh & GVAh)
Demand	Maximum Demand on KW/KVA (Block/Sliding for 15/30 minutes window)
Power Quality	Harmonics for each Voltage and Current (3rd to 15th odd) THD for Voltage & Current (Phase wise)

**ON hour, LOAD hour, IDLE hour (upto 65000 hours Recording)**

**Real time clock & date**

**Power Interruption count (up to 65000) with (Last Power OFF & Latest Power ON)Time & Date**

Accuracy (Class 0.5)	
(Applicable for PF 0.5 Lag-1.0 - 0.8 Lead)	
Voltage	0.25% of reading
Current	0.1% of reading
Frequency	±0.01Hz
Power Factor	0.25% of FS
Active Power	0.3% of reading + 0.01% of FS, (≥0.02 of Ib)
Reactive Power	0.3% of reading + 0.01% of FS, (≥0.02 of Ib)
Apparent Power	0.5% of reading + 0.02% of FS, (≥0.02 of Ib)
Active Energy	Class 0.5s as per IS14697/ IEC 62053-22
Reactive Energy	Class 0.5s as per IS14697/ IEC 62053-23
Apparent Energy	Class 0.5s

Accuracy (Class 0.2) [Optional]	
(Applicable for PF 0.5 Lag-1.0 - 0.8 Lead)	
Voltage	0.25% of reading
Current	0.1% of reading
Frequency	±0.01Hz
Power Factor	0.2% of FS
Active Power	0.2% of reading + 0.01% of FS, (≥0.02 of Ib)
Reactive Power	0.2% of reading + 0.02% of FS, (≥0.02 of Ib)
Apparent Power	0.2% of reading + 0.02% of FS, (≥0.02 of Ib)
Active Energy	Class 0.2s as per IS14697/ IEC 62053-22
Reactive Energy	Class 0.2s as per IS14697/ IEC 62053-23
Apparent Energy	Class 0.2s

Output	
Communication	
Interface	RS485
Baud rate	9600, 19200, 38400 (Selectable)
Start bit	1
Stop bit	1
Protocol	Modbus-RTU

Pulse output	
Type	WH/VARH/VAH
Pulse rate	Programmable from 1 to 65000 pulses per KWh[I]/KWh[E]/KVARLh/KVARCh/KVAh/MWh[I]/MWh[E]/MVARLh/MVARCh/MVAh of total.
Pulse Duration	40 mSec ±10%

Auxiliary Power Supply	
Power Supply	90-270VAC, 50/60Hz or 110-370VDC
Burden	Less than 3VA

**Isolation (Withstanding voltage)**  
Between primary terminals\* and secondary terminals\*\*:  
**At least 1500 V AC for 1 minute**  
Between primary terminals\* and grounding terminal:  
**At least 1500 V AC for 1 minute**  
Between grounding terminal and secondary terminals\*\*:  
**At least 1500 V AC for 1 minute**  
Between secondary terminals\*\*:  
**At least 1000 V AC for 1 minute**  
\* Primary terminals indicate power terminals and relay output terminals.  
\*\* Secondary terminals indicate Communication O/P.  
**Insulation resistance:** 20MΩ or more @ 500 V DC between power terminals

Physical	
Mounting Type	Panel mount
Size (mm)	96(W) x 96(H) x 110(D)
Front Bezel (mm)	96(W) x 96(H)
Panel Cutout (mm)	92(W) x 92(H)
Depth behind panel	110 mm
Material	ABS
Accessory	2 Panel mount clamps
Weight	0.5 Kg
Enclosure Protection Rating	IP51
Terminal Cable Size	3.3 mm <sup>2</sup> (12 - 22 AWG)

Environmental	
Working temperature	0 to 55°C
Storage temperature	-10 to 70°C
Relative humidity	30-95% non-condensing
Warm up time	5 minutes

Ordering Code						
Model	Accuracy	Communication	Max. Demand	THD		
2160-A	1	Class 0.5s	N	None	N	None
	2	Class 0.2s	Y	1-Modbus	Y	Required

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