



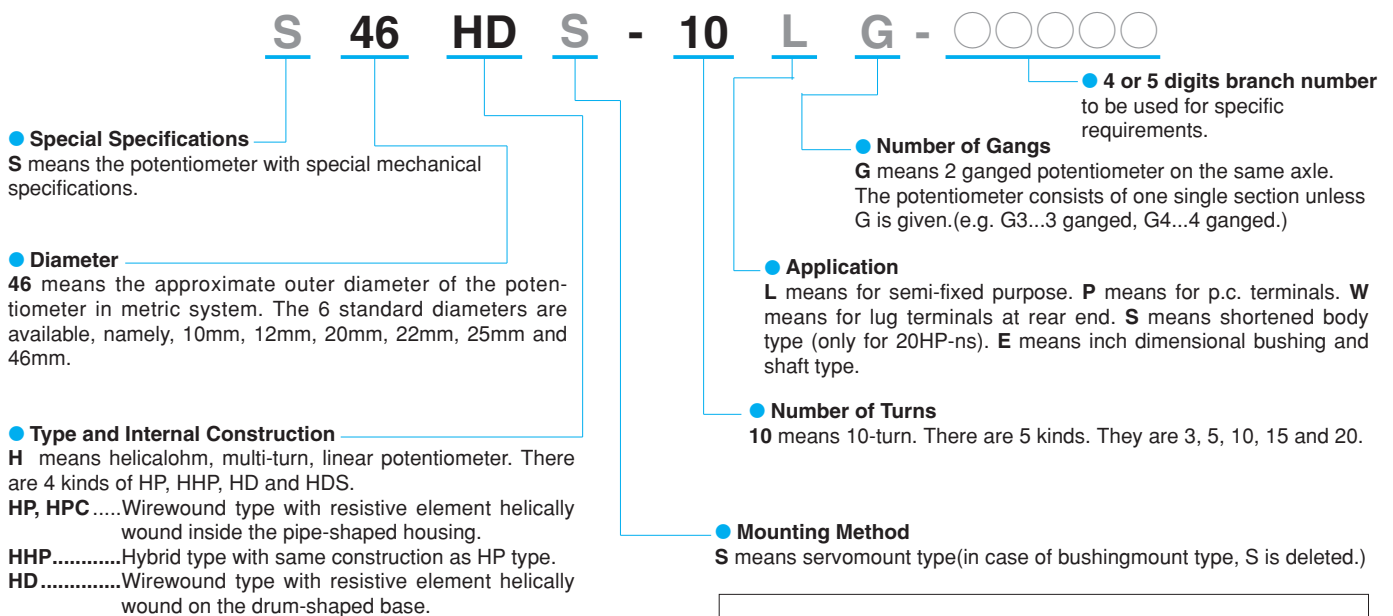
# HELICALOHM<sup>®</sup> MULTI-TURN POTENTIOMETER

(Precision Multi-turn, Wirewound & Hybrid Element)

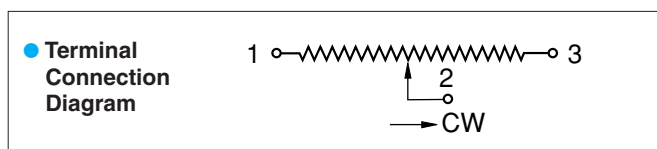
In 1946, we successfully developed the first ever multi-turn precision potentiometer Helicalohm<sup>®</sup>. After several refinements, we came through various precision potentiometers including the world smallest wire-wound potentiometer 10HP-10. (Outer diameter is 10.5mm)  
With superior quality without any peer and high reliability,

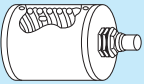
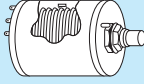
our multi-turn precision potentiometers received very high regards and high evaluations. Subsequently, we expanded to the production of hybrid resistive element which offers both characteristics of high resolution from film resistive element and excellent reliability as well as long life from wire-wound resistive element.

## THE NOMENCLATURE OF SAKAE HELICALOHM POT. SERIES



## SELECTION GUIDE



Internal Construction	Type	Kind of Element	Diameter (mm)	Model No.	Features
Pipe type 	HP	Wirewound	φ 10.5	10HP	World's smallest multi-turn pot. since 1965.
			φ 13	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.
			φ 20	20HP, 20HPS	Precision multi-turn pot. of outer dia. of 20mm. Servomount type is also available.
			φ 22	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.
			φ 25	25HP, 25HPS	Precision multi-turn pot. of outer dia. of 25mm. Various specials based on this item are also available.
	HHP	Hybrid	φ 13	12HHP, 12HHP-P, 12HHPS	World's smallest multi-turn precision hybrid pot. of outer dia. of 13mm. Servomount type is also available.
φ 20			20HHP, 20HHPS	Precision multi-turn hybrid pot. of outer dia. of 20mm. Servomount type is also available.	
φ 22			22HHP, 22HHPS	Low-cost precision multi-turn hybrid pot. of outer dia. of 22mm. Servomount type is also available.	
Drum type 	HD	Wirewound	φ 46	46HD, 46HDS	Traditional item being manufactured continuously over 45 years. Slide wire resistive element type which brings infinite resolution is available as standard version.

## ● 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 ~ 20k	20,50	50k,100k	± 0.25 ~ ± 0.1	—	○	—	—	—	—	—
	12HP	100k ~ 50k	20,50	100k,150k	± 0.25 ~ ± 0.1	○	○	—	○	—	—	○
	12HPC	100 ~ 50k	—	100k	± 0.25 ~ ± 0.1	—	○	—	○	—	—	○
	20HP	100 ~ 50k	10,20,50	100k,150k	± 0.2 ~ ± 0.1	○	○	○	○	○ (with adaptor)	○	○
	22HP	100 ~ 50k	—	100k	± 0.25 ~ ± 0.1	—	○	—	○	—	○	○
	25HP	100 ~ 100k	10,20,50	200k	± 0.2 ~ ± 0.1	○	○	○	—	○ (with adaptor)	○	—
Hybrid	12HHP	2k ~ 50k	—	100k	± 0.4 ~ ± 0.1	○	○	—	○	—	—	○
	20HHP	2k ~ 100k	—	—	± 0.25 ~ ± 0.1	○	○	○	○	○ (with adaptor)	○	○
	22HHP	2k ~ 100k	—	—	± 0.25 ~ ± 0.1	○	○	—	○	—	○	○
Wirewound	46HD	50 ~ 100k	—	200k	± 0.3 ~ ± 0.1	○	○	—	○	○ (with adaptor)	○	—

Note: 1. All values are based on our standard 10-turn models per each series and for further technical details, please see each articles of the models mentioned in this catalog.

## ● Environmental Performances

Model Nos. Parameters	10HP, 12HP, 20HP, 25HP, 46HD	12HPC, 22HP	12HHP, 20HHP (22HHP) ※
<b>Operating Temperature Range</b>	− 55°C ~ + 105°C	− 55°C ~ + 105°C	− 55°C ~ + 105°C
<b>Temperature Cycle</b>	5 cycles under − 55°C ~ + 105°C Total resistance value variation: within ± 5% No mechanical damage	5 cycles under − 55°C ~ + 105°C Total resistance value variation: within ± 5% No mechanical damage	5 cycles under − 55°C ~ + 105°C Total resistance value variation: within ± 5% No mechanical damage
<b>Exposure at Low Temperature</b>	24 hours at − 55°C Total resistance value variation: within ± 5% No mechanical damage	24 hours at − 55°C Total resistance value variation: within ± 5% No mechanical damage	24 hours at − 55°C Total resistance value variation: within ± 5% No mechanical damage
<b>Exposure at High Temperature</b>	1,000 hours at 105°C Total resistance value variation: within ± 5% No mechanical damage	1,000 hours at 105°C Total resistance value variation: within ± 5% No mechanical damage	1,000 hours at 105°C Total resistance value variation: within ± 5% No mechanical damage
<b>Vibration</b>	10Hz to 2,000Hz 147m/s <sup>2</sup> 12 hours Total resistance value variation: within ± 5% No mechanical and electrical damage	10Hz to 2,000Hz 147m/s <sup>2</sup> 12 hours Total resistance value variation: within ± 5% No mechanical and electrical damage	10Hz to 2,000Hz 147m/s <sup>2</sup> 12 hours Total resistance value variation: within ± 5% No mechanical and electrical damage
<b>Shock</b>	490m/s <sup>2</sup> 11ms 18 times Total resistance value variation: within ± 1% No mechanical and electrical damage	490m/s <sup>2</sup> 11ms 18 times Total resistance value variation: within ± 1% No mechanical and electrical damage	490m/s <sup>2</sup> 11ms 18 times Total resistance value variation: within ± 1% No mechanical and electrical damage
<b>Moisture Resistance</b>	40°C 95% RH 240 hours Total resistance value variation: within ± 10% Insulation resistance: over 10MΩ	40°C 95% RH 120 hours Total resistance value variation: within ± 10% Insulation resistance: over 10MΩ	40°C 95% RH 120 hours Total resistance value variation: within ± 10% Insulation resistance: over 10MΩ
<b>Rotational Life Expectancy (at 25°C)</b>	No load at 40 r.p.m. 3-turn .....600,000 shaft revolutions 5-turn .....1,000,000 shaft revolutions 10-turn } 15-turn } .....2,000,000 shaft revolutions 20-turn } 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 40 r.p.m. 3-turn .....300,000 shaft revolutions 5-turn .....500,000 shaft revolutions 10-turn .....1,000,000 shaft revolutions 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 40 r.p.m. 5-turn .....5,000,000 (2,500,000) ※ shaft revolutions 10-turn .....10,000,000 (5,000,000) ※ shaft revolutions Total resistance value variation: within ± 5% against initial value Independent linearity tolerance: within 150% of specified value Output smoothness: 5-turn ... 0.2% against input voltage 10-turn ... 0.1% against input voltage

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. Mark ※ applies only for model 22HHP series.