

VARIABLES PRODUCT SELECTION GUIDE

POTENTIOMETERS, TRIMMERS, ENCODERS,
STEERING SENSORS AND TURN COUNTING DIALS



ABOUT TT ELECTRONICS

TT Electronics is a global provider of engineered electronics for performance critical applications.

**We harness our leading expertise
to engineer electronics that
put our customers ahead.**

TT solves technology challenges for a sustainable world. TT benefits from enduring megatrends in structurally high-growth markets including healthcare, aerospace, defence, electrification and automation. TT invests in R&D to create designed-in products where reliability is mission critical. Products designed and manufactured include sensors, power management and connectivity solutions. TT has design and manufacturing facilities in the UK, North America, Sweden and Asia. For more information about TT Electronics, visit www.ttelectronics.com



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- ≡ Cleveland, US
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- ≡ Denver, CO
- ≡ Juarez, MX
- ≡ Mexicali, MX
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- Kansas City, US
- ≡ Philadelphia, US

UK & Europe

- ≡ Abercynon, UK
- Barnstaple, UK
- Bedlington, UK
- ≡ Cardiff, UK
- ≡ Eastleigh, UK
- ≡ Fairford, UK
- ≡ Hartlepool, UK
- Manchester, UK
- * Nottingham, UK
- Sheffield, UK
- Woking, UK

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- ≡ Dongguan, China
- Hong Kong
- Kuantan, Malaysia
- Singapore
- ≡ Suzhou, China




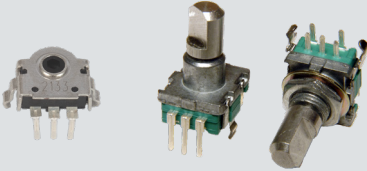
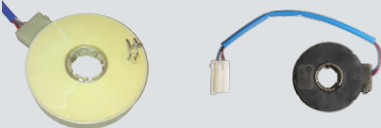
* R&D | ● R&D and Operational | ≡ Operational | □ Sales and Engineering

VARIABLES & EPS SENSORS

BI TECHNOLOGIES

We supply a comprehensive range of potentiometers, trimmers, encoders, steering sensors and turn-counting dials manufactured in Mexicali, Mexico through our BI Technologies product line, designed to improve the precision, speed and reliability of your performance-critical applications.







Our team of design engineer experts can customise solutions to meet the specific needs of your application with vast technical expertise and application experience in industrial, aerospace and defence and medical markets.

	Applications	Key Features
<div>Potentiometers</div> <div></div>	<ul style="list-style-type: none">Welders, irrigation controlDefence nuclear reactors and fly-by-wire cockpit controlMedical pumps and blood analysers	<ul style="list-style-type: none">Rugged designsHigh-reliability and precisionHarsh environment immunityMinimal repair/maintenance costs
<div>Precision Potentiometers & Non-Contact Position Sensors</div> <div></div>	<ul style="list-style-type: none">Industrial wind vanes, joysticks, motors, roboticsAerospace vision and flight controlMedical monitoring systems	<ul style="list-style-type: none">Long life (100M+ rotations)Precise accuracy ($\pm 0.25 - 0.5\%$)No degradation over lifeMinimal repair/maintenance
<div>Trimmers</div> <div></div>	<ul style="list-style-type: none">Industrial control panels, power supplies, and amplifiersMedical hearing aids and patient monitoring devices	<ul style="list-style-type: none">Compact package optionsTH or SMTRoHS compliantWide selection of resistance ranges
<div>Encoders</div> <div></div>	<ul style="list-style-type: none">Applications needing dual outputs (2-bit gray code)Ideal where digital input compatibility is required	<ul style="list-style-type: none">Incremental / Contacting typeMomentary / Push-On switch optionsThreaded and plain BushingTop & Side adjust versionsVarious sizes, PPR and detent versions
<div>Steering Sensors</div> <div></div>	<ul style="list-style-type: none">Electric power steering for EV, off-road, forklift, farm and utility vehicles.	<ul style="list-style-type: none">Torque and multi-turn outputsRedundant outputs for full diagnostic dataEasy push-on assemblyNo degradation over life







POTENTIOMETERS

Potentiometers







Panel Potentiometers









Model Number	P081N	P082N	P083N	P084N	P081S	P082S
Style	Side adjust	Side adjust	Side adjust	Side adjust	Side adjust w/ Switch	Side adjust w/ Switch
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal
Bushing Type	M6 or M7 threaded	M6 or M7 threaded	M6 or M7 threaded	M6 or M7 threaded	M6 or M7 threaded	M6 or M7 threaded
Rotational Life	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles
Switch Option	No	No	No	No	Yes, 30K cycles	Yes, 30K cycles
Gangs	1	2	3	4	1	2
Detents	Yes	Yes	Yes	Yes	No	No









Model Number	P083S	P084S	P082D	P084D	P082E	P084E
Style	Side adjust w/ Switch	Side adjust w/ Switch	Dual Concentric	Dual Concentric	Dual Concentric w/ Switch	Dual Concentric w/ Switch
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal
Bushing Type	M6 or M7 threaded	M6 or M7 threaded	M6 or M7 threaded	M6 or M7 threaded	M6 or M7 threaded	M6 or M7 threaded
Rotational Life	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles
Switch Option	Yes, 30K cycles	Yes, 30K cycles	No	No	Yes	Yes
Gangs	3	4	2	4	2	4
Detents	No	No	Yes	Yes	No	No









Model Number	P090L	P090S	P091B	P091N	P092N	P093N
Style	Side adjust	Top adjust	Side Adjust w/ Switch	Side adjust	Side adjust	Side adjust
Shaft Material	Plastic	Plastic	Metal	Metal	Metal	Metal
Bushing Type	Sleeve	Sleeve	M7 threaded	M7 threaded	M7 threaded	M7 threaded
Rotational Life	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles
Switch Option	No	No	Yes	No	No	No
Gangs	No	No	1	1	2	3
Detents	Yes	Yes	Yes	Yes	Yes	Yes









Model Number	P094N	P095N	P096N	P091S	P092S	P093S
Style	Side adjust	Side adjust	Side adjust	Side adjust w/ Switch	Side adjust w/ Switch	Side adjust w/ Switch
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal
Bushing Type	M7 threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded
Rotational Life	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles
Switch Option	No	No	No	Yes	Yes	Yes
Gangs	4	5	6	1	2	3
Detents	Yes	Yes	Yes	Yes	Yes	Yes









Model Number	P094S	P091M	P092M	P093M	P094M	P0915N
Style	Side adjust w/ Switch	Side adj. w/ Momen- tary Sw.	Side adj. w/ Momen- tary Sw.	Side adj. w/ Momen- tary Sw.	Side adj. w/ Momen- tary Sw.	Top adjust
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal
Bushing Type	M7 threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded
Rotational Life	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles
Switch Option	Yes	Yes	Yes	Yes	Yes	No
Gangs	4	1	2	3	4	1
Detents	Yes	Yes	Yes	Yes	Yes	Yes



Model Number	P0925N	P091P	P092P	P092C	P094C	P092T
Style	Top adjust	Side adjust w/ Push- lock	Side adjust w/ Push- lock	Dual Concentric	Dual Concentric	Side adjust w/ Center tap
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal
Bushing Type	M7 threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded
Rotational Life	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles
Switch Option	No	No	No	No	No	No
Gangs	2	1	2	2	4	2
Detents	Yes	Yes	Yes	Yes	Yes	Yes




Model Number	P110KV	P110KV1	P110KH	P110KH1	P120K	P120PK
Style	Side adjust	Side adjust	Top adjust	Top adjust	Side adjust	Top adjust
Shaft Material	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Bushing Type	Sleeve	M9 threaded	Sleeve	M9 threaded	Sleeve	Sleeve
Rotational Life	30K cycles	30K cycles	30K cycles	30K cycles	100K cycles	100K cycles
Switch Option	No	No	No	No	No	No
Gangs	No	No	No	No	1	1
Detents	Yes	Yes	Yes	Yes	No	No





Model Number	P120KGP	P120KGE	P140KV	P140KV1	P140KH	P140KH1
Style	Top adjust	Side adjust	Side adjust	Side adjust	Top adjust	Top adjust
Shaft Material	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Bushing Type	Sleeve	Sleeve	Sleeve	M9 threaded	Sleeve	M9 threaded
Rotational Life	100K cycles	100K cycles	30K cycles	30K cycles	30K cycles	30K cycles
Switch Option	No	No	No	No	No	No
Gangs	2	2	2	2	2	2
Detents	No	No	No	No	No	No


							
Model Number	P160KNP	P160KN	P160KN2	P160KNPD	P166V	P166P	P166H
Style	Side adjust	Side adjust	Side adjust	Rear Adjust	Side adjust	Top adjust	Top adjust
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal	Metal
Bushing Type	My threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded Plastic	M7 threaded Plastic	M7 threaded Plastic
Rotational Life	100K cycles	100K cycles	100K cycles	100K cycles	15K cycles	15K cycles	15K cycles
Switch Option	No	No	No	No	No	No	No
Gangs	No	No	No	No	No	No	No
Detents	Yes	Yes	Yes	Yes	Yes	Yes	Yes

							
Model Number	P170N	P170S	P170N2	P170S2	P170NP1	P170SP1	
Style	Side adjust	Side adjust	Side adjust	Side adjust	Top adjust	Top adjust	
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal	
Bushing Type	My threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded	M7 threaded	
Rotational Life	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles	100K cycles	
Switch Option	No	Yes	No	Yes	No	Yes	
Gangs	No	No	No	No	No	No	
Detents	No	No	No	No	No	No	


							
Model Number	P170NPD	P170SPD	P230	P231	P232	P233	
Style	Rear adjust	Rear Adjust	Side adjust	Side adjust	Side adjust	Side adjust	
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal	
Bushing Type	M7 threaded	M7 threaded	3/8" threaded	M8 threaded	M9 threaded	M9 threaded	
Rotational Life	100K cycles	100K cycles	500K cycles	100K cycles	2 Million	2 Million	
Switch Option	No	Yes	No	No	No	No	
Gangs	No	No	No	No	1	2	
Detents	No	No	No	No	No	No	

							
Model Number	P260P	P260S	P260D	P260T	P260L	P260R	
Style	Side adjust	Side adjust w/switch	Side adjust	Top adjust	Wire leads	Ribbon cable	
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal	
Bushing Type	1/4" or 3/8" threaded	1/4" or 3/8" threaded	1/4" or 3/8" threaded	1/4" or 3/8" threaded	1/4" or 3/8" threaded	1/4" or 3/8" threaded	
Rotational Life	1 Million	1 Million	1 Million	1 Million	1 Million	1 Million	
Switch Option	No	Yes	No	No	No	No	
Gangs	6 Maximum	5 Maximum	6 Maximum	2 Maximum	6 Maximum	6 Maximum	
Detents	No	No	Yes	No	No	No	

							
Model Number	P261P	P261S	P261D	P265P	P265S	P270	
Style	Side adjust	Side adjust w/switch	Side adjust	Top adjust	Top adjust	Side solder lugs	
Shaft Material	Metal	Metal	Metal	Metal	Metal	Metal	
Bushing Type	1/4" or 3/8" threaded	1/4" or 3/8" threaded	1/4" or 3/8" threaded	1/4" threaded	1/4" threaded	3/8" threaded	
Rotational Life	1 Million	1 Million	1 Million	50K cycles	50K cycles	1 Million	
Switch Option	No	Yes	No	No	No	No	
Gangs	6 Maximum	5 Maximum	6 Maximum	1	1	1	
Detents	No	No	Yes	No	No	No	

							
Model Number	P271	P272	P278				
Style	Side solder lugs w/ center tap	Side solder lugs	Side solder lugs				
Shaft Material	Metal	Metal	Metal				
Bushing Type	3/8" threaded	3/8" threaded	3/8" threaded				
Rotational Life	1 Million	1 Million	1 Million				
Switch Option	No	No	No				
Gangs	1	2	1				
Detents	No	No	No				







Hollow Shaft Rotary Potentiometer







							
Model Number	PHS11R	PHS21					
Mechanical Angle	360°	360°					
Cycle Life	1 Million	50,000					
Electrical Angle	Various	310°					







Non-Contacting Sensor







							
Model Number	6121	6124	6126	6127	6153		
Element Type	Hall effect	Hall effect	Hall effect	Hall effect	Hall effect		
Diameter Size	7/8"	7/8"	7/8"	7/8"	7/8"		
Electrical Angle	Various	Various	Various	Various	Various		
Mounting Style	Bushing	Bushing	Bushing	Bushing	Servo		
Rotational Life	10 Million	10 Million	10 Million	10 Million	50 Million		
Mechanical Angle	360° (320° w/ Stop)	360° (320° w/ Stop)	360° (320° w/ Stop)	360° (320° w/ Stop)	360°		
Output Voltage	0.25 to 4.75 Vdc	0.25 to 4.75 Vdc	0.25 to 4.75 Vdc	0.25 to 4.75 Vdc	0.25 to 4.75 Vdc		







Precision Rotary Potentiometers







						
Model Number	3371	3381	5101	5311	5401	5403
Element Material	Conductive Plastic	Conductive Plastic	Wirewound	Wirewound	Wirewound	Wirewound
Rotational Life	2 Million	10 Million	500,000	500,000	500,000	1 Million
Housing (OD)	1-5/16"	1-5/16"	7/8"	1-5/16"	1-7/16"	1-7/16"
Mounting Style	3/8" Bushing	3/8" Bushing	3/8" Bushing	3/8" Bushing	1/2" Bushing	Servo
Power Rating	0.75W	2.0W	0.75W	2.0W	2.0W	2.0W
Mechanical Angle	360° (350° w/ Stop)	360° (350° w/ Stop)	360°	360° (350° w/ Stop)	360°	360°
Shaft Diameter	1/4"	1/4"	1/8"	1/4"	1/4"	1/4"







						
Model Number	5611	5613	5711	5103	5713	6143
Element Material	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound	Conductive Plastic
Rotational Life	1 Million	1 Million	1 Million	500,000	1 Million	2 Million
Housing (OD)	2"	2"	3"	7/8"	3"	7/8"
Mounting Style	3/8" Bushing	Servo	1/2" Bushing	Servo	Servo	Servo
Power Rating	2.0W	2.0W	5.0W	0.75W	5.0W	1.0W
Mechanical Angle	360°	360°	360°	360°	360°	360°
Shaft Diameter	1/4"	1/4"	1/4"	1/8"	1/4"	1/8"







						
Model Number	6163	6173	6181	6184	6186	6187
Element Material	Conductive Plastic	Conductive Plastic	Conductive Plastic	Conductive Plastic	Conductive Plastic	Conductive Plastic
Rotational Life		25 Million	5 Million	5 Million	5 Million	5 Million
Housing (OD)	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"
Mounting Style	Servo	Servo	1/4" Bushing	3/8" Bushing	3/8" Bushing	3/8" Bushing
Power Rating	1.0W	1.0W	1.0W	1.0W	1.0W	1.0W
Mechanical Angle	360°	360°	360° (320° w/ Stop)	360° (320° w/ Stop)	360° (320° w/ Stop)	360° (320° w/ Stop)
Shaft Diameter	1/8"	1/8"	1/8"	6mm	1/8"	1/4"







						
Model Number	6188	6273	6371	6373	6671	6673
Element Material	Conductive Plastic	Conductive Plastic	Conductive Plastic	Conductive Plastic	Conductive Plastic	Conductive Plastic
Rotational Life	5 Million	25 Million	5 Million	5 Million	25 Million	25 Million
Housing (OD)	7/8"	1-1/16"	1-5/16"	1-5/16"	2"	2"
Mounting Style	3/8" Bushing	Servo	3/8" Bushing	Servo	3/8" Bushing	Servo
Power Rating	1.0W	1.5W	2.0W	2.0W	3.5W	3.5W
Mechanical Angle	360° (320° w/ Stop)	360°	360°	360°	360°	360°
Shaft Diameter	1/4"	1/8"	1/4"	1/4"	1/4"	1/4"

						
Model Number	7216	7221	7223	7246	7274	7276
Element Material	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound
Rotational Life	2 Million	2 Million	2 Million	1 Million	500,000	500,000
Housing (OD)	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"
Mounting Style	3/8" Bushing	1/4" Bushing	Servo	3/8" Bushing	3/8" Bushing	3/8" Bushing
Power Rating	2.0W	2.0W	2.0W	2.0W	2.0W	2.0W
Mechanical Angle	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)
Shaft Diameter	1/4"	1/8"	1/8"	1/4"	6mm	1/4"

						
Model Number	7281	7283	7284	7286	7288	7381
Element Material	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound
Rotational Life	1 Million	1 Million	1 Million	1 Million	1 Million	300,000
Housing (OD)	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"
Mounting Style	1/4" Bushing	Servo	3/8" Bushing	3/8" Bushing	3/8" Bushing	1/4" Bushing
Power Rating	2.0W	2.0W	2.0W	2.0W	2.0W	1.5W
Mechanical Angle	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	1080° (3 turn)
Shaft Diameter	1/8"	1/8"	6mm	1/4"	1/4"	1/8"

						
Model Number	7383	7386	7388	7481	7483	7486
Element Material	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound
Rotational Life	300,000	300,000	300,000	500,000	500,000	500,000
Housing (OD)	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"
Mounting Style	Servo	3/8" Bushing	3/8" Bushing	1/4" Bushing	Servo	3/8" Bushing
Power Rating	1.5W	1.5W	1.5W	1.5W	1.5W	1.5W
Mechanical Angle	1080° (3 turn)	1080° (3 turn)	1080° (3 turn)	1800° (5 turn)	1800° (5 turn)	1800° (5 turn)
Shaft Diameter	1/8"	1/4"	1/4"	1/8"	1/8"	1/4"







						
Model Number	7488	7601	7603	8136	8141	8143
Element Material	Wirewound	Wirewound	Wirewound	Hybrid	Hybrid	Hybrid
Rotational Life	500,000	2 Million	2 Million	1 Million	5 Million	5 Million
Housing (OD)	7/8"	1-13/16"	1-13/16"	7/8"	7/8"	7/8"
Mounting Style	3/8" Bushing	3/8" Bushing	Servo	3/8" Bushing	1/4" Bushing	Servo
Power Rating	1.5W	5W	5W	2.0W	2.0W	2.0W
Mechanical Angle	1800° (5 turn)	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)
Shaft Diameter	1/4"	1/4"	1/4"	1/4"	1/8"	1/8"





						
Model Number	8144	8146	8148	9301	9303	A
Element Material	Hybrid	Hybrid	Hybrid	Wirewound	Wirewound	Wirewound
Rotational Life	5 Million	5 Million	5 Million	2 Million	2 Million	2 Million
Housing (OD)	7/8"	7/8"	7/8"	1-13/16"	1-13/16"	1-13/16"
Mounting Style	3/8" Bushing	3/8" Bushing	3/8" Bushing	3/8" Bushing	Servo	3/8" Bushing
Power Rating	2.0W	2.0W	2.0W	3.0W	3.0W	5W
Mechanical Angle	3600° (10 turn)	3600° (10 turn)	3600° (10 turn)	1080° (3 turn)	1080° (3 turn)	3600° (10 turn)
Shaft Diameter	6mm	1/4"	1/4"	1/4"	1/4"	1/4"

						
Model Number	B	C	D	E	BSP	DSP
Element Material	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound	Wirewound
Rotational Life	2 Million	2 Million	2 Million	2 Million	2 Million	2 Million
Housing (OD)	3-5/16"	1-13/16"	3-5/16"	3-5/16"	3-5/16"	3-5/16"
Mounting Style	3/8" Bushing	3/8" Bushing	3/8" Bushing	3/8" Bushing	Servo	Servo
Power Rating	10W	3W	15W	20W	10W	15W
Mechanical Angle	5400° (15 turn)	1080° (3 turn)	9000° (25 turn)	14400° (40 turn)	5400° (15 turn)	9000° (25 turn)
Shaft Diameter	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"








	
Model Number	ESP
Element Material	Wirewound
Rotational Life	2 Million
Housing (OD)	3-5/16"
Mounting Style	Servo
Power Rating	20W
Mechanical Angle	14400° (40 turn)
Shaft Diameter	1/4"


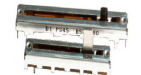
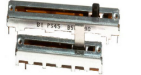




Linear Actuation Potentiometer

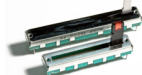
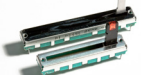


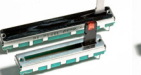
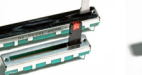

						
Model Number	423	424	432	434	472	474
Travel Length	0.5" to 6.0"	0.5" to 6.0"	0.5" to 6.0"	0.5" to 6.0"	0.5" to 6.0"	0.5" to 6.0"
Body Style	3/4" Dia.	3/4" Dia.	3/4" Dia. w/flange	3/4" Dia. w/flange	Rectangular	Rectangular
Termination Style	Wire Leads	Terminals	Wire Leads	Terminals	Wire Leads	Terminals
Number of Circuits	Single or Dual	Single or Dual	Single or Dual	Single or Dual	Single or Dual	Single or Dual

				
Model Number	482	484	404	405
Travel Length	0.5" to 6.0"	0.5" to 6.0"	0.5"	1.0", 2.0", 3.0"
Body Style	Rectangular w/flange	Rectangular w/flange	Rectangular	1/2" Dia.
Termination Style	Wire Leads	Terminals	Terminals	Wire Leads
Number of Circuits	Single or Dual	Single or Dual	Single	Single or Dual

Slide Potentiometers

							
Model Number	PS100-1	PS100-2	PS15-1	PS20-1	PS30-1	PS45-1	PS60-1
Number of Circuits	1	2	1	1	1	1	1
Travel Length	100mm	100mm	15mm	20mm	30mm	45mm	60mm
Dust Cover	No	No	Yes	Yes	Yes	Yes	Yes
Center Detent	No	No	Yes	Yes	Yes	Yes	Yes
LED	No	No	No	No	No	No	No

							
Model Number	PS15-2	PS20-2	PS30-2	PS60-2	PS45G	PS60G	PS20L
Number of Circuits	2	2	2	2	2	2	1
Travel Length	15mm	20mm	30mm	60mm	45mm	60mm	20mm
Dust Cover	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Center Detent	Yes	Yes	Yes	Yes	No	No	Yes
LED	No	No	No	No	No	No	Yes

							
Model Number	PS30L	PS45L	PS60L	PS20M	PS30M	PS45M	PS60M
Number of Circuits	1	1	1	2	2	2	2
Travel Length	30mm	45mm	60mm	20mm	30mm	45mm	60mm
Dust Cover	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Center Detent	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LED	Yes	Yes	Yes	No	No	No	No

TRIMMERS

Trimmers

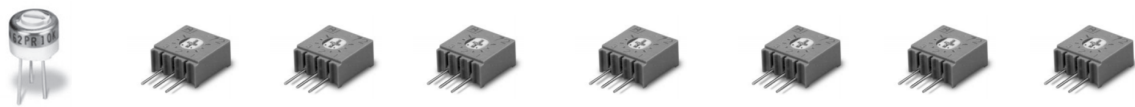
Single Turn Trimmers



Model Number	22A	22S	22AC	22SC	23A	23B	23C	23S
Style	J hook	Side adjust	J hook w/cross slot	Side adjust w/cross slot	J hook	Gull wing	PCB pins	J hook
Housing Size	3mm	3mm	3mm	3mm	4mm	4mm	4mm	4mm
Adjustment Style	Top	Side	Top	Side	Top	Top	Top	Side
Mounting Style	Surface mount	Surface mount	Surface mount	Surface mount	Surface mount	Surface mount	Thru hole	Surface mount
Sealed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



Model Number	25P	25RX	25S	25U	25V	25W	25X	B25
Style	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins
Housing Size	1/4" sq	1/4" sq	1/4" sq	1/4" sq	1/4" sq	1/4" sq	1/4" sq	1/4" sq
Adjustment Style	Top	Side	Side	Top	Side	Top	Side	Side
Mounting Style	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole
Sealed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



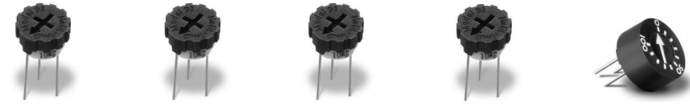
Model Number	62M	72P	72PL	72PM	72PX	72RPX	72RP	72X
Style	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins
Housing Size	1/4" dia.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.
Adjustment Style	Top	Top	Top	Top	Top	Top	Top	Side
Mounting Style	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole
Sealed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



Model Number	72RX	72XL	72RXL	72RW	72XW	72RXW	82P	82PF
Style	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins
Housing Size	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	1/4" dia.	1/4" dia.
Adjustment Style	Side	Side	Side	Side	Side	Side	Top	Top
Mounting Style	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole
Sealed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



Model Number	82M	82W	83P	83Y	91A	91B	91C	91E
Style	PCB pins	PCB pins	Formed leads	Formed leads	PCB pins	PCB pins	PCB pins	PCB pins
Housing Size	1/4" dia.	1/4" dia.	1/4" dia.	1/4" dia.	3/8" dia.	3/8" dia.	3/8" dia.	3/8" dia.
Adjustment Style	Top	Top	Top	Side	Top	Top	Top	Top
Mounting Style	Thru hole	Thru hole	Surface mount	Surface mount	Thru hole	Thru hole	Thru hole	Thru hole
Sealed	Yes	Yes	Yes	Yes	No	No	No	No



Model Number	91T	91V	91W	91X	93P
Style	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins
Housing Size	3/8" dia.	3/8" dia.	3/8" dia.	3/8" dia.	1/2" dia.
Adjustment Style	Side	Side	Side	Side	Top
Mounting Style	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole
Sealed	No	No	No	No	Yes

Multi Turn Trimmers








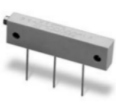



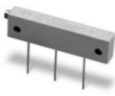
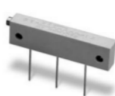
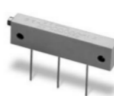




Model Number	43W	44G	44J	44W	45G	45J	45W	64P
Style	J hook	Gull wing	J hook	J hook	Gull wing	J hook	J hook	PCB pins
Adjustment Turns	11	9	9	9	15	15	15	12
Housing Size	3mm	4mm	4mm	4mm	4mm	4mm	4mm	1/4" sq.
Adjustment Style	Top	Side	Side	Top	Side	Side	Top	Side
Mounting Style	Surface mount	Surface mount	Surface mount	Surface mount	Surface mount	Surface mount	Surface mount	Thru hole
Seal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes










Model Number	64W	64X	64Y	64Z	66P	66W	66X	67P
Style	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins
Adjustment Turns	12	12	12	12	20	20	20	20
Housing Size	1/4" sq.	1/4" sq.	1/4" sq.	1/4" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.
Adjustment Style	Top	Side	Top	Side	Side	Top	Side	Side
Mounting Style	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole
Seal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes









Multi Turn Trimmers

								
Model Number	67W	67X	67Y	67Z	68P	68W	68X	78L
Style	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	Wire leads
Adjustment Turns	20	20	20	20	20	20	20	22
Housing Size	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	3/8" sq.	1-1/4" rect.
Adjustment Style	Top	Side	Top	Side	Side	Top	Side	Side
Mounting Style	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Wires
Seal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

								
Model Number	78P	78S	78LBW	78SBW	84P	84W	84X	89P
Style	PCB pins	Solder hooks	Wire leads w/ bushing	Solder hooks w/ bushing	Formed leads	Formed leads	Formed leads	PCB pins
Adjustment Turns	22	22	22	22	12	12	12	22
Housing Size	1-1/4" rect.	1-1/4" rect.	1-1/4" rect.	1-1/4" rect.	1/4" sq.	1/4" sq.	1/4" sq.	1-1/4" rect.
Adjustment Style	Side	Side	Side	Side	Side	Top	Side	Side
Mounting Style	Thru hole	Solder hooks	Bushing	Bushing	Surface mount	Surface mount	Surface mount	Thru hole
Seal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

							
Model Number	89W	89X	89PH	89WH	89XH	90P	89P
Style	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins
Adjustment Turns	20	20	20	20	20	20	22
Housing Size	3/4" rect.	3/4" rect.	3/4" rect.	3/4" rect.	3/4" rect.	3/4" rect.	1-1/4" rect.
Adjustment Style	Side	Side	Side	Side	Side	Side	Side
Mounting Style	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole
Seal	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Open Type Trimmers


								
Model Number	35W	36F	36K	36P	36W	37F	37P	37S
Style	Gull wing	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins	PCB pins
Housing Size	3mm	6mm	6mm	6mm	6mm	9mm	9mm	9mm
Adjustment Style	Top	Top	Side	Top	Side	Top	Top	Side
Mounting Style	Surface mount	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole	Thru hole
Sealed	No	No	No	No	No	No	No	No

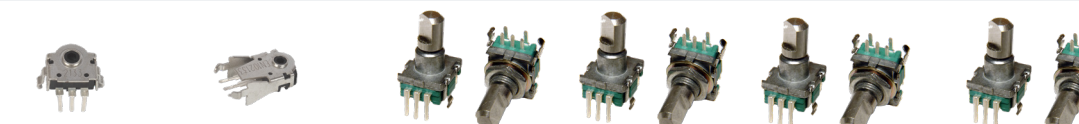
			
Model Number	37W	38P	38W
Style	PCB pins	PCB pins	PCB pins
Housing Size	9mm	10mm	10mm
Adjustment Style	Side	Top	Side
Mounting Style	Thru hole	Thru hole	Thru hole
Sealed	No	No	No

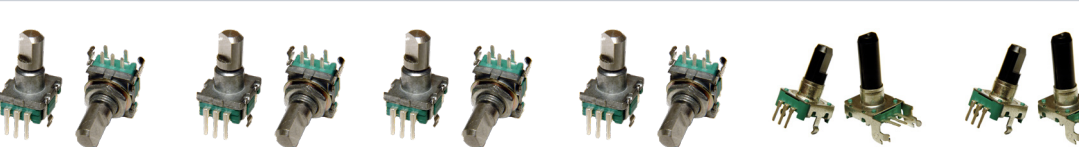
ENCODERS


Encoders

Rotary Encoders


						
Model Number	EN05HS	EN05VS	EN05VT	EN10HS	EN10HT	EN10VT
Size	5mm	5mm	5mm	10mm	10mm	10mm
Adjust	Top	Side	Side	Top	Top	Side
Pulses Available	12	12	12	6, 12	6, 12	6, 12
Detents Available	12	12	12	12, 24	12, 24	12, 24
Switch Option	No	No	No	No	No	No
Bushing Type	NA	NA	NA	NA	NA	NA
Shaft Type	Hollow	Hollow	Hollow	Hollow	Hollow	Hollow

						
Model Number	EN10VTS	EN10VTN	EN11-HSM	EN11-HNM	EN11-HSB	EN11-HNB
Size	10mm	10mm	11mm	11mm	11mm	11mm
Adjust	Side	Side	Top	Top	Top	Top
Pulses Available	6, 12	6, 12	15, 20	15, 20	15, 20	15, 20
Detents Available	12, 24	12, 24	0, 20, 30	0, 20, 30	0, 20, 30	0, 20, 30
Switch Option	No	No	Momentary	No	Momentary	No
Bushing Type	NA	NA	M7 threaded	M7 threaded	Plain	Plain
Shaft Type	Hollow	Hollow	Metal	Metal	Metal	Metal

						
Model Number	EN11-VSM	EN11-VNM	EN11-VSB	EN11-VNB	EN12-HS	EN12-HN
Size	11mm	11mm	11mm	11mm	12mm	12mm
Adjust	Side	Side	Side	Side	Top	Top
Pulses Available	15, 20	15, 20	15, 20	15, 20	12, 24	12, 24
Detents Available	0, 20, 30	0, 20, 30	0, 20, 30	0, 20, 30	0, 12, 24	0, 12, 24
Switch Option	Momentary	No	Momentary	No	Momentary	No
Bushing Type	M7 threaded	M7 threaded	Plain	Plain	Plain	Plain
Shaft Type	Metal	Metal	Metal	Metal	Plastic	Plastic

				
Model Number	EN12-VS	EN12-VN	EN16-H	EN16-V
Size	12mm	12mm	16mm	16mm
Adjust	Side	Side	Top	Side
Pulses Available	12, 24	12, 24	12, 24	12, 24
Detents Available	0, 12, 24	0, 12, 24	0, 12, 24	0, 12, 24
Switch Option	Momentary	No	No	No
Bushing Type	Plain	Plain	M9 threaded	M9 threaded
Shaft Type	Plastic	Plastic	Plastic	Plastic







Absolute Encoders







					
Model Number	EN16ABHB	EN16ABHM	EN16ABVM	EN18ABHH	EN18ABHB
Size	16mm	16mm	16mm	18mm	18mm
Adjust	Top	Top	Side	Top	Top
Positions Available	12	16	16	24	16
Detents Available	12	16	16	24	16
Bushing Type	Plain	M9 threaded	M9 threaded	NA	Plain
Shaft Type	Plastic	Plastic	Plastic	Hollow	Plastic








STEERING SENSORS

Steering Sensors

Torque and Position Sensors

						
Model Number	SX-4289	SX-4300	SX-4404	SX-4414	SX-4417	SX-4431
Technology	Contacting	Contacting	Contacting	Contacting	Magnetic	Contacting
Multi-Turn Position Sensed Angle	+/- 360 deg	+/-900 deg	+/-900 deg	+/- 360 deg	+/-900 deg	+/-900 deg
Torque Signal Sensing Angle	+/- 8 deg	+/- 8 deg	+/- 5 deg	+/- 5 deg	+/- 5 deg	+/- 8 deg
Torque Mechanical Travel	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	Continuos	+/- 11.4 deg
Connector PN'+/-900 deg	Packard 15336723	Delphi 15406142	TE 1376352-1	Yazaki 7122-8365	Delphi 15406142	Tyco 1376352-1

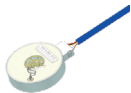
						
Model Number	SX-4433	SX-4471	SX-4472	SX-4473	SX-4474	SX-4475
Technology	Contacting	Contacting	Contacting	Contacting	Contacting	Contacting
Multi-Turn Position Sensed Angle	+/- 360 deg	+/- 360 deg	+/-900 deg	+/- 360 deg	+/-900 deg	+/- 360 deg
Torque Signal Sensing Angle	+/- 8 deg	+/- 5 deg	+/- 5 deg	+/- 5 deg	+/- 5 deg	+/- 8 deg
Torque Mechanical Travel	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg
Connector PN'+/-900 deg	Tyco 1376352-1	None	None	None	None	Delphi 15406142

							
Model Number	SX-4476	SX-4479	SX-4485	SX-4486	SX-4487	SX-4491	SX-4492
Technology	Contacting	Contacting	Contacting	Contacting	Contacting	Contacting	Contacting
Multi-Turn Position Sensed Angle	+/-900 deg	+/- 360 deg	+/- 360 deg	+/- 360 deg	+/-900 deg	+/- 360 deg	+/- 360 deg
Torque Signal Sensing Angle	+/- 8 deg	+/- 8 deg	+/- 8 deg	+/- 5 deg	+/- 8 deg	+/- 5 deg	+/- 8 deg
Torque Mechanical Travel	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg	+/- 11.4 deg
Connector PN'+/-900 deg	Delphi 15406142	Delphi 15406142	Delphi 15406142	Delphi 15406142	Delphi 15406142	Delphi 15406142	Delphi 15406142

Torque Only

					
Model Number	SX-4388	SX-4413	SX-4428	SX-4432	SX-4505
Technology	Contacting	Contacting	Magnetic	Contacting	Contacting
Torque Signal Sensing Angle	+/- 8 deg	+/- 5 deg	+/- 5 deg	+/- 8 deg	+/- 8 deg
Torque Mechanical Travel	+/- 11.4 deg	+/- 11.4 deg	Continuous	+/- 11.4 deg	+/- 11.4 deg
Connector PN	Packard 15336723	Yazaki 7122-8365	Yazaki 7122-8365	Tyco 1376352-1	Yazaki 7122-8365

Position (Angle) Only

	
Model Number	SX-4429
Technology	Contacting
Multi-Turn Position Sensed Angle	+/-900 deg
Position Mechanical Travel	Continuous
Connector PN	Yazaki 7122-8365

TURN COUNTING DIALS

Turn Counting Dials



Model Number	2126	2126M	2601	2606	2606M	2606S
For Shaft Diameter	1/4"	6mm	1/8"	1/4"	6mm	1/4"
For Bushing Diameter	3/8"	3/8"	1/4"	3/8"	3/8"	3/8"
Dial Diameter	1"	1"	7/8"	7/8"	7/8"	7/8"
Number of Turns	10	10	15	20	15	15
Face Display Type	Digital	Digital	Analog	Analog	Analog	Analog



Model Number	2607	2607S	2641	2646	2646M	2646S
For Shaft Diameter	1/4"	1/4"	1/8"	1/4"	6mm	1/4"
For Bushing Diameter	3/8"	3/8"	1/4"	3/8"	3/8"	3/8"
Dial Diameter	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"
Number of Turns	20	15	15	20	15	15
Face Display Type	Analog	Analog	Analog	Analog	Analog	Analog



Model Number	2647	2647S	2694	2694N	2696	RB
For Shaft Diameter	1/4"	1/4"	6mm	6mm	1/4"	1/4"
For Bushing Diameter	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
Dial Diameter	7/8"	7/8"	7/8"	7/8"	7/8"	1-13'16"
Number of Turns	20	15	10	10	10	15
Face Display Type	Analog	Analog	Analog	Analog	Analog	Analog



Model Number	RBB	RBC	RBD	RBJ
For Shaft Diameter	1/4"	1/4"	1/4"	1/8"
For Bushing Diameter	1/2"	3/8"	3/8"	1/4"
Dial Diameter	1-13'16"	1-13'16"	1-13'16"	1-13'16"
Number of Turns	15	15	15	15
Face Display Type	Analog	Analog	Analog	Analog

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