

# Angular Grippers - Cam Driven Series

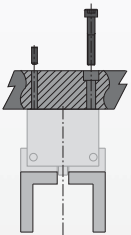
RA SERIES

2.22

- General Purpose:**  
 This style gripper is widely used in the industry and is a rugged design that supplies very high grip force for its size.
- Cost Effective:**  
 The simplified drive mechanism makes these grippers an excellent value.

## Mounting Information:

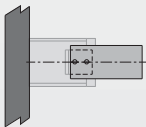
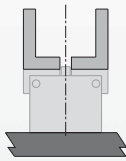
Gripper can be mounted and operated in any orientation



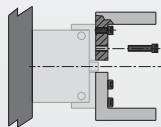
Body mounts with screws and locates with slip fit dowel pins for accuracy



**Warning!** Protect jaw mechanism from falling debris when mounted upside down



Fingers attach to jaws with screws and locate by keying



## Technical Specifications:

Pneumatic Specifications	Imperial	Metric
Pressure Operating Range	40-100 psi	3-7 bar
Cylinder Type	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

Maintenance Specifications†	
Expected Life	5 million cycles
Normal Application 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

### Hard Coat Anodize

The body has hard-coat anodize 60 RC with Teflon® impregnation

### Quality Components

Dynamic components are hardened for wear resistance and long life

### One Piece Body

One piece 7075-T6 aircraft quality aluminum body

### Quality Manufacturing

Components are precision ground for minimal jaw play

### Sensor Magnets

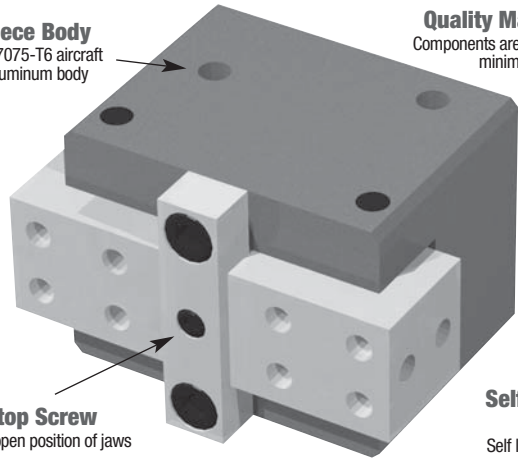
Standard

### Stop Screw

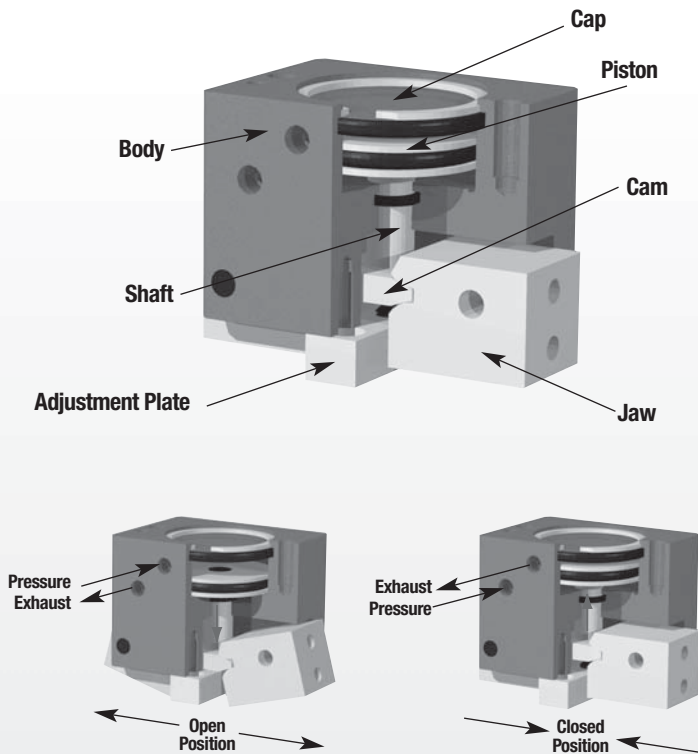
Limits open position of jaws

### Self-Lubricating Seals

Self lubricating dynamic seals (Buna-N only)



## Operating Principle



- A double acting piston is connected by a shaft to a cam.
- The cam rolls in a slot located in each of the jaws converting vertical motion of the wedge into angular synchronous motion of the jaws.
- This gripper is suitable for internal or external gripping.

**Designed and manufactured in the USA**

## Style -RA Angular Gripper

### Size -5M

Style:	RA-5	RA-5M
Stroke:	15° each finger	
Grip Force:	20 lbs.	89 N
Weight:	.25 lbs.	.11 Kg



See Page **2.24**

## Style -RA Angular Gripper

### Size -6M

Style:	RA-6	RA-6M
Stroke:	15° each finger	
Grip Force:	44 lbs.	196 N
Weight:	.68 lbs.	.31 Kg



See Page **2.25**

## Style -RA Angular Gripper

### Size -10M

Style:	RA-10	RA-10M
Stroke:	15° each finger	
Grip Force:	16 lbs.	71 N
Weight:	.06 lbs.	.03 Kg



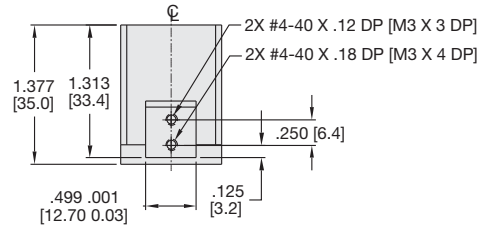
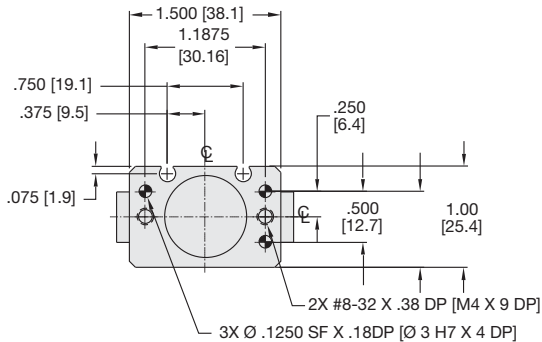
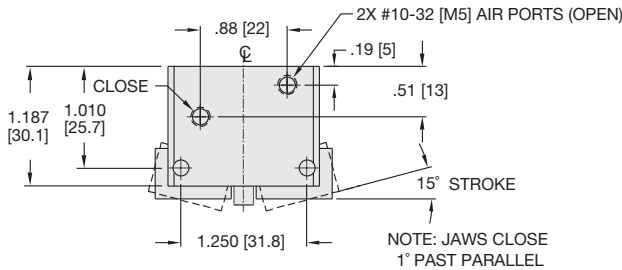
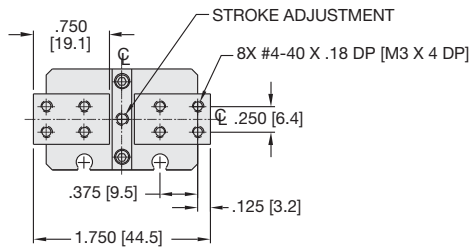
See Page **2.28**

# ANGULAR GRIPPER RA-5M CAM DRIVEN SERIES



RA SERIES

2.24



## Specifications

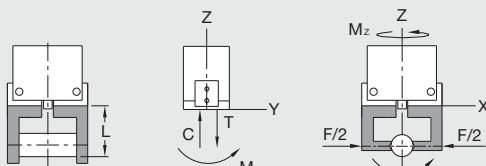
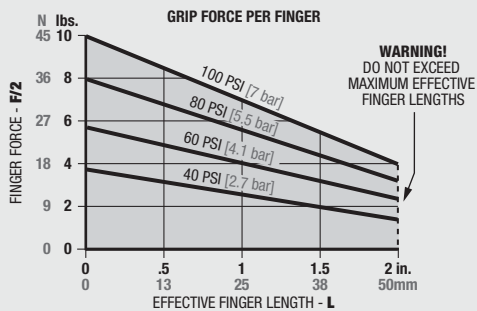
	RA-5	RA-5M
Total Rated Grip Force <b>F</b> @ 100 psi, 7 bar.	20 lbs.	89 N
Stroke	15° of stroke for each finger	15° of stroke for each finger
Open Stroke Adjustment	15° of stroke for each finger	15° of stroke for each finger
Weight	0.25 lbs.	0.11 Kg
Pressure Range	40-100 psi	3-7 bar
Cylinder Bore Ø	.813 in.	20.6 mm
Displacement	0.130 in <sup>3</sup>	2.1 cm <sup>3</sup>
Temperature Range		
Standard Seals	-30°~180° F	-35°~80° C
Viton® Seals	-20°~300° F	-30°~150° C
Actuation	0.10 sec.	0.10 sec.
Accuracy	±0.005 in.	±0.13 mm
Repeatability	±0.003 in.	±0.08 mm
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	<b>Imperial in.</b> 0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	<b>Metric [mm]</b> [0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

## Loading Information

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



### Loading Capacity†

	Static		Dynamic	
	Imperial	Metric	Imperial	Metric
Maximum Tensile <b>T</b>	10 lbs.	44 N	10 lbs.	44 N
Maximum Compressive <b>C</b>	10 lbs.	44 N	10 lbs.	44 N
Maximum Moment <b>M<sub>x</sub></b>	10 in.-lbs.	1.1 Nm	10 in.-lbs.	1.1 Nm
Maximum Moment <b>M<sub>y</sub></b>	10 in.-lbs.	1.1 Nm	10 in.-lbs.	1.1 Nm
Maximum Moment <b>M<sub>z</sub></b>	10 in.-lbs.	1.1 Nm	10 in.-lbs.	1.1 Nm

†Capacities are per set of jaws and are not simultaneous

## BASIC MODEL METRIC

**RA-5 M - V**

## VITON® SEALS

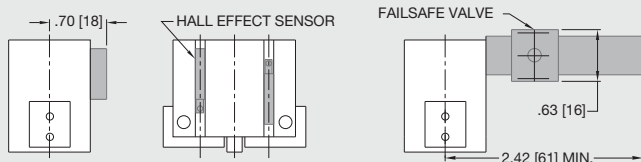
### SENSOR ACCESSORIES

	ORDER #	QTY/UNIT
4mm NPN Magneto Resistive Sensor*	<b>OHSN-017</b>	<b>1 or 2</b>
4mm PNP Magneto Resistive Sensor*	<b>OHSP-017</b>	<b>1 or 2</b>
4mm NPN 90° Magneto Resistive Sensor*	<b>OHSN-011</b>	<b>1 or 2</b>
4mm PNP 90° Magneto Resistive Sensor*	<b>OHSP-011</b>	<b>1 or 2</b>
Quick Disconnect 2 Meter Cable Length*	<b>CABL-010</b>	<b>1 or 2</b>
Quick Disconnect 5 Meter Cable Length*	<b>CABL-013</b>	<b>1 or 2</b>

### PNEUMATIC ACCESSORIES

Fail Safe Valve (Imperial)	<b>OFSV-001</b>	<b>1</b>
Fail Safe Valve (Metric)	<b>OFSV-004</b>	<b>1</b>
Standard Seal Repair Kit	<b>SLKT-022</b>	<b>1</b>
Viton® Seal Repair Kit	<b>SLKT-022V</b>	<b>1</b>

\*Sensor and cable sold separately.

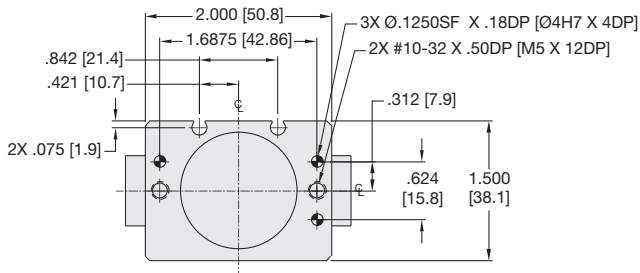
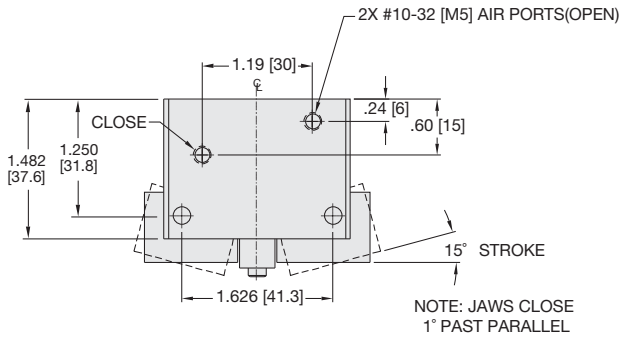
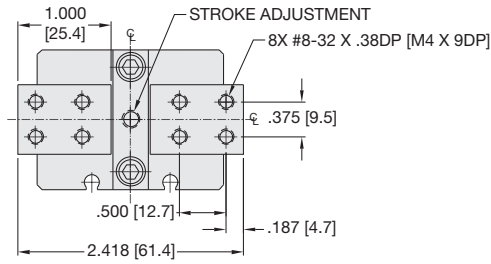




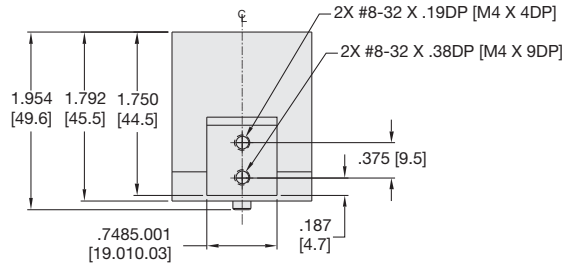
# ANGULAR GRIPPER RA-6M CAM DRIVEN SERIES

RA SERIES

2.25



Specifications	RA-6	RA-6M
Total Rated Grip Force <b>F</b> @ 100 psi, 7 bar4	4 lbs.	196 N
Stroke	15° of stroke for each finger	15° of stroke for each finger
Open Stroke Adjustment	15° of stroke for each finger	15° of stroke for each finger
Weight	0.69 lbs.	0.31 Kg
Pressure Range	40-100 psi	3-7 bar
Cylinder Bore Ø	1.250 in.	31.8 mm
Displacement	0.300 in <sup>3</sup>	4.9 cm <sup>3</sup>
Temperature Range		
Standard Seals	-30°~180° F	-35°~80° C
Viton® Seals	-20°~300° F	-30°~150° C
Actuation	0.11 sec.	0.11 sec.
Accuracy	±0.005 in.	±0.13 mm
Repeatability	±0.003 in.	±0.08 mm
Valve required to actuate	4-way, 2-position	

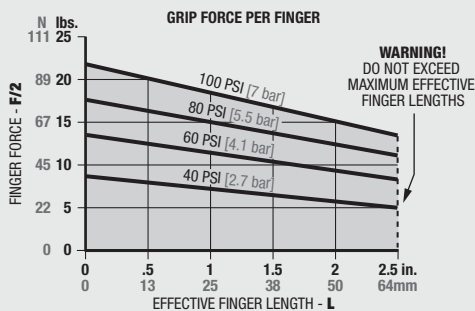


### UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

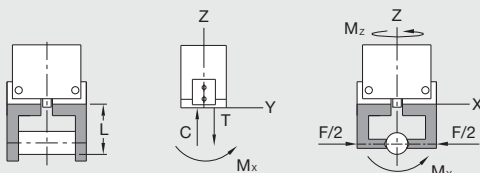
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]
Metric Threads Course Pitch	<b>Imperial in.</b> 0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	<b>Metric [mm]</b> [0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

## Loading Information

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



**WARNING!**  
DO NOT EXCEED  
MAXIMUM EFFECTIVE  
FINGER LENGTHS



### Loading Capacity†

	Static		Dynamic	
	Imperial	Metric	Imperial	Metric
Maximum Tensile <b>T</b>	20 lbs.	89 N	20 lbs.	89 N
Maximum Compressive <b>C</b>	20 lbs.	89 N	20 lbs.	89 N
Maximum Moment <b>M<sub>x</sub></b>	20 in.-lbs.	2.3 Nm	20 in.-lbs.	2.3 Nm
Maximum Moment <b>M<sub>y</sub></b>	20 in.-lbs.	2.3 Nm	20 in.-lbs.	2.3 Nm
Maximum Moment <b>M<sub>z</sub></b>	20 in.-lbs.	2.3 Nm	20 in.-lbs.	2.3 Nm

†Capacities are per set of jaws and are not simultaneous

### BASIC MODEL METRIC

**RA-6 M - V**

VITON® SEALS

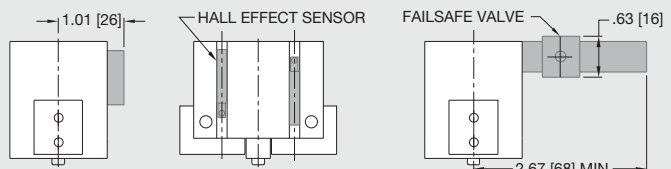
### SENSOR ACCESSORIES

	ORDER #	QTY/UNIT
4mm NPN Magneto Resistive Sensor*	<b>OHSN-017</b>	<b>1 or 2</b>
4mm PNP Magneto Resistive Sensor*	<b>OHSP-017</b>	<b>1 or 2</b>
4mm NPN 90° Magneto Resistive Sensor*	<b>OHSN-011</b>	<b>1 or 2</b>
4mm PNP 90° Magneto Resistive Sensor*	<b>OHSP-011</b>	<b>1 or 2</b>
Quick Disconnect 2 Meter Cable Length*	<b>CABL-010</b>	<b>1 or 2</b>
Quick Disconnect 5 Meter Cable Length*	<b>CABL-013</b>	<b>1 or 2</b>

### PNEUMATIC ACCESSORIES

Fail Safe Valve (Imperial)	<b>OFSV-001</b>	<b>1</b>
Fail Safe Valve (Metric)	<b>OFSV-004</b>	<b>1</b>
Standard Seal Repair Kit	<b>SLKT-023</b>	<b>1</b>
Viton® Seal Repair Kit	<b>SLKT-023V</b>	<b>1</b>

\*Sensor and cable sold separately.

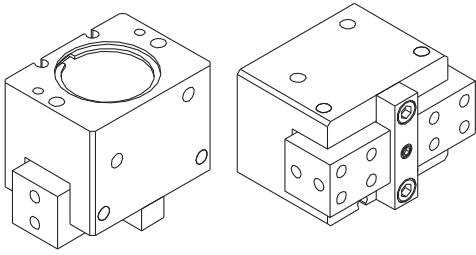


# RA-5 & 6 SERIES EXPLODED VIEW



RA 5 & 6  
SERIES  
MAINTENANCE

2.26



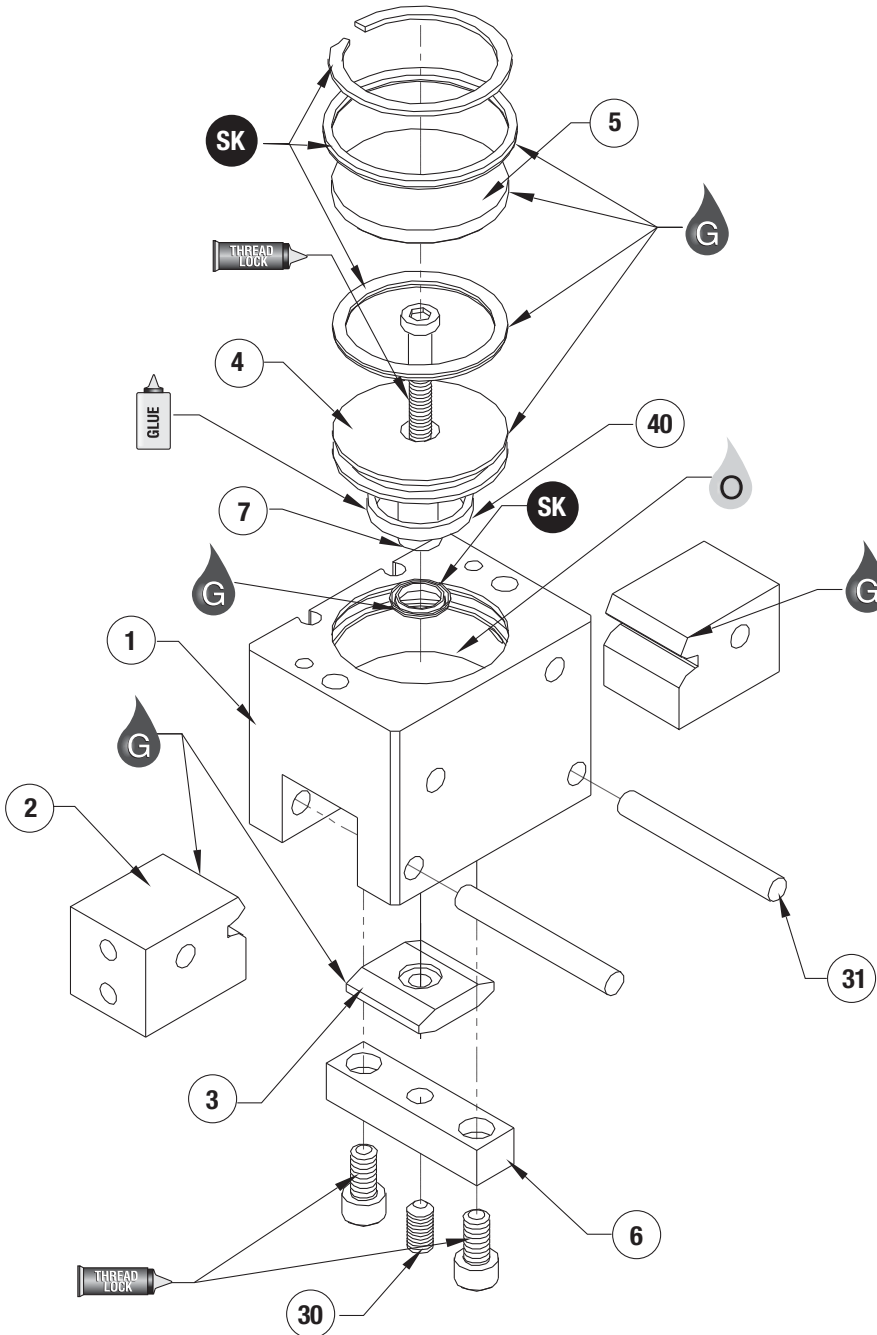
Item	Qty	Name
01	1	Body
02	2	Jaw
03	1	Wedge
04	1	Piston
05	1	Cap
06	1	Plate, Adjustment
30	1	SSS, Nylon Patch, Cup Point
31	2	Dowel Pin
40	2	Magnet

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

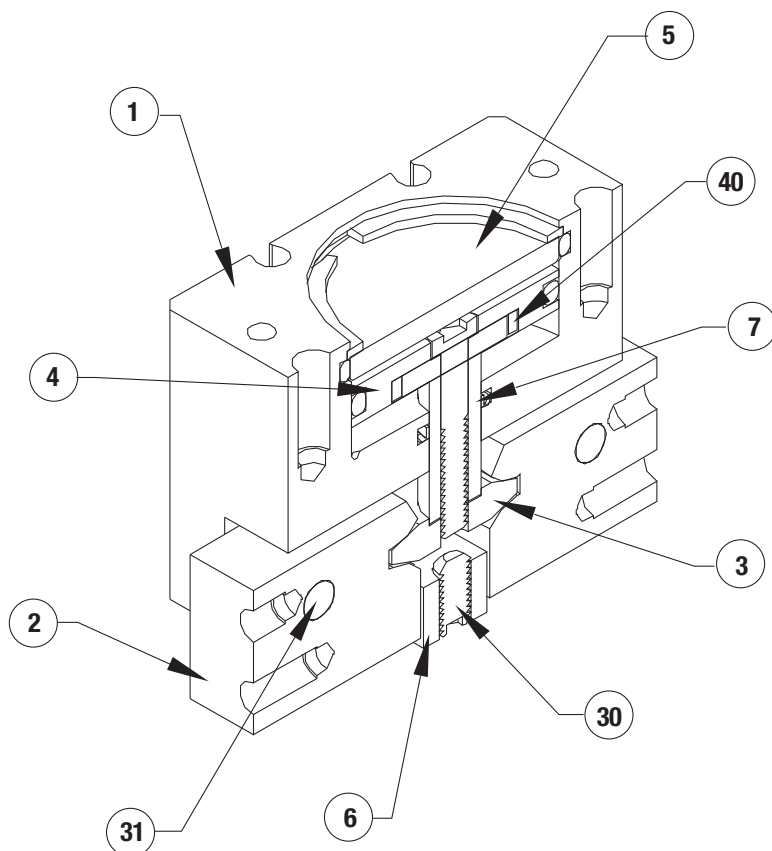
### Assembly Procedure

- 1) Lubricate and install seals.
- 2) Glue magnet into piston.
- 3) Install piston and wedge.
- 4) Install jaws (press dowel pins through fingers from air port side).
- 5) Install cap and retaining ring.
- 6) Install adjustment plate.
- 7) Set adjustment screw for desired stroke.

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



Seal Kit Items	Thread Locker	Krytox™ Lubricant	Lightweight Machine Oil	Teflon™ Based Grease	Super Bonder	Third Angle Projection



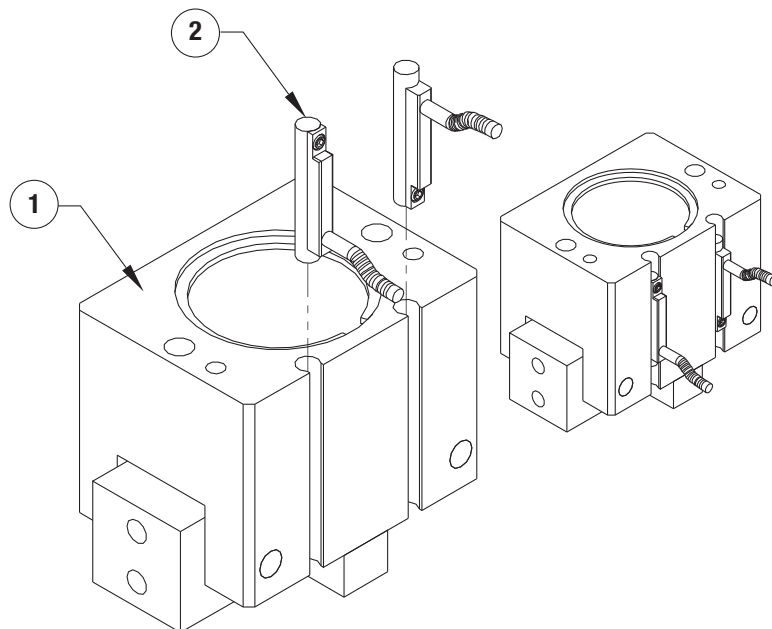
Item	Qty	Name
01	1	Body
02	2	Jaw
03	1	Wedge
04	1	Piston
05	1	Cap
06	1	Plate, Adjustment
30	1	SSS, Nylon Patch, Cup Point
31	2	Dowel Pin
40	2	Magnet

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

RA 5 & 6  
SERIES  
MAINTENANCE

2.27

## ACCESSORY INSTALLATION & ADJUSTMENT INSTRUCTIONS



### Installation

- 1) Install sensors in profile slots as shown.
- 2) Set with integrated set screw.



Seal Kit Items



Thread Locker



Krytox™ Lubricant



Lightweight Machine Oil



Teflon™ Based Grease



Super Bonder



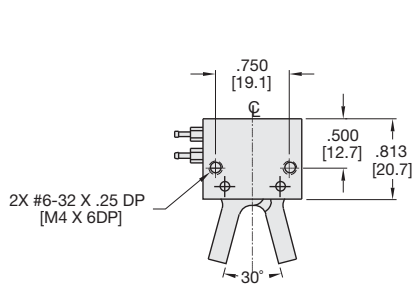
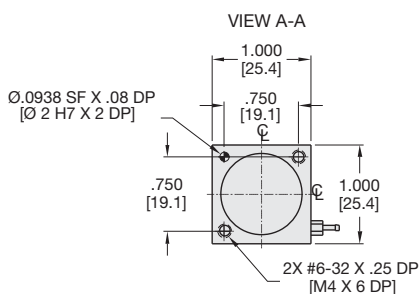
Third Angle Projection

# ANGULAR GRIPPER RA-10M CAM DRIVEN SERIES

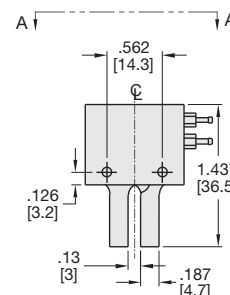
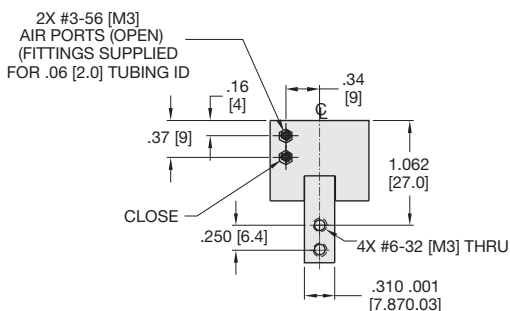


RA SERIES

2.28



NOTE: JAWS CLOSE 1° PAST PARALLEL



## Specifications

	RA-10	RA-10M
Total Rated Grip Force <b>F</b> @ 100 psi, 7 bar	16 lbs.	71 N
Stroke	15° of stroke for each finger	
Weight	0.063 lbs.	0.03 Kg
Pressure Range	40-100 psi	3-7 bar
Cylinder Bore Ø	.813 in.	20.6 mm
Displacement	0.026 in³	.4 cm³
Temperature Range		
Standard Seals	-30°~180° F	-35°~80° C
Viton® Seals	-20°~300° F	-30°~150° C
Actuation Time	0.08 sec.	0.08 sec.
Accuracy	±0.003 in.	±0.08 mm
Repeatability	±0.001 in.	±0.03 mm
Valve required to actuate	4-way, 2-position	

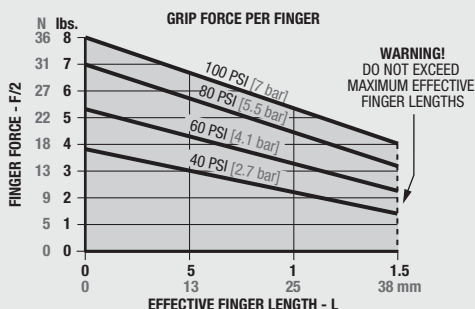
## UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

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

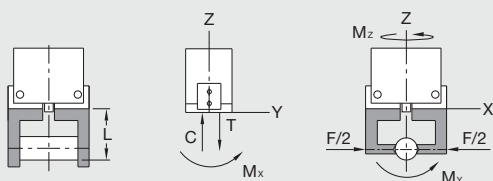
Dimensions are symmetrical about centerline  
All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or ±.013mm  
Metric Threads Course Pitch

## Loading Information

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



BASIC MODEL METRIC  
**RA-10 M - V**  
VITON® SEALS



## PNEUMATIC ACCESSORIES

	ORDER #	QTY/UNIT
Standard Seal Repair Kit	<b>SLKT-018</b>	<b>1</b>
Viton® Seal Repair Kit	<b>SLKT-018V</b>	<b>1</b>

## Loading Capacity†

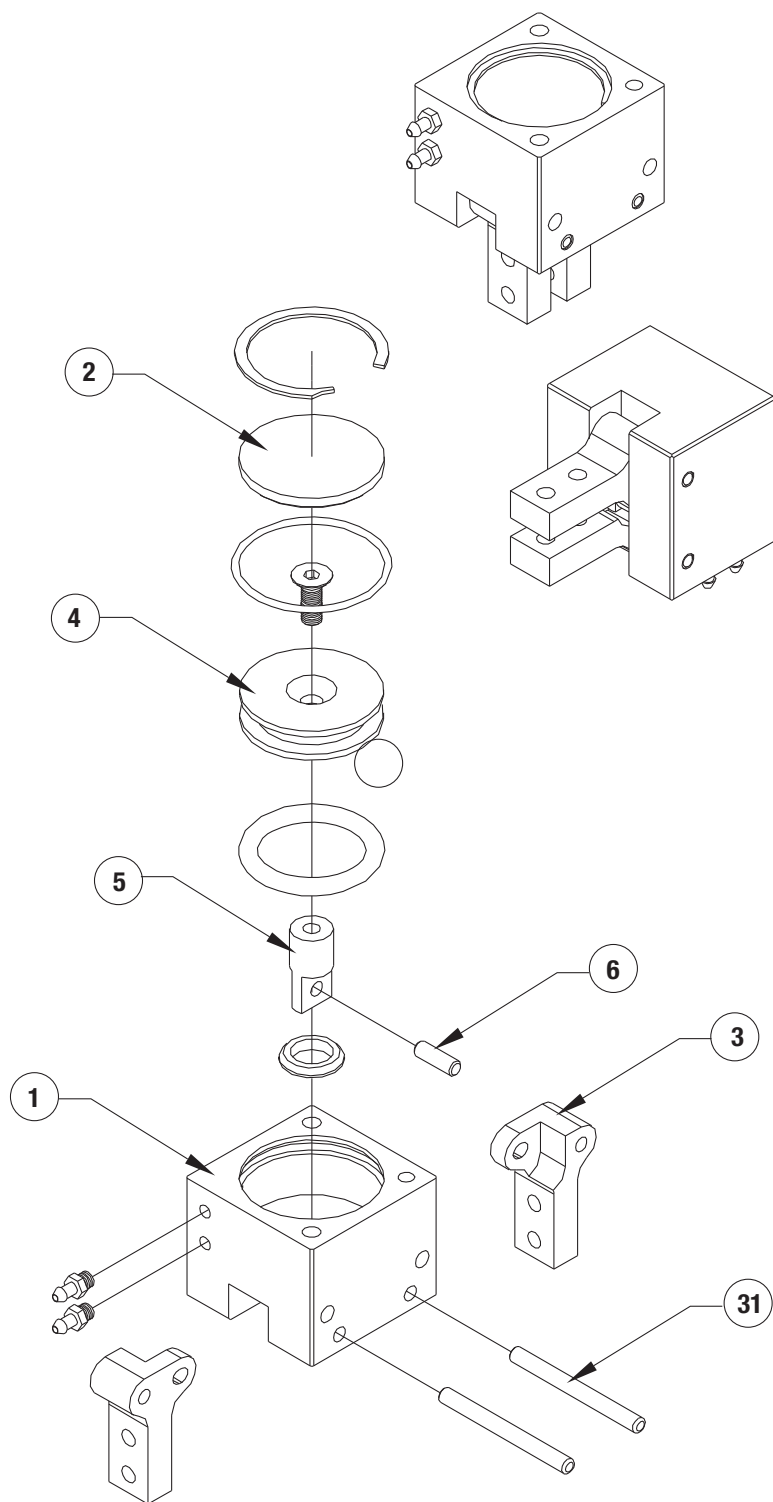
	Static		Dynamic	
	Imperial	Metric	Imperial	Metric
Maximum Tensile <b>T</b>	5 lbs.	22 N	5 lbs.	22 N
Maximum Compressive <b>C</b>	5 lbs.	22 N	5 lbs.	22 N
Maximum Moment <b>M<sub>x</sub></b>	5 in.-lbs.	0.6 Nm	5 in.-lbs.	0.6 Nm
Maximum Moment <b>M<sub>y</sub></b>	5 in.-lbs.	0.6 Nm	5 in.-lbs.	0.6 Nm
Maximum Moment <b>M<sub>z</sub></b>	5 in.-lbs.	0.6 Nm	5 in.-lbs.	0.6 Nm

†Capacities are per set of jaws and are not simultaneous

Item	Qty	Name
01	1	Body
02	1	Cap
03	2	Jaw
04	1	Piston
05	1	Shaft
06	1	Pin
31	2	Dowel Pin

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

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



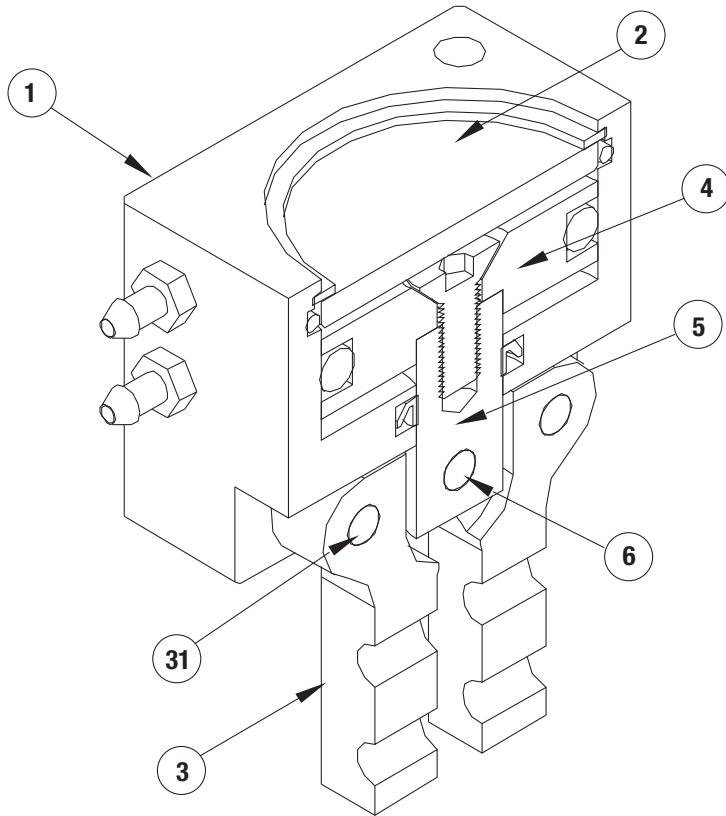
<p>SK Seal Kit Items</p>	<p>THREAD LOCKER Thread Locker</p>	<p>KRYTOX Lubricant</p>	<p>O Lightweight Machine Oil</p>	<p>G Teflon™ Based Grease</p>	<p>GLUE Super Bonder</p>	<p>Third Angle Projection</p>
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# RA-10 SERIES ASSEMBLED VIEW



RA-10 SERIES  
MAINTENANCE  
2.30



Item	Qty	Name
01	1	Body
02	1	Cap
03	2	Jaw
04	1	Piston
05	1	Shaft
06	1	Pin
31	2	Dowel Pin

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

<p>SK Seal Kit Items</p>	<p>THREAD LOCKER Thread Locker</p>	<p>KRYTOX Lubricant</p>	<p>O Lightweight Machine Oil</p>	<p>G Teflon™ Based Grease</p>	<p>GLUE Super Bonder</p>	<p>Third Angle Projection</p>
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# DESIGN NOTES

RA SERIES

2.31

