

Datasheet

The Smart X96-5S Series represents a high-end, fully integrated solution for power monitoring, analysis, and control in industrial and commercial applications. It consolidates the functionality of multiple discrete devices into a single, powerful unit.

Premium Measurement & Certification

- High-Accuracy Metering: Class 0.5S (IEC 62053-22) / Class C (EN 50470-3:2022)
- Wide operating voltage ensure global compatibility.
- Comprehensive Electrical Parameters
- Time of Use (TOU) Metering

Advanced Power Quality Analysis & Diagnostics

- Detailed Harmonic Analysis including THFF, Crest Factor, and K-factor**.
- Voltage Sag & Swell Monitoring
- Real-time & Fault Waveform Capture
- Min/Max Values with Timestamp

Intelligent Demand Management

- Demand Forecasting
- Configurable Demand Settings

Flexible Communication & Integration

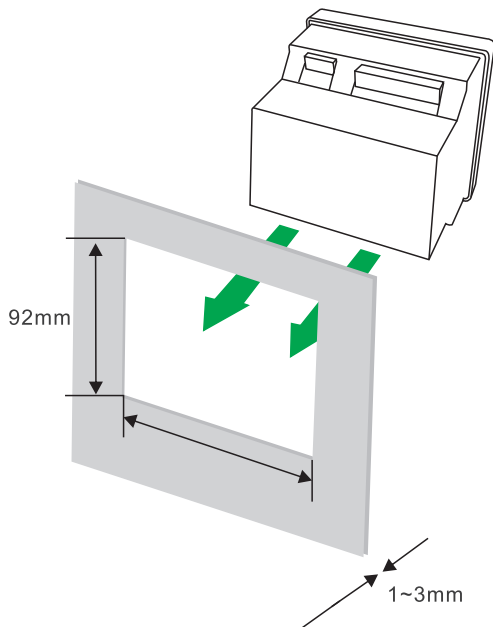
- RS-485 (Modbus-RTU) & Ethernet (Modbus-TCP)

Versatile I/O & Expanded Functionality (X96-5S-L Model)

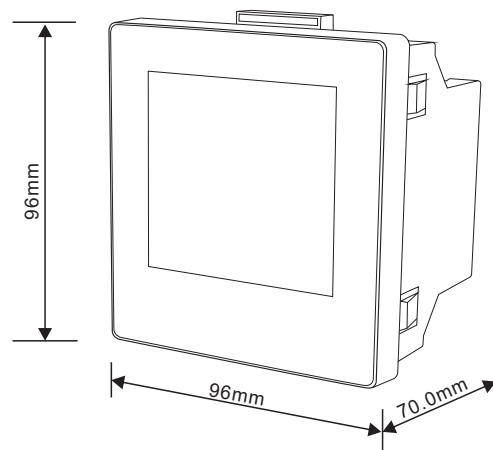
- 4 DI and 2 DO for status monitoring and control.
- Residual current monitoring (X96-5S-L)
- Temperature measurement (X96-5S-L)



Mounting



Dimension Drawing



Height 96mm
Width 96mm
Depth 70mm

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Specification Table

Technical Parameters	
Aux. Power Supply	100~480V AC / 141~678V DC
Voltage AC (Un)	3*230V(L-N) / 400V(L-L)
Voltage Range	50 to 600 V AC(L-L) / 50 to 345 V AC(L-N)
Frequency	45~65Hz
Primary(CT)	1~9999A
Secondary(CT)	1A / 5A
Primary(PT)	100 ~ 500000V
Secondary(PT)	100 ~ 480V
Current Input	5A
Maximum Current	6A
Minimum Current	0.05A
Starting Current (Ist)	0.005A
Transition Current (Itr)	0.25A
Over Current Withstand	20 I _{max} for 0.5S
AC Voltage Withstand	4KV / 1min
Impulse Voltage Withstand	6kV - 1.2 / 50μS waveform
Voltage Circuit Power Consumption	≤ 2W / 10VA
Current Circuit Power Consumption	≤ 0.05VA
Display	Color LCD screen

Accuracy	
Voltage	± 0.2%
Current	± 0.2%
Frequency	± 0.05%
Power Factor	± 0.005
Active Power	± 0.5% (5%I _b -I _{max})
Reactive Power	± 1% (5%I _b -I _{max})
Apparent Power	± 0.5% (5%I _b -I _{max})
Active Energy	Class 0.5S IEC62053-22 / Class C EN50470-3:2022
Reactive Energy	Class 2 IEC 62053-23

Environmental Characteristics	
Operating Temperature	-25°C to +75°C
Storage Temperature	-40°C to +85°C
Operation humidity	≤ 90%, Non-condensing
Storage Humidity	≤ 95%, Non-condensing
Pollution Degree	II
Altitude	≤ 2000m
Vibration	10Hz ~ 50Hz, IEC 60068-2-6

Digital output	
Number / Type	2 - electromagnetic relay
Output Frequency	1 Hz maximum
Switching Current	250 Vac at 3.0 Amps, 100k cycles
Isolation	2.5 KVac for 1min

Digital Input	
Number	4
Input Resistance	10 kΩ
Maximum Frequency	1kHz
Response Time	10 milliseconds
Isolation	2.5 KVac for 1min

Communications	
Interface 1	RS485
Interface 1 Protocol	MODBUS RTU
Communication Address	1 to 247
Transmission Mode	Half Duplex
Data Type	Floating Point
Transmission Distance	1000m Maximum
Transmission Speed	1200/2400/4800/9600(Default)/19200/38400/115200bps
Parity	NONE(Default)/ODD/EVEN
Stop Bits	1/2
Response Time	<100 ms
Interface 2	Ethernet
Interface 2 Protocol	Modbus-TCP
IP Address	192.168.1.200(Default)
IP port	502
Subnet Master	255.255.255.0
Gate way	192.168.1.1
DHCP	OFF(Default)

Mechanical Characteristics	
Weight	≈ 322g
IP Degree of Protection (IEC 60529)	IP51 Front Display / IP20 Whole Meter
Dimensions (DxHxW)	73.5 x 96 x 96mm
Mounting	Vertical
Panel Thickness	1~5mm
Material of Meter Case	Self-extinguishing UL 94 V-0
Mechanical Environment	M1

Safety	
Measurement Category	Per IEC61010-1 CAT III
Current Inputs	Require external Current Transformer for Insulation
Installation Category	CAT III
Over-voltage Category	CAT III
Protective Class	II

Electromagnetic Compatibility	
Electrostatic Discharge	IEC 61000-4-2
Immunity to Radiated Fields	IEC 61000-4-3
Immunity to Fast Transients	IEC 61000-4-4
Surge (Impulse) Immunity	IEC 61000-4-5
Conducted Immunity	IEC 61000-4-6
Immunity to Magnetic Fields	IEC 61000-4-8
Immunity to Voltage Dips	IEC 61000-4-11
Radiated Emissions	CISPR 32
Conducted Emissions	CISPR 32



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Model Table

Instantaneous Measurements	Smart X96-5S	Smart X96-5S-L
Current	●	●
Voltage L-N	●	●
Voltage L-L	●	●
Frequency	●	●
Active Power	●	●
Reactive Power	●	●
Apparent Power	●	●
Power Factor	●	●
Load Type	●	●
Temperature Measurement	—	2
Residual Current	—	1
Phase Sequence		
Voltage / Current Sequence Components	●	●
Phase Angle	●	●
Energy Values		
Active Energy	●	●
Reactive Energy	●	●
Apparent Energy	●	●
Time-of-use Energy	●	●
System Type		
3 P 3 W	●	●
3 P 4 W	●	●
Demand		
Current	●	●
Power	●	●
Maximum Current	●	●
Maximum Power	●	●
Configuration Parameters	●	●
Demand Forecasting	●	●
Max/Min Values		
Voltage Max/Min Values	●	●
Current Max/Min Values	●	●
Active, Reactive, Apparent Power	●	●
Max/Min Values	●	●
Power Factor Max/Min Value	●	●
Frequency Max/Min Value	●	●
Voltage/Current Unbalance	●	●
Max/Min Values	●	●
Voltage/Current THD Max/Min	●	●
Values	●	●
Time Stamp	●	●

Power Quality	Smart X96-5S	Smart X96-5S-L
Unbalance Factor	●	●
Voltage THD	●	●
Current THD	●	●
Individual Voltage Harmonic Ratio	●	●
Individual Current Harmonic Ratio	●	●
Voltage Crest Factor (per phase)	●	●
Telephone Harmonic Form Factor (THFF)	●	●
Current K-Factor (per phase)	●	●
Voltage Swell & Sag	●	●
Alarm		
Alarm Channels	24	24
Time		
Real-Time Clock (RTC)	●	●
Waveform		
Real-time Waveform	●	●
Waveform Capture	●	●
Waveform Recording	●	●
Record		
Event Record	30	30
Alarm Record	●	●
Current Direction correction		
Current Direction Correction	●	●
Communication		
RS485	●	●
Ethernet	●	●
Digital Input /Output		
DI	4	4
DO	2	2

Conformity References

- [1] EN IEC61326-1: 2021 Electromagnetic Compatibility Directive - Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
- [2] EN IEC 61326-2-3: 2021 Electromagnetic Compatibility Directive
- [3] EN61010-1:2010+A1:2019 Low Voltage Directive 2014/35/EU - Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
- [4] EN61010-2-030:2010 Low Voltage Directive 2014/35/EU - Particular requirements for testing and measuring circuits
- [5] EN 50470-3:2022 Electricity metering equipment - Part 3: Particular requirements - Static meters for AC active energy (class indexes A, B and C)

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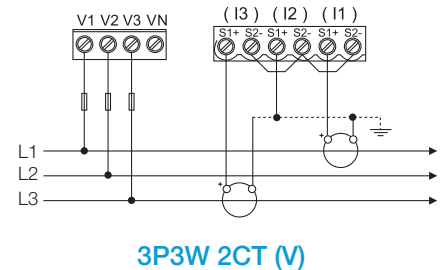
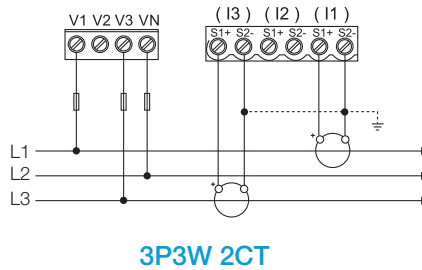
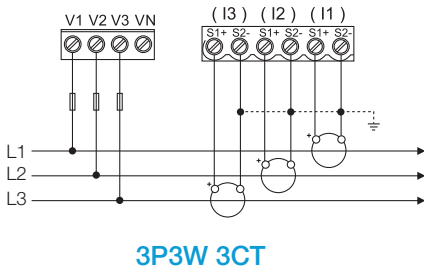
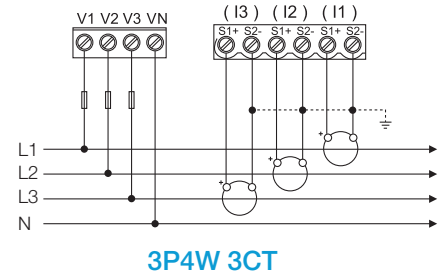
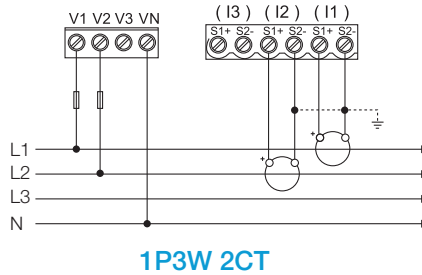
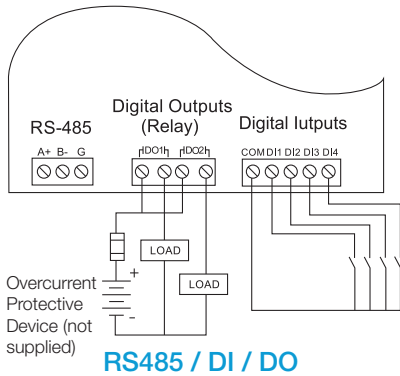
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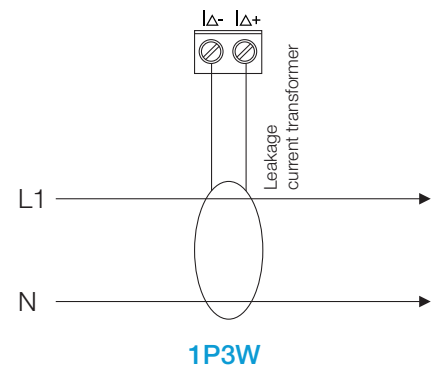
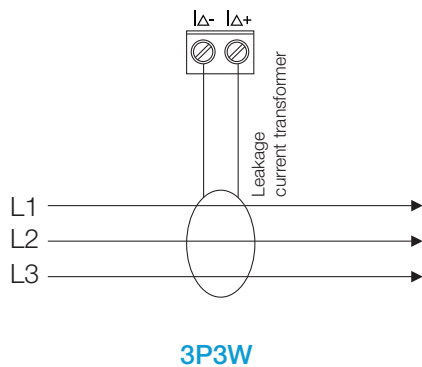
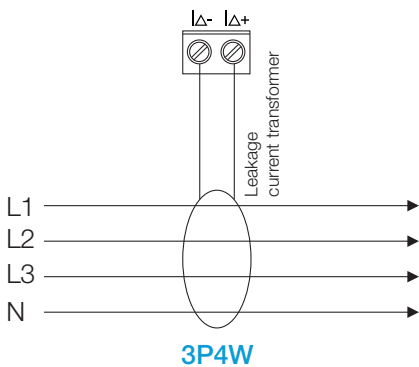
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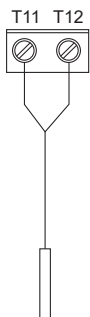
Wiring Configuration



Residual Current Sensor Wiring (X96-5S-L)



Temperature Sensor Wiring (X96-5S-L)



Wiring Guide

Terminal (V1, V2, V3, VN, I1, I2, I3,)	Measurement Connection	Screw Connection	
	Strip Length		7-8mm
Screw		M3	
Rigid/Supple		0.5-2.5mm ² (28-12 AWG)	
Tightening Torque		0.5Nm	
Screw driver		PH0	
Terminal (A+, B-, G, DO1, DO2, COM, DI1, DI2, DI3, DI4)	Measurement Connection	Screw Connection	
	Strip Length		6-7mm
	Rigid/Supple		0.5-1.5mm ² (28-16AWG)
	Tightening Torque		0.2Nm
	Screw driver		PH0

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