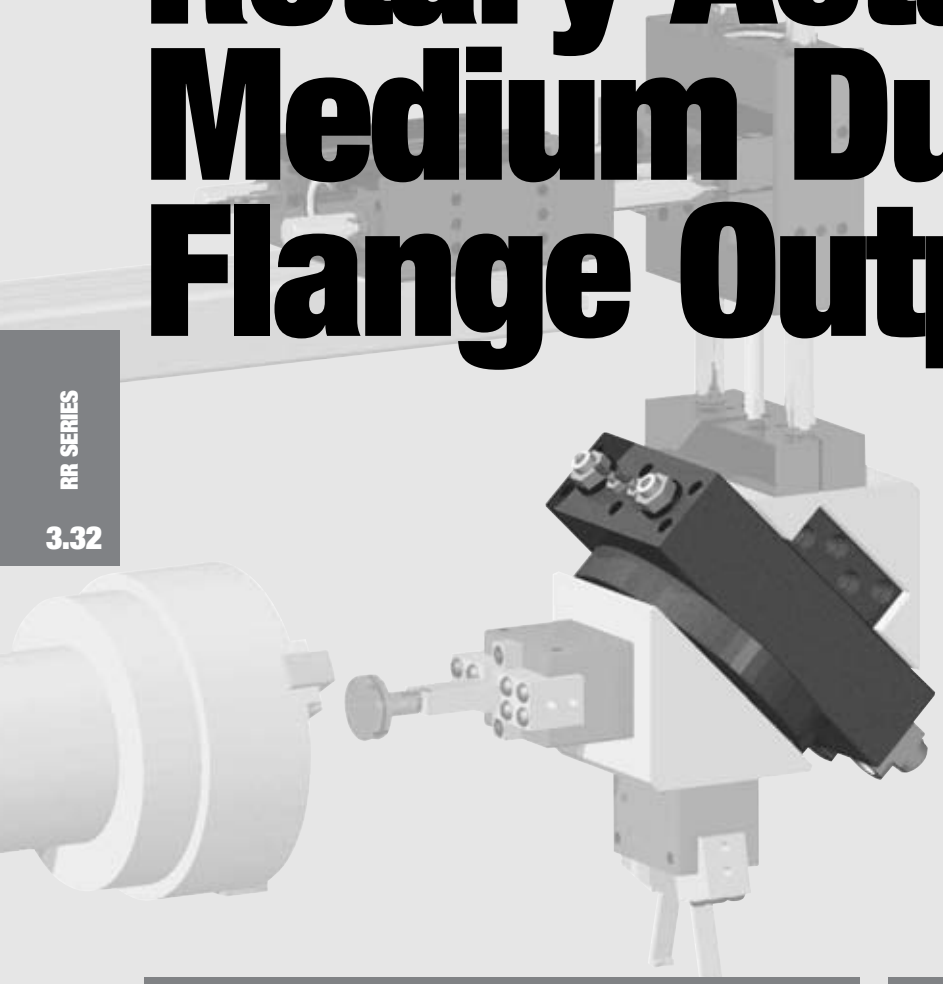
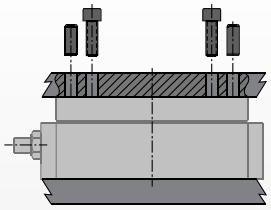
Rotary Actuators- Medium Duty, Flange Output



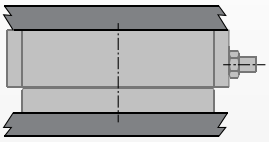
- **Tight spaces:**
  The "ultra thin" profile and bearing supported flange provide an extremely compact package for tight space applications. Payload can be connected directly to the flange without the need for extra bearing support.
- **Precision applications:**
  Zero backlash, preloaded ball bearings, and slip fit dowel pins make this a very precise and repeatable rotary actuator.
- **Rotary Air Manifold**
  Eliminates twisting airlines.

Mounting Information:

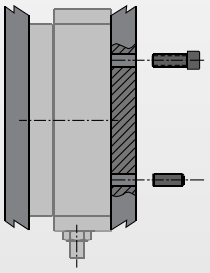
Mounts and operates in any orientation



Payload attaches to flange with screws and locates by using dowel pins



Unit can operate inverted with payload attached to the flange.



Body mounts with screws and locates with dowel pins for accuracy

Technical Specifications:

Pneumatic Specifications	**Imperial**	**Metric**
Pressure Operating Range	**40-100 psi**	**3-7 bar**
Cylinder Type	**Dual Double Acting**	
Dynamic Seals	**Internally Lubricated Buna-N**	
Valve Required to Operate	**4-way, 2-position**	

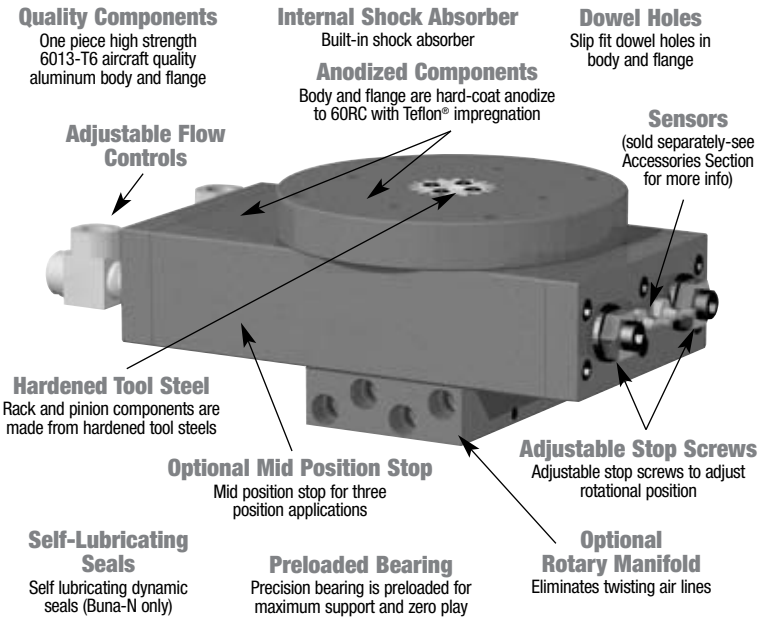
Air Quality Requirements	
Air Filtration	**40 Micron or Better**
Air Lubrication	**Not Necessary***
Air Humidity	**Low Moisture Content (dry)**

Temperature Operating Range		
Buna-N Seals (standard)	**-30°~180° F**	**-35°~80° C**
Viton Seals (optional)	**-20°~300° F**	**-30°~150° C**
Temperature range is limited by internal shock absorber (RR-36 and RR-46 only)	**-32°~150° F**	**-0°~66° C**

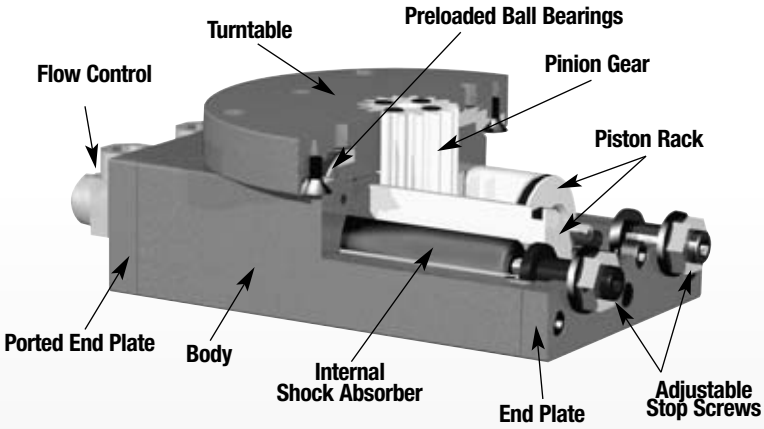
Maintenance Specifications†	
Expected Life	
with Shock Absorbers	**1 million cycles**
without Shock Absorbers	**5 million cycles**
w/ Preventative Maintenance	**10+ million cycles***
Field Repairable	**Yes**
Seal Repair Kits Available	**Yes**

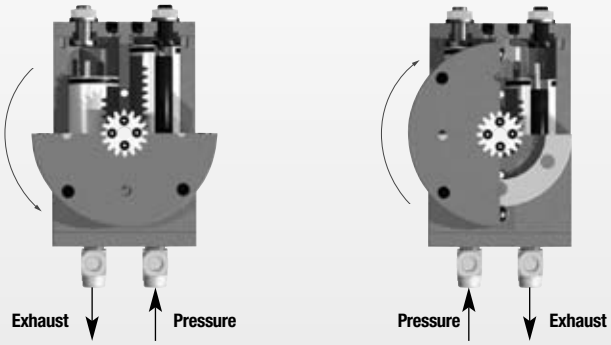
*Addition of lubrication will greatly increase service life
†See Maintenance Section

Product Features



Operating Principle





- Air pressure supplied to both cylinders simultaneously using internal porting, drives the piston racks in opposite directions.
- The piston racks simultaneously drive the pinion gear which is attached to the flange.
- The flange is supported in the body by a preloaded ball bearing

Designed and manufactured in the USA

Style-RR Rotary Actuator

Size -36M

Style:	RR-36	RR-36M
Max. Payload:	8 lbs.	3.6 Kg
Torque:	65 in/lbs	7.4 N-m
Weight:*	2.9 lbs.	1.3 Kg

*Base unit.

See Pages 3.34

Style-RR Rotary Actuator

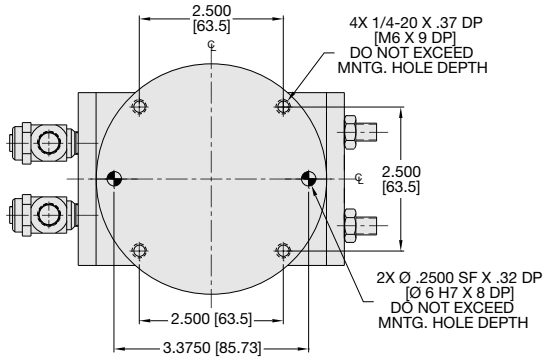
Size -46M

Style:	RR-46	RR-46M
Max. Payload:	15 lbs.	6.8 Kg
Torque:	122 in/lbs	14 N-m
Weight:*	5.0 lbs.	2.3 Kg

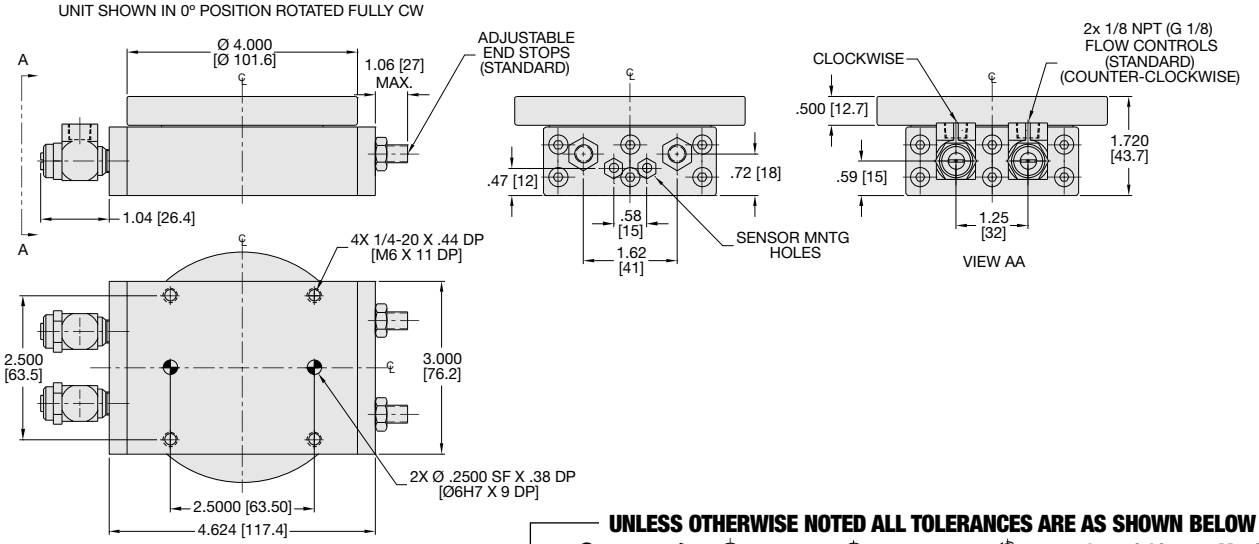
*Base unit.

See Pages 3.36

ROTARY ACTUATORS RR-36M
FLANGE OUTPUT SERIES BASE UNIT



UNIT SHOWN IN 0° POSITION ROTATED FULLY CW

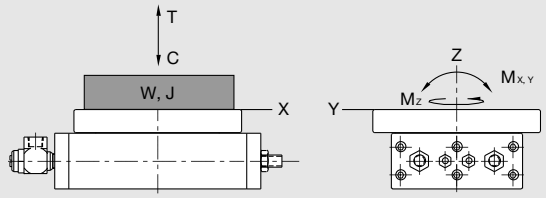


Specifications	**RR-36**	**RR-36M**
Maximum Payload	8.0 lbs.	3.6 Kg
Maximum Payload Inertia	.0414 in.-lbs.-sec^2	.00468 N-m-sec^2
Maximum Rotation	180°	180°
Maximum Torque Mid-Stroke @ 100 PSI	65 in-lbs.	7.4 N-m
Maximum Torque End of Stroke @ 100 PSI	32 in-lbs.	3.7 N-m
Weight of Base Unit	2.9 lbs.	1.3 Kg
Pressure Range	40-100 psi	3-7 bar
Bore Ø (2X)	1.0 in.	25.40 mm
Displacement	2.05 in^3.	33.6 cm^3
Temperature Range		
Standard Seals	32°~150° F	0°~66° C
Viton Seals	32°~150° F	0°~66° C
Actuation Time (180° @ 80PSI/5.5 Bar)	0.35 sec.	0.35 sec.
Actuation Time (90° @ 80PSI/5.5 Bar)	0.25 sec.	0.25 sec.
End Stop Repeatability	±0.02°	±0.02°
End Stop Adjustability	60°	60°
Over-Travel (each direction)	4°	4°
Valve required to actuate	4-way, 2-position	

UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]	Metric Threads Course Pitch	Imperial in.	Metric [mm]
				0.00 = ±.01	[0.] = [±.25]
				0.000 = ±.005	[0.0] = [±.13]
				0.0000 = ±.0005	[0.00] = [±.013]

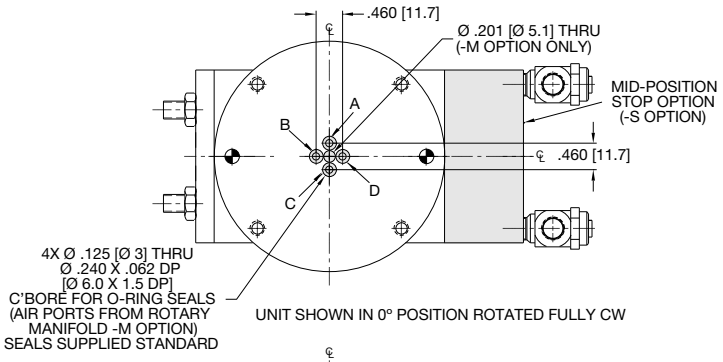
Loading Information

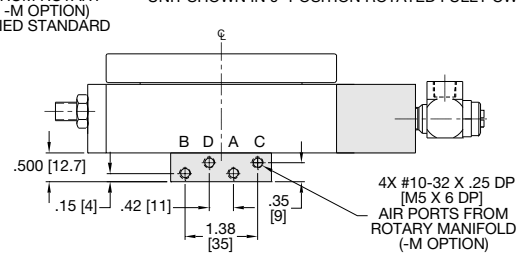


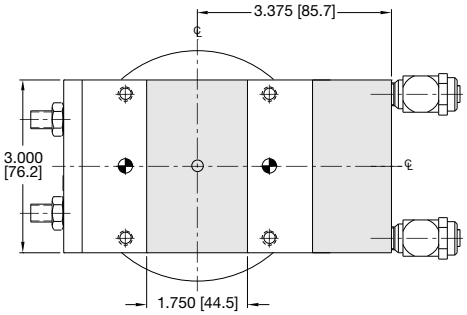
Loading Capacity†	Static Imperial	Static Metric	Dynamic Imperial	Dynamic Metric
Maximum Tension **T**	100 lbs	445 N	20 lbs	89 N
Maximum Compression **C**	500 lbs	2224 N	100 lbs	445 N
Maximum Moment $\mathbf{M_x}$	300 in.-lbs.	34 Nm	75 in.-lbs.	8 Nm
Maximum Moment $\mathbf{M_y}$	300 in.-lbs.	34 Nm	75 in.-lbs.	8 Nm
Maximum Payload **W**			8 lbs.	3.64 Kg
Maximum Inertia **J**			0.0414 in-lb-sec^2	.00468 N-m-sec^2

How to Order: (Order Accessories separately from Basic Model)

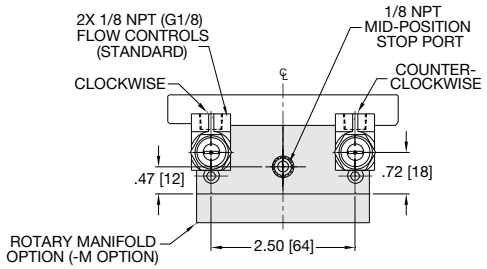
RR-36 **See Next Page**







Specifications	RR-36	RR-36M
Weight (base unit)	2.9 lbs.	1.3 Kg
Weight Adder for Mid-Position Stop	0.4 lbs.	0.18 Kg
Weight Adder for Rotary Manifold	0.1 lbs.	0.04 Kg
Pressure Range	40-100 psi	3-7 bar
Bore Ø of Mid-Position Stop 2X	1.064 in.	27 mm
Mid-Stop Repeatability	±.5°	±.5°
Displacement of Mid-Position Stop	1.200 in^3.	19.66 cm^3
Temperature Range		
Standard Seals	32°~150° F	0°~66° C
Viton Seals	32°~150° F	0°~66° C
Valve required to actuate Mid-Stop	3-way, 2-position	



MID-POSITION STOP VIEW SHOWN

UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]
Metric Threads Course Pitch	**Imperial in.** 0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	**Metric [mm]** [0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

How to Order: (Order Accessories separately from Basic Model)

METRIC MID-STOP ROTARY MANIFOLD

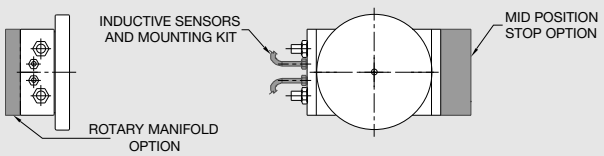
RR-36 M - ____ - S - M - V

BASIC MODEL ROTATION (See below) VITON SEALS

DEGREE OF ROTATION 45°,90°, 135° or 180°
(consult factory for intermediate degrees of rotation)

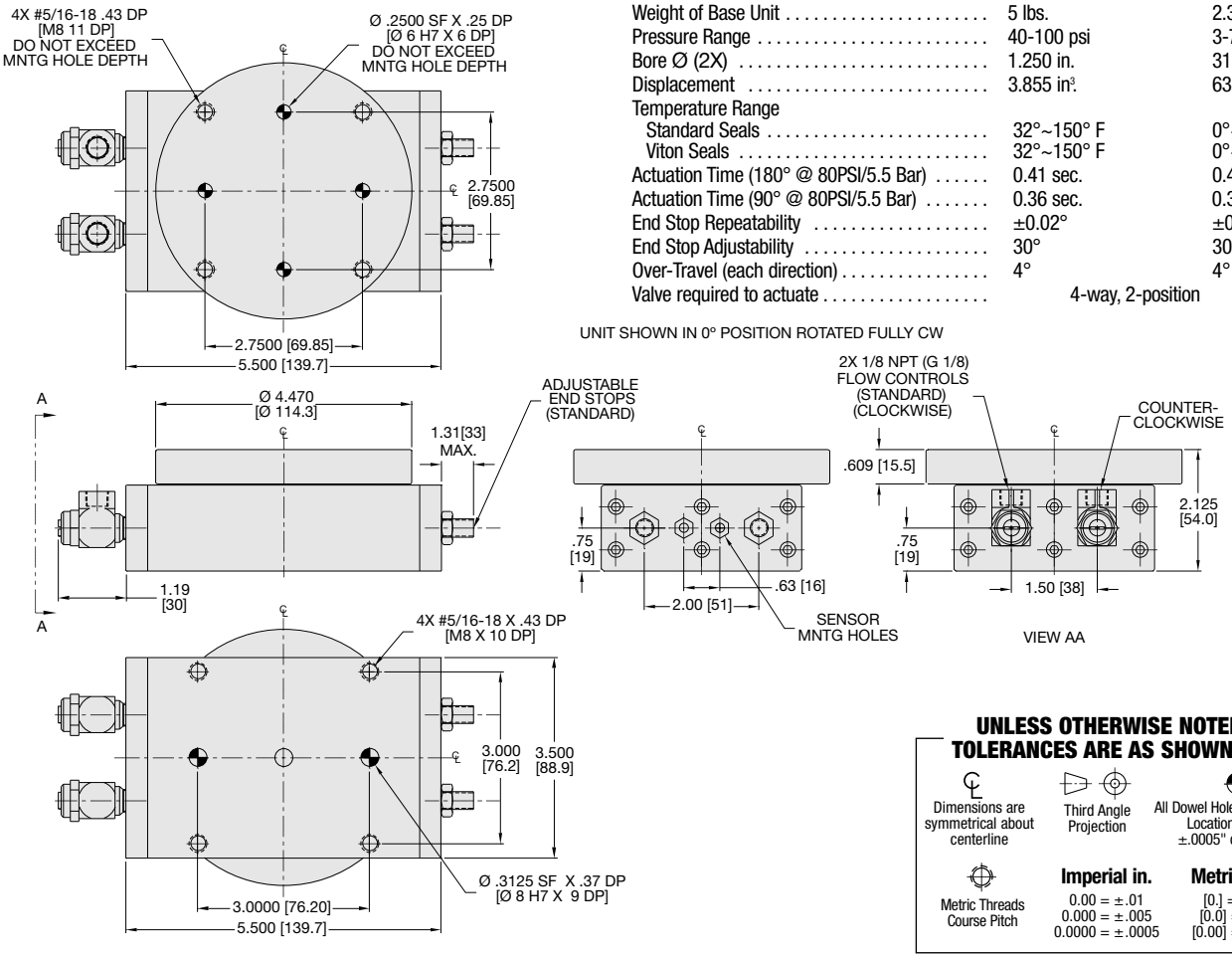
SENSOR ACCESSORIES	MODEL CODE	ORDER#	QTY/UNIT
Sensor Mounting Kit (Mounts 2 Sensors)		OSMK-024	1
NPN Inductive Sensor with Quick Disconnect*		OISN-014	1 or 2
PNP Inductive Sensor with Quick Disconnect*		OISP-014	1 or 2
Quick Disconnect 2M Cable Length*		CABL-010	1 or 2
Quick Disconnect 5M Cable Length*		CABL-013	1 or 2
PNEUMATIC ACCESSORIES			
Standard Base Unit Seal Repair Kit		SLKT-016	1
Viton Base Unit Seal Repair Kit	-V	SLKT-016V	1
Standard Manifold Seal Repair Kit	-M	SLKT-061	1
Viton Manifold Seal Repair Kit	-M-V	SLKT-061V	1
Standard Mid-Stop Seal Repair Kit	-S	SLKT-062	1
Viton Mid-Stop Seal Repair Kit	-S-V	SLKT-062V	1

*Sensor and cable sold separately.



ROTARY ACTUATORS RR-46M
FLANGE OUTPUT SERIES BASE UNIT

Specifications	RR-46	RR-46M
Maximum Payload	15 lbs.	6.8 Kg
Maximum Payload Inertia	.0970 in.-lbs.-sec^2	.01096 N-m-sec^2
Maximum Rotation	180°	180°
Maximum Torque Mid-Stroke @ 100 PSI	122 in-lbs.	14 N-m
Maximum Torque End of Stroke @ 100 PSI	61 in-lbs.	7 N-m
Weight of Base Unit	5 lbs.	2.3 Kg
Pressure Range	40-100 psi	3-7 bar
Bore Ø (2X)	1.250 in.	31.75 mm
Displacement	3.855 in^3.	63.18 cm^3
Temperature Range		
Standard Seals	32°~150° F	0°~66° C
Viton Seals	32°~150° F	0°~66° C
Actuation Time (180° @ 80PSI/5.5 Bar)	0.41 sec.	0.41 sec.
Actuation Time (90° @ 80PSI/5.5 Bar)	0.36 sec.	0.36 sec.
End Stop Repeatability	±0.02°	±0.02°
End Stop Adjustability	30°	30°
Over-Travel (each direction)	4°	4°
Valve required to actuate	4-way, 2-position	



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

Dimensions are symmetrical about centerline

Third Angle Projection

All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]

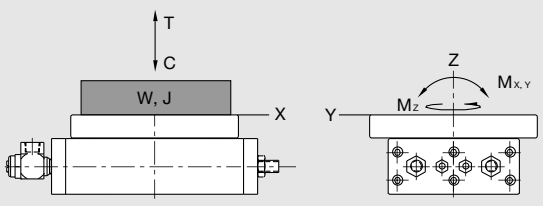
Metric Threads Course Pitch

Imperial in.	Metric [mm]
0.00 = ±.01	[0.] = [±.25]
0.000 = ±.005	[0.0] = [±.13]
0.0000 = ±.0005	[0.00] = [±.013]

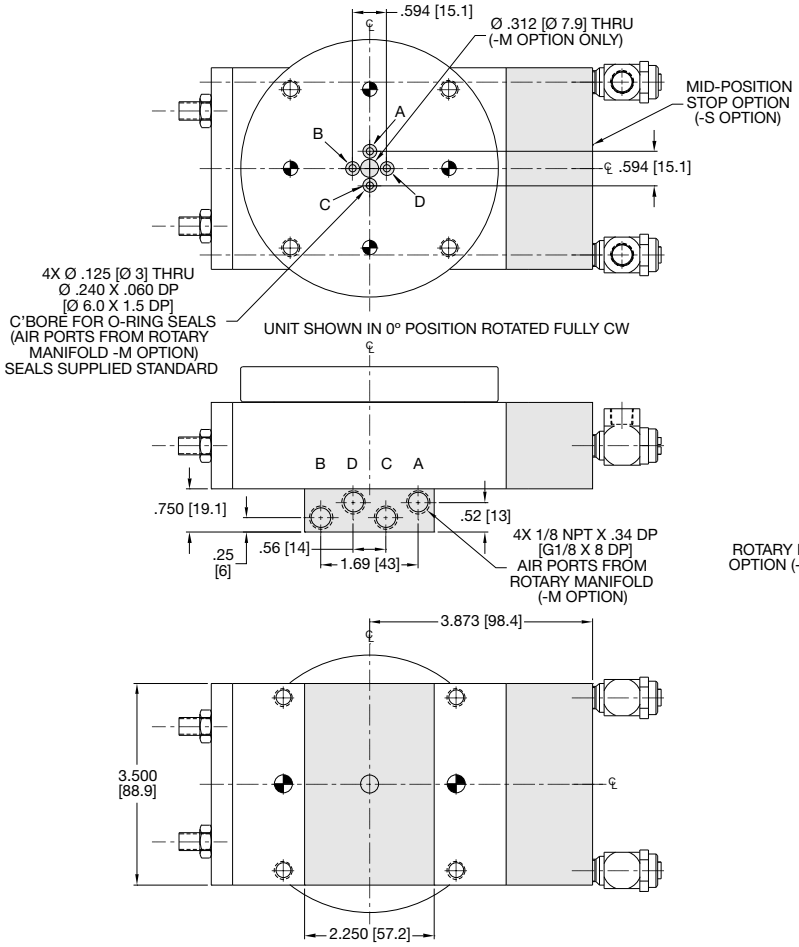
Loading Information

How to Order: (Order Accessories separately from Basic Model)

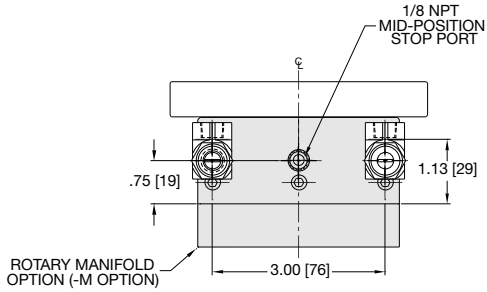
RR-46 See Next Page



Loading Capacity†	Static Imperial	Static Metric	Dynamic Imperial	Dynamic Metric
Maximum Tension **T**	200 lbs	890 N	40 lbs	178 N
Maximum Compression **C**	1000 lbs	4448 N	200 lbs	890 N
Maximum Moment **Mx**	500 in.-lbs.	57 Nm	100 in.-lbs.	11 Nm
Maximum Moment **My**	500 in.-lbs.	57 Nm	100 in.-lbs.	11 Nm
Maximum Payload **W**			15 lbs.	6.8 Kg
Maximum Inertia **J**			0.0970 in-lb-sec^2	.01096 N-m-sec^2



Specifications	RR-46	RR-46M
Weight (base unit)	5.0 lbs.	2.3 Kg
Weight Adder for Mid-Position Stop	0.42 lbs.	0.19 Kg
Weight Adder for Rotary Manifold	0.38 lbs.	0.17 Kg
Pressure Range	40-100 psi	3-7 bar
Bore Ø of Mid-Position Stop 2X	1.314 in.	33.37 mm
Displacement of Mid-Position Stop	2.194 in^3.	35.95 cm^3
Mid-Stop Repeatability	±.5°	±.5°
Temperature Range		
Standard Seals	32°~150° F	0°~66° C
Viton Seals	32°~150° F	0°~66° C
Valve required to actuate Mid-Stop	3-way, 2-position	



MID-POSITION STOP VIEW SHOWN

UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

Dimensions are symmetrical about centerline

Third Angle Projection

All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]

Metric Threads Course Pitch

Imperial in.	Metric [mm]
0.00 = ±.01	[0.] = [±.25]
0.000 = ±.005	[0.0] = [±.13]
0.0000 = ±.0005	[0.00] = [±.013]

How to Order: (Order Accessories separately from Basic Model)

METRIC MID-STOP ROTARY MANIFOLD

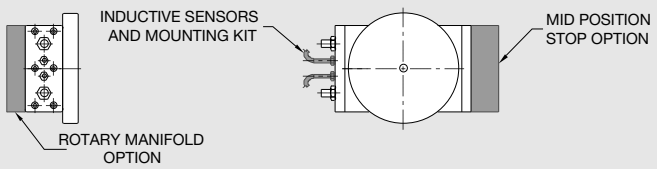
RR-46 M - ___ - S - M - V

BASIC MODEL ROTATION (See below) VITON SEALS

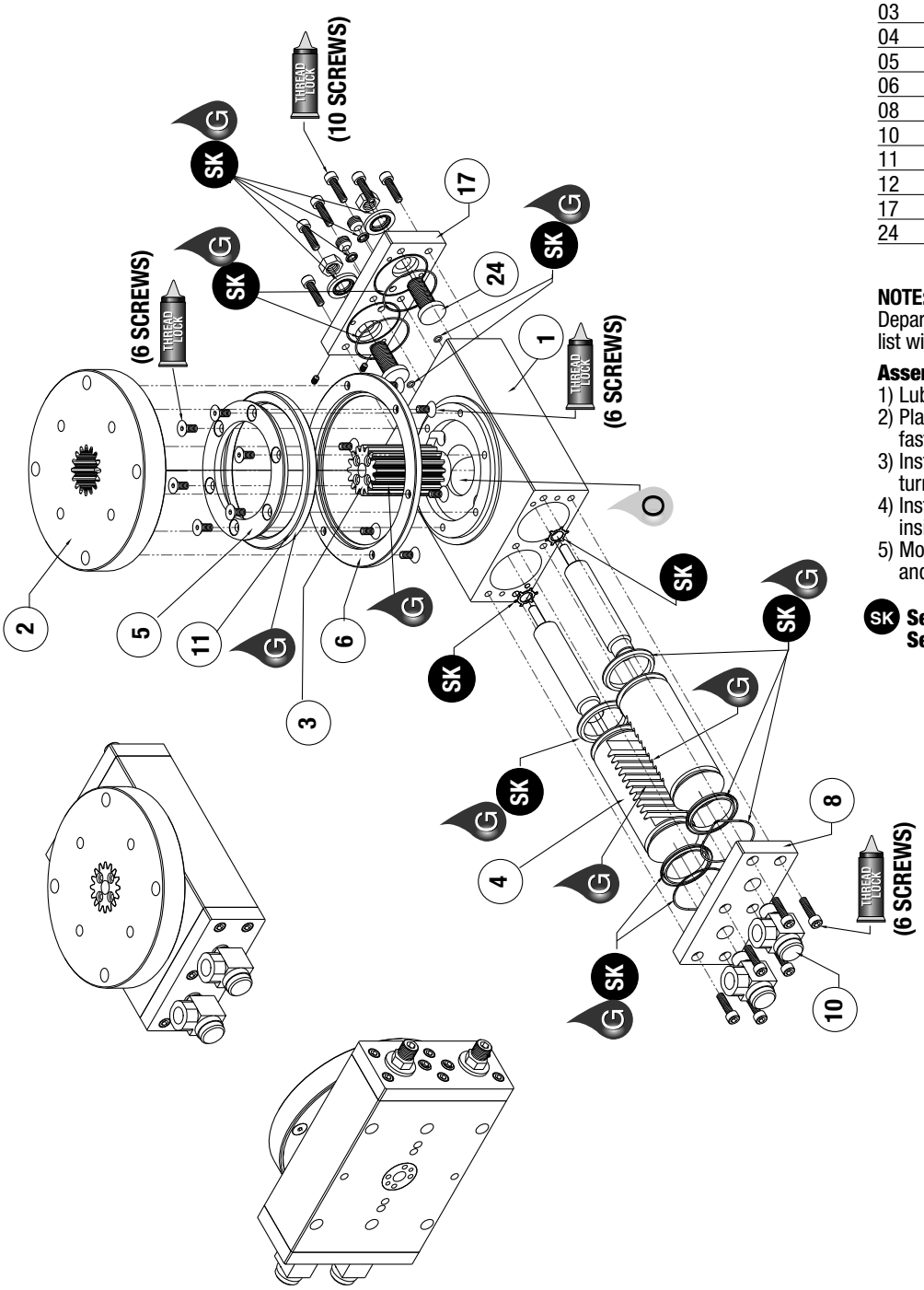
DEGREE OF ROTATION 45°,90°, 135° or 180°
(consult factory for intermediate degrees of rotation)

SENSOR ACCESSORIES	MODEL CODE	ORDER#	QTY/UNIT
Sensor Mounting Kit (Mounts 2 Sensors)		OSMK-024	1
NPN Inductive Sensor with Quick Disconnect*		OISN-014	1 or 2
PNP Inductive Sensor with Quick Disconnect*		OISP-014	1 or 2
Quick Disconnect 2M Cable Length*		CABL-010	1 or 2
Quick Disconnect 5M Cable Length*		CABL-013	1 or 2
PNEUMATIC ACCESSORIES			
Standard Base Unit Seal Repair Kit		SLKT-017	1
Viton Base Unit Seal Repair Kit	-V	SLKT-017V	1
Standard Manifold Seal Repair Kit	-M	SLKT-067	1
Viton Manifold Seal Repair Kit	-M-V	SLKT-067V	1
Standard Mid-Stop Seal Repair Kit	-S	SLKT-068	1
Viton Mid-Stop Seal Repair Kit	-S-V	SLKT-068V	1

*Sensor and cable sold separately.



RR-36 & 46 Series Exploded View



Item	Qty	Name
01	1	Body, Main
02	1	Turntable
03	1	Pinion
04	2	Rack, Piston
05	1	Inner Bearing Ring
06	1	Ring, Outer Bearing
08	1	Plate, Ported End
10	2	Flow Control
11	1	Bearing
12	1	Shock Absorber
17	1	Plate, End
24	2	Stop Adjustment Screws

NOTE: Contact the Robohand Sales Department for a complete spare parts list with order numbers and prices.

Assembly Procedure

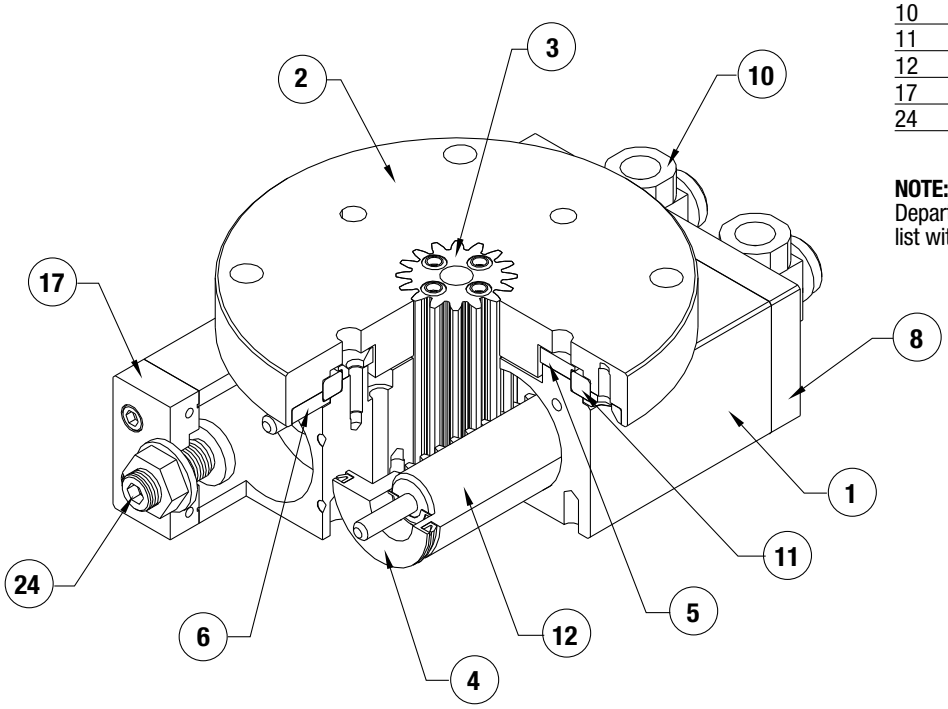
1) Lubricate and install seals.
2) Place outer ring and bearing on body, fasten inner ring to body.
3) Install outer bearing ring on turntable/pinion subassembly.
4) Install shocks in racks and install inside body.
5) Mount end plates, adjustable stops, and flow controls to body.

SK Seal Repair Kit Order #'s See Product Data Sheets

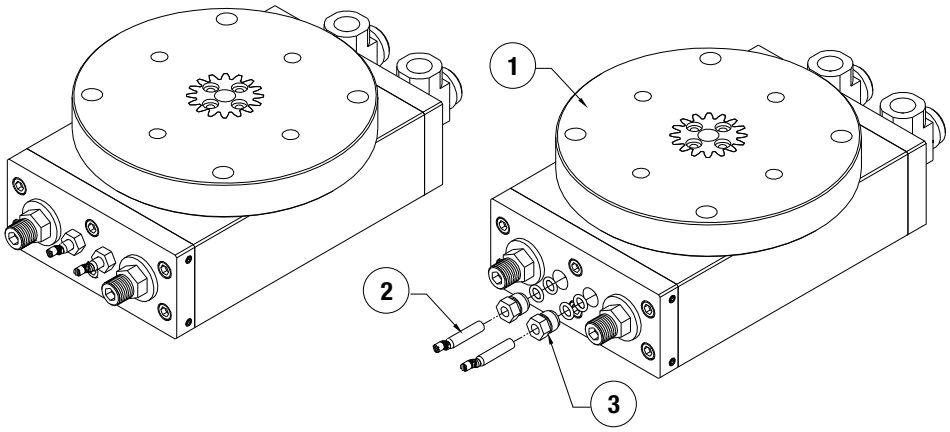
SK Seal Kit Items
THREAD LOCK Thread Locker
KRYTOX Krytox™ Lubricant
O Lightweight Machine Oil
G Teflon® Based Grease
GLUE Super Bonder
Third Angle Projection

Item	Qty	Name
01	1	Body, Main
02	1	Turntable
03	1	Pinion
04	2	Rack, Piston
05	1	Inner Bearing Ring
06	1	Ring, Outer Bearing
08	1	Plate, Ported End
10	2	Flow Control
11	1	Bearing
12	1	Shock Absorber
17	1	Plate, End
24	2	Stop Adjustment Screws

NOTE: Contact the Robohand Sales Department for a complete spare parts list with order numbers and prices.



Accessory Installation & Adjustment Instructions



Installation

For Each Sensor:

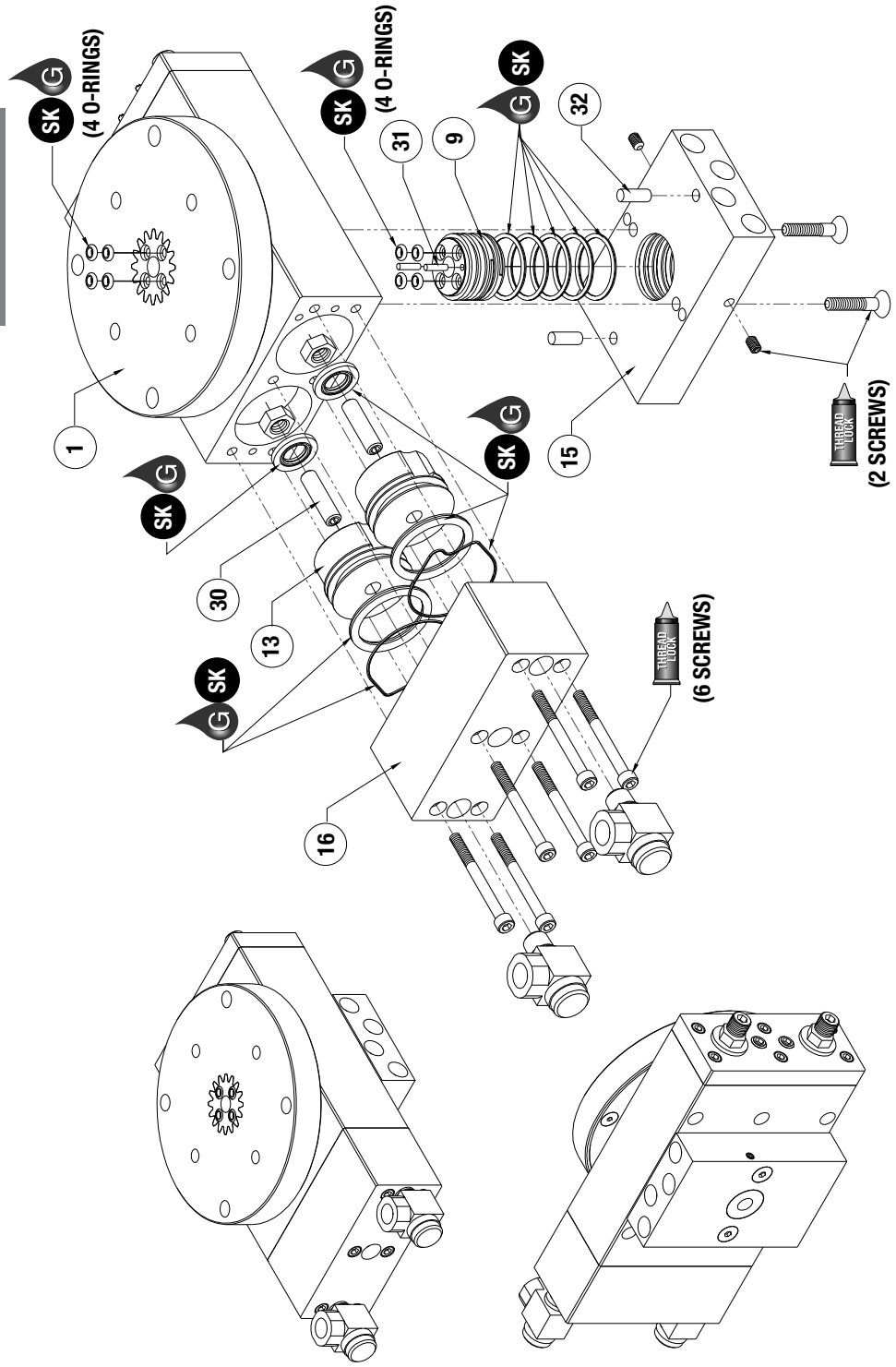
1) Rotate flange so piston rack stops on end stop install sensor as shown, pushing sensor in until it stops.

2) Tighten nut.

Note: Sensors need to be readjusted when end stops are adjusted.

SK Seal Kit Items | THREAD LOCK Thread Locker | KRYTOX Krytox™ Lubricant | O Lightweight Machine Oil | G Teflon® Based Grease | GLUE Super Bonder | Third Angle Projection

RR-36 & 46 Options Exploded View



Item	Qty	Name
RR-36&46-S		
(Mid Position Stop Option)		
13	2	Piston, Midstop
16	1	Body, Midstop
30	2	Mid-Stop Adjustment Screws
RR-36&46-M		
(Rotary Manifold Option)		
09	1	Manifold,Rotary
15	1	Manifold
31	2	Dowel Pin
32	2	Dowel Pin

NOTE: Contact the Robohand Sales Department for a complete spare parts list with order numbers and prices.

Manifold Option
Assembly Procedure

1) Lubricate and install 8 small o-rings. (4 in the pinion, 4 in the rotary manifold body).
2) Install 5 large O-rings on the rotary manifold.
3) Press dowel pin into rotary manifold
4) Install rotary manifold in manifold body.
5) Attach manifold assembly to rotary actuator body.

Mid-Stop Option
Assembly Procedure

1) Lubricate and install o-rings.
2) Install mid-stop pistons, adjustment screws, seal washers, and hex nuts in rotary actuator body.
3) Attach mid-stop body to rotary actuator body.
4) Install flow controls.

Mid-Stop Adjustment Procedure

1) Remove mid-stop body from actuator base.
2) Remove the two mid-stop pistons from the mid-stop body and insert them into their respective cylinder bores in the actuator base.
3) Back off both mid-stop adjustment screws (#30) while pushing the mid-stop pistons firmly into the cylinder bores. The face of the pistons should seat against the actuator base. If not, then continue to back out the stop screws.
4) Turn the turntable to the desired position and advance the mid-stop adjustment screws until both screws touch the main piston faces
5) Re-attach the two mid-stop pistons to the mid-stop body and fasten mid-stop body back onto actuator base.

SK Seal Repair Kit Order #'s See Product Data Sheets

SK Seal Kit Items | THREAD LOCK Thread Locker | KRYTOX Krytox™ Lubricant | O Lightweight Machine Oil | G Teflon® Based Grease | GLUE Super Bonder | Third Angle Projection

Item	Qty	Name
RR-36&46-S		
(Mid Position Stop Option)		
13	2	Piston, Midstop
16	1	Body, Midstop
30	2	Mid-Stop Adjustment Screws
RR-36&46-M		
(Rotary Manifold Option)		
09	1	Manifold,Rotary
15	1	Manifold
31	2	Dowel Pin
32	2	Dowel Pin

NOTE: Contact the Robohand Sales Department for a complete spare parts list with order numbers and prices.

Valve 1:

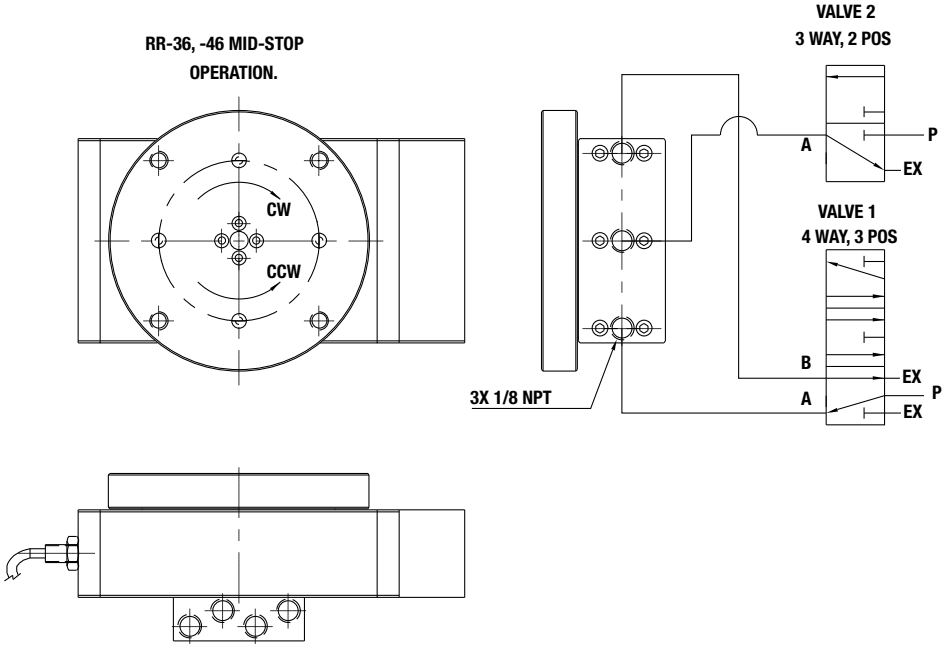
- Actuate Port A to Rotate CW.
- Actuate Port B to Rotate CCW.
- Neutral (Center) position when actuating Valve 2 for mid-position stop.

Valve 2:

Port A Open to Exhaust for Normal Operation.

Actuate Port A for Mid-Position Stop.

Valve1 Must be in Neutral (Center) Position



SK Seal Kit Items | THREAD LOCK Thread Locker | KRYTOX Krytox™ Lubricant | O Lightweight Machine Oil | G Teflon® Based Grease | GLUE Super Bonder | Third Angle Projection