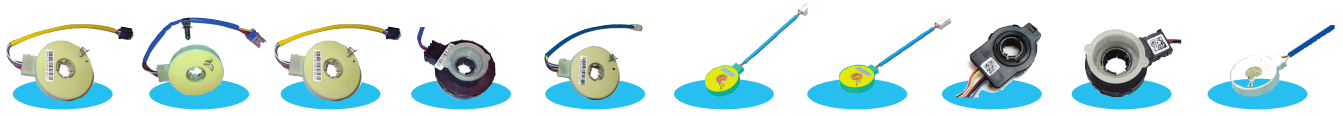


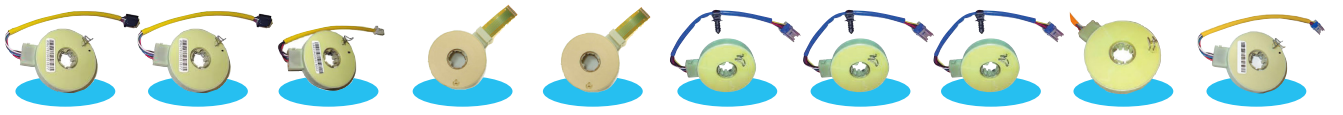
Steering Torque and Position Sensors

TT Electronics position and torque sensors are available in both single- and multi-turn versions, contacting or non-contacting, with a choice of either side or top adjustments, and plain, threaded or sleeve bushing types. Units offer rotational life ranging from single turn, to up to 1000K turns. In addition, TT Electronics offers a full line of rotary panel and slide potentiometers, linear motion sensors and actuators, multi-turn precision potentiometers, steering sensors, and cermet trimmers.

Steering Sensors



Model Number	SX-4289	SX-4300	SX-4388	SX-4400	SX-4404	SX-4413	SX-4414	SX-4417	SX-4428	SX-4429
Technology	contacting	contacting	contacting	magnetic	contacting	contacting	contacting	magnetic	magnetic	contacting
Torque Angle	± 8°	± 8°	± 8°	± 5°	± 5°	± 5°	± 5°	± 5°	± 5°	
Position Angle	360°	± 900°			± 900°		360°	± 900°		± 900°
# of Wires	6	7	4	4	7	4	6	8	4	5
Connector Model	Delphi 15336723	Delphi 15406142	Delphi 15336723	Yazaki 7122-8365	TE 1376352-1 connector	Yazaki 7122-8365	Yazaki 7122-8365	Delphi 15406142	Yazaki 7122-8365	Yazaki 7122-8365



Model Number	SX-4431	SX-4432	SX-4433	SX-4473	SX-4474	SX-4475	SX-4476	SX-4479	SX-4487	SX-4491
Technology	contacting	contacting	contacting	contacting	contacting	contacting	contacting	contacting	contacting	contacting
Torque Angle	± 8°	± 8°	± 8°	± 5°	± 5°	± 8°	± 8°	± 8°	± 8°	± 5°
Position Angle	± 900°		360°	360°	± 900°	360°	± 900°	360°	± 900°	360°
# of Wires	7	4	6	6	7	6	7	6	7	6
Connector Model	TE 1376352-1	TE 1376352-1	TE 1376352-1	Flex circuit	Delphi 15406142	Delphi 15406142	Delphi 15406142	Delphi 15406142	Delphi 15406142	Delphi 15406142

Rotary Encoders



Model Number	EN08-S	EN11-HSM	EN11-HSB	EN11-VSM	EN12-HS	EN12-VS	EN16-H	EN16-V
Size	8 mm	11 mm	11 mm	11 mm	12 mm	12 mm	16 mm	16 mm
Adjust	Side	Top	Top	Side	Top	Side	Top	Side
Pulses	10	15, 20	15, 20	15, 20	12, 24	12, 24	12, 24	12, 24
Detents	0, 20	0, 20, 30	0, 20, 30	0, 20, 30	0, 12, 24	0, 12, 24	0, 12, 24	0, 12, 24
Switch	Y	Y	Y	Y	Y	Y	N	N
Bushing Type	Threaded	Threaded	Plain	Threaded	Sleeve	Sleeve	Threaded	Threaded
Shaft	Metal	Metal	Metal	Metal	Plastic	Plastic	Plastic	Plastic
Life	50K	30K	30K	30K	30K	30K	30K	30K

Rotary Panel Potentiometers



Model Number	P08xN	P08xS	P090L	P090S	P09xS/N	P09x5N	P110KV/KVI	P110KH/KH1
Style	Side adj	Side adj	Side adj	Top adj.	Side adj	Top adj.	Side adj	Top adj.
Package Size	8 mm	8 mm	9 mm	9 mm	9 mm	9 mm	11 mm	11 mm
Element	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.
Shaft	Metal	Metal	Plastic	Plastic	Metal	Metal	Plastic	Plastic
Bushing	Metal	Metal	N/A	N/A	Metal	Metal	Metal	Metal
Power Rating	0.05W	0.05W	0.03W	0.03W	0.05W	0.05W	0.05W	0.05W
Rotational Life	100K	100K	100K	100K	100K	100K	30K	30K
Switch	N/A	Y	N/A	N/A	Y	N/A	N/A	N/A
Multi-Ganged	4	4	N/A	N/A	8	2	N/A	N/A

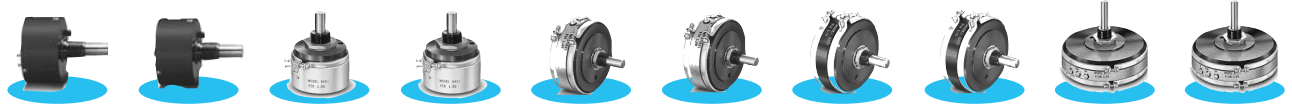


Model Number	P120PK	P140KH/KH1	P160KN/KN2	P160KNPD	P160KNP	P170S/N	P170S2/N2	P170SP1/NP1
Style	Top adj.	Top adj.	Side adj. PC pin	Rear adj. PC pin	Solder lug	Solder lug	Side adj. PC pin	Top adj. PC pin
Package Size	12 mm	14 mm	16 mm	16 mm	16 mm	17 mm	17 mm	17 mm
Element	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.
Shaft	Plastic	Plastic	Metal	Metal	Metal	Metal	Metal	Metal
Bushing	N/A	Metal	Metal	Metal	Metal	Metal	Metal	Metal
Power Rating	0.05W	0.2W	0.2W	0.2W	0.2W	0.1W	0.1W	0.1W
Rotational Life	100K	30K	100K	100K	100K	100K	100K	100K
Switch	N/A	N/A	Y	Y	Y	Y	Y	Y
Multi-Ganged	2	2	6	6	6	N/A	N/A	N/A



Model Number	P170SPD/NPD	P230	P231	P232	P260P	P260S (Switch)	P260D (Detent)	P260T	P261P	P270
Style	Rear ad. PC pin	Solder lug	Solder lug	Solder lug	Side adj. PC pin	Side adj. PC pin	Side adj. PC pin	Top adj. PC pin	Solder Lug	Solder Lug
Package Size	17 mm	24 mm	24 mm	24 mm	12.7 mm	12.7 mm	12.7 mm	12.7 mm	12.7 mm	27 mm
Element	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.	Con. Plas.
Shaft	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal
Bushing	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal	Metal
Power Rating	0.1W	0.5W	0.5W	0.5W	0.5W	0.5W	0.5W	0.5W	0.5W	2.0W
Rotational Life	100K	500K	100K	2,000K	1,000K	100K	100K	1,000K	1,000K	1,000K
Switch	Y	N/A	N/A	N/A	N/A	Y	N/A	Y	N/A	N/A
Multi-Ganged	N/A	N/A	N/A	1	6	5	6	2	6	1

Rotary Single Turn Precision Potentiometers



Model Number	6371	6373	5401	5403	5611	5613	6671	6673	5711	5713
Housing (OD)	1-5/16"	1-5/16"	1-7/16"	1-7/16"	2"	2"	2"	2"	3"	3"
Element*	CP	CP	WW	WW	WW	WW	CP	CP	WW	WW
Resistor Range (Ohms)	1K to 300K	1K to 300K	25 to 50K	25 to 50K	15 to 80K	15 to 80K	1K to 300K	1K to 300K	25 to 145K	25 to 145K
Standard Resistance Tolerance	±10%	±10%	±5%	±5%	±5%	±5%	±10%	±10%	±5%	±5%
Standard Linearity	±0.5%	±0.5%	±0.5% (<100 Ohms±1.0%)	±0.5% (<100 Ohms±1.0%)	±0.5% (<50 Ohms±1.0%)	±0.5% (<50 Ohms±1.0%)	±0.25%	±0.25%	±0.5%	±0.5%
Mounting Style	Bushing	Servo	Bushing	Servo	Bushing	Servo	Bushing	Servo	Bushing	Servo



Model Number	5101	5103	6138	6143	6163	6173	6186	6273	3371	5311
Housing (OD)	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	1-1/16"	1-5/16"	1-5/16"
Element*	WW	WW	CP	CP	CP	CP	CP	CP	CP	WW
Resistor Range (Ohms)	200 to 15K	200 to 15K	1K to 60K	1K to 100K	1K to 100K	1K to 100K	1K to 100K	1K to 900K	1K to 900K	10 to 44.6K
Standard Resistance Tolerance	±5%	±5%	±20%	±10%	±10%	±10%	±10%	±10%	±10%	±3% (<40 Ohms±5%)
Standard Linearity	±0.5%	±0.5%	±1.0%	±1.0%	±1.0%	±0.5%	±1.0%	±0.5%	±0.5%	±0.5% (<250 Ohms±1.0%)
Mounting Style	Bushing	Servo	Bushing	Servo	Servo	Servo	Bushing	Servo	Bushing	Bushing

Rotary Multi-Turn Precision Potentiometers



Model Number	7383	7386	9301	9303	7481	7483	7486	7216
No of Turns	3	3	3	3	5	5	5	10
Housing (OD)	7/8"	7/8"	1-13/16"	1-13/16"	7/8"	7/8"	7/8"	7/8"
Element*	WW	WW	WW	WW	WW	WW	WW	WW, HYB
Resistor Range (Ohms)	100 to 30K	100 to 30K	30 to 90K	30 to 90K	100 to 50K	100 to 50K	100 to 50K	10 to 125K
Standard Resistance Tolerance	±5%	±5%	±5%	±5%	±5%	±5%	±5%	±3%
Standard Linearity	±0.50%	±0.50%	±0.25%	±0.25%	±0.30%	±0.30%	±0.30%	±0.25%
Mounting Style	Servo	Bushing	Bushing	Servo	Bushing	Servo	Bushing	Bushing

Rotary Multi-Turn Precision Potentiometers



Model Number	7221	7223	7274	7276	7284	7286	7288	8146	8148	7601	7603
No of Turns	10	10	10	10	10	10	10	10	10	10	10
Housing (OD)	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	1-13/16"	1-13/16"
Element*	WW, HYB	WW, HYB	WW	WW	WW	WW	WW	HYB	HYB	WW	WW
Resistor Range (Ohms)	10 to 125K	10 to 125K	100 to 100K	100 to 100K	100 to 100K	100 to 100K	100 to 100K	1K to 100K	1K to 100K	1K to 650K	1K to 650K
Standard Resistance Tolerance	±3%	±3%	±5%	±5%	±5%	±5%	±5%	±10%	±10%	±5%	±5%
Standard Linearity	±0.25%	±0.25%	±0.25%	±0.25%	±0.25%	±0.25%	±0.25%	±0.25%	±0.25%	±0.15%	±0.15%
Mounting Style	Bushing	Servo	Bushing	Bushing	Bushing	Bushing	Bushing	Bushing	Bushing	Bushing	Servo

Precision Potentiometers



Model Number	A	B	C	D	E
No of Turns	10	15	3	25	40
Housing (OD)	1-13/16"	3-5/16"	1-13/16"	3-5/16"	3-5/16"
Element*	WW	WW	WW, HYB	WW	WW
Resistor Range (Ohms)	10 to 500K	40 to 2Meg	5 to 194.7K	60 to 3.3Meg	125 to 5.3Meg
Standard Resistance Tolerance	±3% (<100 Ohms=±5%)	±5%	±3%	±5%	±5%
Standard Linearity	±0.25% (<300 Ohms=±0.50%)	±0.50%	±0.50%	±0.50%	±0.50%
Mounting Style	Bushing	Bushing	Bushing	Bushing	Bushing

Slide Potentiometers



Model Number	PS45G	PS60G	PS100-1	PS100-2	PSxx-1	PSxx-2	PSxxL	PSxxM
Gang(s)	Dual	Dual	Single	Dual	Single	Dual	Single	Dual
Element	Con. Plas	Con. Plas	Con. Plas	Con. Plas	Con. Plas	Con. Plas	Con. Plas	Con. Plas
Power Ratio	0.25W	0.25W	0.25W	0.25W				
Cycle Life	200K	200K	100K	100K	100K	100K	100K	100K
Stroke Length	45 mm	60 mm	100 mm	100 mm	15 - 60 mm	16 - 60 mm	20 - 60 mm	20 - 60 mm
Dust Cover	Y	Y	N	N	N	N	Y	Y
Center Detent	N	N	N	N	Y	Y	Y	Y
LED	N	N	N	N	N	N	Y	N

Rotary Single Turn Non-Contacting Hall Effect Position Sensors



Model Number	6121	6124	6126	6127	6153
Housing	7/8"	7/8"	7/8"	7/8"	7/8"
Angle	35-360°	35-360°	35-360°	35-360°	35-360°
Standard Linearity	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
Mounting Style	1/8" Shaft 1/4" Bushing	6 mm Shaft 3/8" Bushing	1/8" Shaft 3/8" Bushing	1/4" Shaft 3/8" Bushing	Servo

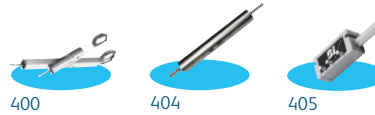
Rotary Multi-Turn Non-Contacting Position Sensors



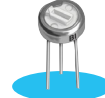
Model Number	8151	8152	8154	8156
Housing	7/8"	7/8"	7/8"	7/8"
Number of Turns	3, 5, 10	3, 5, 10	3, 5, 10	3, 5, 10
Standard Linearity	±0.5%	±0.5%	±0.5%	±0.5%
Mounting Style	1/8" Shaft, 1/4" Bushing	1/8" Shaft, 1/4" Servo Mount	6 mm Shaft, 3/8" Bushing	1/4" Shaft, 3/8" Bushing

Linear Potentiometers

Model 400 Series Linear Actuation Position Sensors
 Model 404 Series Spring Return, Linear Actuation Conductive Plastic Position Sensors
 Model 405 Series Low Cost, Linear Actuation Conductive Plastic Position Sensors



Single Turn Cermet Trimmers



Model Number	22	23	25	62	72	82	83	93
Housing Size	3 mm Sq.	4mm Dia.	1/4" Sq.	1/4" Dia.	3/8" Sq.	1/4" Dia.	1/4" Sq.	1/2" Dia.
Adjustment Style	Top	Top	Top, Side	Top	Top, Side	Top, Side	Top, Side	Top
Mounting Style	Surface	Surface	Thru-Hole	Thru-Hole	Thru-Hole	Thru-Hole	Surface	Thru-Hole
Seal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Resistance Range	100 to 2 Meg	10 to 2 Meg	10 to 2 Meg	10 to 1 Meg	10 to 2 Meg	10 to 1 Meg	10 to 1 Meg	20 to 2 Meg
Standard Resistance Tolerance	±20%	±20%	±10%	±10% (<100 Ohms=±20%)	±10% (<100 Ohms=±20%)	±10% (<100 Ohms=±20%)	±10% (<100 Ohms=±20%)	±10% (<100 Ohms=±20%)
Available Packaging	TR	TR, TB	AP (25U, 25V Only) TB (25U, 25V Only) TR		AP (72 RW Only) TB TR (72 RW Only)	AP (82W Only) TB TR (82W Only)	TB (83Y Only) TR (83Y Only)	

Multi-Turn Cermet Trimmers



Model Number	43LF	44	45	64	66	67	68	78	84	89/90
Adjustment Turns	11	9	15	12	20	20	20	22	12	20
Housing Size	3 mm Sq.	4 mm Sq.	4 mm Sq.	1/4" Sq.	3/8" Sq.	3/8" Sq.	3/8" Sq.	1-1/4" Sq.	1/4" Sq.	3/4" Sq.
Adjustment Style	Top	Top, Side	Top, Side	Top, Side	Top, Side	Top, Side	Top, Side	Side	Top, Side	Side
Mounting Style	Surface	Surface	Surface	Thru-Hole	Thru-Hole	Thru-Hole	Thru-Hole	Thru-Hole	Surface	Thru-Hole
Seal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Resistance Range	10 to 2 Meg	10 to 2 Meg	10 to 2 Meg	10 to 1 Meg	10 to 2 Meg	10 to 2 Meg	10 to 2 Meg	10 to 2 Meg	10 to 1 Meg	10 to 2 Meg
Standard Resistance	±20%	±10% (<100 Ohms=±20%)	±10% (<100 Ohms=±20%)	±10%	±10% (<100 Ohms=±20%)	±10% (<100 Ohms=±20%)	±10% (<100 Ohms=±20%)	±10% (<100 Ohms=±20%)	±10%	±10% (<100 Ohms=±20%)
Available Packaging	TR	TR TB	TR TB	TR AP (66y, 64Z Only)	TB TR AP (66W, 66X Only)	TB TR (67W, 67X Only) AP (67W, 67X Only)	TB TR (68W, 68X Only) AP (68W, 68X Only)	Boxes	TR	TB