

Analog meter

Since 1948



TSURUGA

Tsuruga Electric Corporation

Foreign Trade Department

5F, Taiyo Seimei Osaka-Minami Building

1-10-6, Abiko Higashi, Sumiyoshi-ku, Osaka, Japan 558-0013

Phone: +81-6-4703-3874 Fax: +81-6-4703-3875

URL: <http://www.tsuruga.co.jp/foreign/>

E-mail: ft.info@tsuruga.co.jp

Analog Instruments



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 available
- Easy installation
- Bright scale face with wide surface range

Main specification

Model	T□W-2C	T□W-25	T□W-4B		
Symbol of operating principles	Each '□' symbol is filled with operating principle below. 'M' : Moving Coil type 'C' : Rectifier type 'A' : RMS effective value type e.g. TMW-25 is a 80mm square meter with moving coil.				
Standard Specification	Dimension	65 x 65mm	80 x 80 mm	110 x 110 mm	
	Weight (1 mA DC rated)	0.20kg	0.24kg	0.72kg	
	Operating Principles	DC : Moving Coil type AC : Rectifier type RMS effective value type (for Ammeter more than 1A)			
	Accuracy Class	Class 2.5		Class 1.5	
	Length of Scale	110 mm	136 mm	195 mm	
	Color of indicator panel	White			
	Color of cover	Black			
	Test Voltage	Terminal/Outer case More than AC 2210 V 5sec.			
	Operating temperature	0 to 40 °C			
	Operating humidity	30 to 90 %RH (No Condensing)			
Standard Rated Input	DC Ammeter (Moving coil)	500 μA, 1 mA, 10 mA to 75 mA	500 μA, 1 mA, 10 mA to 10 A	500 μA, 1 mA, 10 mA to 30 A	
	DC Voltmeter (Moving coil)	1 V to 150 V	1 V to 300 V		
	Receiving meter (Moving coil)	4 to 20 mA 1 to 5 V (4kΩ) 1 to 5 V (1 MΩ, with external Converter 7331)			
	AC Ammeter	Rectifier type	1 mA to 10 mA	1 mA to 300 mA	
		RMS effective value type	1 A to 30 A (with external Converter 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			

- ◎ 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.
- ◎ 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.

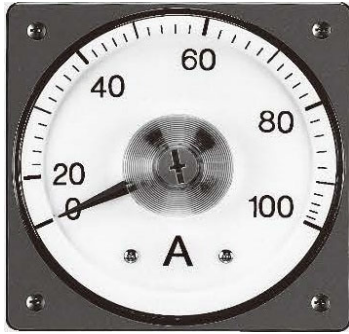
1. Model
2. Rated input value
3. Scale and unit

※Receiving meter of DC 1 to 5 V (1 MΩ) needs power supply.

Analog Instruments

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	
Accuracy class	Class 2.5	Class 1.5
Length of scale	124 mm	175 mm
Color of cover	Black	
Weight	apprx. 0.40 kg	apprx. 0.50kg

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

- ⊙ Cover with red setting pointer can be manufactured.
- ⊙ 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

Analog Instruments



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	
Symbol of operating principles	Each '□' symbol is filled with operating principle below. 'M' : Moving Coil type 'C' : Rectifier type 'A' : RMS effective value type e.g. TME-45A is a edgewise meter with moving coil.						
Standard Specification	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 AC : Rectifier type RMS effective value type (for Ammeter more than 1A)					
	Accuracy Class	Class 2.5			Class 1.5		
	Length of Scale	34.5 mm	46 mm	64 mm	82 mm	80 mm	100 mm
	Shape of pointer	Red bar			Red, flat	Red, larger bar	
	Color of indicator panel	White					
	Color of cover	Transparent (anti-static resin)				Black	
	Test Voltage	Terminal/Outer case More than AC 2210 V 5sec.					
	Operating temperature	0 to 40 °C					
Operating humidity	30 to 90 %RH (No Condensing)						
Standard Rated Input	DC Ammeter (Moving coil)	50 μA, 100 μA, 500 μA, 1 mA 10 mA	50 μA, 100 μA, 1 mA 10 mA to 1 A	100 μA, 1 mA, 10 mA to 1 A	1 mA, 10 mA to 20 A	1 mA	
	DC Voltmeter (Moving coil)	1 V to 100 V	1 V to 150 V	1 V to 300 V			
	Receiving meter (Moving coil)	4 to 20 mA 1 to 5 V (4 kΩ) 1 to 5 V (1 MΩ, with external Converter 7331)				4 to 20 mA 1 to 5 V (4 kΩ) 1 to 5 V (1 MΩ)	
	AC Ammeter	Rectifier type	-	1 mA	1 mA to 300 mA		1 mA
		RMS effective value type	1 A to 30 A (with external Converter 7311)				1 A to 5 A (built-in CT) 10 A to 30 A (with Converter 7311)
AC Voltmeter	10 V to 300 V (with Multiplier)	10 V to 150 V		10 V to 300 V			

- ◎ 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 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.
- ◎ 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
- ※Receiving meter of DC 1 to 5 V (1 MΩ) needs power supply.

Analog Instruments



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 available
- Easy installation
- Bright scale face with wide surface range

Main specification

Model	T□R _D -43	T□R _D -21	T□R _P -25	TSRP-80AA		
Symbol of operating principles	Each '□' symbol is filled with operating principle below. 'M' : Moving Coil type 'C' : Rectifier type 'A' : RMS effective value type 'S' : Moving Iron type e.g. TMRD-43 is a 43mm square 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)		
Standard Specification	Operating Principles			AC : Moving Iron type		
	DC : Moving Coil type					
	AC : Rectifier type					
	RMS effective value type (for Ammeter more than 1A)					
	Accuracy Class					
	Class 2.5					
	Length of Scale					
	30 mm 49 mm 62 mm 70 mm					
	Shape of pointer					
	Black bar					
Color of indicator panel						
White						
Color of cover			Black			
Transparent						
Test Voltage						
Terminal/Outer case More than AC 2210 V 5sec.						
Operating temperature						
0 to 40 °C						
Operating humidity			40 to 75 %RH			
			(No Condensing)			
Standard Rated Input	DC Ammeter (Moving coil)	1 mA,	100 μA, 500 μA, 1 mA		-	
		10 mA to 1 A	10 mA to 10 A	10 mA to 20 A		
	DC Voltmeter (Moving coil)	1 to 150 V		1 to 300 V	-	
	Receiving meter (Moving coil)	4 to 20 mA	4 to 20 mA		-	
			1 to 5 V (4 kΩ)			
			1 to 5 V (1 MΩ, with Converter 7331)			
	AC Ammeter	Rectifier type	-	1 mA to 10 mA	1 mA to 300 mA	-
		RMS effective value type	1 A to 30 A (with external Converter 7311)			-
Moving Iron type		-			1 to 30 A	
AC Voltmeter	Rectifier type	10 V to 150 V		10 to 300 V	-	
	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 MΩ) needs power supply.

Analog Instruments



Rectangle shape Indicator For model R series

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

Main specification

Model	T□R-2B	T□R-25B ₁	T□R-25C ₁	T□R-25C		
Symbol of operating principles	Each '□' symbol is filled with operating principle below. 'M' : Moving Coil type 'C' : Rectifier type 'A' : RMS effective value type e.g. TMR-2B is a rectangle meter with moving coil.					
Standard Specification	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 type AC : Rectifier type RMS effective value type (for Ammeter more than 1A)				
	Accuracy Class	Class 2.5				
	Length of Scale	52 mm	66 mm	73 mm	93 mm	
	Shape of pointer	Black bar				
	Color of indicator panel	White				
	Color of cover	Black				
	Test Voltage	Terminal/Outer case More than AC 2210 V 5sec.				
	Operating temperature	0 to 40 °C				
	Operating humidity	30 to 90 %RH (No Condensing)				
Standard Rated Input	DC Ammeter (Moving coil)	100 μA, 1 mA 10 mA to 10 A	100 μA, 1 mA 10 mA to 20 A	100 μA, 500 μA, 1 mA, 10 mA to 10 A	100 μA, 500 μA, 1 mA, 10 mA to 20 A	
	DC Voltmeter (Moving coil)	1 to 150 V	1 to 300 V			
	Receiving meter (Moving coil)	4 to 20 mA 1 to 5 V (4 kΩ) 1 to 5 V (1 MΩ, with external Converter 7331)				
	AC Ammeter	Rectifier type	1 to 10 mA	1 to 300 mA		
		RMS effective value type	1 A to 30 A (with external Coverter 7311)			
AC Voltmeter	Rectifier type	10 V to 150 V	10 to 300 V			

- ◎ 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 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.
- ◎ 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

※Receiving meter of DC 1 to 5 V (1 MΩ) needs power supply.