PRODUCT CATALOG

DIN STANDARD METER PD Series

PD Series

PMD-96

* Electrical Measuring Instruments, have a long history and established performance, playing an important role in indicating quick and precise operational conditoins of electric power systems.

* Along with recent rapid technical improves in switchboard instrumentation, they are also heading for diversification as well as more compactness and sophistication.

* With this in mind, we are always trying every effort to satisfy such customers need, and have developed put DIN Standard Meters on the market, latest addition to our regular series.

* With these DIN Standard Meter, you applications will be widened for more international specification in switchboard instrumentation.

PAD-96

Features

* High quality and high performance meter.
* Transducer integration system is adopterd
  (Power meter / Var meter / Power factor meter / Frequency meter)
* Comform standard : IEC 60051-1 (performance), DIN-43700 (outer dimension)
* 2-pointer type meter can be manufactured.
* Product has been expanded by adopting transducer with electronics technology.
* Meter with flame retardant material can be manufactured as you specify.

Manufacturing Type List

Product		Operating Principle	Type		Class	Accessory Transducer		1-pointer mass(g)	2-pointer mass(g)
			1-pointer	2-pointer		1-pointer	2-pointer		
DCAmmeter / Voltmeter		Permanent Magnet Moving Coil	PMD-96	PMD-96-2	1.5	—	—	210	240
AC Ammeter / Voltmeter		Moving Iron	PSD-96	PSD-96-2	1.5	—	—	250	300
AC Ammeter / Voltmeter		Rectifier	PCD-96	PCD-96-2	1.5	—	—	210	240
DC Receiving Indicator		Permanent Magnet Moving Coil	PXD-96	PXD-96-2	1.5	—	—	210	240
AC Receiving Indicator		Rectifier	PYD-96	PYD-96-2	1.5	—	—	210	240
Power Meter	Single phase	Transducer Type	PWD-96-12	PWD-96-12-2	1.5	WT-62M-12	WT-62M-12	1080	1110
	Three phase		PWD-96N-33	PWD-96-33-2		—	WT-83M-33	1080	1110
	Three phase 4 wire		PWD-96N-34	PWD-96-34-2		—	WT-83M-34	1080	1110
Reactive Power Meter	Single phase	Transducer Type	PWVD-96-12	PWVD-96-12-2	1.5	WVT-62M-12	WVT-62M-12	1080	1110
	Three phase		PWVD-96N-33	PWVD-96-33-2		—	WVT-83M-33	1080	1110
	Three phase 4 wire		PWVD-96-34	PWVD-96-34-2		WVT-83M-34	WVT-83M-34	1080	1110
Power Factor Meter	Single phase	Transducer Type	PPD-96-12	PPD-96-12-2	5.0	PT-62M-12	PT-62M-12	1020	1050
	Three phase (balanced)		PPBD-96N-33	PPBD-96-33-2		—	PBT-62M-33	1020	1050
	Three phase (unbalanced)		PPD-96N-33	PPD-96-33-2		—	PT-63M-33	1020	1050
	Three phase 4 wire		PPD-96-34	PPD-96-34-2		PT-64M-34	PT-64M-34	1020	1050
Frequency Meter		Transducer Type	PAD-96	PAD-96-2	1.0	—	FT-62M	610	640

* Keep in mind please : Transducer type meter does transitional indication at voltage input start.

Items To Specify When Purchase (Specify The Following Items)

(1) Type name
(2) Rated value (max. scale/ input) *1
(3) Color of meter cover
(4) Terminal cover (specify if necessary)
(5) Units
(6) Option (refer to Common Special Specification)
(7) Test report (specify frequency 50Hz or 60Hz and set of copies necessary)

*1 Refer to standard max. scale value list as for max. scale of power meter or var meter.
Specify for frequency regarding power factor meter upon specification list.

Common Standard Specification

Item		Specification
Standard		Performance: Compliant with IEC 60051-1 Outline: DIN-43700
Class		Refer to [List of PD Series]
Support system		Pivot system
Swing angle of meter		90°
Dimension meter from front		96 x 96mm
Scale length		97mm
Scale plate		White
Pointer		Lance (black)
Meter mounting position		Vertical (⊥)
Mounting panel material		Steel plate
Mounting panel thickness		7mm or less
Color of cover		Black: (Munsell N1.5) Cover: Methacrylic acid resin molding (Antistatic treatment)
Case material		Cover: Phenol (P□D-96N-□ is ABS)
Base material		Phenol resin
Insulation resistance	Between electric circuit & case	DC500V 50MΩ or more
Voltage test	Between electric circuit & case	AC3320V, 5sec.
Safety Requirements	Standard	JIS C 1010-1
	Insulation	Between electric circuit and outer case : Base of insulation
	Use	For indoor use (Cubicle etc.)
	High altitude	2000m or less
	Pollution	Pollution level 2
	Measure category	CATⅢ
	Max. circuit voltage	600V (Ammeter)
Operating temperature Humidity range		-10～55℃, Average temperature 40℃ or less, 25～85% RH (Refer to steel ship rules ambient temperature 45℃)
Storage temperature range		-20～70℃

Common Special Specification (Specify)

ITEM		SPECIFICATION	
Scale	Color line	Red, Green, Yellow (Please specify)	
	Extend scale	PSD, PCD: 2～5-time extend	
	Color area (bar)	Red, Green, Yellow (Please specify)	
	Double scale	Please specify	
	Double seal	Please specify	
	Max. scale division	30 division	
	Special scale	Please specify	
Vibration proof specification		Vibration	2~10Hz Amplitude 15mm p-p 10~55Hz, 29.4m/s²
		Shock	147m/s², 30-time
Tropical specification		Rust preventative,「**FOR TROPICS**」will display at the name plate	
Pointer		Knife shape (red), Rod shape (black), combine use with multiple scale etc.	
Control pointer		Lancet shape (red), 2 control pointer also possible to manufacture (red×2)	
Installation posture		Horizontal, Inclined (specify the angle)	
Flame-retardant materials		Cover	Polycarbonate resin
Protection circuit of meter		Overcurrent	Specify necessary tolerated dose
		Overvoltage	
Extended part of scale		Voltmeter	Please consultation with us
		Ammeter	
For SCR control waves		AC current, AC voltage, Power Meter, Reactive Power Meter, Frequency	
For cycle control use		AC current, AC voltage (Recitifier Type)	
Test report		Specify the useful frequency and number of copies of report require	
Scale (Single item)		Not JIS mark	
Terminal cover		Please consultation with us	
Others		Please consultation with us for special frequency	

Standard Scale Division

Max. scale value (Integer 10-time)	1	1.5	2	2.5	3	4	5	6	7.5	8	9
Scale division no.	20	30	20	25	30	20	25	30	15	16	18

DC AMMETER / VOLTMETER PMD-96

(Moving Coil Type)

Ammeter

Max. scale value	Approx. internal resistance or voltage drop	Accessory
100μA	1.16kΩ	–
1mA	42Ω	
5mA	12Ω	
10mA	3.4Ω	
20mA	3Ω	
4~20mA	3Ω	
50mA ~ 30A	60mV	
30A [1] ~ 10kA	60mV	Shunt [2]

Note:

[1] When 30A is exceeds, shunt will externel to meter 60mV. Meter 50mV, 100mV also can be manufactured.

[2] Lead wire of shunt is not attached. Standard lead wire resistance is 0.07Ω (1.25mm²).

* Meter up to 1Ω will manufactured when lead wire resistance value 0.07Ω is exceeds. Please specify it.

Shunt Lead Wire Resistance Value Table

Cross-section area (mm²)	Annealed copper (Ω/m)	Note
1.25	0.0165	JIS C 3307 (IV) JIS C 3317 (HIV) Above Line
2.0	0.00924	
3.5	0.00520	

* Meter built-in adjustable resistor for external resistance correction can be manufactured.
* Meter both deflection also can be manufactured.

Voltmeter

Max. scale value	Approx. consumption current	Accessory
50mV ~ 900mV	1mA	–
1V ~ 600V [2]	1mA [1]	

Note:

[1] Internal resistance until 10kΩ/V will be manufactured when voltmeter 3V is exceeds.

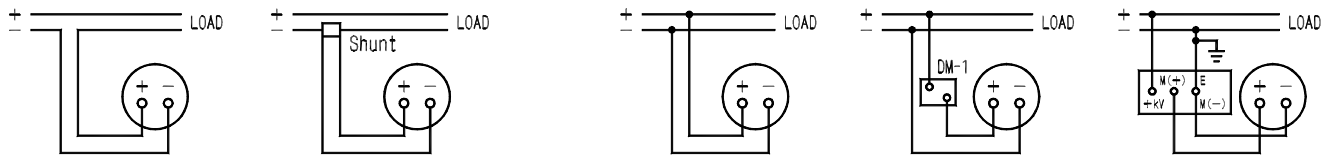
[2] When 600V is exceeds, series resistor will external to meter 1mA.

* Meter both deflection can be manufactured.
* External overvoltage protection to voltmeter 500mV or more also can be manufacture.

DC AMMETER / VOLTMETER PMD-96

(Moving Coil Type)

Connection Diagram



Ammeter

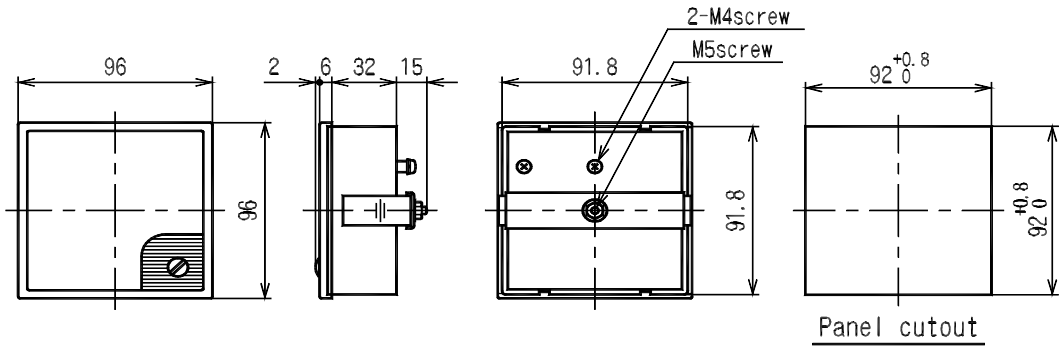
Ammeter
External shunt

Voltmeter

Voltmeter
External series
resistor (DM-1)

Voltmeter
External series
resistor (DM-2~25)

Dimensions



DC / AC RECEIVING INDICATOR PXD-96 / PYD-96

(Moving Coil Type / Rectifier Type)

* Receiving indicator is ammeter or voltmeter which receives electric signal from detector, transnitter etc. and displays various physical quantities and measured value of power/ power factor/ frequency.
Scale value and electric input value can be coped with as you specify.

Example: scale 100% electric input DC 3V
scale 0~2 MPa electric input DC 4~20mA

* Meter with variable resistor (standard: ± 20%) for correction regarding voltage input can be manufactured.

DC Receiving Indicator

Max. scale value	Approx. internal resistance	Max. scale value	Consumption Current
100μA	1.16kΩ	1V	
500μA	228Ω	2V	
1mA	42Ω	1~5V (1)	
2mA	8.5Ω	5V	
5mA	12Ω	10V	1mA (2)
10mA	3.4Ω	20V	
20mA	3Ω	50V	
4~20mA (1)	3Ω	〃	
10~50mA (1)	1.5Ω	300V	

Note:
(1) Input bias for 1V, 4mA scale zero position adjustment is necessary for meter received input electrical signal with bias DC1~5V, DC4~20mA etc.
(2) Consumption current for VR iternal mater is 1mA.
*Meter both deflections also can manufactured.

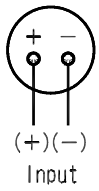
AC Receiving Indicator

Max. scale value	Approx. internal resistance or Consumption VA	Max. scale value	Consumption Current
100μA	5kΩ		
500μA	1.5kΩ	3V	
1mA	800Ω		
3mA	350Ω	〃	1mA (2)
5mA	300Ω		
10mA	0.5VA	300V	
20mA			

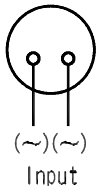
DC / AC RECEIVING INDICATOR
(Moving Coil Type / Rectifier Type)

PXD-96 / PYD-96

Connection Diagram

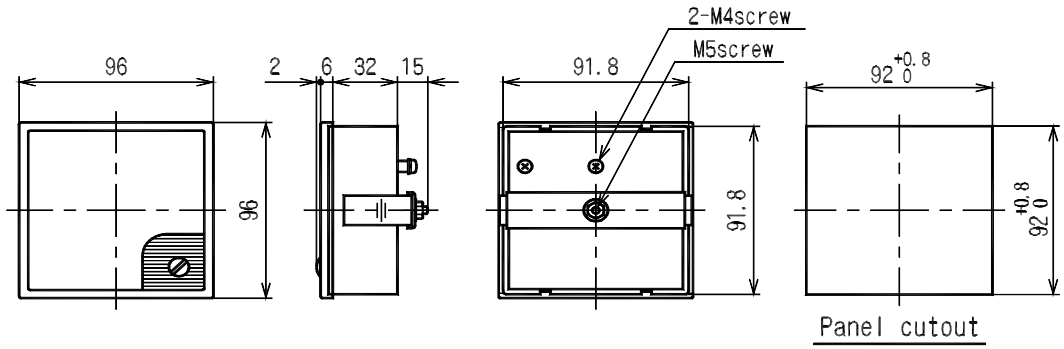


DC Receiving Indicator



AC Receiving Indicator

Dimensions



AC AMMETER / VOLTMETER PSD-96

(Moving Iron Type)

Ammeter

Normal scale	Extended scale				Approx. consumption VA	Accessory
Max. scale value	2-time	3-time	4-time	5-time		
100mA	200mA	300mA	400mA	500mA	1VA	–
1A	2A	3A	4A	5A		
3A	6A	9A	12A	15A		
5A	10A	15A	20A	25A		
10A	20A	30A	40A	50A		
15A	30A	45A	60A	75A		
20A	40A	600A	80A	100A		
30A	60A	90A	120A	150A		
5 / 5A (1) ʃ 10k / 5A	10A ʃ 20kA	15A ʃ 30kA	20A ʃ 40kA	25A ʃ 50kA	1VA	–

Note:

(1) When 30A or 600V in circuit voltage is exceeds, current transformer (CT) will externel to meter 5A (0.1A,1A).

For SCR control waveform

Meter SCR waveform input (distorted waveform) can be manufactured.

Model Name: PSD-96H-□

*** Meter for 400Hz also can be manufactured.**

Voltmeter

Max. scale value	Approx. consumption VA	Accessory (series resistor)
50V ʃ 300V	5VA	–
600V (1)	10VA	DM-41
600/ 150V (2) ʃ 550k/ 150V	5VA	–

Note:

(1) Scale value between 301~600V will external with DM-41.

(2) When 600V is exceeds, voltage transformer (VT) will external to meter 150V.

For SCR Control Wareform

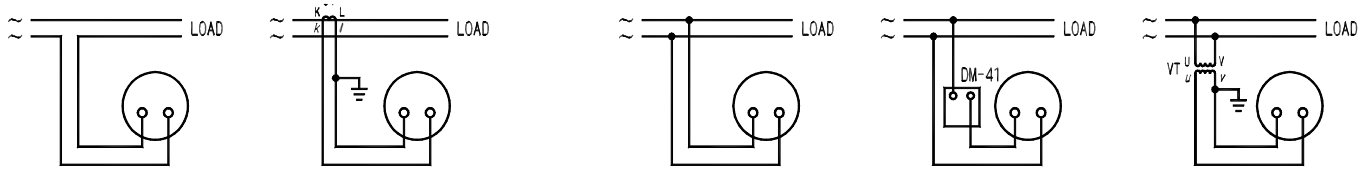
Meter SCR waveform input (distorted waveform) also can be manufactured.

Model name: PSD-96H-□

AC AMMETER / VOLTMETER PSD-96

(Moving Iron Type)

Connection Diagram



Ammeter

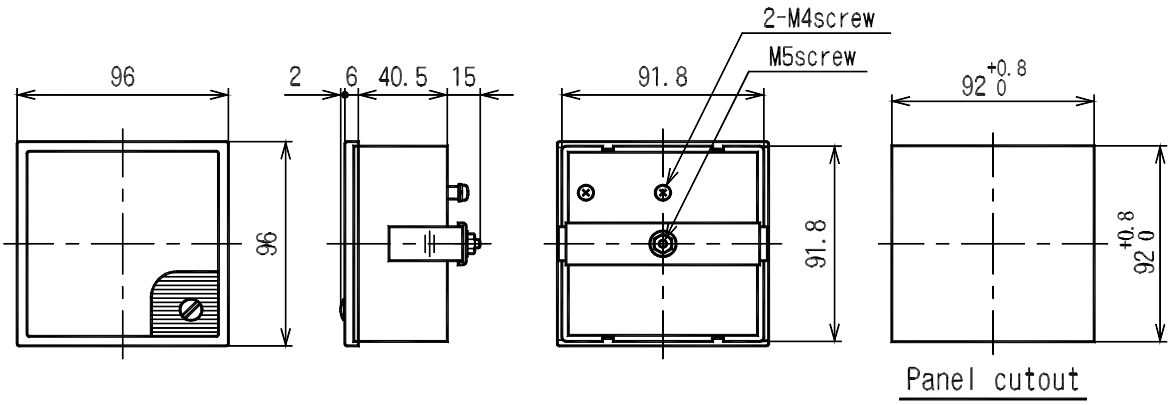
Ammeter
External CT

Voltmeter

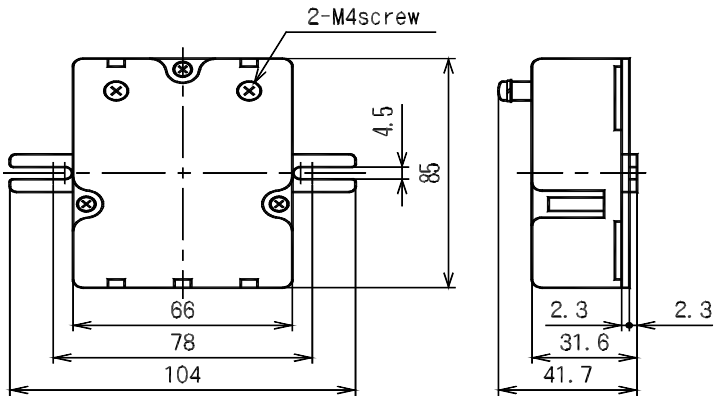
Voltmeter external
series resistor DM-41

Voltmeter
External VT

Dimensions



Dimensions for DM-41



AC AMMETER / VOLTMETER PCD-96

(Rectifier Type)

Ammeter

Max. scale value	Aapprox. internal resistance or consumption VA	Accessory
100μA 1mA 3mA 5mA	5kΩ 800Ω 350Ω 300Ω	—
10mA ∫ 300mA (2)	0.5VA	
350mA ∫ 10A	1VA	
15A (1) ∫ 100A	1VA	MR-CTN

Note:

(1) When 100A or 650V circuit voltage is exceeds, current transformer (CT) will external to meter 5A (0.1A,1A).

(2) Ammeter over current protection for 300mA or less also can be manufactured.

For Cycle Control Wareform Meter

Please use cycle control for cycle control waveform type.

Type name: PCD-96, External with AT-62MEC

For Distorted Wareform Meter (Approx. RMS value rectifier menthod)

Keep in mind please, that standard restifier type will be affected by waveform distortion.

Please use approx. RMS value rectifier method for 3rd harmonics mixed with waveform and SCR waveform.

Type name: PCTD-96, External with AT-62ME

Voltmeter

Max. scale value	Approx. consumption current	Accessory
3V ∫ 600V (1)	1mA (2)	—

Note:

(1) When 600V is exceeds, series resistor will external to meter 1mA.

Please refer to Instrument accessory for the size.

(2) Meter internal resistance up to 10kΩ/V can be manufactured.

For Cycle Control Wareform Meter

Please use cycle control for cycle control waveform type.

Type name: PCTD-96, External with VT-62MEC

For Distorted Wareform Meter (Approx. RMS value rectifier menthod)

Keep in mind please, that standard restifier type will be affected by waveform distortion.

Please use approx. RMS value rectifier method for 3rd harmonics mixed with waveform and SCR waveform.

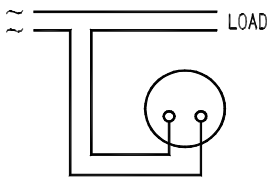
Type name: PCTD-96, External with VT-62ME

AC AMMETER / VOLTMETER PCD-96

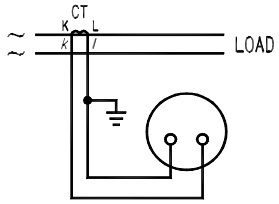
(Rectifier Type)

Connection Diagram

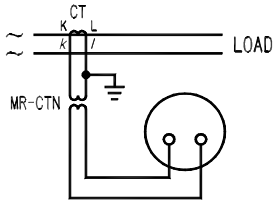
Ammeter



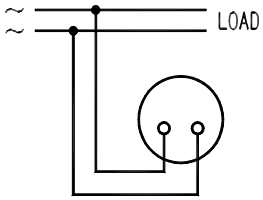
Ammeter external with CT or MR-CTM



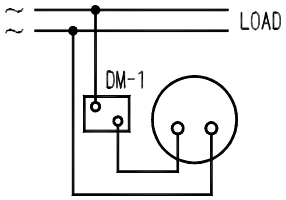
Ammeter external with CT & MR-CTN



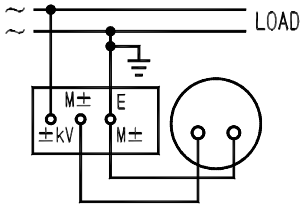
Voltmeter



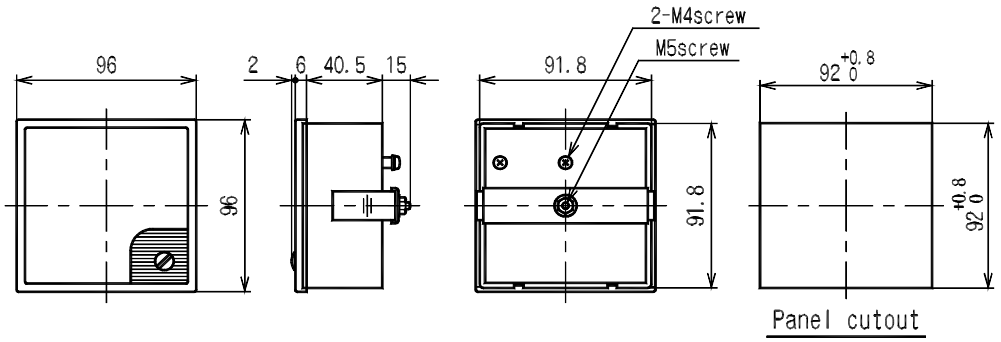
Voltmeter external with series resistor DM-1



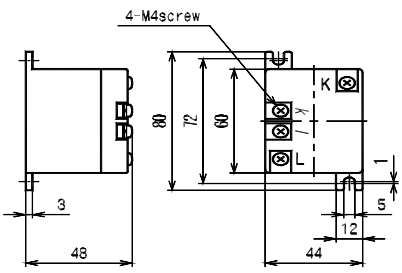
Voltmeter external with series resistor DM-2~25



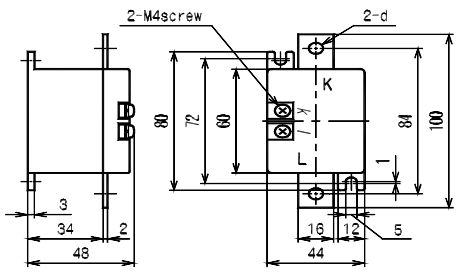
Dimensions



MR-CTN (15~25A/ 10mA)



MR-CTN (30~100A/ 20mA)



Current (A)	d
30～ 70	Φ6.5
75～100	Φ8.5

WATTHOUR METER / VAR METER (Transducer Type) PWD-96 / PWVD-96

Power Meter (1)

Type	Rated Value (2)	Max. scale value peculiar to meter (kW)	Consumption VA		Accessory Transducer
			Voltage	Current	
Single phase	110V, 5A (1A) 220V, 5A (1A)	0.35～0.6 0.7～1.2	2VA 3.5VA	1VA 1VA	WT-62M-12
Three phase	110V, 5A (1A) 220V, 5A (1A)	0.6～1.2 1.2～2.4	each phase 2VA each phase 3.5VA	each phase 1.5VA	–
Three phase 4 wire (3)	110√3V, 5A (1A) 220√3V, 5A (1A)	0.6～1.2 1.2～2.4	each phase 1.5VA each phase 3VA	each phase 1.5VA	–

Note:

(1) Please refer to page for manufacture limit and Max. scale value.

(2) When above rating is exceeds, please external CT or VT respectively to meter 110V, 5A (1A)
Usable voltage range: 110V: 90~130V; 220V:180~260V

(3) Three phase 4 wire is voltage balance.

* For High-frequency ware, please specify the frequency.

For SCR Wareform Meter

Type name: PWD-96H-□-□

Aux. power is necessary. (3 phase 4-wire can not be manufactured.)

*Max. scale value peculiar to meter is calculated like following formula, when sxtrnal VT/CT.

Max. scale value peculiar to meter = (max.scale value) divided by (VT ratio X CT ratio)

Var Meter (2)

Type	Rated Value (2)	Max. scale value peculiar to meter (kW)	Consumption VA		Accessory Transducer
			Voltage	Current	
Single phase (3)	110V, 5A (1A) 220V, 5A (1A)	0.35～0.6 0.7～1.2	2VA 3.5VA	1.5VA	WVT-62M-12
Three phase (3) (4)	110V, 5A (1A) 220V, 5A (1A)	0.6～1.2 1.2～2.4	each phase 2VA each phase 3.5VA	each phase 1.5VA	–
Three phase 4 wire (4) (5)	110V, 5A (1A) 220V, 5A (1A)	0.6～1.2 1.2～2.4	each phase 2VA each phase 3.5VA	each phase 1.5VA	WVT-83M-34

Note:

(1) Please refer to page for manufacture limit and Max. scale value.
Standard scale: Lead□var~0~Lag□var.

(2) When above rating is exceeds, please external CT or VT respectively to meter 110V, 5A (1A)
Usable voltage range: 110V: 90~130V, 220V: 180~260V.

(3) Please specify the frequency (50Hz or 60Hz) for single phase circuit and 3 phase unbalanced circuit.

(4) Please use 3 phase, 3 phase 4-wire in positive sequence.

(5) 3 phase 4 wire is voltage balance.

For SCR Control Wareform

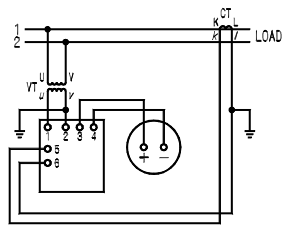
Type name: PWD-96H-□-□. Aux. power is necessary (3 phase 4-wire can not be manufactured)

WATTHOUR METER / VAR METER
(Transducer Type)

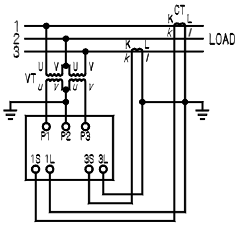
PWD-96 /
PWVD-96

Connection Diagram

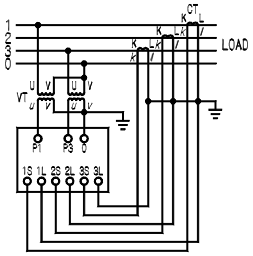
Single phase power meter/
Single phase var meter
PWD-96-12/ PWVD-96-12
External WT(WVT)-62M-12



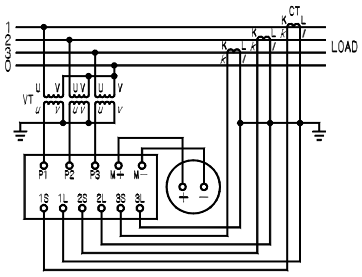
Three phase power meter/
Three phase var meter
PWD-96N-33
PWVD-96N-33



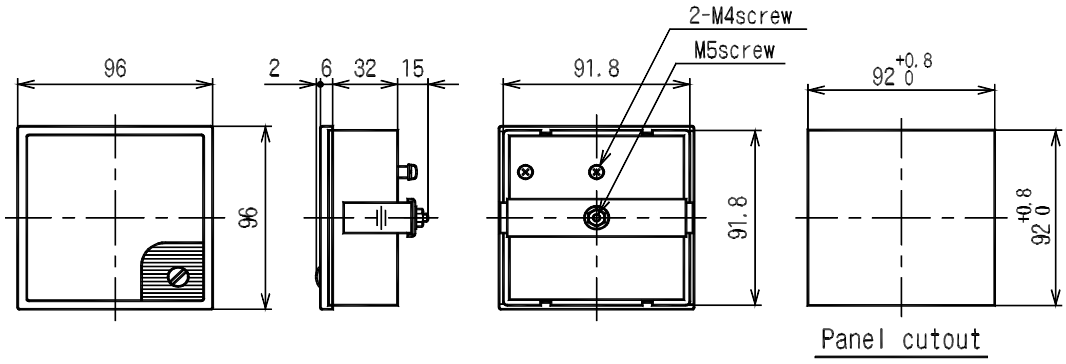
Three phase 4 wire
power meter
PWD-96N-34



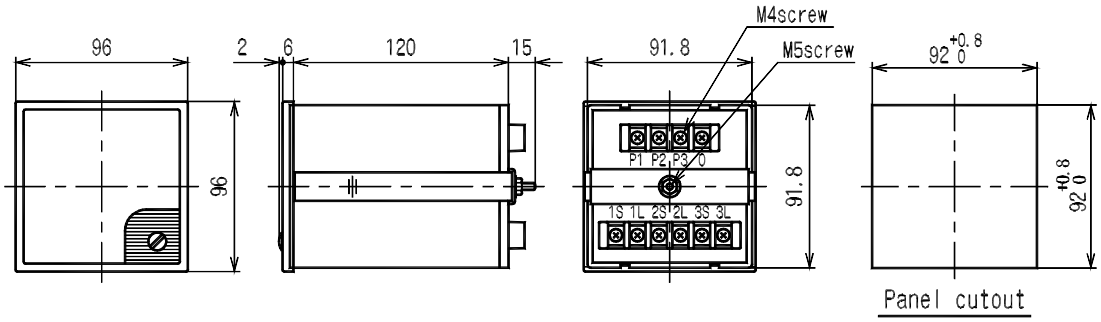
Three phase 4 wire
var meter
PWVD-96-34
External WVT-83M-34



Dimensions (External with Transducer)



Dimensions (Internal with Transducer)



WATTHOUR METER / VAR METER (*Transducer Type*)

PWD-96 / PWVD-96

Production Range of the Max. Scale Value of the Meter

Manudacturability range will be limited where intrinsic max. scale value is within the scope as shown in the list at below.
But in the case, the meter used external CT or VT, max. scale value will be calculated as following formula:

$$\text{Max. scale value for meter} = \frac{\text{Max. scale value}}{\text{VT ratio} \times \text{CT ratio}}$$

Type Name	Rating			Manufacturability Intrinsic Range	
				Power Meter	Var Meter
Single phase	110V/5A (1A)			350~600W (70~120W)	350~600var (70~120var)
	220V/5A (1A)			700~1200W (140~240W)	700~1200var (140~240var)
Single phase 3-wire	110V/5A (1A)			600~1200W (120~240W)	—
3 phase 3-wire	110V/5A (1A)			600~1200W (120~240W)	600~1200var (120~240var)
	220V/5A (1A)			1200~2400W (240~480W)	1200~2400var (240~480var)
3 phase 4-wire	Line	Phase	Current	—	—
	110V	110/√3V	5A (1A)	600~1200W (120~240W)	600~1200var (120~240var)
	220V	220/√3V	5A (1A)	1200~2400W (240~480W)	1200~2400var (240~480var)

Reference List For Standard Max. Scale Value Three Phase Power Meter

The following table is for standard three phase power meter.
Also applies for three phase 4 wire, single phase 3 wire power meter and var meter.
For single pahse power meter calculation: listed value x 1/2

VT ratio / CT ratio	6600V (VT6600 / 110V)			3300V (VT3300 / 110V)			440V (VT440 / 110V)			220V			110V		
5 / 5A	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
	60	50	40	30	25	20	4	5	3	2	1.5	1.2	1	0.8	0.6
7.5 / 5A	90	75	60	45	40	30	6	5	4	3	2.5	2	1.5	1.2	1
10 / 5A	120	100	80	60	50	40	8	7	6	4	3	2.5	2	1.5	1.2
15 / 5A	200	150	120	100	75	60	12	10	8	6	5	4	3	2.5	2
20 / 5A	240	200	150	120	100	80	15	—	12	8	6	5	4	3	2.5
25 / 5A	300	250	200	150	120	100	20	—	15	10	8	7.5	5	4	3
30 / 5A	400	300	240	200	150	120	24	—	20	12	10	8	6	5	4
40 / 5A	480	400	300	240	200	150	30	—	24	15	12	10	8	7.5	5
50 / 5A	600	500	400	300	250	200	40	—	30	20	15	12	10	8	6
60 / 5A	750	600	480	400	300	240	48	—	40	24	—	20	12	10	8
75 / 5A	900	750	600	450	400	300	60	50	40	30	25	20	15	12	10
100 / 5A	1200	1000	800	600	500	400	80	75	60	40	30	25	20	15	12
150 / 5A	2000	1500	1200	1000	750	600	120	100	80	60	50	40	30	25	20
200 / 5A	2400	2000	1500	1200	1000	800	150	—	120	80	60	50	40	30	25
250 / 5A	3000	2500	2000	1500	1200	1000	200	—	150	100	80	75	50	40	30
300 / 5A	4000	3000	2400	2000	1500	1200	240	—	200	120	100	80	60	50	40
350 / 5A	4000	—	3000	2000	—	1500	300	250	200	150	120	100	75	60	50
400 / 5A	4800	4000	3000	2400	2000	1500	300	—	250	150	120	100	80	75	50
450 / 5A	6000	5000	4000	3000	2500	2000	400	300	250	200	150	120	100	75	60
500 / 5A	6000	5000	4000	3000	2500	2000	400	—	300	200	150	120	100	75	60
600 / 5A	7500	6000	4800	4000	3000	2400	500	—	400	240	—	200	120	100	70
750 / 5A	9000	7500	6000	4500	4000	3000	650	500	400	300	250	200	150	120	100
800 / 5A	10MW	8000	7500	5000	—	4000	700	600	500	300	250	200	150	120	100
1000 / 5A	12MW	10MW	8000	6000	5000	4000	800	750	600	400	300	250	200	150	120
1200 / 5A	15MW	12MW	10MW	7500	6000	5000	1000	800	750	500	400	300	250	200	150
1500 / 5A	20MW	15MW	12MW	10MW	7500	6000	1200	1000	800	600	500	400	300	250	200

POWER FACTOR METER / FREQENCY MATER PPD-96 / PAD-96

(Transducer Type)

Power Factor Meter [1]

Type	Rated Value [2] [3]	Approx. consumption VA		Accessory Transducer
		Voltage	Current	
Single phase	110V, 5A (1A)	2VA	1VA	PT-62M-12 [5]
	220V, 5A (1A)			
Three phase (balanced)	110V, 5A (1A)	each phase 1VA	each phase 1VA	—
	220V, 5A (1A)	each phase 2VA		
Three phase (unbalanced) [4]	110V, 5A (1A)	each phase 1VA	each phase 1VA	—
	220V, 5A (1A)	each phase 2VA		
Three phase 4 wire [4]	110V, 5A (1A)	each phase 1VA	each phase 1VA	PT-64M-34 [5]
	220V, 5A (1A)	each phase 2VA		

Note:

[1] Standard scale: Lead0.5~1~Lag0.5. Scale for Three phase balance: Lead0~1~Lag0.
(Effective measuring range: Lead0.3~1~Lag0.3) also can be manufactured.
Please specify the frequency (50Hz or 60Hz) for all type except 3 phase balanced circuit.

[2] When above rating is exceeds, please external CT or VT respectively to meter 110V, 5A (1A)
Usable voltage range: 110V: 90~130V ; 220V: 180~260V
Please use in positive phase sequence.

[3] Tolerance guarantee is 1/5 or more of the rated current.

[4] 3 phase (unbalanced), 3 phace 4 wire (unbalanced) is voltage balanced.

[5] Please refer to page for the Transducer connection diagram.

Frequency Meter

Rated Voltage	Measuring Range	Approx. Consumption VA	Voltage variation range	Accessory
110V [2]	45~55Hz	1.7VA	90~130V	—
	55~65Hz			
	45~65Hz			
	350~450Hz [1]			
220V [2]	45~55Hz	2.5VA	180~260V	—
	55~65Hz			
	45~65Hz			
	350~450Hz [1]			

Note:

[1] Meter with special frequency range also can be manufactured (up to 1000Hz).

[2] Usable voltage range: 110V: 90~130V ; 220V: 180~260V
Please cotact with us for manufactured above rated voltage and voltage change range.

For SCR Wareform Meter

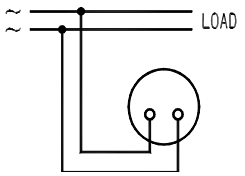
Meter SCR wareform input (Distortion wareform) also can be manufactured.

Type Name: PAD-96H-□

POWER FACTOR METER / FREQUENCY METER PPD-96 / PAD-96

(Transducer Type)

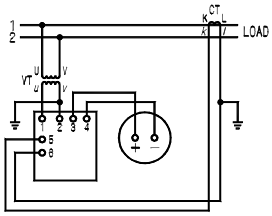
Connection Diagram



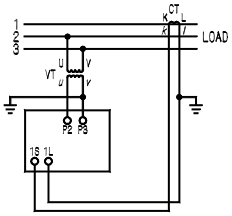
Frequency Meter PAD-96

Connection Diagram (False Phase Sequence Leads To Error)

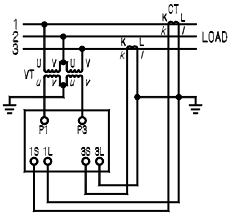
Single phase
power factor meter
PPD-96-12
External PT-62M-12



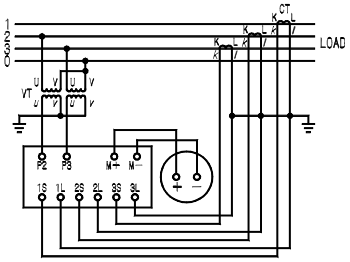
Single phase power
factor meter (balance)
PPBD-96N-33



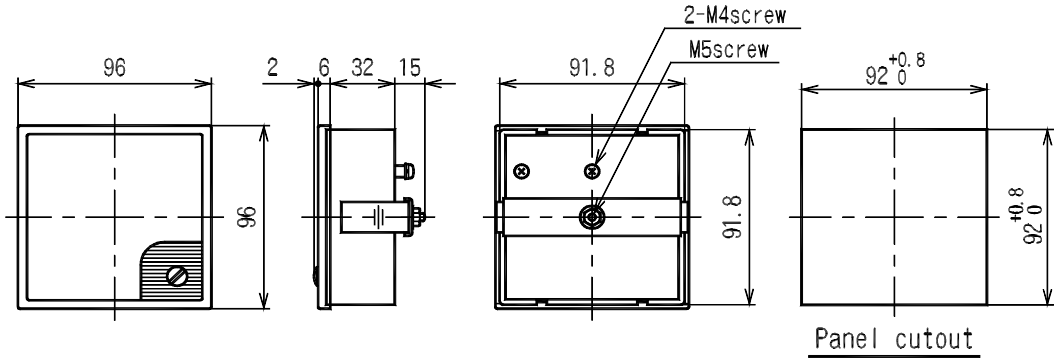
Single phase power factor
meter (unbalanced)
PPD-96N-33



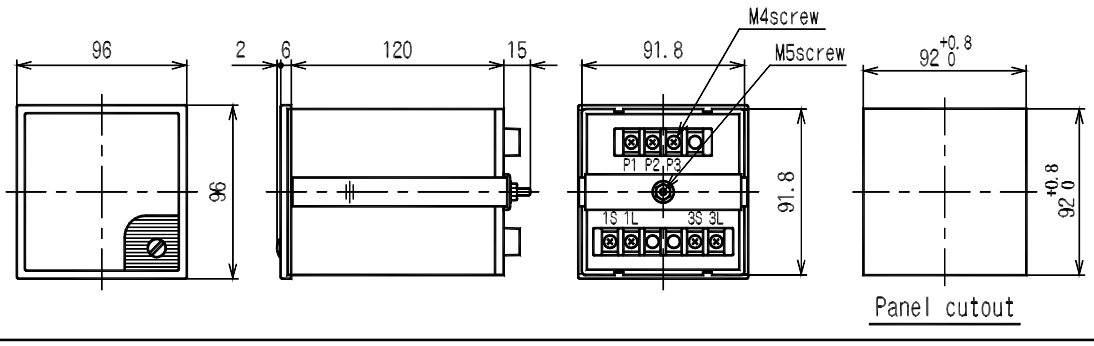
Three phase 4 wire unbalanced
power factor meter
PPBD-96-34
External PT-64M-34



Dimensions (PPD-96 / PAD-96 External Transducer)



Dimensions (PPD-96N Internal Transducer)



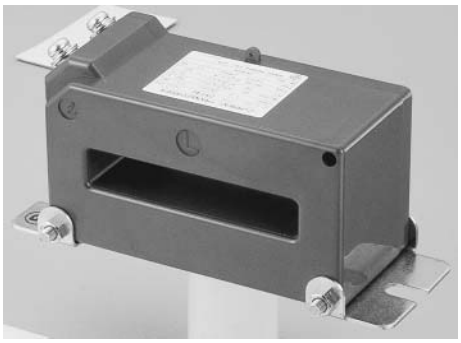
Instrument Accessory

Current Transformers (CT) & Voltage Transformers (VT)

It is possible to measure a large current by combine with 5A or 1A current transformer.

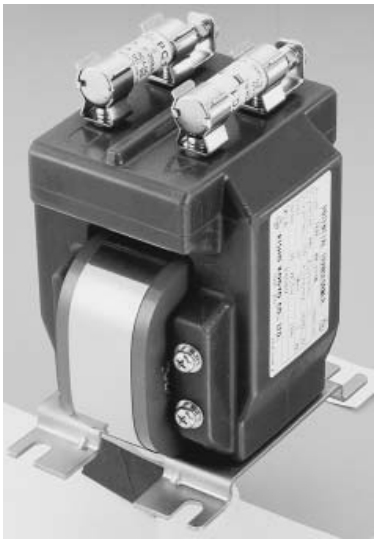
Circle Window Type & Square Window Type for use depending on the magnitude of the current.

It is possible to measure a large voltage by combine with 110V voltage transformer.



FEATURES

► High reliability & high performance current transformer.
Compliance with:
JIS C-1731-1 Standard Instrument current transformer &
JED-1201 Standard Instrument voltage transformer.
Class: 1.0
Tolerance:±1.0%



►Depend on the intended use, we have few selections for current transformer & voltage transformer like mold type or dry open type can be choice.

Specification List for Current Transformers (CT) & Voltage Transformers (VT)

Instrument Transformers

- JIS C 1731-1 standard for Current Transformer & JEC-1201 standard for Voltage Transformer
- Instrument transformer have few selections depend on the intended use like mold type or dry open type etc.
- Low voltage transformer wiring work is easy & compact.

List of Current Transformers

Max. circuit voltage (V)	Construction	Insulated system	Type Name	Primary current (A)	Secondary current (A)	Rated burden (VA)	Class	Frequency (Hz)	Over current (Times)	weight (kg)
Below 1,150	Circle Window	ABS resin	CPI–1TR	5~30	5	1	1.0	50/60	40	0.5
		Epoxy resin Mould ABS coated	CR2–5	10~750	5	5	1.0	50/60	40	0.8
			CR2–15	10~750	5	15	1.0	50/60	40	0.7
			CR2–40	20~750	5	40	1.0	50/60	40	0.9
	Square Window	Epoxy resin Mould ABS coated	CS1–15	200~750	5	15	1.0	50/60	40	1.2
			CS1–40	200~2,000	5	40	1.0	50/60	40	1.1
	Primary Winding	ABS resin	CPX–15	5~30	5	15	1.0	50/60	40	0.75
		Epoxy resin Mould ABS	CM1-15	5~30	* 5	15	1.0	50/60	40	1.8

※2017.1.31. CPI-1TR: Discontinued Production

※2017.1.31. CPX-15: Discontinued Production

- Product with mark * can be manufacture by secondary current 1A.

List of Voltage Transformers

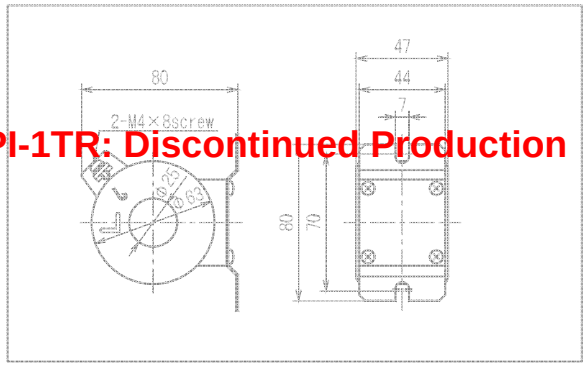
Max. circuit voltage (V)	Construction	Insulated system	Type Name	Primary current (A)	Secondary current (A)	Rated burden (VA)	Class	Frequency (Hz)	AC Withstand voltage	weight (kg)
Below 230	Winding Type	Dry opening type	PDI–1	220	110	15	1.0	50/60	2kV, 1 min	2.2
						50				3.6
Below 460				440					3kV, 1 min	
						100				6.5
Below 460	With a fuse	Epoxy resin mould	RP–111N	220	110	50	1.0	50/60	2kV, 1 min	5.0
				440					3kV, 1 min	
			RP–112N	220	110	100	1.0	50/60	2kV, 1 min	6.0
				440					3kV, 1 min	
			RP–113N	220	110	200	1.0	50/60	2kV, 1 min	8.5
				440					3kV, 1min	

Circle Window Type (Below 1,150V)

Insulated System	Type Name	Primary current (A)																						Secondary current	Rated Burden
		/	5	10	15	20	25	30	40	50	60	75	80	100	120	150	200	250	300	400	500	600	750	(A)	(VA)
ABS resin	CPI-1TR	*T	24	15	10	8	※2017.1.31. CPI-1TR: Discontinued Production																	5	10
Epoxy resin ABS coated	CR2-5	*T	-	10	8	5	4	4	3	2	2	2	-	1	1	1	1	1	1	1	1	1	1	5	5
	CR2-15	*T	-	15	10	10	6	5	5	3	4	2	3	2	2	1	1	1	1	1	1	1	1	5	15
	CR2-40	*T	-	-	-	10	8	7	5	4	4	4	3	2	2	2	1	1	1	1	1	1	1	5	40

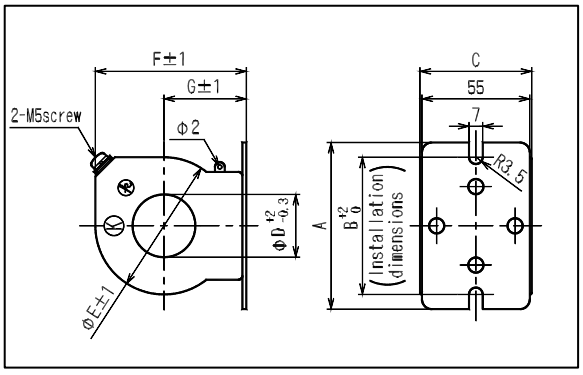
* T = Number of primary conductor penetration.

CPI-1TR 10VA



※2017.1.31. CPI-1TR: Discontinued Production

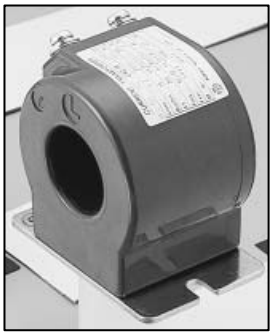
CR2 – 5

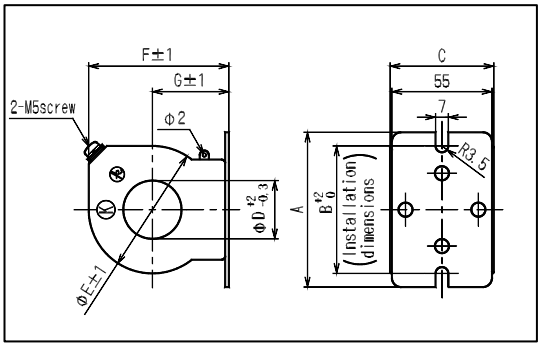


Primary Current (A)	A	B	C	ΦD	ΦE	F	G
10~200	85	70	57	23	61	70	37
240~400	85	70	55	32	70	77	42
500~750	100	85	57	50	86	93	50

Circle Window Type (Below 1,150V)

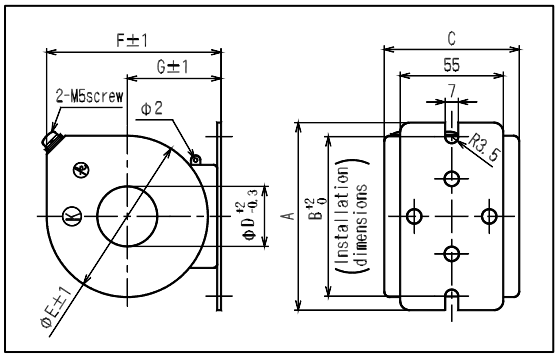
CR2 – 15





Primary Current (A)							A	B	C	ΦD	ΦE	F	G
10	15	25	30	50	75	150	100	85	57	25	76	83	45
60	80	120	240~400				85	70	55	32	70	77	42
20	40	100	200				100	85	55	32	70	77	42
500~750							100	85	57	50	86	93	50

CR2 – 40



Primary Current (A)	A	B	C	ΦD	ΦE	F	G
20~400	100	85	72	32	86	93	50
500~750	100	85	57	50	86	93	50

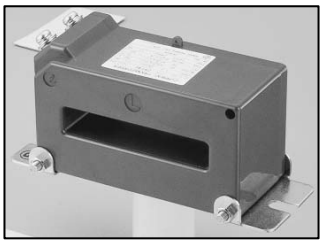
Current Transformers (CT)

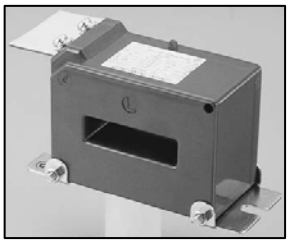
Square Window Type (Below 1,150V)

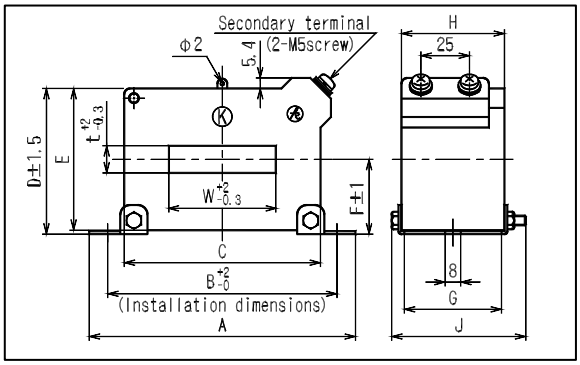
Insulated System	Type Name	Primary Current (A)	Secondary Current (A)	Rated Burden (VA)	A	B	C	D	E	F	G	H	J	W	t
Epoxy resin Mould ABS coated	CS1-15	200, 300, 400, 500	5	15	137	118	101	75	73	39	50	53	69	55	14
		600, 750			150	131	114	64	62	33	50	53	69	80	14
	CS1-40	200	5	40	163	144	130	107	104	55	65	68	84	55	14
		300,400,500			137	118	101	75	73	39	50	53	69	55	14
		600, 750			150	131	114	64	62	33	50	53	69	80	14
		1,000, 1,200, 1,500, 2,000			169	150	133	82	80	42	50	53	69	105	28

◆ Fitting metal for bus bar also available (Option onerous)

CS1–15, CS1–40





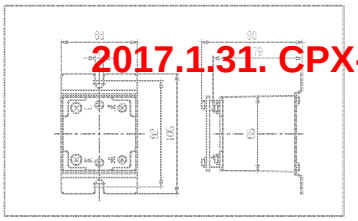


Primary Winding Type

CPX – 15

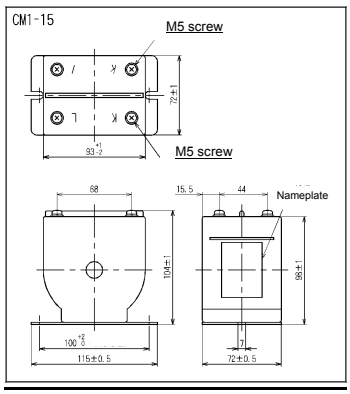
Insulated System	Type Name	Primary Current (A)	Secondary Current (A)	Rated Burden (VA)
ABS resin	CPX–15	5, 10, 15, 20, 30	5	15

2017.1.31. CPX-15: Discontinued Production



CM1-15

Insulated System	Type Name	Primary Current (A)	Secondary Current (A)	Rated Burden (VA)
Epoxy resin Mould ABS coated	CM1–15	5, 10, 15, 20, 30	5	15



Voltage Transformers (VT)

For low voltage Instrument use below 460V & 230V

1) Dry Open Type

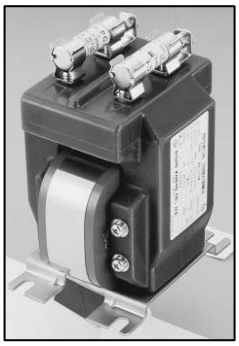
Type Name	Max. Circuit Voltage (V)	Primary Voltage (V)	Secondary Voltage (V)	Rated Burden (VA)	Dimension (mm)					
					A	B	C	A'	B'	D' (Attachment)
PDI – 1	230	220	110	15	100	90	110	70	75	6 × 15 cut
				50	120	100	125	74	85	7 × 15 cut
				100	135	130	140	84	105	7 × 15 cut
	460	440	110	15	100	90	110	70	75	6 × 15 cut
				50	120	100	125	74	85	7 × 15 cut
				100	135	130	140	84	105	7 × 15 cut

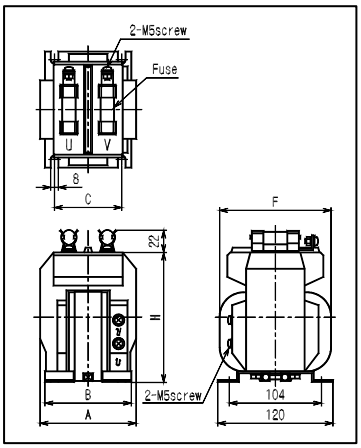
For below 460V

2) Epoxy Resin Mould

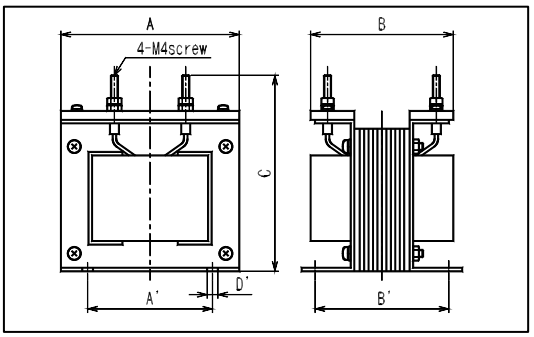
Type Name	Max. Circuit Voltage (V)	Primary Voltage (V)	Secondary Voltage (V)	Rated Burden (VA)	Dimension (mm)				
					A	B	C	F	H
RP-111N	460	220, 440	110	50	100	90	70	116	135
RP-112N				100	114	90	70	134	160
RP-113N				200	114	100	80	154	162

RP–111N, RP–112N, RP–113N





PDI–1



◆ **Item To Specify When make Purchase**

1) Type name
2) Primary current (voltage) / Secondary current (voltage)
3) Rated burden (VA)

Instrument Accessory

Direct Current Shunt & Resistor Series

SHUNT

Shunt is possible to combine with mill voltmeter for measuring a large current.

There are 2 types wire connection with insulating stand & bus bar connection can use depending on the magnitude of the current.

FEATURES

► High reliability & high performance shunt.
This product is compliance with:
JIS C-1721-1976 standard.
Class: 1.0
Tolerance: ±1.0%
►Continuous excitation current have set at 80% or less on the rated value.
► We have 2sets voltage terminal DSW type.
► Also have 3sets output terminal DST type for consideration of the heat dissipation and avoid rise in the temperature.

RESISTOR SERIES

External with resistor series is possible to combine with milliampere meter for measuring a large voltage.

FEATURES

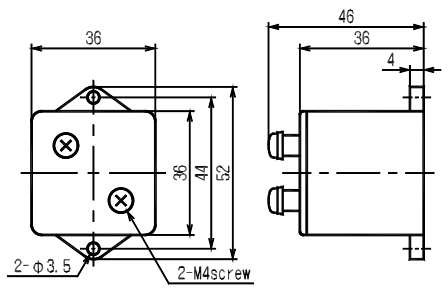
► High reliability & high performance resistor series.
► There are 7 types from DM-1 (750V) until DM-25 (25kV) can use depending on the magnitude of the voltage.
► DM-2～25 will built-in the measures against open resistor.

DC SHUNTS

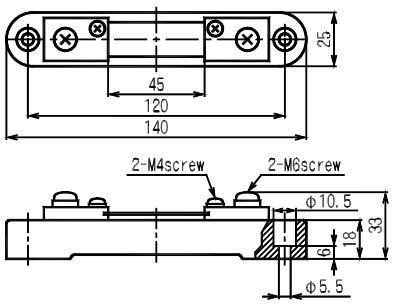
For DC Shunts

- Shunts type DS, DSW and DST is compliance with standard JIS (JIS C-1721-1976).
  Continuous excitation current is 80% or less of the range value.
  Please consultation with us when specification overload capacity or other is different.
- Standard for shunts terminal voltage is 60mV and 100mV, Please refer to diagram at below and specify it.
- Power consumption of shunt is (Current) X (Millivolt) which becomes larger in proportionality of the rated current.
- Please attach especially a large current shunt in consideration of radiation to make the minimize temperature rise of a resistor part.
- Please clamping enough the connection of the electric wire, so that contact resistance becomes small.
- Pay attention not to make a contact between current terminal and voltage terminal electrically to prevent error.

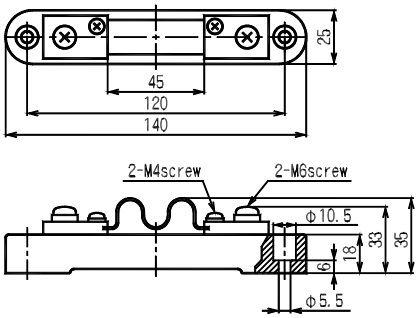
DM-1 10mA～4A 60mV, 100mV



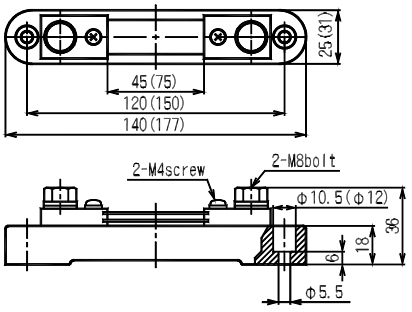
DS 5A～50A 60mV



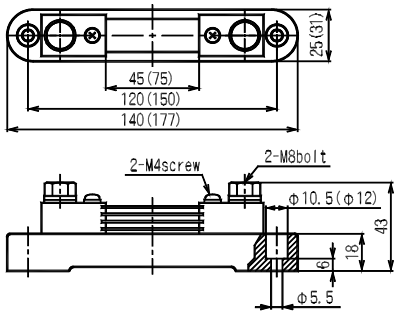
DS 5A～50A 100mV



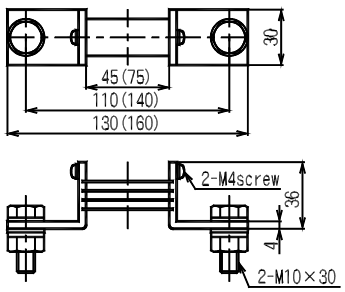
DS 60～100A 60mV (100mV)



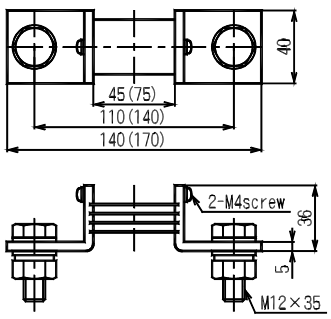
DS 120A～200A 60mV (100mV)



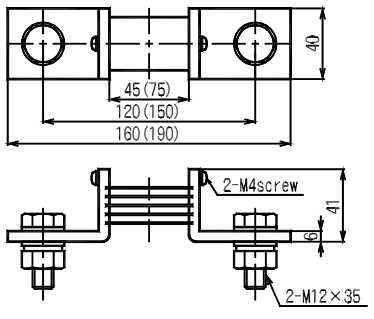
DS 225A～300A 60mV (100mV)



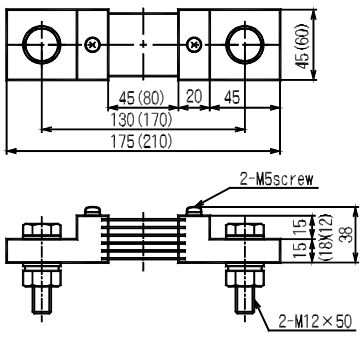
DS 350A～450A 60mV (100mV)



DS 500A～600A 60mV (100mV)

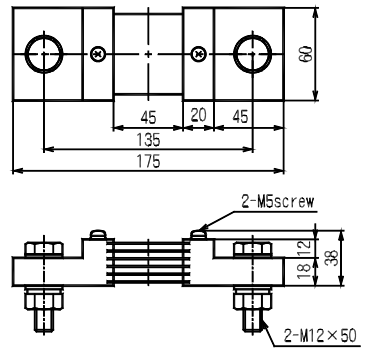


DS 750A 60mV (100mV)

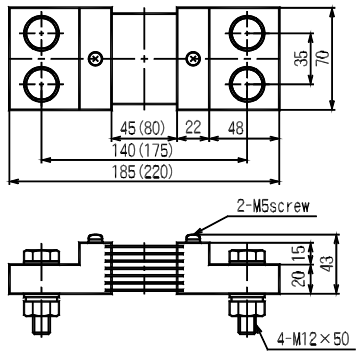


DS SHUNTS

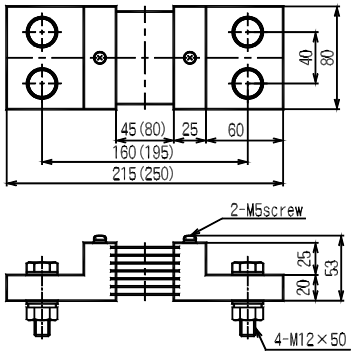
DS 1000A 60mV



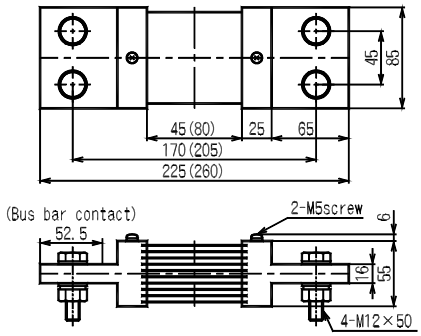
DS 1500A 60mV (1000A 100mV)



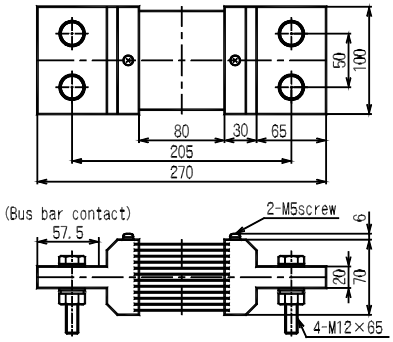
DS 2000A 60mV (1500A 100mV)



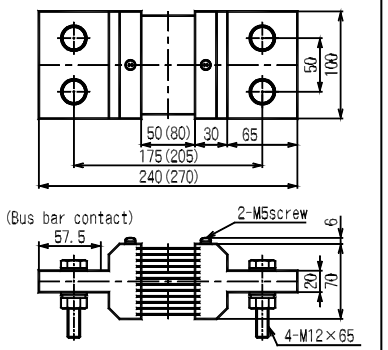
DS 2500A 60mV (2000A 100mV)



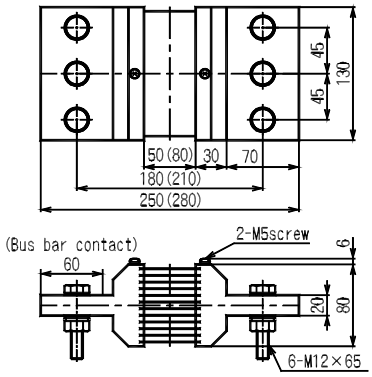
DS 2500A 100mV



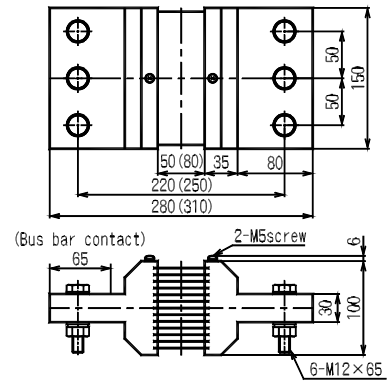
DS 3000A 60mV (100mV)



DS 4000A 60mV (100mV)



DS 5000A 60mV (100mV)



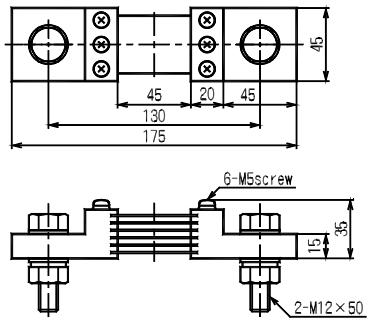
- Please consultation with us when 5000A is exceeding.
- Please inform us if the load resistance value is less then 900A (by our indication meter type name)
- Please specify the item as below when make order
  1) Type Name
  2) Input (A)/ output (mV)
  3) Option (with or without shunt stand etc.)

DS SHUNTS

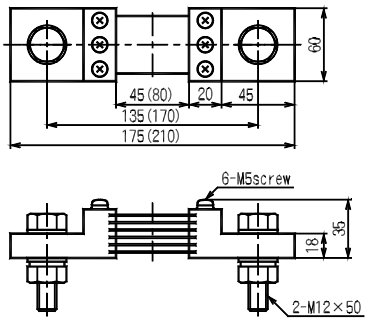
For DST Type Shunt

- Standard JIS C 1721-1976.
- Standard shunt terminal voltage is 60mV and 100mV, other voltage also can manufacture please request.
- There are 3 sets output terminal.
- Manufactured this product in consideration of the heat dissipation avoid rise in the temperature.

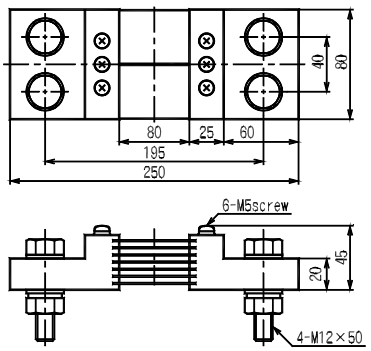
DST 750A 60mV



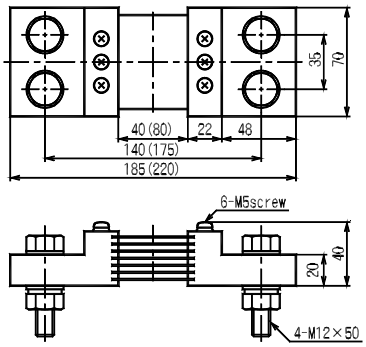
DST 1000A 60mV, (750A 100mV)



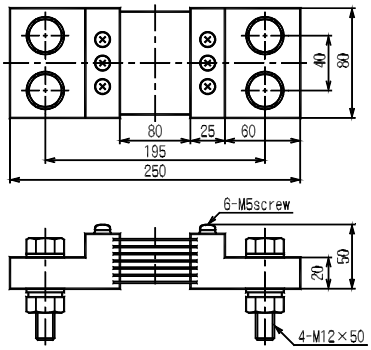
DST 1100A~1300A 100mV



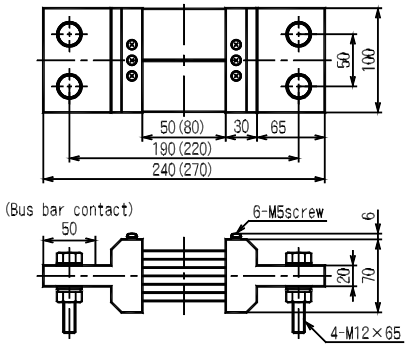
DST 1300A~1500A 60mV, (1000A 100mV)



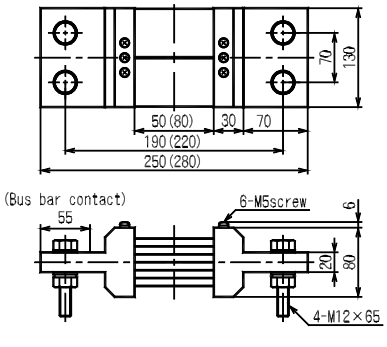
DST 1350A~1500A 100mV



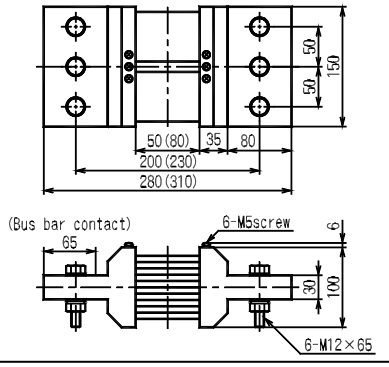
DST 2000A 60mV (100mV)



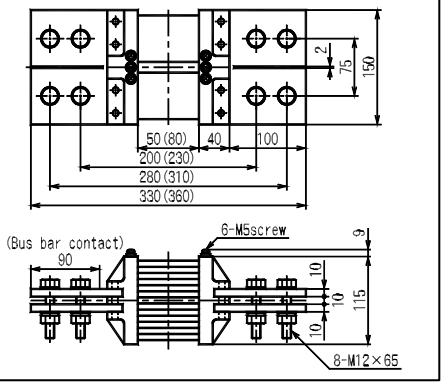
DST 2300A~3000A 60mV (100mV)



DST 3500A~4000A 60mV (100mV)



DST 4500A~5000A 60mV (100mV)

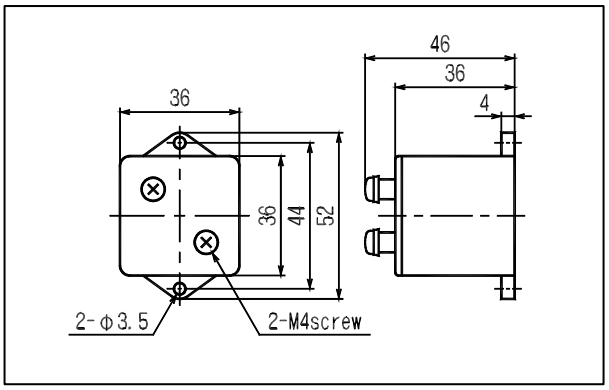


- Please consultation with us when 5000A is exceeded.

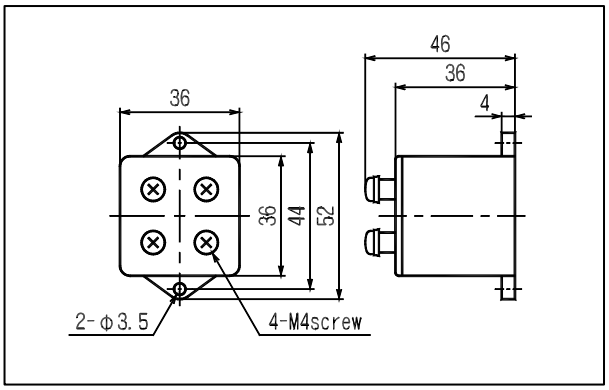
RESISTOR SERIES

External with Resistor Series

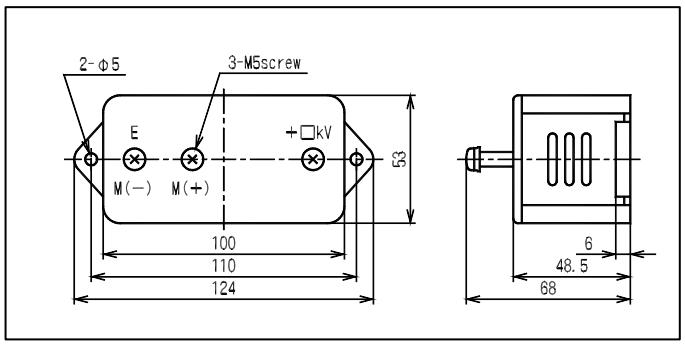
DM – 1 (Below 1000V)



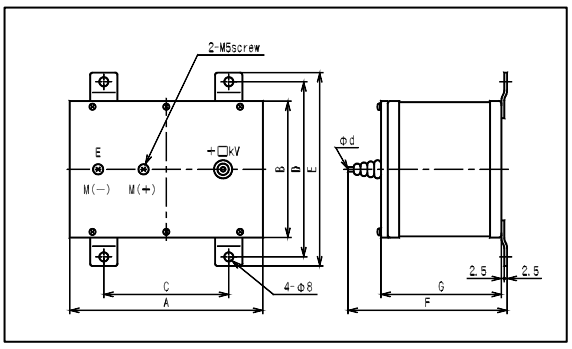
DM – 1T (Rectifier built in)



DM – 2 (Below 2500V)



DM – 5, 10, 15, 20, 25 (5～25kV)

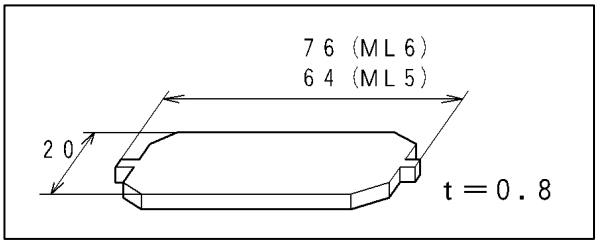


Type Name	Rated	A	B	C	D	E	F	G	d
DM – 5	5000V	170	120	110	154	170	140	106	4
DM – 10	10kV	220	160	140	194	210	140	106	4
DM – 15	15kV	290	210	200	248	264	190	146	5
DM – 20	20kV	390	260	300	294	310	220	176	5
DM – 25	25kV	500	330	400	356	372	280	236	5

OPTIONS

1. TERMINAL COVER FOR TYPE WIDE ANGLE L SERIES

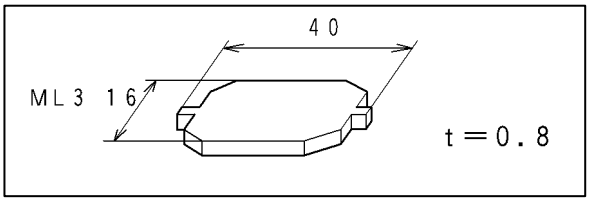
Terminal Cover for Type ML- 6 and ML- 5



Set into terminal block

Type Name	Units Required	
	ML-6	ML-5
ML-110C, YL-110C, XL-110C, CL-110C, AL-110C, PL-110NC-12, PBL-110NC-33, WL-110NC-12, WVL-110NC-12,	–	1
WL-110NC-33, 34 WVL-110NC-33, 34	1	1

Terminal Cover for Type ML- 3



Set into terminal block

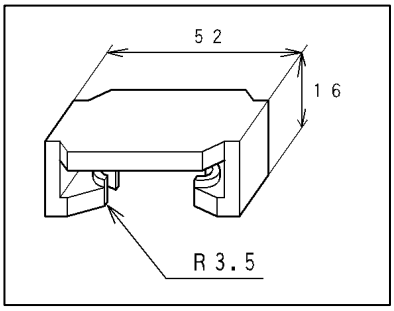
Type Name		Units Required		
		ML-6	ML-5	ML-3
ML-80C, YL-80C, XL-80C, CL-80C, AL-80C, PL-80C-12		–	–	1
WL-80C-12, 33, 34 Attach with transducer	WT-53MC-12	–	1	–
	WT-53MC-33	1	1	1
	WT-53MC-34 (1)	1	1	1
WVL-80C-12, 33, 34 Attach with transducer		–	–	1
	WVT-53MC-12	–	1	–
	WVT-53MC-33	1	1	1
	WVT-53MC-34 (2)	1	1	1
PL-80C-33, 34 Attach with transducer		–	–	1
	PT-53MC-33, 34	1	1	1

(1) For WT-53MC-34, use two OA-BCP3 made by OHM.

(2) For WVT-53MC-34, use two OA-BCP3 made by OHM.

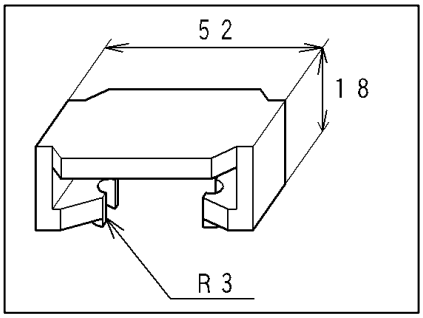
2. TERMINAL COVER FOR TYPE WIDE ANGLE L SERIES

Terminal Cover For Type SL



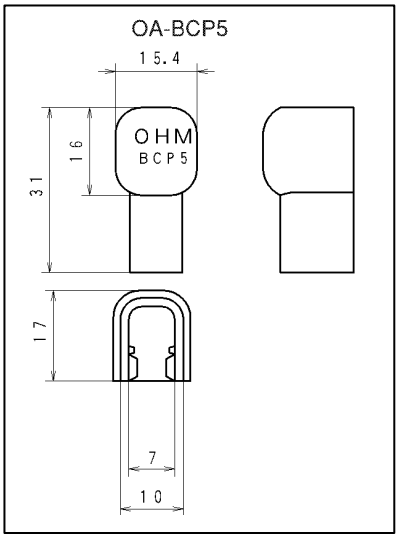
Set into terminal block

Terminal Cover For Narrow Angle

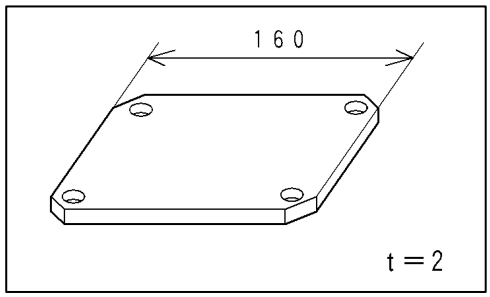


Type Name	Units Required	
	SL terminal cover	Narrow-angle terminal cover
SL-110C	1	-
SL-80C	1	-
□L-65C	-	1

3. TERMINAL COVER FOR TYPE WIDE ANGLE L SERIES



Set into terminal fitting



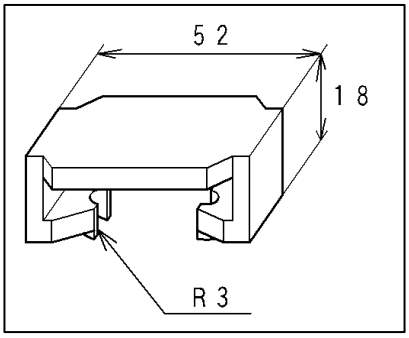
Multiplier covers for single phase Synchroscope meter (Cover: DMD-50)
Lock screw on pillar.

Type Name	Unit Required	
	OA-BCP5	Cover DMD-50
DL-110C-12	6	1
DL-110NC-33	5	-

***** Please specify cover DMD-50 when ordering. The meter shall be shipped with the cover fixed.

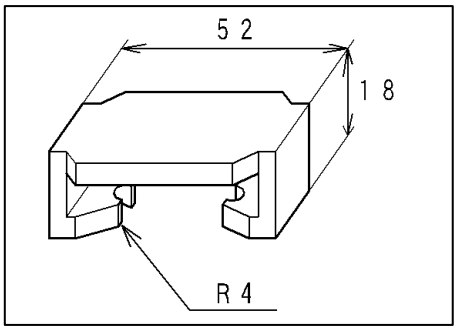
4. TERMINAL COVER FOR TYPE NARROW ANGLE METER COMMON

Narrow Angle Terminal Cover



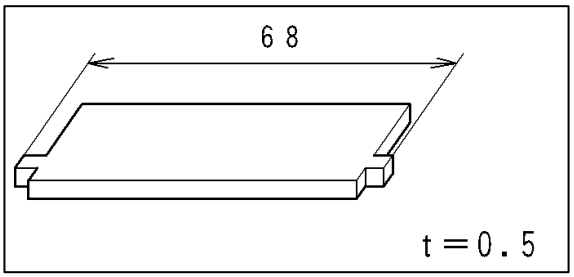
Set into terminal fitting

Hz Terminal Cover



Type Name	Measurement Element	Mark	Narrow Angle Terminal Cover	Hz Terminal Cover
			Units Required	
P□K-120C/ 100C/ 80C/ 60C (Except 120NC1, 100NC) L□K-12C/ 10C/ 8C (Except 12C, 10C, 8C) P□D-96 (Except P□D-96N) F□K-7/ 5 FAK-7C/ 5C PAD-96	DC Current / Voltage	M	2pcs terminal cover is necessarily for P□D-96 Series 2 Pointers type 1	-
	DC Receiving Indicator Meter	X		
	AC Receiving Indicator Meter	Y		
	AC Current / Voltage	S		
	AC Current / Voltage	C		
	AC Watthour Meter	W		
	AC Var Meter (balanced)	WVB		
	AC Var Meter (unbalanced)	WV		
	Power Factor (balanced)	PB		
	Power Factor (unbalanced)	P		
	Heat Electric Temperature	H		
	Heat Electric Temperature	HT		
	Revolutions (DC)	Z		
	Revolutions (AC)	V		
PAK-120C/ 100C/ 80C/ 60C LAK-12C/ 10C/ 8C/ 6C	Frequency	A	-	1

5. TERMINAL COVER FOR TYPE NARROW ANGLE PK/ LK INTERGRATED

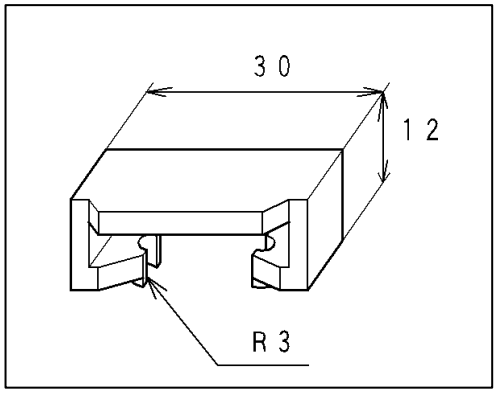


Set into terminal block

Meter Type	Units Required
	Kw Terminal Cover
P□K-□NC-□	1
L□K-□NC-□	

6. TERMINAL COVER FOR TYPE F SERIES

Terminal Cover For Type MF

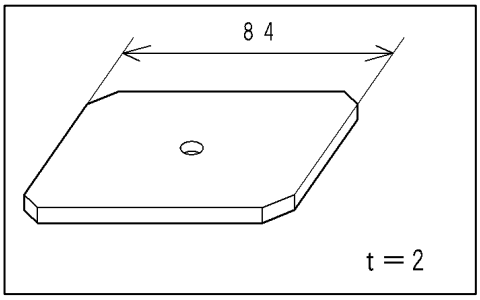


Type Name	Measurement Element	Mark	Units Required	
			1 Pointers	2 Pointers
□F – 17 □F – 15 □F – 10	DC Current/ Voltage	M	1	2
	DC Receiving Indicator Meter	X	1	2
	AC Receiving Indicator Meter	Y		
	AC Current/ Voltage	C		
	AC Watthour Meter	W		
	AC Var Meter (balanced)	WVB		
	AC Var Meter (unbalanced)	WV		
	Power Factor (balanced)	PB		
	Power Factor (unbalanced)	P		
	Frequency	A		
	Heat Electric Temperature	H		
	Heat Electric Temperature	HT		
	Revolutions (DC)	Z		
	Revolutions (AC)	V		

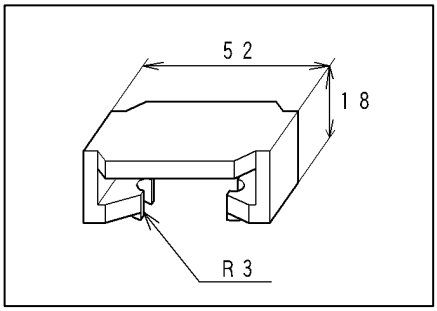
Use specify terminal cover or
OA-BCP3 for attachment transducer

7. TERMINAL COVER FOR TYPE PWD – 96

Terminal Cover For Tye PWD – 96



Narrow Angle Terminal Cover



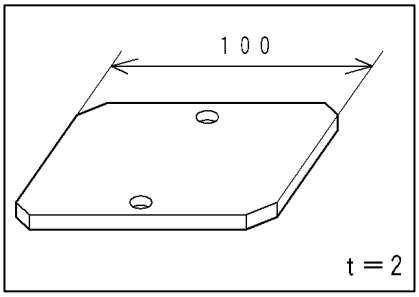
Please use nut to lock the meter stud.

Type Name	Measurement Element	Mark	Unit Required		
			Terminal Cover PWD-96	Narrow Angle Terminal Cover	
P□D-96N-□	Power	W	1	1 Pointer	2 Pointers
	Reactive Power	WV		-	-
	Power Factor (balanced)	P			
	Power Factor (unbalanced)	PB			
P□D-96-□-□	Power	W	-	1	1
	Reactive Power	WV			
	Power Factor (balanced)	P			
	Power Factor (unbalanced)	PB			

Use specify terminal cover or OA-BCP3 for attachment transducer

8. TERMINAL COVER FOR TYPE EL SE

Terminal Cover For Type EL

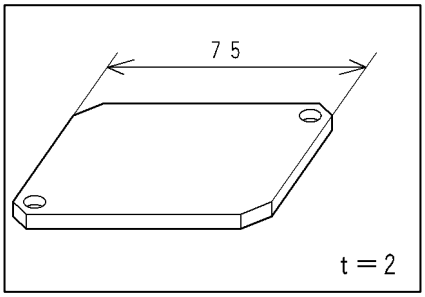


Lock screw on pillar.

Type Name	Measurement Element	Mark	Terminal Cover Type EL
			Units Required
Wide Angle Meter Relay □EL-110C EP Series Normal Angle Meter Relay (All-in-one Type Ralay Box) □EP-100NC/ 120NC EK Series Normal Angle Meter Relay (All-in-one Type Relay Box) □EK-12NC	DC Current/ Voltage	M	1
	DC Receiving Indicator Meter	X	
	AC Receiving Indicator Meter	Y	
	AC Current/ Voltage	S	
	AC Current/ Voltage	C	
	AC Watthour Meter	W	
	AC Var Meter (balanced)	WVB	
	AC Var Meter (unbalanced)	WV	
	Power Factor (balanced)	PB	
	Power Factor (unbalanced)	P	
	Frequency	A	
	Heat Electric Temperature	H	
	Heat Electric Temperature	HT	
	Revolutions (DC)	Z	
	Revolutions (AC)	V	

9. TERMINAL COVER FOR TYPE DM – 61

Terminal Cover For Type DM – 61



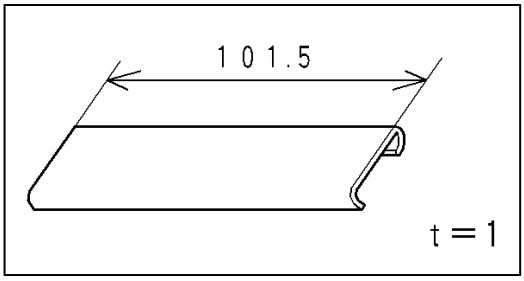
Lock screw on pillar.

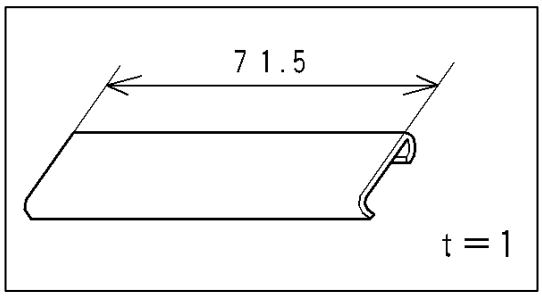
Attached Relay Box Type Name	Terminal Cover Type DM – 61
	Units Required
DM – 61	1

***** Please use EP/ EK series normal angle attached relay box for DM-61 terminal cover.

10. TERMINAL COVER FOR TYPE EF SERIES

Terminal Cover For EF Serise



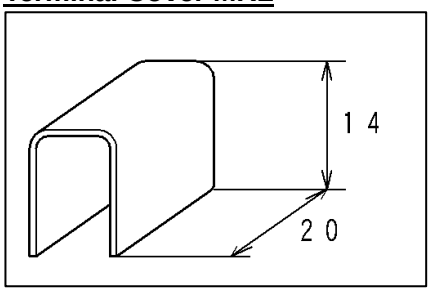


Type Name	Measurement Element	Mark	Terminal Cover For EF Series Units Required
□EF – 17 □EF – 15	DC Current/ Voltage	M	1
	DC Receiving Indicator Meter	X	
	AC Receiving Indicator Meter	Y	
	AC Current/ Voltage	S	
	AC Current/ Voltage	C	
	AC Watthour Meter	W	
	AC Var Meter (balanced)	WVB	
	AC Var Meter (unbalanced)	WV	
	Power Factor (balanced)	PB	
	Power Factor (unbalanced)	P	
	Frequency	A	
	Heat Electric Temperature	H	
	Heat Electric Temperature	HT	
	Revolutions (DC)	Z	
	Revolutions (AC)	V	

RTF – 15	-	1
RTF – 10	-	1

11. TERMINAL COVER FOR HIGHEST (LOWEST) INDICATOR METER

Terminal Cover MRL



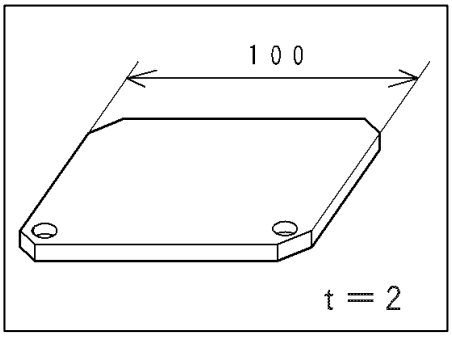
Set into terminal fitting

Type Name	Measurement Element	Mark	Terminal cover for MRL
Highest (Lowest) Indicator Meter □RL-110CH, 110CL, 110CHL □RL-80CH, 80CL, 80CHL	DC Current/ Voltage	M	2
	DC Receiving Indicator Meter	X	2 addition for electromagnetism return 2 addition for Aux. Power Supply
	AC Receiving Indicator Meter	Y	
	AC Current/ Voltage	S	
	AC Current/ Voltage	C	
	AC Watthour Meter	W	
	AC Var Meter (balanced)	WVB	
	AC Var Meter (unbalanced)	WV	
	Power Factor (balanced)	PB	
	Power Factor (unbalanced)	P	
	Frequency (Except PAK, LAK)	A	
	Heat Electric Temperature	H	
	Heat Electric Temperature	HT	
	Revolutions (DC)	Z	
	Revolutions (AC)	V	

* Please Use specify terminal cover or OA-BCP3 for attachment transducer

12. TERMINAL COVER FOR HIGHEST (LOWEST) INDICATOR (ALARM CONTACT)

Terminal Cover ERL

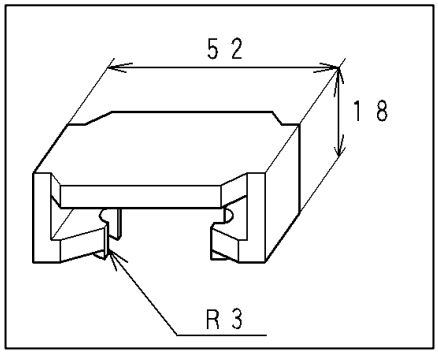


Lock by screw

Type Name	Measurement Element	Mark	Terminal cover for ERL
Highest (Lowest) Indicator Meter (Alarm Contact) □ERL-110C-H, 110C-L, 110C-HL	DC Current/ Voltage	M	1
	DC Receiving Indicator Meter	X	
	AC Receiving Indicator Meter	Y	
	AC Current/ Voltage	S	
	AC Current/ Voltage	C	
	AC Watthour Meter	W	
	AC Var Meter (balanced)	WVB	
	AC Var Meter (unbalanced)	WV	
	Power Factor (balanced)	PB	
	Power Factor (unbalanced)	P	
	Frequency (Except PAK, LAK)	A	
	Heat Electric Temperature	H	
	Heat Electric Temperature	HT	
	Revolutions (DC)	Z	
	Revolutions (AC)	V	

* Please Use specify terminal cover or OA-BCP3 for attachment transducer

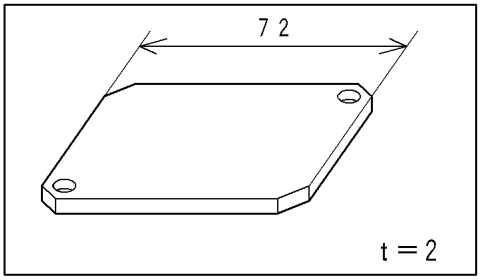
13. TERMINAL COVER FOR MAX. DEMAND AMMETER



Set into terminal fitting

Type Name	Terminal Cover For Narrow Angle
	Units Required
Max. Demand Ammeter BRL – 110CH	1
Max. Demand Ammeter (With warning contact)	2

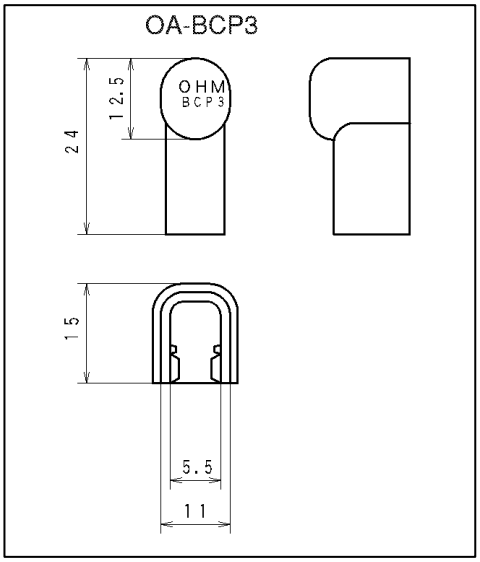
14. TERMINAL COVER FOR AUXILIARY CT



Accessory CT Type	Units Required
	Terminal Cover For MR-CTN
MR – CTN	1

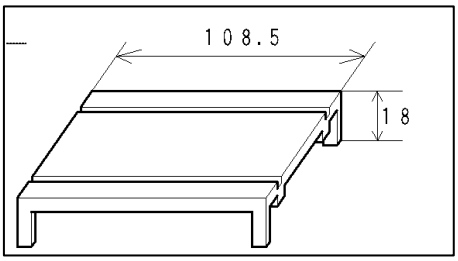
Please use accessory CT cover for Accessory CT, MR-CTN.

15. ATTACHMENT TRANSDUCER TERMINAL COVER



Set into terminal fitting

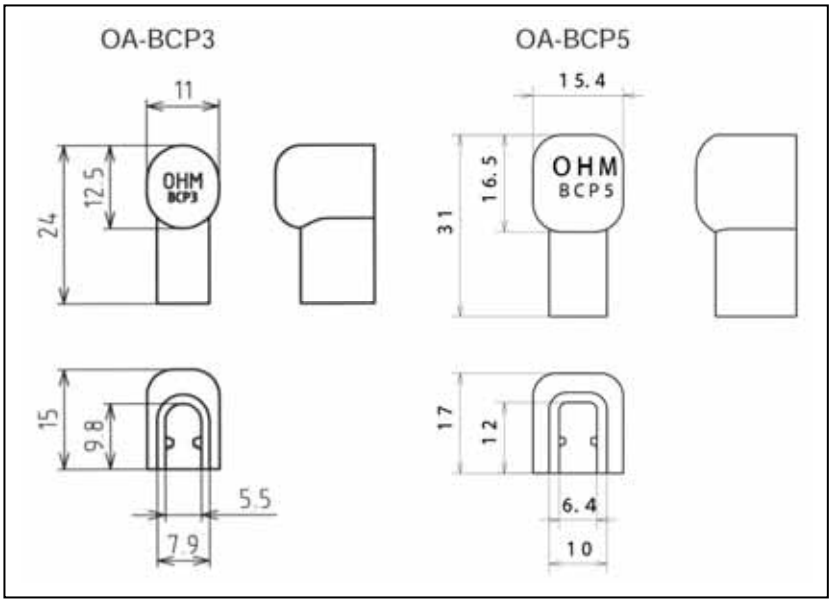
Terminal Cover for T-83M



Attachment Transducer	Units required	
	OA-BCP3	T-83 terminal cover
A(V)T-62M	4	-
W(WV, P, PB)T-62M	6	-
PT-63M	8	-
DM-63(H, L)	10	-
DM-63(HL, HH, LL)	16	-
W(WV, P, PB)T-64M-12	6	-
W(WV, P, PB)T-64M-34	11	-
PT-64M-34	10	-
□-T-83M-□	-	1

* Please Use specify terminal cover or OA-BCP3 for attachment transducer

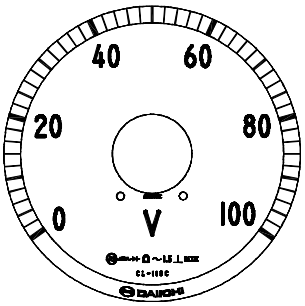
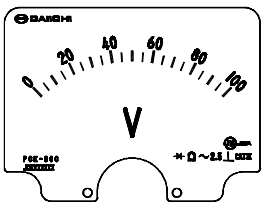
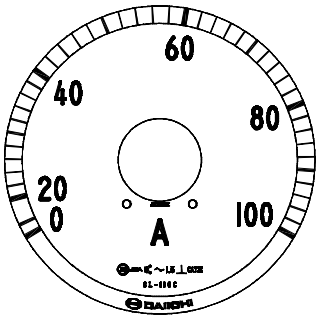
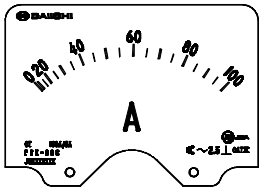
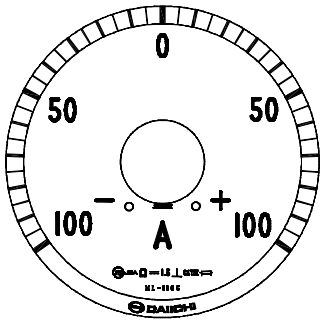
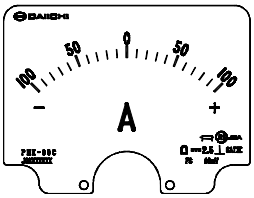
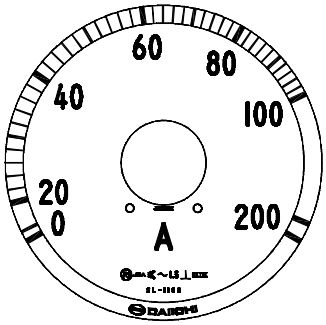
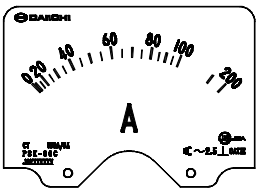
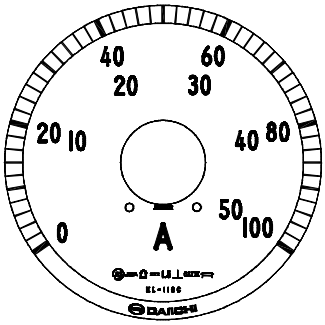
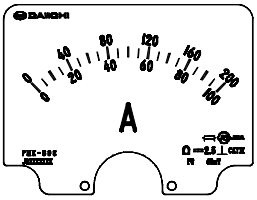
16. SERIES RESISTOR TERMINAL COVER



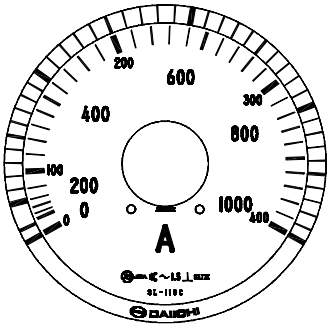
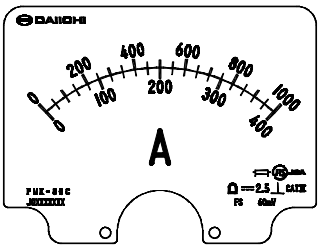
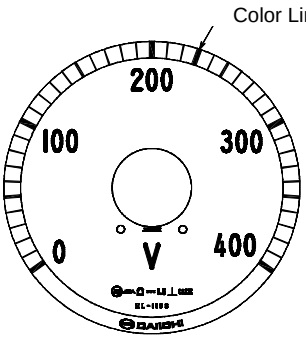
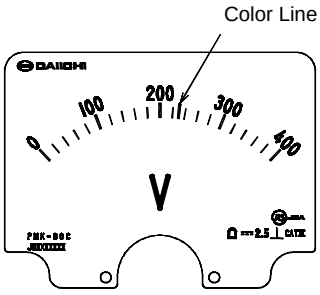
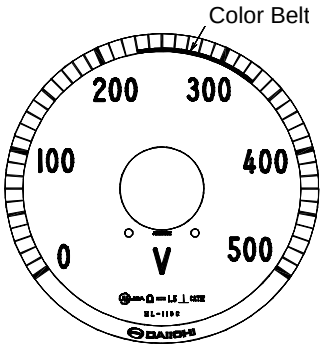
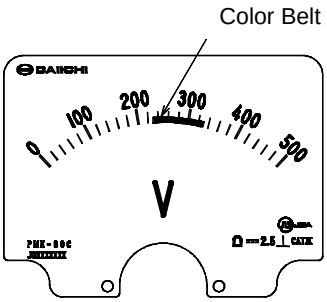
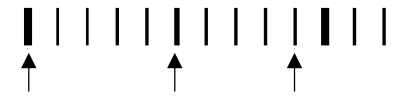
Set into terminal fitting

Type	Units Required	
	OA-BCP3	OA-BCP5
DM – 1	2	-
DM – 2	-	3
DM – 1T	4	-
DM – 41	-	2

EX. SCALE

Scale Specification	Wide Angle Meter Ex.: L-110C	Square Shape Meter Ex.: PK-80C
Standard Scale Scale digit: Black Scale line : Black Unit mark : Black Scale division : Refer to standard lancet shape pointer division		
Moving iron type can be left out the lower value part of scale Scale division : Refer to standard lancet shape pointer division		
± Scale Meter (Both Side Deflect Meter) Scale digit: Black Scale line : Black Unit mark : Black		
Extend Scale (2-Fold Extend) Scale digit: Black ; Extend part: Red Scale line : Black ; Extend part: Red Unit mark : Black		
Single Scale Double Seal Meter Scale digit: Black Scale line : Black Unit mark : Black Standard place a seal of scale figure : Higher value will display at inside & smaller value will display at outside		

EX. SCALE

Scale Specification	Wide Angle Meter Ex.: L-110C	Square Shape Meter Ex.: PK-80C
Double Scale Double Seal Scale digit: Black Scale line : Black Unit mark : Black Scale division : Refer to standard lancet shape pointer division Standard place a seal of scale figure : Higher value will display at outside & smaller value will display at inside For wide angle meter : Higher value will display at inside & smaller value will display at outside		
Coloring Scale (Color Line) Scale color line : Red, Yellow, Green Possible combine the color line & color figure to use for double scale		
Color Belt Color Belt : Red, Yellow, Green		
Scale line and Scale figure 1) Type of scale line Scale figure will print at main line Please refer to standard lancet shape pointer division & standard knife shape pointer division		

2) Figure of scale : Max. 4-digit (9999)
If 10000 is exceed, unit will be change like 6.6kV or use multiple like 36× 1000min^{-1}

3) Please have a consultation with us if scale division is diffirent with standard division (odd scale)
Please specify for Max. division

4) Display「0」will be left out if the scale figure after decimal point is Zero. (like scale figure 1 as below)

5) Display「0」will be left out if the scale figure before decimal point is Zero. (like scale figure 0.5 as below)

Ex. : For range value 1.5

Wide Angle Meter
Scale will display by「1.0」for wide angle meter (except BRL & RL series)

Square Share Meter
BRL & RL series is same scale as square share meter

STANDARD DIVOSION OF LANCET-SHAPED POINTER

L series

PK series

MODEL	L-65C PK-60C, 80C, 100C LK-8C, 10C BRL-110CH Instant Meter		RL-80C PK-120C LK-12C F-10	
MAX. SCALE VALUE	SCALE DIVISION DIAGRAM	DIV.	SCALE DIVISION DIAGRAM	DIV.
1	0 2 4 6 8 10	20	0 2 4 6 8 10	20
1.5	0 *1 5 10 15	30	0 5 10 15	30
2	0 5 10 15 20	20	0 *2 5 10 15 20	40
2.5	0 5 10 15 20 25	25	0 5 10 15 20 25	25
3	0 *1 10 20 30	30	0 10 20 30	30
4	0 10 20 30 40	20	0 *2 10 20 30 40	40
5	0 10 20 30 40 50	25	0 10 20 30 40 50	25
6	0 20 40 60	30	0 20 40 60	30
7.5	0 20 40 60 75	15	0 *3 20 40 60 75	37.5
8	0 20 40 60 80	16	0 *6 20 40 60 80	40
9	0 30 60 90	18	0 *7 30 60 90	45

§ Wide Angle METER §

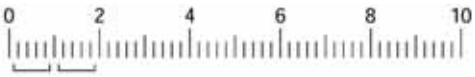
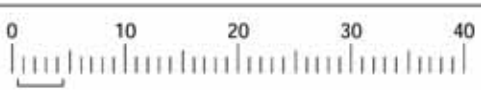
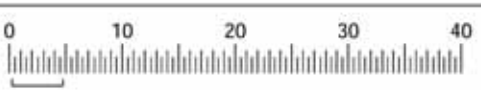
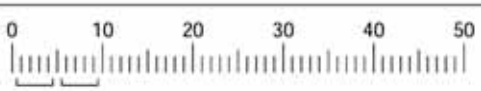
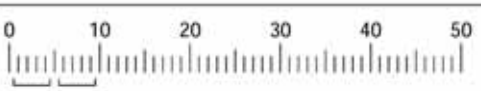
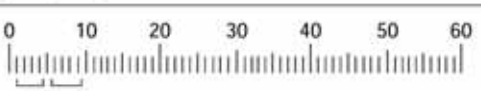
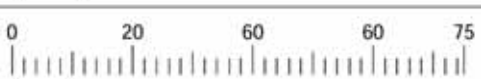
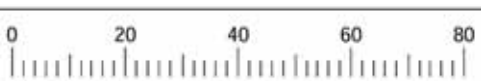
LK series

F series

F series

MODEL	RL−110C BRL−110CH **Utility meter**		F−15, 17 L−110C L−80C EL−110C Note) 4-digit scale of 2T is not manufacturable.	
MAX. SCALE VALUE	SCALE DIVISION DIAGRAM	DIV.	SCALE DIVISION DIAGRAM	DIV.
1	*2 0 2 4 6 8 10	50	*2 0 2 4 6 8 10	50
1.5	0 5 10 15	30	*8 0 5 10 15	75
2	*2 0 5 10 15 20	40	0 5 10 15 20	40
2.5	*4 0 5 10 15 20 25	50	0 5 10 15 20 25	50
3	0 10 20 30	30	*8 0 5 10 15 20 25 30	60
4	*2 0 10 20 30 40	40	0 10 20 30 40	40
5	*4 0 10 20 30 40 50	50	0 10 20 30 40 50	50
6	0 20 40 60	30	*8 0 10 20 30 40 50 60	60
7.5	0 20 40 60 75	37.5	I-110 & I-80: 37.5 DIVISION *9 0 20 40 60 75	75
8	0 20 40 60 80	40	0 20 40 60 80	40
9	0 30 60 90	45	*5 0 20 40 60 80 90	45

STANDARD DIVOSION OF KNIFE-EDGE POINTER

MODEL	PK−60C, 80C, 100C LK− 8C, 10C FK− 5C,		PK−120C LK− 12C FK− 7C	
MAX. SCALE VALUE	SCALE DIVISION DIAGRAM	DIV.	SCALE DIVISION DIAGRAM	DIV.
1		50		50
1.5		30		75
2		40		40
2.5		50		50
3		30		60
4		40		80
5		50		50
6		30		60
7.5		37.5		75
8		40		80
9		45		45

► Division line part of ⌊‾‾⌋ is omitted for moving iron type meter.

► For scale extended meter, red color line and numbers of extended part.

► Have a consultation with us for +/- meter, notation of max. scale value, multiple scale meter, etc.

► *1, becomes 15 divisions for scale extended ammeter PK-60C, PK-80C and LK-8C.

► *2, becomes 20 divisions for scale extended ammeter PK-120C, LK-12C, F-10, 15, 17, RL-80C and RL-110C.

► *3, becomes 15 divisions for scale extended ammeter PK-120C, LK-12C, F-10, 15, 17 and RL-80C.

► *4, becomes 25 divisions for scale extended ammeter RL-110C.

► *5, seal numbers: 0, 30, 60, 90 for type meter F-15, and 17.

► *6, becomes 16 divisions for scale extended ammeter PK-120C, LK-12C, F-10, RL-80C.

► *7, becomes 18 divisions for scale extended ammeter PK-120C, LK-12C, F-10, RL-80C.

► *8, becomes 30 divisions for scale extended ammeter F-15, 17.

► *9, becomes 37.5 divisions for scale extended ammeter F-15, 17.