TAIWAN METERS
TAIWAN SAFTY CONTROLS

Panel Meter

DIN PANEL METERS (For A.C.)

90°

240°

AMMETERS

Type	BE-48				BE-72				BE-96				BE-144			
Size	48×48mm				72×72mm				96×96mm				144×144mm			
	DIRECT		CT /1A or /5A		DIRECT		CT /1A or /5A		DIRECT		CT /1A or /5A		DIRECT		CT /1A or /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							●○	●			●○	●			●	●

VOLTMERS

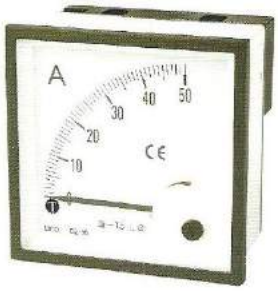
Type	BE-48	BE-72	BE-96	BE-144
100V	●	●○	●○	●
300V	●	●○	●○	●
500V	●	●○	●○	●
600V		●○	●○	●

● 90° 1. Interchangeable dials

○ 240° 1. Interchangeable dials 2. Fixed dials

DIN PANEL METERS (For D.C.)

90°



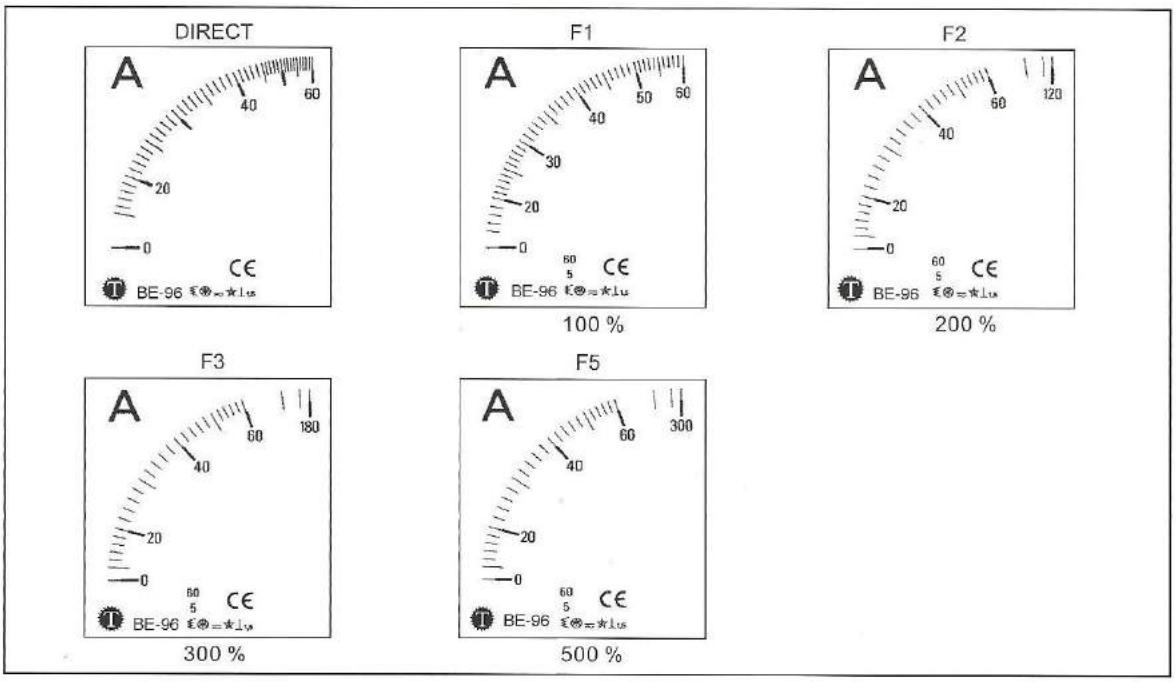
240°

	AMMETERS							
Type	BE-48		BE-72		BE-96		BE-144	
Size	48×48mm		72×72mm		96×96mm		144×144mm	
	50,60,75 mV	0 central 50,60,75mV	50,60,75 mV	0 central 50,60,75 mV	50,60,75 mV	0 central 50,60,75 mV	50,60,75 mV	0 central 50,60,75 mV
10A	●	●	●○	●○	●○	●○	●	●
15A	●	●	●○	●○	●○	●○	●	●
20A	●	●	●○	●○	●○	●○	●	●
25A	●	●	●○	●○	●○	●○	●	●
30A	●	●	●○	●○	●○	●○	●	●
40A	●	●	●○	●○	●○	●○	●	●
50A	●	●	●○	●○	●○	●○	●	●
60A	●	●	●○	●○	●○	●○	●	●
80A	●	●	●○	●○	●○	●○	●	●
100A	●	●	●○	●○	●○	●○	●	●
150A	●	●	●○	●○	●○	●○	●	●
200A	●	●	●○	●○	●○	●○	●	●
300A~	●	●	●○	●○	●○	●○	●	●

	VOLTMETERS							
Type	BE-48		BE-72		BE-96		BE-144	
Size	48×48mm		72×72mm		96×96mm		144×144mm	
DIRECT		0 central		0 central		0 central		0 central
60mV	●	●	●○	●○	●○	●○	●	●
10V	●	●	●○	●○	●○	●○	●	●
20V	●	●	●○	●○	●○	●○	●	●
40V	●	●	●○	●○	●○	●○	●	●
100V	●	●	●○	●○	●○	●○	●	●
150V	●	●	●○	●○	●○	●○	●	●
200V	●	●	●○	●○	●○	●○	●	●
300V	●	●	●○	●○	●○	●○	●	●
400V	●	●	●○	●○	●○	●○	●	●
500V	●	●	●○	●○	●○	●○	●	●

● 90° 1. Interchangeable dials
○ 240° 1. Interchangeable dials 2. Fixed dials

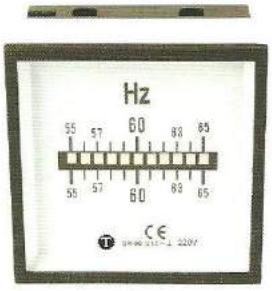
DRAWING OF DIALS



DIRECT		F1 (A)	F2 (A)	F3 (A)
1	1/2	1	1/2	1/3
5	5/10	5	5/10	5/15
10	10/20	10	10/20	10/30
15	15/30	15	15/30	15/45
20	20/40	20	20/40	20/60
25	25/50	25	25/50	25/75
30	30/60	30	30/60	30/90
40	40/80	40	40/80	40/120
50	50/100	50	50/100	50/150
60	60/120	60	60/120	60/180
80	80/160	80	80/160	80/240
100	100/200	100	100/200	100/300
		120	120/240	120/360
		150	150/300	150/450
		200	200/400	200/600
		250	250/500	250/750
		300	300/600	300/900
		400	400/800	400/1200
		500	500/1000	500/1500
		600	600/1200	600/1800
		800	800/1600	800/2400
		1000	1000/2000	1000/3000
		1250	1250/2500	1250/3750
		1500	1500/3000	1500/4500
		2000	2000/4000	2000/6000
		2500	2500/5000	2500/7500
		3000	3000/6000	3000/9000

REEDS/POINTER, FREQUENCY METERS

BE-48/72/96



BE-72/96

IF SERIES BY POINTER

Type	Frequency Hz	Range	Voltage
BE48/72/96/144	50/60	45~65	110V-220V-380V ±15%

IF SERIES BY REEDS

BE-72	7 reeds	1cycle each reed	47~53Hz 57~63Hz
BE-96	11reeds	1cycle each reed	45~55Hz 55~65Hz

MAXIMUM DEMAND, BIMETALLIC PANEL METER

MD-96 (2pointers)

MDI-96 (3pointers)

BImetallic (Maximum Demand) Panel Meter are designed for testing thermal load If transformers, cables, electrical machines, etc. They can indicate average rms current value in a setting period of 15 minutes.

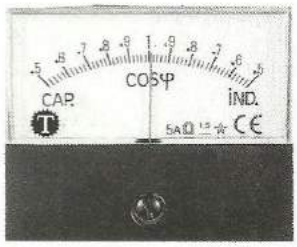
IF SERIES BY POINTER

BIMETALLIC (MAXIMUM DEMAND) AMMETES		
Type	DELAY TIME	ON C.T. RATIO / 5A
BE-96 BE-72	15 minutes	10A, 15A, 25A, 40A, 60A, 100A, 150A, 250A, 400A, 600A, 1000A~

POWER FACTOR METER (COS ϕ METERS)

BE-72/96/144

BE-72/96 /144



BP-80/100S

		COS ϕ METERS				
		Type				
	Scale	BP-80	BP-100S	BE-72	BE-96	BE-144
Single phase	90°	●	●	●	●	●
	240°			●	●	
Three phase unbalanced (ARON) 3 wires	90°	●	●	●	●	●
	240°			●	●	
Three phase unbatanced (RIGHI) 4 wires	90°	●	●	●	●	●

Full scale instrument value:	10 - 0 - 10 mA per COS ϕ 0.5 ÷ 1 ÷ 0.5
Nominal current:	1 1A 5 5A (to be specified)
Nominal voltage:	0-450V
Auxiliary voltage:	A 110V B 220V F 380V G 440V c.c./ A.C. C 24V D 48V E 110V c.c./ D.C.

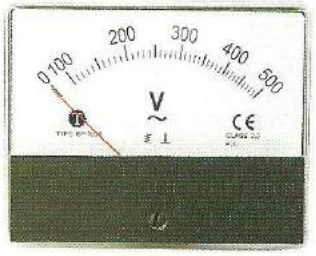
GENERAL FEATURES

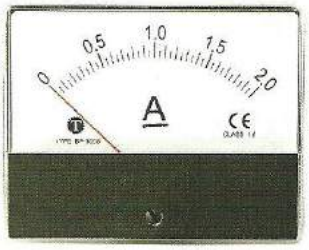
The phasemeters are composed by a reading instrument and a static transducer accessory galvanically insulated S3PD series, to be placed between the line and the instrument.

For further technical details please see our catalogue for transducers.

The transduer is foreseen with auxiliary power supply, so it can work with volage from zero to the max. value, and the output signal will change proportionally to changing of the current and of the voltage.

PANEL AMMETERS AND VOLTMETERS





FOR A.C.

AMMETERS

Type	BP-50S		BP-60		BP-65		BP-670		BP-80		BP-100S	
Size	50×50		60×60		65×65		70×60		80×80		100×80	
(A)	direct	from C.T. 5A	direct	from C.T. 5A	direct	from C.T. 5A	direct	from C.T. 5A	direct	from C.T. 5A	direct	from C.T. 5A
5	●		●		●		●		●		●	
10	●	●	●	●	●	●	●		●		●	
20	●	●	●	●	●	●	●	●	●	●	●	●
40		●		●		●		●	●	●		●
60		●		●		●		●		●		●
100		●		●		●		●		●		●
200		●		●		●		●		●		●
300		●		●		●		●		●		●
500~		●		●		●		●		●		●

VOLTMETERS

Type	BP-50S	BP-60	BP-65	BP-670	BP-80	BP-100S
Size	50×50	60×60	65×65	70×60	80×80	100×80
300V	●	●	●	●	●	●
500V	●	●	●	●	●	●

FOR D.C.

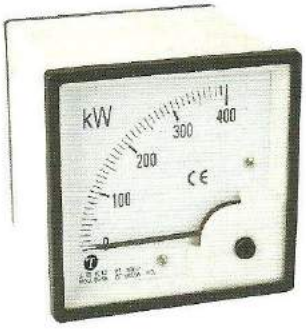
AMMETERS

Type	BP-50S		BP-60		BP-65		BP-670		BP-80		BP-100	
Size	50×50		60×60		65×65		70×60		80×80		100×80	
(A)	50,60,75mV	1A	50,60,75mV	1A	50,60,75mV	1A	50,60,75mV	1A	50,60,75mV	1A	50,60,75mV	1A
10	●	●	●	●	●	●	●	●	●	●	●	●
20	●	●	●	●	●	●	●	●	●	●	●	●
30	●	●	●	●	●	●	●	●	●	●	●	●
40	●	●	●	●	●	●	●	●	●	●	●	●
60	●	●	●	●	●	●	●	●	●	●	●	●
100 ~	●	●	●	●	●	●	●	●	●	●	●	●

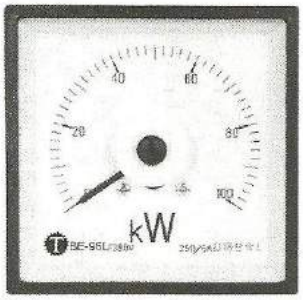
VOLTMETERS

Type	BP-50S	BP-60	BP-65	BP-670	BP-80	BP-100S
Size	50×50	60×60	65×65	70×60	80×80	100×80
40V	●	●	●	●	●	●
60V	●	●	●	●	●	●
100V	●	●	●	●	●	●
200V	●	●	●	●	●	●
300V	●	●	●	●	●	●
500V	●	●	●	●	●	●

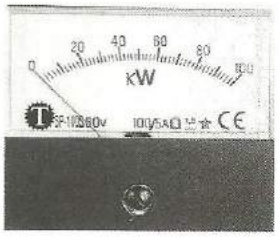
WATTMETERS (active power)



BE-72/96/144



BE-72/96/144

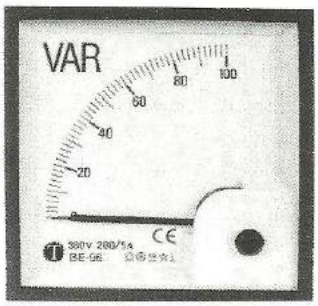


BP-65/80/100S

WATTMETERS							
		Type					
	Scale	BP-65	BP-80	BP-100S	BE-72	BE-96	BE-144
Single phase	90°	●	●	●	●	●	●
	240°				●	●	
Three phase unbalanced (ARON) 3 wires	90°	●	●	●	●	●	●
	240°				●	●	
Three phase unbatanced (RIGHI) 4 wires	90°	●	●	●	●	●	●
	240°				●	●	

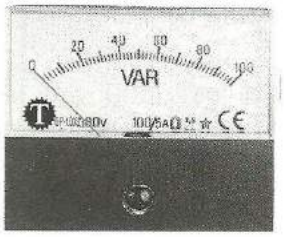
Full scale instrument value:	10mA				
Nominal current:	1 1A	5 5A (to be specified)			
Nominal voltage:	0-450V				
Auxiliary voltage:	A 110V	B 220V	F 380V	G 440V	c.c./A.C.
	C 24V	D 48V	E 110V		c.c./D.C.
The full scale value must be>20% of the nominal power					

VARMETERS (reactive power)



BE-72/96/144

BE-72/96/144

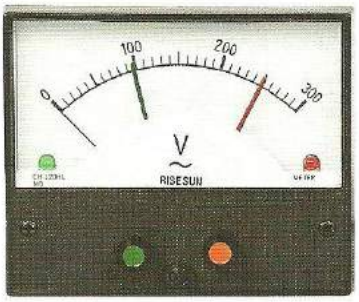


BP-65/80/100S

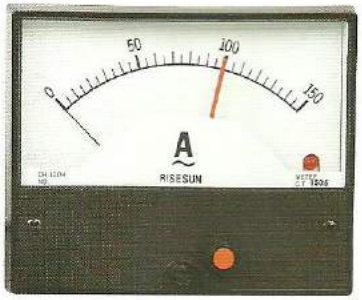
VARMETERS							
		Type					
	Scale	BP-65	BP-80	BP-100S	BE-72	BE-96	BE-144
Single phase	90°	●	●	●	●	●	●
	240°				●	●	
Three phase unbalanced (ARON) 3 wires	90°	●	●	●	●	●	●
	240°				●	●	
Three phase unbatanced (RIGHI) 4 wires	90°	●	●	●	●	●	●
	240°				●	●	

Full scale instrument value:	10mA
Nominal current:	1 1A 5 5A (to be specified)
Nominal voltage:	0-450V
Auxiliary voltage:	A 110V B 220V F 380V G 440V c.c./A.C. C 24V D 48V E 110V c.c./D.C.
The full scale value must be>20% of the nominal power	

ANALOG METER RELAY



CH-120HL



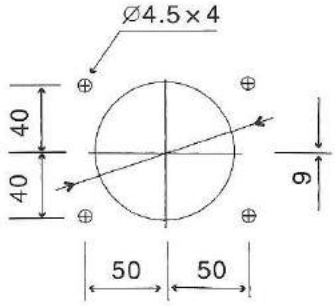
CH-120H

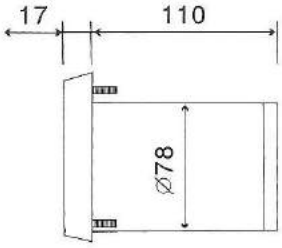
MODEL No.

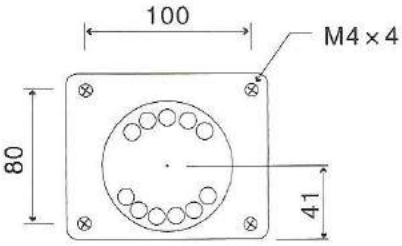
	CONTACTS
CH-120HL CH-100HL	Both high and low contacts standard
CH-120H CH-100H	One high or one low or one high and one low or two high

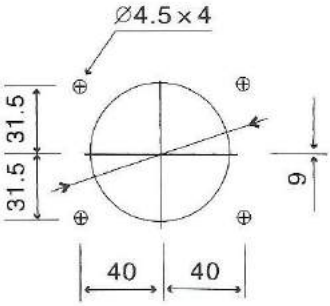
CH-120HL
CH-100HL

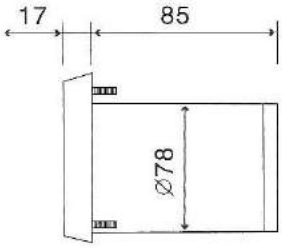
WIRING DIAGRAM

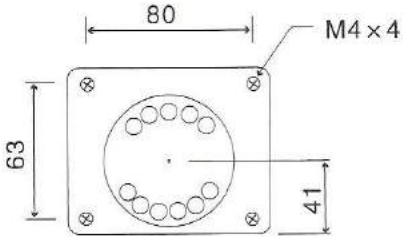












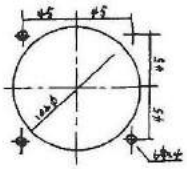
LONG SCALE INSTRUMENT

LS-110A/V

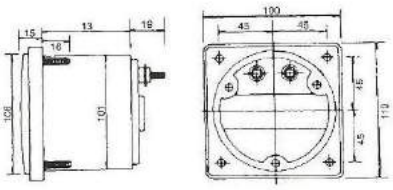
LS-110 KW

LS-110 COSϕ

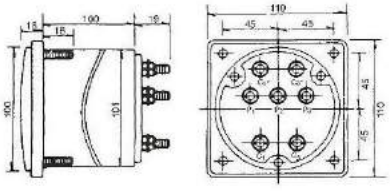
LS-110 Hz



PANEL CUT-OUT



GENERAL DIMENSION



DIMENSION FOR LS-110 KW

mm

MEASURING RANGES:

LS-110A / V :

Moving Coil Type

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

Rectifier Type :

AC A	AC V
1	150
5	300
	500
	600

- For ranges higher than 30A DC, use external shunt with a 50mV DC ammeter.
- For ranges higher than 300v DC, use external Multiplier with a 1 mA Voltmeter.
- For ranges higher than 5A AC, use external Current Transformer with a 5A AC Ammeter.
- For ranges higher thab 600V AC, use external Potential Transformer with a 150V AC Voltmeter.

LS-110KW : 110V,220V,380V,500V.1A,5A.

- For any rating other than listed above. use external Current transformer and/or external Potential Transformer with a 110V/5A instrument.

LS-110 COSϕ : 110V,220V,380V,500V.
1A,5A.

- For any rating other than those loisted above. use external Potential Transformer with a 110B/5A instrumentl

LS-Hz : 110V,220V,380V,500V.

- For a voltage rating higher than above, use an external Potential Transformer with a 110V instrument.

ACCURACY : LS-110 A/V-Class 1.5
LS-110 KW-Class1.5
LS-110 C0Sϕ -4° in [hase angle.
LS-110 Hz-Class 1.5

FULL SCALE DEFLECTION : 250°

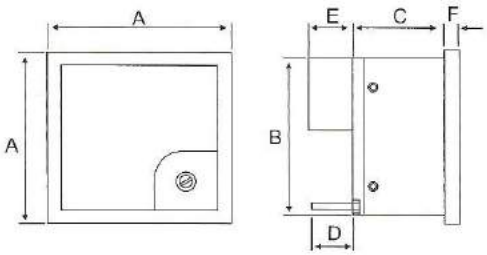
FULL SCALE LENGTH : 183MM, 7 1/4"

CASE AND COMPOSITION :
Acrylic Resin cover, plastic meter body, bakelite terminal plate.
four stud mounting.

COLOUR : White scale plate, black terminalpate. grey meter body.

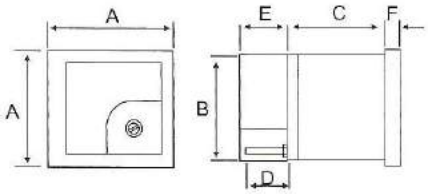
POINTER : Sword type in black colour.

OVERALL DIMENSIONS



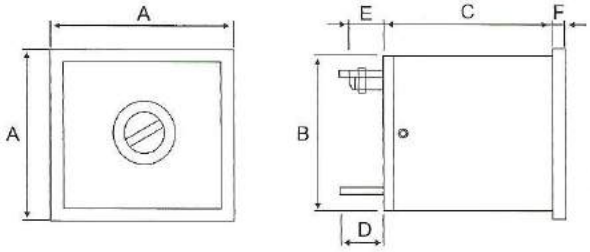
Size	A	B	C	D	E	F	Hole
BE-48	48	44	39	17	20	5.5	46×46
BE-144	144	136	144	17	20	7	140×140

mm



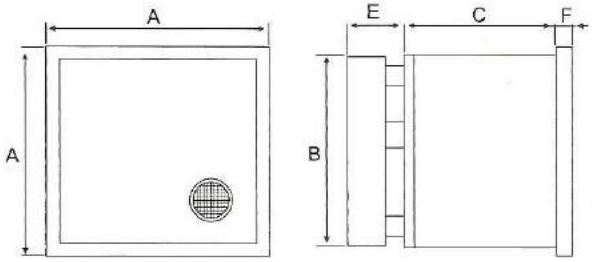
Size	A	B	C	D	E	F	Hole
BE-72	72	66	36.5	17	17.5	5.5	68×68
BE-96	96	90	45	17	17.5	6	92×92

mm



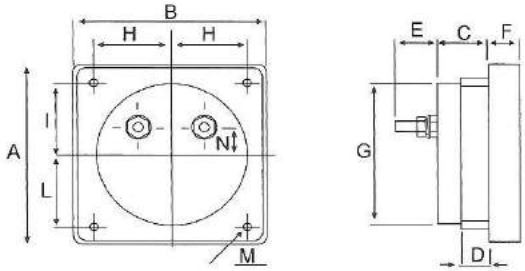
Size	A	B	C	D	E	F	Hole
BE-72	73	66	68	17	13	6.5	68×68
BE-96L	96.5	90	45	17	13	6	92×92

mm



Size	A	B	C	E	F	Hole
BE-96B	96	90	68	24	8	92×92

mm



Size	A	B	C	D	E	F	G	H	I	L	M	N	For Hole
BP-50S	50	52	23.5	13.5	4.4	12.5	45	19	19	19	3.5	15	46
BP-60	60	60	24	11	9.5	11	52	24	24	24	3.5	4	53
BP-65	67	67	24	11	10	13	52.5	25.5	25.5	25.5	3.5	4	53.5
BP-670	60	70	25.5	13	10	11	52.5	24	24	24	3.5	5	53
BP-80	81	81	22	12	18.5	13.5	63.5	32.5	32.5	32.5	3.5	12	65
BP-100S	80	100	25	13.5	11	14	64	41.5	36.5	27.5	3.5	4	65

mm

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