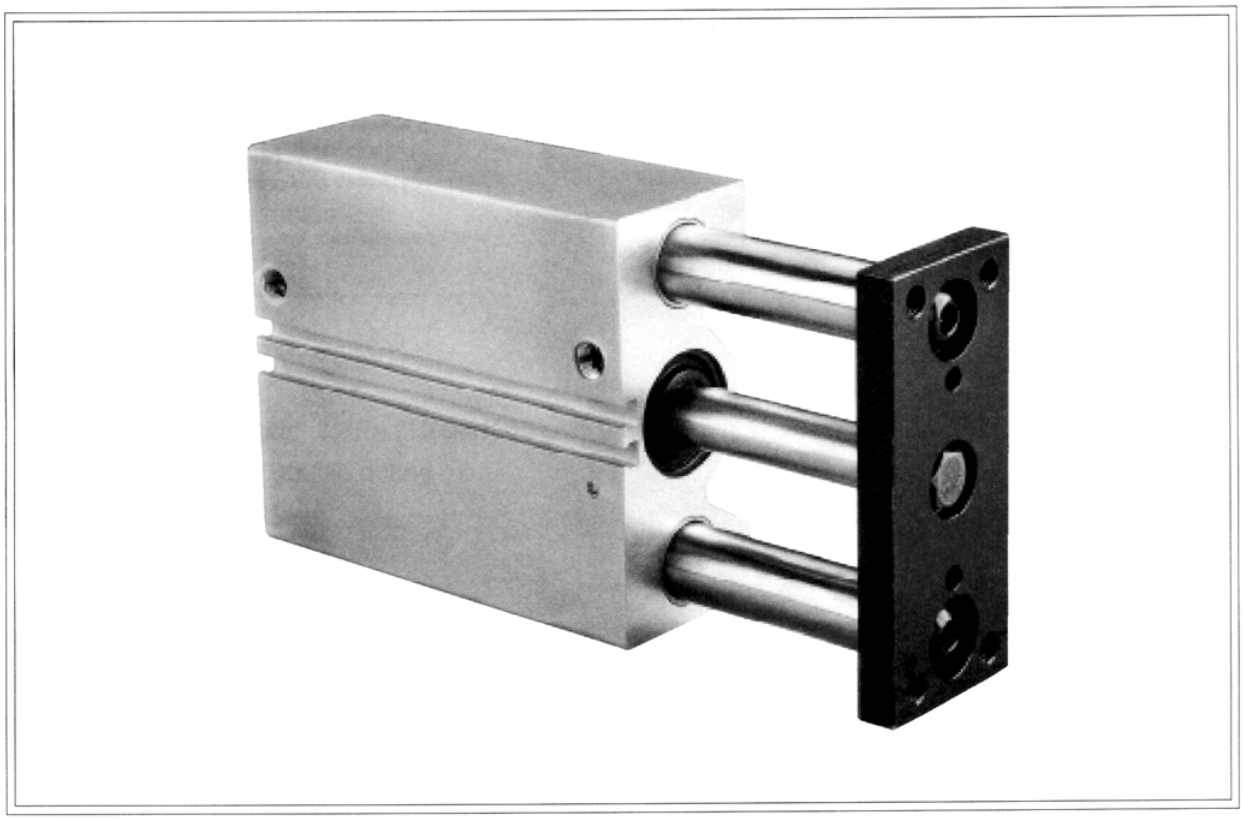


Operating Information

P5T Series Features

- **COMPACT, ONE PIECE BODY – CYLINDER IS BUILT IN**
  The P5T minimizes overall package size by integrating a low profile cylinder and support shaft bushings into a unitized body. Direct mounting to the body and tool plate provides economy.
- **WEAR COMPENSATING PISTON SEAL**
  The piston seal is pressure energized and wear compensating. The P5T can use lubricated or non-lubricated air.
- **THREE PORTING OPTIONS – TOP, REAR & SIDE**
  Flexible port locations provide space efficiency and are available on all sizes.
- **RUGGED, THICK STEEL TOOLING PLATE**
  The tooling plate is machined from steel providing a strong, durable connection.
- **COMPOSITE OR LINEAR BALL BUSHINGS**
  Oversized shafting with composite bushings is standard. Optional precision linear ball bushings provide low friction.
- **PISTON MAGNET STANDARD**
  Magnets are standard on all pistons. Hall Effect and reed switches are available in 90° short or inline flush mount.

Ordering Information

MODEL CODE AND ORDERING INFORMATION

Example: P5T-J032DHSN100

P5T	–	J	032	D	H	S	N	100

Series

P5T

Shaft/Bearing Type

J Composite Bearing – Chrome Plated Shaft (Standard)
H Ball Bearing – Stainless Steel Shaft
C Composite Bearing – Stainless Steel Shaft

Bore Size

016 16mm Bore	**032** 32mm Bore	**063** 63mm Bore
020 20mm Bore	**040** 40mm Bore	**080** 80mm Bore
025 25mm Bore	**050** 50mm Bore	**100** 100mm Bore

Port Location/Mounting Option

D Dowel Holes, Top Ports, Rear Plugged (Standard)
R Dowel Holes, Rear Ports, Top Plugged (Standard)
S Dowel Holes, Side Ports

Port Style

H NPTF (Standard)
G BSPP
P Flow Control, BSPP Port, Prestolok Tube (mm)
F Flow Control, NPTF Port, Prestolok Tube (inch)
B Flow Control, BSPP
N Flow Control, NPTF

Seals

S Nitrile (Standard)
F Fluorocarbon (High Temp)

Options

N None
E Bumpers and Adjustable Stop Collars (Extend Only)
D Dual Tool Plate
A Bumpers, Adjustable Stop Collars (Extend Only) and Dual Tool Plate (Side Ports Rec.)
X Special

Stroke

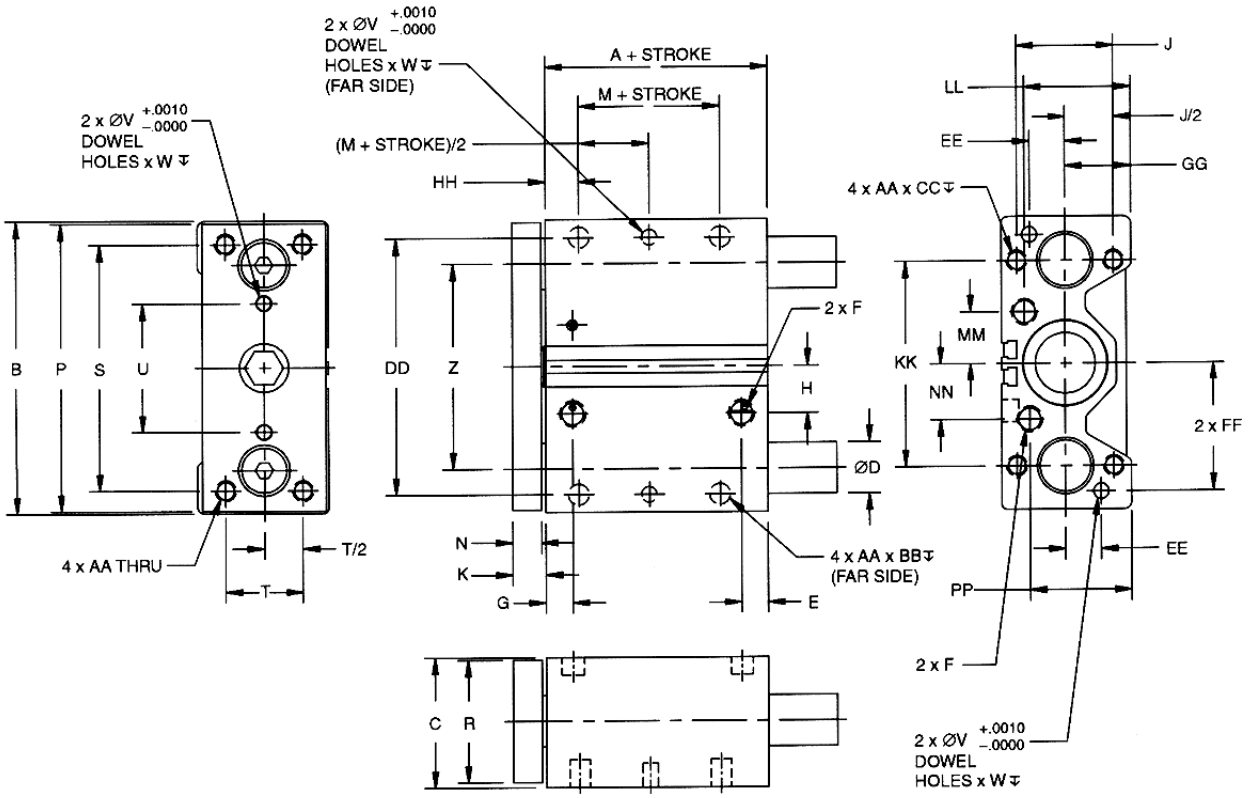
See table below for standard stroke lengths. Consult factory for special stroke lengths.

Bore Size (mm)	Standard Strokes (mm)									
	10	25	40	50	75	100	125	150	175	200
16	●	●	●	●	●	●				
20		●	●	●	●	●	●			
25		●		●	●	●	●	●		
32 - 100		●		●	●	●	●	●	●	●

Sensors (order separately)

Connector	Right Angle Short Sensor			Standard Sensor		
	Hall Effect		Reed	Hall Effect		Reed
	PNP	NPN		PNP	NPN	
.27m lead w/connector	P8S-SPTHXD	P8S-SNTHX	P8S-SRTHX	P8S-TPSHX	P8S-TNSHX	P8S-TRSHX
3m flying leads	P8S-SPELXD	P8S-SNELX	P8S-SRELX	P8S-TPFLX	P8S-TNFLX	P8S-TRFLX
10m flying leads	P8S-SPETXD	P8S-SNETX	P8S-SRETX	P8S-TPFTX	P8S-TNFTX	P8S-TRFTX

Basic Unit



NOTE: *On 16mm bore size only, one switch groove is available. When utilizing two switches on the 16mm bore size with 25mm stroke or less, use right angle short sensors.*

Mounting Bolts

Bore Size	Socket Head Cap
16	M5 x .8
20	M5 x .8
25	M6 x 1.0
32	M8 x 1.25
40	M8 x 1.25
50	M10 x 1.5
63	M10 x 1.5
80	M12 x 1.75
100	M14 x 2.0

NOTE: *When the P5T is used as an impact stopping system, mounting bolt thread engagement should be 1.5 times bolt diameter.*

Basic Unit

Model	A	B	C	D[1]	D[2]	E	F	G	H	J	K
16	37.75 (1.49)	64 (2.52)	31 (1.22)	8 (.315)	10 (.394)	10.1 (.40)	M5/10-32	10.1 (.40)	6.95 (.27)	22 (.866)	9.94 (.39)
20	35 (1.38)	74 (2.91)	36 (1.42)	10 (.394)	12 (.472)	19 (.75)	1/8 NTPF OR BSPP	10 (.39)	15.8 (.62)	26 (1.024)	9.94 (.39)
25	38 (1.50)	88 (3.46	42 (1.65)	12 (.472)	16 (.630)	21 (.83)	1/8 NPTF OR BSPP	11.4 (.45)	15.5 (.61)	32 (1.260)	9.94 (.39)
32	36 (1.42)	114 (4.49)	51 (2.00)	16 (.630)	20 (.787)	10.26 (.40)	1/8 NTPF OR BSPP	10.35 (.41)	18.42 (.73)	38 (1.496)	13.1 (.52)
40	44 (1.73)	124 (4.88)	52 (2.05)	16 (.630)	20 (.787)	12.10 (.48)	1/8 NPTF OR BSPP	14.9 (.59)	22.53 (.89)	38 (1.496)	13.1 (.52)
50	44.9 (1.77)	140 (5.51)	62 (2.44)	20 (.787)	25 (.984)	14.5 (.57)	1/4 NTPF OR BSPP	16.1 (.63)	27 (1.06)	44 (1.732)	14.7 (.58)
63	50.05 (1.97)	150 (5.91)	75 (2.95)	20 (.787)	25 (.984)	16.4 (.65)	1/4 NPTF OR BSPP	14.5 (.57)	33 (1.30)	44 (1.732)	14.7 (.58)
80	59.5 (2.34)	188 (7.40)	95 (3.74)	25 (.984)	30 (1.181)	15.5 (.610)	3/8 NTPF OR BSPP	19 (.75)	37 (1.46)	56 (2.205)	18 (.71)
100	66 (2.60)	224 (8.82)	115 (4.53)	30 (1.181)	35 (1.38)	21.9 (.862)	3/8 NPTF OR BSPP	23 (.91)	40 (1.57)	62 (2.441)	18 (.71)

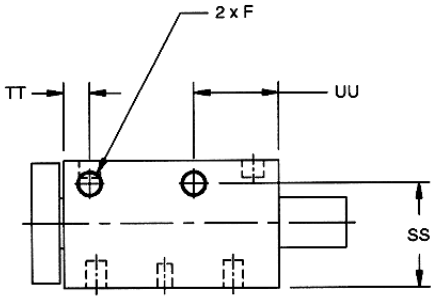
Model	M	N	P	R	S	T	U	V	W	Z	AA	BB
16	7 (.276)	7.94 (.31)	62 (2.44)	25.4 (1.00)	52 (2.047)	16 (.630)	20 (.787)	3 (.118)	6 (.236)	42 (1.654)	M5 X 0.8	7.5 (.30)
20	10 (.394)	7.94 (.31)	72 (2.83)	31.76 (1.25)	60 (2.362)	18 (.709)	30 (1.181	4 (.157)	6 (.236)	52 (2.047)	M5 X 0.8	7.5 (.30)
25	10 (.394)	7.94 (.31)	86 (3.39)	38 (1.50)	70 (2.756)	26 (1.024)	34 (1.339)	4 (.157)	6 (.236)	62 (2.441)	M6 X 1.0	10 (.39)
32	5 (.197)	11.1 (.44)	112 (4.41)	44.5 (1.75)	96 (3.780)	30 (1.181)	50 (1.969)	6 (.236)	6 (.236)	80 (3.150)	M8 X 1.25	11 (.43)
40	10 (.394)	11.1 (.44)	122 (4.80)	44 (1.73)	106 (4.173)	30 (1.181)	60 (2.362)	6 (.236)	6 (.236)	90 (3.543)	M8 X 1.25	11 (.43)
50	10 (.394)	12.7 (.50)	138 (5.43)	57 (2.24)	120 (4.724)	40 (1.575)	60 (2.362)	8 (.315)	8 (.315)	100 (3.937)	M10 X 1.5	12 (.47)
63	10 (.394)	12.7 (.50)	148 (5.83)	70 (2.76)	130 (5.118)	50 (1.969)	72 (2.835)	8 (.315)	8 (.315)	110 (4.331)	M10 X 1.5	15 (.59)
80	15 (.591)	16 (.63)	185 (7.28)	88.9 (3.50)	160 (6.299)	60 (2.362)	92 (3.622)	10 (.394)	10 (.394)	140 (5.512)	M12 X 1.5	18 (.71)
100	15 (.591)	16 (.63)	221 (8.70)	108 (4.25)	190 (7.480)	80 (3.150)	114 (4.488)	10 (.394)	10 (.394)	170 (6.693)	M14 X 2.0	21 (.83)

Model	CC	DD	EE	FF	GG	HH	KK	LL	MM	NN	PP	Piston Rod
16	10 (.39)	54 (2.126)	8 (.315)	27 (1.063)	15 (.591)	13.06 (.514)	42 (1.654)	22.5 (.88)	11.25 (.44)	9.7 (.38)	23.0 (.91)	8 (.315)
20	10 (.39)	64 (2.520)	10 (.394)	32 (1.260)	17 (.669)	13.06 (.514)	54 (2.126)	26.0 (1.02)	15.4 (.61)	15.4 (.61)	10.5 (.41)	10 (.394)
25	12 (.47)	76 (2.992)	11 (.433)	38 (1.496)	21 (.827)	14.06 (.553)	62 (2.441)	33.4 (1.31)	17 (.67)	17 (.67)	33.4 (1.31)	10 (.394)
32	16 (.63)	100 (3.937)	14 (.551)	50 (1.969)	26 (1.024)	12.9 (.508)	80 (3.150)	42 (1.65)	20 (.79)	21.7 (.85)	38 (1.50)	16 (.630)
40	16 (.63)	110 (4.311)	14 (.551)	55 (2.165)	26 (1.024)	13.9 (.547)	90 (3.543)	41 (1.61)	24 (.95)	26.4 (1.04)	37.9 (1.49)	16 (.630)
50	20 (.79)	124 (4.882)	16 (.630)	62 (2.441)	30 (1.181)	14.3 (.563)	100 (3.937)	51 (2.01)	29 (1.14)	33 (1.30)	44 (1.73)	20 (.787)
63	20 (.79)	132 (5.197)	18 (.709)	66 (2.598)	36.5 (1.437)	16.3 (.642)	110 (4.331)	62 (2.44)	36 (1.42)	37.75 (1.49)	57.75 (2.27)	20 (.787)
80	24 (.94)	166 (6.353)	22 (.866)	83 (3.268)	46.5 (1.831)	21 (.83)	140 (5.512)	78 (3.07)	45 (1.77)	48 (1.89)	74 (2.91)	25 (.984)
100	28 (1.10)	200 (7.784)	24 (.945)	100 (3.937)	56.5 (2.224)	25 (.98)	170 (6.693)	91.5 (3.60)	56 (2.21)	51 (2.01)	95.5 (3.76)	25 (.984)

1) With linear ball bearing bushing
2) With composite bushing

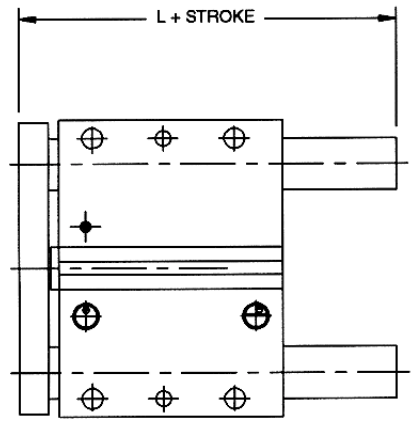
All dimensions in mm (inch)

Side Porting (S)



Model	SS mm (in)	TT mm (in)	UU mm (in)	F
16	24.1 (.95)	10 (.39)	20 (.79)	M5
20	29.00 (1.15)	10 (.39)	20 (.79)	10-32 or M5
25	35.15 (1.38)	11.4 (.45)	24 (.94)	10-32 or M5
32	43.2 (1.70)	10.35 (.41)	34 (1.34)	1/8 NTPF or BSPP
40	43.0 (1.69)	14.9 (.59)	34 (1.34)	1/8 NPTF or BSPP
50	51.25 (2.02)	16.1 (.64)	38 (1.50)	1/4 NTPF or BSPP
63	60.70 (2.39)	15.55 (.61)	41.8 (1.65)	1/4 NPTF or BSPP
80	78.5 (3.09)	19 (.75)	47 (1.85)	3/8 NTPF or BSPP
100	88.4 (3.48)	23 (.91)	53.3 (2.10)	3/8 NPTF or BSPP

Standard Length (N) – No Options

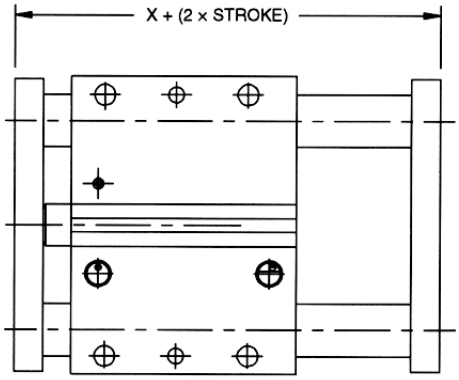


Model	Stroke	L	
		mm	inch
16	10*, 25, 40, 50, 75	60.2	2.37
	100	75.2	2.96
20	25, 40, 50, 75	66.9	2.63
	100, 125	91.9	3.62
25	25, 50, 75, 100	69.9	2.75
	125, 150	91.9	3.62
32	25, 50, 75, 100	77.9	3.07
	125, 150, 175, 200	116.0	4.57
40	25, 50, 75, 100	77.9	3.07
	125, 150, 175, 200	116.0	4.57
50	25, 50, 75, 100	84.0	3.31
	125, 150, 175, 200	124.1	4.89
63	25, 50, 75, 100	84.0	3.31
	125, 150, 175, 200	124.1	4.89
80	25, 50, 75, 100	101.8	2.59
	125, 150, 175, 200	140.0	5.51
100	25, 50, 75, 100	120.3	4.74
	125, 150, 175, 200	158.4	6.24

* For Model 16 with 10mm stroke, L = 36.2 mm (1.43 in).

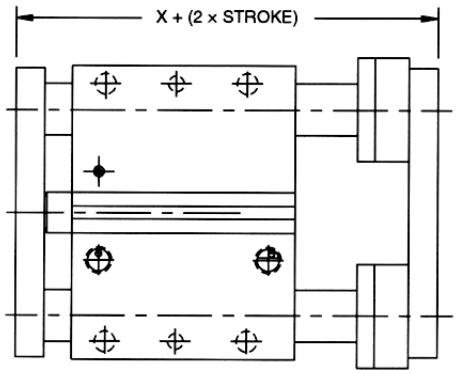
All dimensions in mm (inch)

Dual Tool Plate (D)

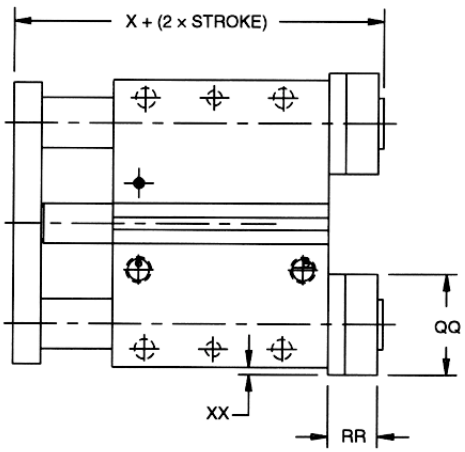


Note: Load capacities increase on dual tool plate.

Bumpers, Stop Collars & Dual Tool Plate (A)



Bumpers & Adjustable Stop Collars, Extend Only (E)



Model	Rod Dia.	X			QQ	RR	XX
		D option	A option	E option			
16	8	57.6 (2.27)	70.6 (2.78)	62.7 (2.47)	18.0 (0.71)	13.0 (0.51)	0
	10	57.6 (2.27)	70.6 (2.78)	62.7 (2.47)	24.0 (0.95)	13.0 (0.51)	1 (0.04)
20	10	54.9 (2.16)	67.9 (2.67)	59.9 (2.36)	24.0 (0.95)	13.0 (0.51)	1 (0.04)
	12	54.9 (2.16)	72.6 (2.86)	64.6 (2.54)	28.0 (1.10)	13.0 (0.51)	3 (0.12)
25	12	57.8 (2.28)	75.5 (2.97)	67.6 (2.66)	28.0 (1.10)	17.7 (0.70)	1 (0.04)
	16	57.8 (2.28)	77.5 (3.05)	69.6 (2.74)	34.0 (1.34)	17.7 (0.70)	4 (0.16)
32	16	62.2 (2.45)	81.9 (3.22)	70.8 (2.79)	34.0 (1.34)	19.7 (0.78)	0
	20	62.2 (2.45)	83.9 (3.30)	72.8 (2.87)	41.4 (1.63)	19.7 (0.78)	3.7 (0.15)
40	16	70.2 (2.76)	89.9 (3.54)	78.8 (3.10)	34.0 (1.34)	19.7 (0.78)	0
	20	70.2 (2.76)	91.9 (3.62)	80.8 (3.18)	41.4 (1.63)	19.7 (0.78)	3.7 (0.15)
50	20	74.3 (2.93)	96.0 (3.78)	83.3 (3.28)	41.4 (1.63)	21.7 (0.85)	0.7 (0.03)
	25	74.3 (2.93)	96.0 (3.78)	83.3 (3.28)	50.8 (2.00)	21.7 (0.85)	5.4 (0.21)
63	20	79.5 (3.13)	101.2 (3.98)	88.5 (3.48)	41.4 (1.63)	21.7 (0.85)	0.7 (0.03)
	25	79.5 (3.13)	101.2 (3.98)	88.5 (3.48)	50.8 (2.00)	21.7 (0.85)	5.4 (0.21)
80	25	95.5 (3.76)	117.2 (4.61)	101.2 (3.98)	50.8 (2.00)	21.7 (0.85)	1.4 (0.06)
	30	95.5 (3.76)	117.2 (4.61)	101.2 (3.98)	60.5 (2.38)	21.7 (0.85)	6.3 (0.25)
100	30	102.0 (4.02)	123.7 (4.87)	107.7 (4.24)	60.5 (2.38)	21.7 (0.85)	3.3 (0.13)
	35	102.0 (4.02)	123.7 (4.87)	107.7 (4.24)	65.0 (2.56)	21.7 (0.85)	5.5 (0.22)

All dimensions in mm (inch)

SHAFT BEARINGS

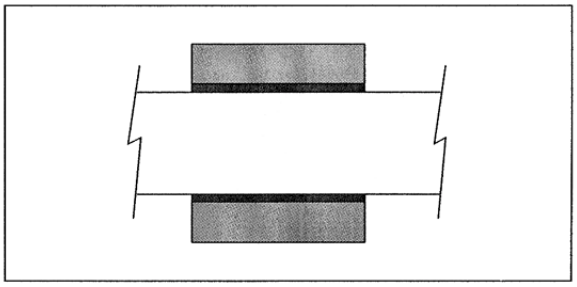
Composite bushings are supplied as standard.
Linear ball bushings are optional.

Selection should be based on the following criteria:

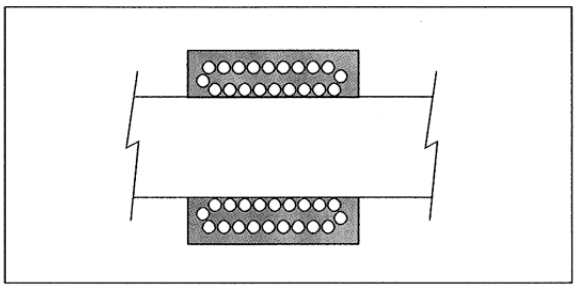
Application Requirement	Ball	Composite
Precision	Excellent	Good
Friction	Low	Higher
Friction coefficient	Constant	Variable
Precision over life of bearing	Constant	Variable
Static Load Capacity	Good	Excellent
Dynamic Load Capacity	Good	Good with lower efficiency
Vibration Resistance	Fair	Excellent
Contamination Resistance	Poor	Excellent
Washdown Compatibility	Poor	Excellent

For bearing load capacities, reference the Engineering Data section of this catalog.

Consult factory for special bearing/shaft requirements.



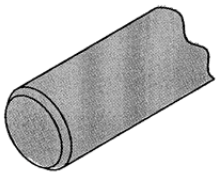
Composite Bushing (J,C)



Recirculating Ball Bushing (H)

CORROSION RESISTANT SHAFTING (C, H)

Chrome-plated case hardened, high carbon alloy steel shafting with composite bearings is utilized for standard slides. This may corrode in some applications. Stainless steel corrosion resistant shafting is available.

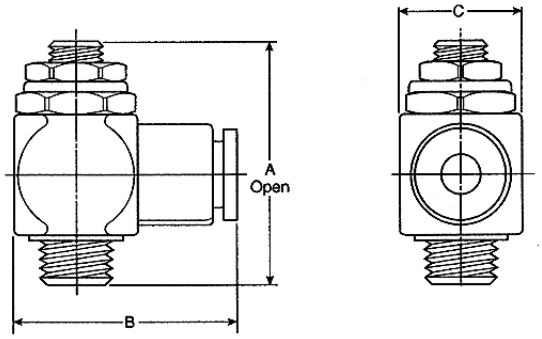


FLOW CONTROLS (B, F, N, P)

Right angle flow control valves allow precise adjustment of cylinder speed by metering exhaust air flow. Prestolok push-in or threaded ports provide 360° orientation capability.

Model	A (in)	B (in)	C (in)	Imperial	
				Prestolok (F)	NPT (N)
16, 20*, 25*	0.87	0.96	0.39	5/32"	10-32
20, 25, 32, 40	1.63	1.38	0.67	5/32"	1/8
50, 63	1.86	1.64	0.91	1/4"	1/4
80, 100	2.15	1.90	1.06	3/8"	3/8
Model	A (mm)	B (mm)	C (mm)	Metric	
				Prestolok (P)	BSPP (B)
16, 20*, 25*	22.0	24.5	10.0	4mm	M5
20, 25, 32, 40	34.5	31.6	14.4	6mm	1/8
50	41.0	34.9	18.4	6mm	1/4
63	41.0	41.3	18.4	10mm	1/4
80	51.0	46.7	21.6	10mm	3/8
100	51.0	46.7	21.6	12mm	3/8

* Side ports only.



NOTE: When flow controls are specified with rear ports, a 90° right angle fitting is supplied to provide ample rod clearance in the rear.

FLUOROCARBON SEALS (F)

Standard abrasion resistant nitrile seals should be used for general purpose applications with temperatures of -18 to 74°C (0 to 165°F). Fluorocarbon seals are recommended for high temperature applications up to 121°C (250°F).

Feature	Temperature Range*
Bumpers	-18 to 93°C (0 to 200°F)
Magnets	-18 to 74°C (0 to 165°F)
Switches	-10 to 85°C (14 to 185°F)

*Consult factory for higher temperature operation.

SENSOR CHARACTERISTICS

Hall Effect Switches

- Fully Adjustable Travel
- Solid State Electronics
- LED Indicator
- 6-30 VDC
- PNP and NPN Available
- Senses magnet band on piston
- Long Life

Reed Switches

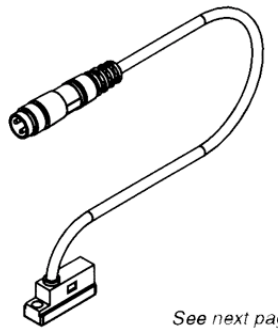
- Fully Adjustable Travel
- Mechanical Reed
- LED Indicator
- 10-30 VDC or 10-120 VAC
- Senses magnet band on piston
- Medium Life

HALL EFFECT SENSORS

SPECIFICATIONS

Type	Electronic
Output Function	Normally Open
Switching Output	PNP
Operating Voltage	10 - 30VDC
Continuous Current	≤150 mA
Response Sensitivity	3 ml
Switching Frequency	50 Hz
Power Consumption	15 mA
Voltage Drop	≤2 V
Ripple	≤10% of Operating Voltage
Delay Time (24V)	Approx. 20 ms
Time Delay before Availability	≤2 ms
Hysteresis	≤1.5 mm
Repeatability	≤0.7 mm
DMC	to 0V 50 947-5-2
Short-circuit Protection	Yes
Power-up Pulse Supression	Yes
Reverse Polarity Protection	Yes
Enclosure Rating	to DIN 40050 IP 67
Shock and Vibration Stress	30g, 11 ms, 10 to 55 Hz, 1 mm
Ambient Temperature Range	-25° to +75°C (-13° to 167°F)
Housing Material	PA 12, Black
Connector Cable	PVC, 270mm (10.6") long
Connector	PJR cable with 8 mm connector

Part Number	Function	Connection
P8S-SPTHXD	PNP	.27m lead w/connector
P8S-SPELXD	PNP	3m flying leads
P8S-SPETXD	PNP	10m flying leads
P8S-SNTHX	NPN	.27m lead w/connector
P8S-SNELX	NPN	3m flying leads
P8S-SNETX	NPN	10m flying leads



See next page for wiring connection.

REED SENSORS

SPECIFICATIONS

Type	Reed
Output Function	Normally Open
Operating Voltage	10 - 120 VAC 10 - 30 VDC
Continuous Current	≤100 mA
Response Sensitivity	3 mT
Switching Frequency	400 Hz
Voltage Drop	≤3 V
Ripple	≤10% of Operating Voltage
Delay Time (24V)	Approx. 20 ms
Time Delay before Availability	≤2 ms
Hysteresis	≤1.0 mm
Repeatability	≤0.2 mm
EMC	EN 60 947-5-2
Reverse Polarity Protection	Yes
Enclosure Rating	IP 67
Shock and Vibration Stress	30g, 11 ms, 10 to 55 Hz, 1 mm
Ambient Temperature Range	-25° to +75°C (-13° to 167°F)
Housing Material	PA 12, Black
Connector Cable	PVC
Connector	PUR cable with 8 mm connector

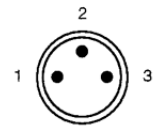
Part Number	Connection
P8S-SRTHX	.27m lead w/connector
P8S-SRELX	3m flying leads
P8S-SRETX	10m flying leads

HALL EFFECT SENSORS

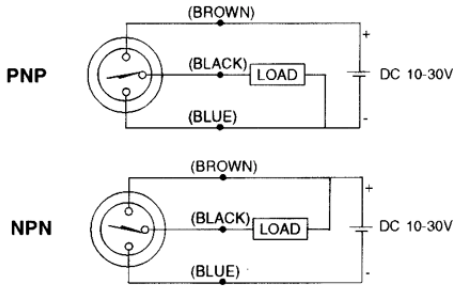
SPECIFICATIONS

Type	Electronic
Output Function	Normally Open
Switching Output	PNP/NPN
Operating Voltage	10 - 30VDC
Continuous Current	≤150 mA
Response Sensitivity	3 mT
Switching Frequency	5 kHz
Power Consumption	15 mA
Voltage Drop	≤2 V
Ripple	≤10% of Operating Voltage
Time Delay before Availability	≤2 ms
Hysteresis	≤1.5 mm
Repeatability	≤0.2 mm
EMC	EN 60 947-5-2
Short -circuit Protection	Yes
Power-up Pulse Supression	Yes
Reverse Polarity Protection	Yes
Enclosure Rating	IP 67
Shock and Vibration Stress	30g, 11 ms, 10 to 55 Hz, 1 mm
Ambient Temperature Range	-25° to +75°C (-13° to 167°F)
Housing Material	PA 12, Black
Connector Cable	PVC
Connector	PUR cable with 8 mm connector

WIRING CONNECTION



Pin	Wire	Function
1	Brown	10-30 VDC
2	Black	Output signal
3	Blue	0V



Part Number	Function	Connection
P8S-TPSHX	PNP	.27m lead w/connector
P8S-TPFLX	PNP	3m flying leads
P8S-TPFTX	PNP	10m flying leads
P8S-TNSHX	NPN	.27m lead w/connector
P8S-TNFLX	NPN	3m flying leads
P8S-TNFTX	NPN	10m flying leads

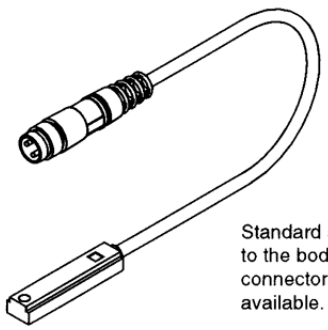
REED SENSORS

SPECIFICATIONS

Type	Reed
Output Function	Normally Open
Operating Voltage	10 - 120 VAC 10 - 30 VDC
Continuous Current	≤100 mA
Response Sensitivity	3 mT
Switching Frequency	400 Hz
Voltage Drop	≤3 V
Ripple	≤10% of Operating Voltage
Delay Time (24V)	Approx. 20 ms
Time Delay before Availability	≤2 ms
Hysteresis	≤1.0 mm
Repeatability	≤0.2 mm
EMC	EN 60 947-5-2
Reverse Polarity Protection	Yes
Enclosure Rating	IP 67
Shock and Vibration Stress	30g, 11 ms, 10 to 55 Hz, 1 mm
Ambient Temperature Range	-25° to +75°C (-13° to 167°F)
Housing Material	PA 12, Black
Connector Cable	PVC
Connector	PUR cable with 8 mm connector

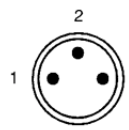
⚠ *Contact suppression is strongly recommended for reed switch applications with inductive loads (solenoids) or cable lengths in excess of 5 m (16.4 ft).*

Reed switches exhibit a 3V voltage drop. This voltage drop will be cumulative for switches in series, eg. 12 V for 4 switches.



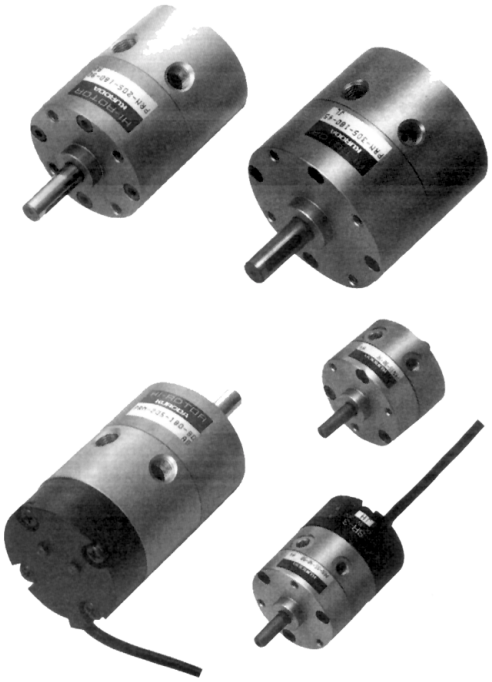
Standard sensors mount flush to the body. Sensor shown with connector. Lead wires also available.

WIRING CONNECTION



Pin	Wire	Function
1	Brown	10-30 VDC
2	Black	Output signal
3	Blue	Not Used

Part Number	Connection
P8S-TRSHX	.27m lead w/connector
P8S-TRFLX	3m flying leads
P8S-TRFTX	10m flying leads



The numerical values shown in this catalog are mainly those for SI units. However the table of output values is shown using the standard unit. The standard unit can be converted to an SI unit using the following formula :

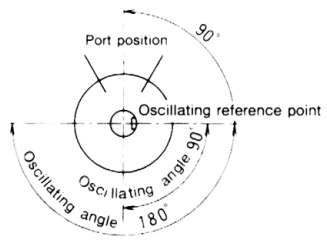
Pressure $Y(MPa) X(kgf/cm^2) \times 9.80665 \times 10^{-2}$

Force $Y(N) = X(kgf) \times 9.80665$

Oscillating reference point and oscillating angle

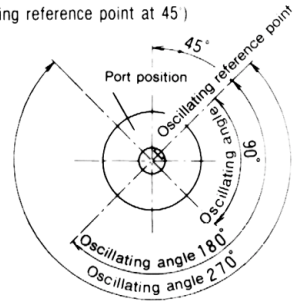
PRN1S、3S、10S、20S

(Oscillating reference point at 90)



PRN10S、30S、30D

(Oscillating reference point at 45)



Only 270° are available for PRN 10S

Ordering Information

PRN20S - 90 - 90 S - P - FR

Model No. ① ② ③ ④ ⑤

PRN1S (Single vane)
PRN3S (Single vane)
PRN10S (Single vane)
PRN20S (Single vane)
PRN30S (Single vane)
PRN30D (Double vane)

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 PR1S, 30S and 30D.

④ Mounting hardware

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

⑤ Types of switch units

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

(Notes) 1. Two switches are provided.
2. Only FR and FU are available for PRN1S.
3. SR and SU are not available for PRN 10S-270-45. see page 52.

(Notes) 1. Switch units and mounts with two feed are not available on "S" (Ports on the rear cover) model.
2. Switch units cannot be mounted on HI-ROTORs with two feet plate (L2).
3. Mounting hardware comes being not fabricated.

Oscillating angle and oscillating reference point

Model No.	Oscillating angle			Oscillating reference point	
	90°	180°	270°	90°	45°
PRN1S	○	○	—	○	—
PRN3S	○	○	—	○	—
PRN10S	○	○	—	○	—
	—	—	○	—	○
PRN20S	○	○	—	○	—
PRN30S	○	○	○	—	○
PRN30D	○	—	—	—	○

(Note) When oscillating angles other than those in the above table are required, variable oscillating angle type HI-ROTOR/PRO series are available, (see Page 13).

Model Nos. of mounting hardware.

Applicable HI-ROTOR	Plate	Foot
PRN1S	PRN1-P	PRN1-L
PRN3S	PRN3-P	PRN3-L
PRN10S	PRN10-P	PRN10-L
PRN20S	PRN20-P	PRN20-L
PRN30S、D	PRN30-P	PRN30-L

(Note) These hardware are provided with set screws.

Operating Information

Model No.	Unit	PRN1S		PRN3S		PRN10S			PRN20S		PRN30S			PRN30D
Vane		Single vane												Double vane
Fluid		Non-lubricated air (Lubricated air)												
Oscillating angle	(Degree)	90^{+4}_{0}	180^{+4}_{0}	90^{+4}_{0}	180^{+4}_{0}	90^{+4}_{0}	180^{+4}_{0}	270^{+4}_{0}	90^{+3}_{0}	180^{+3}_{0}	90^{+3}_{0}	180^{+3}_{0}	270^{+3}_{0}	90^{+3}_{0}
Oscillating reference point	(Degree)	90						45	90		45			
Port size		M5							Rc(PT) 1/8					
Minimum working pressure	MPa{kgf/cm²}	0.15 {1.5}				0.1 {1}								0.08{0.8}
Operation pressure range	MPa{kgf/cm²}	0.3~0.7{3.1~7.1}				0.2~0.7{2~7.1}			0.2~1 {2~10.2}					
Proof withstanding pressure	MPa{kgf/cm²}	1.05 {10.7}							1.5 {15.3}					
Temperature range	°C	5 ~ 60												
Maximum frequency of use	cycle/min	300	180	260	160	240	150	100	210	120	200	110	70	200
Internal volume	cm³	0.5	1	2.4	2.6	5	8.5	10	12	16	37		43	34
Allowable radial load	N{kgf}	9.8{1}		39.2{4}		49{5}			294{30}		392 {40}			
Allowable thrust load	N{kgf}	0.98{0.1}		3.92 {0.4}					24.5{2.5}		29.4 {3}			
Allowable energy	mJ{kgf·cm}	0.29{0.003}		1.47{0.015}		2.94 {0.03}			14.7{0.15}		24.5 {0.25}			
Mass	kg	0.035		0.07		0.14		0.13	0.36		0.47		0.46	0.48

1. Maximum frequency of use at the supply pressure of 0.49 MPa {5 kgf/cm²} (Unloaded)
2. Make sure to use the HI-ROTOR within allowable energy. Refer to page 58 for the allowable energy calculation.
3. HI-ROTORs with keyways are provided with keys.
4. For HI-ROTORs other than standard, consult KURODA.

Output (Effective torque)

(Unit : N·cm{kgf·cm})

Model No.	Supply pressure MPa {kgf/cm²}								
	0.2{2}	0.29{3}	0.39{4}	0.49{5}	0.59{6}	0.69{7}	0.78{8}	0.88{9}	0.98{10}
PRN1S	–	5.8{0.6}	7.8{0.8}	10.7{1.1}	12.7{1.3}	15.6{1.6}	–	–	–
PRN3S	–	14.7{1.5}	21.5{2.2}	27.4{2.8}	35.3{3.6}	42.1{4.3}	–	–	–
PRN10S	23.5{2.4}	44.1{4.5}	62.7{6.4}	84.3{8.6}	103.9{10.6}	125.4{12.8}	–	–	–
PRN20S	39{4}	78{8}	117{12}	156{16}	191{19.5}	235{24}	264{27}	304{31}	343{35}
PRN30S	108{11}	176{18}	245{25}	313{32}	402{41}	470{48}	568{58}	637{65}	706{72}
PRN30D	265{27}	431{44}	588{60}	755{77}	931{95}	1098{112}	1274{130}	1451{148}	1627{166}

Oscillating time range

(Unit : sec)

Model No.	Oscillating angle		
	90°	180°	270°
PRN1	0.03 ~0.3	0.06~0.6	–
PRN3	0.04 ~0.4	0.08~0.8	--
PRN10	0.045~0.45	0.09~0.9	0.135~1.35
PRN20	0.05 ~0.5	0.1 ~1	–
PRN30	0.07 ~0.7	0.14~1.4	0.21 ~2.1

Operate the HI-ROTOR within the oscillating time range prescribed in the above table. Otherwise, the HI-ROTOR will tend to perform in stick-slip motions.

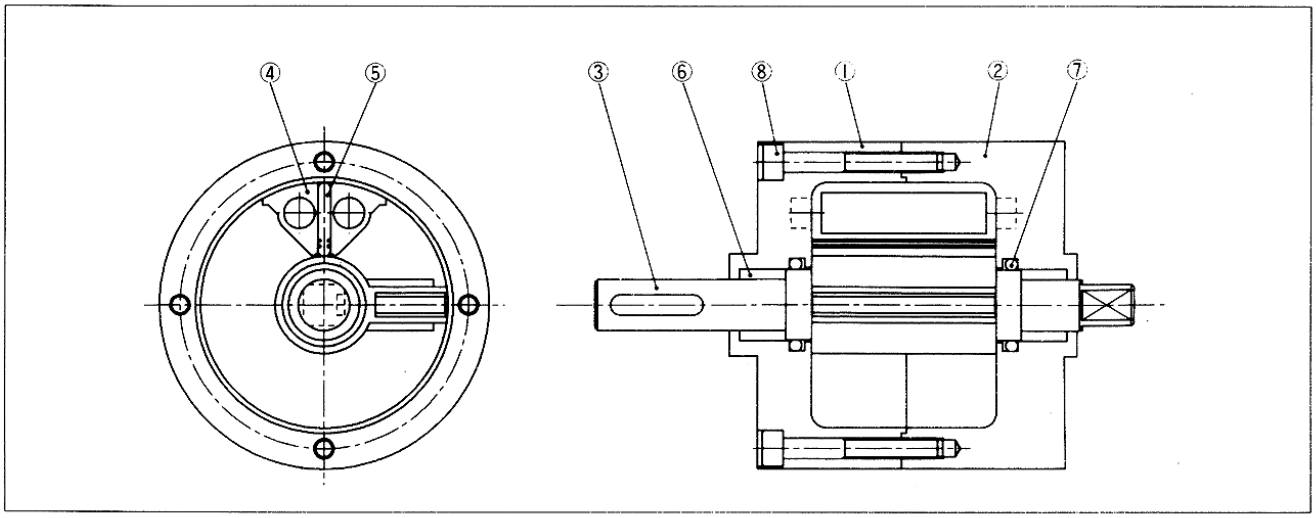
HI-ROTOR with switch

CT and SR type proximity switches

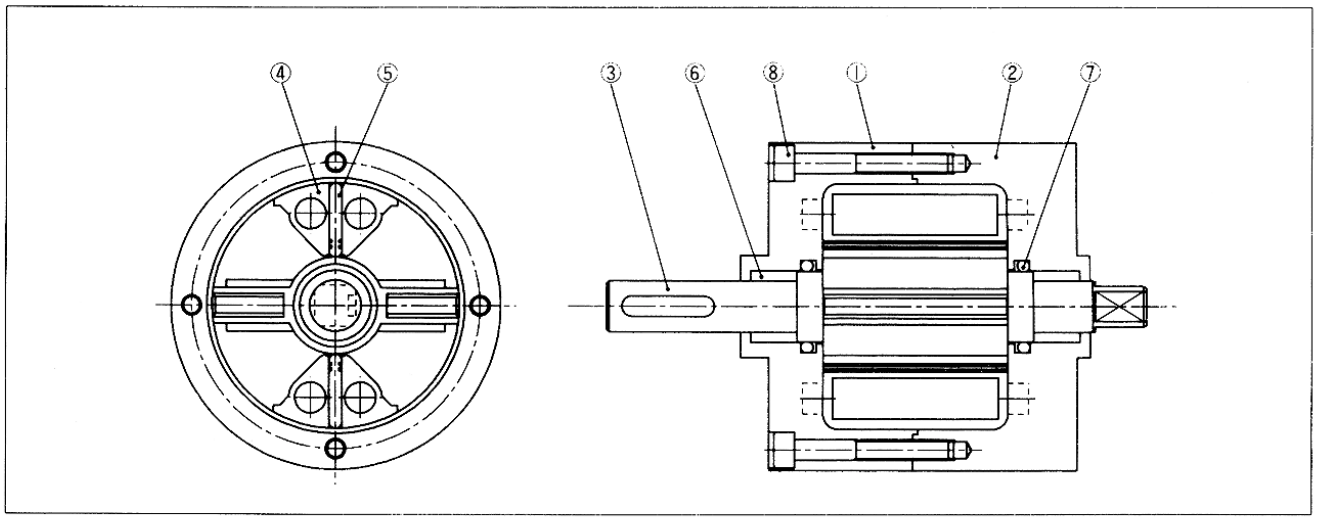
Type of switch	Mounting	Voltage range (V)	Current range (mA)	Indicating lamp (Lights up at ON.)	Applications
CT-3 CT-3U	Switch position adjustable	DC5~30	5~200	○	Relay PLC IC circuit
SR SU	Switch position fixed				

Structure

PRN1S、3S、10S、20S、30S



PRN30D



Main components

Part No.	Part name
①	Body A
②	Body B
③	Vane shaft
④	Shoe
⑤	Shoe seal
⑥	Bushing
⑦	O-ring
⑧	Set screw

Model Nos. of packing kit

Applicable HI-ROTOR	Model No.
PRN1S	PRN1S-PS
PRN3S、PRO3S	PRN3S-PS
PRN10S、PRO10S、PRH10S	PRN10S-PS
PRN20S、PRO20S、PRH20S	PRN20S-PS
PRN30S、PRO30S、PRH30S	PRN30S-PS
PRN30D、PRO30D、PRH30D	PRN30D-PS

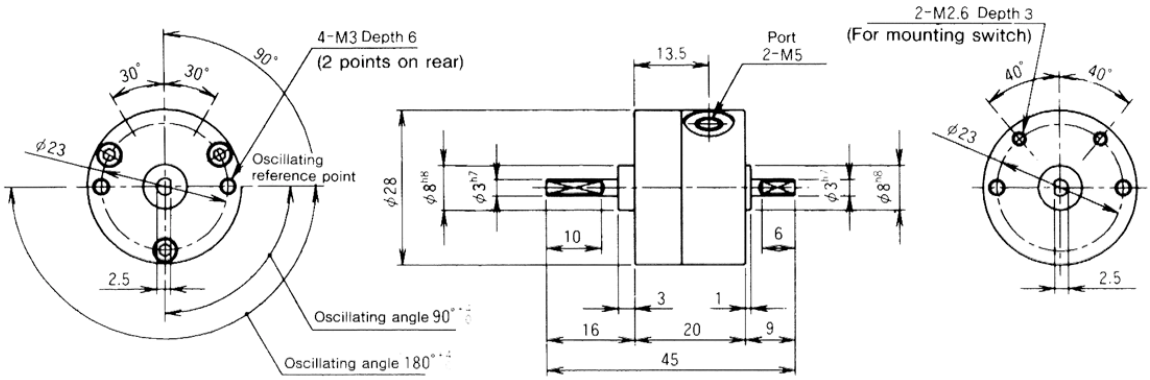
(Note) A set of packings consists of part nos ③, ⑤ and ⑦.

Configurations and dimensions

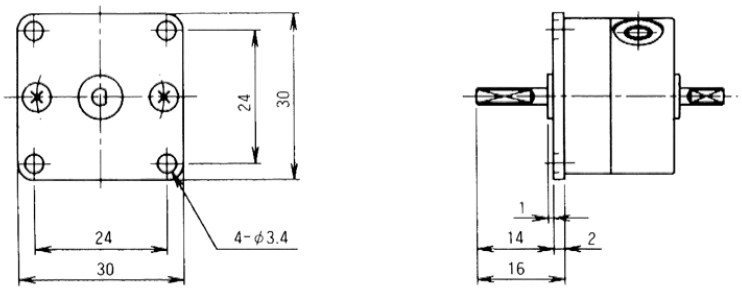
(Unit : mm)

Basic type
PRN1S-○-○

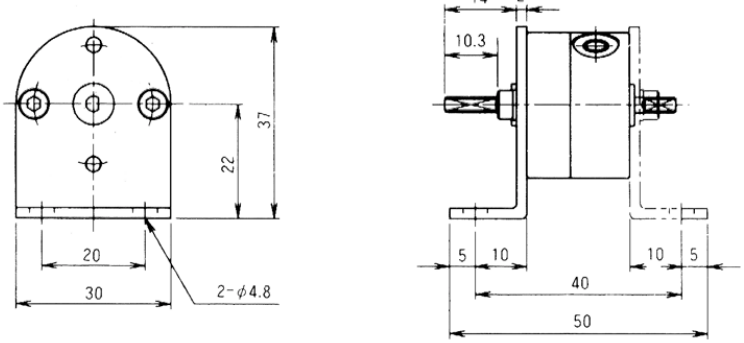
Model changes have been made. Note that the dimensions of mounts differ from those of previous HI-ROTORs.



With plate
PRN1S-○-○-P

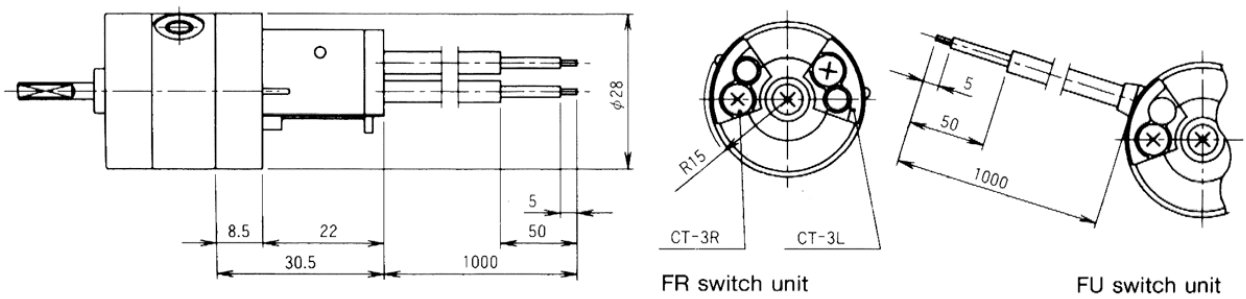


With foot plate
PRN1S-○-○-L1 (L2)



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

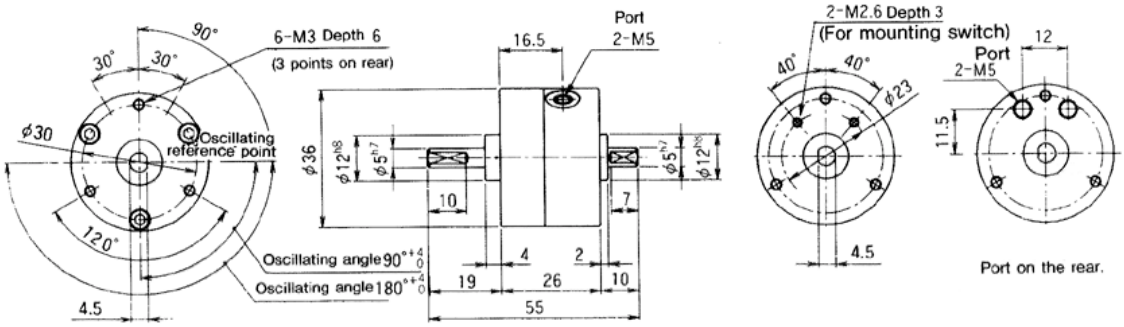
With switch unit
(Switch position adjustable type)
PRN1S-○-○-○-FR (FU)



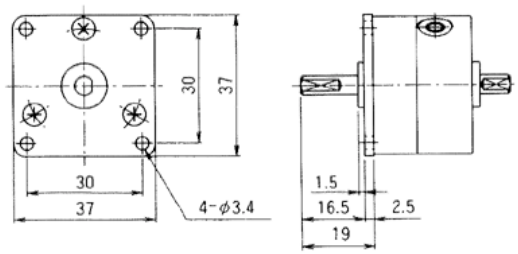
For switch unit- mounting hardware combinations, refer to the required dimensions in each Fig.

Basic type
PRN3S-○-○○

Model changes have been made. Note that the dimensions of mounts differ from those of previous HI-ROTORs.

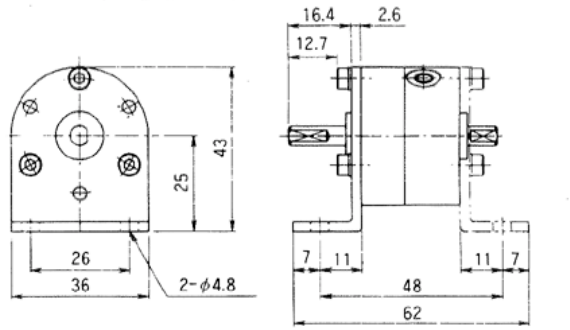


With plate
PRN3S-○-○○-P



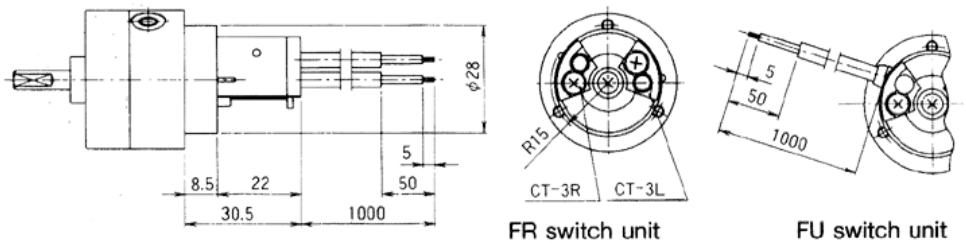
(Note) A plate can be fitted with it turned in steps of 120° from the original posture.

With foot plate
PRN3S-○-○○-L1(L2)



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

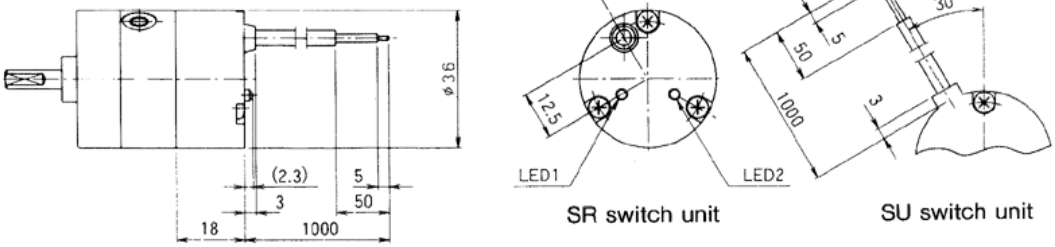
With switch unit
(Switch position adjustable type)
PRN3S-○-○-○-FR(FU)



FR switch unit

FU switch unit

With switch unit
(Switch position fixed type)
PRN3S-○-○-○-SR(SU)



SR switch unit

SU switch unit

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

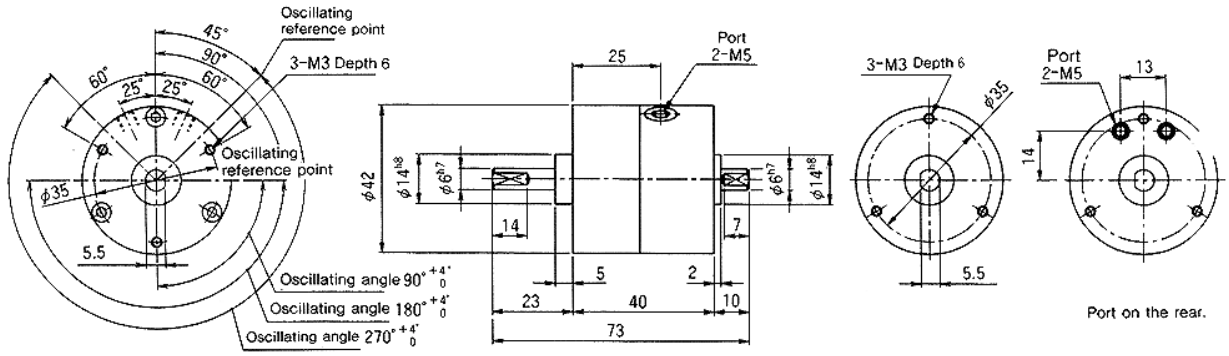
For switch unit- mounting hardware combinations, refer to the required dimensions in each Fig.

Configurations and dimensions

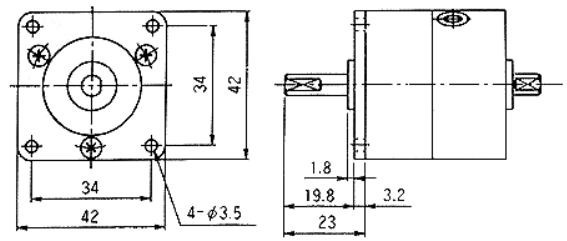
(Unit : mm)

Basic type
PRN10S-○-○○

Model changes have been made. Note that the dimensions of mounts differ from those of previous HI-ROTORs.

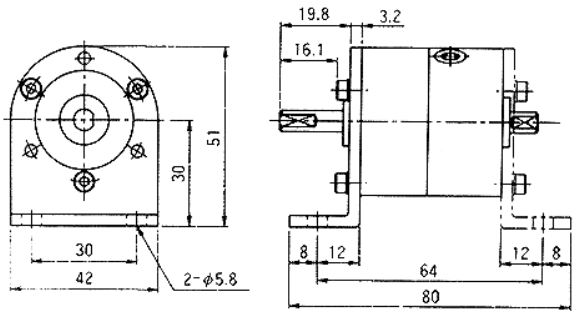


With plate
PRN10S-○-○○-P



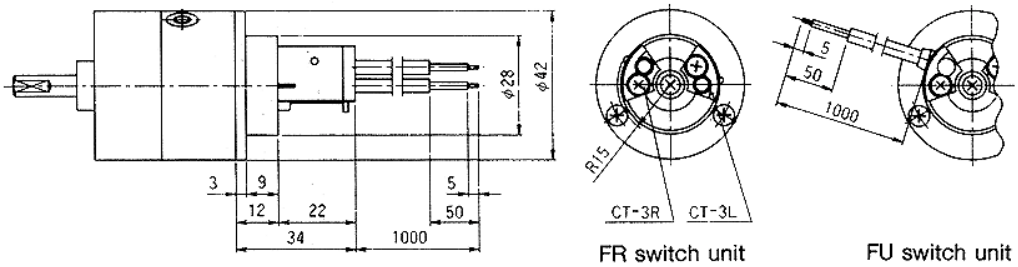
(Note) A plate can be fitted with it turned in steps of 120° from the original posture.

With foot plate
PRN10S-○-○○-L1(L2)



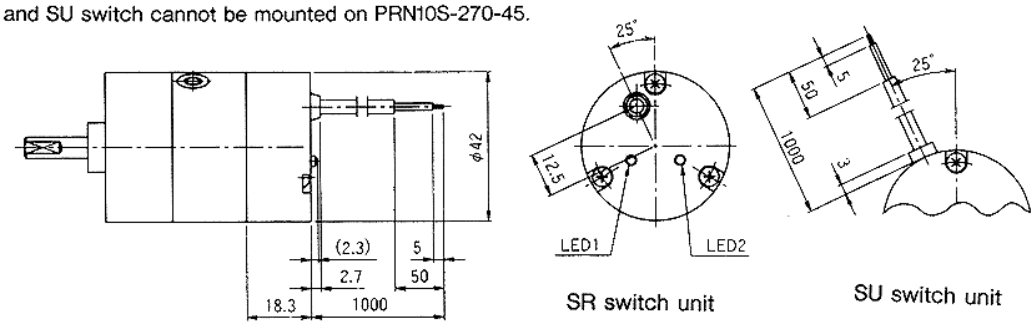
(Note) A foot plate can be fitted with it turned in steps of 60° from the original posture.

With switch unit
(Switch position adjustable type)
PRN10S-○-○-○-FR(FU)



FR switch unit FU switch unit

With switch unit
(Switch position fixed type)
PRN10S-○-○-SR(SU)
SR and SU switch cannot be mounted on PRN10S-270-45.



SR switch unit SU switch unit

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

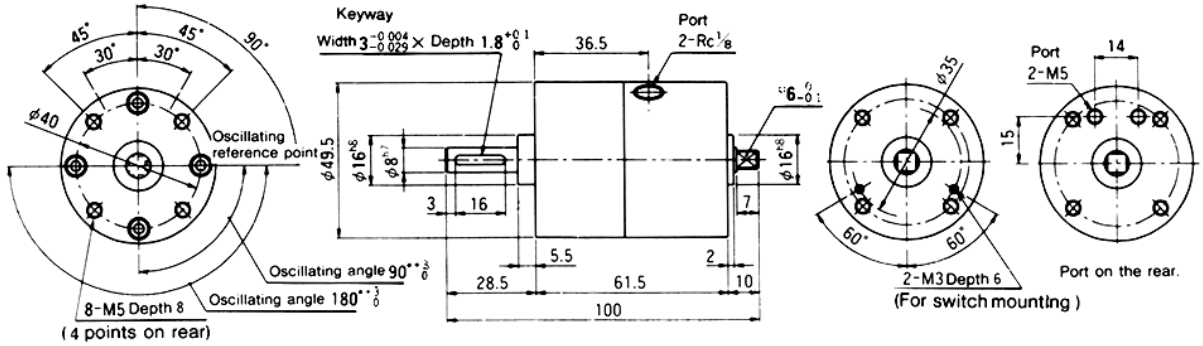
For switch unit- mounting hardware combinations, refer to the required dimensions in each Fig.

Configurations and dimensions

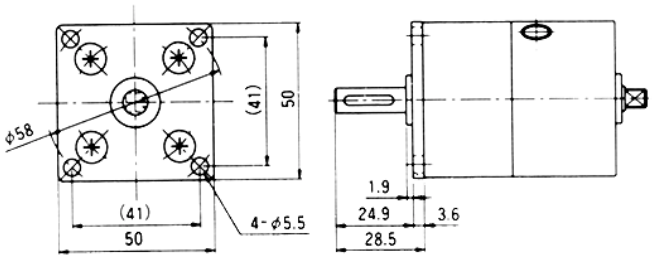
(Unit : mm)

Basic type
PRN20S-○-○○

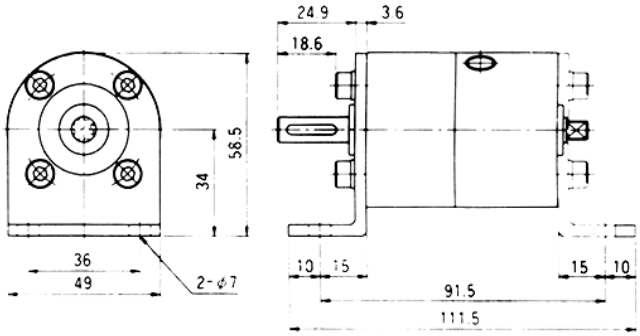
Model changes have been made. Note that the dimensions of mounts differ from those of previous HI-ROTORs.



With plate
PRN20S-○-○○-P

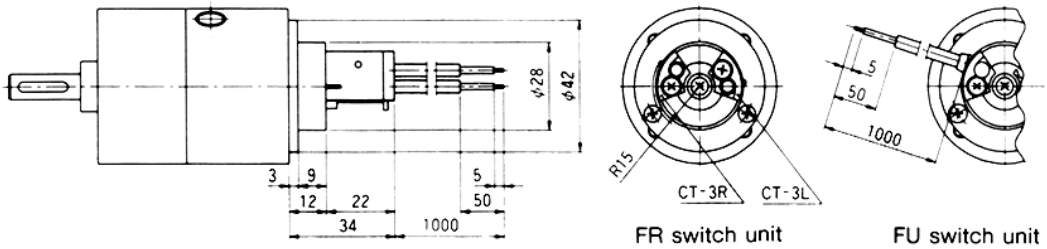


With foot plate
PRN20S-○-○○-L1(L2)



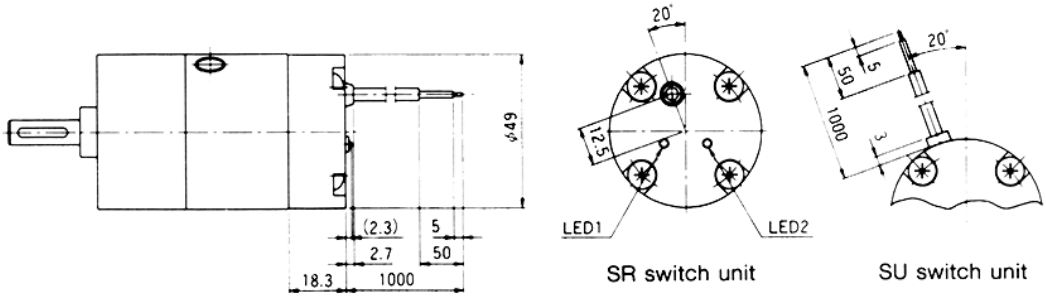
(Note) A foot plate can be fitted with it turned in steps of 90° from the original posture.

With switch unit
(Switch position adjustable type)
PRN20S-○-○-○-FR(FU)



FR switch unit FU switch unit

With switch unit
(Switch position fixed type)
PRN20S-○-○-○-SR(SU)



SR switch unit SU switch unit

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

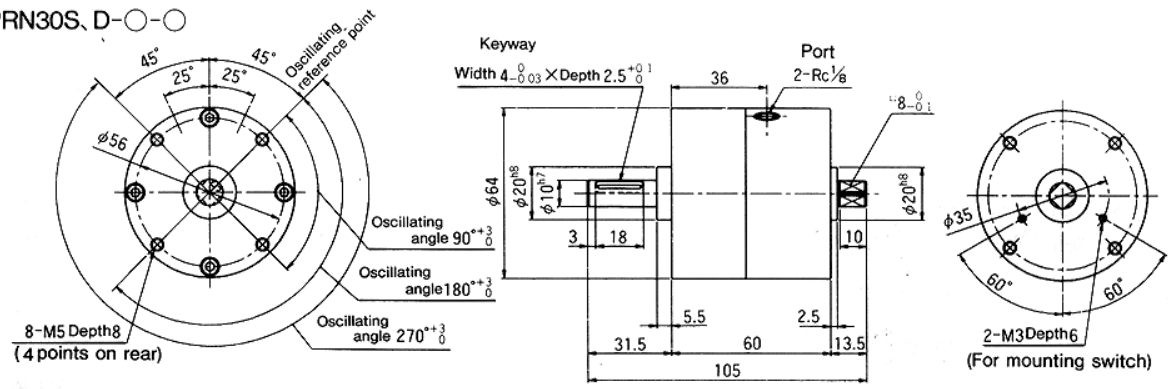
For switch unit- mounting hardware combinations, refer to the required dimensions in each Fig.

Configurations and dimensions

(Unit : mm)

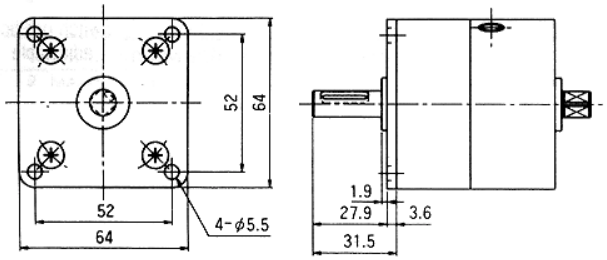
Basic type

PRN30S、D-○-○



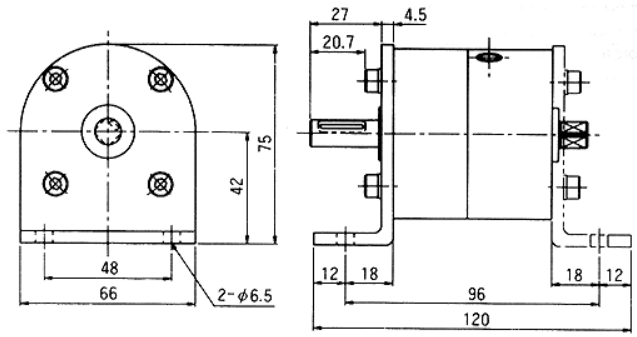
With plate

PRN30S、D-○-○-P



With foot plate

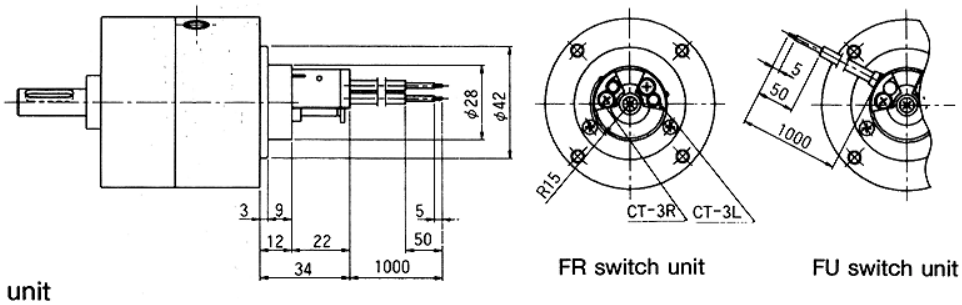
PRN30S、D-○-○-L1 (L2)



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

With switch unit
(Switch position adjustable type)

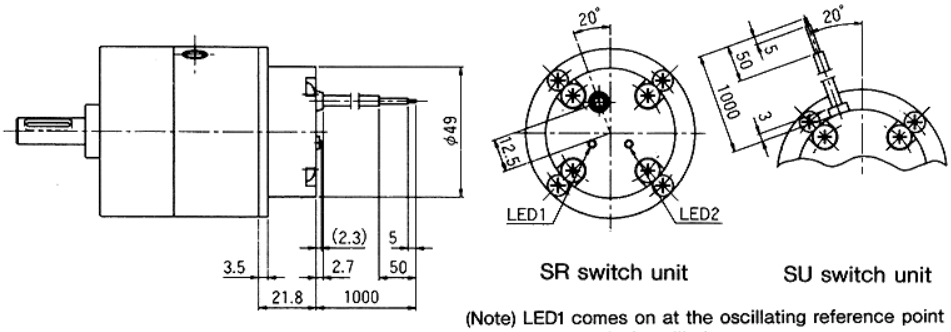
PRN30S、D-○-○-○-FR (FU)



FR switch unit FU switch unit

With switch unit
(Switch position fixed type)

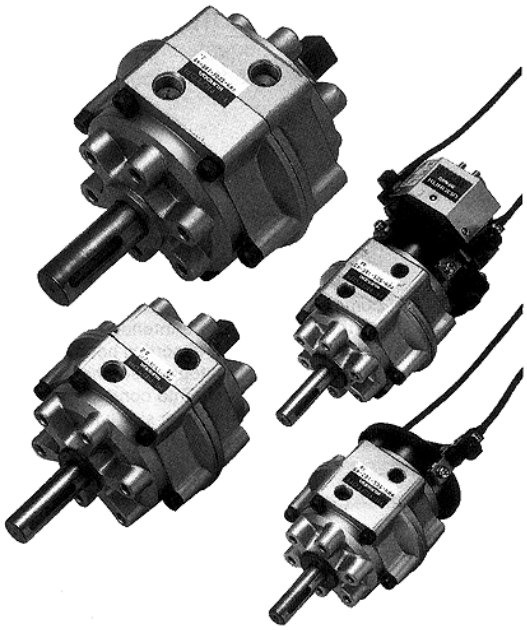
PRN30S、D-○-○-○-SR (SU)



SR switch unit SU switch unit

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

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



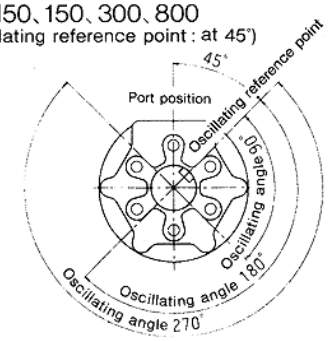
The numerical values shown in this catalog are mainly those for SI units. However the table of output values is shown using the standard unit. The standard unit can be converted to an SI unit using the following formula :

Pressure $Y(MPa) X(kgf/cm^2) \times 9.80665 \times 10^{-2}$

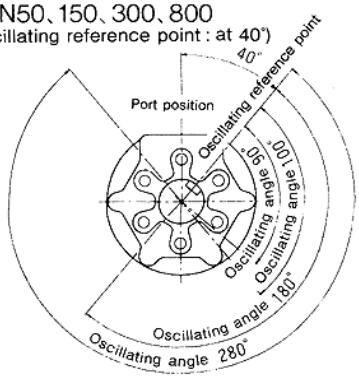
Force $Y(N) = X(kgf) \times 9.80665$

Oscillating reference point and oscillating angle

PRN50、150、300、800
(Oscillating reference point : at 45°)



PRN50、150、300、800
(Oscillating reference point : at 40°)



Ordering Information

PRN50S - 90 - 45 - P - FM - MA 2

Model No. ① ② ③ ④ ⑤ ⑥

Single vane	Double vane
PRN50S	PRN50D
PRN150S	PRN150D
PRN300S	PRN300D
PRN800S	PRN800D

① Oscillating angle

90	90°
100	100°
180	180°
270	270°
280	280°

② Oscillating reference point

45	45°
40	40°

③ Moumting hardware

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

(Note) P is not available for Moodeis PRN300, PRN800

④ Option

No mark	Standard
CR	Hydro-cushion
FM	Switch unit
FC	Hydro-cushion + Switch unit

(Note) For FM and FC, be sure to specify the type and quantity of switches.

⑤ Types of switch

No mark	No switch
MA	MA-1
MB	MD-1
MC	MD-3
MD	MR
ME	MA-2L
MF	MA-2H
MG	MT-3
MH	MT-3U
MJ	MT-2
MK	MT-2U

⑥ Number of switches

No mark	No switch
1	With one switch
2	With two switches

(Note) 1. Only oscillating reference point 45°is available with FC option. (Combination of Hydro-cushion and Switch unit.)
2. Two foot plates (L2) is not available with CR, FM, FC option.
3. Mounting hardware and Hydro-cushion come being not fabricated.

Oscillating angle and oscillating reference point

Single vane

Model No.	Oscillating angle				reference point	
	90°	180°	270°	280°	45°	40°
PRN50S	○	○	○	—	○	—
	—	○	—	○	—	○
PRN150S	○	○	○	—	○	—
	—	○	—	○	—	○
PRN300S	○	○	○	—	○	—
	—	○	—	○	—	○
PRN800S	○	○	○	—	○	—
	—	○	—	○	—	○

Double vane

Model No.	angle		reference point	
	90°	100°	45°	40°
PRN50D	○	—	○	—
	○	○	—	○
PRN150D	○	—	○	—
	○	○	—	○
PRN300D	○	—	○	—
	○	○	—	○
PRN800D	○	—	○	—
	○	○	—	○

Model Nos. mounting hardware

Applicable HI-ROTOR	Plate	Foot
PRN50	PRN50-P	PRN50-L
PRN150	PRN150-P	PRN150-L
PRN300	—	PRN300-L
PRN800	—	PRN800-L

(Note) These hardwares are provided with set screws.

Operating Information

Model No.	Unit	PRN50S				PRN150S				PRN300S			
Vane		Single vane											
Fluid		Non-lubricated air (Lubricated air)											
Oscillating angle	(Degree)	90 $^{+3}_{0}$	180 $^{+3}_{0}$	270 $^{+3}_{0}$	280 $^{+3}_{0}$	90 $^{+3}_{0}$	180 $^{+3}_{0}$	270 $^{+3}_{0}$	280 $^{+3}_{0}$	90 $^{+3}_{0}$	180 $^{+3}_{0}$	270 $^{+3}_{0}$	280 $^{+3}_{0}$
Oscillating reference point	(Degree)	45	45 40	45	40	45	45 40	45	40	45	45 40	45	40
Port size		Rc (PT) 1/8				Rc (PT) 1/4				Rc (PT) 3/8			
Minimum working pressure	MPa{kgf/cm²}	0.1 {1}				0.08 {0.8}				0.08 {0.8}			
Operating pressure range	MPa{kgf/cm²}	0.2~1 {2~10.2}											
Proof withstanding pressure	MPa{kgf/cm²}	1.5 {15.3}											
Temperature range	°C	5~60											
Maximum frequency of use	cycle/min	180	90	60		120	80	50		90	60	40	
Internal volume	cm³	51	51	61	62	146	146	179	185	244	283	352	365
Allowable radial load	N{kgf}	588 {60}				1176 {120}				1960 {200}			
Allowable thrust load	N{kgf}	44.1 {4.5}				88.2 {9}				147 {15}			
Allowable energy	mJ{kgf·cm}	49 {0.5}				225.4 {2.3}				1078 {11}			
Weight	kg	0.82	0.79	0.73	0.7	2.0	1.9	1.7	1.6	3.7	3.7	3.7	3.6

Model No.	Unit	PRN800S				PRN50D		PRN150D		PRN300D		PRN800D	
Vane		Single vane				Double vane							
Fluid		Non-lubricated air (Lubricated air)											
Oscillating angle	Degree	90 $^{+3}_{0}$	180 $^{+3}_{0}$	270 $^{+3}_{0}$	280 $^{+3}_{0}$	90 $^{+3}_{0}$	100 $^{+3}_{0}$	90 $^{+3}_{0}$	100 $^{+3}_{0}$	90 $^{+3}_{0}$	100 $^{+3}_{0}$	90 $^{+3}_{0}$	100 $^{+3}_{0}$
Oscillating reference point	Degree	45	45 40	45	40	45 40	40	45 40	40	45 40	40	45 40	40
Port size		Rc (PT) 1/2				Rc (PT) 1/8		Rc (PT) 1/4		Rc (PT) 3/8		Rc (PT) 1/2	
Minimum working pressure	MPa{kgf/cm²}	0.05 {0.5}				0.08 {0.8}		0.06 {0.6}		0.06 {0.6}		0.05 {0.5}	
Operating pressure range	MPa{kgf/cm²}	0.2~1 {2~10.2}											
Proof withstanding pressure	MPa{kgf/cm²}	1.5 {15.3}											
Temperature range	°C	5~60											
Maximum frequency of use	cycle/min	65	45	30		180		120		90		65	
Internal volume	cm³	754	869	1036	1046	42	43	127	123	244	271	754	774
Allowable radial load	N{kgf}	4900 {500}				588 {60}		1176 {120}		1960 {200}		4900 {500}	
Allowable thrust load	N{kgf}	490 {50}				44.1 {4.5}		88.2 {9}		147 {15}		490 {50}	
Allowable energy	mJ{kgf·cm}	3920 {40}				49 {0.5}		225.4 {2.3}		1078 {11}		3920 {40}	
Weight	kg	12.7	12.2	11.2	11.0	0.82	0.8	2.0	1.9	4.3	4.1	12.7	12.5

1. Maximum frequency of use at the supply pressure of 0.49 MPa {5 kgf/㎠} (Unloaded)
2. Make sure to use the HI-ROTOR within allowable energy. Refer to page 58 for the allowable energy calculation.
3. HI-ROTORs with keyways are provided with keys.
4. For HI-ROTORs other than standard, consult KURODA.

Output (Effective torque)

(Unit : N·cm{kgf·cm})

Model No.	Supply pressure MPa {kgf/㎠}								
	0.2{2}	0.29{3}	0.39{4}	0.49{5}	0.59{6}	0.69{7}	0.78{8}	0.88{9}	0.98{10}
PRN50S	123{12.5}	254{26}	362{37}	470{48}	578{59}	686{70}	813{83}	931{95}	1039{106}
PRN50D	324{33}	568{58}	813{83}	1019{104}	1255{128}	1480{151}	1725{176}	1971{201}	2206{225}
PRN150S	539{55}	833{85}	1127{115}	1470{150}	1765{180}	2059{210}	2353{240}	2677{273}	2991{305}
PRN150D	1225{125}	1863{190}	2647{270}	3432{350}	4069{415}	4707{480}	5393{550}	6080{620}	6766{690}
PRN300S	1029{105}	1618{165}	2206{225}	2794{285}	3383{345}	3971{405}	4511{460}	5079{518}	5638{575}
PRN300D	2500{255}	3824{390}	5295{540}	6668{680}	8139{830}	9512{970}	10787{1100}	12111{1235}	13435{1370}
PRN800S	3706{378}	5795{591}	7943{810}	10032{1023}	12091{1233}	14101{1438}	16279{1660}	18210{1857}	20142{2054}
PRN800D	7590{774}	11718{1195}	15788{1610}	20152{2055}	24173{2465}	28203{2876}	32567{3321}	36412{3713}	40246{4104}

Oscillating time range

(Unit : sec)

Model No.	Oscillating angle				
	90°	100°	180°	270°	280°
PRN50	0.08～0.8	0.09～0.9	0.16～1.6	0.24～2.4	0.25～2.5
PRN150	0.12～1.2	0.13～1.3	0.24～2.4	0.36～3.6	0.37～3.7
PRN300	0.16～1.6	0.17～1.7	0.32～3.2	0.48～4.8	0.49～4.9
PRN800	0.22～2.2	0.24～2.4	0.44～4.4	0.66～6.6	0.68～6.8

(Note) Use HI-ROTORs within the range of the oscillating time range shown in the above table. Otherwise, the HI-ROTOR will tend to occur in a stick-slip motion.
When it is necessary to operate a HI-ROTOR at a low speed which is outside the above-mentioned range, use of a air-hydro HI-ROTOR (see Page 30) is recommended.

HI-ROTOR with switch

M type reed switch

Lead wire type

Type of switch	Rating voltage (V)	Current range (mA)	Indicating lamp (Lights up at ON.)	Applications
MA-1	AC100	5～45	○	Relay PLC
	DC24	5～45		
MD-1	DC24	25～65	○	Relay
MD-3	DC5、6	50 or less (Inductive load) 300 or less (Resistance load)	○	IC circuit
MR	AC DC 5～100	50 or less (Inductive load) 300 or less (Resistance load)	Not provided	Relay
MA-2L	AC100/110	5～150	○	Relay
MA-2H	AC200/220	5～150	○	Relay

(Note) The MA-2L is the same as the MA-1 except that it is provided with a surge suppressor SS-2L.
The MA-2H is the same as the MA-1 except that it is provided with a surge suppressor SS-2H.

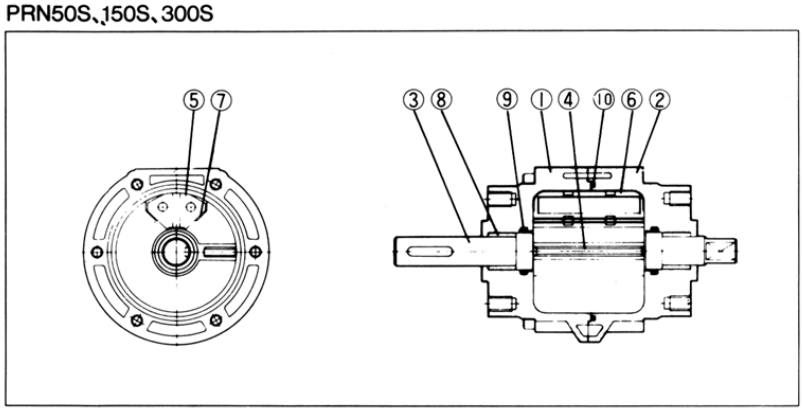
M type proximity switch

Lead wire type

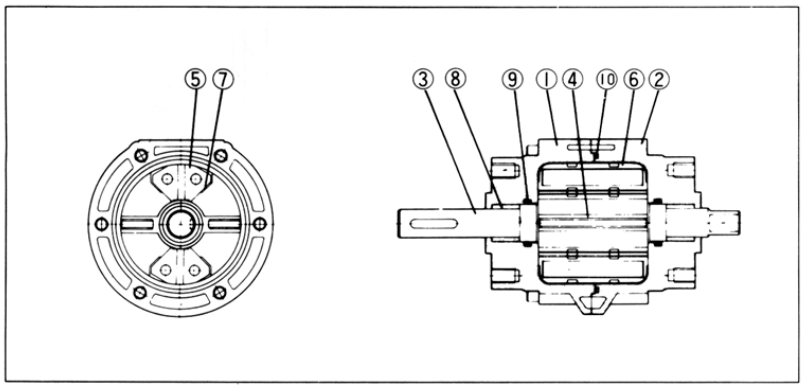
Type of switch	Rating voltage (V)	Current range (mA)	Indicating lamp (Lights up at ON.)	Applications
MT-2 **MT-2U**	DC24 (DC10～30)	5～100	○	Relay PLC
MT-3 **MT-3U**	DC5～30	5～200	○	Relay PLC IC circuit

Structure

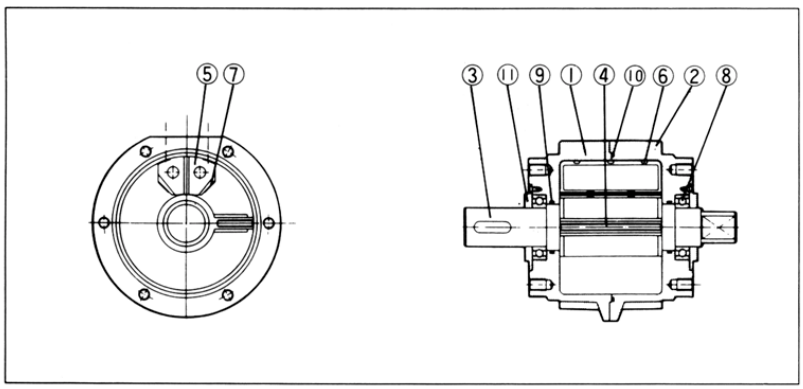
PRN50S、150S、300S



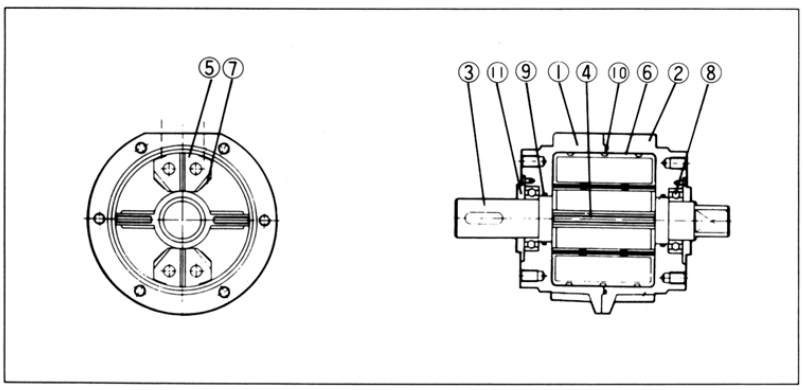
PRN50D、150D、300D



PRN800S



PRN800D



Main components

PRN50、150、300

Part No.	Part name
①	Body A
②	Body B
③	Vane shaft
④	Vane seal (Vane shaft)
⑤	Shoe
⑥	Shoe seal
⑦	Damper
⑧	Bearing
⑨	O-ring
⑩	O-ring

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

Model Nos. of packing kit

Applicable HI-ROTOR	Model No.
PRN50S、PRH50S、PRF50S	PRN50S-PS
PRN50D、PRH50D、PRF50D	PRN50D-PS
PRN150S、PRH150S、PRF150S	PRN150S-PS
PRN150D、PRH150D、PRF150D	PRN150D-PS
PRN300S、PRH300S、PRF300S	PRN300S-PS
PRN300D、PRH300D、PRF300D	PRN300D-PS

(Note) A set of packings consists of part nos ④、⑥、⑨ and ⑩.

PRN800

Part No.	Part name
①	Body A
②	Body B
③	Vane shaft
④	Vane seal (Vane shaft)
⑤	Shoe
⑥	Shoe seal
⑦	Damper
⑧	Bearing
⑨	O-ring
⑩	O-ring
⑪	Cover plate

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

Model Nos. of packing kit

Applicable HI-ROTOR	Model No.
PRN800S、PRH800S、PRF800S	PRN800S-PS
PRN800D、PRH800D、PRF800D	PRN800D-PS

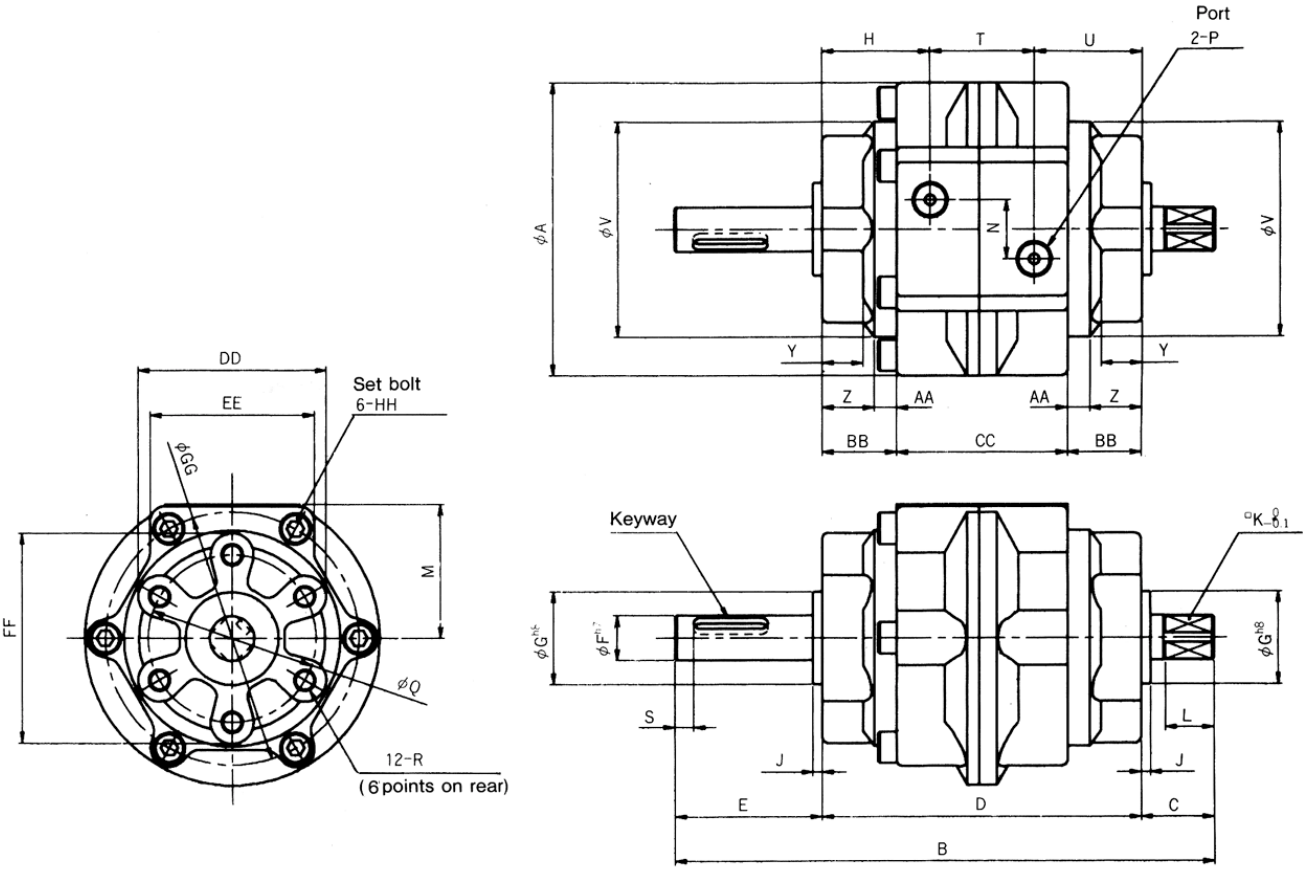
(Note) A set of packings consists of part nos ④、⑥、⑨ and ⑩.

Configurations and dimensions

(Unit : mm)

Basic type

PRN50、150、300、800



(Unit : mm)

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
PRN50	79	145	19.5	86	39.5	12	25	29	2.5	10	13	36	16	Rc(PT)1/8	45	M6×1 Depth 9	5	28
PRN150	110	180	23.5	103	53.5	17	30	34.5	3	13	16	51	24	Rc(PT)1/4	70	M8×1.25 Depth12	5	34
PRN300	141.5	220	30	125	65	25	45	41.5	3.5	19	22	66	32	Rc(PT)3/8	80	M10×1.5 Depth15	5	42
PRN800	196	285	44.5	171	69.5	40	70	53.5	4.5	32	35	90	44	Rc(PT)1/2	120	M12×1.75 Depth18	10	64

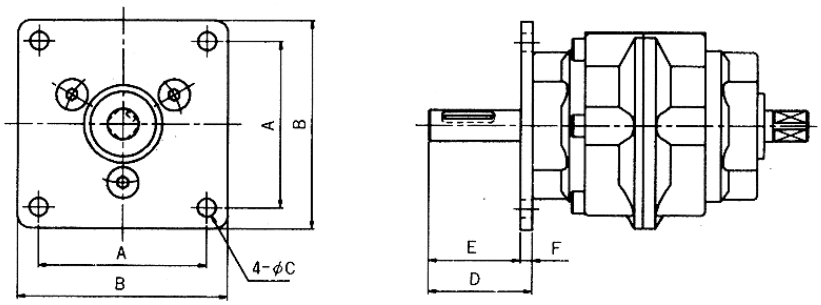
Model No.	U	V	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	Keyway W×D×L
PRN50	29	58	11	14	6	20	46	51	44	57	68	M5×30ℓ	$4^{\ 0}_{-0.03}\times 2.5^{+0.1}_{\ 0}\times 20$
PRN150	34.5	85.2	10.5	15.5	8	23.5	56	75	61	85	97	M6×35ℓ	$5^{\ 0}_{-0.03}\times 3^{+0.1}_{\ 0}\times 36$
PRN300	41.5	110	13	17.5	10	27.5	70	88.5	78	98.5	125	M8×45ℓ	$7^{\ 0}_{-0.036}\times 4^{+0.2}_{\ 0}\times 40$
PRN800	53.5	152	14.5	21.1	11.4	32.5	106	130	110	145	173	M12×70ℓ	$12^{\ 0}_{-0.043}\times 5^{+0.2}_{\ 0}\times 40$

Configurations and dimensions

(Unit : mm)

With plate

PRN50、150○-○-○-P

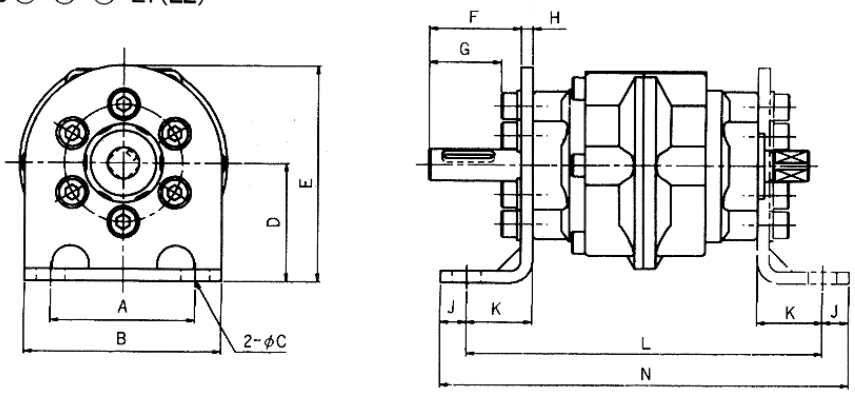


Model No.	A	B	C	D	E	F
PRN50	64	80	7	39.5	35	4.5
PRN150	88	110	9	53.5	47.5	6

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

With foot plate

PRN50、150、300、800○-○-○-L1 (L2)



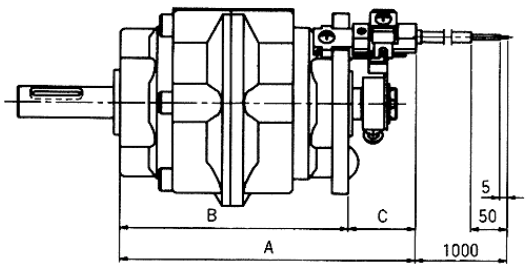
Model No.	A	B	C	D	E	F	G	H	J	K	L	N
PRN50	55	75	11	45	82.5	35	27.5	4.5	10	25	136	156
PRN150	80	110	13	65	115	43.5	33.5	10	12	28	159	183
PRN300	100	140	15	80	135	53	40.5	12	13	32	189	215
PRN800	140	200	15	110	185	54.5	39.5	15	15	35	241	271

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

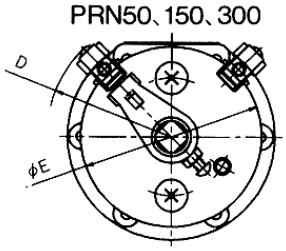
With switch unit

(Switch position adjustable type)

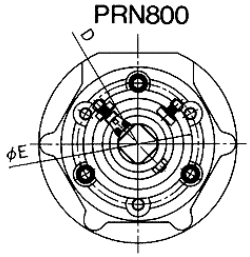
PRN50、150、300、800○-○-○-○-FM-○



PRN50、150、300



PRN800



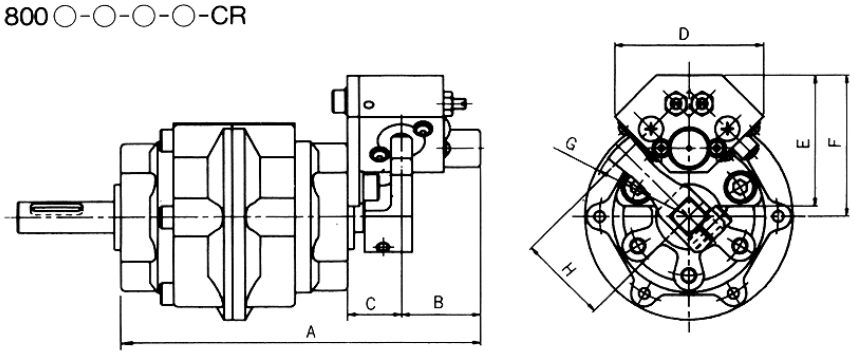
Model No.	A	B	C	D	E
PRN50	115	87.2	27.5	R47	69
PRN150	131.7	104.2	27.5	R61	97
PRN300	161.2	126.2	35	R69	113
PRN800	215.5	174.2	41.3	R60	108

Configurations and dimensions

(Unit : mm)

With Hydro-cushion

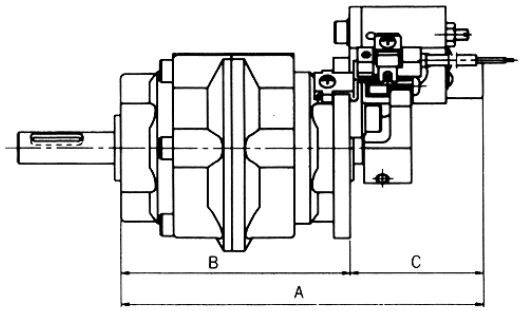
PRN50、150、300、800○-○-○-○-CR



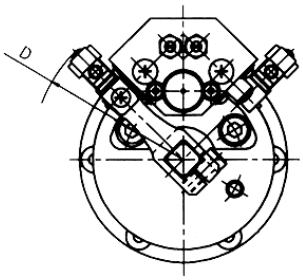
Model No.	A	B	C	D	E	F	G	H
PRN50	136.5	30	20.5	56	50	54	R38	34
PRN150	159.5	34	22.5	80	62	71.5	R51	46
PRN300	187.5	37	25.5	95	87	96	R68	62
PRN800	244	42	31	130	118	135	R78	90

With Hydro-cushion + switch unit

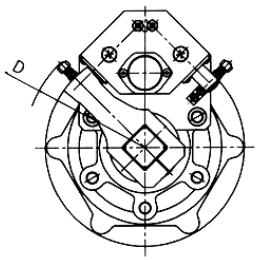
PRN50、150、300、800○-○-○-○-FC-○



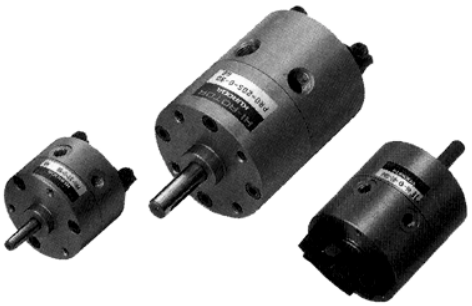
PRN50、150、300



PRN800



Model No.	A	B	C	D
PRN50	137.7	87.2	50.5	R58.2
PRN150	160.7	104.2	56.5	R72.2
PRN300	188.7	126.2	62.5	R88.2
PRN800	244	174.2	69.8	R118.5

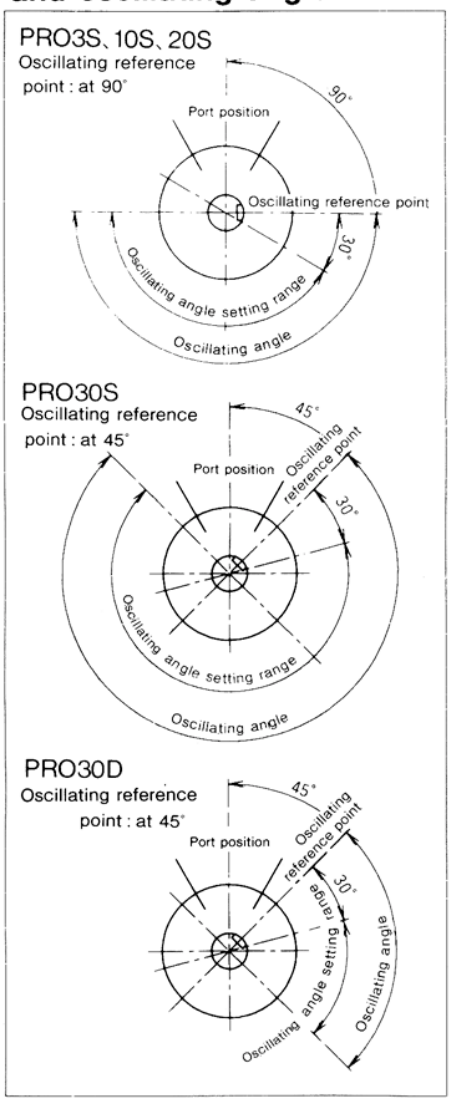


The numerical values shown in this catalog are mainly those for SI units. However the table of output values is shown using the standard unit. The standard unit can be converted to an SI unit using the following formula :

Pressure $Y(MPa) X(kgf/cm^2) \times 9.80665 \times 10^{-2}$

Force $Y(N) = X(kgf) \times 9.80665$

Oscillating reference point and oscillating angle



Ordering Information

PRO20S - O - 90 - P - FR - ☐

Model No. ① ② ③ ④ ⑤

PRO3S (Single vane)
PRO10S (Single vane)
PRO20S (Single vane)
PRO30S (Single vane)
PRO30D (Double vane)

① Oscillating angle

0	Angle setting not specified
*Desired	angle: Angle setting specified

※ Custom-made

② Oscillating reference point

90	90°
45	45°

③ Mounting hardware

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

④ Types of switch units

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

(Note) Two switches are provided.

⑤ Option

No mark	Without protective cover
Symbol	With protection cover

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

(Notes) 1. 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.
2. HI-ROTORs of which angle setting is specified (made-to-order) will be delivered with the angle setting stopper attached to the approximate position. Be sure to adjust the stopper position with the fine adjust screw before use.
3. 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 43.
4. Mounting hardwares are not fabricated to the HI-ROTOR when delivered but are included in the package.

Model No. of stopper unit

Applicable HI-ROTOR	Model No.
PRO3S	RO3-U
PRO10S	RO10-U
PRO20S	RO20-U
PRO30S、D	RO30-U

For details, see page 16.

Model No. of protective cover

Applicable HI-ROTOR	Model No.
PRO3S	PRO3-K
PRO10S	PRO10-K
PRO20S	PRO20-K
PRO30S、D	PRO30-K

Model Nos. of mounting hardware

Applicable HI-ROTOR	Plate	Foot
PRO3S	PRN3-P	PRN3-L
PRO10S	PRN10-P	PRN10-L
PRO20S	PRN20-P	PRN20-L
PRO30S、D	PRN30-P	PRN30-L

(Note) These hardwares are provided with set screws

Operating Information

Model No.	Unit	PRO3S	PRO10S	PRO20S	PRO30S	PRO30D
Vane		Single vane				Double vane
Fluid		Non-lubricated air (Lubricated air)				
Oscillation angle setting range	(Degree)	30～180			30～270	30～90
Oscillating reference point	(Degree)	90			45	
Port size		M5		Rc (PT) 1/8		
Minimum working pressure	MPa〔kgf/cm²〕	0.15 〔1.5〕	0.1 〔1〕			
Operating pressure range	MPa〔kgf/cm²〕	0.3～0.7〔3.1～7.1〕	0.2～0.7〔2～7.1〕	0.2～1 〔2～10.2〕		
Proof withstanding pressure	MPa〔kgf/cm²〕	1.05 〔10.7〕		1.5 〔15.3〕		
Temperature range	℃	5 ～ 60				
Maximum frequency of use	cycle/min	160(at 180°)	150(at 180°)	120(at 180°)	70(at 270°)	200(at 90°)
Internal volume	cm³	2.6	8.5	16	43	34
Allowable radial load	N〔kgf〕	39.2 〔4〕	49 〔5〕	294 〔30〕	392 〔40〕	
Allowable thrust load	N〔kgf〕	3.92 〔0.4〕		24.5 〔2.5〕	29.4 〔3〕	
Allowable energy	mJ〔kgf·cm〕	0.98 〔0.01〕	1.96 〔0.02〕	2.94 〔0.03〕	6.86 〔0.07〕	
Weight	kg	0.085	0.17	0.39	0.51	0.53

1. The allowable energy differs from that of the PRN series.
2. Maximum frequency of use at the supply pressure of 0.49 MPa 〔5 kgf/cm²〕 (Unloaded)
3. Make sure to use the HI-ROTOR within allowable energy.
4. HI-ROTORs with keyways are provided with keys.
5. For HI-ROTORs other than standard, consult KURODA.

Output (Effective torque)

(Unit : N·cm〔kgf·cm〕)

Model No.	Supply pressure MPa 〔kgf/cm²〕								
	0.2〔2〕	0.29〔3〕	0.39〔4〕	0.49〔5〕	0.59〔6〕	0.69〔7〕	0.78〔8〕	0.88〔9〕	0.98〔10〕
PRO3S	–	14.7〔1.5〕	21.5〔2.2〕	27.4〔2.8〕	35.3〔3.6〕	42.1〔4.3〕	–	–	–
PRO10S	23.5〔2.4〕	44.1〔4.5〕	62.7〔6.4〕	84.3〔8.6〕	103.9〔10.6〕	125.4〔12.8〕	–	–	–
PRO20S	39〔4〕	78〔8〕	117〔12〕	156〔16〕	191〔19.5〕	235〔24〕	264〔27〕	304〔31〕	343〔35〕
PRO30S	108〔11〕	176〔18〕	245〔25〕	313〔32〕	402〔41〕	470〔48〕	568〔58〕	637〔65〕	706〔72〕
PRO30D	265〔27〕	431〔44〕	588〔60〕	755〔77〕	931〔95〕	1098〔112〕	1274〔130〕	1451〔148〕	1627〔166〕

External stopper specifications

Model No.	Unit	PRO3S	PRO10S	PRO20S	PRO30S	PRO30D
Min. angle setting	(Degree)	30				
Max. angle setting	(Degree)	180			270	90
Pitch for angle setting	(Degree)	15				
Angle fine adjustment range	(Degree)	−9 ～ +6				
Oscillating reference point fine adjust range	(Degree)	± 3				
Fine adjust range at maximum angle setting	(Degree)	−9 ～ +3				

Oscillation angle setting range and reference point

Model No.	Oscillating angle	Oscillating reference point
PRO3S	30° ～ 180°	90°
PRO10S		
PRO20S		
PRO30S	30° ～ 270°	45°
PRO30D	30° ～ 90°	45°

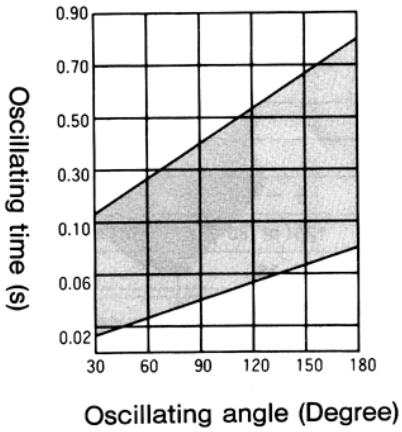
HI-ROTOR with switch

CT type proximity switches

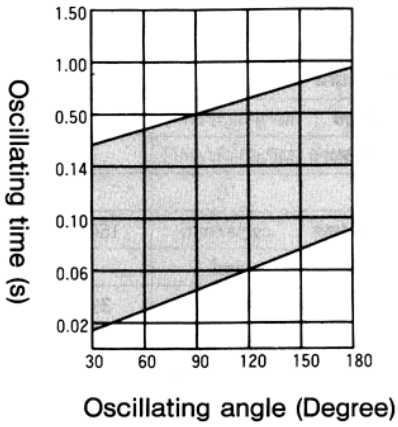
Type of switch	Mounting	Voltage range (V)	Current range (mA)	Indicating lamp (Lights up at ON.)	Applications
CT-3	Switch position adjustable	DC5～30	5～200	○	Relay PLC IC circuit
CT-3U					

Oscillating time range

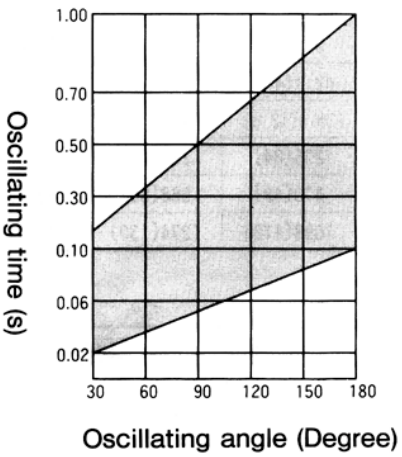
PRO3S



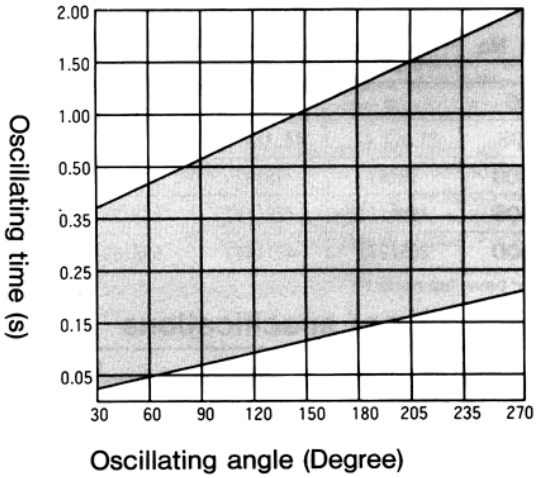
PRO10S



PRO20S



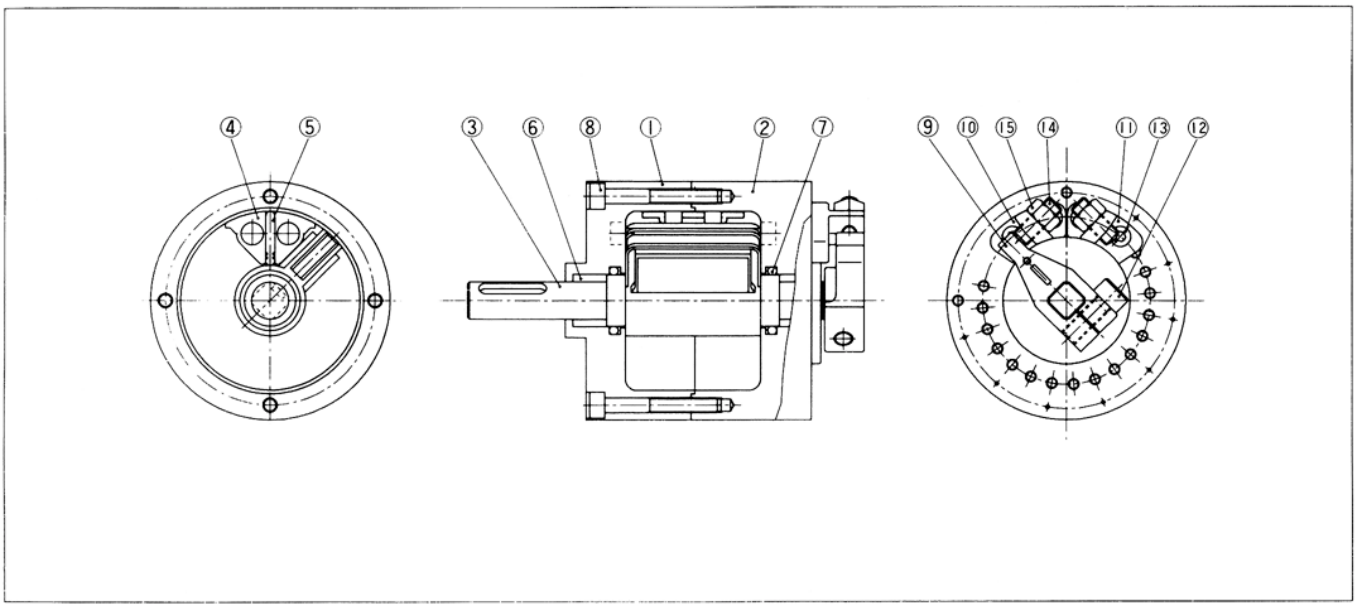
PRO30S、30D



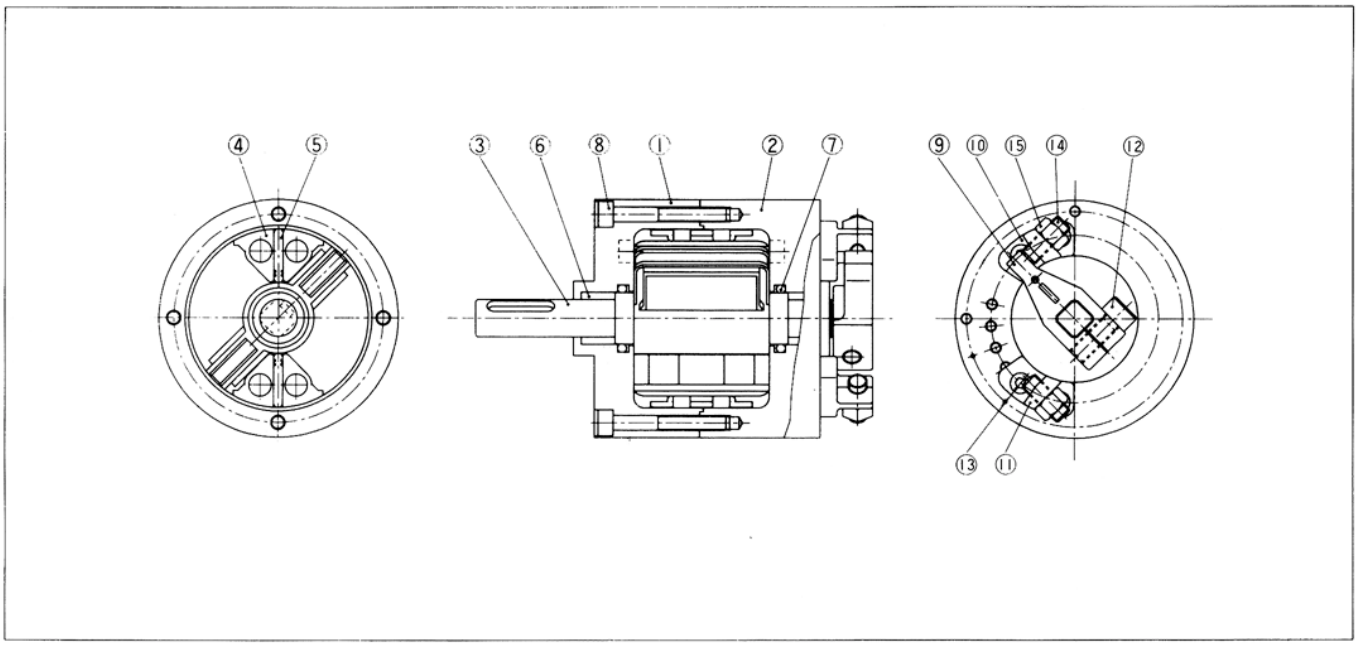
(Note) Operate HI-ROTORs within the range of duration shown in the above charts.
Otherwise, the HI-ROTORs will tend to move in stick-slip motions.

Structure

PRO3S、10S、20S、30S



PRO30D



Main components

Part No.	Part name
①	Body A
②	Body B
③	Vane shaft
④	Shoe
⑤	Shoe seal
⑥	Bushing
⑦	O-ring
⑧	Set screw

Part No.	Part name
⑨	Claw
⑩	Stopper L
⑪	Stopper R
⑫	Claw set screw
⑬	Stopper set screw
⑭	Fine-adjust screw
⑮	Locknut

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

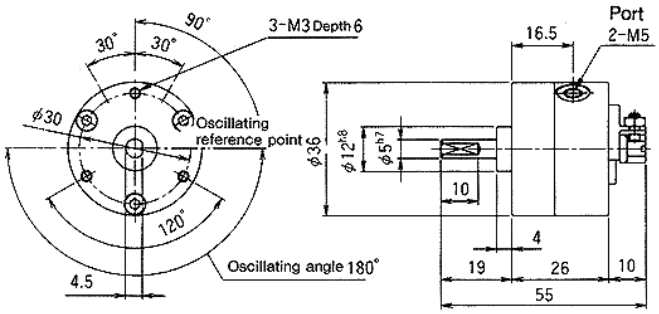
Same as those for stanard type HI-ROTOR (PRN Series).

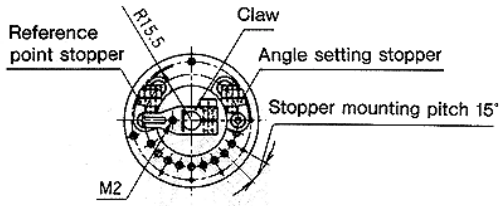
Configurations and dimensions

(Unit : mm)

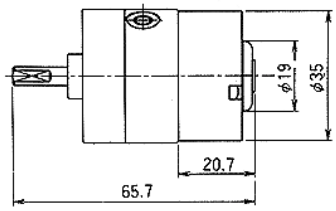
Basic type

PRO3S-○-○



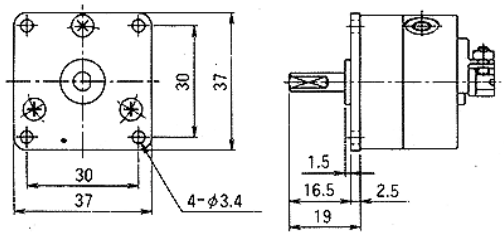


With protection cover



With plate

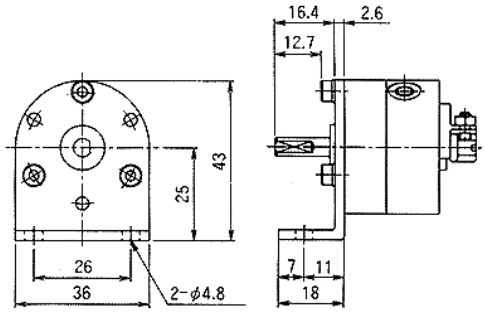
PRO3S-○-○-P



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

With foot plate

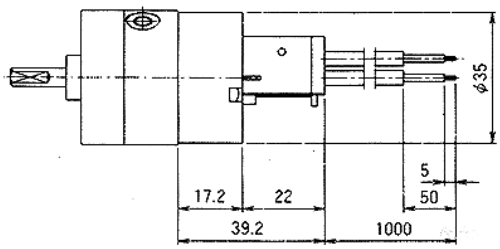
PRO3S-○-○-L1

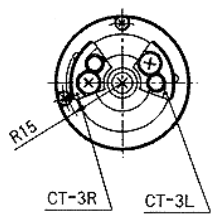


(Note) A foot plate can be fitted with it turned in steps of 60° from the original posture.

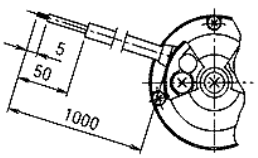
With switch unit
(Switch position adjustable type)

PRO3S-○-○-○-FR(FU)





FR switch unit



FU switch unit

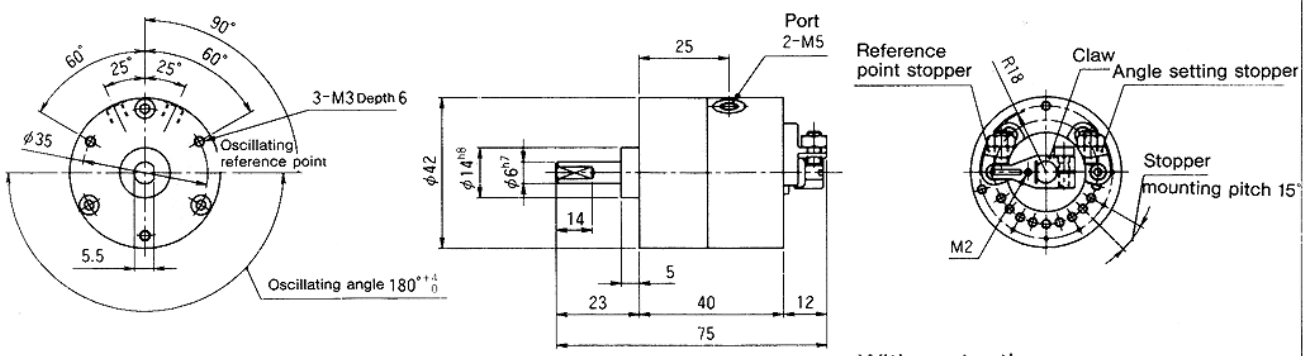
For switch unit- mounting hardware combinations, refer to the required dimensions in each Fig.

Configurations and dimensions

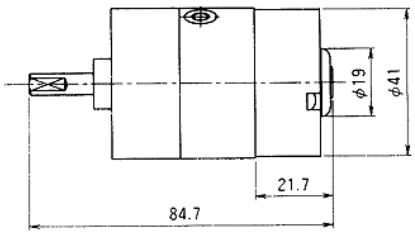
(Unit : mm)

Basic type

PRO10S-○-○

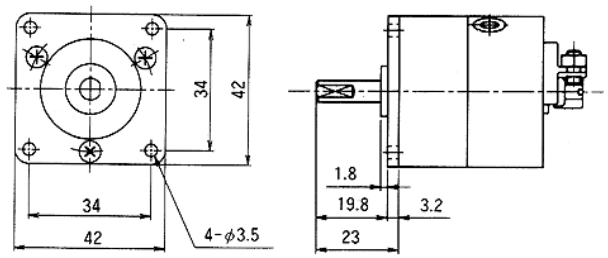


With protection cover



With plate

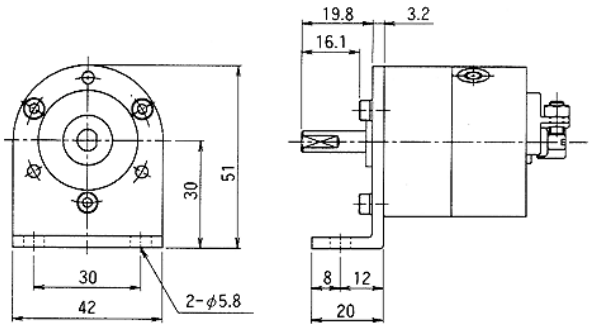
PRO10S-○-○-P



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

With foot plate

PRO10S-○-○-L1

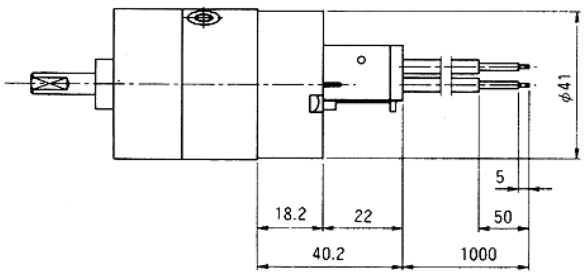


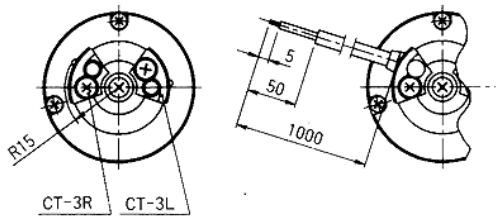
(Note) A foot plate can be fitted with it turned in steps of 60° from the original posture.

With switch unit

(Switch position adjustable type)

PRO10S-○-○-○-FR (FU)





FR switch unit

FU switch unit

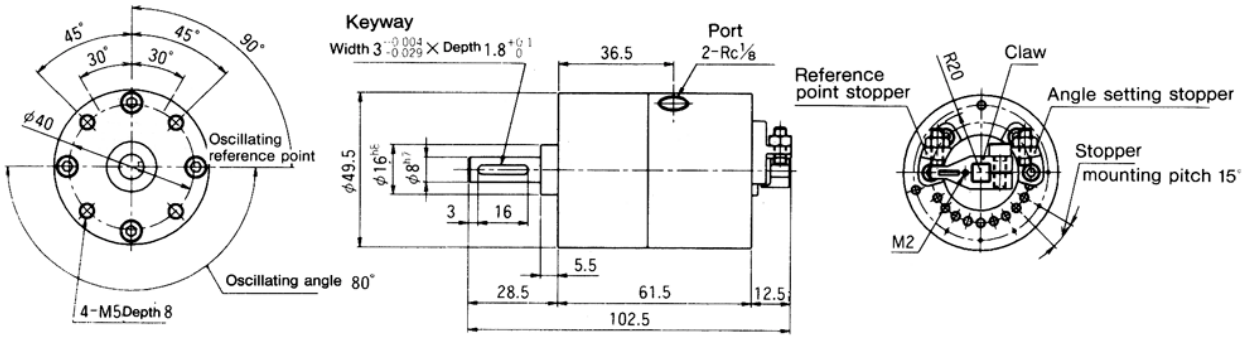
For switch unit- mounting hardware combinations, refer to the required dimensions in each Fig.

Configurations and dimensions

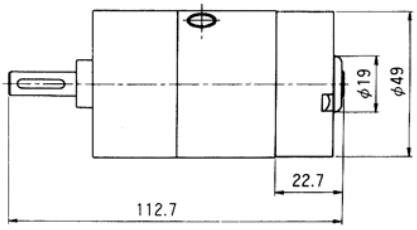
(Unit : mm)

Basic type

PRO20S-○-○

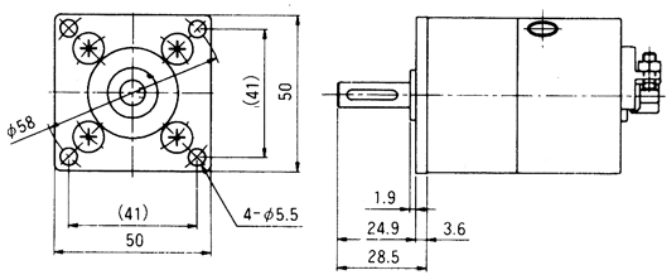


With protection cover



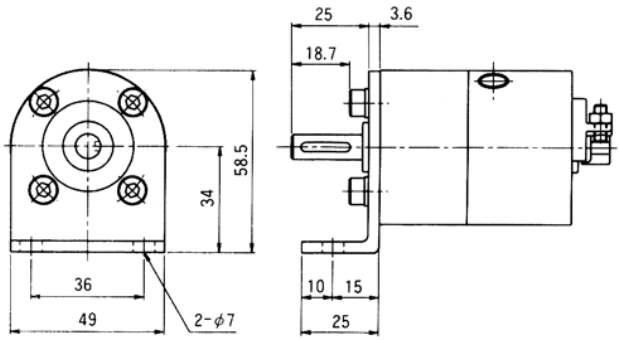
With plate

PRO20S-○-○-P



With foot plate

PRO20S-○-○-L1

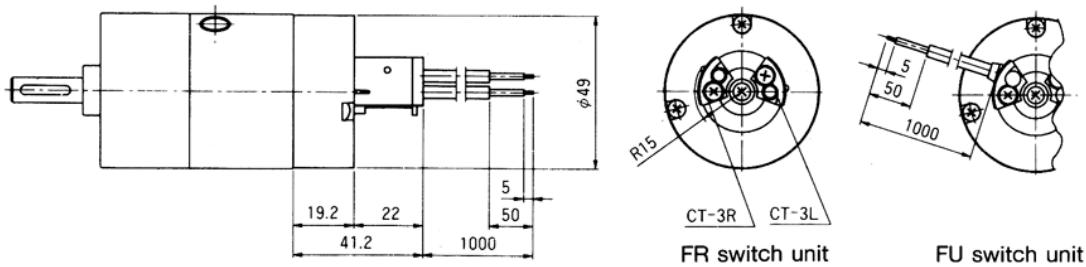


(Note) A foot plate can be fitted with it turned in steps of 90° from the original posture.

With switch unit

(Switch position adjustable type)

PRO20S-○-○-○-FR(FU)



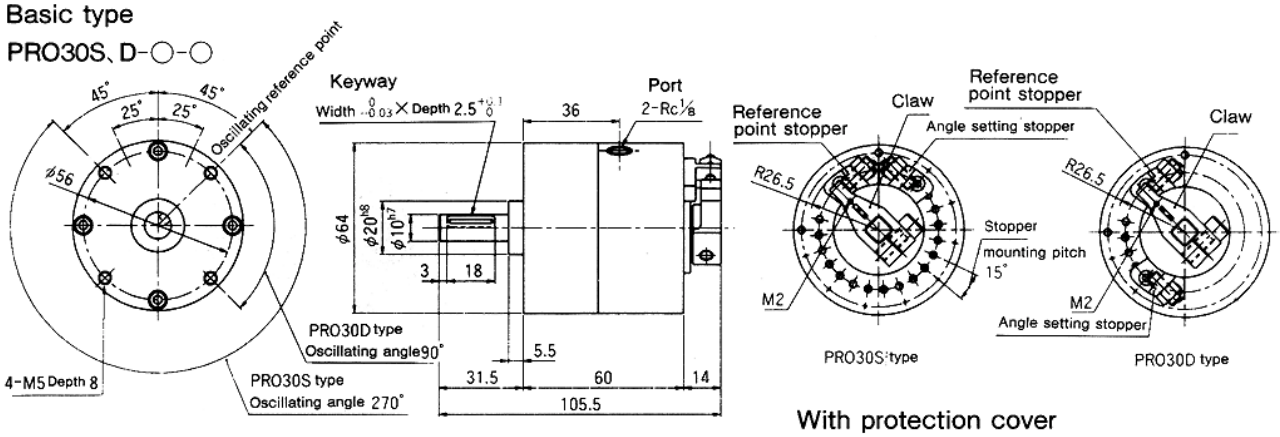
For switch unit- mounting hardware combinations, refer to the required dimensions in each Fig.

Configurations and dimensions

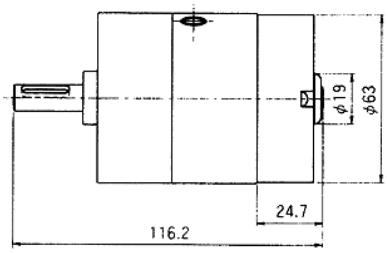
(Unit : mm)

Basic type

PRO30S、D-○-○

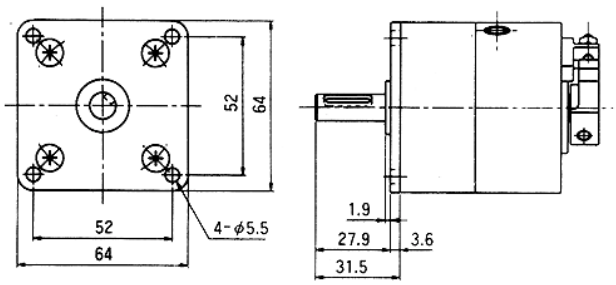


With protection cover



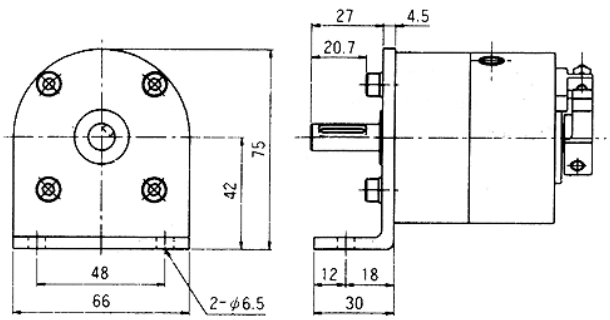
With plate

PRO30S、D-○-○-P



With foot plate

PRO30S、D-○-○-L1

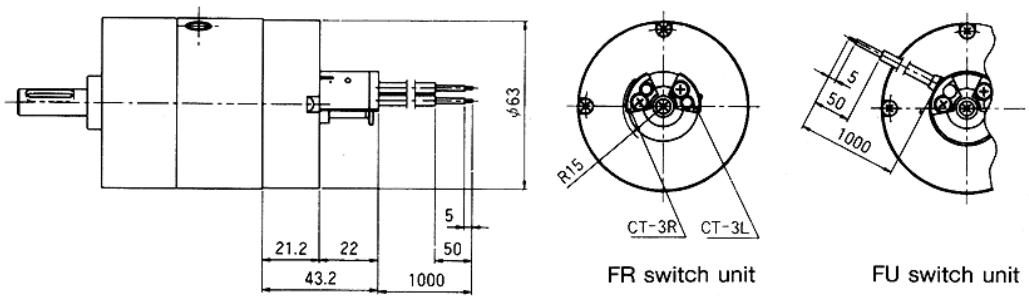


(Note) A foot plate can be fitted with it turned in steps of 90° from the original posture.

With switch unit

(Switch position adjustable type)

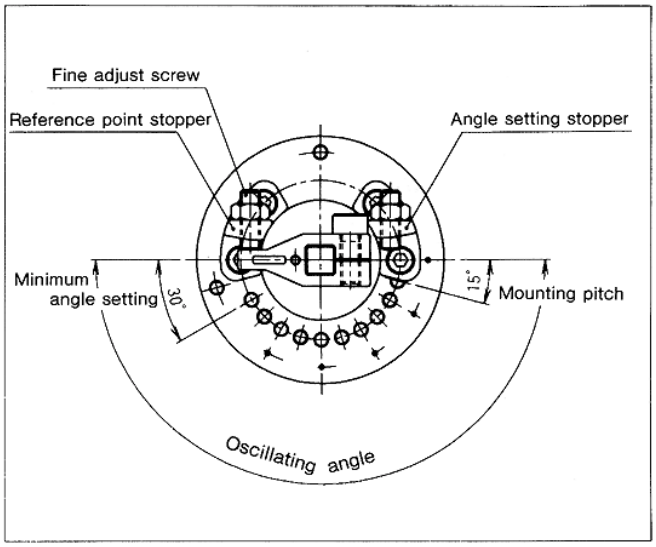
PRO30S、D-○-○-○-FR(FU)



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

Structure of variable oscillating angle mechanism

Attach external stoppers to the tapped hole provided 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 runs against the stopper. Fine adjustment of the angle can be accomplished with the adjust screw on the stopper.



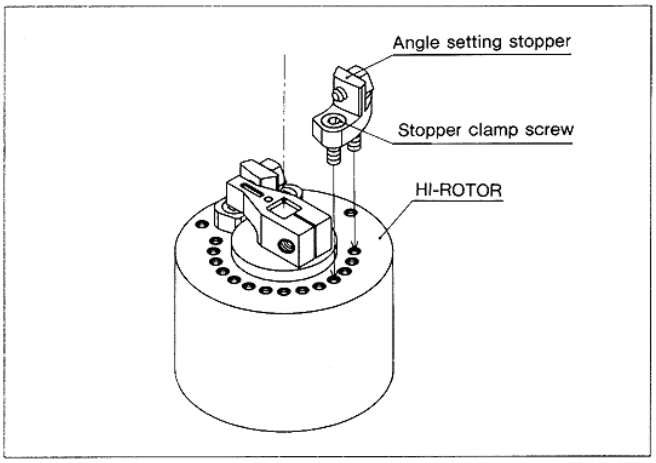
Setting the oscillating angle

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°.

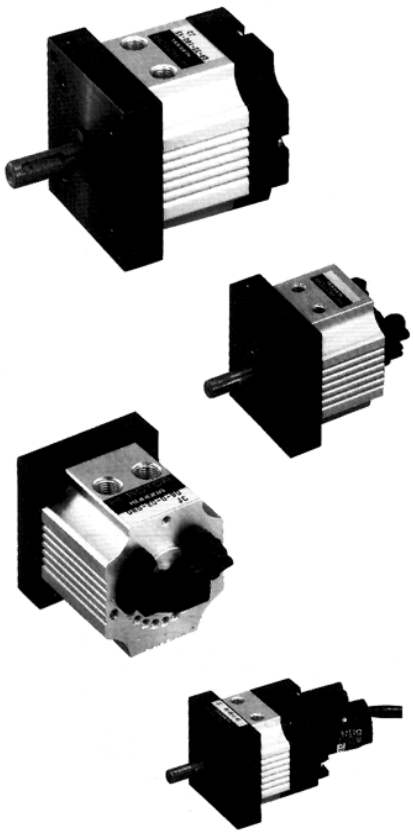
HI-ROTORs of which the angle setting is specified (Made-to-order) :

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.



Precautions for setting angles

① Be sure to attach the reference point stopper and angle setting stopper before starting the HI-ROTOR.
② 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.
③ The reference point stopper is fixed and immovable.
④ The oscillation angle is determined by the claw when it hits the fine adjust screw of each stopper. The accuracy of the stop angle does not take into consideration wear from operation. When the oscillation angle has changed due to wear, readjust it with the fine adjust screw.



Ordering Information

QRO20S - 0 - 90 - FR - K

Model No. ① ② ③ ④

QRO3S
QRO10S
QRO20S
QRO30S

①Oscillating angle

0	No specified angle setting
※Desired angle	Specified angle setting

※Custom made.

②Oscillating reference point

90	90°
45	45°

③Types of switch units

No mark	Without switch unit	
FR	With CT-3 switch	Variable switch position type
FU	With CT-3U switch	

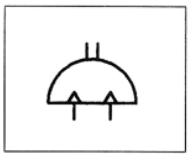
(Note) Two switches are provided.

④Option

No mark	Without protective cover
K	With protective cover

(Note) Models with switch cannot be fitted with protective cover.

(Note) 1. Models without angle setting (standard type) will be shipped with a reference point stopper fitted and an angle setting stopper attached. Be sure to fit the angle setting stopper when using the HI-ROTOR.
2. Models with the desired angle setting (made-to-order) will be shipped with an angle setting stopper set at the desired angle. However since the angle has been roughly set, be sure to adjust the angle. setting with the fine adjust screw when using the HI-ROTOR.
3. Models fitted with switch will be shipped with a switch unit attached. Fit the switch unit after adjusting the external stopper. For fitting procedures refer to Page 18.



JIS symbol

STOPPER UNIT MODEL NO.

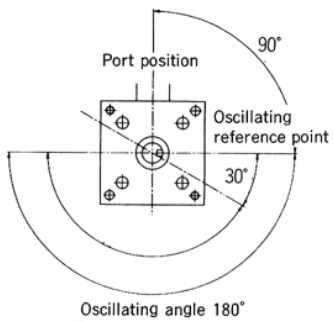
Applicable HI-ROTOR	Stopper unit
QRO3S	RO3-U
QRO10S	RO10-U
QRO20S	RO20-U
QRO30S	RO30-U

PROTECTIVE COVER MODEL NO.

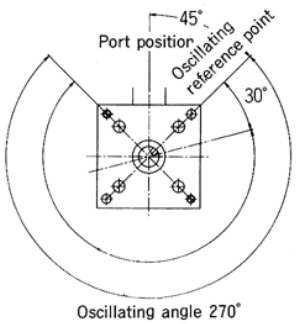
Applicable HI-ROTOR	Protective cover
QRO3S	QRO3-K
QRO10S	QRO10-K
QRO20S	QRO20-K
QRO30S	QRO30-K

OSCILLATING REFERENCE POINT AND OSCILLATING ANGLE

QRO3S、10S、20S



QRO30S

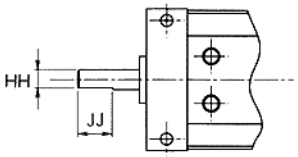


DIMENSIONS

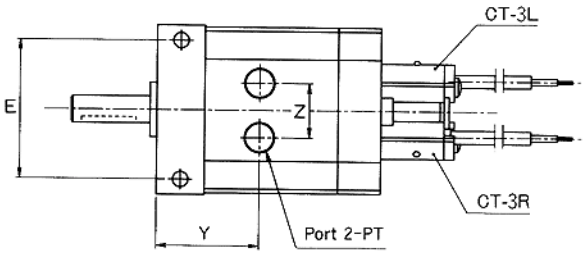
QR○○-○-○-F○

(Unit:mm)

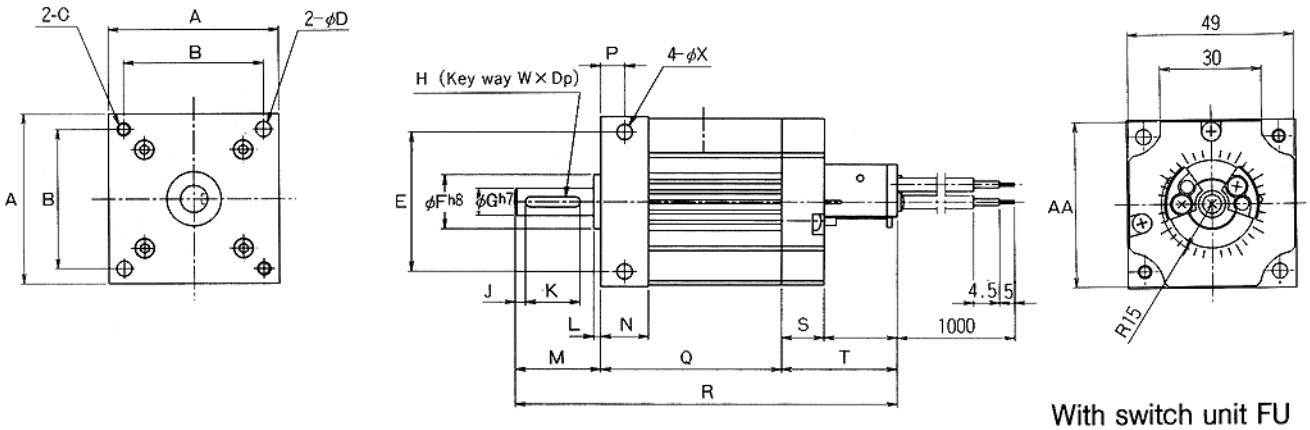
QR3S
QR10S



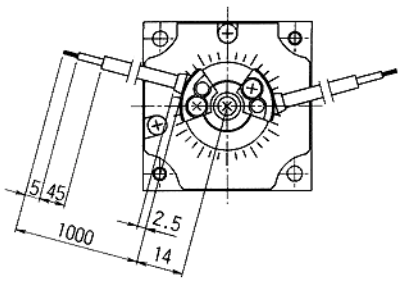
QR20S
QR30S



With switch unit FR



With switch unit FU



Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
QR3S	36	29	M3 through	3.5 through	29	12	5	—	—	—	2	19	10	5	23	72.5	8.5
QR10S	42	35	M3 through	3.5 through	35	14	6	—	—	—	2	20	12	6	37	91	12
QR20S	50	41	M4 through	4.5 through	41	16	8	$3^{-0.004}_{-0.029}\times 1.8^{+0.1}_{0}$	3	16	2	25	14	7	53	112	12
QR30S	64	53	M5 through	5.5 through	53	20	10	$4^{0}_{-0.03}\times 2.5^{+0.1}_{0}$	3	18	2.5	31.5	16	7	53	118.5	12

Model No.	T	X	Y	PT	Z	AA	BB	HH	JJ
QR3S	30.5	3.5 through	15	M5	14	35	22	4.5	10
QR10S	34	3.5 through	19	M5	14	41	26	5.5	14
QR20S	34	4.5 through	30	Rc⅛	16	49	30	—	—
QR30S	34	5.5 through	27	Rc⅛	24	63	40	—	—

Operating Information

Model No.	Unit	QR3S		QR10S			QR20S		QR30S		
Vane		Single vane									
Fluid		Non-lubricated/lubricated air									
Oscillating angle	Degree	90^{+4}_{0}	180^{+4}_{0}	90^{+4}_{0}	180^{+4}_{0}	270^{+4}_{0}	90^{+3}_{0}	180^{+3}_{0}	90^{+3}_{0}	180^{+3}_{0}	270^{+3}_{0}
Oscillating reference point	Degree	90		90		45	90		45		
Port size		M5					Rc(PT)1/8				
Minimum working pressure	MPa{kgf/cm²}	0.15{1.5}		0.1{1}							
Operation pressure range	MPa{kgf/cm²}	0.29~0.69{3~7}		0.2~0.69{2~7}							
Proof withstanding pressure	MPa{kgf/cm²}	1.03{10.5}									
Temprerature range	℃	5~60									
Maximum frequency of use	cycle/min	260	160	240	150	100	210	120	200	110	70
Internal volume	cm^3	2.4	2.6	5	8.5	10	12	16	37		43
Allowable radial load	N{kgf}	14.7{1.5}		29.4{3}			39.2{4}		49{5}		
Allowable thrust load	N{kgf}	9.8{1}		19.6{2}			24.5{2.5}		34.3{3.5}		
Allowable energy	mJ{kgf·cm}	1.47{0.015}		2.94{0.03}			9.8{0.1}		19.6{0.2}		
Shaft runout	mm	0.06(T.I.R.)									
Mass	kg	0.065	0.065	0.14	0.14	0.13	0.31	0.31	0.42	0.42	0.41

1. Maximum frequency of use at the supply pressure of 0.49 MPa {5kgf/cm²} (Unloaded)
2. Make sure to use the HI-ROTOR within allowable energy.
3. HI-ROTOR's with keyways are provided with keys.
4. For HI-ROTOR's other than standard, consult KURODA.

OUTPUT (Effective torque)

(Unit:N·cm{kgf·cm})

Model No.	Supply pressure MPa{kgf/cm²}					
	0.2{2}	0.29{3}	0.39{4}	0.49{5}	0.59{6}	0.69{7}
QR3S	—	14.7{1.5}	21.6{2.2}	27.5{2.8}	35.3{3.6}	42.2{4.3}
QR10S	28.4{2.9}	51.0{5.2}	73.5{7.5}	94.1{9.6}	116.6{11.9}	140.1{14.3}
QR20S	39.2{4}	78.4{8}	117.6{12}	156.8{16}	191.1{19.5}	235.2{24}
QR30S	107.8{11}	176.4{18}	245 {25}	313.6{32}	401.8{41}	470.4{48}

OSCILLATING TIME RANGE (Unit:sec)

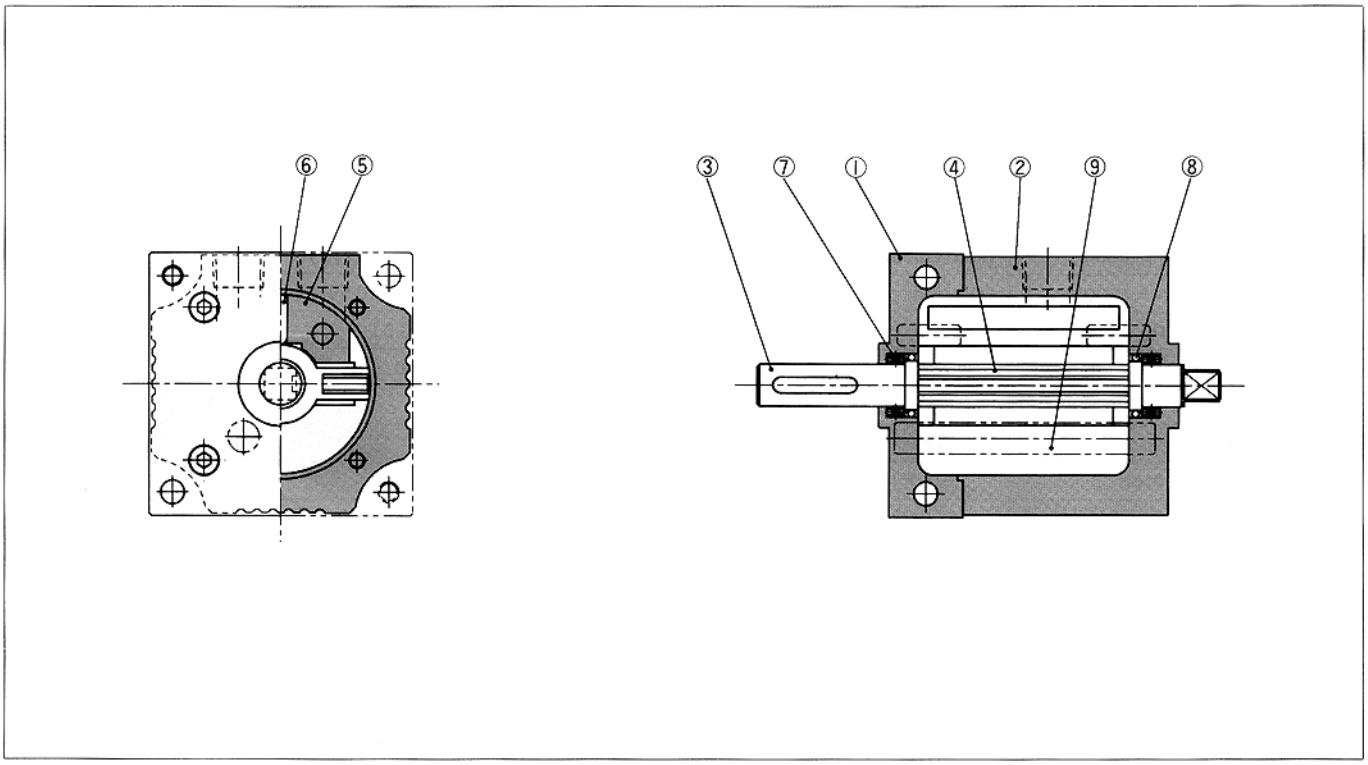
Model No.	Oscillating angle		
	90°	180°	270°
QR3S	0.04~0.4	0.08~0.8	—
QR10S	0.045~0.45	0.09~0.9	0.14~1.4
QR20S	0.05~0.5	0.1~1	—
QR30S	0.07~0.7	0.14~1.4	0.21~2.1

(Note) Set oscillating time within the range shown in the above table. If oscillating time is outside this range, the unit will not smoothly operate due to sticking etc.

CT, SR TYPE PROXIMITY SWITCHES

Type of switch	Mounting of switch	Operating voltage (V)	Operating current range (mA)	Pilot lamp (Light up at ON)	Applications
CT-3	Variable switch position type	DC5~30	5~200	○	Relay PLC IC circuit
CT-3U					
SR	Fixed switch position type				
SU					

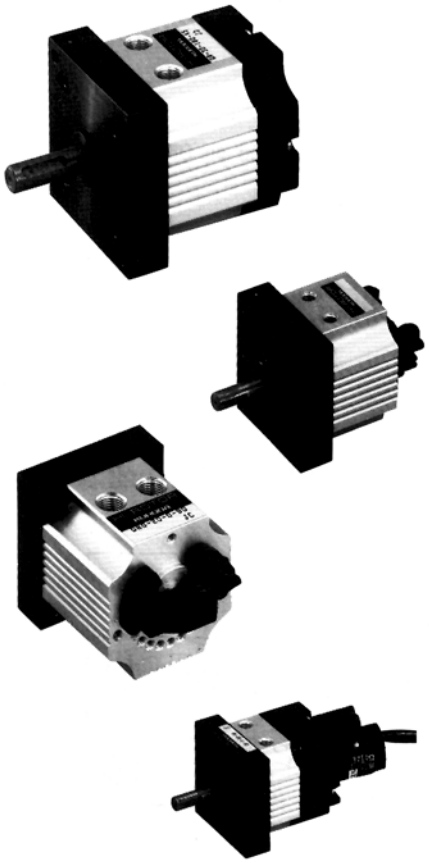
STRUCTURE



MAIN COMPONENTS

Part No.	Description
①	Body A
②	Body B
③	Vane shaft
④	Vane seal
⑤	Shoe
⑥	Shoe seal
⑦	Ball bearing
⑧	O-ring
⑨	Stopper pin

(Note) Vane shaft ③ and vane seal ④ are united.



Ordering Information

QRO20S - 0 - 90 - FR - K

Model No. ① ② ③ ④

QRO3S
QRO10S
QRO20S
QRO30S

①Oscillating angle

0	No specified angle setting
※Desired angle	Specified angle setting

※Custom made.

②Oscillating reference point

90	90°
45	45°

③Types of switch units

No mark	Without switch unit	
FR	With CT-3 switch	Variable switch position type
FU	With CT-3U switch	

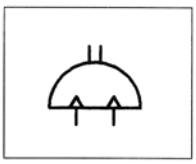
(Note) Two switches are provided.

④Option

No mark	Without protective cover
K	With protective cover

(Note) Models with switch cannot be fitted with protective cover.

(Note) 1. Models without angle setting (standard type) will be shipped with a reference point stopper fitted and an angle setting stopper attached. Be sure to fit the angle setting stopper when using the HI-ROTOR.
2. Models with the desired angle setting (made-to-order) will be shipped with an angle setting stopper set at the desired angle. However since the angle has been roughly set, be sure to adjust the angle. setting with the fine adjust screw when using the HI-ROTOR.
3. Models fitted with switch will be shipped with a switch unit attached. Fit the switch unit after adjusting the external stopper. For fitting procedures refer to Page 18.



JIS symbol

STOPPER UNIT MODEL NO.

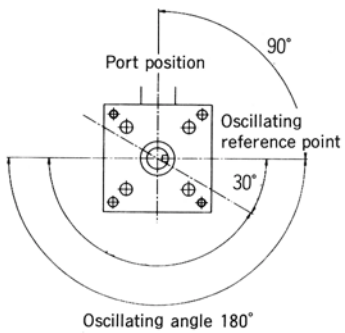
Applicable HI-ROTOR	Stopper unit
QRO3S	RO3-U
QRO10S	RO10-U
QRO20S	RO20-U
QRO30S	RO30-U

PROTECTIVE COVER MODEL NO.

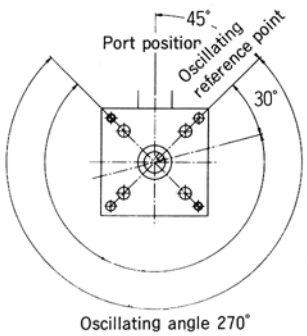
Applicable HI-ROTOR	Protective cover
QRO3S	QRO3-K
QRO10S	QRO10-K
QRO20S	QRO20-K
QRO30S	QRO30-K

OSCILLATING REFERENCE POINT AND OSCILLATING ANGLE

QRO3S、10S、20S



QRO30S



Operating Information

Model No.	Unit	QRO3S	QRO10S	QRO20S	QRO30S
Vane		Single vane			
Fluid		Non-lubricated/lubricated air			
Angle setting range	Degree	30～180			30～270
Oscillating reference point	Degree	90			45
Port size		M5		Rc(PT)⅛	
Minimum working pressure	MPa{kgf/cm²}	0.15{1.5}	0.1{1}		
Operation pressure range	MPa{kgf/cm²}	0.29～0.69{3～7}	0.2～0.69{2～7		
Proof withstanding pressure	MPa{kgf/cm²}	1.03{10.5}			
Temperature range	℃	5～60			
Maximum frequency of use	cycle/min	150/180°	120/180°	120/180°	70/270°
Internal volume	cm³	2.6	10	16	43
Allowable radial load	N{kgf}	14.7{1.5}	29.4{3}	39.2{4}	49{5}
Allowable thrust load	N{kgf}	9.8{1}	19.6{2}	24.5{2.5}	34.3{3.5}
Allowable energy	mJ{kgf·cm}	0.98{0.01}	1.96{0.02}	2.94{0.03}	6.86{0.07}
Shaft runout	mm	0.06(T.I.R.)			
Mass	kg	0.08	0.15	0.34	0.46

1. The allowable energy differs from that of QR series.
2. Maximum frequency of use at the supply pressure of 0.49 MPa {5kgf/cm²} (Unloaded)
3. Make sure to use the HI-ROTOR within allowable energy.

4. HI-ROTOR's with keyway are provided with keys.
5. For HI-ROTOR's other than standard, consult KURODA.

OUTPUT (Effective torque)

(Unit: N·cm{kgf·cm})

Model No.	Supply pressure MPa{kgf/cm²}					
	0.2{2}	0.29{3}	0.39{4}	0.49{5}	0.59{6}	0.69{7}
QRO3S	—	14.7{1.5}	21.6{2.2}	27.5{2.8}	35.3{3.6}	42.2{4.3}
QRO10S	22.5{2.3}	44.1{4.5}	66.6{6.8}	88.2{9}	112.7{11.5}	134.3{13.7}
QRO20S	39.2{4}	78.4{8}	117.6{12}	156.8{16}	191.1{19.5}	235.2{24}
QRO30S	107.8{11}	176.4{18}	245 {25}	313.6{32}	401.8{41}	470.4{48}

SPECIFICATIONS OF EXTERNAL STOPPER

Model No.	Unit	QRO3S	QRO10S	QRO20S	QRO30S
Minimum angle setting	Degree	30			
Maximum angle setting	Degree	180			270
Angle setting pitch	Degree	15			
Range of fine angle adjustment	Degree	−9～+6			
Range of fine adjustment of oscillating reference point	Degree	±3			
Range of fine end adjustment at maximum angle setting	Degree	−9～+3			

OSCILLATING ANGLE SETTING RANGE AND OSCILLATING REFERENCE POINT

(Unit: Degree)

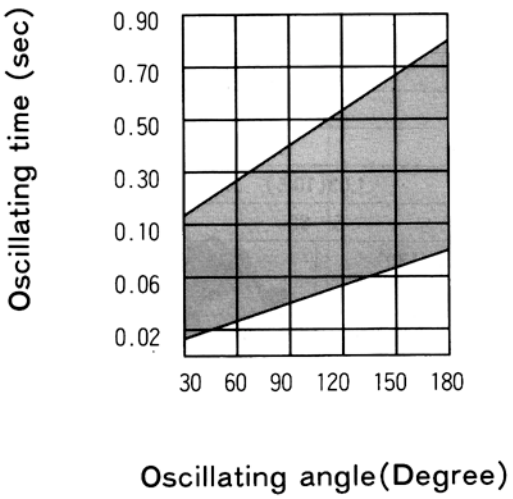
Model No.	Angle setting range	Oscillating reference point
QRO3S	30°～180°	90°
QRO10S		
QRO20S		
QRO30S	30°～270°	45°

CT TYPE PROXIMITY SWITCH

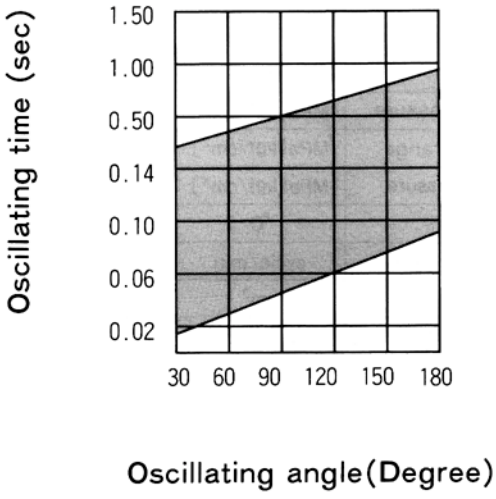
Type of switch	Mounting of switch	Operating voltage (V)	Operating current range (mA)	Pilot lamp (Light up at ON)	Applications
CT-3	Variable switch position type	DC5～30	5～200	○	Relay PLC IC circuit
CT-3U					

SETTING THE OSCILLATING TIME

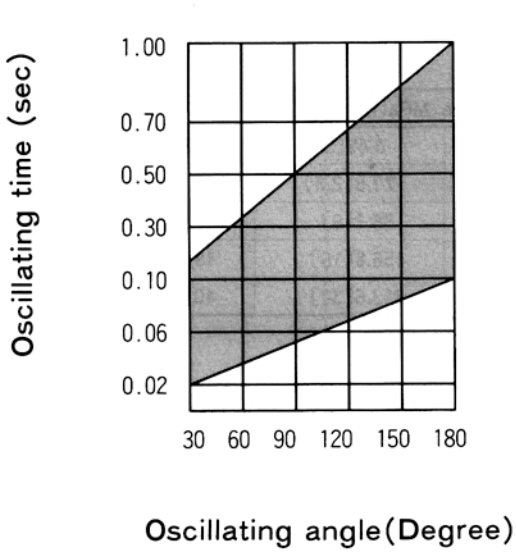
QRO3S



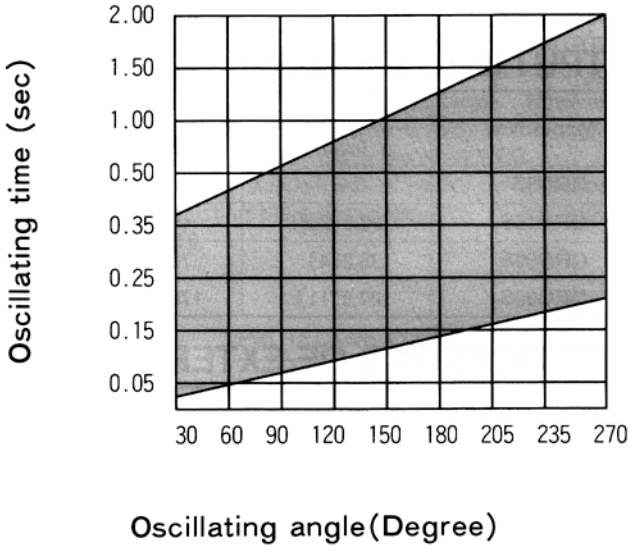
QRO10S



QRO20S

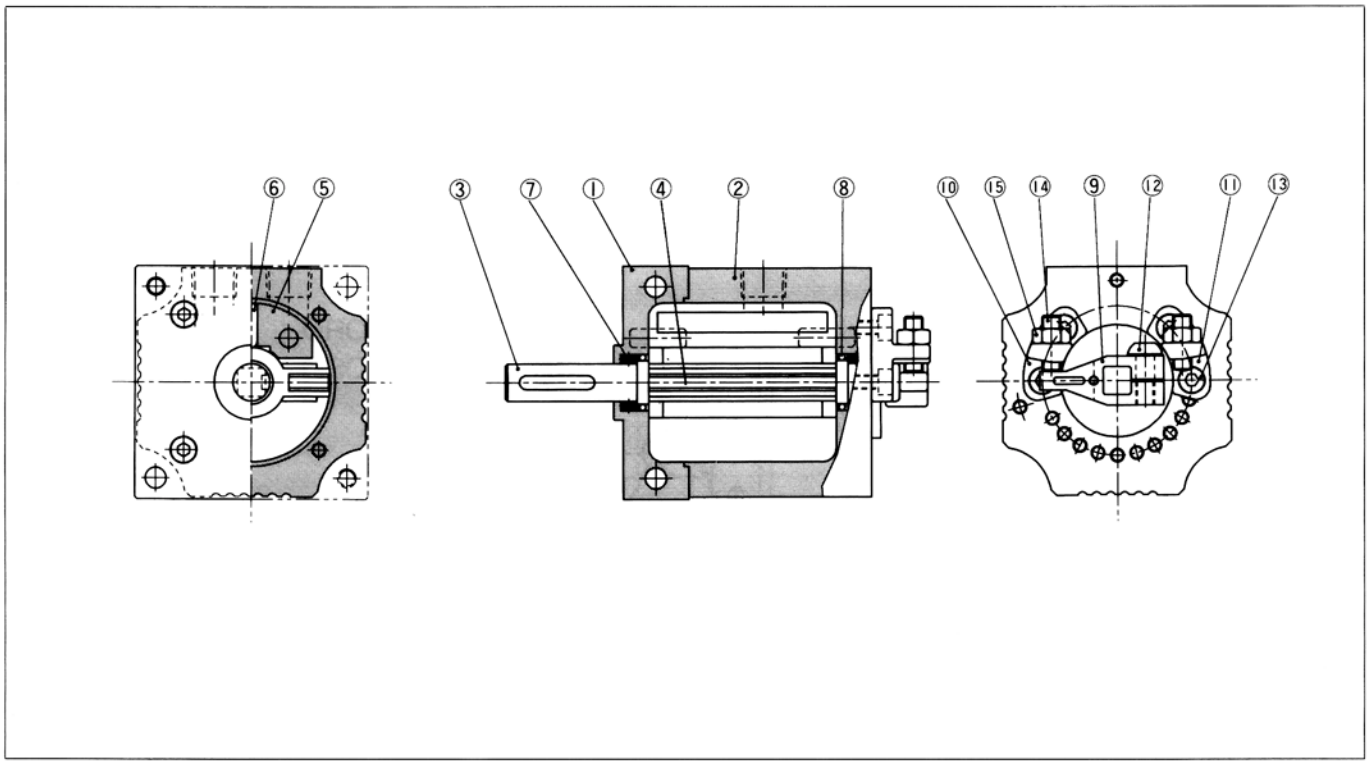


QRO30S



Use oscillating time within the range of the above graphs.
If oscillating time is set outside the range, smooth operation cannot be attained due to sticking etc.

STRUCTURE



MAIN COMPONENTS

Part No.	Description
①	Body A
②	Body B
③	Vane shaft
④	Vane seal
⑤	Shoe
⑥	Shoe seal
⑦	Ball bearing
⑧	O-ring
⑨	Claw
⑩	Stopper L
⑪	Stopper R
⑫	Claw set bolt
⑬	Stopper set bolt
⑭	Fine adjust screw
⑮	Lock nut

(Note) Vane shaft ③ and vane seal ④ are united.

CONTENTS OF STOPPER UNIT PARTS

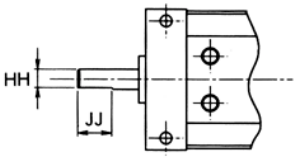
Parts Nos. ⑨、⑩、⑪、⑫、⑬、⑭ and ⑮ are supplied as a set.

DIMENSIONS

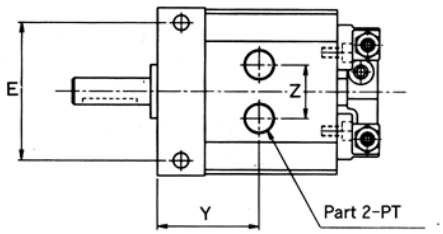
QRO○○-○-○、QRO○○-○-○-K

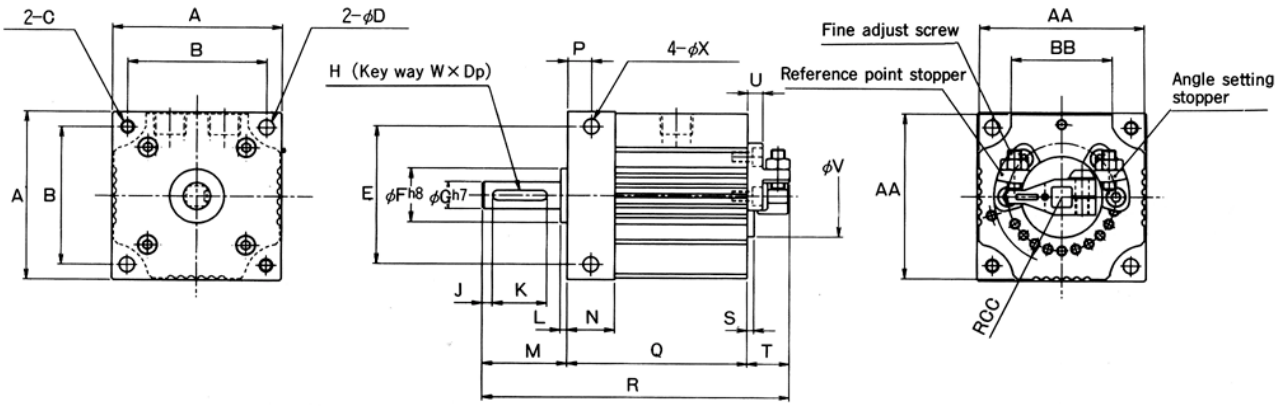
(Unit: mm)

QRO3S
QRO10S

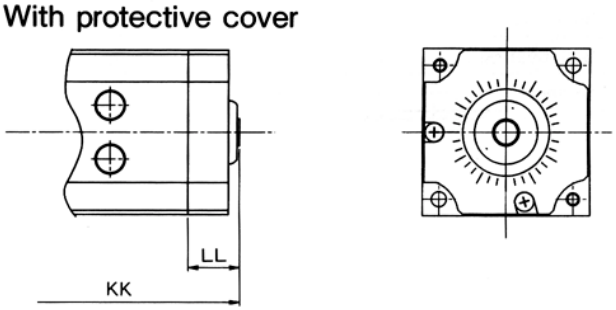


QRO20S
QRO30S





With protective cover



Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
QRO3S	36	29	M3 through	3.5 through	29	12	5	—	—	—	2	19	10	5	23	52	2
QRO10S	42	35	M3 through	3.5 through	35	14	6	—	—	—	2	20	12	6	37	69	2
QRO20S	50	41	M4 through	4.5 through	41	16	8	$3^{-0.004}_{-0.029}\times 1.8^{+0.1}_{0}$	3	16	2	25	14	7	53	90.5	2
QRO30S	64	53	M5 through	5.5 through	53	20	10	$4^{0}_{-0.03}\times 2.5^{+0.1}_{0}$	3	18	2.5	31.5	16	7	53	98.5	2.5

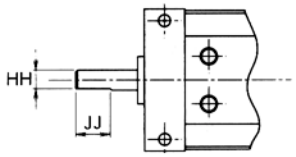
Model No.	T	U	V	X	Y	PT	Z	AA	BB	CC	HH	JJ	KK	LL
QRO3S	10	3	19	3.5 through	15	M5	14	35	22	15.5	4.5	10	63	21
QRO10S	12	4	22	3.5 through	19	M5	14	41	26	18	5.5	14	79	22
QRO20S	12.5	4.5	24	4.5 through	30	Rc⅛	16	49	30	20	—	—	101	23
QRO30S	14	4.5	34	5.5 through	27	Rc⅛	24	63	40	26.5	—	—	109.5	25

DIMENSIONS

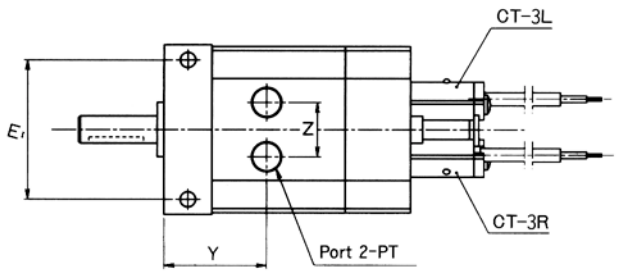
QRO○○-○-○-F○

(Unit:mm)

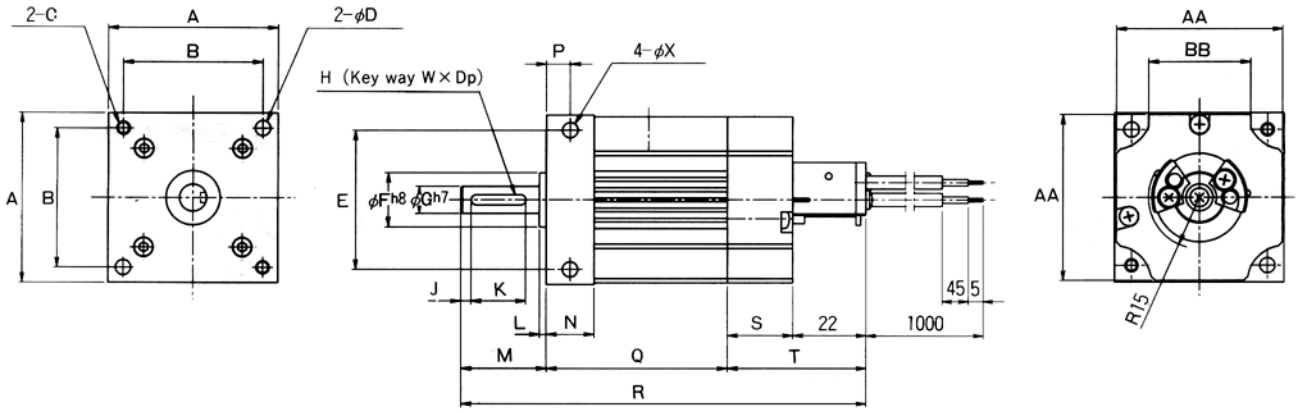
QRO3S
QRO10S



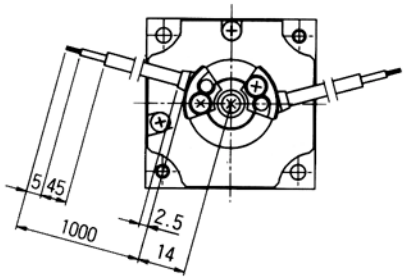
QRO20S
QRO30S



With switch unit FR



With switch unit FU

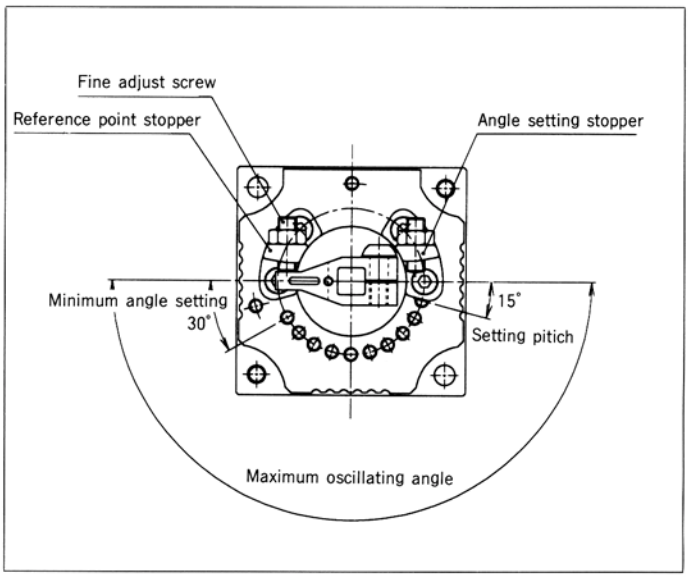


Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
QRO3S	36	29	M3 through	3.5 through	29	12	5	—	—	—	2	19	10	5	23	81	17
QRO10S	42	35	M3 through	3.5 through	35	14	6	—	—	—	2	20	12	6	37	97	18
QRO20S	50	41	M4 through	4.5 through	41	16	8	$3^{-0.004}_{-0.029}\times1.8^{+0.1}_{0}$	3	16	2	25	14	7	53	119	19
QRO30S	64	53	M5 through	5.5 through	53	20	10	$4^{0}_{-0.03}\times2.5^{+0.1}_{0}$	3	18	2.5	31.5	16	7	53	127.5	21

Model No.	T	X	Y	PT	Z	AA	BB	HH	JJ
QRO3S	39	3.5 through	15	M5	14	35	22	4.5	10
QRO10S	40	3.5 through	19	M5	14	41	26	5.5	14
QRO20S	41	4.5 through	30	Rc1/8	16	49	30	—	—
QRO30S	43	5.5 through	27	Rc1/8	24	63	40	—	—

OSCILLATING ANGLE CHANGING MECHANISM

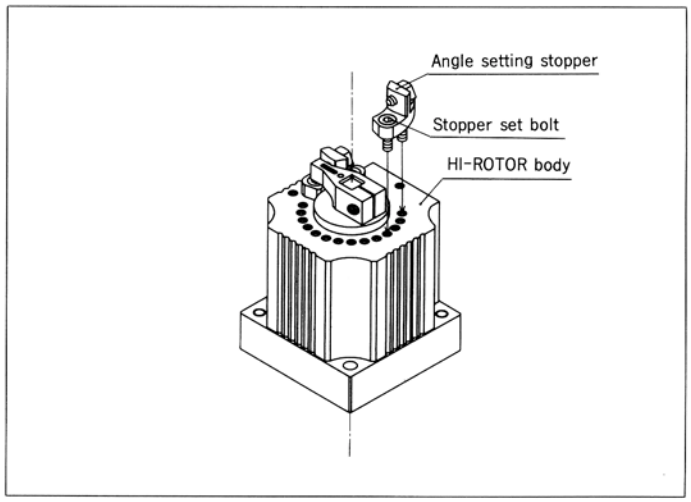
Fit an external stopper into the tap hole on the HI-ROTOR body. A reference point stopper and angle setting stopper are provided. The reference point stopper is fixed at the set position (oscillation starting point). Fix the angle setting stopper at the position where the desired angle setting can be attained. The shaft will stop at the desired angle when the claw fitted to the shaft hits against the stopper. The angle can be finely adjusted with the adjust screw fitted to stopper.



SETTING THE OSCILLATING ANGLE

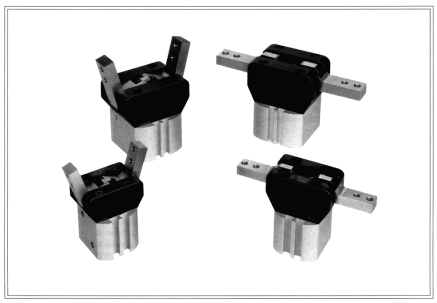
For model without angle setting function (Standard)

This model is shipped with the reference point stopper fixed and the angle setting stopper attached.
When using this model, therefore, it is necessary to set the angle setting stopper at the position where the angle setting can be attained.
The setting pitch is 15°.



For model with angle setting function (Custom made)

This model is shipped with the reference point stopper and angle setting stopper fixed at the specified angle.
When using this model, however, it is necessary to adjust the angle by rotating the fine adjust screw fitted to the stopper.



Operating Information

P5G Series Angular Features

■ **HIGH GRIP FORCE**
P5G Series has a high grip force to weight ratio.

■ **MULTIPLE FUNCTION**
The standard jaw design allows for grip open or grip close.

■ **LIGHTWEIGHT CONSTRUCTION**
The body is anodized aluminum for light weight. The jaws are hardened stainless steel for long life.

■ **CONVENIENT MOUNTING**
Grippers may be mounted from the rear or side. Parker transition kits are available.

■ **ELECTRICAL POSITION SENSING**
Magnetic pistons are standard and all gripper bodies have standardized sensor grooves. Grippers can be ordered with Hall Effect, reed or proximity sensors.

P5G Series Angular Grippers

The Parker P5G Series angular grippers provide 30° or 180° angular gripping motion. These globally available grippers are compact, precise and reliable. Designed specifically for factory automation service, this rugged, lightweight gripper has many important features:

- High grip force to weight ratio
- Spring return option allows for single acting operation, saving on components
- Stroke adjust option on either end for adjustable and precise jaw location
- Mounting holes for rear or side mounting are standard allowing mounting alternatives

Of course all grippers are position sensor ready with magnetic pistons. Each size uses a standardized sensor groove to accommodate Hall Effect, reed or proximity sensors, making sensor inventory simple. Optional Prestolok flow control fittings provide smooth and controlled jaw action. For high temperature service, fluorocarbon seals are available. Integration with other Parker Automation products is simple with a selection of transition kits and mounting hardware.

With compact size, low weight and a life in excess of 10 million cycles, the Parker P5G Series angular gripper is the perfect solution for small parts handling in confined spaces!

SPECIFICATIONS

- Operating pressure range: 0.3 to 7 Bar (4 to 100 psi)
- Operating characteristics: double acting, single acting
- Mounting orientation: unrestricted
- Working ports: M5
- Operating temperature range:
  Standard seals -20 to 82°C (-4° to 180°F)
  Fluorocarbon seals* -20 to 121°C (-4° to 250°F)
- Filtration requirement: 40 micron filtered, dry air

MODEL QUICK REFERENCE

Type	Size	Bore Size	Force, N (lbf) @ 5 bar (72.5 psi)				Weight, N (lbf) Standard Unit	
			Total Force (F)		Grip Force (F/2)			
			30°	180°	30°	180°	30°	180°
No Spring	3	16 mm	82.3 (18.50)	52.7 (11.84)	41.1 (9.25)	26.3 (5.92)	1.2 (0.27)	1.3 (0.29)
	4	25 mm	232.2 (52.20)	122.2 (27.48)	116.1 (26.10)	61.1 (13.74)	2.4 (0.54)	2.7 (0.61)
	5	32 mm	387.3 (87.06)	147.5 (33.16)	193.6 (43.53)	73.8 (16.58)	4.0 (0.90)	4.1 (0.92)
	6	40 mm	640.3 (143.94)	205.7 (46.24)	320.1 (71.97)	102.8 (23.12)	5.7 (1.28)	5.8 (1.30)
Spring Return	3	16 mm	61.9 (13.91)	34.0 (7.65)	30.9 (6.96)	17.0 (3.83)	1.5 (0.34)	1.6 (0.37)
	4	25 mm	181.0 (40.68)	87.7 (19.72)	90.5 (20.34)	43.9 (9.86)	2.5 (0.56)	3.0 (0.67)
	5	32 mm	299.3 (67.29)	111.2 (24.99)	149.7 (12.50)	55.6 (12.50	4.1 (0.92)	4.6 (1.04)
	6	40 mm	518.8 (116.64)	170.4 (38.31)	259.4 (58.32)	85.2 (19.15)	5.8 (1.30)	6.1 (1.37)

*See Fluorocarbon seal option for high temperature anomalies.

Ordering Information

P5G	–	A	A	4	B	A	N	HB	S	–	*

Global Pneumatic Grippers
P5G

Series
A – Automation

Type
A – Standard Angular (30°)
W – Wide Opening Angular (180°)

Size
3 – 16 mm
4 – 25 mm
5 – 32 mm
6 – 40 mm

Ports
B – M5 Female
3 – Prestolok Flow Control 4mm (5/32") tube diameter

Function
A – Standard

Spring/Stroke Adjust Options*

Spring Option	Stroke Adjust Front	Stroke Adjust Rear	No Stroke Adjust
Spring Return	A	—	C
No Springs	F	G	N

* *Stroke adjust is not available on 30° grippers.*

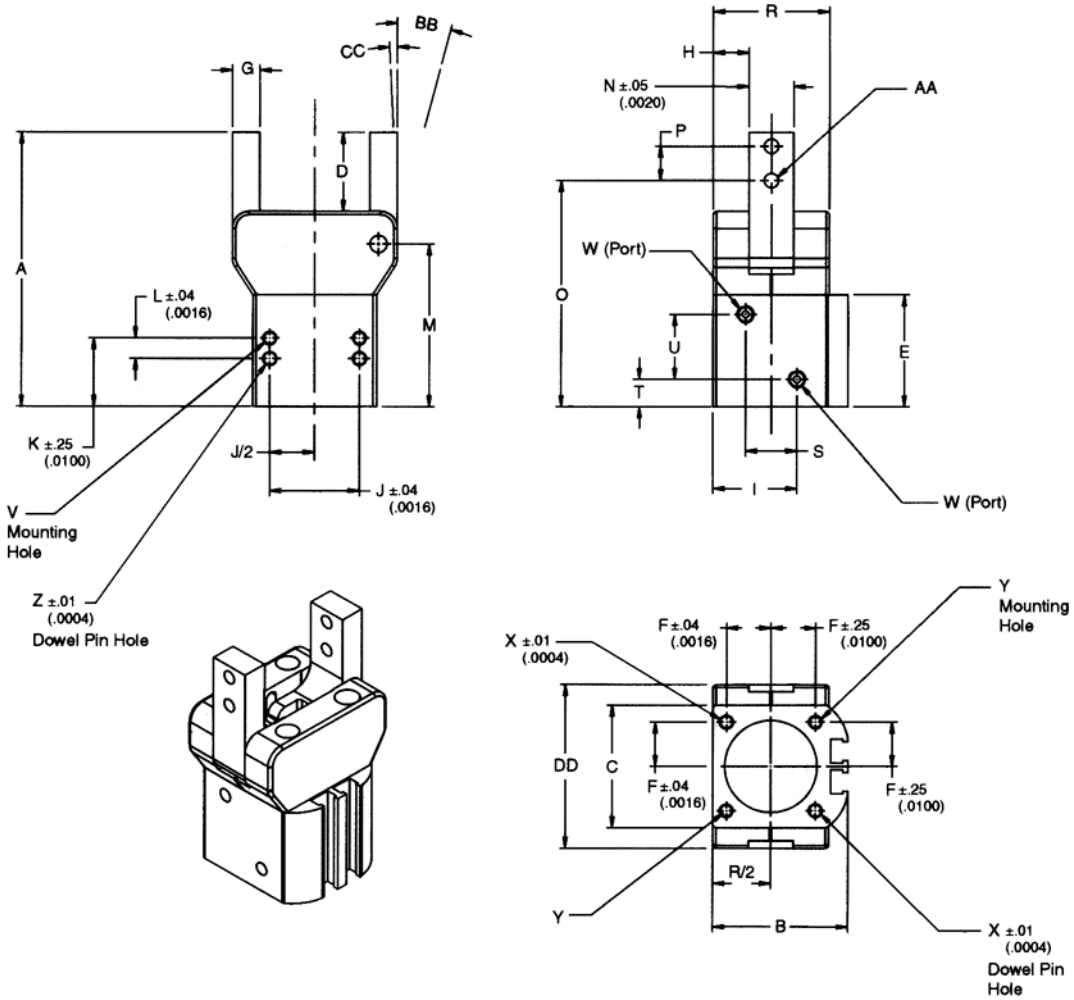
Sensors
NN – No Sensors
PJ – Proximity Sensor Ready
To order sensor(s), select code from table below.

Sensor Type		Cable Type	2 per Gripper		1 per Gripper	
			NPN	PNP	NPN	PNP
Hall Effect	Standard	0.27 m w/Plug	HA	HB	HC	HD
		3 m w/o Plug	HE	HF	HG	HK
	Short	0.27 m w/Plug	—	HV	—	HY
		3 m w/o Plug	—	KB	—	KD
Proximity		Plug-in w/5m cable	PA	PB	PC	PD
		Potted in w/6m lead	PE	PF	PG	PK
Reed	Standard	0.27 m w/Plug	RA		RB	
		3 m w/o Plug	RC		RD	

Seals
S – Standard
F – Fluorocarbon

Design Series
* – Assigned by Factory

BASIC DIMENSIONS

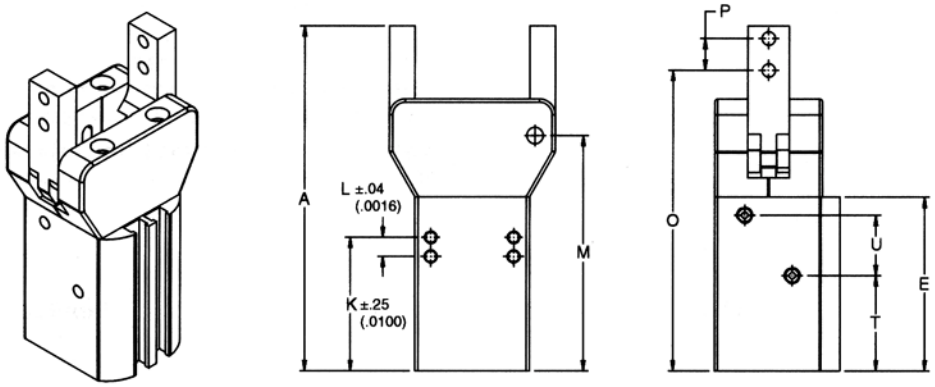


Size	A 30°	A 180°	B	C	D	E	F	G	H	I	J	K	L	M 30°	M 180°	N	O 30°	O 180°	P
3	65.0 (2.56)	70.0 (2.76)	32.5 (1.28)	28.0 (1.10)	18.0 (0.71)	28.7 (1.13)	10.0 (0.39)	6.0 (0.24)	8.5 (0.33)	18.0 (0.71)	20.0 (0.79)	16.5 (0.65)	5.5 (0.22)	39.5 (1.56)	43.3 (1.70)	10.0 (0.39)	54.0 (2.13)	59.0 (2.32)	7.0 (0.28)
4	80.0 (3.15)	86.5 (3.41)	39.5 (1.56)	36.0 (1.42)	23.0 (0.91)	32.7 (1.29)	13.0 (0.51)	8.0 (0.31)	10.5 (0.41)	24.5 (0.96)	26.0 (1.02)	20.0 (0.79)	6.0 (0.24)	47.5 (1.87)	52.5 (2.07)	13.0 (0.51)	66.0 (2.60)	72.5 (2.85)	10.0 (0.39)
5	90.0 (3.54)	96.5 (3.80)	46.5 (1.83)	43.0 (1.69)	27.5 (1.08)	34.0 (1.34)	16.0 (0.63)	8.0 (0.31)	12.5 (0.49)	31.5 (1.24)	36.0 (1.42)	21.0 (0.83)	6.0 (0.24)	51.0 (2.01)	57.0 (2.24)	16.0 (0.63)	73.0 (2.87)	79.5 (3.13)	11.0 (0.43)
6	98.0 (3.86)	106.0 (4.17)	53.5 (2.11)	50.0 (1.97)	31.0 (1.22)	35.2 (1.39)	19.0 (0.75)	10.0 (0.39)	15.0 (0.59)	36.0 (1.42)	41.0 (1.61)	21.0 (0.83)	8.0 (0.31)	54.5 (2.15)	60.0 (2.36)	18.0 (0.71)	80.0 (3.15)	88.0 (3.46)	12.0 (0.47)

Size	R	S	T	U	V	W	X & Z	Y	AA	BB 30°	BB 180°	CC	DD 30°	DD 180°
3	27.0 (1.06)	9.0 (0.35)	7.0 (0.28)	14.5 (0.57)	M4 x 7.0 DP (0.28 DP)	M5	3.08 x 3.00 DP (0.12 x 0.12 DP)	M4 x 7.0 DP (0.28 DP)	M4 THRU	15°	90°	2.5°	35.5 (1.40)	39.0 (1.54)
4	34.0 (1.34)	15.0 (0.59)	8.0 (0.31)	19.0 (0.75)	M4 x 7.0 DP (0.28 DP)	M5	4.08 x 4.00 DP (0.16 x 0.16 DP)	M4 x 7.0 DP (0.28 DP)	M5 THRU	15°	90°	2.5°	48 (1.89)	52 (2.06)
5	41.0 (1.61)	22.0 (0.87)	8.0 (0.31)	20.0 (0.79)	M5 x 11.0 DP (0.43 DP)	M5	4.08 x 4.00 DP (0.16 x 0.16 DP)	M5 x11.0 DP (0.43 DP)	M6 THRU	15°	90°	2.5°	58 (2.28)	60 (2.36)
6	48.0 (1.89)	24.0 (0.94)	8.0 (0.31)	22.0 (0.87)	M6 x 9.5 DP (0.37 DP)	M5	5.08 x 5.50 DP (0.20 x 0.22 DP)	M6 x13.0 DP (0.51 DP)	M6 THRU	15°	90°	2.5°	68 (2.68)	65 (2.56)

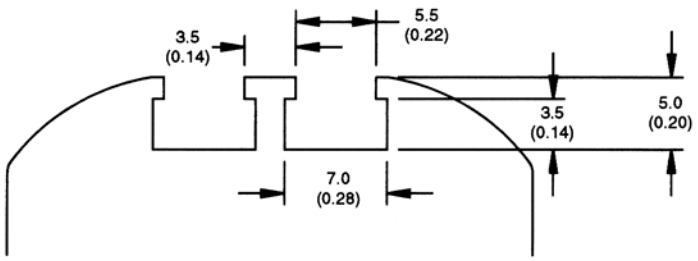
BODY WITH SPRING RETURN

The spring return option increases the main body length for all wide angle (180°) grippers and Size 3 standard (30°) grippers.



Size	Style	A	E	K	L	M	O	P	T	U
3	30°	81 (3.19)	44.7 (1.76)	32.5 (1.28)	5.5 (0.22)	55.5 (2.19)	70 (2.76)	7 (0.28)	23 (0.91)	14.5 (0.57)
	180°	86 (3.39)	44.7 (1.76)	32.5 (1.28)	5.5 (0.22)	59.3 (2.33)	75 (2.95)	7 (0.28)	23 (0.91)	14.5 (0.57)
4	180°	108.5 (4.27)	54.7 (2.15)	42 (1.65)	6 (0.24)	74.5 (2.93)	94.5 (3.72)	10 (0.39)	30 (1.18)	19 (0.75)
5	180°	116.5 (4.59)	54 (2.13)	41 (1.61)	6 (0.24)	77 (3.03)	99.5 (3.92)	11 (0.43)	28 (1.10)	20 (0.79)
6	180°	131 (5.16)	60.2 (2.37)	46 (1.81)	8 (0.31)	85 (3.35)	113 (4.45)	12 (0.47)	33 (1.30)	22 (0.87)

SENSOR GROOVES



MOUNTING

Size	Screw	Dowel Pin	Torque, Nm (in-lb)	Thread Depth
3	M4 x 0.7 (.028)	3 mm x 3.00 (.118) DP	4.5 (40)	7.00 (.276)
4	M4 x 0.7 (.028)	4 mm x 4.00 (.157) DP	4.5 (40)	7.00 (.276)
5	M5 x 0.8 (.031)	4 mm x 4.00 (.157) DP	9.0 (70)	11.00 (.433)
6	M6 x 1.0 (0.39)	5 mm x 5.50 (.216) DP	15.5 (137)	9.50 (.374)

All dimensions in mm (inches)

STROKE ADJUST (A, B, D, F, G)

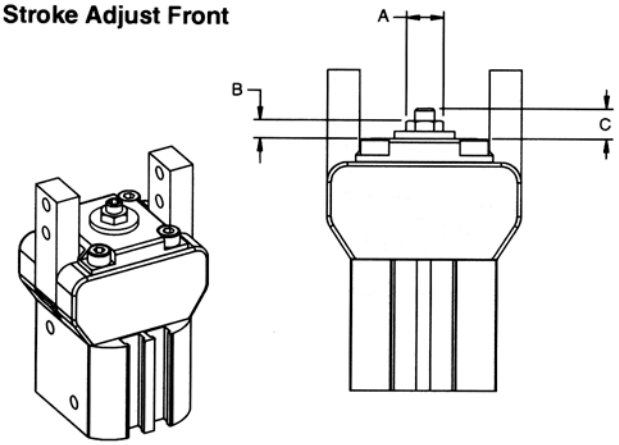
Use the stroke adjust option when you need exact travel distances. Fully adjustable internal stops permit precise stopping locations anywhere within the jaw travel. The stroke adjust option is available in two configurations:

- Stroke adjust front
- Stroke adjust rear

This gives the machine designer the flexibility to create the best possible design within limited space requirements.

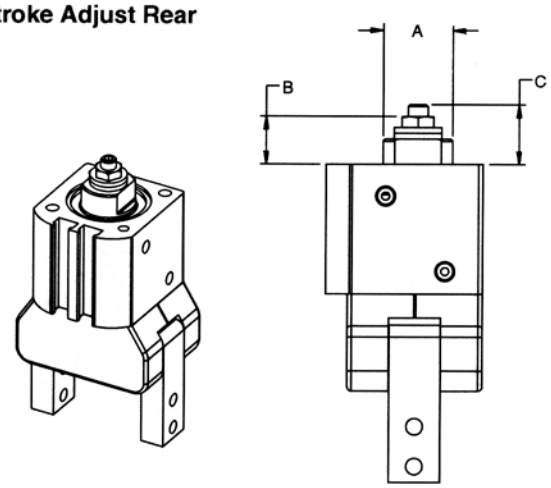
NOTE: *Stroke adjust is not available on 30° angle grippers. Stroke adjust rear is not available with spring return.*

Stroke Adjust Front



Size	Style	A	B	C
3	180°	8 (0.31)	3 (0.12)	11.5 (0.45)
4	180°	9.5 (0.37)	4.5 (0.18)	14.5 (0.57)
5	180°	9.5 (0.37)	4.5 (0.18)	16 (0.63)
6	180°	9.5 (0.37)	4.5 (0.18)	14.5 (0.57)

Stroke Adjust Rear



Size	Style	A	B	C (Max)
3	180°	10.5 (0.41)	10 (0.39)	14.5 (0.57)
4	180°	15 (0.59)	11.5 (0.45)	19 (0.75)
5	180°	20 (0.79)	14 (0.55)	21.5 (0.85)
6	180°	24 (0.94)	12.5 (0.49)	21.5 (0.85)

NOTE: *Stroke adjust rear not available with spring return.*

Adjustment Tools

Gripper Size	Socket Stroke Adjuster		Nut	
	Size	Wrench	Size	Wrench
3	M4	2 mm	M4	7 mm
4	M5	2.5 mm	M5	8 mm
5	M5	2.5 mm	M5	8 mm
6	M5	2.5 mm	M5	8 mm

All dimensions in mm (inches)

P5G Series

Standard Sensors

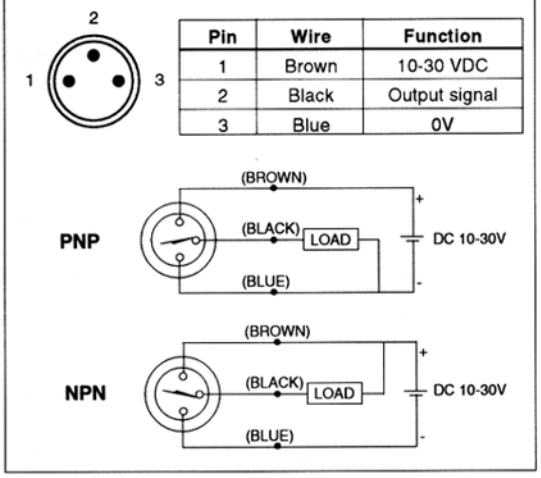
Angular & Parallel Grippers

HALL EFFECT SENSORS

SPECIFICATIONS

Type	Electronic
Output Function	Normally Open
Switching Output	PNP/NPN
Operating Voltage	10 - 30VDC
Continuous Current	≤150 mA
Response Sensitivity	3 mT
Switching Frequency	5 kHz
Power Consumption	15 mA
Voltage Drop	≤2 V
Ripple	≤10% of Operating Voltage
Time Delay before Availability	≤2 ms
Hysteresis	≤1.5 mm
Repeatability	≤0.2 mm
EMC	EN 60 947-5-2
Short -circuit Protection	Yes
Power-up Pulse Supression	Yes
Reverse Polarity Protection	Yes
Enclosure Rating	IP 67
Shock and Vibration Stress	30g, 11 ms, 10 to 55 Hz, 1 mm
Ambient Temperature Range	-25° to +75°C (-13° to 167°F)
Housing Material	PA 12, Black
Connector Cable	PVC
Connector	PUR cable with 8 mm connector

WIRING CONNECTION



Pin	Wire	Function
1	Brown	10-30 VDC
2	Black	Output signal
3	Blue	0V

Part Number	Function	Connection
P8S-TPSHX	PNP	.27m lead w/connector
P8S-TPFLX	PNP	3m flying leads
P8S-TPFTX	PNP	10m flying leads
P8S-TNSHX	NPN	.27m lead w/connector
P8S-TNFLX	NPN	3m flying leads
P8S-TNFTX	NPN	10m flying leads

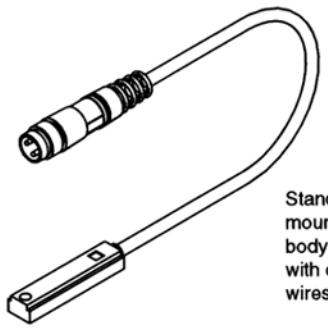
REED SENSORS

SPECIFICATIONS

Type	Reed
Output Function	Normally Open
Operating Voltage	10 - 120 VAC 10 - 30 VDC
Continuous Current	≤100 mA
Response Sensitivity	3 mT
Switching Frequency	400 Hz
Voltage Drop	≤3 V
Ripple	≤10% of Operating Voltage
Delay Time (24V)	Approx. 20 ms
Time Delay before Availability	≤2 ms
Hysteresis	≤1.0 mm
Repeatability	≤0.2 mm
EMC	EN 60 947-5-2
Reverse Polarity Protection	Yes
Enclosure Rating	IP 67
Shock and Vibration Stress	30g, 11 ms, 10 to 55 Hz, 1 mm
Ambient Temperature Range	-25° to +75°C (-13° to 167°F)
Housing Material	PA 12, Black
Connector Cable	PVC
Connector	PUR cable with 8 mm connector

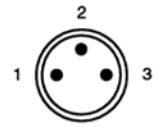
⚠ *Contact suppression is strongly recommended for reed switch applications with inductive loads (solenoids) or cable lengths in excess of 5 m (16.4 ft).*

Reed switches exhibit a 3V voltage drop. This voltage drop will be cumulative for switches in series, eg. 12 V for 4 switches.



Standard sensors mount flush to the body. Sensor shown with connector. Lead wires also available.

WIRING CONNECTION



Pin	Wire	Function
1	Brown	10-30 VDC
2	Black	Output signal
3	Blue	Not Used

Part Number	Connection
P8S-TRSHX	.27m lead w/connector
P8S-TRFLX	3m flying leads
P8S-TRFTX	10m flying leads

CORDSET WITH FEMALE QUICK CONNECT
(order separately)

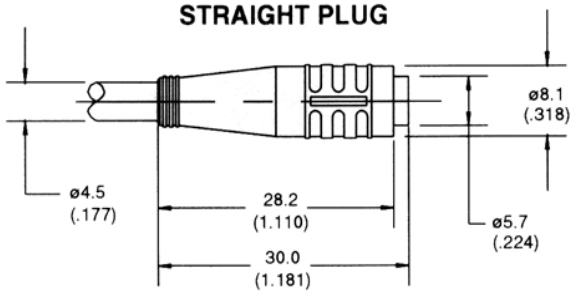
A female connector is available for all Hall Effect and reed sensors with the male quick connect option. The male plug will accept a snap-on or threaded connector. Parker's cordset part numbers and other manufacturer's part numbers are listed below:

Manufacturer	Threaded Connector	Snap-on Connector
Parker	B8786	B8785
Brad Harrison	45310-102	45300-102
Lumberg	RKMV3-G1/5m	RKM3-G1/5m
Hirschman	—	ELKA-K308PUR014
Turck	PKG 3M-6/S90	PKG 3-6/S90

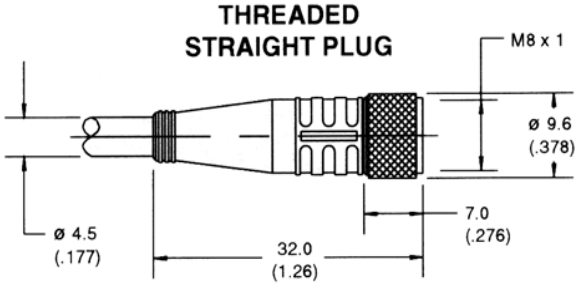
CORDSET SPECIFICATIONS:

Connector:	Oil resistant polyurethane body material, PA 6 (Nylon) contact carrier, spacings to VDE 0110 Group C, (30 VAC / 36 VDC)
Contacts:	Gold plated beryllium copper, machined from solid stock
Coupling Method:	Snap-Lock or chrome plated brass nut
Cord Construction:	Oil resistant black PUR jacket, non-wicking, non-hygroscopic, 300V. Cable end is stripped and tinned.
Conductors:	Extra high flex stranding, PVC insulation
Temperature:	-40 to 90°C (-40 to 194°F)
Protection:	NEMA 1,3,4,6P and IEC IP67
Cable Length:	6 m (20 ft)

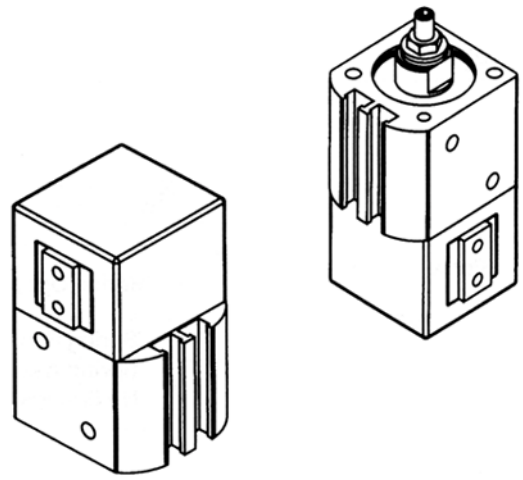
SNAP-ON STRAIGHT PLUG



THREADED STRAIGHT PLUG



- **High grip force**
- **Multiple function**
- **Lightweight construction**
- **Convenient mounting**
- **Electrical position sensing**



Specification

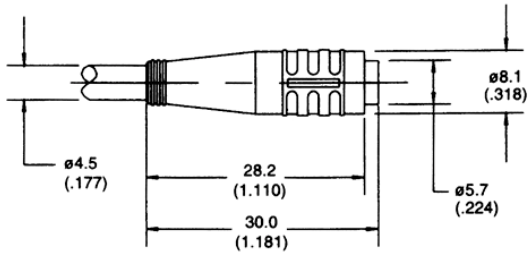
Operating Pressure		0.3 to 7 bar
Operating characteristics		double acting, single acting, spring assist
Gripping force @ 6 bar		78 to 1,086N
Repeatability		0.1mm
Mounting orienation		unrestricated
Port size		M5
Operating temperature	Standard seals	-20 to 82℃
	Fluorocaronbon seals	-20 to 121℃

Model quick reference

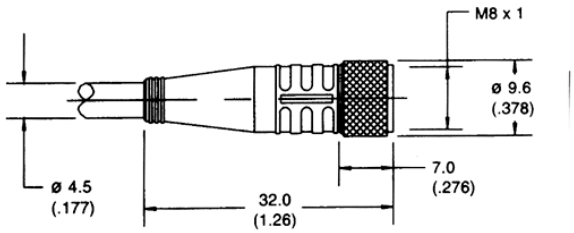
Type	Bore	Size	Force, N @ 5 bar		Jaw travel		Weight(kg)		Cylinder volume(mm)	
			Total force(F)	Grip force(F/2)	Standard	Extended	Standard	Extended	Full bore	Rod side
	3	16.00	120.00	60.00	5.30	9.40	1.10	1.20	1,134	325
No	4	25.00	294.00	147.00	8.00	14.00	2.30	2.70	4,891	3,523
spring	5	32.00	440.00	220.00	9.20	15.60	3.60	3.80	9,540	6,060
	6	40.00	754.00	377.00	10.50	17.90	5.20	5.50	15,003	11,758
	3	16.00	103.20	51.60	5.30	9.40	1.40	1.50	3,286	325
Spring	4	25.00	218.00	109.00	8.00	14.00	2.30	2.70	4,891	3,523
return	5	32.00	406.00	203.00	9.20	15.60	3.60	3.80	9,540	6,060
	6	40.00	620.00	310.00	10.50	17.90	5.20	5.50	15,003	11,758
	3	16.00	185.30	92.60	5.30	9.40	1.50	1.60	3,769	325
Spring	4	25.00	410.00	205.00	8.00	14.00	3.20	3.60	13,874	3,523
assist	5	32.00	630.00	315.00	9.20	15.60	4.60	4.90	23,147	6,060
	6	40.00	942.80	471.40	10.50	17.90	6.80	7.10	41,242	11,758

Cordsets

Snap-on straight plug



Theraded straight plug



Specification

Connector	Oil resistant polyurethane body material, PA 6(Nylon) contact carrier, spacings to VDE 0110 Group C(30 VAC / 36 VDC)
Contacts	Gold plated beryllium copper, machined from solid stock
Coupling method	Snap-Lock or chrome plated brass nut
Cord construction	Oil resistant black PUR jacket, non-wicking, non-rygroscopic, 300v. Cable end is stripped and tinned.
Conductors	Extra high flex stranding, PVC insulation
Temperature	-14˚ to 90˚C
Protection	NEMA 1, 3, 4, 6P and IEC IP67
Cable length	6m

Manufacturer	Threaded Connector	Snap-on Connector
Parker	B8786	B8785
Brad Harrison	45310-102	45300-102
Lumberg	RKMV3-G1/4m	RKMV3-G1/5m
Hirschman	-	ELKA-K308PURO14
Truck	PKG 3M-6/S90	PKG 3-6/S90

Order key

P 5 G - A P 4 B A N H B S

Ports	
B	M5 Female
3	Prestolok Flow Control 4mm tube

Spring Option	Stroke Adjust Front	Stroke Adjust Rear	No Stroke Adjust
Spring Return	A	B*	C
Spring Assist	D	N**	E
No Springs	F	G	N

Size	
3	16mm
4	25mm
5	32mm
6	40mm

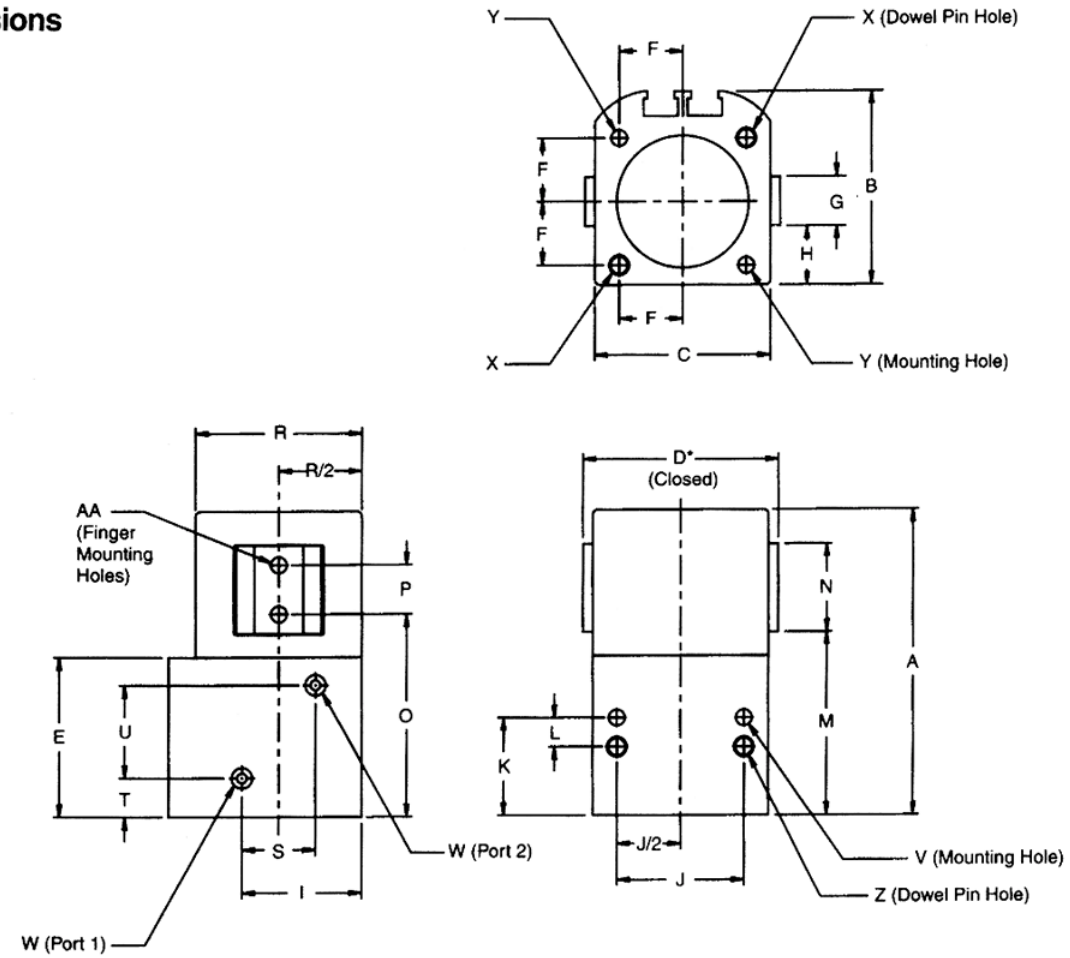
Function	
A	Standard Travel, Maximum Grip Close
B	Standard Travel, Maximum Grip Open
C	Extended Travel, Maximum Grip Close
D	Extended Travel, Maximum Grip Open

Seal	
S	Standard
F	Fluorocarbon

Sensor type		Cable type	2 per Gripper		1 per Gripper	
			NPN	PNP	NPN	PNP
Hall Effect	Standard	0.27 m w/plug	HA	HB	HC	HD
		3 m w/0 plug	HE	HF	HG	HK
	Short	0.27 m w/plug	-	HV	-	HY
		3 m w/0 plug	-	KB	-	KD
Proximity		Plug-in w/5m cable	PA	PB	PC	PD
		Potted in w/6 m lead	PE	PF	PG	PK
Reed	Standard	0.27 m w/plug	RA		RB	
		3 m w/0 plug	RC		RD	

* Option B not available for Size 3 gripper
** Spring assist with stroke adjust rear is not available

Basic dimensions



size	A	B	C	D* Std	D* Ext	E	F	G	H	I	J	K	L	M	N	O
3	51	32.5	28	31	38.5	28.7	10	8	9.5	18	20	16.5	5.5	32.5	13	35.5
4	62.5	39.5	36	40	51	32.7	13	10	12.0	24.5	26	20	6	37.5	18	41.5
5	66.5	46.5	43	48	59	34	16	12	14.5	31.5	36	21	6	39.5	20	44
6	72	53.5	50	56	63	35.2	19	12	18.0	36	41	21	8	41.0	22	45

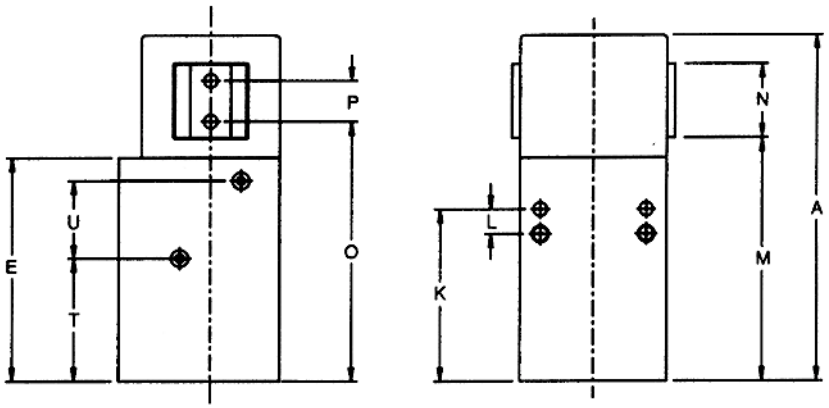
size	P	R	S	T	U	V	W	X	Y	Z	AA
3	7	27	9	7	14.5	M4 x 7.0 DP	M5	3.08 x 3.00 DP	M4 x 7.0 DP	3.08 x 3.00 DP	M3 x 5.5 DP
4	10	34	15	8	19	M4 x 7.0 DP	M5	4.08 x 4.00 DP	M4 x 7.0 DP	4.08 x 4.00 DP	M4 x 7.0DP
5	11	41	22	8	20	M5 x 11.0 DP	M5	4.08 x 4.00 DP	M5 x 11.0 DP	4.08 x 4.00 DP	M5 x 8.5 DP
6	12	48	24	8	22	M6 x 9.5 DP	M5	5.08 x 5.50 DP	M6 x 13.0 DP	5.08 x 5.50 DP	M6 x 10.0DP

* Jaws closed Refer to table at right for stroke and dimension (D) with jaws fully open.

All dimensions in mm

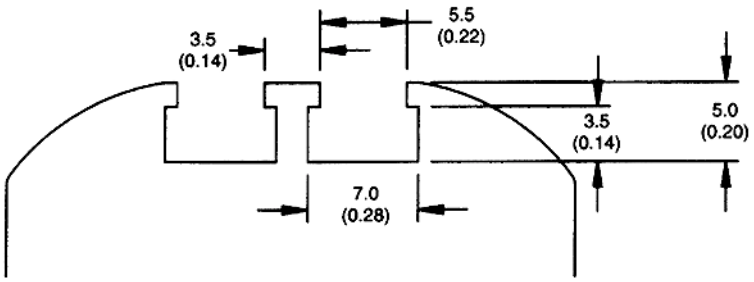
size	Stroke		Jaws Fully Open (D)	
	Standard	Extended Travel	Standard	Extended Travel
3	5.3	9.4	36.3	47.9
4	8.0	14.0	48.0	65.0
5	9.2	15.6	57.2	74.6
6	10.5	17.9	66.5	80.9

Body with spring assist



size	A	E	K	L	M	N	O	P	T	U
3	67	44.7	32.5	5.5	48.5	13.0	51.5	7	23	14.5
4	84.5	54.7	42	6	59.5	18.0	63.5	10	30	19
5	86.5	54	41	6	59.5	20.0	64.0	11	28	20
6	97	60.2	46	8	66	22	71	12	33	22

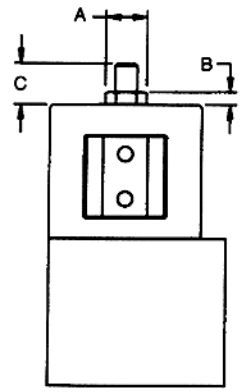
Sensor grooves



Mounting

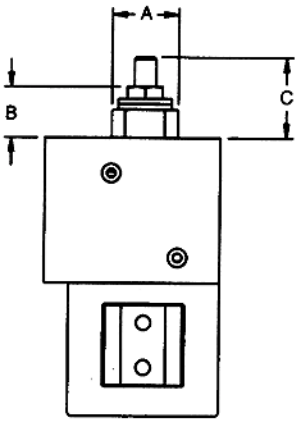
size	Screw	Dowel Pin	Torque, Nm (In-lb)	Thread Depth
3	M4 x 0.7	3 mm x 3.30DP	4.5	7.00
4	M4 x 0.7	4 mm x 4.00DP	4.5	7.00
5	M5 x 0.8	4 mm x 4.00DP	9.0	11.00
6	M6 x 1.0	5 mm x 5.50DP	15.5	9.50

Stroke adjust front



Size	A	B	C
3	8	3	7
4	9.5	3	11
5	9.5	3	11
6	9.5	3	12

Stroke adjust rear



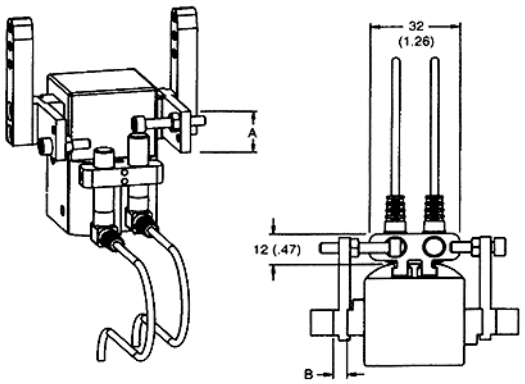
Size	A	B	C
3	10.5	10	14.5
4	15	11.5	19
5	20	14	21.5
6	24	12.5	21.5

NOTES:
Stroke adjust rear not available with spring return on Size 3.
Stroke adjust rear is not available with spring assist.

Gripper Size	Socket Stroke Adjuster		Nut	
	Size	Wrench	Size	Wrench
3	M4	2mm	M4	7mm
4	M5	2.5mm	M5	8mm
5	M5	2.5mm	M5	8mm
6	M5	2.5mm	M5	8mm

Proximity sensors
Proximity sensor ready(PJ)

- Fully adjustable travel
- Solid state electronics
- LED Indicator
- 10-30 VDC
- PNP and NPN available
- Senses metal flapper or pin attached to gripper finger
- Long life



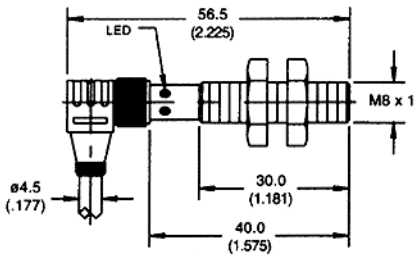
Size	A	B
3	15	4.5
4	18	5.0
5	20	5.5
6	22	6.0

Specification

Voltage	10 - 30 VDC(3 wire), PNP or NPN
Current	7 mA at 24 VDC
Outlet current	130 mA
Switching speed	1000 Hz
Switching distance	Steel 1.0 mm, Brass 0.7 mm, Aluminum 0.4 mm
Overload protection	Triggered at 170 mA
Reverse polarity protection	incorporated
Temp. range	-25˚ to 70˚C
Enclosure	Meets NEMA 1, 3, 4, 6, 13 and IEC IP67, fully encapsulated

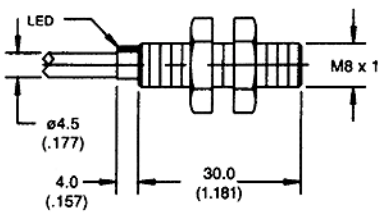
PLUG-IN SENSOR

A threaded right angle cordset is included as standard. The cordset contains two LEDs: 1-power, 2-target indication. Cordset length is 5 m.

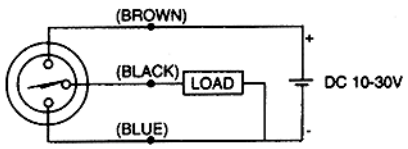


POTTED-IN SENSOR

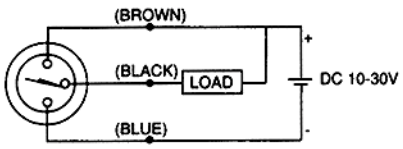
Lead type sensor with 6m cord length.



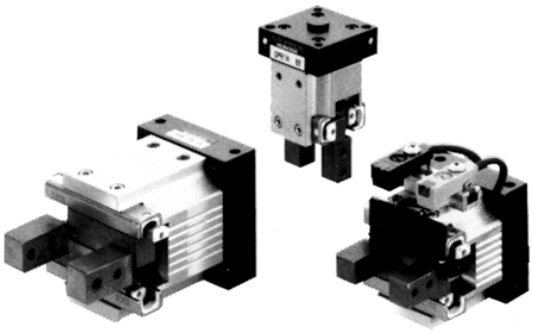
PNP WIRING CONNECTION



NPN WIRING CONNECTION



Strong gripping force and large stroke.
Proximity switch available as option.



SPECIFICATIONS

Model No.	Unit	GPR1A	GPR3A	GPR10A
Type of action		Double acting		
Reference gripping force (at 0.5MPa〔5kgf/cm²〕)	N 〔kgf〕	17.7 〔1.8〕	33.3 〔3.4〕	72.5 〔7.4〕
Maximum stroke	mm	10	14	20
Port seze		M3×0.5	M5×0.8	M5×0.8
Mass	g	90	140	245
Fluid		Non-lubricated/lubricated air		
Pressure range	MPa〔kgf/cm²〕	0.3～0.6〔3～6〕		0.2～0.6〔2～6〕
Temperature range	℃	−5～60		

②Special care should be taken for freezing when operating a PARALLEL GRIPPER at a temperature below 5℃.
If water is completely removed from air using an air dryer, the PARALLEL GRIPPER can be operated at a temperature of −5℃.

ORDERING INSTRUCTIONS

Parallel Gripper

GPR10A - **PA** | | **2**

Model No.
GPR1A
GPR3A
GPR10A

Number of switch
No mark : Without switch
2 : With two switches
1 : With one switch

Specifications of cable
No mark : Standard or switchless type
R : Flexible cable

Switch
No mark : Without switch
PA : With switch

(Note) ①When using PARALLEL GRIPPER equipped with switch for rotatory applications, use a model PAR8F or PAR8FI equipped with flexible cable.
PARALLEL GRIPPER with flexible cable is made to order.
②In 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.

Switch uint only (Consists of : Switch, Metallic object, Rail, Screw & mounter)

PA **R** - **10GP** **2**

Number of switch
2 : With two switches
1 : With one switches

Applicable gripper
1GP : GPR1A
3GP : GPR3A
10GP : GPR10A

Specifications of cable
No mark : Standard
R : Flexible type

Switch unit

Switch only (Consists of : Switch, Screw & mounter)

PA **R** **8F** **I**

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

Specifications of cable
No mark : Standard
R : Flexible cable

MODEL WITH SWITCH

PA TYPE PROXIMITY SWITCH

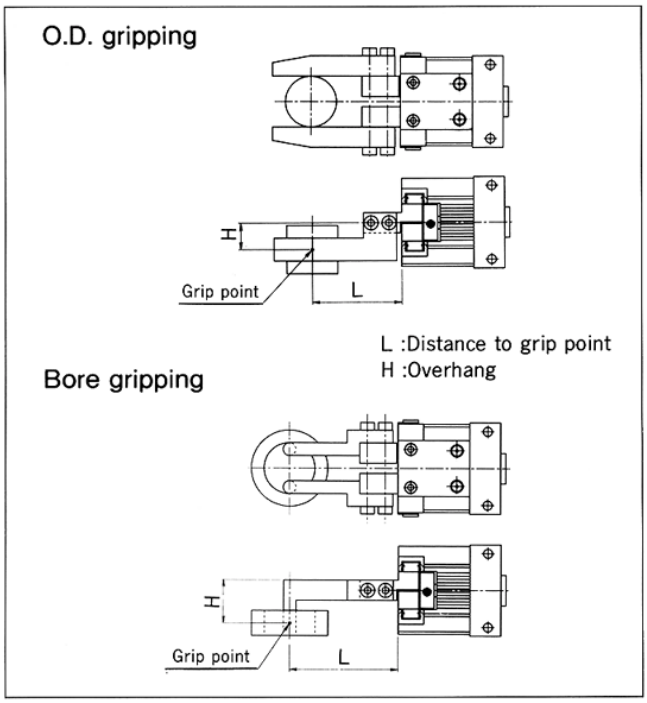
Lead wire type

Model No.	Rated voltage (V)	Rated current range (mA)	Pilot lamp (Lightsup at ON)	Applications
PA8F PA8FI	DC12～24	100(max.)	○	Relay PLC IC circuit

GRIP POINT

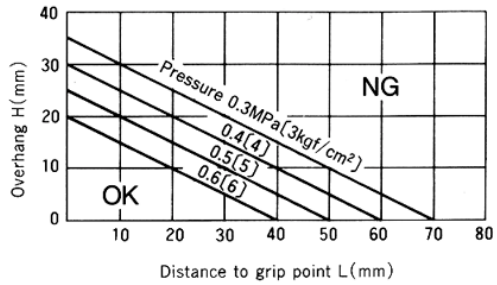
①Determine a work grip point within the grip point distance (L) and overhang length (H) according to supply pressure within the range figured right.

②If the work grip point is set outside the limiting range, excessively imbalanced load is applied to the finger and guide, thus adversely affecting the life of the gripper.

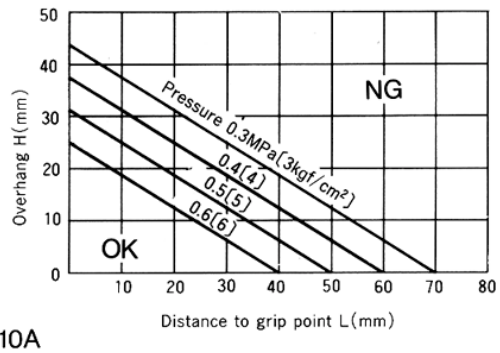


GRIP POINT RANGE

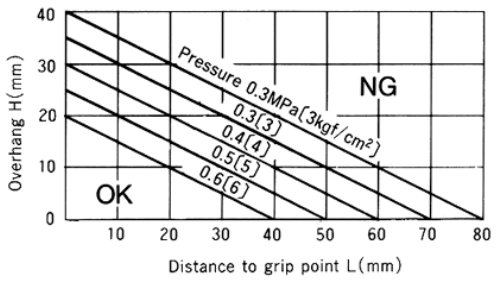
GPR1A



GPR3A



GPR10A



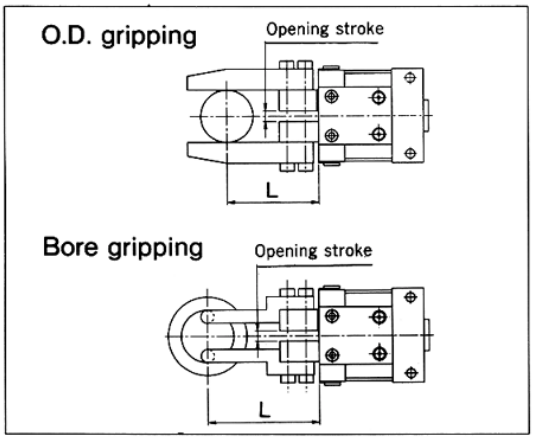
HOW TO DETERMINE GRIPPING FORCE

Effective gripping force varies with supply pressure, grip point length and opening stroke of fingers.

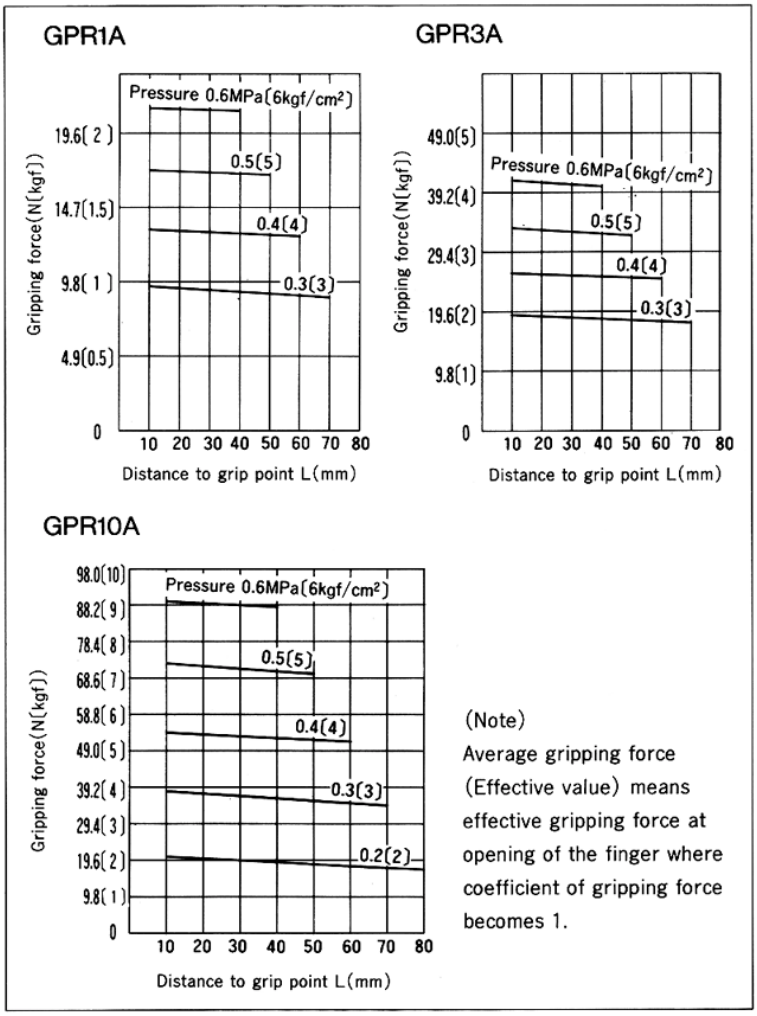
①Read average gripping force (effective value) corresponding to the supply pressure and grip point distance on the right charts.

②Read coefficient of gripping force corresponding to the opening stroke of the fingers on the charts on the bottom of this page.

③Effective gripping force is calculated as follows ;
Average gripping force × Coefficience of gripping force.

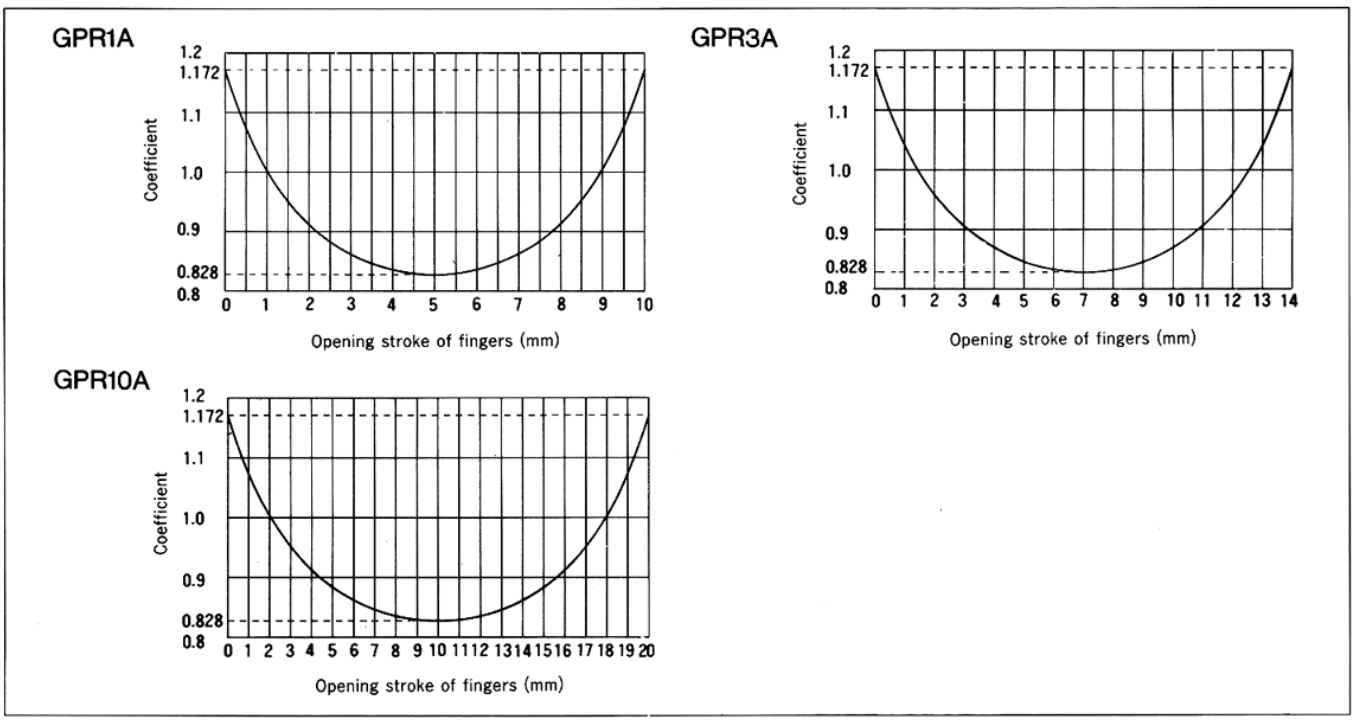


AVERAGE GRIPPING FORCE (Effective value)



(Note)
Average gripping force (Effective value) means effective gripping force at opening of the finger where coefficient of gripping force becomes 1.

COEFFICIENT OF GRIPPING FORCE

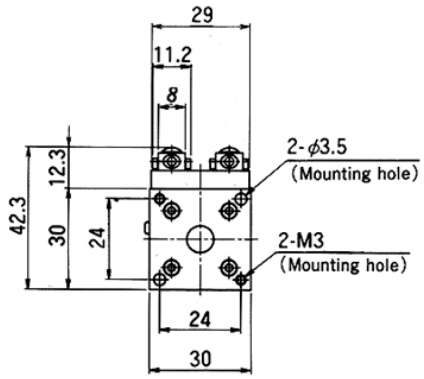


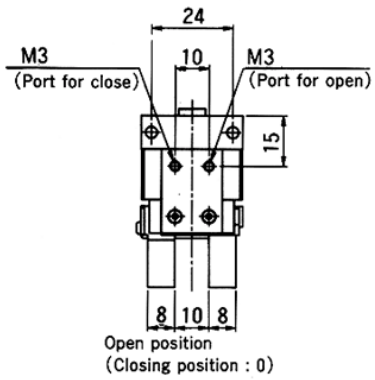
DIMENSIONS

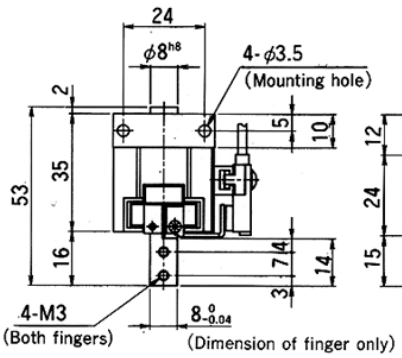
GPR1A

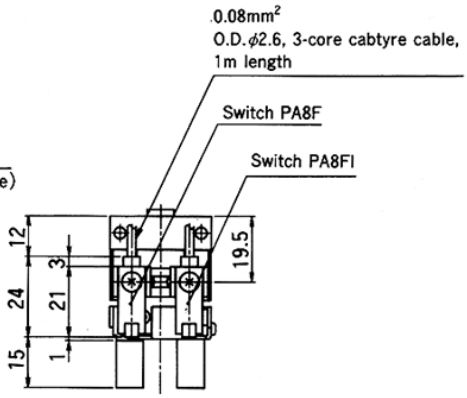
(Unit : mm)

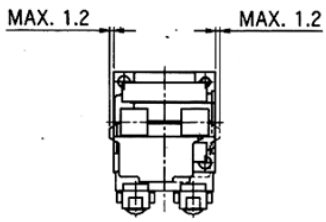
With switch

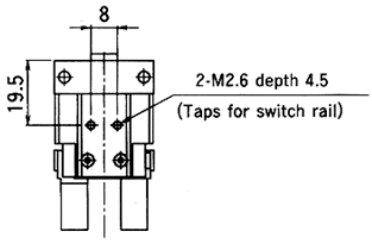












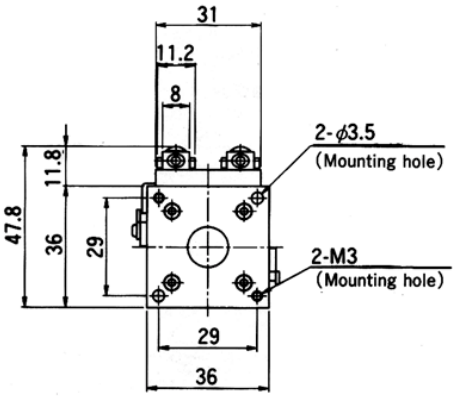
Without switch

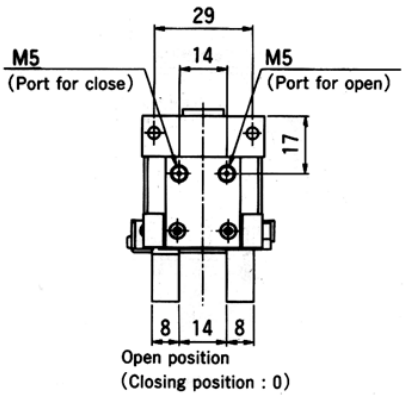
DIMENSIONS

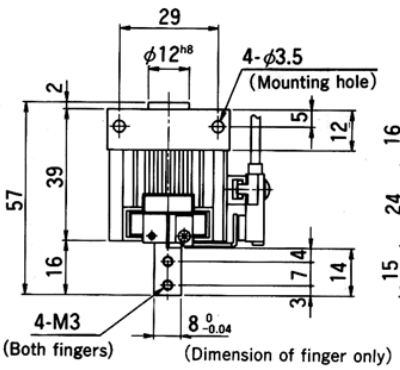
GPR3A

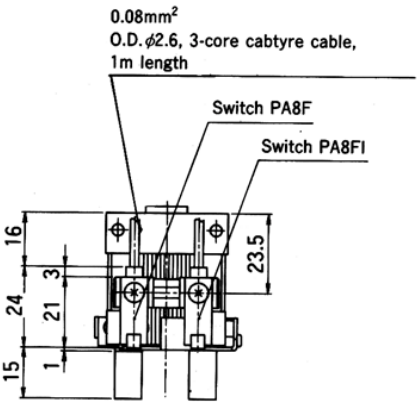
(Unit : mm)

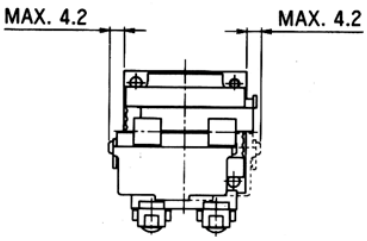
With switch

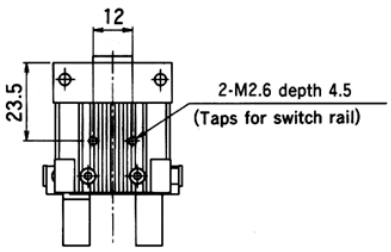












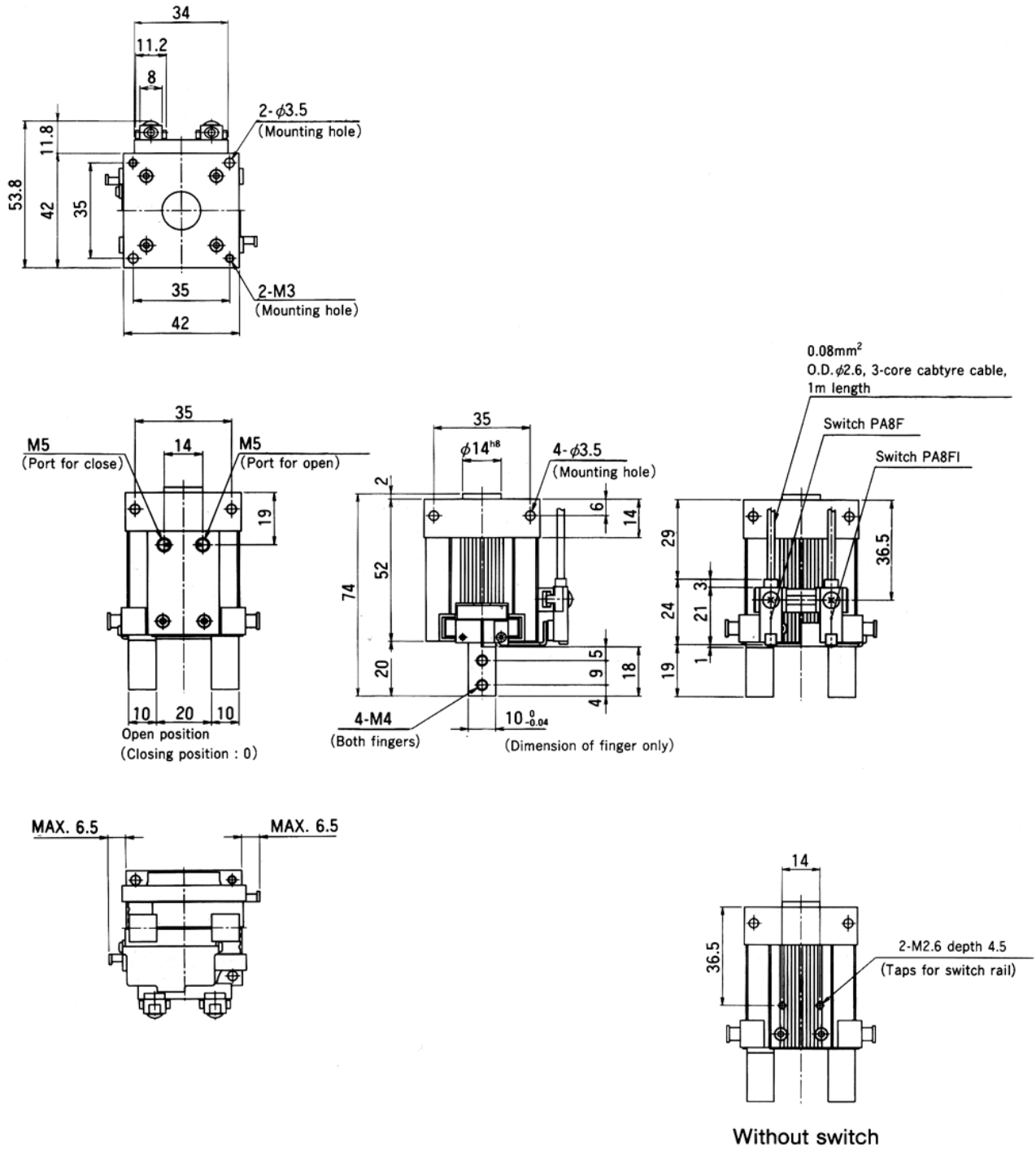
Without switch

DIMENSIONS

GPR10A

(Unit : mm)

With switch



Without switch

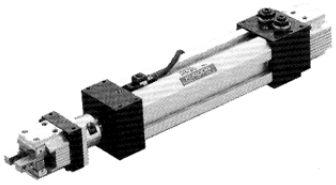
COMBINATION OF HYBRID ARM & PARALLEL GRIPPER

Optional Gripper Adapter meets to combine Parallel Gripper to Hybrid Arm as follws ;

Hybrid Arm	Parallel Gripper
HA-25	GPR1A
	GPR3A
HA-32	GPR3A
	GPR10A
HA-40	GPR3A
	GPR10A

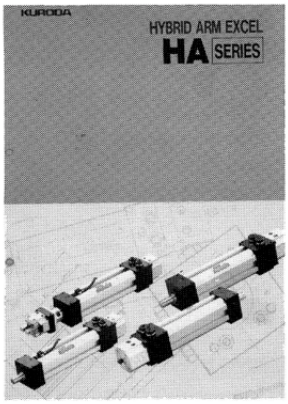
Actuator for robot arms

HYBRID ARM



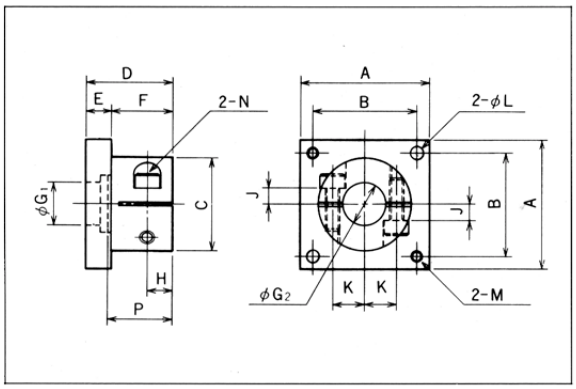
A uniquely coupled construction with the Rotary Actuator, Cylinder and Gripper, which enables "Oscillation + Liner Motion + Gripper".

CAT.No.KAHA1003



ACCESSORIES

Gripper adapter



(Unit : mm)

Model No.	Applicable Hybrid Arm	Applicable Parallel Gripper	A	B	C	D	E
H25G 1 -GA	HA-25	GPR1A	30	24	26	24	7
H25G 3 -GA	HA-25	GPR3A	36	29	26	24	7
H32G 3 -GA	HA-32、HA-40	GPR3A	36	29	34	29	7
H32G10-GA	HA-32、HA-40	GPR10A	42	34	34	29	7

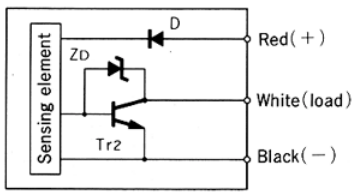
Model No.	F	G_1	G_2	H	J	K	L	M	N (Bolt)	P	Mass (g)
H25G 1 -GA	17	8^{H8}	12^{H8}	6	4.5	9	3.5	M3	M4×12 ℓ	20	35.8
H25G 3 -GA	17	12^{H8}	12^{H8}	6	4.5	9	3.5	M3	M4×12 ℓ	—	43.6
H32G 3 -GA	22	12^{H8}	14^{H8}	8	5	11	3.5	M3	M5×14 ℓ	20	62.6
H32G10-GA	22	14^{H8}	14^{H8}	8	5	11	3.5	M3	M5×14 ℓ	—	71.5

PA TYPE PROXIMITY SWITCH

SWITCH SPECIFICATION

Model No.	Unit	PA8F(Black), PA8FI(Grey)
Application		Relay logic. PLC. Transistor logic
Type of contact	V	NPN transistor. Open collector
Voltage range		DC12 to 24V±10%(Ripple p-p.less than 10%)
Power consumption	mA	Max. 15
Switching current	mA	Max. 100
Internal voltage drop	V	Less than 1 (At 100mA input) Less than 0.4 (At 16mA input)
Leakage current	μA	Less than 5
Mean response time	msec	1
Indicator lamp		Red LED (Light turning on)
Protection grade		IP67
Vibration	G	100
Temperature range	℃	0 to 55
Lead wire		Oil proof 3-core black, 1m length

INTERNAL CIRCUIT OF SWITCH

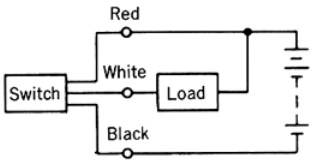


D : Diode for reverse polarity
Z_D : Zenor diode for surge suppresion
Tr^2 : NPN transistor.

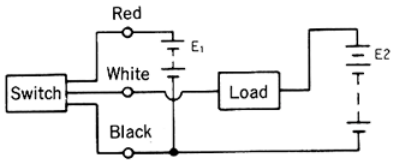
(Note) Lead wire colors will be changed to new colors according to the revision of JIS for lead wire colors. Red→Brown, White→Black, Black→Blue(Present color→New color)

HOW TO CONNECT THE SWITCH

When power supply to load is common to power supply to switch :

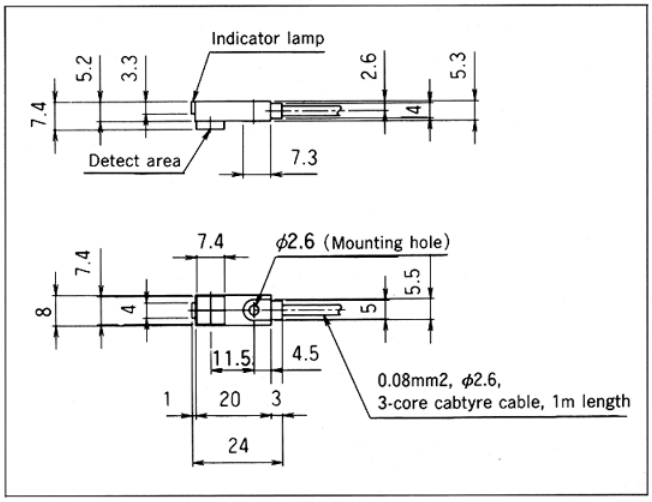


When power supply to load is not common to power supply to switch :



DIMENSIONS OF SWITCH

(Unit:mm)



TECHNICAL INFORMATION OF SWITCH

①Be sure turn off power supply before conducting wiring work, Purge compressed air from the equipment completely.

②Since the switch is temporarily fitted to the product before it leaves our factory, avoid using it directly.

③When using the switch, be sure to check load current.

④If some metal comes near to PARALLEL GRIPPER separate the switch from the metal by more than 10mm.

⑤Do not accumlate metallic powder or dust on the switch.

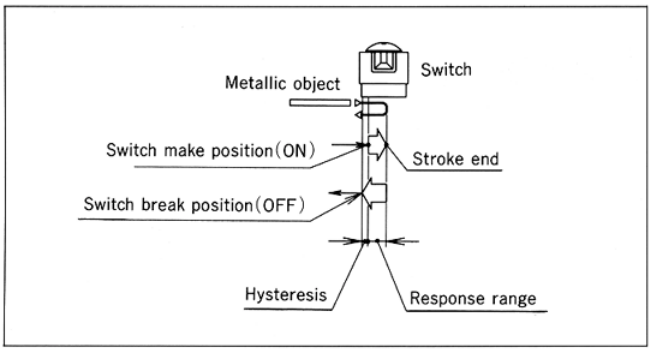
⑥Be careful not to mistake the polarity of red lead(+) and black lead (−)when connecting them.
Lead wire colors will be changed to new colors according to the revision of JIS for lead wire colors.
Red→Brown, White→Black, Black→Blue(Present color→New color)

⑦Avoid connecting the white lead of the switch directly to power supply. (It is advisable to connect it to relay load etc.)

⑧This switch is designed to meet IEC Standard "IP67 Structure" (JIS C0920 : Oil/water-proof structure).
However, the watertightness of the switch is limited in a surrounding condition where the switch is directly exposed to water and oil for long time.
So, provide a cover or take other proper means to prevent water and oil from splashing on the switch.

⑨When the cable of the switch undergoes bending force, select and use a switch with a flexible cable.

HYSTERESIS AND RESPONSE RANGE

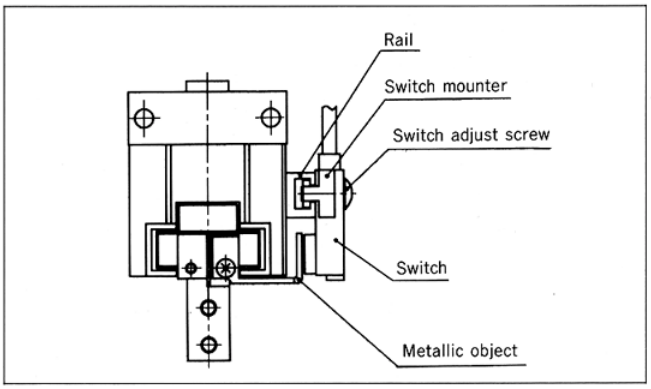


When the metallic object approaches from left to right, the lamp lights at the Switch make position.
This state is held within the Response range.
When the metallic object return from right to left, the lamp turns off at the Switch break position.
The Break position shifts from the Make position, causing a response lag(hysteresis).

(Unit:mm)

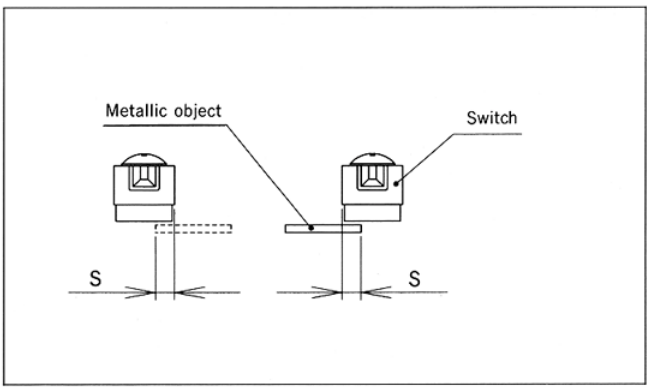
Model No.	Response range	Hysteresis
GPR 1A	5	0.4
GPR 3A	7	
GPR10A	10	

SWITCH MOUNTING AND ADJUSTMENT



①Place the switch onto switch mounter, then lightly screw the switch adjust screw.
②Insert the switch assembly into the rail groove on the gripper.
③Check the appropriate switch position for your application, then tighten the switch adjust screw at the torque of 0.4N·m〔4kgf·cm〕
④Examine the switch function. If the position is not correct, repeat step③.

RECOMMENDED SWITCH POSITION



To ensure the switch function, we recommend the dimensional relation between the switch and metallic object as follows:

S : Dimension between end of metallic object and the side face of the proximity switch.

(Unit : mm)

Model No.	Recommended switch position : s
GPR 1A	3
GPR 3A	
GPR10A	