

SH Series

5S、20S (Single vane) 5D、20D (Double vane)



ORDERING INSTRUCTIONS

STEP HI-ROTOR

SH20S	K	60	90	L	PB		4
Model No.	①	②	③	④	⑤	⑥	⑦

SH5S
SH20S
SH5D
SH20D

② External HI-ROTOR setting angle

③ Internal HI-ROTOR setting angle

- Do not fill in, when ordering a standard type or angle setting is not required.
 - Write the desired angle within oscillating angle range given in specifications on Page 16.
- (Note) • When the angle setting of two HI-ROTORS differ each other set the larger angle to the internal HI-ROTOR.
- For angle setting outside the specifications, contact KURODA.

Standard type STEP HI-ROTOR is provided with the reference point stopper to have been set.

Set the attached angle setting stopper before use.

STEP HI-ROTOR with an angle setting stopper fixed at the desired stop angle can be manufactured upon order.

As the angle is roughly set, be sure to readjust it with the fine adjust screw before using the STEP HI-ROTOR. (Refer to Page. 11)

① Shaft configuration

	Shaft configuration	SH5S、SH5D	SH20S、SH20D
O	Round shaft	○	—
D	D-cut	○	—
K	Key-way	—	○
A	Right angle 2 flats	—	○

(Note) For specific shaft configuration, contact KURODA.

④ Mounting

No mark	Without foot mounting
L	With foot mounting

⑤ Switch

No mark	Without switch
PB	With switch

Switch: Switch, set screw, metal fixture

PB	R	8F	I
①	②		

① Cable specifications

No mark	Standard
R	Flexible cable

(Note) Flexible cable is supplied to custom-made product.

② Switch type

No mark	Standard type (Black)
I	Different frequency type (Grey)

⑥ Cable specifications

No mark	Standard or without switch
R	Flexible cable

(Note) Flexible cable is supplied to custom-made product.

⑦ Number of switches

No mark	Without switch
4	4 pcs.
3	3 pcs.
n	n pc(s).

(Note) In order to prevent mutual interference and malfunction of the switches, each product is supplied with a combination of PB8F (standard type) and PB8FI (different frequency type). Both types can be used in the same manner.



Be sure to fit a reference point stopper and an angle setting stopper before using the STEP HI-ROTOR. Otherwise, the vane and seal may be broken, causing a faulty operation.

SPECIFICATIONS

Model No.	Unit	SH5S	SH20S	SH5D	SH20D
Vane type		Single vane		Double vane	
Fluid		Non-lubricated air (Lubricated air)			
Oscillating angle	Degree	Internal HI-ROTOR : 30~180 External HI-ROTOR : 30~180		Internal HI-ROTOR : 30~90 External HI-ROTOR : 30~180	
Oscillating reference point	Degree	90			
Port size		M5	Rc $\frac{1}{8}$	M5	Rc $\frac{1}{8}$
Operating puressure range	MPa	0.3~0.7	0.3~1	0.3~0.7	0.3~1
Proof withstanding pressure	MPa	1.05	1.5	1.05	1.5
Temperature range	℃	-5~60			
Internal volume	cm2	35(for internal:7, for external:28)	95(for internal:23, for external:72)	33(for internal:5, for external:28)	91(for internal:19, for external:72)
Allowable radial load	N	59	255	59	255
Allowable thrust load	N	29	126	29	126
Allowable energy	mJ	1.96	8.82	1.96	8.82
Mass	kg	0.50	1.13	0.51	1.1

(Note) • When operating STEP HI-ROTOR at low temperature below 5°C, use dry air passing through an air dryer so as to prevent dewing and freezing.
• Be sure to use STEP HI-ROTOR within the allowable energy. For calculation of allowable energy, refer to Step 3 "How to check allowable energy".

EXTERNAL STOPPER

Model No.		SH5S	SH20S	SH5D	SH20D
Min. setting angle	Internal HI-ROTOR	30°	30°	30°	30°
	External HI-ROTOR	30°	30°	30°	30°
Max. setting angle	Internal HI-ROTOR	180°	180°	90°	90°
	External HI-ROTOR	180°	180°	180°	180°
Angle setting pitch	Internal HI-ROTOR	15°	15°	15°	15°
	External HI-ROTOR	10°	10°	10°	10°
Angle fine adjustment range	Internal HI-ROTOR	-9°+6°			
	External HI-ROTOR	-6°+4°			
Fine adjustment range of oscillating reference point		±5°			

OUTPUT TORQUE

(Unit: N·cm)

Model No.		Supply pressure (MPa)							
		0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
SH5S	Internal HI-ROTOR	22.0	34.0	47.9	59.0	74.0	—	—	—
	External HI-ROTOR	121	171	227	273	337	—	—	—
SH5D	Internal HI-ROTOR	44.0	67.9	96.0	118	148	—	—	—
	External HI-ROTOR	118	171	231	273	337	—	—	—
SH20S	Internal HI-ROTOR	105	145	195	235	280	320	370	415
	External HI-ROTOR	279	440	575	720	850	1010	1140	1280
SH20D	Internal HI-ROTOR	210	290	390	470	560	640	740	829
	External HI-ROTOR	279	440	575	720	850	1010	1140	1280

(Note) As the output of the internal HI-ROTOR is smaller than that of the external, select a proper load on the basis of the output torque of the internal HI-ROTOR.

HOW TO SET OSCILLATING TIME (Unit: s)

Model No.	SH5S, SH5D	SH20S, SH20D
Oscillating angle	90°	90°
Internal HI-ROTOR	0.05~0.5	0.08~0.8
External HI-ROTOR	0.08~0.8	0.11~1.1

Set oscillating time within the range shown above. Slower setting exceeding this range may result in stick-and-slip. So you cannot get smooth operation. Search for oscillating time at angles other than 90 degree on the basis of these values.

ACCURACY

Model No.	SH5S, SH5D	SH20S, SH20D
Shaft runout	0.06mm (T.I.R.)	0.05mm (T.I.R.)
Stop angle accuracy	±3'	

(Note) • Shaft runout is the value at the shaft end.
• Stop angle accuracy is the value at the initial state after setting the angle.

MODEL WITH SWITCH/For detailed specifications of switch, refer to Page 24 to 26.

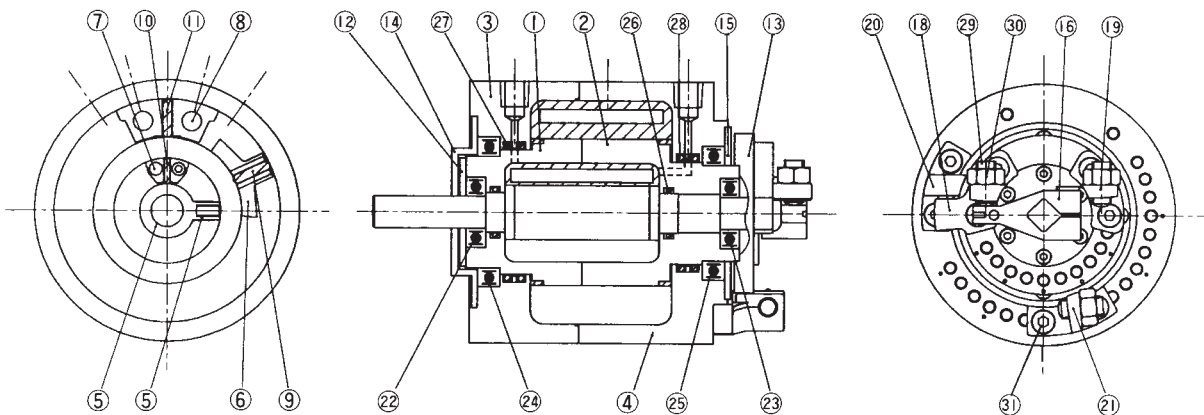
PB TYPE PROXIMITY SWITCH

Lead wire type

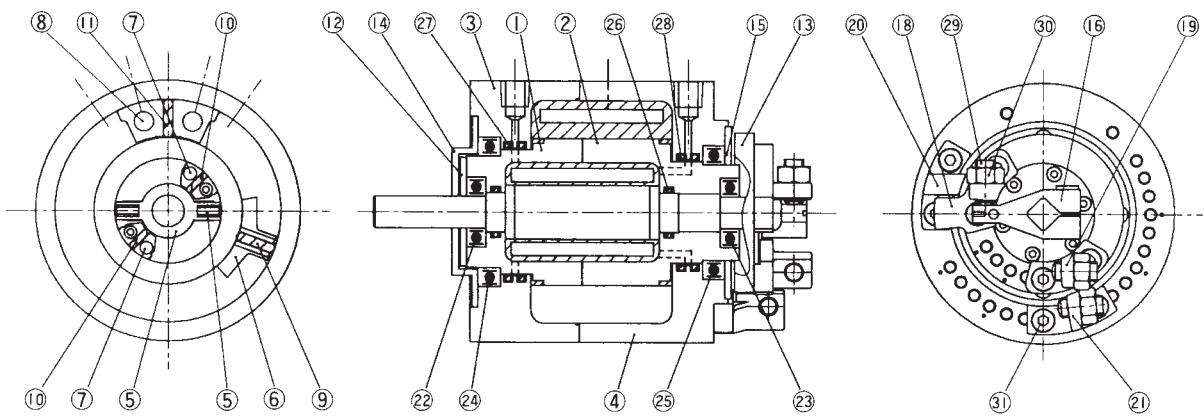
Model No.	Rated voltage (V)	Rated current range (mA)	Pilot lamp (Light up at ON)	Applications
PB8F PB8FI	DC12~24	100(max.)	○	Relay PLC IC circuit

STRUCTURE

Single vane



Double vane



MAIN COMPONENTS

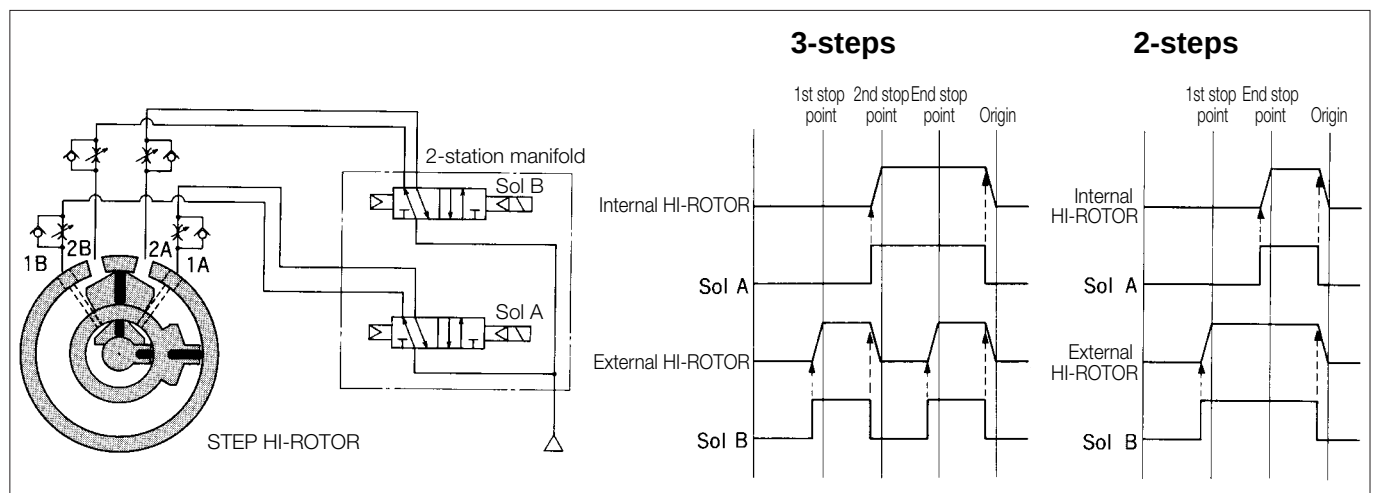
No.	Description	Material
①	Body 1-A	Aluminium alloy
②	Body 1-B	Aluminium alloy
③	Body 2-A	Aluminium alloy
④	Body 2-B	Aluminium alloy
⑤	Vane shaft	Steel alloy for structure
⑥	Vane	Synthetic resins
⑦	Shoe 1	Synthetic resins
⑧	Shoe 2	Synthetic resins
⑫	Cover plate 1-A	Aluminium alloy
⑬	Cover plate 1-B	Aluminium alloy
⑭	Cover plate 2-A	Aluminium alloy
⑮	Cover plate 2-B	Aluminium alloy
⑯	Claw 1	Carbon steel for structure
⑱	Stopper 1-L	Carbon steel for structure
⑲	Stopper 1-R	Carbon steel for structure
⑳	Stopper 2-L	Carbon steel for structure
㉑	Stopper 2-R	Carbon steel for structure
㉒	Bearing	Bearing steel
㉓	Bearing	Bearing steel
㉔	Bearing	Bearing steel
㉕	Bearing	Bearing steel
㉙	Fine adjusting screw	Steel alloy for structure
㉚	Lock nut	Soft steel
㉛	Bolt for stopper	Steel alloy for structure

PACKING

No.	Description	Material	Quantity	
			Single	Double
⑤	Vane seal 1	NBR	1	1
⑨	Vane seal 2	NBR	1	1
⑩	Shoe seal 1	NBR	1	2
⑪	Shoe seal 2	NBR	1	1
㉖	O-ring	NBR	2	2
㉗	O-ring	NBR	2	2
㉘	O-ring	NBR	2	2

(Note) The vane seal and vane shaft are united in one piece.

EXAMPLE OF APPLICATIONS TO CONTROL

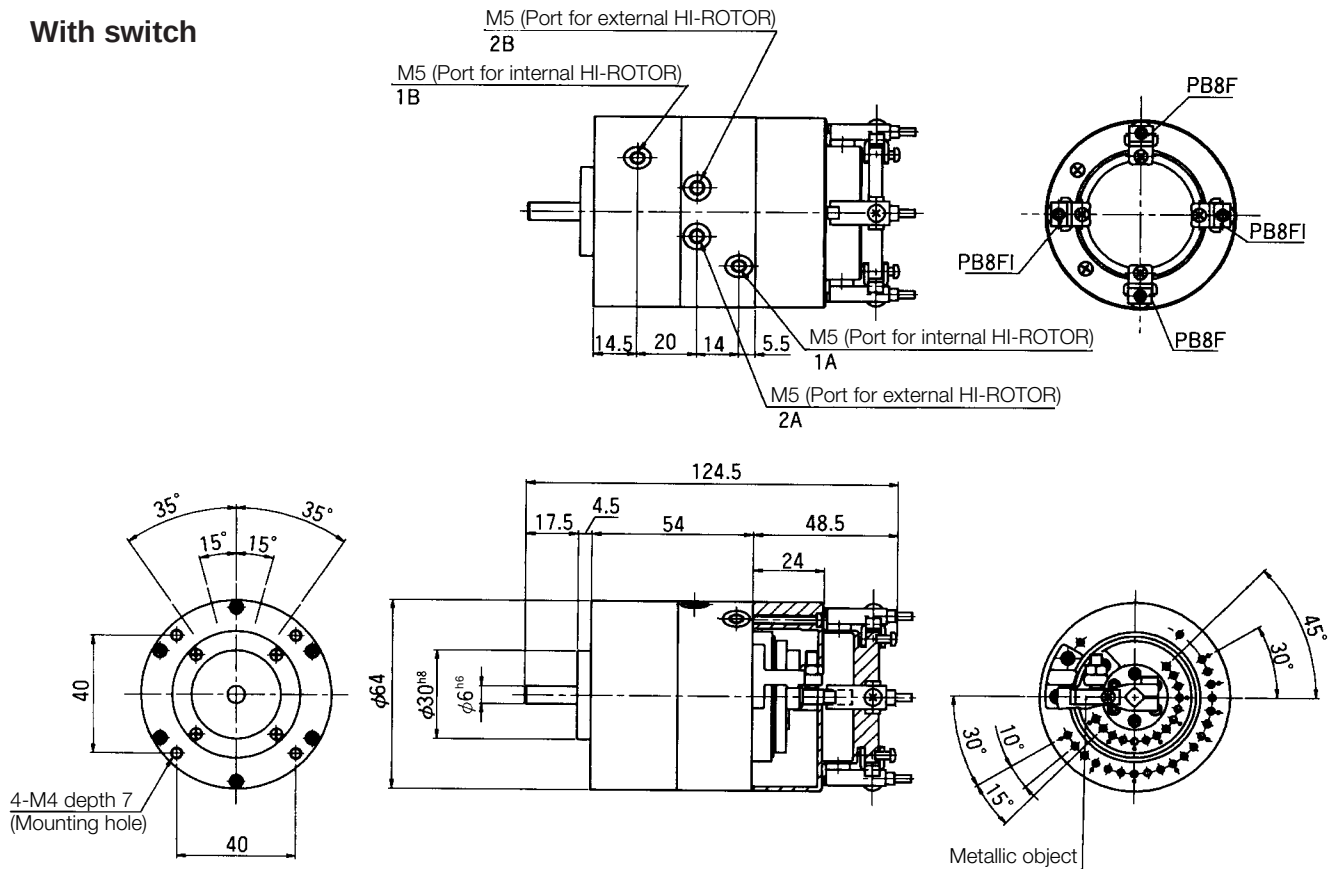


DIMENSIONS

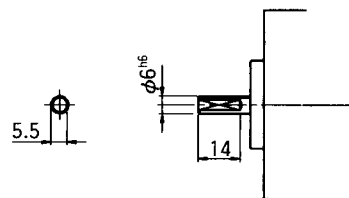
SH5S

(Unit : mm)

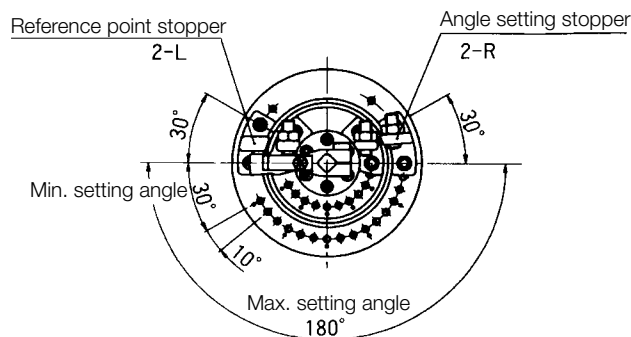
With switch



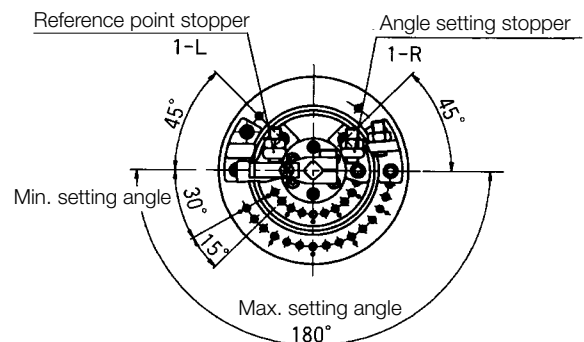
Without switch



D-cut shaft



External HI-ROTOR



Internal HI-ROTOR

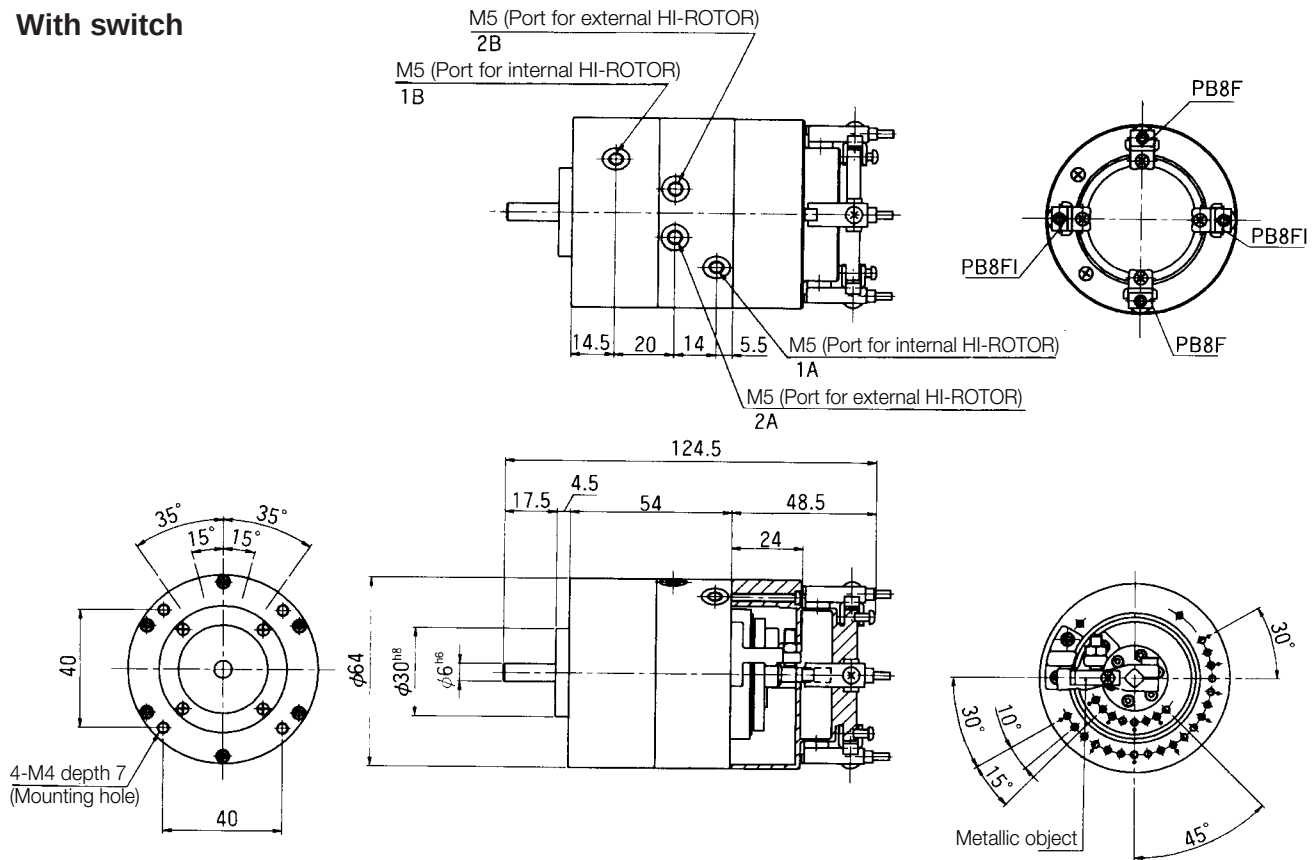
Setting ranges of stopper

DIMENSIONS

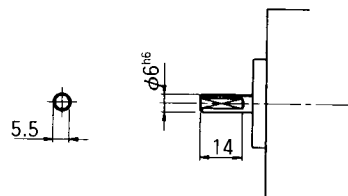
SH5D

(Unit : mm)

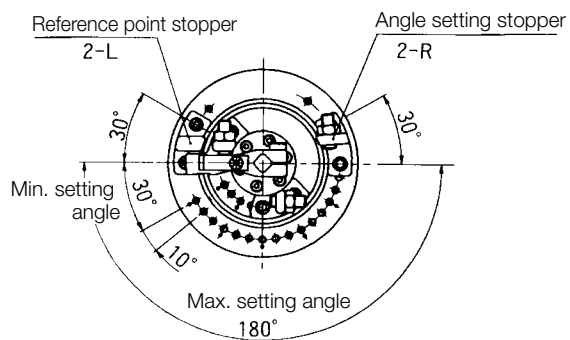
With switch



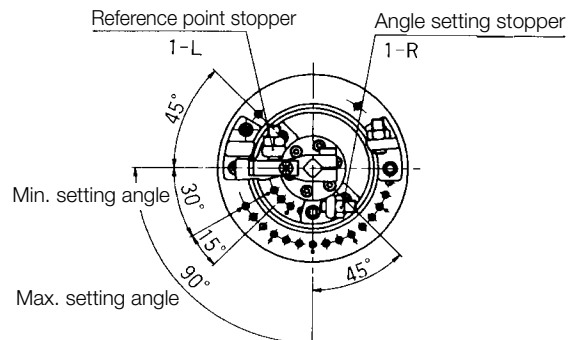
Without switch



D-cut shaft



External HI-ROTOR



Internal HI-ROTOR

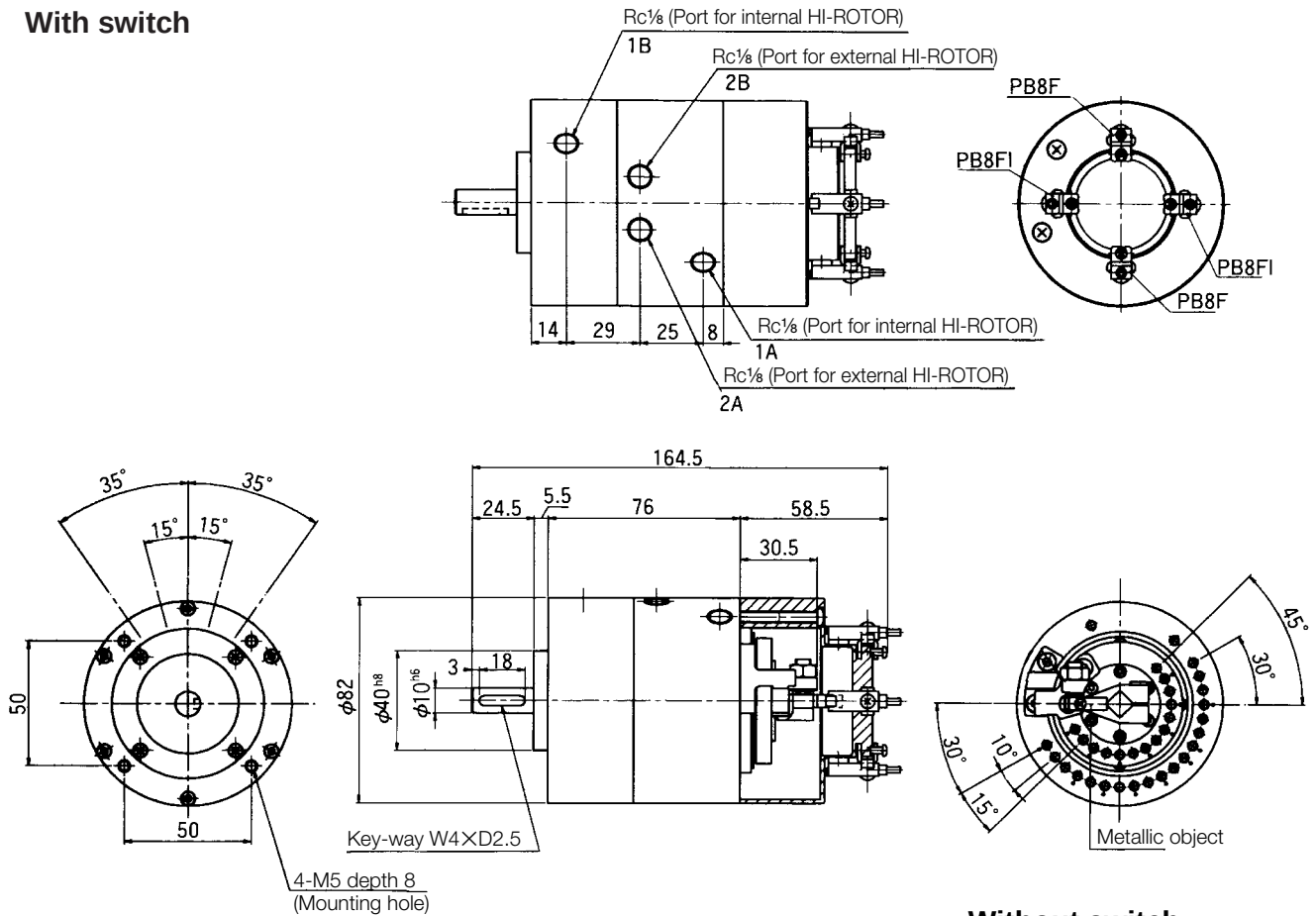
Setting ranges of stopper

DIMENSIONS

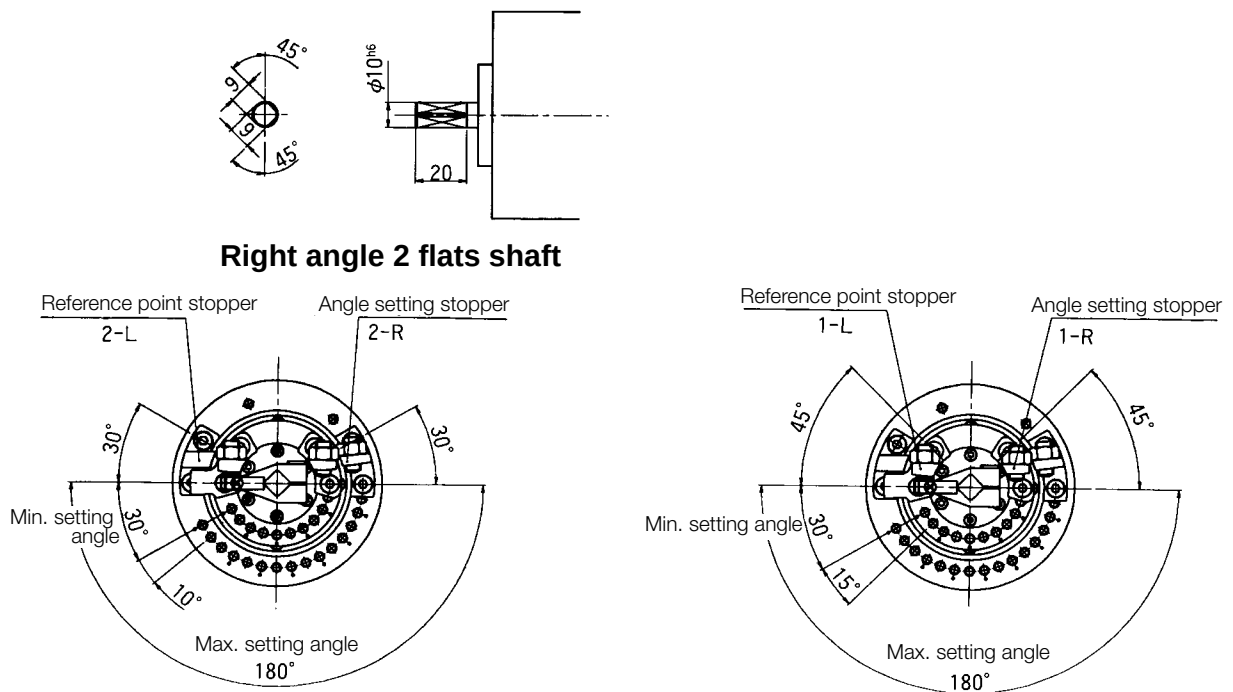
SH20S

(Unit : mm)

With switch



Without switch



External HI-ROTOR

Internal HI-ROTOR

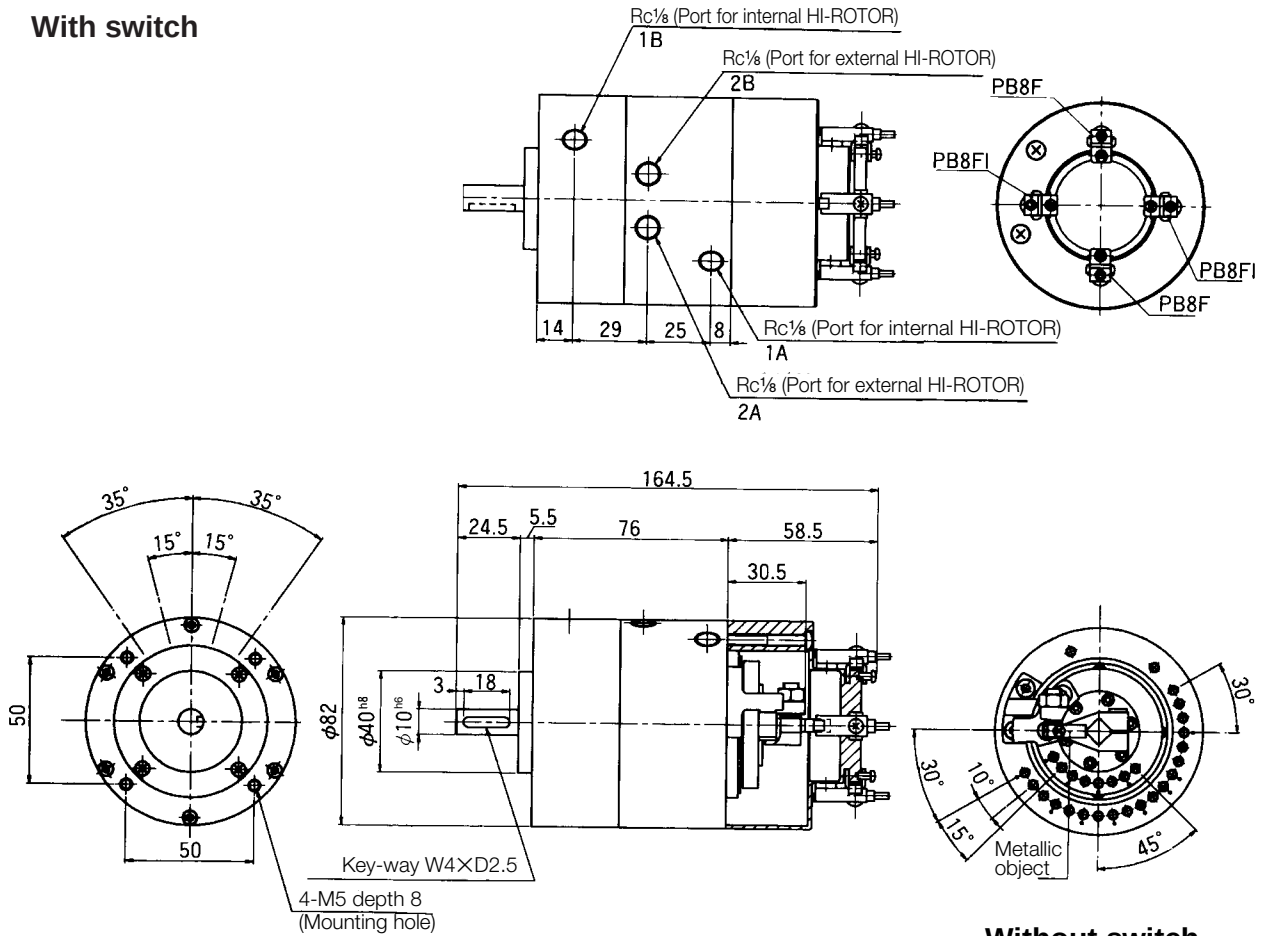
Setting ranges of stopper

DIMENSIONS

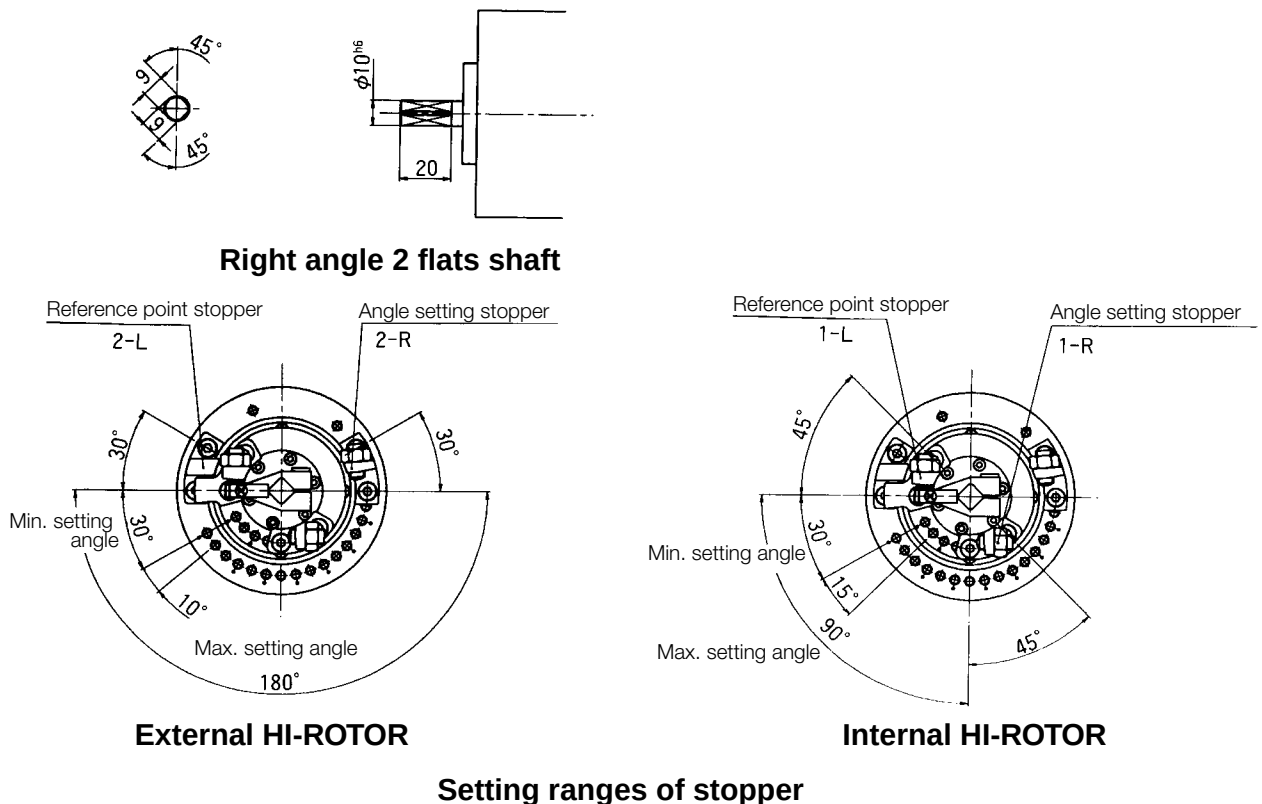
SH20D

(Unit : mm)

With switch

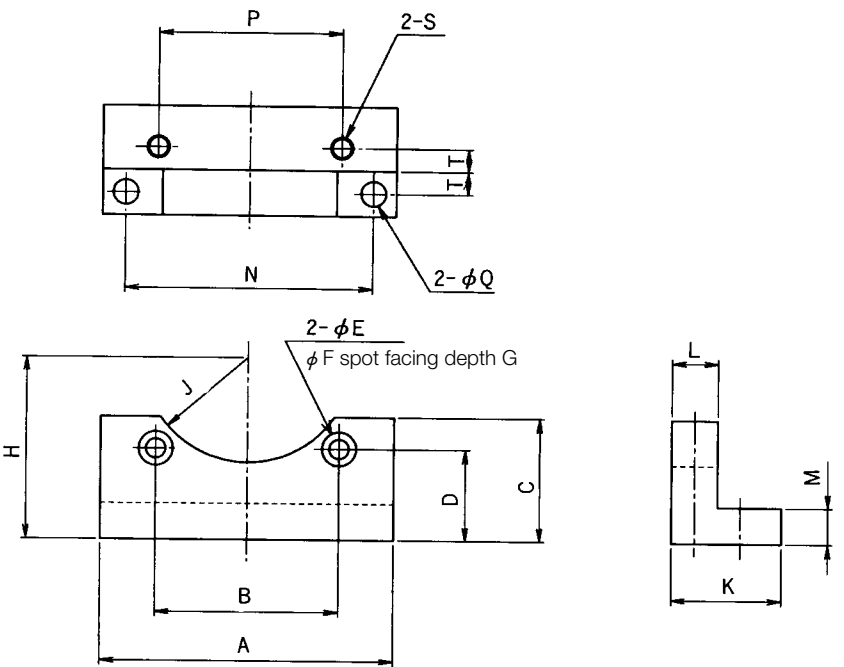


Without switch



ACCESSORIES

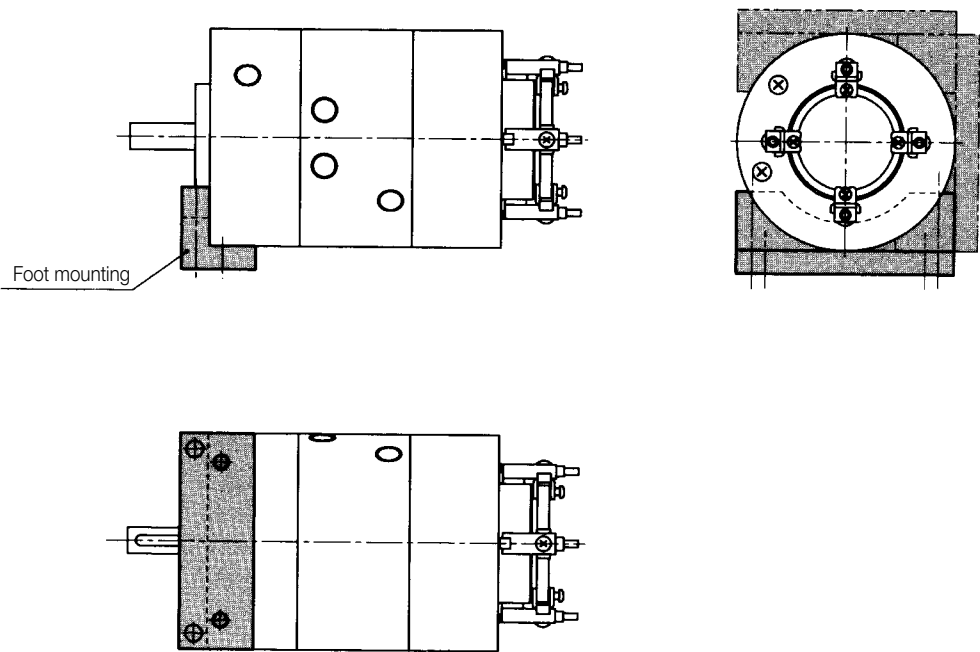
FOOT MOUNTING



(Unit : mm)

Model No.	Applicable STEP HI-ROTOR	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	S	T
G5-L	SH5S, SH5D	64	40	27	20	4.3	7.5	4.5	40	23	24	10	7.9	54	40	5.5	M5	5
G20-L	SH20S, SH20D	82	50	31	25	5.3	9	5.5	50	30.5	28	10.5	8.9	70	60	6.5	M6	5

Foot mounting can be fitted onto 3 sides by rotating 90 dgree in each direction as shown below :



Model No.	Mass (g)
G5-L	60
G20-L	90