



● 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.

● 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	M0 P=0.75	No
22HP-10E	∅6.35	20.6	3/8-32UNEF	Yes
22HP-10N	∅6	20.6	M0 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<sup>+0.05</sup>.

● 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 <sup>+10°</sup>/<sub>0°</sub> (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.)  
 Approx. 20g (Both 5-turn and 10-turn)

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

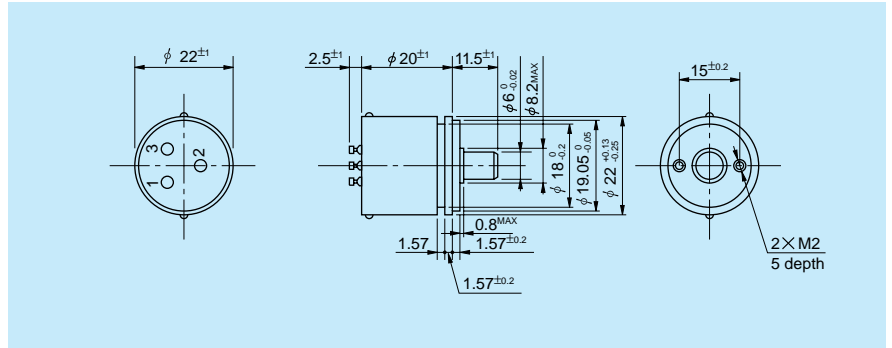
Resist. Value (Ω)	100	200	500	1k	2k	5k	10k	20k	50k	100k
22HP-5	1,240	1,560	2,000	2,510	2,400	3,200	3,900	4,800	5,500	—
22HP-10	2,100	2,480	3,300	4,000	5,020	5,000	6,400	7,800	10,100	11,000
Resist. Wire Used	Cu-Ni System					Ni-Cr System				

● 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).



● Standard Dimensions



● 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 ±1.0% Precision Class ±0.5%
Resolution:	Essentially infinite
Output Smoothness:	Below 0.1% against input voltage

Contact Resistance

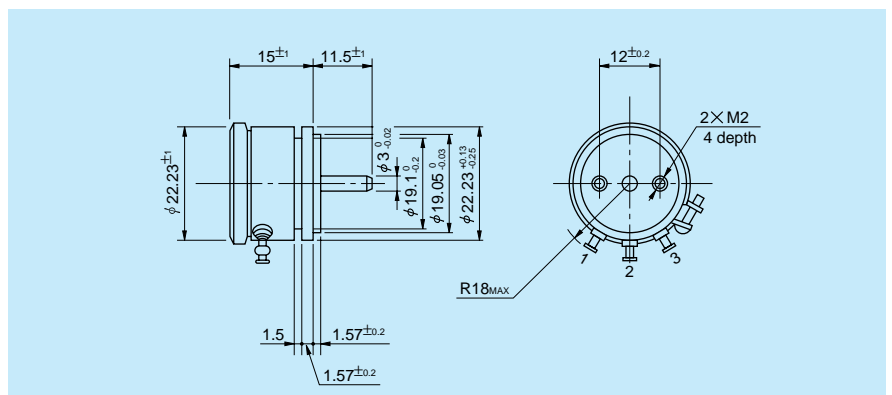
Variation:	Below 2% C.R.V.
Power Rating:	1.0W
Electrical Travel:	320° ±5°
Mechanical Travel:	360° (Endless)
Insulation Resistance:	Over 1,000MΩ at 500V.D.C.
Dielectric Strength:	1 minute at 500V.A.C.
Starting Torque:	Below 5mN•m (50gf•cm)
Resistance Temperature Coefficient:	±400p.p.m./ °C
Mass:	Approx. 30g

● Special Specifications Available

Extra taps (Available up to 1 tap), Shaft with front and rear extension (Rear shaft with 3mm dia. and 20mm length), With stopper (Rotating angle becomes 320° and stopper strength is 0.9N•m [9kgf•cm]), Special electrical travel, Shaft dia. (Ø6.35mm), Special machining on the shaft, With ball bearings incorporated.



● Standard Dimensions



● General Specifications

<b>Standard Resistance Values:</b>	1k, 2k, 5k, 10k (Ω)	<b>Contact Resistance Variation:</b>	Below 3% C.R.V.
<b>Special Practical Resistance Values:</b>	500, 20k, 50k, 100k (Ω)	<b>Power Rating:</b>	0.2W
<b>Total Resistance Tolerance:</b>	Standard Class ±15% (L) Precision Class ±10% (K)	<b>Electrical Travel:</b>	300° ±5°
<b>Independent Linearity Tolerance:</b>	Standard Class ±2.0% Precision Class ±1.0%	<b>Mechanical Travel:</b>	360° (Endless)
<b>Resolution:</b>	Essentially infinite	<b>Insulation Resistance:</b>	Over 1,000MΩ at 500V.D.C.
<b>Output Smoothness:</b>	Below 0.1% against input voltage	<b>Dielectric Strength:</b>	1 minute at 500V.A.C.
		<b>Starting Torque:</b>	Below 1mN•m (10gf•cm)
		<b>Resistance Temperature Coefficient:</b>	±400p.p.m./ °C
		<b>Mass:</b>	Approx. 5g

● Special Specifications Available

Extra taps (Available up to 1 tap), Shaft with front and rear extension (Rear shaft with 1mm dia. and 10mm length), With stopper (Rotating angle becomes 310° and stopper strength is 0.3N•m [3kgf•cm]), Special electrical travel, Shaft dia. (Ø3.175mm)•with inch dimensions, Special machining on the shaft.

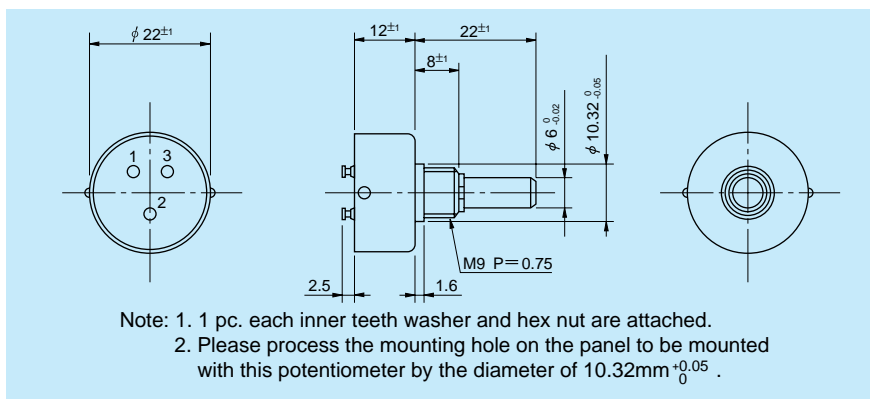
LOW-COST ITEM

Conductive Plastic

MODEL FCP22AC

(Bushingmount)

● Standard Dimensions



● General Specifications

<b>Standard Resistance Values:</b>	1k, 2k, 5k, 10k (Ω)	<b>Contact Resistance Variation:</b>	Below 2% C.R.V.
<b>Special Practical Resistance Values:</b>	500, 20k, 50k, 100k (Ω)	<b>Power Rating:</b>	1.0W
<b>Total Resistance Tolerance:</b>	Standard Class ±15% (L) Precision Class ±10% (K)	<b>Electrical Travel:</b>	320° ±5°
<b>Independent Linearity Tolerance:</b>	Standard Class ±1.5% Precision Class ±1.0%	<b>Mechanical Travel:</b>	360° (Endless)
<b>Resolution:</b>	Essentially infinite	<b>Insulation Resistance:</b>	Over 1,000MΩ at 500V.D.C.
<b>Output Smoothness:</b>	Below 0.1% against input voltage	<b>Dielectric Strength:</b>	1 minute at 500V.A.C.
		<b>Starting Torque:</b>	Below 5mN•m (50gf•cm)
		<b>Resistance Temperature Coefficient:</b>	±400p.p.m./ °C
		<b>Mass:</b>	Approx. 30g

● Special Specifications Available

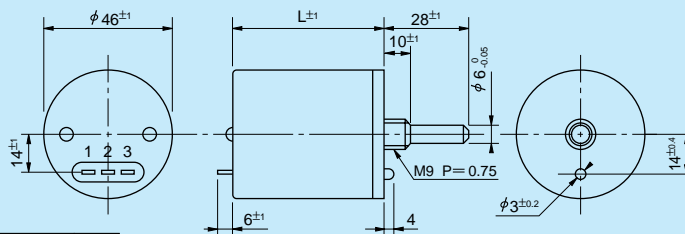
Extra taps (Available up to 1 tap), Shaft with front and rear extension (Rear shaft with 3mm dia. and 20mm length), With stopper (Rotating angle becomes 320° and stopper strength is 0.9N•m [9kgf•cm]), Special electrical travel, Shaft dia. (Ø6.35mm)•bushing with inch dimensions, Special machining on the shaft.



Model 46HD-10

●Standard Dimensions

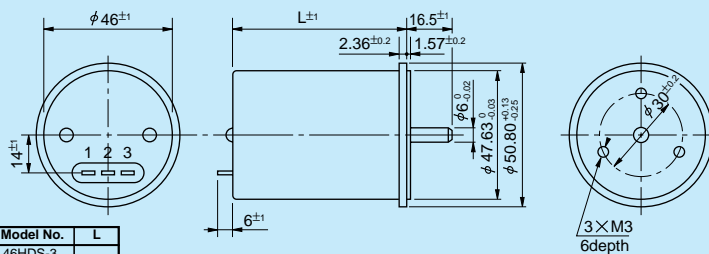
■Bushingsmount type



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.

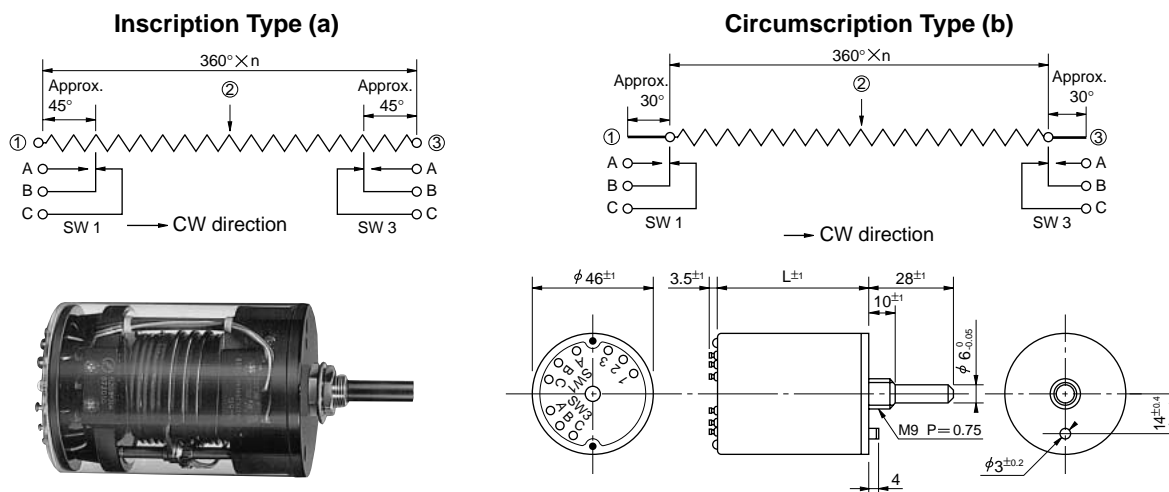
The construction of the Limit-Switch is given in the below figure and its function limit, either upper or lower, or to either side, can be freely determined according to customer's requirement.

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.