

General features

Standards

- CE CERTIFICATE IEC414 IEC51

ABS & PC material.

- Protection degree (CEI 70-1, IEC 529)IP 52 for the case.
- Protection degree (CEI 70-1, IEC 529)IP 00 for terminals.

Accuracy class

- All the instruments are manufactured in 1.0 1.5 2.5 accuracy class (if no special indications).
- The precision for reduced scale instruments (F2-F3-F5) will be <20%, with stop time <2 second.

Overloads

- All amperometry circuits support an overload of 1.2 in continuous and 10 in during 5 seconds.

Working voltage: 650V

- Test voltage: 2000V-50Hz/60Hz, for 1 minute.

Insulation

- Insulation reference voltage 0.6 KV.

Working temperature

- 20°C(±10°C) working range between -25°C and ±55°C.

Vibrations

- ±0.25mm amplitude at 50Hz/60Hz (CE68-2-6).

Humidity

- Ambient relative humidity 85% without condensing, with 35 temperature for max. 60 days per year. Yearly average humidity must be not higher than 65% (DIN 40040).

Tropical Version

- 95% relative humidity. for a maximum of 30 days per year.

Mounting position

- The normal execution of our instruments is for vertical mounting. If other mounting positions are known in advance, please indicate the angle of inclination when ordering.

Scales

- The full scale deflections correspond to DIN 43701.
- The scale divisions correspond to DIN 43802.

Special execution

General features

- Tropical version
- Red stroke at any point on the scale
- Red stripe on the scale
- Additional lettering
- Anti-reflection glass
- Internal illumination (when possible)
- Test voltage higher than 2000V
- Knife edge pointer and scale with mirror reading
- Red pointer adjustable from the exterior
- Scale for other ranges scale with double numbering
- Scale with double sets of numbering divisions.

Moving coil instruments

- Scale with zero point in the middle or displaced
- Range differing from standard series
- Two/three/four range voltmeters
- Two range ammeters(3 terminals)
- Adjustment to other internal resistance for ammeters
- Internal resistance for voltmeters from 1 to 600V: 1000Ω/V, 4000Ω/V, 10000Ω/V, 20000Ω/V
- Separate resistorbox for 1000V and 1500V
- Suppressed zero
- Accuracy class 1
- Potentiometer adjustable from the exterior (±20% FSD)

Moving Iron voltmeters and ammeters

- Calibration for other ranges
- Range for voltmeters differing from standard series
- Range for ammeters differing from standard series
- Ammeters with 2 in-3 in-5 in overload capacity
- Two range voltmeters (3 terminal)
- Two range ammeters (3 terminal) (max 10A)
- Calibration for A.C and D.C. (max 50A)
- Separate resistance for 1000V and 1500V
- Accuracy class 1 (only 50-60 Hz)

Wattmeters

- Scale with zero point in the middle or displaced
- Nominal current 5A (per element)
- Double-triple voltage
- Double current

Power factor meters

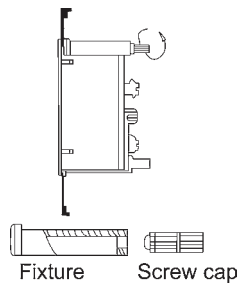
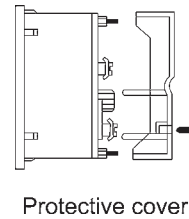
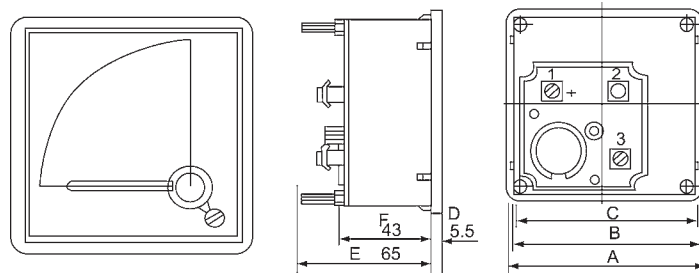
- Non-standard voltage

Reed frequency meters

- Non-standard voltage
- Double voltage (when possible)

Symbols of the main measuring units and the principals multiples and submultiples

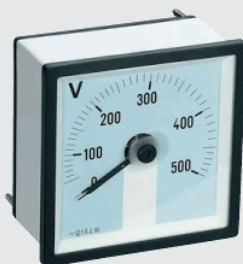
Symbols	Description
	Electronic device in a measure circuit
	Rectifier (instrument with A.C. input).
	Shunt
	Additional resistor
	Zero setting device(of the field measure amplitude)
	General accessories
	Ground terminal
	Positive terminal
	Negative terminal
1.0 1.5 2.5	Class index(for ex.1)except when the conventional value corresponds to the scale length or to the indicated value or to measure range
	D.C. circuit and/or measure mark which corresponds to D.C.
	A.C. circuit and/or measure mark which corresponds to A.C.
	D.C.and/or A.C. circuit and/or measure mark which corresponds to D.C.and to A.C.
	Testing voltage higher than 500V(for example 2kV)
	Instrument to be used with vertical scale
	Instrument to be used with scale inclined compared to the horizontal (for example 60°)-on request
	Moving coil for D.C. instruments
	Moving iron instrument for A.C.instruments
	Bimetal instrument
	Vibrating reeds instrument


Flush mounting with fixture

Push on mounting

Outline and mounting dimensions


Model	A	B	C	D	E	F
PM-144	144	140	138	17	65	43
PM-96	96	91	90	5.5	65	43
PM-72	72	67	66	5.5	65	43
PM-48	48	43	42	5.5	65	43

External packing

Model	Size(mm)	Volume(m3)	Gr.Wt(kgs)	Nt.Wt(kgs)	PCS(one carton)
PM-72-3	44 x 39 x 35.5	0.061	17	15	100
PM-96-3	53.5 x 38 x 43	0.087	23	21	100
PM-80	47 x 38.5 x 37.5	0.068	17	15	120
PM-65	47 x 38.5 x 37.5	0.068	17	15	120
PM-72-6	42.5 x 42 x 52.5	0.095	17	15	100
PM-96 Foam	53.5 x 46.5 x 38.5	0.096	25	23	100
PM-96-8	49.3 x 22.3 x 52.3	0.058	17	15	50
PM-72-8	49.5 x 34.5 x 41.5	0.071	23	21	100
PM-62T2	47.5 x 37 x 44	0.077	25	23	100
PM-60 PM-48	45.2 x 35 x 37	0.059	18	16	200
PM-50	45 x 28 x 29	0.037	16	14	200
PM-52	47 x 38.5 x 37.5	0.068	17	15	200
PM-72 foam	43.5 x 38 x 48	0.079	20	18	100
PM-670	47 x 38.5 x 37.5	0.068	17	15	200
PM-96-6	42.5 x 42.5 x 52.5	0.095	23	21	100
MSQ-30	41 x 30 x 24	0.030	28	27	60
MSQ-40	44 x 30 x 24	0.030	28	27	60
MSQ-60	43 x 28 x 28.5	0.034	24	23	32
MSQ-100	46 x 35 x 33.5	0.054	25	24	30


A.C. Ammeters-Voltmeters
A.C. Ammeters

Type	PM-48(48 x 48mm)				PM-72(72 x 72mm)				PM-96(96 x 96mm)				PM-144(144 x 144mm)			
	DIRECT		CT/1A-/5A		DIRECT		CT/1A-/5A		DIRECT		CT/1A-/5A		DIRECT		CT/1A-/5A	
	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2
1A					●	○					●	○				
5A	●	●	●	●	●	○	●	●	●	○	●	●	●	●	●	●
10A	●	●	●	●	●	○	●	●	●	○	●	●	●	●	●	●
15A	●	●	●	●	●	○	●	●	●	○	●	●	●	●	●	●
20A	●	●	●	●	●	○	●	●	●	○	●	●	●	●	●	●
25A	●	●	●	●	●	○	●	●	●	○	●	●	●	●	●	●
30A	●	●	●	●	●	○	●	●	●	○	●	●	●	●	●	●
40A	●	●	●	●	●	○	●	●	●	○	●	●	●	●	●	●
50A			●	●	●	○	●	●	●	○	●	●	●	●	●	●
60A			●	●	●	○	●	●	●	○	●	●	●	●	●	●
75A			●	●			●	○	●	●	○	●	●	●	●	●
100A			●	●			●	○	●	●	○	●	●	●	●	●
120A			●	●			●	○							●	●
150A			●	●			●	○	●			●	○	●		●
200A			●	●			●	○	●			●	○	●		●
250A			●	●			●	○	●			●	○	●		●
300A			●	●			●	○	●			●	○	●		●
400A			●	●			●	○	●			●	○	●		●
500A			●	●			●	○	●			●	○	●		●
600A			●	●			●	○	●			●	○	●		●
800A			●	●			●	○	●			●	○	●		●
1000A							●	○	●			●	○	●		●
1200A							●	○	●			●	○	●		●
1250A							●	○	●			●	○	●		●
1500A							●	○	●			●	○	●		●
2000A							●	○	●			●	○	●		●
2500A							●	○	●			●	○	●		●
3000A							●	○	●			●	○	●		●

A.C. VOLTMERS

Type	PM-48	PM-72	PM-96	PM-144
100V	●	●	●	●
300V	●	●	●	●
500V	●	●	●	●
600V	●	●	●	●

● 90°C

○ 240°C

Interchangeable scale

D.C. Ammeters-Voltmeters
D.C. Ammeters

Type	PM-48(48 x 48mm)		PM-72(72 x 72mm)		PM-96(96 x 96mm)		PM-144(144 x 144mm)	
	50,60,75mV	0 central 50,60,75mV	50,60,75mV	0 central 50,60,75mV	50,60,75mV	0 central 50,60,75mV	50,60,75mV	0 central 50,60,75mV
10A	●	●	●○	●○	●○	●○	●	●
15A	●	●	●○	●○	●○	●○	●	●
20A	●	●	●○	●○	●○	●○	●	●
25A	●	●	●○	●○	●○	●○	●	●
30A	●	●	●○	●○	●○	●○	●	●
40A	●	●	●○	●○	●○	●○	●	●
50A	●	●	●○	●○	●○	●○	●	●
60A	●	●	●○	●○	●○	●○	●	●
80A	●	●	●○	●○	●○	●○	●	●
100A	●	●	●○	●○	●○	●○	●	●
150A	●	●	●○	●○	●○	●○	●	●
200A	●	●	●○	●○	●○	●○	●	●
300~3000A	●	●	●○	●○	●○	●○	●	●

A.C. VOLTMERS

Type	PM-48(48 x 48mm)		PM-72(72 x 72mm)		PM-96(96 x 96mm)		PM-144(144 x 144mm)	
		0 central		0 central		0 central		0 central
Direct	●	●	●○	●○	●○	●○	●	●
60mV	●	●	●○	●○	●○	●○	●	●
10V	●	●	●○	●○	●○	●○	●	●
20V	●	●	●○	●○	●○	●○	●	●
40V	●	●	●○	●○	●○	●○	●	●
100V	●	●	●○	●○	●○	●○	●	●
150V	●	●	●○	●○	●○	●○	●	●
200V	●	●	●○	●○	●○	●○	●	●
300V	●	●	●○	●○	●○	●○	●	●
400V	●	●	●○	●○	●○	●○	●	●
500~600V	●	●	●○	●○	●○	●○	●	●

● 90°C

○ 240°C

Interchangeable scale



96 x 96



72 x 72



96 x 96



96 x 96



96 x 96



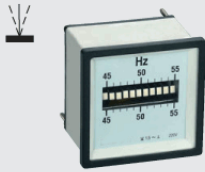
72 x 72



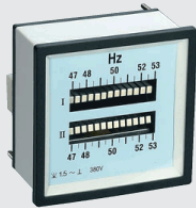
96 x 96



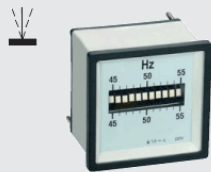
96 x 96

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90°C



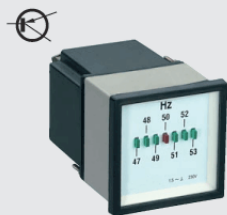
240°C



1 x 11reeds



2 x 11reeds



72 x 72

Frequency Meters

Analogue Frequency meters

- Model: 90°: PM-48, PM-72, PM-96, PM-144; 240°: PM-72, PM-96
- Voltage: 110V, 220V, 380V, 440V
- Frequency: 45-55Hz, 45-65Hz, 55-65Hz, 47-53Hz
- Class: 1.0
- Heat resistance: Case of non-combustible plastic material.
- Fastening: By means of nuts, absolutely safe, fast, robust, side-by-side
- Mounting depth: Max 43mm.

Reeds Frequency meters

This vibrating reed frequency meter with one row of horizontal reeds or with two rows of horizontally arranged reeds for connection to one main voltage. Vertical arrangements on request

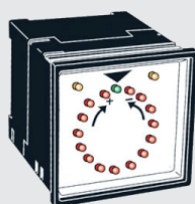
- Heat resistance: Case of non-combustible plastic material.
- Changeable scale: All scales with printing technique.
- The dial plate with different scale, which is at the same internal value, can be changeable.
- But the accuracy is unchangeable.
- Fastening: By means of nuts, absolutely safe, fast, robust, side-by-side.
- Mounting depth: Max, 43mm.
- Model: 1 x 11reeds: PM-72, PM-96, 2 x 11reeds: PM-96
- Voltage: 110V, 220V, 380V, 440V
- Frequency: 45-55Hz, 45-65Hz, 55-65Hz, 47-53Hz
- Class: 1.5

LED Frequency meters

- Model: PM-96, PM-72
- Voltage: 110V, 220V, 380V
- Frequency: 45-55Hz, 45-65Hz, 55-65Hz, 47-53Hz
- Class: 1.5



48 x 48



96 x 96 x 130mm



Frequency Meters

Power factor meter (Cosφ meters)

- Model: 90°: PM-48, PM-72, PM-96, PM-144; 240°: PM-72, PM-96
- Voltage: 110V, 220V, 380V, 440V
- Current: 1A, 5A
- Full scale value: 0.5cap-1-0.5ind; 0.3cap-1-0.1ind; 0.7cap-1-0.2ind; 0.4cap-1-0.4ind
- Class: 2.5
- Heat resistance: Case of non-combustible plastic material.
- Fastening: By means of nuts, absolutely safe, fast, robust, side-by-side
- Mounting depth: Max 43mm.
- This meter can be used for single phase or three phase three wire circuit.

Analogue synchroscope meters

Synchrony scope for phase comparison for three phase AC circuits

- Model: PM-96
- Voltage: 110V 220V 380V 440V
- Working time: 15min max.
- Freq: 50Hz or 60Hz

Electronic synchrosopes

- Consumption: 3VA
- Supply voltage (line/generator): 380Vac+20%-40% standard
- These instruments indicate the synchronism condition when the green LED placed under the arrow in the centre of the dial is lit with a fixed light, and the two yellow phase indication leds are off. The lighting up of the red leds in a clockwise or anti clockwise sequence indicates that the generator to synchronize is fast or slow regarding the line. If the phase indication LED flashes this means that the generator voltage to synchronize is not present.
- PM-96 380V synchroscope with 380/50Hz supply voltage

Sequence indicator

This indicator is designed for easy testing of phase sequence in three-phase systems with a permissible operating voltage up to 500V. For short connections, not longer than 5 minutes for one test, a push-button switch is placed on the front plate. A disc with an indicating arrow rotates in the direction of the arrow, if the three phases are properly connected, otherwise the disc rotates in the other direction. By changing of two wires, the phase sequence will be corrected to corresponding designation of the terminals.

- Model: PM-SI96 PM-SI72
- Voltage: 110-500V
- Working time: not longer than 5 minutes.

Watt meters & Var meters

- Model: 90 : PM-48, PM-72, PM-96, PM-144; 240°: PM-72, PM-96
- Voltage: 110V, 220V, 380V, 440V
- Current: 1A, 5A

Multiscale function in wattmeters and varmeters for alternating current

Current transformer	Single-phase wattmeters and varmeters			Three-phase wattmeters and varmeters		
	110V	220V	380V	110V	220V	380V
5/5A	500 W(VAR)	1000 W(VAR)	2000 W(VAR)	1000 W(VAR)	2000 W(VAR)	4000 W(VAR)
10/5A	1000 W(VAR)	2000 W(VAR)	4000 W(VAR)	2000 W(VAR)	4000 W(VAR)	8000 W(VAR)
15/5A	1500 W(VAR)	3000 W(VAR)	6000 W(VAR)	3000 W(VAR)	6000 W(VAR)	12 KW(KVAR)
20/5A	2000 W(VAR)	4000 W(VAR)	8000 W(VAR)	4000 W(VAR)	8000 W(VAR)	16 KW(KVAR)
25/5A	2500 W(VAR)	5000 W(VAR)	10 KW(KVAR)	5000 W(VAR)	10 KW(KVAR)	20 KW(KVAR)
30/5A	3000 W(VAR)	6000 W(VAR)	12 KW(KVAR)	6000 W(VAR)	12 KW(KVAR)	24 KW(KVAR)
40/5A	4000 W(VAR)	8000 W(VAR)	16 KW(KVAR)	8000 W(VAR)	16 KW(KVAR)	32 KW(KVAR)
50/5A	5000 W(VAR)	10 KW(KVAR)	20 KW(KVAR)	10 KW(KVAR)	20 KW(KVAR)	40 KW(KVAR)
60/5A	6000 W(VAR)	12 KW(KVAR)	24 KW(KVAR)	12 KW(KVAR)	24 KW(KVAR)	48 KW(KVAR)
80/5A	8000 W(VAR)	16 KW(KVAR)	32 KW(KVAR)	16 KW(KVAR)	32 KW(KVAR)	64 KW(KVAR)
100/5A	10 KW(KVAR)	20 KW(KVAR)	40 KW(KVAR)	20 KW(KVAR)	40 KW(KVAR)	80 KW(KVAR)
150/5A	15 KW(KVAR)	30 KW(KVAR)	60 KW(KVAR)	30 KW(KVAR)	60 KW(KVAR)	120 KW(KVAR)
200/5A	20 KW(KVAR)	40 KW(KVAR)	80 KW(KVAR)	40 KW(KVAR)	80 KW(KVAR)	160 KW(KVAR)
250/5A	25 KW(KVAR)	50 KW(KVAR)	100 KW(KVAR)	50 KW(KVAR)	100 KW(KVAR)	200 KW(KVAR)
300/5A	30 KW(KVAR)	60 KW(KVAR)	120 KW(KVAR)	60 KW(KVAR)	120 KW(KVAR)	240 KW(KVAR)
400/5A	40 KW(KVAR)	80 KW(KVAR)	160 KW(KVAR)	80 KW(KVAR)	160 KW(KVAR)	320 KW(KVAR)
500/5A	50 KW(KVAR)	100 KW(KVAR)	200 KW(KVAR)	100 KW(KVAR)	200 KW(KVAR)	400 KW(KVAR)
600/5A	60 KW(KVAR)	120 KW(KVAR)	240 KW(KVAR)	120 KW(KVAR)	240 KW(KVAR)	480 KW(KVAR)
800/5A	80 KW(KVAR)	160 KW(KVAR)	320 KW(KVAR)	160 KW(KVAR)	320 KW(KVAR)	640 KW(KVAR)
1000/5A	100 KW(KVAR)	200 KW(KVAR)	400 KW(KVAR)	200 KW(KVAR)	400 KW(KVAR)	800 KW(KVAR)
1500/5A	150 KW(KVAR)	300 KW(KVAR)	600 KW(KVAR)	300 KW(KVAR)	600 KW(KVAR)	1200 KW(KVAR)
2000/5A	200 KW(KVAR)	400 KW(KVAR)	800 KW(KVAR)	400 KW(KVAR)	800 KW(KVAR)	1600 KW(KVAR)
2500/5A	250 KW(KVAR)	500 KW(KVAR)	1000 KW(KVAR)	500 KW(KVAR)	1000 KW(KVAR)	2000 KW(KVAR)

Interchangeable scale table

In order to achieve the above, the various converters have been calibrated as follows For the Active Power:

100V, 5A=500W 220V, 5A=1000W 380, 5A=2000W in the Monophase system

100V, 5A=1000W 220V, 5A=2000W 380, 5A=4000W in the system:

- Balanced threephase without neutral, 3 wires
- Non balanced threephase without neutral, 3 wires (ARON)
- Balanced threephase with neutral, 4 wires
- Non balanced threephase with neutral, 4 wires

For the reactive power

100V, 5A=500VAR 220V, 5A=1000W 380, 5A=2000VAR in the Monophase system

100V, 5A=1000VAR 220V, 5A=2000W 380, 5A=4000VAR in the system:

- Balanced threephase without neutral, 3 wires
- Non balanced threephase without neutral, 3 wires (ARON)
- Balanced threephase with neutral, 4 wires
- Non balanced threephase with neutral, 4 wires



72 x 72



96 x 96



Watt meters & Var meters

Maximum demand ammeter

- Model: PM-96, PM-72
- Class: 3.0
- 15min 5A, 15min 1A
- Interchangeable scale

Standard capacities

Primary CT (A)	Scale capacity	Primary CT (A)	Scale capacity	Primary CT (A)	Scale capacity	Primary CT (A)	Scale capacity
100%	120%	100%	120%	100%	120%	100%	120%
10	12	80	96	500	600	2500	3000
15	18	120	120	600	720	3000	3600
20	24	125	150	750	900	4000	4800
25	30	150	180	800	960	5000	6000
30	36	200	240	1000	1200		
40	48	250	300	1200	1400		
50	60	300	360	1500	1800		
60	72	400	480	2000	2400		

Combined maximum demand ammeters

- Model: PM-96 Class: 3.0
- 15min 5A, 15min 1A Interchangeable scale

Standard capacities

Primary CT(A)	Scale		Primary CT(A)	Scale		Primary CT(A)	Scale	
	Bimetal	Movingiron		Bimetal	Movingiron		Bimetal	Movingiron
100%	120%	120%	100%	120%	120%	100%	120%	120%
10	12	20	80	96	160	600	720	1200
15	18	30	100	120	200	800	960	1600
20	24	40	150	180	300	1000	1200	2000
25	30	50	200	240	400	1200	1400	2400
30	36	60	250	300	500	1500	1800	3000
40	48	80	300	360	600	2000	2400	4000
50	60	100	400	480	800	2500	3000	5000
60	72	120	500	600	1000	3000	3600	6000

Plug-in maximum demands ammeter

- Model: PM-96, PM-72
- Class: 3.0
- 15min 5A, 15min 1A
- Interchangeable scale

Moving Iron Instrument AC Ammeters For Explosive Gas Atmospheres (Increased Safety "e")

- Model:PM-E96A PM-E72A PM-E48A
- Accuracy:Class 1.5,2.5
- Marking:EEExe T6
- Specification:AC 100mA, 1A,5A,
- For 10A~10kA meters have to use external transformer with secondary current 1A,5A.
- Frequency:50/60Hz Consumption:0.2VA
- The dial plate with different scale,which is at the same internal value,can be changeable.
- But the accuracy is unchangeable.


Watt meters & Var meters
AC Ammeter with change-over switch

- Model: PM-96, PM-72
- Measuring range: 0.1A/1A 0.2A/2A 0.3A/3A 0.4A/4A 0.5A/5A 1A/10A 5/5A
- 3 phase 3 wire Position: L1, L2
- 3 phase 4 wire Position: L1, L2, L3
- Freq: 50Hz
- Class: 1.5



72 x 72

96 x 96

AC Voltmeter with change-over switch

- Model: PM-96, PM-72
- 3 phase 4 wire Measuring range: 60V/100V, 80/150V, 100/200V, 150/250V, 250/400V, 300/500V.
- Position: L1-L2, L1-L3, L2-L3, L1-N, L2-N, L3-N
- 3 phase 3 wire Measuring range: 100V, 150V 200V 250V 400V 500V.
- Position: L1-L2, L1-L3, L2-L3
- Accuracy: class 1.5
- Frequency range: 50HZ


Double ammitters

- Model: PM-96
- Voltage: 0.1A 0.5A 1A 1.5A 3A 5A 7.5A 10A 15A 20A 25A 30A 40A 50A 60A 75A 100A For 10A-10kA use external current transformer with secondary current 1A and 5A
- Class: 1.5


Double voltmeter

- Model: PM-96
- Specification: 0-100V 0-300V 0-500V
- Class: 1.5


Double frequency meter

- Model: PM-96
- Voltage: 110V 220V 380V 440V
- Frequency range: 45~50Hz, 45~65Hz, 55~65Hz, 47~53Hz
- Class: 1.0

Panel Meters
Hour Meter
Elapsed Time meters or hours run meters

Features: Elapsed Time Meters or Hours Run Meters monitor ON/RUN time of plant and equipment allowing the user to perform functions such as Production Efficiency Cost Estimating and Service Period monitor-ink for preventative maintenance etc.

The time is measured in instrument of 0.01h up to 99999.99 hours after which time the meter resets to zero. Non-reset table to prevent accidental resetting.

- Model: PM-96, PM-72
- Display: 99999.99
- Voltage: AC 110V, 220V, 380V
- Freq: 50/60Hz



72 x 72



96 x 96

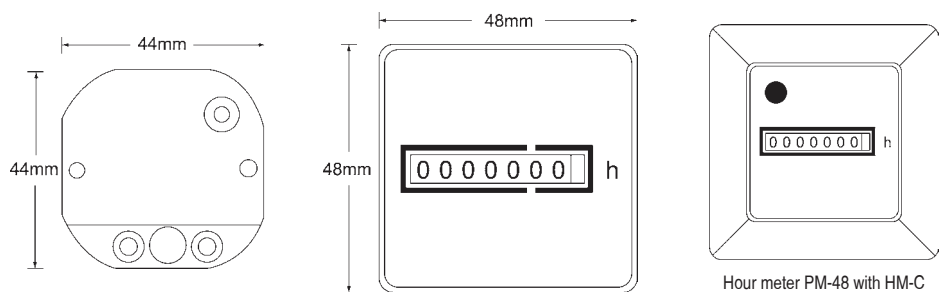

Hour meter

This products is suitable for usage of House, Industry Air condition, etc.

Time setting range available from 0 to 99,999.99 Hours.

Accessories parts HM-C Adapter 72 72 for PM-48.

- Model: PM-48
- Size: 48x48 mm
- Display: 0~99,999.99
- Voltage: AC 110V, 220V, 380V
- Freq: 50/60Hz

Dimensions(mm)


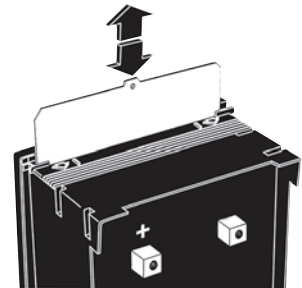
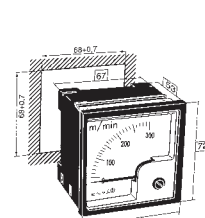
Hour meter PM-48 with HM-C


RC-96-8, RC-72-8

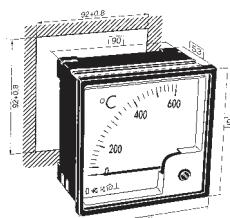
Name	Specification		Model of meter	Accuracy
AC Ammeter	From 10A, 15A, 20A, 30A...to 3000A, 5000A	With ext. c/t 1A or 5A	RC-96, RC-72	Class 1.5
	From 0.1A, .5A, 1A, 5A, 10A, 25A...to 80A, 100A	AC direct connection	RC-96, RC-72	Class 1.5
DC Ammeter	From, 50uA, 100uA, 1mA, 5mA...1A, 5A, 10A, 25A, 30A...tp 100A	DC direct connection	RC-96, RC-72	Class 1.5
	From 10A, 15A, 20A, 30A...2500A, 3000A...to 8KA, 10KA	With ext. shunt 50mv, 60mv or 75mv	RC-96, RC-72	Class 1.5
AC Voltmeter	From 30V, 50V, 100V...to 300V, 500V, 600V	AC direct connection	RC-96, RC-72	Class 1.5
	From 1KV, 2KV, 5KV...to 380KV, 450KV	With ext. voltage transformer	RC-96, RC-72	Class 1.5
DC Voltmeter	From 10V, 20V, 30V...to 500V, 600V, 1000V	DC direct connection	RC-96, RC-72	Class 1.5
	From 1KV, 2KV, 5KV...to 8KV, 9KV, 10KV	With ext. resistor	RC-96, RC-72	Class 1.5
Frequency meter	Voltage: 110V, 220V, 380V, 440V		RC-96, RC-72	Class 1.0
	Frequency: 45-55Hz, 45-65Hz, 55-65Hz, 47-53Hz			
Power factor meter (cosø)	Voltage: 110V, 220V, 380V, 440V Current: 1A or 5A	For 1phase or 3phase	RC-96, RC-72	Class 2.5
	Scale: 0.5cap-1-0.5ind, 0.3cap-1-0.1ind, 0.7cap-1-0.2ind			
Power meter (kw or kvar)	Voltage: 110V, 220V, 380V, 440V Current: 1A OR 5A	For 1p1w, 3p3w, 3p4w	RC-96, RC-72	Class 1.5
		With c/t or voltage transformer		
Maximum demands ammeter	15MIN 5A,or15MIN 1A	Changeable scale	RC-96, RC-72	Class 3.0

Interchangeable scale

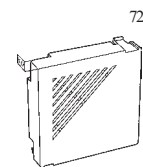
- The scales of the instruments in this catalogue are conform to the DIN 43802 standards.
- The instruments for use by means of a C.T. or Shunt can have interchangeable scales and are made in such a way that it is impossible to touch the indicator or damage the mechanism while the change is carried out.
- Shift the lid placed on the upper part of the instrument in the direction of the arrows to obtain access to the aperture; After each operation, close the lid accurately to totally close the aperture.
- Important warning: the instrument should not be connected into the supply when the scale is replaced.


Dimensions in mm


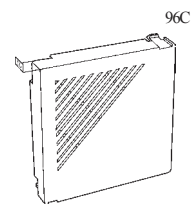
72 x 72



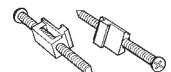
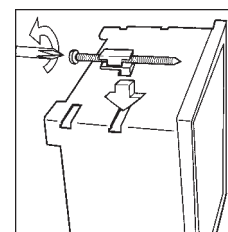
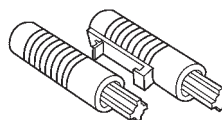
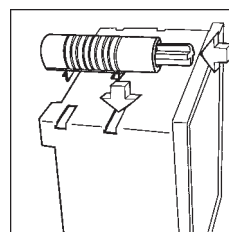
96 x 96

Rear clamp covers


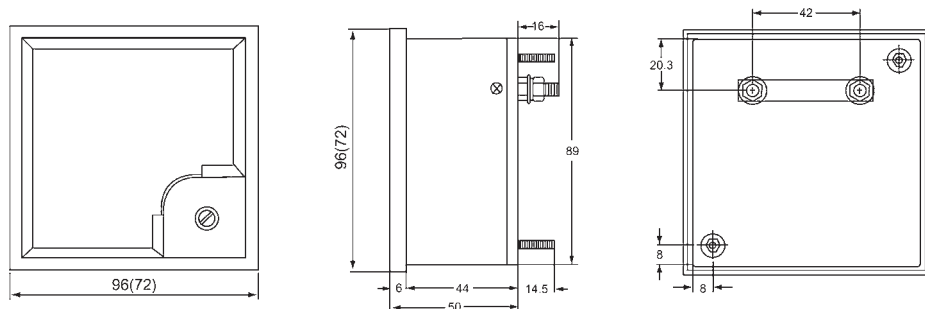
For instruments 72 x 72



For instruments 96 x 96

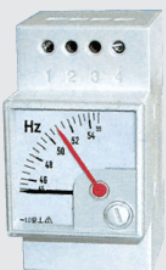
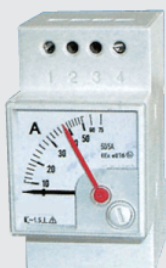
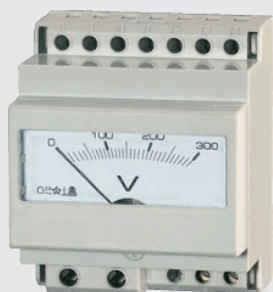
Fixing systems


For instruments 72 x 72, 96 x 96

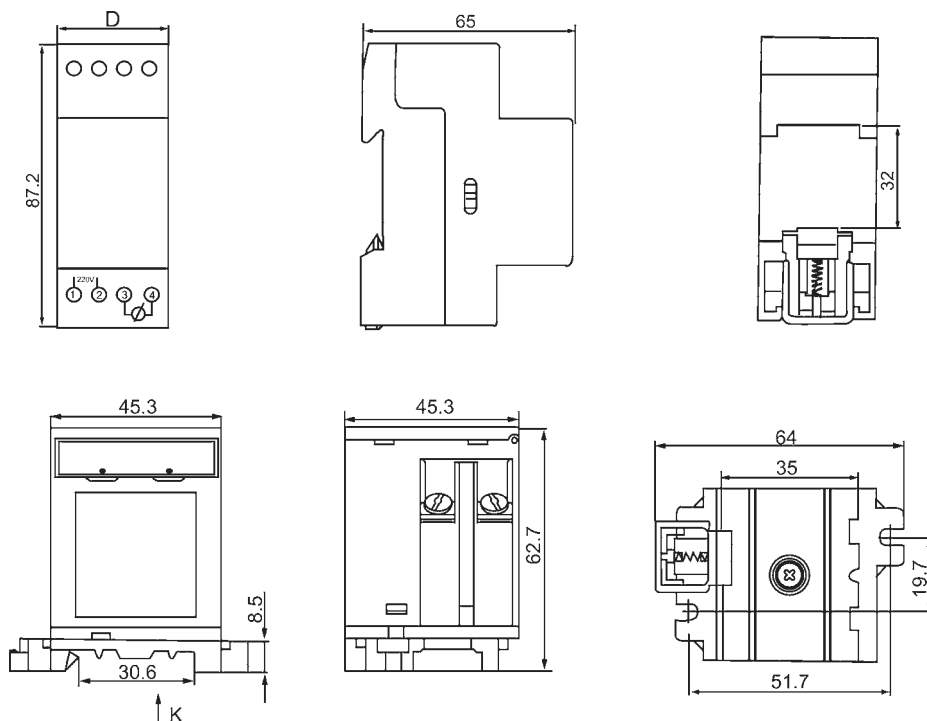
**48 x 48****72 x 72****96 x 96****PM-96-6 PM-72-6 Series panel meter****Outline drawing****Measuring ranges**

- AC.DC.Ameter.Voltmeter
- Moving coil type: DC 100 A- 50A DC 30V-600V
- Moving iron type: AC 1A-60A AC 150V-60V
- Rectifier type: AC 3V-600V AC 1A-5A
- Accuracy: class 1.5
- Model:PM-96 PM-72 PM-48
- AC ampere overrolad Scale:100%, 200%, 300%, 500%,
- DC Ammeters above 50A require a basic 50mV meter combined with an external shunt.
- AC Ammeters above 100A require a basic 5A meter combined with an external CT.
- AC Voltmeters above 600 Volts require a basic 150V meter combined with an external PT.

Accuracy	Class 1.5
Working Position	Vertical.
Rated voltage	100V, 220V, 380V,500V
Limit of voltage fluctuation	±20%
Consumption	Max. 15mA.
Test voltage	2KV, 50 c/s.
Measuring range	45-65 c/s
Composition	Glass window, ABS Resin frame and case, PC glass fiber base Mounting fittings included.
Colour	Black base and frame, white scale plate and meter body.
Pointer	Stick shape in black colour.

1
PMC-45

PMC-100

Modular type panel meter

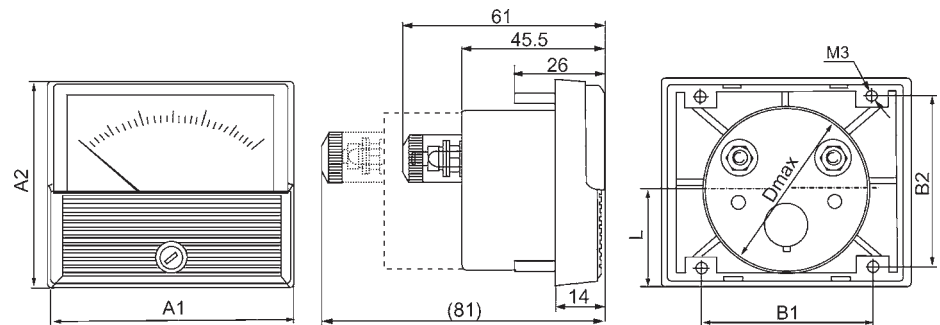
Model	Name	Specification	Accuracy
PMC-45 PMC-100	AC Ammeter	From 10A, 15A, 20A, 30A...to 3000A, 5000A From 0.1A, 0.5A, 1A, 5A, 10A, 25A...to 80A, 100A	With ext. c/t 1A or 5A AC direct connection Class 1.5
	DC Ammeter	From 50uA, 100uA, 1mA, 5mA...1A, 5A, 10A, 25A, 30A...to 100A From 10A, 15A, 20A, 30A...2500A, 3000A...to 8KA, 10KA	DC direct connection With ext. shunt 50mv, 60mv or 75mv Class 1.5
	AC Voltmeter	From 30V, 50V, 100V...to 300V, 500V, 600V From 1KV, 2KV, 5KV...to 380KV, 450KV	AC direct connection With ext. voltage transformer Class 1.5
	DC Voltmeter	From 10V, 20V, 30V...to 500V, 600V, 1000V From 1KV, 2KV, 5KV...to 8KV, 9KV, 10KV	DC direct connection With ext. resistor Class 1.5
	Frequency meter	Voltage: 110V, 220V, 380V, 440V Frequency: 45-55Hz, 45-65Hz, 55-65Hz, 47-53Hz	 Class 1.0
	Power factor meter (cosφ)	Voltage: 110V, 220V, 380V, 440V Current: 1A or 5A Scale: 0.5cap-1-0.5ind, 0.3cap-1-0.1ind, 0.7cap-1-0.2ind	For 1phase or 3phase Class 2.5
	Power meter (kw or kvar)	Voltage: 110V, 220V, 380V, 440V Current: 1A or 5A	Changeable scale Power meter (kw or kvar) Class 1.5

Outline drawing

Size of din rail type series meter

Model	Unit	D	Number of terminal	Measurement of din rail
PMC-45	mm	45	4	35
PMC-100	mm	100	10	35

PMT Series panel meter

Model	Name	Specification	Accuracy
PMT-80 PMT-670 PMT-60 PMT-680 PMT-780 PMT-560 PMT-50	AC Ammeter	From 10A, 15A, 20A, 30A...to 3000A, 5000A From 0.1A, 0.5A, 1A, 5A, 10A, 25A...to 80A, 100A	With ext. c/t 1A or 5A AC direct connection Class 1.5
	DC Ammeter	From 50uA, 100uA, 1mA, 5mA...1A, 5A, 10A, 25A, 30A...to 100A From 10A, 15A, 20A, 30A...2500A, 3000A...to 8KA, 10KA	DC direct connection With ext. shunt 50mv, 60mv or 75mv Class 1.5
	AC Voltmeter	From 30V, 50V, 100V...to 300V, 500V, 600V From 1KV, 2KV, 5KV...to 380KV, 450KV	AC direct connection With ext. voltage transformer Class 1.5
	DC Voltmeter	From 10V, 20V, 30V...to 500V, 600V, 1000V From 1KV, 2KV, 5KV...to 8KV, 9KV, 10KV	DC direct connection With ext. resistor Class 1.5
	Frequency meter	Voltage: 110V, 220V, 380V, 440V Frequency: 45-55Hz, 45-65Hz, 55-65Hz, 47-53Hz	 Class 1.0
	Power factor meter (cosφ)	Voltage: 110V, 220V, 380V, 440V Current: 1A or 5A Scale: 0.5cap-1-0.5ind, 0.3cap-1-0.1ind, 0.7cap-1-0.2ind	For 1phase or 3phase Class 2.5
	Power meter (kw or kvar)	Voltage: 110V, 220V, 380V, 440V Current: 1A or 5A	Changeable scale Power meter (kw or kvar) Class 1.5

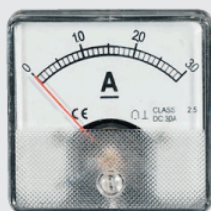
Size Of Square Or Rectangular With Round Panel Cut-out Meter


Model	A1	A2	B1	B2	L	D1
PMT-120	120	100	84	84	31.2	47.5
PMT-80	80	80	64	64	29.2	47.5
PMT-780	80	70	54	54	27.2	47.5
PMT-670	70	60	48	48	27.2	47.5
PMT-560	60	50	34	34	23.2	47.5
PMT-60	60	60	36	36	30.2	47.5
PMT-50	50	50	34	34	23.2	44

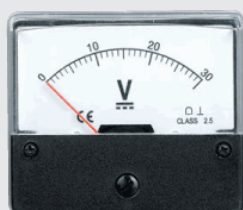
The items of B1 and B2 for the distance of the mounting screws. The item D1 for the size of panel cut-out of switchboard

Panel Meters
1

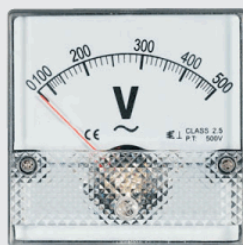

50 x 50



60 x 60



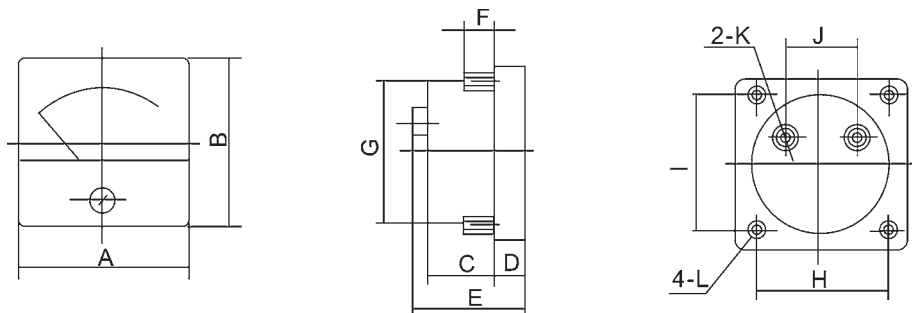
60 x 70



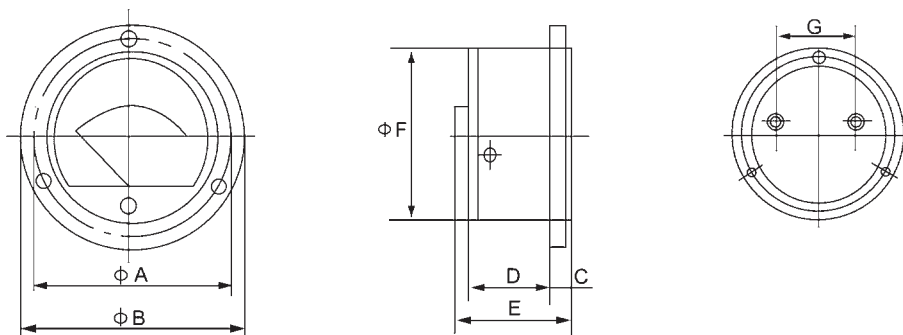
80 x 80

Square or rectangular panel meter

Model	Name	Specification	Accuracy
PM-80 PM-670 PM-60 PM-50	AC Ammeter	From 10A,15A,20A,30A...to 3000A,5000A From 0.1A,0.5A,1A,5A,10A,25A...to 80A,100A	With ext. c/t 1A or 5A AC direct connection Class 1.5
	DC Ammeter	From 50uA, 100uA, 1mA, 5mA...1A, 5A, 10A, 25A, 30A...to 100A From 10A, 15A, 20A, 30A...2500A, 3000A...to 8KA, 10KA	DC direct connection With ext. shunt 50mv, 60mv or 75mv Class 1.5
	AC Voltmeter	From 30V, 50V, 100V...to 300V, 500V, 600V From 1KV, 2KV, 5KV...to 380KV, 450KV	AC direct connection With ext. voltage transformer Class 1.5
	DC Voltmeter	From 10V, 20V, 30V...to 500V, 600V, 1000V From 1KV, 2KV, 5KV...to 8KV, 9KV, 10KV	DC direct connection With ext. resistor Class 1.5
	Frequency meter	Voltage: 110V, 220V, 380V, 440V Frequency: 45-55Hz, 45-65Hz, 55-65Hz, 47-53Hz	 Class 1.0
	Power factor meter (cosφ)	Voltage: 110V, 220V, 380V, 440V Current: 1A or 5A Scale: 0.5cap-1-0.5ind, 0.3cap-1-0.1ind, 0.7cap-1-0.2ind	For 1phase or 3phase Class 2.5
	Power meter (kw or kvar)	Voltage: 110V, 220V, 380V, 440V Current: 1A or 5A	Changeable scale Power meter (kw or kvar) Class 1.5

Outline drawing


Model	Measure ment											
	A	B	C	D	E	F	G	H	I	J	K	L
PM-80	80	80	23	13	49	13	63	65	65	24	M5 Outside	M3
PM-60	60	60	22	11	39	11	51	48	48	25	M4 Inside	M3
PM-670	70	60	22	11	45	10	51	50	50	31	M4 Inside	M3
PM-50	52	52	22	10	39	10	44	38	38	21	M4 Inside	M3

Panel Meters
Round panel meter
Outline drawing


Model	Unit	A	B	C	D	E	F	G
PM-52	mm	58	66.5	4.5	26	40.5	52	39
PM-65	mm	73.5	83.5	4.5	31	42	65	39
PM-62T2	mm	75	90	8	45	65	70	35
PM-45	mm	45	47.8	1.5	22	35.2	45.2	18



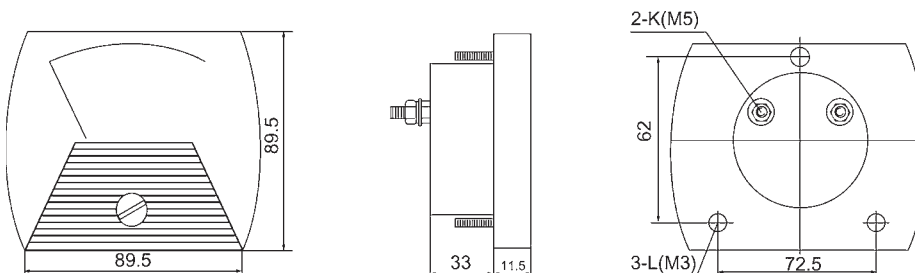
PM-52



PM-65

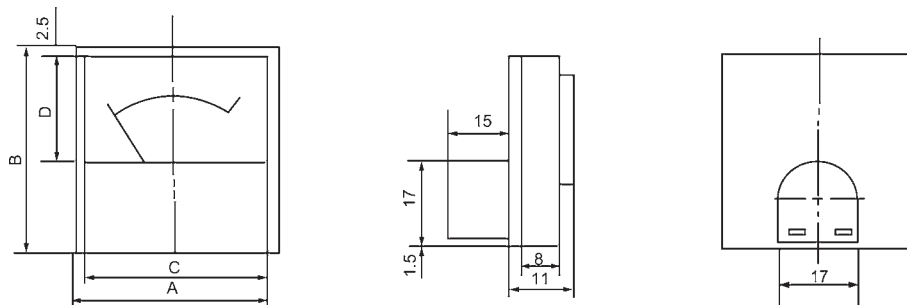

PM-100Y Panel meter

Model	Name	Specification	Accuracy
PM-45 PM-52 PM-65 PM-62T2	AC Ammeter	From 10A, 15A, 20A, 30A...to 3000A, 5000A From 0.1A, 0.5A, 1A, 5A, 10A, 25A...to 80A, 100A	With ext. c/t 1A or 5A AC direct connection Class 1.5
	DC Ammeter	From 50uA, 100uA, 1mA, 5mA...1A, 5A, 10A, 25A, 30A...to 100A From 10A, 15A, 20A, 30A...2500A, 3000A...to 8KA, 10KA	DC direct connection With ext. shunt 50mv, 60mv or 75mv Class 1.5
	AC Voltmeter	From 30V, 50V, 100V...to 300V, 500V, 600V From 1KV, 2KV, 5KV...to 380KV, 450KV	AC direct connection With ext. voltage transformer Class 1.5
	DC Voltmeter	From 10V, 20V, 30V...to 500V, 600V, 1000V From 1KV, 2KV, 5KV...to 8KV, 9KV, 10KV	DC direct connection With ext. resistor Class 1.5
	Frequency meter	Voltage: 110V, 220V, 380V, 440V Frequency: 45-55Hz, 45-65Hz, 55-65Hz, 47-53Hz	 Class 1.0

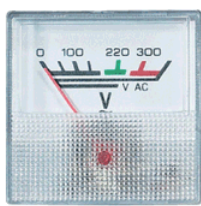
Outline drawing


Supply-battery panel meters

Outline drawing



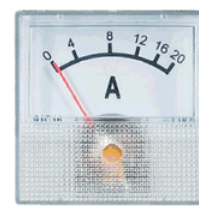
Model	A	B	C	D
PM-55	55	50	50	30
PM-48	55	48	50	28
PM-40	40	40	36	21
PM-48A	48	48	44	25



40 x 40



40 x 40



40 x 40



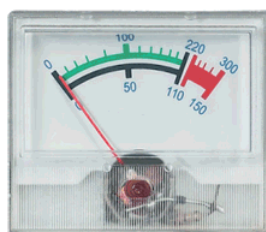
40 x 40



40 x 40



40 x 40



55 x 50



48 x 48



55 x 48