Analog meter

Since 1948









TSURUGA

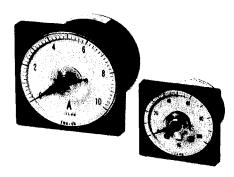
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Wide angle round indicator For model TMW, TCW, TAW series

- Lineup with 3 types
- · Easy-to-Read with large and clear indicator
- · Variety of scale and unit availbale
- · Easy installation
- · Bright scale face with wide surface range

Main specification

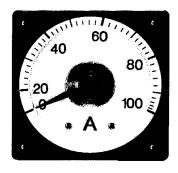
Model			T□W-2C	T□W-25	T□W-4B			
			Each '□' symbol is filled with operating principle below.					
			'M' :	'M' : Moving Coil type				
S	ymbol of operati	ng principles	'C' :	Rectifier type				
				RMS effective valu	ie type			
			e.g. TMW-25 is a 80mm squre meter with moving coil.					
	Dimension		65 x 65mm	80 x 80 mm	110 x 110 mm			
	Weight (1 mA DC rated)		0.20kg	0.24kg	0.72kg			
_		<u> </u>	DC : Moving Coil	type				
ije	Operating Princ	ciples	AC : Rectifier type	e				
Specification] ' '		e value type (for Amr	meter more than 1A)			
Sec	Accuracy Class		Class 2.5	<u> </u>	Class 1.5			
S	Length of Scale		110 mm	136 mm	195 mm			
larc	Color of indicator panel		White					
Standard	Color of cover		Black					
ಭ	Test Voltage		Terminal/Outer case More than AC 2210 V 5sec.					
	Operating temperature		0 to 40 ℃					
	Operating humidity		30 to 90 %RH (No Condensing)					
	DC Ammeter	(Moving coil)	500 μA, 1 mA,	500 μA,1 mA,	500 μA, 1 mA,			
يد	DC Affiliteter	(Moving con)	10 mA to75 mA	10 mA to 10 A	10 mA to 30 A			
ď	DC Voltmeter	(Moving coil)	1 V to 150 V		1 V to 300 V			
D	Receiving		4 to 20 mA					
ate	Receiving	(Moving coil)	1 to 5 V (4kΩ)					
2 2	meter		1 to 5 V (1 MΩ, with external Converter 7331)					
Standar		Rectifier type	1 mA to 10 mA		1 mA to 300 mA			
	DC Voltmeter Receiving meter AC Ammeter	RMS effective value type	1 A to 30 A (with ex	ternal Coverter 7311)	1 A to 5 A (with built-in CT) 10 A to 30 A (with Converter 7311)			
	AC Voltmeter	(Rectifier type)	10 V to 150 V	10 V to 300 V	<u> </u>			

- o Twice or three times extended scale can be manufactured if AC Ammeter of RMS type and moving coil type of analog meter.
- W-2C, W-25: When the rated value is exceeded in DC Ammeter, connect the shunt and analog meter with 100 mV rated value.
- W-4B: When the rated value is exceeded in DC Ammeter, connect the shunt and analog meter with 60 mV rated value.
- When the rated value is exceeded in DC voltmeter, connect the multiplier and analog meter with 1 mA rated voltage.
- When the rated value is exceeded in AC Ammeter, connect the current transformer (CT) with analog meter with 5 A rated current.
- o When the rated value is exceeded in AC voltmeter, connect voltage transformer (VT) and analog meter with 100 V rated voltage.

Customers are requested to provide the following information during order.

- 1. Model
- 2. Rated input value
- 3. Scale and unit

 \times Receiving meter of DC 1 to 5 V (1 M Ω) needs power supply.



Wide angle round indicator For model TMW-80□, TSW-80□, TMW-110□, TSW-110□ series

- · Lineup with 2 types
- · Easy-to-Read with large and clear indicator
- · Variety of scale and unit indication adjustable
- · Easy installation

Main specification

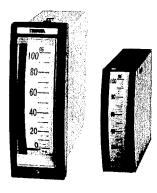
Model	W-80	W-110
Dimension	80 x 80 mm	110 x 110 mm
Standard	JIS C	1102
Accuray class	Class 2.5	Class 1.5
Length of scale	124 mm	175 mm
Color of cover	Bla	ack
Weight	apprx. 0.40 kg	apprx. 0.50kg

	DC Ammeter	DC Voltmeter	Reciver		AC Ammeter	AC Voltmeter
Moving principles		Moving Iron type				
Model	TMW-80DA	TMW-80DV	TMW-80DA	TMW-80DV	TSW-80AA	TSW-80AV
Inodei	TMW-110DA	TMW-110DV	TMW-110DA	TMW-110DV	TSW-110AA	TSW-110AV
	500 µA	1, 3, 5, 10 V	4 to 20 mA	1 to 5 V	1, 3, 5, 10 A	150, 300 V
Rated Input	1, 5, 10, 20, 50 mA	30, 50, 100 V			15, 20, 30 A	
Rated Input	100, 200, 500 mA	150, 300V				
	1, 2, 5, 10, 20, 30 A	500∨			5	

- © Cover with red setting pointer can be manufactred.
- © Extended scale for AC Ammeter can be manufactured.

Customers are requested to provide the following information during order.

- 1. Model
- 2. Rated input value
- 3. Scale and unit



Edgewise shape Indicator For model TME, TCE, TAE series

- · Lineup with 6 types from small to large
- · Easy-to-Read with clear indicator
- · Variety of scale and unit available
- Easy installation
- Two or more units can be connected (T□E-100A)
- Tag plates are attached to the top of display to display information such as measuring place, name and tag No.(T□E-120, T□E-152)

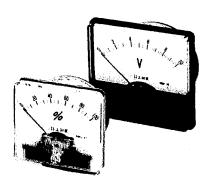
Main specification

Model		T□E-45A	T□E-60C	T□E-80B	T□E-100A	T□E-120	T□E-152			
Г			Each '□' symbol is filled with operating principle below.							
		'M' : Moving Coil type								
Sy	mbol of operatir	ng principles	'C' : Rectifier type							
			'A' : RMS effective value type							
			e.g. TME-45A is a edgewise meter with moving coil.							
	Dimension		44.5 x 13 mm	60 x 22 mm	80 x 16 mm	100 x 30 mm	120 x 46 mm	152.3 x 50.7 mm		
	Weight (1 mA DC rated)		0.04kg	0.14kg	0.175kg	0.23kg	0.55kg	1.1kg		
	Operating Principles		DC : Moving	Coil type	· · · · · · · · · · · · · · · · · · ·			•		
<u>g</u> ,			AC : Rectifier	type						
둉			RMS effe	RMS effective value type (for Ammeter more than 1A)						
Specification	Accuracy Class		Class 2.5			Class 1.5				
ß	Length of Scale		34.5 mm	46 mm	64 mm	82 mm	80 mm	100 mm		
힏			Red bar							
Standard	Color of indicator panel		White							
ga	Color of cover		Transparent ((anti-static resin)		Black				
'	Test Voltage		Terminal/Outer case More than AC 2210 V 5sec.							
	Operating temperature		0 to 40 ℃							
	Operating humidity		30 to 90 %RH (No Condensing)							
	DC Ammeter	(Moving coil)	50 μΑ, 100 μΑ,	50 μA, 100 μA, 1 mA		100 μΑ,	1 mA,			
			500 μA, 1 mA	10 mA to 1 A	1 MA	1 mA,	10 mA to 20 A	1 mA		
			10 mA			10 mA to 1 A		<u> </u>		
¥	DC Voltmeter	(Moving coil)	1 V to 100 V	1 V to 150 V		1 V to 300 V				
Input	Receiving (Moving coil) meter		4 to 20 mA	4 to 20 mA						
ğ			1 to 5 V (4 k	1 to 5 V (4 kΩ)						
ate			1 to 5 V (1 M	Ω , with exte		1 to 5 V (1 MΩ)				
Standard Rated	AC Ammeter	Rectifier type	-	1 mA		1 mA to 300 mA		1 mA		
dar		ļ						1 A to 5 A		
tal		RMS effective	1 A to 30 A (with e	1 A to 30 A (with external Converter 7311)						
S		value type								
								(with Converter 7311)		
	AC Voltmeter		10 V to 300 V 10 V to 150 V 10 V to 300 V							
			(with Multiplier)				<u> </u>	·		

- Twice or three times extended scale can be manufactured if the rated current of AC Ammeter is more than 1 A.
- When the rated value is exceeded in DC Ammeter, connect the shunt and analog meter with 60 mV rated value (except T□E-152).
- When the rated valueis exceeded in DC voltmeter, connect the multiplier and analog meter with 1 mA rated voltage.
- When the rated value is exceeded in AC Ammeter, connect the current transformer (CT) with analog meter with 5 A rated current.
- When the rated value is exceeded in AC voltmeter, connect voltage transformer (VT) and analog meter with 100 V rated voltage.

Customers are requested to provide the following information during order.

- 1. Model
- 2. Rated input value
- 3. Scale and unit
- 4. Vertical or Horizontal installation
- \times Receiving meter of DC 1 to 5 V (1 M Ω) needs power supply.



Square shape Indicator For model R_D, R_P series

- · Lineup with 4 types
- Easy-to-Read with clear indicator
- · Variety of scale and unit availbale
- Easy installation
- · Bright scale face with wide surface range

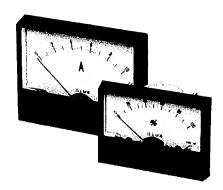
Main specification

M	odel		T□R _D -43	T□R _D -21	T□R _P -25	TSRP-80AA		
			Each '□' symbol is filled with operating principle below.					
			'M' : Moving Coil type					
c.	mbol of operati	na principlos	'C' : R	ectifier type				
Э	illuoi oi operati	ng principles	'A' : RMS effective value type					
			'S' : Moving Iron type					
			e.g. TMRD-43 is a 43mm squre meter with moving coil.					
	Dimension		43 x 43 mm	60 x 60 mm	80 x 80 mm	82 x 82 mm		
	Weight (1 mA DC rated)		0.04kg	0.07kg	0.12kg	0.1kg (5A)		
			DC: Moving Coil ty	pe				
드	Operating Princ	ciples	AC : Rectifier type	AC: Moving Iron type				
atic			RMS effective					
Standard Specification	Accuracy Class		Class 2.5					
ğ	Length of Scale		30 mm	49 mm	62 mm	70 mm		
ص ری	Shape of pointer		Black bar					
ğ	Color of indicator panel		White					
ğ	Color of cover		Transparent Black					
0)	Test Voltage		Terminal/Outer case More than AC 2210 V 5sec.					
	Operating temperature		0 to 40 ℃					
	Operating humidity		30 to 90 %RH (No Condensing)			40 to 75 %RH		
_	Topolating namually					(No Condensing)		
	DC Ammeter	er (Moving coil)	1 mA,					
	DC Valter story (Marriage 221)		10 mA to 1 A	10 mA to 10 A 150 V	10 mA to20 A 1 to 300 V			
Ĭ	DC Voltmeter (Moving coil)		1 10	14 to 20 mA	11 to 300 V	-		
Inp	Receiving	(Moving coil)	4.5- 204	==				
g	(Moving coil)		4 to 20 mA	1 to 5 V (4 k Ω) 1 to 5 V (1 M Ω , with Converter 7331)		-		
Ra Ta	Double on home			1 mA to 10 mA	1 mA to 300 mA			
ğ		Rectifier type RMS effective value	-	I ma to 10 ma	I ma to 300 ma	-		
Standard Rated Input	AC Ammeter	type	1 A to 30 A (with external Coverter 7311)			-		
S		Moving Iron type				1 to 30 A		
	AC Voltmeter Rectifier type		10 V to 150 V		10 to 300 V	-		
	, to voicingto	Moving Iron type	-					

- Twice or three times extended scale can be manufactured if AC Ammeter of RMS type and moving coil type of analog
- When the rated value is exceeded in DC Ammeter, connect the shunt and analog meter with 60 mV rated value.
- When the rated value is exceeded in DC voltmeter, connect the multiplier and analog meter with 1 mA rated voltage.
- When the rated value is exceeded in AC Ammeter, connect the current transformer (CT) with analog meter with 5 A rated
- When the rated value is exceeded in AC voltmeter, connect voltage transformer (VT) and analog meter with 100 V rated

Customers are requested to provide the following information during order.

- 1. Model
- 2. Rated input value
- 3. Scale and unit
- %Receiving meter of DC 1 to 5 V (1 M Ω) needs power supply.



Rectangle shape Indicator For model R series

- Lineup with 4 types
- · Easy-to-Read with clear indicator
- · Variety of scale and unit availbale
- · Easy installation

Main enocification

_	lain specific	ation	ITO 00	Irms are	T	ITEMS 250			
М	odel		T□R-2B	T□R-25B ₁	T□R-25C ₁	T□R-25C			
			Each '□' symbol is filled with operating principle below.						
			'M' : Moving Coil type						
S	ymbol of operati	ng principles		'C' : Rectifier type					
				RMS effective valu	* *				
			e.g. TMR-2B is a rectangle meter with moving coil.						
	Dimension		80 x 60 mm	100 x 75 mm	100 x 83 mm	120 x 100 mm			
	Weight (1 mA DC rated)		0.145kg	0.170kg	0.150kg	0.180kg			
	Operating Principles		DC: Moving Coil t	• •					
<u>S</u>			AC : Rectifier type						
cat			RMS effective value type (for Ammeter more than 1A)						
Specification	Accuracy Class		Class 2.5						
Š	Length of Scale	2	52 mm	66 mm	73 mm	93 mm			
ard	Shape of pointer		Black bar						
Standard	Color of indicator panel		White						
Sta	Color of cover		Black						
	Test Voltage		Terminal/Outer case More than AC 2210 V 5sec.						
	Operating temperature		0 to 40 ℃						
	Operating humidity		30 to 90 %RH (No Condensing)						
	DC Ammeter	(Moving coil)	100 μA, 1 mA	100 μA, 1 mA	100 μA, 500 μA, 1 mA,	100 μA, 500 μA, 1 mA,			
			10 mA to 10 A	10 mA to 20 A	10 mA to 10 A	10 mA to 20 A			
Input	DC Voltmeter (Moving coil)		1 to 150 V	1 to 300 V					
ij	De calida a		4 to 20 mA						
ate	Receiving meter	(Moving coil)	1 to 5 V (4 kΩ)						
무			1 to 5 V (1 MΩ, with external Converter 7331)						
dar		Rectifier type	1 to 10 mA	1 to 300 mA					
Standard Rated	AC Ammeter	RMS effective value							
S		type	1 A to 30 A (with ex	tternal Coverter 73:	11)				
	AC Voltmeter Rectifier type		10 V to 150 V	10 to 300 V	· · · · · · · · · · · · · · · · · · ·				
	1	1 ''	<u> </u>	1					

- o Twice or three times extended scale can be manufactured if the rated current of AC Ammeter is more than 1 A.
- When the rated value is exceeded in DC Ammeter, connect the shunt and analog meter with 60 mV rated value.
- When the rated value exceeded in DC voltmeter, connect the multiplier and analog meter with 1 mA rated voltage.
- When the rated value is exceeded in AC Ammeter, connect the current transformer (CT) with analog meter with 5 A rated current.
- When the rated value is exceeded in AC voltmeter, connect voltage transformer (VT) and analog meter with 100 V rated voltage.

Customers are requested to provide the following information during order.

- 1. Model
- 2. Rated input value
- 3. Scale and unit

 \times Receiving meter of DC 1 to 5 V (1 M Ω) needs power supply.