

● Multi-turn Potentiometers.....See pages 29 to 48

Appearance	Model	Construction	Resistive Element	Outer Dia. (Ømm.)	Shaft Dia. (Ømm.)	Protection Grade (IP)		Features	Page		
						Standard	Special				
	10HP	Pipe type	Wirewound	10.5	4	40	54	World's smallest multi-turn pot. since 1965.	31		
	12HP (12HP-E)			13	3 (3.175)	40	54	Small multi-turn pot. with outer dia. of 13mm. Terminals for P.C. board are also available in addition to standard lug terminals.	32 (33)		
	12HPC (12HPC-E)					40	54	Low-cost small multi-turn pot. with outer dia. of 13mm. Terminals for p.c. board and rear lug terminals are also available in addition to standard lug terminals.	34 (35)		
	20HP			Drum type	Wirewound	20	6	40	54	Precision multi-turn pot. with outer dia. of 20mm. Servomount type and with limit-switches adaptor are also available.	36
	22HP					22	6 6.35	40	54	Lowest-cost multi-turn pot. with outer dia. of 22mm. and this pot. has an international patented snapping-in construction.	37
	25HP					25	4 6	40	54	Precision multi-turn pot. with outer dia. of 25mm. There are 4 kinds of combination with a shaft and a bushing dimensions.	38
	46HD	46	6			40	54	Precision multi-turn pot. with outer dia. 46mm. and high reliability. This pot. is manufacturing continuously over 45 years. With limit-switches incorporated type is also available.	39 } 40		
	30HDS	Drum type	Wirewound	27	3	40	—	Super-precision small multi-turn pot. with outer dia. of 27mm. Independent linearity tolerance of ±0.05% to ±0.025% is available.	41		
	50HDS			49	6	40	—	Super-precision multi-turn pot. with outer dia. of 49mm. Independent linearity tolerance of ±0.02% to ±0.01% is available.	42		
	12HHP (12HHP-E)	Pipe type	Hybrid	13	3 (3.175)	40	54	Small size, high resolution and long life are offerable and outer dimensions are same as those of model 12HP series.	43 (44)		
	20HHP			20	6	40	54	High resolution and long life are offerable and outer dimensions are same as those of model 20HP series.	45		
	22HHP			22	6 6.35	40	54	Low-cost, high resolution and long life are offerable and outer dimensions are same as those of model 22HP series. Servomount type is also available.	46		

●Turns-Counting Dials.....See pages 49 to 60

Appearance	Model	Read-out	Max. Number of Turns-Counting	Outer Dimensions (mm.)		Features	Page
				Dia.	Matching Shaft Dia.		
	MA	Analog	3, 5, 10, 15, 20	Ø54	Ø6	Special graduations are available and this dial is always supplied by the pot. and dial combination from us because of necessity of a little technical skill to mount the pot. with this dial.	50
	MB		10	Ø26 Ø31	Ø4 Ø6	The window of read-out is larger for easy reading.	51 } 52
	MF		10 20	15×18.5 Ø22 25×29 Ø46	Ø3 Ø4 Ø6	There are 4 kinds of size in this series and all of them have an international patented flexible coupling inside.	53 } 54
	MG		20	Ø22	Ø6	Low-cost and most popular type and 2 kinds of lock mechanism are selected.	55
	DA	Digital	10	Ø24	Ø6	Round-shaped digital read-out dial. To save the height of this dial above the panel, the combination with this dial, recessed mount adaptor and the pot. is available.	56
	DB		10 100	26×43.5	Ø6	Rectangular shape digital read-out dial. With or without an international patented flexible coupling inside are selected.	57
	DC		10	Ø27 Ø30.5	Ø6	Low-cost and round-shaped digital dial. Recessed mounting type is selected.	58 } 59

●1-turn Potentiometers.....See pages 61 to 85

Appearance	Model	Output	Resistive Element	Mounting Method	Outer Dimensions (Ømm.)		Protection Grade (IP)		Features	Page
					Dia.	Shaft Dia.	Standard	Special		
	CP22C	Linear	Wire-wound	Bushing mount	22	6	40	54	Low-cost, metal housing and rear extended lug terminals.	63
	CP22E						40	54	Low-cost, plastic housing with an international patented snapping-in construction and side lug terminals.	64
	CP22			Servo mount			3	40	54	See next page 9.

●1-turn Potentiometers.....See pages 61 to 85

Appearance	Model	Output	Resistive Element	Mounting Method	Outer Dimensions (Ømm.)		Protection Grade (IP)		Features	Page	
					Dia.	Shaft Dia.	Standard	Special			
	CP30	Linear	Wire-wound	Servo mount	27	3	40	54	Servomount type with ball bearings and there are 4 kinds of outer diameter of the body for your suitable selection. Turret side terminals are fitted.	66	
	CP45				41	6	40	54		67	
	CP50				51		40	54		68	
	FCP12AC		Conductive Plastic	Bushing mount	Servo mount	13	3	40	54	Low-cost and rear extended pin terminals.	69
	FCP12A							40	54	Servomount type with ball bearings and rear extended pin terminals.	69 } 70
	FCP22AC			Bushing mount	Servo mount	22	6	40	54	Low-cost, metal housing and rear extended turret terminals.	70
	FCP22E							40	54	Low-cost, plastic housing with an international patented snapping-in construction and side lug terminals.	71
	FCPS22AC			Servo mount	Servo mount	27	3	40	54	Low-cost, servomount type with oil-less metal bearings and rear extended turret terminals.	72
	FCP22A							40	54	72 } 73	
	FCP30A	40									54
	FCP40A	6		Servo mount	37	6	40	54	Servomount type with ball bearings and there are 4 kinds of outer diameter of the body for your suitable selection. Turret side terminals are fitted.	74	
	FCP50A						40	54		74 } 75	

●1-turn Potentiometers.....See pages 61 to 85

Appearance	Model	Output	Resistive Element	Mounting Method	Outer Dimensions (Ømm.)		Protection Grade (IP)		Features	Page		
					Dia.	Shaft Dia.	Standard	Special				
	LNB22	Linear	Wire-wound		22	2	40	—	Low-torque, servomount type with ball bearings with outer diameter of 22mm.	76 77		
	SCB50						51	6	40	54	Most popular functional precision pot. with a wirewound resistive element. Sine-cosine output is standard version.	80
	FP50								40	54	Various kinds of special output function are available in this series. E.G. X ² , $\frac{1}{x}$ etc..	81
	FSCB22A	Non-Linear		Servo mount	22	3	40	54	Servomount type with ball bearings and precision sine-cosine output potentiometers with 3 different kinds of body diameter.	82		
	FSCB30A				27		40	54		82 83		
	FSCB50A		Conductive Plastic		51	6	40	54		83		
	FFP12A						13	3	40	54	Miniature sized servomount type with ball bearings and special output functions are available. Rear extended pin terminals.	84
	FFP22A						22		40	54	Servomount type with ball bearings. Various kinds of special output function are available in this series.	85











●Linear-motion Potentiometers.....See pages 87 to 103

Appearance	Model	Resistive Element	Shaft/ Mounting Method	Outer Dimensions (mm.)		Protection Grade (IP)		Features	Page
				Body(H×W)	Shaft Dia.	Standard	Special		
	18LP	Wirewound	Front extended shaft/ Screw holes	20.5×18	6	40	54	Rigid housing case. Stroke from 15mm. to 100mm. is available.	90
	30LP		Front and Rear extended shaft/ Screw holes	32×32	5	40	54	Medium stroke from 50mm. to 200mm. is available.	91





● Linear-motion Potentiometers See pages 87 to 103

Appearance	Model	Resistive Element	Shaft/ Mounting Method	Outer Dimensions (mm.)		Protection Grade (IP)		Features	Page
				Body(H×W)	Shaft Dia.	Standard	Special		
	50LP	Wirewound	Front and Rear extended shaft/ Using fixing nails	50×50	8 12* (over1000 strokes)	40	54	Long stroke from 300mm. to 1,000mm. is available.	92
	8FLP	Conductive Plastic	Front and Rear extended shaft/ Circle holes	8×7	2	40	54	Miniature sized and low-cost item with leadwire terminals. (Stroke: 10mm.)	93
	13FLP		Front extended shaft/ Circle holes	11×13	M3 (threaded)	40	54	Low-cost item with side turret terminals and a thread cutting at the end of shaft. (Stroke: 12mm. to 100mm.)	94
	15FLP		Front and Rear extended shaft/ Screw holes	15×24	M3 (threaded)	40	54	Low-cost item with a thread cutting at the end of shaft and short stroke from 10mm. to 30mm.	95
	18FLPA		Front extended shaft/ Screw holes	20.5×18	6	40	54	Rigid housing case and with faston-terminals. (Stroke: 15mm. to 100mm.)	96
	18FLPB		Front extended shaft/ Using fixing nails	18×18	M4 (threaded)	40	54	Connector block on the housing case and a shaft with a cardan joint. (Stroke: 25mm. to 150mm.)	97
	18FLPC		Front and Rear extended shaft/ Using fixing nails		Ball tip	40	54	Connector block on the housing case and a shaft with a spring return device and a ball tip at the end of shaft. (Stroke: 25mm. to 50mm.)	98
	30FLP		Front extended shaft/ Using fixing nails	35×32	M5 (threaded)	40	54	Medium and long stroke from 100mm. to 1,000mm. is available and with a connector as terminals.	99
	40FLP		Slider/ Using fixing nails	47×40	Travelling by a slider	40	—	Long stroke from 200mm. to 1,000mm. is available. Dust-proof and with a connector as terminals.	100
	CFL		Slider/ Circle holes	12×20	Travelling by a slider	—	—	Long stroke from 200mm. to 1,000mm. is available. Open-frame housing.	101
	9HLP		Hybrid	Slider/ Circle holes	20×9	Travelling by a slider with knob	40	—	Manual adjustment by operating the knob. (Stroke: 100mm. and 120mm.)


●Oil-filled Potentiometers.....See pages 104 to 115

Appearance	Model	Mechanism	Resistive Element	Mounting Method	Outer Dia. (Ømm.)		Protection Grade (IP)	Features	Page
					Body	Shaft			
	OF30	1-turn type	Wire-wound	Bushing mount	32	5	65	Small sized 1-turn and general-purpose type.	106
	OF50				62	65	General-purpose type with a stopper and suitable for high-voltage use.	107	
	OF50PB				62		65	Long-life type with sleeve bearings and a stopper. Suitable for high-voltage use.	108
	OF50CP			Servo mount	70	6	65	Long-life type with servomount and ball bearings. Suitable for precision servo use. (endless)	109
	OF46HD	Multi-turn type	Wire-wound	Bushing mount	62	65	65	Precision multi-turn type and servomount type is also available.	110
	OF20HHP				Hybrid		32	65	Small sized precision multi-turn type with long-life and high resolution. Servomount type is also available.
	OF30-MCA	1-turn type	Conductive Plastic	Bushing mount	5	65		Small sized long-life 1-turn type and with infinite resolution.	112
	OF10LP	Linear-motion type	Wire-wound	Bushing mount			12	3	55
	OF20LP				20	5	55	Long-life type with a water-proof connector. (Stroke: 30mm. to 200mm.)	114
	OF40LP			Ball end mounting	40	With a universal joint	55	Long-life and long stroke type with a water-proof connector. (Stroke: 100mm. to 300mm.)	115



● Contactless Potentiometers.....See pages 116 to 121

Appearance	Model	Mounting Method	Outer Dia. (∅mm.)		Protection Grade(IP)	Features	Page
			Body	Shaft			
	KSM22F	Bushingmount	22	4	40	Popular type with oilless bearings. Possible to meet with special requirements.	118
	KSM22FI				65	Completely sealed type with oilless bearings. Possible to meet with special requirements.	
	KSM22FS	Servomount	22	3	40	Low-torque and long-life type with ball bearings. Possible to meet with special requirements.	119
	KSM22E	Bushingmount		4	40	Low-cost type with oilless bearings.	
	KSM22EI		54		Simple sealed version of low-cost type with oilless bearings.		
	LSM22-10-5 LSM22-20-5 LSM22-30-5			3	40	Linear-motion contactless potentiometer.	121





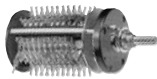



● Digital Potentiometers.....See pages 122 to 123

Appearance	Model	Using Method	Element	Features	Page
	DP	Potentiometer use	Fixed resistors connected in parallel	For use of voltage adjustment. 2 to 4 digits connected type is available.	123
	MR	Rheostat use	Fixed resistors connected in series	For use of current adjustment. 2 to 4 digits connected type is available.	

● Servo Components.....See pages 124 to 135

Kinds	Appearance	Model	Rating, etc.	Features	Page
Motor Potentiometer		MPH22	6V.D.C., 0.26W type (With A motor) 6V.D.C., 0.43W type (With B motor)	Panel mounting type for 1-turn or 10-turn potentiometer to be combined.	125 } 126
		MPH30		Chassis mounting type for 1-turn or 10-turn potentiometer to be combined. Suitable for use of automatic balancer.	126 } 127

● Servo Components.....See pages 124 to 135

Kinds	Appearance	Model	Rating, etc.	Features	Page
Motor Potentiometer		MPH35	6V.D.C., 3.1W type (With C motor)	Panel mounting type for 1-turn potentiometer to be combined.	127 }
		MPH46		Panel mounting type for multi-turn potentiometer to be combined.	128
Servo Amplifier		AP1231	Output: 6W Change over of ± 6 , ± 12 and $\pm 18V$ is possible.	Developed only for use of our motor-potentiometers. Save-energy type with pulse width modulated control.	129
D.C. Power Supply		AP9201A	Output $\pm 10mA(\pm 6V)$ for pot. Abt. $700mA(24V)$ for amp.	Power supply for driving of motor-potentiometer and servo amplifier.	130
Helicaswitch		50HS10	100 contacts/1 circuit	Patented multi-turn rotary switch. Can select a heavy starting torque type (H) or light starting torque type (L). (H) is our standard version.	133
Coupling		C17	Allowable eccentricity: Below 0.15mm. Allowable angle of deflection: Below 5° Allowable torque: $0.9N \cdot m(9kgf \cdot m)$	Mountable to fit the shaft diameters of 3, 4, 5 and 6mm.	134
Slipping Clutch		USC15	Slipping torque $20mN \cdot m(200gf \cdot cm)$	For low torque use. Mountable to fit the shaft diameters of 2, 3, 4, 5 and 6mm.	
		USC20	Slipping torque $50mN \cdot m(500gf \cdot cm)$	For high torque use. Mountable to fit the shaft diameters of 4, 5 and 6mm.	
Fixing Nail for use of servomount type potentiometer		SFN1	For servomount dia. from $\varnothing 30$ to $\varnothing 50mm$. (For large diameter)	For large diameter fixing to be used by 3 pcs.	135
		SFN2	For servomount dia. from $\varnothing 19$ to $\varnothing 25mm$. (For medium diameter)	For medium diameter fixing to be used by 3 pcs.	
		SFN3	For servomount dia. from $\varnothing 9$ to $\varnothing 12mm$. (For small diameter)	For small diameter fixing to be used by 2 pcs.	
Joystick Controller	Outline Explanation Only (For details, please refer to separate catalog on joystick controllers / foot controllers.)				137 }
Foot Controller					143