HNL40-A

RESISTIVE ROTARY SWITCH



The resistance rotary level switch uses a micro motor as the driving device, and the transmission shaft is connected to the clutch. When the blade contacts the material, the motor stops rotating, and the detection device outputs a contact signal, while cutting off the power and stopping the rotation.

PRODUCT FEATURES

1. Suitable for almost all solid materials
2. Not affected by dust, dielectric constant, adhesive, temperature and pressure changes
3. Simple and reliable working principle, modular design, maintenance free
4. Highly integrated mechanical seal to prevent dust from infiltrating along the axis
5. Unique friction clutch mechanism protects the motor from damage
6. Multiple process connectors can be used, and installation is simple
7. Provide high temperature resistant and optional extensions to adapt to various working conditions

APPLICATION SCENARIOS

The HNL40-A series resistive rotary level switch is usually used for monitoring the full level, intermediate level, and empty level of solid material silos. Suitable for various solid materials, such as powder, particle, adhesive or block. Automatic monitoring and control of material level can be carried out.

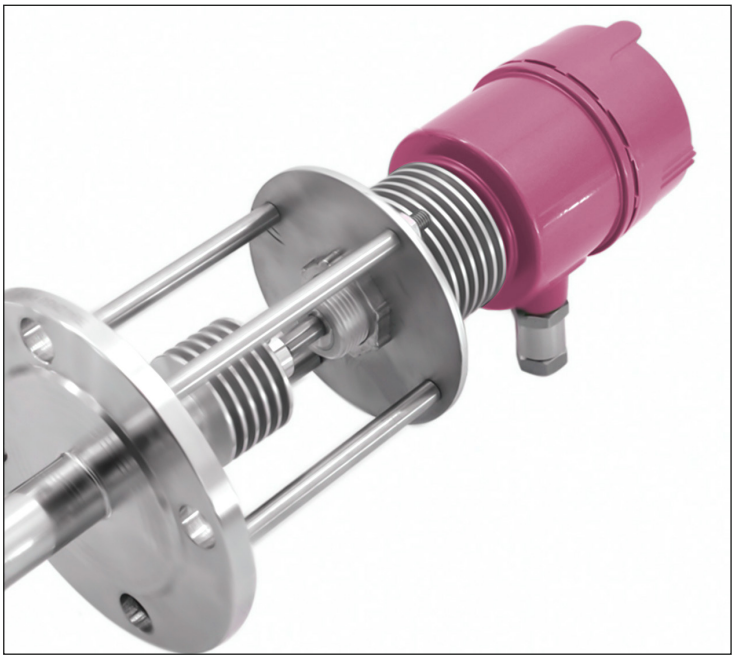
Different models of resistive rotary level switches can meet the requirements of different working conditions, and are widely used in material transportation and control processes in various industries such as metallurgy, grain, flour, building materials, cement, electricity, coal, chemical, casting rubber, environmental dust removal, etc. It is also used for monitoring chemical plastics, pharmaceuticals, feed, cement and chemical fertilizers, and food powder manufacturing and processing industries.

WORKING PRINCIPLE

A low-speed gear motor with a sliding clutch drives a rotating measuring blade. When the measuring object obstructs the rotation of the blade, the motor will rotate on its own, causing the internal micro switch to actuate and output a detection signal. At the same time, the motor power will be cut off and the power supply will be stopped.

Once the tested material is no longer present, the obstruction of the blade will be released, and it will be reset by the internal spring tension. At the same time, the detection signal will be switched to start supplying power to the motor, and the blade will start rotating again.





TECHNICAL PARAMETER

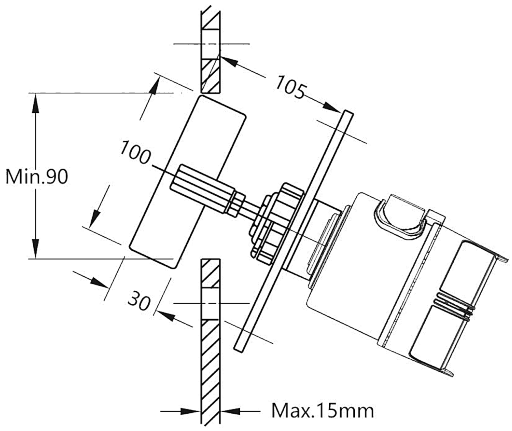
NAME	SPECIFICATION
Power supply	110VAC / 220VAC / 24VAC / 24VDC 50/60HZ
Signal output	Micro switch 5A / 250VAC SPDT
Blade speed	1R.P.M
Body material	M12*1-5pin/8pin aviation cable
Measuring range	100~2000mm / 100~1500mm / 300~3000mm / 450~6000mm 100~6000mm / 450~1500mm / 80~1000mm
Work pressure	Normal pressure
Temperature range	-20~80°C / -20~350°C / -20~1300°C / -40~350°C / -20~250°C / Customizable

Connection specifications	Thread: G1" / G1-½" (customizable) Flange: 2-½ * 5kg/cm³ (customizable) Thread: G1" / G1-½" Flange: 2-½ * 5kg/cm³ (customizable) Thread: G1-½" / G2-½" Thread: G¾" Flange: 2-½ * 5kg/cm³ (customizable)
Applicable material weight	⩾0.5g/cm³ ⩾0.3g/cm³
Blade	Type A, refer to the blade specification table (customizable) Type B, refer to blade specification table (customizable)
Material of junction box	Aluminum alloy baking paint/PEK/stainless steel
Protection level	IP65/IP66/IP67

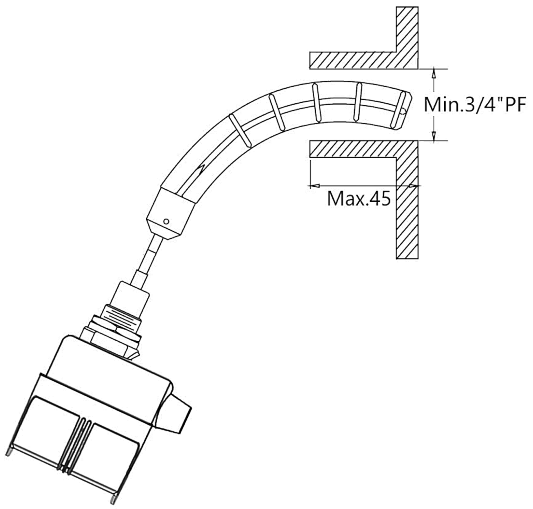
INSTALL INSTANCE

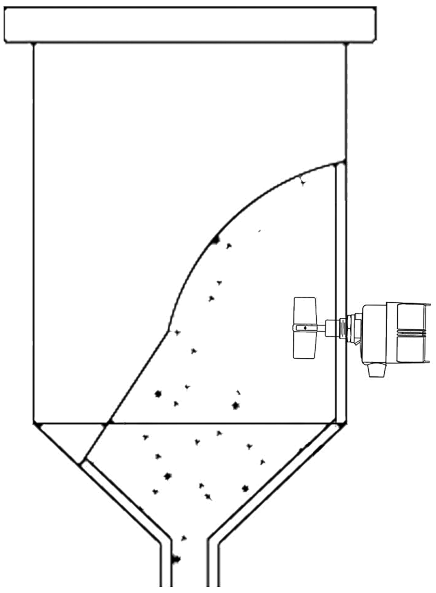
Example of installation dimensions for storage tanks

Taking HNL40-A-11 as an example, the method of directly installing it on the barrel wall is shown in the figure on the right. Insert one end of the blade into the barrel groove opening at an angle of about 35 °, and slowly turn it to the right when the other end of the blade passes through half the thickness of the barrel wall.



The minimum opening size of the HNL40-A-80 series is 28mm sickle shaped blades, which can be directly installed on the barrel wall as shown in the figure below. The blades are placed in a circular arc into the barrel groove 3/4 "pipe teeth, and then the screw teeth are locked.

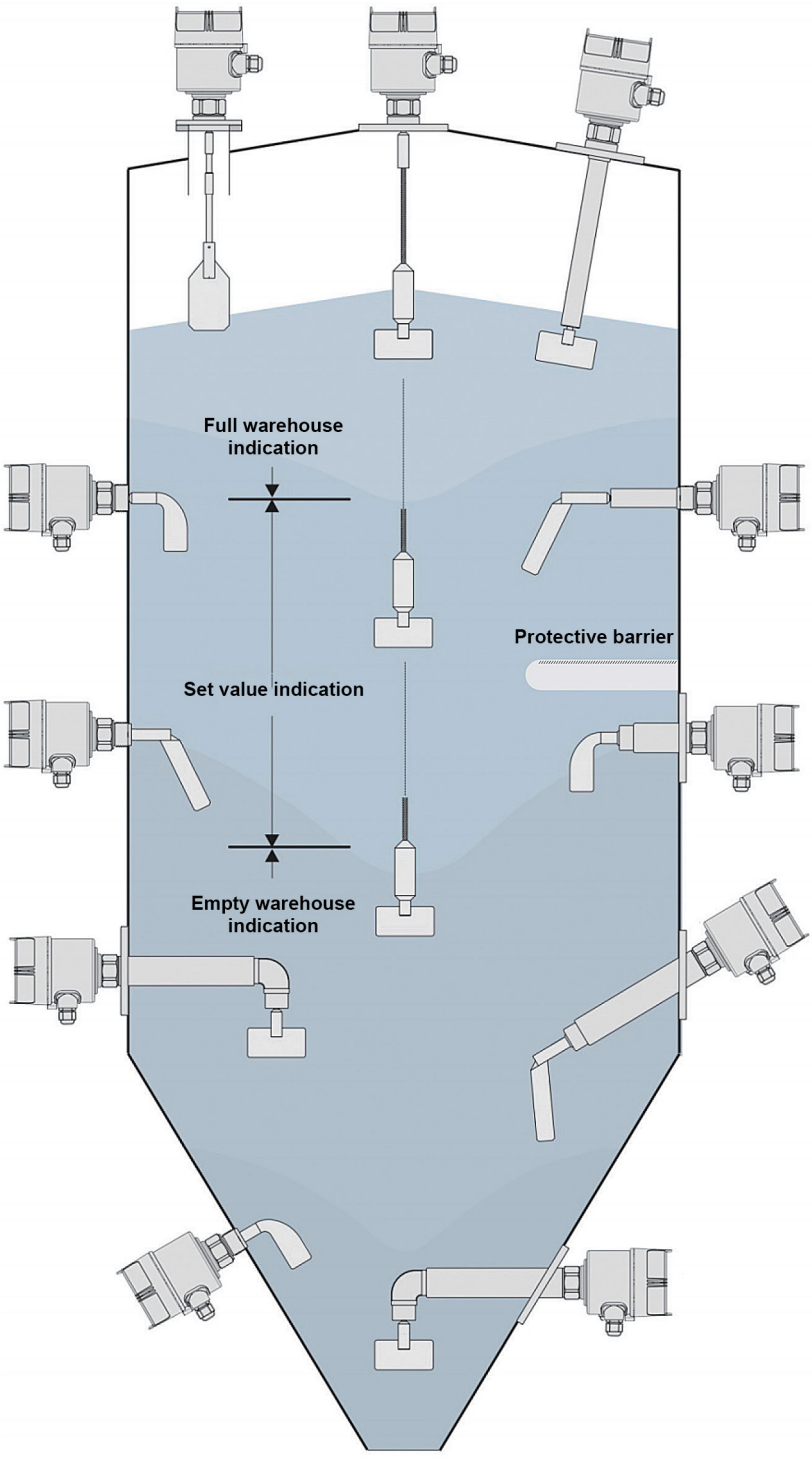




Installation Example on Injection Machine

Injection molding machines generally use small blades. When installing, drill a Ø 28 hole under the material bucket, extract the opening tip on the blade switch, take out the cross blade, and loosen the copper nut. Then, as shown in the figure below, insert the HNL40-A-80 into the hole and lock the copper nut. After inserting the cross blade back, insert it back into the opening tip and open its tail end to fix the blade.

INSTALL INSTANCE



The HNL40-A series material level switch can be used for detecting full, empty, and set material levels. It can ensure high stability and safety even in extremely harsh environments.

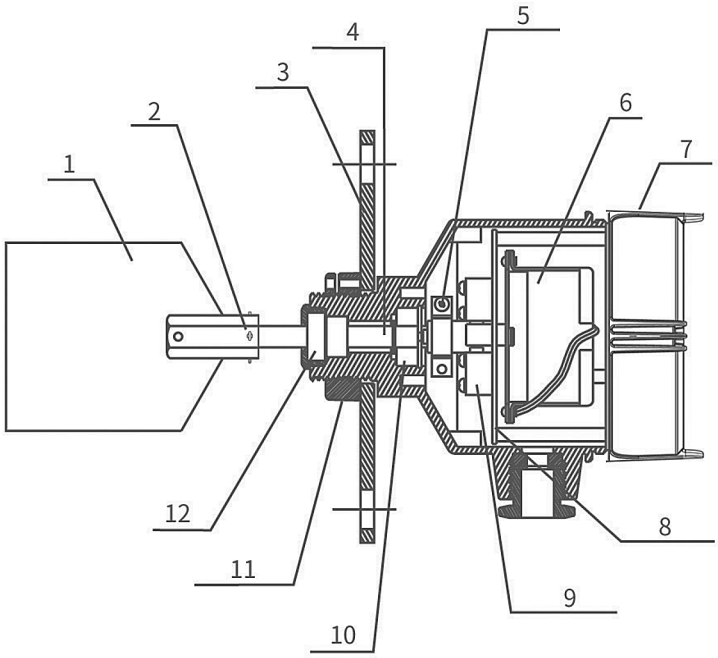
Product Features

1. Suitable for measuring the material level of containers such as silos, hoppers, scales, and discharge pipelines.
2. Suitable for measuring materials such as dust, particulate matter, slurry, paste, etc.
3. Even under conditions such as dust accumulation, loose material adhesion, electrostatic discharge, high temperature, and high voltage, it can still be used with confidence.
4. Certified for use in environments with potentially explosive dust, gases, and complex mixtures.

Matters needing attention

Pay attention to the resting angle and ensure that the sensing blade comes into contact with the powder during installation. Especially pay attention to the upper limit alarm. Be careful when installing the hopper at a low position and avoid dead corners. Be careful to stay away from bridge breakers. In addition, when the bridge collapses, the sensor may be impacted and damaged. If the powder deposition distance from the sensor is more than 1 meter, the customer should be equipped with appropriate protective equipment. When filling powder into cans, do not install the sensor in a position that directly contacts the sensor. If installation is necessary, please install a protective plate to prevent powder from directly hitting the sensor.

STRUCTURAL DIAGRAM



1. Blade *2. Cotter pin* *3. Flange*

4. Transmission shaft *5. Clutch*

6. Motor *7. Noumenon*

8. Circuit board *9. The micro switch*

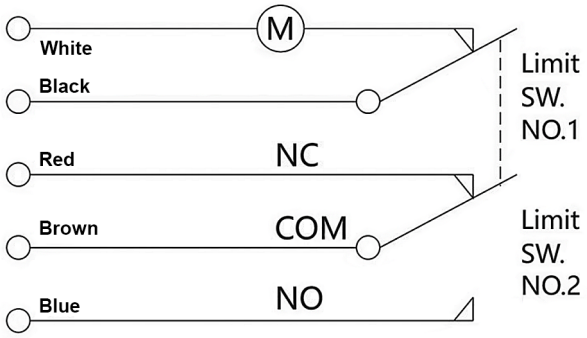
10. Bearing *11. Fixed nut*

12. Oil seal

PRINCIPLE OF CONTROL CIRCUIT

1.When the motor is running and there is no resistance on the blades, it indicates that the (COM, NC) circuit is connected. When the motor circuit is cut off and there is resistance on the blades, it indicates that (COM, NC) is open circuit (COM, NO) is open circuit.

2.When the resistance on the blade disappears and the motor rotates again, it indicates that the (COM, NC) circuit is connected and then restarted to initiate the action.



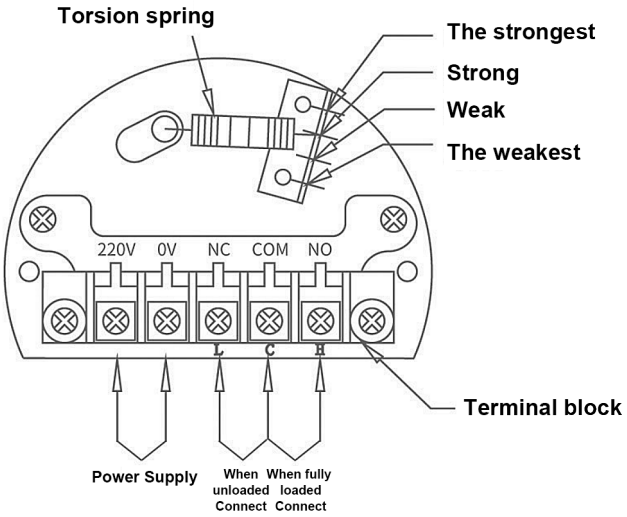
Wiring diagram for motor rotation

TORQUE ADJUSTMENT



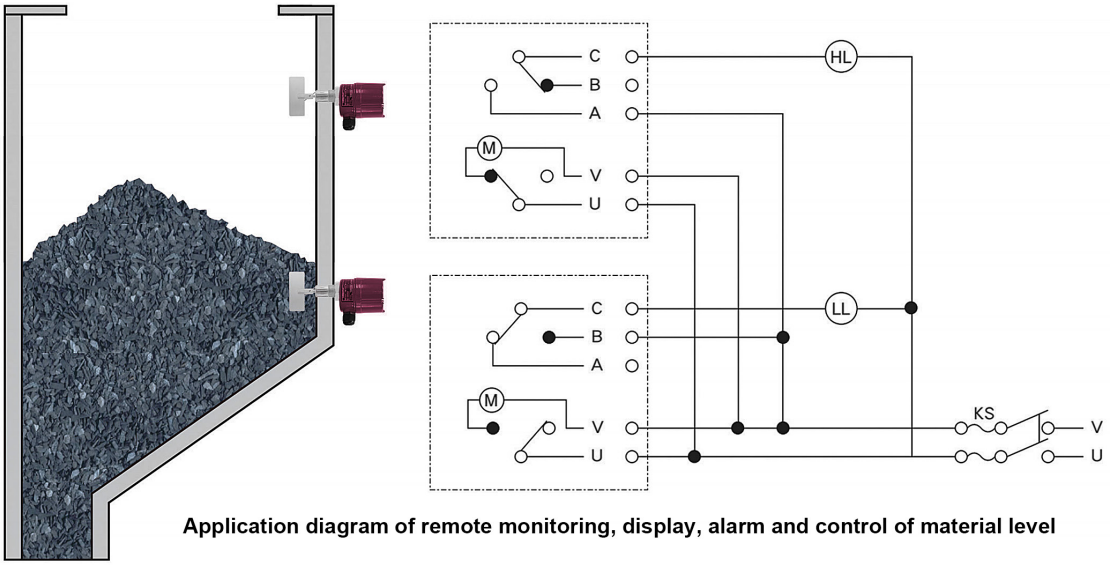
The torsion spring is used to adjust the output torque of the shaft. When the specific gravity of the material is too low (the blade still rotates continuously when in contact with the material), the torsion spring can be hooked to a weaker hole to increase sensitivity.

On the contrary, if the torque is insufficient (not touching the material but not rotating), change the torsion spring to a stronger hole hook to lower the sensitivity.

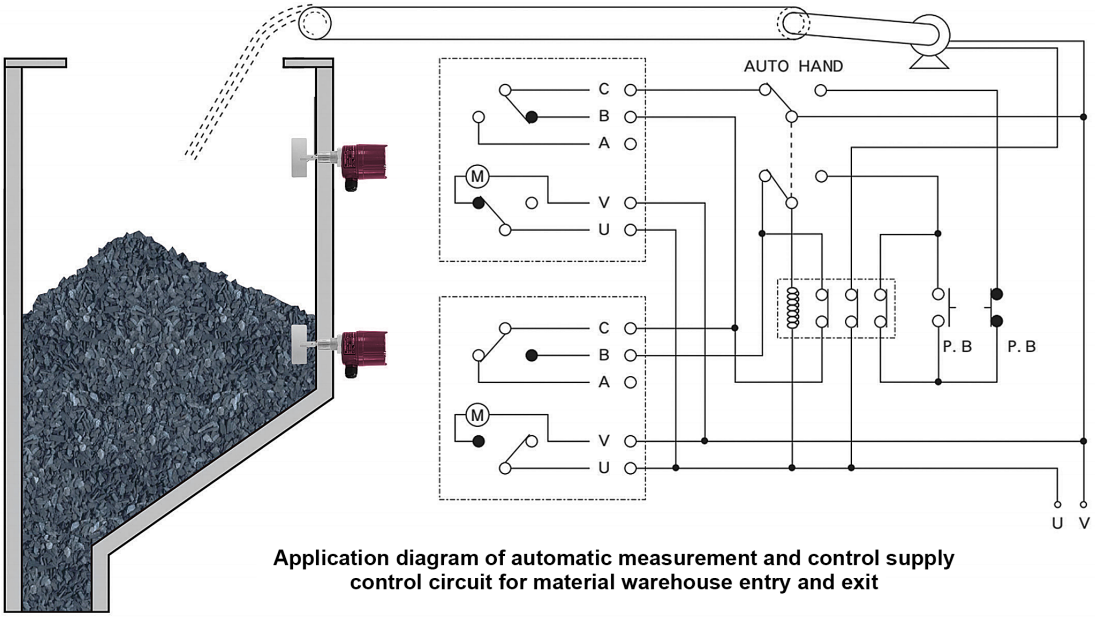




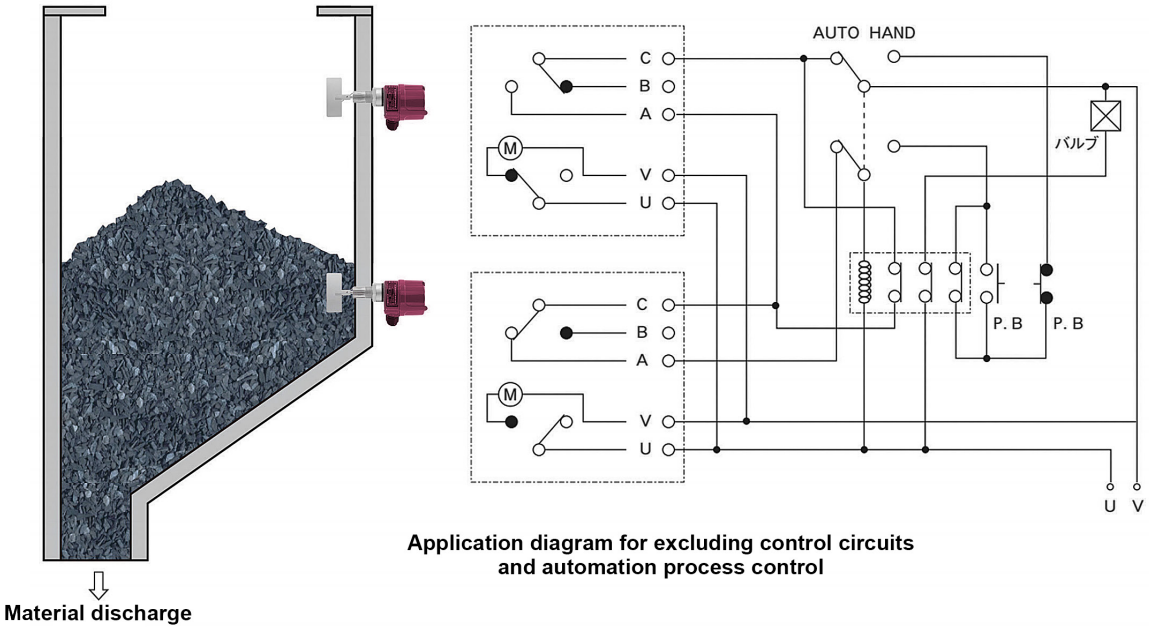
APPLICATION CIRCUIT



Application diagram of remote monitoring, display, alarm and control of material level



Application diagram of automatic measurement and control supply control circuit for material warehouse entry and exit



Application diagram for excluding control circuits and automation process control

TECHNICAL PARAMETERS OF MICRO SWITCH

Voltage and current	125-250VAC 5A	**Action speed**	0.1mm·m/s
Action frequency (mechanical)	400 times/minute (below)	**Action frequency (electrical)**	30 times/minute (below)
Mechanical lifespan	2 million times or more	**Electrical lifespan**	10000 to 100000 times
Contact resistance (initial resistance)	30M ohms or less	**Insulation impedance (500VDC)**	100M ohms or more
Ambient temperature	-25°C to+120°C	**Ambient humidity**	85% RH (upper limit)
Waterproof grade	IP67		

TECHNICAL PARAMETERS OF MICRO MOTORS

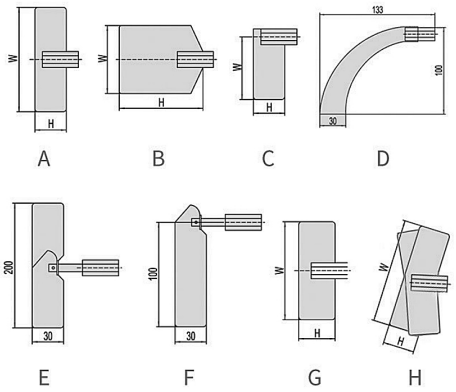
Supply voltage	AC200V-240V (50HZ/60HZ) (Or customize voltage through contract)		
Rotation direction	Clockwise direction	**Output speed**	0.8 rpm(50zh) 1.0 rpm(60hz)
Environmental temperature for use	-20°C-80°C	**Output torque**	25kgf.cm
Rated power	⩽4W		

HNL40-A RESISTANCE ROTARY SWITCH SELECTION TABLE

NAME	CODE	CODE DESCRIPTION
Product type	10	Standard thread type
	11	Standard flange type
	20	Flange shaft protection tube type
	21	Adjustable flange shaft length type
	30	High temperature thread type
	31	High temperature flange type
	32	High temperature flange shaft protection tube
	33	Ultra high temperature flange shaft protection tube
	40	Steel cable type
	41	High temperature steel cable type
	42	High temperature flange shaft length adjustable type
	980D	Explosion proof type
	50	Indicator light type
	60	Special type for cement silo
	80	Standard small resistance rotation
	80A	High temperature low resistance rotation
	80C	Flange shaft protection tube with small resistance rotation
Power Supply	A	110 VAC
	B	220 VAC
	C	24 VAC
	D	24 VDC

Continuation	Size		Specifications		
	Teeth Mouth	**A**:¾″(20A) **F**:3″(80A)	**Q**: PT (R) dental canal	**P**: Sanitary clamps	
		B:1″(25A) **G**:3½″(100A)	**N**: NPT dental tube	**T**: PF (G) Dental Tube	
		C:1-½″(40A) **H**:4″(125A)	**M**: BSP dental canal	**S**: Special specifications	
	Flange	**D**:2″(50A) **I**: 5″(150A)	**O**:150lbs	**X**:PN16	**U**:5kg/cm²
		E: 2-½″(65A) **J**:6″(200A)	**R**: 300lbs	**Y**:PN25	**V**:10kg/cm²
		S: Special specifications	**W**: PN10	**Z**: PN40	**L**: Special specifications

Blade	A	W*H(100*30)
	B	W*H(65*80)
	C	W*H(60*30)
	D	Sickle shaped
	E	Double folding type
	F	Single folding type
	G	W*H(80*35)
	H	cross-bonding



length	□ □ □ □	Unit: mm