Ziegler

Redefine Innovative Metering

Technical Datasheet

ZAM MDC4

TOUCH SCREEN DEMAND CONTROLLER

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ZAM MDC4 is a smart Demand Monitor and controller which controls the Active, Reactive, Apparent or Current Demand according to allowed limits. This instrument prevents consumption of excess power or peaks resulting in higher penalties by providing output control using programmable relay outputs. It provides the simulation feature allowing one to enter the load values and verify the system conditions prior to installation.

Product Features

- Demand Measurement and Control:
  - W, Var, VA and Current Demand
  - Selectable window type - Fixed or Sliding
  - Demand Period selectable from 1 to 60 minutes
  - Predictive Demand Control for faster controlling action even before completion of present demand interval
  - Demand Control with separate load shedding thresholds for each tariff zone
- 4 programmable Relay Outputs for efficient Demand Control and Management
- The instrument measures distorted waveform upto 56th Harmonic for 50Hz and upto 46th Harmonic for 60Hz

- Real time vector representation of all 3 Phases for complete system analysis & er phase individual harmonic bar graph representation
- Accuracy Class 0.5S as per IEC 62053-22, IEC62053-23
- Time Of DAY (TOD / TOU) settings with 4 seasons, 4 tariffs, 6 time zones per day, 4 types of days, 5 tariff energy register
- Direct remote access via MODBUS with programmable baud rates up to 38.4kbps
- Custom color setting that enable the user to assign individual colour for each phase as per the application requirement through display and MODBUS

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Technical Specifications

Accuracy	
Active energy	Class 0.5S as per IEC 62053 - 22
Apparent energy	Class 0.5S as per IEC 62053 - 22
Fundamental Reactive Energy	Class 2 as per IEC 62053 – 23
Reference conditions	Ambient 23°C ± 1°C Sinusoidal(distortion factor 0.005)50/60Hz
Active power	±0.2% of Nominal value
Fundamental Reactive power	±0.2% of Nominal value
Apparent power	±0.2% of Nominal value
Power factor/Phase angle	±2°
Voltage	±0.2% of Nominal value
Current	±0.2% of Nominal value
Frequency	±0.1% of mid frequency
Harmonics	±1.0%
THD Voltage / Current	±1.0%
Input Voltage	
Nominal input voltage (AC rms)	57.7 - 288.68 V_{L-N} On site Programmable (Line-Line 100-500 V_{L-L})
System PT Primary values	100V_{LL} to 692.8 kV_{LL} On site Programmable
Max continuous input voltage	347 V_{LN}, 600 V_{LL}
Voltage measuring range	5 V_{LN}.... 347 V_{LN}, 9 V_{LL}....600 V_{LL}
Overload withstand	2x times of Nominal voltage for 1 second, repeated 10 times at 10 second intervals
Frequency Measuring range	45Hz to 66Hz
Input Current	
Nominal Input current	1A / 5A AC RMS On site Programmable
System CT Primary values	From 1A up to 9999A On site Programmable
Max continuous input current	120% of Nominal value
Current measuring range	5% to 120% of Nominal current.
Overload withstand	20x times of Nominal current for 1 second, repeated 5 times at 5 min intervals
Starting current for energy as per IEC 62053-22 class 0.5S	1 mA for 1A range 5 mA for 5A range
Auxiliary supply	
External aux.	60 V – 300V AC-DC
Aux supply frequency	50 / 60 Hz (± 10 %)
VA Burden	
Nominal Input voltage burden	< 0.2 VA approx. per phase
Nominal Input current burden	< 0.2 VA approx. per phase
Auxiliary supply burden	< 6.5 VA approx

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Real time clock(RTC)	
Uncertainty	± 2 minutes / month (23°C ± 1°C)(trimmable through display orModbus)
Display Update rate	
Response time to step input	1 sec approx.
Applicable Standards	
EMC	IEC 61326
Immunity	IEC 61000-4-3. 10V/m min – Level 3 industrial Low level
Safety	IEC 61010-1-2010 , Permanently connected use
IP for water & dust	(IP 54 forFront)IEC60529
Pollution degree:	2
Installation category:	III
High Voltage Test(DC 1 min)	5.23 kV DC between all other Electrical circuits
Environmental Conditions, other information	
Operating temperature	-10 to +55°C
Storage temperature	-20 to +65°C
Relative humidity	0.95% non condensing
Warm up time	Minimum 3 minute
Shock	15g in 3 planes
Vibration	10...150.....10 Hz, 0.075mm amplitude
Temperature Coefficient	0.05%/°C
Interfaces	
Relay	Used as Control Output
Load Capacity	240 V AC, 5 A
Contact	Change over contact, bistable
Mechanical Endurance	1×10^6 operations
Electrical Endurance(240V,5A)	1×10^5 operations
ModBus / RTU	RS485,max. 1200m Boud rate : 4.8k,9.6k,19.2k,38.4k bps

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Display Parameter

Sr No	Displayed Parameters	3 Phase 4Wire	3Phase 3Wire	1 Phase 2Wire
1.	System Voltage	✓	✓	✓
2.	System Current	✓	✓	✓
3.	Volts L1 – N	✓	×	✓
4.	Volts L2 – N	✓	×	×
5.	Volts L3 – N	✓	×	×
6.	Volts L1 – L2	✓	✓	×
7.	Volts L2 – L3	✓	✓	×
8.	Volts L3 – L1	✓	✓	×
9.	Current L1	✓	✓	✓
10.	Current L2	✓	✓	×
11.	Current L3	✓	✓	×
12.	Neutral Current	✓	×	×
13.	Frequency	✓	✓	✓
14.	System Active Power (kW)	✓	✓	✓
15.	Active Power L1 (kW)	✓	×	✓
16.	Active Power L2 (kW)	✓	×	×
17.	Active Power L3 (kW)	✓	×	×
18.	System Fundamental Reactive Power (kVAr)	✓	✓	✓
19.	Fundamental Reactive Power L1 (kVAr)	✓	×	✓
20.	Fundamental Reactive Power L2 (kVAr)	✓	×	×
21.	Fundamental Reactive Power L3 (kVAr)	✓	×	×
22.	System Apparent Power (kVA)	✓	✓	✓
23.	Apparent Power L1 (kVA)	✓	×	✓
24.	Apparent Power L2 (kVA)	✓	×	×
25.	Apparent Power L3 (kVA)	✓	×	×
26.	System Power Factor	✓	✓	✓
27.	Power Factor L1	✓	×	✓

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Sr No	Displayed Parameters	3 Phase 4Wire	3Phase 3Wire	1 Phase 2Wire
28.	Power Factor L2	✓	×	×
29.	Power Factor L3	✓	×	×
30.	Phase Angle L1	✓	×	✓
31.	Phase Angle L2	✓	×	×
32.	Phase Angle L3	✓	×	×
33.	Import kWh (Up to 14 digit resolution)	✓	✓	✓
34.	Export kWh (Up to 14 digit resolution)	✓	✓	✓
35.	Fundamental Import kVArh (Up to 14 digit resolution)	✓	✓	✓
36.	Fundamental Export kVArh (Up to 14 digit resolution)	✓	✓	✓
37.	kVAh (Up to 14 digit resolution)	✓	✓	✓
38.	Current Demand	✓	✓	✓
39.	kVA Demand	✓	✓	✓
40.	kW Import Demand	✓	✓	✓
41.	kW Export Demand	✓	✓	✓
42.	Fundamental Import kVAr Demand	✓	✓	✓
43.	Fundamental Export kVAr Demand	✓	✓	✓
44.	Max Current Demand	✓	✓	✓
45.	Max kVA Demand	✓	✓	✓
46.	Max kW Import Demand	✓	✓	✓
47.	Max kW Export Demand	✓	✓	✓
48.	Max Fundamental Import kVAr Demand	✓	✓	✓
49.	Max Fundamental Export kVAr Demand	✓	✓	✓
50.	Run Hour	✓	✓	✓
51.	On Hour	✓	✓	✓
52.	Number of Interruption	✓	✓	✓
53.	Phase Reversal Indication	✓	×	×
54.	Phasor Diagram	✓	×	✓
55.	Voltage Waveform	✓	✓	✓

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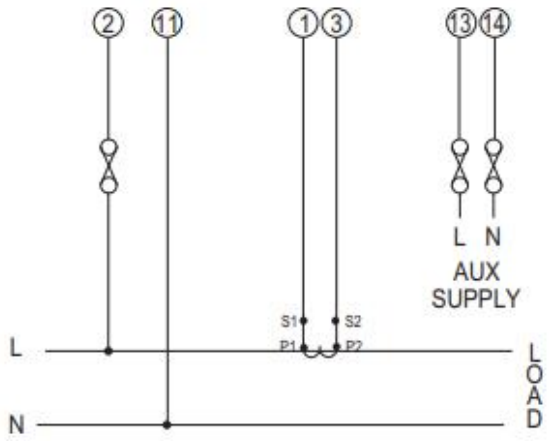
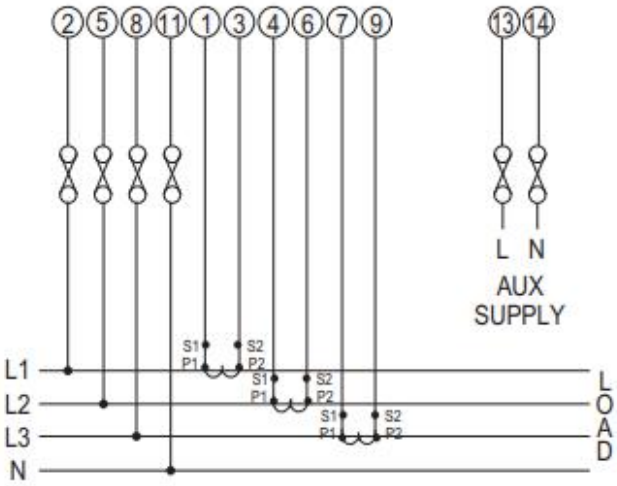
Sr No	Displayed Parameters	3 Phase 4Wire	3Phase 3Wire	1 Phase 2Wire
56.	Current Waveform	✓	✓	✓
57.	% THD Voltage L1-N	✓	×	✓
58.	% THD Voltage L2-N	✓	×	×
59.	% THD Voltage L3-N	✓	×	×
60.	% THD Voltage L1-L2	×	✓	×
61.	% THD Voltage L2-L3	×	✓	×
62.	% THD Voltage L3-L1	×	✓	×
63.	% THD Current L1	✓	✓	✓
64.	% THD Current L2	✓	×	×
65.	% THD Current L3	✓	✓	×
66.	% THD Voltage Mean	✓	✓	×
67.	% THD Current Mean	✓	✓	×
68.	RMS voltage of Harmonics	✓	✓	✓
69.	RMS Current of Harmonics	✓	✓	✓
70.	Fundamental Active Power per phase	✓	×	✓
71.	Fundamental Reactive Power per phase	✓	×	✓
72.	Fundamental Apparent Power per phase	✓	×	✓
73.	Fundamental Power Factor per phase	✓	×	✓
74.	Individual Harmonic Active Power per phase	✓	×	✓
75.	Individual Harmonic Reactive Power per phase	✓	×	✓
76.	Individual Harmonic Apparent Power per phase	✓	×	✓
77.	Distortion Factor of all harmonics on phase voltage	✓	✓	✓
78.	Distortion Factor of all harmonics on phase Current	✓	✓	✓
79.	Power Factor of Individual Harmonic per phase	✓	×	✓
80.	Fundamental voltage RMS per phase	✓	✓	✓
81.	Fundamental current RMS per phase	✓	✓	✓

Connection Diagram and Installation

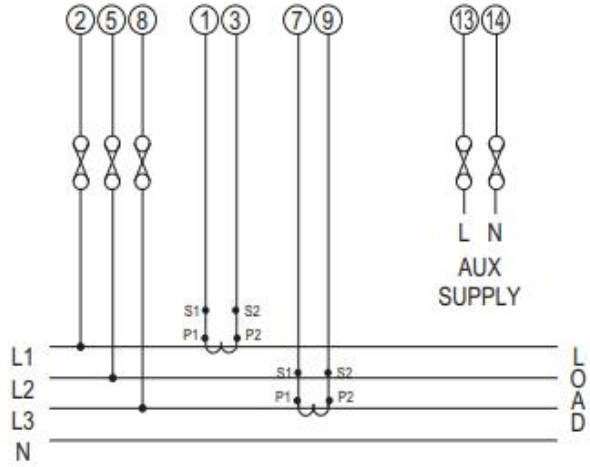
SINGLE PHASE 2-WIRE



3-PHASE 4-WIRE UNBALANCED LOAD



3-PHASE 3-WIRE UNBALANCED LOAD



It is recommended that the wires used for connections to the instrument should have lugs soldered at the end. That is, the connections should be made with Lugged wires for secure connections. The Maximum diameter of the lug should be 7.0 mm and maximum thickness 3.5mm.

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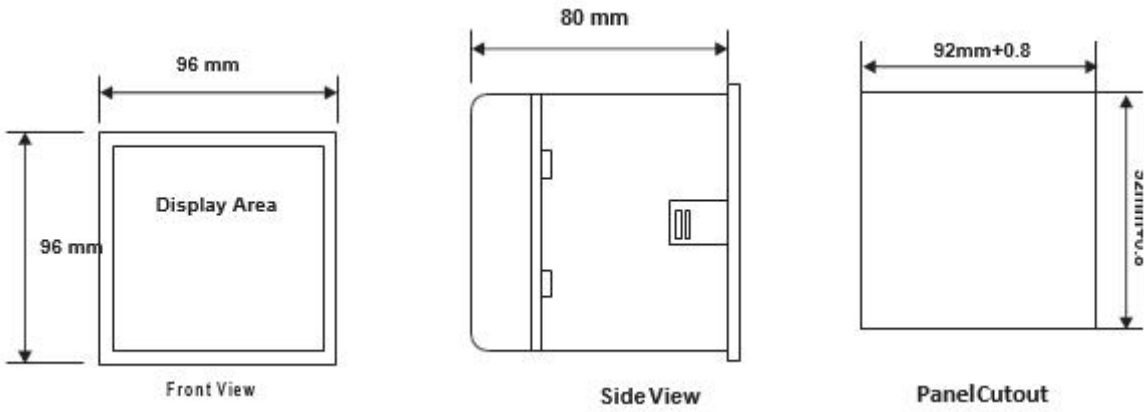
Dimensions



Ordering Information

Ordering information	(✓)
System Type (Connection Network)	
3 Phase	
1 Phase	
Communication Interface	
Without MODBUS (RS485) output	
With MODBUS (RS485) output	

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