WR Series
Wrist Rotator

Contents

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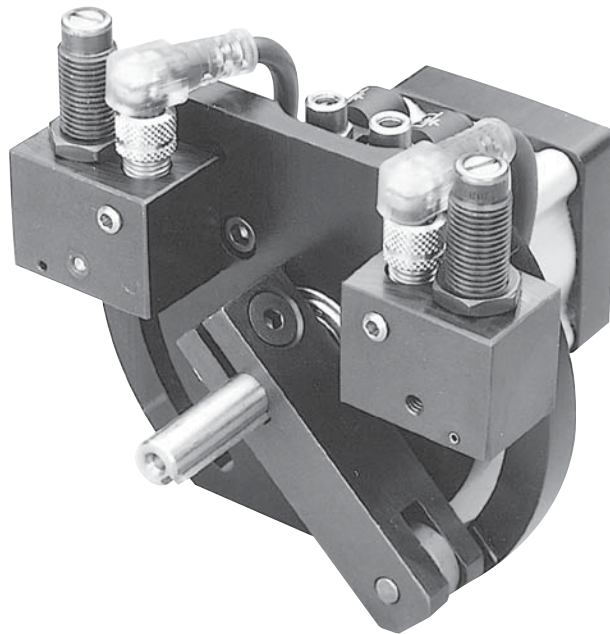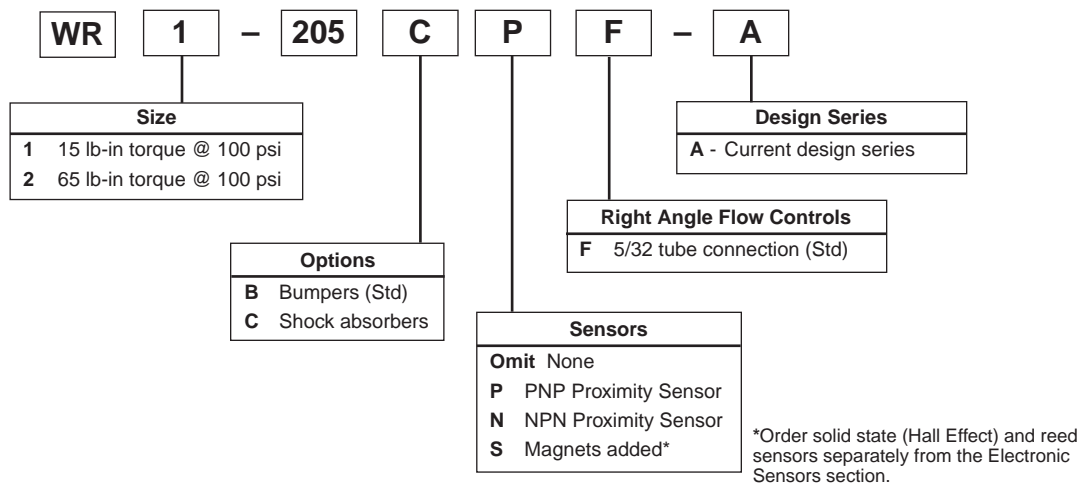Pneumatic Division
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WR Series Wrist Rotator

The Wrist Rotate Series rotary actuator provides added features to allow use as a modular pick-and-place component or as a precision pneumatic rotary actuator. Rotation stops provide adjustable rotation from 30° to 205° and feature hydraulic shock absorbers or polyurethane bumpers. Optional plug-in style inductive proximity sensors provide an end of rotation signal. Piston magnet option is available for use with Hall Effect and reed sensors for full rotation position sensing. The body features anodized aluminum and stainless steel construction for corrosion resistance.

H

Ordering Information

| WR | 1 | – 205 | C | P | F | – A |

Size

| 1 | 15 lb-in torque @ 100 psi |
| 2 | 65 lb-in torque @ 100 psi |

Design Series

A - Current design series

Options

| B | Bumpers (Std) |
| C | Shock absorbers |

Right Angle Flow Controls

| F | 5/32 tube connection (Std) |

Sensors

Omit	None
P	PNP Proximity Sensor
N	NPN Proximity Sensor
S	Magnets added*

*Order solid state (Hall Effect) and reed sensors separately from the Electronic Sensors section.

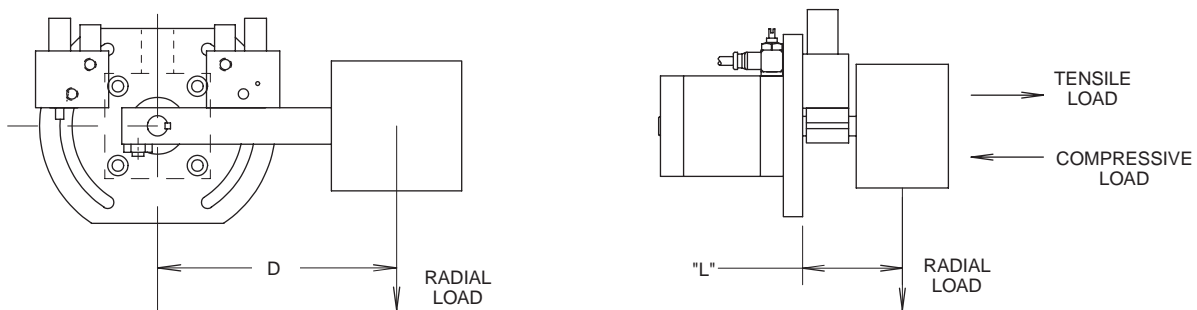**800.696.6165**   **www.comoso.com**

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Specifications

- Maximum operating pressure: 150 psi air
- Output torque @ 100 psi: 15 or 65 lb-in
- Rotation range: 30 to 205°
- Mounting orientation: unrestricted
- Operating temperature range: 0 to 180°F
- Filtration requirement: 40 micron filtered, dry air

Quick Reference

Model	Actual Output Torque (lb-in) at Specified Input Pressure (PSI)			Displacement (in^3)	Maximum Breakaway Pressure	Unit Weight (lb)
	50	75	100			
WR1	5	10	15	1.04	20	1.5
WR2	25	45	65	3.67	15	3.5

Sizing Information

Model	Maximum Dynamic Load Ratings				Max. Kinetic Energy (lb-in)	
	Radial Load (lbs)	Compressive Load (lbs)	Tensile Load (lbs)	Moment Load (lb-in)	With Bumpers	With Shock Absorbers
WR1	5	10	5	25	.11	6.00
WR2	25	50	25	125	.57	30.10

Kinetic Energy Calculations

In many cases, the size and life of a rotary actuator is determined not by its torque output, but rather by its energy dissipation capability. This is based on the assumption that if the actuator is capable of stopping the load, it is certainly capable of starting the load.

Both torque output and kinetic energy absorption must be considered if the actuator physically stops the load.

To calculate Kinetic Energy, the following variables are required:

1. Rotational Mass Moment of Inertia (J_m)
2. Total Rotation (Degrees)
3. Rotation Time (Seconds)

KINETIC ENERGY BASIC FORMULA

$$KE = 1/2\ J_m \omega^2$$

$$\omega = 0.035 \times \frac{\text{Angle Traveled (deg.)}}{\text{Rotation Time (sec.)}}$$
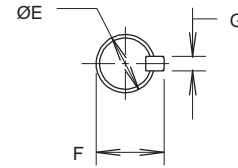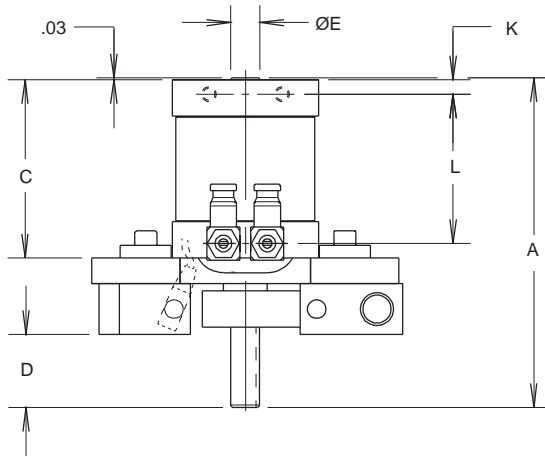
where

KE = Kinetic Energy (in-lb)

J_m = Rotational Mass Moment of Inertia (in-lb-sec^2)
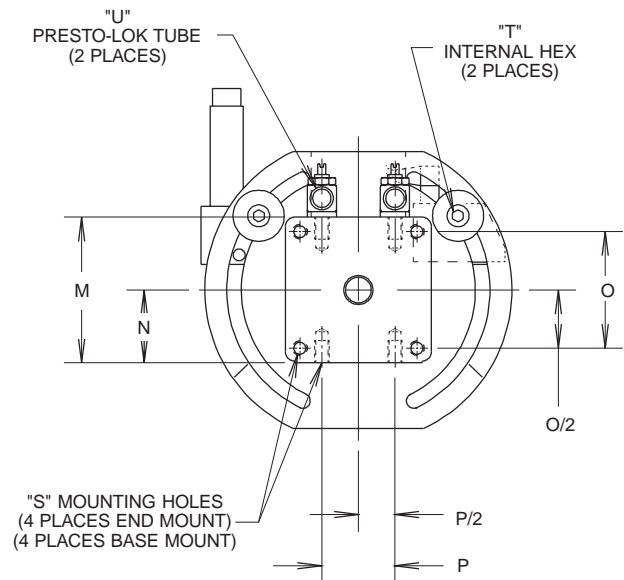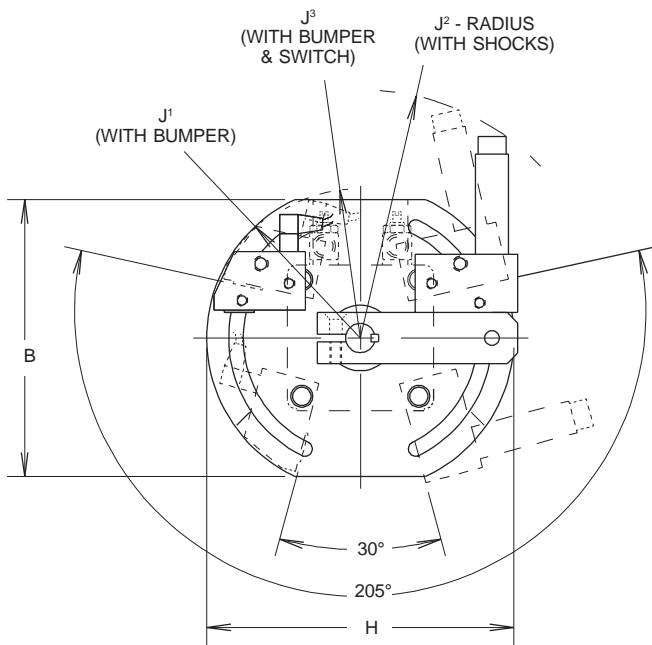
ω = Peak Velocity (rad/sec)

(Assuming twice average velocity)

H | PV | PRN(A) | WR | PTR | B671 | HP

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3D CAD FILES
available for download at
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J³
(WITH BUMPER
& SWITCH)

J² - RADIUS
(WITH SHOCKS)

J¹
(WITH BUMPER)

30°

205°

H

"U"
PRESTO-LOK TUBE
(2 PLACES)

"T"
INTERNAL HEX
(2 PLACES)

"S" MOUNTING HOLES
(4 PLACES END MOUNT)
(4 PLACES BASE MOUNT)

Dimensions

Model	A	B	C	D	ØE	F	G	H	J¹	J²	J³
WR1	3.97	3.00	2.00	0.88	0.312 0.311	0.352 0.347	0.094 0.093	3.63	1.89	2.54	2.30
WR2	5.65	4.75	3.06	1.25	0.499 0.498	0.548 0.543	0.125 0.124	5.25	2.61	4.26	—

Model	K	L	M	N	O	P	S	T	U
WR1	0.19	1.625	1.62	0.810	1.220	0.750	8-32 UNC x 0.25 DEEP	5/32	5/32
WR2	0.25	2.560	2.50	1.250	2.000	1.250	1/4-20 UNC x 0.38 DEEP	3/16	1/4

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