

# Shark 100

## MULTIFUNCTION POWER AND ENERGY METER



## Introduction

Electro Industries' Shark® 100 meter is one of the industry's highest performance revenue grade panel meters. With a sampling rate of over 400 samples per cycle, the meter excels in accuracy, with readings rated at ANSI C12.20 0.2 CL and IEC 62053-22 0.2S classes. The meter has an easy-to-read, bright red LED display, with intuitive navigation. The Shark® 100 meter is ruggedly designed using intrinsically safe current inputs. It is ideal for both new metering applications and as an easy replacement for existing, installed meters.

## Features

- 0.2% Class Accuracy - 400+ Samples/Cycle with 24-bit ADC
- Measures Voltage, Current, Power, Frequency, Energy, and Max Demand
- Optional KYZ Pulse and Standard IrDA Port
- Power Quality Measurements (THD and Alarm Limits)

- V-Switch™ Technology - Field Upgrade without Removing Installed Meter
- Large, Bright Red LED Display, with Intuitive Navigation
- % of Load Bar for Analog Meter Perception
- Optional RS485 Modbus and DNP3 Protocols
- Optional 10/100BaseT Ethernet
- Fits Both ANSI and DIN Cutouts
- Superior Quality - Rugged Design

## Applications

- Utility Metering
- Commercial Metering
- Substations
- Industrial Metering
- Power Generation
- Campus Metering
- Submetering
- Analog Meter Replacement



## Superior Accuracy

Measured Parameters	Accuracy % of Reading	Display Range
Voltage L-N	0.1%	0-9999 V or kV Scalable
Voltage L-L	0.1%	0-9999 V or kV Scalable
Current	0.1%	0-9999 Amps or kAmps
+/-Watts	0.2%	0-9999 Watts, kWatts, MWatts
+/-Wh	0.2%	5 to 8 Digits, Programmable
+/-VARs	0.2%	0-9999 VARs, kVARs, MVARs
+/-VARh	0.2%	5 to 8 Digits, Programmable
VA	0.2%	0-9999 VA, kVA, MVA
VAh	0.2%	5 to 8 Digits, Programmable
PF	0.2%	+/- 0.5 to 1.0
Frequency	0.01 Hz	(45 to 65) Hz
THD	5.0%	0 to 100%
% of Load Bar	1-120%	10 Digit Resolution Scalable

**Note:** Typical results are more accurate. Applies to 3 Element WYE and 2 Element Delta Connections. Add 0.1% of Full Scale plus 1 digit to accuracy specs for 2.5 Element connections.

## Communication and Pulse Output

- Optional RS485 port offers Modbus communication and baud rates from 9,600 to 57,600 (485P Option).
- Optional 10/100BaseT Modbus TCP Ethernet Port (INP10 Option).
- Optional communication includes a fixed energy pulse mapped to positive energy.

## Easy to Install and Use

- Simple faceplate programming.
- Set up through PC.
- Phasor diagram showing wiring status.
- Auto scroll of meter readings (programmable).
- Analog style % of load bar.
- Shallow panel depth.
- Color coordinated voltage and current inputs.

## Virtual Upgrade Switches

The Shark® 100 meter is equipped with EIG's exclusive V-Switch™ technology. This allows you to upgrade and add features, even after the meter is installed.

- V1 – Voltage and Current Meter (Default).
- V2 – V, A, kW, kVAR, PF, kVA, Freq.
- V3 – V, A, kW, kVAR, PF, kVA, Freq, kWh, kVAh, kVARh, and DNP3.

- V4 – V, A, kW, kVAR, PF, kVA, Freq, kWh, kVAh, kVARh, THD Monitoring, Limit Exceeded Alarms, and DNP3.

## Rugged and Safe Voltage and Current Inputs

The Shark® 100 meter is designed for harsh electrical applications in high and low voltage power systems. This feature is especially important in power generation, utility substation, and critical user applications. This meter's structural and electrical design was developed based on the recommendations and approval of many of our utility customers.

## High Isolation Universal Voltage Inputs

- Voltage inputs allow measurement of up to 416 volts line to neutral and 721 volts line to line.
- One unit will perform to specification on 69 volt, 120 volt, 230 volt, 277 volt, and 347 volt power systems.

**Short Circuit Safe Current Inputs** - Current inputs use a unique dual input method:

- **Method One** – CT Lead Pass Through: The CT lead passes directly through the meter without any physical termination on the meter. This ensures that the meter cannot be a point of failure on the CT circuit. This method is preferable to utility users when sharing relay class CTs. No burden is added to the secondary CT circuit.
- **Method Two** – Current "Gills": The meter also provides ultrarugged termination pass-through bars that allow the CT leads to be terminated on the meter. The Shark® meter's stud-based design ensures that your CTs will not open in a fault condition.

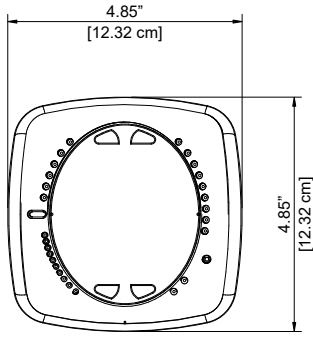
## Shark® Meter ANSI and DIN Mounting

The unit mounts directly in an ANSI C39.41(4" round form) or an IEC 96 mm DIN square form. In new installations, simply use DIN or ANSI replace older meters with the Shark® 100 meter. Current CT and PT wiring does not need

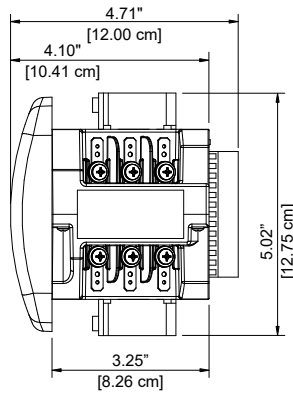
to be replaced.

- Perfect for switchgear panel direct retrofit.
- Uses minimal panel space.
- Mounts in 4" panel depth.
- Transducer version for DIN rail mounting.

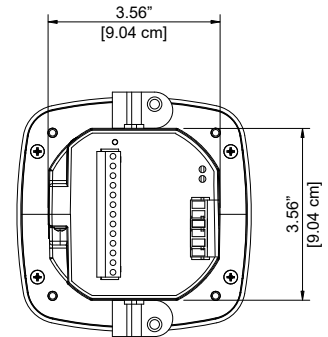
# Dimensional Drawings



**SHARK® 100 METER  
FRONT DIMENSIONS**

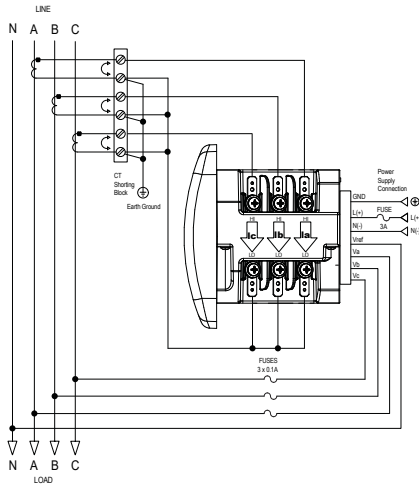


**SHARK® 100 METER  
SIDE DIMENSIONS**

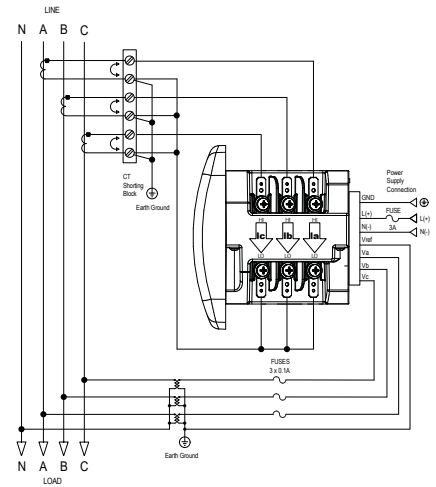


**SHARK® 100 METER  
REAR DIMENSIONS**

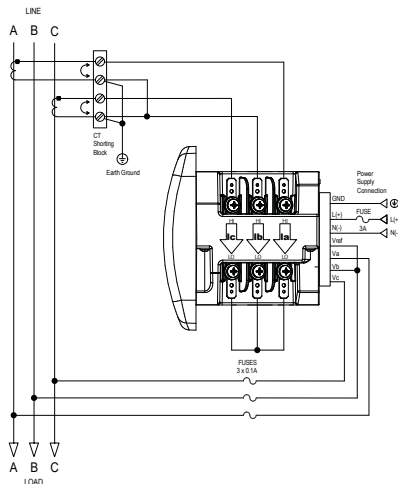
# Wiring Diagrams



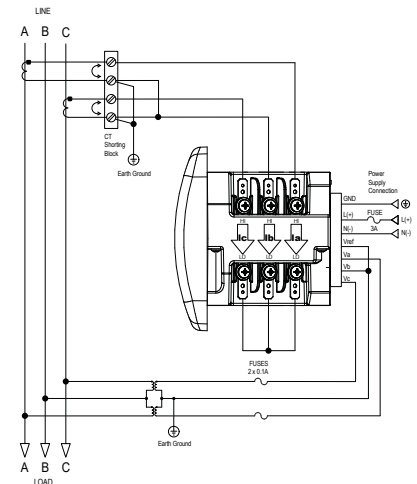
**3 PHASE, 4 WIRE WYE DIRECT**



**3 PHASE, 4 WIRE WYE WITH PTS**



**3 PHASE, 3 WIRE DELTA DIRECT**



**3 PHASE, 3 WIRE DELTA WITH PTS**

**Note:** See the Shark® 100 Meter User Manual for additional wiring diagrams.

### Voltage Inputs

- Absolute Range: (20-416) Volts Line to Neutral, (0-721) Volts Line to Line
- Universal Voltage Input
- Input Withstand Capability – Meets IEEE C37.90.1 (Surge Withstand Capability)
- Programmable Voltage Range to Any PT Ratio
- Supports: 3 Element WYE, 2.5 Element WYE, 2 Element Delta, 4 Wire Delta Systems
- Burden: 0.36 VA per phase Max at 600 V, 0.014 VA at 120 Volts
- Input wire gauge max (AWG 12 / 2.5 mm<sup>2</sup>)

### Current Inputs

- Class 10: (0.005 to 10) A, 5 A Nominal CT Secondary
- Class 2: (0.001 to 2) A, 1A Nominal CT Secondary
- Fault Current Withstand (at 23 °C): 100 A for 10 Seconds, 300 A for 3 Seconds, 500 A for 1 Second
- Programmable Current to Any CT Ratio
- Burden 0.005 VA per phase Max at 11 A
- 5 mA Pickup Current
- Pass through wire gauge dimension: 0.177" / 4.5 mm
- Continuous Current Withstand: 20 A for

screw terminated or pass through current connections

### Isolation

- All Inputs and Outputs are Galvanically Isolated to 2500 Volts

### Environmental Rating

- Storage: (-20 to +70) °C
- Operating: (-20 to +70) °C
- Humidity: to 95% RH Non-Condensing
- Faceplate Rating: NEMA12 (Water Resistant)
- Mounting Gasket Included
- Protection: IP30 - Meter Front/Back, Optional DIN Rail Mounting

### Sensing Method

- RMS
- Sampling at 400+ samples per cycle on all channels of measured readings simultaneously
- Harmonic THD (% of Total Harmonic Distortion)

### Update Rate

- Watts, VAR, and VA - Every 6 Cycles
- All Other Parameters - One Second

### Power Supply

- Option D2: Universal, (90 to 265) Volts AC@50/60 Hz or (100 to 370) Volts DC,

- Universal AC/DC Supply/5 VA Max
- Option D: (18-60) V DC/3.5 W Max

### Standard Communication Format

- 2 Com Ports (Back and Faceplate)
- RS485 Port Through Backplate (485P)
- IrDA Through Faceplate
- 10/100BaseT Ethernet Modbus TCP/IP Through Backplate (INP10)
- Com Port Baud Rate: (9,600 to 57,600)
- Com Port Address: 0-247
- 8-bit, No parity
- Modbus RTU, ASCII, or DNP3 Protocols

### KYZ Pulse

- Type Form A
- On Resistance: (25-35) Ω
- Peak Voltage: 350 V DC
- Continuous Load Current: 120 mA
- Peak Load Current: 350 mA (10 ms)
- Off State Leakage Current @ 350 V DC: 1 mA
- Opto-Isolation: 3750 V AC (60 Hz, 1 min)

### Dimensions and Shipping

- Basic Unit: (H4.85 x W4.85 x L4.25) in.
- Shark® 100 – mounts in 96 mm DIN and ANSI C39.1 4" Round Cutouts
- Shark® 100T-DIN rail mounted transducer
- Shipping Container Dimensions: 6" cube

### Meter Accuracy

- See page 2.

### Compliance

- ANSI C12.20-2010 Accuracy, Class 0.2 CL
  - IEC 62053-22 Accuracy, Class 0.2S\*
  - IEC 62053-23 Edition 1 Class 2
  - CE (IEC 61000-6-2 & IEC 61000-6-4 & IEC 61326-1)\*
    - IEC 61000-4-2 (Electrostatic Discharge)\*
    - IEC 61000-4-3 (Radiated EM Immunity)\*
    - IEC 61000-4-4 (EFT)\*
    - IEC 61000-4-5 (Surge Immunity)\*
    - IEC 61000-4-6 (Conducted Immunity)\*
    - IEC 61000-4-8 (Magnetic Immunity)
    - IEC 61000-4-11 (Voltage Variations Immunity)\*
  - IEC/CISPR 11, Class A (Conducted, Radiated Emissions)\*
  - IEEE C37.90.1 (Surge Withstand)
  - IEEE C62.41 (Surge Immunity)
  - EU Directive 2011/65/EU (RoHS 3 Directive)
  - REACH Compliant
  - Certified to UL 61010-1 and CSA C22.2 No. 61010-1, UL File: E250818
- \* Third party lab tested

## Ordering Information - All fields must be filled in to create a valid part number.

	Model	Frequency Range	Current Input	V-Switch™ Pack	Power Supply	COM	Mounting
<b>Option Numbers:</b>	-	-	-	-	-	-	-
<b>Example:</b>	Shark100	60	10	V1	D2	X	X
	<b>Shark100</b> (Meter)	<b>60</b> 60 Hz System	<b>10</b> 5 A Nominal CT Secondary	<b>V1</b> Voltage Current	<b>D2</b> (90-265) V AC @ 50/60 Hz or (100- 370) V DC	<b>X</b> No Com	<b>X</b> ANSI Mounting
	<b>Shark100T</b> (Transducer)	<b>50</b> 50 Hz System	<b>2</b> 1 A Nominal CT Secondary	<b>V2</b> Above with Power & Freq	<b>D</b> (18-60) V DC	<b>485P</b> RS485+KYZ Pulse (Standard in Shark® 100T Transducer)	<b>DIN</b> DIN Mounting Brackets
				<b>V3</b> Above with DNP3 and Energy Counters		<b>INP10</b> 10/100BaseT+KYZ Pulse	
				<b>V4</b> Above with THD & Limits			
<b>Software</b>							
<b>ComPQA6P1Y</b>				CommunicatorPQA® 6 Configuration Software - Single Computer License (One Site)			
<b>EnergyPQA-1Year</b>				AI Driven Energy Management System			
<b>Additional Accessories</b>							
<b>Communication Converters</b>				<b>Compliance Documents</b>			
<b>9PINC</b>	RS232 Cable			<b>Certificate of Calibration, Part # CCal</b>	This provides Certificate of Calibration with NIST traceable test data.		
<b>CAB6490</b>	USB to IrDA Adapter						
<b>Unicom 2500</b>	RS485 to RS232 Converter						
<b>Unicom 2500-F</b>	RS485 or RS232 to Fiber Optic Converter						

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