

Elecnova

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**ELECTRIC APPLICATION
SOLUTION**

**E L E
C N O
V A**

Empower Your Success

JIANGSU SFERE ELECTRIC CO., LTD.
www.sfere-elec.net

01

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 - R&D and Innovation
 - Modern Management
- 04

 - Brand Strength
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 - Product Overview

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03

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MAIN PROJECTS

Elecnova

Electric Application Solution Expert



■ R&D AND INNOVATION

Leading the industry trend and adhering to independent innovation, Sferre Electric has formed a highly-educated, high-quality, highly-innovative elite team after years of talent reserve and cultivation. Its R&D Center has nearly 70 IT staff currently, who, under the leadership of innovation. The company's three series of products, i.e. power monitoring systems, power quality improvement products and electric safety products, which derived from abundant technology accumulation capability, have laid a solid foundation for its leading position in the industry.

■ CORPORATE CULTURE

Core Values

Create value for customers
Share values with employees
Contribute values to community

Corporate Vision

Build SFERE Electric as a top domestic supplier of power products and services focusing on comprehensive power applications.

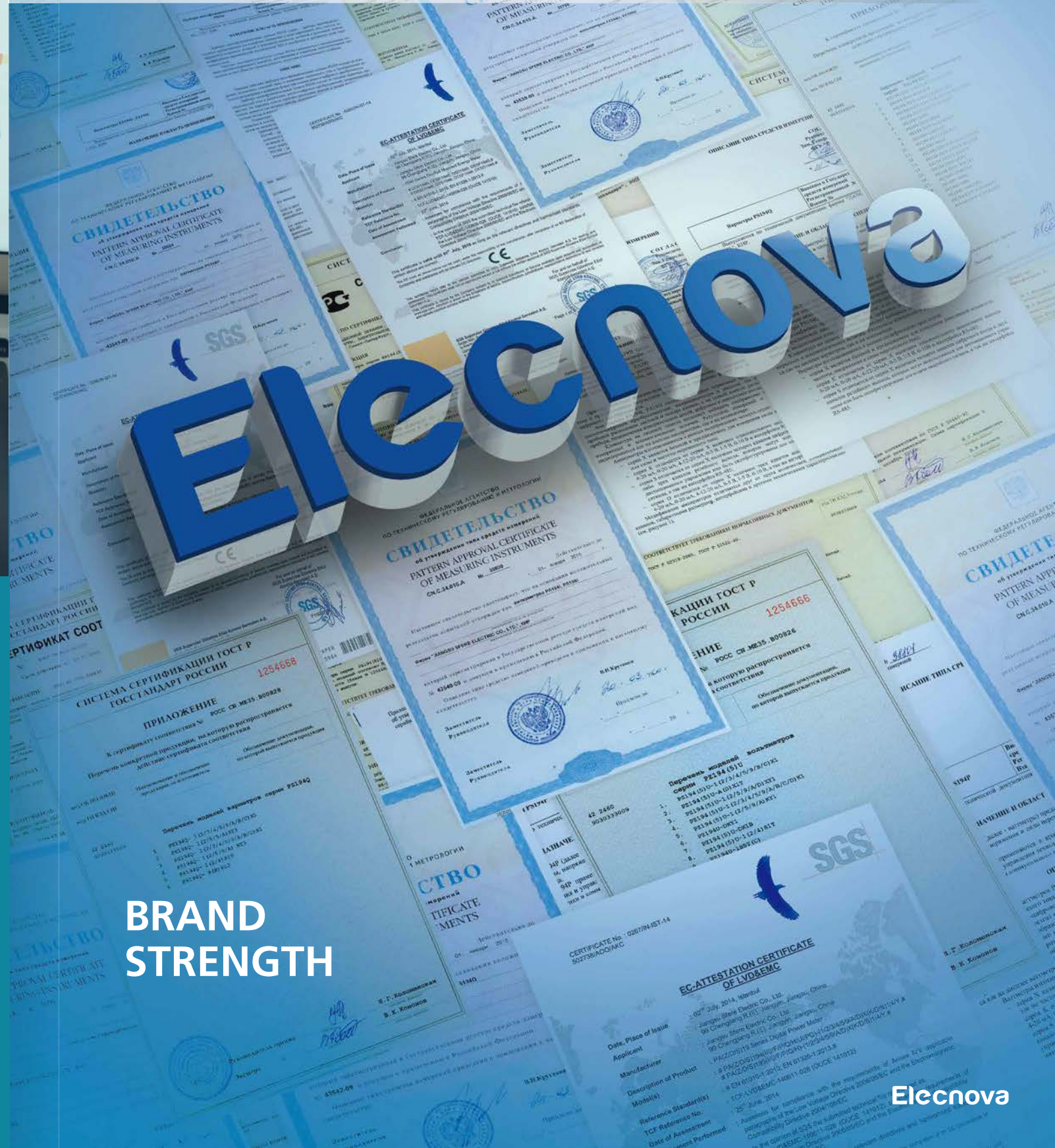
Enterprise Spirit

Unity in a concerted effort Honesty
Intelligence, innovation
Scientific development





Sfere Electric is dedicated in being the first brand in the industry. Since its establishment, the company has been adhering to the principle of down-to-earth development, the attitude of keeping abreast of the times, the idea of exploration and innovation, which cultivates Sfere Electric into a striking example of the entrepreneurialism. Over the past decade, Sfere Electric was honored many awards, such as "High-tech Enterprise in Jiangsu Province", "Software Enterprise", "Excellent Private Technology Enterprise", "Engineering Center", "Famous Brand in Jiangsu Province", 122 invention and utility model patents, and 42 software copyrights, etc.

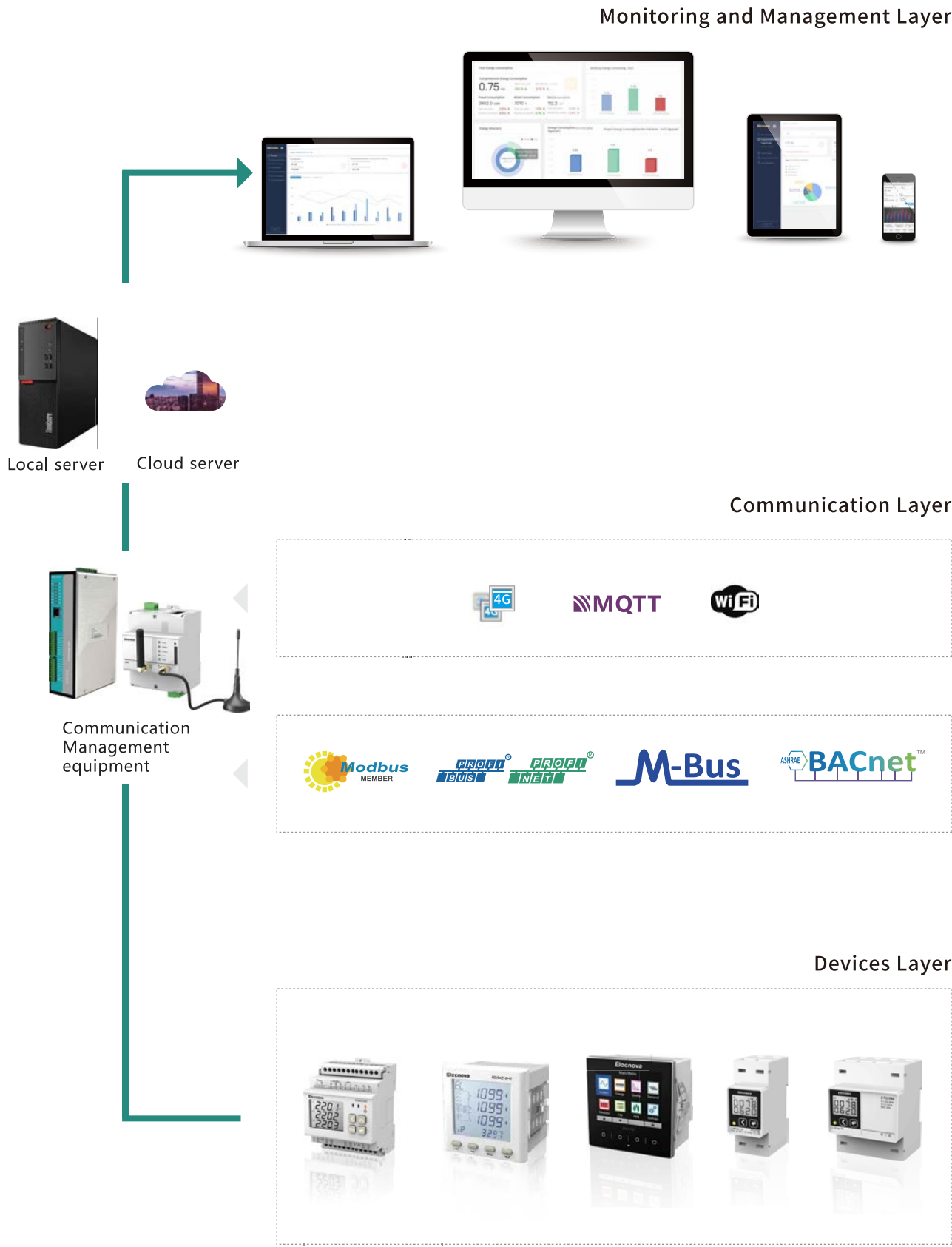


MODERN MANAGEMENT

Backed by the extensive industry experience, ISO9001 quality management system, three information systems (ERP, MES, CRM) as platforms, the world's leading process equipment and efficient supply chain management as the core, Sfere Electric has been practicing its solemn commitment to "fastest delivery, highest quality and best service".

BRAND STRENGTH

A SIMULATION DIAGRAM FOR POWER SUPPLY SYSTEM
(DISPLAY INSTRUMENT PRODUCTS)



MULTI-FUNCTIONAL POWER METER

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Electrical Application Solution Expert





COMPARISON TABLE



Model		PD194Z-9HY	PD194Z-E20	Sfere720A	Sfere720B	Sfere720C	Sfere720
Appearance	Display mode	LCD	LCD	LCD	LCD	LCD	TFT
	Panel mounted	■	—	■	■	■	■
	DIN rail mounted	—	■	—	—	—	—
Accuracy	Active energy accuracy	0.5S	0.5S	0.5S	0.5S	0.2S	0.2S
	Reactive energy accuracy	2	2	2	2	2	2
Measurement	V/A/P/Q/S/PF/F	■	■	■	■	■	■
	Demand	■	■	■	■	■	■
	Max. / Min. value	■	■	■	■	■	■
	Neutral current	—	—	—	■	■	■
	Residual current	—	■	—	—	—	—
	Fundamental V/A/P/Q/S/PF	—	■	—	—	■	■
Energy Metering	Bi-directional energy	■	■	■	■	■	■
	Four-quadrant reactive energy	■	■	■	■	■	■
	Spare energy	—	—	—	■	■	■
	Tariff energy	□	■	—	■	■	■
	Fundamental energy	—	■	—	—	■	■
Power Quality	THD	■	■	—	■	■	■
	Harmonics V/A	1st-31st	1st-31st	—	1st-51st	1st-63rd	1st-63rd
	Sequence component	—	■	—	■	■	■
	Unbalance	■	■	—	■	■	■
	Crest and K factor	—	■	—	■	■	■
	Flicker	—	—	—	—	—	■
	Transient	—	—	—	—	—	■
Data Log	Hour meter	—	■	■	■	■	■
	Demand/Max./Min. record	—	■	—	■	■	■
	Off-limit record	—	■	—	■	■	■
	SOE record	—	■	—	■	■	■
	Memory	—	—	—	—	8MB	8MB
Input and Output	Energy pulse output	2	■	■	■	■	■
	RS485 port(Modbus-RTU)	■	■	■	■	■	■
	2 AC digital inputs	□	—	—	■	■	■
	2 relay outputs	□	—	—	■	■	■
Optional Module	EK1(4 dry digital inputs and 2 relay outputs)	—	□	—	—	—	—
	FM1(2 AC digital inputs)	—	—	—	—	□	□
	FM2(4 dry digital inputs)	—	—	—	—	□	□
	FM3(2 relay outputs)	—	—	—	—	□	□
	FM4(2 analog inputs)	—	—	—	—	□	□
	FM5(2 temperature inputs)	—	—	—	—	□	□
	FM6(2 analog outputs)	—	—	—	—	□	□
	FM7(Modus-TCP)	—	—	—	—	□	□
	FM8(Profibus-DP V0)	—	—	—	—	□	□
	FM11(RS485, Modbus-RTU)	—	—	—	—	□	□

NOTE: "■": Yes "—": No "□": Optional

Sfere720C

Sfere720



Memory 8MB
Energy Accuracy 0.2S
Harmonics
Neutral Current Input
4 Tariffs
Optional Modules
Capacitive Buttons



FUNCTION

Networks

-TN,TT, IT networks

Communication

-Modbus-RTU -Modbus-TCP -Profibus-DP

Accuracy

-Active energy: 0.2S
-Voltage: 0.1%
-Current: 0.1%

Data Log

-Demand record
-Max./Min. value record
-Off-limit record
-SOE record

Power Quality

-THD
-Harmonics up to 63rd
-Unbalance
-Sequence component
-Crest factor and K factor
-Waveform display
-Flicker
-Transient (Only Sfere720)

Optional Modules

-FM1(2 AC digital inputs)
-FM2(4 dry digital inputs)
-FM3(2 relay outputs)
-FM4(2 analog inputs)
-FM5(2 temperature inputs)
-FM6(2 analog outputs)
-FM7(Modbus-TCP)
-FM8(Profibus-DP V0)
-FM9(WiFi)
-FM10(GPRS)
-FM11(RS485, Modbus-RTU)
-FM12 (M-Bus communication)
-FM13 (BACnet/MSTP communication)
-FM14 (BACnet/IP communication)
-FM15 (RS232,Modbus-RTU)



APPLICATIONS



Data Acquisition



Energy Management



Remote Power Monitoring



MAIN FEATURES

Measuring

-Fundamental V/A/P/Q/S
-Demand
-Max./Min. Value
-Load profile

Power Quality

-Harmonics up to 63rd
-Sequence component
-Unbalance
-Crest factor and K factor
-Phasor diagram

Energy Metering

-Bi-directional energy
-Four-quadrant reactive energy
-Tariff energy
-Fundamental energy

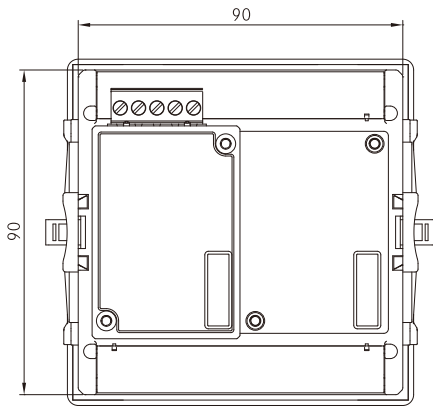
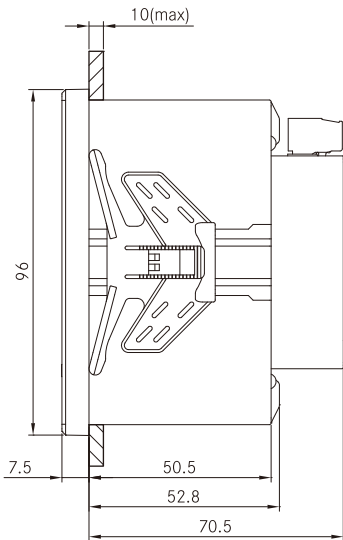
Extension Functions

GPRS	M-Bus	WIFI	BACnet/IP	RS232
Modbus-TCP	Modbus-RTU	2relay outputs	BACnet/MSTP	Profibus-DP
2 analog outputs	4DC digital inputs	2AC digital inputs	2 analog inputs (4-20mA)	2 analog inputs (PT100)

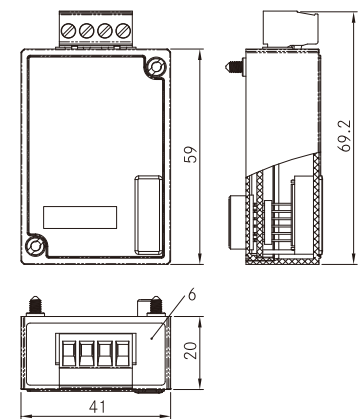


DIMENSIONS

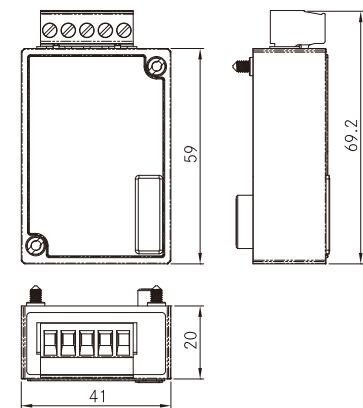
Sfere720



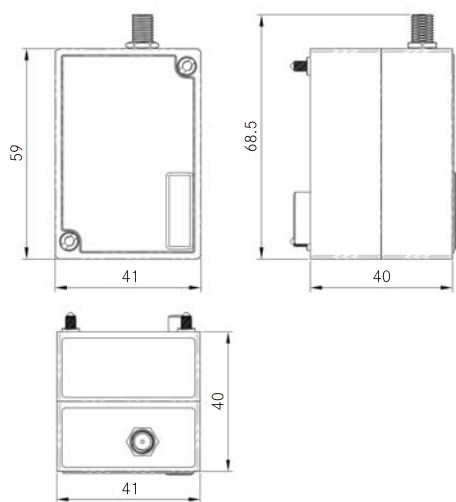
FM1/FM3/FM4/FM6/FM11/FM12/FM13



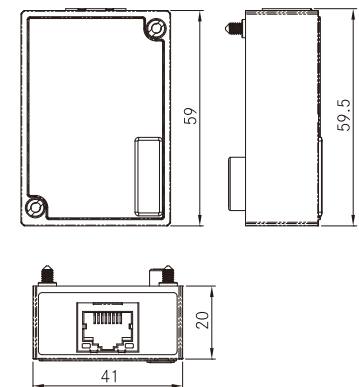
FM2/FM5



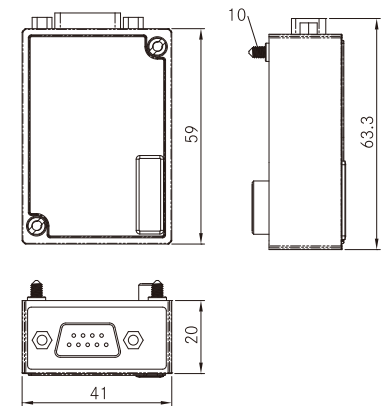
FM9/FM10



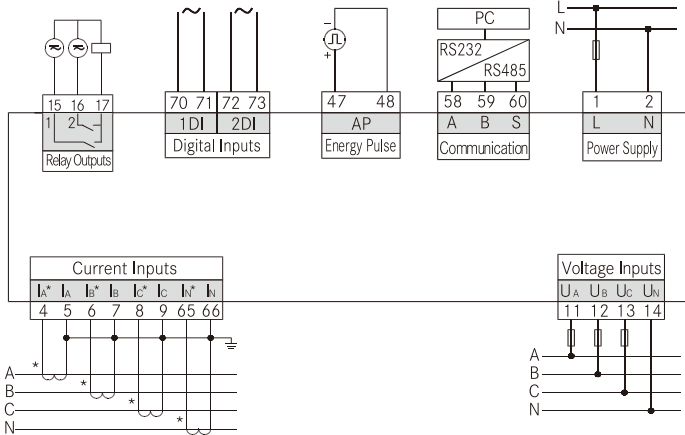
FM7/FM14



FM8/FM15



 TYPICAL WIRING



TECHNICAL SPECIFICATION

Display Mode		Sfere720C: LCD, Sfere720: TFT
Accuracy	V/A	0.2%
	P/Q/S/PF	0.2%
	F	±0.01Hz
	±kWh	Class 0.2S
	±kvarh	Class 2
Voltage Input	Rated value	AC 100V, AC 380V
	Overload	Continuous: 1.2Vn Instantaneous: 2Vn/10s
	Burden	≤0.1VA(per phase)
	Impedance	≥1.7MΩ
	Frequency	45Hz~65 Hz
Current Input	Rated value	AC 1A, AC 5A
	Overload	Continuous: 1.2In Instantaneous: 2In/5s
	Burden	≤0.2VA(per phase)
	Impedance	≤20mΩ
Auxiliary Supply	Working range	AC 80~270V 50/60Hz, DC 100~350V
	Consumption	≤5VA
Communication Port		RS485, Modbus-RTU, 2-wire, up to 38.4kbps
Energy Pulse Output		1 photocoupler output, pulse width (80±20%) ms
Digital Input		2 AC wet contact inputs, Isolation: 5kVAC
Relay Output		2 relay outputs, contact rated at AC 5A/250V or DC 5A/30V, Isolation: 2kVAC
Environment Conditions	Operating temperature	-25 °C ~70 °C
	Storage temperature	-30 °C ~80 °C
	Relative humidity	≤93%
	Altitude	≤2500m
Insulation		≥ 2kVAC
IP Degree		Front IP64, Rear IP20

Sfere720A Sfere720B



Modbus Interface
Energy Accuracy 0.5S
Pulse Output
Harmonics (Only Sfere720B)
Neutral Current Input (Only Sfere720B)
4 Tariffs (Only Sfere720B)
Data Record (Only Sfere720B)



FUNCTION

Networks

-TN, TT, IT networks

Communication

-Interface: RS485
-Protocol: Modbus-RTU

Accuracy

-Energy: 0.5S
-Voltage: 0.2%
-Current: 0.2%

Power Quality(Sfere720B)

-THD
-Harmonics up to 51st
-Unbalance
-Sequence component
-Crest factor and K factor

Data Log (Sfere720B)

-Demand record
-Max./Min. value record
-Off-limit record
-SOE record



APPLICATIONS



Data Acquisition



Energy Management



Remote Power Monitoring



MAIN FEATURES

Measuring

-Demand -Max./Min. Value

Energy Metering

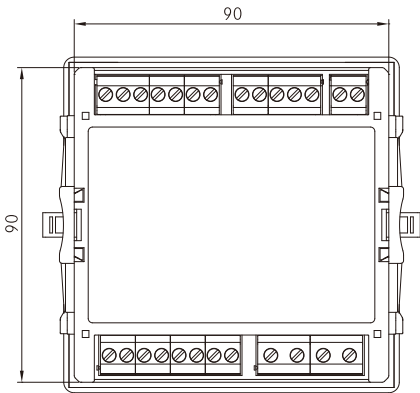
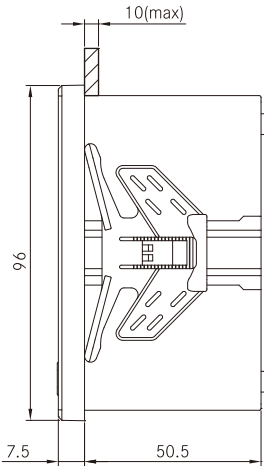
-Bi-directional energy
-Four-quadrant reactive energy
-Tariff energy (Sfere720B)

Power Quality (Sfere720B)

-Harmonics up to 51st
-Sequence component
-Unbalance
-Crest factor and K factor

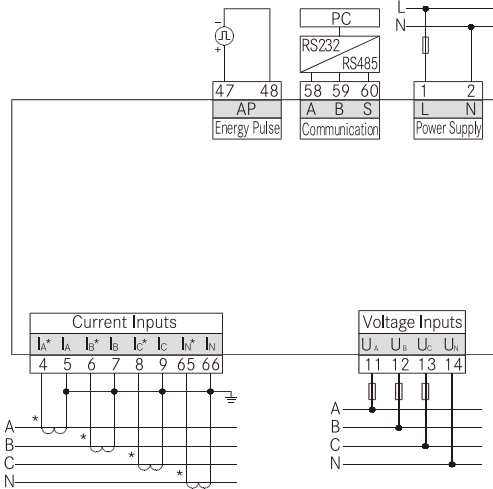


DIMENSIONS

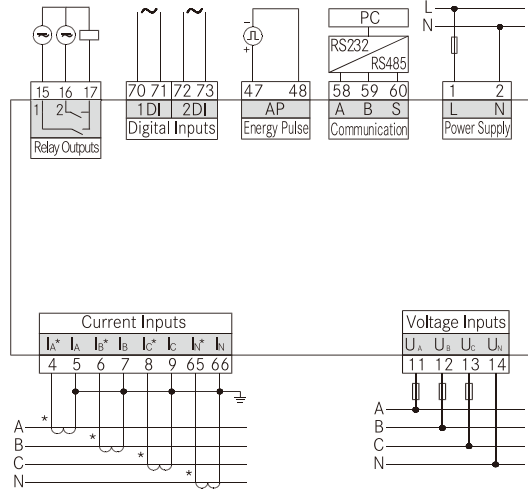


TYPICAL WIRING

Sfere720A



Sfere720B





TECHNICAL SPECIFICATION

Display Mode		LCD
Accuracy	V/A	0.2%
	P/Q/S/PF	0.5%
	F	±0.01Hz
	±kWh	Class 0.5S
	±kvarh	Class 2
Voltage Input	Rated value	AC 100V, AC 380V
	Overload	Continuous: 1.2Vn Instantaneous: 2Vn/10s
	Burden	≤0.1VA (per phase)
	Impedance	≥1.7MΩ
	Frequency	45Hz~65 Hz
Current Input	Rated value	AC 1A, AC 5A
	Overload	Continuous: 1.2In Instantaneous: 2In/5s
	Burden	≤0.2VA (per phase)
	Impedance	≤20mΩ
Auxiliary Supply	Consumption	≤5VA
Communication Port		RS485, Modbus-RTU, 2-wire, up to 38.4kbps
Energy Pulse Output		1 photocoupler output, pulse width (80±20%) ms
Digital Input		2 AC wet contact inputs, Isolation: 5kVAC
Relay Output		2 relay outputs, Contact rated at AC 5A/250V or DC 5A/30V, Isolation: 2kVAC
Environment Conditions	Operating temperature	-25 C ~70 C
	Storage temperature	-30 C ~80 C
	Relative humidity	≤93%
	Altitude	≤2500m
Insulation		≥ 2kVAC
IP Degree		Front IP54, Rear IP20

PD194Z-9HY



Harmonics
4 Tariffs
Energy Accuracy 0.5S
Pulse Output



DEVICES



FUNCTION

Networks

-TN, TT, IT networks

Accuracy

-Energy: 0.5S
-Voltage: 0.2%
-Current: 0.2%

Communication

-Interface: RS485
-Protocol: Modbus-RTU
Profibus-DP (Optional)



MAIN FEATURES

Measuring

-Fundamental V/A
-Demand
-Max./Min. Value
-Load profile

Energy Metering

-Bi-directional energy
-Four-quadrant reactive energy
-Tariff energy

Power Quality

-Harmonics up to 31st
-Unbalance



APPLICATIONS



Data Acquisition



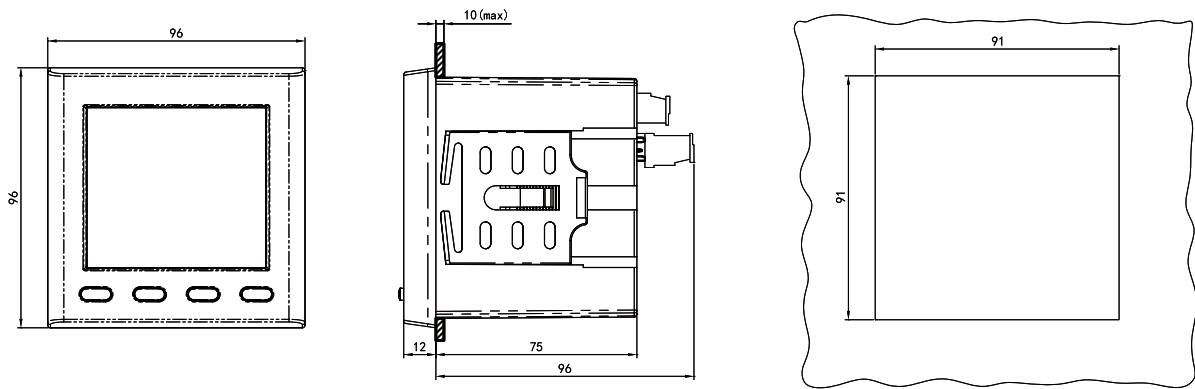
Energy Management



Remote Power Monitoring

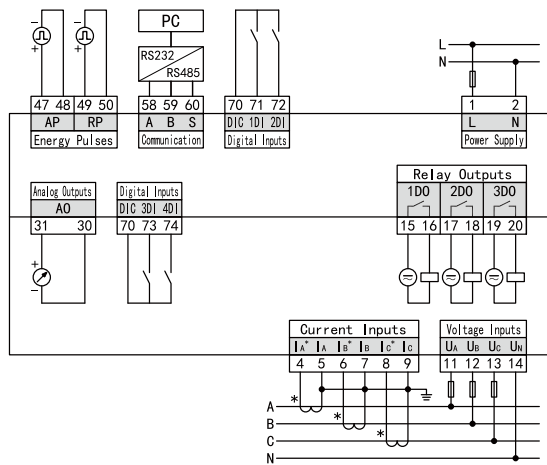


DIMENSIONS

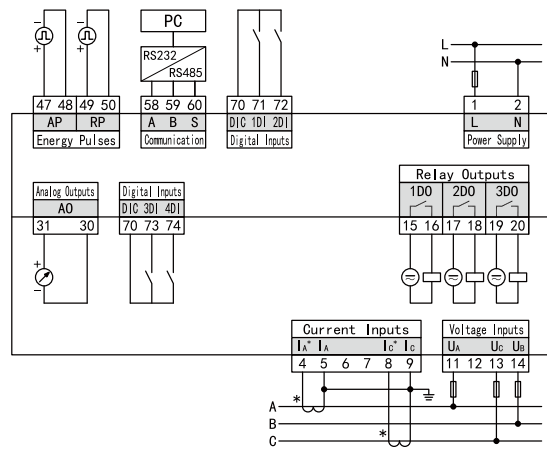


TYPICAL WIRING

3P4W



3P3W



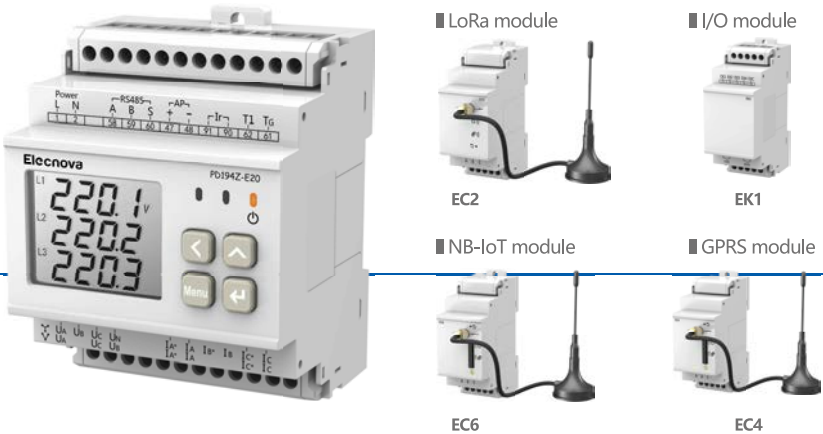
TECHNICAL SPECIFICATION

Feature		Parameters	
Accuracy		U, I: class 0.2 , P, Q, PF: class 0.5, Harmonic: class S , Active energy: class 0.5S , Reactive energy:class 2 , Analog output: class 0.5	
Display		LCD	
Signal Input	Signal Input		
	3 phase 4 wire, 3 phase 3 wire, single phase		
	Voltage	Rated Value	AC100V, AC380V
		Overload	Sustainable: 1.2 times, Instantaneous: 2 times/10s
		Consumption	<0.1VA(each phase)
		Impedance	>1MΩ
		Current	Rated Value
	Overload		Sustainable:1.2 times, Instantaneous:10 times/5s
	Consumption		<0.1 VA(each phase)
	Impedance		<20mΩ
	Frequency		(50±5%) (60±5%) Hz, accuracy: ±0.01Hz
	Harmonic		Voltage, current total harmonic distortion and 2-31 times odd harmonic distortion
Energy		Dual direction active and reactive metering	
Power	Working range	AC, DC: 80V~270V	
	Consumption	<5VA	
Function Module	Energy pulse output		
	2 loops energy pulse output, photo coupler relay, constant 5000imp/kWh (kvarh)		
	Communication port		
	1 loop RS-485, MODBUS-RTU, Baud rate: 2400~9600bps		
	Digital input		
At most 4 loops digital invariables input, dry node connection			
Relay output			
At most 3 relay outputs, AC250V/5A, DC30V/5A			
Analog output			
1 analog output: 0/4~20mA or 0~5/10V			
Operating environment		-20~70℃, humidity ≤93%, no erosion gas, altitude≤2500m	
Storage environment		-30~80℃,humidity≤93%	
Safety	Insulation	Signal, power, output terminal to shell resistance>100MΩ	
	Withstand voltage	Input and power>2kV, Input and output>1kV, power and output>2kV	

PD194Z-E20



Harmonics
Modbus Interface
Energy Accuracy 0.5S
Pulse Output



FUNCTION

Networks

-TN, TT, IT networks

Communication

-Interface: RS485
-Protocol: Modbus-RTU
-LoRa
-NB-IoT
-GPRS

Accuracy

-Energy: 0.5S
-Voltage: 0.2%
-Current: 0.2%



MAIN FEATURES

Measuring

-Fundamental V/A
-Demand
-Max./Min. Value

Power Quality

-THD
-Harmonics up to 31st
-Sequence component
-Unbalance
-Crest factor and K factor

Energy Metering

-Bi-directional energy
-Four-quadrant reactive energy
-Tariff energy
-Fundamental energy



APPLICATIONS



Data Acquisition



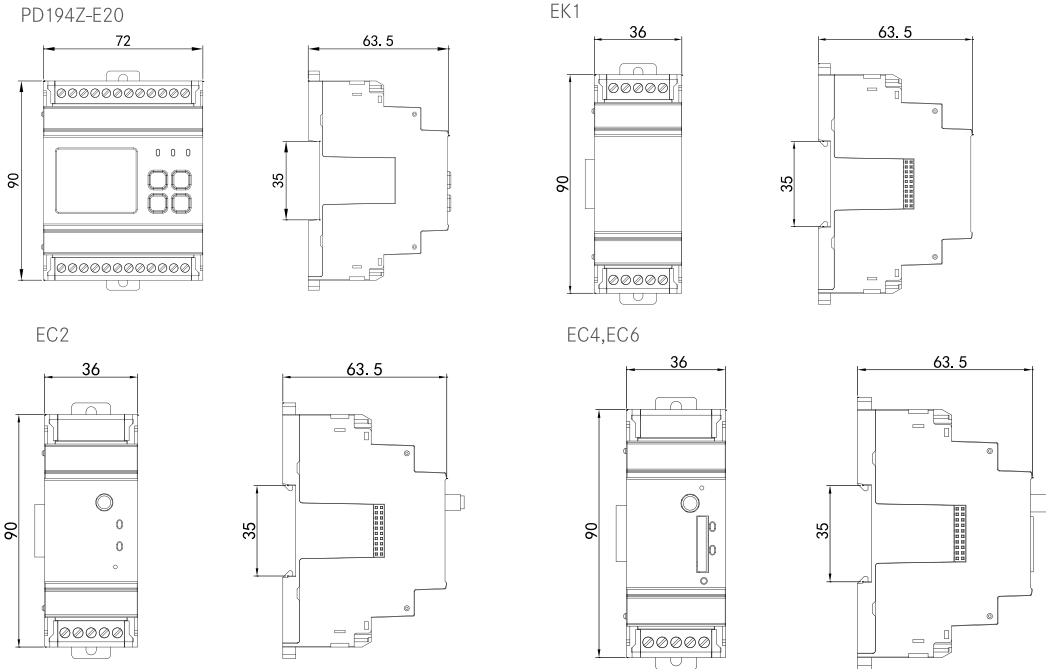
Energy Management



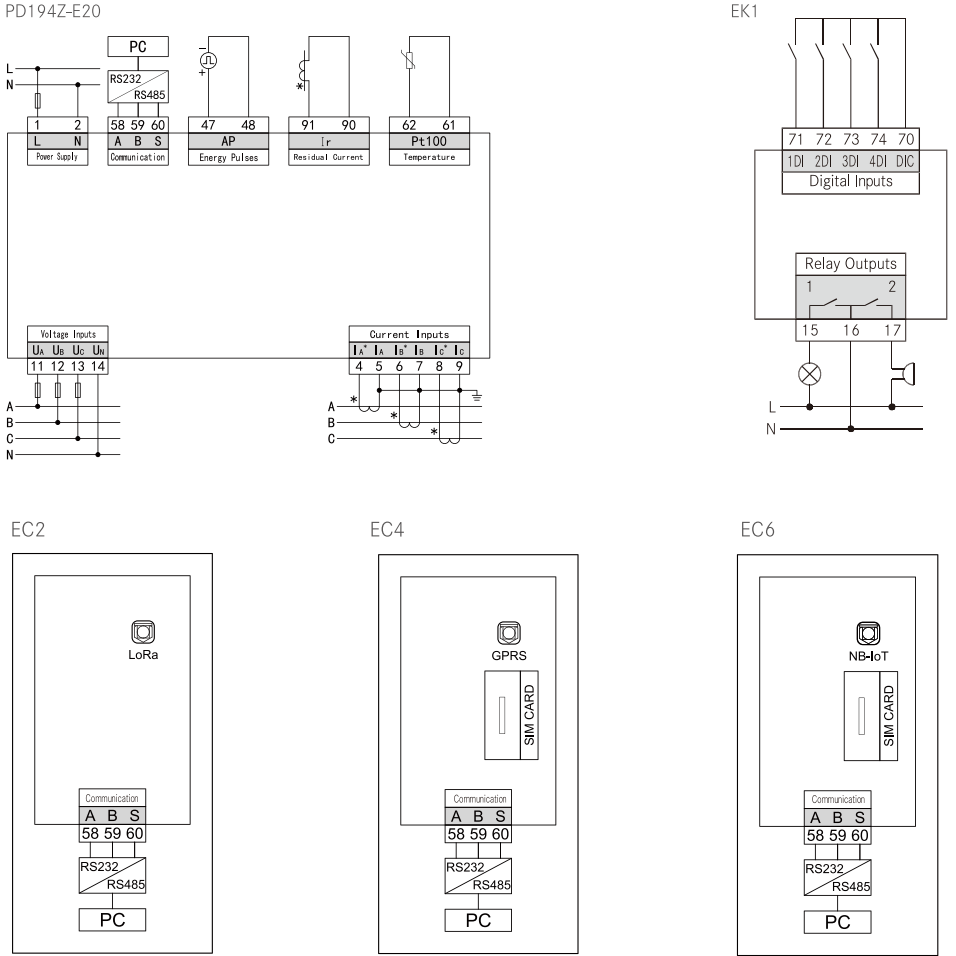
Remote Power Monitoring



DIMENSIONS



TYPICAL WIRING

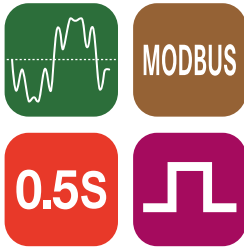




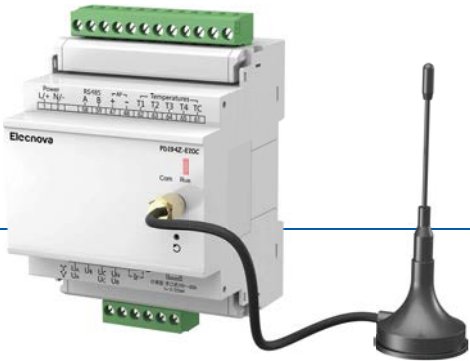
TECHNICAL SPECIFICATION

Display Mode		LCD
Accuracy	V / A	0.2%
	P/Q/S/PF	0.5%
	F	±0.01Hz
	±kWh	Class 0.5S
	±kvarh	Class 2
Voltage Input	Rated value	AC 100V, AC 380V
	Overload	Continuous: 1.2Vn Instantaneous: 2Vn/10s
	Burden	≤0.1VA (per phase)
	Impedance	≥1.7MΩ
	Frequency	45Hz~65Hz
Current Input	Rated value	AC 1A, AC 5A
	Overload	Continuous: 1.2In Instantaneous: 2In/5s
	Burden	≤0.2VA (per phase)
	Impedance	≤20mΩ
Residual Current Input		AC 1mA
Temperature Measurement		PT100
Auxiliary Power Supply	Working range	AC 80~270V 50/60Hz, DC 100~350V
	Consumption	≤5VA
Communication Port		RS485, Modbus-RTU, 2-wire, up to 9600bps
	LoRa, EC2 module	470MHz
	GPRS, EC4 module	850/900/1800/1900MHz
	NB-IoT, EC6 module	Band3/5/8
Energy Pulse Output		1 photocoupler output, pulse width (80±20%) ms
Optional Module (EK1)	Digital inputs	Dry digital inputs, Isolation: ≥2kVAC
	Relay outputs	Contact rated at AC 250V/5A or DC 30V/5A
Environment Conditions	Operating temperature	-25 C ~ 70 C
	Storage temperature	-30 C ~ 80 C
	Relative humidity	≤93%
	Altitude	≤2500m
Insulation		≥ 2kVAC

PD194Z-E20C/D/E



Harmonics
Modbus Interface
Energy Accuracy 0.5S
Pulse Output



FUNCTION

Networks

-TN, TT, IT networks

Communication

-RS485 : Modbus-RTU
-LoRa
-NB-IoT
-GPRS

Accuracy

-Energy: 0.5S
-Voltage: 0.2%
-Current: 0.2%



MAIN FEATURES

Measuring

-Fundamental V/A
-Demand
-Max./Min. Value

Power Quality

-THD
-Harmonics up to 31st
-Sequence component
-Unbalance
-Crest factor and K factor

Energy Metering

-Bi-directional energy
-Four-quadrant reactive energy
-Tariff energy
-Fundamental energy



APPLICATIONS



Data
Acquisition



Energy
Management

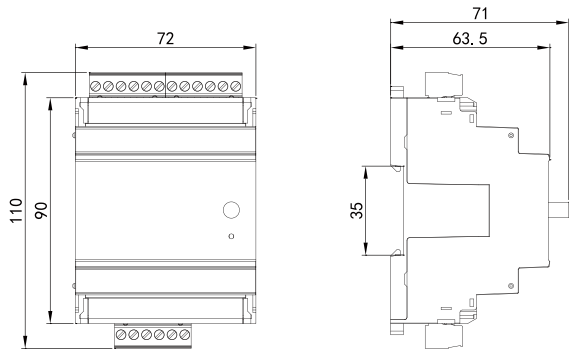


Remote Power
Monitoring



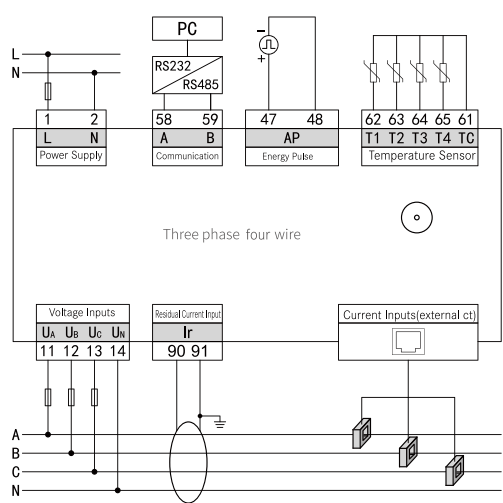
DIMENSIONS

PD194Z-E20C/D/E



TYPICAL WIRING

PD194Z-E20C/D/E



TECHNICAL SPECIFICATION

Display Mode		PD 194Z-E20C	PD 194Z-E20D	PD 194Z-E20E
Accuracy	V/A	0.2%		
	P/Q/S/PF	0.5%		
	F	±0.01Hz		
	±kWh	Class 0.5S		
	±kvarh	Class 2		
Voltage Input	Rated value	AC 100V, AC 380V		
	Overload	Continuous: 1.2Vn Instantaneous: 2Vn/10s		
	Frequency	45Hz~65Hz		
Current Input	Rated value	External CT		
	Overload	Continuous: 1.2In Instantaneous: 2In/5s		
Residual Current Input		AC 1mA		
Temperature measurement		PT100		
Auxiliary Power Supply	Working range	AC/DC 80~270V 50/60Hz		
	Consumption	≤5VA		
Communication Port	RS485	Modbus-RTU, up to 9600bps		
	LoRa	-	-	470/868/915MHz
	GPRS	850/900/1800/1900MHz	-	-
	NB-IoT	-	Band3/5/8	-
Energy Pulse Output		1 photocoupler output, pulse width (80±20%) ms		
Environment Conditions	Operating temperature	-25 C ~ 70 C		
	Storage temperature	-30 C ~ 80 C		
	Relative humidity	≤93%		
	Altitude	≤2500m		
Insulation		≥ 2kVAC		

LNF53/56/58

This series of multi-function power meters support all-parameter measurement, bi-directional energy metering, four-quadrant reactive metering and harmonic analysis. They can be connected to power monitoring system and energy management system to realize remote data monitoring.



- Ultra-thin design
- Bracket free installation
- LCD display
- High-level protection



FUNCTION

Networks

- TN, TT, IT networks

Communication

- Interface: RS485
- Protocol: Modbus-RTU

Accuracy

- Energy: 0.5S
- Voltage: 0.2%
- Current: 0.2%

Power Quality(LNF58)

- THD
- Harmonics up to 15th
- Unbalance



APPLICATIONS

Intelligent Device

Smart Building

INC

Industrial And Mining Enterprise

Public Facilities



MODEL SELECTION



		LNF53	LNF56	LNF58
Dimension(mm)		72×72×44.5	96×96×34	96×96×34
Real-time measurement	U/I/P/Q/S/F/PF	■	■	■
	Demand	■	■	■
Energy metering	Bi-directional energy	■	■	■
	Four-quadrant reactive energy	■	■	■
Power quality monitoring	Unbalance	■	■	■
	THD	-	-	■
	2nd ~ 15th harmonic content	-	-	■
	Energy pulse	1	1	2
Input & output	RS485 communication interface	1	1	1
	Digital input	-	-	■
	Relay output	-	-	■

Note: “■” Yes, “-” No, “□” Optional



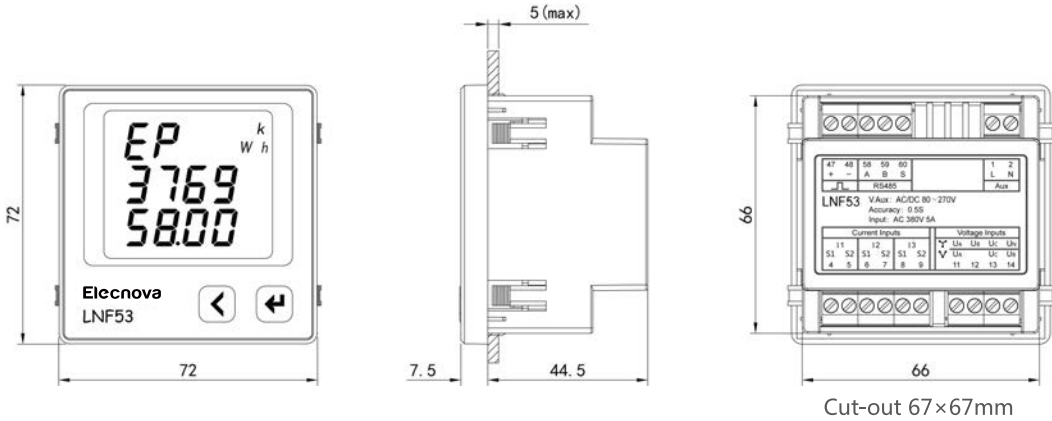
TECHNICAL PARAMETER

Item		Parameter
Accuracy		Voltage, current: 0.2%; Power: 0.5%; Frequency: ±0.01Hz; Active energy: 0.5S
Display data update time		1s
Voltage	Rated voltage	AC100V/AC380V
	Overload	Continuous: 1.2Un, instantaneous: 2Un/1min
	Energy consumption	≤0.1VA
Signal input	Current	Rated voltage
	Overload	Continuous: 2In, instantaneous: 10In/5s
	Energy consumption	≤0.2VA
Frequency		45~65Hz
Communication	RS485 interface	Modbus-RTU protocol, baud rate up to 9600bps
Energy pulse		Optocoupler isolation, pulse width 80ms±20%
Digital input		Optocoupler isolation, passive dry contact
Relay output		Contact capacity AC250V 5A or DC 30V 5A
Auxiliary power supply	Working range	AC/DC 80 ~ 270V
	Energy consumption	≤5VA
Environment condition	Working temperature	-10℃ ~ 55℃
	Storage temperature	-25℃ ~ 70℃
	Relative humidity	≤93%RH
	Altitude	≤2500m
Safety	Insulation	Signal, power supply, output terminals to case resistance≥100MΩ
	Withstand voltage	Power supply, input and output≥2kV
Protection level		IP54

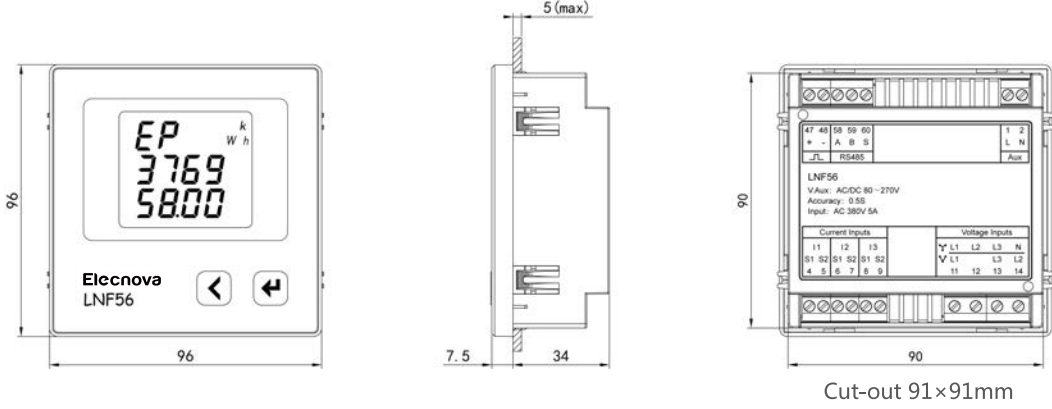


DIMENSION

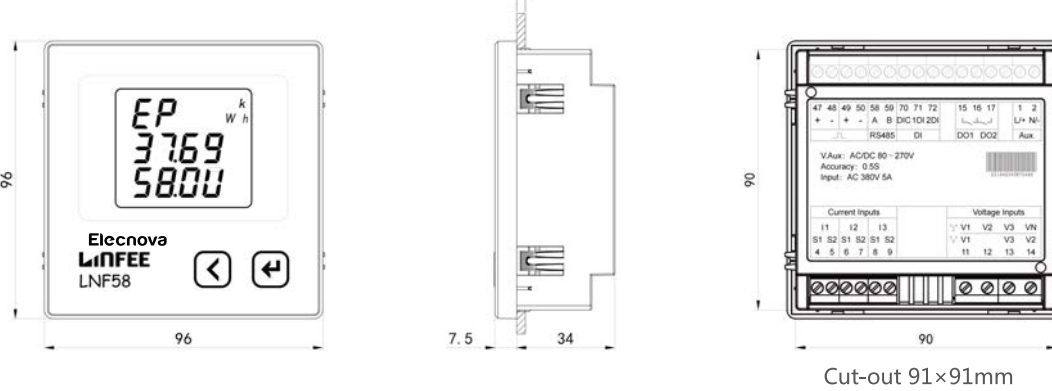
LNF53



LNF56

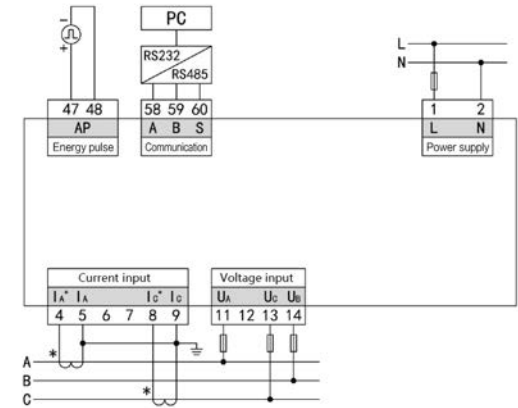


LNF58

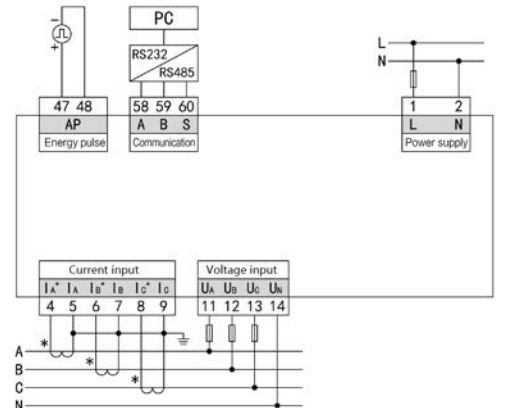


TYPICAL WIRING

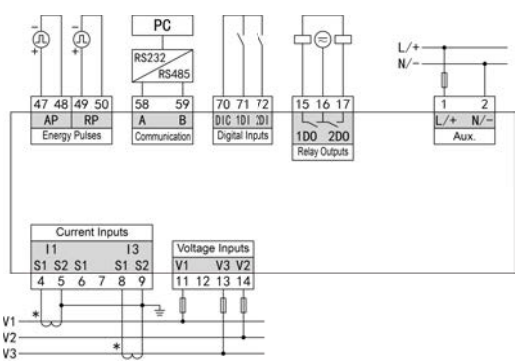
LNF53/LNF56 (3P3W)



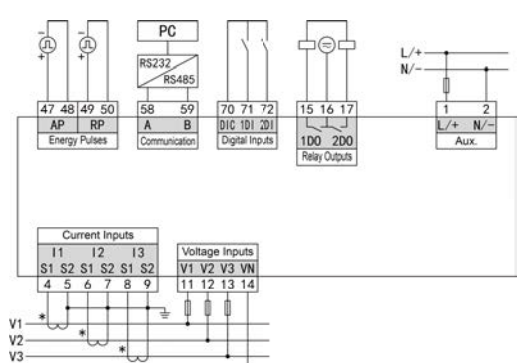
LNF53/LNF56 (3P4W)



LNF58 (3P3W)



LNF58 (3P4W)



ORDER SAMPLE

Model	LNF56
Signal input	AC380V, AC1000/5A
Wiring mode	Three phase four wire
Other	Factory default setting (Please specify special parameters such as frequency and power supply when ordering)

DC MULTI-FUNCTIONAL POWER METER

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Electrical Application Solution Expert



PD195E-5SY1



Programmable
Wide range of working temperature
High protection level
High DC voltage input

FUNCTION

Networks

-TN, TT, IT networks

Accuracy

-Voltage: 0.5%
-Current: 0.5%

Communication

-Interface: RS485
-Protocol: Modbus-RTU



MAIN FEATURES

Measuring

-Fundamental V/A/P/E

Energy Metering

-Analog outputs
-DC digital inputs
-Relay outputs



APPLICATIONS



Solar Power
Generation



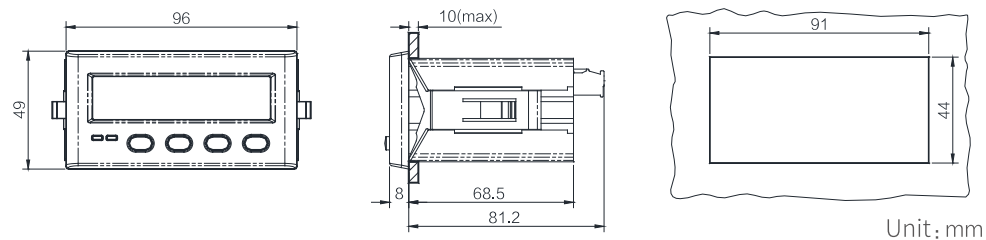
Industrial Control



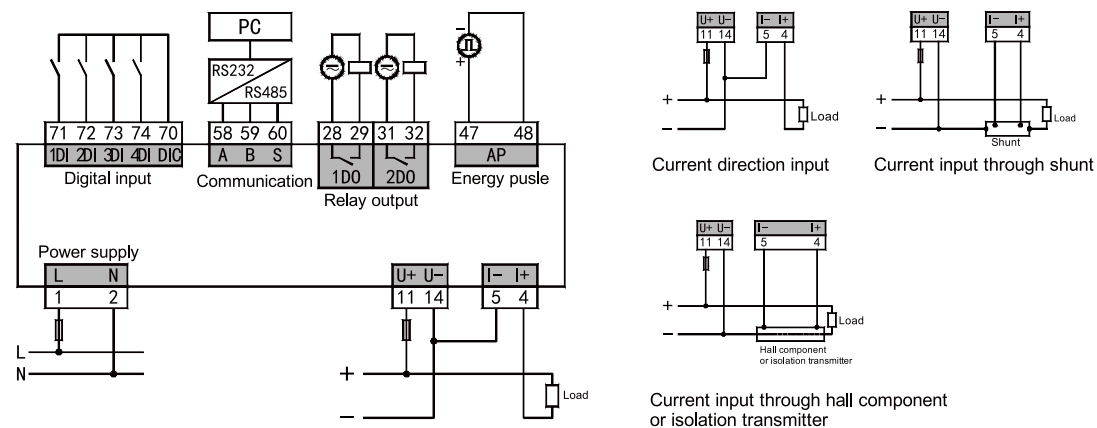
Remote Power
Monitoring



DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

Item		Parameter
Accuracy class		0.5%
Display data refresh frequency		1s
Input characteristics	Voltage	Rated value 1000V, 1500V
		Overload Continuous: 1.2Vn
	Current	Rated value DC±4V, 10A, 75mV(External current diverter)
		Overload Continuous: 1.2In
Power supply	Working range	AC,DC 80 ~ 270V
	Power consumption	≤5VA
Digital input		≤0.1mW(each channel)
Relay output		AC,DC(80 ~ 270)V, 50Hz/60Hz
Analog output	Current output	DC 4 ~ 20mA, 0 ~ 20mA and etc. load≤350Ω
	Voltage output	DC 0 ~ 5V,1 ~ 5V and etc. load≥20kΩ
Communication		RS-485 interface, Modbus-RTU protocol, baud rate2400 ~ 9600bps
Protection level		IP64(Front panel), IP20(Rear panel)
Working temperature		-10 ~ 55°C
Storage temperature		-25 ~ 70°C
Relative humidity		≤93%RH
Insulation ability		Power supply, input and output≥ AC 2kV
Safety		2500m

PD195Z-E31
PD195Z-E33



Programmable
Optional Modules
Din rail Mounted 3x3 phase circuits



FUNCTION



MAIN FEATURES

Networks

-TN, TT, IT networks

Communication

-Interface: RS485
-Protocol: Modbus-RTU

Accuracy

-Voltage: 0.5%
-Current: 0.5%

Measuring

-Fundamental V/A/P/E

Energy Metering

-Analog outputs
-DC digital inputs
-Relay outputs
-Measure up to 21 circuits(add EM2D modules)



APPLICATIONS

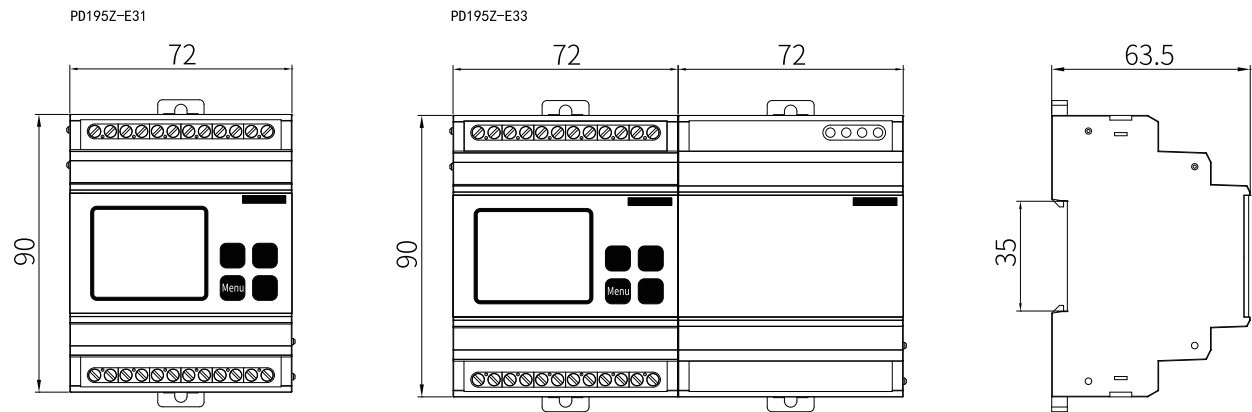
 Wind Power Generation

 Industrial Control

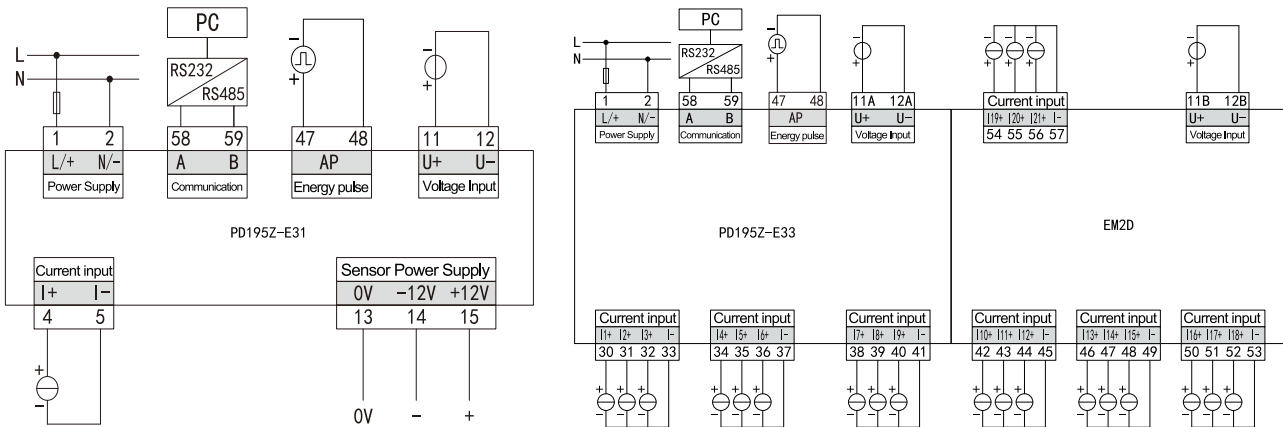
 Remote Power Monitoring



DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

Item			Parameter
Accuracy class			Measuring module: U,I,P 0.5Class, Energy 1Class Measuring module+Hall sensor: U 0.5Class, I,P 1Class, Energy: 2Class
Display mode			LCD
Signal input	Voltage	Rated value	DC(40 ~ 1000)V direct access
		Overload	Continuous: 1.2Vn
		Power consumption	≤0.2W
	Current	Impedance	≥6MΩ
		Rated value	DC(0 ~ 4)V(External hall sensor)
		Overload	Continuous: 1.2In
		Power consumption	≤0.1mW(each channel)
Power supply	Working range	AC,DC(80 ~ 270)V, 50Hz/60Hz	
	Power consumption	≤5VA	
Communication			RS-485 interface, Modbus-RTU protocol, communication rate up to 9600bps, higher rate can be customized
Digital input			Optocoupler isolation, dry contact type(Optional EK1 module)
Relay output			Contact capacity: AC250V/5A, DC30V/5A(Optional EK1 module)
Working temperature			-20 ~ 70℃, ≤93%RH, altitude: ≤4000m
Storage temperature			-30 ~ 80℃, ≤93%RH
Protection level			IP50(Front panel), IP20(Case)
Safety	Insulation	Signal, power supply, output terminal to case resistance≥ 100MΩ	
	Withstand voltage	Power supply, input and output≥ AC2kV	

MULTI-CIRCUIT MONITORING SYSTEM

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Electrical Application Solution Expert



APPLICATIONS



Data
Acquisition



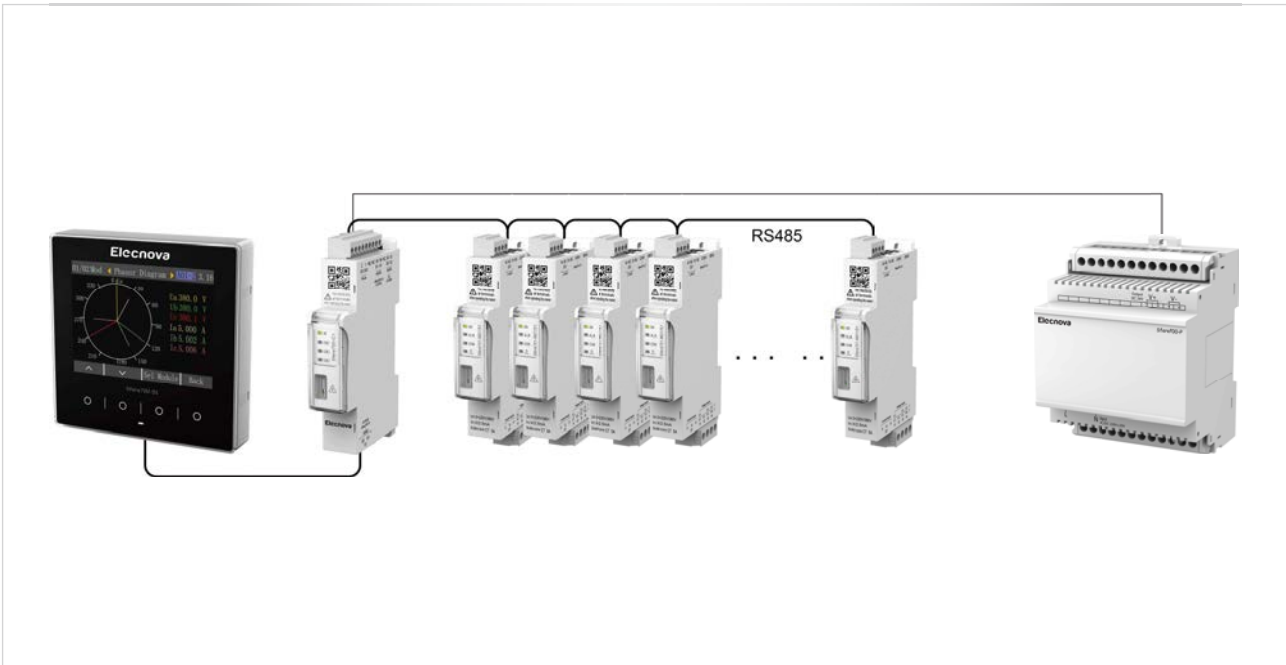
Energy
Management



Remote Power
Monitoring



PRODUCT COMBINATION



Sfere700 SERIES PRODUCTS LIST	One Display Module Sfere700-D1	One Communication Module Sfere700-C1
	One Power Supply Module Sfere700-P	32 Monitoring Modules Sfere700-M2 At Most
	Matched Current Transformers	Transfer Modules Specialized Connection Lines

Sfere700-M2



High Accuracy Measurement
Compact Design
Plug-in Fast Terminals
Self Power Supply
Automatic Networking



MAIN FEATURES

High Accuracy Measurement

-Adopt solid current transformer to realize energy accuracy 0.5S

Compact Design

-18mm width, installed near load point, less wiring

Plug Type Wiring Terminals

-Quick installation

Self Power Supply

-Ua≥180V

Automatic Networking

-Communication address of module can be set automatically or by manual



COMPARISON TABLE

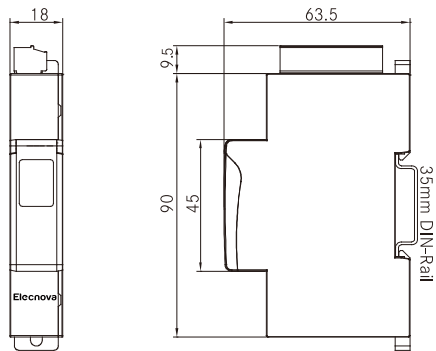


Model	Sfere700-M21	Sfere700-M22	Sfere700-M23
V/A/F/P/Q/S/PF	■	■	■
Demand	■	■	■
Max./Min./Avg. Value	■	■	■
Fundamental V/A/P/Q/S/PF	—	—	■
±kWh/±kvarh/kVAh	■	■	■
Four-quadrant Reactive Energy	■	■	■
Tariff Energy	—	■	■
Fundamental Energy	—	—	■
THD	■	■	■
Harmonics V/A	—	1st-63rd	1st-63rd
Unbalance	—	■	■
Crest Factor/K Factor	—	■	■
Flicker	—	—	■
Transient	—	—	■
Demand Record	—	■	■
Max./Min./Avg. Value record	—	■	■
Off-limit Record	—	■	■
SOE Record	—	■	■
Digital Input	2	2	2
Relay Output	1	1	1

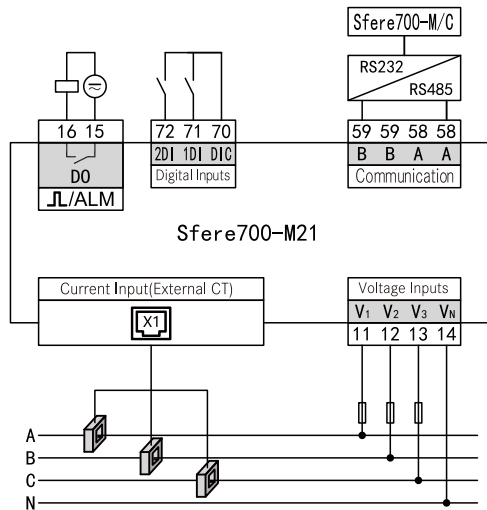
NOTE: "■": Yes "—"": No



DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

Environmental Conditions	Operating temperature	-20 °C ~ 70 °C
	Storage temperature	-40 °C ~ 85 °C
	Relative humidity	≤95%RH
	Altitude	≤2500m
Self Power Supply	Working range	Ua≥180V
Voltage Input	Rated value	3×220V/380V
	Impedance	≥1.7 MΩ/per phase
	Burden	≤0.1 VA /per phase
	Overload	Continuous: 1.2Vn Instantaneous: 2Vn/10s
	Frequency	45Hz~65 Hz
Current Input	External CT	
Relay Output	Contact rated at AC: 0.12A/400V; DC: 0.12A/400V, Isolation: 5kVAC	
Digital Input	2 dry contact inputs, Isolation: 4kVAC	
Communication Port	RS485, Modbus-RTU, 2-wire, up to 9600bps	
IP Degree	IP20	
Insulation	≥2kVAC	

Sfere700-D1



TFT Display
Touch Button
Breathing Light
Simple Installation
Compact Design
IP67(Front)
Safe Power Supply



MAIN FEATURES

Display

-3.5"TFT, 320×RGB×240, 16.7M colors

Button

-Capacitive buttons

Breathing Light

-LCD OFF: 1Hz
-Alarm: 2Hz

Simple Installation

-Screw mounting, plastic accessories are suitable for different cut-out sizes

Compact Design

-Panel thickness 18mm, RJ12 connection cable, small occupied space in cabinet

High IP

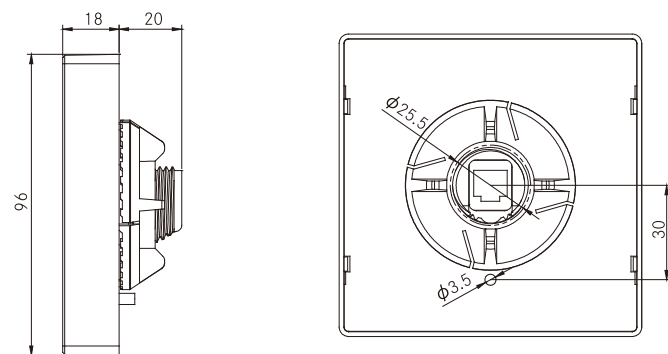
-IP67

Safe Power Supply

-DC 24V, wiring safety

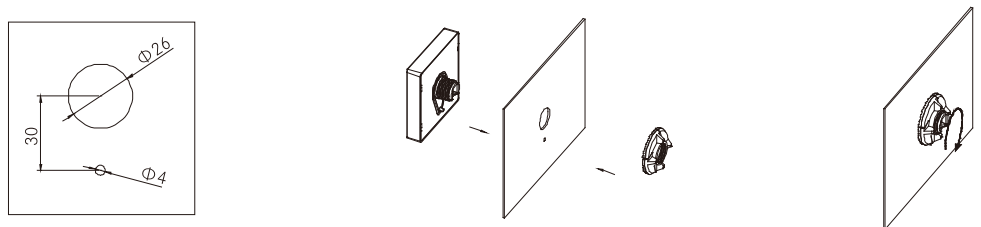


DIMENSIONS

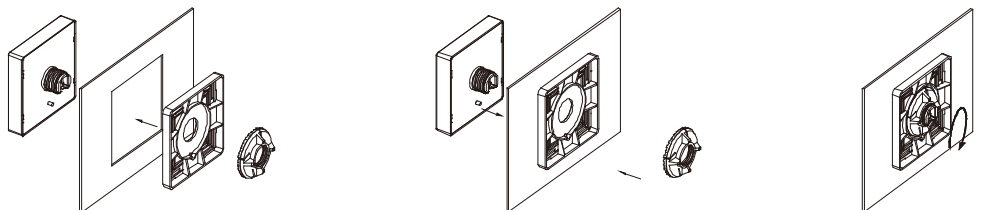


INSTALLATION

Installation Method 1



Installation Method 2 (Used for Cut-out Size 91×91mm, 76×76mm, 67×67mm)



TECHNICAL SPECIFICATION

Connection	RJ12 cable
Display	3.5"TFT, 320×RGB×240, 16.7m colors
Button	4 Capacitive buttons with backlight
Breathing Light	LCD OFF: 1Hz, Alarm: 2Hz
IP Degree	Front: IP67
Operating Temperature	-20 C ~ 70 C
Storage Temperature	-30 C ~ 80 C
Relative Humidity	≤95%RH
Safe Power Supply	(24±20%)VDC
Consumption	≤2W

Sfere700-C1



3 RS485 Ports
DIN-rail Mounting
Safe Power Supply



FUNCTION

3 RS485 Ports

-Sfere700-C1 has three communication ports. One port is used to connect to Sfere700-D1 by adopting RJ12, and the other two ports are used to connect to Sfere700-M and communication manager by adopting plug terminals.



MAIN FEATURES

DIN-rail Mounting

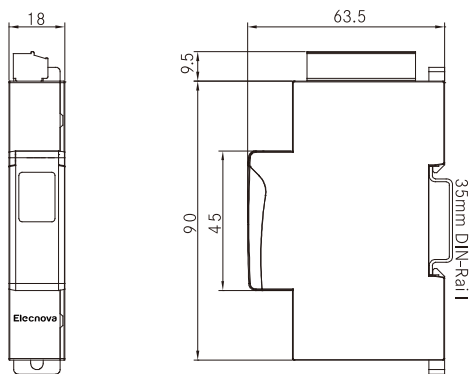
-Small occupied space

Safe Power Supply

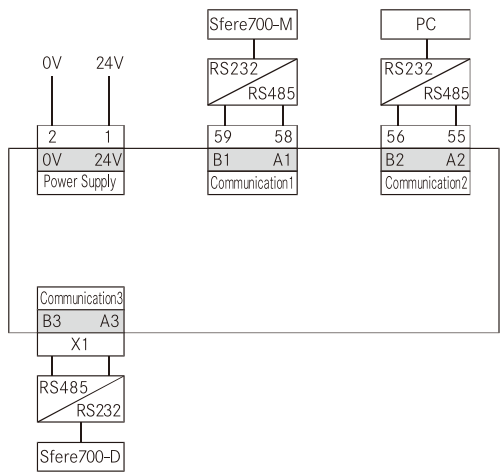
-DC 24V, wiring safety



DIMENSIONS



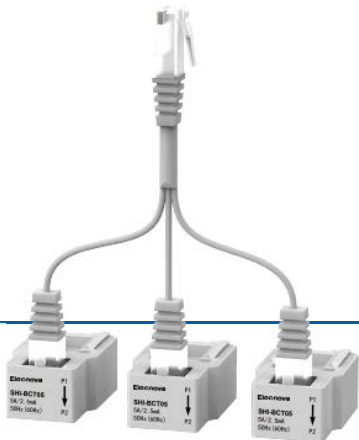
TYPICAL WIRING



TECHNICAL SPECIFICATION

Operating Temperature	-20℃~70℃
Storage Temperature	-20℃~70℃
Relative Humidity	≤95%RH
Altitude	≤2500m
IP Degree	IP20
Insulation	≥2kVAC
Safe Power Supply	DC 24V
Consumption	≤0.5W
Communication Port(COM3)	RS485, Modbus-RTU, up to 38.4kbps

CURRENT TRANSFORMER



SOLID CORE CT

Model	SHI-BCT05	SHI-BCT100	SHI-BCT200	SHI-BCT400	SHI-BCT600
Rated Current	5A	100A	200A	400A	600A
Maximum Current	10A	120A	240A	480A	720A
Accuracy	0.1%	0.1%	0.1%	0.1%	0.1%
Isolation Voltage	4kVAC	4kVAC	4kVAC	4kVAC	4kVAC
Operating Temperature	-40℃~70℃	-40℃~70℃	-40℃~70℃	-40℃~70℃	-40℃~70℃
Storage Temperature	-40℃~70℃	-40℃~70℃	-40℃~70℃	-40℃~70℃	-40℃~70℃
Diameter(mm)	8	18	24	29	29
Dimension(mm)	28×18×44	36×20×59	60×20×80	75×22.5×95	75×22.5×95

SPLIT CORE CT



Model	SHI-SCT05	SHI-SCT100	SHI-SCT200	SHI-SCT400	SHI-BCT600
Rated Current	5A	100A	200A	400A	600A
Maximum Current	6A	120A	240A	480A	720A
Accuracy	1%	0.5%	0.5%	0.5%	0.5%
Isolation Voltage	4kVAC	4kVAC	4kVAC	4kVAC	4kVAC
Operating Temperature	-40 °C ~ 70 °C	-40 °C ~ 70 °C	-40 °C ~ 70 °C	-40 °C ~ 70 °C	-40 °C ~ 70 °C
Storage Temperature	-40 °C ~ 70 °C	-40 °C ~ 70 °C	-40 °C ~ 70 °C	-40 °C ~ 70 °C	-40 °C ~ 70 °C
Diameter(mm)	10	16	24	35	35
Dimension(mm)	29×27×42	30×31×53	44×39×70	57×41×84	57×41×84

FLEXIBLE CT

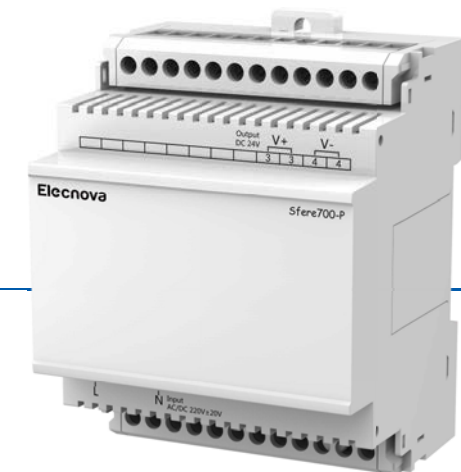


Model	SHI-FCT600	SHI-FCT1000	SHI-FCT2000	SHI-FCT3000
Rated Current	600A	1000A	2000A	3000A
Range	60~720A	100~1200A	200~2400A	300~3600A
Accuracy	1%	1%	1%	1%
Operating Temperature	-20 °C ~ 70 °C	-20 °C ~ 70 °C	-20 °C ~ 70 °C	-20 °C ~ 70 °C
Storage Temperature	-30 °C ~ 90 °C	-30 °C ~ 90 °C	-30 °C ~ 90 °C	-30 °C ~ 90 °C
Diameter(mm)	65	95	95	95

Sfere700-P



DIN Rail Mounted
Safe Power Supply
Cable Length



FUNCTION

DIN Rail Mounted

-Quick installation

Safe Power Supply

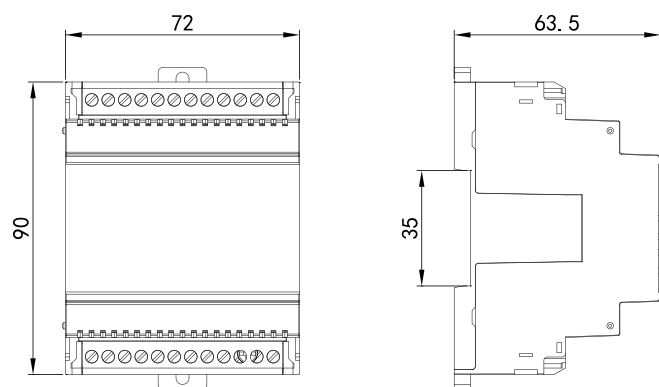
-DC 24V, wiring safety

Cable Length

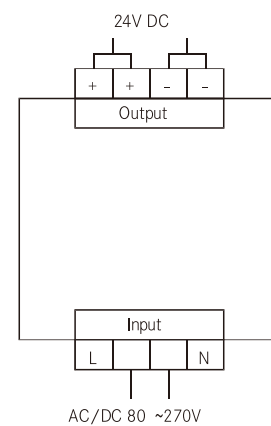
-Power supply cable length ≤100m



DIMENSIONS



TYPICAL WIRING



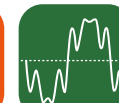
TECHNICAL SPECIFICATION

Safe Power Supply	AC/DC 80V~270V
Output Voltage	DC: 24V
Output Power	≤20W
Accuracy	±1%
Effectiveness	≥75%
Insulation	≥2kVAC

PD194Z-E14



0.5S



MODBUS

Multi-circuit
Harmonics
Modbus Interface
Energy Accuracy 0.5S
Pulse Output



FUNCTION

Networks

-TN, TT, IT networks

Communication

-Interface: RS485
-Protocol: Modbus-RTU
-LoRa
-NB-IoT
-GPRS

Accuracy

-Energy: 0.5S (Closed Type CT)
-Voltage: 0.2%
-Current: 0.2%



APPLICATIONS



Data Acquisition



Energy Management



Remote Power Monitoring



LoRa module



EC2

I/O module



EK1

NB-IoT module



EC6

GPRS module



EC4



MAIN FEATURES

Measuring

-Fundamental V/A
-Demand
-Max./Min. Value

Power Quality

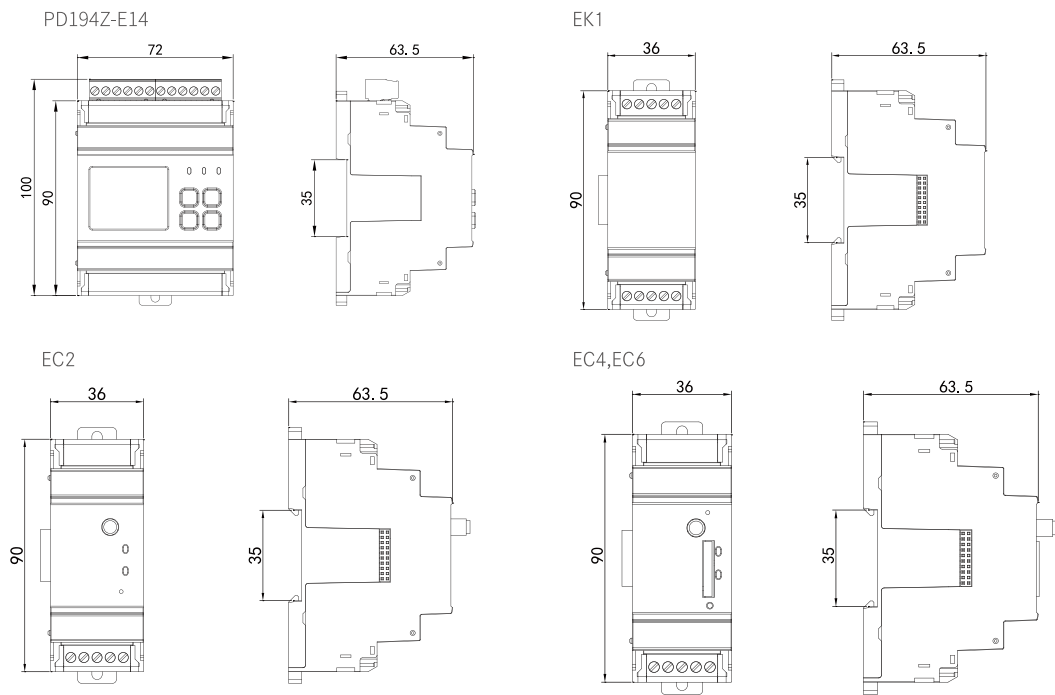
-THD
-Harmonics up to 31st
-Sequence component
-Unbalance
-Crest factor and K factor

Energy Metering

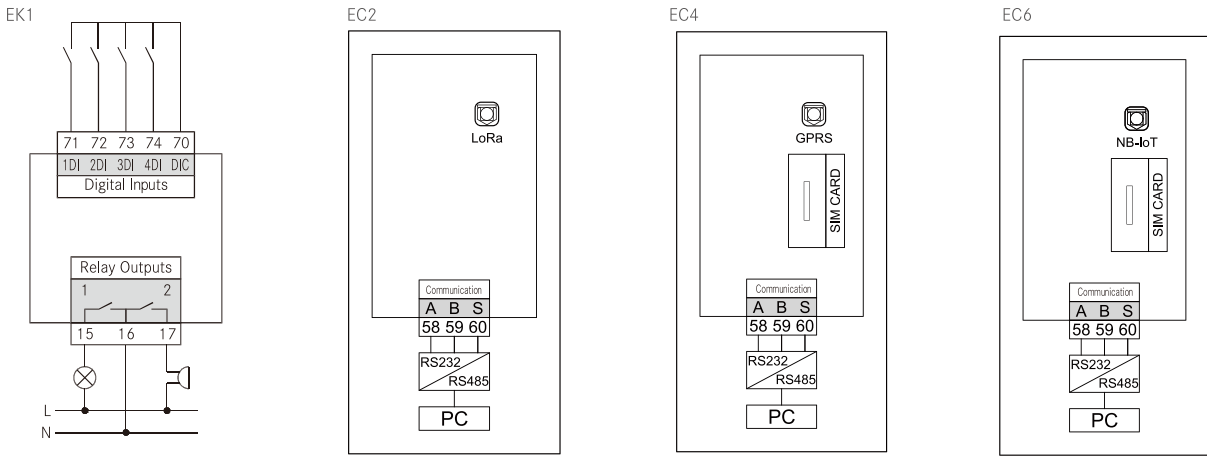
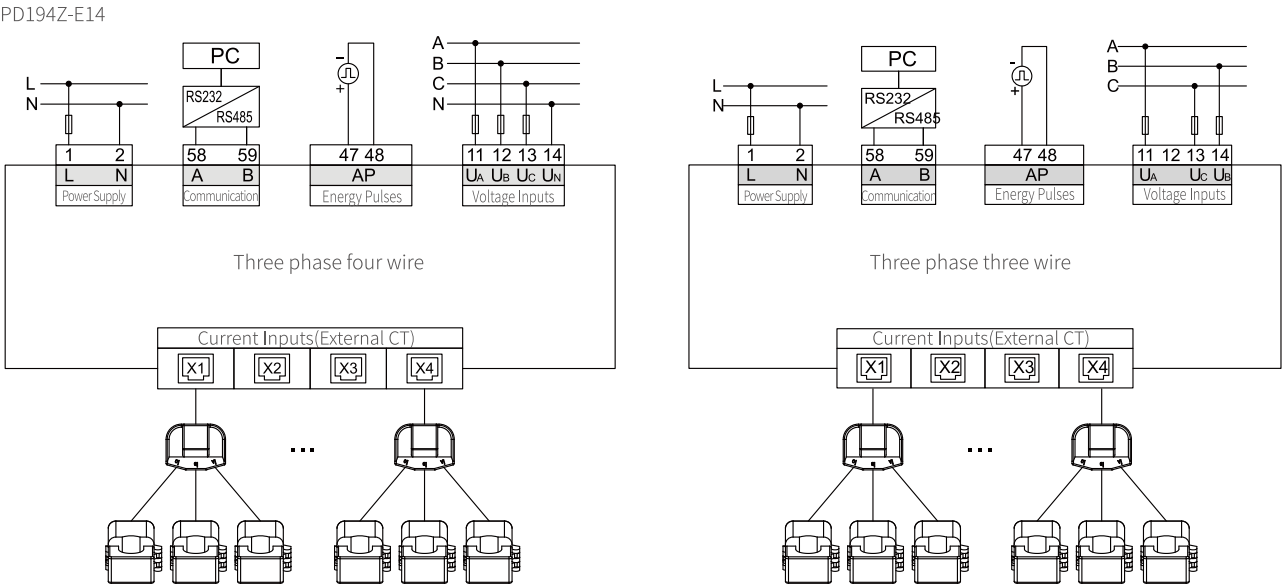
-Bi-directional energy
-Four-quadrant reactive energy
-Tariff energy
-Fundamental energy



DIMENSIONS



TYPICAL WIRING



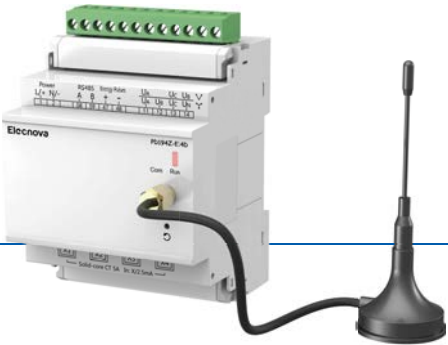
TECHNICAL SPECIFICATION

Display Mode		LCD
Accuracy	V/A	0.2%
	P/Q/S/PF	0.5%
	F	±0.01 Hz
	±kWh	Class 0.5S (Closed Type CT)
	±kvarh	Class 2
Voltage Input	Rated value	3×220V/380V
	Overload	Continuous: 1.2Vn Instantaneous: 2Vn/10s
	Burden	≤0.1VA (per phase)
	Impedance	≥1.7MΩ
	Frequency	45Hz~65Hz
Current Input	Rated value	External CT
	Overload	Continuous: 1.2In Instantaneous: 2In/5s
	Burden	≤0.2VA (per phase)
	Impedance	≤20mΩ
Auxiliary Power Supply	Working range	AC 80~270V 50/60Hz, DC 100~350V
	Consumption	≤5VA
Communication Port	RS485	Modbus-RTU, 2-wire, up to 9600bps
	LoRa, EC2 module	470MHz
	GPRS, EC4 module	850/900/1800/1900MHz
	NB-IoT, EC6 module	Band3/5/8
Energy Pulse Output		1 photocoupler output, pulse width (80±20%) ms
Optional Module (EK1)	Digital inputs	Dry digital inputs, Isolation: ≥2kVAC
	Relay outputs	Contact rated at AC 250V/5A or DC 30V/5A
Environment Conditions	Operating temperature	-25 C ~ 70 C
	Storage temperature	-30 C ~80 C
	Relative humidity	≤93%
	Altitude	≤2500m
Insulation		≥ 2kVAC

PD194Z-E14C/D/E



Harmonics
Modbus Interface
Energy Accuracy 0.5S
Pulse Output



FUNCTION

Networks

-TN, TT, IT networks

Communication

-RS485 : Modbus-RTU
-LoRa
-NB-IoT
-GPRS

Accuracy

-Energy: 0.5S
-Voltage: 0.2%
-Current: 0.2%



MAIN FEATURES

Measuring

-Fundamental V/A
-Demand
-Max./Min. Value

Power Quality

-THD
-Harmonics up to 31st
-Sequence component
-Unbalance
-Crest factor and K factor

Energy Metering

-Bi-directional energy
-Four-quadrant reactive energy
-Tariff energy
-Fundamental energy



APPLICATIONS



Data
Acquisition



Energy
Management

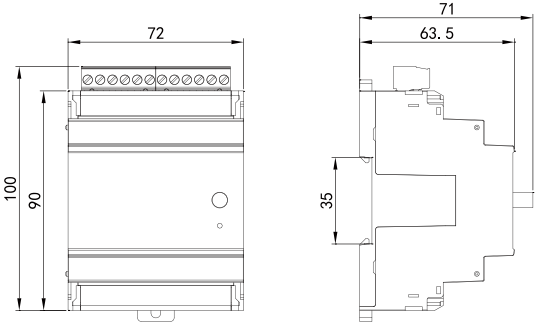


Remote Power
Monitoring



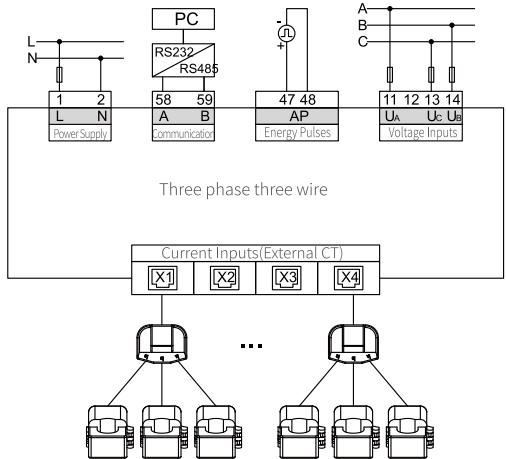
DIMENSIONS

PD194Z-E14C/D/E



TYPICAL WIRING

PD194Z-E14C/D/E



TECHNICAL SPECIFICATION

Display Mode		PD 194Z-E 14C	PD 194Z-E 14D	PD 194Z-E 14E
Accuracy	V/A	0.2%		
	P/Q/S/PF	0.5%		
	F	±0.01Hz		
	±kWh	Class 0.5S		
	±kvarh	Class 2		
Voltage Input	Rated value	3×220V/380V		
	Overload	Continuous: 1.2Vn Instantaneous: 2Vn/10		
	Frequency	45Hz~65Hz		
Current Input	Rated value	External CT		
	Overload	Continuous: 1.2In Instantaneous: 2In/5s		
Auxiliary Power Supply	Working range	AC/DC 80~270V 50/60Hz		
	Consumption	≤5VA		
Communication Port	RS485	Modbus-RTU, up to 9600bps		
	LoRa	-	-	470/868/915MHz
	GPRS	850/900/1800/1900MHz	-	-
	NB-IoT	-	Band3/5/8	-
Energy Pulse Output		1 photocoupler output, pulse width (80±20%) m		
Environment Conditions	Operating temperature	-25 °C ~ 70 °C		
	Storage temperature	-30 °C ~ 80 °C		
	Relative humidity	≤93%		
	Altitude	≤2500m		
Insulation		≥ 2kVAC		

DIGITAL POWER METER

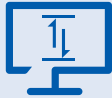
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APPLICATIONS



Data
Acquisition



Limit Value Monitoring



Measured Value
Transducer



MAIN FEATURES

- User programmable
- IP67(Front)
- Wide range of operating temperature



TECHNICAL SPECIFICATION

Accuracy		0.5% (default), 0.2%
Data Update Rate		1s
Input	Current	Rated value: AC 1A, 5A
	Voltage	Rated value: AC 100V, 220V, 400V etc
	Overload	Continuous: 2 times of rated value
	Frequency	45~65Hz
Safe Power Supply	Range	AC 80~270V 50/60Hz, DC 100~350V
	Consumption	≤5VA
Digital Input		2 dry contact inputs, Isolation: 2kVAC
Relay Output		2 relay outputs, contact rated at AC 5A/250V or DC 5A/30V, Isolation: 2kVAC
Analog Output		DC 4~20mA, load≤350Ω DC 0~5V, load≥20kΩ
Communication Port		RS485, Modbus-RTU, 2-wire, up to 9600bps
Degree of Protection		Front: IP64, Rear: IP20
Operating Temperature		-40 C ~70 C (LED), -25 C ~70 C (LCD)
Storage Temperature		-45 C ~85 C (LED), -30 C ~80 C (LCD)
Relative Humidity		≤93%RH
Insulation		≥2kVAC
Altitude		≤2500m



COMPARISON TABLE



Model	SI48Y	S3I48	SU48Y	S3U48	SI72Y	S3I72Y	SU72Y	S3U72Y	SI96Y	S3I96Y	SU96Y	S3U96Y
Panel Size (48×48mm)	■	■	■	■	—	—	—	—	—	—	—	—
Panel Size (72×72mm)	—	—	—	—	■	■	■	■	—	—	—	—
Panel Size (96×96mm)	—	—	—	—	—	—	—	—	■	■	■	■
1-phase Current	■	—	—	—	■	—	—	—	■	—	—	—
3-phase Current	—	■	—	—	—	■	—	—	—	■	—	—
1-phase Voltage	—	—	■	—	—	—	■	—	—	—	■	—
3-phase Voltage	—	—	—	■	—	—	—	■	—	—	—	■
RS485 Port (C)	□	—	□	—	□	□	□	□	□	□	□	□
Analog Output (M)	□	—	□	—	□	□	□	□	□	□	□	□
Relay Output (J)	—	—	—	—	□	□	□	□	□	□	□	□
Digital Input (K)	—	—	—	—	□	□	□	□	□	□	□	□

NOTE: "■": Yes "—": No "□": Optional
As for 48 type meter, only one function between communication and analog output can be selected.
The meters are LCD display except that S3I48 and S3U48 are LED display.

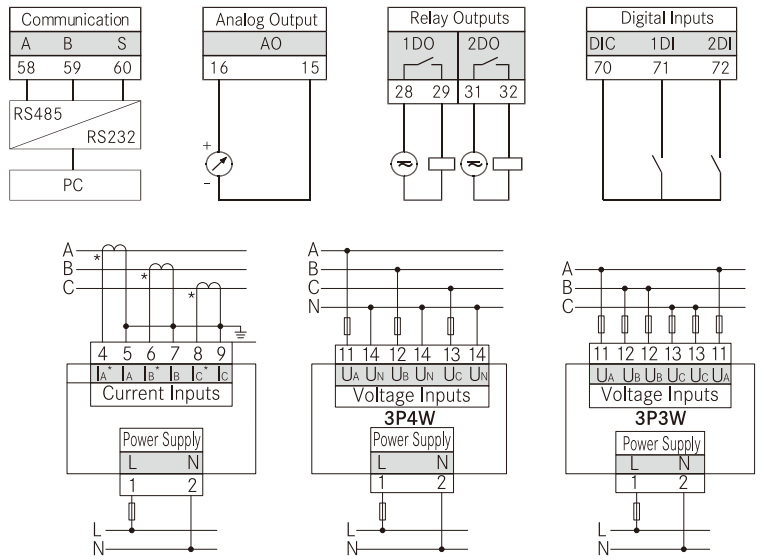
RECOMMENDED MODEL

SU48Y-C	SI72Y-C
SI48Y-M	SU96Y-CM
SI72Y	S3U96Y-CMJK
S3U72Y-CMJK	...

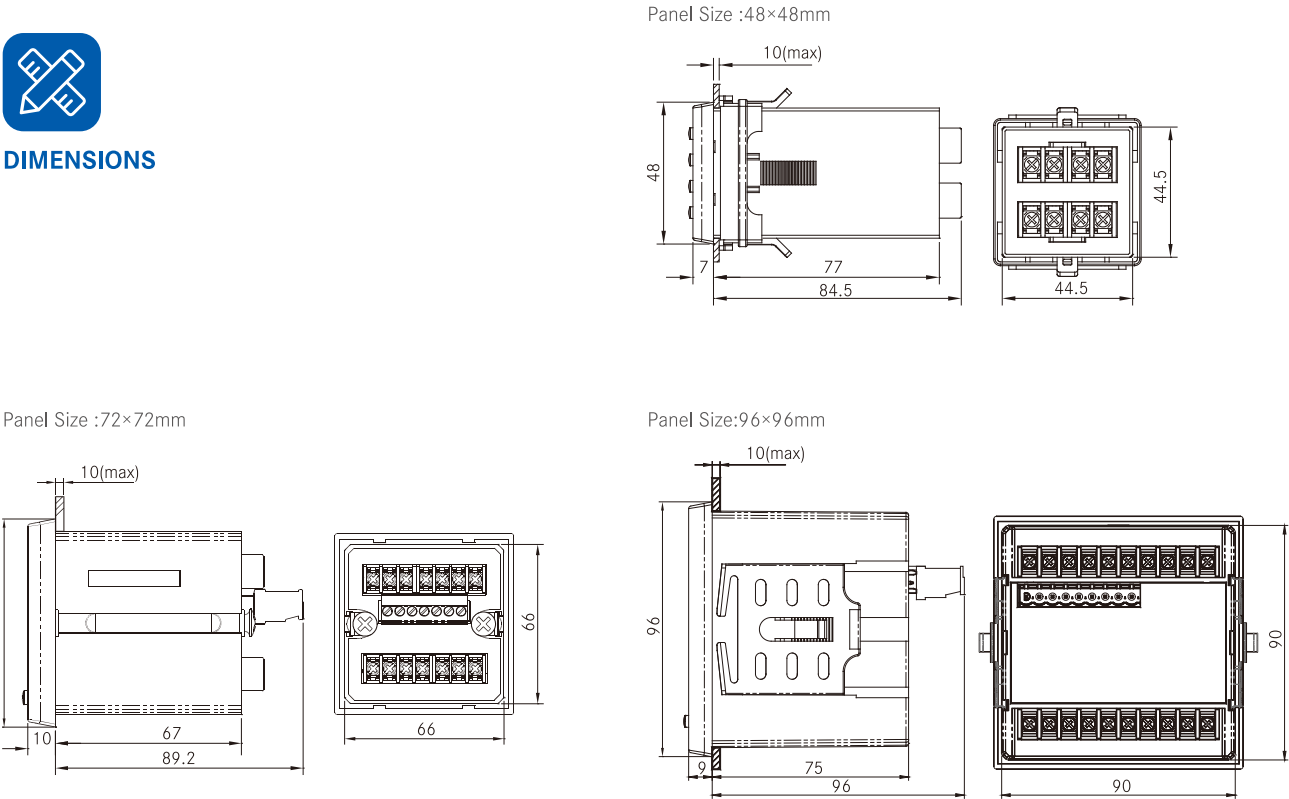


TYPICAL WIRING

Optional

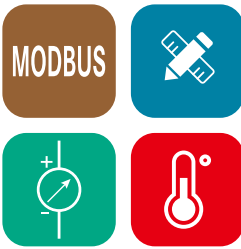


DIMENSIONS



DC DIGITAL POWER METER

This series of meters can be used for continuous monitoring and control of DC systems. They support switching status monitoring, remote control through relays, analog output, voltage and current off-limit alarm, and can output alarm signal. They also support communication so that all measured data and status can be read through RS485 communication port via Modbus-RTU protocol.



Support digital input, relay output, analog output
Support Modbus-RTU communication protocol
-40 ~ 70 °C working temperature
Various installation sizes



APPLICATIONS

Solar Power Generation

Industrial Control

Wind Power



DIMENSIONS

Dimension	2	3	9	A	5
Panel Size (mm ²)	120×120	83×83	96×96	74×74	96×48
Hole Size (mm ²)	111×111	76×76	91×91	67×67	91×44
Fitting Depth(mm)	55.5/76	75	75/98	75/90	68.5/82



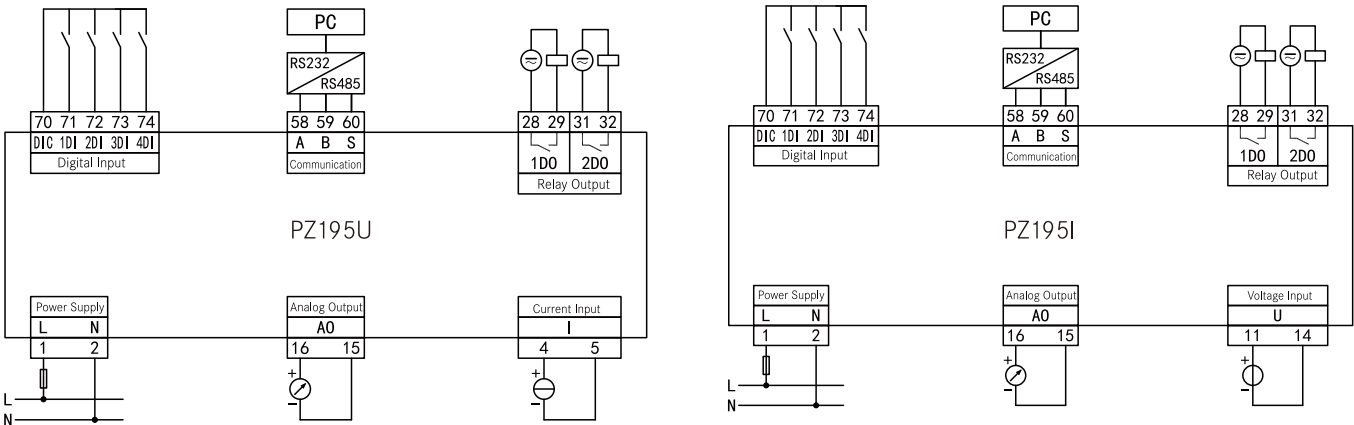
COMPARISON TABLE

Model	Phase	Display	Communication	Analog output	Digital input	Relay output	□ Shape code				
							2	3	5	9	A
PZ195U - □ X1	Single	LED	—	—	—	—	■	■	■	■	■
PA195I - □ X1	Single	LED	—	—	—	—	■	■	■	■	■
PZ195U - □ K1	Single	LED	1	1	—	—	■	■	■	■	■
PA195I - □ K1	Single	LED	1	1	—	—	■	■	■	■	■
PZ195U - 2S1T	Single	LED	1	—	4	2	■	—	—	—	—
PA195I - 2S1T	Single	LED	1	—	4	2	■	—	—	—	—
PZ195U - 9S1J	Single	LED	1	—	—	2	—	—	—	■	—
PA195I - 9S1J	Single	LED	1	—	—	2	—	—	—	■	—
PZ195U - □ XY1	Single	LCD	—	—	—	—	—	—	■	■	■
PA195I - □ XY1	Single	LCD	—	—	—	—	—	—	■	■	■
PZ195U - □ KY1	Single	LCD	1	1	—	—	—	—	■	■	■
PA195I - □ KY1	Single	LCD	1	1	—	—	—	—	■	■	■
PZ195U - □ SY1	Single	LCD	1	□	4	2	—	—	■	■	■
PA195I - □ SY1	Single	LCD	1	□	4	2	—	—	■	■	■

- Note:
- ASY1 only has 2 digital inputs and 2 relay outputs;
 - The numbers in the table represent the number of channels. For example, 4 in the digital input column means that there are 4 digital inputs;
 - “■” indicates that the dimension is available.



TYPICAL WIRING





TECHNICAL SPECIFICATION

Accuracy		0.5% (default), 0.2%
Data Update Rate		1 s
Input	Current	Rated value: DC 4~20mA,1A,5A,10A,75mV(External diverter or hall sensor)
	Voltage	Rated value: DC 75mV,1~5V,110V,220V,1000V etc
	Overload	Continuous: 1.2 times of rated value
	Frequency	45~65Hz
Safe Power Supply	Range	AC 80~270V 50/60Hz, DC 80~270V, DC 24V
	Consumption	≤5VA
Digital Input		2 dry contact inputs, Isolation: 2kVAC
Relay Output		2 relay outputs, contact rated at AC 5A/250V or DC 5A/30V, Isolation: 2kVAC
Analog Output		DC 4~20mA, load≤350Ω DC 0~5V, load≥20kΩ
Communication Port		RS485, Modbus-RTU, 2-wire, up to 9600bps
Degree of Protection		Front: IP64, Rear: IP20
Operating Temperature		-40℃~70℃ (LED), -25℃~70℃ (LCD)
Storage Temperature		-45℃~85℃ (LED), -30℃~80℃ (LCD)
Relative Humidity		≤93%RH
Insulation		≥2kVAC
Altitude		≤2500m

LNF31/33/32/36/26

This series of digital display AC electrical measurement meters are applied for voltage and current measurement in power distribution system. They support programmable transformation ratio and can be equipped with communication interface. They are featured with good appearance and compact structure.



- Ultra-thin design
- Bracket free installation
- LCD display
- High-level protection



FUNCTION

Measuring Accuracy

- Voltage: 0.5%
- Current: 0.5%
- Overload: 1.2Un, 2In

Communication

- Interface: RS485
- Protocol: Modbus-RTU



APPLICATIONS


Intelligent Device


Smart Building


INC
Industrial And Mining Enterprise


Public Facilities



MODEL SELECTION



	LNF31	LNF33	LNF32	LNF36	LNF26
Dimension(mm)	72×72×44.5	72×72×44.5	96×96×34	96×96×34	96×96×34
Real-time measurement	Single-phase current	Three-phase current	Single-phase current	Three-phase current	Three-phase voltage
LCD display	■	■	■	■	■
RS485	□	□	□	□	□

Note: "■" Yes, "□" Optional



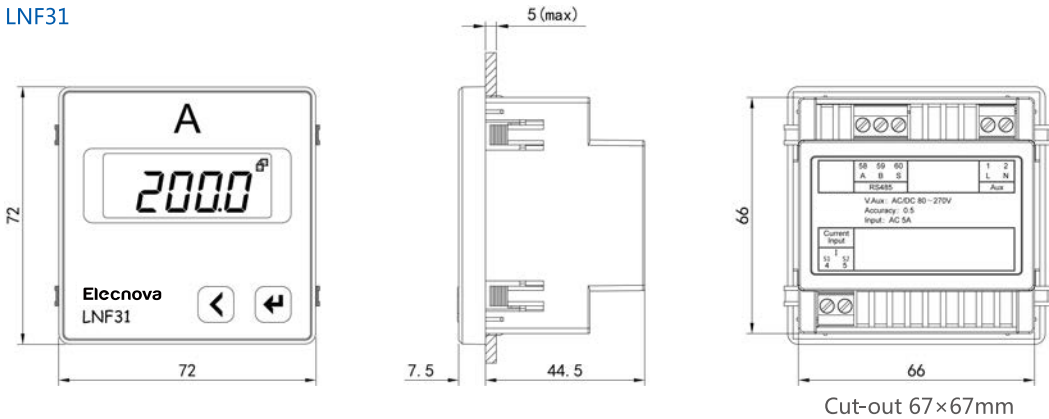
TECHNICAL PARAMETER

Item			Parameter
Accuracy			0.5%
Display data update time			1s
Signal input	Voltage	Rated value	AC100V/380V
		Overload	Continuous: 1.2Un, instantaneous: 2Un/1min
		Energy consumption	≤0.1VA
	Current	Rated value	1A/5A
		Overload	Continuous: 2In, instantaneous: 10In/5s
		Energy consumption	≤0.2VA
	Frequency		45~65Hz
	Communication	RS485 interface	Modbus-RTU protocol, baud rate up to 9600bps
	Auxiliary power supply	Working range	AC/DC 80 ~ 270V
Energy consumption		≤3VA	
Environment condition	Working temperature		-10℃ ~ 55℃
	Storage temperature		-25℃ ~ 70℃
	Relative humidity		≤93%RH
	Altitude		≤2500m
Safety	Insulation		Signal, power supply, output terminals to case resistance≥100MΩ
	Withstand voltage		Power supply, input and output≥2kV
Protection level			IP54

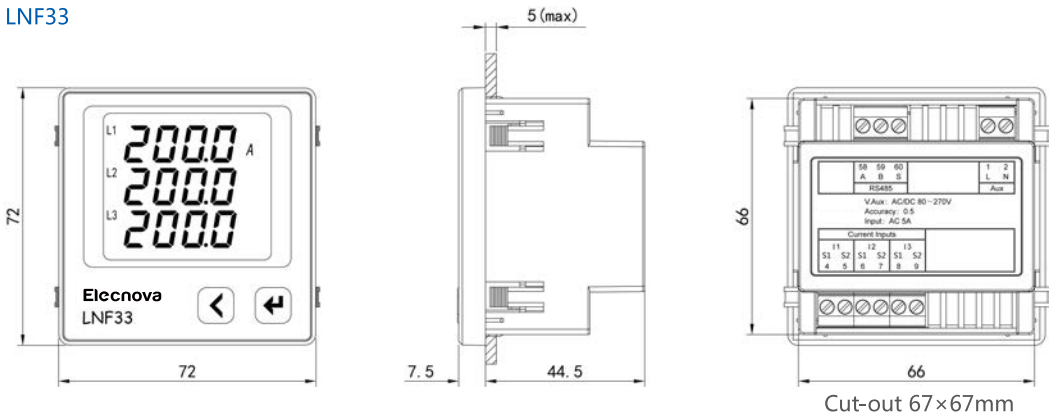


DIMENSION

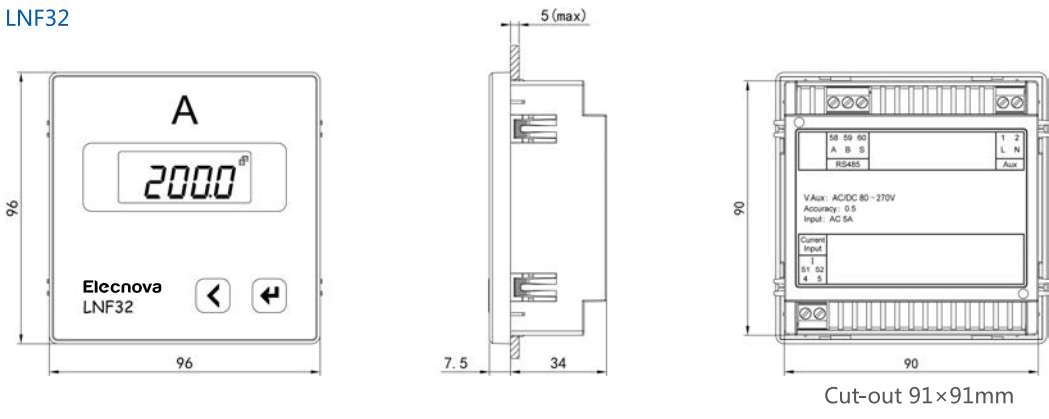
LNF31



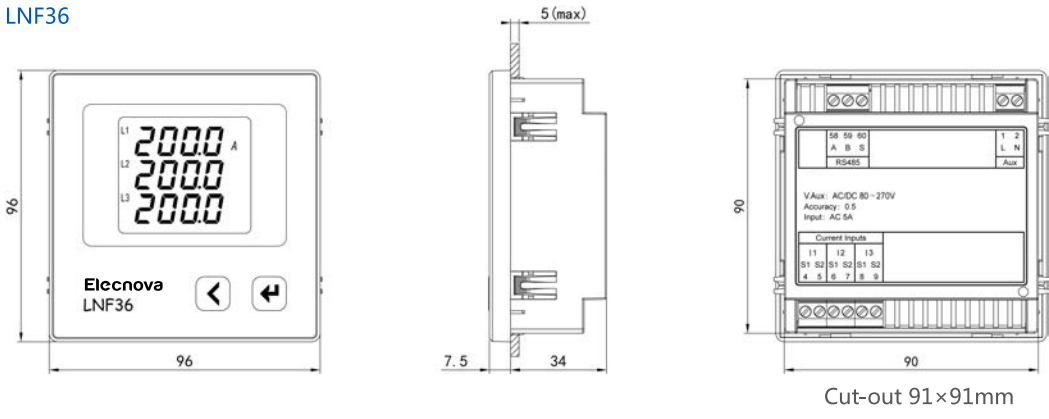
LNF33



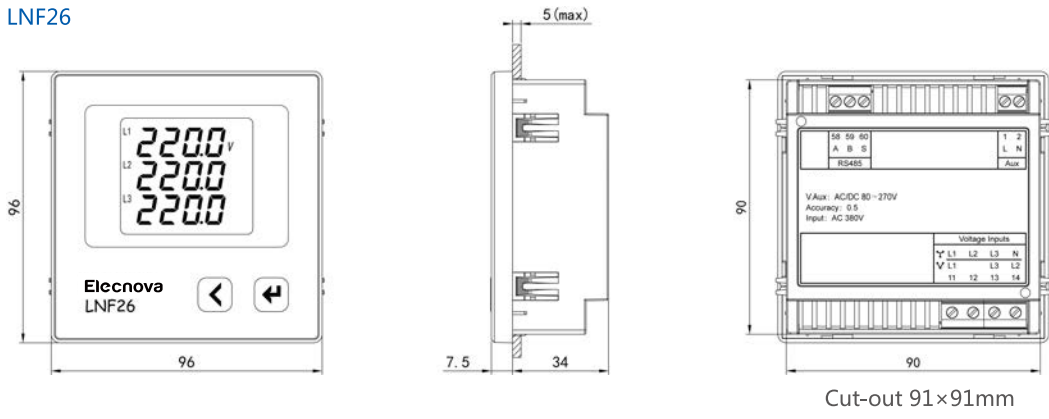
LNF32



LNF36

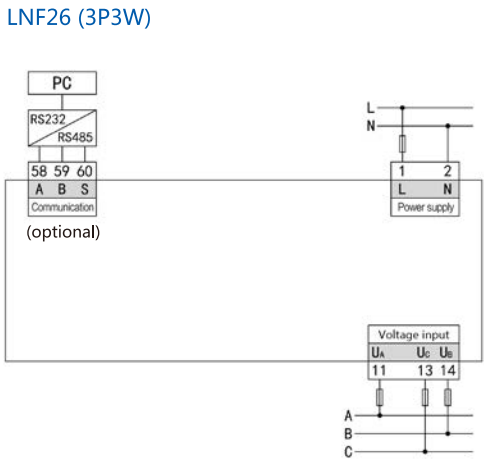


LNF26

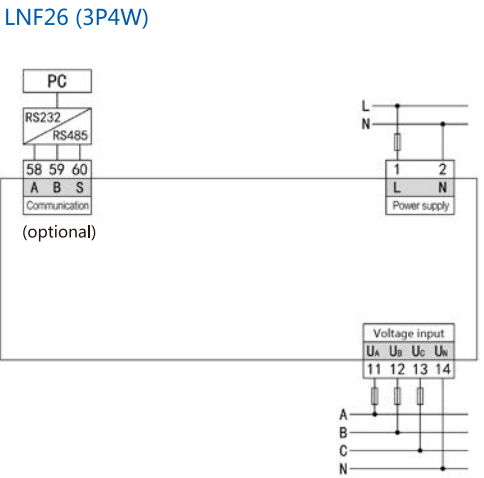


TYPICAL WIRING

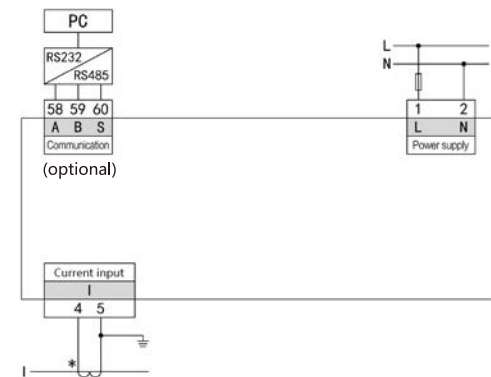
LNF26 (3P3W)



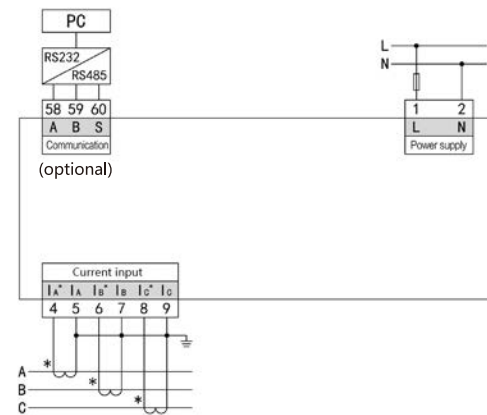
LNF26 (3P4W)



LNF31/32



LNF33/36



ORDER SAMPLE

Three-phase voltmeter, with communication

Model	LNF26-C
Power supply	AC/DC 80 ~ 270V
Input signal	10kV/100V
Wiring mode	Three phase three wire

Three-phase ammeter, with communication

Model	LNF36-C
Power supply	AC/DC 80 ~ 270V
Input signal	300A/5A

LNF22E/26E/32E/36E

This series of meters have programmable transformation ratio. They can be expanded with functions of digital input, relay output, analog output and communication supporting Modbus RTU protocol; They provide various installation dimensions to facilitate the directly replacing of analog pointer voltmeter; They can be widely used in different control systems, power transformation and distribution automation, industrial automation and intelligent buildings.



- Ultra-thin design
- Bracket free installation
- LED display
- High-level protection



FUNCTION

Accuracy

- Energy: 0.5%
- Voltage: 0.2%
- Current: 0.2%

Communication

- Interface: RS485
- Protocol: Modbus-RTU



APPLICATIONS



Control system



Smart Building

power transformation
and distribution automation

Industrial Automation



MODEL SELECTION



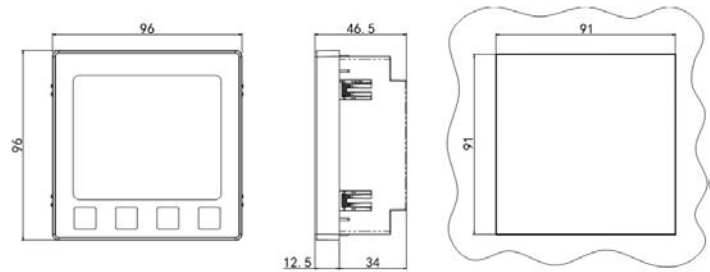
	LNF22E	LNF26E	LNF32E	LNF36E
Dimension(mm)	96×96×34	96×96×34	96×96×34	96×96×34
Real-time measurement	Single-phase voltage	Three-phase voltage	Single-phase current	Three-phase current
LED display	■	■	■	■
RS485	□	□	□	□

Note: "■" Yes, "-" No, "□" Optional



DIMENSION

LNF22E/26E/32E/36E

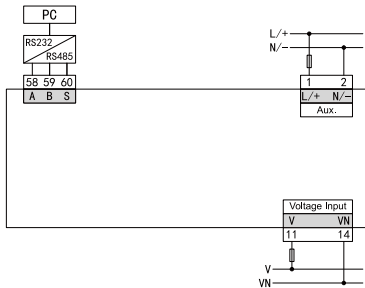


Cut-out 96×96mm

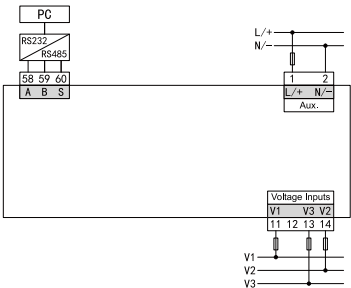


TYPICAL WIRING

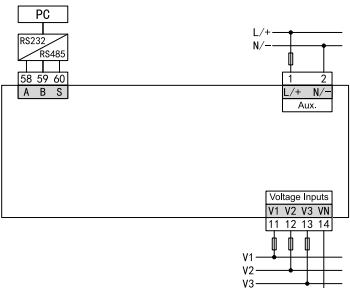
LNF22E



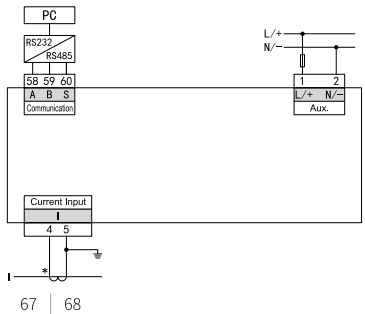
LNF26E(3P3W)



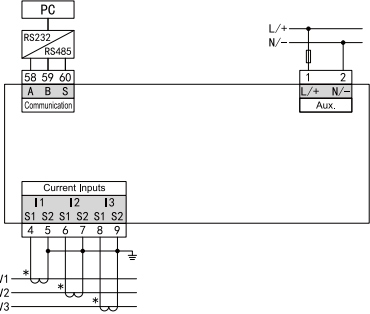
LNF26E(3P4W)



LNF32E



LNF36E



TECHNICAL PARAMETER

Item		Parameter
Display		Display mode: LED
Accuracy		Voltage, current: 0.5% ; Frequency: ±0.01Hz
Current input	Range	5A/1A
	Resolution	1 mA
	Impedance	≤20mΩ/phase
	Power consumption	≤0.2 VA/phase
	Over current	Continuous: 1.2In; Instantaneous: 10In/5s
Voltage input	Frequency	45 Hz~65 Hz
	Range	57.7/100/230/400V
	Resolution	0.1 V
	Impedance	≥1.7 MΩ/phase
	Power consumption	≤0.1 VA /phase
Communication port	Over voltage	Continuous:1.2Vn; instantaneous: 2Vn/1min
	Frequency	45 Hz~65 Hz
	Physical interface	RS-485
	Communication speed	Up to 9.6 kbps
	Communication protocol	Modbus-RTU
Working power supply	Isolation voltage	2000 VAC (1 min)
	Rated range	AC/DC (80 ~ 270) V
	Power consumption	≤3VA
	Withstand voltage	≥2kV
Working environment	Working temperature	10°C ~55°C
	Storage temperature	-25 °C~ 70°C
	Relative humidity	≤95%RH, no condensation
	Working altitude	≤2500m
	Anti-pollution degree	No corrosive gas
Protection degree	Protection degree	Front case IP54, rear case IP20
	Insulation	Resistance between signal, power supply, output terminals and case >100MΩ
	Withstand voltage	Input and power supply ≥2kV, input and output ≥2kV, power supply and output ≥2kV

MOTOR PROTECTION CONTROLLER

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COMPARISON TABLE



Model		WDH-31-200	WDH-31-580
Control mode		-	9
Motor protection		9	21
Measuring	Voltage	1-phase	3-phase
	Current	■	■
	Current unbalance	■	■
	Ground current(0.3-8.0In)	-	■
	Residual current(50-5000mA)	□	■
	Frequency	-	■
	Power, Power factor	-	■
	Energy	-	■
	Temperature	-	■
	Analog input(4-20mA)	-	-
Communication	Modbus-RTU	■	□
	Double Modbus-RTU	-	□
	Profibus-DP	-	□
Real-time Clock	RTC	-	■
Digital Inputs	Dry contact input	-	12
	Wet contact input	-	□
Relay Outputs	Control relays	1	4
	Signal relays	1	4
Analog Input	DC 4-20mA	-	-
Analog Output	DC 4-20mA	□	■
Records	Alarm and fault record	■	■
	Motor start and stop record	-	■
	Running and stopping time record	-	■

NOTE: "■": Yes "-": No "□": Optional

WDH-3 1-200



Modbus Interface
Protection (9 Types)
Analog Output



FUNCTION

Motor Protection

- Start timeout
- Stall
- Jam
- Overload
- Under load
- Over voltage
- Low voltage
- Current unbalance
- Residual current

Measuring

- 1-phase voltage
- 3-phase current
- Residual current (optional)



APPLICATIONS



MODELS

WDH-3 1-203K



PRODUCT COMBINATION

- Controller
- CT: SHH
- Residual CT (optional)
- External CT (optional): SHI-ZT40, 5P10: 500A/5A, 800A/5A, corresponding controller rated current of 5A

Current Code		Optional Code	Installation Mode	Cable Length for CT
1A	50A	L: residual current	Y: Integrated	1m
2A	100A	M2: Analog output	F: Split	3m
6.3A	200A			
30A	5A(Secondary current)			

Current	Rated Current for Motor	SHI-I CT Code
1A	0.2A~1A	SHI01-I, ϕ 20mm
2A	1A~2A	
6.3A	2A~6.3A	SHI30-I, ϕ 20mm
30A	6.3A~30A	
50A	30A~50A	SHI200-I, ϕ 20mm
100A	50A~100A	
200A	100A~200A	SHI300-I, ϕ 30mm
5A	/	SHI30-I, ϕ 20mm

OPTIONAL CT

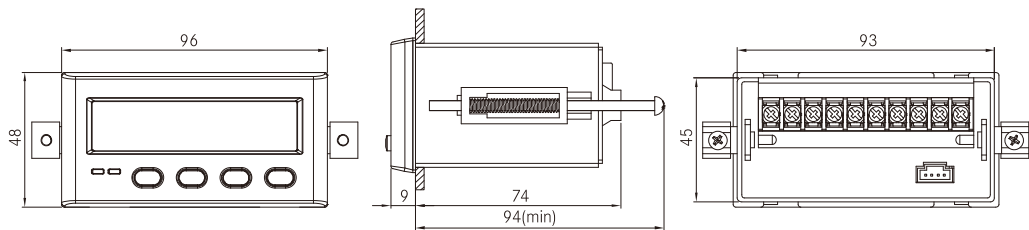


Model	THREE-PHASE CT		EXTERNAL CT		RESIDUAL CURRENT CT
	SHI01-I/SHI30-I/SHI200-I	SHI300-I	SHI-ZT40	SHI-ZT30	SHI-ZT100
Diameter(mm)	20	30	42×30	31	100
Dimension(mm)	93×45×96	185×36×72	75×44×102	75×44×98	185×44×190

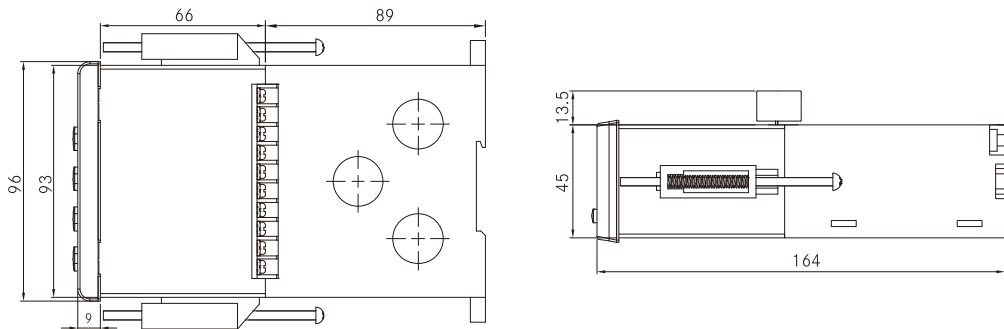


DIMENSIONS

Splited Installation (Cut-out Size: 94×46mm)



Integrated Installation



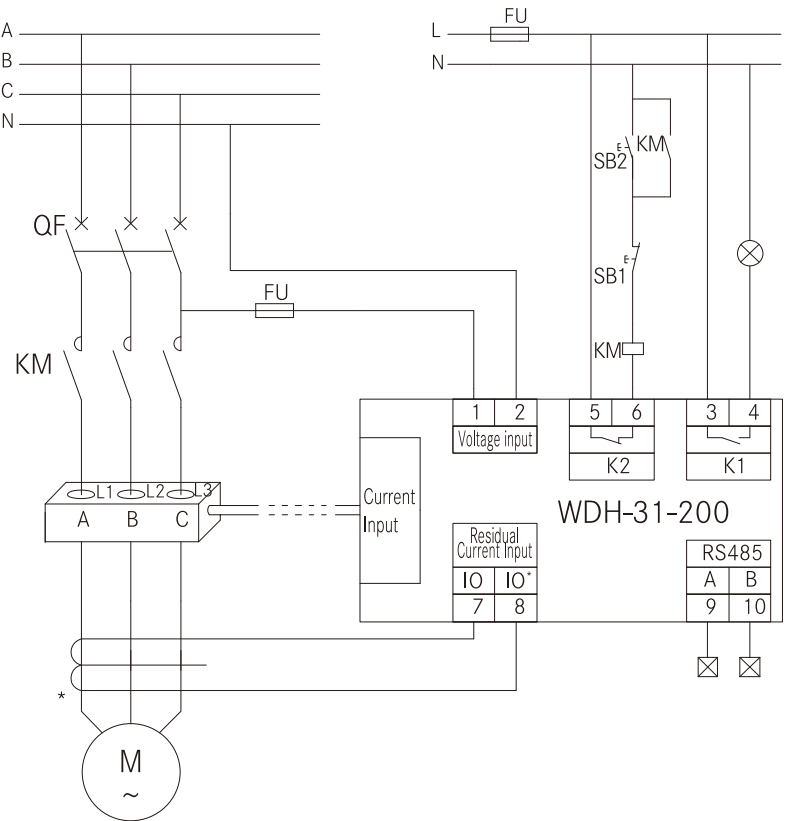
TECHNICAL SPECIFICATION

System	Rated voltage of motor	AC 380V or AC 660V, 50Hz
	Rated current of motor	0.1 A~800 A
	Insulation resistor	≥100MΩ
Safe Power Supply	Working range	AC 100~415V
	Power consumption	≤3VA
Environment Condition	Operating temperature	-20℃~+60℃
	Relative humidity	≤93%RH
	Storage temperature	-25℃~70℃
	IP degree	Front: IP64, Rear: IP20
Protection Accuracy	Current/ voltage	±1% of setting value
	Thermal capacity	±1% of setting value
	Delayed acting time	When delayed acting value < 2s: ±100ms When delayed acting value ≥2s: ±5%
Control Relay	Contact capacity	AC 250V/5A
Signal Relay	Contact capacity	AC 250V/5A
Analog Output	Mode	DC 4~20mA, RL≤350Ω
Insulation		≥2kVAC

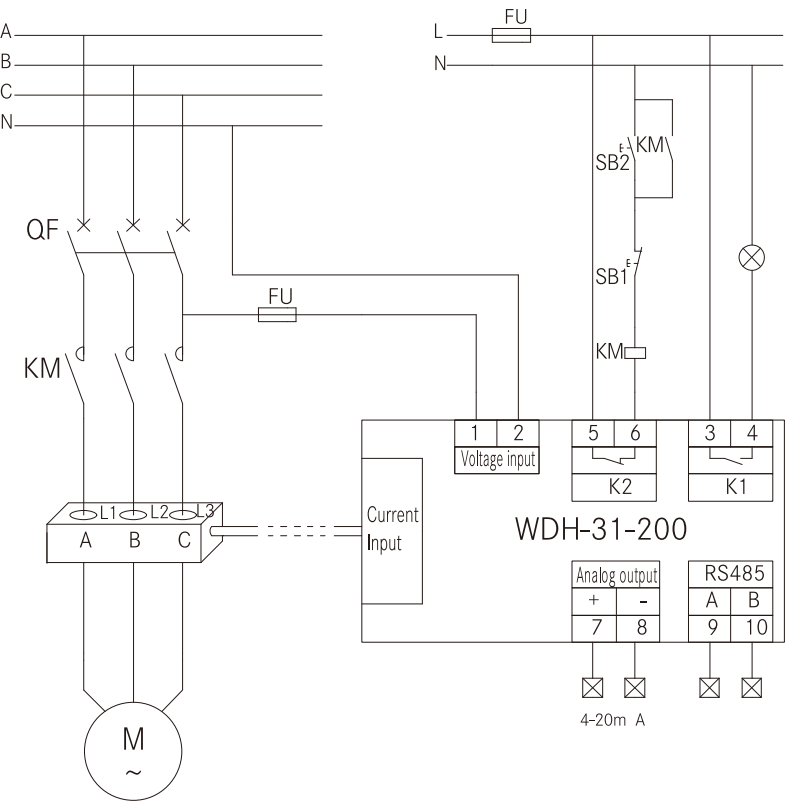


TYPICAL WIRING

Wiring Diagram With Residual Current Function



Wiring Diagram With Analog Output Function



WDH-3 1-580



Modbus Interface
Protection (21 Types)
Analog Output
Temperature
Harmonics



FUNCTION

Motor Protection

- Start timeout
- Stall
- Jam
- Overload
- Under load
- Current unbalance
- Over voltage
- Low voltage
- Residual current
- Phase loss
- Phase-sequence
- Under power
- Temperature
- Analog input
- External fault
- tE time

Measuring

- 3-phase voltage
- 3-phase current
- Residual current
- Energy
- Harmonics

Communication

- Profibus-DP
- Modbus-RTU
- Ethernet Modbus/TCP

APPLICATION

Buildings

(Commercial building, school, hospital...)

Industrial facilities

(steel, petrochemical, electronic...)

Utilities

(railway, airport, water supply...)



MODELS

WDH-3 1-58

Communication Protocol	Control Mode	Current Specification of Protection Controller	Main Circuit Voltage	Digital Input Type	Optional Functions	Additional Components
2: 1 Profibus-DP protocol+ 1 Modbus-RTU protocol	A: Direct start	1:5A	1:AC 380V	1: Internal DC24V power supply	R: Insulation resistance monitoring	D: Switching module-DC24V
3: 2 Modbus-RTU protocol	B: Bidirectional start	2:25A	2:AC 660V	2: External AC220V power supply	V: Anti voltage sag/under voltage restart	DA: Switching module-AC220v
7: 1 Modbus-RTU protocol+ 1 Ethernet Modbus/TCP protocol	C: Double speed start	3:100A	3:AC 100V			X: Display module
	D: Resistor divider start	4:250A				
	E: Y/△ start	5:500A				
	H: Autotransformer start	6:800A				
	K: Protection mode					
	R: Start with soft-start					
	P: Start with inverter					

Code	Adjustable Range	Configurable Motor Power (380V system)	Measurement Module	Diameter
1	0.2A~5A	0.13kW~2kW	WM1/05	φ18mm
2	5A~25A	2kW~11kW	WM1/25	φ18mm
3	25A~100A	11kW~55kW	WM1/100	φ18mm
4	100A~250A	45kW~115kW	WM1/250	Copper Bar
5	200A~500A	90kW~280kW (Configured with 3pcs of external CT 500A:5A)	WM1/05	φ18mm
6	500A~800A	280kW~400kW (Configured with 3pcs of external CT 800A:5A)	WM1/05	φ18mm



PRODUCT COMPONENTS

WDH-31-580 series Motor Protection Controller includes the following components:

Main control module
(required)

Measurement Module
(required, including connection line)

Switching module
(optional)

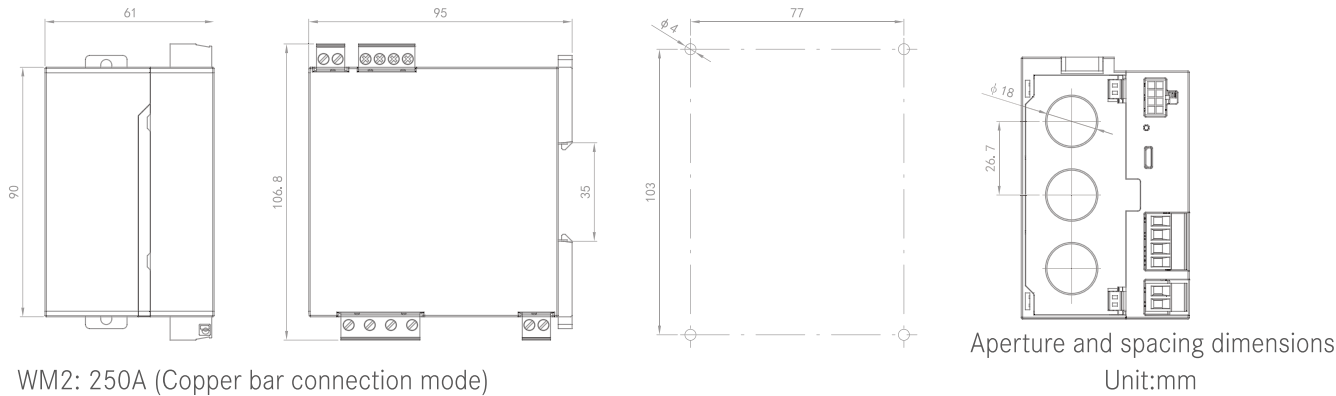
Display module
(optional, including connection line)

External CT (optional)-model: SHI-ZT40/SHI-ZT60, one set consisting of three pieces, protection type, specification: 500A/5A, 800A/5A. corresponding controller rated current of 5A

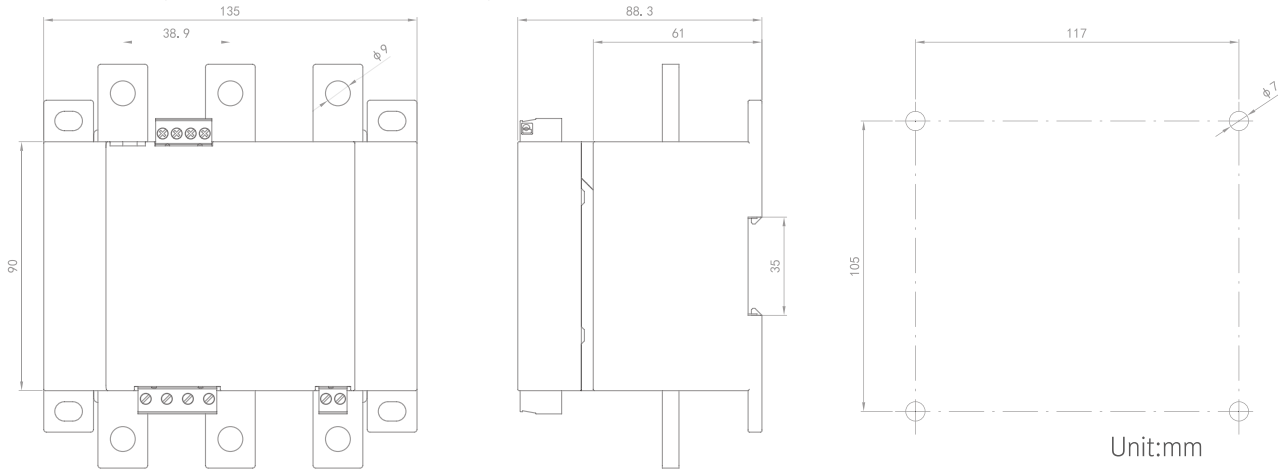


DIMENSIONS

Measurement Module
WM1: 5A , 25A , 100A (Perforation connection mode)

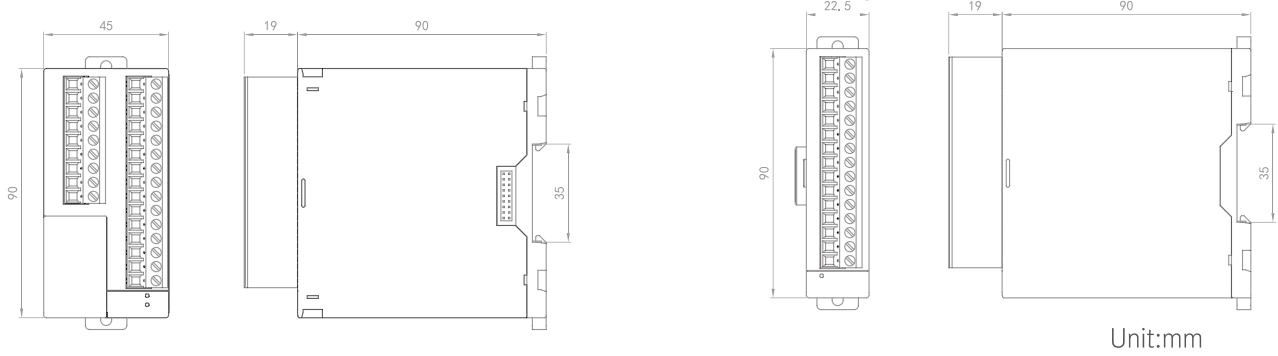


WM2: 250A (Copper bar connection mode)

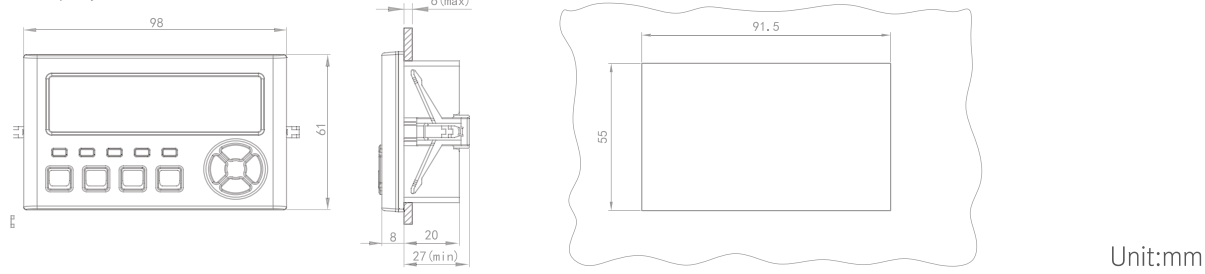


Main Control Module

Switching Module



Display Module



OPTIONAL CT



External CT		
Model	SHI-ZT40	SHI-ZT60
Diameter(mm)	42×30	32×62.5
Dimension(mm)	75×44×102	100×50×112



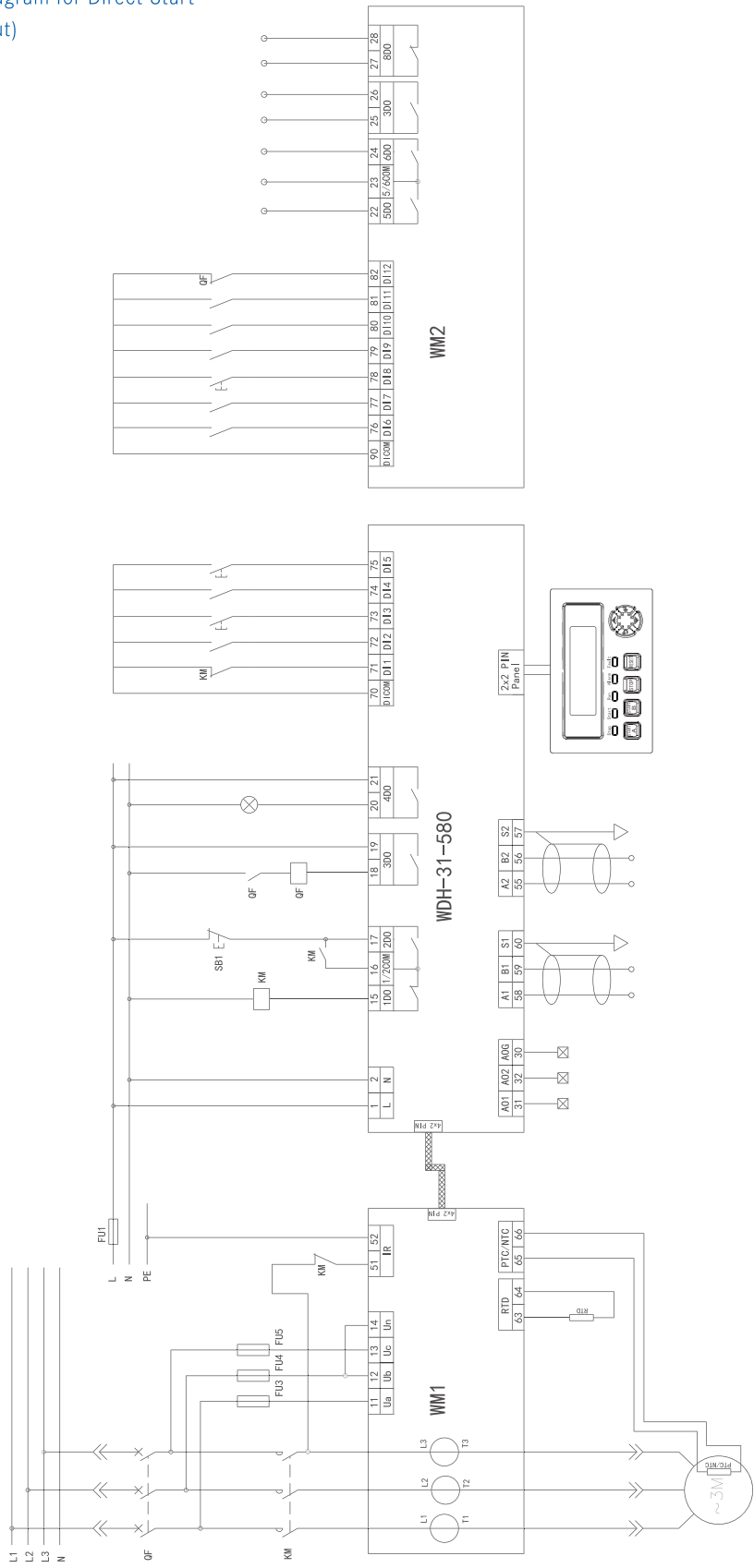
TECHNICAL SPECIFICATION

System Running Parameter	Rated voltage of motor	AC380V,50HZ
	Rated current of motor	0.1~800A
	Insulation resistance	>100MΩ
Auxiliary Power Supply of Controller Operating Environment	Working Range	AC/DC 80~270V
	Environment temperature	-20℃~60℃
	Relative humidity	≤93%RH
	Storage temperature	-40℃~70℃
	Protection degree(front panel)	IP64
	Attention	No corrosive gases, explosive and conductive media in the environment
Protection Accuracy	Current/ voltage starting value	±2% of setting value
	Thermal capacity accumulated value	±1% of setting value
Delayed action time	Delayed action time<2S	±100ms
	Delayed action time≥2S	±5%
Relay Output	Control relay contact capacity	AC250V/5A
	Signal relay contact capacity	AC250V/3A,DC30V/3A
	Relay electric service time	100000 times
EMC characteristics	Electrostatic discharge	Severity level: III
	Electrical fast transient burst	Severity level: III
	Surge	Severity level: III
	Oscillatory waves immunity	Severity level: III
	Electromagnetic field immunity	Severity level: III
	Radio frequency radiation immunity	Severity level: III
	Power frequency immunity	Severity level: A
	Conducted emission limit test	150kHz-30MHz
Withstand Voltage	Radiation emission limits test	30MHz-1000MHz
	Between power supply and input	AC2kV/1min
	Between power supply andoutput	AC2kV/1min
	Between input and output	AC1kV/1min



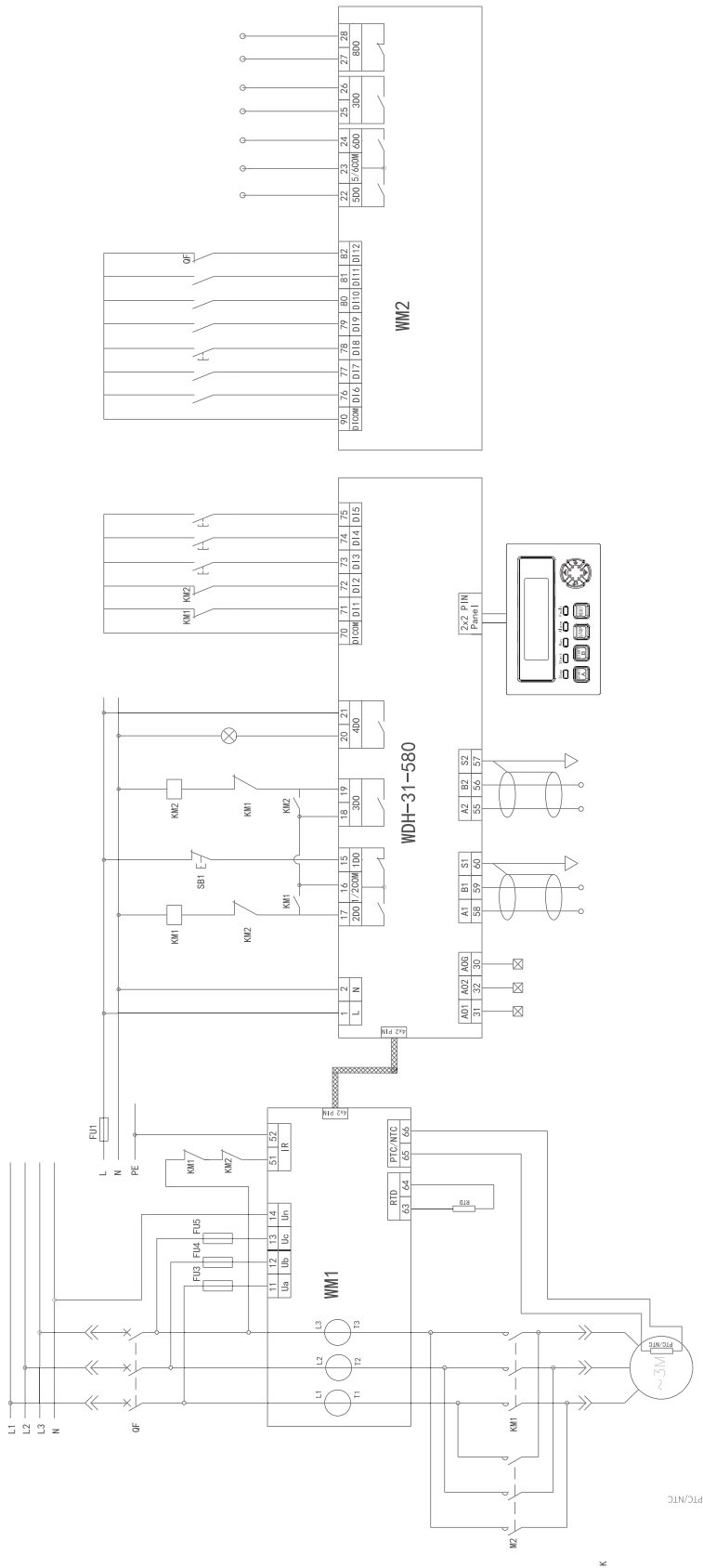
TYPICAL WIRING

Typical Wiring Diagram for Direct Start
(with input/output)



- Under the direct start mode, WDH-31-580 controls the motor start/stop by relay 1DO(NC)/2DO(NO).
- As drawing shown, when the controller receive the start command(such as 3DI terminal or display interface), 2DO closed(pulse), contactor(KM) power on, motor start
- When the controller receives the stop command(sunch as 5DI terminal or display interface),1DO open(pulse), contractor KM power off, motor stop.
- When faults were detected,1DO open(level), contractor KM power off, motor stop.
- After reset, 1DO closed, controller allows the motor restart again.

Typical Wiring Diagram for Bidirectional Start
(with input/output)



- In the bidirectional mode(forward/reverse rotation), WDH-31-580 controls the motor forward rotation start/stop by relay 1DO(NC)/2DO(NO) and by realy 1DO (NC)/3DO(NO) to the reverse direction start/stop of the motor.
- As the drawing shown, when the controller receives the forward directional start command(such as 3DI terminal or display interface), 2DO closed(pulse), contactor KM1 power on, the motor start with forward direction.
- When the controller receives the reverse direction start command (such as 4DI terminal or display interface), 3DO closed(pulse), contractor KM2 power on, the motor starts with reverse direction.
- When the controller receives the stop command (such as 5DI terminal or display interface), 1DO open (pulse), contractor KM1/2 power off, the motor stop.
- If enable "Continuous Switching", if the current rotation direction is forward, the controller receives the reverse start signal, the motor will stop than delay 1s and start in reverse, or vice versa.

TEMPERATURE AND HUMIDITY CONTROLLER

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CD195X-DM7 CD195X-9M7

The controller adopts high-performance temperature and humidity sensors and advanced complete circuit design. Its performance is stable and reliable with obvious effect of moisture proof and dehumidification. It can work in the harsh environment of strong electric field, strong magnetic field, humidity and low temperature for a long time. It can effectively prevent all kinds of accidents caused by moisture, creepage and flashover in the operation of power equipment so as to improve the safety of the power grid.



High protection class
High sensitivity
High accuracy



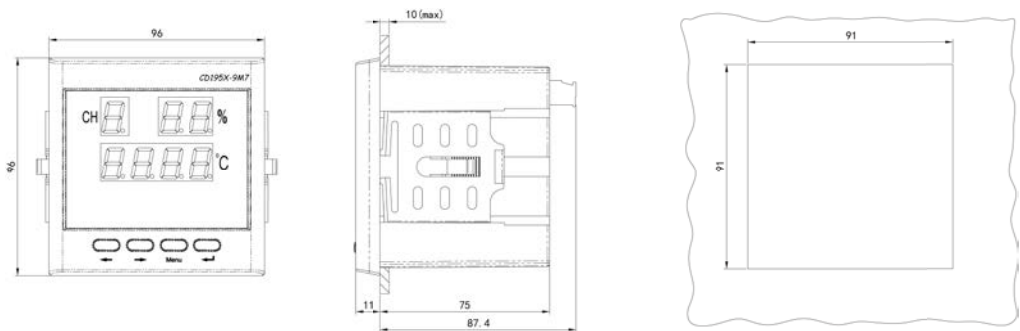
DIMENSION

		CD195X-DM7	CD195X-9M7
Dimension(mm)		48×48×77	96×96×75
Interface	RS485	1	1
	Sensor channel	1	3
	Heater control	1	3
	Fan control	1	3

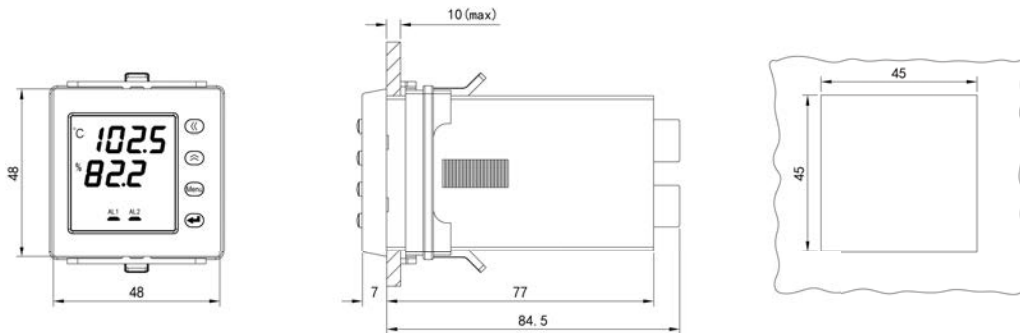


DIMENSION

CD195X-9M7

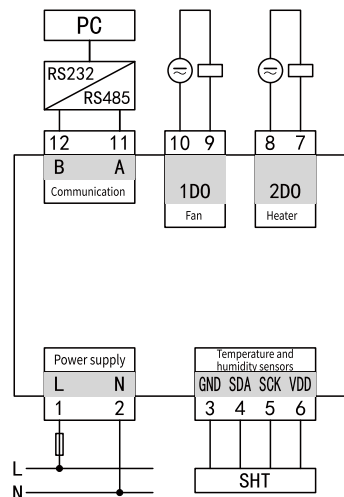


CD195X-DM7

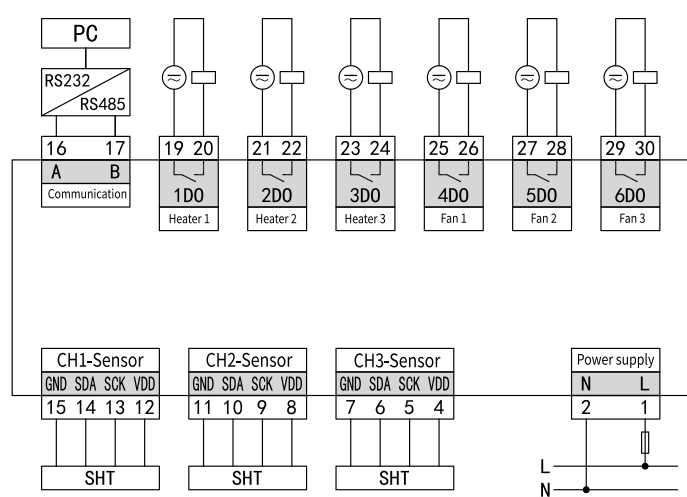


TYPICAL WIRING

CD195X-DM7



CD195X-9M7



TECHNICAL PARAMETER

Item		Parameter	
Input	Sensor	Type	Integrated temperature and humidity sensor
		Distance	<5m
	Temperature	Measuring range	-40°C ~ 85°C
		Accuracy	±2.5°C @25°C
	Humidity	Measuring range	0% ~ 99%
		Accuracy	±5%
Output	Heater control	Type	Relay/resistive load/passive contact
		Capacity	AC220V/5A DC30V/5A
		Temperature hysteresis	0 ~ 30 °C
		Action delay	0 ~ 60 s
	Fan control	Type	Relay/resistive load/passive contact
		Capacity	AC220V/5A DC30V/5A
		Temperature hysteresis	0 ~ 30%
		Action delay	0 ~ 60 s
		Insulation	Between power supply, input and output
Communication	Interface	Type	RS485
		Protocol	Modbus-RTU
Power supply	Range	DM7	AC/DC 80 ~ 270V (AC220V)or DC18 ~ 36V (DC24V)
		9M7	AC/DC 80 ~ 270V (AC220V)
	Power consumption		< 3VA
	Insulation		2kV /50Hz/1min

MULTIFUNCTIONAL ELECTRICAL TRANSDUCER

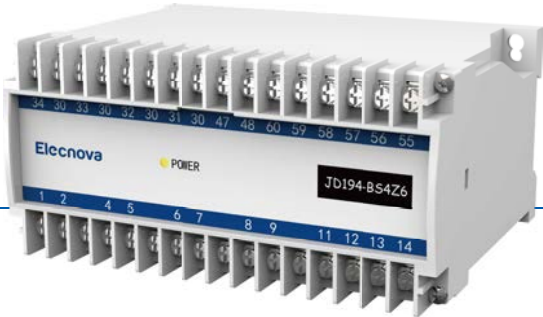
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JD194-BS4Z6



Easy installation
Parameter programmability
maintenance friendly



DEVICES



FUNCTION

Networks

-TN, TT, IT networks

Communication

-Interface: 2 RS485
-Protocol: Modbus-RTU

Accuracy

-Voltage: 0.5%
-Current: 0.5%
-Energy: 0.5s



MAIN FEATURES

Measuring

-Fundamental V/A/P/Q/S

Analog outputs

-4 Analog Outputs (Photo Coupler isolation)



APPLICATION

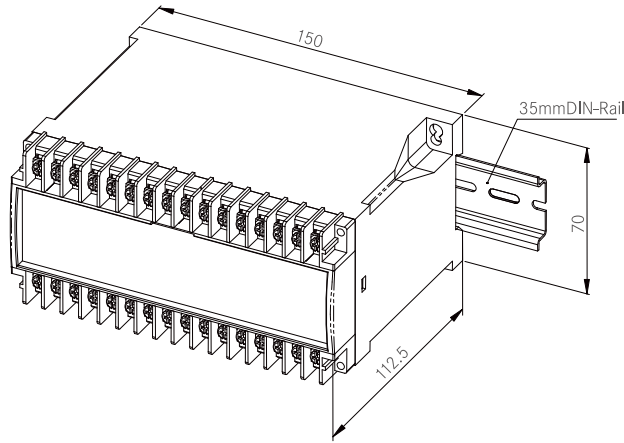
Energy management System

Substation Automation

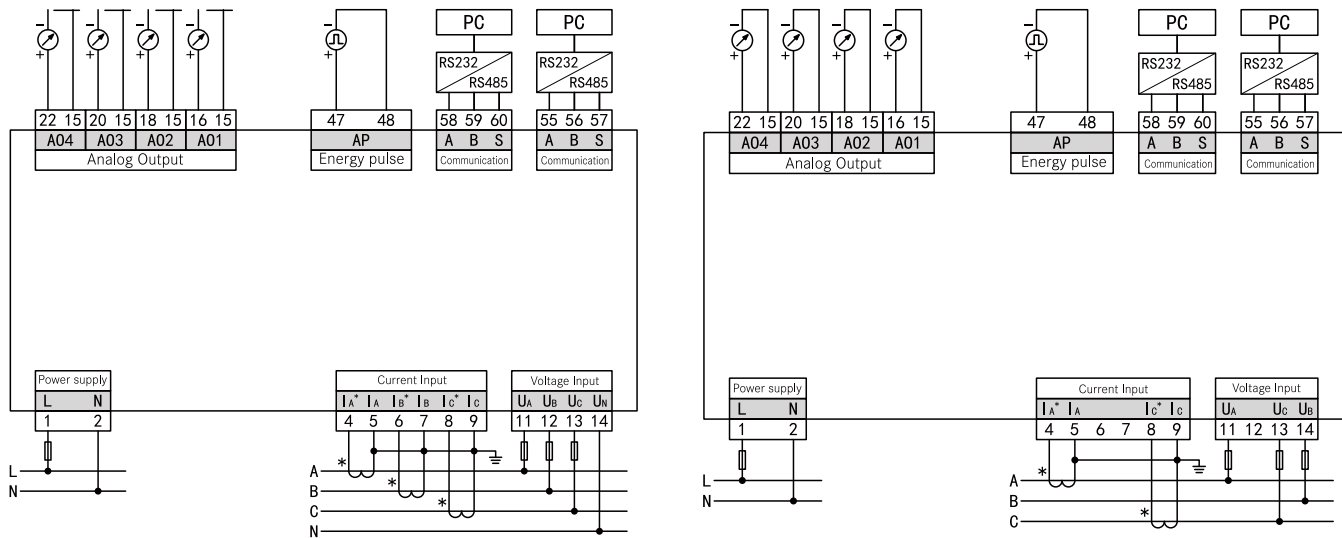
Switch Cabinet



DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

Item		Parameter
Current input	Rated value	5A
	Resolution	1 mA
	Impedance	<20mΩ/phase
	Consumption	About 0.1 VA /phase
	Overload	Sustainable: 1.2times instantaneous 10times/5s
Power supply	Working range	AC/DC: 80 ~ 270V or DC: 24V
	Consumption	<5VA
	Withstand	>2kV
Voltage input	Rated value	380V (most 480V)
	Resolution	0.1 V
	Impedance	1.6 MΩ/phase
	Consumption	About 0.1 VA /phase
	Overload	Sustainable: 1.2times instantaneous 2times/10s
Working environment	Frequency	45-65 Hz
	Operating temperature	-40°C ~ 70°C ,Altitude ≤2500m
	Storage temperature	-45°C ~ 85°C
	Relative humidity	≤93%RH, no gel
	IP degree	IP64(front panel), IP20(meter body)
Energy pulse output	Insulation	signal,power supply,output terminal to case resistance ≥100MΩ
	Pulse width	80ms±20%
	Maximum port voltage	35V
	Maximum port current	10mA
	Impulse frequency	<10Hz
Analog outputs	Pulse constant	5000imp/kWh (380V/5A), 80000imp/kWh (100V/1A), 20000imp/kWh (100V/5A, 380V/1A)
		Four analog outputs (Photo Coupler isolation)
	Range	4 ~ 20mA or ±5mA
	Load	most1kΩ
	Isolation voltage	2000 VAC (1 min)
Communication	Accuracy	0.5%
	Refresh time	1s
	Interface	2 RS-485(Photo Coupler isolation)
	Speed	2.4-38.4 kbps
	Protocol	Modbus-RTU
	Isolation voltage	2000 VAC (1 min)

ENERGY MANAGEMENT DIN RAIL MOUNTED ENERGY METER

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APPLICATIONS



Energy Management



Sub-item Metering



Power Monitoring



MAIN FEATURES

Measuring

-Direct measurement up to 100A

Communication

-Interface: RS485
-Protocol: Modbus-RTU

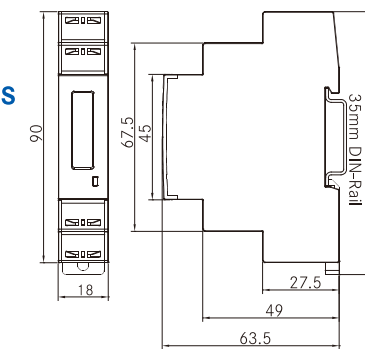
Energy Metering

-Bi-directional energy
-Tariff energy

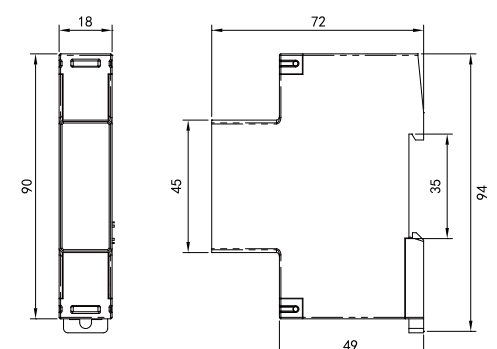


DIMENSIONS

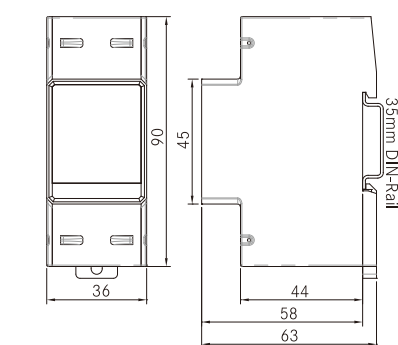
DDS1946-1P/DDS1946-1P



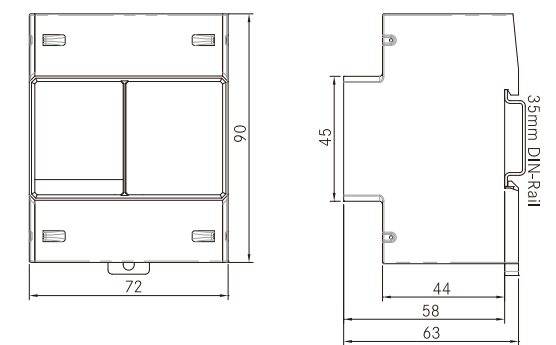
DDS1946-1P+/DDS1946-1P+



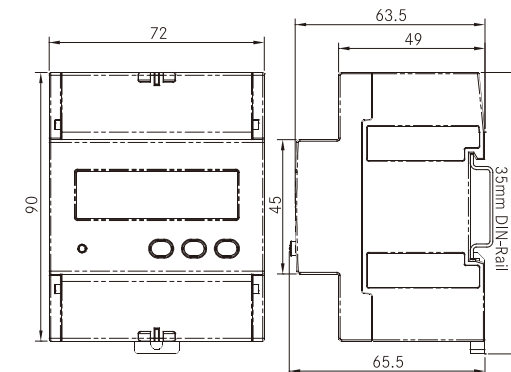
DDS1946-2P(M)/DDS1946-2P(M)



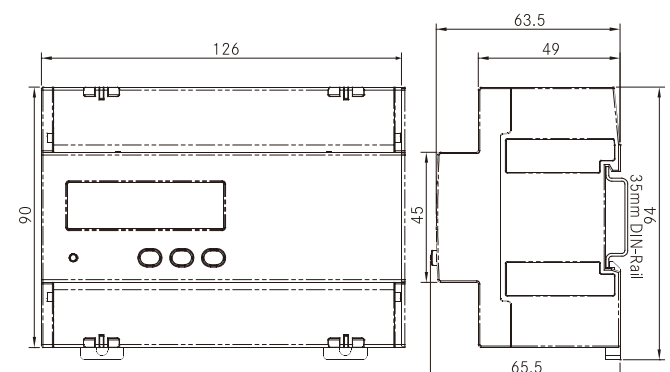
DTS1946-4P(M)/DTS1946-4P(M)



DDS1946/DDS1946



DSS1946/DSS1946/DTS1946/DTS1946





COMPARISON TABLE

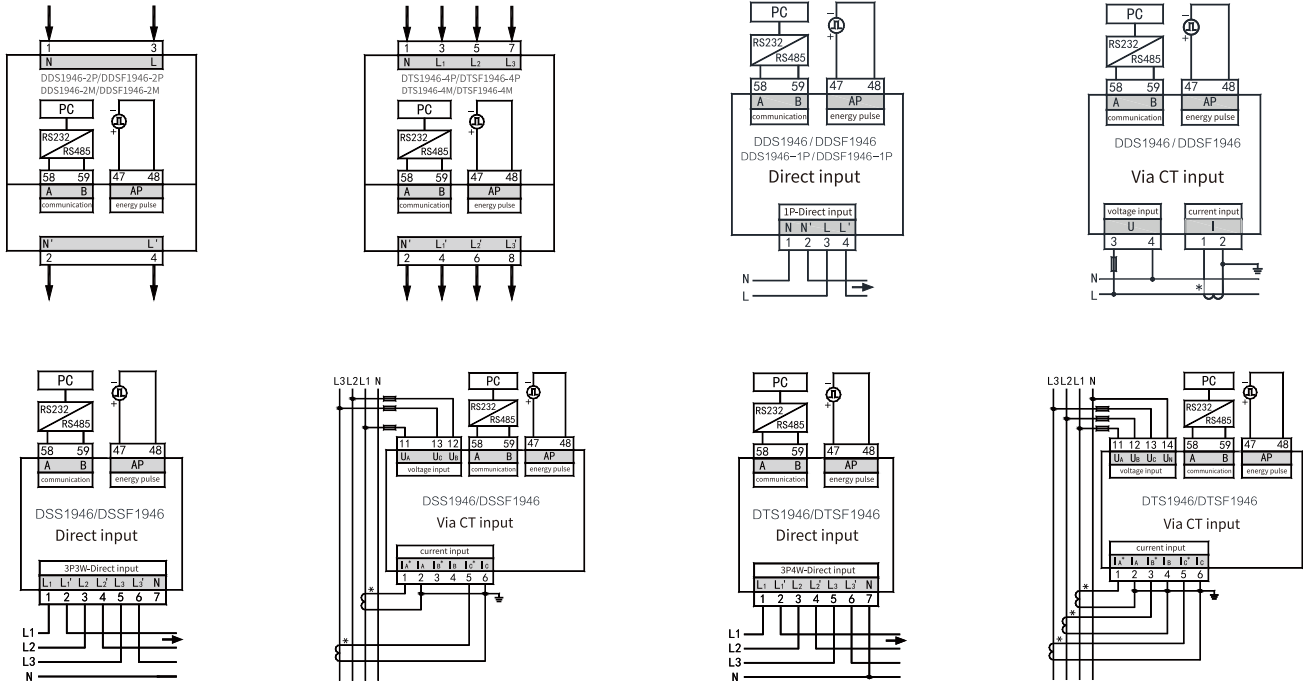


Model		DDS1946-1P+/ DDSF1946-1P+	DDS1946-2M/ DDSF1946-2M	DDS1946-2P/ DDSF1946-2P	DTS1946-4M / DTSF1946-4M		DTS1946-4P / DTSF1946-4P		DDS1946-1P/ DDSF1946-1P	DDS1946 / DDSF1946	DSS1946 / DSSF1946	DTS1946 / DTSF1946
Wiring Method		Up In Down Out				Up In Down Out		Down In Down Out				
Accuracy		Class 1	Class B	Class 0.5S	Class B		Class 0.5S	Class 1	Class 0.5S	Class 0.5S	Class 0.5S	Class 0.5S
Wiring	1P2W	■	■	■	—		—	■	■	—	—	
	3P3W	—	—	—	—		—	—	—	■	—	—
	3P4W	—	—	—	■		■	—	—	—	—	■
Voltage	230V	■	■	■	—		—	■	■	—	—	—
	3×400V	—	—	—	—		—	—	—	—	■	—
	3×230/400V	—	—	—	■		■	—	—	—	—	■
Current	Direct	10(100)A	5(63)A	5(100A)	5(63)A		5(100)A	5(40)A	5(100)A	5(100)A	5(100)A	5(100)A
	Via CT	—	—	—	—		—	—	1.5(6)A	1.5(6)A	1.5(6)A	1.5(6)A
Measuring	Voltage	■	■	■	■		■	■	■	■	■	■
	Current	■	■	■	■		■	■	■	■	■	■
	Power	■	■	■	■		■	■	■	■	■	■
	Power factor	■	■	■	■		■	■	■	■	■	■
Energy Metering	Frequency	■	■	■	■		■	■	■	■	■	■
	±kWh	■	■	■	■		■	■	■	■	■	■
	Tariffs	— / ■	— / ■	— / ■	— / ■		— / ■	— / ■	— / ■	— / ■	— / ■	— / ■
	Backup*	—	—	—	—		—	—	□	□	□	□
Width(mm)		18	36	36	72		72	18	72	126	126	
Communication (Modbus-RTU)		■	■	■	■		■	■	■	■	■	■
Digital Input		—	—	—	—		—	—	□	□	□	□
Energy Pulse		■	■	■	■		■	■	■	■	■	■
Display Mode		LCD	LCD	LCD	LCD		LCD	LCD	LCD	LCD	LCD	LCD

NOTE:1."■": Yes "—": No "□": Optional
2.DDS/DDSF1946-2M and DTS /DTSF1946-2M are MID certified.
3.Only those with F in the model name have the tariffs function.
4.*The measurement of backup energy is realized by the digital input of optional ,and a B is added after the model is selected.For example,DTSF1946B



Typical wiring



Technical specification

Model		DDS(F)1946-1P DDS(F)1946-1P+	DDS(F)1946-2P DDS(F)1946-2M	DDS(F)1946	DSS(F)1946	DTS(F)1946-4P DTS(F)1946-4M	DTS(F)1946
Normal Voltage		230V	230V	230V	3×400V	3×230/400V	3×230/400V
Frequency		45Hz~65 Hz					
Voltage Range		0.8Un~1.2Un					
Start Current	Direct input	0.004Ib					
	Via CT input	0.002In					
Consumption		< 2VA					
Energy Pulse		1 output, pulse width (80±20%) ms					
Digital Input		Active digital input, input range 0~220VAC; >150VAC closed, <70VAC open.					
RTC Error		≤0.5s/day					
Communication		RS485, Modbus-RTU, 2-wire, up to 9600bps					
IP Degree		Front: IP51					
Operating Temperature		-25℃~55℃					
Storage Temperature		-25℃~70℃					
Relative Humidity		≤93%					

DDSY1946A
DTSY1946A

The Pre-payment energy meter is designed by adopting advanced microprocessor and signal processing technology, and it possesses functions as below: whole power quantity measurement, electric energy metering, time-division charging, prepayment, demand quantity statistic, event recording, malignant load identification, fault warning, etc.



Strong and weak electric separation design
Pre-payment
Bi-directional energy
Parameter programmability



Comparison table

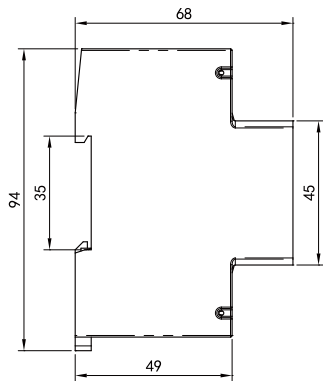
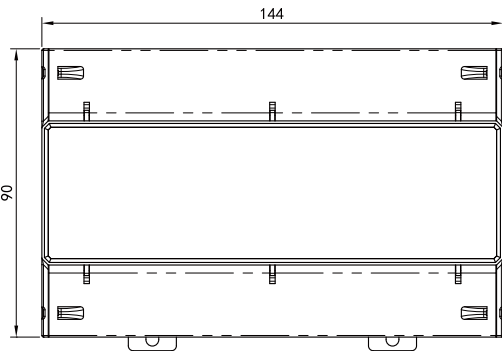
Model		DDSY1946A	DTSY1946A
Wiring mode		Single phase	Three-phase four-wire
Voltage range		230V	3×230/400V
Current specification	Direct access	5(80)A	5(80)A
Real-time measurement	Voltage and current	■	■
	Power	■	■
	Power factor	■	■
	Frequency	■	■
Electric energy metering	Bi-directional energy	■	■
	Multi-rate electric energy	■	■
Switching value	Switching value input (AC wet contact)	■	■
	Relay output	■	■
Communication	RS485 interface	■	■
Electric energy pulse/Clock pulse		■	■
Display Mode		LCD	LCD

Note: The “■” above means that the item has the corresponding function.

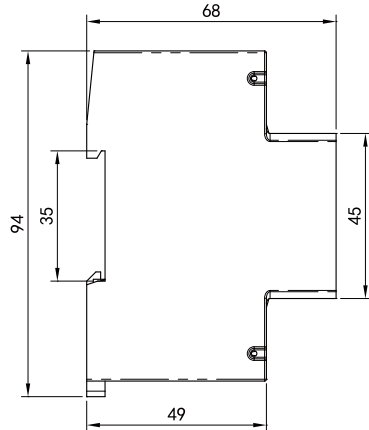
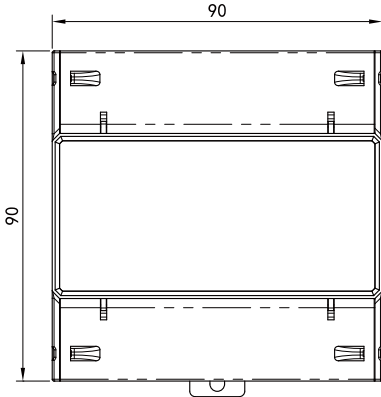


DIMENSIONS

DTSY1946A

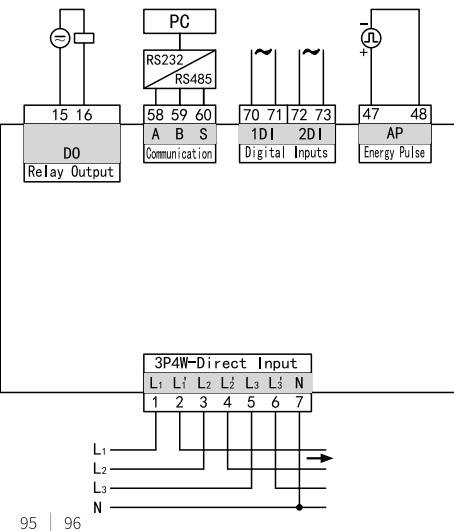


DDSY1946A

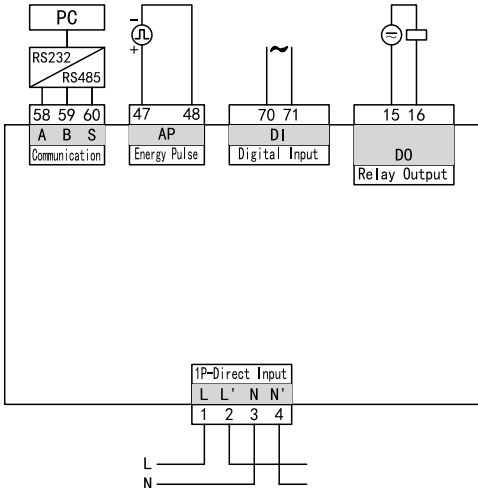


TYPICAL WIRING

DTSY1946A



DDSY1946A



TECHNICAL SPECIFICATION

Model	DDSY1946A	DTSY1946A
Accuracy grade	Voltage and current: 0.2%; Power: 0.5%; Frequency: ±0.01Hz; Active electric energy: grade 0.5S; Reactive electric energy: Grade 2	
Rated voltage	AC 230V	AC 3×230/400V
Input current	5(80)A	5(80)A
Frequency	50/60 Hz	50/60 Hz
Wiring Mode	Single phase	Three-phase four-wire
Scope of working voltage	0.8Un~1.2Un	
Power consumption	Power consumption of voltage circuit	< 5VA
	Power consumption of current circuit	< 2VA
Startup current	Access via CT	-
	Direct access	0.002In
AC wet contact	ON: AC 180~270V, OFF: < AC 100V	
RS485 communication interface	Modbus-RTU protocol, maximum baud rate: 9,600bps	
Electric energy pulse	Pulse width: 80ms±20ms	
Clock pulse	Pulse width: 80ms±20ms	
Tripping Control Contact capacity	3A/250 VAC; 5A/30 VDC	
IP protection	IP54 (panel)/IP20 (case)	
Working temperature	(-25 ~ 70)°C	
Storage temperature	(-30 ~ 80)°C	
Relative humidity	(5 ~ 95)%(no condensation)	

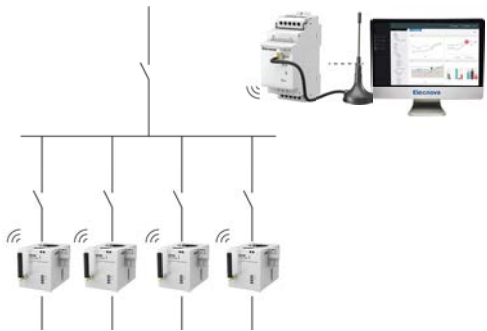
WIRELESS TRANSMISSION POWER METER

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INTRODUCTION

SDT series power meter is a new type of power measurement device. Due to its puncture installation and wireless transmission technology, SDT series power meter has many advantages such as compact size, less wiring and easy installation. It is especially suitable for the energy management of the built projects.



- Single phase or three phase: 230V/400V,50(400)A, 45-65 Hz
- V/A/P/Q/S/F/PF
- Demand/Max/Min/Average value
- THD(2nd~31st)
- kWh: Class 1
- Installation without cutting off the power
- LoRa or RS-485,ModBus-RTU
- Suitable for existing installations



MODEL SELECTION



	SDT11L	SDT11R	SDT13L	SDT13R
V/A/F/P/Q/S/PF	●	●	●	●
Demand/Max/Min/Averagevalue	●	●	●	●
THD	●	●	●	●
Harmonics	●	●	●	●
Energy	●	●	●	●
Temperature	●	●	●	●
SOE	●	●	●	●
LoRa	●	-	●	-
RS485	-	●	-	●

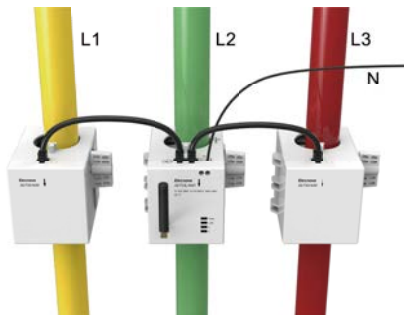
Note: 1. ● Yes, - No;
2. When selecting SDT11L or SDT13L, PD194-C10 module (LoRa to RS485) can be selected to access RS485 network.



INSTALLATION



Single phase

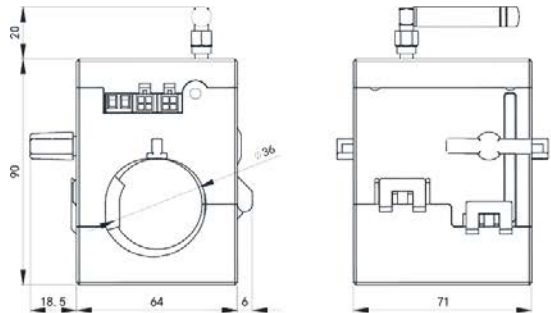


Three phase

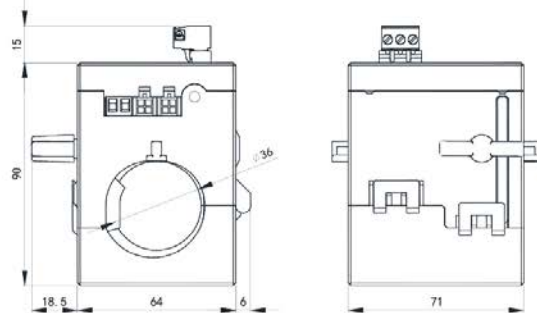


DIMENSION

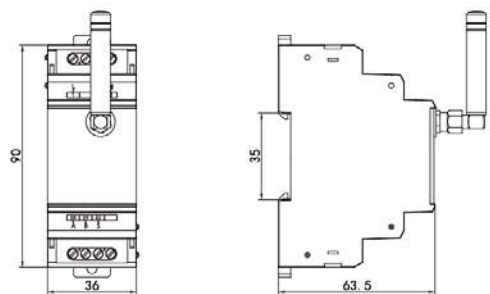
SDT11L, SDT13L



SDT11R, SDT13R



PD194Z-C10



Unit: mm

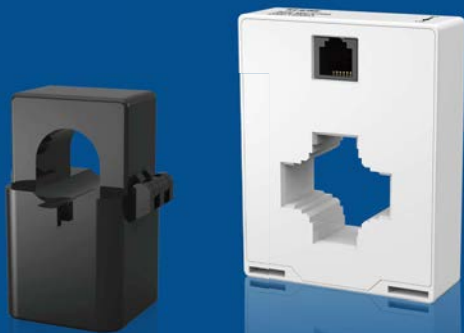


TECHNICAL PARAMETER

		SDT11	SDT13
Accuracy		V/A : 0.5%	V/A : 0.5%
		kWh : Class 1	kWh : Class 1
		kvarh : Class 2	kvarh : Class 2
Signal Input	Rated voltage	230V	3x230V/400V
	Rated current	50(600)A	3x50(600)A
Wiring		1P2W	3P4W
Frequency		45 ~ 65Hz	
Working Voltage Range		0.8Un~1.2Un	
Power Consumption	Voltage loop	≤2VA	
	Current loop	≤0.1VA	
Starting Current		100mA	
Communication	LoRa	Modbus-RTU protocol, default 470MHz, optional 868MHz/915MHz	
	RS485	ModBus-RTU protocol, baud rate up to 9600bps	
Working Environment	Operating temperature	-10℃ ~ 55℃	
	Storage temperature	-25℃ ~ 70℃	
	Relative humidity	≤95%RH	
	Altitude	≤2500m	

LOW POWER CURRENT TRANSFORMER

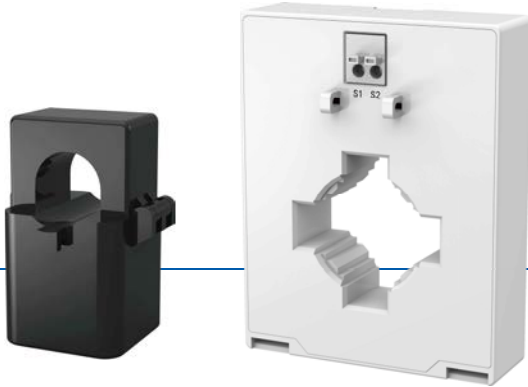
www.sfere-elec.net
Electrical Application Solution Expert



SHI-BCT/SCT M SERIES



High accuracy
Safe and reliable
Easy installation



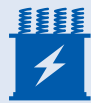
DEVICES



APPLICATIONS



Current Measurement



Power Transformer
and Distribution



Power Circuit Upgrade



MAIN FEATURES

High Accuracy

- High-permeability nanocrystalline material
- segmented core design

Output

- mV signal

Easy Installation

- Compact size

Reliable

- Open Circuit Allowed



COMPARISON TABLE

				
Model	SHI-BCT50M	SHI-BCT100M	SHI-BCT200M	SHI-BCT400M
Rated value	50A	100A	200A	400A
Aperture of transformer(mm)	φ18	φ18	φ23, 32×12	φ29, 42×12
Outline dimension(mm)	36×20×59	36×20×59	60×20×80	75×22.5×95

				
Model	SHI-BCT600M	SHI-BCT800M	SHI-BCT1000M	SHI-BCT2000M
Rated value	600A	800A	1000A	2000A
Aperture of transformer(mm)	φ29, 42×12	φ61, 82×22	φ61, 82×22	φ61, 82×22
Outline dimension(mm)	75×22.5×95	132×37×158	132×37×158	132×37×158

					
Model	SHI-SCT05M	SHI-SCT100M	SHI-SCT200M	SHI-SCT400M	SHI-SCT600M
Rated value	5A	100A	200A	400A	600A
Aperture of transformer(mm)	φ9	φ16	φ24	φ35	φ35
Outline dimension(mm)	30×26×42	37×33×47	52×45×70	65×56×85	65×56×85



TECHNICAL SPECIFICATION

Model	BCT	SCT
Rated voltage	AC660V	AC660V
Frequency	50/60Hz	50/60Hz
Power frequency withstand voltage	3kV/min	3kV/min
Primary current	50～2000A	5～600A
Secondary current	333mV	333mV
Accuracy	0.5S	1S
Altitude	≤3000m	≤3000m
Operating temperature	-10℃～55℃	-10℃～55℃
Storage temperature	-25℃～70℃	-25℃～70℃
Relative humidity	≤95%RH	≤95%RH

WIRELESS COMMUNICATION MODULE

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PD194Z-C10

The PD194Z-C series wireless communication module is a LoRa and RS485 transparent transmission module, which supports the 470, 868, and 915MHz frequency bands. The maximum transmission distance of the basic model can reach 5 kilometers (empty space, 100mW), and the maximum transmission distance of the enhanced model can reach 10 kilometers (empty space, 1W) with strong anti-interference ability and high signal sensitivity.



Long distance
Anti-interference
Hardware watchdog



APPLICATIONS



Intelligent meter data acquisition



Intelligent power monitoring



Intelligent agriculture



MAIN FEATURES

Long transmission distance

-5km(empty sapce,100 mW)

High receiving sensitivities

-139dBm

Compact design

-35mm Din-Rail



PRODUCT COMBINATION



Power Meter

RS485



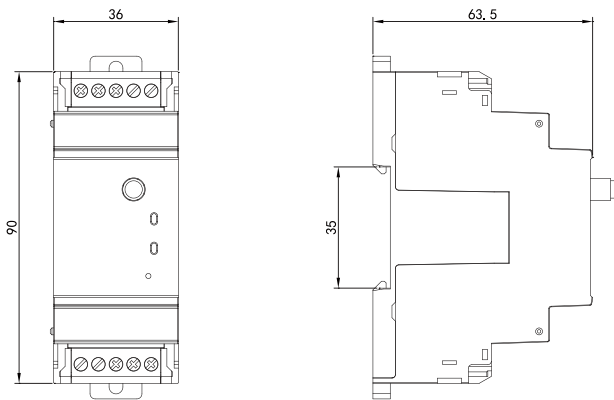
RS485



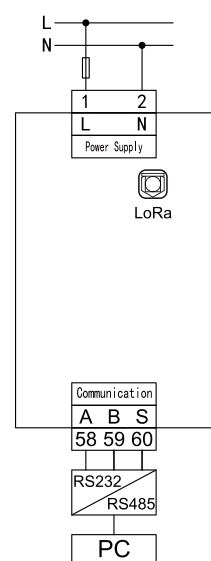
System



DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

Item		Parameter		
		PD194Z-C10	PD194Z-C10A	PD194Z-C11
Wireless interface	Transmitting and reception frequency	470-510,863-870,902-928MHz		470-510MHz
	Modulation	LoRa		
	Transmission power	100mW	100mW-1W	100mW
	Reception sensitivity	-139dBm		
RS485 interface	Communication method	N81/E81/O81/N82		
	Communication baud rate	2400-19200bps		
Power supply	Voltage range	AC 80-270V		DC 18-36V
	Power consumption	<2W		<4W
Operation environment		-25-70°C, ≤93%RH		
Storage environment		-40-85°C, ≤93%RH		

SC4

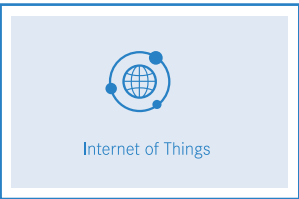
The SC4 wireless communication module is a GPRS and RS485 transparent transmission module, which supports 850/900/1800/1900MHz frequency band. It supports domain name access, and automatically reconnect when dropped. SC4 can be set by tools for parameter setting, status monitoring, and IAP upgrade.



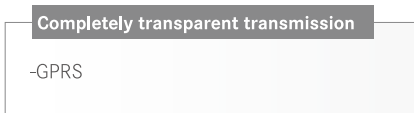
Quad-band universal
IAP upgrade
Dropped reconnection



APPLICATIONS



MAIN FEATURES

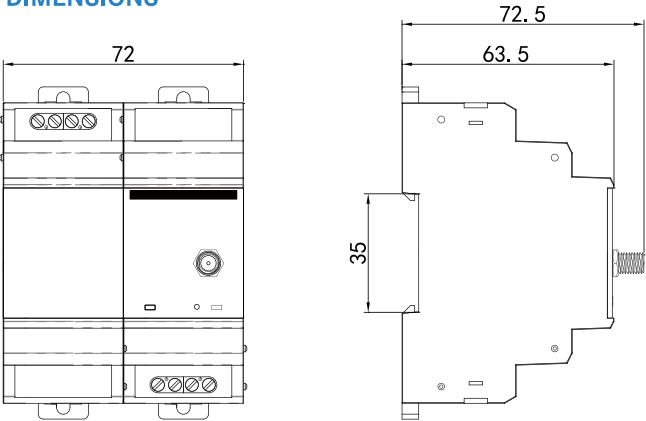


PRODUCT COMBINATION

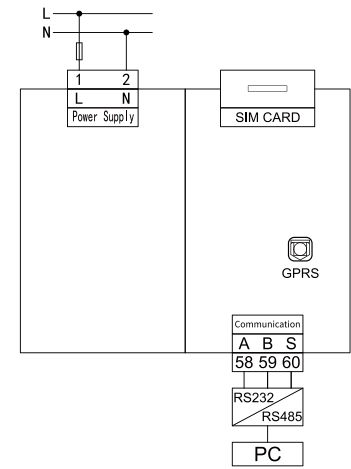




DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

Item		Parameter
Wireless interface	Transmitting and reception methods	GPRS
	Frequency band	850/900/1800/1900MHz
	Antenna interface	50Ω/SMA(female)
	SIM card voltage	3V、1.8V
	Transmission power	GSM900 class4(2w),DCS1800 class1(1W)
	Network protocol	TCP
	Network cache	Transmit 4Kbyte,receive 4Kbyte
RS485 interface	Communication method	N81/E81/O81/N82
	Communication baud rate	2400-19200bps
Power supply	Voltage range	AC 80-270V
Operation environment		-25-70℃, ≤93%RH
Storage environment		-40-85℃, ≤93%RH

SC6

SC6 wireless communication module is transparent transmission module of NB-IoT and RS485, supporting frequency band B3/B5/B8. It supports domain access, and disconnection and reconnection. SC6 can be set with tools for parameter setting, status monitoring, and IAP upgrade.



Strong links
High coverage
Low-power



APPLICATIONS

Intelligent meter data acquisition

Internet of Things

Intelligent agriculture



MAIN FEATURES

TCP transparent transmission
-NB-IoT

Multiband support
- B3/B5/B8

Compact design
-35mm Din-Rail

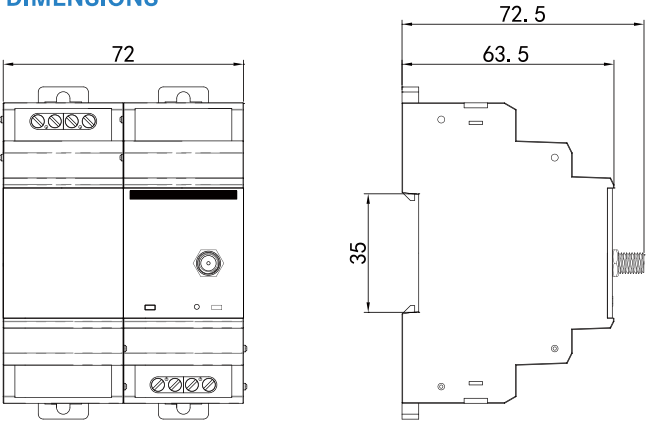


PRODUCT COMBINATION

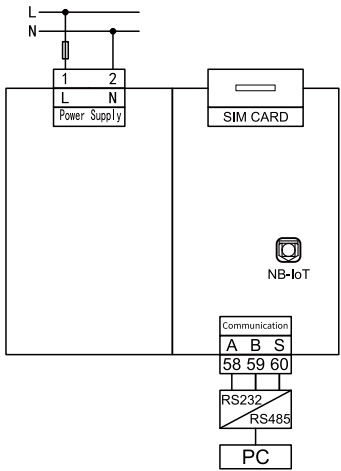




DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

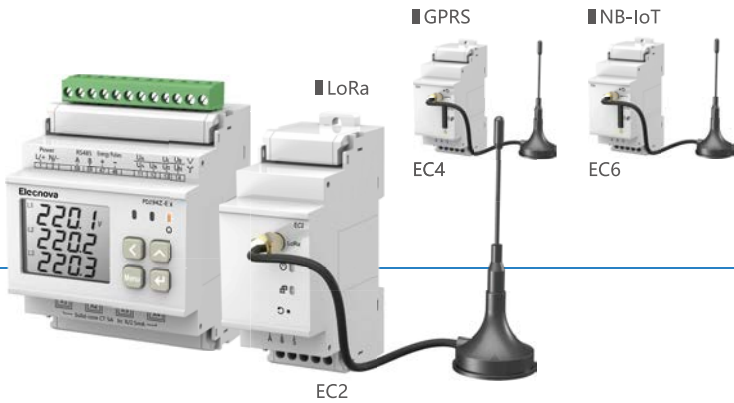
Item		Parameter
Wireless interface	Transmitting and receiving	NB-IoT
	Frequency band	B1/B2/B3/B5/B8/B20/B28, default B3/B5/B8
	Antenna interface	50Q/SMA(Female head)
	SIM card voltage	3V、1.8V
	Transmission power	23dBm
	Receiving sensitivity	-129dBm
	Network protocol	TCP
	Network cache	Transmit 460byte , receive 460byte
RS485 interface	Communication	N81/E81/O81/N82
	Communication baud rate	2400-19200bps
Power supply	Voltage range	AC 80-270V
Working environment		-25-70℃ , ≤93%RH
Storage environment		-40-85℃ , ≤93%RH

EC2/EC4/EC6

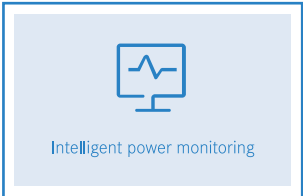
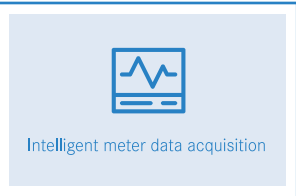
EC2 (LoRa), EC4 (GPRS), EC6 (NB-IoT) modules can be used in combination with the multi-functional power meter PD194Z-E14 or PD194Z-E20 series to realize wireless transmission of grid data.



High coverage
Condition monitoring
Value Display



APPLICATIONS



MAIN FEATURES

Communication

- RS485:Modbus-RTU
- LoRa
- NB-IoT
- GPRS

Multiband support

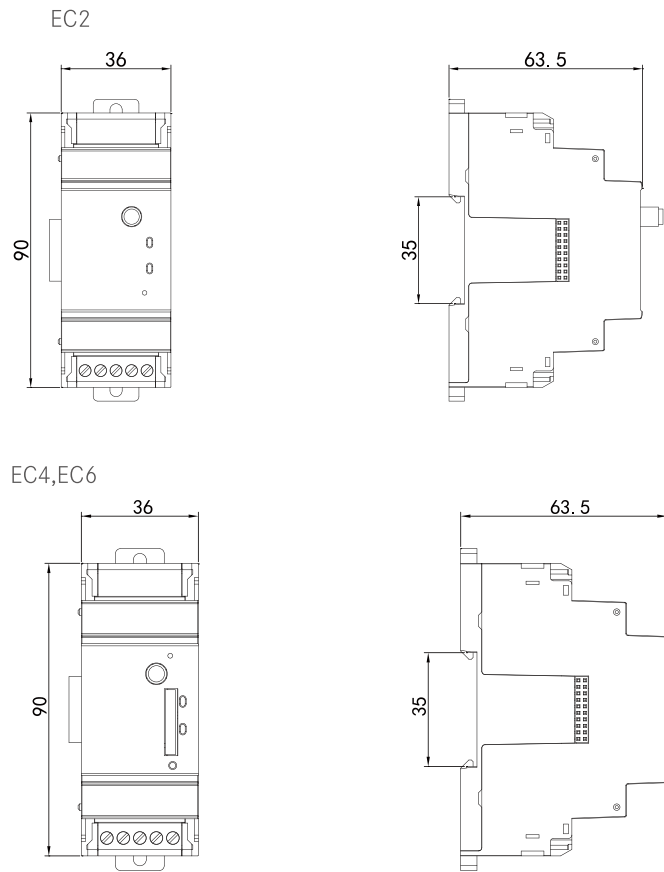
- 470/868/915MHz
- 850/900/1800/1900MHz
- Band3/5/8

Compact design

- 35mm Din-Rail



DIMENSIONS

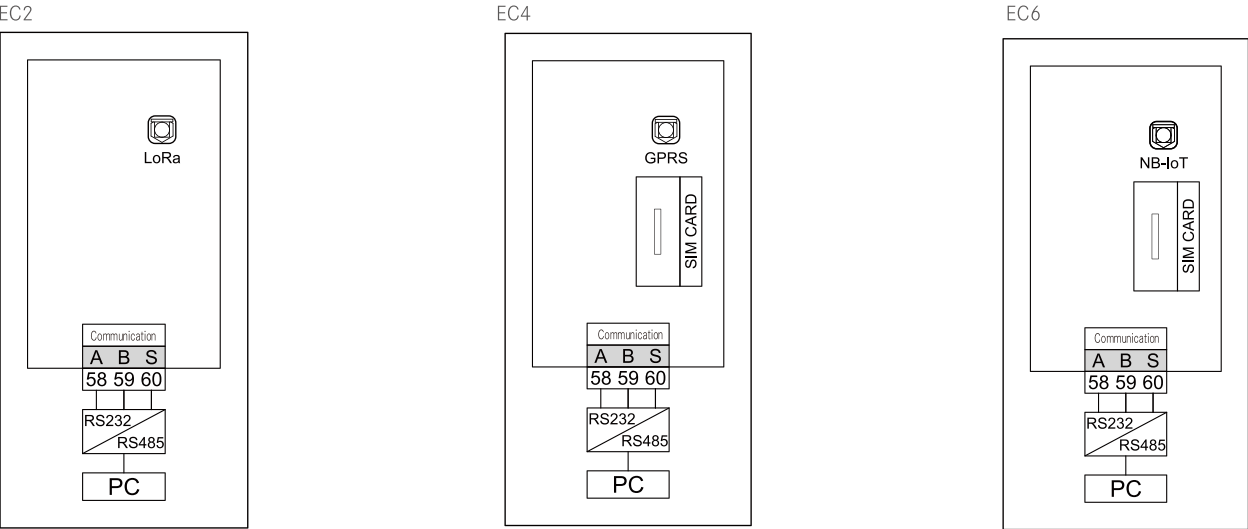


TECHNICAL SPECIFICATION

Model		EC2	EC4	EC6
Wireless interface	Modulation mode	LoRa	GPRS	NB-IOT
	Frequency band/Range	470-510M/863-870M/902-928M	850/900/1800/1900MHz	B3/B5/B8
	Transmitting power	100mW	2W@850/900MHz 1W@1800/1900MHz	200mW
	Sensitivity	-139dBm	-110dBm	-129dBm
	SIM card voltage	-	3V/1.8V	3V/1.8V
RS485 interface	Communication mode	N81/E81/O81/N82		
	Communication baud rate	2400-19200bps		
Power supply	Supporting Main Module	PD194Z-E14、PD194Z-E20		
	Power consumption	<2W		
Working environment		-25~70℃，≤93%RH		
Storage environment		-40~85℃，≤93%RH		



TYPICAL WIRING



GATEWAY

www.sphere-elec.net

Electrical Application Solution Expert



S12

S12 is a small gateway which can collect the protocols of multiple bus and transmit data via different protocols and channels. The supporting tool SmartHMI can help users to access the basic information of all slave devices and configure the gateway itself, collection points and application nodes. S12 is mainly used to collect the data from the products of intelligent measurement and control, power quality and electrical safety. As for downlink devices, it supports Modbus RTU and DL/T 645 protocols; as for uplink device, it supports communication with SmartHMI through Ethernet and supports SmartHMI to read the data of downlink devices through Modbus-TCP protocol.



Multi-protocol
High coverage
Low-power



APPLICATIONS



Intelligent monitoring device



Power quality device



Electrical safety device



MAIN FEATURES

Multi-protocol

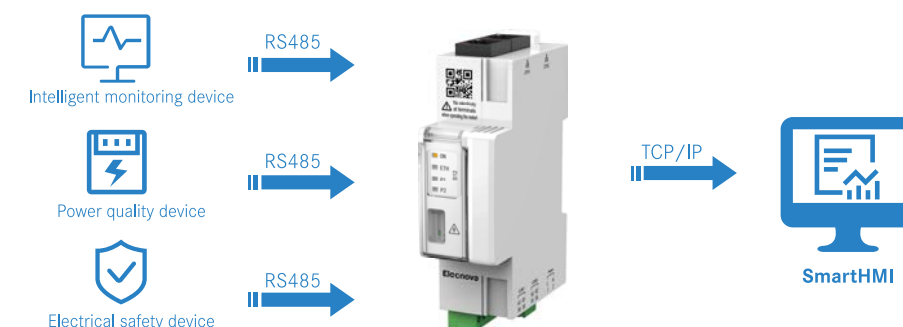
-Support Modbus-RTU, Modbus-TCP and DL/T645
Support collecting data points ≥ 4000

Condition monitoring

- Support to check whether the devices connected to the communication manager is online.



PRODUCT COMBINATION

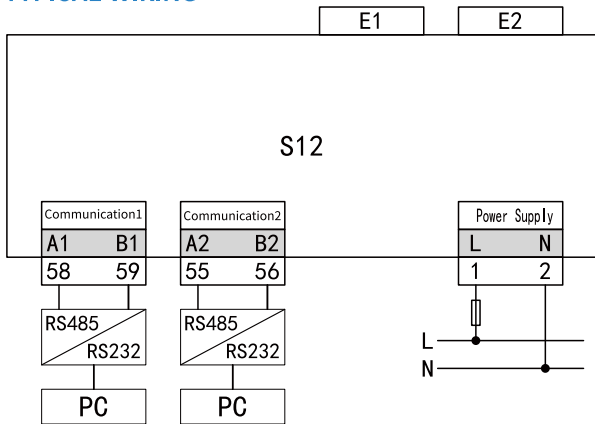




DIMENSIONS



TYPICAL WIRING



TECHNICAL PARAMETER

Item		Parameter
Hardware	LED	One running indicator light, two RS485 indicator lights, one Ethernet indicator light
	RS485	Two
	Enthernet	Two
	Working voltage	AC220V±20V 50Hz
	Working temperature	-25...+70°C
	Storage temperature	-40...+85°C
Working environment	Relative humidity	≤95%RH, no condensation
	Working altitude	≤2000m
	Protection degree	IP20
	Insulation	Double insulation
	Withstand voltage	2.5kV AC/1min
Communication port	Interface	Two RJ45 (100M), electrostatic 6kV
	Standard	IEEE 802.3
	Communication protoco	Modbus-TCP/IP, Modbus-RTU,DL/T645

S15-X-L

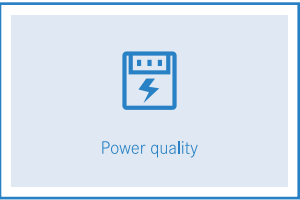
S15-X-L gateway is a small gateway device that can collect multiple protocol bus devices and upload data to cloud platform or local HMI display. Its supporting SmartHMI tool supports configuration of the connected devices and monitoring their data or status. The product is mainly used to collect intelligent measurement and control, power quality, electrical safety product data, communicate with the monitoring system through the Ethernet port, implement wireless networking through the LoRa interface, and upload to the HMI platform through 2G, 4G, NB-IoT wireless methods.



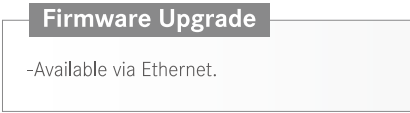
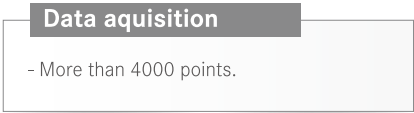
Multi-protocol support
Multiple data point acquisition
Online device numerical display



APPLICATIONS



MAIN FEATURES



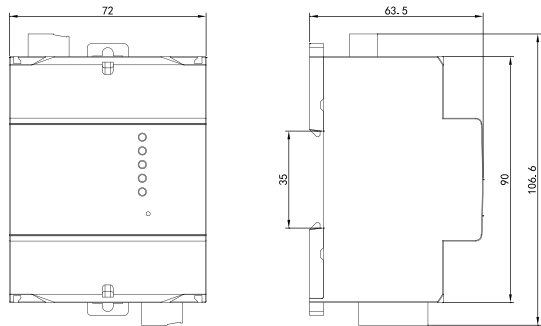
PRODUCT COMBINATION



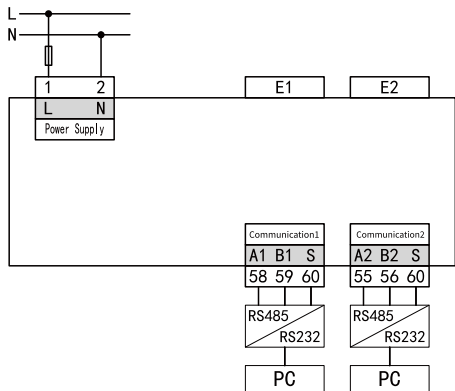
COMMUNICATION



DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

		S15-F	S15-T	S15-G	S15-N	S15-X*-L
communication interface	RS485	■	■	■	■	■
	ENET	■	■	■	■	■
	NB-IoT	—	—	—	■	—
	WiFi	■	—	—	—	—
	2G	—	—	■	—	—
	LoRa	—	—	—	—	■
	4G	—	■	—	—	—
Communication protocol		Modbus TCP/IP, Modbus RTU, MQTT, etc.				
Hardware	RS485	2				
	Ethernet	2 RJ45(100M)				
	Working voltage	AC220V±20V 50Hz				
	Standard	IEEE 802.3				
Working environment	Working temperature	-25...+70 °C, ≤95%RH				
	Storage temperature	-40...+85 °C, ≤95%RH				
	Protection level	IP20				

* X=F(WiFi),T(4G),G(2G),N(NB-IoT), choose only one

S3100



LINUX 2.6 OS
Low power consumption
Open serial protocol



APPLICATIONS



TECHNICAL SPECIFICATION

Model		S3100C16E2BJ	S3100C8E1BD	S3100C4E1BD	S3100C2E1BD
Kernal	CPU	400MHz ARM9			
	Memory	128MB SDRAM,128M NAND FLASH			
Uplink network interface	Quantity	2	1	1	1
	Type	10/100Mbps Ethernet			
	Protocol	Modbus-TCP			
Downlink serial interface	Quantity	16	8	4	2
	Type	RS-232/422/485 Serial Interface			
	Interface	RJ45			
	Protocol	Modbus-RTU、 power Statute etc.			
Serial port communication parameters	Baud rate	Most 921.6kbps			
	Parity	None,Even,Odd,Mark,Space			
	Data bits	5,6,7,8			
	Stop bit	1,1.5,2 bits			
		Flow control			
		RTS/CTS,XON/XOFF,None			
Power Supply		9-48VDC			
Power Consumption		Most 3.6W			
Working temperature		0~70°C			
Dimensions (mm)		483×226.7×44	200×121.01×54.1	102×184×27	89 ×121×27

ELECTRIC INTEGRATION OPERATION PLATFORM EIOP

EIOP Introduction

Concept

- With the help of existing computer and network technology, EIOP provides users with the business services such as intuitive real-time status monitoring, energy consumption data statistics and analysis and event management.
- Through the operation of EIOP, the user's overall level of energy management is improved, the workload of various types of staff in monitoring, management, inspection, operation and maintenance is reduced, the efficiency of human resource is improved, and the costs of energy management, operation and maintenance are reduced.
- Through scientific energy efficiency analysis, EIOP can identify key links of energy consumption, find out weak parts in energy efficiency and excavate energy-conservation potential, which facilitate formulating energy-saving programs and implementing energy-saving measures, in order to reduce energy costs.



Good expansibility

Extensible business system and system function module to meet users' customized needs



Convenient

Automatic generation of remote meter reading report and data comparison and analysis function



Safe

Perfect user management operation permission Settings and data backup



Reliable

Each business system operates independently



Advanced and efficient system docking

Support data docking with other third-party intelligent software system



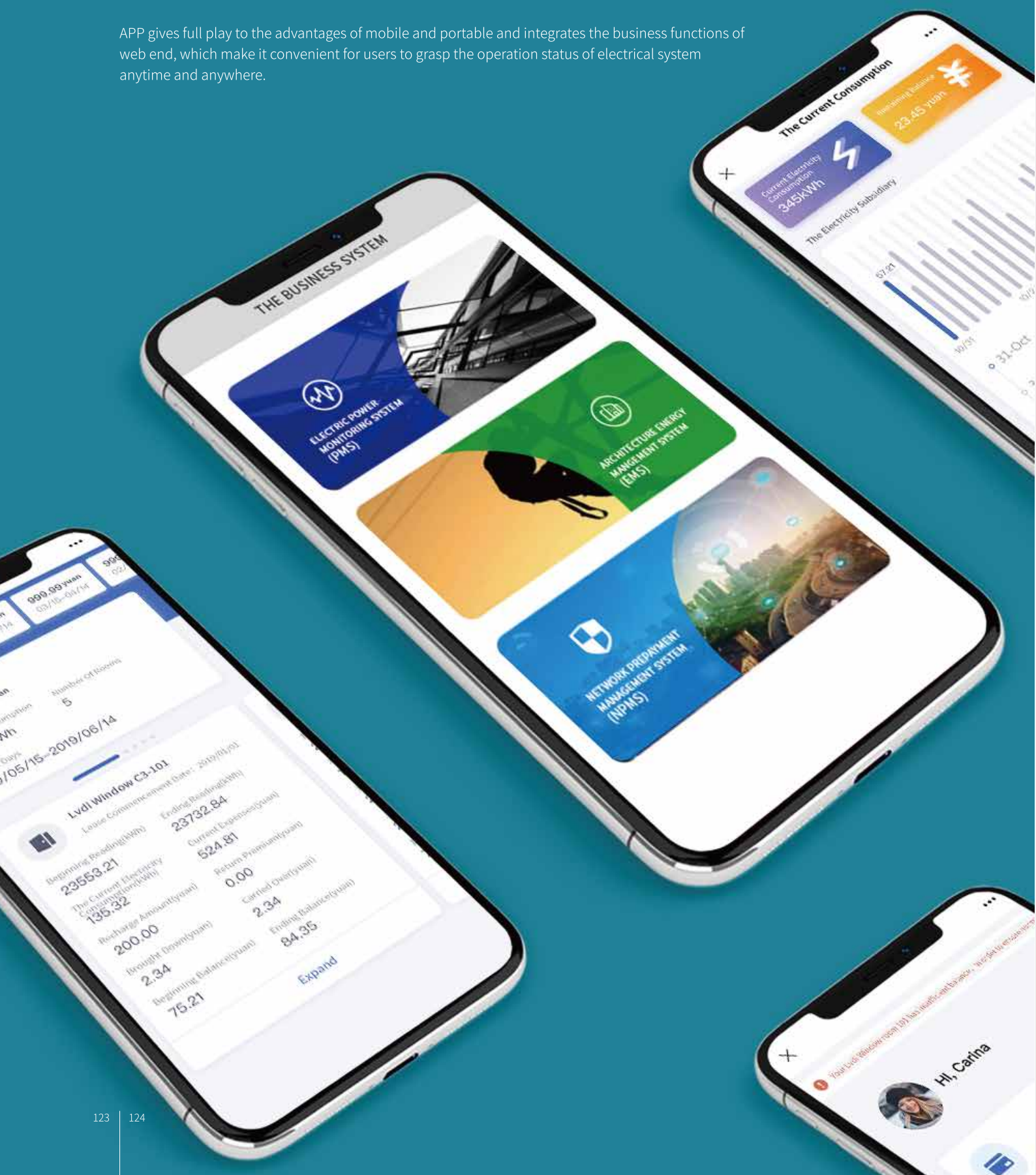
Convenient configuration

Convenient equipment configuration configuration design and project management



MOBILE EIOP

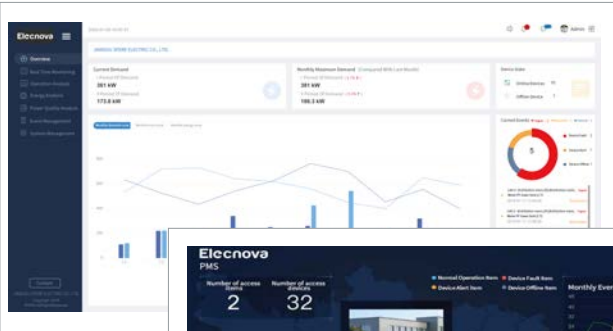
APP gives full play to the advantages of mobile and portable and integrates the business functions of web end, which make it convenient for users to grasp the operation status of electrical system anytime and anywhere.



PLATFORM FEATURE

Electric Power Monitoring System (PMS)

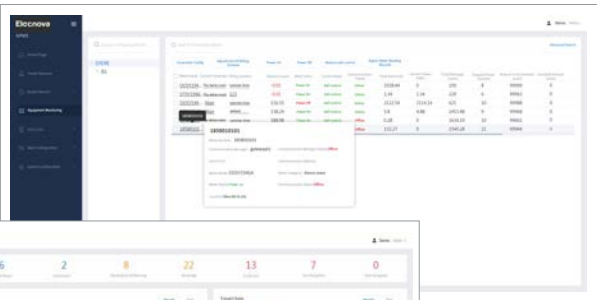
The power monitoring system (PMS) integrates various terminal hardware such as smart meters, integrated protection devices, smart circuit breakers, and temperature control meters through network communication equipment to achieve business functions such as data collection, remote control, event alarm, and data analysis, in order to improve the comprehensive management level of users' power distribution.



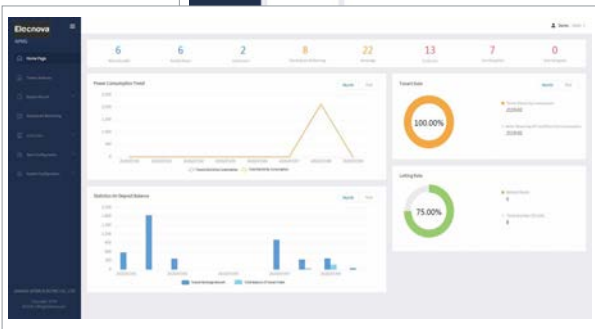
- Ensure the safety of the power distribution system
- Improve daily inspection efficiency
- Identify key control objects
- Reduce overall operating costs

Network Prepayment Management System (NPMS)

The network prepayment management system NPMS is based on smart meter technology, Internet technology, IT technology and communication technology. This system realizes online monitoring of energy consumption and property charging management with the help of terminal meters.



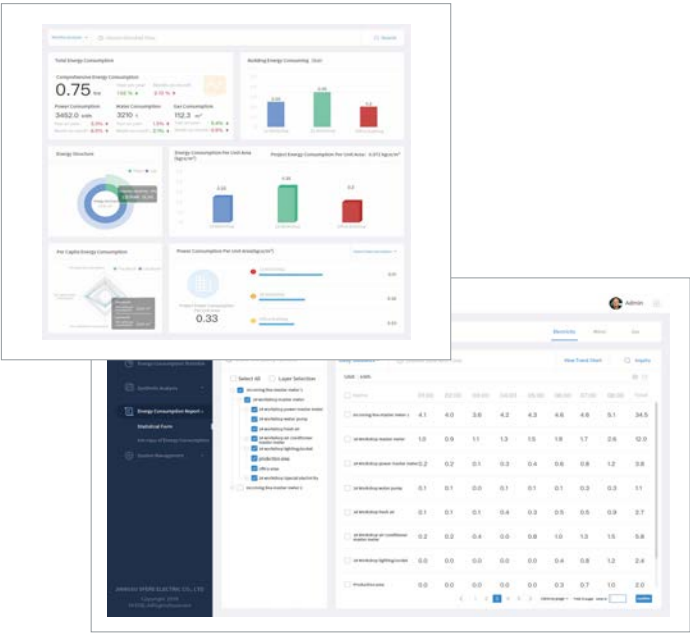
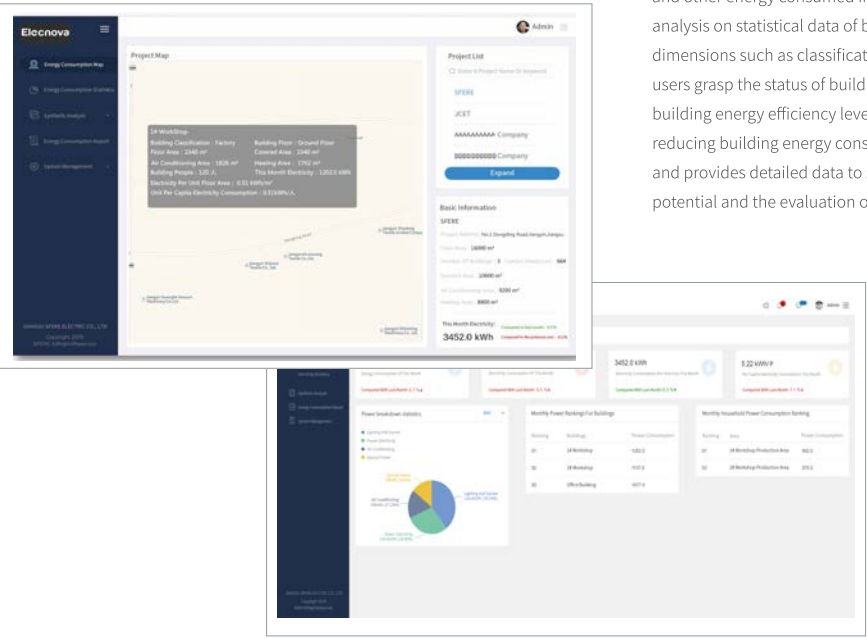
- Unified platform deployment
- Flexible billing scheme
- Tenant friendly
- Billing design
- Balance alert & Overdraft amount & Ensuring power supply on holidays
- Detailed report records



PLATFORM FEATURE

Architecture Energy Management System (EMS)

Architecture Energy Management System (EMS) takes the concept of networking, integration and intelligence as the design concept. It implements centralized monitoring, measurement and management of energy, water, gas and other energy consumed in buildings. It can perform dynamic trend analysis on statistical data of building energy consumption from various dimensions such as classification, item, partition and household so as to help users grasp the status of building energy consumption, analyze and judge building energy efficiency levels. It plays a role in improving energy efficiency, reducing building energy consumption and optimizing building energy use, and provides detailed data to support the excavation of energy-conservation potential and the evaluation of energy-saving benefit.



Architecture Energy Management System(EMS)

- Ensure the safety of the power distribution system
- Improve daily inspection efficiency
- Identify key control objects
- Reduce overall operating costs

MAIN PROJECTS

Nanyang Technological University

Russian Federal Grid Substation

Gwadar Port

Hong Kong-Zhuhai-Macao Bridge

ST Telemedia Data Center

Oasia Hotel Downtown

Raffles Medical Group

Keppel Data Center

LHN Building at New Industrial Road

Singapore Power Grid Data Center

Core Factory of LENS Technology

Production Line of Asia Cements

BCA Academy

King Power Duty Free

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