

● Standard Resistance Values ■ No. of Wire Turns ■ Resistance Wire Used

Resist. Value (Ω)	0.5	1	2	5	10	20	50	100	200	500
46HD-3	※	※	※	※	556	690	950	1,190	1,515	2,080
46HD-5	※	※	※	※	※	925	1,275	1,640	2,080	2,860
46HD-10	※	※	※	※	※	※	2,000	2,500	3,180	4,350
46HD-15	※	※	※	※	※	※	2,530	3,220	4,160	5,710
46HD-20	※	※	※	※	※	※	3,030	3,920	5,120	7,140
Resist. Wire Used	Cu-Ni System									

Resist. Value (Ω)	1k	2k	5k	10k	20k	50k	100k	200k	500k	
46HD-3	2,550	2,330	3,225	4,080	5,130	6,890 *	8,330 *	—	—	
46HD-5	3,450	3,230	4,170	5,720	7,410	11,000	12,500 *	—	—	
46HD-10	5,400	6,850	6,600	8,550	10,850	14,900	18,850	24,390 *	—	
46HD-15	7,410	9,510	8,800	11,300	14,500	20,000	25,600	32,250 *	—	
46HD-20	9,300	11,900	14,100	13,150	16,950	23,250	30,790	38,200	55,550 *	
Resist. Wire Used	Cu-Ni System			Ni-Cr System						

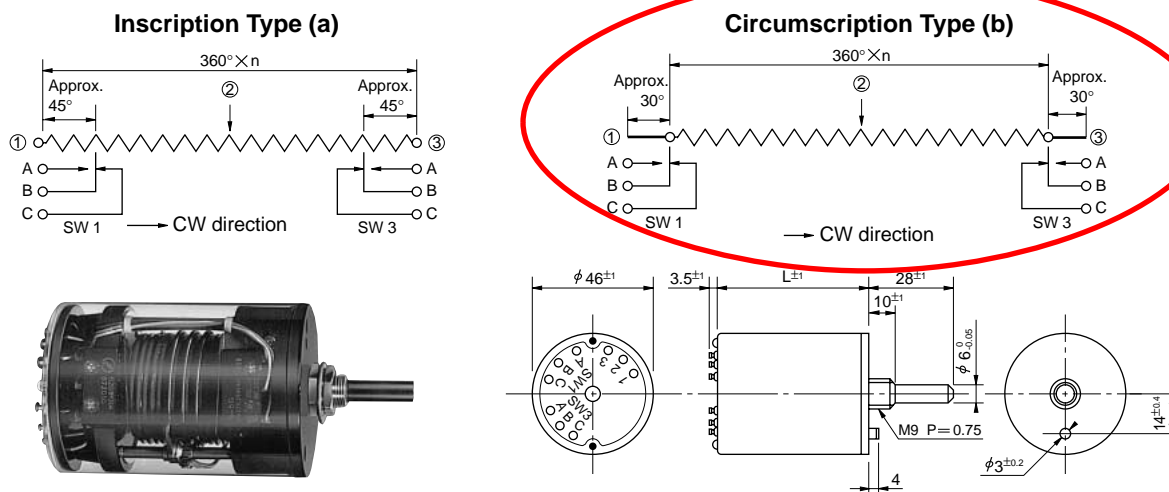
Note: Mark ※ shows the pot. with a single-wire resistive element, which gives an essentially infinite resolution.
 Mark * shows values at special higher practical resistance.

S46HD Series with LIMIT-SWITCHES

Special 46HD Series Helicalohm potentiometer with incorporated Limit-Switch can automatically control the circuit. It can conveniently be used for minifying the instrument in which this model is employed. The construction of the Limit-Switch is given in the below figure and its function limit, either upper or lower, or to either side, can be freely determined according to customer's requirement. Its capacity is 5 A, 125V.A.C. (or 2.5A, 250V.A.C.). This model is most recommended to all kinds of automatic control equipment.

Note. Functioning position of Limit-Switch...

In case of this model being coupled to servo-motor, an over-rotation of the servo-motor due to its inertia, after the power source being OFF, may sometimes break the Helicalohm Pot. unless an adequate precaution is made. In order to avoid such failure, two kinds of the Helicalohm Potentiometer with limit-switch are offered: one is an inscription type (a) limit-switch having its function position slightly this side from the stopper of Helicalohm Pot. and the other is a circumscription type (b) for which a special overtravel is prepared in the Helicalohm Pot.



N.B.: Unless otherwise specified, we will supply the circumscription type (b).

- Outer dimensions of these special versions are the same as those of standard model 46HD Series except its body length which is longer than the latter by 28 mm.
- Electrical and mechanical specifications and mounting dimensions are also the same as those of standard model 46HD series.
- As for smaller multi-turn potentiometer with limit-switches, please see page 47.



HELICALOHM® MULTI-TURN POTENTIOMETER

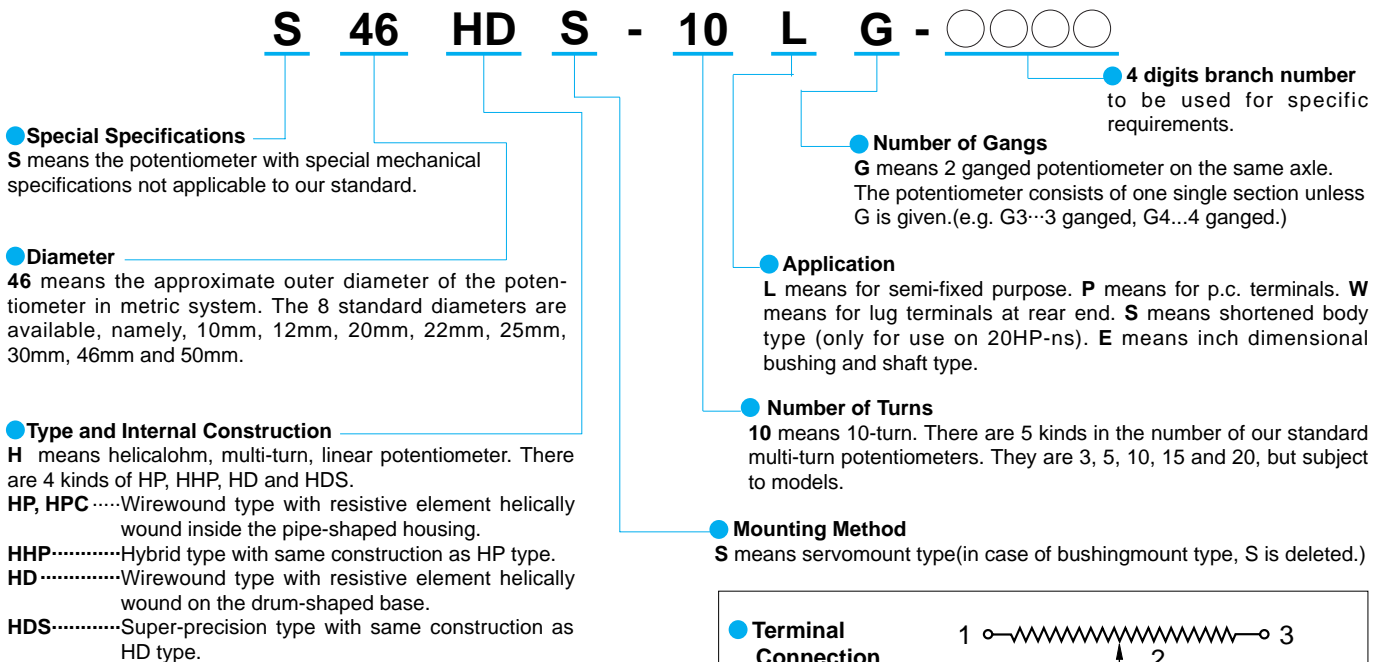
(Precision Multi-turn, Wirewound & Hybrid Element)

There are two kinds in **SAKAE** Helicalohm Potentiometers with a wirewound resistive element. One is Model HD Series which are an original device consisting of a resistive element wound helically on a drum surface and a slider of which contact is made around the resistance drum and the other is Model HP Series which are formed with a slider travelling along the interior surface of a resistive element

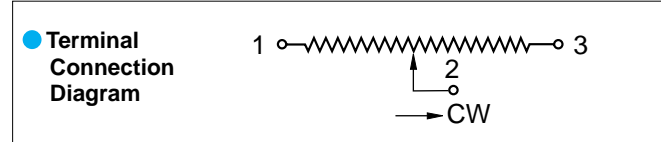
helically wound inside a sealed pipe.

Both of them equally offer high resolution, excellent reliability and long life. **SAKAE** has expanded to the production of hybrid resistive element potentiometers and this element has now been incorporated into Model HP Series with small size.

THE NOMENCLATURE OF SAKAE HELICALOHM POT. SERIES



SELECTION GUIDE



Internal Construction	Type	Kind of Element	Diameter (mm)	Model No.	Features
	HP	Wirewound	Ø10.5	10HP	World's smallest multi-turn pot. since 1965.
			Ø13	12HP, 12HP-P, 12HPS, 12HPC, 12HPC-P, 12HPC-W	Low-cost multi-turn pot. of outer dia. of 13mm. Terminals for p.c. board and rear terminals are also available.
			Ø20	20HP, 20HPS	Precision multi-turn pot. of outer dia. of 20mm. Servomount type is also available.
			Ø22	22HP	Low-cost multi-turn pot. of outer dia. of 22mm. Most popular items for general applications. Two kinds of bushing in 22HP series are available : plastic and metal.
			Ø25	25HP, 25HPS	Precision multi-turn pot. of outer dia. of 25mm. Various specials based on this item are also available.
	HHP	Hybrid	Ø13	12HHP, 12HHP-P, 12HHPS	World's smallest multi-turn precision hybrid pot. of outer dia. of 13mm. Servomount type is also available.
Ø20			20HHP, 20HHPS	Precision multi-turn hybrid pot. of outer dia. of 20mm. Servomount type is also available.	
Ø22			22HHP, 22HHPS	Low-cost precision multi-turn hybrid pot. of outer dia. of 22mm. Servomount type is also available.	
	HD	Wirewound	Ø46	46HD, 46HDS	Traditional item being manufactured continuously over 45 years. Slide wire resistive element type which brings infinite resolution is available as standard version against the standard resistance values below 20Ω in this series, but subject to models.
			HDS	Wirewound	Ø30
	Ø50	50HDS			

● 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						
						Servo-mount Type	Front and Rear Shaft Extension	Extra Taps	Simple Sealing Type	With Limit-Switch Adaptor	Multi-ganged	Semi-fixed Setting Type
Wirewound	10HP	100~50k	20,50	100k	±0.25~±0.1	—	○	—	—	—	—	—
	12HP	100~100k	20,50	150k	±0.25~±0.1	○	○	—	○	—	—	○
	12HPC	100~100k	—	—	±0.25~±0.1	—	○	—	○	—	—	○
	20HP	100~50k	10,20,50	150k	±0.2~±0.1	○	○	○	○	(with adaptor)	○	○
	22HP	100~100k	—	—	±0.25~±0.1	○	○	—	○	—	○	○
	25HP	100~100k	10,20,50	200k	±0.25~±0.1	—	○	○	—	(with adaptor)	○	—
Hybrid	12HHP	1k~50k	—	100k	±0.4~±0.1	○	○	—	○	—	—	○
	20HHP	2k~100k	—	—	±0.25~±0.1	○	○	○	○	(with adaptor)	○	○
	22HHP	2k~100k	—	—	±0.25~±0.1	○	○	—	○	—	○	○
Wirewound	46HD	0.5~100k	—	200k	±0.3~±0.1	○	○	—	○	(Incorporated)	○	—
Wirewound	30HDS	2k~50k	—	—	±0.05~±0.025	○	○	—	—	—	—	—
	50HDS	5k~100k	—	—	±0.02~±0.01	○	○	○	—	—	—	—

Note: 1. Above-mentioned data are applied for our standard 10-turn models per each series and for further technical details, please see each articles of the models in question mentioned in this catalog.

● Environmental Performances

Model Nos.	10HP, 12HP, 20HP, 25HP, 46HD	12HPC, 22HP, 30HDS, 50HDS	12HHP, 20HHP (22HHP) ※
Operating Temperature Range	-55℃ ~ +105℃	-55℃ ~ +105℃	-55℃ ~ +105℃
Temperature Cycle	5 cycles under -55℃ ~ +105℃ Total resistance value variation: below ±5% No mechanical damage	5 cycles under -55℃ ~ +105℃ Total resistance value variation: below ±5% No mechanical damage	5 cycles under -55℃ ~ +105℃ Total resistance value variation: below ±5% No mechanical damage
Exposure at Low Temperature	24 hours at -55℃ Total resistance value variation: below ±5% No mechanical damage	24 hours at -55℃ Total resistance value variation: below ±5% No mechanical damage	24 hours at -55℃ Total resistance value variation: below ±5% No mechanical damage
Exposure at High Temperature	1,000 hours at 105℃ Total resistance value variation: below ±5% No mechanical damage	1,000 hours at 105℃ Total resistance value variation: below ±5% No mechanical damage	1,000 hours at 105℃ Total resistance value variation: below ±5% No mechanical damage
Vibration	10Hz to 2,000Hz 147m/s ² 12 hours Total resistance value variation: below ±5% No mechanical and electrical damage	10Hz to 2,000Hz 147m/s ² 12 hours Total resistance value variation: below ±5% No mechanical and electrical damage	10Hz to 2,000Hz 147m/s ² 12 hours Total resistance value variation: below ±5% No mechanical and electrical damage
Shock	490m/s ² 11ms 18 times Total resistance value variation: below ±1% No mechanical and electrical damage	490m/s ² 11ms 18 times Total resistance value variation: below ±1% No mechanical and electrical damage	490m/s ² 11ms 18 times Total resistance value variation: below ±1% No mechanical and electrical damage
Moisture Resistance	40℃ 95%RH 240 hours Total resistance value variation: below ±10% Insulation resistance: over 10MΩ	40℃ 95%RH 120 hours Total resistance value variation: below ±10% Insulation resistance: over 10MΩ	40℃ 95%RH 120 hours Total resistance value variation: below ±10% Insulation resistance: over 10MΩ
Rotational Life Expectancy (at 25℃)	No load at 40 r.p.m. 3-turn600,000 shaft revolutions 5-turn1,000,000 shaft revolutions 10-turn } 15-turn }2,000,000 shaft revolutions 20-turn } Total resistance value variation: below ±5% against initial value Independent linearity tolerance: below 150% of specified value Noise: below 500Ω E.N.R.	No load at 40 r.p.m. 3-turn300,000 shaft revolutions 5-turn500,000 shaft revolutions 10-turn1,000,000 shaft revolutions Total resistance value variation: below ±5% against initial value Independent linearity tolerance: below 150% of specified value Noise: below 500Ω E.N.R.	No load at 40 r.p.m. 5-turn5,000,000 (2,500,000) ※ shaft revolutions 10-turn10,000,000 (5,000,000) ※ shaft revolutions Total resistance value variation: below ±5% against initial value Independent linearity tolerance: below 150% of specified value Output smoothness: 5-turn0.2% against input voltage 10-turn0.1% against input voltage

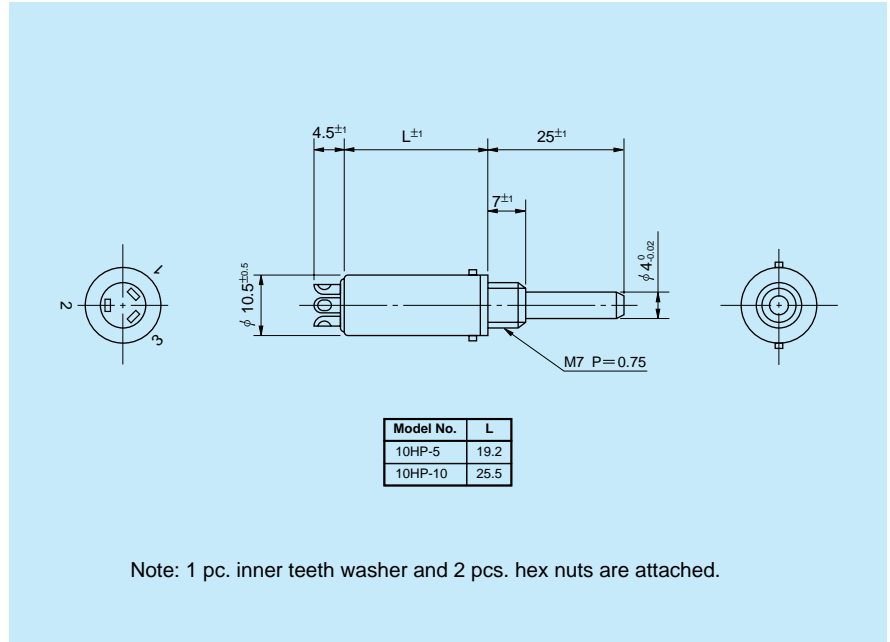
Note: 2. In case of the potentiometer with special resistance values and special specifications, the above performances may change and therefore, please consult us in advance, separately.

3. As for operating temperature range, we can not guarantee that all values of performances can satisfy within this operating temperature range. (Please see page 25 in this catalog for further details.)

4. 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.

5. Mark ※ applies only for model 22HHP series.

●Standard Dimensions



●Standard Model Nos.

- 10HP-5 (5-turn)
- 10HP-10 (10-turn)

●General Specifications

Standard Resistance

Range: 100Ω to 20kΩ (5-turn)
100Ω to 50kΩ (10-turn)

Max. Practical

Resistance Value: 50kΩ (5-turn)
100kΩ (10-turn)

Total Resistance

Tolerance: Standard Class ±3% (H)
Precision Class ±1% (F)

Independent Linearity

Tolerance:

	5-turn	10-turn
Standard Class	±0.35%	±0.25%
Precision Class	±0.2%	±0.1%
(Below 5kΩ)	(±0.25%)	(±0.15%)

Power Rating:

0.5W (5-turn)
1.0W (10-turn)

Noise:

Below 100Ω E.N.R.

Electrical Travel:

360°×n ±5° (n: No. of turns)

Mechanical Travel:

360°×n +30°
0° (n: No. of turns)

Insulation Resistance:

Over 100 MΩ at 500V.D.C.

Dielectric Strength:

1 minute at 500V.A.C.

Starting Torque:

Below 3mN·m (30gf·cm)

Stopper Strength:

Approx. 0.1N·m (1kgf·cm)

Max. Torque exerted on fastening the mounting nut to the bushing:

Below 1N·m (10kgf·cm)

Max. Working Voltage:

450V

Resist. Temperature

Coefficient of Wire: ±20p.p.m./°C

Mass:

Approx. 17g (5-turn)
Approx. 20g (10-turn)

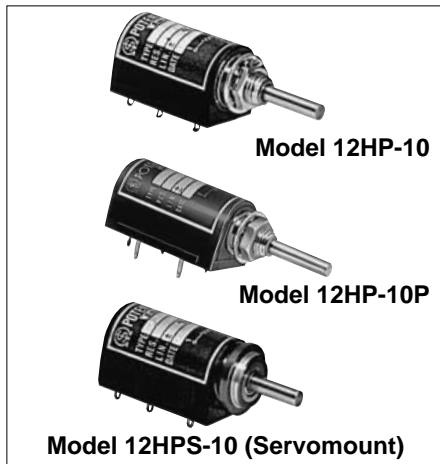
●Standard Resistance Values ■No. of Wire Turns ■Resistance Wire Used

Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k
10HP-5	750	620	830	1,050	1,330	1,820	2,300	2,940	* 3,900	—
10HP-10	1,200	1,500	1,350	1,670	2,100	2,860	3,640	4,550	6,250	* 7,850
Resist. Wire Used	Cu-Ni System			Ni-Cr System						

Note: Mark * shows values at special higher practical resistance.

●Special Specifications Available

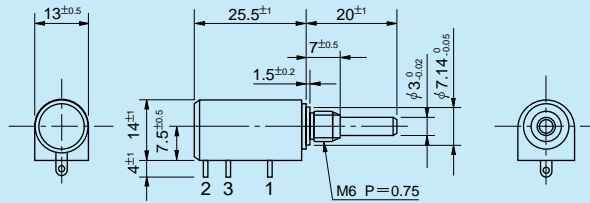
3-turn type (S10HP-3), Lower resistance values (20Ω, 50Ω), Shaft dia. (Ø3.175mm)•bushing with inch dimensions, Special machining on the shaft, Shaft with front and rear extension (Rear shaft with 0.8mm dia. and 10mm length).



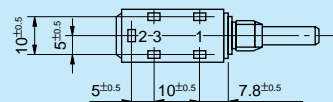
● Standard Dimensions

■ Bushingmount type

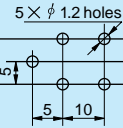
● With lug terminals



● With pin terminals for p.c. board

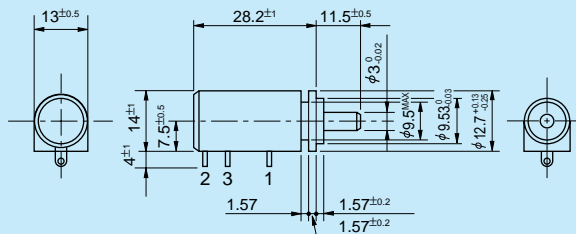


Terminal Holes Layout



Note: 1. p.c. 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 7.14mm^{+0.05}.

■ Servomount type



Note: 1. Outer dimensions of 5-turn version are same as those of 10-turn.
2. Servomount type with pin terminals for p.c. board is also available.

● Standard Model Nos.

Bushingmount type:

With lug terminals:

- 12HP-5 (5-turn)
- 12HP-10 (10-turn)

With pin terminals for p.c. board:

- 12HP-5P (5-turn)
- 12HP-10P (10-turn)

Servomount type:

- 12HPS-5 (5-turn)
- 12HPS-10 (10-turn)

● General Specifications

Standard Resistance

Range: 100Ω to 50kΩ (5-turn)
100Ω to 100kΩ (10-turn)

Max. Practical

Resistance Value: 70kΩ (5-turn)
150kΩ (10-turn)

Total Resistance

Tolerance: Standard Class ±3% (H)
Precision Class ±1% (F)

Independent Linearity

Tolerance: 5-turn 10-turn
Standard Class ±0.35% ±0.25%
Precision Class ±0.2% ±0.1%
(Below 5kΩ) (±0.25%) (±0.15%)

Power Rating:

0.75W (5-turn)
1.5W (10-turn)

Noise:

Below 100Ω E.N.R.

Electrical Travel:

360°×n±5°(n: No. of turns)

Mechanical Travel:

360°×n +15°
0°(n: No. of turns)

Insulation Resistance:

Over 1,000MΩ at 500V.D.C.

Dielectric Strength:

1 minute at 1,000V.A.C.

Starting Torque:

Below 3mN·m (30gf·cm)
(Bushingmount type)
Below 2mN·m (20gf·cm)
(Servomount type)

Stopper Strength:

Approx. 0.15N·m (1.5kgf·cm)

Max. Torque exerted

on fastening the

mounting nut to

the bushing:

Below 0.8N·m (8kgf·cm)

Max. Working

Voltage:

450V

Resist. Temperature

Coefficient of Wire:

±20p.p.m./°C

Mass:

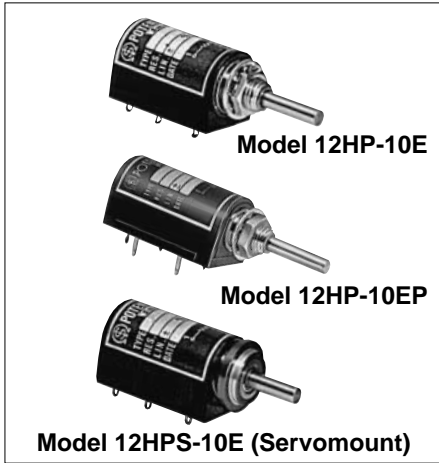
Approx. 10g
(Both 5-turn and 10-turn)

● Standard Resistance Values ■ No. of Wire Turns ■ Resistance Wire Used

Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k
12HP-5	920	1,190	1,250	1,510	1,790	2,380	3,120	3,800	5,430	—
12HP-10	1,690	1,850	2,560	2,500	3,030	4,170	4,760	6,250	8,330	10,870
Resist. Wire Used	Cu-Ni System					Ni-Cr System				

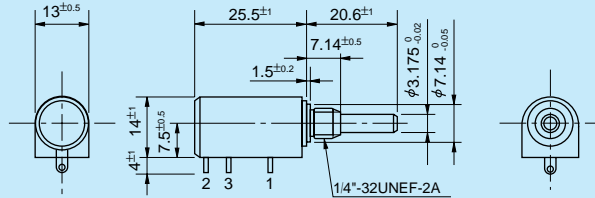
● Special Specifications Available

3-turn type (S12HP-3), Lower resistance values (20Ω, 50Ω), Shaft with front and rear extension (Rear shaft with 0.8mm dia. and 10mm length), Special machining on the shaft, Simple sealed housing (in case of servomount type, the housing length becomes longer by 1.5mm).

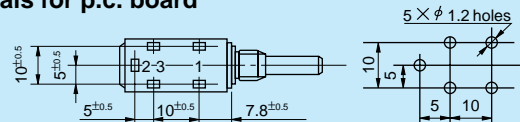


● Standard Dimensions

■ Bushingmount type
● With lug terminals

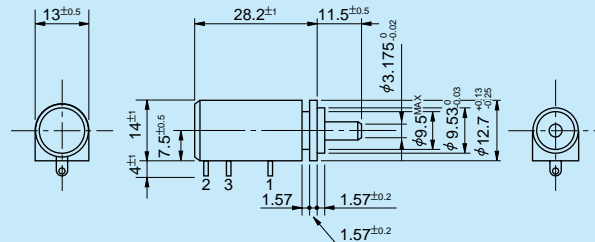


● With pin terminals for p.c. board



Terminal Holes Layout

■ Servomount type



Note: 1 pc. each inner teeth washer and hex nut are attached.

Note: 1. Outer dimensions of 5-turn version are same as those of 10-turn.
2. Servomount type with pin terminals for p.c. board is also available.
3. Please process the mounting hole on the panel to be mounted with this potentiometer by the diameter of 7.14mm +0.05.

● Standard Model Nos.

Bushingmount type:

With lug terminals:

12HP-5E (5-turn)

12HP-10E (10-turn)

With pin terminals for p.c. board:

12HP-5EP (5-turn)

12HP-10EP (10-turn)

Servomount type:

12HPS-5E (5-turn)

12HPS-10E (10-turn)

● General Specifications

Standard Resistance

Range: 100Ω to 50kΩ (5-turn)
100Ω to 100kΩ (10-turn)

Max. Practical

Resistance Value: 70kΩ (5-turn)
150kΩ (10-turn)

Total Resistance

Tolerance: Standard Class ±3% (H)
Precision Class ±1% (F)

Independent Linearity

Tolerance: 5-turn 10-turn
Standard Class ±0.35% ±0.25%
Precision Class ±0.2% ±0.1%
(Below 5kΩ) (±0.25%) (±0.15%)

Power Rating:

0.75W (5-turn)
1.5W (10-turn)

Noise:

Below 100Ω E.N.R.

Electrical Travel:

360°×n±5° (n: No. of turns)

Mechanical Travel: 360°×n +15°_{0°} (n: No. of turns)

Insulation Resistance: Over 1,000MΩ at 500V.D.C.

Dielectric Strength: 1 minute at 1,000V.A.C.

Starting Torque: Below 3mN·m (30gf·cm)
(Bushingmount type)
Below 2mN·m (20gf·cm)
(Servomount type)

Stopper Strength: Approx. 0.15N·m (1.5kgf·cm)

Max. Torque exerted

on fastening the mounting nut to the bushing: Below 0.8N·m (8kgf·cm)

Max. Working

Voltage: 450V

Resist. Temperature

Coefficient of Wire: ±20p.p.m./°C

Mass: Approx. 10g
(Both 5-turn and 10-turn)

● Standard Resistance Values ■ No. of Wire Turns ■ Resistance Wire Used

Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k
12HP-5E	920	1,190	1,250	1,510	1,790	2,380	3,120	3,800	5,430	—
12HP-10E	1,690	1,850	2,560	2,500	3,030	4,170	4,760	6,250	8,330	10,870
Resist. Wire Used	Cu-Ni System			Ni-Cr System						

● Special Specifications Available

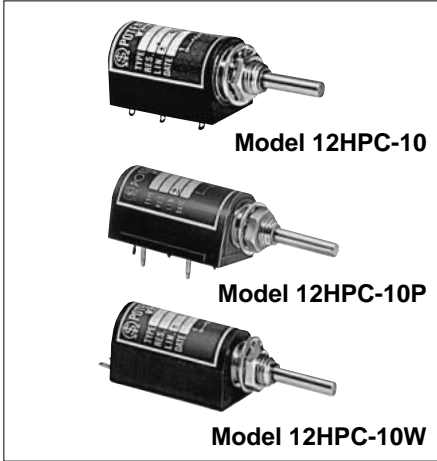
3-turn type (S12HP-3), Lower resistance values (20Ω, 50Ω), Shaft with front and rear extension (Rear shaft with 0.8mm dia. and 10mm length), Special machining on the shaft, Simple sealed housing (in case of servomount type, the housing length becomes longer by 1.5mm).

Wirewound

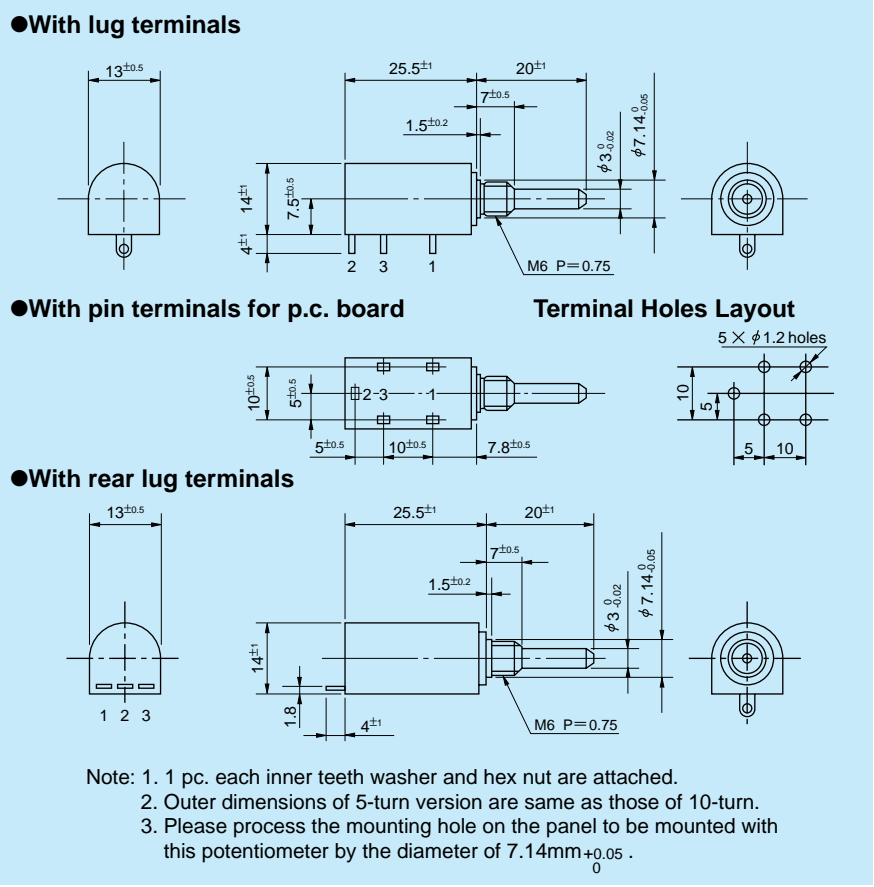
MODEL 12HPC

(Bushingmount)

(with metric dimensions)



● Standard Dimensions



● Standard Model Nos.

- Bushingmount type:**
- With lug terminals:
 - 12HPC-5 (5-turn)
 - 12HPC-10 (10-turn)
 - With pin terminals for p.c. board:
 - 12HPC-5P (5-turn)
 - 12HPC-10P (10-turn)
 - With rear lug terminals:
 - 12HPC-5W (5-turn)
 - 12HPC-10W (10-turn)

● General Specifications

- Standard Resistance Range:** 100Ω to 50kΩ (5-turn)
100Ω to 100kΩ (10-turn)
- Total Resistance Tolerance:** Standard Class ±3% (H)
Precision Class ±1% (F)
- Independent Linearity Tolerance:**
- | | 5-turn | 10-turn |
|-----------------|----------|----------|
| Standard Class | ±0.35% | ±0.25% |
| Precision Class | ±0.2% | ±0.1% |
| (Below 5kΩ) | (±0.25%) | (±0.15%) |
- Power Rating:** 0.75W (5-turn)
1.5W (10-turn)
- Noise:** Below 100Ω E.N.R.
- Electrical Travel:** 360°×n ±5° (n: No. of turns)
- Mechanical Travel:** 360°×n ^{+15°}_{0°} (n: No. of turns)

- Insulation Resistance:** Over 1,000MΩ at 500V.D.C.
- Dielectric Strength:** 1 minute at 1,000V.A.C.
- Starting Torque:** Below 3mN·m (30gf·cm)
- Stopper Strength:** Approx. 0.15N·m (1.5kgf·cm)
- Max. Torque exerted on fastening the mounting nut to the bushing:** Below 0.8N·m (8kgf·cm)
- Max. Working Voltage:** 450V
- Resist. Temperature Coefficient of Wire:** ±20p.p.m./°C
- Mass:** Approx. 10g (Both 5-turn and 10-turn)

● Standard Resistance Values ■ No. of Wire Turns ■ Resistance Wire Used

Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k
12HPC-5	920	1,190	1,250	1,510	1,790	2,380	3,120	3,800	5,430	—
12HPC-10	1,690	1,850	2,560	2,500	3,030	4,170	4,760	6,250	8,330	10,870
Resist. Wire Used	Cu-Ni System					Ni-Cr System				

● **Special Specifications Available**

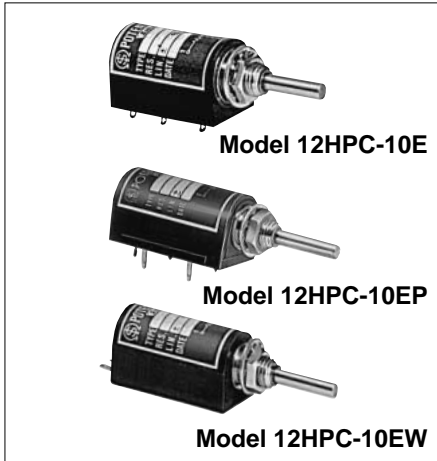
3-turn type (S12HPC-3), Lower resistance values (20Ω, 50Ω), Shaft with front and rear extension (Rear shaft with 0.8mm dia. and 10mm length), Special machining on the shaft, Simple sealed housing.

Wirewound

MODEL 12HPC-E

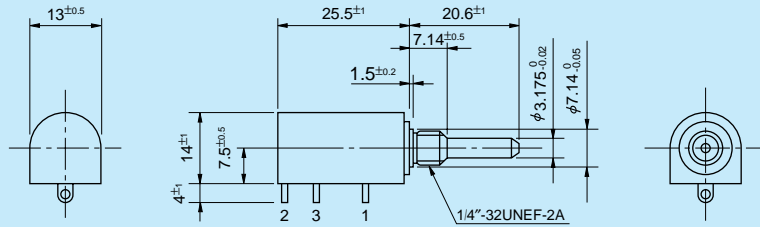
(Bushingmount)

(with inch dimensions)



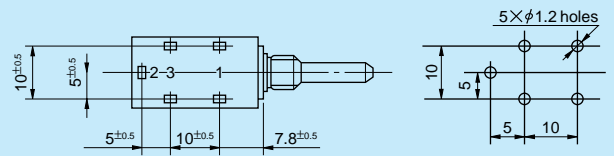
●Standard Dimensions

●With lug terminals

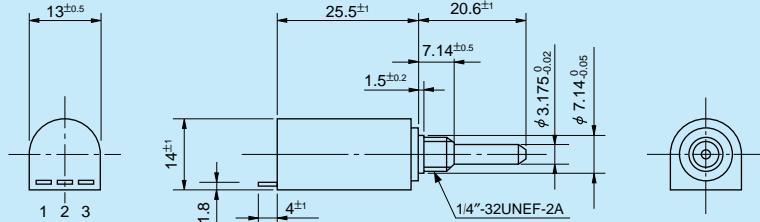


●With pin terminals for p.c. board

Terminal Holes Layout



●With rear lug terminals



- Note: 1. 1 pc. each inner teeth washer and hex nut are attached.
- 2. Outer dimensions of 5-turn version are same as those of 10-turn.
- 3. Please process the mounting hole on the panel to be mounted with this potentiometer by the diameter of $7.14\text{mm}^{+0.05}_0$.

●Standard Model Nos.

Bushingmount type:

With lug terminals:

12HPC-5E (5-turn)

12HPC-10E (10-turn)

With pin terminals for p.c. board:

12HPC-5EP (5-turn)

12HPC-10EP (10-turn)

With rear lug terminals:

12HPC-5EW (5-turn)

12HPC-10EW (10-turn)

●General Specifications

Standard Resistance

Range: 100Ω to 50kΩ (5-turn)
100Ω to 100kΩ (10-turn)

Total Resistance

Tolerance: Standard Class ±3% (H)
Precision Class ±1% (F)

Independent Linearity

Tolerance:

	5-turn	10-turn
Standard Class	±0.35%	±0.25%
Precision Class	±0.2%	±0.1%
(Below 5kΩ)	(±0.25%)	(±0.15%)

Power Rating:

0.75W (5-turn)

1.5W (10-turn)

Noise:

Below 100Ω E.N.R.

Electrical Travel:

360°×n ±5° (n: No. of turns)

Mechanical Travel:

360°×n $\begin{matrix} +15^\circ \\ 0^\circ \end{matrix}$ (n: No. of turns)

Insulation Resistance: Over 1,000MΩ at 500V.D.C.

Dielectric Strength: 1 minute at 1,000V.A.C.

Starting Torque: Below 3mN·m (30gf·cm)

Stopper Strength: Approx. 0.15N·m (1.5kgf·cm)

Max. Torque exerted

on fastening the

mounting nut to the

bushing:

Below 0.8N·m (8kgf·cm)

Max. Working Voltage: 450V

Resist. Temperature

Coefficient of Wire: ±20p.p.m./°C

Mass: Approx. 10g

(Both 5-turn and 10-turn)

●Standard Resistance Values ■No. of Wire Turns ■Resistance Wire Used

Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k
12HPC-5E	920	1,190	1,250	1,510	1,790	2,380	3,120	3,800	5,430	—
12HPC-10E	1,690	1,850	2,560	2,500	3,030	4,170	4,760	6,250	8,330	10,870
Resist. Wire Used	Cu-Ni System					Ni-Cr System				

●Special Specifications Available

3-turn type (S12HPC-3E), Lower resistance values (20Ω, 50Ω), Shaft with front and rear extension (Rear shaft with 0.8mm dia. and 10mm length), Special machining on the shaft, Simple sealed housing.



Model 20HP-10S

● Standard Model Nos.

Bushingmount type:

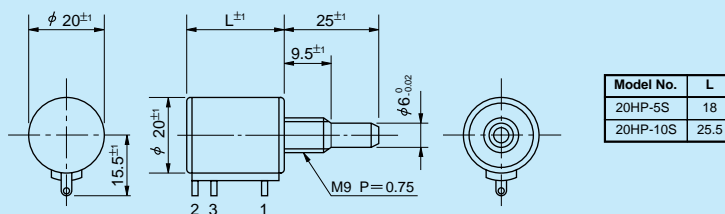
- 20HP-5S (5-turn)
- 20HP-10S (10-turn)

Servomount type:

- 20HPS-5S (5-turn)
- 20HPS-10S (10-turn)

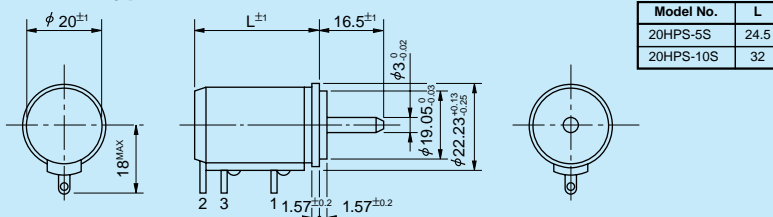
● Standard Dimensions

■ Bushingmount type



Note: 1 pc. inner teeth washer and 2 pcs. hex nuts are attached.

■ Servomount type



● General Specifications

Standard Resistance

Range: 100Ω to 50kΩ (5-turn)
100Ω to 100kΩ (10-turn)

Max. Practical

Resistance Value: 100kΩ (5-turn)
150kΩ (10-turn)

Total Resistance

Tolerance: Standard Class ±3% (H)
Precision Class ±1% (F)

Independent Linearity

Tolerance: 5-turn 10-turn
Standard Class ±0.3% ±0.2%
Precision Class ±0.2% ±0.1%
(Below 5kΩ) (±0.25%) (±0.15%)

Power Rating:

1.0W (5-turn)
2.0W (10-turn)

Noise:

Below 100Ω E.N.R.

Electrical Travel:

360°×n ±5°(n: No. of turns)

Mechanical Travel:

360°×n +10°_{0°}(n: No. of turns)

Insulation Resistance:

Over 100MΩ at 1,000V.D.C.

Dielectric Strength:

1 minute at 1,000V.A.C.

Starting Torque:

Below 5mN·m (50gf·cm)
(Bushingmount type)
Below 3mN·m (30gf·cm)
(Servomount type)

Stopper Strength:

Approx. 0.9N·m (9kgf·cm)
(Bushingmount type)
Approx. 0.6N·m (6kgf·cm)
(Servomount type)

Max. Working Voltage:

900V

Resist. Temperature

Coefficient of Wire:

±20p.p.m./°C

Mass:

Approx. 25g (5-turn)
Approx. 30g (10-turn)

● Standard Resistance Values ■ No. of Wire Turns ■ Resistance Wire Used

Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k
20HP-5S	1,100	1,500	2,000	2,500	2,400	3,200	3,900	4,800	5,500	※ 6,500
20HP-10S	1,800	2,200	3,200	4,000	5,000	5,000	6,400	7,800	10,000	11,000
Resist. Wire Used	Cu-Ni System					Ni-Cr System				

Note: Mark ※ shows values at special higher practical resistance.

● Special Specifications Available

3-turn type (S20HP-3S), Lower resistance values (10Ω, 20Ω, 50Ω), Extra taps (Available up to 1 tap), Multi-ganged (Available up to 2 gangs), Shaft with front and rear extension (Rear shaft with 2mm dia. and 10mm length), Shaft dia. (Ø6.35mm)*bushing with inch dimensions, Special machining on the shaft, Simple sealed housing (except servomount type), Slipping-clutch incorporated type (S20HP-10S-1782), With a limit-switch adaptor, With pin terminals for p.c. board (20HP-5P, 20HP-10P).

Wirewound

MODEL 22HP

(Bushingmount)



●Standard Dimensions

Model No.	Shaft Dimensions		Mounting Screw	Anti-rotation
	d1	L		
22HP-10	∅6	20.6	3/8-32UNEF	Yes
22HP-10M	∅6	25.0	M9 P=0.75	No
22HP-10E	∅6.35	20.6	3/8-32UNEF	Yes
22HP-10N	∅6	20.6	M9 P=0.75	No

Note: 1. 1 pc. each inner teeth washer and hex nut are attached.
2. Outer dimensions of 5-turn version are same as those of 10-turn.
3. Housing length of 2 ganged version is extended by 19mm.
4. Please process the mounting hole on the panel to be mounted with this potentiometer by the diameter of 10.32mm_{+0.05}.

●Standard Model Nos.

5-turn models:

- 22HP-5 22HP-5M
- 22HP-5E 22HP-5N

10-turn models:

- 22HP-10 22HP-10M
- 22HP-10E 22HP-10N

Note: Please select the exact model number from the right-side table, because each model number has different shaft dia. and bushing dimensions.

●General Specifications

Standard Resistance

Range: 100Ω to 50kΩ (5-turn)
100Ω to 100kΩ (10-turn)

Total Resistance

Tolerance: Standard Class ±5% (J)
Precision Class ±1% (F)

Independent Linearity

Tolerance:

	5-turn	10-turn
Standard Class	±0.3%	±0.25%
Precision Class	±0.2%	±0.1%
(Below 5kΩ)	(±0.25%)	(±0.15%)

Power Rating:

1.0W (5-turn)
2.0W (10-turn)

Noise:

Below 100Ω E.N.R.

Electrical Travel:

360°×n ±5°(n: No. of turns)

Mechanical Travel:

360°×n $\begin{matrix} +10^\circ \\ 0^\circ \end{matrix}$ (n: No. of turns)

Insulation Resistance:

Over 1,000MΩ at 500V.D.C.

Dielectric Strength:

1 minute at 1,000V.A.C.

Starting Torque:

Below 10mN·m (100gf·cm)

Stopper Strength:

Approx. 0.35N·m (3.5kgf·cm)

Max. Torque exerted on fastening the mounting nut to the bushing:

Below 1.0N·m (10kgf·cm)
(In case of panel thickness with over 2.5mm., the rotating torque may become heavier.)

Max. Working Voltage: 250V

Resist. Temperature

Coefficient of Wire: ±20p.p.m./°C

Materials:

Shaft: Stainless steel
Housing case: Glass-filled nylon
Bushing: Glass-filled nylon
(For ganged version, the bushing is metal-brass without plating.)
Terminals: Gold-plated brass
(All terminals can be fitted with the AMP 110 series faston receptacle (2.8×0.5mm) or equivalents.)

Mass:

Approx. 20g (Both 5-turn and 10-turn)

●Standard Resistance Values ■No. of Wire Turns ■Resistance Wire Used

Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k
22HP-5	1,240	1,560	2,000	2,510	2,400	3,200	3,900	4,800	5,500	—
22HP-10	2,100	2,480	3,300	4,000	5,020	5,000	6,400	7,800	10,100	11,000
Resist. Wire Used	Cu-Ni System					Ni-Cr System				

●Special Specifications Available

Shaft with front and rear extension (Rear shaft with 6mm dia. and 15mm length), Multi-ganged (Available up to 10 gangs), With high torque, Special shaft dia. (∅3mm, ∅3.175mm, ∅4mm, ∅5mm), Special machining on the shaft, With plastic shaft, Metal bushing type (22HPM-n with anti-rotation pin), 1, 2, 3, 4, 6, 7 and 8-turn versions are available (These versions have same outer dimensions, but general specifications are please request us for details), Simple sealed housing, Slipping-clutch incorporated type, Extra taps (Available up to 1 tap only for 10-turn model), Servomount type (Same dimensions as 22HHPS-10).



Model 25HP-10E

● Standard Model Nos.

Bushingsmount type:

- 25HP-5 (B ~ E) (5-turn)
- 25HP-10 (B ~ E) (10-turn)

{ Note: Our standard shaft designation is B, unless otherwise specified. }

Servomount type:

- 25HPS-5 (5-turn)
- 25HPS-10 (10-turn)

● General Specifications

Standard Resistance

Range: 100Ω to 50kΩ (5-turn)
100Ω to 100kΩ (10-turn)

Max. Practical

Resistance Value: 100kΩ (5-turn)
200kΩ (10-turn)

Total Resistance

Tolerance: Standard Class ±3% (H)
Precision Class ±1% (F)

Independent Linearity

Tolerance:

	5-turn	10-turn
Standard Class	±0.3%	±0.2%
Precision Class	±0.2%	±0.1%
(Below 5kΩ)	(±0.25%)	(±0.15%)

Power Rating:

1.5W (5-turn)
2.0W (10-turn)

Noise:

Below 100Ω E.N.R.

Electrical Travel:

360°×n ±5° (n: No. of turns)

Mechanical Travel:

360°×n +10°
0° (n: No. of turns)

Insulation Resistance:

Over 100 MΩ at 1,000V.D.C.

Dielectric Strength:

1 minute at 1,000V.A.C.

Starting Torque:

Below 8mN·m (80gf·cm)
(Bushingsmount type)
Below 5mN·m (50gf·cm)
(Servomount type)

Stopper Strength:

Approx. 0.9N·m (9kgf·cm)

Max. Working

Voltage:

900V

Resist. Temperature

Coefficient of Wire:

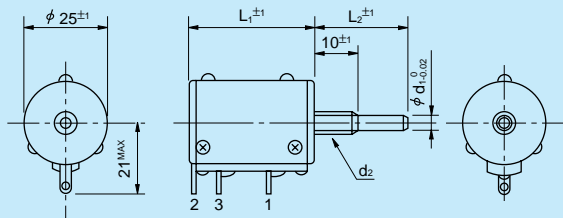
±20p.p.m./°C

Mass:

Approx. 50g (5-turn)
Approx. 60g (10-turn)

● Standard Dimensions

■ Bushingsmount type

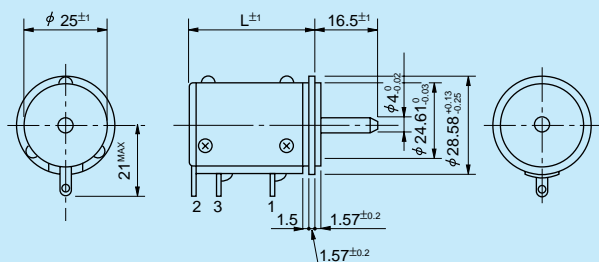


Model No.	L1
25HP-5	29
25HP-10	37.5

Shaft Designation	Shaft Dimensions		Mounting Screw
	d1	L2	
B	∅4	25	M7 P=0.75
C	∅6	28	M9 P=0.75
D	∅6	18.5	M9 P=0.75
E	∅6	25	M9 P=0.75

Note: 1. Unless otherwise specified our standard shaft designation is B.
2. 1 pc. inner teeth washer and 2 pcs. hex nuts are attached.

■ Servomount type



Model No.	L
25HPS-5	30.5
25HPS-10	39

● Standard Resistance Values ■ No. of Wire Turns ■ Resistance Wire Used

Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k	200k
25HP-5	1,300	1,700	2,000	2,400	2,500	3,200	4,000	5,000	7,000	* 8,800	—
25HP-10	2,000	2,600	3,100	4,000	4,800	5,000	6,500	8,000	10,000	14,000	* 18,000
Resist. Wire Used	Cu-Ni System						Ni-Cr System				

Note: Mark * shows values at special higher practical resistance.

● Special Specifications Available

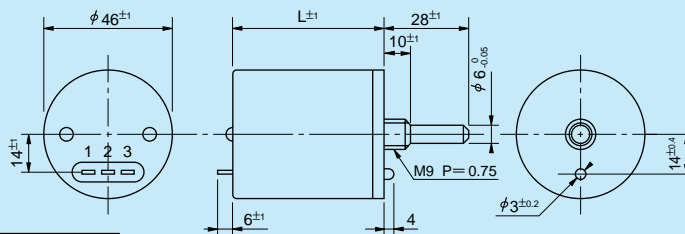
Lower resistance (10Ω, 20Ω, 50Ω), 3-turn type (S25HP-3), 15-turn type (S25HP-15), 20-turn type (S25HP-20), Extra taps (Available up to 5 taps), Multi-ganged (Available up to 2 gangs), Shaft with front and rear extension (Rear shaft with 3mm dia. and 10mm length), Shaft dia.(3.175mm,∅6.35mm)•bushing with inch dimensions, With a limit-switch adaptor, Special machining on the shaft.



Model 46HD-10

● Standard Dimensions

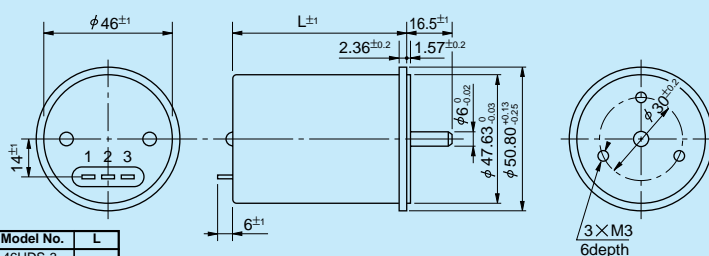
■ Bushingsmount type



Model No.	L
46HD-3	38.5
46HD-5	56
46HD-10	75
46HD-15	94.5

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 9.0mm +0.05.

■ Servomount type



Model No.	L
46HDS-3	43.5
46HDS-5	61.5
46HDS-10	80
46HDS-15	100

● Standard Model Nos.

Bushingsmount type:

- 46HD-3 (3-turn)
- 46HD-5 (5-turn)
- 46HD-10 (10-turn)
- 46HD-15 (15-turn)
- 46HD-20 (20-turn)

Servomount type:

- 46HDS-3 (3-turn)
- 46HDS-5 (5-turn)
- 46HDS-10 (10-turn)
- 46HDS-15 (15-turn)
- 46HDS-20 (20-turn)

● General Specifications

Standard Resistance Range:

- 0.5Ω to 20kΩ (3-turn)
- 0.5Ω to 50kΩ (5-turn)
- 0.5Ω to 100kΩ (10,15-turn)
- 0.5Ω to 200kΩ (20-turn)

Max. Practical Resistance Value:

- 50kΩ, 100kΩ (3-turn)
- 100kΩ (5-turn)
- 200kΩ (10,15-turn)
- 500kΩ (20-turn)

Total Resistance Tolerance:

- Standard Class ±3% (H)
- [±5% (J) in case of below 1kΩ
- Precision Class ±1% (F)]
- [in the pot. with a single-wire resistive element, the precision class should read ±2% (G)]

Independent Linearity Tolerance:

- | | | |
|-----------------|----------|----------|
| | 3, | 10, 15, |
| | 5-turn | 20-turn |
| Standard Class | ±0.4% | ±0.3% |
| Precision Class | ±0.2% | ±0.1% |
| (Below 5kΩ) | (±0.25%) | (±0.15%) |

Power Rating:

- 2.0W (3-turn)
- 2.5W (5-turn)
- 5.0W (10-turn)
- 7.5W (15-turn)
- 10.0W (20-turn)

Noise:

Below 100Ω E.N.R.

Electrical Travel:

360°×n ±5°(n: No. of turns)

Mechanical Travel:

360°×n +10°
0°(n: No. of turns)

Insulation Resistance:

Over 100MΩ at 1,000V.D.C.

Dielectric Strength:

1 minute at 1,000V.A.C.

Starting Torque:

Below 20mN·m (200gf·cm)
(Bushingsmount type)
Below 10mN·m (100gf·cm)
(Servomount type)

Stopper Strength:

Approx. 0.9N·m (9kgf·cm)

Max. Working Voltage:

900V

Resist. Temperature Coefficient of Wire:

±20p.p.m./°C

Mass:

- Approx. 90g (3,5-turn)
- Approx. 120g (10-turn)
- Approx. 150g (15-turn)
- Approx. 180g (20-turn)

● Special Specifications Available

30-turn type (S46HD-30), Multi-ganged, (Available up 2 gangs), With limit-switches, Shaft with front and rear extension (in case of bushingsmount type, rear shaft with 6mm dia. and 28mm length together with the bushing of M9 × 10mm and in case of servomount type, rear shaft with 6mm dia. and 15mm length), Shaft dia. (∅6.35mm)•bushing with inch dimensions, Simple sealed housing, Oil-filled type (OF46HD), Special machining on the shaft.

● Standard Resistance Values ■ No. of Wire Turns ■ Resistance Wire Used

Resist. Value (Ω)	0.5	1	2	5	10	20	50	100	200	500
46HD-3	※	※	※	※	556	690	950	1,190	1,515	2,080
46HD-5	※	※	※	※	※	925	1,275	1,640	2,080	2,860
46HD-10	※	※	※	※	※	※	2,000	2,500	3,180	4,350
46HD-15	※	※	※	※	※	※	2,530	3,220	4,160	5,710
46HD-20	※	※	※	※	※	※	3,030	3,920	5,120	7,140
Resist. Wire Used	Cu-Ni System									

Resist. Value (Ω)	1k	2k	5k	10k	20k	50k	100k	200k	500k	
46HD-3	2,550	2,330	3,225	4,080	5,130	6,890 *	8,330 *	—	—	
46HD-5	3,450	3,230	4,170	5,720	7,410	11,000	12,500 *	—	—	
46HD-10	5,400	6,850	6,600	8,550	10,850	14,900	18,850	24,390 *	—	
46HD-15	7,410	9,510	8,800	11,300	14,500	20,000	25,600	32,250 *	—	
46HD-20	9,300	11,900	14,100	13,150	16,950	23,250	30,790	38,200	55,550 *	
Resist. Wire Used	Cu-Ni System				Ni-Cr System					

Note: Mark ※ shows the pot. with a single-wire resistive element, which gives an essentially infinite resolution.

Mark * shows values at special higher practical resistance.

S46HD Series with LIMIT-SWITCHES

Special 46HD Series Helicalohm potentiometer with incorporated Limit-Switch can automatically control the circuit. It can conveniently be used for minifying the instrument in which this model is employed.

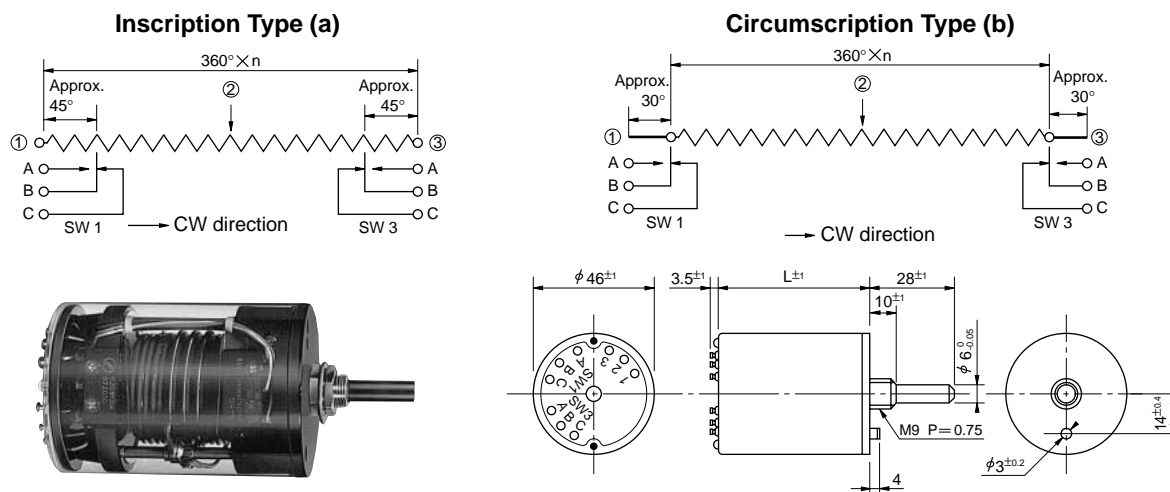
The construction of the Limit-Switch is given in the below figure and its function limit, either upper or lower, or to either side, can be freely determined according to customer's requirement.

Its capacity is 5 A, 125V.A.C. (or 2.5A, 250V.A.C.)

This model is most recommended to all kinds of automatic control equipment.

Note. Functioning position of Limit-Switch...

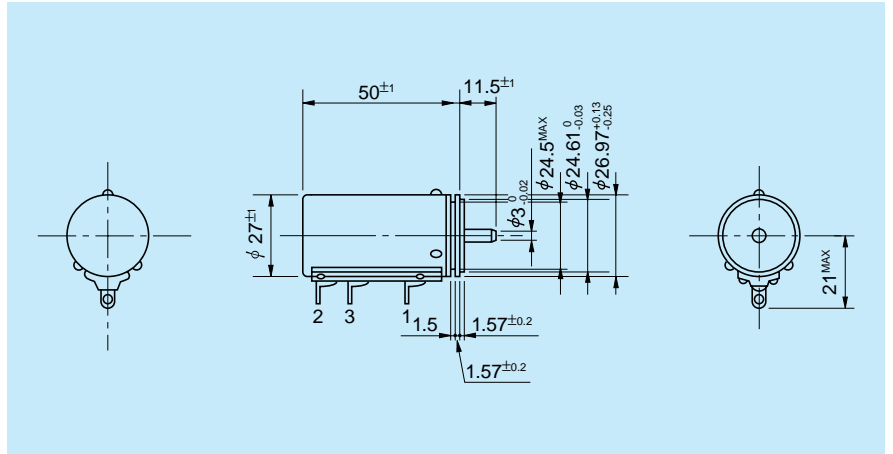
In case of this model being coupled to servo-motor, an over-rotation of the servo-motor due to its inertia, after the power source being OFF, may sometimes break the Helicalohm Pot. unless an adequate precaution is made. In order to avoid such failure, two kinds of the Helicalohm Potentiometer with limit-switch are offered: one is an inscription type (a) limit-switch having its function position slightly this side from the stopper of Helicalohm Pot. and the other is a circumscription type (b) for which a special overtravel is prepared in the Helicalohm Pot.



N.B.: Unless otherwise specified, we will supply the circumscription type (b).

- Outer dimensions of these special versions are the same as those of standard model 46HD Series except its body length which is longer than the latter by 28 mm.
- Electrical and mechanical specifications and mounting dimensions are also the same as those of standard model 46HD series.
- As for smaller multi-turn potentiometer with limit-switches, please see page 47.

●Standard Dimensions



●General Specifications

Standard Resistance Range: 2kΩ to 50kΩ

Total Resistance Tolerance: Standard Class ±3% (H)
Precision Class ±1% (F)

Independent Linearity Tolerance: Standard Class ±0.05%
Precision Class ±0.025%

Power Rating: 2.0W

Noise: Below 100Ω E.N.R.

Electrical Travel: 3,600°^{+5°}_{0°}

Mechanical Travel: 3,600°^{+20°}_{0°}

Insulation Resistance: Over 100MΩ at 500V.D.C.

Dielectric Strength: 1 minute at 500V.A.C.

Starting Torque: Below 5mN•m (50gf•cm)

Stopper Strength: Approx. 0.9N•m (9kgf•cm)

Max. Working Voltage: 250V

Resist. Temperature Coefficient of Wire: ±20p.p.m./°C

Mass: Approx. 55g

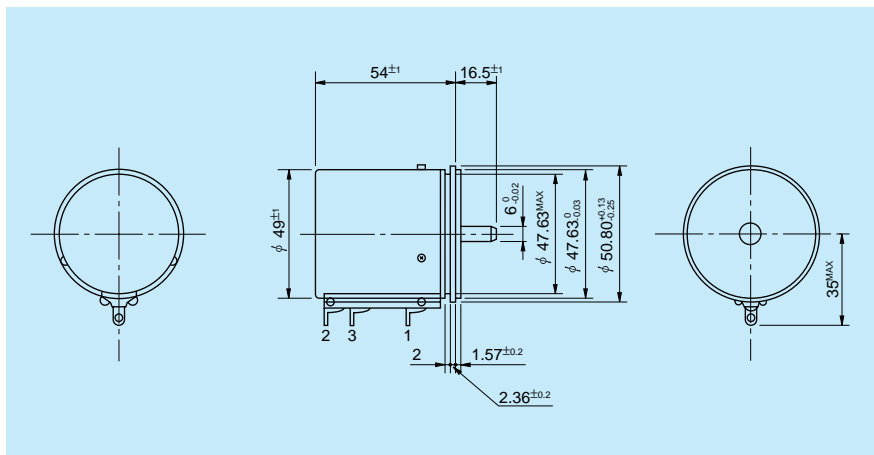
●Standard Resistance Values ■No. of Wire Turns ■Resistance Wire Used

Resist. Value (Ω)	2k	5k	10k	20k	50k
No. of Wire Turns	5,260	7,140	9,090	11,630	16,130
Resist. Wire Used	Ni-Cr System				

●Special Specifications Available

Shaft with front and rear extension (Rear shaft with 3mm dia. and 10mm length), Special machining on the shaft.

● Standard Dimensions



● General Specifications

Standard Resistance

Range: 5kΩ to 100kΩ

Total Resistance

Tolerance: Standard Class ±3% (H)
Precision Class ±1% (F)

Independent Linearity

Tolerance: Standard Class ±0.02%
Precision Class ±0.01%

Power Rating:

5.0W

Noise:

Below 100Ω E.N.R.

Electrical Travel:

3,600° +3°
0°

Mechanical Travel:

3,600° +10°
0°

Insulation Resistance: Over 100MΩ at 1,000V.D.C.

Dielectric Strength: 1 minute at 1,000V.A.C.

Starting Torque: Below 10mN·m (100gf·cm)

Stopper Strength: Approx. 1.5N·m (15kgf·cm)

Max. Working Voltage: 500V

Resist. Temperature

Coefficient of Wire: ±20p.p.m./°C

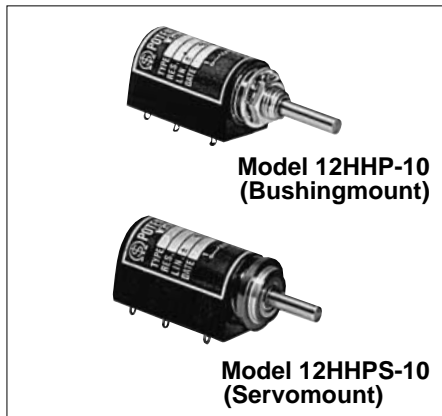
Mass: Approx. 200g

● Standard Resistance Values ■ No. of Wire Turns ■ Resistance Wire Used

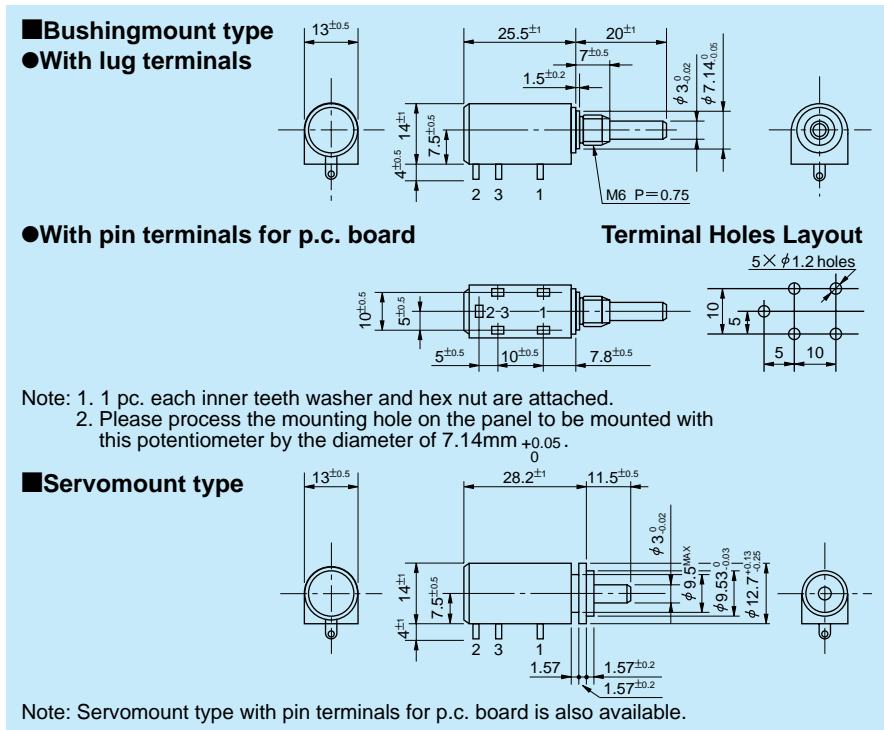
Resist. Value (Ω)	5k	10k	20k	50k	100k
No. of Wire Turns	11,630	14,700	18,520	25,640	32,260
Resist. Wire Used	Ni-Cr System				

● Special Specifications Available

Extra taps (Available up to 1 tap), Shaft with front and rear extension (Rear shaft with 6mm dia. and 15mm length), Special machining on the shaft.



●Standard Dimensions



●Standard Model Nos.

Bushingmount type:

- With lug terminals: 12HHP-10
- With pin terminals for p.c. board: 12HHP-10P

Servomount type:

- 12HHP-10

●General Specifications

Standard Resistance Values:	1k, 2k, 5k, 10k, 20k, 50k (Ω)
Max. Practical Resistance Value:	100kΩ
Total Resistance Tolerance:	Standard Class ±10% (K) Precision Class ±5% (J)
Independent Linearity Tolerance:	Standard Class ±0.4% Precision Class ±0.1% (±0.2% in case of below 5kΩ)
Resolution:	Essentially infinite
Output Smoothness:	Below 0.05% against input voltage
Contact Resistance Variation:	Below 5% C.R.V.
Power Rating:	1.0W
Electrical Travel:	3,600° ±5°
Mechanical Travel:	3,600° +15° 0°

Insulation Resistance:	Over 1,000MΩ at 500V.D.C.
Dielectric Strength:	1 minute at 1,000V.A.C.
Starting Torque:	Below 3mN•m (30gf•cm) (Bushingmount type) Below 2mN•m (20gf•cm) (Servomount type)
Stopper Strength:	Approx. 0.15N•m (1.5kgf•cm)
Max. Torque exerted on fastening the mounting nut to the bushing:	Below 0.8mN•m (8kgf•cm)
Max. Working Voltage:	450V
Resistance Temperature Coefficient:	±100p.p.m./°C
Mass:	Approx. 10g

●Special Specifications Available

5-turn type (S12HHP-5), Shaft with front and rear extension (Rear shaft with 0.8mm dia. and 10mm length), Special machining on the shaft, Simple sealed housing (in case of servomount type, the housing length becomes longer by 1.5mm.).

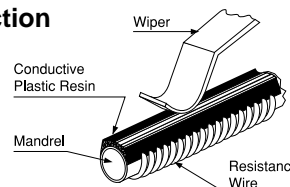
Features of Hybrid resistive element

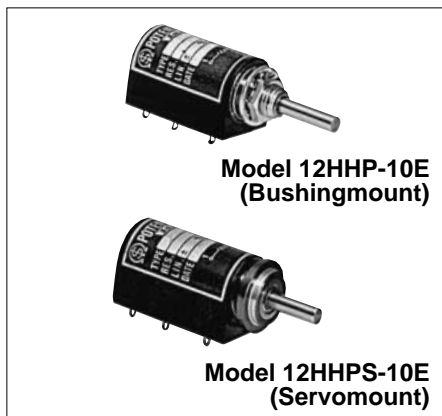
The hybrid resistive element type potentiometer is the newest type potentiometer, in which the merits of a wirewound resistive element are combined with those of a film type resistive element.

■Main Features

- Good stability of resistance value
- Good resistance temperature coefficient
- Essentially infinite resolution
- Less resistance variation
- Long life expectancy 10,000,000 shaft revolutions

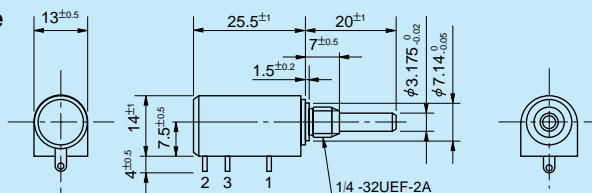
■Construction





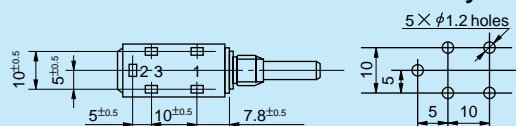
● Standard Dimensions

■ Bushingmount type
● With lug terminals



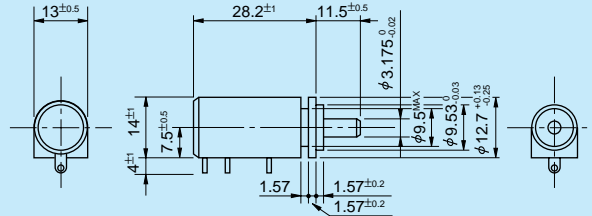
● With pin terminals for p.c. board

Terminal Holes Layout



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 7.14mm +0.05.

■ Servomount type



Note: Servomount type with pin terminals for p.c. board is also available.

● Standard Model Nos.

Bushingmount type:

With lug terminals:

12HHP-10E

With pin terminals for p.c. board:

12HHP-10EP

Servomount type:

12HHPS-10E

● General Specifications

Standard Resistance

Values: 1k, 2k, 5k, 10k, 20k, 50k (Ω)

Max. Practical

Resistance Value: 100kΩ

Total Resistance

Tolerance: Standard Class ±10% (K)
Precision Class ±5% (J)

Independent Linearity

Tolerance: Standard Class ±0.4%
Precision Class ±0.1%
(±0.2% in case of below 5kΩ)

Resolution:

Essentially infinite

Output Smoothness:

Below 0.05% against input voltage

Contact Resistance

Variation: Below 5% C.R.V.

Power Rating:

1.0W

Electrical Travel:

3,600° ±5°

Mechanical Travel:

3,600° +15°
0°

Insulation Resistance: Over 1,000MΩ at 500V.D.C.

Dielectric Strength: 1 minute at 1,000V.A.C.

Starting Torque: Below 3mN•m (30gf•cm)
(Bushingmount type)
Below 2mN•m (20gf•cm)
(Servomount type)

Stopper Strength: Approx. 0.15N•m (1.5kgf•cm)

Max. Torque exerted

on fastening the mounting nut to the bushing: Below 0.8mN•m (8kgf•cm)

Max. Working Voltage: 450V

Resistance

Temperature

Coefficient: ±100p.p.m./°C

Mass:

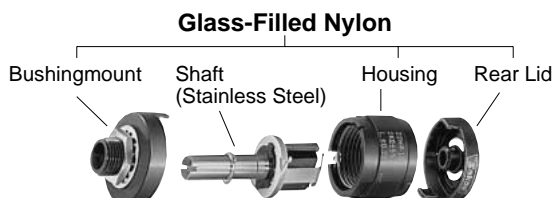
Approx. 10g

● Special Specifications Available

5-turn type (S12HHP-5E), Shaft with front and rear extension (Rear shaft with 0.8mm dia. and 10mm length), Special machining on the shaft, Simple sealed housing (in case of servomount type, the housing length becomes longer by 1.5mm.).

The World's Newest Snapping-in Construction in Model 22HP series

(PAT.)



By using most modern plastic engineering technology as well as our patented designs, number of parts can be reduced steeply by about 50% almost without any degradation in all performances and by that means, the total cost-down by 30 to 50% is achieved in comparison with similar multi-turn potentiometers of the same diameter.



Model 20HHP-10S
(Servomount)

● Standard Model Nos.

Bushingsmount type:

- 20HHP-5S (5-turn)
- 20HHP-10S (10-turn)

Servomount type:

- 20HHP-5S (5-turn)
- 20HHP-10S (10-turn)

● General Specifications

Standard Resistance

Values: 1k,2k,5k,10k,20k,50k (Ω) (5-turn)
2k,5k,10k,20k,50k,100k (Ω)(10-turn)

Total Resistance

Tolerance: Standard Class ±10% (K)
Precision Class ±5% (J)

Independent Linearity

Tolerance:

	5-turn	10-turn
Standard Class	±0.35%	±0.25%
Precision Class	±0.2%	±0.1%

Resolution:

Essentially infinite

Output Smoothness:

Below 0.05% against input voltage (5-turn)
Below 0.015% against input voltage (10-turn)

Contact Resistance

Variation: Below 5% C.R.V. (5-turn)
Below 3% C.R.V. (10-turn)

Power Rating:

1.0W (5-turn)
2.0W (10-turn)

Electrical Travel:

360°×n ±5°(n: No. of turns)

Mechanical Travel:

360°×n +10°₀(n: No. of turns)

Insulation Resistance:

Over 100MΩ at 1,000V.D.C.

Dielectric Strength:

1 minute at 1,000V.A.C.

Starting Torque:

Below 5mN·m (50gf·cm) (Bushingsmount type)
Below 3mN·m (30gf·cm) (Servomount type)

Stopper Strength:

Approx. 0.9N·m (9kgf·cm) (Bushingsmount type)
Approx. 0.6N·m (6kgf·cm) (Servomount type)

Max. Working Voltage: 500V

Resistance

Temperature

Coefficient:

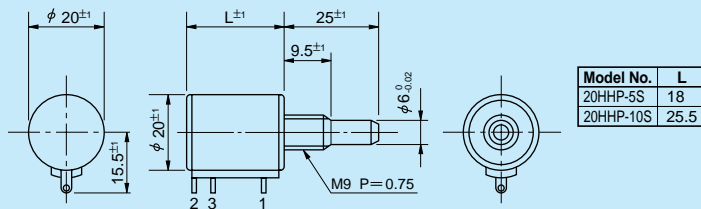
±100p.p.m./°C

Mass:

Approx. 20g (5-turn)
Approx. 25g (10-turn)

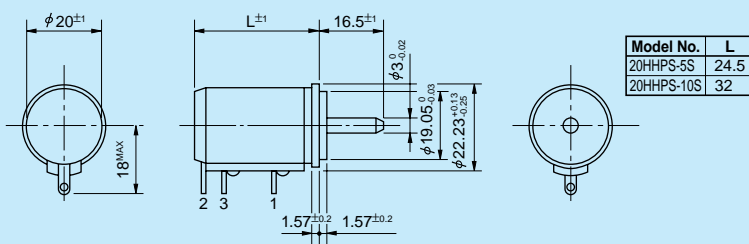
● Standard Dimensions

■ Bushingsmount type



Note: 1 pc. inner teeth washer and 2 pcs. hex nuts are attached.

■ Servomount type

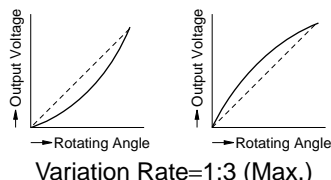


● Special Specifications Available

Extra taps (Available up to 1 tap), Multi-ganged (Available up to 2 gangs), Shaft with front and rear extension (Rear shaft with 2mm dia. and 10mm length), Shaft dia. (Ø6.35mm for 20HHP, Ø3.175mm for 20HHP-5S)•bushing with inch dimensions, Special machining on the shaft, With slipping-clutch, With a limit-switch adaptor, Simple sealed housing (except servomount type).

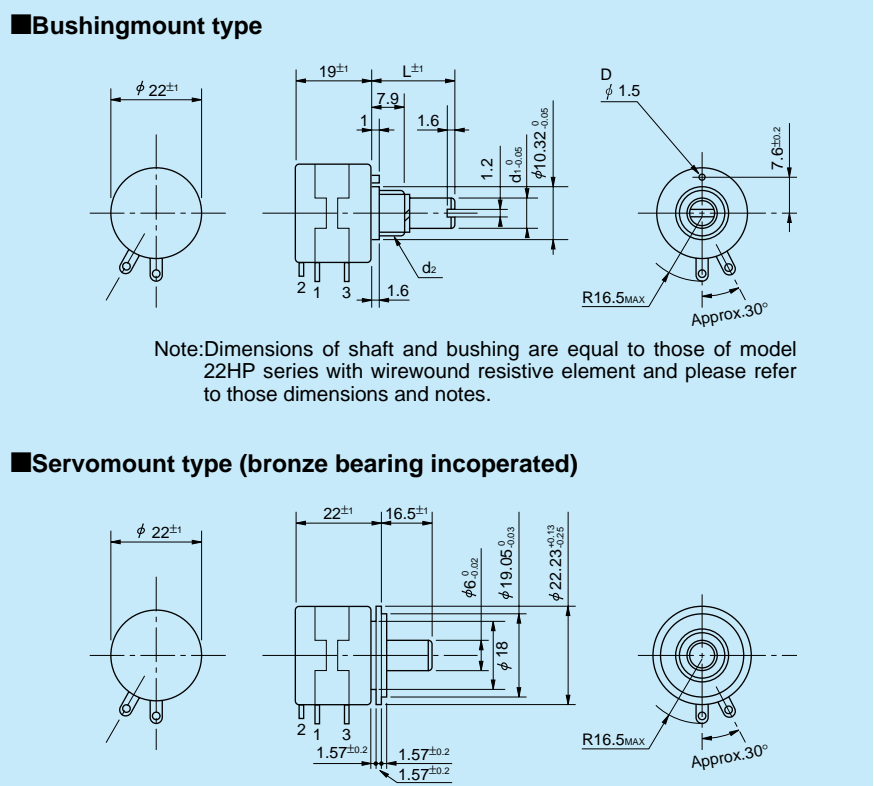
Specialty Ordered Models

Special functions of high accuracy are available for multiturn hybrid potentiometers of models 12HHP and 20HHP series as illustrated on the right hand side and are suitable for load correction circuit or temperature compensation circuit.





● **Standard Dimensions**



● **Standard Model Nos.**

Bushingmount type:

5-turn models:	22HHP-5	22HHP-5M
	22HHP-5E	22HHP-5N
10-turn models:	22HHP-10	22HHP-10M
	22HHP-10E	22HHP-10N

Servomount type:

5-turn models:	22HHP-5
10-turn models:	22HHP-10

Contact Resistance Variation: Below 5% C.R.V. (5-turn)
Below 3% C.R.V. (10-turn)

Power Rating: 1.0W (5-turn)
2.0W (10-turn)

Electrical Travel: 360°×n ±5° (n: No. of turns)

Mechanical Travel: 360°×n +10°₀ (n: No. of turns)

Insulation Resistance: Over 100MΩ at 1,000V.D.C.

Dielectric Strength: 1 minute at 1,000V.A.C.

Starting Torque: Below 5mN·m (50gf·cm)

Stopper Strength: Approx. 0.9N·m (9kgf·cm)

Max. Working Voltage: 500V

Resistance Temperature Coefficient: ±100p.p.m./°C

Max. Torque exerted on fastening the mounting nut to the bushing: Below 1.0N·m (10kgf·cm)
(In case of panel thickness with over 2.5mm., the rotating torque may become heavier.)

Mass: Approx. 20g (Bushingmount)
Approx. 30g (Servomount)
(Both 5-turn and 10-turn)

● **General Specifications**

Standard Resistance Values:

1k,2k,5k,10k,20k,50k (Ω) (5-turn)
2k,5k,10k,20k,50k,100k (Ω)(10-turn)

Total Resistance Tolerance: Standard Class ±10% (K)
Precision Class ±5% (J)

Independent Linearity Tolerance:

	5-turn	10-turn
Standard Class	±0.35%	±0.25%
Precision Class	±0.2%	±0.1%

Resolution: Essentially infinite

Output Smoothness: Below 0.05% against input voltage (5-turn)
Below 0.015% against input voltage (10-turn)

● **Special Specifications Available**

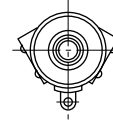
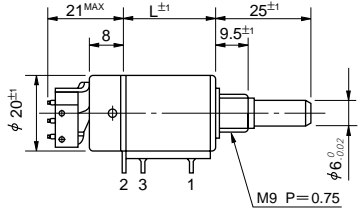
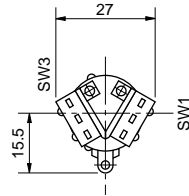
Shaft with front and rear extension (Rear shaft with 6mm dia. and 15mm length), 3-turn type, Multi-ganged (Available up to 10 gangs), With high torque, Special shaft dia. (Ø3mm,Ø3.175mm,Ø4mm,Ø5mm,Ø6.35mm), Special machining on the shaft, With plastic shaft, Metal bushing type (22HHPM with anti-rotation pin), Simple sealed housing, Extra taps (Available up to 1 tap only for 10-turn), Slipping-clutch incorporated type.

Helicalohm Potentiometer with Limit-Switch Adaptor

Miniature limit-switch adaptor type MS can be mounted to Helicalohm Potentiometer, model 20HP, 20HHP and 25HP Series.



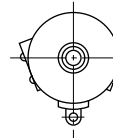
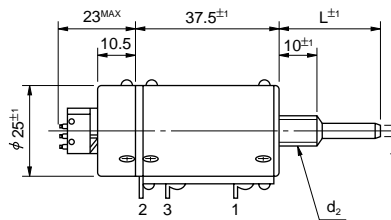
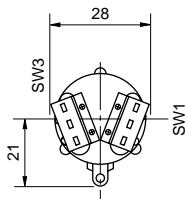
● Model S20HP-nSMS



Model No.	L
S20HP-3SMS	18
S20HP-5SMS	18
S20HP-10SMS	25.5

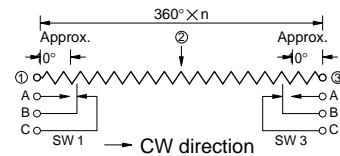


● Model S25HP-nMS



● Functioning position of Limit-Switch

Unless otherwise specified, the limit-switch is of inscription type on both ends.



Shaft Designation	Shaft Dimensions		Mounting Screw
	d ₁	L	d ₂
S25HP-10BMS	φ 4	25	M7 P=0.75
S25HP-10CMS	φ 6	28	M9 P=0.75
S25HP-10DMS	φ 6	18.5	M9 P=0.75
S25HP-10EMS	φ 6	25	M9 P=0.75

- Rating of limit-switch 3A, 125V.A.C. (resistance load)
- Life expectancy of limit-switch: 50,000 operations
- Operating temperature range: -55°C ~ +105°C

NOTE: In case of model 25HP, the limit-switch adaptor for 20-turn is also available as a special version.

SPECIALY ORDERED ITEMS

Model S20HP-10SG



(2-ganged version of 20HP-10S with front and rear shaft extension)

Model S22HPM-10G10



(10-ganged version of 22HP-10)

SPECIALY ORDERED ITEMS

Model S46HP-10



(10-turn Pot. with spring return device and with turning handle.)

Model S46HP-3



(3-turn Pot. with special mounting panel.)

Model S10HP-20



(World's smallest 20-turn Pot.)

Model S12HPS-10-3354

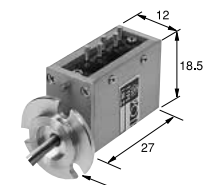


(10-turn Pot. with special round shape housing case and with servomount.)

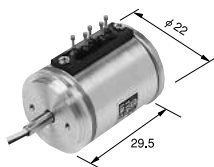
SLIP RINGS : Models RSK12 & RSM22

Features

● Longer life slip rings for micro current use have been recently developed under our unique ideas (Pat. Pend.) basing on our rotating contact technique which comes from our long experience on manufacturing precision potentiometers since 1950.



Model RSK12



Model RSM22

- Excellent tracking ability of high speed.
- Can select from two kinds of square shape and round shape depending on your applications.

Number of Poles : 5 poles
 Allowable Rotating Speed : 1,500 r.p.m.
 Current Capacity : 0.3A
 Starting Torque : Abt.2mN·m(20gf·cm.)
 Contact Resistance : Max.0.3Ω

Rotating Life Expectancy:
 Abt.100,000,000 shaft revolutions.
 Operating Temperature Range : -55℃ ~ +85℃

Applications

Medical instruments, optical instruments, various studio apparatuses, various inspection measuring apparatuses, etc.