

POWER METERING AND MONITORING SOLUTIONS

www.sfere-electric.com

JIANGSU SFERE ELECTRIC CO., LTD.

SFERE



Sfere Electric is committed to building the top brand in the industry. Since our establishment, Sfere Electric has been adhering to a great attitude of down-to-earth, advancing with times and innovation, and striving for development with our hard work, dedication and wisdom. In the past decades, we have won a variety of honors and highly recognition from different sectors of Chinese society such as "High-tech Enterprise in Jiangsu Province", "Software Enterprise", "Excellent Private Technology Enterprise", "Engineering Center", "Famous Brand in Jiangsu Province", more than 80 invention patents and utility model patents, more than 20 software copyrights.

SFERE

**BRAND
STRENGTH**



R&D AND INNOVATION

Leading the industry trend and adhering to independent innovation, Sfere 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 post-doctoral researchers, successfully developed the first digital electric instrument in China with their expertise and entrepreneurial spirit 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 and powerful innovation capability, have laid a solid foundation for its leading position in the industry.

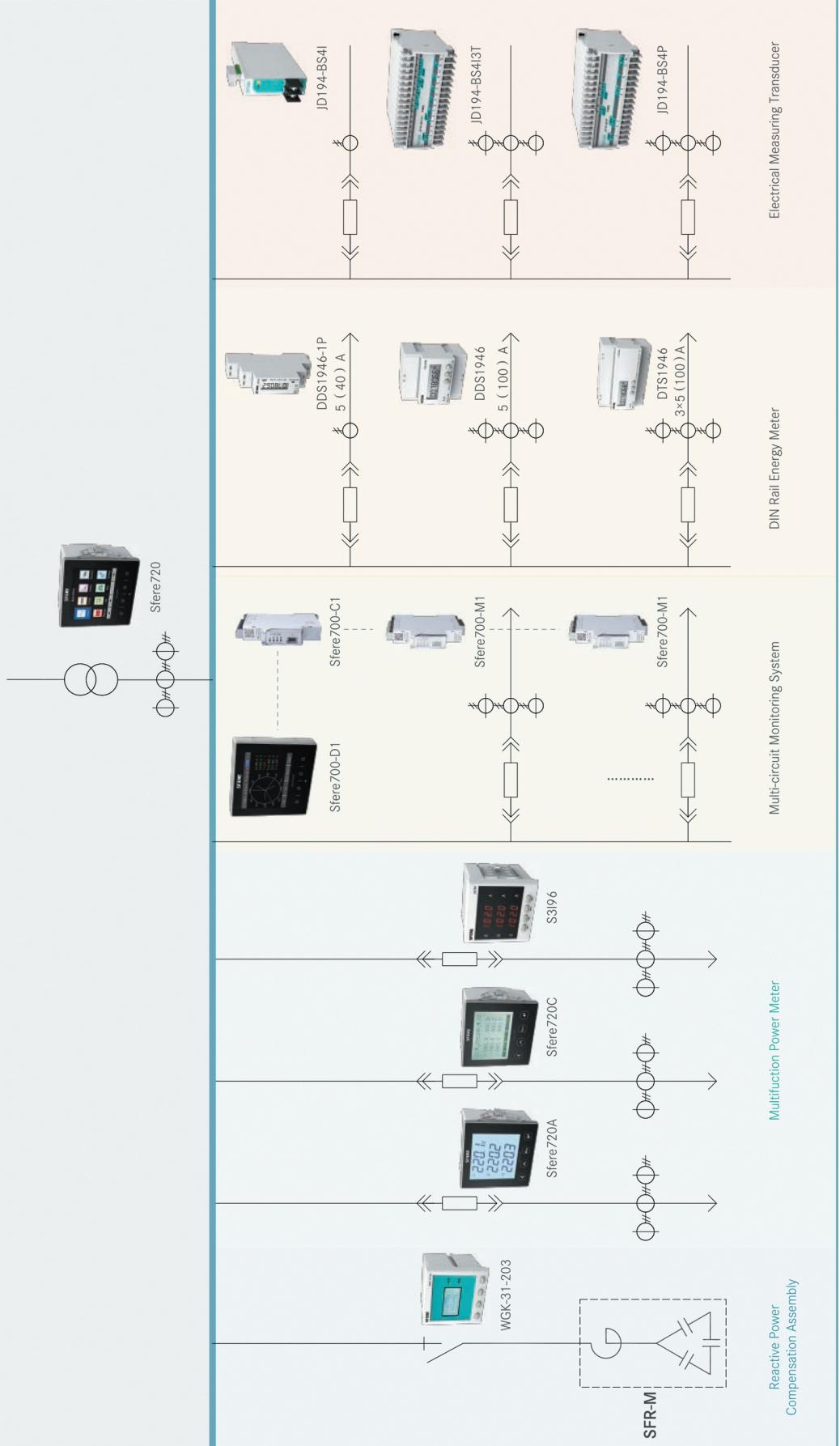
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WWW.ITTHIRITTECHNOLOGY.COM

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".



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



MULTI-FUNCTION POWER METER

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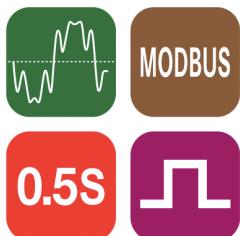



COMPARISON TABLE


Model	PD194Z-E20	Sfere720A	Sfere720B	Sfere720C	Sfere720
Appearance	Display mode	LCD	LCD	LCD	TFT
	Panel mounted	—	■	■	■
	DIN rail mounted	■	—	—	—
Accuracy	Active energy accuracy	0.5S	0.5S	0.5S	0.2S
	Reactive energy accuracy	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	■	—	—	■
	Bi-direction energy	■	■	■	■
Energy Metering	Four quadrant reactive energy	■	■	■	■
	Spare energy	—	—	■	■
	Tariff energy	■	—	■	■
	Fundamental energy	■	—	—	■
	THD	■	—	■	■
Power Quality	Harmonics V/A	1st-31st	—	1st-51st	1st-63rd
	Sequence component	■	—	■	■
	Unbalance	■	—	■	■
	Crest and K factor	■	—	■	■
	Flicker	—	—	—	■
Data Log	Transient	—	—	—	—
	Hour meter	■	■	■	■
	Demand/Max./Min. record	■	—	■	■
	Off-limit record	■	—	■	■
	SOE record	■	—	■	■
Input and Output	Memory	—	—	—	8MB
	Energy pulse output	■	■	■	■
	RS485 port(Modbus-RTU)	■	■	■	■
	2 AC digital inputs	—	—	■	■
Optional Module	2 relay outputs	—	—	■	■
	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(Modbus-TCP)	—	—	—	□
	FM8(Profibus-DP V0)	—	—	—	□
	FM11(RS485, Modbus-RTU)	—	—	—	□

NOTE: "■": Yes "—": No "□": Optional

PD194Z-E20



Harmonics
Modbus Interface
Energy Accuracy 0.5S
Pulse Output



FUNCTION

Networks

-TN, TT, IT networks

Communication

-Interface: RS485
-Protocol: Modbus-RTU

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-direction energy
-Four-quadrant reactive energy
-Tariff energy
-Fundamental energy



AREAS OF APPLICATION



Data
Acquisition



Energy
Management



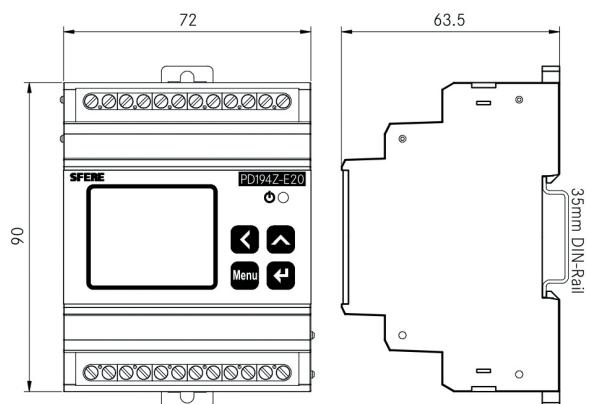
Remote Power
Monitoring

POWER MONITORING

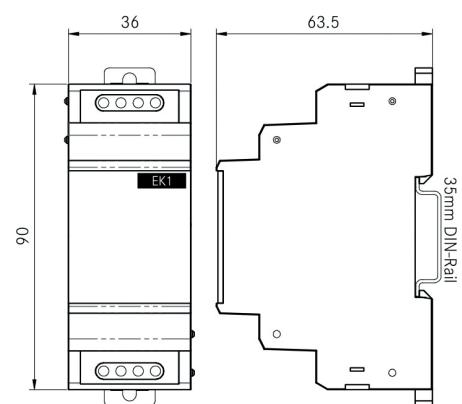


DIMENSIONS

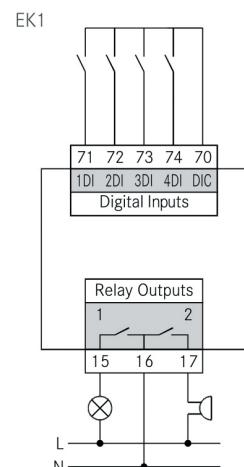
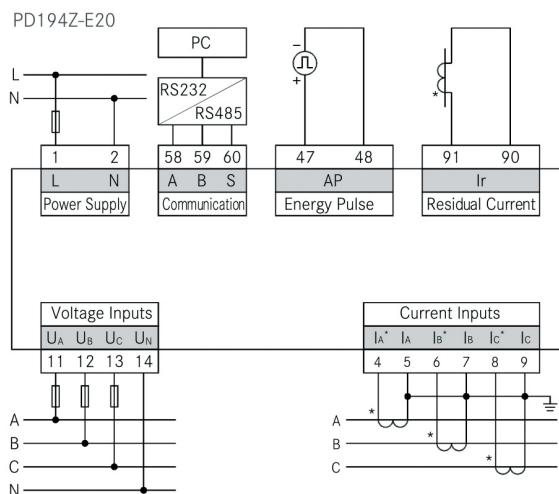
PD194Z-E20



EK1



TYPICAL WIRING



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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
		AC 1mA
Residual Current Input		
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
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

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)



POWER MONITORING



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

SFERE



AREAS OF APPLICATION



Data
Acquisition



Energy
Management



Remote Power
Monitoring



MAIN FEATURES

Measuring

-Demand -Max./Min. Value

Energy Metering

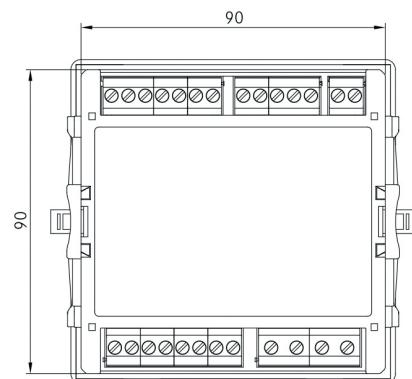
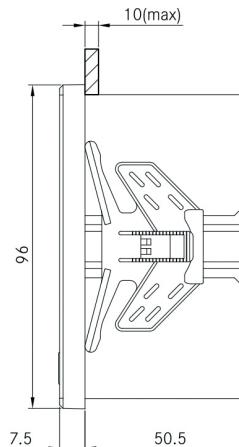
-Bi-direction energy
-Four quadrant reactive energy
-Tariff energy (Sfere720B)

Power Quality (Sfere720B)

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

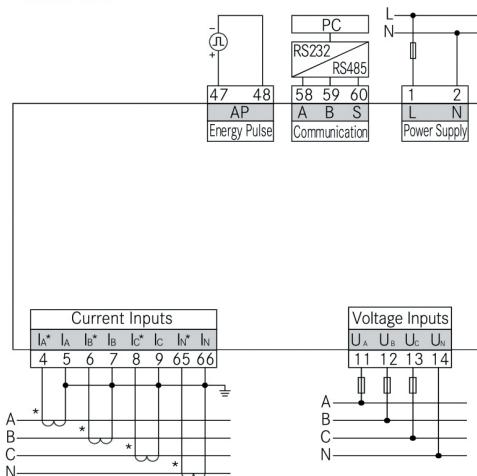


DIMENSIONS

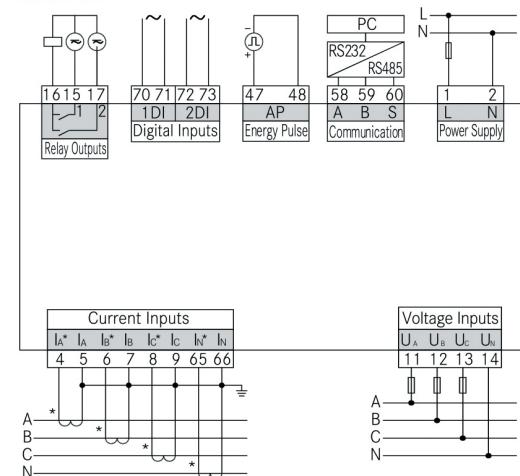


TYPICAL WIRING

Sfere720A



Sfere720B



SFERE



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
	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	

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) -FM11(RS485, Modbus-RTU)



AREAS OF APPLICATION



Data
Acquisition



Energy
Management



Remote Power
Monitoring

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

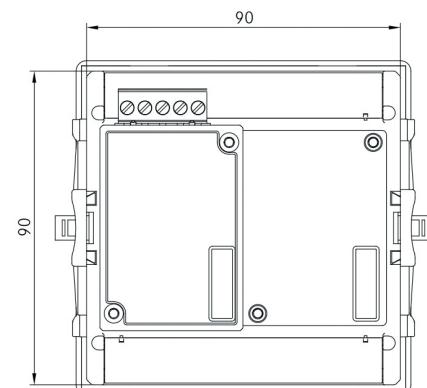
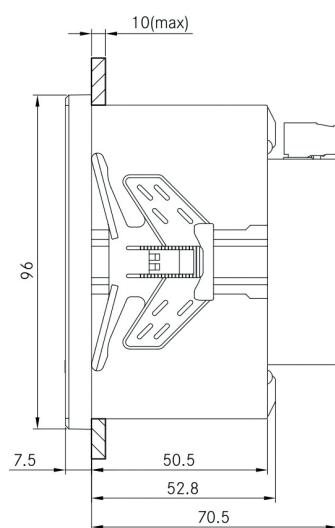
Energy Metering

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



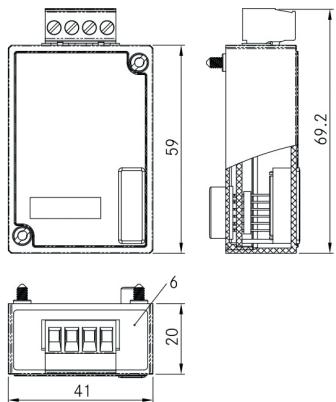
DIMENSIONS

Sfere720

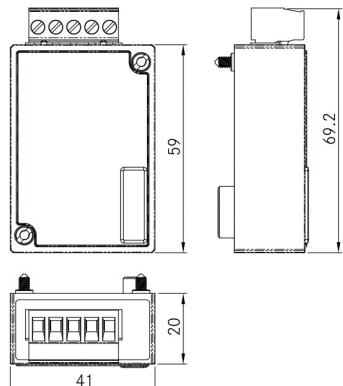


SFERE

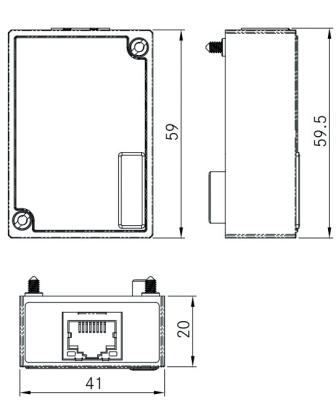
FM1/FM3/FM4/FM6/FM11



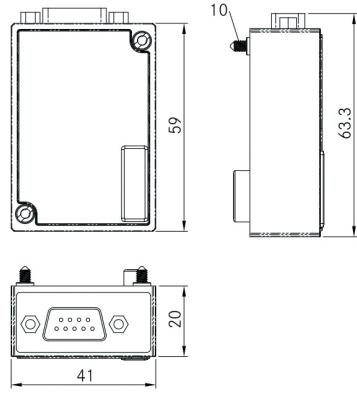
FM2/FM5



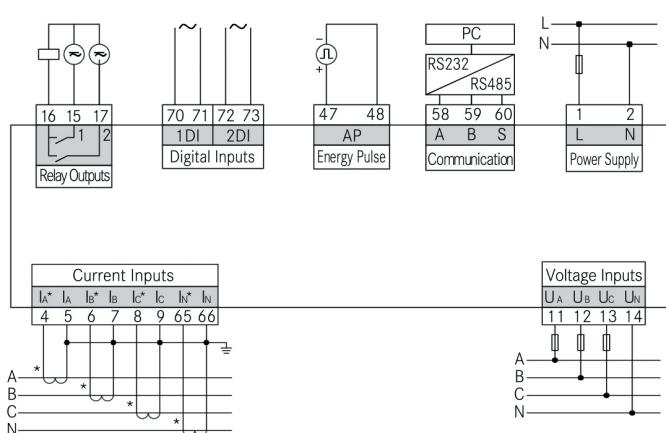
FM7



FM8



TYPICAL WIRING





TECHNICAL SPECIFICATION

Display Mode		Stere720C: 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
	Working range	AC 80~270V 50/60Hz, DC 100~350V
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 IP64, Rear IP20

MULTI-CIRCUIT MONITORING SYSTEM



FUNCTION

Multi-Circuit

-Up to 32 three-phase circuits

Cost Saving

-<20W (Measuring 32 circuits)

Power Quality

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

Accuracy

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

TFT

-TFT, 3.5", 320×240



Multi-circuit
Cost Saving
Harmonics
Energy Accuracy 0.5S
TFT





AREAS OF APPLICATION



Data
Acquisition



Energy
Management

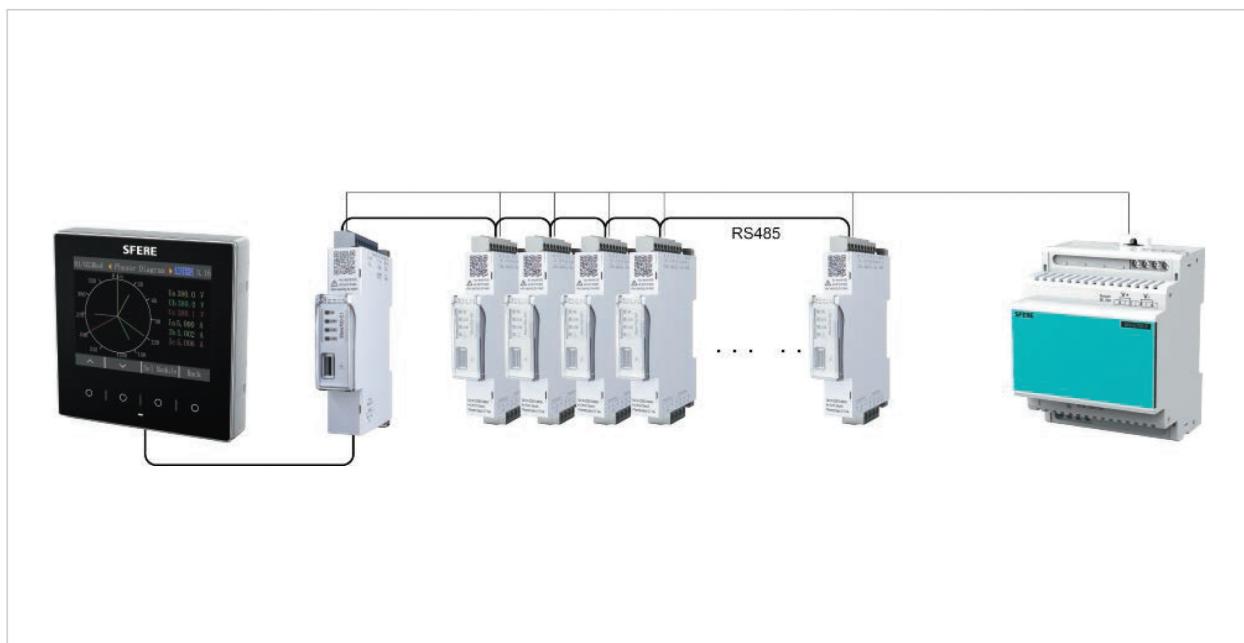


Remote Power
Monitoring

POWER MONITORING



PRODUCT COMPONENTS



Sfere700 SERIES

PRODUCTS LIST

One Display Module Sfere700-D1

One Power Supply Module Sfere700-P

Matched Current Transformers

One Communication Module Sfere700-C1

32 Monitoring Modules Sfere700-M At Most

Transfer Modules

Specialized Connection Lines

SFERE

Sfere700-M



High Accuracy Measurement
Compact Design
Plug Type Wiring Terminals
Safe 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

Safe Power Supply

-DC 24V, wiring safety

Automatic Networking

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

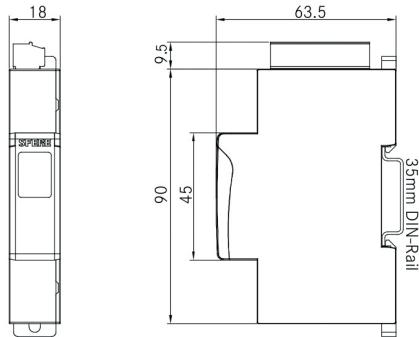

COMPARISON TABLE


Model	Sfere700-M1	Sfere700-M2	Sfere700-M3
V/A/F/P/Q/S/PF	■	■	■
Demand	■	■	■
Max./Min./Avg. Value	■	■	■
Fundamental V/A/P/Q/S/PF	—	—	■
±kWh/±kvarh/kVAh	■	■	■
Four Quadrants	■	■	■
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

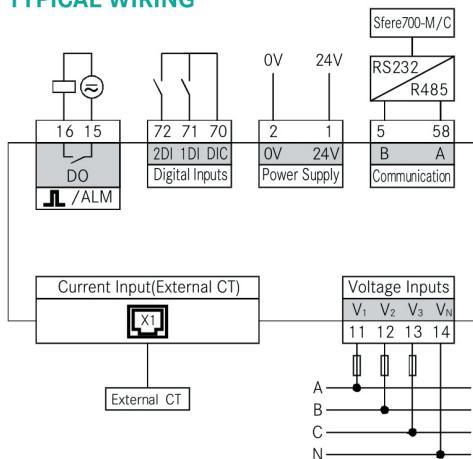
NOTE: "■": Yes "—" No



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
Safe Power Supply	Working range	DC: 24V±20%
	Consumption	≤0.5W
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



Display
Button
Breathing Light
Simple Installation
Compact Design
High IP
Safe Power Supply



POWER MONITORING

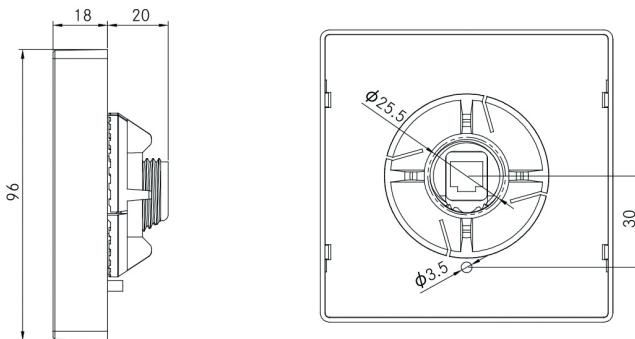


MAIN FEATURES

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

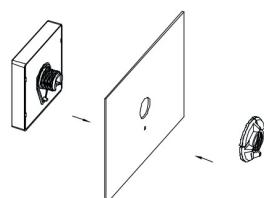
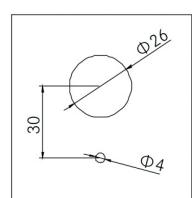


DIMENSIONS

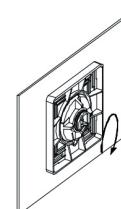
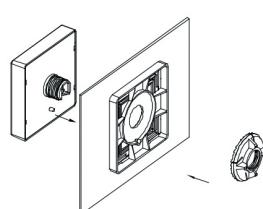
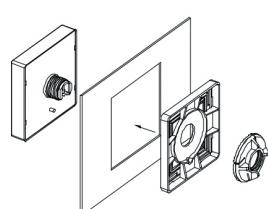


INSTALLATION

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



POWER MONITORING



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

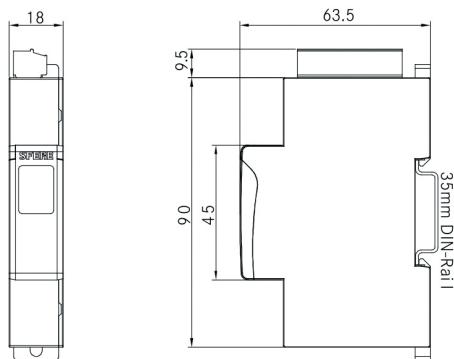
-Small occupied space

Safe Power Supply

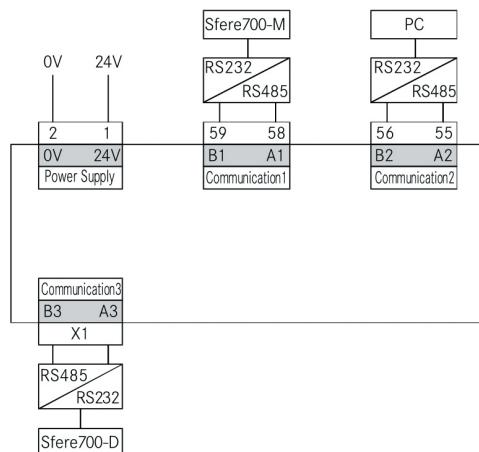
-DC 24V, wiring safety



DIMENSIONS



TYPICAL WIRING



TECHNICAL SPECIFICATION

Operating Temperature	-20 °C ~ 70 °C
Storage Temperature	-20 °C ~ 70 °C
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



POWER MONITORING



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°C ~ 70°C				
Storage Temperature	-40°C ~ 70°C				
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				
Storage Temperature	-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%
Lead Length	2m	2m	2m	2m
Operating Temperature	-20 °C ~ 70 °C			
Storage Temperature	-30 °C ~ 90 °C			
Diameter(mm)	65	95	95	95

SFERE700-P



DIN Rail Mounted
Safe Power Supply
Cable Length



POWER MONITORING



FUNCTION

DIN Rail Mounted

-Quick installation

Safe Power Supply

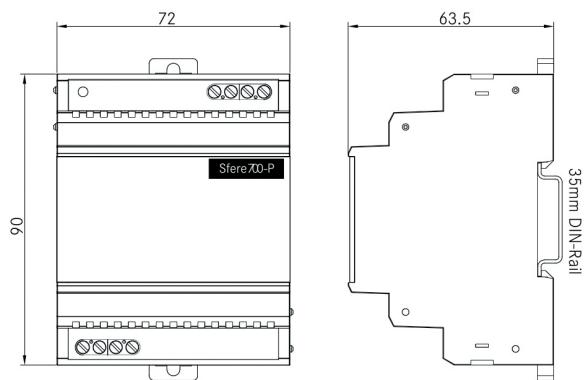
-DC 24V, wiring safety

Cable Length

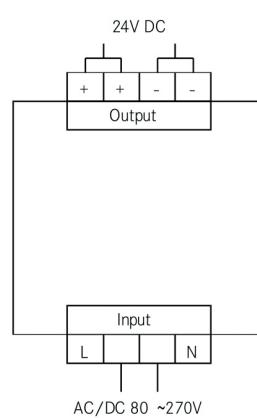
-Power supply cable length ≤100m



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

DIGITAL POWER METER



FUNCTION

Measuring Accuracy

- Voltage: 0.2%/0.5%
- Current: 0.2%/0.5%
- Overload: 2 times of rated value

Communication

- Interface: RS485
- Protocol: Modbus-RTU

Inputs and Outputs

- 2 digital inputs
- 2 relay outputs
- 1 analog output

POWER MONITORING



Modbus Interface
Accuracy 0.2%

Operating Temperature (-40 °C ~ 70 °C)




COMPARISON TABLE

Model	SI48	S3I48	SU48	S3U48	SI72	S3I72	SU72	S3U72	SI96	S3I96	SU96	S3U96
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)	—	—	—	—	□	□	□	□	□	□	□	□

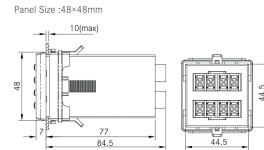
NOTE: ■: Yes, —: No, □: Optional

As for 48 type meter, only one function between communication and analog output can be selected.

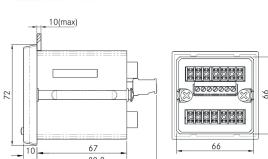
RECOMMENDED MODEL	
SU48-C	SI72-C
SI48-M	SU96-CM
SI72	S3U96-CMJK
S3U72-CMJK	...


MAIN FEATURES

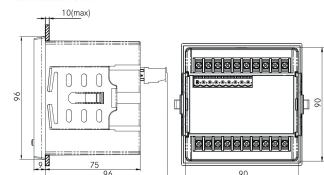
- User programmable
- High IP
- Wide range of operating temperature


DIMENSIONS


Panel Size : 72×72mm



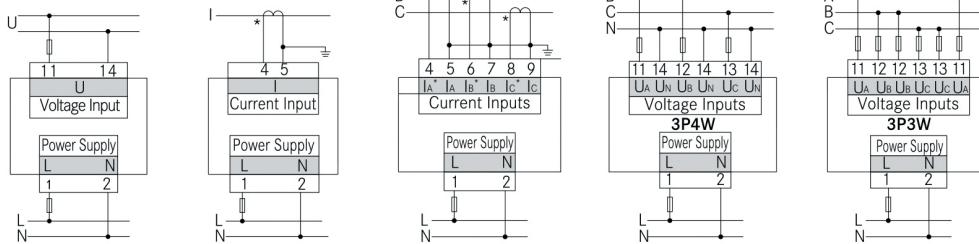
Panel Size : 96×96mm


AREAS OF APPLICATION

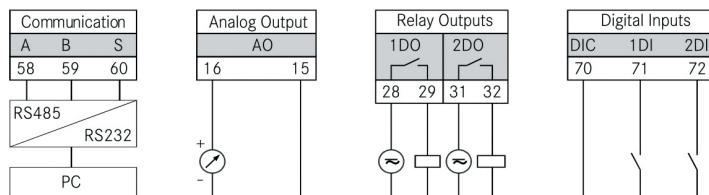
SFERE



TYPICAL WIRING



Optional



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	
Storage Temperature	-40 °C ~ 85 °C	
Relative Humidity	≤93%RH	
Insulation	≥2kVAC	
Altitude	≤2500m	

ELECTRICAL MEASURING TRANSDUCER



FUNCTION

Communication

-Interface: RS485 -Protocol: Modbus-RTU

Plug Type Wiring Terminals

-Quick installation

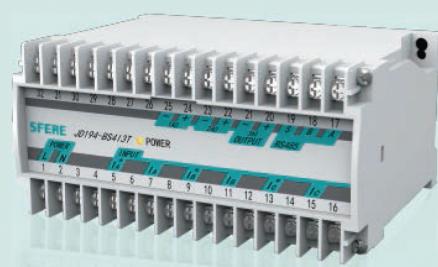
POWER MONITORING

MODBUS

0.5%



Modbus Interface
Accuracy 0.5%
Operating Temperature (-40 °C ~ 70 °C)





COMPARISON TABLE

Model	JD194-BS4I	JD194-BS4U	JD194-BS4H7	JD194-BS4F7	JD194-BS4I3T	JD194-BS4U3T	JD194-BS4P	JD194-BS4P-Y	JD194-BS4Q	JD194-BS4Q-Y
Current	1-phase	1-phase	3P3W	1-phase	3-phase	3P3W/3P4W	3P3W	3P4W	3P3W	3P4W
Voltage	—	—	—	—	—	—	—	—	—	—
Active Power	—	—	—	—	—	—	—	—	—	—
Reactive Power	—	—	—	—	—	—	—	—	—	—
Power Factor	—	—	—	—	—	—	—	—	—	—
Frequency	—	—	—	—	—	—	—	—	—	—
Analog Output	1	1	1	1	3	3	1	1	1	1
RS485	—	—	—	—	—	—	—	—	—	—

NOTE: ■ Yes, □ No



MAIN FEATURES

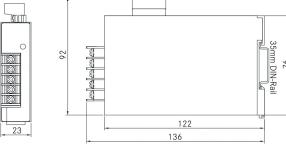
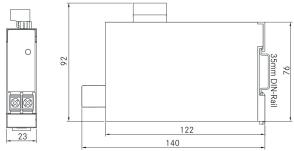
- Small size
- Wide range of operating temperature (-40°C ~ 70°C)



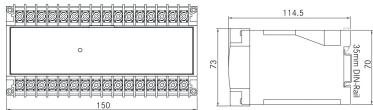
DIMENSIONS

JD194-BS4I//JD194-BS4U

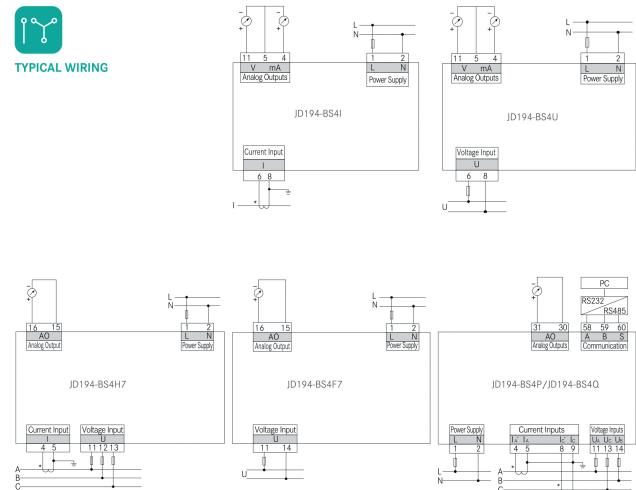
JD194-BS4H7//JD194-BS4F7



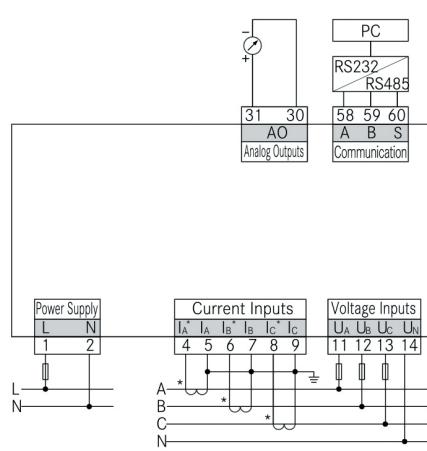
JD194-BS4I3T//JD194-BS4U3T//JD194-BS4P//JD194-BS4Q//JD194-BS4P-Y//JD194-BS4Q-Y



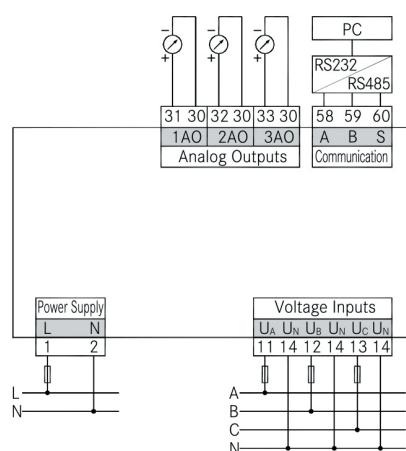
TYPICAL WIRING



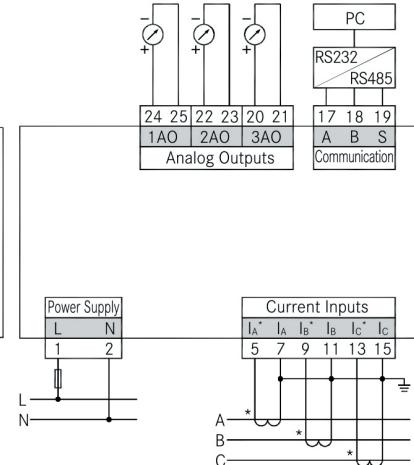
JD194-BS4P-Y/JD194-BS4Q-Y



JD194-BS4U3T



JD194-BS4I3T



TECHNICAL SPECIFICATION

Accuracy	0.5%	
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
Analog Output	DC 4~20mA, load≤350Ω DC 0~5V, load≥20kΩ	
Communication	RS485 port, Modbus-RTU, 2-wire, up to 9600bps	
Operating Temperature	-40 C ~ 70 C	
Storage Temperature	-40 C ~ 85 C	
Relative Humidity	≤93%RH	
Insulation	≥2kVAC	
Altitude	≤2500m	

MOTOR PROTECTION CONTROLLER

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POWER MONITORING




COMPARISON TABLE


Model		WDH-31-200	WDH-31-500
Control mode		—	8
Motor protection		9	16
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	—	□
	Profinet-DP	—	□
Real-time Clock	RTC	—	■
Digital Inputs	Dry contact input	—	12
	Wet contact input	—	□
Relay Outputs	Control relays	1	3
	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-31-200



Modbus Interface
Protection (9 Types)
Analog Output



POWER MONITORING



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)

ENERGY MANAGEMENT

DIN RAIL MOUNTED ENERGY METER

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4 Tariffs
Modbus-RTU
Pulse Output




AREAS OF APPLICATION

MAIN FEATURES

- | Measuring | Communication | Energy Metering |
|--------------------------------|--|--|
| -Direct measurement up to 100A | -Interface: RS485
-Protocol: Modbus-RTU | -Bi-direction energy
-Tariff energy |


COMPARISON TABLE


Model	DDS1946-1P	DDSF1946-1P	DDS1946-2P	DDSF1946-2P	DTS1946-4P	DTSF1946-4P
Wiring	1P2W	■	■	■	■	—
	3P3W	—	—	—	—	—
	3P4W	—	—	—	■	■
Voltage	230V	■	■	■	■	—
	3×400V	—	—	—	—	—
	3×230/400V	—	—	—	■	■
Current	Direct	5(40)A	5(40)A	5(100)A	5(100)A	5(100)A
	Via CT	—	—	—	—	—
Measuring	Voltage	■	■	■	■	■
	Current	■	■	■	■	■
	Power	■	■	■	■	■
	Power factor	■	■	■	■	■
	Frequency	■	■	■	■	■
Energy Metering	±kWh	■	■	■	■	■
	Tariffs	—	■	—	—	■
Width(mm)	18	18	36	36	72	72
Communication (Modbus-RTU)	■	■	■	■	■	■
Energy Pulse	■	■	■	■	■	■
Display Mode	LCD	LCD	LCD	LCD	LCD	LCD

NOTE: "■": Yes "—" No "□": Optional


COMPARISON TABLE

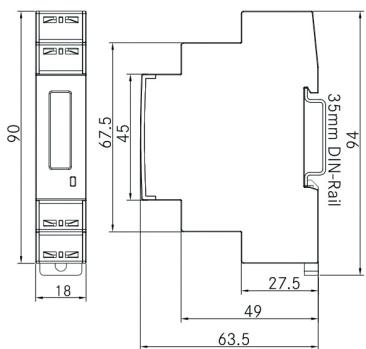

Model	DDS1946	DDSF1946	DSS1946	DSSF1946	DTS1946	DTSF1946
Wiring	1P2W	■	■	—	—	—
	3P3W	—	—	■	■	—
	3P4W	—	—	—	■	■
Voltage	230V	■	■	—	—	—
	3×400V	—	—	■	■	—
	3×230/400V	—	—	—	■	■
Current	Direct	5(100)A	5(100)A	5(100)A	5(100)A	5(100)A
	Via CT	1.5(6)A	1.5(6)A	1.5(6)A	1.5(6)A	1.5(6)A
Measuring	Voltage	■	■	■	■	■
	Current	■	■	■	■	■
	Power	■	■	■	■	■
	Power factor	■	■	■	■	■
	Frequency	■	■	■	■	■
Energy Metering	±kWh	■	■	■	■	■
	Tariffs	—	■	—	■	■
Width(mm)	72	72	126	126	126	126
Communication (Modbus-RTU)	■	■	■	■	■	■
Energy Pulse	■	■	■	■	■	■
Display Mode	LCD	LCD	LCD	LCD	LCD	LCD

NOTE: "■": Yes "—": No "□": Optional

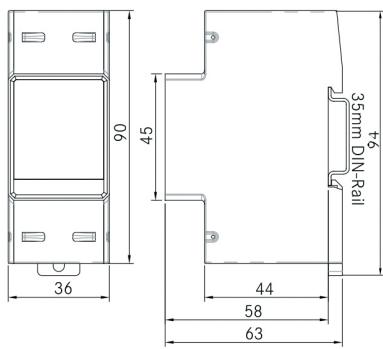


DIMENSIONS

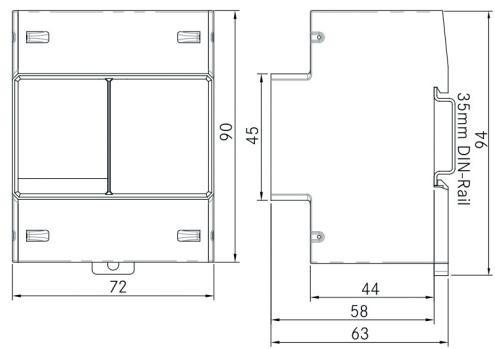
DDS1946-1P/DDSF1946-1P



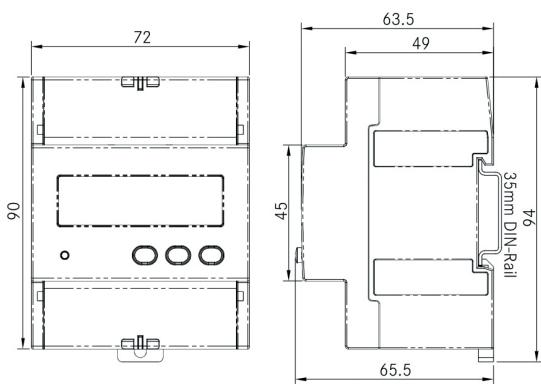
DDS1946-2P/DDSF1946-2P



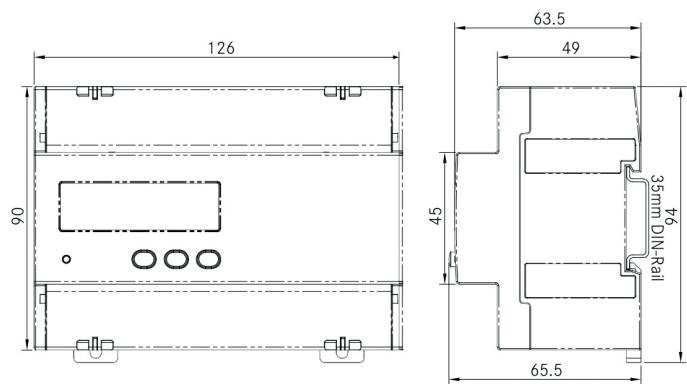
DTS1946-4P/DTSF1946-4P



DDS1946/DDSF1946



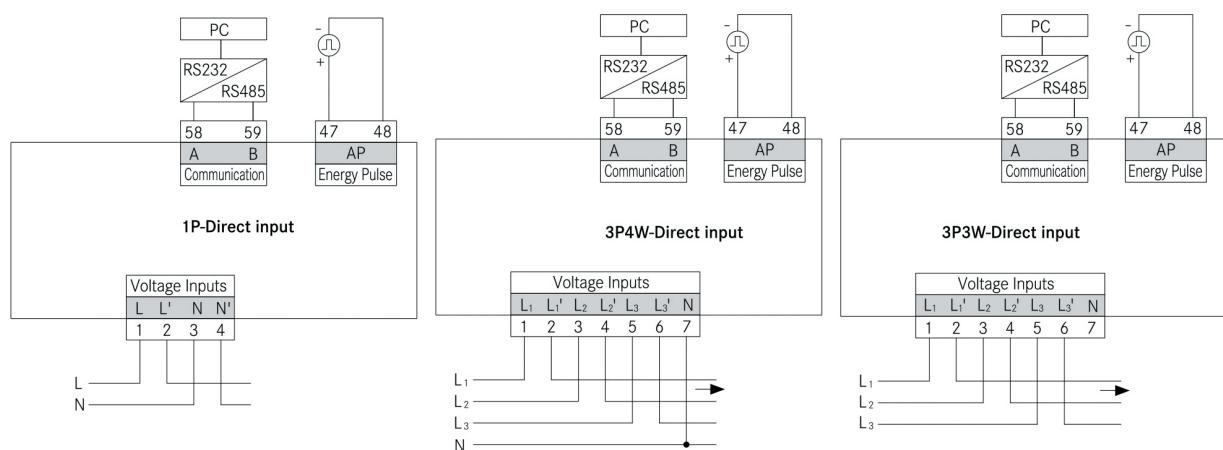
DSS1946/DSSF1946/DTS1946/DTSF1946



ENERGY MANAGEMENT



TYPICAL WIRING



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TECHNICAL SPECIFICATION

	DDS1946-1P DDSF1946-1P	DDS1946 DDSF1946	DSS1946 DSSF1946	DTS1946-4P DTSF1946-4P	DTS1946 DTSF1946				
Normal Voltage	230V	230V	3×400V	3×230/400V	3×230/400V				
Current	Direct input	5(40)A	5(100)A	5(100)A	5(100)A				
	Via CT input	-	1.5(6)A	1.5(6)A	1.5(6)A				
Accuracy	Class 1 (Optional: Class 0.5S)								
Frequency	45Hz~65 Hz								
Voltage Range	0.8Un~1.2Un								
Start Current	Direct input	0.004In							
	Via CT input	0.002In							
Consumption	< 2VA								
Energy Pulse	1 output, pulse width (80±20%) ms								
RTC Error	≤0.5s/d								
Communication	RS485, Modbus-RTU, 2-wire, up to 9600bps								
IP Degree	Front: IP51								
Operating Temperature	-10 °C ~55 °C								
Storage Temperature	-25 °C ~70 °C								
Relative Humidity	≤93%								

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