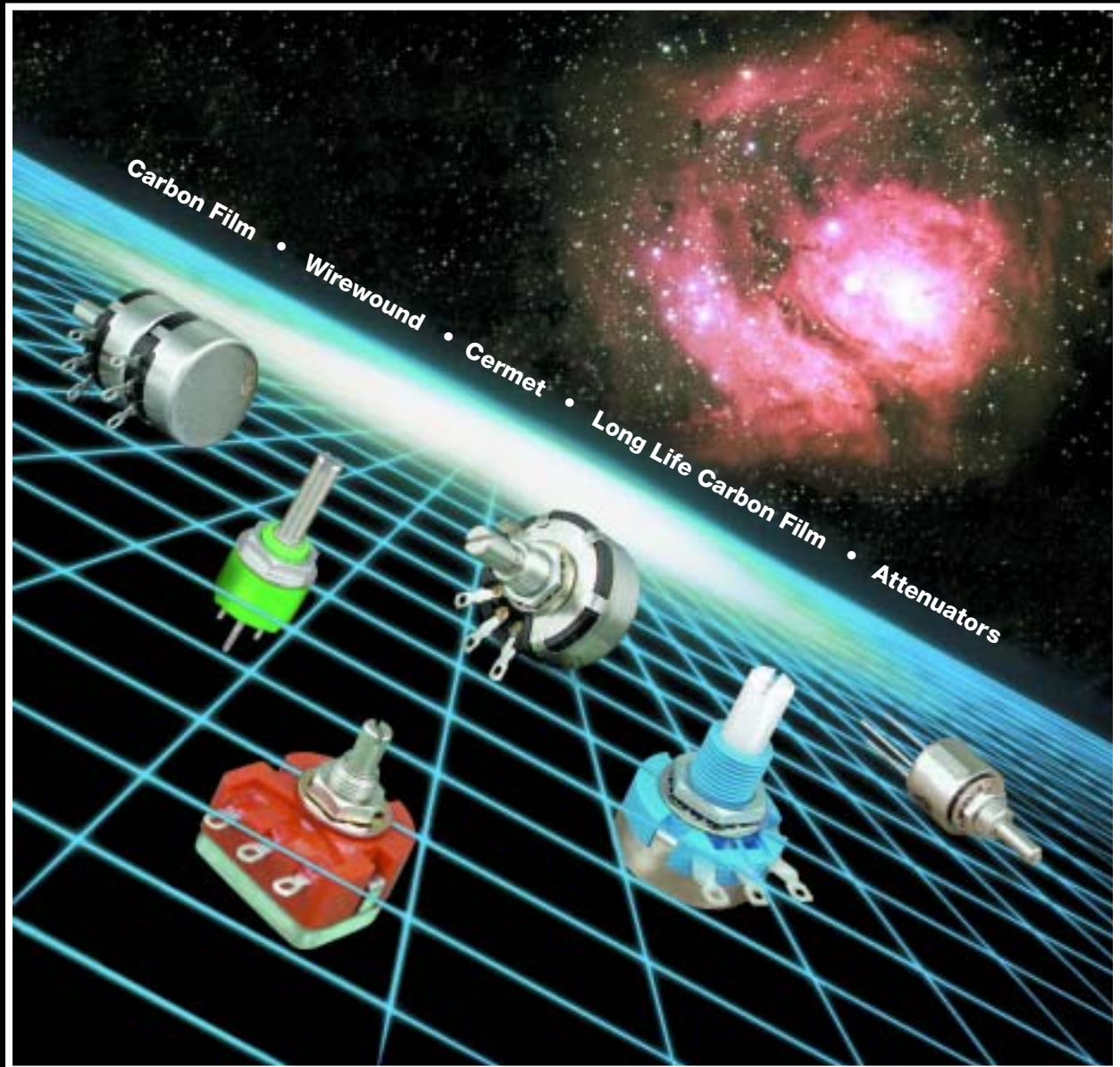


TOCOS

PANEL CONTROLS

INDUSTRIAL APPLICATIONS



SELECTION GUIDE

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Carbon Panel Controls

Industrial Series	RV102 Series	RV103 Series	RV12 Series
Model Examples			
Element Type	Carbon Film	Carbon Film	Carbon Film
Resistance Range	100Ω-2MΩ (B)	100Ω-2MΩ (B)	100Ω-2MΩ (B)
Resistance Taper	B = Linear	B = Linear	B = Linear
Resistance Tolerance	±20% Standard (±10% Special Order)	±10% Standard	±20% Standard (±10% Special Order)
Power Rating	0.25W at +40°C 0W at +85°C	0.25W at +40°C 0W at +85°C	0.5W at +40°C 0W at +85°C
Adjustment Travel	270° ±10°	270° ±10°	270° ±10°
Temperature Range	-10°C to +85°C	-10°C to +85°C	-10°C to +85°C
Rotational Life	10,000 Cycles	10,000 Cycles	15,000 Cycles
Construction	Plastic Bushing, Metal Shaft	Plastic Bushing, Metal Shaft	Metal Bushing, Metal Shaft
Nominal Body Size	10mm Diameter	10mm Diameter	12.8mm Diameter
Bushing Type	M6 (P0.75), 6.5mmℓ	M6 (P0.75), 3.5mmℓ	1/4"-32UNEF-2A, 6.35mmℓ
Shaft Dimensions	Ø3mm x 10 or 15mmℓ (FMS)**	Ø3mm x 10 or 15mmℓ (FMS)**	Ø3.2mm x 10 or 15mmℓ (FMS)**
Shaft End Styles	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)
Terminal Styles	Lug or PCB Pins	Lug or PCB Pins	Lug or PCB Pins
Configurations	Single Unit, Single Shaft	Single Unit, Single Shaft	Single Unit, Single Shaft
Other Features	Molded Plastic Housing and Bushing Small Size, Lightweight	Optional Center Detent Models Molded Plastic Housing and Bushing	Metal Housing Anti-rotational Adapter Plate

Carbon Panel Controls

Industrial Series	RV16 Series	RV20 Series	RV20N Series
Model Examples			
Element Type	Carbon Film	Carbon Film	Carbon Film
Resistance Range	100Ω-2MΩ (B), 2kΩ-2MΩ (A,C)	100Ω-2MΩ (B), 2kΩ-2MΩ (A,C)	500Ω-2MΩ (B), 1kΩ-2MΩ (A,C)
Resistance Taper	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear, A = CW Audio (log), C = CCW Audio (log)
Resistance Tolerance	±10% Standard	±10% Standard	±20% Standard
Power Rating	0.1W (B), 0.05W (A,C) at +40°C 0W at +85°C	0.25W (B), 0.125W (A,C) at +40°C 0W at +85°C	0.25W (B), 0.125W (A,C) at +40°C 0W at +85°C
Adjustment Travel	240° ±10°	230° ±10°	245° ±10°
Temperature Range	-10°C to +85°C	-10°C to +85°C	-10°C to +85°C
Rotational Life	15,000 Cycles, Shaft Lock 500 Cycles	15,000 Cycles	15,000 Cycles
Construction	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft	Plastic Bushing, Plastic Shaft
Nominal Body Size	16.8mm Diameter	20mm Diameter	20.4mm Diameter
Bushing Type	M6 (P0.75), 6 or 7.5*mmℓ	M9 (P0.75), 5 or 12.7*mmℓ	M9 (P0.75), 10mmℓ
Shaft Dimensions	Ø3.2mm x 10 or 15mmℓ (FMS)**	Ø6mm x 10, 15 or 20mmℓ (FMS)**	Ø6mm x 15 or 20mmℓ (FMS)**
Shaft End Styles	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)	Slot (S) or Flat (F)
Terminal Styles	Ear-Lug, Rear Switch Lug or PCB Pins	Rear Exit Lug or PCB Pins	Right Angle Ear-Lug
Configurations	Single or Tandem Unit, Single Shaft Dual Unit, Dual Concentric Shaft	Single Unit, Single Shaft	Single Unit, Single Shaft
Other Features	Switch Functions, Shaft Lock and Center Detent Available	Shaft Lock Models Available	Meets UL 94HB Flammability Test

*Length for Shaft Lock Models Only **FMS = From Mounting Surface

Selection Guide

Carbon Panel Controls

Industrial Series	RV20N2 Series	RV202 Series	RV24 Series
Model Examples			
Element Type	Carbon Film	Carbon Film	Carbon Film
Resistance Range	500Ω - 2MΩ (B), 1kΩ - 2MΩ (A,C)	500Ω - 2MΩ (B), 1kΩ - 2MΩ (A,C)	50Ω - 2MΩ (B), 1kΩ - 2MΩ (A,C)
Resistance Taper	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear, A = CW Audio (log), C = CCW Audio (log)
Resistance Tolerance	±20% Standard	±10% Standard	±10% Standard
Power Rating	0.40W at +40°C 0W at +80°C	0.25W (B), 0.125W (A,C) at +40°C 0W at +85°C	0.25W (B), 0.125W (A,C) at +40°C 0W at +85°C
Adjustment Travel	245° ± 10°	270° ± 10°	280° ± 10°
Temperature Range	-10°C to +80°C	-10°C to +85°C	-10°C to +85°C
Rotational Life	15,000 Cycles	15,000 Cycles	15,000 Cycles, Shaft Lock 500 Cycles
Construction	Plastic Bushing, Plastic Shaft	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft
Nominal Body Size	20.4mm Diameter	20mm Diameter	24.6mm Diameter
Bushing Type	M9 (P0.75), 5mmℓ	M9 (P0.75), 10mmℓ	M9 (P0.75), 10 or 12.7*mmℓ
Shaft Dimensions	ø6mm × 10mmℓ (Knurled)	ø6mm × 15 or 20mmℓ (FMS)**	ø6mm × 15 or 20mmℓ (FMS)**
Shaft End Styles	Full Knurled Shaft with Blade Slot	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)
Terminal Styles	Right Angle Ear-Lug	Right Angle Ear-Lug or PCB Pins	Ear-Lug, Rear Exit Switch Lug
Configurations	Single Unit, Single Shaft	Single Unit, Single Shaft	Single, Tandem or Triple Unit, 1 Shaft Dual Unit, Dual Concentric Shaft
Other Features	Fingertip or Blade Adjustment Meets UL 94HB Flammability Test	2-Pin Rear Support Bracket for PCB Pin Models	Switch Functions, Shaft Lock and Center Tap Available

Carbon Panel Controls

Wirewound Panel Controls

Industrial Series	RV28 Series	RV30 Series	RA16 Series
Model Examples			
Element Type	Carbon Film	Carbon Film	Wirewound
Resistance Range	100Ω - 5MΩ (B, A,C)	100Ω - 2MΩ (B), 1kΩ - 2MΩ (A,C)	10Ω - 10kΩ (B)
Resistance Taper	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear
Resistance Tolerance	±10% Standard	±10% Standard	±10% Standard (Options Available)
Power Rating	Y = 1.5W (B), 0.75W (A,C) at +40°C W = 2W (B), 1.0W (A,C) at +40°C	0.2-1.0W at +40°C (per Resistance Range and Taper), 0W at +85°C	0.5W at +40°C
Adjustment Travel	300° ± 5°	280° ± 10°	290° ± 5°
Temperature Range	-10°C up to +85°C (Y) or +120°C (W)	-10°C to +85°C	-10°C (Y) or -30°C (X) up to +100°C
Rotational Life	15,000 Cycles, Shaft Lock 500 Cycles	15,000 Cycles, Shaft Lock 500 Cycles	15,000 Cycles, Shaft Lock 500 Cycles
Construction	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft
Nominal Body Size	28mm Diameter	30mm Diameter	16.5W × 17.8H (mm)
Bushing Type	3/8"-32UNEF-2A, 9.5 or 12.7*mmℓ	M9 (P0.75), 10 or 12.7*mmℓ	M5 (P0.5), 5 or 7.8*mmℓ
Shaft Dimensions	ø6mm × 15 or 20mmℓ (FMS)**	ø6mm × 15 or 20mmℓ (FMS)**	ø3mm × 10 or 15mmℓ (FMS)**
Shaft End Styles	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)
Terminal Styles	Right Angle Ear-Lug	Ear-Lug, Rear Exit Switch Lug	Right Angle Ear-Lug or PCB Pins
Configurations	Single or Tandem Unit, Single Shaft	Single, Tandem or Triple Unit, 1 Shaft Dual Unit, Dual Concentric Shaft	Single Unit, Single Shaft
Other Features	Shaft Lock Available High Power Rating	Switch Functions and Shaft Lock Available	Shaft Lock Available, 2-Pin Rear Support Bracket for PCB Models

*Length for Shaft Lock Models Only **FMS = From Mounting Surface

Selection Guide

Wirewound Panel Controls

Industrial Series	RA20 Series	RA25 Series	LRA25 Series
Model Examples			
Element Type	Wirewound	Wirewound	Wirewound ($\pm 0.5\%$ max. Linearity)
Resistance Range	10 Ω -20k Ω (B), 100 Ω -3k Ω (A,C)	5 Ω -20k Ω (B), 100 Ω -5k Ω (A,C)	500 Ω -20k Ω (B)
Resistance Taper	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear
Resistance Tolerance	$\pm 10\%$ Standard (Options Available)	$\pm 10\%$ Standard (Options Available)	$\pm 5\%$ Standard (Options Available)
Power Rating	1.0W (B), 0.5W (A,C) at +40°C	1.2W (B), 0.6W (A,C) at +40°C	1.5W at +40°C
Adjustment Travel	290° $\pm 5^\circ$	300° $\pm 5^\circ$	300° $\pm 5^\circ$
Temperature Range	-10°C (Y) or -30°C (X) up to +100°C	-10°C (Y) or -30°C (X) up to +100°C	-10°C to +100°C
Rotational Life	15,000 Cycles, Shaft Lock 500 Cycles	15,000 Cycles, Shaft Lock 500 Cycles	15,000 Cycles
Construction	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft
Nominal Body Size	20mm Diameter	25mm Diameter	25mm Diameter
Bushing Type	M8 (P0.75), 5.5 or 12.7*mm ℓ	M9 (P0.75), 9, 10 or 12.7*mm ℓ	M9 (P0.75), 10mm ℓ
Shaft Dimensions	$\varnothing 6\text{mm} \times 10$ or 15mm ℓ (FMS)**	$\varnothing 6\text{mm} \times 15$ or 20mm ℓ (FMS)**	$\varnothing 6\text{mm} \times 20\text{mm}\ell$ (FMS)**
Shaft End Styles	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)
Terminal Styles	Right Angle Ear-Lug or PCB Pins	Right Angle Ear-Lug	Right Angle Ear-Lug
Configurations	Single or Tandem Unit, Single Shaft	Single or Tandem Unit, Single Shaft Dual Unit, Dual Concentric Shaft	Single Unit, Single Shaft
Other Features	Shaft Lock Available, 2-Pin Rear Support Bracket for PCB Models	Shaft Lock Available, Special Model with Push-To-Turn Knurled Shaft	High Linearity, $\pm 0.5\%$ max. High Torque

Wirewound Panel Controls

Industrial Series	RA30 Series	RA50 Series	HR121 Series
Model Examples			
Element Type	Wirewound	Wirewound	Wirewound
Resistance Range	5 Ω -20k Ω (B), 100 Ω -5k Ω (A,C)	10 Ω -50k Ω (B), 50 Ω -10k Ω (A,C)	300 Ω -10k Ω (B)
Resistance Taper	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear, A = CW Audio (log), C = CCW Audio (log)	B = Linear
Resistance Tolerance	$\pm 10\%$ Standard (Options Available)	$\pm 10\%$ Standard (Options Available)	$\pm 10\%$ Standard (Options Available)
Power Rating	2.5W (B), 1.25W (A,C) at +40°C	4W (B), 2W (A,C) at +40°C	4W at +40°C
Adjustment Travel	300° $\pm 5^\circ$	300° $\pm 5^\circ$	320° $\pm 10^\circ$
Temperature Range	-10°C (Y) or -30°C (X) up to +100°C	-10°C (Y) or -30°C (X) up to +100°C	-10°C to +100°C
Rotational Life	15,000 Cycles, Shaft Lock 500 Cycles	15,000 Cycles, Shaft Lock 500 Cycles	1,200 Cycles
Construction	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft
Nominal Body Size	30mm Diameter	50mm Diameter	12.8mm Diameter
Bushing Type	M9 (P0.75), 10 or 12.7*mm ℓ	3/8"-32UNEF-2A, 9.5, 10 or 10.5*mm ℓ	1/4"-32UNEF-2A, 7.8mm ℓ
Shaft Dimensions	$\varnothing 6\text{mm} \times 15$ or 20mm ℓ (FMS)**	$\varnothing 6\text{mm} \times 15$ or 20mm ℓ (FMS)**	$\varnothing 1/8" \times 10$ or 15mm ℓ (FMS)**
Shaft End Styles	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)
Terminal Styles	Ear-Lug, Rear Exit Switch Lug	Ear-Lug, Rear Exit Switch Lug	Rear Exit Wirewrap Terminals
Configurations	Single, Tandem or Triple Unit, 1 Shaft Dual Unit, Dual Concentric Shaft	Single or Tandem Unit, Single Shaft	Single Unit, Single Shaft
Other Features	Switch Functions, Shaft Lock and Center Tap Available	Switch Functions and Shaft Lock Available, High Power Rating	One Piece Aluminum Housing and Bushing, High Power Rating

*Length for Shaft Lock Models Only **FMS = From Mounting Surface

Selection Guide

Cermet Panel Controls

Industrial Series	GF16 Series	GF201 Series	GF281 Series
Model Examples			
Element Type	Cermet	Cermet	Cermet
Resistance Range	100Ω-1MΩ (B)	100Ω-1MΩ (B)	100Ω-1MΩ (B)
Resistance Taper	B = Linear	B = Linear	B = Linear
Resistance Tolerance	±20% Standard (±10% Special Order)	±10% Standard	±10% Standard
Power Rating	0.5W at +70°C 0W at +120°C	1.0W at +70°C 0W at +120°C	2.0W at +70°C 0W at +120°C
Adjustment Travel	260° ±10°	260° ±10°	295° ±10°
Temperature Range	-55°C to +125°C	-10°C to +125°C	-10°C to +120°C
Rotational Life	15,000 Cycles, Shaft Lock 500 Cycles	15,000 Cycles, Shaft Lock 500 Cycles	15,000 Cycles, Shaft Lock 500 Cycles
Construction	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft
Nominal Body Size	16.5W x 17.5H (mm)	20mm Diameter	28mm Diameter
Bushing Type	M6 (P0.75), 6 or 7.5*mmℓ	M9 (P0.75), 6 or 10*mmℓ	M9 (P0.75), 9.5 or 12.7*mmℓ
Shaft Dimensions	∅3.2mm x 10 or 15mmℓ (FMS)**	∅6mm x 15 or 20mmℓ (FMS)**	∅6mm x 15 or 20mmℓ (FMS)**
Shaft End Styles	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)
Terminal Styles	Right Angle Ear-Lug or PCB Pins	Rear Exit Straight Lug or PCB Pins	Right Angle Ear-Lug
Configurations	Single Unit, Single Shaft	Single Unit, Single Shaft	Single or Tandem Unit, Single Shaft
Other Features	Shaft Lock Available Excellent Environmental Characteristics	Shaft Lock Available Excellent Environmental Characteristics	Shaft Lock Available, High Power Excellent Environmental Characteristics

Long Life Carbon Panel Controls

Industrial Series	TP96N93 Series	RVQ103YN Series	RVQ12YN Series
Model Examples			
Element Type	Carbon Film	Carbon Film	Carbon Film
Resistance Range	1kΩ-100kΩ	5kΩ and 10kΩ (B)	1kΩ-10kΩ (B)
Resistance Taper	B = Linear	B = Linear	B = Linear
Resistance Tolerance	±20% standard	±20% Standard	±10% Standard
Power Rating	0.05W at +50°C 0W at +70°C	0.125W at +40°C 0W at +85°C	0.125W at +40°C 0W at +80°C
Adjustment Travel	300° ±5°	320° Nominal	320° Nominal
Temperature Range	-20°C to +70°C	-10°C to +85°C	-30°C to +80°C
Rotational Life	300,000 Cycles	200,000 Cycles	200,000 Cycles
Construction	Metal Bushing, Metal Shaft	Plastic Bushing, Metal Shaft	Metal Bushing, Metal Shaft
Nominal Body Size	9mm Square	10mm Diameter	12.8mm Diameter
Bushing Type	M7 (P0.75), Optional 5, 7 or 10mmℓ	M6 (P0.75), 3.5mmℓ	1/4"-32UNEF-2A, 6.85mmℓ
Shaft Dimensions	∅6mm x 15 or 20mmℓ (FMS)**	∅3mm x 10 or 15mmℓ (FMS)**	∅3.2mm x 10 or 15mmℓ (FMS)**
Shaft End Styles	Slot (S), Flat (F), Round (R) or Slotted and Knurled (SK)	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)
Terminal Styles	Right Angle PCB Pins	Rear Exit Lug (PCB Pins Special Order)	Rear Exit Lug (PCB Pins Special Order)
Configurations	Single Unit, Single Shaft	Single Unit, Single Shaft	Single Unit, Single Shaft
Other Features	Contact TOCOS for Bushing and Shaft Options and Vertical Mount Models.	One Piece Molded Plastic Housing and Bushing, Lightweight	Lightweight Plastic Housing PCB Pin Style Available (Special Order)

*Length for Shaft Lock Models Only **FMS = From Mounting Surface

Long Life Carbon Panel Controls

Industrial Series	RVQ12YN3 Series	RVQ16YN Series	RVQ20N Series
Model Examples			
Element Type	Carbon Film	Carbon Film	Carbon Film
Resistance Range	1k Ω -10k Ω (B)	1k Ω -10k Ω (B)	2.5k Ω -30k Ω (B)
Resistance Taper	B = Linear	B = Linear	B = Linear
Resistance Tolerance	$\pm 20\%$ Standard	$\pm 10\%$ Standard	$\pm 20\%$ Standard
Power Rating	0.5W at +40°C 0W at +85°C	0.1W at +40°C 0W at +85°C	0.5W at +40°C 0W at +80°C
Adjustment Travel	300° $\pm 10^\circ$	220° Nominal	220° $\pm 10^\circ$
Temperature Range	-10°C to +85°C	-10°C to +85°C	-10°C to +80°C
Rotational Life	50,000 Cycles	100,000 Cycles	1,000,000 Cycles
Construction	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft	Plastic Bushing, Metal Shaft
Nominal Body Size	12.8mm Diameter	16.8mm Diameter	20.4mm Diameter
Bushing Type	1/4"-32UNEF-2A, 6.35mm ℓ	M6 (P0.75), 6mm ℓ	M9 (P0.75), 10mm ℓ
Shaft Dimensions	$\varnothing 3.2\text{mm} \times 10$ or 15mm ℓ (FMS)**	$\varnothing 3.2\text{mm} \times 10$ or 15mm ℓ (FMS)**	$\varnothing 6\text{mm} \times 15$ or 20mm ℓ (FMS)**
Shaft End Styles	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)	Slot (S) or Flat (F)
Terminal Styles	Rear Exit Lug (PCB Pins Special Order)	Right Angle Ear-Lug	Right Angle Ear-Lug
Configurations	Single Unit, Single Shaft	Single Unit, Single Shaft	Single Unit, Single Shaft
Other Features	Zinc Alloy Housing and Bushing PCB Pin Style Available (Special Order)	Suitable for Automotive Applications	Independent Linearity $\pm 5\%$ max. High Torque Available (Special Order)

Long Life Carbon Panel Controls

Industrial Series	RVQ20N2 Series	RVQ24YN03 Series	RVQ24YN04 Series
Model Examples			
Element Type	Carbon Film	Carbon Film	Carbon Film
Resistance Range	3k Ω , 5k Ω , 10k Ω , 20k Ω and 30k Ω (B)	3k Ω , 5k Ω , 10k Ω , 20k Ω and 30k Ω (B)	3k Ω , 5k Ω , 10k Ω , 20k Ω and 30k Ω (B)
Resistance Taper	B = Linear	B = Linear	B = Linear
Resistance Tolerance	$\pm 20\%$ Standard	$\pm 10\%$ Standard	$\pm 10\%$ Standard
Power Rating	0.5W at +40°C 0W at +80°C	0.5W at +40°C 0W at +85°C	0.5W at +40°C 0W at +85°C
Adjustment Travel	220° $\pm 10^\circ$	280° Nominal	280° Nominal
Temperature Range	-10°C to +80°C	-10°C to +85°C	-10°C to +85°C
Rotational Life	2,000,000 Cycles	2,000,000 Cycles	10,000,000 Cycles
Construction	Plastic Bushing, Metal Shaft	Metal Bushing, Metal Shaft	Metal Bushing, Metal Shaft
Nominal Body Size	20.4mm Diameter	24mm Diameter	24mm Diameter
Bushing Type	M9 (P0.75), 10mm ℓ	M9 (P0.75), 10mm ℓ	M9 (P0.75), 10mm ℓ
Shaft Dimensions	$\varnothing 6\text{mm} \times 15$ or 20mm ℓ (FMS)**	$\varnothing 6\text{mm} \times 15$ or 20mm ℓ (FMS)**	$\varnothing 6\text{mm} \times 15$ or 20mm ℓ (FMS)**
Shaft End Styles	Slot (S) or Flat (F)	Slot (S), Flat (F) or Round (R)	Slot (S), Flat (F) or Round (R)
Terminal Styles	Right Angle Ear-Lug	Right Angle Ear-Lug	Right Angle Ear-Lug
Configurations	Single Unit, Single Shaft	Single Unit, Single Shaft	Single Unit, Single Shaft
Other Features	Independent Linearity $\pm 5\%$ max.	Independent Linearity $\pm 3\%$ max. Continuous Rotation (Special Order)	Independent Linearity $\pm 3\%$ max. Continuous Rotation (Special Order)

*Length for Shaft Lock Models Only **FMS = From Mounting Surface

Selection Guide

TOCOS
ATTENUATORS

Through-Hole and Panel Control Attenuators

Attenuator Series	Through-Hole AT10 Series			Through-Hole AT16 Series		Panel Mount AT28 Series	
Model Examples							
Element Type	Cermet			Cermet		Cermet	
Nominal Impedance	50Ω, 75Ω and 600Ω			50Ω, 75Ω and 600Ω		50Ω, 75Ω and 600Ω	
Nominal Attenuation	6.5dB	12dB	20dB	10dB	20dB	6.5dB	20dB
Attenuation Tolerance	±0.7dB	±1.1dB	±1.5dB	±1.0dB	±1.5dB	±0.7dB	±1.5dB
Minimum Attenuation	0.4dB max.	0.6dB max.	1.2dB max.	0.6dB max.	1.2dB max.	0.4dB max.	1.2dB max.
Power Rating	0.2W at +70°C, 0W at +100°C			0.2W at +70°C, 0W at +125°C		1.0W at +70°C, 0W at +125°C	
Adjustment Travel	140° ±10°			140° ±10°		150° ±10°	
Temperature Range	-55°C to +100°C			-55°C to +125°C		-55°C to +125°C	
Rotational Life	50 Cycles			1,500 Cycles		500 Cycles	
Construction	Sealed Plastic Housing (Washable)			Sealed Plastic Housing (Washable)		Metal Bushing, Metal Shaft	
Nominal Body Size	11mm Square			16.6mm Square		28mm Diameter	
Bushing Type	Not Applicable			Not Applicable		M9 (P0.75), 9.5mmℓ	
Shaft Dimensions	ø4.6mm × 13 or 23mmℓ (PK)			Not Applicable		ø6mm × 20mmℓ (FMS)**	
Shaft End Styles	7mmℓ Knurled, Slotted End Style (PK)			Not Applicable		Slot (S), Flat (F) or Round (R)	
Terminal Styles	3-Pin Triangular PCB Patterns			3-Pin and 5-Pin PCB Patterns		Right Angle Ear-Lug	
Adjustment Type	Top or Side Adjust			Top or Side Adjust		Panel Adjust	
Configurations	Through-Hole, Single-Slot, No Shaft, Rotor Flush with Housing Through-Hole, Plastic Shaft with Knurled, Slotted End Style			Through-Hole, Single-Slot, Rotor Flush with Housing Through-Hole, Single-Slot, Rotor Flush with Housing, 2-Pin Support Bracket		Single Unit, Single Shaft	
Other Features	Fingertip or Blade Adjustment Meets UL 94V-0 Flammability Test			Blade Adjustment Meets UL 94V-0 Flammability Test		High Power Rating Meets UL 94HB Flammability Test	

*Length for Shaft Lock Models Only **FMS = From Mounting Surface

Part Numbering System for Through-Hole and Panel Control Attenuators

Series Name	Size	Style	Nominal Attenuation	Shaft Length	Nominal Impedance
AT = Attenuators	Unit: mm	See List of Part Numbers on back page for Standard Style Codes.	Expressed in dB. Standard 6.5dB, 10dB, 12dB or 20dB depending on series.	For AT10PK model only. The shaft has a knurled, slotted end style. 20S = 13mm Shaft 30S = 23mm Shaft	Expressed in ohms. Three digit code: the first two digits are significant figures, the third digit indicates the number of zeros. (i.e., standard ratings are 500 = 50Ω; 750 = 75Ω; 601 = 600Ω)

Part Number Example for Attenuators: AT10P 20dB 500

Part Numbering System for Industrial Panel Controls

Series Name	Feature	Size	Temperature Range	Style	Switch	Shaft Length	Shaft End Style	Taper	Resistance Code	Resistance Tolerance
RV = Carbon Film RA = Wirewound GF = Cermet	Unit: mm T = Center Tap Q = Long Life B = Low Torque V = 6-Turn		Y = -10°C to +85°C X = -30°C to +100°C W = -10°C to +120°C	See List of Part Numbers on back page for Standard Style Codes. SE = SPST, 1A SF = SPST, 3A ME = SPDT, 1A MF = SPDT, 3A SH = SPST, 0.5A MH = SPDT, 0.5A		Length is measured From Mounting Surface (FMS) for Single Shaft or Inner Shaft of Dual Concentric Shafts.	S = Blade Slot F = Flat R = Round H = Deep Slot SK = Slotted and Knurled	B = Linear A = CW Audio (log) C = CCW Audio (log)	Expressed in ohms. A three digit code: the first two digits are significant figures, the third digit indicates the number of zeros. (i.e., 103 = 10,000Ω)	M = ±20% K = ±10% J = ±5% G = ±2% F = ±1%

Part Number Example for Panel Controls: RV24YN 20S B103 K

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List of Part Numbers

TOCOS
PANEL CONTROLS

Carbon Film	RV20YN	RV30YNSE	LRA25	GF201
RV102YN	RV20YL	RV30YNSF		GF201L
RV102YP	RV20YP1	RV30YNME	RA30Y	GFP201
RV102YP2	RV20N	RV30YNMF	RA30X	
RV102YP3	RV20N2	RV30YG	RA30YL	GF281
	RV202YN	RV30YGL	RA30XL	
RV103YN	RV202YP	RV30YGSE	RA30YSE	GF281L
RV103YN-4C		RV30YGSF	RA30XSE	GF281G
RV103YP	RV24YN	RV30YGME	RA30YSF	
RV103YP-4C	RVB24YN*	RV30YGMF	RA30XSF	Long Life Carbon
RV103YP2	RV24YNHT*	RV30YT	RA30YME	TP96N93
RV103YP2-4C	RV24YS*	RV30YD	RA30XME	RH96N93*
RV103YP3	RV24YL		RA30YMF	TPQ96N*
RV103YP3-4C	RV24YNSE	Wirewound	RA30XMF	RHQ96N*
RV103YPB	RV24YNSF	RA16Y	RAT30Y	RVQ103YN
RV103YP-4CB	RV24YNME	RA16X	RA30YG	RVQ103YP*
	RV24YNMF	RA16YL	RA30YGL	RVQ12YN
RV12YN	RVT24YN	RA16YP	RAT30YG	RVQ12YP*
RV12YP	RV24YG	RA16XP	RA30YT	RVQ12YN3
RV12YP5	RV24YGL	RA16YPL	RA30YD	RVQ12YP3*
	RVT24YG			RVQ16YN
RV16YN	RV24YGSE	RA20Y		RVQ20N
RV16YN-4C	RV24YGME	RA20X		RVQ20NHT*
RV16YL	RV24YT	RA20YL		RVQ20N2
RV16YNH	RV24YD	RA20XL		RVQ24YN03
RV16YNMH	RV24DME	RA20YP2		RVQ24YNC0301*
RV16YP		RA20YG		RVQ24YN04
RV16YPL				RVQ24YNC0401*
RV16YG		RA25Y		
RV16YGP		RA25X		Attenuators
RV16YGMH		RA25YL		AT10P (PCB, Top Adjust)
RV16YD		RA25XL		AT10S (PCB, Side Adjust)
RV16YDSH		RA25YPR	Cermet	AT10PK (PCB, Knurled Shaft)
RV16YDMH	RV30YN	RA25YG	GF16	AT16 (PCB, Top Adjust)
	RV30YNHT*	RA25YGL	GF16L	AT162 (PCB, Side Adjust)
	RV30YS*	RA25YD	GFP16	
	RV30YL		GFP16L	

*Special Order Products

Definitions for Part Numbering Codes

Y -10°C to +85°C Operating Temperature Range	G Ganged Tandem, 2 Units, 1 Shaft	RVQ Long Life, Carbon Series	TP 9mm PCB Mount, Side Adjust, 300,000 Cycle Rotational Life
X -30°C to +100°C Operating Temperature Range	GL Ganged Tandem, 2 Units, 1 Locking Shaft	RVT Center Tap, Carbon Series	RH 9mm PCB Mount, Top Adjust, 300,000 Cycle Rotational Life
W -10°C to +120°C Operating Temperature Range	D Dual Unit, Dual Concentric Shaft (2 Units, 2 Shafts)	RAT Center Tap, Wirewound Series	TPQ 9mm PCB Mount, Side Adjust, 100,000 Cycle Rotational Life
N Panel Mount, 1 Unit, 1 Shaft	T Triple, 3 Units, 1 Shaft	NC Continuous Rotation, Long Life Carbon Series	RHQ 9mm PCB Mount, Top Adjust, 100,000 Cycle Rotational Life
P PCB Mount (P1, P2, P3, P5 have varied pin-out styles)	S Panel Seal Mount	SE Switch, SPST, 1A	Attenuators
-4C Center Detent	HT High Torque	SF Switch, SPST, 3A	AT10P, AT10S, AT16 and AT162 have rotor flush with housing, no shaft.
L Locking Shaft	RVB Low Torque, Carbon Series	ME Switch, SPDT, 1A	
PL PCB Mount, Locking Shaft	PB PCB Mount, 4-Pin Mounting Bracket (P-4CB with Detent)	MF Switch, SPDT, 3A	
	PR Push-To-Turn Knurled Shaft	SH Switch, SPST, 0.5A	
		MH Switch, SPDT, 0.5A	

Visit our web site at www.tocos.com for drawings and additional product information.

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