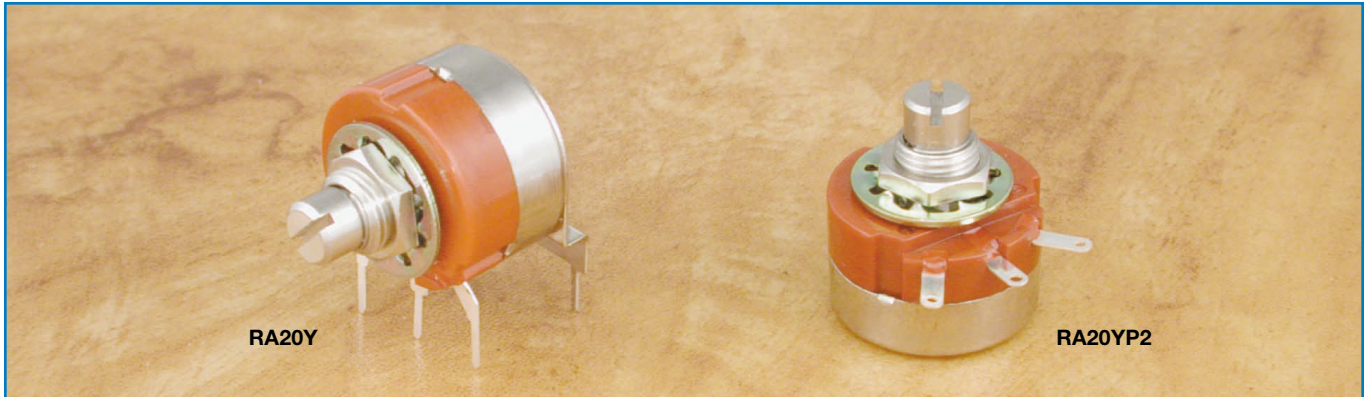


20mm Diameter, Single-Turn, Wirewound Industrial Panel Controls



RA20Y

RA20YP2

Features

- 20mm diameter, single-turn industrial panel controls
- Wirewound element
- Linear or audio tapers
- Single or tandem units, single shaft
- Metal shaft and bushing
- Panel and PCB mounting styles
- Shaft lock available
- 6mm diameter shafts in slot, flat or round end styles
- Standard 10mm or 15mm shaft length
- Lug or right angle mount pin terminals
- Low operating temperature option of -10°C or -30°C , up to $+100^{\circ}\text{C}$

Specifications

Electrical

Standard Resistance Range B = 10Ω to $20\text{k}\Omega$
 A, C = 100Ω to $3\text{k}\Omega$

Resistance Tolerance $\pm 10\%$ standard
 ($\pm 5\%$, $\pm 2\%$ or $\pm 1\%$ special order)

End Resistance $R < 500\Omega = 1\Omega$ max.
 $R \geq 500\Omega = 0.2\%$ max.

Resistance Taper B = linear; A = CW audio (logarithm);
 C = CCW audio (logarithm)

Power Rating B = 1 watt; A, C = 0.5 watt, at $+40^{\circ}\text{C}$

Insulation Resistance $100\text{M}\Omega$ minimum at 500VDC

Dielectric Strength 500VAC, 1 minute

Theoretical Resolution

| Resistance (Ω) | Resolution (%) | Resistance (Ω) | Resolution (%) |
|-------------------------|----------------|-------------------------|----------------|
| 10 | 0.62 | 1,000 | 0.44 |
| 20 | 1.12 | 2,000 | 0.35 |
| 50 | 0.78 | 5,000 | 0.25 |
| 100 | 0.62 | 10,000 | 0.18 |
| 200 | 0.46 | 20,000 | 0.14 |
| 500 | 0.38 | - | - |

Mechanical

Mechanical Travel $290^{\circ} \pm 5^{\circ}$

Shaft Torque

Single Unit 30.6 to 204 gf•cm (0.424 to 2.828 oz•in)

Tandem Unit 71.2 to 510 gf•cm (0.987 to 7.07 oz•in)

Stop Strength 6.12 kgf•cm (84.84 oz•in) max.

Mounting Nut Torque 15 kgf•cm (207.94 oz•in) max.

Solderability 235°C , 3 seconds

Marking Model type, taper, resistance code,
 shaft type, terminal identification, date code

Environmental

Temperature Range Y = -10°C to $+100^{\circ}\text{C}$
 or X = -30°C to $+100^{\circ}\text{C}$

Temperature Characteristics $+85^{\circ}\text{C}$, 5 hours
 without load
 $\Delta T/R \leq \pm 5\%$

Low Temperature Exposure -10°C (Y), -30°C (X)
 1 hour without load
 $\Delta T/R \leq \pm 3\%$

Load Life $+40^{\circ}\text{C}$, 1,000 hours with rated load
 $\Delta T/R \leq \pm 3\%$

Moisture and Load Life $+40^{\circ}\text{C}$, 90-95% RH,
 500 hours with 1/10 rated load
 $\Delta T/R \leq \pm 5\%$

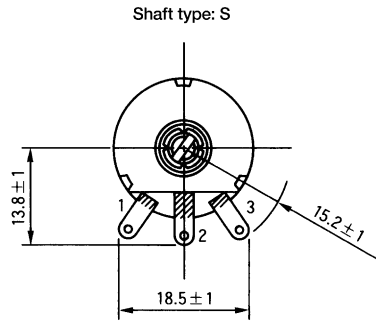
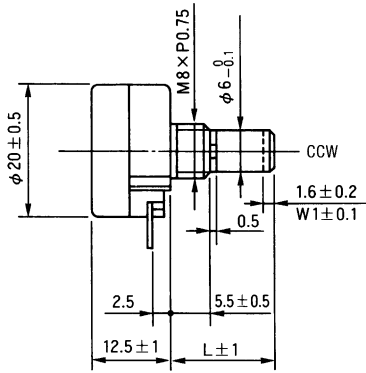
Vibration 10-55Hz, 1.5mm amplitude,
 2 directions, 2 hours each
 $\Delta T/R \leq \pm 1\%$

Soldering Heat Resistance 350°C , 3.5 seconds;
 260°C , 5 seconds (PCB units)
 $\Delta T/R \leq \pm 2\%$

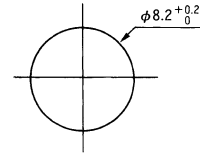
Rotational Life 15,000 cycles (500 cycles for shaft lock
 models only) with 1/2 rated load
 $\Delta T/R \leq \pm 3\%$

R = Total Resistance Value; $\Delta T/R$ = Total Resistance Change

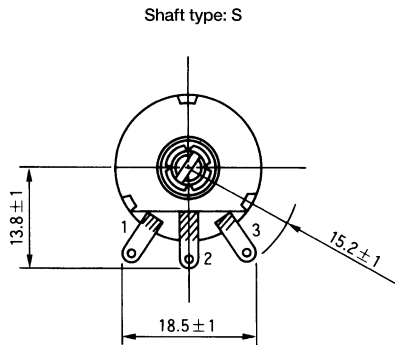
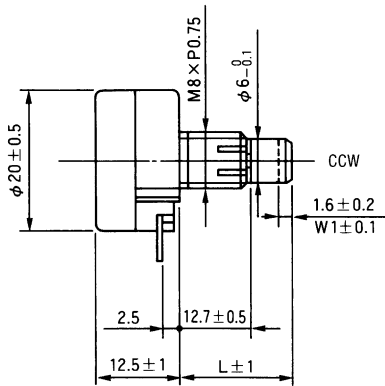
RA20Y & RA20X
Panel Mount, Single Unit, Single Shaft
Right Angle Ear-Lug Terminals



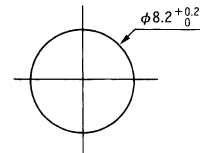
Recommended Panel Mounting Hole



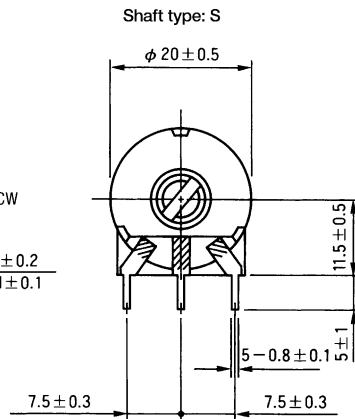
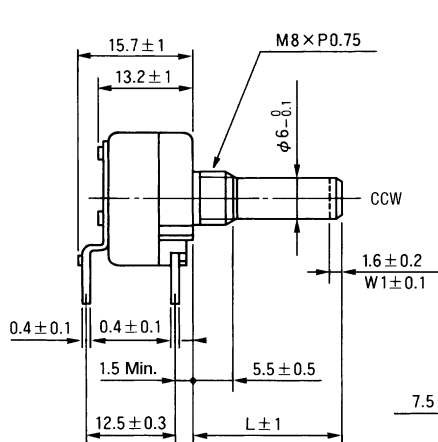
RA20YL & RA20XL
Panel Mount, Single Unit, Single Shaft with Shaft Lock
Right Angle Ear-Lug Terminals



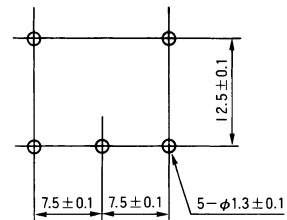
Recommended Panel Mounting Hole



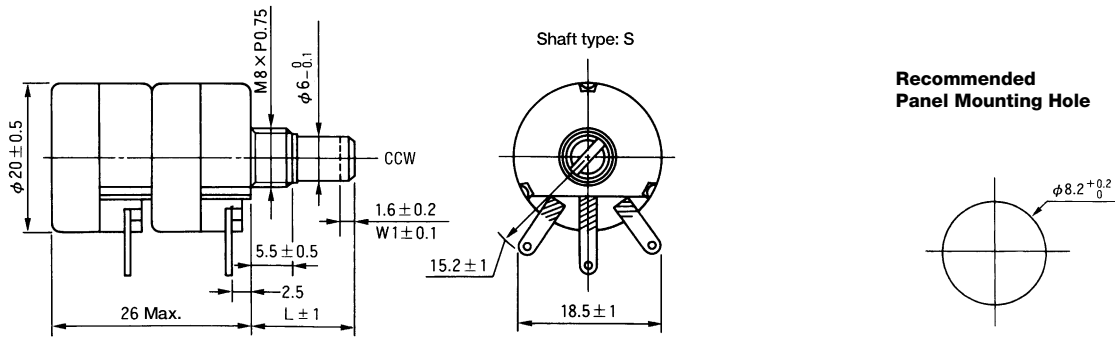
RA20YP2
PCB Mount, Single Unit, Single Shaft
Right Angle Mount Pin Terminals, 3-Pin Inline Pattern, 2-Pin Standoff Rear Support Bracket



Recommended PCB Mounting Holes



RA20YG
Panel Mount, Ganged Tandem Unit, Single Shaft
Right Angle Ear-Lug Terminals on Each Unit



RA 20 Y L 10 S B 203 K

NOTE: FMS = From Mounting Surface

- ➔ **Resistance Tolerance:** K = ±10% (standard).
J = ±5% (special order).
G = ±2% (special order).
F = ±1% (special order).
- ➔ **Resistance Code:** Expressed in ohms. A three digit code where the first two digits are significant figures, and the third digit indicates the number of zeros that follow these figures (i.e., 200 = 20Ω; 201 = 200Ω; 202 = 2,000Ω; 203 = 20,000Ω). See table for standard resistance values.
- ➔ **For Single Unit:**
Specify taper and resistance code as shown.
- ➔ **For Ganged Tandem Unit:**
Specify a taper code and resistance code for each unit starting with the front unit followed by the rear unit. If both units have the same taper and resistance codes, add "X2" suffix per example below.
Examples: B203A503 or if both units are the same: B203X2
- ➔ **Resistance Taper:** B = Linear.
A = CW Audio (logarithm).
C = CCW Audio (logarithm).
- ➔ **Shaft End Style:** S = Slotted.
F = Flatted.
R = Round.
- ➔ **Standard Shaft Length:** 10 = 10mm FMS.
15 = 15mm FMS.
Up to 30mm shaft length available (special order).
- ➔ **Style:** Blank = Panel Mount, Single Unit, Single Shaft, Right Angle Ear-Lug Terminals.
L = Panel Mount, Single Unit, Single Shaft with Shaft Lock, Right Angle Ear-Lug Terminals.
P2 = PCB Mount, Single Unit, Single Shaft, Right Angle Mount Pin Terminals, 3-Pin Inline Pattern, 2-Pin Rear Support Bracket.
G = Panel Mount, Ganged Tandem Unit, Single Shaft, Right Angle Ear-Lug Terminals on Each Unit.
- ➔ **Operating Temperature Range:** Y = -10°C to +100°C.
X = -30°C to +100°C.
- ➔ **Size:** 20 = 20mm Diameter.
- ➔ **TOCOS Series Name:** RA = Wirewound Element.

Standard Resistance Values and Part Numbering Codes

Standard Nominal Total Resistance Values and Part Numbering Codes

| Resistance (Ω) | Code | Resistance (Ω) | Code | Resistance (Ω) | Code | Resistance (Ω) | Code |
|----------------|------|----------------|------|----------------|------|----------------|------|
| 10 | 100 | 100 | 101 | 1,000 | 102 | 10,000 | 103 |
| 20 | 200 | 200 | 201 | 2,000 | 202 | 20,000 | 203 |
| 50 | 500 | 500 | 501 | 5,000 | 502 | | |

Refer to Shaft End Styles Specifications and Hardware Specifications for details and availability.
For additional information, refer to Guidelines and Precautions for Using Panel Controls.