LINEAR-MOTION POTENTIOMETER

(Precision Linear-motion, Wirewound, Conductive Plastic & Hybrid Element)

SAKAE Linear-motion Potentiometers are compact in size and light in weight and are capable of transforming mechanical linear movements into corresponding electrical variations. Easy to operate and handy. It is suitable for measurement of linear movements in various machinery and tools and displacements in linearly moving objects such as steering angles, numerical control tooling machines, robots, etc.

Besides, wirewound type (LP), there is another kind of resistive element in this series: Conductive Plastic (FLP-A) which features high resolution, long life expectancy and excellent high speed tracking ability. Please select the resistive element appropriately according to your applications.

THE NOMENCLATURE OF SAKAE LINEAR-MOTION POT. SERIES

S 30 FLP 100 A - ○○○○○

●Special Specifications
S means the potentiometer with special mechanical specifications not applicable to our standard.

●Diameter
30 means 30mm square in cross sectional outer size of the body of the potentiometer. The 8 standard sizes are available, namely, 8mm, 13mm, 15mm, 18mm, 30mm and 40mm, but subject to models.

●Type
FLP-A means linear-motion, conductive plastic resistive element type potentiometer. According to the kinds of resistive elements incorporated, there are 2 kinds:
LP.....Wirewound resistive element type (A is not given).
FLP-A.....Conductive plastic resistive element type.

●4 or 5 digits branch number
to be used for specific requirements.

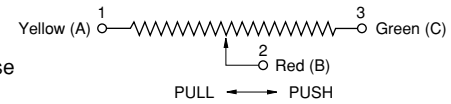
●Characteristics
A means a conductive plastic resistive element type. (A is not given to wirewound type and hybrid type.)

●Stroke
100 means effective electrical travel on the resistive element. The 16 standard strokes are available, namely, 10mm, 12mm, 15mm, 20mm, 25mm, 30mm, 50mm, 75mm, 100mm, 120mm, 200mm, 300mm, 400mm, 500mm, 750mm and 1,000mm.

NOTE: The nomenclature of model 18 (F) LP series is mentioned in the next page 85 because of its complexity.

●Terminal Connection Diagram

Note: in case of with a connector, please use indications in the parenthesis.



SELECTION GUIDE

Kind of Element	Size (mm)	Model No.	Stroke (mm)	Features
Wirewound	20×18	**18LP**	15, 30, 50, 100	This model is a substitute model against our old model 20LP series.
	32×32	**30LP**	50, 100, 200	These types have a shaft with front and rear extension as standard version. Available with special mechanical devices such as spring return device and position-adjustable limit-switches.
Conductive Plastic	8×7	**8FLP**	10, 15	Low-cost and miniature size pot. with a shaft with front and rear extension. Available with spring return device incorporated as special.
	11×13	**13FLP**	12, 25 50, 100	Popular type pot. with a front extended shaft. Available with spring return device as special version.
	15×14	**15FLP**	10, 15, 20, 30	Popular type pot. with screw-mounting method.
	20×18	**18FLP-A, B, C**	15, 30, 50, 75, 100, 150	Rigid housing case and can select the shaft shapes and with connector to your applications.
	32×32	**30FLP**	100, 200, 300, 400, 500, 750, 1,000	Long-life expectancy and low-cost pot. with a front extended shaft, Various strokes are available.
	47×40	**40FLP**	200, 300, 400, 500, 750, 1,000	Dust-proof and rigid construction most suitable for various kinds of robots, machine tools, etc.
	10×20	**CFL**	200, 300, 400, 500, 1,000	Sub-assembled resistive element unit with a wiper. Low-cost and open frame housing.

●General Performances

Kind of Element	Model No.	Stroke (mm)	Standard Total Resistance Range (Ω)	Independent Linearity Tolerance (%)	Special Specifications				
					Spring Return Device	Front and Rear Shaft Extension	Extra Taps	Simple Sealing Type	With Switch
Wirewound	**18LP**	15～100	10～20k	±2.0～±0.25	○	—	—	○	—
	30LP	50～200	50～20k	±0.7～±0.25	○	○	○	○	○
Conductive Plastic	**8FLP10A**	10	1k～20k	±2.0～±1.0	○	○	—	○	—
	8FLP15A	15	1k～20k	±2.0～±1.0	○	○	—	—	—
	13FLP-A	12～100	500～20k	±2.0～±0.3	○	—	—	—	—
	15FLP-A	10～30	500～10k	±2.0～±0.5	○	○	—	○	—
	18FLPA	15～100	500～20k	±0.7～±0.2	○	—	—	○	—
	18FLPB	25～150	500～20k	±0.5～±0.05	○	○	○	○	—
	18FLPC	25～50	500～10k	±0.5～±0.1	◎	◎	○	○	—
	30FLP-A	100～1,000	1k～500k	±0.5～±0.05	—	—	○	○	—
	40FLP-A	200～1,000	2k～500k	±0.5～±0.05	—	—	—	—	—
	CFL	200～1,000	2k～500k	±0.5～±0.05	—	—	—	—	—

Note: 1. For detailed performances, please refer to the general specifications of each model in this catalog.
2. ◎ means standard specifications and ○ means special specifications available.
3. Standard total resistance values are based on 1, 2 and 5 series (i.e. 100Ω, 200Ω, 500Ω, 1kΩ, 2kΩ, 5kΩ...).

●Environmental Performances

Parameters \ Model Nos.	18LP, 30LP	8FLP, 13FLP, 15FLP, 18FLPA, 18FLPB, 18FLPC, 30FLP, 40FLP, CFL
Operating Temperature Range	−30℃～+105℃	−30℃～+105℃※
Temperature Cycle	5 cycles under −30℃～+105℃ Total resistance value variation: within ±5% No mechanical damage	5 cycles under −30℃～+105℃ Total resistance value variation: within ±10% No mechanical damage
Exposure at Low Temperature	24 hours at −30℃ Total resistance value variation: within ±5% No mechanical damage	24 hours at −30℃ Total resistance value variation: within ±5% No mechanical damage
Exposure at High Temperature	1,000 hours at 105℃ Total resistance value variation: within ±5% No mechanical damage	1,000 hours at 105℃ Total resistance value variation: within ±10% No mechanical damage
Vibration	10Hz to 2,000Hz 147m/s² 12 hours Total resistance value variation: within ±5% No mechanical and electrical damage	10Hz to 2,000Hz 147m/s² 12 hours Total resistance value variation: within ±5% No mechanical and electrical damage
Shock	490m/s² 11ms 18 times Total resistance value variation: within ±1% No mechanical and electrical damage	490m/s² 11ms 18 times Total resistance value variation: within ±1% No mechanical and electrical damage
Moisture Resistance	40℃ 95%RH 120 hours Total resistance value variation: within ±10% Insulation resistance: over 10MΩ	40℃ 95%RH 120 hours Total resistance value variation: within ±10% Insulation resistance: over 10MΩ
Life Expectancy, Shaft Reciprocating Motions	No load at 60 c.p.m. 100,000 reciprocating motions Total resistance value variation: within ±5% against initial value Independent linearity tolerance: within 150% of specified value Noise: within 500Ω E.N.R.	No load at 120 c.p.m. 20,000,000 reciprocating motions (except 40FLP, CFL) 40FLP, CFL...10,000,000 reciprocating motions Total resistance value variation: within ±10% against initial value Independent linearity tolerance: within 150% of specified value Output smoothness: within 150% of specified value

Note: 4. In case of the potentiometer with special resistance values and special specifications, the above performances may change and therefore, please consult us in advance, separately.
5. As for operating temperature range. we can not guarantee that all values of performances can satisty within this operating temperature range. (Please see page 23 in this catalog for further details.)
6. The above values of performances based on each testings were measured after each testings completed, respectively, under standard conditions. As for the values during testings and other values not mentioning in the above table, please ask us separately.

※N.B : Model 18 FLP series with spring return device and sealed version under IP54 have the operating temperature range of 0℃ to + 60℃.

THE NOMENCLATURE OF MODEL 18 (F) LP SERIES

S 18 FLP B C 100 R E I - ○○○○○

●Special Specifications
S means with special mechanical specifications not applicable to our standard.

●Diameter
18 means 18mm square in cross sectional outer size of the housing.

●Type
FLP means linear-motion, conductive plastic resistive element type potentiometer. If the resistive element is a wirewound, F is not given and only LP is indicated.

●Mounting Method and Shaft Shape
A : Screw mounting, plain shaft
B : Fixing nail mounting to the body, shaft with a cardan joint
C : Fixing nail mounting to the body, shaft with a ball tip

●Terminal Shape
C : Connector type
W : Leadwire type
1=Brown
2=Yellow
3=Blue
- : Lug terminal type

●Stroke
100 means effective electrical travel of 100mm on the resistive element. 15mm to 200mm are available depending on the models.

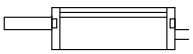
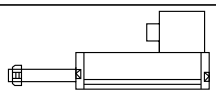
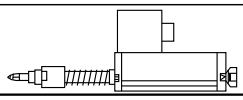
●With Spring Return Device
R : With spring return device
- : Without spring return device

●Shaft Extension
E : With front and rear extended shaft.
- : With front extended shaft.

●Sealing
I : With simple sealing (Abt. IP54)
- : Without sealing

●4 or 5 digits branch number
to be used for specific requirements.

SELECTION GUIDE

Model	Outer Shape	Kind of Resistive Element	Mounting Method and Shaft Shape	Stroke (mm)
18LP		Wirewound	Screw mounting to the body. Plain shaft.	15, 30, 50, 100
18FLPA		Conductive Plastic	Screw mounting to the body. Plain shaft.	15, 30, 50, 100
18FLPB		Conductive Plastic	Fixing nail mounting to the body. Shaft with a cardan joint.	25, 50, 75, 100, 150
18FLPC		Conductive Plastic	Fixing nail mounting to the body. Shaft with a ball tip.	25, 50