

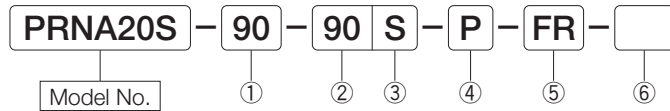
Miniature HI-ROTOR/Standard type

PRNseries

1S, 3S, 10S, 20S, 30S, 1D, 3D, 10D, 20D, 30D



ORDERING INSTRUCTIONS



Single vane	Double vane
PRNA1S	PRNA1D
PRNA3S	PRNA3D
PRNA10S	PRNA10D
PRNA20S	PRNA20D
PRN30S	PRN30D

① Oscillating angle

90	90°
180	180°
270	270°

② Oscillating reference point

90	90°
45	45°

③ Port position

No mark	Standard
S	On the rear cover

(Note) S is not available for Models PRN30S and 30D.

④ Mounting hardware

No mark	No mounting hardware
P	With flange plate
L1	With one foot plate
L2	With two foot plates

⑤ Type of switch units

No mark	No switch	Switch position adjustable
FR	With CT-3 switch	
FU	With CT-3U switch	
FP	With CTP-3 switch	Switch position fixed
SR	With SR switch	
SU	With SU switch	

(Note) • Two switches are provided.
• Only FR and FU are available for PRNA1.
• FP is made-to-order

⑥ Custom-made shafts (Refer to P.53)

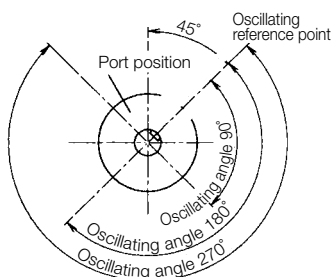
(Note) • Switch units and mounts with two foot plate are not available on "S" (Ports on the rear cover) model.

- Switch units cannot be mounted on HI-ROTORs with two foot plates (L2).
- Mounting hardware comes being not fabricated.

OSCILLATION STARTING POINT AND OSCILLATION ANGLE

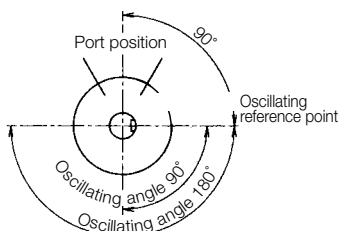
PRNA1S/D, PRNA3S/D,
PRNA10S/D, PRNA20S/D,
PRN30S/D

Oscillating reference point at 45°



PRNA1S, PRNA3S
PRNA10S, PRNA20S

Oscillating reference point at 90°



Oscillating angle and oscillating reference point

Model No.	Oscillating angle			Oscillating reference point	
	90°	180°	270°	45°	90°
PRNA1S	○	○	○	○	—
PRNA3S	△	△	—	—	△
PRNA10S	○	○	○	○	—
PRNA20S	△	△	—	—	△
PRN30S	○	○	○	○	—
PRNA1D	○	—	—	○	—
PRNA3D	○	—	—	○	—
PRNA10D	○	—	—	○	—
PRNA20D	○	—	—	○	—
PRN30D	○	—	—	○	—

○: Standard △: Custom-made

Model Nos. of mounting hardware

Applicable HI-ROTOR	Flange plate	Foot plate
PRNA1S/D	PRN1-P	PRN1-L
PRNA3S/D	PRN3-P	PRN3-L
PRNA10S/D	PRN10-P	PRN10-L
PRNA20S/D	PRN20-P	PRN20-L
PRN30S/D	PRN30-P	PRN30-L

(Note) These hardware are provided with set screws.

Miniature HI-ROTOR/PRN series

SPECIFICATIONS

Model No.	Unit	PRNA1S			PRNA3S			PRNA10S			PRNA20S			PRN30S		
Vane		Single vane														
Fluid		Non-lubricated air (Lubricated air)														
Oscillating angle	Degree	90 ⁺⁴	180 ⁺⁴	270 ⁺⁴	90 ⁺⁴	180 ⁺⁴	270 ⁺⁴	90 ⁺⁴	180 ⁺⁴	270 ⁺⁴	90 ⁺⁴	180 ⁺⁴	270 ⁺⁴	90 ⁺³	180 ⁺³	270 ⁺³
Oscillating reference point	Degree	45,90			45			45,90			45			45		
Port size		M5												Rc1/8		
Minimum working pressure	MPa	0.1						0.08						0.1		
Operation pressure range	MPa	0.2~0.7						0.2~1								
Proof withstanding pressure	MPa	1.05						1.5								
Temperature range	°C	-5~80												-5~60		
Maximum frequency of use	Hz	5	3	1.6	4	2.5	1	4	2.5	1.5	3.5	2	1	3	1.5	1
Internal volume	cm ³	1.4	1.4	1.5	3.4	3.4	4	9.8	9.8	12	17	17	21	37	37	43
Allowable radial load	N	30			40			50			300			400		
Allowable thrust load	N	3			4			4			25			30		
Allowable energy	mJ	0.6			1.5			3			15			25		
Mass	kg	0.036			0.07			0.14			0.25			0.47		0.46

Model No.	Unit	PRNA1D			PRNA3D			PRNA10D			PRNA20D			PRN30D		
Vane		Double vane														
Fluid		Non-lubricated air (Lubricated air)														
Oscillating angle	Degree	90 ⁺⁴			90 ⁺⁴			90 ⁺⁴			90 ⁺⁴			90 ⁺³		
Oscillating reference point	Degree	45			45			45			45			45		
Port size		M5												Rc1/8		
Minimum working pressure	MPa	0.08			0.07						0.06			0.08		
Operation pressure range	MPa	0.2~0.7						0.2~1								
Proof withstanding pressure	MPa	1.05						1.5								
Temperature range	°C	-5~80												-5~60		
Maximum frequency of use	Hz	5			4			4			3			3		
Internal volume	cm ³	1.1			2.8			8.1			15			34		
Allowable radial load	N	30			40			50			300			400		
Allowable thrust load	N	3			4			4			25			30		
Allowable energy	mJ	0.6			1.5			3			15			25		
Mass	kg	0.037			0.072			0.14			0.26			0.48		

(Note) • Maximum frequency of use at the supply pressure of 0.5 MPa (Unloaded).

- Make sure to use the HI-ROTOR within allowable energy. Refer to page 68 for the allowable energy calculation.
- HI-ROTORS with keyways are provided with keys.
- For HI-ROTORS other than standard, consult KURODA.

Output (Effective torque)

(Unit : N·cm)

Model No.		Supply pressure (MPa)								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Single vane	PRNA1S	4.9	7.6	10.1	12.9	15.6	18.5	—	—	—
	PRNA3S	10	17	24	31	38	45	—	—	—
	PRNA10S	35	56	75	98	120	139	—	—	—
	PRNA20S	59	95	133	170	210	249	287	326	368
	PRN30S	110	180	250	319	410	480	580	650	720
Double vane	PRNA1D	10.4	16.5	22.5	28.6	34.7	41.1	—	—	—
	PRNA3D	25	39	54	71	86	101	—	—	—
	PRNA10D	76	117	162	211	254	303	—	—	—
	PRNA20D	140	222	306	388	470	553	633	717	807
	PRN30D	270	440	600	770	950	1120	1299	1480	1660

Miniature HI-ROTOR/PRN series

OSCILLATING TIME RANGE

(Unit : s)

Model No.	Oscillating angle		
	90°	180°	270°
PRNA1S, 1D	0.03~0.6	0.06~1.2	0.09~1.8
PRNA3S, 3D	0.04~0.8	0.08~1.6	0.12~2.4
PRNA10S, 10D	0.045~0.9	0.09~1.8	0.135~2.7
PRNA20S, 20D	0.05~1.0	0.1~2.0	0.15~3.0
PRN30S, 30D	0.07~0.7	0.14~1.4	0.21~2.1

(Note) Operate the HI-ROTOR within the oscillating time range prescribed in the above table. Otherwise, the HI-ROTOR will be perform in stick-slip motions.

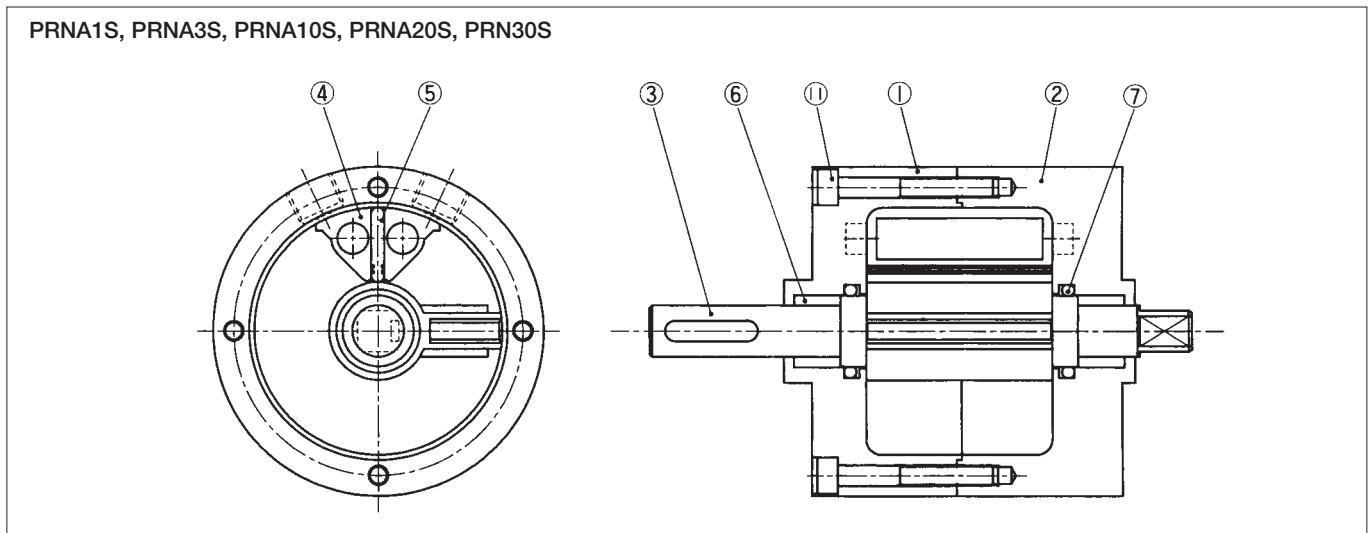
HI-ROTOR with switch/For details, see pages 52 to 54.

CT AND SR TYPE PROXIMITY SWITCHES

Type of switch	Mounting	Load voltage (V)	Load current (mA)	Indicating lamp (Lights up at ON)	Applications
CT-3 CT-3U CTP-3	Switch position adjustable	DC5~30	5~200	○	Relay PLC IC circuit
SR SU	Switch position fixed				

(Note) CTP-3 is made-to-order

STRUCTURE



MAIN COMPONENTS

No.	Description	Material	
		PRN30S	PRNA1S, PRNA3S, PRNA10S, PRNA20S
①	Body A	Aluminium alloy	
②	Body B	Aluminium alloy	
③	Vane shaft	Steel+Resin+Nitrile rubber	Steel+Resin+Hydrogenated nitrile rubber
④	Shoe	Resin	
⑤	Shoe seal	Nitrile rubber	Hydrogenated nitrile rubber
⑥	Bushing	—	
⑦	O-ring	Nitrile rubber	Hydrogenated nitrile rubber
⑪	Set screw	Steel	

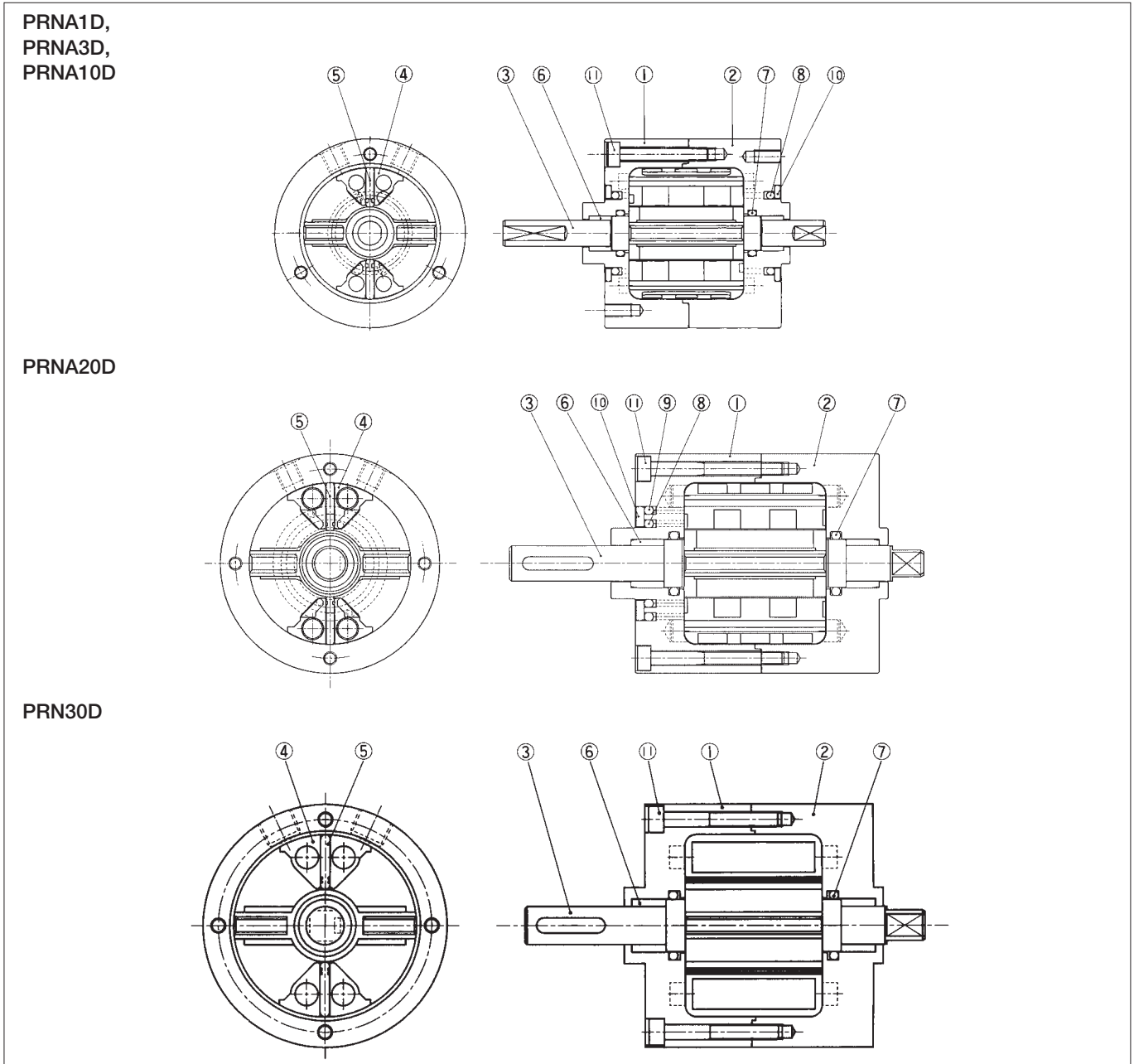
MODEL Nos. OF PACKING KIT

Applicable HI-ROTOR	Model No.
PRNA1S	PRNA1S-PS
PRNA3S, PROA3S	PRNA3S-PS
PRNA10S, PROA10S	PRNA10S-PS
PRNA20S, PROA20S	PRNA20S-PS
PRN30S, PRO30S	PRN30S-PS
PRH30S	PRH30S-PS

(Note) A set of packings consists of part Nos. ③, ⑤ and ⑦.

Miniature HI-ROTOR/PRN series

STRUCTURE



MAIN COMPONENTS

No.	Description	Material	
		PRNA1D, PRNA3D, PRNA10D, PRNA20D	PRN30D
①	Body A	Aluminium alloy	
②	Body B	Aluminium alloy	
③	Vane shaft	Steel+Resin+Hydrogenated nitrile rubber	Steel+Resin+Nitrile rubber
④	Shoe	Resin	
⑤	Shoe seal	Hydrogenated nitrile rubber	Nitrile rubber
⑥	Bushing	—	
⑦	O-ring	Hydrogenated nitrile rubber	Nitrile rubber
⑧	O-ring	Hydrogenated nitrile rubber	Nitrile rubber
⑨	O-ring	Hydrogenated nitrile rubber (PRNA20D only)	—
⑩	Plate	Steel	—
⑪	Set screw	Steel	

MODEL Nos. OF PACKING KIT

Applicable HI-ROTOR	Model No.
PRNA1D	PRNA1D-PS
PRNA3D, PROA3D	PRN3D-PS
PRNA10D, PROA10D	PRNA10D-PS
PRNA20D, PROA20D	PRNA20D-PS
PRN30D, PRO30D	PRN30D-PS
PRH30D	PRN30D-PS

(Note) A set of packings consists of part Nos. ③, ⑤ and ⑦.

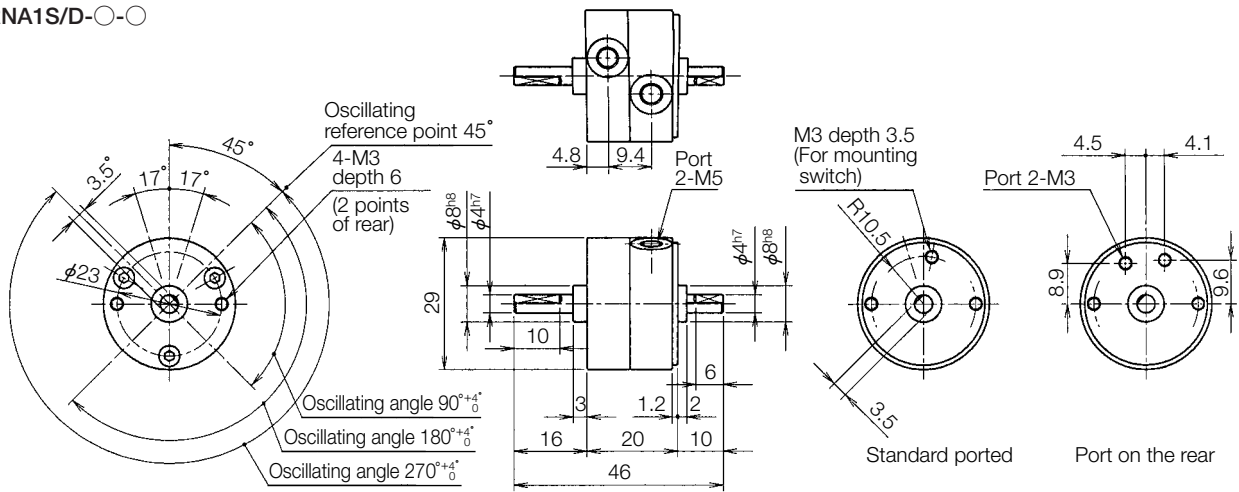
Miniature HI-ROTOR/PRN series

DIMENSIONS

(Unit : mm)

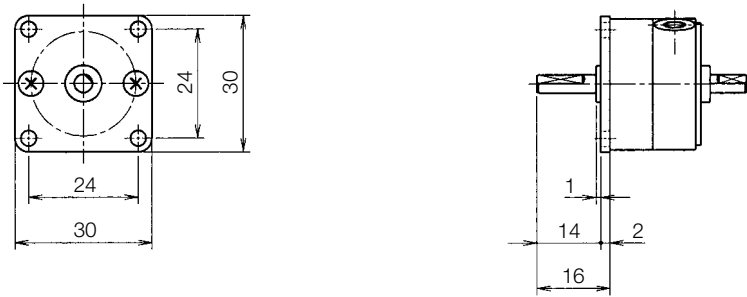
Basic type

PRNA1S/D-○-○



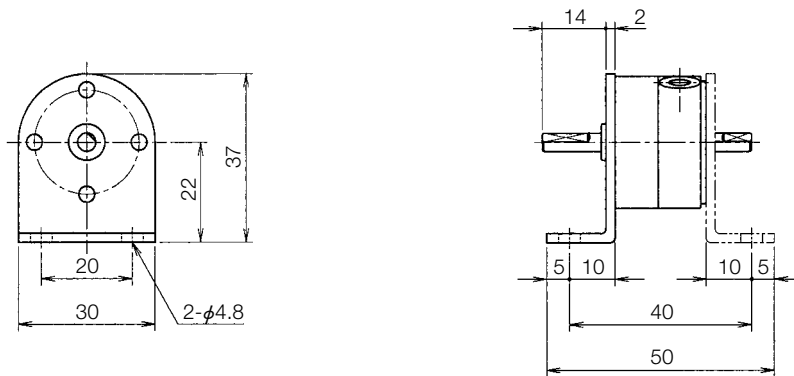
With flange plate

PRNA1S/D-○-○-P



With foot plate

PRNA1S/D-○-○-L1 (L2)

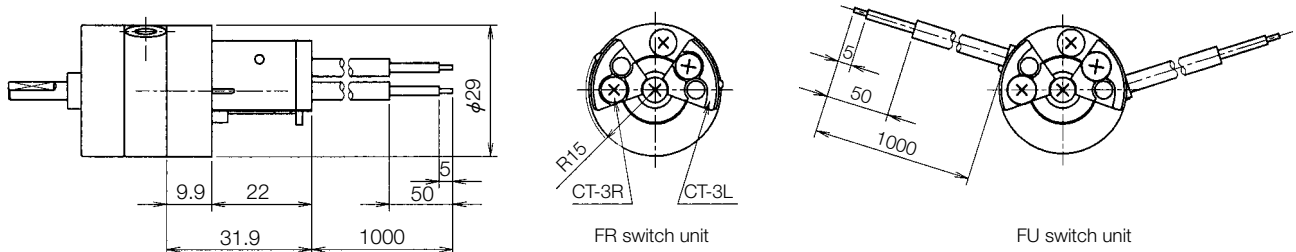


(Note) •A foot plate can be fitted with it turned in steps of 90° from the original posture.
 •Short shaft side : Example with L2 (2 pcs.)

With switch unit

(Switch position adjustable type)

PRNA1S/D-○-○-○-FR(FU)



(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

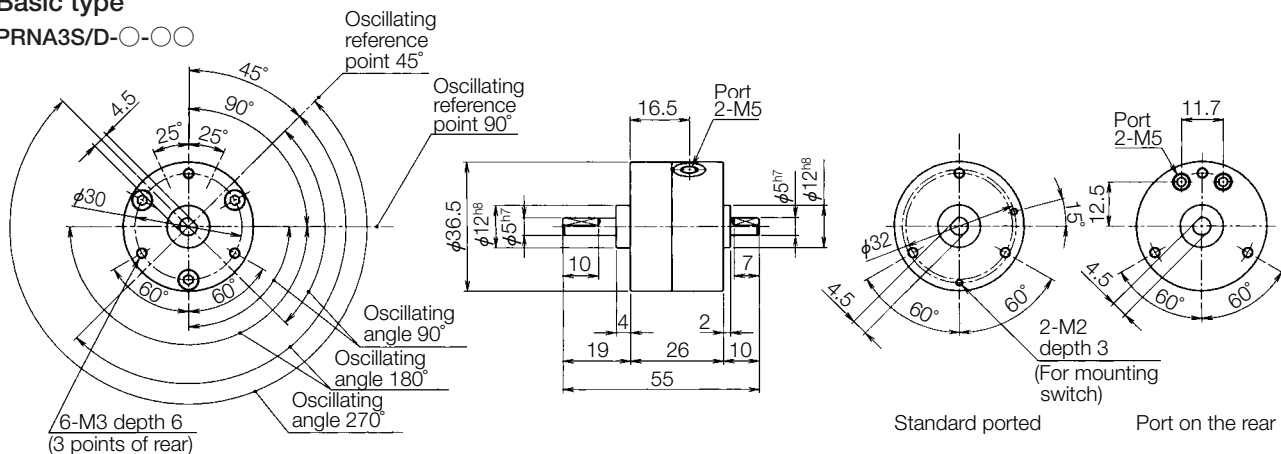
Miniature HI-ROTOR/PRN series

DIMENSIONS

(Unit : mm)

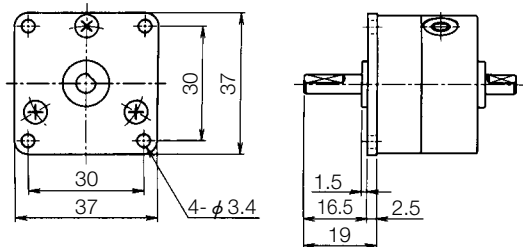
Basic type

PRNA3S/D-○-○-○



With flange plate

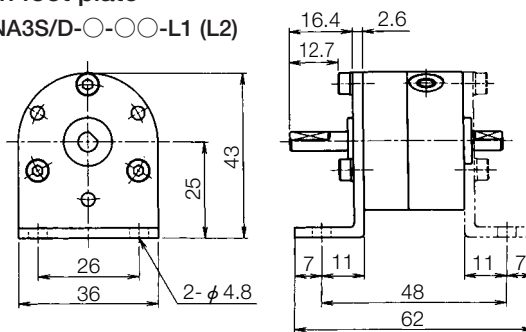
PRNA3S/D-○-○-○-P



(Note) A flange plate can be fitted with it turned in steps of 120° from the original posture.

With foot plate

PRNA3S/D-○-○-○-L1 (L2)

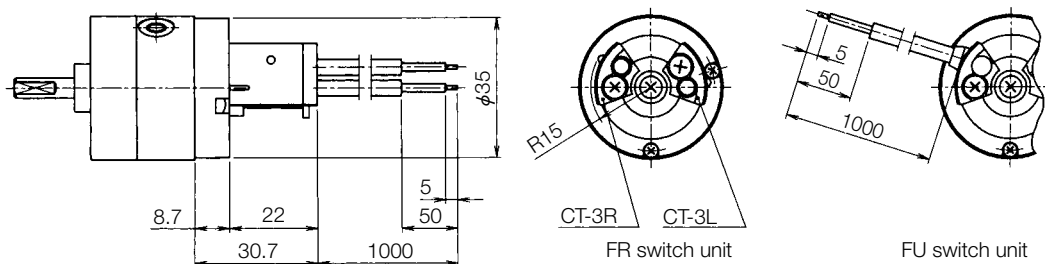


(Note) •A foot plate can be fitted with it turned in steps of 60° from the original posture.

•Short shaft side : Example with L2 (2 pcs.)

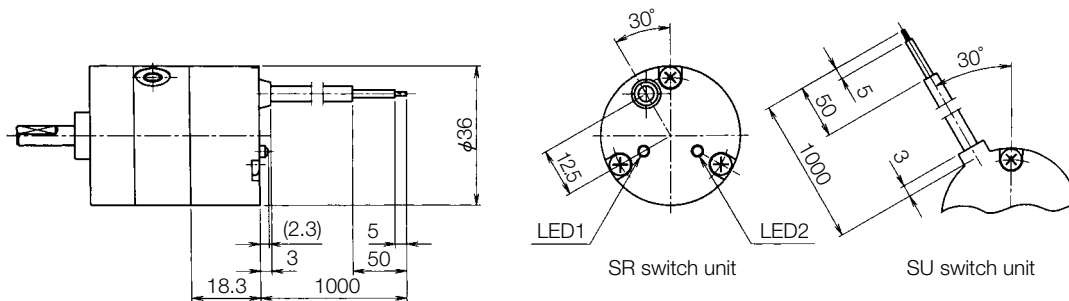
With switch unit (Switch position adjustable type)

PRNA3S/D-○-○-○-FR(FU)



With switch unit (Switch position fixed type)

PRNA3S-○-○-○-SR(SU)



(Note) LED1 comes on at the oscillating reference point and LED2 at the end of oscillation.

(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

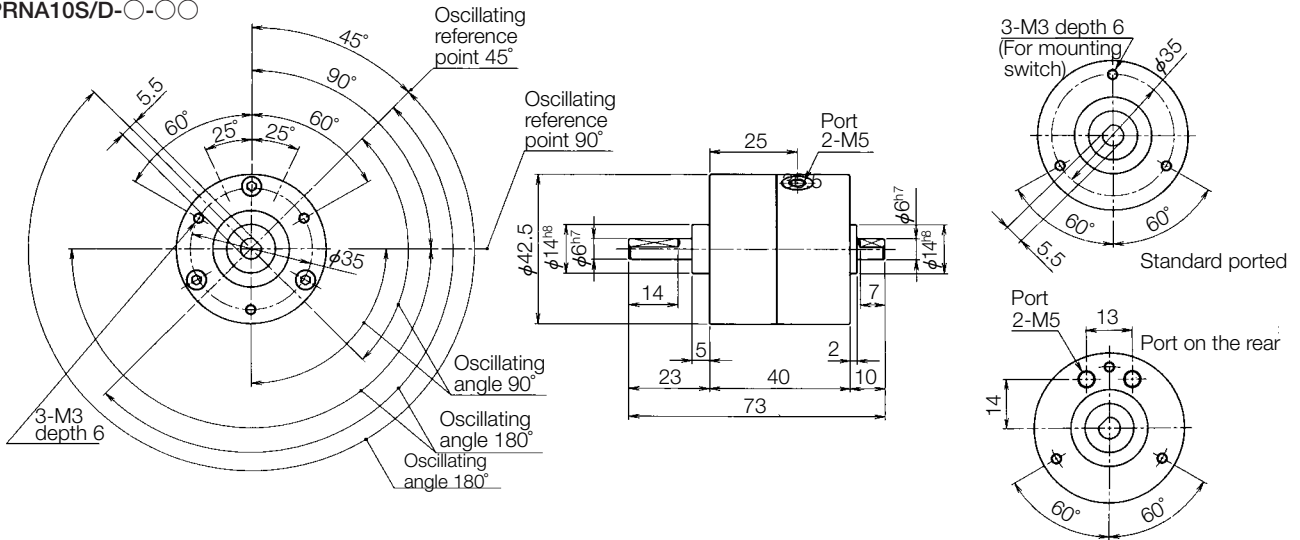
Miniature HI-ROTOR/PRN series

DIMENSIONS

(Unit : mm)

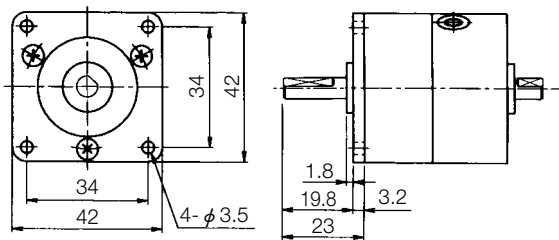
Basic type

PRNA10S/D-○-○-○



With flange plate

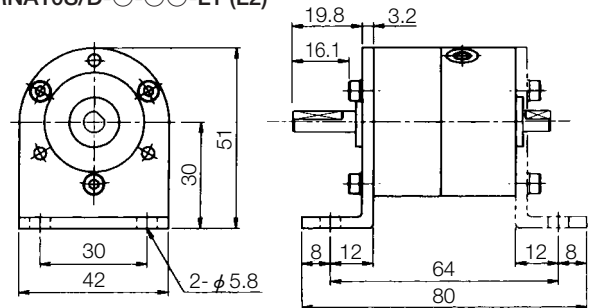
PRNA10S/D-○-○-○-P



(Note) A flange plate can be fitted with it turned in steps of 120° from the original posture.

With foot plate

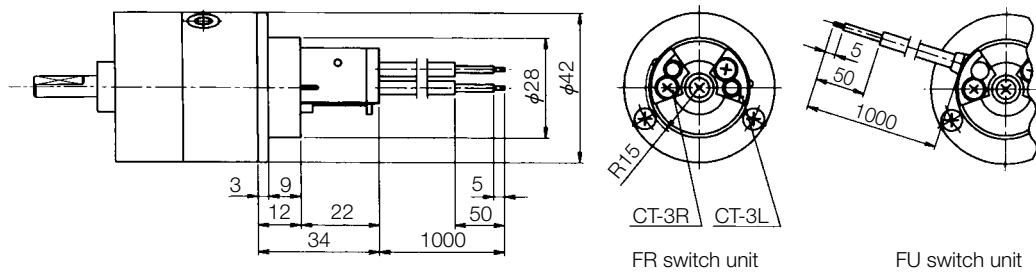
PRNA10S/D-○-○-○-L1 (L2)



(Note) • A foot plate can be fitted with it turned in steps of 60° from the original posture.
• Short shaft side : Example with L2 (2 pcs.)

With switch unit (Switch position adjustable type)

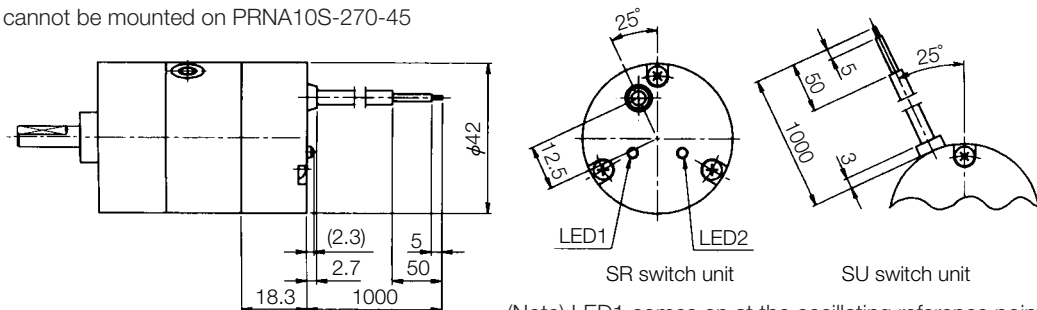
PRNA10S/D-○-○-○-FR(FU)



With switch unit (Switch position fixed type)

PRNA10S/D-○-○-○-SR(SU)

SR and SU switch cannot be mounted on PRNA10S-270-45



(Note) LED1 comes on at the oscillating reference point and LED2 at the end of oscillation.

(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

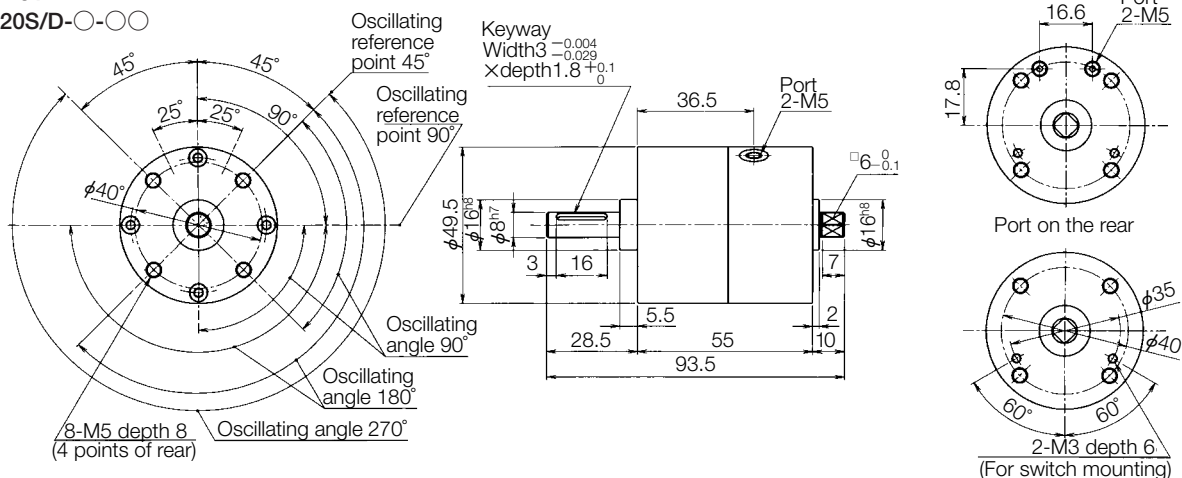
Miniature HI-ROTOR/PRN series

DIMENSIONS

(Unit : mm)

Basic type

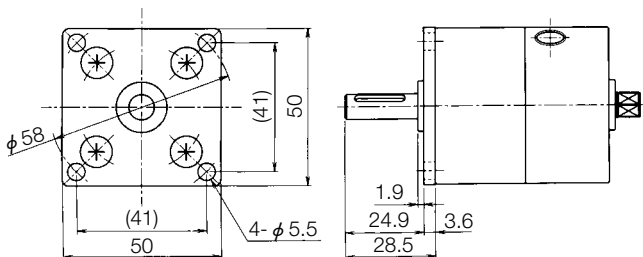
PRNA20S/D-○-○-○



Standard ported

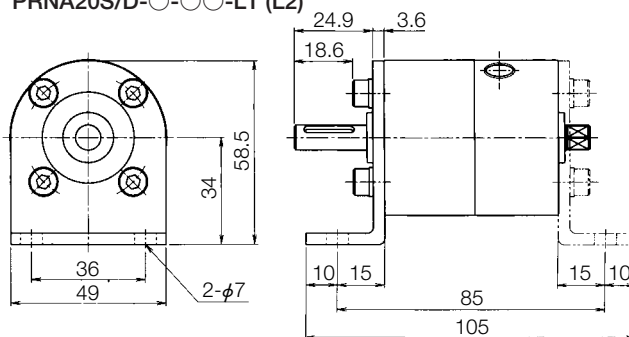
With flange plate

PRNA20S/D-○-○-○-P



With foot plate

PRNA20S/D-○-○-○-L1 (L2)

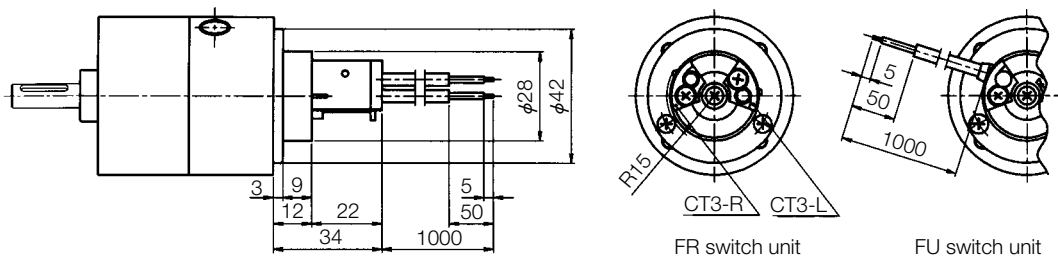


(Note) • A foot plate can be fitted with it turned in steps of 90° from the original posture.

• Short shaft side : Example with L2 (2 pcs.)

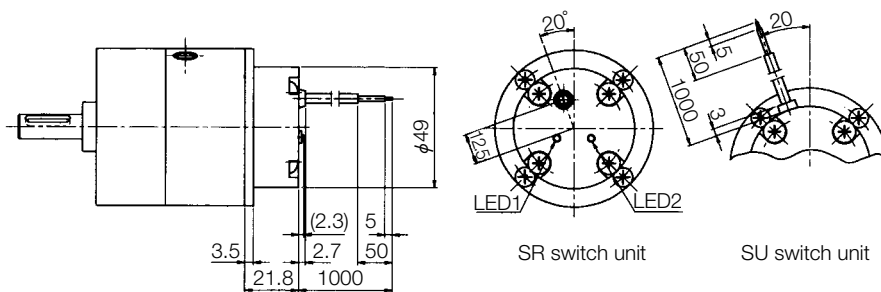
With switch unit (Switch position adjustable type)

PRNA20S/D-○-○-○-FR(FU)



With switch unit (Switch position fixed type)

PRNA20S-○-○-○-SR(SU)



(Note) LED1 comes on at the oscillating reference point and LED2 at the end of oscillation.

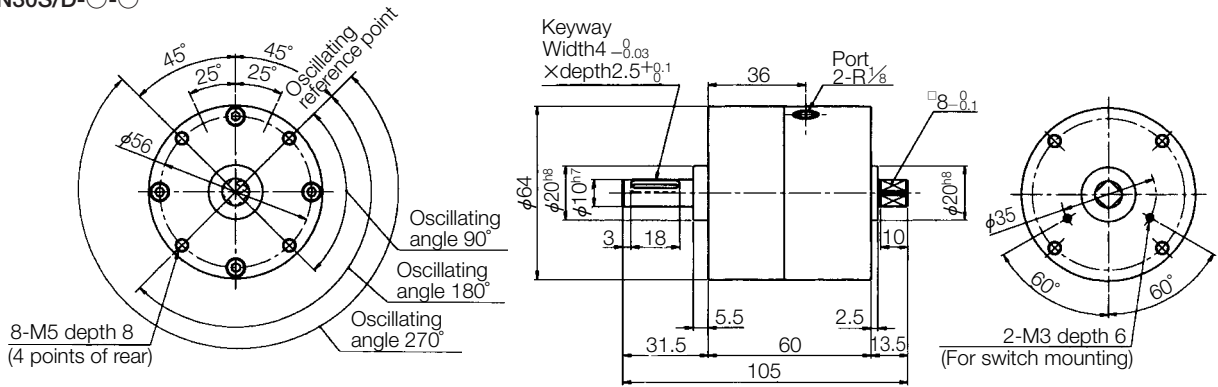
(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

Miniature HI-ROTOR/PRN series

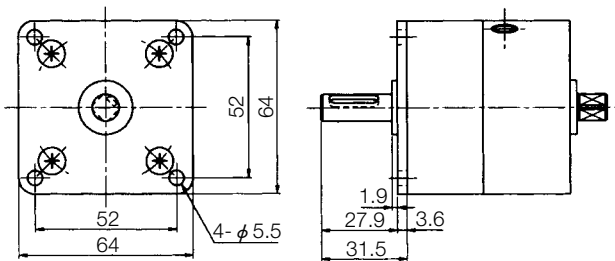
DIMENSIONS

(Unit : mm)

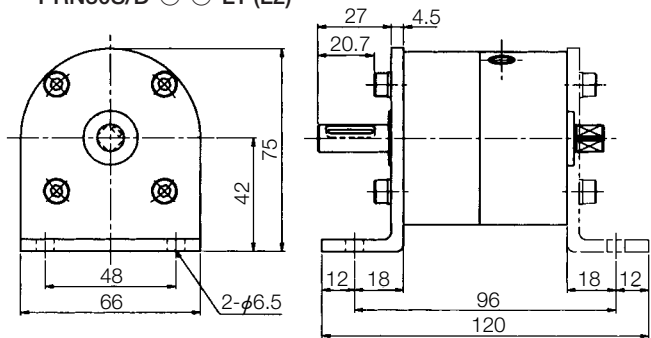
Basic type PRN30S/D-○-○



With flange plate PRN30S/D-○-○-P

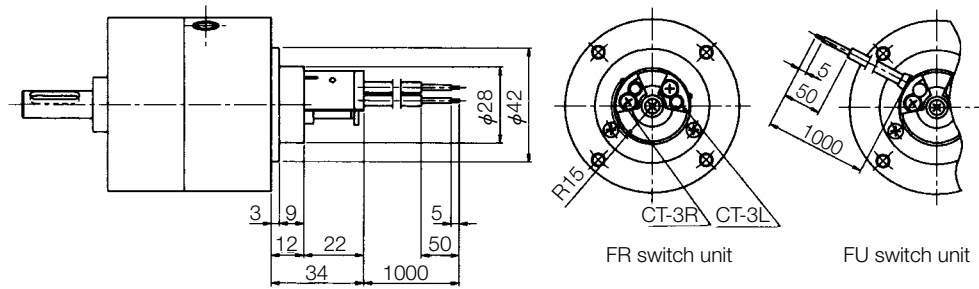


With foot plate PRN30S/D-○-○-L1 (L2)

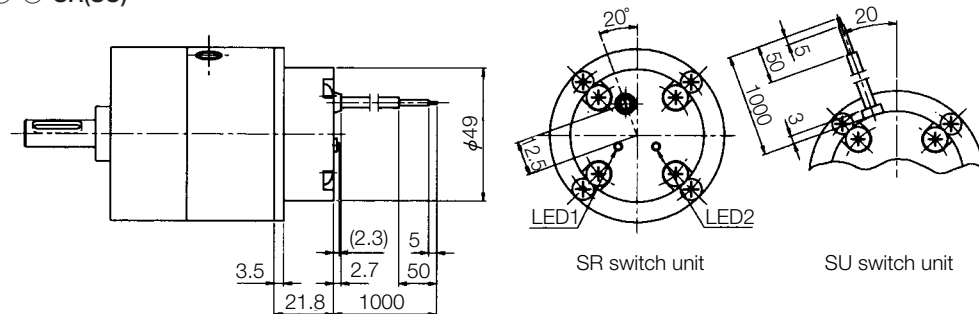


(Note) • A foot plate can be fitted with it turned in steps of 90° from the original posture.
• Short shaft side : Example with L2 (2 pcs.)

With switch unit (Switch position adjustable type) PRN30S/D-○-○-○-FR(FU)



With switch unit (Switch position fixed type) PRN30S/D-○-○-○-SR(SU)



(Note) LED1 comes on at the oscillating reference point and LED2 at the end of oscillation.

(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

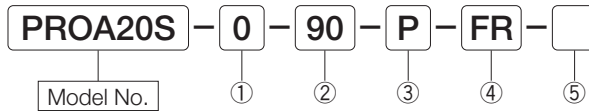
Miniature HI-ROTOR / Variable oscillating angle type

PROseries

3S, 10S, 20S, 30S, 3D, 10D, 20D, 30D



ORDERING INSTRUCTIONS



Single vane	Double vane
PROA3S	PROA3D
PROA10S	PROA10D
PROA20S	PROA20D
PRO30S	PRO30D

① Oscillating angle

0	Angle setting not specified
Desired angle*	Angle setting specified

* Custom-made

② Oscillating reference point

90	90° (PROA3S, 10S, 20S)
45	45° (PROA3D, 10D, 20D) (PRO30S/D)

③ Mounting hardware

No mark	No mounting hardware
P	With flange plate
L1	With one foot plate

④ Type of switch units

No mark	No switch	
FR	With CT-3 switch	Switch position adjustable
FU	With CT-3U switch	
FP	With CTP-3 switch	

(Note) • Two switches are provided.

• FP is made-to-order

⑥ Option

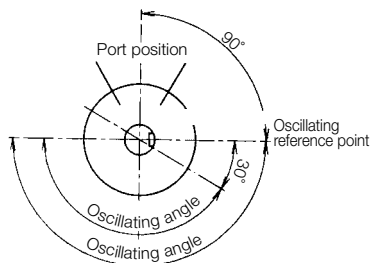
No mark	Without protective cover
K	With protective cover

(Note) For HI-ROTORs with switches, the protective cover cannot be mounted.

OSCILLATION STARTING POINT AND OSCILLATION ANGLE

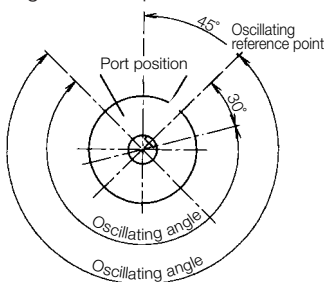
PROA3S, PROA10S, PROA20S

Oscillating reference point at 90°



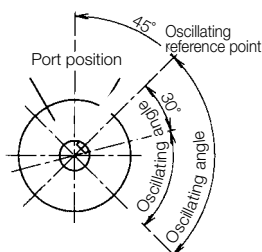
PRO30S

Oscillating reference point at 45°



PROA3D, PROA10D, PROA20D, PRO30D

Oscillating reference point at 45°



(Note) • HI-ROTORs of which the angle setting is not specified are shipped with fixed the reference point stopper but not the angle setting stopper when delivered. Be sure to attach the accompanying angle setting stopper without fail before use.

• HI-ROTORs of which angle setting is specified (made-to-order) will be delivered with angle setting stopper attached to the approximate position. Be sure to adjust the stopper position with the fine adjust screw before use.

• HI-ROTORs with a switch unit will be delivered together with the switch unit in the package. Assemble them after adjusting the external stopper. For the method of assembly, see Page 54.

• Mounting hardwares are not fabricated to the HI-ROTOR when delivered but are included in the package.

Model Nos. of stopper unit

Applicable HI-ROTOR	Model No.
PROA3S/D	RO3-U
PROA10S/D	RO10-U
PROA20S/D	RO20-U
PRO30S/D	RO30-U

Model Nos. of protective cover

Applicable HI-ROTOR	Model No.
PROA3S/D	PRO3-K
PROA10S/D	PRO10-K
PROA20S/D	PRO20-K
PRO30S/D	PRO30-K

(Note) For details, see page 26.

Model Nos. of mounting hardware

Applicable HI-ROTOR	Flange plate	Foot plate
PROA3S/D	PRN3-P	PRN3-L
PROA10S/D	PRN10-P	PRN10-L
PROA20S/D	PRN20-P	PRN20-L
PRO30S/D	PRN30-P	PRN30-L

(Note) These hardware are provided with set screws.

Miniature HI-ROTOR/PRO series

SPECIFICATIONS

Model No.	Unit	PROA3S	PROA10S	PROA20S	PRO30S
Vane		Single vane			
Fluid		Non-lubricated air (Lubricated air)			
Oscillating angle	Degree	30~180			30~270
Oscillating reference point	Degree	90			45
Port size		M5			Rc1/8
Minimum working pressure	MPa	0.1			
Operation pressure range	MPa	0.2~0.7		0.2~1	
Proof withstanding pressure	MPa	1.05		1.5	
Temperature range	°C	-5~80			-5~60
Maximum frequency of use	Hz	3 (at 180°)	2.5 (at 180°)	2 (at 180°)	1 (at 270°)
Internal volume	cm ³	4	12	21	43
Allowable radial load	N	40	50	300	400
Allowable thrust load	N	4	4	25	30
Allowable energy	mJ	1	2	3	7
Mass	kg	0.085	0.17	0.28	0.51

Model No.	Unit	PROA3D	PROA10D	PROA20D	PRO30D
Vane		Double vane			
Fluid		Non-lubricated air (Lubricated air)			
Oscillating angle	Degree	30~90			
Oscillating reference point	Degree	45			
Port size		M5			Rc1/8
Minimum working pressure	MPa	0.07		0.08	
Operation pressure range	MPa	0.2~0.7		0.2~1	
Proof withstanding pressure	MPa	1.05		1.5	
Temperature range	°C	-5~80			-5~60
Maximum frequency of use	Hz	4 (at 90°)	4 (at 90°)	3 (at 90°)	3 (at 90°)
Internal volume	cm ³	2.8	8.1	15	34
Allowable radial load	N	40	50	300	400
Allowable thrust load	N	4	4	25	30
Allowable energy	mJ	1	2	3	7
Mass	kg	0.087	0.18	0.29	0.53

(Note) • The allowable energy differs from that of the PRN series.

• Maximum frequency of use at the supply pressure of 0.5MPa (Unloaded).

• Make sure to use the HI-ROTOR within allowable energy. Refer to page 68 for the allowable energy calculation.

• HI-ROTORs with keyways are provided with keys.

• For HI-ROTORs other than standard, consult KURODA.

Output (Effective torque)

(Unit : N·cm)

Model No.		Supply pressure (MPa)								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Single vane	PROA3S	10	17	24	31	38	45	—	—	—
	PROA10S	35	56	75	98	120	139	—	—	—
	PROA20S	59	95	133	170	210	249	287	326	368
	PRO30S	110	180	250	319	410	480	580	650	720
Double vane	PROA3D	25	39	54	71	86	101	—	—	—
	PROA10D	76	117	162	211	254	303	—	—	—
	PROA20D	140	222	306	388	470	553	633	717	807
	PRO30D	270	440	600	770	950	1120	1299	1480	1660

Miniature HI-ROTOR/PRO series

EXTERNAL STOPPER SPECIFICATIONS

(Unit : Degree)

Model No.	PROA3S	PROA10S	PROA20S	PRO30S	PROA3D	PROA10D	PROA20D	PRO30D
Minimum angel setting	30							
Maximum angle setting	180			270	90			
Pitch for angle setting	15							
Angle fine adjustment range	-9~+6							
Oscillating reference poit fine adjust range	±3				-1~+3	±3		
Fine adjust range at maximum angle setting	-9~+6			-9~+3	-9~+1	-9~+3		

OSCILLATING ANGLE SETTING RANGE AND REFERENCE POINT

Model No.		Oscillation angle setting range	Oscillating reference point
Single vane	PROA3S	30~180°	90°
	PROA10S		
	PROA20S		
	PRO30S	30~270°	45°
Double vane	PROA3D	30~90°	45°
	PROA10D		
	PROA20D		
	PRO30D		

HI-ROTOR with switch/ For details, see pages 53.

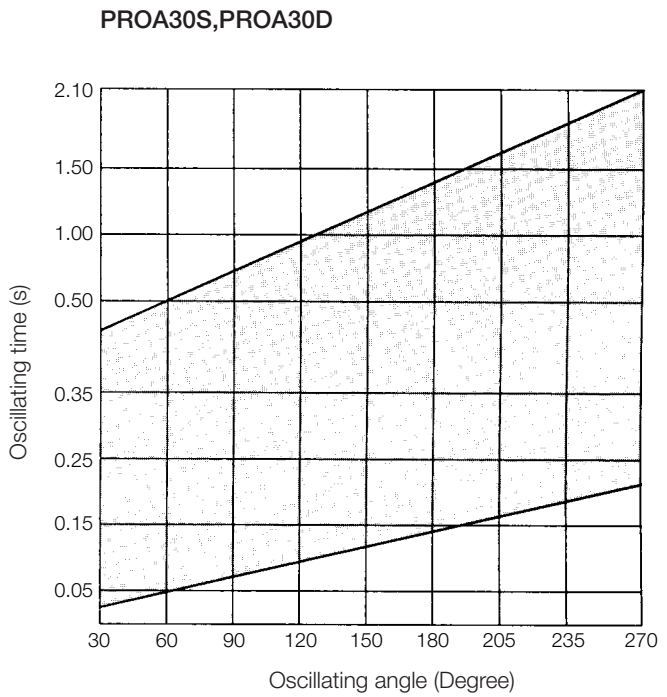
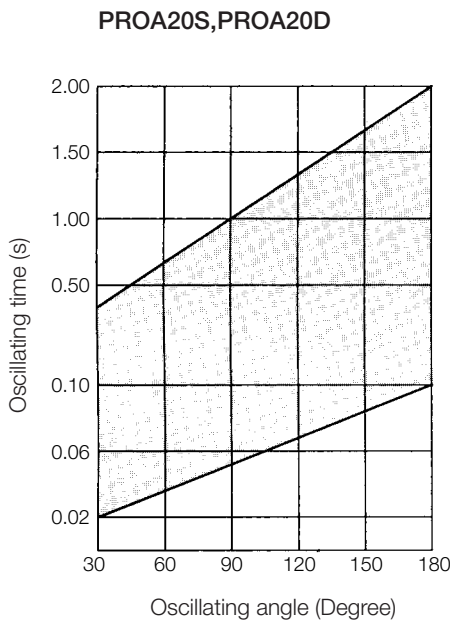
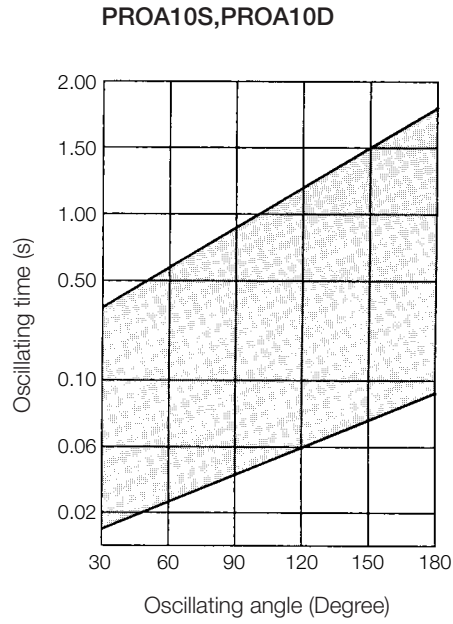
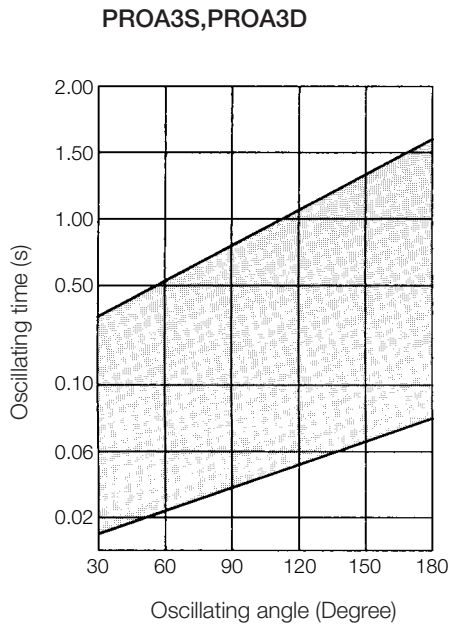
CT TYPE PROXIMITY SWITCHES

Type of switch	Mounting	Load voltage (V)	Load current (mA)	Indicating lamp (Lights up at ON)	Applications
CT-3 CT-3U CTP-3	Switch position adjustable	DC5~30	5~200	○	Relay PLC IC circuit

(Note) CTP-3 is made-to-order

Miniature HI-ROTOR/PRO series

OSCILLATING TIME RANGE

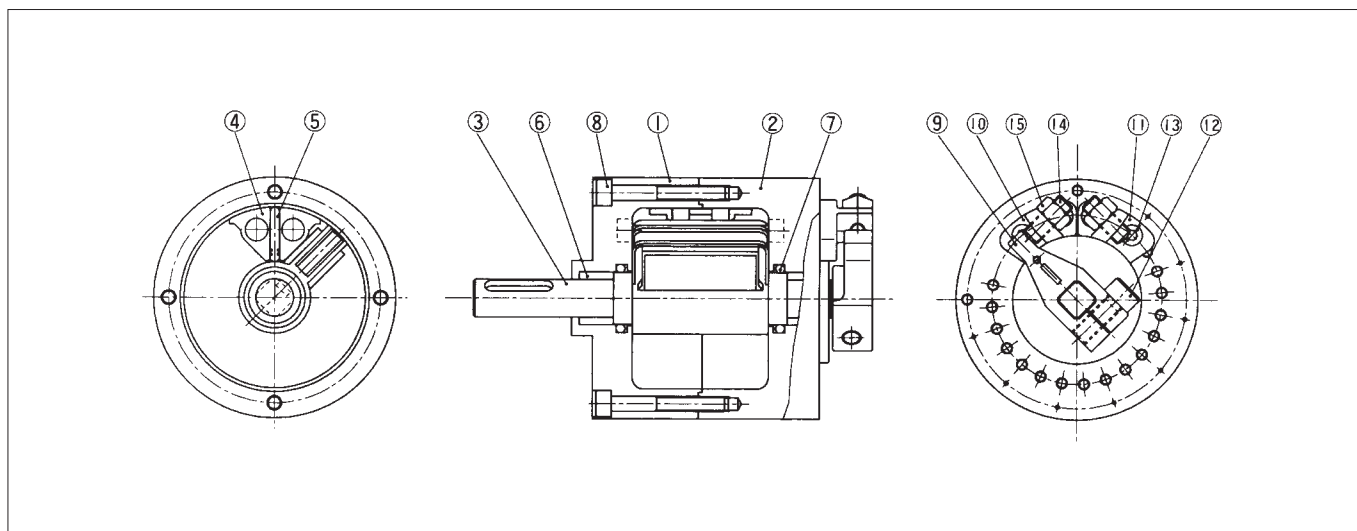


(Note) Operate HI-ROTORs within the range of duration shown in the above charts. Otherwise, the HI-ROTORs will tend to move in stick-slip motion.

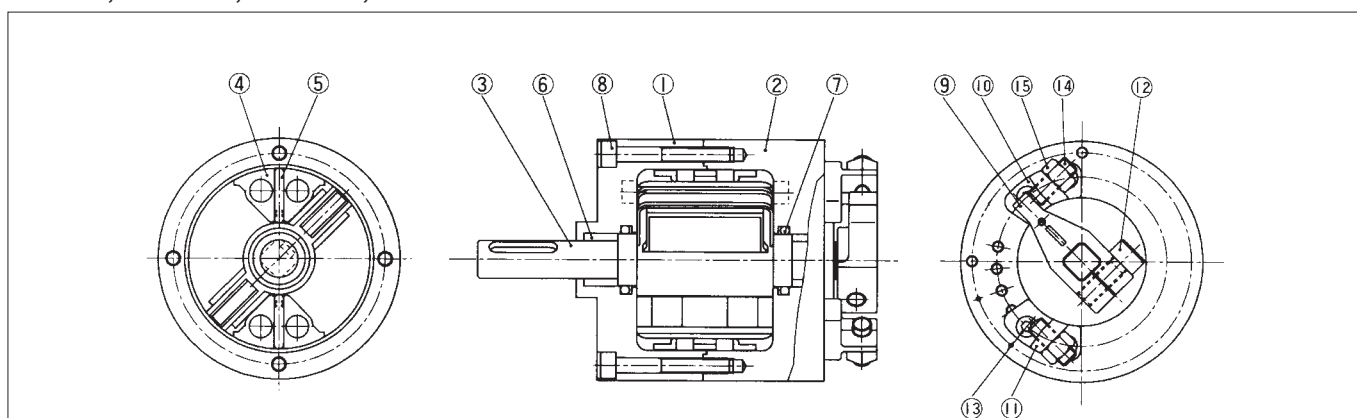
Miniature HI-ROTOR/PRO series

STRUCTURE

PROA3S, PROA10S, PROA20S, PRO30S



PROA3D, PROA10D, PROA20D, PRO30D



(Note) The above figure is the structural drawing of PRO30D.

The body of PROA3D, 10D and 20D has the same structure as standard HI-ROTOR PRNA3D, 10D and 20D. (See Page 16)

MAIN COMPONENTS

No.	Description	Material	
		PROA3, PROA10, PROA20	PRO30
①	Body A	Aluminium alloy	
②	Body B	Aluminium alloy	
③	Vane shaft	Steel+Resin+Hydrogenated nitrile rubber	Steel+Resin+Nitrile rubber
④	Shoe	Resin	
⑤	Shoe seal	Hydrogenated nitrile rubber	Nitrile rubber
⑥	Bushing	—	
⑦	O-ring	Hydrogenated nitrile rubber	Nitrile rubber
⑧	Set screw	Steel	
⑨	Claw	Steel	
⑩	Stopper L	Steel	
⑪	Stopper R	Steel	
⑫	Claw set screw	Steel	
⑬	Stopper set screw	Steel	
⑭	Fine-adjust screw	Steel	
⑮	Locknut	Steel	

COMPONENTS OF STOPPER UNIT

A stopper unit consists of ⑨, ⑩, ⑪, ⑫, ⑬, ⑭ and ⑮ shown in the above list.

MODEL Nos. OF PACKING KIT

Same as those for standard type HI-ROTOR (PRN series), See page 15 to 16.

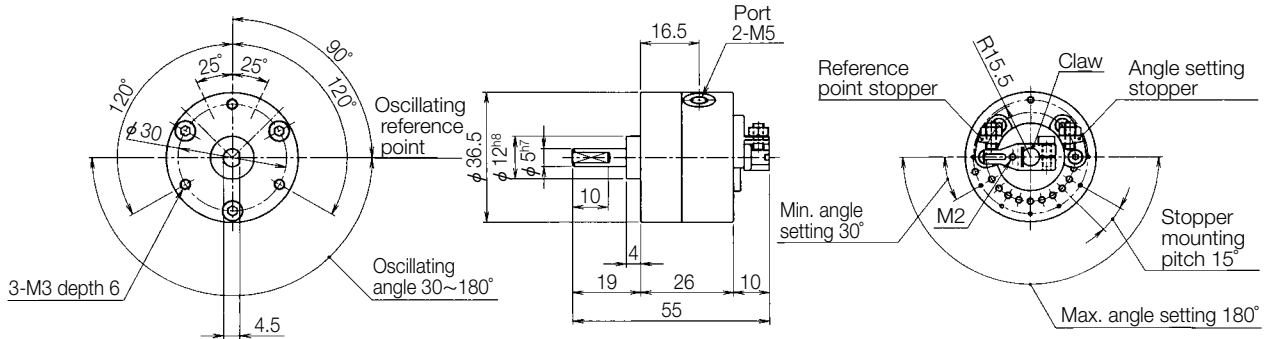
Miniature HI-ROTOR/PRO series

DIMENSIONS

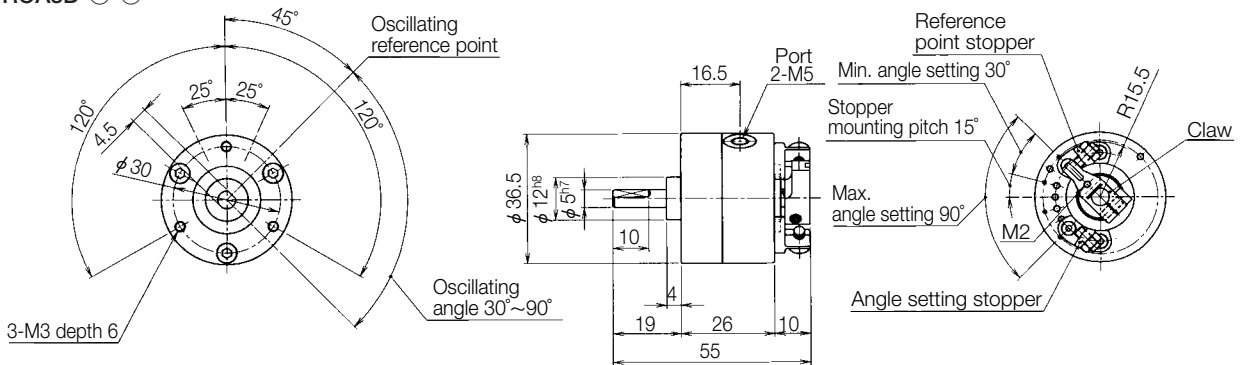
(Unit : mm)

Basic type

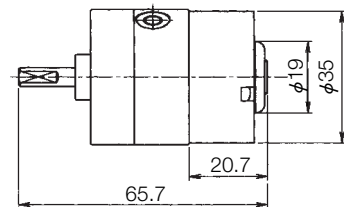
PROA3S-○-○



PROA3D-○-○

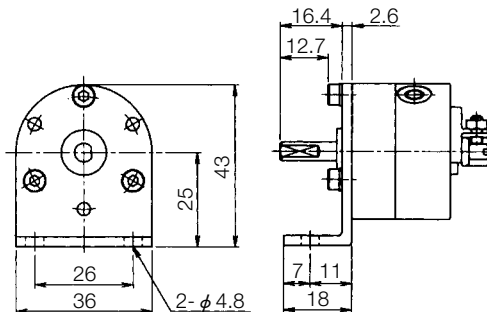


With protection cover



With foot plate

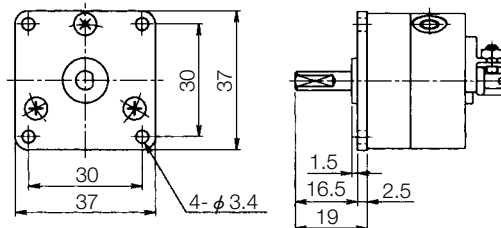
PROA3S/D-○-○-L1



(Note) A foot plate can be fitted with it turned in steps of 60° from the original posture.

With flange plate

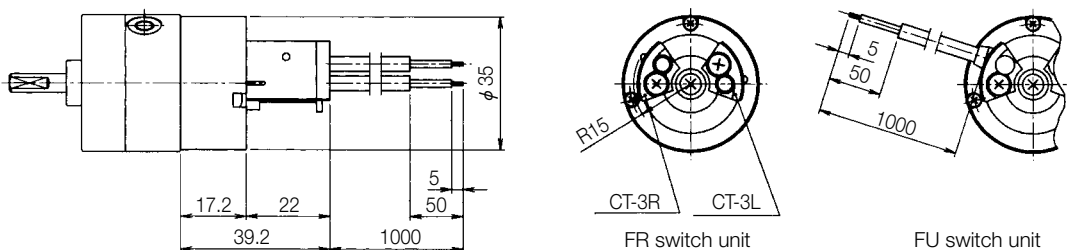
PROA3S/D-○-○-P



(Note) A flange plate can be fitted with it turned in steps of 120° from the original posture.

With switch unit (Switch position adjustable type)

PROA3S/D-○-○-○-FR(FU)



(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

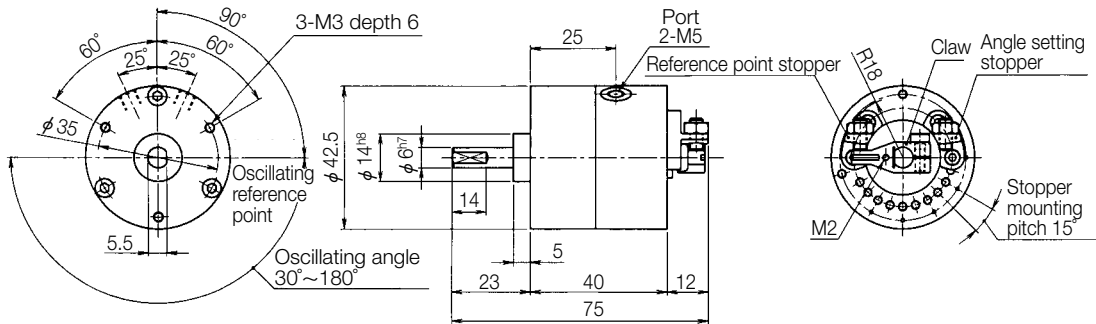
Miniature HI-ROTOR/PRO series

DIMENSIONS

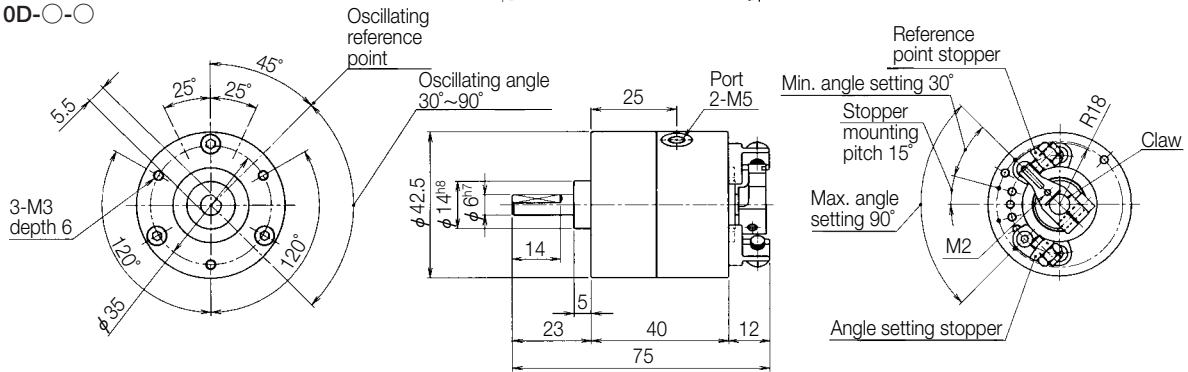
(Unit : mm)

Basic type

PROA10S-○-○

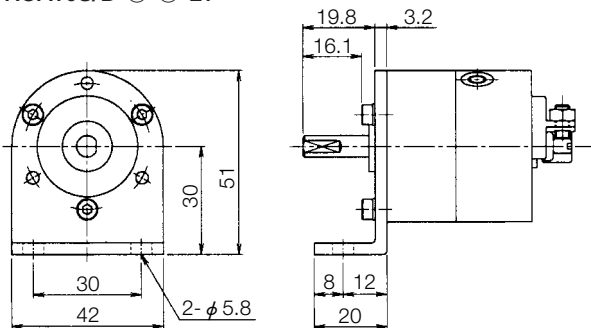


PROA10D-○-○



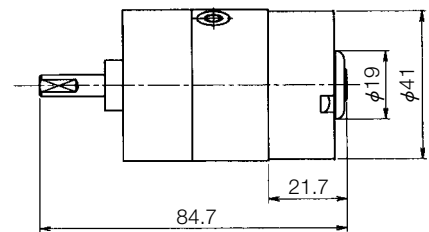
With foot plate

PROA10S/D-○-○-L1



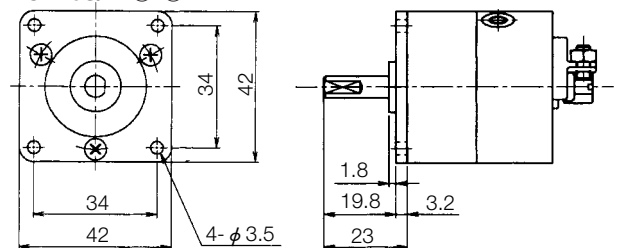
(Note) A foot plate can be fitted with it turned in steps of 60° from the original posture.

With protection cover



With flange plate

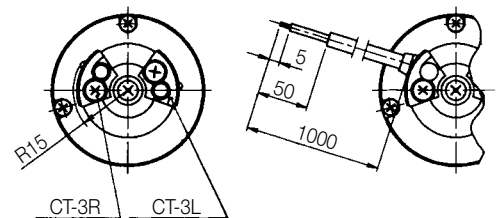
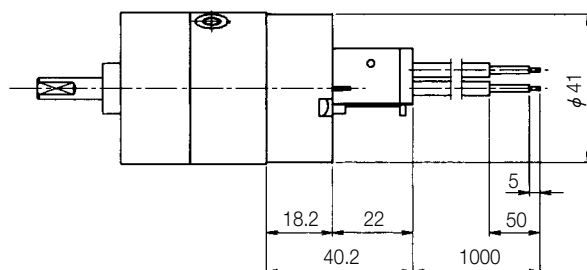
PROA10S/D-○-○-P



(Note) A flange plate can be fitted with it turned in steps of 120° from the original posture.

With switch unit (Switch position adjustable type)

PROA10S/D-○-○-○-FR(FU)



FR switch unit

FU switch unit

(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

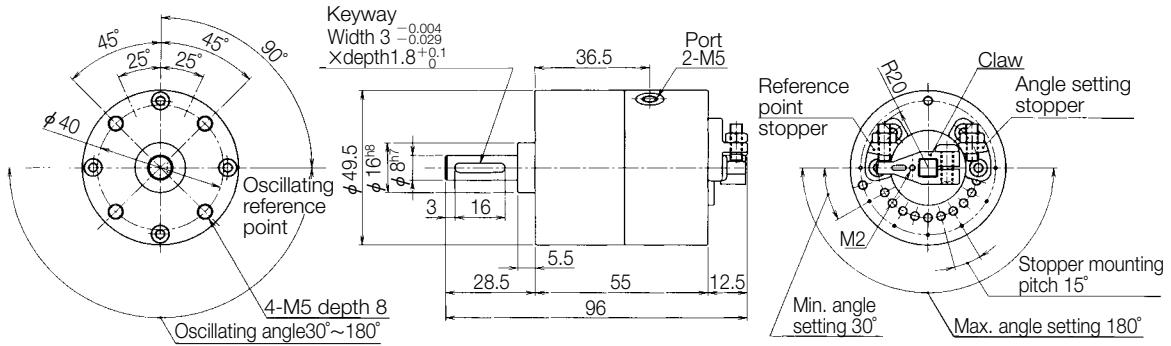
Miniature HI-ROTOR/PRO series

DIMENSIONS

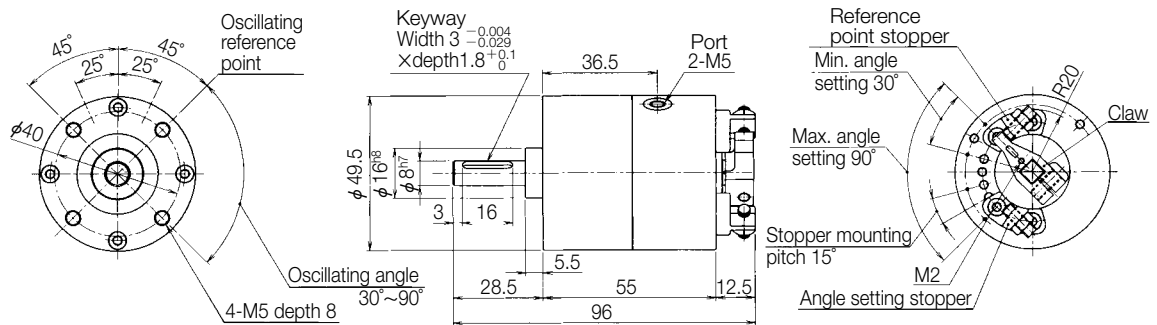
(Unit : mm)

Basic type

PROA20S-○-○

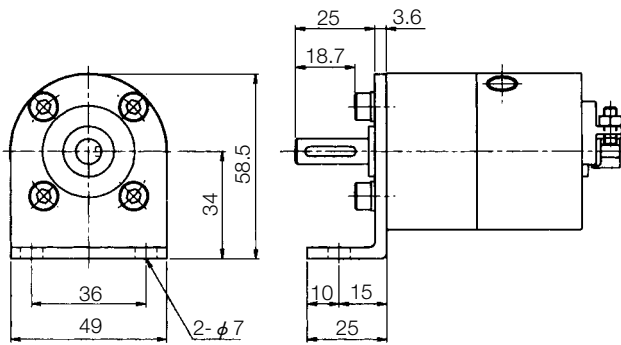


PROA20D-○-○



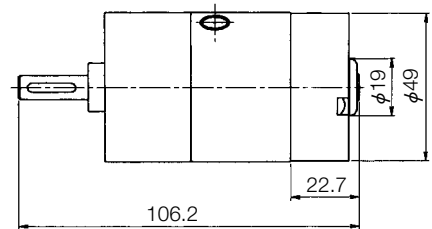
With foot plate

PROA20S/D-○-○-L1



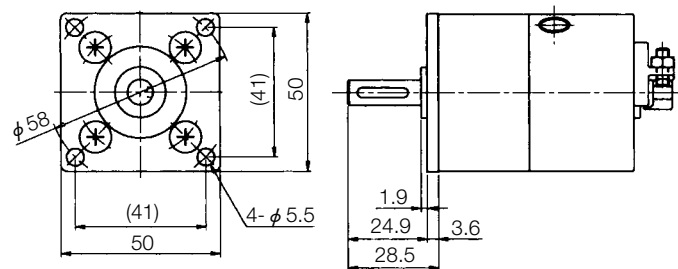
(Note) A foot plate can be fitted with it turned in steps of 90° from the original posture.

With protection cover



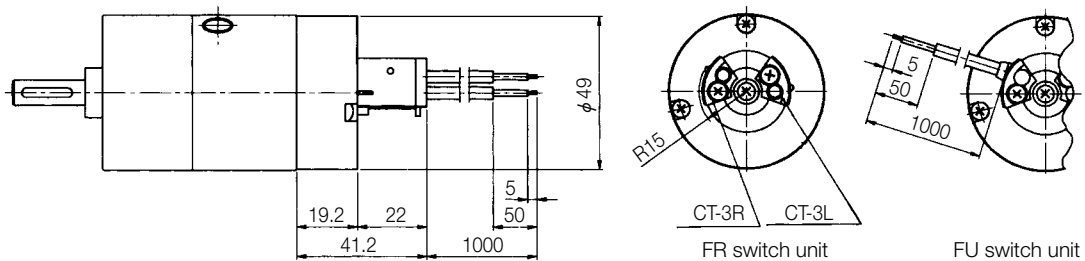
With flange plate

PROA20S/D-○-○-P



With switch unit (Switch position adjustable type)

PROA20S/D-○-○-○-FR(FU)



(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

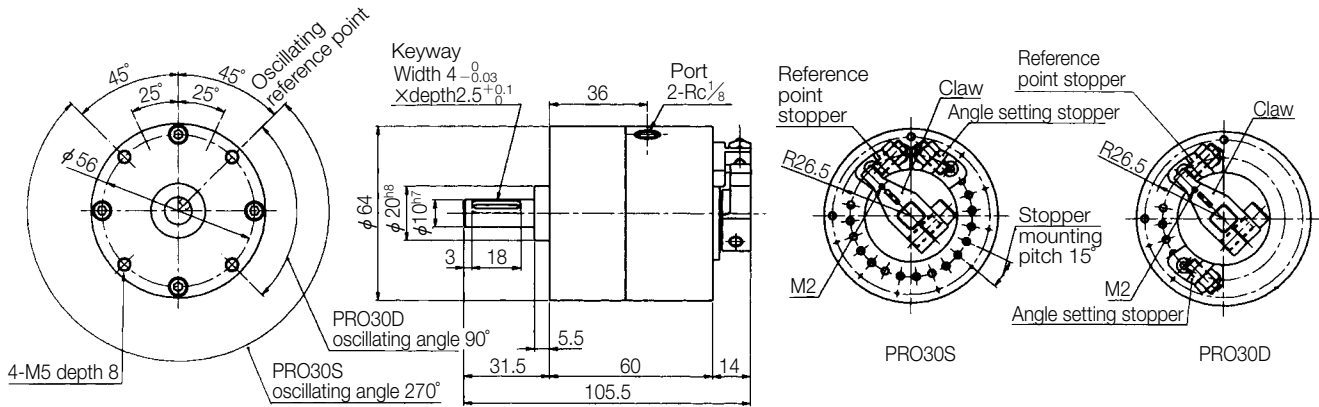
Miniature HI-ROTOR/PRO series

DIMENSIONS

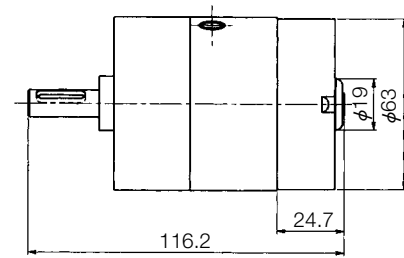
(Unit : mm)

Basic type

PRO30S/D-○-○

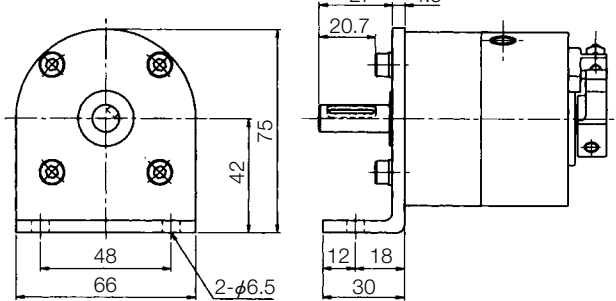


With protection cover



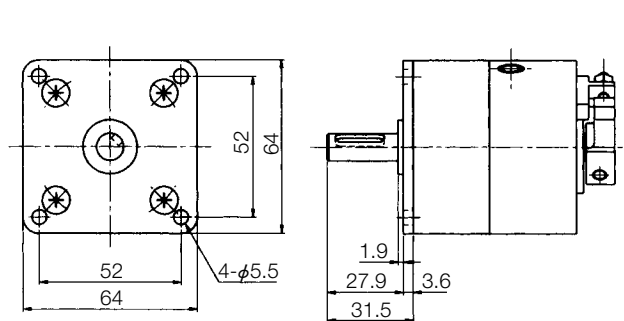
With foot plate

PRO30S/D-○-○-L1



With flange plate

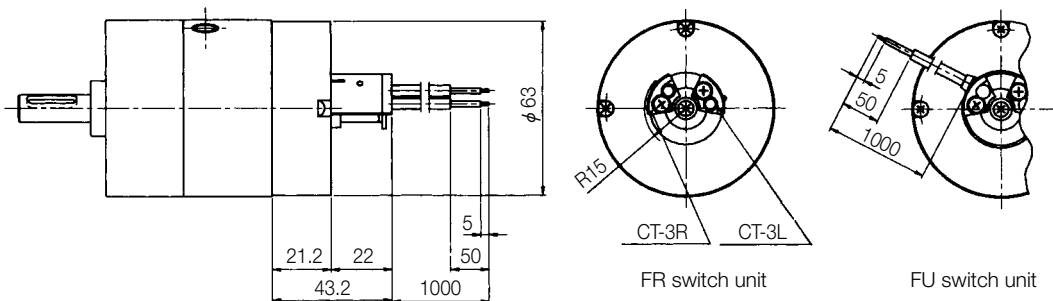
PRO30S/D-○-○-P



(Note) A foot plate can be fitted with it turned in steps of 90° from the original posture.

With switch unit (Switch position adjustable type)

PRO30S/D-○-○-○-FR(FU)



(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

Miniature HI-ROTOR/PRO series



INDIVIDUAL INSTRUCTIONS

Be sure to read them before use.

Also refer to Par. "For Safety Use" and common instructions.

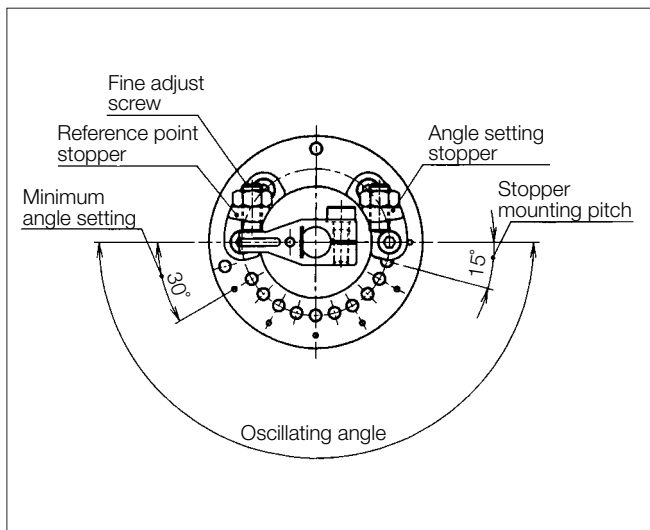
SETTING ANGLE

! WARNING

- Be sure to attach the reference point stopper and angle setting stopper before starting the HI-ROTOR.
- When setting the stoppers at the oscillation reference point and at the maximum oscillating angle, be careful not to set them outside the adjustable range. Otherwise, the vane will run against the internal stopper and damage it. Be sure to adjust the angle so that the claw will stop when it touches the external stopper.
- The reference point stopper is fixed and immovable.
- The oscillation angle is determined by the claw when it hits the fine adjust screw of each stopper. The accuracy of the stop angle dose not take into consideration wear from operation. When the oscillation angle has changed to wear, readjust it with the fine adjust screw.

STRUCTURE OF VARIABLE OSCILLATING ANGLE MECHANISM

Attach external stoppers to the tapped hole provid on the HI-ROTOR body. Two types of stoppers are provided: a reference point stopper and an angle setting stopper. The reference point stopper has been attached to the fixed position (oscillating reference point). On the other hand, the angle setting stopper is attached to a position where the desired angle can be set. The HI-ROTOR stops when the claw fitted to the shaft run against the stopper. Fine adjustment of the angle can be accomplished with the adjust screw on the stopper.



SETTING THE OSCILLATING ANGLE

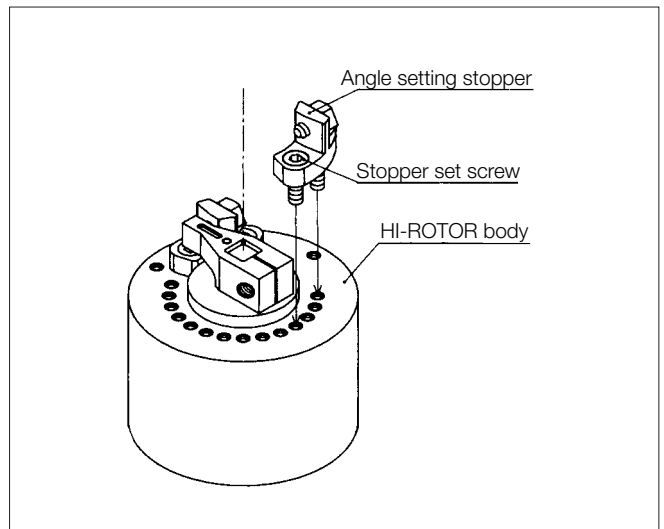
! CAUTION

• HI-ROTORs of which the angle setting is not specified (Standard)

For these HI-ROTORs, only the reference point stopper has been fixed and the angle setting stopper is shipped with the HI-ROTOR when delivered. Therefore, you are required to attach the angle setting stopper to the position for the desired angle setting. The angle setting stopper can be attached at intervals of 15°. For setting procedures, refer to "How to set the oscillating angle" (Page 20).

• HI-ROTORs of which the angle setting is specified (Made-to-order)

These HI-ROTORs are delivered with the reference point stopper and angle setting stopper fixed at the specified angle. However, you are required to adjust the fine adjust screws provided on each stopper to set the exact angle.





INDIVIDUAL INSTRUCTIONS

Be sure to read them before use.

Also refer to Par. "For Safety Use" and common instructions.

HOW TO SET THE OSCILLATING ANGLE

! CAUTION

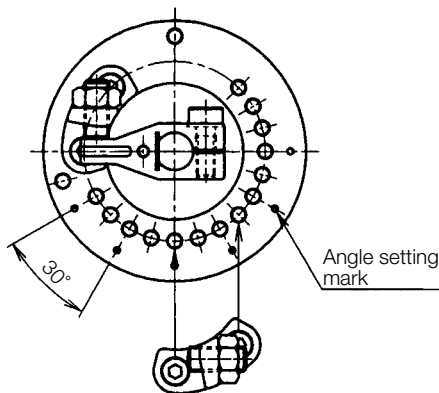
• When the angle setting equals the stopper mounting pitch (15°)

- ① Place the stopper into the tapped hole corresponding to the intended angle and fix it. When mounting the stopper, use the angle setting marks provided, at an interval of 30°, near the tapped hole.

Angle setting

Model No.	Angle setting (at 15° intervals)
PROA3S/D	30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°, 150°, 165°, 180°
PROA10S/D	
PROA20S/D	
PRO30S/D	30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°, 150°, 165°, 180°, 195°, 210°, 225°, 240°, 255°, 270°

In case of 90°



- ② Then, rotate the fine adjust screws on the reference point stopper and angle setting stoppers until the correct angle is obtained. After completing the angle setting, tighten the locknut without fail.

Angle fine adjust range

Reference point stopper fine adjust range	*±3°
Angle setting stopper fine adjust range	-9°~+6°
Angle setting stopper fine adjust range for maximum angle setting	** -9°~+3°

(Note) *PROA3D : -1° to +3°

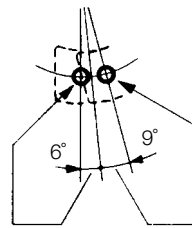
**PROA3D : -9° to +1°

HOW TO SET THE OSCILLATING ANGLE

! CAUTION

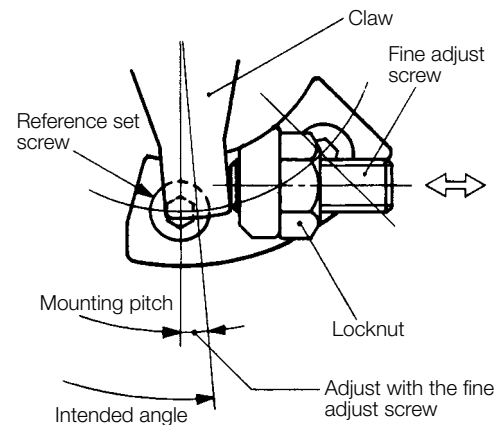
• When the angle setting lies between two 15° stops:

- ① When the desired angle lies between two 15° stops, fix the stopper into the tapped hole with the arrow as shown in the Fig. below and fix it.



When the desired angle lies in the 6° portion on this side (viewing from the reference point) between the stops, insert the stopper so its reference side comes into contact with the set screw on this side. When the intended angle lies in the remaining 9° portion between stops, attach the stopper so that its reference side comes into contact with the set screw on the other side (viewing from the reference point).

- ② Then, rotate the fine adjust screw fitted to the stopper to obtain the correct angle. After completing the angle setting, tighten the locknut without fail.



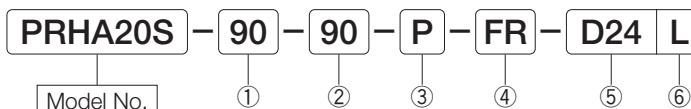
Miniature HI-PAL HI-ROTOR/With solenoid valve

PRHseries

10S, 20S, 30S, 10D, 20D, 30D



ORDERING INSTRUCTIONS



Single vane	Double vane
PRHA10S	PRHA10D
PRHA20S	PRHA20D
PRH30S	PRH30D

① Oscillating angle

90	90°
180	180°
270	270°

② Oscillating reference point

90	90°
45	45°

③ Mounting hardware

No mark	No mounting hardware
P	With flange plate
L1	With one foot plate
L2	With two foot plates

④ Type of switch units

No mark	No switch	Switch position adjustable
FR	With CT-3 switch	
FU	With CT-3U switch	Switch position fixed
FP	With CTP-3 switch	
SR	With SR switch	Switch position fixed
SU	With SU switch	

(Note) • Two switches are provided.

• SR and SU are not available for PRHA10S-270-40.

• FP is made-to-order

⑤ Solenoid valve voltage

D24	DC24V
100	AC100/110V
200	AC200/220V

⑥ Solenoid valve wiring specifications

L	Lead wire
SP	Plug-in connector with indicator light & surge suppressor
UP	Plug-in connector with indicator light & surge suppressor

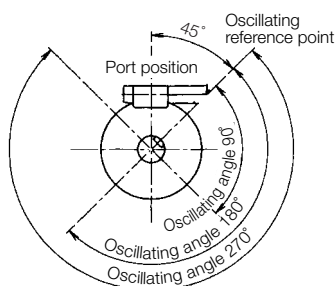
(Note) • Switch units cannot be mounted on HI-ROTORs with two foot plates (L2).

• Mounting hardware comes being not fabricated.

OSCILLATING REFERENCE POINT AND OSCILLATING ANGLE

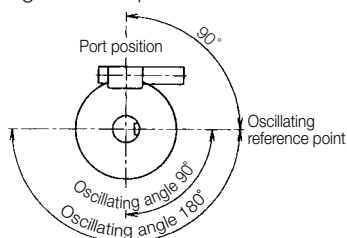
PRHA10S, 20S, PRH30S
PRHA10D, 20D, PRH30D

Oscillating reference point at 45°



PRHA10S, 20S

Oscillating reference point at 90°



Oscillating angle and oscillating reference point

Model No.	Oscillating angle			Oscillating reference point	
	90°	180°	270°	45°	90°
PRHA10S	○	○	○	○	—
	△	△	—	—	△
PRHA20S	○	○	○	○	—
	△	△	—	—	△
PRH30S	○	○	○	○	—
PRHA10D	○	—	—	○	—
PRHA20D	○	—	—	○	—
PRH30D	○	—	—	○	—

○: Standard △: Custom-made

Model Nos. of mounting hardware

Applicable HI-ROTOR	Flange plate	Foot plate
PRHA10S/D	PRN10-P	PRN10-L
PRHA20S/D	PRN20-P	PRN20-L
PRH30S/D	PRN30-P	PRN30-L

(Note) These hardware are provided with set screws.

Model Nos. of packing kit

Same as those for standard type HI-ROTOR (PRN series). See Page 15.

Miniature HI-PAL HI-ROTOR/PRH series

SPECIFICATIONS

Model No.	Unit	PRHA10S			PRHA20S			PRH30S			PRHA10D	PRHA20D	PRH30D
Vane		Single vane									Double vane		
Fluid		Non-lubricated air (Lubricated air)											
Oscillating angle	Degree	90 ⁺⁴	180 ⁺⁶	270 ⁺⁶	90 ⁺⁴	180 ⁺⁶	270 ⁺⁶	90 ⁺³	180 ⁺³	270 ⁺³	90 ⁺⁴	90 ⁺³	
Oscillating reference point	Degree	45, 90		45	45, 90		45	45			45		
Port size		M5			Rc1/8						M5	Rc1/8	
Operation pressure range	MPa	0.2~0.7			0.2~0.8						0.2~0.7	0.2~0.8	
Temperature range	°C	-5~50											
Solenoid valve mounted		PCS245 (DC24, AC100/110V, AC200/220V)											
Mass	kg	0.23	0.22	0.37			0.58	0.57	0.23	0.38	0.59		

(Note) Other specifications are the same as Standard type PRN series. See Page 14.

OUTPUT (Effective torque)

(Unit : cm)

Model No.		Supply pressure (MPa)						
		0.2	0.3	0.4	0.5	0.6	0.7	0.8
Single vane	PRHA10S	35	56	75	98	120	139	—
	PRHA20S	59	95	133	170	210	249	287
	PRH30S	110	180	250	319	410	480	580
Double vane	PRHA10D	76	117	162	211	254	303	—
	PRHA20D	140	222	306	388	470	553	633
	PRH30D	270	440	600	770	950	1120	1299

OSCILLATING TIME RANGE

(Unit : s)

Model No.	Supply pressure (MPa)		
	90°	180°	270°
PRHA10S, 10D	0.045~0.9	0.09~1.8	0.135~2.7
PRHA20S, 10D	0.05~1.0	0.1~2.0	0.15~3.0
PRH30S, 30D	0.07~0.7	0.14~1.4	0.21~2.1

(Note) Operate the HI-ROTOR within the oscillating time range prescribed in the above table. Otherwise, the HI-ROTOR will be perform in stick-slip motions.

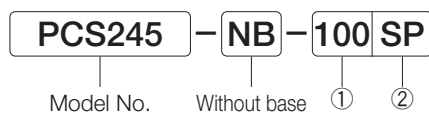
SPEED CONTROL

Although HI-PAL HI-ROTORs are not provided with a speed control mechanism, the speed can be easily controlled with the metering valve or speed controller. For the metering valve and speed controller, please instruct.

HI-PAL HI-ROTOR	PRHA10, 20, PRH30
Metering valve	MV-M5
Speed controller	SPF-H-M5, SPER-H-M5, SPSR-H-M5
Speed controller with push-in fitting	MB4R-M5-O, M4R-M5-O MB6R-M5-O, M6R-M5-O

SOLENOID VALVE

Ordering instructions for solenoid valves



① Solenoid valve voltage ② Solenoid valve wiring specifications

D24	DC24V	L	Lead wire
100	AC100/110V	SP	Plug-in connector with indicator light & surge suppressor
200	AC200/220V	UP	Plug-in connector with indicator light & surge suppressor

The standard solenoid valve is a 2-position solenoid valve with single solenoid. For specific solenoid valves, consult KURODA.

Type of solenoid valve	Model
2-position solenoid valve with a double solenoid	PCD245
3-position solenoid valve with a double solenoid(Closed center)	PCD345
3-position solenoid valve with a double solenoid(Exhaust center)	PCE345
3-position solenoid valve with a double solenoid(Pressure center)	PCO345

HI-ROTOR with switch/

For details, see pages 52 to 54.

CT AND SR TYPE PROXIMITY SWITCHES

Type of switch	Mounting	Load voltage (V)	Load current (mA)	Indicating lamp (Lights up at ON)	Applications
CT-3 CT-3U CTP-3	Switch position adjustable	DC5~30	5~200	○	Relay PLC IC circuit
SR SU	Switch position fixed				

(Note) CTP-3 is made-to-order

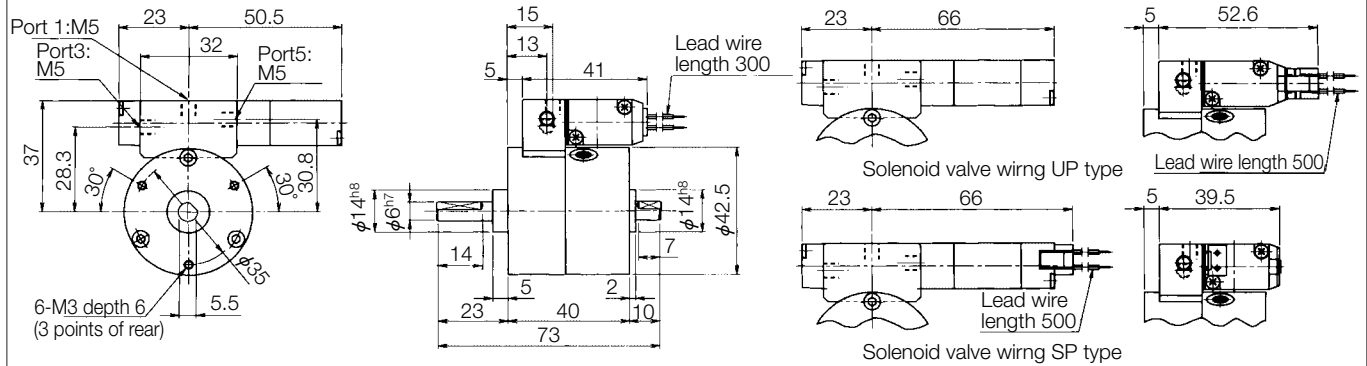
Miniature HI-PAL HI-ROTOR/PRH series

DIMENSIONS

(Unit : mm)

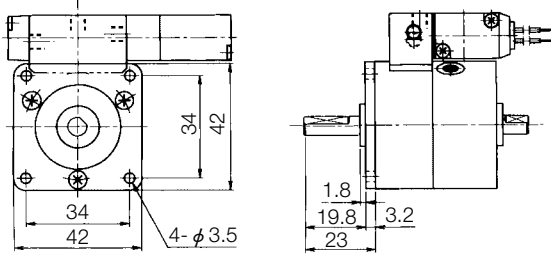
Basic type

PRHA10S/D-○-○-○-○-○-○-L(SP, UP)



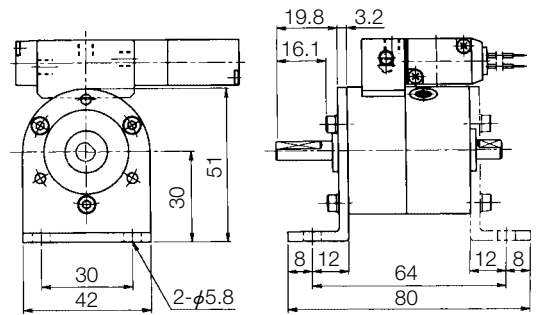
With flange plate

PRHA10S/D-○-○-○-P



With foot plate

PRHA10S/D-○-○-○-L1(L2)



(Note) A flange plate can be fitted with it turned in steps of 120° from the original posture.

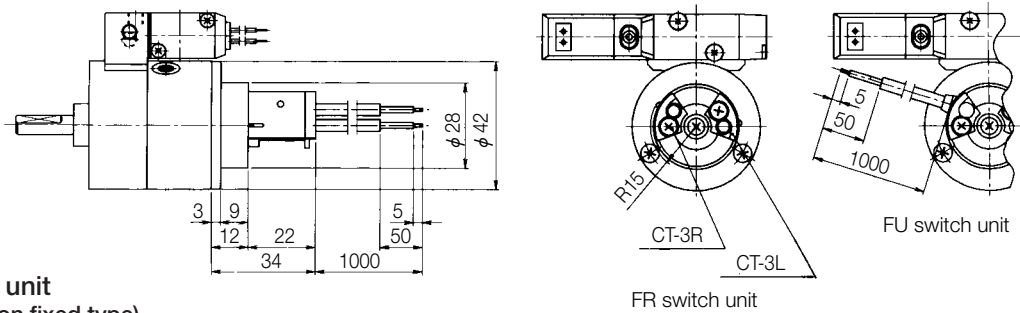
(Note) • A foot plate can be fitted with it turned in steps of 60° from the original posture.

• Short shaft side : Example with L2 (2 pcs.)

With switch unit

(Switch position adjustable type)

PRHA10S/D-○-○-○-○-FR(FU)

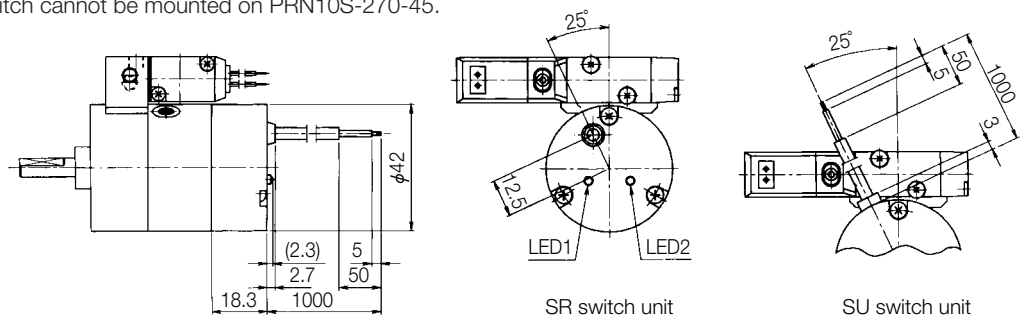


With switch unit

(Switch position fixed type)

PRHA10S/D-○-○-○-○-SR(SU)

SR and SU switch cannot be mounted on PRN10S-270-45.



(Note) LED1 comes on at the oscillating reference point and LED2 at the end of oscillation.

(Note) For switch unit-mounting hardware combinations, refer to the required dimensions in each Fig.

