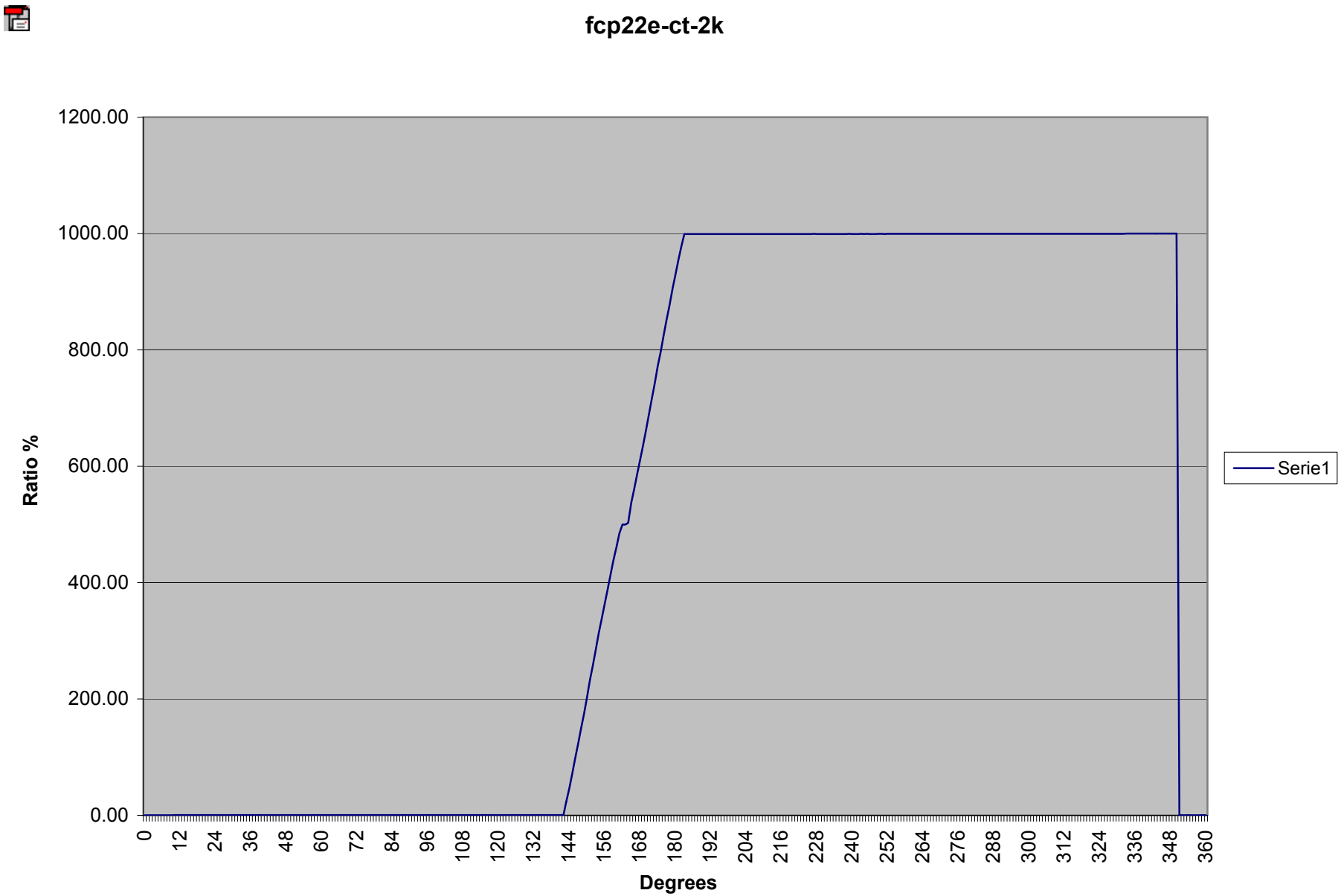

fcp22e-ct-2k
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
Ratio %
0
12
24
36
48
60
72
84
96
108
120
132
144
156
168
180
192
204
216
228
240
252
264
276
288
300
312
324
336
348
360
Degrees
Serie1

MODEL FCP22E

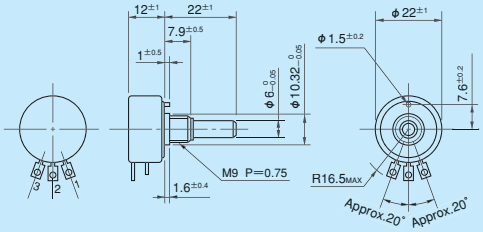
"Sakae"

● Conductive Plastic ● Bushingmount ● Low-cost Item ● RoHS Compliant

U.S.A. PAT. No.4400687 F.R.G. PAT. No.3136765
HONGKONG PAT. No.751 of 1984 U.K. PAT. No.2087160
FRANCE PAT. No.8118538 SINGAPORE PAT. No.372/84

Model FCP22E
(Plastic Housing)

● Standard Dimensions



Note: 1. 1 pc. each inner teeth washer and hex nut are attached.
2. Please process the mounting hole on the panel. The diameter should be 10.32mm $^{+0.05}_{0}$.

● General Specifications

Standard Resistance Values	1k, 2k, 5k, 10k (Ω)
Special Practical Resistance Values	500, 20k, 50k, 100k (Ω)
Total Resistance Tolerance	Standard Class ±15% (L) Precision Class ±10% (K)
Independent Linearity Tolerance	Standard Class ±1.5% Precision Class ±1.0%
Resolution	Essentially infinite
Output Smoothness	Within 0.1% against input voltage

Contact Resistance Variation	Within 2% C.R.V.
Power Rating	1.0W
Electrical Travel	320° ±5°
Mechanical Travel	360° (Endless)
Insulation Resistance	Over 1,000MΩ at 500V.D.C.
Dielectric Strength	1 minute at 500V.A.C.
Starting Torque	Within 5mN・m (50gf・cm)
Resistance Temperature Coefficient	±400p.p.m./℃
Mass	Approx. 20g

● Special Specifications Available

(In case of the potentiometer with special specifications, the general specifications and environmental specifications may change. Please consult us in advance.)

● Extra tap (Available up to 1 tap) ● Shaft with front and rear extension (Rear shaft with 6mm dia. and 20mm length)

● Multi-ganged (Available up to 10 gangs) ● With stopper (Rotating angle is 320° and stopper strength is 0.6N・m [6kgf・cm])

● Special electrical travel ● Shaft dia. (φ6.35mm) & bushing with inch dimension ● Special machining on the shaft

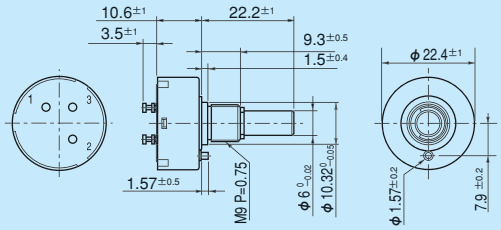
MODEL FCP22R

"Sakae"

● Conductive Plastic ● Bushingmount ● Low-cost Item ● RoHS Compliant

Model FCP22R
(Plastic Housing)

● Standard Dimensions



Note: 1. 1 pc. each inner teeth washer and hex nut are attached.
2. Please process the mounting hole on the panel. The diameter should be 10.32mm $^{+0.05}_{0}$.

● General Specifications

Standard Resistance Values	1k, 2k, 5k, 10k (Ω)
Special Practical Resistance Values	500, 20k, 50k, 100k (Ω)
Total Resistance Tolerance	Standard Class ±15% (L) Precision Class ±10% (K)
Independent Linearity Tolerance	Standard Class ±1.5% Precision Class ±1.0%
Resolution	Essentially infinite
Output Smoothness	Within 0.1% against input voltage

Contact Resistance Variation	Within 2% C.R.V.
Power Rating	1.0W
Electrical Travel	340° ±5°
Mechanical Travel	360° (Endless)
Insulation Resistance	Over 1,000MΩ at 500V.D.C.
Dielectric Strength	1 minute at 500V.A.C.
Starting Torque	Within 5mN・m (50gf・cm)
Resistance Temperature Coefficient	±400p.p.m./℃
Mass	Approx. 20g

● Special Specifications Available

(In case of the potentiometer with special specifications, the general specifications and environmental specifications may change. Please consult us in advance.)

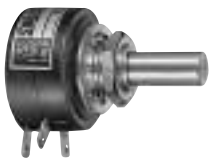
● Extra tap (Available up to 1 tap) ● Special electrical travel ● Shaft dia. (φ6.35mm) & bushing with inch dimension

● Special machining on the shaft

Conductive Plastic

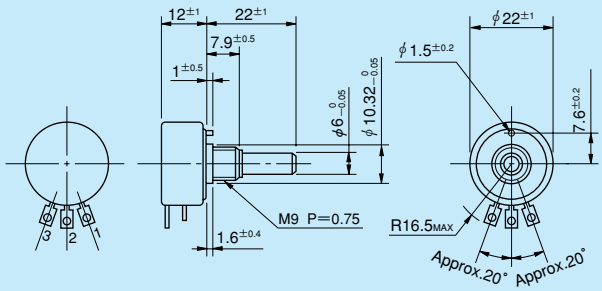
MODEL FCP22E

(Bushingmount)



Model FCP22E
(Plastic Housing)

●Standard Dimensions



Note: 1. 1 pc. each inner teeth washer and hex nut are attached.
2. Please process the mounting hole on the panel to be mounted with this potentiometer by the diameter of 10.32mm $^{+0.05}_{0}$.

●General Specifications

Standard Resistance Values:	1k, 2k, 5k, 10k (Ω)	**Contact Resistance Variation:**	Within 2% C.R.V.
Special Practical Resistance Values:	500, 20k, 50k, 100k (Ω)	**Power Rating:**	1.0W
Total Resistance Tolerance:	Standard Class ±15% (L) Precision Class ±10% (K)	**Electrical Travel:**	320° ±5°
		Mechanical Travel:	360° (Endless)
Independent Linearity Tolerance:	Standard Class ±1.5% Precision Class ±1.0%	**Insulation Resistance:**	Over 1,000MΩ at 500V.D.C.
		Dielectric Strength:	1 minute at 500V.A.C.
Resolution:	Essentially infinite	**Starting Torque:**	Within 5mN・m (50gf・cm)
Output Smoothness:	Within 0.1% against input voltage	**Resistance Temperature Coefficient:**	±400p.p.m./℃
		Mass:	Approx. 20g

●Special Specifications Available

Extra taps (Available up to 1 tap), Shaft with front and rear extension (Rear shaft with 6mm dia. and 20mm length), Multi-ganged (Available up to 10 gangs), With stopper (Rotating angle becomes 320° and stopper strength is 0.6N・m [6kgf・cm]), Special electrical travel, Shaft dia. (φ6.35mm)・bushing with inch dimensions, Special machining on the shaft.

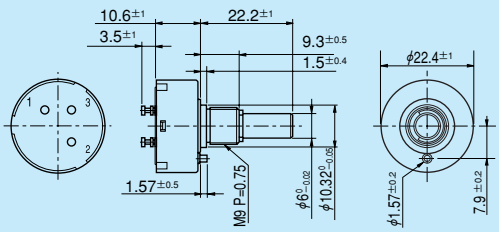
LOW-COST ITEM

Conductive Plastic

MODEL FCP22R

(Bushing mount)

●Standard Dimensions



Note: 1. 1 pc. each inner teeth washer and hex nut are attached.
2. Please process the mounting hole on the panel to be mounted with this potentiometer by the diameter of 10.32mm $^{+0.05}_{0}$.

Model FCP22R
(Plastic Housing)

●General Specifications

Standard Resistance Values:	1k, 2k, 5k, 10k (Ω)	**Contact Resistance Variation:**	Within 2% C.R.V.
Special Practical Resistance Values:	500, 20k, 50k, 100k (Ω)	**Power Rating:**	1.0W
Total Resistance Tolerance:	Standard Class ±15% (L) Precision Class ±10% (K)	**Electrical Travel:**	340° ±5°
		Mechanical Travel:	360° (Endless)
Independent Linearity Tolerance:	Standard Class ±1.5% Precision Class ±1.0%	**Insulation Resistance:**	Over 1,000MΩ at 500V.D.C.
		Dielectric Strength:	1 minute at 500V.A.C.
Resolution:	Essentially infinite	**Starting Torque:**	Within 5mN・m (50gf・cm)
Output Smoothness:	Within 0.1% against input voltage	**Resistance Temperature Coefficient:**	±400p.p.m./℃
		Mass:	Approx. 20g

●Special Specifications Available

Extra taps (Available up to 1 tap), Special electrical travel, Shaft dia. (φ6.35mm) & bushing with inch dimensions, Special machining on the shaft.

1-TURN POTENTIOMETER

(Precision 1-turn, Wirewound & Conductive Plastic Element)

SAKAE 1-turn Potentiometers are fully continuous rotation potentiometers without stopper and are highly reliable in offering an excellent quality as well as a prolonged rotating life. There are 2 kinds of resistive element available in this series: Wirewound **(CP)** and Conductive Plastic **(FCP-A)** elements. You can easily make a best selection between these versions to your versatile application programs ranging from hand-operating use to servo applications.

CP or **FCP-A** is respectively contained in an aluminum housing case processed by electrolytic corrosion-proof plating in silver color **(CP)** and black color **(FCP-A)** with performances and dimensions according to U.S. MIL, and V.R.C.I. Standards. They are light in weight and small in size as well as of rigid construction. Selection of any desired item is possible among a variety of standard models, of which diameters are variable between 12mm and 50mm.

THE NOMENCLATURE OF SAKAE 1-TURN POT. SERIES

S FCP 30 A G - ○○○○○

● **Special Specifications**
S means the potentiometer with special mechanical specifications.

● **Type**
FCP means continuous, 1-turn, linear conductive plastic element type potentiometer.
CP..... Wirewound resistive element type (A is not given.)
FCP-A..... Conductive plastic resistive element type.
FCP-R..... Conductive plastic resistive element and bushingmount type.

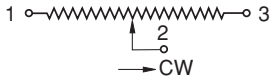
● **Diameter**
30 means approximate outer diameter of the potentiometer in metric system. The 6 standard diameters are available, namely, 12mm, 22mm, 30mm, 40mm, 45mm and 50mm.

● **Characteristic**
A means a conductive plastic resistive element type. (A is not given to wirewound type.)

● **Number of Gangs**
G means 2 ganged potentiometer on the same axle. The potentiometer consists of one single section unless G is given. (e.g. G3...3 ganged, G4...4 ganged)

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

● **Terminal Connection Diagram**



SELECTION GUIDE

Kind of Element	Diameter (mm)	Model No.	Features
Wirewound	ϕ22	**CP22C, CP22E**	Bushingmount type low-cost pot. with outer diameter of 22mm.
	ϕ22～ϕ50	**CP22, CP30, CP45, CP50**	Servomount type precision pots with outer diameter of 22mm to 50mm and excellent in temperature coefficient.
Conductive Plastic	ϕ12, ϕ22	**FCP12AC, FCP22AC, FCP22E FCP22R**	Bushingmount type low-cost pots with outer diameter of 12mm and 22mm.
		FCPS22AC	Servomount type low-cost pot. with outer diameter of 22mm.
	ϕ12～ϕ50	**FCP12A, FCP22A, FCP30A, FCP40A, FCP50A**	Servomount type precision pots with outer diameter of 12mm to 50mm and with a patented multi-finger contact to make a good contact stability and excellent high speed tracking ability.

General Performances

Kind of Element	Model No.	Standard Total Resistance Range (Ω)	Special Lower Resistance Values (Ω)	Special Higher Resistance Values (Ω)	Independent linearity Tolerance (%)	Special Specifications					
						With Stopper	Front and Rear Shaft Extension	Extra Taps	Simple Sealing Type	With switch	Multi-ganged
Wirewound	CP22C	50～10k	10, 20	20k	±0.5～±0.25	○	○	○	○	—	—
	CP22E	50～10k	10, 20	20k	±0.5～±0.25	○	○	○	○	—	○
	CP22	50～10k	10, 20	20k	±0.5～±0.2	○	○	○	○	—	○
	CP30	50～20k	10, 20	50k	±0.5～±0.15	○	○	○	○	—	○
	CP45	50～20k	10, 20	50k	±0.5～±0.1	○	○	○	○	○	○
	CP50	50～20k	10, 20	50k	±0.5～±0.1	○	○	○	○	○	○
Conductive Plastic	FCP12AC	1k～10k	500	20k, 50k, 100k	±2.0～±1.0	○	○	○	○	—	—
	FCP12A	1k～10k	500	20k, 50k, 100k	±2.0～±1.0	○	○	○	○	—	—
	FCP22AC	1k～10k	500	20k, 50k, 100k	±1.5～±1.0	○	○	○	○	—	—
	FCP22E	1k～10k	500	20k, 50k, 100k	±1.5～±1.0	○	○	○	○	—	○
	FCP22R	1k～10k	500	20k, 50k, 100k	±1.5～±1.0	—	—	○	—	—	—
	FCPS22AC	1k～10k	500	20k, 50k, 100k	±1.0～±0.5	○	○	○	○	—	—
	FCP22A	1k～10k	500	20k, 50k, 100k	±1.0～±0.3	○	○	○	○	—	○
	FCP30A	1k～10k	500	20k, 50k, 100k	±1.0～±0.2	○	○	○	○	—	○
	FCP40A	1k～10k	500	20k,50k,100k,200k	±0.5～±0.1	○	○	○	○	○	○
	FCP50A	1k～10k	500	20k, 50k, 100k, 200k, 500k	±0.5～±0.05	○	○	○	○	○	○

Note: 1. For detailed performances, please refer to specifications of each model in this catalog.

Environmental Performances

Parameters \ Model Nos.	CP22C, CP22E, CP22, CP30, CP45, CP50 (LNB22)	FCP12AC, FCP12A, FCP22E, FCP22R, FCP22AC, FCPS22AC	FCP22A, FCP30A, FCP40A, FCP50A
Operating Temperature Range	− 55℃～+ 105℃	− 55℃～+ 105℃	− 55℃～+ 125℃
Temperature Cycle	5 cycles under − 55℃～+ 105℃ Total resistance value variation: within ± 5% No mechanical damage	5 cycles under − 55℃～+ 105℃ Total resistance value variation: within ± 10% No mechanical damage	5 cycles under − 55℃～+ 125℃ Total resistance value variation: within ± 10% No mechanical damage
Exposure at Low Temperature	24 hours at − 55℃ Total resistance value variation: within ± 5% No mechanical damage	24 hours at − 55℃ Total resistance value variation: within ± 5% No mechanical damage	24 hours at − 55℃ Total resistance value variation: within ± 5% Output voltage variation: within 0.5% 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	1,000 hours at 125℃ Total resistance value variation: within ± 10% Output voltage variation: within 0.5% 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 ± 2% No mechanical and electrical damage	10Hz to 2,000Hz 147m/s² 12hours Total resistance value variation: within ± 2% 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	490m/s² 11ms 18 times Total resistance value variation: within ± 1% No mechanical and electrical damage
Moisture Resistance	40℃ 95% RH 240 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	40℃ 95% RH 120 hours Total resistance value variation: within ± 10% Insulation resistance: over 10MΩ
Rotational Life Expectancy (at 25℃)	No load at 40 r.p.m. 1,000,000 shaft revolutions 500,000 shaft revolutions for CP22C & CP22E 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 400 r.p.m., inverting every 15 minutes FCP12AC⋯5,000,000 shaft revolutions FCP12A, FCP22E, FCP22R, FCP22AC } 10,000,000 shaft revolutions FCPS22AC⋯20,000,000 shaft revolutions Total resistance value variation: within ± 10% against initial value Independent linearity tolerance: within 150% of specified value Output smoothness: within 150% of specified value	No load at 400 r.p.m., inverting every 15 minutes 50,000,000 shaft revolutions 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: 2. In case of the potentiometer with special resistance values and special specifications, the above performances may vary and therefore, please consult us in advance, separately.
3. As for operating temperature range, we can't always guarantee exactly the same performances and values in actual industrial applications even if the temperature out there is within standard range. (Please see page 23 in this catalog for further details.)
4. All values of each parameter were measured under standard temperature and standard testing conditions. For the values during the tests and other characteristics, please ask us separately.
5. In case of model LNB22, all values mentioned in the above table are reference only.