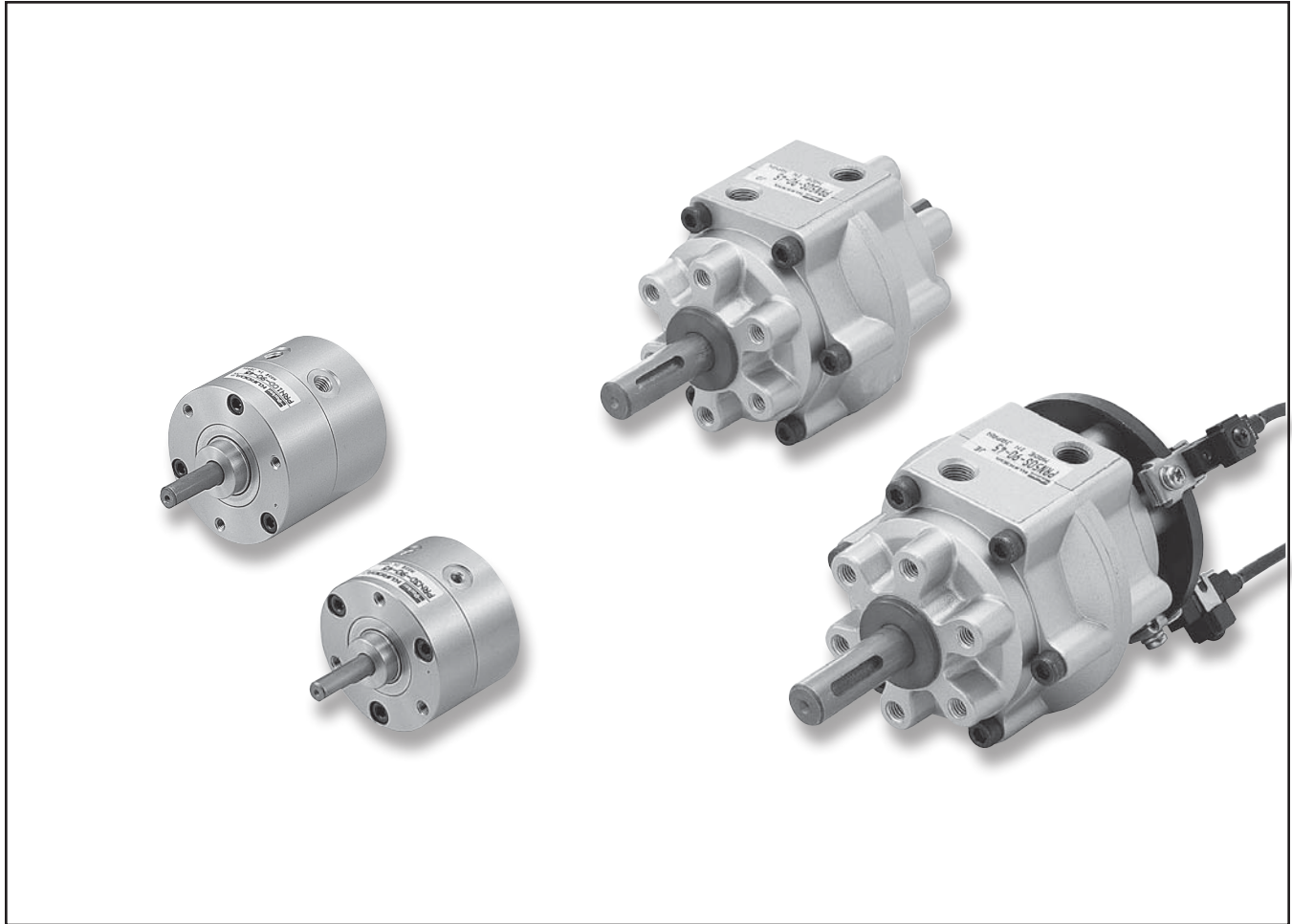




PRNA/PRN Series Vane Rotary Actuators



Contents

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Specifications	H20	Shock Absorbers	H28
Engineering Data	H21-H22	Sensor Options.....	H29-H30

H

PV

PRN(A)

WR

PTR

B671

HP



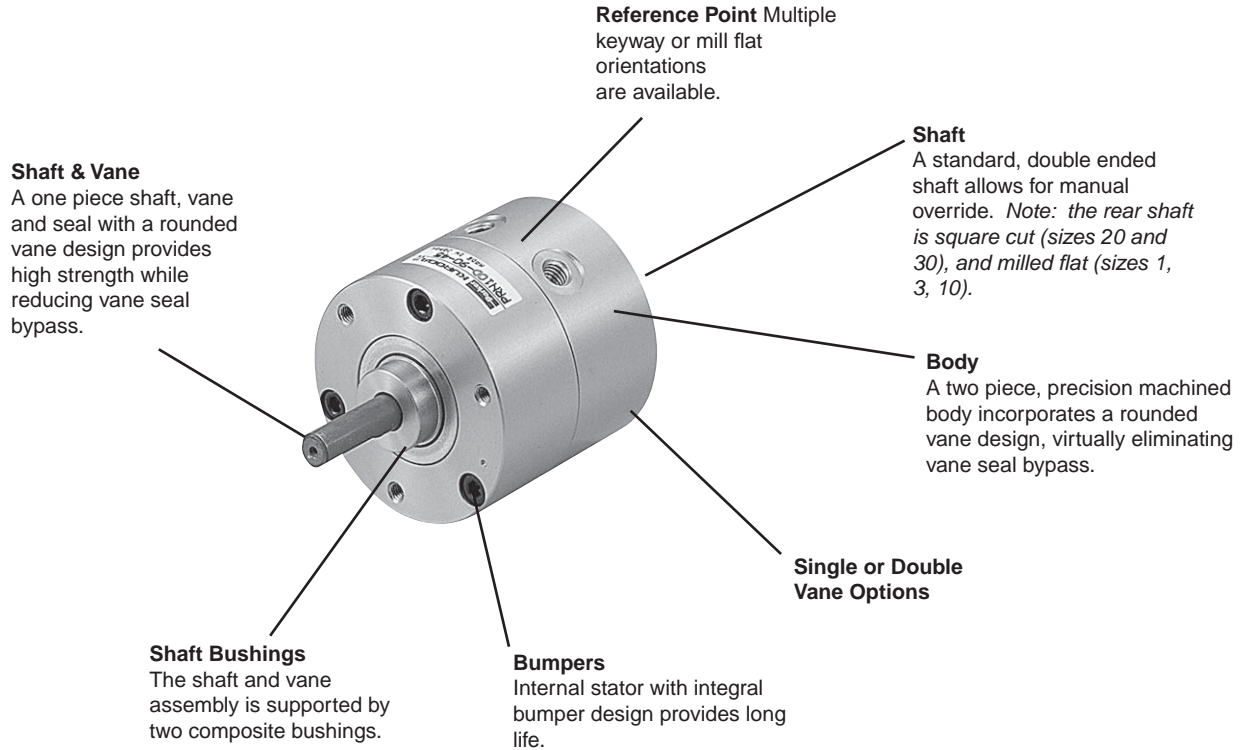
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H17

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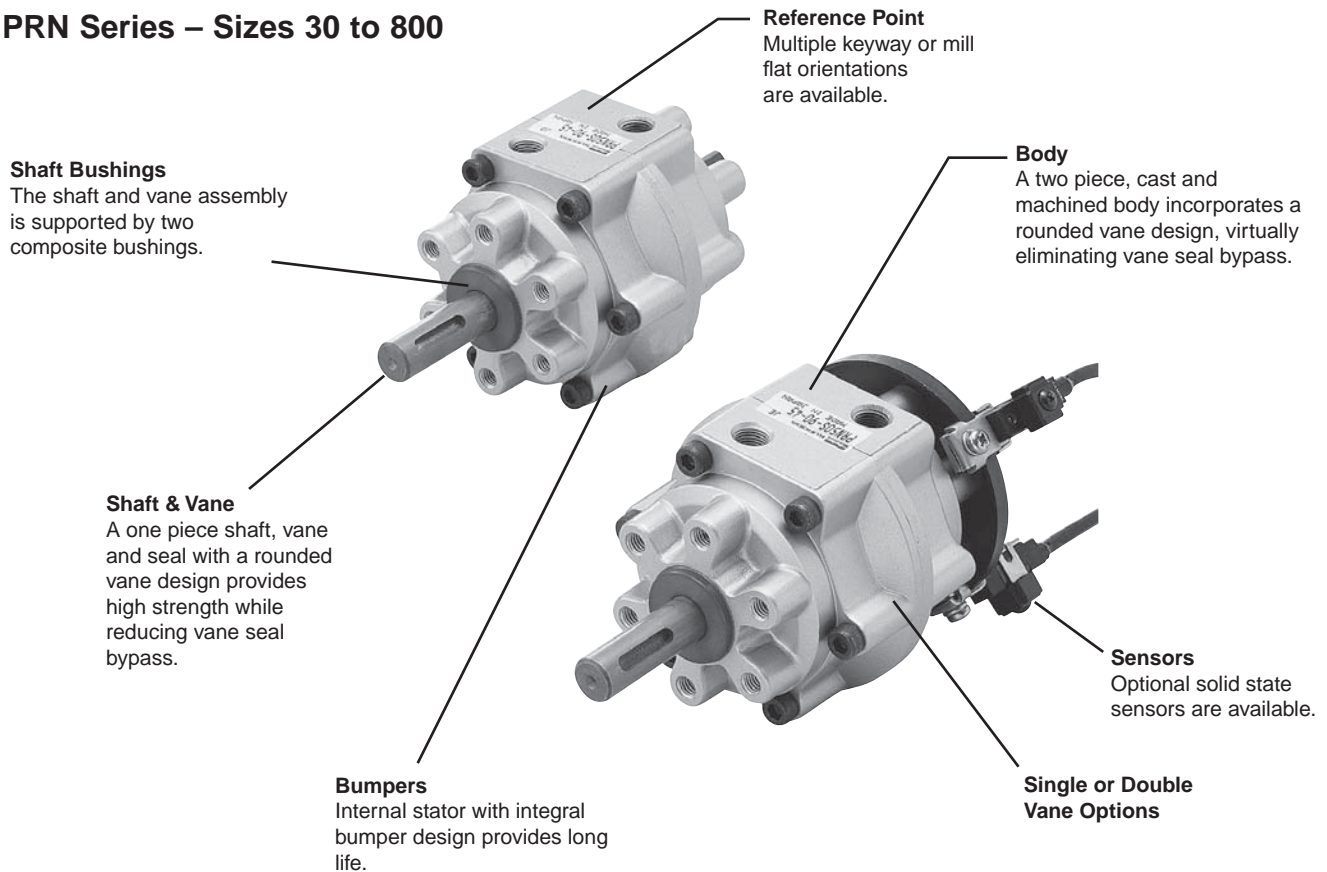
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PRNA Series – Miniature Sizes 1 to 20



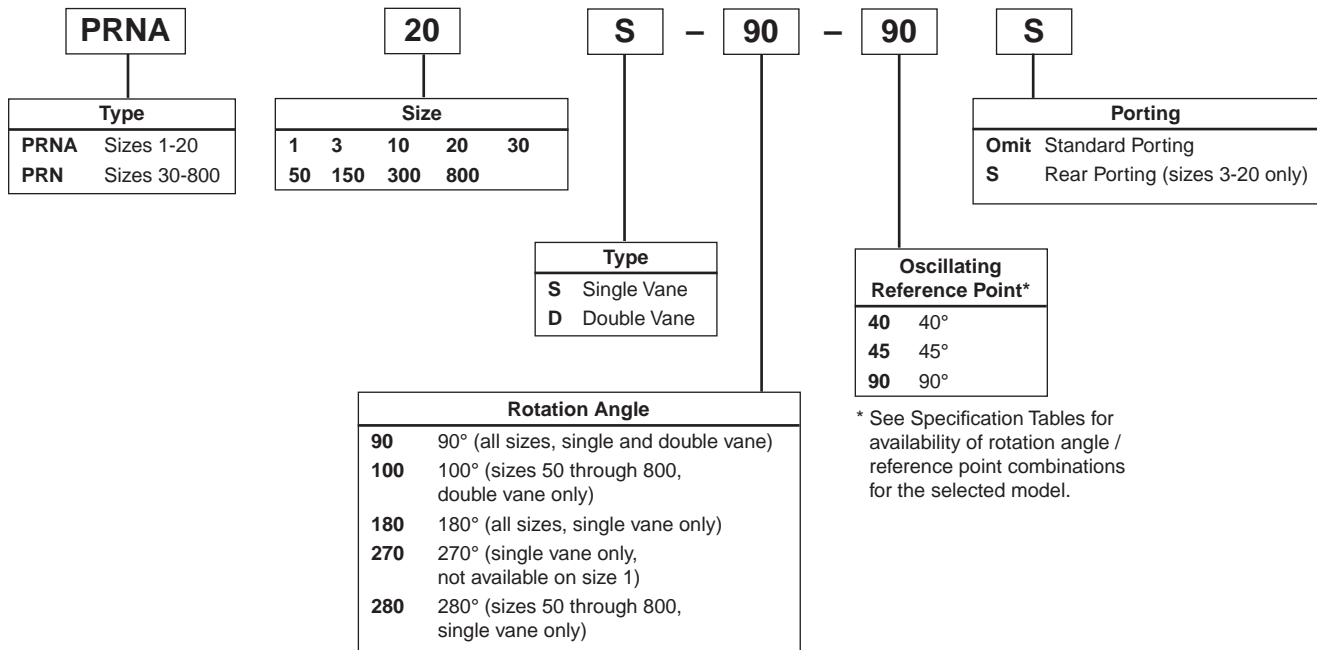
PRN Series – Sizes 30 to 800

H

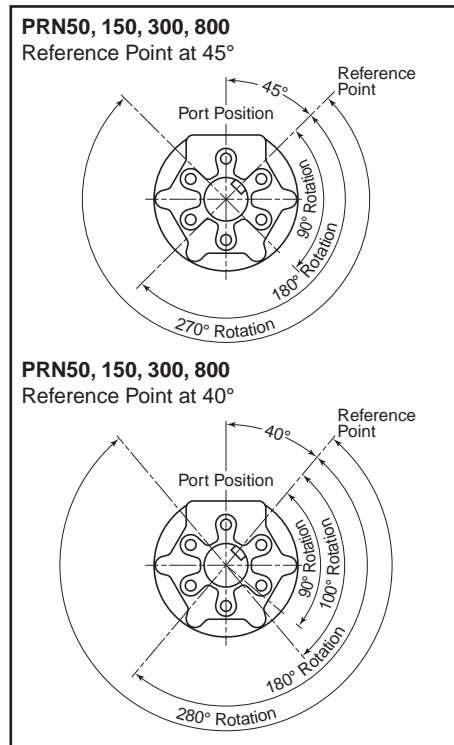
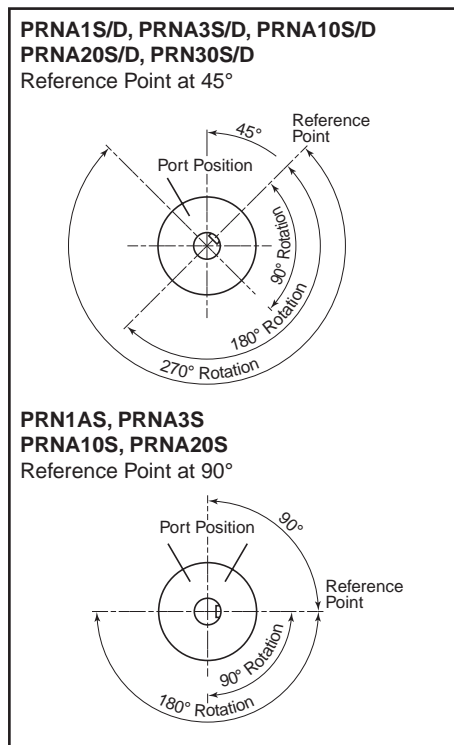


Model Code and Ordering Information

Example: PRNA20S - 90 - 90S



Reference Point and Rotation Orientations



Specifications

- Maximum Operating Pressure: See tables on pages H21-H22
- Output Torque @ 0.7 MPa: 16 to 1120 N•cm (1.4 to 99 in-lb)
- Standard Rotations: 90°, 180°, or 270° (See ordering information for limitations)
- Operating Temperature Range: -5 to 80°C (-23 to 176°)
- Filtration Requirement: 40 Micron Filtered, Dry Air

Quick Reference Data – PRNA Miniature

Model		Theoretical Output Torque								Maximum Breakaway Pressure		Unit Weight	
		0.3 Mpa (45 PSI)		0.5 MPa (75 PSI)		0.7 MPa (100 PSI)		1.0 MPa (145 PSI)					
		Ncm	(in-lb)	Ncm	(in-lb)	Ncm	(in-lb)	Ncm	(in-lb)	MPa	PSI	kg	lb
Single Vane	PRNA1S	8	(0.7)	13	(1.2)	19	(1.6)	—		0.08	(12)	0.04	(0.08)
	PRNA3S	17	(1.5)	31	(3)	45	(4.0)	—		0.10	(15)	0.07	(0.15)
	PRNA10S	46	(4.1)	86	(7.6)	127	(11)	—		0.10	(15)	0.14	(0.31)
	PRNA20S	80	(7.1)	159	(14)	240	(21)	350	(31)	0.10	(15)	0.25	(0.55)
Double Vane	PRNA1D	17	(1.5)	28	(2.5)	41	(3.6)	—		0.10	(15)	0.04	(0.09)
	PRNA3D	32	(2.9)	54	(4.8)	76	(6.7)	—		0.07	(10)	0.07	(0.16)
	PRNA10D	101	(8.9)	168	(15)	235	(21)	—		0.07	(10)	0.15	(0.33)
	PRNA20D	165	(15)	330	(29)	530	(47)	800	(71)	0.06	(9)	0.26	(0.57)

Quick Reference Data – PRN

Model		Theoretical Output Torque								Maximum Breakaway Pressure		Unit Weight	
		0.3 Mpa (45 PSI)		0.5 MPa (75 PSI)		0.7 MPa (100 PSI)		1.0 MPa (145 PSI)					
		Ncm	(in-lb)	Ncm	(in-lb)	Ncm	(in-lb)	Ncm	(in-lb)	MPa	PSI	kg	(lb)
Single Vane	PRN30S	180	(16)	319	(28)	480	(42)	720	(64)	0.10	(15)	0.47	(1.04)
	PRN50S	259	(23)	479	(42)	700	(62.0)	1060	(94)	0.10	(15)	0.8	(1.8)
	PRN150S	850	(75)	1500	(133)	2100	(186)	3050	(270)	0.08	(12)	2.0	(4.4)
	PRN300S	1650	(146)	2850	(252)	4050	(358)	5750	(509)	0.08	(12)	3.7	(8.2)
	PRN800S	5910	(523)	10200	(903)	14400	(1274)	20500	(1814)	0.05	(7)	13	(28)
Double Vane	PRN30D	440	(39)	770	(68)	1120	(99)	1660	(147)	0.08	(12)	0.48	(1.06)
	PRN50D	579	(51)	1040	(92.0)	1510	(134)	2250	(199)	0.08	(12)	0.8	(1.8)
	PRN150D	1900	(168)	3500	(310)	4800	(425)	6900	(611)	0.06	(9)	2.0	(4.4)
	PRN300D	3900	(345)	6800	(602)	9700	(858)	1370	(121)	0.06	(9)	4.3	(9.5)
	PRN800D	12000	(1062)	20600	(1823)	28800	(2549)	41100	(3637)	0.05	(7)	13	(28)



Model	Unit	PRNA1S			PRNA3S			PRNA10S			PRNA20S			PRN30S		
Vane		Single Vane														
Rotation	Degree	90	180	270	90	180	270	90	180	270	90	180	270	90	180	270
Rotational Tolerance	Degree	+4, -0														
Reference Point	Degree	90			45, 90		45	45, 90		45	45, 90		45	45		
Port Size		M5			M5			M5			M5			R _c 1/8		
Operating Pressure Range	MPa	0.3 to 0.7			0.2 to 0.7						0.2 to 1					
	psi	45 to 100			30 to 100						30 to 150					
Temperature Range	°C	-5 to 80												-5 to 60		
	°F	23 to 176												23 to 140		
Maximum Frequency*	cycle/min	300	180	70	260	160	60	240	150	100	210	120	60	180	90	60
Displacement	cm ³	1.4	1.4	1.5	3.4	3.4	4	9.8	9.8	12	17	17	21	37		43
	in ³	0.09	0.09	0.09	0.2	0.2	0.2	0.6	0.6	0.7	1.0	1.0	1.3	2.3		2.6

Model	Unit	PRNA1D			PRNA3D			PRNA10D			PRNA20D			PRNA30D		
Vane		Double Vane														
Rotation	Degree	90			90			90			90			90		
Rotational Tolerance	Degree	+4, -0														
Reference Point	Degree	45			45			45			45			45		
Port Size		M5			M5			M5			M5			R _c 1/8		
Operating Pressure Range	MPa	0.3 to 0.7			0.2 to 0.7						0.2 to 1					
	psi	45 to 100			30 to 100						30 to 150					
Temperature Range	°C	-5 to 80												-5 to 60		
	°F	23 to 176												23 to 140		
Maximum Frequency*	cycle/min	240			240			240			200			200		
Displacement	cm ³	2			2.4			5			10			34		
	in ³	0.12			0.1			0.3			0.6			2.1		

Kinetic Energy Ratings and Bearing Load Capacities

Model Number	Bearing Load Capacities				Distance Between Centerline Bearings		Maximum Kinetic Energy Rating	
	Thrust Load		Radial Load		mm	in	mJ	in-lb
	N	lb	N	lb				
PRNA1S	1	0.2	10	2	15	0.6	0.8	0.01
PRNA3S	4	0.9	40	9	20	0.8	4	0.03
PRNA10S	4	0.9	50	11	30	1.2	8	0.07
PRNA20S	25	5.6	300	67	42	1.7	40	0.35
PRN30S	30	6.7	400	90	48	1.9	67	0.60



Model	Unit	PRN50S				PRN150S				PRN300S			
Vane		Double Vane											
Rotation	Degree	90	180	270	280	90	180	270	280	90	180	270	280
Rotational Tolerance	Degree	+3 -0											
Reference Point	Degree	45	40, 45	45	40	45	40, 45	45	40	45	40, 45	45	40
Port Size		Rc 1/8				Rc 1/4				Rc 3/8			
Operating Pressure Range	MPa	0.2 to 1.0											
	psi	30 to 150											
Temperature Range	°C	5 to 60											
	°F	41 to 140											
Maximum Frequency*	cycle/min	180	90	60		120	80	50		90	60	40	
Displacement	cm ³	51		61	62	146		179	185	244	283	352	365
	in ³	3.1		3.7	3.8	8.9		10.9	11.3	14.9	17	21	22

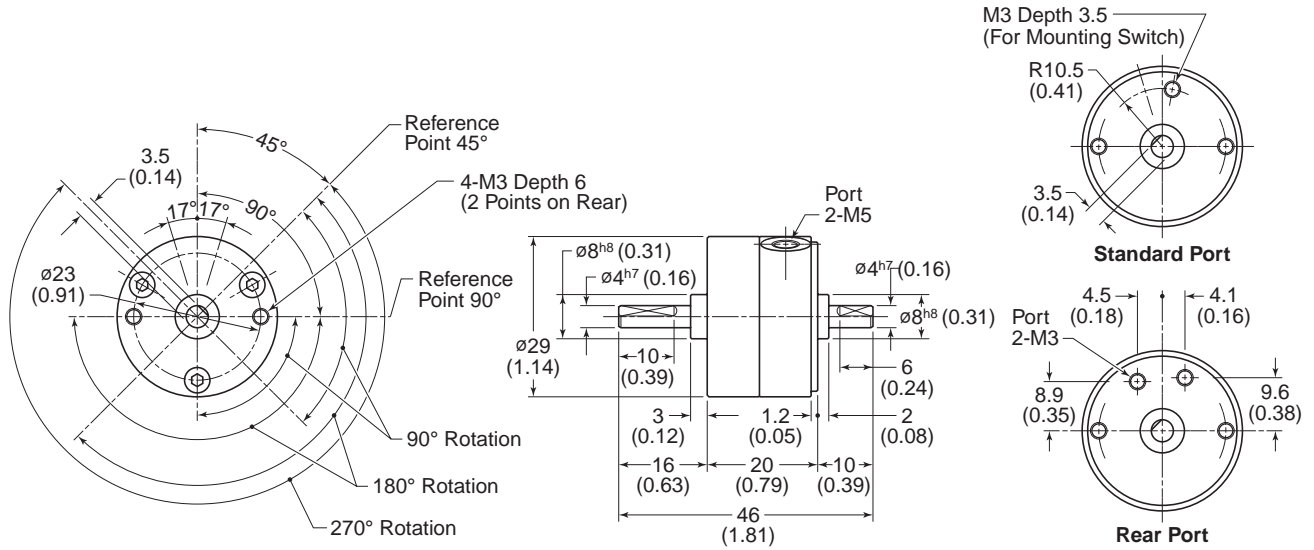
Model	Unit	PRN800S				PRN50D		PRN150D		PRN300D		PRN800D	
Vane		Double Vane											
Rotation	Degree	90	180	270	280	90	100	90	100	90	100	90	100
Rotational Tolerance	Degree	+3, -0											
Reference Point	Degree	45	40, 45	45	40	40, 45	40	45	40	45	40, 45	45	40
Port Size		Rc 1/2				Rc 1/8		Rc 1/4		Rc 3/8		Rc 1/2	
Operating Pressure Range	MPa	0.2 to 1.0											
	psi	30 to 150											
Temperature Range	°C	5 to 60											
	°F	41 to 140											
Maximum Frequency*	cycle/min	65	45	30									
Displacement	cm ³	754	869	1036	1046	42	43	127	123	244	271	754	774
	in ³	46	53	63	64	2.6	2.6	7.7	7.5	14.9	16.5	46	47

* Maximum frequency value given at a pressure of 0.5 MPa (73 psi) and under no load.

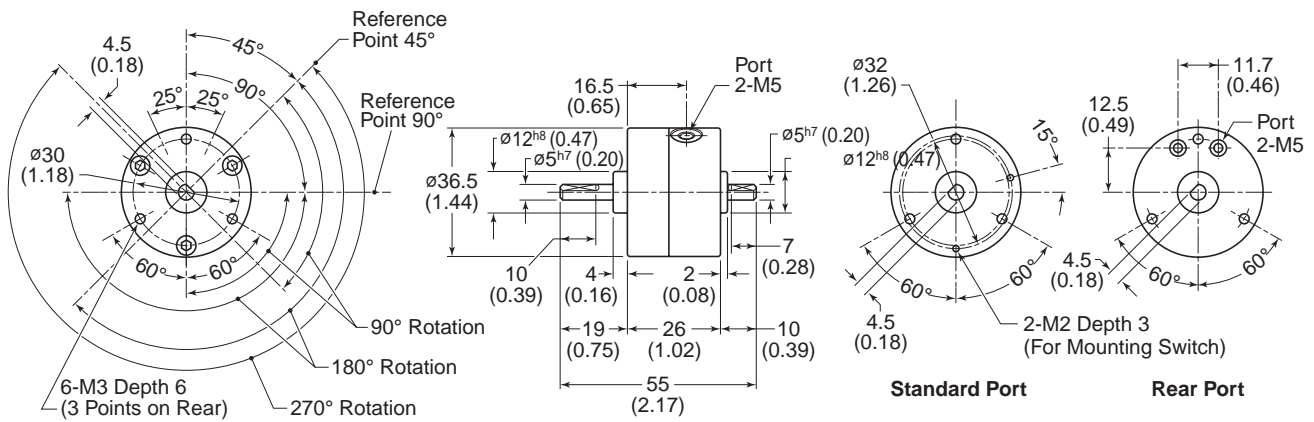
Kinetic Energy Ratings and Bearing Load Capacities

Model	Bearing Load Capacities				Distance Between Centerline Bearings		Maximum Kinetic Energy Rating					
	Thrust Load		Radial Load				Standard Unit		Shock Absorber (per cycle)		Shock Absorber (per cycle)	
	N	lb	N	lb	mm	in	J	in-lb	J	in-lb	J/hr	in-lb/hr
PRN50S/D	44.1	9.9	588	132	66	2.6	0.13	1.2	7.8	69	3100	27000
PRN150S/D	88.2	19.8	1176	264	79.5	3.1	0.6	5.3	10	231	11300	100000
PRN300S/D	147	33.0	1960	441	97.5	3.8	8.0	70	20	462	22000	194000
PRN800S/D	490	110.2	4900	1102	138.5	5.5	10.5	92	156	1387	56500	500000

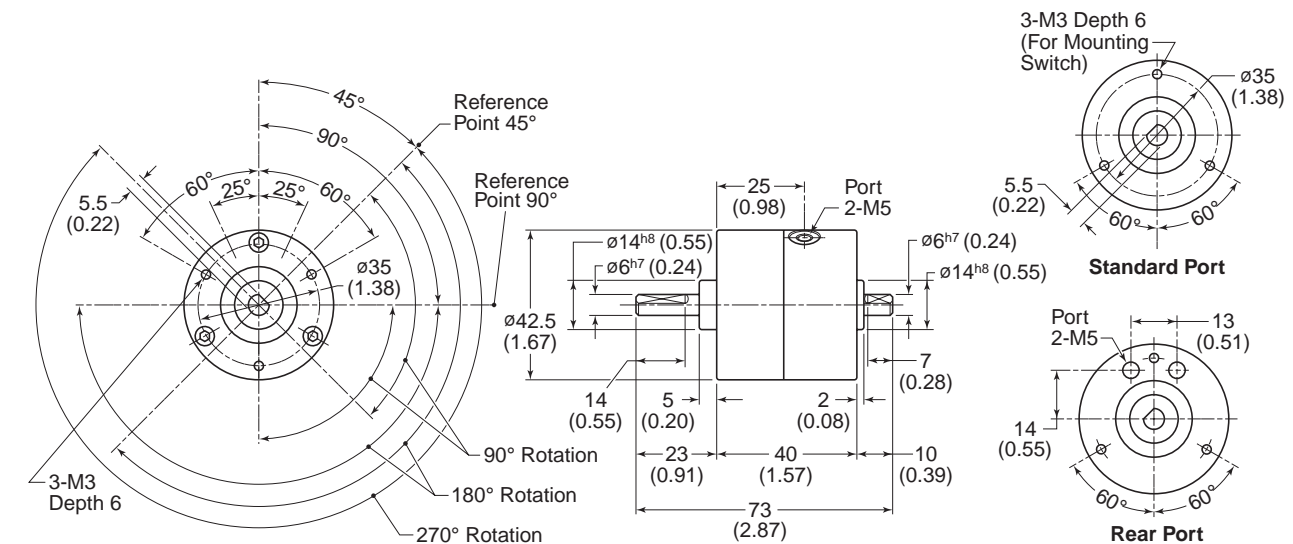
PRNA1S



PRNA3S/D



PRNA10S/D



Dimensions are in mm (Inches)



H23

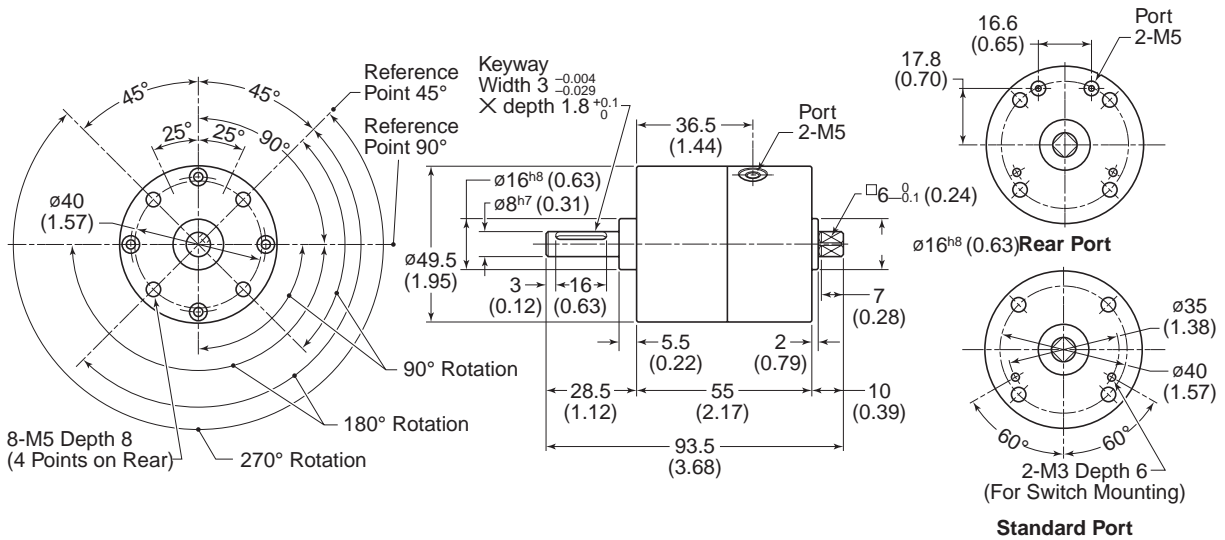
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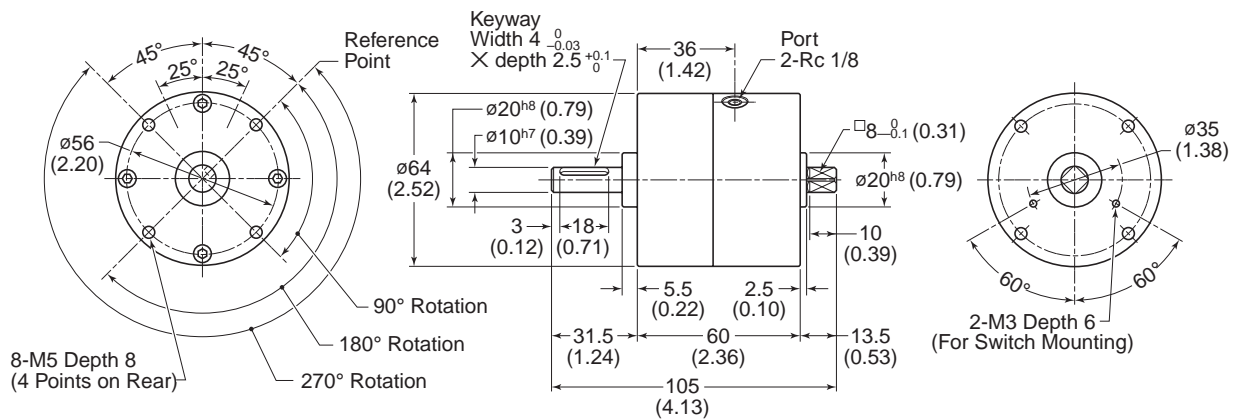
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PRN(A)
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PTR
B671
HP

PRNA20S/D



H

PRN30S/D



Dimensions are in mm (Inches)



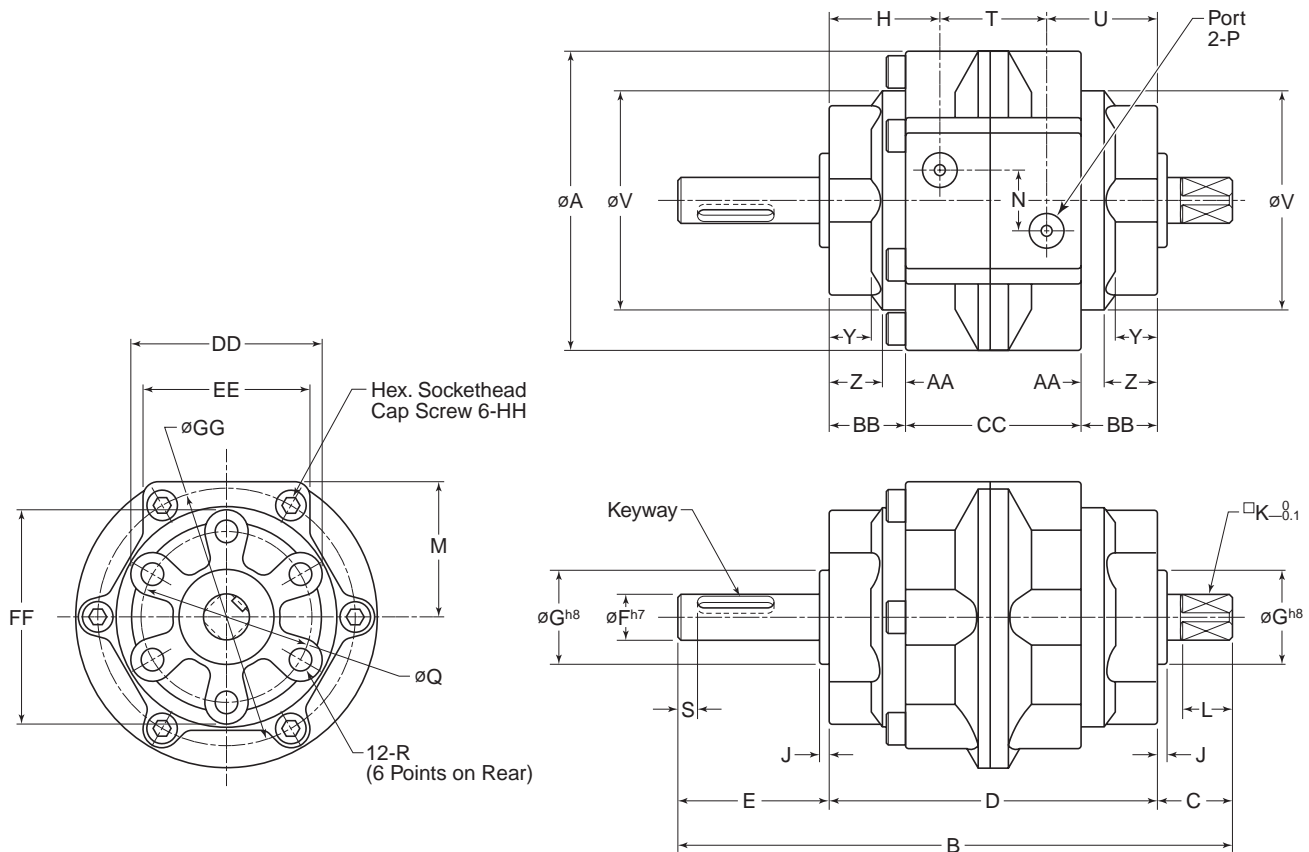
H24

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PRN Sizes 50 to 800



Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
PRN50	79 (3.11)	145 (5.71)	19.5 (0.77)	86 (3.39)	39.5 (1.56)	12 (0.47)	25 (0.98)	29 (1.14)	2.5 (0.10)	10 (0.39)	13 (0.51)	36 (1.42)	16 (0.63)	Rc1/8	45 (1.77)	M6 x 1, Depth 9	5 (0.20)
PRN150	110 (4.33)	180 (7.09)	23.5 (0.93)	103 (4.06)	53.5 (2.11)	17 (0.67)	30 (1.18)	34.5 (1.36)	3 (0.12)	13 (0.51)	16 (0.63)	51 (2.01)	24 (0.94)	Rc1/4	70 (2.76)	M8 x 1.25, Depth 12	5 (0.20)
PRN300	141.5 (5.57)	220 (8.66)	30 (1.18)	125 (4.92)	65 (2.56)	25 (0.98)	45 (1.77)	41.5 (1.63)	3.5 (0.14)	19 (0.75)	22 (0.87)	66 (2.60)	32 (1.26)	Rc3/8	80 (3.15)	M10 x 1.5, Depth 15	5 (0.20)
PRN800	196 (7.72)	285 (11.22)	44.5 (1.75)	171 (6.73)	69.5 (2.74)	40 (1.57)	70 (2.76)	53.5 (2.11)	4.5 (0.18)	32 (1.26)	35 (1.38)	90 (3.54)	44 (1.73)	Rc1/2	120 (4.72)	M12 x 1.75, Depth 18	10 (0.39)

Model No.	T	U	V	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	Keyway Width x Depth x Length
PRN50	28 (1.10)	29 (1.14)	58 (2.28)	11 (0.43)	14 (0.55)	6 (0.24)	20 (0.79)	46 (1.81)	51 (2.01)	44 (1.73)	57 (2.24)	68 (2.68)	M5 x 30	4 ⁰ _{-0.03} x 2.5 ^{+0.1} ₀ x 20
PRN150	34 (1.34)	34.5 (1.36)	85.2 (3.35)	10.5 (0.41)	15.5 (0.61)	8 (0.31)	23.5 (0.93)	56 (2.20)	75 (2.95)	61 (2.40)	85 (3.35)	97 (3.82)	M6 x 35	5 ⁰ _{-0.03} x 3 ^{+0.1} ₀ x 36
PRN300	42 (1.65)	41.5 (1.63)	110 (4.33)	13 (0.51)	17.5 (0.69)	10 (0.39)	27.5 (1.08)	70 (2.76)	88.5 (3.48)	78 (3.07)	98.5 (3.88)	125 (4.92)	M8 x 45	7 ⁰ _{-0.03} x 4 ^{+0.2} ₀ x 40
PRN800	64 (2.52)	53.5 (2.11)	152 (5.98)	14.5 (0.57)	21.1 (0.83)	11.4 (0.45)	32.5 (1.28)	106 (4.17)	130 (5.12)	110 (4.33)	145 (5.71)	173 (6.81)	M12 x 70	12 ⁰ _{-0.043} x 5 ^{+0.2} ₀ x 40

mm (Inches)



H25

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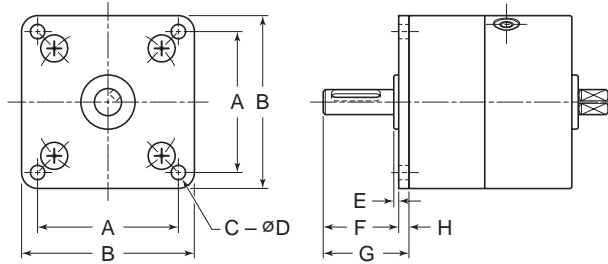
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Flange Mount – Sizes 1 to 30

Note: • Should not be used on rear face when rear ports (S) or switches are specified.



Dimensions

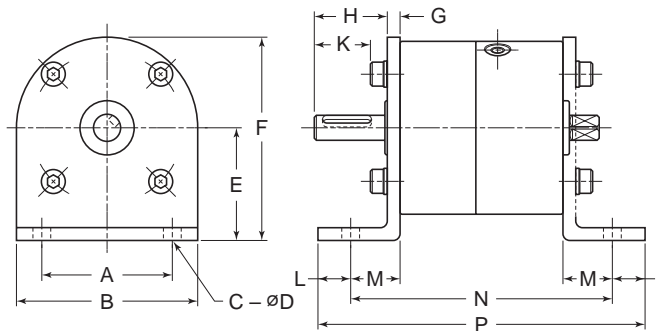
Part No.	A	B	C	D	E	F	G	H
PRNA1-P	24 (0.94)	30 (1.18)	4 (0.16)	3.4 (0.13)	1 (0.04)	14 (0.55)	16 (0.63)	2 (0.08)
PRNA3-P	30 (1.18)	37 (1.46)	4 (0.16)	3.4 (0.13)	1.5 (0.06)	16.5 (0.65)	19 (0.75)	2.5 (0.10)
PRNA10-P	34 (1.34)	42 (1.65)	4 (0.16)	3.5 (0.14)	1.8 (0.07)	19.8 (0.78)	23 (0.91)	3.2 (0.13)
PRNA20-P	41 (1.61)	50 (1.97)	4 (0.16)	5.5 (0.22)	1.9 (0.07)	24.9 (0.98)	28.5 (1.12)	3.6 (0.14)
PRNA30-P	52 (2.05)	64 (2.52)	4 (0.16)	5.5 (0.22)	1.9 (0.07)	27.9 (1.10)	31.5 (1.24)	3.6 (0.14)

mm (Inches)

H

Foot Mount – Sizes 1 to 30

Note: • A foot plate can be rotated in intervals of 90°.
 • Only one plate included. Two plates must be purchased to mount from both sides (as shown).
 • Should not be used on rear face when rear ports (S) or switches are specified.



Dimensions

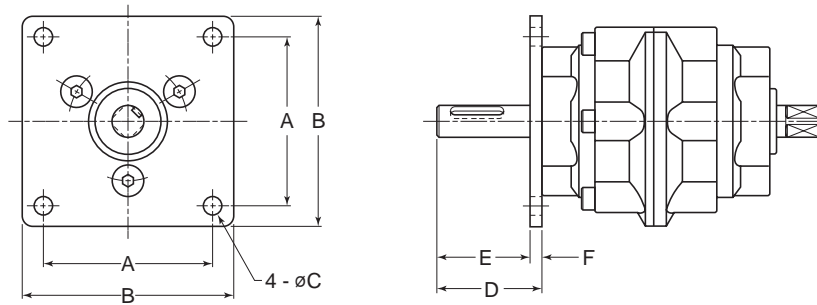
Part No.	A	B	C	D	E	F	G	H	K	L	M	N	P
PRNA1-L	20 (0.79)	30 (1.18)	2 (0.08)	4.8 (0.19)	22 (0.87)	37 (1.46)	2 (0.08)	14 (0.55)	10.3 (0.41)	5 (0.20)	10 (0.39)	40 (1.57)	50 (1.97)
PRNA3-L	26 (1.02)	36 (1.41)	2 (0.08)	4.8 (0.19)	25 (0.98)	43 (1.69)	2.6 (0.10)	16.4 (0.65)	12.7 (0.50)	7 (0.28)	11 (0.43)	48 (1.89)	62 (2.44)
PRNA10-L	30 (1.18)	42 (1.65)	2 (0.08)	5.8 (0.23)	30 (1.18)	51 (2.01)	3.2 (0.13)	19.8 (0.78)	16.1 (0.63)	8 (0.31)	12 (0.47)	64 (2.52)	80 (3.15)
PRNA20-L	36 (1.42)	49 (1.93)	2 (0.08)	7 (0.28)	34 (1.34)	58.5 (2.30)	3.6 (0.14)	24.9 (0.98)	18.6 (0.73)	10 (0.39)	15 (0.59)	85 (3.35)	105 (4.13)
PRNA30-L	48 (1.89)	66 (2.60)	2 (0.08)	6.5 (0.26)	42 (1.65)	75 (2.95)	4.5 (0.18)	27 (1.06)	20.7 (0.81)	12 (0.47)	18 (0.71)	96 (3.78)	120 (4.72)

mm (Inches)



Flange Mount – Sizes 50 and 150

Note: A flange plate can be rotated in intervals of 60°



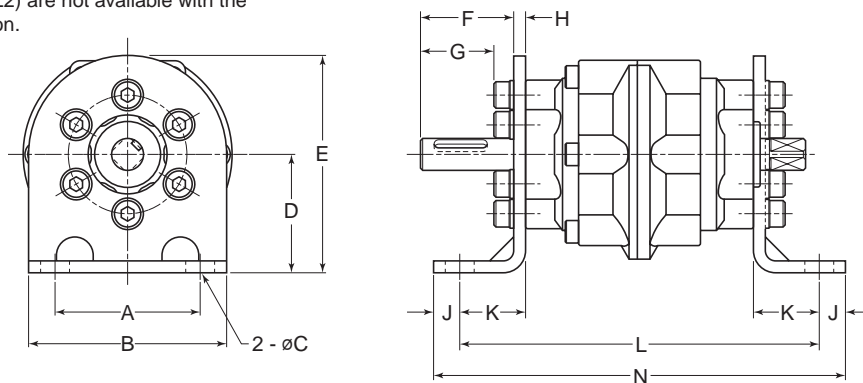
Dimensions

Part No.	A	B	C	D	E	F
PRN50-P	64 (2.52)	80 (3.15)	7 (0.28)	39.5 (1.56)	35 (1.38)	4.5 (0.18)
PRN150-P	88 (3.46)	110 (4.33)	9 (0.35)	53.5 (2.11)	47.5 (1.87)	6 (0.24)

mm (Inches)

Foot Mount – Sizes 50 to 800

Note: • A foot plate can be rotated in intervals of 60°.
 • Two foot plates (L2) are not available with the CR, FM, FC option.



Dimensions

Part No.	A	B	C	D	E	F	G	H	J	K	L	N
PRN50-L	55 (2.17)	75 (2.95)	11 (0.43)	45 (1.77)	82.5 (3.25)	35 (1.38)	27.5 (1.08)	4.5 (0.18)	10 (0.39)	25 (0.98)	136 (5.35)	156 (6.14)
PRN150-L	80 (3.15)	110 (4.33)	13 (0.51)	65 (2.56)	115 (4.53)	43.5 (1.71)	33.5 (1.32)	10 (0.39)	12 (0.47)	28 (1.10)	159 (6.26)	183 (7.20)
PRN300-L	100 (3.94)	140 (5.51)	15 (0.59)	80 (3.15)	135 (5.31)	53 (2.09)	40.5 (1.59)	12 (0.47)	13 (0.51)	32 (1.26)	189 (7.44)	215 (8.46)
PRN800-L	140 (5.51)	200 (7.87)	15 (0.59)	110 (4.33)	200 (7.87)	54.5 (2.15)	39.5 (1.56)	15 (0.59)	15 (0.59)	35 (1.38)	241 (9.49)	271 (10.67)

mm (Inches)



H27

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Shock Absorber

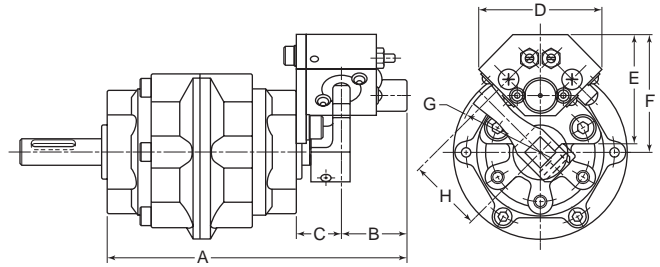
The CRN Series Shock Absorber should be used in applications involving high inertial loads. Inertial loads are a result of any or all of the following:

- High cycle speeds
- Heavy loads
- Physically / dimensionally large loads

When any of these characteristics are present, it is important that some means of deceleration, such as the CRN, is used.

Note:

- It is critical not to exceed the maximum kinetic energy values of the CRN. See chart below for kinetic energy calculations.
- When ordering a CRN, the shock absorber and the shock arm must be ordered separately.
- When a CRN is specified, maintain a minimum working pressure of 0.3 MPa.

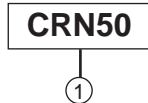


Dimensions

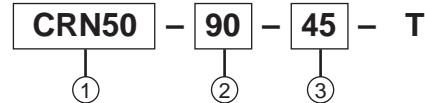
Model No.	A	B	C	D	E	F	G	H
CRN50	136.5 (5.37)	30 (1.18)	20.5 (0.81)	56 (2.20)	50 (1.97)	54 (2.13)	R38 (1.50)	34 (1.34)
CRN150	159.5 (6.28)	34 (1.34)	22.5 (0.89)	80 (3.15)	62 (2.44)	71.5 (2.81)	R51 (2.01)	46 (1.81)
CRN300	187.5 (7.38)	37 (1.46)	25.5 (1.00)	95 (3.74)	87 (3.43)	96 (3.78)	R68 (2.68)	62 (2.44)
CRN800	244 (9.61)	42 (1.65)	31 (1.22)	130 (5.12)	118 (4.65)	135 (5.31)	R78 (3.07)	90 (3.54)

mm (Inches)

Shock Absorber Only



Shock Arm



①

Model	
CRN50	for PRN50
CRN150	for PRN150
CRN300	for PRN300
CRN800	for PRN800

②

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

③

Reference Point	
40	40°
45	45°

Relationship Between Rotation and Reference Point

Reference Point Options	Rotation			
	90°	180°	270°	280°
40°	X	X	N/A	X
45°	X	N/A	X	N/A

Note: Select a shock arm based on the reference point and rotation of the PRN to be used.

Model No.	Unit	CRN50	CRN150	CRN300	CRN800
Kinetic Energy (per cycle)	J	7.8	10	20	156
	in-lb	68	85	170	1356
Maximum Angular Velocity	Degree/s	850	750	650	550
Kinetic Energy (per hour)	J/hr	3100	11300	22000	56500
	in-lb/hr	26939	98197	191180	490985
Temperature Range	°C	5 to 50			
	°F	41 to 122			
Deceleration Angle	Degree	11	12	14	15
Weight	g	240	420	780	1620
	lb	0.528	0.924	1.716	3.564

H

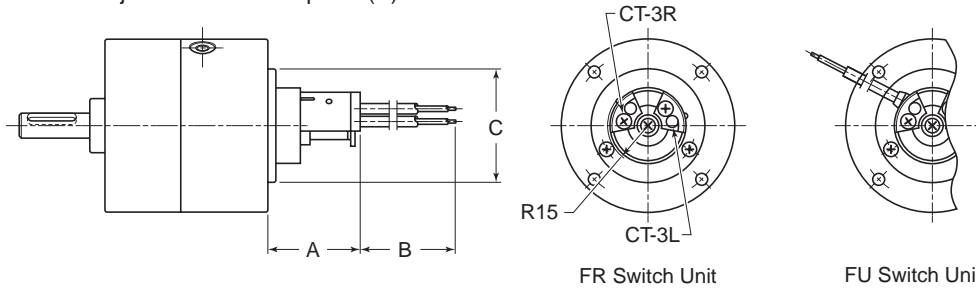


Variable Position Solid State (FR Series) Sensor

The FR Series variable position sensor provides the ability to adjust the sensor to sense along the full travel of the actuator. All switches and sensors must be ordered separately.

See the Electronic Sensors section for part numbers and sensor specifications.

Note: Not to be used in conjunction with rear ports (S).



Dimensions

Model	A	B	C
PRNA1	31.9 (1.26)	1000 (39.37)	29 (1.14)
PRNA3	30.7 (1.21)	1000 (39.37)	35 (1.38)
PRNA10	34 (1.34)	1000 (39.37)	42 (1.65)
PRNA20	34 (1.34)	1000 (39.37)	42 (1.65)
PRNA30	34 (1.34)	1000 (39.37)	42 (1.65)

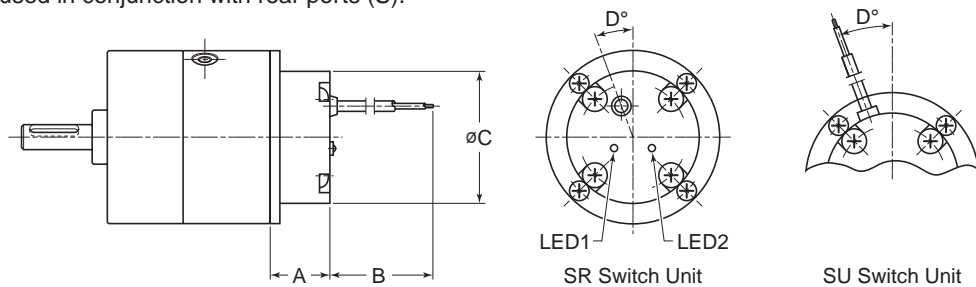
mm (Inches)

Fixed Position Solid State (SR / SU Series) Sensor

The SR or SU Series fixed position sensor senses the end of stroke only. All switches and sensors must be ordered separately.

See the Electronic Sensors section for part numbers and sensor specifications.

Note: Not to be used in conjunction with rear ports (S).



Dimensions

Model	A	B	C	D
PRNA1	N/A	N/A	N/A	N/A
PRNA3	18 (0.71)	1000 (39.37)	36 (1.42)	30 (1.18)
PRNA10	18.3 (0.72)	1000 (39.37)	42 (1.65)	25 (0.98)
PRNA20	18.3 (0.72)	1000 (39.37)	49 (1.93)	20 (0.79)
PRNA30	21.8 (0.86)	1000 (39.37)	49 (1.93)	20 (0.79)

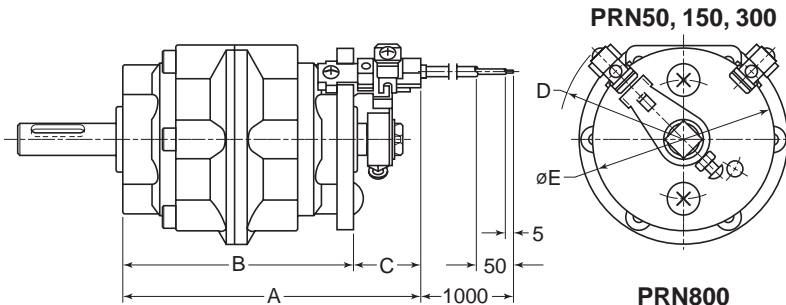
mm (Inches)



Variable Position Solid State (FR / FC Series) Sensor

The FR and FC Series variable position sensor provides the ability to adjust the sensor to sense along the full travel of the actuator. The FR Series sensor is to be used with the standard PRN sizes 50–800, and the FC Series sensor is to be used when a CRN Series shock absorber is specified.

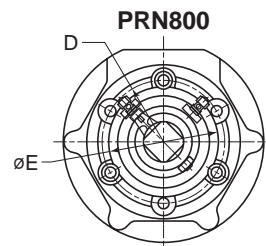
See the Electronic Sensors section for part numbers and sensor specifications.



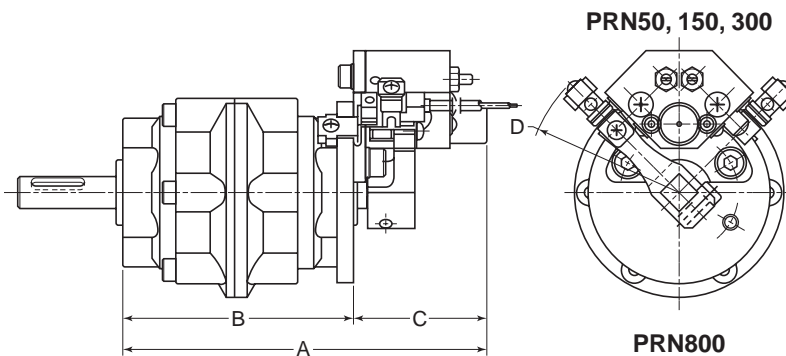
Dimensions

Model No.	A	B	C	D	E
PRN50	115 (4.53)	87.2 (3.43)	27.5 (1.08)	R47 (1.85)	69 (2.72)
PRN150	131.7 (5.19)	104.2 (4.10)	27.5 (1.08)	R61 (2.40)	97 (3.82)
PRN300	161.2 (6.35)	126.2 (4.97)	35 (1.38)	R69 (2.72)	113 (4.45)
PRN800	215.5 (8.48)	174.2 (6.86)	41.3 (1.63)	R60 (2.36)	108 (4.25)

mm (Inches)



H



Dimensions

Model No.	A	B	C	D
PRN50	137.7 (5.42)	87.2 (3.43)	50.5 (1.99)	R58.2 (2.29)
PRN150	160.7 (6.33)	104.2 (4.10)	56.5 (2.22)	R72.2 (2.84)
PRN300	188.7 (7.43)	126.2 (4.97)	62.5 (2.46)	R88.2 (3.47)
PRN800	244 (9.61)	174.2 (6.86)	69.8 (2.75)	R118.5 (4.67)

mm (Inches)



H30

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