masibus

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 60687. 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.

Features

- Accuracy class 0.5s as per IS14697/ IEC 60687
- Accuracy class 0.2s as per IEC 62053-22 also available
- Field programmable CT/PT primary & secondary values
- True RMS, Microcontroller based
- SMPS Auxiliary power supply
- 4x16 LCD with backlit
- Isolated RS485 (Modbus-RTU protocol)
- Digital pulse output for energy
- Auto Scaling from Kilo to Mega to Giga watt

Benefits

- More than 100 Electrical parameters
- Low burden
- Stores energy and programmed parameters into non-volatile memory
- Password Protection for set parameters

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:

System 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
Accuracy	Class 0.5
Burden	<0.2VA per phase
Wire gauge	16 AWG
PT Ratio	1 to 220KV (Site selectable)
Overload	1.2 x Nominal Voltage (Continuous)

Current

Secondary Current	1 or 5A (Site selectable)
Accuracy	Class 0.5
Burden	<0.2VA per phase
Wire gauge	16 AWG
Measurement range	1 to 9999A Programmable
CT Ratio	Site selectable
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	50Hz ±5.0%
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)
Real time clock & date, ON hours	

Environmental

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

Accuracy (Class 0.5s)

(Applicable for PF 0.5 Lag-1.0 - 0.8 Lead)

Voltage	0.25% of reading
Current	0.1% of reading
Frequency	±0.1Hz
Power Factor	0.25% of FS
Active Power	0.3% of reading (0.01% of FS, ≥0.02 of Ib)
Reactive Power	0.5% of reading (0.02% 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 (IS14697)
Reactive Energy	Class 0.5s (IS14697)
Apparent Energy	Class 0.5s

Output

Communication Output

Interface	RS485
Baud rate	9600, 19200, 38400 (Selectable)
Protocol	Modbus-RTU

Pulse output

Type	WH/VARH/VAH
Pulse rate	Programmable from 1to 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 analog I/O signal and Communication O/P.
Insulation resistance: 20MΩ or more at 500 V DC between power terminals and grounding terminal

Physical

Mounting Type	Panel mount
Size	96 x 96 x 110 mm
Front Bezel	96 x 96 mm
Panel Cutout	92 x 92 mm
Depth behind panel	110 mm
Weight	0.5 Kg
Enclosure Protection Rating	IP51

Ordering Code

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

Head Office:
Masibus Automation And Instrumentation Pvt. Ltd.
B-30, GIDC Electronics Estate, Sector-25, Gandhinagar-382044, Gujarat, India.
Tel: +91 79 23287275-79, Fax: +91 79 23287281-82
E-mail: sales@masibus.com, Web: www.masibus.com

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Masibus Representative: