



PANEL METER

- U.M.P.S.F.T.W. Series
- Portable Instrument
- Bench Type
- Wide Angle Scale Instrument
- Switchboard Instrument
- Thin Edgewise
- Crossing Type
- Digital Panel Meter
- Current Transformer



STANDARD ELECTRIC WORKS CO., LTD.

History

In 1973 Mr. and Mrs. **Stanley Shay** established the **Standard Electric Works Co., Ltd. (SEW)** in Pan Chiao, Taipei Hsien, Taiwan to manufacture and market various test and measurement instruments worldwide. Our manufacturing department is composed of dependable, highly skilled individuals. Their hard work and dedication has set the foundation for the company's continual growth.

1973 Major products included Analog Panel Meters, Multitesters, Insulation Testers, Clamp Meters, Earth Resistance Testers, and Phase Sequence Indicators.

1989 Began research, development, and production of digital and analog electric field measurement instruments.

1998 SEW partnered with TOPTRONIC to enhance product development and upgrade our manufacturing technology. In addition to the products that SEW and TOPTRONIC already offered, we jointly developed a new line of test and measurement instruments that included the following :

- High Voltage Insulation Testers
- High Voltage Detectors
- High Voltage Probe Meters
- High Voltage Multifunction Phasing Sticks
- Personal Safety Voltage Detectors
- Capacitive High Voltage Detectors
- Earth Leakage Circuit (ELCB) Testers
- Circuit Break Identifier

2006 The Miao Li Plant, a new state-of-the-art production plant was built to meet the needs of our expanding business. This facility houses a 100kV testing facilities, environmental control test laboratory, high voltage tester, hardness tester molding machine, H.V. insulation tester, and other testing facilities. All of which are tested and calibrated regularly.

2007 Production of Test Leads for applications of different kinds of instruments. Most of them are patented in the U.S., Germany and China.

2008 Plastic extruder was added to production lines to further ensure the quality of products and reduce the production costs.

2010 For its continual growth, SEW recently purchased a new factory. Its headquarters will be relocated from Panchiao Taipei Hsien to the Yongning Scientific Park in Tucheng District Xinbei City.

Mission Statement

To develop, manufacture, and supply high quality test and measurement instruments worldwide, SEW is committed to meeting our clients' needs and expectations by constantly striving to develop new and innovative products with the latest technology to meet current market demands. With our dedicated team, we pride ourselves in delivering a reliable, quality product with the highest safety standards.

Quality Control Certifications

Most SEW products meet the safety requirements to protect the users' safety.

- 1996.6 TUV ISO 9002
Quality Management System
- 2002.12 TÜV ISO 9001 : 2000
Quality Management System
- 2009.12 TÜV ISO 9001 : 2008
Quality Management System
- TÜV(SÜD) ETL MET conducts
inspects the plant annually.



Head Office (5F)



Miao Li Plant

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Portable Instrument

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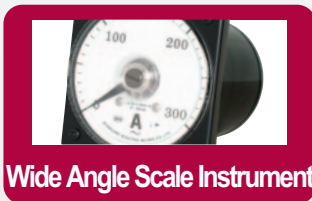
ST-2000



Bench Type

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ED-305
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Wide Angle Scale Instrument

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Switchboard Instrument

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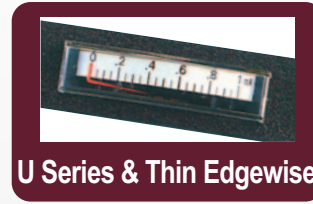
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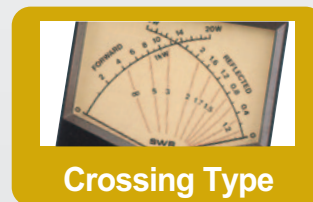
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Crossing Type

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Digital panel meter

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ST-312V
(ST-312mV)
ST-312A



Current Transformer

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ST-40CT, ST-30CT
ST-30RCT, ST-12RCT
ST-6RCT
ST-3RCT

Portable Instrument

Portable AC/DC Ammeter & Voltmeter



ST-2000

AC/DC Ammeter & Voltmeter are moving coil or Rectifier instrument.

Name	Range	No.	
AC Ammeter	2Ranges	20/100mA	1301
		50/100mA	1302
		100/500mA	1303
		0.2/1A	1304
		0.5/1A	1305
		1/5A	1306
		2/10A	1307
		5/25A	1308
	3Ranges	20/100/500mA	1310
		0.2/0.5/1A	1312
		0.5/1/2A	1313
		2/5/10A	1314
		5/10/20A	1315
	4Ranges	20/50/100/200mA	1316
		0.1/0.2/0.5/1A	1317
0.5/1/2/5A		1318	
2/5/10/20A		1319	
AC Volt meter	2Ranges	15/30V	1501
		30/75V	1502
		75/150V	1503
		150/300V	1504
		300/750V	1505
	3Ranges	75/150/300V	1506
		150/300/600V	1507
		150/300/750V	1508

- **Principle :** Moving coil type
- **Accuracy :** $\pm 0.5\%$ of F.S.
- **Scale Length :** Approx. 135mm(5-3/8")
- **Weight :** Approx. 1.7kg
- **Dimension :** 196(L)x170(W)x87(D)mm
- **Case Material :** Bakelite with glass window

Name	Range	No.	
DC Ammeter	2Ranges	50/100uA	1403
		100/500uA	1404
		500/1000uA	1405
		10/50mA	1406
		50/100mA	1407
	3Ranges	10/30/100mA	1409
		0.1/0.3/1A	1410
		1/3/10A	1411
		3/10/30A	1412
	4Ranges	0.1/0.3/1/3mA	1414
		1/3/10/30mA	1415
		10/30/100/300mA	1416
		0.1/0.3/1/3A	1417
		1/3/10/30A	1418
		30/100/300/1000mA	1419
1Range		50mV	1601
DC Volt meter	2Ranges	5/10V	1602
		1/3V	1603
		10/30V	1604
		30/100V	1605
		100/300V	1607
	300/1000V	1608	
	3Ranges	0.3/1/3V	1609
		1/3/10V	1610
		3/10/30V	1611
		30/100/300V	1612
	4Ranges	0.3/1/3/10V	1613
		3/10/30/100V	1614
1/3/10/30V		1615	
10/30/100/300V		1616	
30/100/300/1000V		1617	
0.2/2/20/2000V		1618	

Special Ranges Are Available Upon Request.

Portable Instrument

Portable Frequency Meter



The Hz meters use a frequency-to-DC current transducer which drives a high sensitivity moving coil type indicator. It features accurate frequency measurements without noticeable influence of line voltage fluctuation (50 to 300V) or waveform distortion.

- **Principle :** Frequency sensing transducer
- **Accuracy :** 0.5% of full scale value on 45 to 65 Hz range
±1.0% of full scale value on 20 to 100Hz range
±0.5% of full scale value on 100 to 500Hz range
- **Scale Length :** Approx. 135mm(5-3/8")
- **Dimension :** Bakelite with glass window

Name	Frequency	Voltage	No.
Hz meter	45-65Hz	120/240V	1701
	0-100Hz	120/240V	1702
	0-500Hz	120/240V	1703

Portable Power Factor Meter



The PF meter is used for measurement in single-phase And balanced three-phase circuits. From a phase Discriminating circuit, the output of the built-in transducer Produces a DC proportional to the phase between voltage And current to operate the DC indicator

- **Principle :** Phase angle sensing transducer
- **Rated Accuracy :** ±3° phase angle
- **Scale :**
Power Factor : Lead 0 – 0.3 – 1.0 – 0.3 – 0 Lag
Power Angle : Lead 90° – 0° – 90° Lag
- **Effective Power Factor Measuring Range :**
Lead 0.5 – 1.0 – 0.5 Lag
- **Scale Length :** Approx. 135mm(5-3/8")
- **Frequency Influence :** Within ±1.5° phase angle at 45 to 65Hz

Name	Current	Voltage	No.
PF(1Ø,3Ø) meter	0.2/1A	120V	3801
	1/5A	120V	3802
	5/25A	120V	3803

Portable Wattmeter



The wattmeter is electro-dynamometer type, this instrument is highly reliable, and designed for use in laboratories or factories for precision measurement of power at AC and commercial frequencies 45-65 Hz.

- **Principle :** Electro-dynamometer type
- **Accuracy :** ±0.5% of full scale
- **Scale Length :** Approx. 135mm(5-3/8")
- **Scale Divisions :** 120
- **Frequency Ranges :** AC 25 to 1000Hz (COSØ=1.0) (suitable for DC)
AC 25 to 500Hz (COSØ=0.2)

Name	Range		Power Factor	No.
	Current	Voltage		
Single-Phase Wattmeter	0.2/1A	120/240V	1.0	2101
	1/5A	120/240V	1.0	2102
	2/10A	120/240V	1.0	2103
	5/25A	120/240V	1.0	2104
	1/2.5A	120/240V	1.0	2105

Special Ranges Are Available Upon Request.

Bench Type



FEATURES

- Precision meters for plant maintenance, field servicing and educational purposes.
- Different meters can be chosen from the front panel.
- Moving coil movement.
- Waterproof.
- Tilted front panel for easier viewing.
- Hidden terminals (4mm socket) for range selection and safety design.
- Carbon pointer, mirror scale to eliminate parallax error.
- Accuracy : $\pm 1.5\%$ F.S.
- Dimension : 245(L)x190(W)x110(D)mm.
- Weight : Approx. 1300g.

ED-4195

Name	Range	
AC Ammeter	3 Ranges	10/30/100mA 1/2.5/5A
	4 Ranges	50/100/250/500mA 10/50/500mA/1A
AC Voltmeter	3 Ranges	10/30/100V 75/150/300V
	4 Ranges	75/150/300/750V
DC Ammeter	1 Range	0-1A 0-3A 0-5A 0-200mA 0-500mA
	4 Ranges	30/100/300/1000uA 30/100/300/1000mA 10/50/500uA/1mA 1/3/10/30mA 1/3/10/300mA
DC Voltmeter	3 Ranges	3/15/30V 3/15/300V 10/30/100V
	4 Ranges	1/3/10/30V 10/30/100/300V
Galvanometer	-35 to +35	

Special Ranges Are Available Upon Request.



ED-305

FEATURES

- Precision meters for plant maintenance, field servicing and educational purposes.
- Taut Band movement with rectifier type.
- Multi terminals (4mm socket) for range selection.
- Carbon pointer, mirror scale to eliminate parallax error.
- High resistance to shock and vibration.
- Accuracy : $\pm 1.5\%$ F.S.
- Scale length : 80mm.
- Dimension : 107(L) \times 117(W) \times 53(D)mm.
- Weight : Approx. 300g.

Name	Range	No.	
AC Ammeter Accuracy : $\pm 1.5\%$ F.S.	3 Ranges	1/2.5/5A	305ACA 301
		1/3/5A	305ACA 302
		5/10/25A	305ACA 303
	4 Ranges	50/250/500/1000mA	305ACA 400
		50/100/250/500mA	305ACA 401
		10mA/50mA/500mA/1A	305ACA 402
		25/100/250/1000mA	305ACA 403
		2/5/10/20A	305ACA 404
		5/10/20/30A	305ACA 405
	AC Voltmeter Accuracy : $\pm 1.5\%$ F.S.	3 Ranges	10/30/100V
75/150/300V			305ACV 301
4 Ranges		1/3/10/30V	305ACV 400
		15/30/150/450V	305ACV 401
		100/250/500/1000V	305ACV 402
		5/30/100/300V	305ACV 403
		75/150/300/750V	305ACV 404
DC Ammeter Accuracy : $\pm 1.5\%$ F.S.	1 Ranges	200mA	305DCA 100
		500mA	305DCA 101
		1A	305DCA 102
		3A	305DCA 103
	3 Ranges	5A	305DCA 104
		1/3/5A	305DCA 301
	4 Ranges	5/10/25A	305DCA 302
		1/3/10/30mA	305DCA 400
		10/100/300/1000mA	305DCA 401
		10/30/300/1000mA	305DCA 402
		30/100/300/1000mA	305DCA 403
		50/250/500/1000mA	305DCA 404
		50mA/500mA/1A/10A	305DCA 405
DC Voltmeter Accuracy : $\pm 1.5\%$ F.S.	3 Ranges	10/30/100V	305DCV 301
		3/15/300V	305DCV 302
	4 Ranges	300mV/1V/3V/30V	305DCV 400
		1/3/10/30V	305DCV 401
		10/30/100/300V	305DCV 402
		15/30/150/450V	305DCV 403
		3/30/100/300V	305DCV 404
DC Galvanometer $\pm 1.5\%$ F.S.	+/- 35G	305G 100	

Special Ranges Are Available Upon Request.

Bench Type



ED-205

- **Dimension :**
91(L)×103(W)×100(D)mm
- **Scale Length :**
Approx. 65mm (deflection angle : 90°)
- **Terminal :**
4mm socket captive head, suitable for wire or pin-type test lead.
- **Material And Color :**
Acrylic resin meter cover, white scale plate, plastic stand in black.
- **Safety Standard :**
IEC/EN 61010-1 CAT III 600V
EN 61326-1 EN 61000-4-2 EN 61000-4-3

Name	Range	No.	
AC Ammeter (Rectifier Type) Accuracy : ±2.5% F.S.	1 Range	1A 205ACA 100	
		500mA 205ACA 101	
		5A 205ACA 102	
	2 Ranges	1/10A 205ACA 200	
		10/100mA 205ACA 201	
		100/500mA 205ACA 202	
		500mA/1A 205ACA 203	
		80/200mA 205ACA 204	
	3 Ranges	50mA/500mA/5A 205ACA 301	
		500mA/1A/5A 205ACA 302	
		1/2.5/5A 205ACA 303	
		5/10/25A 205ACA 304	
30/100/500mA 205ACA 305			
AC Voltmeter (Rectifier Type) Accuracy : ±2.5% F.S.	1 Range	5V 205ACV 100	
		10V 205ACV 101	
		20V 205ACV 102	
		50V 205ACV 103	
		250V 205ACV 104	
	2 Ranges	10/100V 205ACV 201	
		3/30V 205ACV 202	
		5/15V 205ACV 203	
	3 Ranges	15/30/50V 205ACV 301	
		30/50/100V 205ACV 302	
	DC Ammeter (Moving Coil Type) Accuracy : ±2.0% F.S.	1 Range	50uA 205DCA 100
			100uA 205DCA 101
500uA 205DCA 102			
3mA 205DCA 103			
10mA 205DCA 104			
100mA 205DCA 105			
200mA 205DCA 106			
300mA 205DCA 107			
500mA 205DCA 108			
500uA 205DCA 109			
1A 205DCA 110			
2.5A 205DCA 111			
3A 205DCA 112			
5A 205DCA 113			
10A 205DCA 114			
2 Ranges		1/10mA 205DCA 200	
		1/5A 205DCA 201	
		1/10A 205DCA 202	
		50/500mA 205DCA 203	
		50mA/500mA/5A 205DCA 301	
3 Ranges		100mA/1A/5A 205DCA 302	
	1/5/10A 205DCA 303		

Name	Range	No.
DC Voltmeter (Moving Coil Type) Accuracy : ±2.0% F.S.	1 Range	1mV 205DCV 100
		1V 205DCV 101
		3V 205DCV 102
		5V 205DCV 103
		6V 205DCV 104
		10V 205DCV 105
		15V 205DCV 106
	2 Ranges	20V 205DCV 107
		50/500mV 205DCV 200
		50/500uA 205DCV 201
		1/10V 205DCV 202
		1/5V 205DCV 203
		2/20V 205DCV 204
		3/15V 205DCV 205
		5/10V 205DCV 206
		5/15V 205DCV 207
		10/50V 205DCV 208
30/60V 205DCV 209		
3 Ranges	50/500/5000uA 205DCV 301	
	100uA/500uA/1mA 205DCV 302	
	3/10/15V 205DCV 303	
	3/15/300V 205DCV 304	
	3/15/30V 205DCV 305	
	3/30/300V 205DCV 306	
DC (Galvanometer Type) Accuracy : ±2.0% F.S.	+/- 0.1mA 205G 100	
	+/- 0.5mA 205G 101	
	+/- 10V 205G 102	
	+/- 1A 205G 103	
	+/- 3.5G 205G 104	
	+/- 3.5mA 205G 105	
	+/- 30G 205G 106	
	+/- 30mA 205G 107	
	+/- 35G 205G 109	
	+/- 35mV 205G 110	
	+/- 50G 205G 111	
	+/- 60uA 205G 112	
Custom Accuracy : ±2.0% F.S.	+1A-0-5A 205DC 101	
	+20uA-0-100uA 205DC 102	
	+20mA-0-100mA 205DC 103	
	+5V-0-15V 205DC 104	
	+50mA/500mA/5A 205DC 105	
+3/15/300V 205DC 106		

Special Ranges Are Available Upon Request.

Wide Angle Scale Instrument



CE

LS-110



File No. E205138
Project No. 00CA03127



CE

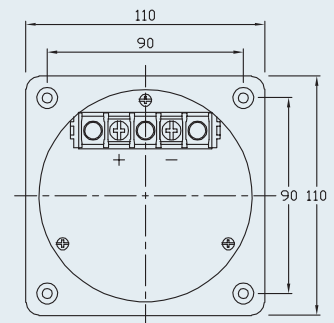
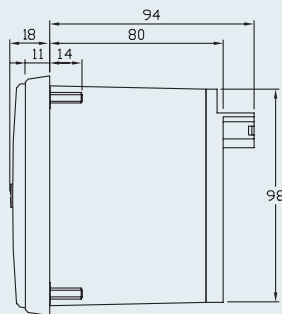
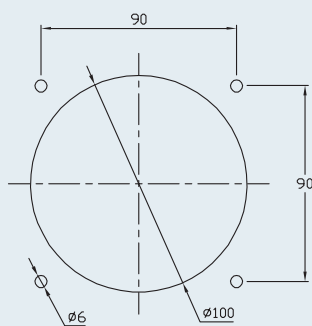
LS-80



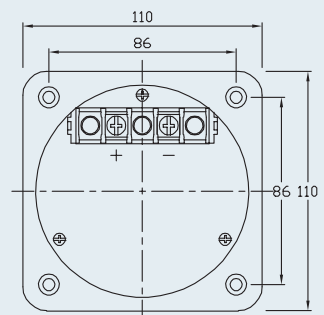
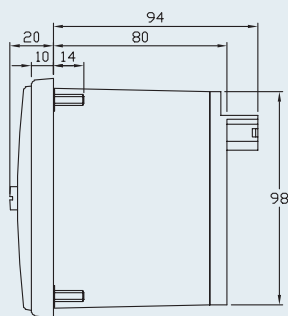
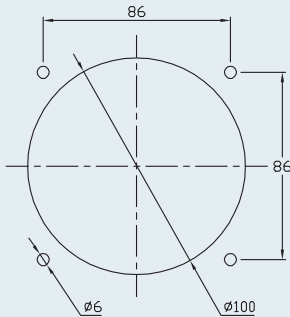
File No. E205138
Project No. 00CA06290

- Easy to read long-scales and pointer-indications can easily be read from a distance.
- Full Scale Deflection : 250°
- Accuracy : Class 1.5
- Length : 183mm
- Case And Composition : Acrylic Resin cover, plastic body and terminal, Four studs mounting.
- Color : White scale plate, black terminal plate, gray meter body.
- Pointer : Sword-type in black color.

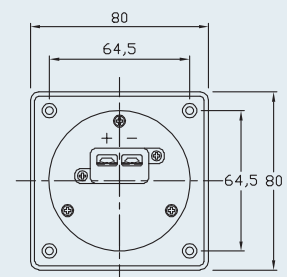
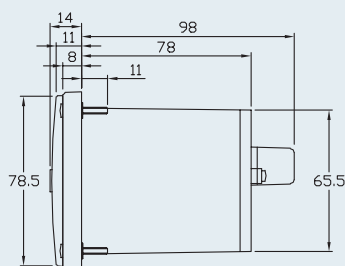
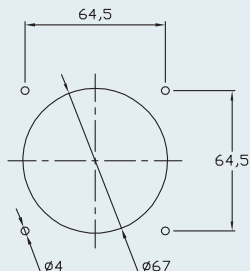
LS-110-J



LS-110-A



LS-80



Wide Angle Scale Instrument







Rectifier Type (LS-110 LS-80)

Meter	Description	class	Safety Standard
AC Ammeter	<ul style="list-style-type: none"> Measuring range Extended range type (0-X-2X) Burden:1 VA 0-5 A 0-5-10 A	1.5	CE RU
	For connection CT CT ratio • Measuring range • Extended range type (0-X-2X) • Extended range type 10/5 0-10 A 0-10-20 A 0-X-3X 15/5 0-15 A 0-15-30 A 0-X-5X 20/5 0-20 A 0-20-40 A Available on request 25/5 0-25 A 0-25-50 A Burden:1 VA 30/5 0-30 A 0-30-60 A 50/5 0-50 A 0-50-100 A 60/5 0-60 A 0-60-120 A 75/5 0-75 A 0-75-150 A 100/5 0-100 A 0-100-200 A 150/5 0-150 A 0-150-300 A 200/5 0-200 A 0-200-400 A 300/5 0-300 A 0-300-600 A 500/5 0-500 A 0-500-1000 A 750/5 0-750 A 0-750-1500 A 1000/5 0-1000 A 0-1000-2000 A 1500/5 0-1500 A 0-1500-3000 A 2000/5 0-2000 A 0-2000-4000 A 3000/5 0-3000 A 0-3000-6000 A	1.5	CE RU
AC Voltmeter	For direct connection • Measuring range Burden:1 VA 0-10 V 0-150 V 0-50 V 0-300 V 0-75 V 0-500 V 0-100 V 0-600 V	1.5	CE RU
	For connection to PT PT ratio • Measuring range PT ratio:Y/110 (Y: PT primary voltage) 220/110 V 0-300 V Measuring range:0-1.5/1.1 x Y 440/110 V 0-600 V Burden:0.5 VA 3300/110 V 0-4.5 KV 6600/110 V 0-9 KV 13200/110 V 0-18 KV 22000/110 V 0-30 KV 30000/110 V 0-45 KV	1.5	CE RU

Moving Coil Type (LS-110 LS-80)



Meter	Description	class	Safety standard
DC Ammeter	For direct connection • Measuring range 0-1 mA 0-20 mA 0-1 A Internal resistance: 500Ω 0-1.5 mA 0-40 mA 0-1.5 A 0-2 mA 0-50 mA 0-2 A 0-3 mA 0-70 mA 0-3 A 0-5 mA 0-100 mA 0-5 A 0-7.5 mA 0-150 mA 0-7.5 A 0-10 mA 0-200 mA 0-10 A	1.5	CE RU

Wide Angle Scale Instrument

	0-15 mA 0-300 mA 0-15 A 0-20 mA 0-500 mA 0-20 A 0-30 mA 0-750 mA			 
	For connection to shunt •Measuring range 0-1 A 0-15 A 0-7.5 A 0-20 A 0-10 A	Burden : 50 mV	1.5	 
DC Voltmeter	For direct connection •Measuring range 0-10 V 0-150 V 0-30 V 0-300 V 0-50 V 0-500 V 0-75 V 0-600 V 0-100 V	Burden : 1 V/1 K Ω	1.5	 

- For ranges higher than 20A DC, use external shunt with a 50mV DC Ammeter.
- For ranges higher than 300V DC, use external Multiplier with a 1mA Voltmeter.
- For ranges higher than 5A AC, use external Current Transformer with a 5A AC Ammeter.
- For ranges higher than 600VAC, use external potential Transformer with a 150V AC Voltmeter.

Frequency/DC Transducing Type (LS-110 LS-80)

FREQUENCY METER	45-65 110 V 45-65 220 V 55-65 110 V 55-65 220 V	Burden : 1.4 VA at 110 V : 2.6 VA at 220 V	1.5	 
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- For any voltage rating higher than above, use an external Potential Transformer with a 110V instrument.

Power/DC Transducing Type (LS-110)

Single-Phase Wattmeter	•Measuring range 110 V 1 A 220 V 5 A 10A		1.5	
3-Phase Wattmeter	•Measuring range 110 V 5 A 220 V		1.5	

Phase Angle/DC Transducing Type (LS-110)

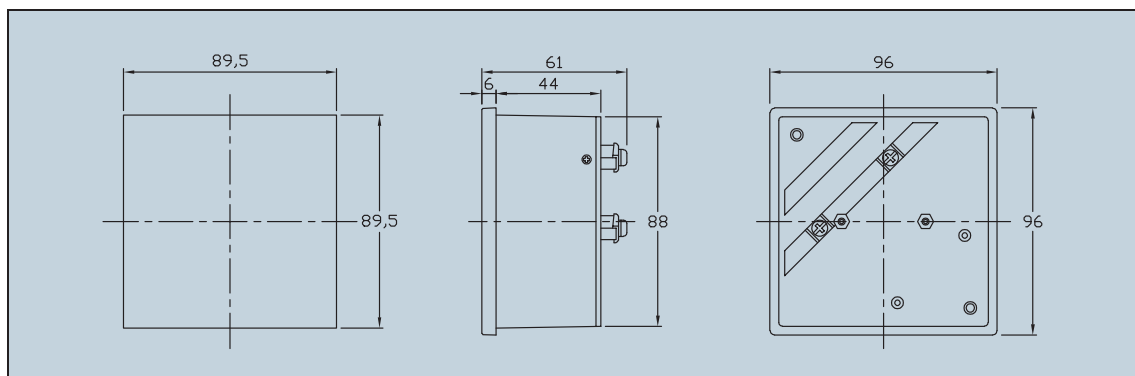
3-Phase Power Factor Meter (For Balanced Circuit) (LS-110)	•Measuring range 110 V 5 A 220 V		1.5	
3-Phase 4-Wire Power Factor Meter (LS-110)	•Measuring range 110 V/ 5 A 190 V/ 380 V/		5.0	

Special Ranges Are Available Upon Request.

Wide Angle Scale Instrument



LS-96



Measuring Ranges :

Moving Coil Type

DC μ A	DC mA	DC A	DC V
500	1	1	10
	2	1.5	30
	5	2	50
	10	3	100
	20	5	150
	50	10	300
	100	15	
	200	20	
	500		

Rectifier Type

AC A	AC V
1	150
5	300
	500
	600

- For ranges higher than 20A DC, use external shunt with a 50mV DC Ammeter.
- For ranges higher than 300V DC, use external Multiplier with a 1mA Voltmeter.
- For ranges higher than 5A AC, use external Current Transformer with a 5AAC Ammeter.
- For ranges higher than 600V AC, use external Potential Transformer with a 150V AC Voltmeter.

- **Accuracy :** Class 1.5
- **Full Scale Deflection :** 250°
- **Composition :** Glass window, ABS Resin frame and case, PC glass fiber base Mounting fittings included.
- **Color :** Black base and frame, white scale plate and meter body.
- **Pointer :** Stick shape in black color.

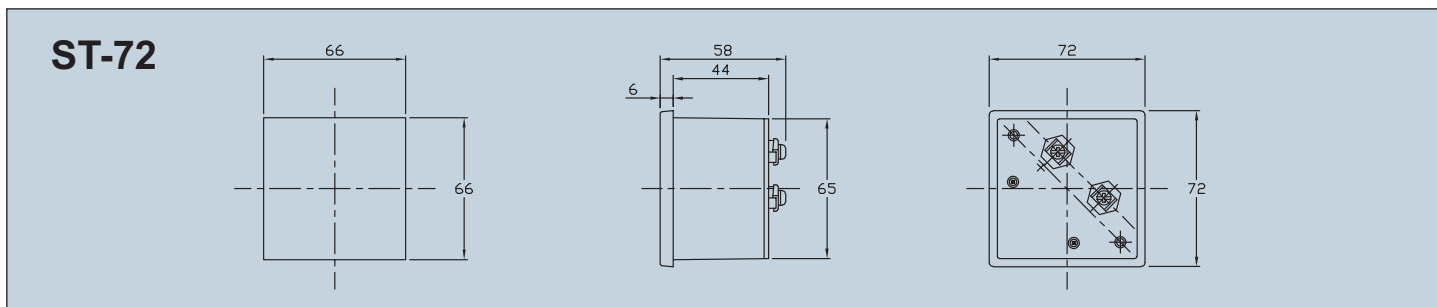
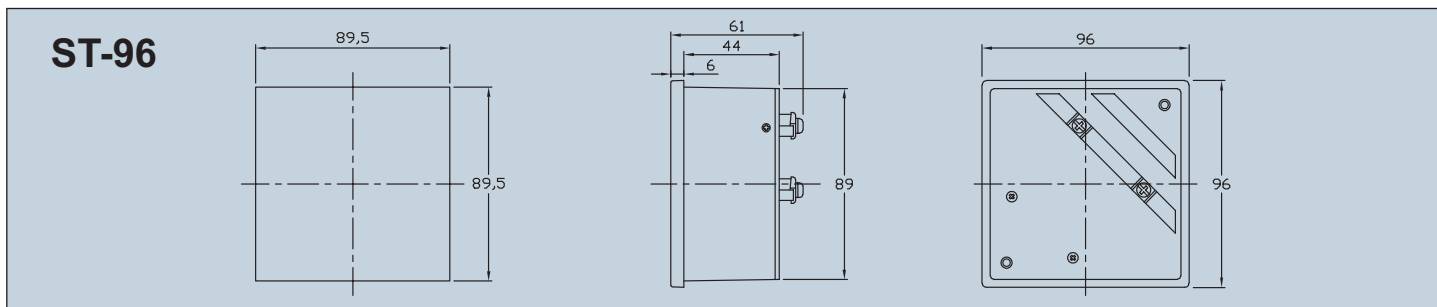
Switchboard Instrument



ST-96



ST-72



Measuring Ranges : Moving Coil Type

DC uA	DC mA	DC A	DC mV	DC V
50	1	1	50	1
100	1.5	1.5	60	1.5
150	2.5	2.5	100	2.5
200	3	3	500	3
250	5	5		5
300	10	10		10
400	50	15		15
500	100	20		20
600	500	25		25
800	800	30		30
		40		40
		50		100
		60		150
				200
				300
				400
				600

Moving Iron Type

AC mA	AC A	AC V
100	1	100
500	1.5	150
	2.5	250
	5	300
	10	500
	15	600
	20	
	25	
	30	
	40	
	60	
	100	

- **Test Voltage :** 2kV 50-60Hz
- **AC Ampere Over Load Scale :** 200%,300%,500%
- **Composition :** Glass Window, ABS resin frame and case, Bakelite base
- **Color :** Black case and frame, white scale plate and meter body
- **Pointer :** Stick shape in black color
- **Pointer Length :** ST-96 : 55mm
ST-72 : 38mm

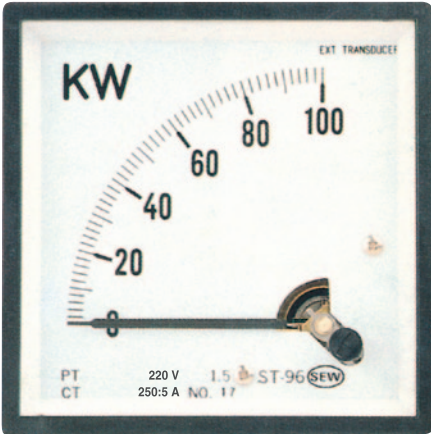
AC Ammeters above 100A require a basic meter combined with an external CT (Current Transformer)

AC Voltmeters above 600 Volts require a basic 150V meter combined with an external PT(Potential Transformer)

DC Ammeters above 50A require a basic 50mV meter combined with an external shunt

Measuring range	CT ratio	Measuring range	CT ratio	Measuring range	PT ratio	For connection to shunt measuring range		
0-5 A		0-250 A	250/5	0-300V	220/110	0-0.5A	0-100 A	0-1200 A
0-10 A	10/5	0-300 A	300/5	0-600V	440/110	0-7.5A	0-150 A	0-1500 A
0-15 A	15/5	0-400 A	400/5	0-4.5 kV	3300/110	0-10 A	0-200 A	0-2000 A
0-20 A	20/5	0-500 A	500/5	0-9 kV	6600/110	0-15 A	0-300 A	0-3000 A
0-25 A	25/5	0-600 A	600/5	0-18 kV	13200/110	0-20 A	0-400 A	0-4000 A
0-30 A	30/5	0-750 A	750/5	0-30 kV	22000/110	0-30 A	0-500 A	0-5000 A
0-40 A	40/5	0-800 A	800/5	0-45 kV	33000/110	0-40 A	0-600 A	0-6000 A
0-50 A	50/5	0-1000 A	1000/5			0-50 A	0-750 A	0-7000 A
0-60 A	60/5	0-1200 A	1200/5			0-75 A	0-1000 A	0-10000 A
0-75 A	75/5	0-1500 A	1500/5					
0-100 A	100/5	0-2000 A	2000/5					
0-150 A	150/5	0-2500 A	2500/5					
0-200 A	200/5	0-3000 A	3000/5					

Switchboard Instrument



**ST-72
ST-96 KW Meter**

ST-96 and ST-72 KW instruments are used for measuring the active and reactive power of AC single and three phase networks. They are primarily built in switchboards and electric devices.

- **Measuring Range** : 110V,220V, 380V,440V,1A,5A
- **Accuracy** : Class 1.5
- **Frequency** : 45-65 Hz
- **Test Voltage** : 2 kV,50-60 Hz
- **Pointer Length** : ST-96:55mm
ST-72:38mm
- **Composition** : Glass window, ABS resin frame and case, bakelite base mounting fitting included.
- **Color** : Black base and frame, white scale plate and meter body
- **Pointer** : Stick shape in black color.
- **Transducer** : External.



**ST-72
ST-96 Hz Meter**

ST-96 and ST-72 Hz instruments are suitable for frequency measurements from AC current networks and can be used in power engineering systems, power plants, switch and test rooms. They can be built in switchboards, measuring desks and electrical equipments.

- **Measuring Range** : 45-55Hz, 45-65Hz, 55-65Hz
- **Accuracy** : Class 1.5
- **Working Position** : Vertical.
- **Rated Voltage** : 110V,220V,380V,440V.
- **Limit Of Voltage Fluctuation** : $\pm 20\%$
- **Consumption** : Max. 15mA.
- **Test Voltage** : 2 kV,50-60 Hz
- **Pointer Length** : ST-96:55mm
ST-72:38mm
- **Composition** : Glass window, ABS resin frame and case, bakelite base mounting fitting included.
- **Color** : Black base and frame, white scale plate and meter body.
- **Pointer** : Stick shape in black color.

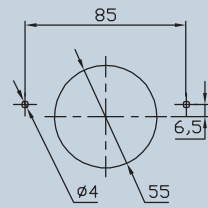


ST-96 COSφ Meter

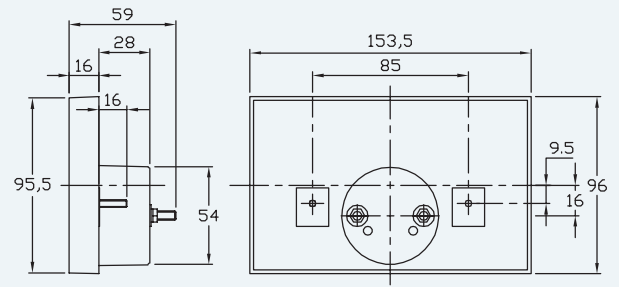
ST-96 COS ϕ instruments are used for measuring the power factor of AC single and three phases networks. They are also built primarily in switchboards and electric devices.

- **Measuring Range** : 110V, 220V 380V, 440V/1A, 5A
- **Accuracy** : $\pm 5^\circ$ phase angle
- **Frequency** : 45~65Hz
- **Test Voltage** : 2 kV,50-60 Hz
- **Pointer Length** : 55mm
- **Composition** : Glass window, ABS resin frame and case, bakelite base mounting fitting included.
- **Color** : Black base and frame, white scale plate and meter body
- **Pointer** : Stick shape in black color.

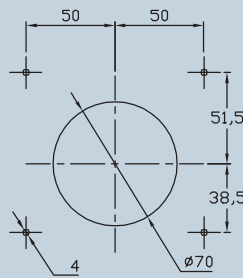
ST-150T



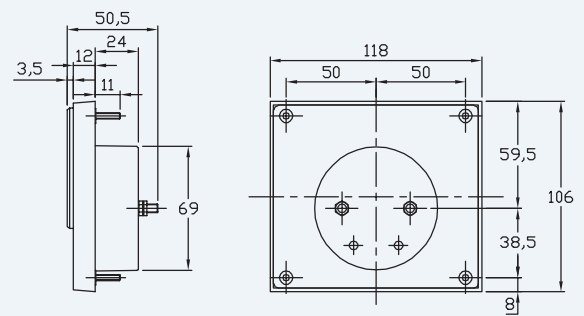
PANEL CUT-OUT



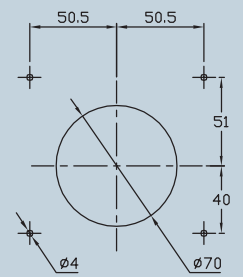
ST-118



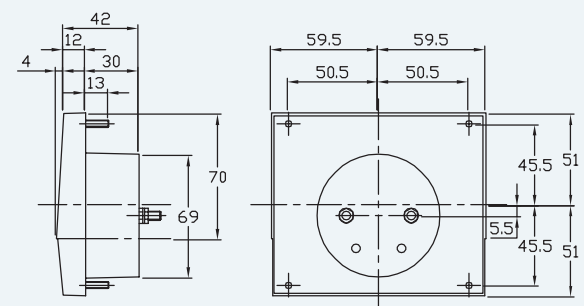
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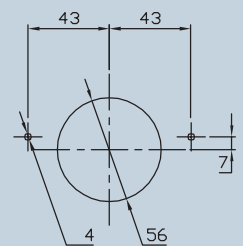
ST-118T



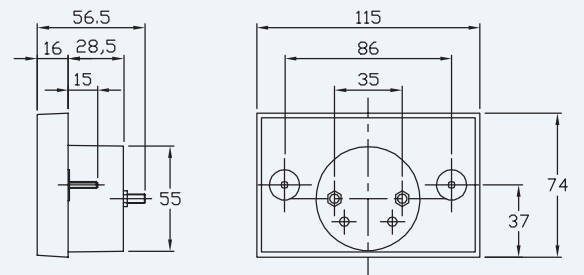
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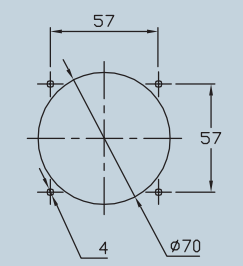
ST-115



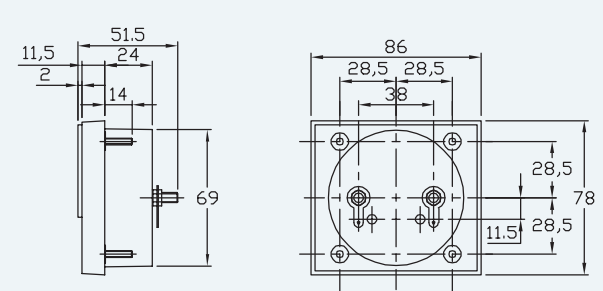
PANEL CUT-OUT



ST-86

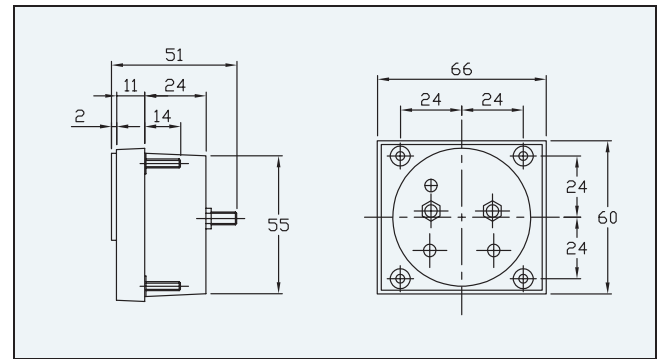
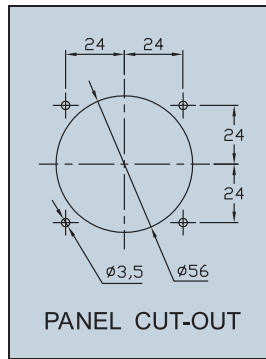
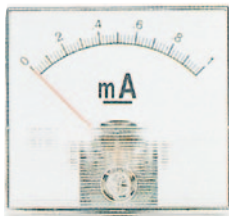


PANEL CUT-OUT



M Series

ST-66



Measuring Ranges :

Moving Coil Type

DC uA	DC mA	DC A	DC mV	DC V
50	1	1	50	3
100	5	5	60	5
150	10	10	100	10
200	50	15	500	30
250	100			50
300	150			100
500	200			150
800	300			200
	500			300
	800			500
				600

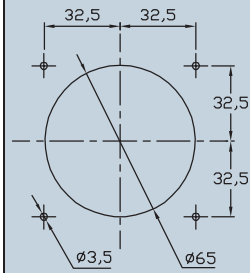
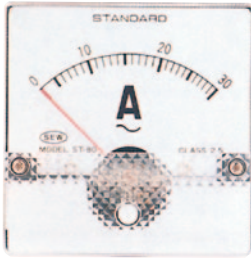
Rectifier Type

AC V
30
50
100
150
200
300
500

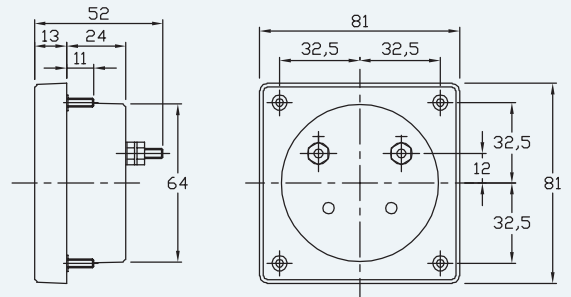
M series all up to 15A

- **Case And Composition :** Acrylic resin front and ABS resin case.
Four studs mounting.
Two studs mounting for ST-115.
- **Accuracy :** Moving coil type : Class 2.0
Rectifier type : Class 2.0
- **Color :** Black case, white scale plates.
- **Pointer :** Tube type, color in black or red.

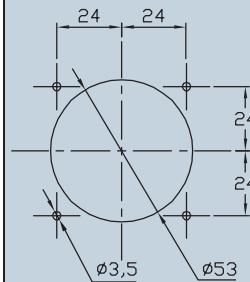
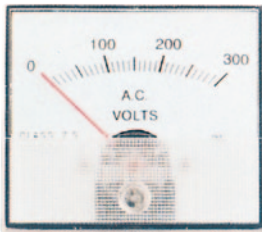
ST-80



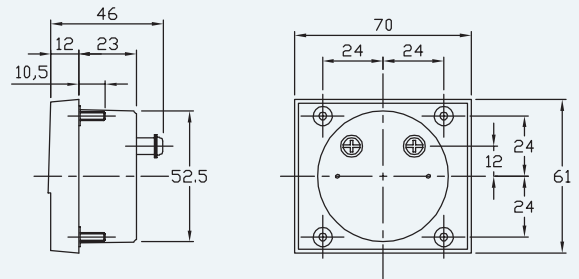
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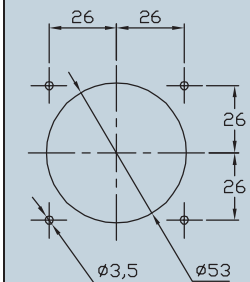
ST-70P



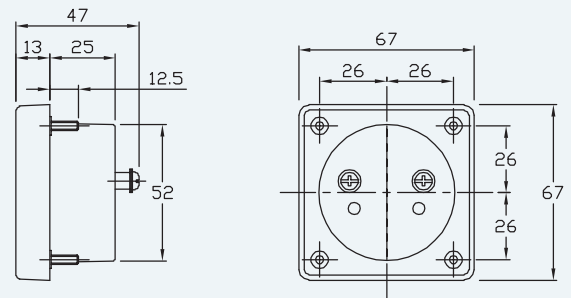
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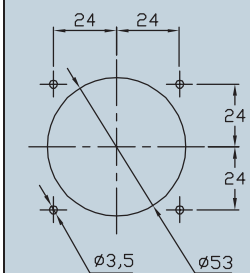
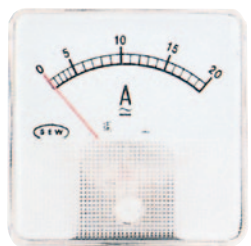
ST-65



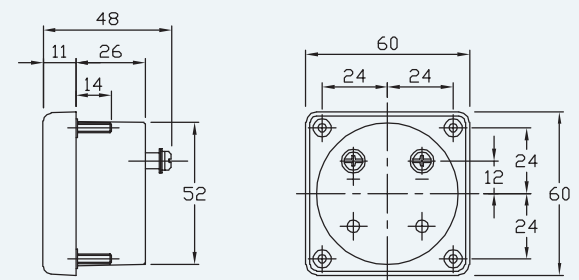
PANEL CUT-OUT



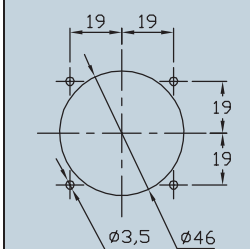
ST-60



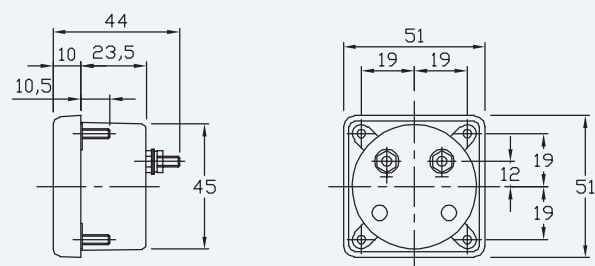
PANEL CUT-OUT



ST-45

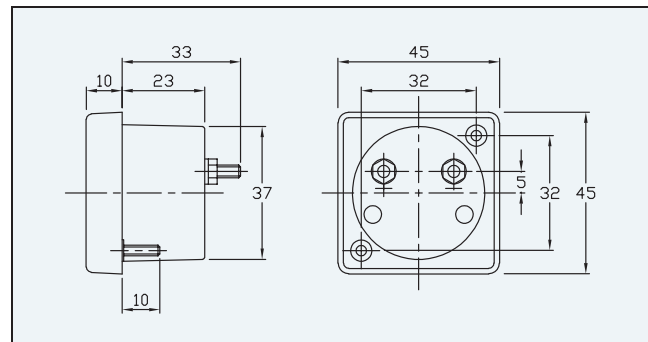
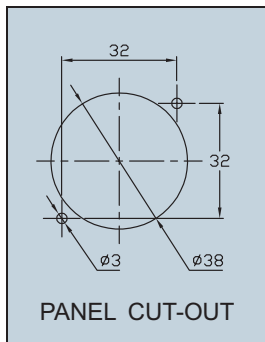


PANEL CUT-OUT

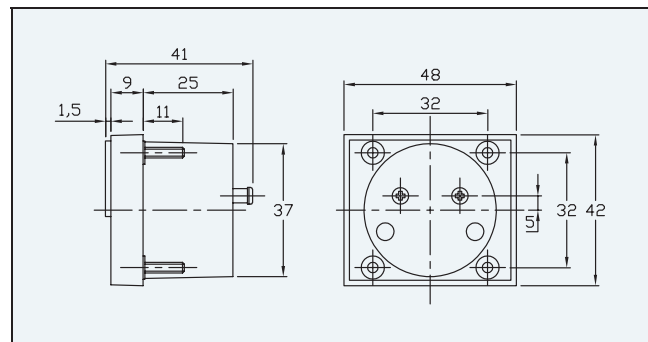
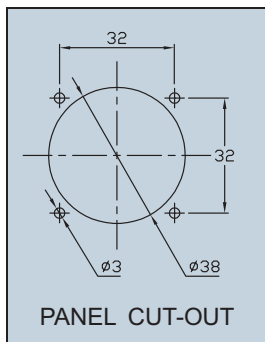


P Series

ST-38



ST-38N



Measuring Ranges :

Moving Coil Type

DC μ A	DC mA	DC A	DC mV	DC V
50	1	1	50	3
100	5	5	60	5
150	10	10	100	10
200	15	20	500	15
250	50	30		20
300	100	50		30
500	150			50
800	200			100
	250			150
	300			200
	500			300
	800			500
				600

Moving Iron Type

AC mA	AC A	AC V
50	1	150
100	5	250
150	10	300
200	15	500
250	20	
300	30	
500	50	
750		

Rectifier Type

AC V
30
50
100
150
200
300
500

DC up to 50A : ST-80

DC up to 30A : ST-65, ST-60, ST-45

DC up to 15A : ST-70P, ST-38, ST-38N

AC up to 50A : ST-80, ST-65

AC up to 30A : ST-70P, ST-60, ST-45

• Hz Meter(Only ST-80)

Measuring Ranges : 45~55Hz 45~65Hz
55~65Hz

Rated Voltage : 110V, 220V

Accuracy : Class 2.0

• Case And Composition :

Acrylic resin front.

Bakelite case : ST-80, ST-65, ST-45 AC & DC and ST-70P, ST-60 AC

ABS case : ST-70P, ST-60, ST-38, ST-38N DC

Four studs mounting

Two studs mounting for ST-38, ST-38N

• Accuracy :

DC : class 2.0 AC : Class 2.5 Rectifier : Class 2.0

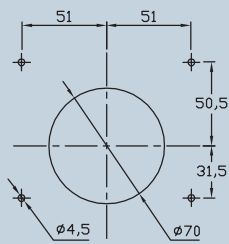
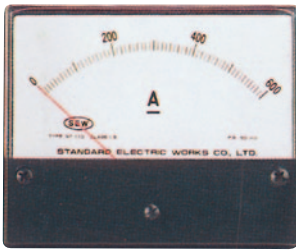
• Color :

Black case and white scale plate.

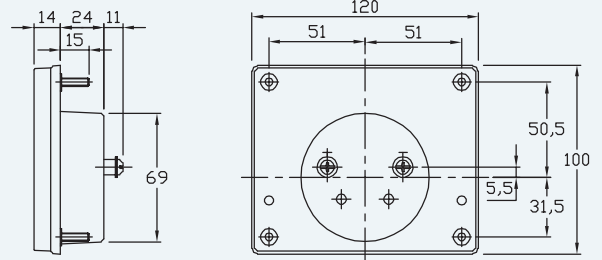
• Pointer :

Tube type, color in black or red.

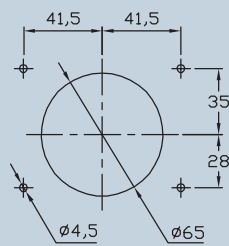
ST-110



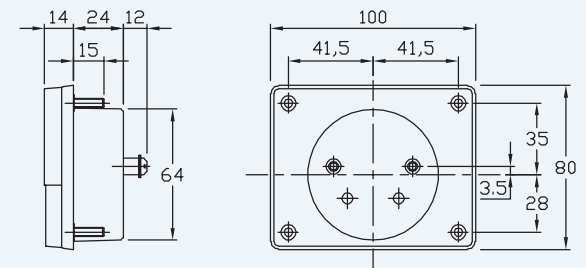
PANEL CUT-OUT



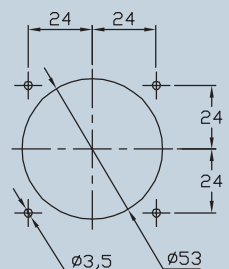
ST-100



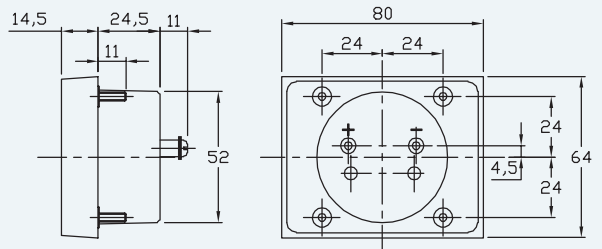
PANEL CUT-OUT



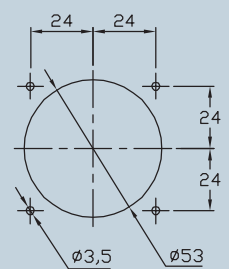
ST-680



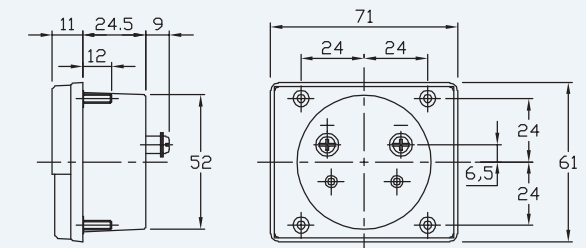
PANEL CUT-OUT



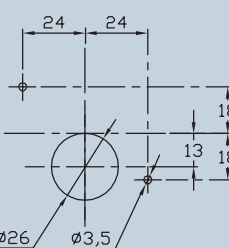
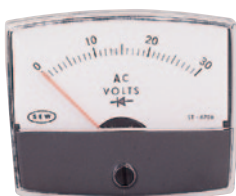
ST-670



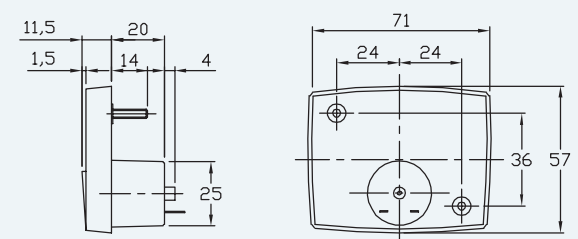
PANEL CUT-OUT



ST-670R

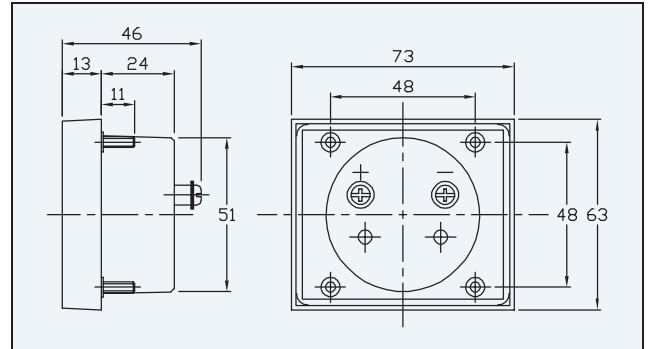
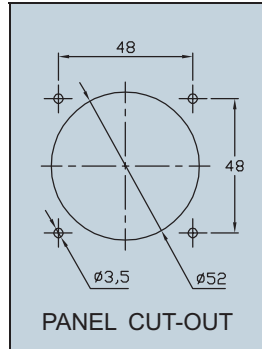
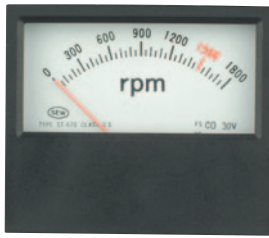


PANEL CUT-OUT

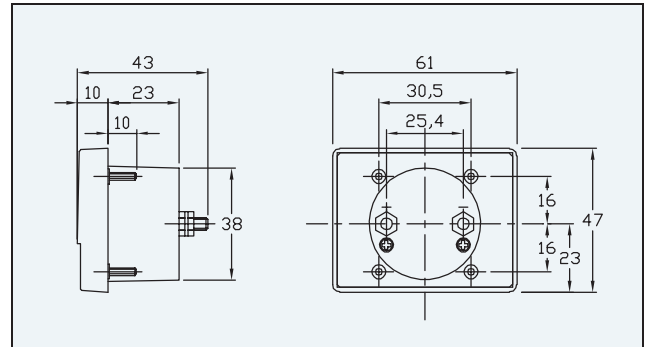
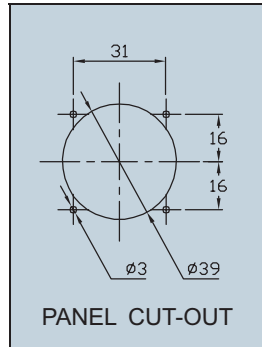


S Series

ST-670B



ST-645



Measuring Ranges :

Moving Coil Type

DC uA	DC mA	DC A	DC mV	DC V
50	1	150	1	50
100	5	200	5	60
150	10	250	10	100
200	15	300	20	500
250	20	500	30	30
300	30	800		50
500	100			600
800				

Moving Iron Type

AC mA	AC A	AC V
50	1	150
100	5	250
150	10	300
200	15	500
250	20	
300	30	
500	50	
800		

Rectifier Type

AC V
30
50
100
150
200
300
500

DC up to 50A : ST-110, ST-100, ST-670, ST-670B

DC up to 30A : ST-680

DC up to 10A : ST-670R, ST-645

AC up to 50A : ST-110, ST-100

AC up to 30A : ST-670, ST-670B

• Hz Meter :

Measuring Ranges : 45~55Hz, 55~65Hz, 45~65Hz

Rated Voltage : 110V, 220V

Accuracy : Class 2.0

Suitable Model : ST-110, ST-100, ST-680, ST-670, ST-670B

• Case And Composition :

Acrylic resin front and Bakelite case(Glass window, ABS resin frame, Bakelite case : Only ST-680)

Four studs mounting(Two stud for ST-670R)

• Accuracy :

Moving coil type : class 2.0

Moving Iron type : Class 2.5

Rectifier type : Class 2.0

• Color :

Black case

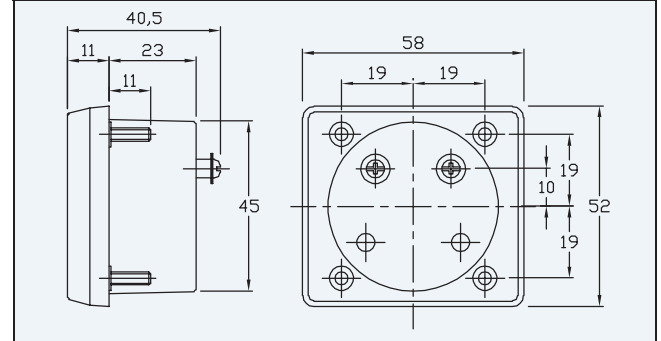
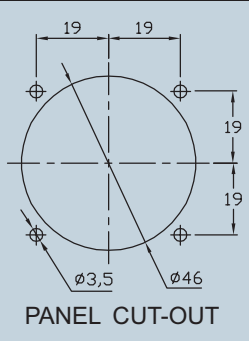
white scale plate.(yellow scale plate only ST-645)

• Pointer :

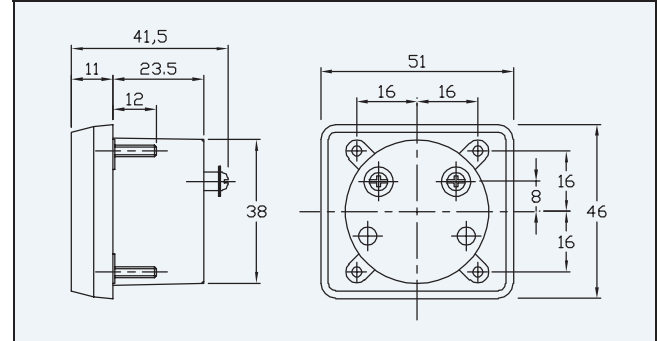
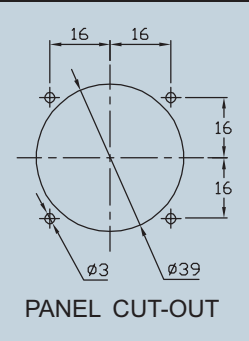
Tube or knife-type, color in black or red.

U Series & Thin Edgewise

ST-45U



ST-38U



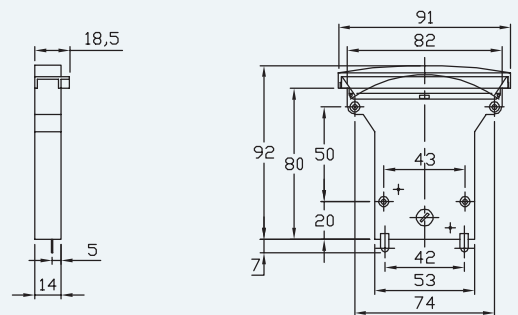
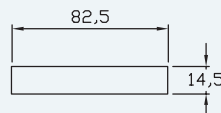
Measuring Ranges :

Moving Coil Type

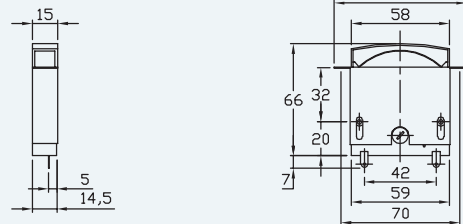
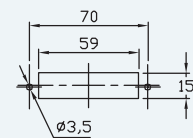
DC mA	DC A	DC V
1	1	5 50
50	5	10 100
100	10	15 150
200	20	20 200
300		30 300
500		

- **Case And Composition** : Acrylic resin front and bakelite case.
Four studs mounting.
- **Accuracy** : Class 2.0
- **Color** : Black case and white scale plate.
- **Pointer** : Tube type color in red.

ST-90E

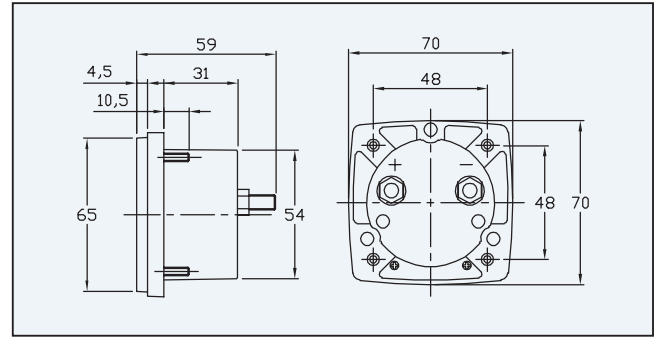
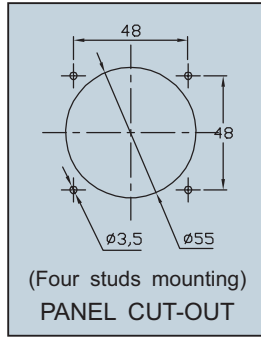
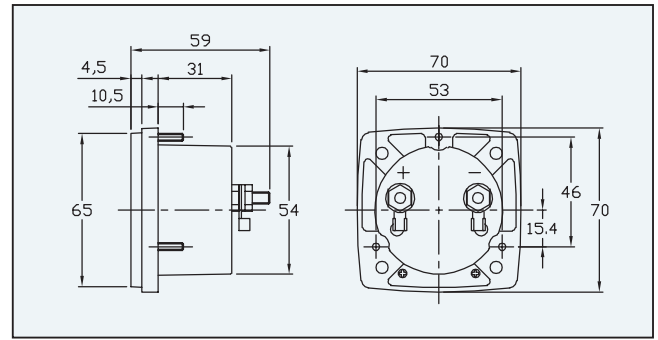
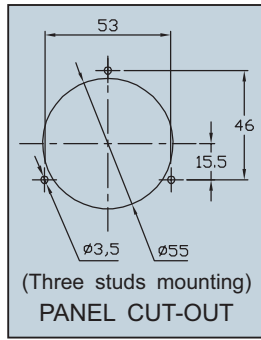
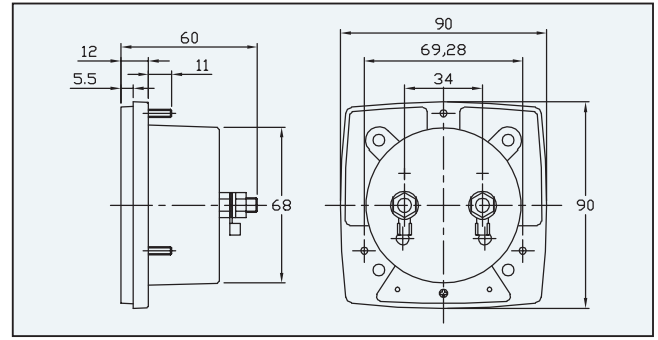
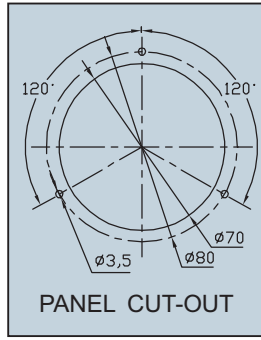


ST-58E



- **Movement** : Taut Band suspension type.
 - **Accuracy** : $\pm 2.5\%$
 - **Mounting** : Horizontal or Vertical
 - **Pointer** : Tube (Red)
 - **Full Scale Deflection** : 60°
 - **Measuring Range** : F.S. 1mA DC
- Customer's specs are available

F Series



File No. E205138
Project No. 00CA03127

- **Case And Composition :** Acrylic resin front and bakelite case.
Three studs mounting.
- **Accuracy :** AC class 2.0
DC class 2.0
Rectifier class 2.0
- **Color :** Black case and white scale plate.
- **Pointer :** Sword type color in black.

Measuring Ranges :

Moving Coil Type

DC uA	DC mA	DC A	DC mV	DC V
50	1 200	1	50	3 200
100	2 250	1.5	60	5 300
150	5 300	10	100	10 500
200	10 500	20	500	20 600
250	20 800	30		30
300	50			50
500	100			100
800	150			150

Moving Iron Type

AC mA	AC A	AC V
50	1	150
100	5	250
150	10	300
200	15	500
250	20	
300	30	
500	50	
800		

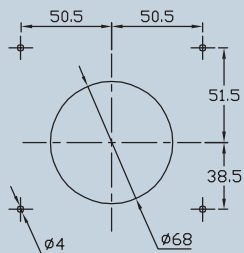
Rectifier Type

AC V
30
50
100
150
200
300
500

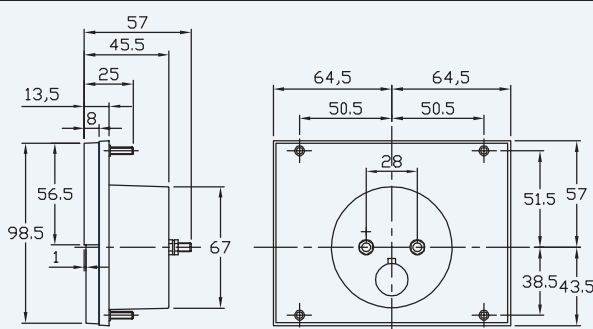
- **Hz Meter :** Measuring Ranges : 45-65Hz, 45-55Hz, 55-65Hz
Rated Voltage : 110V, 220V
Accuracy : Class 2.0
Consumption : Max. 15 mA
Test Voltage : 2kV. 50-60Hz

Switchboard Instrument

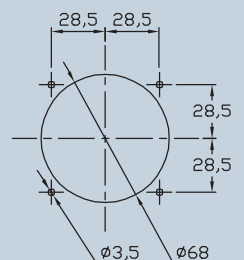
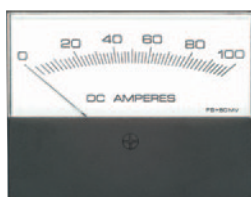
ST-125



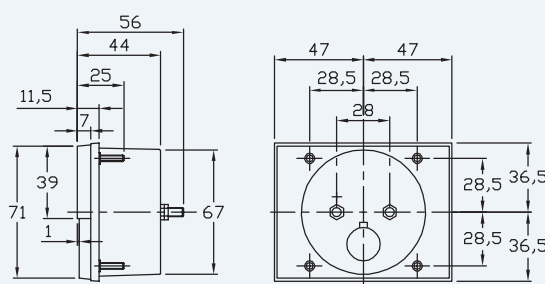
PANEL CUT-OUT



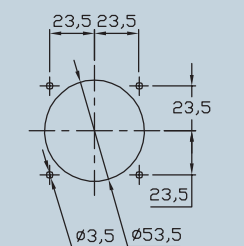
ST-95



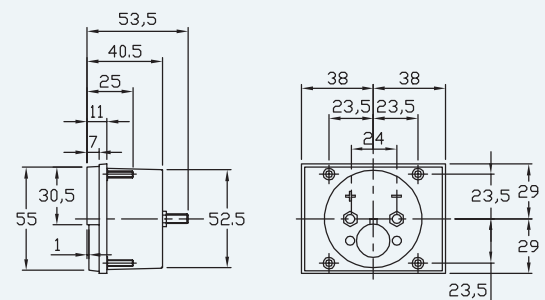
PANEL CUT-OUT



ST-75



PANEL CUT-OUT



- **Case And Composition :** ABS case and PC cover
Four studs mounting
- **Accuracy :** $\pm 2.0\%$ full scale value
- **Color :** Black case and white scale plate.
- **Pointer :** Knife-type, color in black

Measuring Ranges :

Moving Coil Type

DC uA	DC mA	DC A	DC mV	DC V
50	1	1	50	3
100	5	1.5	60	5
150	10	5	100	10
200	20	10	500	20
250	50	20		30
300	100			50
500	150			100
	200			150
	250			200
	300			300
	500			500

Rectifier Type

AC V
30
50
100
150
200
300
500

- **Hz Meter :**

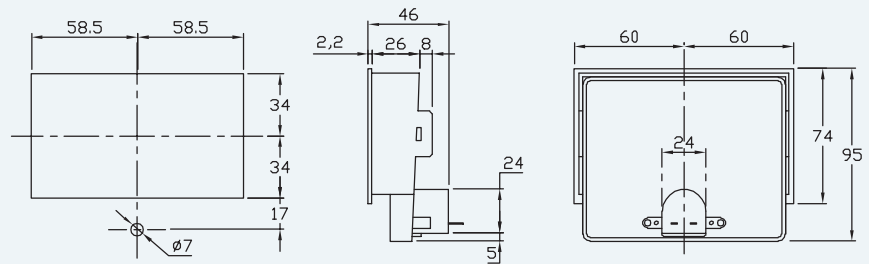
Ranges : 45-65Hz, 45-55Hz, 55-65Hz

Rated Voltage : 110V, 220V

Accuracy : $\pm 2.0\%$ full scale

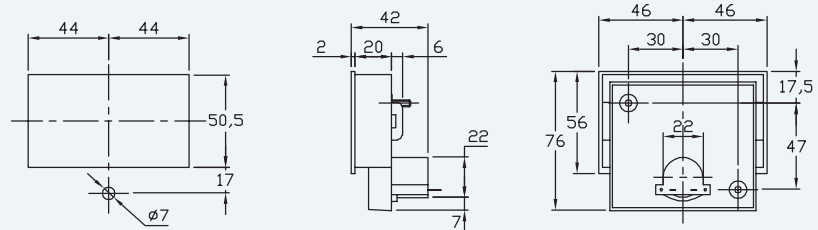
W Series

ST-160



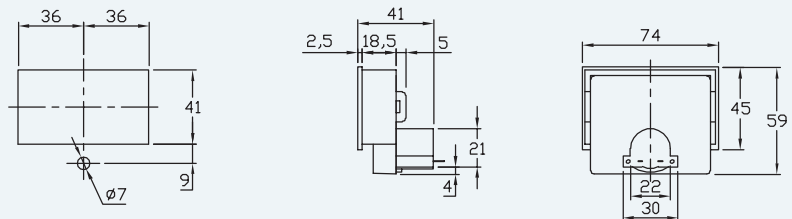
- **Measuring Range :** DC uA – 200,500
DC A – 1,5,10
DC V – 5,10,15,20,30,50,100,150,300,500
 - **Accuracy :** Class 2.0
 - **Case And Composition :** Acrylic Resin front and ABS Resin case
Bezel mounting
 - **Color :** Black case, yellow scale plate
 - **Pointer :** Tube type, black or red
- Illumination lamp or LED optional**
Custom ranges depend upon warrant quantity
Suitable for VU meters of Amplifier usage

ST-475



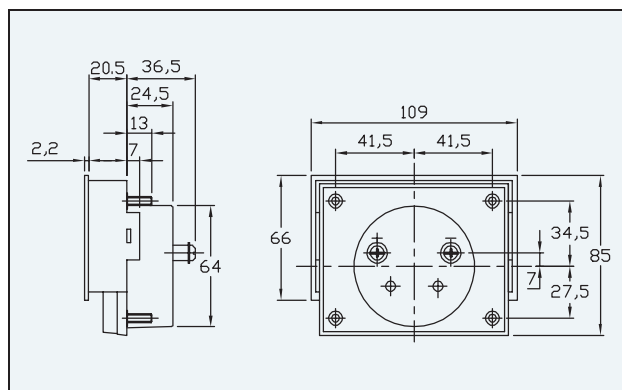
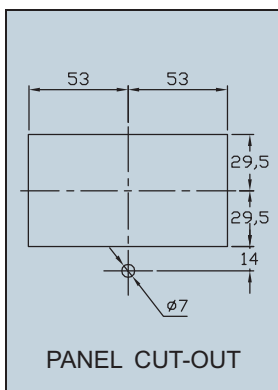
- **Measuring Range :** DC uA – 200,500
DC mA – 1,5,10,15,20,30,50,100,150,300,500
DC A – 1,5,10
DC V – 5,10,15,20,30,50,100,150,300,500
 - **Accuracy :** Class 2.0
 - **Case And Composition :** Acrylic Resin front and ABS Resin case
Bezel mounting
 - **Color :** Black case, yellow scale plate
 - **Pointer :** Knife type or tube black or red
- Illumination lamp or LED optional**
Custom ranges depend upon warrant quantity
Suitable for VU meters of Amplifier usage

ST-315



- **Measuring Range :** DC uA – 200,500
DC A – 1,5,10
DC V – 5,10,15,20,30,50,100,150,300,500
 - **Accuracy :** Class 2.0
 - **Case And Composition :** Acrylic Resin front and ABS Resin case
Bezel mounting
 - **Color :** Black case, yellow scale plate
 - **Pointer :** Knife type or tube black or red
- Illumination lamp or LED optional**
Custom ranges depend upon warrant quantity
Suitable for VU meters of Amplifier usage

ST-100R



Measuring Ranges :

Moving Coil Type

DC uA	DC mA	DC A	DC V
50	1	1	3
100	5	5	5
150	10	10	10
200	50	20	15
250	100	30	20
300	150	50	30
500	200		50
800	300		100
	500		150
	800		200
			300
			500
			750

Moving Iron Type

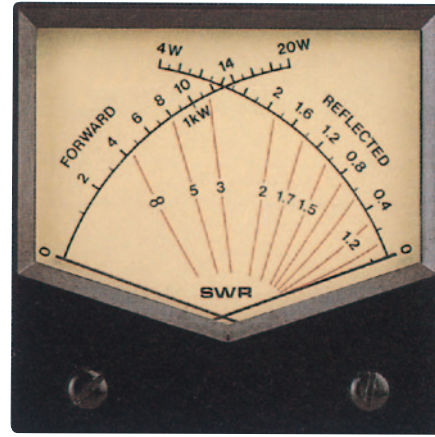
AC mA	AC A	AC V
50	1	150
100	5	250
150	15	300
200	20	500
250	30	
300	50	
500		
800		

Rectifier Type

AC V
10
15
20
30
50
100
150
200
300
500

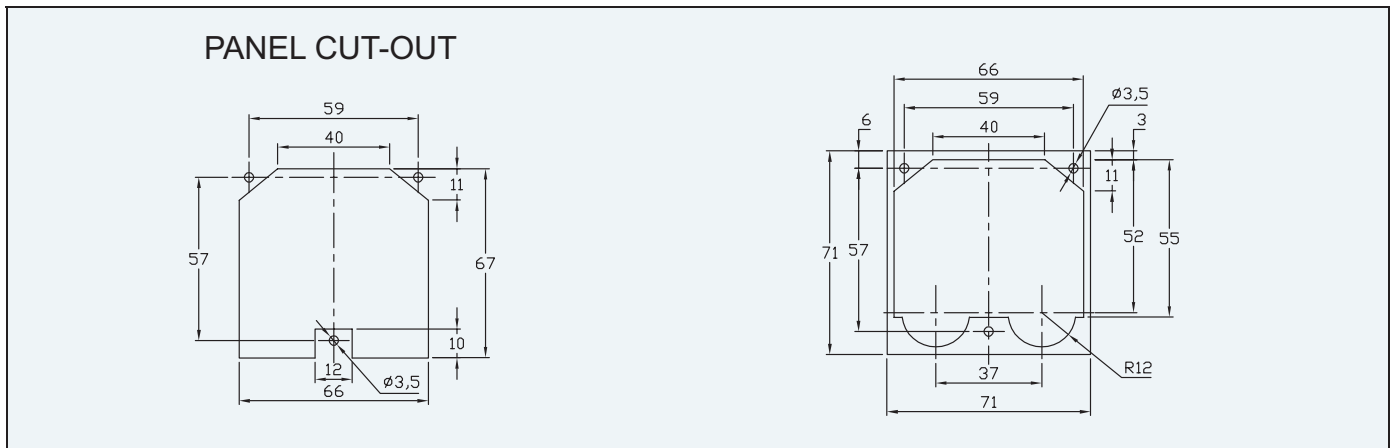
- **Case And Composition :** Acrylic resin front and bakelite case.
Bevel mounting.
- **Color :** Moving Coil Type DC, Class 2.0
Moving Iron Type AC, Class 2.5
Rectifier Type AC, Class 2.0
- **Dimension :** Black case and white scale plate.
- **Pointer Shape :** Tube or Knife type, color in black or red.

Crossing Type



ST-70W

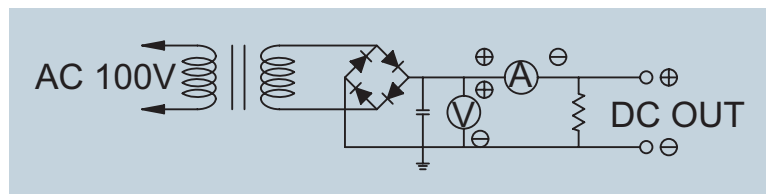
Dual Pointer Intercrossing Type DC. A-V-Watt Panel Meter.
(Watt Value Read At The Joint Point Of The Two Pointers)



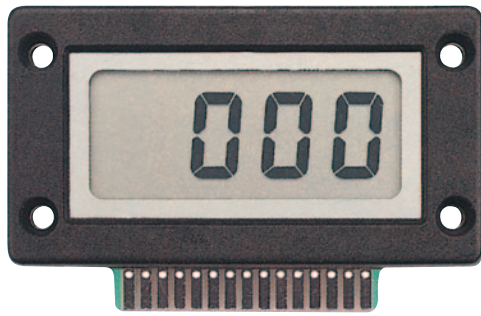
Measuring Ranges :

Volt	Ampere	Watt Value
30	5	80
30	15	250
30	30	500

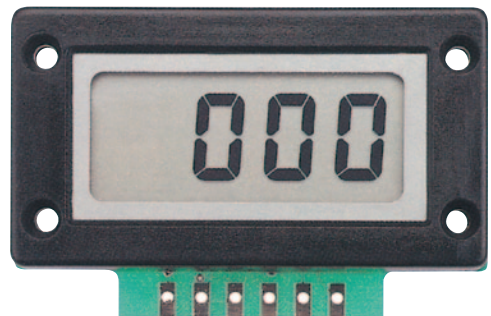
Connecting Diagram



- **Sensitivity Full Scale :** 100uA DC
- **Internal Resistance :** 1100 OHM
- **Accuracy :** Class 2.5
- **Case And Composition :** Acrylic resin front and ABS resin case.
- **Color :** Black case, white scale plate or yellow.
- **Dimension :** 70(L) x 70(W) x 30(D)mm
- **Pointer Shape :** Knife or Tube-type, color in black or red.



CE **ST-312V(ST-312mV)**



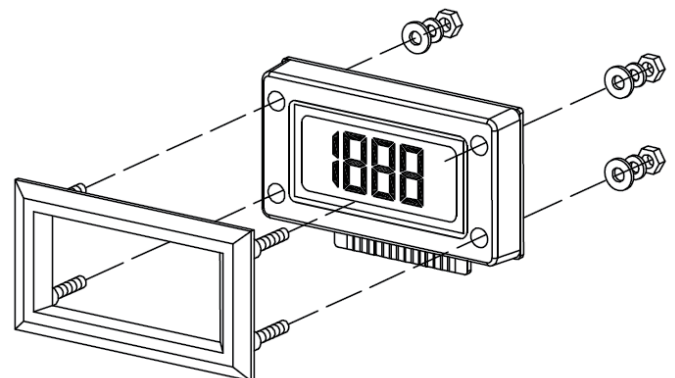
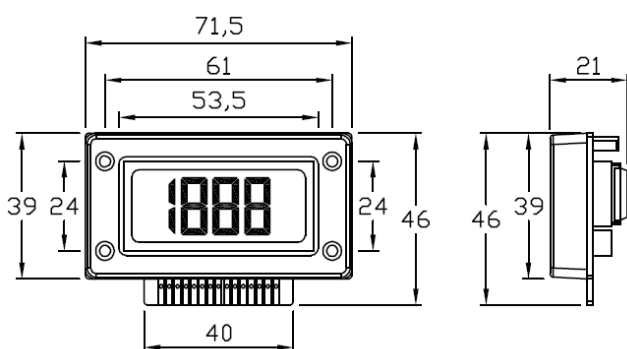
CE **ST-312A**

Features

- 3 1/2 digit liquid crystal display.
- 200mV and 2V full scale input sensitivity.
- Single Battery operated 9V supply or $\pm 5V$ DC power supply (Dual supply).
- Built-in low battery indication and automatic polarity indication.
- Decimal point selectable.
- Low power dissipation Typically less than 20mV.
- High input impedance ($> 1M \text{ ohm}$).
- Guaranteed zero reading for 0 volts input on all scales.
- True differential input or single-ended input.
- Self mountable with optional mounting bezel.
- Low cost high performance.
- EN50081-1 EN50082-1 EN55022 EN61000-4-2 IEC801-3

Specifications

Input Voltage	DC 200mV or 2V full scale
Accuracy	$\pm 0.1\% \text{rdg} \pm 1 \text{dgt}$
Operating Voltage	DC 7V-12V
Polarity	Automatic input polarity indication
Over Input	Over-range indication by displaying "1" or "-1"
Zero Adjustment	Automatic adjustment
Sampling Rate	Approx. 3 times per second
Low Battery Indication (LOBAT)	When power supply voltage less than 7.2V typically
Operating Temperature & Humidity	0°C-50°C at 80% R.H.
Storage Temperature & Humidity	-10°C-70°C at 85% R.H.



Current Transformer



ST-100CT



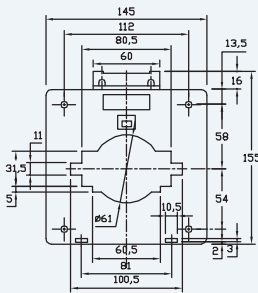
ST-60CT



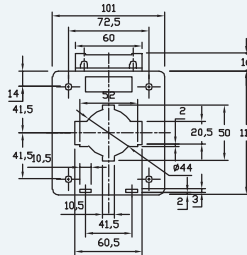
ST-40CT



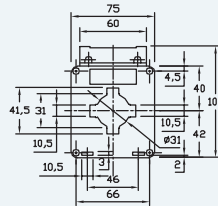
ST-30CT



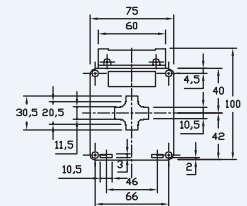
1000/5A-3000/5A
10-15V A
Class 1
Insulation 600V



400/5A-800/5A
7.5-10V A
Class 1
Insulation 600V



200/5A-400/5A
3-5V A
Class 1
Insulation 600V



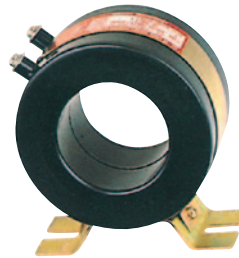
30/5A-150/5A
2-3V A
Class 1
Insulation 600V



ST-30RCT



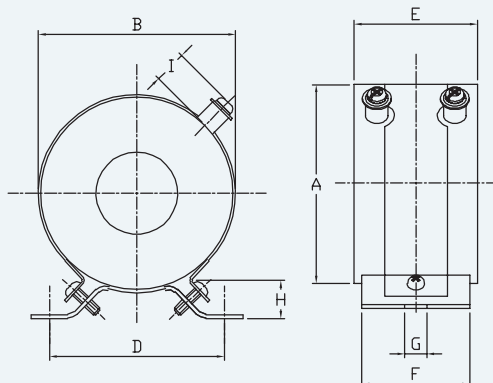
ST-12RCT



ST-6RCT



ST-3RCT



Model	Primary Current Rating (Amp)	Sec. Current(A)	Burden (VA)	Accuracy	Power Strength	Weight
ST-3RCT	20~300	5	15	1.0	40	0.8
ST-6RCT	400~600	5	15	1.0	40	1
ST-9RCT	800~1200	5	15	1.0	40	1.2
ST-12RCT	800~2000	5	15	1.0	40	1.3
ST-30RCT	1600~4000	5	15	1.0	40	2

Model	A	B	C	D	E	F	G	H	I
ST-3RCT	95	80	35	80	55	45	9	20	13
ST-6RCT	120	100	55	80	55	45	9	20	13
ST-9RCT	150	135	90	80	55	45	9	20	13
ST-12RCT	170	150	110	80	55	45	9	20	13
ST-30RCT	200	180	125	80	60	45	9	20	13



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