

SE -
1 2 3 4 5 6

1. Product code
2. Input Signal Mode
48--48X48 72--72X72
96--96X96 94--96X48
3. Function Mode
I--current U--voltage P--active power
Q--reactive power H--power factor
F--frequency E--multifunctional energy power monitoring meter
4. Outline Mode
4--48X48 5--96X48 7--72X72
9--96X96
5. X--digital panel meter
D--intelligent transmission meter
K--intelligent programmable meter
S--intelligent programmable alarm meter
6. 1--digital display 4- triple digital display 7-- Dual digital display



SE96I-9X1



SE72U-7X1

Specification:

The instruments comply with IEC51

Over load

The instruments are designed to withstand 1.2 times rated current and voltage for 2 hours, Ammeters are also designed for 10 times rated current and voltmeters and frequency meters for 2 times rated voltage for 0.5 seconds

Dielectric Test:

All meters are designed to 2kv AC RMS for 1 minute

Environment:

The meters are suitable to work between -10°C to 60°C with relative humidity upto 90% these meters can be calibrated at other temperatures if required on request

Damping time :

less than 3 seconds

Mounting Clamps:

Mounting clamps are provided to fix the meter flush type on panel

Size/Type	Hatch Size
48mm sq.	44mm
72mm sq.	66mm
96 mm sq.	90mm
96x48 mm	91x45mm

Ammeters & Voltmeters

Single Phase Digital AC/DC Ammeters				
Model	SE48I-4X1	SE72I-7X1	SE94I-5X1	SE96I-9X1
Size	48x48mm	72x72mm	96x48mm	96x96mm
Display	3 1/2 Digit, Red LED Display			
Accuracy	Class 1.0 & Class 0.5			
Auxiliary Supply	110V, 220V(50/60Hz), 24VDC			
Standard	IEC51			
Range	For AC meter, CT operated, secondary 5A or 1A for DC meters ,Shunt(75mV) operated			
Consumption	<1.8VA			
Signal Consumption	<0.3VA			
Protection	IP20			
Operation temperature	-10°C to +60°C			
Test voltage	2kV			

Single Phase Digital AC/DC Voltmeters				
Model	SE48U-4X1	SE72U-7X1	SE94U-5X1	SE96U-9X1
Size	48x48mm	72x72mm	96x48mm	96x96mm
Display	3 1/2 Digit, Red LED Display			
Accuracy	Class 1.0 & Class 0.5			
Auxiliary Supply	AC 110V,220 (50/60Hz), 24VDC			
Standard	IEC51			
Range	500V or PT Operated-/110V			
Consumption	<1.8VA			
Signal Consumption	<0.3VA			
Protection	IP20			
Operation temperature	-10°C to +60°C			
Test voltage	2kV			

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SE96I-9X4



SE96I-9K4

	Three Phase Digital AC Ammeters		Three Phase Digital AC Voltmeters	
Model	SE96I-9X4	SE72I-7x4	SE964U-9X4	SE72U-7x4
Size	96x96mm	72x72mm	96x96mm	72x72mm
Display	3 1/2 Digit, Red LED Display		3 1/2 Digit, Red LED Display	
Accuracy	Class 1.0 & Class 0.5		Class 1.0 & Class 0.5	
Auxiliary Supply	AC 110V, 220V(50/60Hz), 24VDC		AC110V, 220V(50/60Hz), 24VDC	
Standard	IEC51		IEC51	
Range	CT Operated, Secondary 5A or 1A		500V or PT Operated-/110V	
Consumption	<1.8VA		<1.8VA	
Signal Consumption	<0.3VA		<0.3VA	
Protection	IP20		IP20	
Operation temperature	-10°C to +60°C		-10°C to +60°C	
Test voltage	2kV		2kV	

	Three Phase Digital AC Ammeters		Three Phase Digital AC Voltmeters	
Model	SE96I-9K4	SE72I-7K4	SE96U-9K4	SE72U-7K4
Size	96x96mm	72x72mm	96x96mm	72x72mm
Display	3 1/2 Digit, Red LED Display		3 1/2 Digit, Red LED Display	
Accuracy	Class 1.0 & Class 0.5		Class 1.0 & Class 0.5	
Auxiliary Supply	AC 110V, 220V(50/60Hz), 24VDC		AC110V, 220V(50/60Hz), 24VDC	
Standard	IEC51		IEC51	
Range	20A or Ratio of CT is random setting, RS485 port is selectable		440V or Ratio of PT is random setting, RS485 port is selectable	
Consumption	<1.8VA		<1.8VA	
Signal Consumption	<0.3VA		<0.3VA	
Protection	IP20		IP20	
Operation temperature	-10°C to +60°C		-10°C to +60°C	
Test voltage	2kV		2kV	

Analog Panel Meters



SE96F-9X4



SE96IVHZ-9K4



SE72F-7X1

A, V, Hz Meter

	Three Display with 3 Parameters, Single Phase AC Ammeter, Voltmeter, Voltmeter & Frequency Meter	
Model	SE72F-7X4	SE96F-9X4
Size	72x72mm	96x96mm
Display	3 1/2 Digit, Red LED Display	
Accuracy	Class 0.5	
Auxiliary Supply	AC110V, 220V (50/60Hz),24VDC	
Standard	IEC51	
Range	600V or PT Operated -/110V, 20A or CT Operated -/5A or -/1A Frequency 30-999.9 Hz	
Consumption	<1.8VA	
Signal Consumption	<0.3VA	
Protection	IP20	
Operation temperature	-10°C to +60°C	
Test voltage	2kV	

	Three Display with 3 Parameters, Single Phase AC Ammeter, Voltmeter, Voltmeter & Frequency Meter	
Model	SE72IVHZ-7K4	SE96IVHZ-9K4
Size	72x72mm	96x96mm
Display	3 1/2 Digit, Red LED Display	
Accuracy	Class 0.5	
Auxiliary Supply	AC110V, 220V (50/60Hz),24VDC	
Standard	IEC51	
Range	440V, 20A or Ratio of CT&PT is random setting, RS485 port is selectable	
Consumption	<1.8VA	
Signal Consumption	<0.3VA	
Protection	IP20	
Operation temperature	-10°C to +60°C	
Test voltage	2kV	

Digital frequency meter

Model	SE48F-4X1	SE94F-5X1	SE72F-7X1	SE96F-9X1
Size	48x48mm	96x48mm	72x72mm	96x96mm
Display	4 Digit, Red LED Display			
Accuracy	Class 0.1			
Auxiliary Supply	AC110V, 220V (50/60Hz),24VDC			
Standard	IEC51			
Range	up to 600V, 0-999.9Hz			
Consumption	<1.8VA			
Signal Consumption	<0.3VA			
Protection	IP20			
Operation temperature	-10°C to +60°C			
Test voltage	2kV			



SE96P-9X1



SE96P-9K1



SE96H-9X1

Digital power meters

	1Phase, 1Wire & 3Phase, 3Wire & 3 Phase, 4 Wire, 3 Element type KW, MW Meters		
Model	SE94P1-5X1 SE94P-5X1 SE94Q-5X1	SE72P1-7X1 SE72P-7X1 SE72Q-7X1	SE96P1-9X1 SE96P-9X1 SE96Q-9X1
Size	96x48mm	72x72mm	96x96mm
Display	4 Digit, Red LED Display		
Accuracy	Class 0.5		
Auxiliary Supply	AC110V, 220V (50/60Hz), 24VDC		
Standard	IEC51		
Range	440V or PT Operated -/110V, Current CT Operated -/5A or -/1A		
Consumption	<1.8VA		
Signal Consumption	<0.3VA		
Protection	IP20		
Operation temperature	-10°C to +60°C		
Test voltage	2kV		

Programmable digital power meters

	1Phase, 1Wire & 3Phase, 3Wire & 3 Phase, 4 Wire, 3 Element type KW, MW Meters		
Model	SE94P1-5K1 SE94P-5K1 SE94Q-5K1	SE72P1-7K1 SE72P-7K1 SE72Q-7K1	SE96P1-9K1 SE96P-9K1 SE96Q-9K1
Size	96x48mm	72x72mm	96x96mm
Display	4 Digit, Red LED Display		
Accuracy	Class 0.5		
Auxiliary Supply	AC110V, 220V (50/60Hz), 24VDC		
Standard	IEC51		
Range	440V or PT Operated -/110V, Current CT Operated -/5A or -/1A		
Consumption	<1.8VA		
Signal Consumption	<0.3VA		
Protection	IP20		
Operation temperature	-10°C to +60°C		
Test voltage	2kV		

Note: display ratio can be setted at will, with 4-20mA analog output or RS485 port

Digital power factor meters

Model	SE94H-5X1	SE72H-7X1	SE96H-9X1
Size	96x48mm	72x72mm	96x96mm
Display	4 Digit, Red LED Display		
Accuracy	Class 0.5		
Auxiliary Supply	AC110V, 220V (50/60Hz), 24VDC		
Standard	IEC51		
Range	440V or PT Operated -/110V, Current CT Operated -/5A or -/1A		
Consumption	<1.8VA		
Signal Consumption	<0.3VA		
Protection	IP20		
Operation temperature	-10°C to +60°C		
Test voltage	2kV		



SE-T45U-TX1



SE-T45F-TX1

Din Rail Digital Panel Meters

	Digital AC/DC Ammeters	Digital AC/DC Voltmeters
Model	SE-T45I-TX1	SE-T45U-TX1
Size	85x42mm	85x42mm
Display	3 1/2 Digit, Red LED Display	3 1/2 Digit, Red LED Display
Accuracy	Class 1.0 & Class 0.5	Class 1.0 & Class 0.5
Auxiliary Supply	110V, 220V(50/60Hz),24VDC	AC 110V,220 (50/60Hz),24VDC
Standard	IEC51	IEC51
Range	For AC meter, CT operated, secondary 5A or 1A for DC meters ,Shunt(75mV) operated	500V or PT Operated-/110V
Consumption	<1.8VA	<1.8VA
Signal Consumption	<0.3VA	<0.3VA
Protection	IP20	IP20
Operation temperature	-10°C to +60°C	-10°C to +60°C
Test voltage	2kV	2kV

Din Rail Digital Frequency Meters

	Digital Frequency Meters
Model	SE-T45F-TX1
Size	85x42mm
Display	3 1/2 Digit, Red LED Display
Accuracy	Class 1.0 & Class 0.5
Auxiliary Supply	110V, 220V(50/60Hz),24VDC
Standard	IEC51
Range	30.0-999.9HZ
Consumption	<1.8VA
Signal Consumption	<0.3VA
Protection	IP20
Operation temperature	-10°C to +60°C
Test voltage	2kV

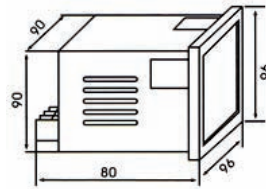
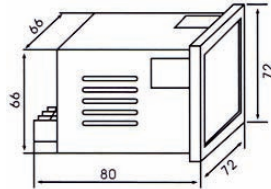


SE72E1-7S4

Single-phase Multifunction Electric Power Monitoring Meter

	1P1L(single phase single wire)	
Model	SE72E1-7S4	SE96E1-9S4
Size	72x72mm	96x96mm
Measuring Parameters	Single phase volt, current, power, energy, power factor, frequency	Single phase volt, current, power, energy, power factor, frequency
Display	3-Row-4-Digit, Red LED Display	
Accuracy	Class 0.5	
Auxiliary Supply	AC110V, 220V (50/60Hz),24VDC	
Standard	IEC51	
Range	CT & PT is random setting, with RS485 communication port	
Consumption	<1.8VA	
Signal Consumption	<0.3VA	
Protection	IP20	
Operation temperature	-10°C to +60°C	
Test voltage	2kV	

Dimension



Digital Panel Meter



EN 9610

EN 9620

EN 9630

Multifunction Electric Power Monitoring Meter

General instruction of function

Multifunctional electric energy monitor meter is designed on the base of the advanced technology from the same imported products and according to the power apparatus operation and the computer intelligent monitor requirement.

This product is an integrative electric energy monitor meter systemed from current meter, voltmeter, wattmeter and electric meter, RS485 communication interface connects the meter with the computer network of monitor center, It's a high performance & automatic meter which is applied to industrial automation and modern power supply and distribution system,

This meter is specially used for electric energy parameter collect of 50/60 Hz power supply system. It can measure & display three phase voltage, three phase current, active power, reactive power, power factor, active energy (accumulating), reactive energy (accumulating) and frequency.

Main technical standards

Model	3P3L(three phase three wire) or 3P4L (three phase four wire)		
	EN9610	EN9620	EN9630
Measuring parameters	3-phase current, active energy & reactive energy	3-phase volt, current, active & reactive power, power factor, frequency, active & reactive energy	3-phase volt, current
Signal input			
Current	rated input current AC:1A, 5A		
Voltage	0.5 %		
Allowed over range	instantaneous	AC110V, 220V (50/60Hz)	
	continuous	1.2 times	
Serial communication	RS484 serial interface, Modbus protocol, RTU format, communication baud rate 4800,9600 available		
Measurement range and precision			
Current	0-5A 0.5%		
Voltage	0-450V 0.5%		
Active power	0~9999.999999 MW 0.5%		
Eactive power	0~9999.999999 Mvar 0.5%		
Power factor	0~1.000 0.5%		
Frequency:	45-60Hz ±0.1Hz		
Active energy (electrical degree accumulating and display)	0~9999.999999 kWh 0.5%		
Reactive energy (electrical degree accumulating and display)	0~9999.999999 kWh 0.5%		
Anti-jamming performance (magnetic compatibility)			
Fast instantaneous impulse train	GB/T17626.4 -1998 III grade		
Static discharge	GB/T17626.2-1998 III grade		
Voltage temporal lower, stop and changes	GB/TD626.11-1999 III grade		
Surge impact	GB/T17626.5-1999 III grade		
Insulating strength	IEC 6025-52 KVrms-1min		
Environment endurance			
Operating IEC 60068-1 &2	0℃~+55℃		
Stocking IEC 60068-1&2	-25℃~+70℃		
Damp heat IEC 60068-1-3	93%RH 40℃		
Application	non corrosive gas and metal powder, altitude <3000m		

GR 48 - 3 □ □ □

1 2 3 4 5 6

1. GREGOO
2. Outlinedimension fo analog panel meter
3. Appearance code:3 ; 6;
4. Input signal: A: AC
D:DC
5. Function code: A: current
V: voltage
F:frequency
PF:power factor
AP:active power
RP:reactive power
6. 1: 1 phase 1 wire
3: 3 phase 3 wire
4: 3 phase 4 wire



GR72-6DA



GR72-3DV



GR72-6AF



GR96-3AF

Moving coil meters

The moving coil meters are used for measurement and continuous indication of DC Current & voltage. The meters above 20A are used with external shunts. The rectifier type moving coil meters can be used for A.C Measurements.

Technical characteristics

Model	GR48-3DA,GR72-3DA,GR96-3DA,GR48-3DV,GR72-3DV,GR96-3DV,GR48-6DA,GR72-6DA,GR96-6DA,GR48-6DV,GR72-6DV,GR96-6DV,		
Format(mmxmm)	48x48,72x72 & 96x96		
Input	DC Current or AC rectifier current DC Voltage or AC rectifier voltage		
Precision	Ammeter class 1.5 and Voltmeter class 1.0 for 96x96 and class 1.5 for 72x72 class 2.5 for all rectifier type meter.		
Projection	IP52		
Range/Scale		DC	AC Rectifier
	Microammeter	uA	100 to 1000
	Milliammeter	mA	1 to 1000
	Ammeter	A	1 to 30 & above 30A with external shunt upto 15000A
	Millivoltmeter	mV	50 to 1000
Voltmeter		10 to 600v	10 to 600V
Impedance/ Sensitivity	200 ohms/ V and 1000 ohms/V for Voltmeter and 75 mV OR 60 mV or 100mV for Ammeter with External shunt		
Frequency	50Hz		
High voltage test	2kV for one minute		
Scale	90°		
Type of movement	Moving coil with core magnet system spring loaded jewel bearing and spring controlled.		
Overload limit	1.2 times		
Environment	-10°C-60°C		
Option	Centre zero meters can be supplied		
Speciality	<ul style="list-style-type: none"> ■ Meters with external resistance box upto 1000V can be supplied ■ Speed indicators calibrators calibrated to any DC or AC rectifier current or voltage can be given. 		
Shunts for meters above 20A	The shunts are made of brass/gun metal blocks and managanin wire. These are used to extent range of DC ammeter above 20A.		

Frequency meters

Frequency meters are vibrating reed type to indicate continuously accurate frequency of the system.

Technical characteristics

Model	GR48-3AF,GR72-3AF,GR96-3AF, GR48-6AF,GR72-6AF,GR96-6AF
Format (mmxmm)	48x48, 72x72, 96x96,
Input	A.C. Voltage
Accuracy	2.5%
Protection	IP52
Range & Scales	45-55Hz, 47-53Hz, 57-63Hz
Voltage range	110V to 440V
Burden	2.5VA at 250V
HV Test	2kV for one minute
Environment	-10°C to 60°C
Options	<ul style="list-style-type: none"> ■ Multirange 110/220/415V & 110/240/440 meters are also available ■ Double reed meters can be supplied in 144mm square type.

Analog Panel Meters

Moving iron meters

The Moving Iron Meters are designed to measure and indicate continuously A.C Current or A.C Voltage. Interchangeable dials are provided for C.T Operated meters to give different scale.

Technical characteristics

	Ammeter	Voltmeter
Model	GR48-3AA,GR72-3AA,GR96-3AA GR48-6AA,GR72-6AA,GR96-6AA	GR48-3AV,GR72-3AV,GR96-3AV GR48-6AV,GR72-6AV,GR96-6AV
Format (mmxmm)	48x48 ,72x72, 96x96	48x48 ,72x72, 96x96
Input	AC Current	AC Voltage
Precision	Class 1.5	Class 1.0 for 96x96 Class 1.5 for 72x72
Protection	IP50	IP52
Range/Scale	1A up to 100A direct rating 1A or 5A CT Operated to required A	10V to 600V Direct rating 100V, 110V, 133V 140V, 150V, P. T. Operated meters to required
Burden	2VA	6VA
Over scales	2 times & 6 times	-
Frequency	50Hz	50Hz
High voltage test	2kV/for one minute	2kV/for one minute
Scale	90°	90°
Type of movement	Moving Iron with jewel bearing and oil damping, spring controlled	
Overload limit	1-2 times	1-2 times
Environment	-10°C to 60°C	-10°C to 60°C



GR72-3AA



GR96-6AV



GR96-3AV2

Synchronising set of meters

For synchronising equipment double voltmeter, double frequency meters, and synchroscope meters are manufactured.

Technical characteristics

	Double voltmeter	Double frequency meter	Synchroscope
Format (mmxmm)	96x96	96x96	96x96
Input	-----	A. C. Voltage	-----
Accuracy	1.5	0.5	-----
Protection	-----	IP52	-----
Range	63.5V, 110V, 500, 600V (63.5 & 110V for V.T.Operation)	63.5V, 110V, 220V, 230V, 240V, 400V, 415V, 440V	63.5V, 110V, 220V, 230V, 240V, 400V, 415V, 440V except 110V other meters will be with external V. T.
Burden	6VA	2.5VA	8VA
Frequency	-----	50Hz	-----
High voltage	-----	2kV for one minute	-----
Scale	90°	-	360°
Type movement	Moving iron with jewel bearing and oil damping, spring controlled	Vibrating reed type	Dark lamp method
Environment	-----	-10°C to 60°C	-----

Note: All meters are in metallic casing & clamping only



GR72-6AP3



GR72-3AP3



GR72-3PF3

Dynamometer type meters

In the range of dynamometer type meters, watt meter(W, KW & MW) Power factor indicators, (cosφ) VAR (VAR, KVAR, MVAR), are manufactured, these meters are to indicate respective units of watt, power factor or VAR of AC and or DC circuit.

Technical characteristics

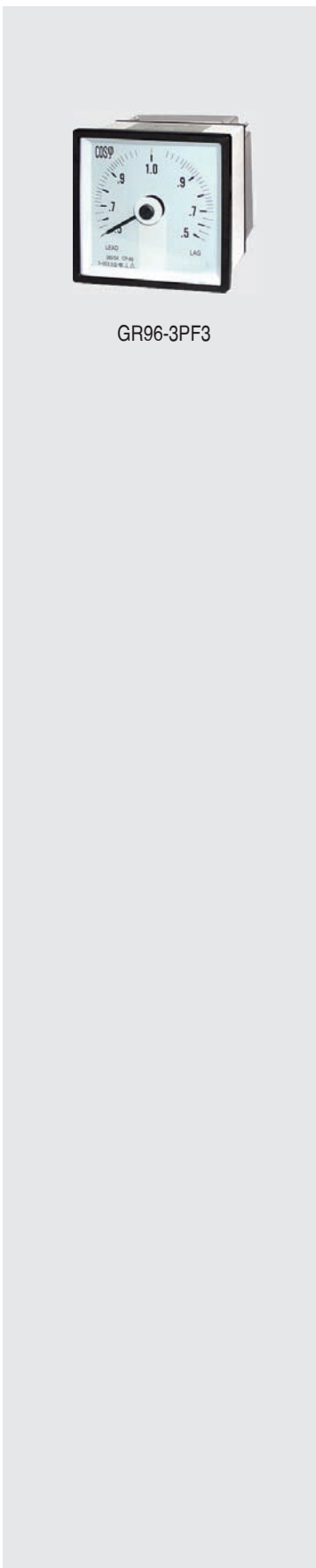
Model	GR48-3A/RP1,GR72-3A/RP1,GR96-3A/RP1; GR48-6A/RP1,GR72-6A/RP1,GR96-6A/RP1 GR48-3A/RP3,GR72-3A/RP3,GR96-3A/RP3; GR48-6A/RP3,GR72-6A/RP3,GR96-6A/RP3 GR48-3A/RP4,GR72-3A/RP4,GR96-3A/RP4; GR48-6A/RP4,GR72-6A/RP4,GR96-6A/RP4
Format (mmxmm)	48x48, 72x72, 96x96
Input	AC or DC Current AC or DC Voltage
Accuracy	Class 1.5
Protection	IP52
Range	Current Up to 30A for 1 phase and up to 600V 1 or 5A for 3 Phase(CT Operated) Voltage 440V or 110V(P. T. Operated) Meters availablein: ■ Single phase, single element type. ■ Element phase meter in single element, Two element and three element type respectively.
Scale	Watt meters & VAR meters: as per calculation of C. T. & P. T. VAR meters.
Burden	3VA for 5A Watt meter & VAR 2VA for 110V Meter 4.5VA for 5A for P. F. Indicator 2VA for 110V
Frequency	50Hz
High voltage test	2kV for one minute
Scale	90°
Type of movement	Dynamometer
Environment	-10 °C to 60 °C
Option	■ Centre zero meters are available ■ Meters for other voltage range up to 600V can be supplied.

Power Factor meters

Model	GR48-3PF1,GR72-3PF1,GR96-3PF1: GR48-6PF1,GR72-6PF1,GR96-6PF1 GR48-3PF3,GR72-3PF3,GR96-3PF3: GR48-6PF3,GR72-6PF3,GR96-6PF3
Format (mmxmm)	48x48, 72x72, 96x96
Input	AC or DC Current AC or DC Voltage
Accuracy	Class 1.5
Protection	IP52
Range	Current Up to 30A for 1 phase and up to 600V 1 or 5A for 3 Phase(CT Operated) Voltage 440V or 110V(P. T. Operated) Meters availablein: ■ Single phase, single element type. ■ Element phase meter in single element, Two element and three element type respectively.
Scale	P. F. Indicators: 0.5 CAP-Unity 0.5IND
Burden	3VA for 5A Watt meter & VAR 2VA for 110V Meter 4.5VA for 5A for P. F. Indicator 2VA for 110V
Frequency	50Hz
High voltage test	2kV for one minute
Scale	90°
Type of movement	Dynamometer
Environment	-10 °C to 60 °C
Option	■ Centre zero meters are available ■ Meters for other voltage range up to 600V can be supplied.

Analog Panel Meters

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GR96-3PF3

Taut band (240° scale) meters

The taut band meters are designed to measure and continuously indicate AC Current, voltage, watt, power factor, VAR and DC current and DC voltage.

Technical characteristics

Model	GR96-3PF1,GR96-3PF3
Format (mmxmm)	96x96
Input	AC or DC current / AC or DC voltage
Accuracy	Class 1.5 for AC & DC & 2° for power factor indicators
Protection	IP52
Range	Ammeter AC: 1A up to 5A Voltmeter AC: 10V up to 600V
Power factor Indicator AC	1A or 5A / 110V or 240V or 440V
Ammeter DC	1mA to 30A and with external shunt up to 15000A
Voltmeter DC	1V to 1000V
Frequency AC	110V or 240V or 440V 45-55Hz & 40-60Hz