

### ELECTRIC CYLINDER TECHNICAL INTRODUCTION

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**ActionJac™  
Electric Cylinders**



## ACTIONJAC™ CYLINDERS

ActionJac™ Electric Cylinders are ruggedly designed and produced in standard models with thrust capacities from 500 lbs. to 40,000 lbs. Electric Cylinders are intended for use in industrial environments and feature ground and hard chrome plated actuator tubes with industrial enamel paint on exterior surfaces. Epoxy paint available on request. Electric Cylinders can be supplied for outdoor applications.

These cylinders may be used individually or in multiple arrangements. Each ActionJac™ Electric Cylinder is built to specification.

### DD WORM GEAR ELECTRIC CYLINDERS

DD or "Direct Drive" worm gear driven Electric Cylinders incorporate an alloy steel worm which drives a high strength bronze worm gear (drive sleeve). The worm shaft is supported on anti-friction tapered roller bearings with external

seals provided to prevent loss of lubrication (sealed radial ball bearings on the Series 5 and Series 10 units). The drive sleeve is supported on anti-friction tapered roller or ball thrust bearings. The jack housing is made of ductile iron and proportioned to support the rated capacity of the unit.

In operation, the drive sleeve rotates the lift shaft causing the actuator tube to extend and retract from the housing tube. Actuator tube must be secured to prevent rotation.

Motors can be mounted to DD Electric Cylinders by using available standard motor mounts. For use in multiple cylinder arrangements, DD Electric Cylinders can be supplied without motor mounts.

The DD Electric Cylinders are available in Acme Screw or Ball Screw versions and have a variety of worm gear ratios resulting in a wide range of speeds and thrust capacities. (SEE FIG. 1)

### RAD WORM GEAR ELECTRIC CYLINDERS

RAD worm gear driven Electric Cylinders incorporate the features of the DD with a second stage of gear reduction. This secondary worm gear reduction of the RAD Electric Cylinders provides higher thrust at lower speeds. The reducer and motor can be mounted in eight possible positions for maximum flexibility.

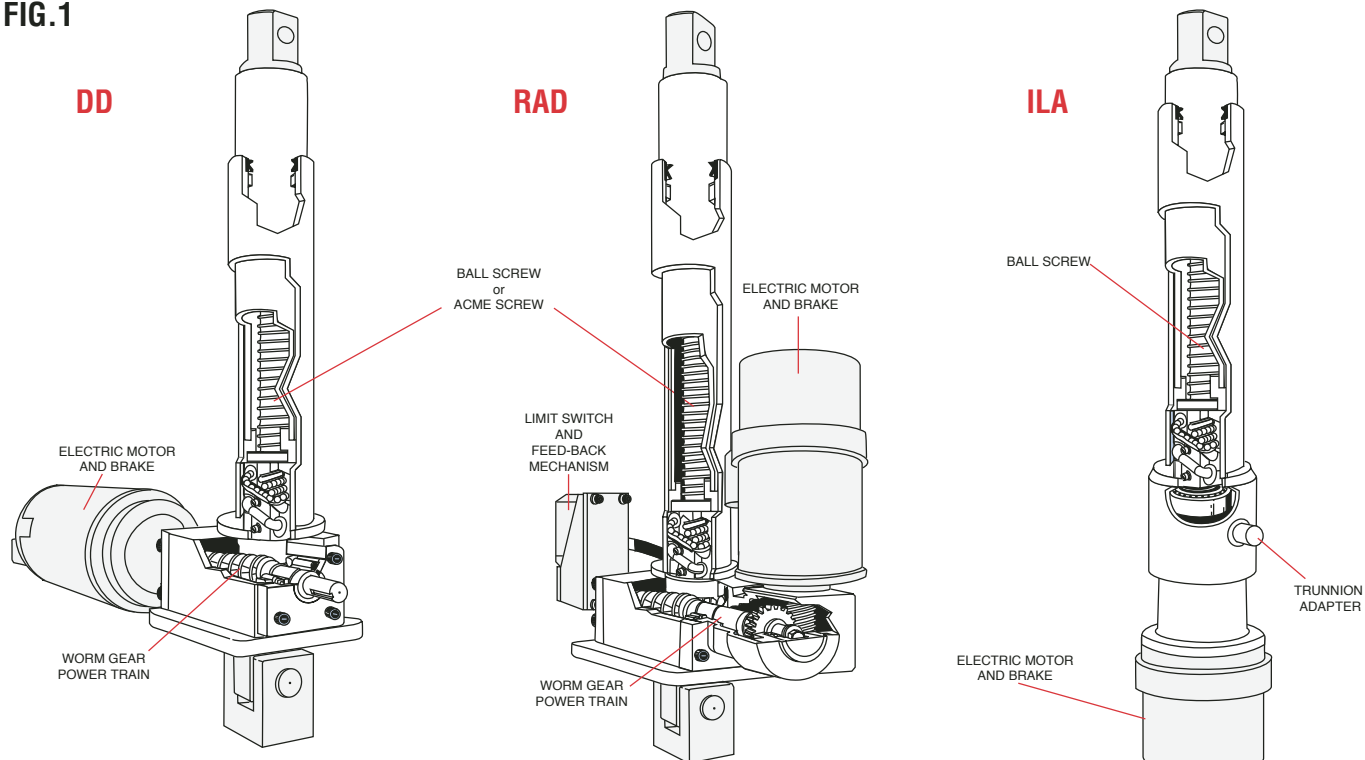
RAD Electric Cylinders are available in Acme Screw or Ball Screw versions. (SEE FIG. 1)

### ILA ELECTRIC CYLINDER

The ILA ActionJac™ In-Line Electric Cylinders are designed to have a motor or gear reducer directly coupled to the lift shaft. This provides for fast, precise operation and/or higher duty cycles.

ILA Electric Cylinders feature standard trunnion pin mounting and are easily adapted for use with servo motors and planetary gear reducers. (SEE FIG. 1)

FIG. 1



**GLOSSARY & TERMS**

In-line Electric Cylinders are Ball Screw actuated. Configurations are available with keyed and un-keyed actuator tubes.

**ACCESSORIES**

Accessories such as motors, motor mounts, encoders, hand wheels, counters, couplings, miter gear boxes, boots, limit switches, clevises, clevis pins and clevis brackets are available. (SEE FIG. 2)

**NOTE:** Units are not to be used for personnel support or movement.

**GLOSSARY & TERMS**

**BACKLASH**

Backlash (lash) is the relative axial movement between a screw and nut without rotation of the screw or nut. Backlash in cylinders occurs wherever reversible load conditions exist. Backlash is less than .015" for all but the largest cylinder models.

Ball Screw Cylinders can be factory adjusted to reduce backlash at the lift shaft by selecting bearing ball size in the ball nut. This selective fit technique can be used to achieve a minimal lash between the ball nut and ball screw of .003" to .005". Precision ball screws with preloaded nuts can be supplied when less than .003" backlash is required.

**REACTION TORQUE**

When an electric cylinder is used to move a load, the actuator tube must be secured to prevent rotation. The reaction torque required to prevent rotation is a function of the screw lead and the load applied on the cylinder. See product specification sheets for rod reaction torque.

Prior to installation, the actuator tube can rotate freely in or out of the cylinder without movement of the input worm. This ability to rotate

aids installation but prevents the optional rotary limit switch from being factory preset for end of travel positions.

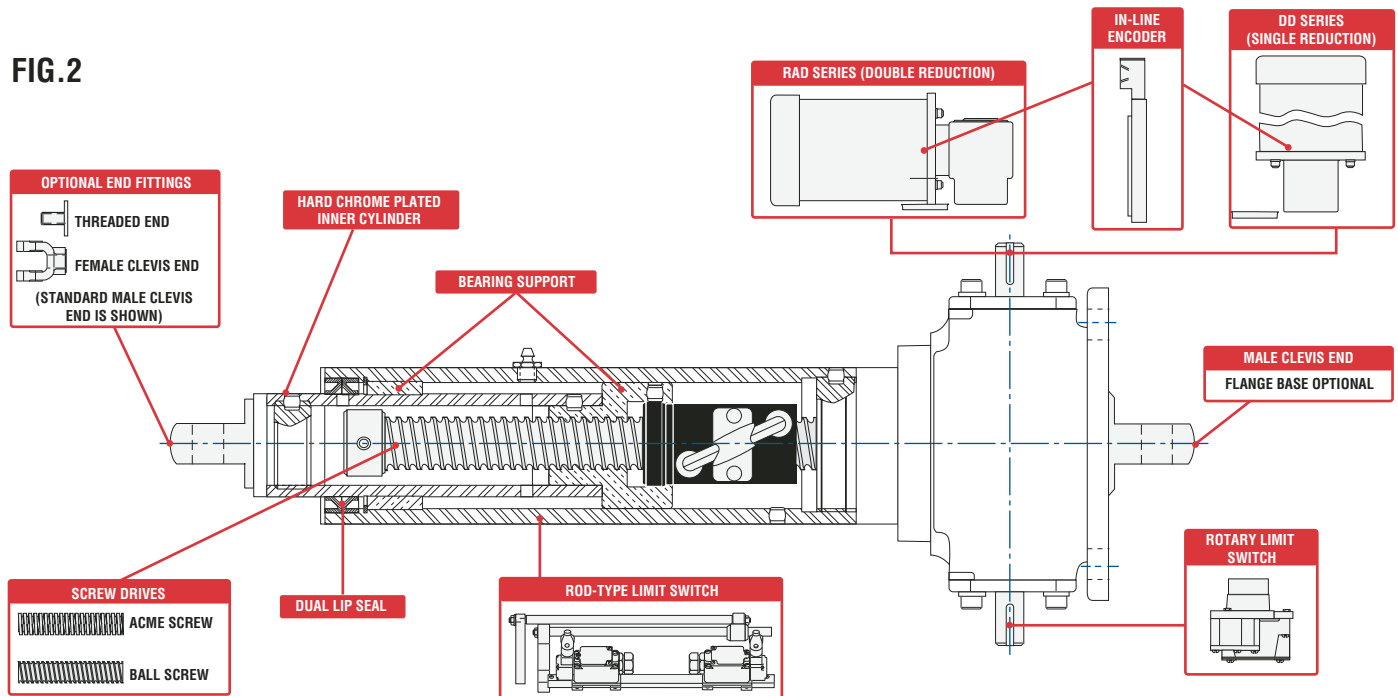
Rod-Type Limit Switches prevent tube from freely rotating but are not intended to absorb rod reaction torque.

**TRAVEL LENGTH**

Electric Cylinders are not pre-assembled or stocked with standard length screws. Each cylinder is made to order based on travel length.

Cylinders can be built with non-standard lead screws to change the cylinder operating speed or with ground or preloaded screws if required by the application. Contact Nook Industries for availability of special units.

**FIG.2**





### LEAD ACCURACY

Lead accuracy is the difference between the actual distance traveled versus the theoretical distance traveled based on lead. For example: Consider a lift shaft with a .5" lead and +/- .004"/foot lead accuracy. If the shaft is rotated 24 times, the distance the nut moves is 11.996 to 12.004 inches.

The rolled thread screws, as employed in ActionJac™ products, are held within +/- .004" per foot lead error.

### INPUT TORQUE

The input torque is the rotary force required at the input of the cylinder to generate an output force at the actuator tube. The torque necessary to raise one pound is shown in charts on pages 384-385. This number multiplied by the load is the required input torque.

Due to static friction, starting or "breakaway" torque can be as much as two to three times running torque. If the load is moved horizontally, the force required to move the load will be lessened in proportion to the coefficient of friction of the surface along which the load is moved. In addition, the force needed to start, stop and hold the load (inertia loading) is provided by the cylinder. Cylinder sizing should consider all these forces.

If an application calls for several cylinders to be driven together in series, input torque values should be limited to three times the rated value of the first cylinder. For multiple high lead (HL, SL) ball screw cylinders contact Nook Industries for allowable input torque values. Multiple cylinders driven in a series may require operation at reduced load.

### INPUT SPEED

DD and RAD ActionJac™ Electric Cylinder models are rated at 1725

rpm input. If provided without a motor, cylinders may be operated up to 3000 rpm provided horsepower and temperature ratings are not exceeded. Contact Nook Industries engineers if higher speeds are required.

When using variable speed motors, use the Input Turns Per Inch Of Travel information from the Electric Cylinder Design Data table to determine actual travel speed. Input speed (rpm) divided by input turns per inch of travel produces the travel speed in inches per minute.

**NOTE:** That maximum horsepower values should not be exceeded.

### DUTY CYCLE

Duty cycle is the ratio of run time to total cycle time. Some of the electrical energy input to an electric cylinder is converted into heat. The duty cycle is limited by the ability of the electric cylinder to dissipate this heat. An increase in temperature can affect the properties of some components resulting in accelerated wear, damage and possible unexpected failure.

Ratings for DD and RAD Electric Cylinders are based on intermittent operation. The approximate allowable duty cycles for DD and RAD worm gear cylinders are:

Ball Screw versions = 35%

Acme Screw versions = 25%

Housing temperature should be monitored and kept below 200°F maximum. Continuous or heavy-duty operation is possible by de-rating the cylinder capacity, external cooling of the unit or through the use of a recirculating lubrication system.

ILA and ILAK cylinders are direct drives with no internal gears. Duty cycle for these cylinders is a function of the motor or add-on gear box.

### SELF-LOCKING AND BRAKES

Self-locking occurs when system efficiencies are low enough that the force on the actuator lifting tube cannot cause the drive system to reverse direction. Actionjac Electric Cylinders that utilize acme screws and have ratios of 20:1 or greater are self-locking and, in the absence of vibration, will hold loads without backdriving. All other models require a motor brake to prevent backdriving.

Holding torque is the amount of input torque required to restrain the load once stopped. The standard brake torque shown in the product specification sheets for DD and RAD Cylinders will stop low inertia loads within the stopping distances shown. Larger brakes may be required to stop high inertial loads or stop travel in shorter distances. Contact Nook Industries, for recommendations.

### TEMPERATURE

All Actionjac™ Electric Cylinders are suitable for operation within the specified limits, provided that the housing temperature is not lower than -20°F or higher than +200°F. Factory supplied grease in standard units will operate in this range. For higher or lower operating temperature ranges contact Nook Industries, for recommendations.

### END-OF-TRAVEL STOPS

Travel stops are not standard. A limit switch and a brake should be used to stop the motor. Mechanical stops can cause damage to the cylinders because most electric motors will deliver stall torques much higher than their rated torques and motor inertia can cause severe shock loads. For hand operation, mechanical stops can be provided.



**DESIGN CONSIDERATIONS**

ELECTRIC CYLINDER TECHNICAL INTRODUCTION

**DESIGN CONSIDERATIONS**

**BALL SCREW VS. ACME SCREW CYLINDER**

The decision to use a Ball Screw or an Acme Screw Cylinder is based on the application. For many applications, a ball screw model is the best choice. Ball screw cylinders are more efficient and therefore require less power than an acme screw cylinder in the same application.

For low duty cycle applications, for hand-operated applications, or if backdriving is not acceptable consider an acme screw cylinder.

Ball Screw Cylinders are preferred for:

- Long, predictable life
- High duty cycles
- Oscillating motion

Acme cylinder is preferred for:

- Resistance to backdriving
- Vibration environments
- High static loads

**LOAD CAPACITY**

All anticipated loads should be within the rated capacity of the cylinder. Loads on the cylinder in most applications include: static loads, dynamic or moving loads, cutting forces or other reaction forces and acceleration/ deceleration loads.

For shock loads, the peak load must not exceed the rated capacity of the cylinder, and an appropriate design factor should be applied commensurate with the severity of the shock.

For accidental overloads not anticipated in the design of the system, cylinders can sustain without damage the following

overload conditions: 10% for dynamic loads, 30% for static loads.

For multiple cylinder systems, load distribution should be considered. System stiffness, center of gravity, drive shaft windup and lead variation in the lift shafts may result in unequal load distribution.

**HORSEPOWER RATINGS**

Standard DD and RAD Electric Cylinder Models are supplied with electric brake-motors sized for the load and speed rating of the cylinder.

The allowable duty cycles for DD and RAD worm gear cylinders being used at full rated load are:

Ball Screw Cylinders = 35%

Acme Screw Cylinders = 25%

If an Electric Cylinder is applied at less than rated capacity, higher duty cycles may be possible. The best way to determine allowable duty cycle is to measure the cylinder gear housing temperature. The temperature of the housing near the worm must not exceed 200°F.

For Electric Cylinders supplied without brakemotors, use the information in the “Electric Cylinder Design Data” chart for motor sizing.

The horsepower is calculated by using the following formula:

$$\text{Horsepower per cylinder} = \frac{\text{Torque to raise one pound} \times \text{Number of pounds to be raised} \times \text{Input rpm}}{63,025}$$

The “Torque to raise one pound” value is particular to each cylinder and can be obtained from the “Electric Cylinder Design Data” chart on pages 384-385.

Maximum horsepower ratings are based on intermittent operation.

To determine whether performance is within horsepower and duty cycle limits, measure the cylinder temperature. The temperature of the housing near the worm (or at the thrust bearing mounting block for ILA cylinders) must not exceed 200°F.

Do not exceed the maximum allowable input horsepower for a cylinder.

**COLUMN STRENGTH**

Electric Cylinder capacity may be limited by its column strength. Column strength is the ability of the cylinder to hold compressive loads without buckling. With longer screw lengths, column strength can be substantially lower than nominal cylinder capacity. When the lift screw is in tension only, stroke is limited by available screw and/or tube material or by screw critical speed. If there is any possibility for the cylinder to go into compression, the application should be checked for sufficient column strength.

The charts on each cylinder specification page are used to determine the cylinder size in applications where the lift screw is loaded in compression.

The charts assume proper cylinder alignment with no bending loads present. Effects from side loading are not included in this chart. Also, cylinders operating horizontally with long lift screws can have significant bending from the weight of the screw and tubes. Consult Nook Industries, if side loads are anticipated.



### CYLINDER SIZING DATA

Cylinders are limited by two constraints: load capacity and horsepower. The load capacity of the cylinder is limited by the physical constraints of its components (drive sleeve, lift shaft, bearings, etc.). The horsepower limit of the cylinder is a result of the ability to dissipate the heat generated from the inefficiencies of its components.

In order to test for these constraints, application information must be collected. The data required to size a cylinder includes:

**1) Total Load** – The total load includes static loads, dynamic loads and inertia loads from acceleration and deceleration. Also consider reaction forces received from the load such as drilling or cutting forces when using a cylinder to move a machine tool.

**2) Number of Cylinders** – The number of cylinders used depends on physical size and design of the equipment. Stiffness of the equipment structure and guide system will determine the appropriate number of cylinders required. Fewer cylinders are easier to drive, align and synchronize. For multiple-cylinder arrangements, do not assume equal loading. Calculations should be based upon “worst case” unequal loading.

**3) Travel Rate** – Establishing a travel rate allows for a quick cylinder selection and will be used to evaluate critical speed and horsepower limits. The desired rate should include time for acceleration/deceleration.

**4) Travel** – Travel is the total distance the cylinder extends. This is the number that is used to calculate maximum compressive load. For cylinders with non-standard retracted lengths include

the additional length in the compressive load evaluation.

**5) Duty Cycle** – The duty cycle is the ratio of run time to the total cycle time.

**6) Type of Guidance** – Every linear motion system needs something to move the load and something to guide the load. The degree of guidance (stiffness, accuracy, etc.) is based on application requirements.

### CYLINDER SELECTION

Once the cylinder sizing information is collected, a preliminary cylinder selection can be made and verified.

**1) Select a standard cylinder** – Use the DD and RAD Model Quick Reference Chart page 374 to find a unit which matches the desired force and speed. Choose between a ball screw or acme screw model based on duty cycle (model suffixes which begin with “A” are acme models).

**2) Travel Length** – When a unit is chosen, go to the product specification page for that model. Check that the desired travel length does not exceed column strength and maximum travel limits. A larger capacity cylinder may be required in order to stay within these limits.

**3) Reference Number** – Use the information on page 389 to specify a complete Electric Cylinder Reference Number.

If the cylinder is to be used with a motor other than those listed in the catalog, if multiple cylinders are used or if the cylinder is manually operated, go to the Electric Cylinder Design Data on pages 384-385.

**1) Select a cylinder** – Choose a model whose basic capacity matches or exceeds the expected

load. Make certain the dynamic and static loads do not exceed the cylinder capacity. In multiple cylinder applications, check the distribution of the load for potential uneven loading on the cylinders.

**2) Speed** – Use the “turns for one inch of travel” from the chart to determine the input speed required. If travel rate and motor speed are known, divide the motor speed (rpm) by the travel rate (inches per minute) to determine the “turns for one inch of travel.”

**3) Motor Horsepower** – Calculate the horsepower required from the load, speed and “torque to raise one pound value” from the chart. Use the horsepower calculation on page 369.

If using the cylinders in multiple cylinder systems, check the total horsepower. Remember that additional gearboxes and couplings used to distribute power to the cylinders are not 100% efficient.

If the horsepower required exceeds the maximum value for the cylinder selected, several solutions are possible.

- Use a larger cylinder model to increase the maximum allowable horsepower
- Use a Ball Screw Cylinder to reduce the power required to do the same work
- Operate at a lower input speed
- Use a RAD cylinder to bring the power requirement within acceptable limits

Upon selecting a motor and brake, verify that the brake has sufficient torque to both hold the load and stop the load.

**CAUTION:** Cylinders with high lead ball screws (HL and SL) may



## DESIGN CONSIDERATIONS

require larger brakes to stop the load. An appropriately sized brake will insure against excessive "drift".

**4) Column Strength** – If it is possible for the cylinder to be loaded in compression, check for column strength. Consider cases where a unit normally loaded in tension can be compressively loaded if it runs into an obstruction. Also check horizontal applications for compressive loading due to acceleration or deceleration.

**5) Cycle Time** – If using a worm gear style Electric Cylinder, make sure cycle time does not exceed the allowable duty cycles.

**6) Life** – For Ball Screw Cylinders, check life expectancy against the life charts.

**7) Reference Number** – Use the information on page 389 to specify a complete Electric Cylinder Reference Number.

**INSTALLATION**

The alignment of the cylinders directly affects their service life. Cylinders must be properly aligned in all planes so the actuator tube can move in and out without evidence of binding.

Since the majority of cylinder applications use the cylinders with clevis or trunnion mounts, simply align the clevises and install the cylinder.

Set limit switches before operating. Allow for drift when setting the position. The actuator tube can move (rotate) until the unit is installed. Turn the actuator tube in or out to get the cylinder to a known position before installation to prevent over-travel.

**MAINTENANCE**

ActionJac™ Electric Cylinders require minimum maintenance. In addition to maintaining lubrication

levels in the gearbox and tubes, the following items should be checked:

- The actuator tube should be kept free of dirt. If possible, the actuator should be returned to the retracted position when not in use.
- For acme cylinders, lash between the lift shaft and travel nut greater than 1/4 the screw pitch indicates the need for replacement of the cylinder lift shaft components. Refer to the acme section for the specifications on the nut used.
- For machine screw or ball screw worm gear Electric Cylinders, check for excessive backlash between the worm and worm gear. Lash in excess of 30° for ratios 5:1 to 8:1 and 60° for ratios 20:1 and 24:1 indicates the need to replace the worm and worm gear.

**LUBRICATION**

Actionjac™ Electric Cylinders require lubrication to operate efficiently and with maximum life. Standard lubrication is NLGI #1 grease. If operating conditions exceed -20° F to 200° F, contact Nook Industries, for alternative lubricants.

The cylinder gear boxes are shipped pre-greased unless otherwise specified. Before operating any unit, check the lubricant level. All cylinder housings are furnished with a grease fitting. Most have a pipe plug opposite the grease fitting. When adding grease to the housing, remove the pipe plug and fill the unit until grease exits the pipe plug opening. Overfilling the cylinder may result in grease leakage from the seals.

In normal operation, cylinder lubricant levels should be checked once per month. Application conditions may dictate a more or

less frequent lubrication cycle. In extreme conditions, automatic lubrication may be desired.

Lubricants containing additives such as molydisulfide or graphite should not be used.

The lift shafts (ball and acme screws) inside the Electric Cylinder actuator tube receive lubrication through the fittings on the outside of the housing tube. Lubrication added to the housing tube can pass to the screw regardless of actuator tube position, but there is a guide at the bottom outside of the actuator tube which runs along the inside of the housing tube. The best way to lubricate this section of the cylinder is to add some lubricant when the cylinder is fully retracted and additional lubricant when the cylinder is extended beyond where the guide is past the lube port (see cylinder cutaway view on page 367).



### Application #1 – HVAC DUCT VALVE

An HVAC 6' x 6' duct valve is located 30 feet above a manufacturing process facility floor. The baffle needs to be adjusted periodically to maintain proper airflow through the building. The loads, duty cycle and other operation details have been identified. The concern is with the amount of dust and particulate that will accumulate on the actuator due to the fact that it is located directly above foam manufacturing equipment.

#### SPECIFICATIONS:

- Maximum force to open and close the valve under maximum airflow is 2,000 lbs.
- Cylinder will be in compression
- Maximum speed is 32 inches per minute
- Actuation cycle: 2 times per day; 365 days per year
- Desired design life is twenty years
- Mechanism must be mounted overhead
- Limit Switches needed
- Maximum stroke is 18 inches

#### ANALYSIS:

There is a specific life requirement so a ball screw actuator is needed. As shown on the Series DD-25 product reference page 366, using the DD-2512-HD with a 1/2 hp brake motor will provide a travel rate of 36"/min and give 4.1 million inches of life at 2000lbs. Additionally, the charts show that this application is within the column load strength of the DD-2512-HD. The door swings through an arc so a double clevis style will be needed. Due to the environment concerns an enclosed Rotary Limit Switch should be used instead of a Rod type Limit Switch.

#### SELECTION:

**DD-2512-HD / 05BT -1 / 2CA – 4E / CC / 18 / S**

### Application #2 – DISTRIBUTION CONVEYOR

A warehouse conveyor system distributes filler material across a 48 inch wide packaging line. One end of the conveyor is hinged to a loading station, the other end must move across the conveyor.

#### SPECIFICATIONS:

- The maximum load from the conveyor with material is 1,100 pounds
- A servo drive will be used to control the actuator
- The conveyor will move 480 times an hour, 16 hours a day, 350 days per year
- Life expectancy is 5 years
- Stroke length is 24 inches maximum
- Minimum Travel Rate is 24 inches in 3 seconds

#### ANALYSIS:

An In-Line cylinder will be used because of the frequent cycle requirement. With a travel rate of 480 inches per min ((24 inches / 3 seconds) \* 60 seconds) and a life expectancy of 15 million inches, an ILA-10-HL is selected. The application would require a servomotor that can produce 96.8 inch-lbs of torque (0.088 inch-lbs \* 1,100 lbs) at 960 rpm (480 inches per min / .500 Lead).

#### SELECTION:

**ILA-10-HL / 24 / M**

M- Modified motor adapter to mount servomotor.





# REQUIRED APPLICATION DATA FORM

ELECTRIC CYLINDER TECHNICAL INTRODUCTION

## LOAD

Total Maximum Thrust Load on Cylinder(s): \_\_\_\_\_ pounds force      Number of Cylinders: \_\_\_\_\_

Maximum Thrust Load on any one Cylinder: \_\_\_\_\_ pounds force  
(Note: load can rarely be assumed to be equal on all cylinders)

## TRAVEL

Inches: \_\_\_\_\_      Orientation:    vertical     horizontal     other (arc, diagonal, etc)

## TRAVEL RATE

Optimal Speed: \_\_\_\_\_ inches/minute

Minimum Acceptable Speed: \_\_\_\_\_ inches/minute      Maximum Acceptable Speed: \_\_\_\_\_ inches/minute

## DUTY CYCLE

Distance per cycle \_\_\_\_\_ inches    (One cycle = extend and retract)

Number of cycles per time period: \_\_\_\_\_ cycles per

Maximum Distance Traveled in any Year: \_\_\_\_\_ inches

Life Desired: \_\_\_\_\_    (Important: If load varies significantly, please explain below.)

## OPERATION

Cylinders are Loaded in:    Tension     Compression     Both

Driven Motor type:    Servo     AC Induction motor     Other Type of motor (describe)

## APPLICATION

Please briefly describe the application. State type of machine, function of jack(s), load guidance system and environment (shock or impact loading, vibration, temperature extremes, corrosive, dirty, or other extreme operating conditions). Attach any sketches and other relevant information. Also, if a tentative selection has been made, please give the reference number or model and description below.

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**QUICK REFERENCE:  
DD & RAD MODEL STANDARD WITH MOTORS**

STANDARD DD & RAD MODELS WITH MOTORS							
CYLINDER MODEL NUMBER	DYNAMIC CAPACITY (lbf.)	TRAVEL RATE IN/MIN. @ 1725 RPM	PAGE NUMBER	CYLINDER MODEL NUMBER	DYNAMIC CAPACITY (lbf.)	TRAVEL RATE IN/MIN. @ 1725 RPM	PAGE NUMBER
DD-105-HL / 05XX	750	172	391	DD-3012-HD / 10XX	3,600	60	394
DD-1020-HL / 02XX	800	43	391	DD-256-HD / 10XX	3,600	72	392
DD-105-A5 / 02XX	850	69	391	DD-256-ML / 20XX	3,600	144	392
DD-1020-A5 / 02XX	900	17	391	RAD-10086-A2 / 10XX	3,800	18	399
DD-256-HL / 10XX	900	287	392	RAD-5066-HL / 10XX	4,000	48	397
DD-506-SL / 20XX	950	539	392	DD-20024-HL / 20XX	4,000	72	400
DD-506-A3 / 10XX	1,000	108	396	DD-506-HD / 20XX	4,000	136	396
DD-1008-SL / 20XX	1,150	404	398	DD-2008-A2 / 70XX	4,250	108	400
DD-3024-A4 / 05XX	1,200	18	394	RAD-10086-HL / 10XX	4,275	36	399
DD-2524-HD / 03XX	1,500	18	392	DD-2524-HD / 05XX	4,450	18	392
DD-2512-HL / 10XX	1,500	144	392	DD-2512-HD / 07XX	4,450	36	392
DD-256-A2 / 15XX	1,725	144	392	RAD-5062-A3 / 10XX	4,500	9	397
DD-256-ML / 10XX	1,800	144	392	DD-1008-A2 / 50XX	4,500	108	398
DD-256-HL / 20XX	1,800	288	392	DD-1008-HD / 20XX	4,600	102	398
DD-2524-A4 / 05XX	1,880	18	392	DD-2008-A3 / 70XX	4,620	72	400
DD-5024-A3 / 07XX	1,900	27	396	RAD-3066-HD / 05XX	4,775	20	395
DD-105-HD / 05XX	1,900	69	391	RAD-3062-A4 / 07XX	4,925	6	395
DD-506-A2 / 20XX	1,900	144	396	RAD-2546-HD / 02XX	5,000	3	393
DD-1020-HD / 02XX	2,000	17	391	RAD-2546-A4 / 05XX	5,000	3	393
DD-2512-HD / 05XX	2,000	36	392	RAD-2562-HD / 03XX	5,000	6	393
DD-10024-A2 / 15XX	2,000	36	398	RAD-2562-A4 / 05XX	5,000	6	393
DD-1008-A4 / 20XX	2,000	54	398	RAD-2566-A4 / 07XX	5,000	12	393
DD-256-HD / 07XX	2,000	72	392	RAD-5066-HD / 10XX	5,000	23	397
DD-1008-A2 / 20XX	2,000	108	398	RAD-2566-ML / 05XX	5,000	24	393
DD-506-HL / 20XX	2,000	288	396	RAD-2562-HL / 10XX	5,000	24	393
DD-306-A4 / 15XX	2,100	72	394	RAD-3062-HD / 03XX	5,250	10	395
DD-1008-HL / 20XX	2,175	216	398	DD-1008-HL / 50XX	5,400	216	398
DD-3012-A4 / 10XX	2,200	36	394	DD-506-HD / 30XX	5,750	136	396
DD-506-A3 / 20XX	2,200	108	396	RAD-3022-A4 / 05XX	6,000	3	395
DD-256-A4 / 15XX	2,280	72	392	RAD-3022-HD / 02XX	6,000	5	395
DD-2512-A4 / 10XX	2,500	36	392	RAD-3066-A4 / 10XX	6,000	12	395
DD-20024-A2 / 20XX	2,500	36	400	RAD-10082-A2 / 10XX	6,275	9	399
DD-3012-HD / 07XX	2,500	60	394	DD-20024-HD / 20XX	7,000	36	400
DD-306-HD / 15XX	2,500	120	394	DD-10024-HD / 15XX	7,150	34	398
DD-506-HL / 30XX	2,500	287	396	RAD-5046-A3 / 10XX	7,200	4.5	397
RAD-5066-A3 / 10XX	2,700	18	397	DD-1008-HD / 30XX	7,500	102	398
DD-3024-HD / 05XX	2,700	30	394	RAD-10046-A2 / 10XX	7,800	6	399
DD-10024-HL / 15XX	2,700	72	398	RAD-5046-HL / 10XX	8,000	12	397
DD-506-A3 / 30XX	2,900	108	396	DD-2008-HL / 70XX	8,000	216	400
DD-508-A4 / 20XX	3,000	54	396	RAD-5046-HD / 10XX	9,000	6	397
DD-1008-A2 / 30XX	3,000	108	398	RAD-5062-HD / 10XX	9,000	11	397
DD-306-HD / 15XX	3,275	120	394	RAD-10046-HL / 10XX	9,750	12	399
DD-5024-HD / 07XX	3,400	34	396	RAD-10086-HD / 10XX	10,000	17	399
DD-20024-A2 / 30XX	3,500	36	400	DD-20024-HD / 30XX	10,000	36	400
RAD-2566-HL / 10XX	3,550	48	393	DD-2008-HD / 50XX	11,000	108	400
				DD-1008-HD / 50XX	12,000	102	398
				RAD-20048-A2 / 30XX	12,500	4.5	401
				RAD-10082-HD / 10XX	15,000	9	399
				DD-2008-HD / 70XX	16,600	108	400
				RAD-10046-HD / 10XX	18,750	6	399
				RAD-20088-A3 / 50XX	22,250	9	401
				RAD-20088-HL / 50XX	30,000	27	401
				RAD-20088-A2 / 70XX	31,000	13.5	401
				RAD-20048-HL / 30XX	35,000	9	401
				RAD-20088-HD / 30XX	35,000	13.5	401
				RAD-20048-HD / 20XX	40,000	4.5	401

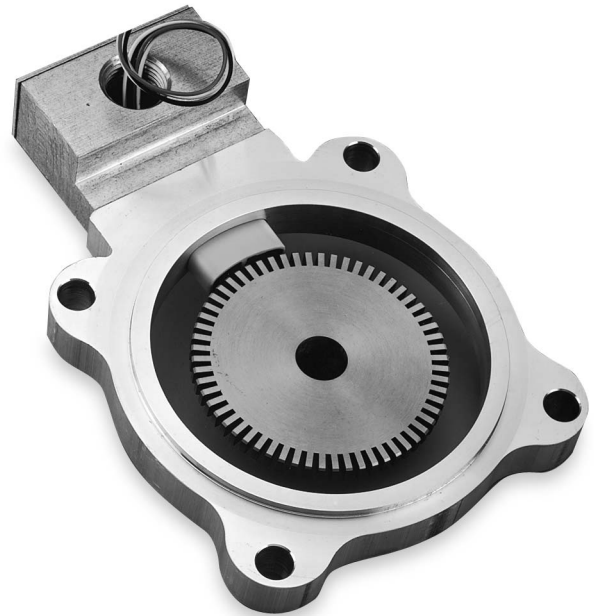
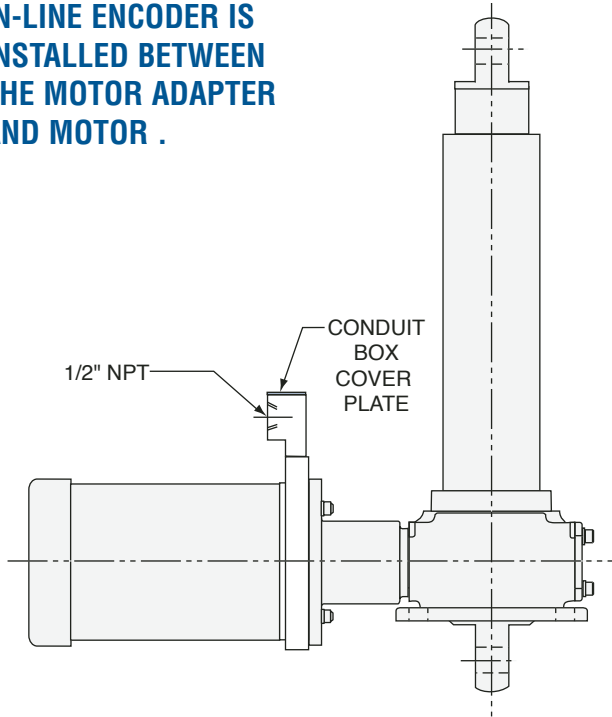
= indicates Acme Models.

XX = motor specification, see page 377



**IN-LINE ENCODER**

**IN-LINE ENCODER IS INSTALLED BETWEEN THE MOTOR ADAPTER AND MOTOR .**



ELECTRIC CYLINDER ACCESSORIES

For position sensing at the input shaft, the ActionJac™ in-line encoder option may be factory installed between the motor and motor adapter or Right-Angle Reducer. This low-cost option requires minimal space. When used with worm gear type cylinders, it leaves the extension shaft side of the cylinder free for clearance, for a rotary limit switch, or for coupling to another cylinder .

The In-line encoder's quadrature output design allows detection of both speed and direction of shaft rotation.

The ActionJac™ in-line encoder option mounts to a motor and therefore requires an optional motor mount or right-angle reducer.

- Sensing speed range: 0 -10,000 rpm
- Pulse Output: 60 pulses/revolution
- Supply voltage: +12 Volts DC +/-5%
- Supply current: 60 mA typical, 115 mA maximum
- Output drive capability: 250 mA per channel continuous
- Maximum load: 50 ohms per channel

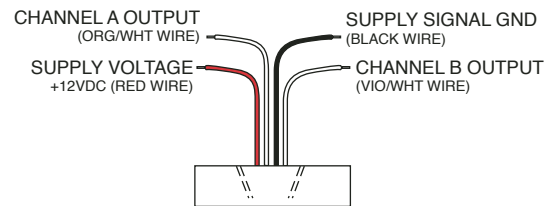
Encoder is face mounted between the motor and motor mount and will offset the length of the motor .61 inches for NEMA 56 and 140 frames and .88 inches for NEMA 180 and 210 frames.

**HOW TO ORDER AN IN-LINE ENCODER:**

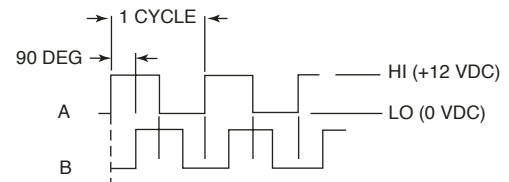
Specify the Cylinder reference number, using the system described on page 389.

**EXAMPLE:**  
DD-1008-HD / 10BT-2 / 000-1 / CC / 24.0 / SE

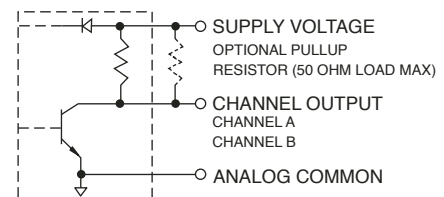
“E” anywhere in this field indicates Encoder



**ELECTRICAL CONNECTIONS**



**OUTPUT CHANNEL WAVEFORMS**

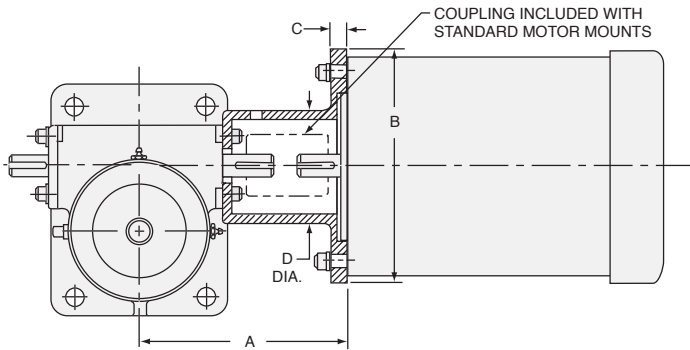


**OUTPUT CHANNEL SCHEMATIC (CHANNELS A & B)**



**MOTOR MOUNTS WITH AND WITHOUT BRAKEMOTORS**

ELECTRIC CYLINDER ACCESSORIES



ActionJac™ motor mount assemblies are designed for standard motors and include jaw type couplings. These assemblies are stocked for DD-25, DD-50, DD-100 and DD-200 and are available for the cylinder sizes listed in the table. Non-standard motor mounts can be designed for special requirements including, special couplings, small NEMA frame motors, DIN standard motors, stepper motor and servomotor designs, contact Nook Industries for additional information.

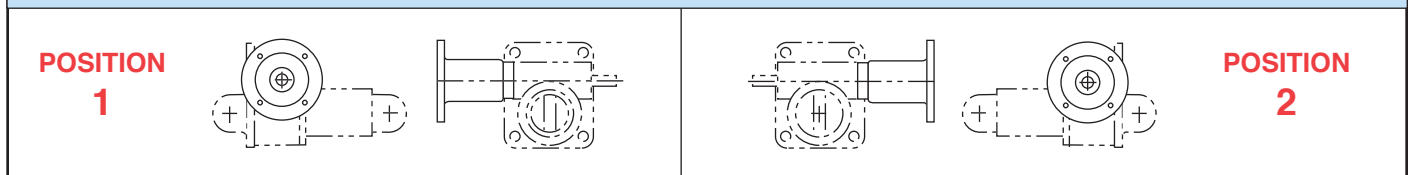
STANDARD MOTOR MOUNT SIZES & DIMENSIONS						
CYLINDER SERIES	NEMA FRAME SIZE	ORDER CODE WITHOUT MOTOR	DIMENSIONS			
			A	B	C	D
DD-5	42	X02	4.48	4.63	.50	2.69
	48	X04	4.48	4.63	.50	3.12
DD-10	56C	X05	5.71	6.63	.49	3.12
DD-25	56C	X05	6.25	6.63	.63	3.50
	140TC	X14	6.25	6.63	.63	3.50
DD-50	56C	X05	7.25	6.75	.56	3.75
	140TC	X14	7.25	6.75	.56	3.75
	180TC	X18	8.00	9.25	.75	3.75
DD-100	56C	X05	8.25	6.75	.50	4.38
	140TC	X14	8.25	6.75	.50	4.38
	180TC	X18	9.00	9.25	.75	4.38
DD-200	56C	X05	8.66	6.75	.50	3.75
	140TC	X14	8.66	6.75	.50	3.75
	180TC	X18	9.00	9.25	.63	5.19
	213TC	X21	9.68	8.88	.88	5.69

ActionJac™ electric cylinders can be ordered with industrial quality induction motors. Motors with internally and externally wired brake motors are available. Brake motors utilize an integral, spring actuated brake. Standard motors are 3-phase, 230-460 VAC, 60hz, 1725 rpm. Single-phase motors are 115-130 VAC, 60hz, 1725 rpm. All motors are rated for continuous duty. Specific duty motors, as wash down extended duty, may be supplied upon request.

See charts on page 377 for order codes.

**CAUTION:** Ball screw cylinders are self-lowering. A brake of sufficient torque is required to hold the load with a ball screw cylinder. Be sure to verify that the brakemotor selected has sufficient brake torque for your application.

**MOTOR MOUNT POSITIONS**



**HOW TO ORDER A MOTOR ADAPTER WITH OR WITHOUT A BRAKEMOTOR**

**EXAMPLE:**

DD-1008-HD / **10BT-1** / 000-1 / CC / 24.0 / S

————— Mounting Position (see above & for Right Angle Reducer see page 378)

————— Order Code for No Motor (see chart above)

See page 377 for Order Code with Motor



# MOTOR REFERENCE AND BRAKEMOTOR WIRING

**ELECTRIC CYLINDERS**

ActionJac Electric Cylinders can be supplied with industrial quality brake motors. Brake motors include a spring actuated, electrically released braking mechanism which will hold a load when the power is off. In normal operation, power is applied and removed to the motor windings and brake release simultaneously.

If it is desired to operate the brake separately, as when used with a speed control, the brake needs to be wired

externally. Standard for Reliance motors, special order for Baldor motors.

Standard motors are: 3 phase, 208-230 / 460 VAC, 60 Hz. 1725 rpm. Also available are single phase motors at: 115 / 230 VAC, 60 Hz. 1725 rpm. All motors are rated for continuous duty. Note: for inverter duty motors or additional options, contact Nook Industries.

ELECTRIC CYLINDER ACCESSORIES

## BALDOR: INTERNALLY WIRED BRAKE MOTOR ORDER CODE

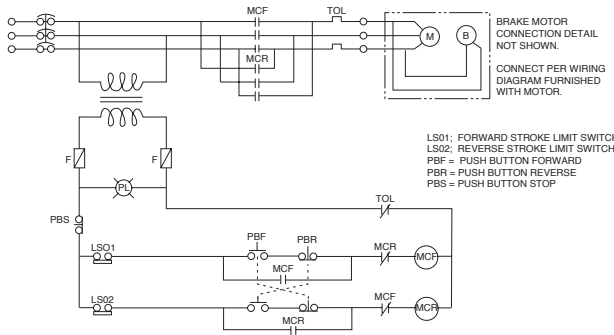
MOTOR HP	STD. MOTOR 208-230/460 3PH	SINGLE PHASE 115/230 1PH	XT EXTRA TUFF 208-230/460 3PH	WASH DOWN MOTOR IP55 208-230/460 3PH	EXPLOSION PROOF • DIVISION 1 • CLASS 1,2 • GROUP F & G • 208/230/460 • 3PH
1/4	02BT	02BS	02BX	02BW	02BE
1/3	03BT	03BS	03BX	03BW	03BE
1/2	05BT	05BS	05BX	05BW	05BE
3/4	07BT	07BS	07BX	07BW	07BE
1	10BT	10BS	10BX	10BW	10BE
1-1/2	15BT	-	15BX	15BW	15BE
2	20BT	-	20BX	20BW	20BE
3	30BT	-	30BX	30BW	30BE
5	50BT	-	50BX	50BW	50BE
7-1/2	75BT	-	75BX	75BW	-

## RELIANCE: EXTERNALLY WIRED BRAKE MOTOR ORDER CODE

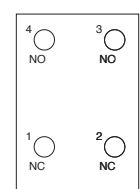
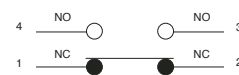
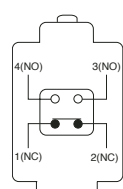
MOTOR HP	STD. MOTOR 208-230/460 3PH	SINGLE PHASE 115/230 1PH	XT EXTRA TUFF 208-230/460 3PH	WASH DOWN MOTOR IP55 208-230/460 3PH	EXPLOSION PROOF • DIVISION 1 • CLASS 1,2 • GROUP F & G • 208/230/460 • 3PH
1/4	02RT	02RS	02RX*	02RW*	02RE*
1/3	03RT	03RS	03RX*	03RW*	03RE*
1/2	05RT	05RS	05RX*	05RW	05RE
3/4	07RT	07RS	07RX*	07RW	07RE
1	10RT	10RS	10RX*	10RW	10RE
1-1/2	15RT	-	15RX*	15RW	15RE
2	20RT	-	20RX*	20RW	20RE
3	30RT	-	30RX*	30RW*	30RE
5	50RT	-	50RX*	50RW*	50RE
7-1/2	75RT*	-	75RX*	75RW*	75RE*

\*specify minimum quantity required

## BRAKE MOTOR WIRING



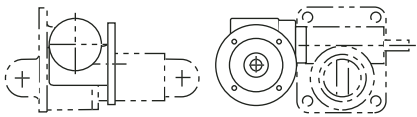
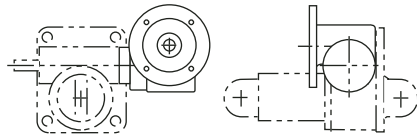
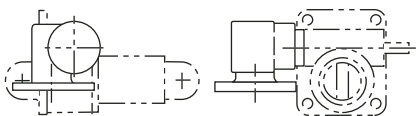
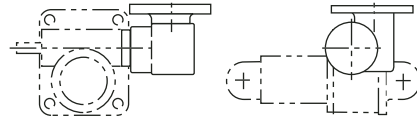
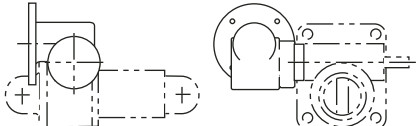
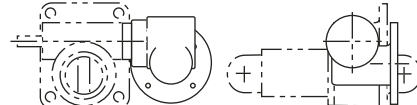
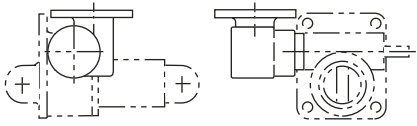
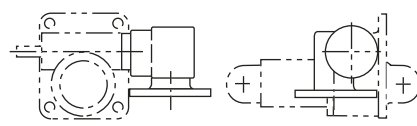
A typical wiring drawing is shown here, for a three-phase brake motor. This example is for reference only, the correct wiring will vary for each application.



### CONTACT CONFIGURATION

### TERMINAL ARRANGEMENT

The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

RIGHT-ANGLE REDUCER POSITIONS			
<b>POSITION 1</b>			<b>POSITION 2</b>
<b>POSITION 3</b>			<b>POSITION 4</b>
<b>POSITION 5</b>			<b>POSITION 6</b>
<b>POSITION 7</b>			<b>POSITION 8</b>

### Download Accurate Moveable Assembly 3D Models and 2D Drawings For ActionJac™ Worm Gear Screw Jacks and Electric Cylinders:

- **Configure** specific requirements for your worm gear screw jack or electric cylinder application in a simple interface, including motor adapter, right angle reducer, bellows boots and limit switch accessories.
- **View** complete assemblies on-line with zoom, pan and rotate capabilities.
- **Download** true assembly models with full range of motion in native AutoCAD®, SolidWorks®, Pro/E®, CATIA®, ParaSolids®, SAT® and many other formats.
- **Order** complete jack assemblies with generated part number.

**ActionJac™**  
WORM GEAR SCREW JACKS  
& ELECTRIC CYLINDERS



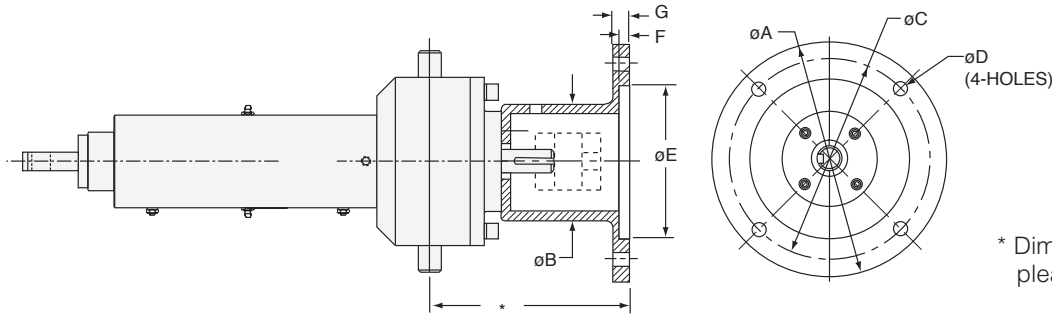
[www.nookindustries.com](http://www.nookindustries.com)





**ILA SERIES  
MOTOR MOUNTS**

**ELECTRIC  
CYLINDERS**



\* Dimension is application dependent, please contact factory.

Actionjac™ ILA Series cylinders can be supplied with motor mounts. The sizes listed in the chart are mounts designed to match up to common motor faces. Application torque requirements and coupling size, style and attachment method will affect the size of the motor mount. See reference number page 376-377 for motor mount/cylinder model availability. A custom motor mount can be manufactured to your specifications, please contact Nook Industries.

MODEL	NEMA FRAME MOTOR SIZE	øA	øB	øC	øD	øE	F	G
ILA-5	48	4.63	3.12	3.75	.28	3.00	.16	.50
	48	4.63	3.12	3.75	.28	3.00	.16	.50
ILA-10	56C	6.75	3.50	5.88	.41	4.50	.16	.50
ILA-25	56C	6.75	3.75	5.88	.41	4.50	.16	.50
	140TC	6.75	3.75	5.88	.41	4.50	.16	.50
ILA-100	180TC	9.25	3.75	7.25	.56	8.50	.28	.75
	56TC	6.75	4.38	5.88	.41	4.50	.16	.50
ILA-200	140TC	6.75	4.38	5.88	.41	4.50	.16	.50
	180TC	9.25	4.38	7.25	.56	8.50	.28	.75
ILA-200	180TC	9.25	5.19	7.25	.56	8.50	.28	.75
	213TC	8.88	5.69	7.25	.56	8.50	.28	.88

Dimensions in inches

Other NEMA and Custom Frame Motor Sizes available upon request.

MODEL	IEC FRAME MOTOR SIZE	øA	øB	øC	øD	øE	F	G
ILA-5	56B5	120	64	100	8.5	80	3.5	7
	56B14	80	64	65	6	50	3.0	6
ILA-10	63B5	140	70	115	9	95	4	8
	63B14	90	70	75	6	60	3.5	8
	71B5	160	85	130	9	110	4.5	10
	71B14	105	85	85	7	70	4	10
ILA-25	71B5	160	85	130	9	110	4.5	10
	71B14	105	85	85	7	70	4	10
	80B5	200	85	165	11	130	4.5	12
	80B14	120	85	100	7	80	4	12
ILA-100	80B5	200	96	165	11	130	4.5	12
	80B14	120	96	100	7	80	4	12
	90B5	200	116	165	11	130	4.5	12
	90B14	140	116	115	9	95	4.5	12
	100B5	250	116	215	13	180	5	14
	100B14	160	116	130	9	110	5	14
ILA-200	100B5	250	134	215	13	180	5	14
	100B14	160	134	130	9	110	5	14

Dimensions in mm  
Other IEC Motor Sizes  
available upon request.

The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

## ROTARY LIMIT SWITCH



Every motorized Electric Cylinder must be controlled so that power to the motor is turned off and the brake engaged before the limits of mechanical travel are reached.

The ActionJac™ rotary limit switch senses extension shaft rotation and provides switch contact closures that can be used to control motors.

This sturdy, durable assembly is available with two or four circuits or two circuits and a potentiometer. Each circuit has a separate rotating cam that actuates a high quality switch. The switch actuation may be individually and infinitely adjusted anywhere within the travel of the cylinder.

These assemblies contain gear reducers with ratios that vary according to the model and travel of the jack. Nook selects ratios that result in maximum cam rotation for best accuracy, repeatability and minimum hysteresis. In most cases, with full travel of the actuator, the cam will rotate 3/8 to 7/8 of a revolution to actuate a switch. In the event that the cam continues to rotate, the switch returns to its original state after approximately

25° of rotation, with no damage to the limit switch assembly.

A 2-circuit switch assembly is useful for limiting the maximum and minimum extension. A 4-circuit assembly gives the possibility of additional signals for other user purposes. The potentiometer version is used to provide an analog signal for sensing cylinder position.

Single Pole Double Throw (SPDT) switches are standard and Double Pole Double Throw (DPDT) switches are optional. These assemblies are dust protected and meet NEMA 4 and 5 standards for oil and water tightness.

An ActionJac™ Rotary Limit Switch assembly is mounted to the extension shaft side of the ActionJac™ Worm Gear Screw Cylinder opposite the motor.



A rotary limit switch is available for ActionJac™ Electric Cylinder Series DD-25 and RAD-25 and larger. Most cylinder models have close and extended mounts for the switches to provide clearance around the switch housing. See the charts below for dimensions.

Switches are factory installed to assure proper assembly in the correct orientation for the specified mounting position. **CAUTION: Limit switches are not adjusted at the factory. Switches should be set after installation.**

## HOW TO ORDER ROTARY LIMIT SWITCH:

**SPECIFY:**

- 2-circuits, 4-circuits, or 2-circuits with potentiometer
- SPDT or DPDT
- Mounting Position

Insert the correct designation in the ActionJac™ Electric Cylinder reference number (see page 000 for more information on jack reference numbers).

**EXAMPLE:** RAD-10086-HD / 10BT-1 / **2CA-4C** / CC / 24.5 / S

**Extension shaft designation**

Examples of rotary limit switch designations:

**2CA-4** = Rotary Limit Switch, 2-circuit, SPDT, position 4

**4CE-1** = Rotary Limit Switch, 4-circuit, DPDT, position 1

**PTA-8** = Rotary Limit Switch with potentiometer, 2 SPDT's, position 8

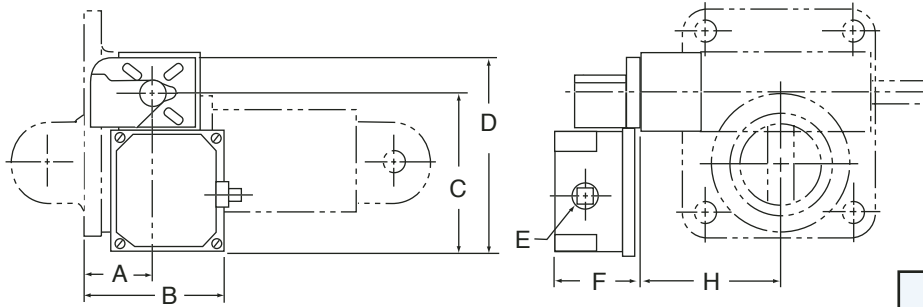
**“dash” number designates mounting position (see following page)**

ORDER CODE	NUMBER OF CIRCUITS	SWITCH TYPE	POTENTIOMETER
2CA	2	SPDT	NO
2CC	2	DPDT	NO
4CA	4	SPDT	NO
4CE	4	DPDT	NO
PTA	2	SPDT	YES
PTC	2	DPDT	YES

**IMPORTANT:** These designation numbers are not complete part numbers. These assemblies contain gear reducers with ratios that vary according to the model and travel of the cylinder. If you are ordering a replacement switch assembly, complete information on the cylinder is required.



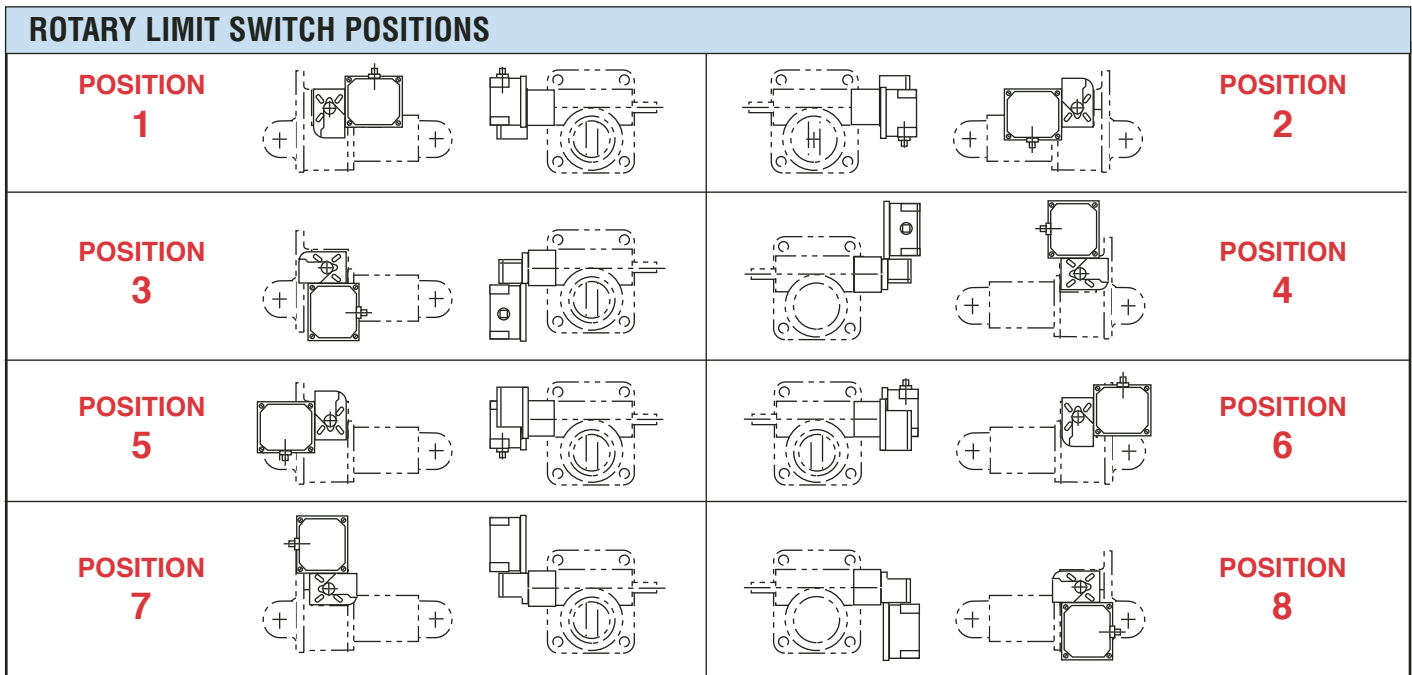
**ROTARY LIMIT SWITCH**



CIRCUITS	DIMENSIONS					
	A	B	C	D	E	F
2 CIRCUIT	2.46	5.25	6.24	7.62	3/4-NPT	3.25
4 CIRCUIT OR 2 CIRCUIT WITH POTENTIOMETER	2.46	5.25	8.24	9.62	1-NPT	3.88

SERIES	DIMENSION "H"	
	CLOSE MOUNT	EXT. MOUNT
DD & RAD 25	2.75	3.56
DD & RAD 30	2.75	3.56
DD & RAD 50	3.56	4.56
DD & RAD 100	3.88	5.56
DD & RAD 200	4.41	5.81

ELECTRIC CYLINDER ACCESSORIES



**ELECTRICAL RATINGS:**

**SWITCHES:**

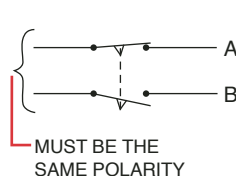
DC Current — 115 Volts SPDT, .50 amps  
 DPDT, .80 amps  
 AC Current — 115 Volts SPDT, 15 amps  
 DPDT, 10 amps

**10-TURN POTENTIOMETER:**

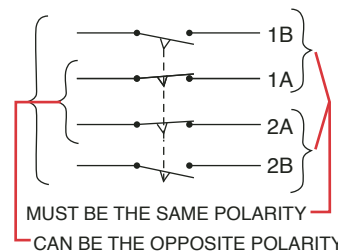
0-500 OHM, 2 Watt

**WIRING DIAGRAMS:**

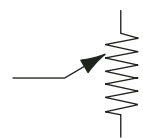
S.P.D.T.



D.P.D.T.



POTENTIOMETER



**NOTE:** While the 10-turn potentiometer is rated for 0-500 Ohms, as implemented in the rotary limit switch assembly, it can not and should not operate over its full range. Minimum and maximum resistance values can not be known until the cylinder is installed and final travel limit adjustments have been made, therefore, the device connected to the potentiometer should include provisions for trimming to compensate for these values.



## ROD-TYPE LIMIT SWITCH ASSEMBLIES

ELECTRIC CYLINDER ACCESSORIES

The Rod-Type Limit Switch provides two SPDT switches used to limit the maximum and minimum cylinder extension. The switch assembly mounts to the cylinder tubes for convenient access and leaves the extension shaft free for other purposes. The simple design permits easy installation and maintenance. Independent adjustment allows for quick and easy fine tuning of the travel limits.

*Every ActionJac™ Electric Cylinder should be installed so that electrical power to the motor is turned off and the brake engaged before the travel limits are reached, or damage to the cylinder can result.*

*Minimum travel is 6" and maximum travel is 72" for all ACTIONJAC™ ELECTRIC CYLINDERS equipped with rod-type limit switches.*

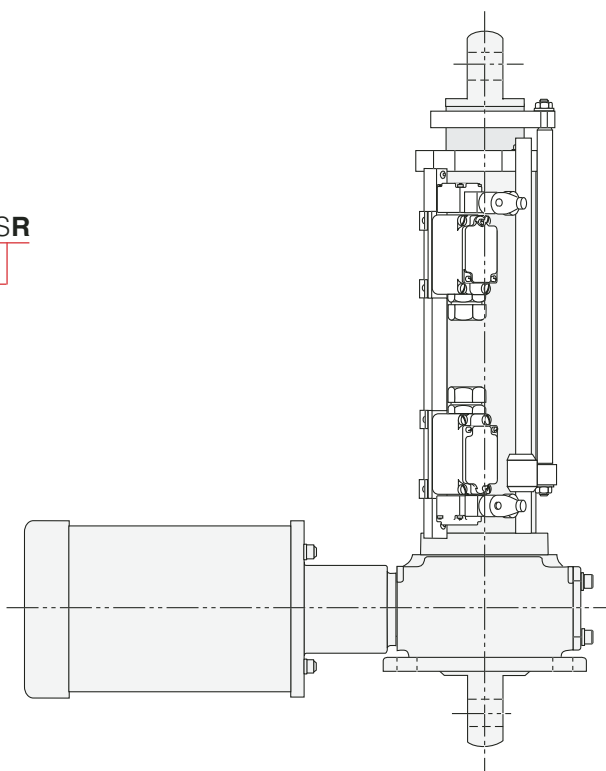
### HOW TO ORDER A ROD-TYPE LIMIT SWITCH:

Specify the Electric Cylinder reference number, using the system described on page 389.

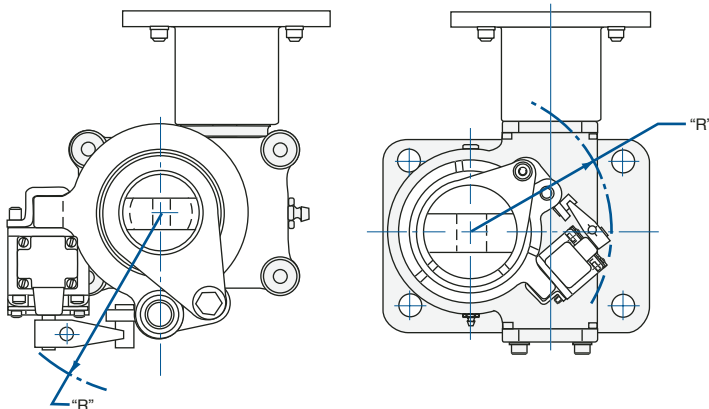
**EXAMPLE:** DD-1008-HD / 10BT-2 / 000-1 / CC / 24.0 / **SR**

“R” anywhere in this field \_\_\_\_\_ indicates Rod-Type Limit Switch Assembly

SWITCH ENCLOSURE RATINGS	
NEMA	1,2,3,3R,4,5,6,12,13
IEC	IP67



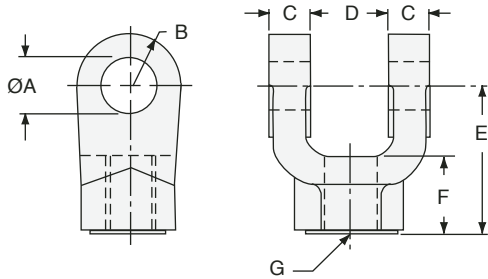
### ROD-TYPE LIMIT SWITCH DIMENSIONS



SERIES	CLEARANCE RADIUS “R”
DD-5	4.00
DD-10	3.66
DD & RAD-25	4.00
DD & RAD-30	4.20
DD & RAD-50	4.66
DD & RAD-100	4.60
DD & RAD-200	5.40

**DD & RAD ACCESSORIES**

**FEMALE ROD CLEVIS**

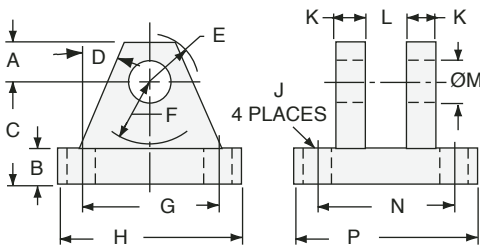


**FEMALE ROD CLEVIS**

CYLINDER SERIES	PART NUMBER	DIMENSIONS						
		øA	B radius	C	D	E	F	G thread
SERIES 5	B9012-5	.3145/.3165	19/64	13/64	11/32	2 1/4	13/16	5/16-24
SERIES 10	B-9012-8	.504/.502	1/2	1/2	3/4	1 1/2	3/4	7/16-20
SERIES 25 SERIES 30	B-9012-12	.752/.754	3/4	5/8	1 1/4	2 1/8	1 1/8	3/4-16
SERIES 50 SERIES 100	B-9012-16	1.002/1.004	1	3/4	1 1/2	2 15/16	1 5/8	1-14
SERIES 200	B-9012-22	1.377/1.379	1 3/8	1	2	3 3/4	2	1 1/4-12

Note: Rod Clevis' with swivel bearings can be supplied. Contact Nook Engineering.

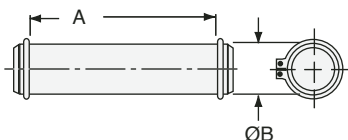
**CLEVIS BRACKET**



**CLEVIS BRACKET FOR KNUCKLE**

CYLINDER SERIES	PART NUMBER	DIMENSIONS													
		A	B	C	D	E	F	G	H	øJ	K	L	øM	N	P
SERIES 5	B-9013-7	3/8	3/8	1	25°	1/2	5/8	1.75	2 1/4	17/64	3/8	15/32	.4395/.4415	1.75	2 1/4
SERIES 10	B-9013-8	1/2	1/2	1 1/2	25°	5/8	3/4	2.55	3 1/2	13/32	1/2	3/4	.504/.502	2.55	3 1/2
SERIES 25 SERIES 30	B-9013-12	3/4	5/8	1 7/8	25°	29/32	3/4	3.82	5	17/32	5/8	1 1/4	.752/.754	3.82	5
SERIES 50 SERIES 100	B-9013-16	1	3/4	2 1/4	25°	1 1/4	1 1/2	4.95	6 1/2	21/32	3/4	1 1/2	1.002/1.004	4.95	6 1/2
SERIES 200	B-9013-22	1 3/8	7/8	3	25°	1 21/32	2	5.73	7 1/2	21/32	1	2	1.377/1.379	5.73	7 1/2

**PIVOT PIN**



**PIVOT PIN**

CYLINDER SERIES	PART NUMBER	DIMENSIONS	
		A	øB
SERIES 5	B9014-7	1 15/16	.4385/.4355
SERIES 10	B-9014-8	1 7/8	.501/.498
SERIES 25 SERIES 30	B-9014-12	2 5/8	.751/.748
SERIES 50 SERIES 100	B-9014-16	3 1/8	1.001/0.999
SERIES 200	B-9014-22	4 1/8	1.376/1.373

**ELECTRIC CYLINDER DESIGN DATA**



ELECTRIC CYLINDER SUMMARY

STANDARD DD, RAD & ILA MODELS						
CYLINDER SERIES	MODEL NUMBER	INPUT TURNS PER INCH OF TRAVEL	TORQUE AT MOTOR INPUT (IN.-LB.) PER LB.	MAX LOAD LB.	MAX HORSE POWER	PAGE NUMBER
5 SERIES	DD - 55 - HL	10	0.0242	1,000	.33	390
	DD - 520 - HL	40	0.0102	1,000	.16	390
	DD - 55 - HD	25	0.0095	1,000	.33	390
	DD - 520 - H5	100	0.0040	1,000	.16	390
	DD - 55 - A5	25	0.0021	1,000	.33	390
	DD - 520 - A5	100	0.009	1,000	.16	390
	DD - 55 - A8	40	0.017	1,000	.33	390
	DD - 520 - A8	160	0.007	1,000	.16	390
	DD - 55 - A10	50	0.014	1,000	.33	390
	DD - 520 - A10	200	0.006	1,000	.16	390
	ILA - 5 HL	2	0.088	1,000	—	403
	ILA - 5 HD	5	0.035	1,000	—	403
	ILAK - 5 HL	2	0.088	1,000	—	403
ILAK - 5 HD	5	0.035	1,000	—	403	
10 SERIES	DD - 105 - HL	10	0.0241	2,000	.5	391
	DD - 1020 - HL	40	0.0114	2,000	.25	391
	DD - 105 - HD	25	0.0095	2,000	.5	391
	DD - 1020 - HD	100	0.0045	2,000	.25	391
	DD - 105 - A5	25	0.0225	2,000	.5	391
	DD - 1020 - A5	100	0.0125	2,000	.25	391
	ILA - 10 HL	2	0.088	1,200	—	404
	ILA - 10 HD	5	0.035	2,200	—	404
	ILAK - 10 HL	2	0.088	1,200	—	404
	ILAK - 10 HD	5	0.035	2,200	—	404
25 SERIES	DD - 256 - HL	6	0.0404	5,000	2	392
	DD - 2512 - HL	12	0.0244	5,000	1.5	392
	DD - 256 - ML	12	0.0201	5,000	2	392
	DD - 256 - HD	24	0.0102	5,000	2	392
	DD - 2512 - HD	48	0.0061	5,000	1.5	392
	DD - 2524 - HD	96	0.0042	5,000	.5	392
	DD - 256 - A2	12	0.0334	5,000	2	392
	DD - 256 - A4	24	0.0252	5,000	2	392
	DD - 2512 - A4	48	0.0148	5,000	1.5	392
	DD - 2524 - A4	96	0.0106	5,000	.5	392
	RAD - 2566 - HL	36	0.0102	5,000	1	393
	RAD - 2562 - HL	72	0.0037	5,000	1	393
	RAD - 2566 - ML	72	0.0057	5,000	.5	393
	RAD - 2566 - HD	144	0.0026	5,000	.5	393
	RAD - 2562 - HD	288	0.0015	5,000	.33	393
	RAD - 2522 - HD	576	0.0009	5,000	.33	393
	RAD - 2546 - HD	576	0.0010	5,000	.33	393
	RAD - 2566 - A4	144	0.0064	5,000	1	393
	RAD - 2562 - A4	288	0.0039	5,000	.75	393
	RAD - 2522 - A4	576	0.0023	5,000	.5	393
	RAD - 2546 - A4	576	0.0027	5,000	.33	393
	ILA - 25 HL	1	0.177	2,200	—	405
	ILA - 25 ML	2	0.088	3,500	—	405
	ILA - 25 HD	4	0.035	3,500	—	405
	ILAK - 25 HL	1	0.177	2,200	—	405
	ILAK - 25 ML	2	0.088	3,500	—	405
ILAK - 25 HD	4	0.035	3,500	—	405	
30 SERIES	DD - 306 - HD	14.53	0.0167	6,000	2	394
	DD - 3012 - HD	29.1	0.0169	6,000	1.5	394
	DD - 3024 - HD	58.10	0.0070	6,000	.5	394
	DD - 306 - A4	24	0.0271	6,000	2	394
	DD - 3012 - A4	48	0.0165	6,000	1.5	394
	DD - 3024 - A4	96	0.0118	6,000	.5	394
	RAD - 3066 - HD	87.18	0.0041	6,000	.5	395
	RAD - 3062 - HD	174.36	0.0026	6,000	.33	395
	RAD - 3022 - HD	348.2	0.0026	6,000	.25	395
	RAD - 3046 - HD	348.96	0.0018	6,000	.25	395
	RAD - 3066 - A4	144	0.0071	6,000	1	395
	RAD - 3062 - A4	288	0.0043	6,000	.75	395
	RAD - 3022 - A4	576	0.0025	6,000	.5	395
	RAD - 3046 - A4	576	0.0030	6,000	.5	395



**ELECTRIC CYLINDER DESIGN DATA**

STANDARD DD, RAD & ILA MODELS						
CYLINDER SERIES	MODEL NUMBER	INPUT TURNS PER INCH OF TRAVEL	TORQUE AT MOTOR INPUT (IN.-LB.) PER LB.	MAX LOAD LB.	MAX HORSE POWER	PAGE NUMBER
<b>50 SERIES</b>	DD - 506 - SL	3.2	0.0726	10,000	3	396
	DD - 506 - HL	6	0.0387	10,000	3	396
	DD - 5024 - HL	24	0.0153	10,000	.75	396
	DD - 506 - HD	12.66	0.0183	10,000	3	396
	DD - 5024 - HD	50.66	0.0073	10,000	.75	396
	DD - 506 - A2	12	0.0437	10,000	3	396
	DD - 506 - A3	16	0.0376	10,000	3	396
	DD - 5024 - A3	64	0.0144	10,000	.75	396
	RAD - 5066 - HL	36	0.0098	10,000	1	397
	RAD - 5046 - HL	144	0.0039	10,000	1	397
	RAD - 5066 - HD	76	0.0046	10,000	1	397
	RAD - 5062 - HD	152	0.0028	10,000	1	397
	RAD - 5046 - HD	304	0.0019	10,000	1	397
	RAD - 5066 - A3	96	0.0096	10,000	1	397
	RAD - 5062 - A3	192	0.0058	10,000	1	397
	RAD - 5046 - A3	384	0.0037	10,000	1	397
<b>100 SERIES</b>	DD - 1008 - SL	2.67	0.0598	20,000	5	398
	DD - 1008 - HL	8	0.0319	20,000	5	398
	DD - 10024 - HL	24	0.0162	20,000	1.5	398
	DD - 1008 - HD	16.88	0.0151	20,000	5	398
	DD - 10024 - HD	50.66	0.0077	20,000	1.5	398
	DD - 1008 - A2	16	0.0377	20,000	5	398
	DD - 10024 - A2	48	0.0192	20,000	1.5	398
	DD - 1008 - A4	32	0.0314	20,000	5	398
	DD - 10024 - A4	96	0.0160	20,000	1.5	398
	RAD - 10086 - HL	48	0.0081	20,000	1	399
	RAD - 10046 - HL	144	0.0041	20,000	1	399
	RAD - 10086 - HD	101.28	0.0038	20,000	1	399
	RAD - 10082 - HD	202.58	0.0023	20,000	1	399
	RAD - 10046 - HD	303.96	0.0020	20,000	1	399
	RAD - 10086 - A2	96	0.0096	20,000	1	399
	RAD - 10082 - A2	192	0.0058	20,000	1	399
	RAD - 10046 - A2	288	0.0049	20,000	1	399
	ILA-100 SL	.53	0.332	2,500	—	406
	ILA-100 HL	1	0.177	4,600	—	406
	ILA-100 HD	2.11	0.084	9,000	—	406
ILAK-100 SL	.53	0.332	2,500	—	406	
ILAK-100 HL	1	0.177	4,600	—	406	
ILAK-100 HD	2.11	0.084	9,000	—	406	
<b>200 SERIES</b>	DD - 2008 - HL	8	0.0313	40,000	7.5	400
	DD - 20024 - HL	24	0.0157	40,000	2.5	400
	DD - 2008 - HD	16	0.0157	40,000	7.5	400
	DD - 20024 - HD	48	0.0079	40,000	2.5	400
	DD - 2008 - A2	16	0.0435	40,000	7.5	400
	DD - 20024 - A2	48	0.0218	40,000	2.5	400
	DD - 2008 - A3	24	0.0394	40,000	7.5	400
	DD - 20024 - A3	72	0.0198	40,000	2.5	400
	RAD - 20088 - HL	64	0.0062	40,000	5	401
	RAD - 20048 - HL	192	0.0031	40,000	3	401
	RAD - 20088 - HD	128	0.0031	40,000	3	401
	RAD - 20048 - HD	384	0.0016	40,000	2	401
	RAD - 20088 - A2	128	0.0086	40,000	7.5	401
	RAD - 20048 - A2	384	0.0043	40,000	3	401
	RAD - 20088 - A3	192	0.0078	40,000	7.5	401
	RAD - 20048 - A3	576	0.0039	40,000	3	401
	ILA-200 HL	1	0.177	11,000	—	407
	ILA-200 HD	2	0.088	21,000	—	407
	ILAK-200 HL	1	0.177	11,000	—	407
	ILAK-200 HD	2	0.088	21,000	—	407

The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.



These definitions/descriptions are for the Product Specifications listed on the Electric Cylinder pages. Additional technical information on the preceding

pages is designed to help in selecting the cylinder that is best for the application. For additional assistance please contact Nook Industries.

**DD & RAD CYLINDERS**

**Model Type and Number** See page 389 for reference number configuration information.

**Travel Rate** Measured in inches per minute at full dynamic load.

**Dynamic Capacity** Measured in pounds.

**Rated Life** Measured in millions of inches (ball screw models only). Based on the ball screw cylinder only dynamic capacity.

**Standard Motor HP Rating** See page 377 for additional motor information.

**Standard Brake Torque** Measured in (pound-feet).

**Approximate Stopping Distance** These values are used when initially setting the limit switches. Stopping distances are approximate. Large inertia forces, such as loads moved at high speed supported on anti-friction guides may affect stopping distance. **INERTIAL LOADS SHOULD BE EVALUATED TO BE SURE IT DOES NOT EXCEED THE UNITS DYNAMIC CAPACITY.**

**Max Rod Reaction Torque** Based on full dynamic load. Torque will be proportionally lower for lower loads.

**Basic Weight** See specific units for weight. These weights do not include motor weight.

ELECTRIC CYLINDER SUMMARY

RAD-25 BALL SCREW MODELS									
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
RAD-2566-HL / 10XX	48	3,550	.22	1	6	.08	.08	628	46
RAD-2562-HL / 10XX	24	5,000	.08	1	6	.04	.04	885	46
RAD-2566-ML / 05XX	24	5,000	.33	.5	3	.014	.014	443	46
RAD-2562-HD / 03XX	6	5,000	.03	.33	3	.007	.007	221	46
RAD-2546-HD / 02XX	3	5,000	.03	.25	3	.003	.003	221	46

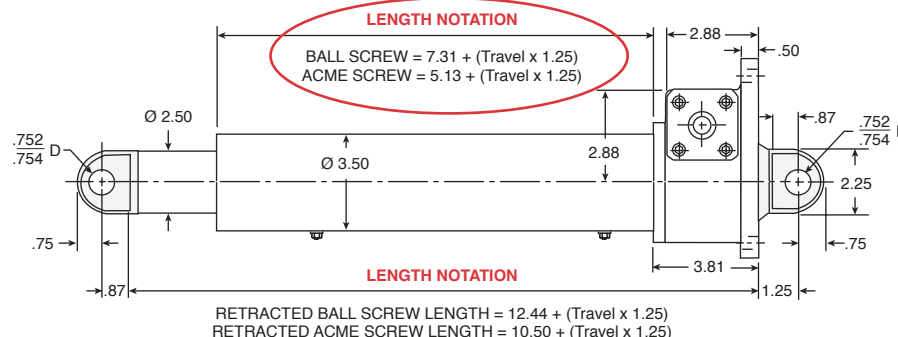


# DD & RAD LENGTH NOTATION & ILA CYLINDER CHARACTERISTICS DEFINED

**ELECTRIC CYLINDERS**

## DD & RAD CYLINDERS CONTINUED

**Length Notation** to determine standard extended and retracted length use the formula for each specific model/capacity. For special retracted lengths please contact Nook. **WARNING!** Any change to standard lengths may compromise the cylinder's compression load carrying capacity.



ELECTRIC CYLINDER SUMMARY

## ILA CYLINDERS

**Model Type and Number** See page 402 for reference number configuration information.

**Max Load** Thrust capacity Measured in pounds.

**Max Input Torque** Measured in (inch-pounds)

**Max Travel Rate** Measured in inches per minute

**Ball Screw** See individual ball screw page for screw specifications. Lead accuracy of 0.004"/ft.

**Torque Per lb.** Torque, in inch-pounds, required to generate one pound of output force. This is also the rod reaction torque.

\* DIMENSION BASED ON MOTOR MOUNT, contact factory with your specific requirements.

ILA-25 & ILAK-25 BALL SCREW MODELS							
MODEL NUMBER	MAXIMUM LOAD [lb.]	MAX. INPUT TORQUE [in.-lb.]	MAX. TRAVEL RATE [in./min.]	BALL SCREW	TORQUE PER LB. [in.-lb.]	DIMENSIONS	
						A	B
ILA-25 HL	2,200	390	3,000	1000-1000 SRT	0.177	3.00	1.50
ILA-25-ML	3,500	308	1,500	1000-0500 SRT	0.088	3.00	1.50
ILA-25-HD	3,500	154	750	1000-0250 SRT	0.035	3.00	1.50
ILAK-25 HL (Keyed)	2,200	390	3,000	1000-1000 SRT	0.177	4.00	1.25
ILAK-25-ML (Keyed)	3,500	308	1,500	1000-0500 SRT	0.088	4.00	1.25
ILAK-25-HD (Keyed)	3,500	154	750	1000-0250 SRT	0.035	4.00	1.25

**ROD REACTION TORQUE** = TORQUE PER LB. x LOAD

**NOTE:** CYLINDER IS SELF-LOWERING. INPUT SHAFT MUST BE SECURED TO PREVENT ROTATION.

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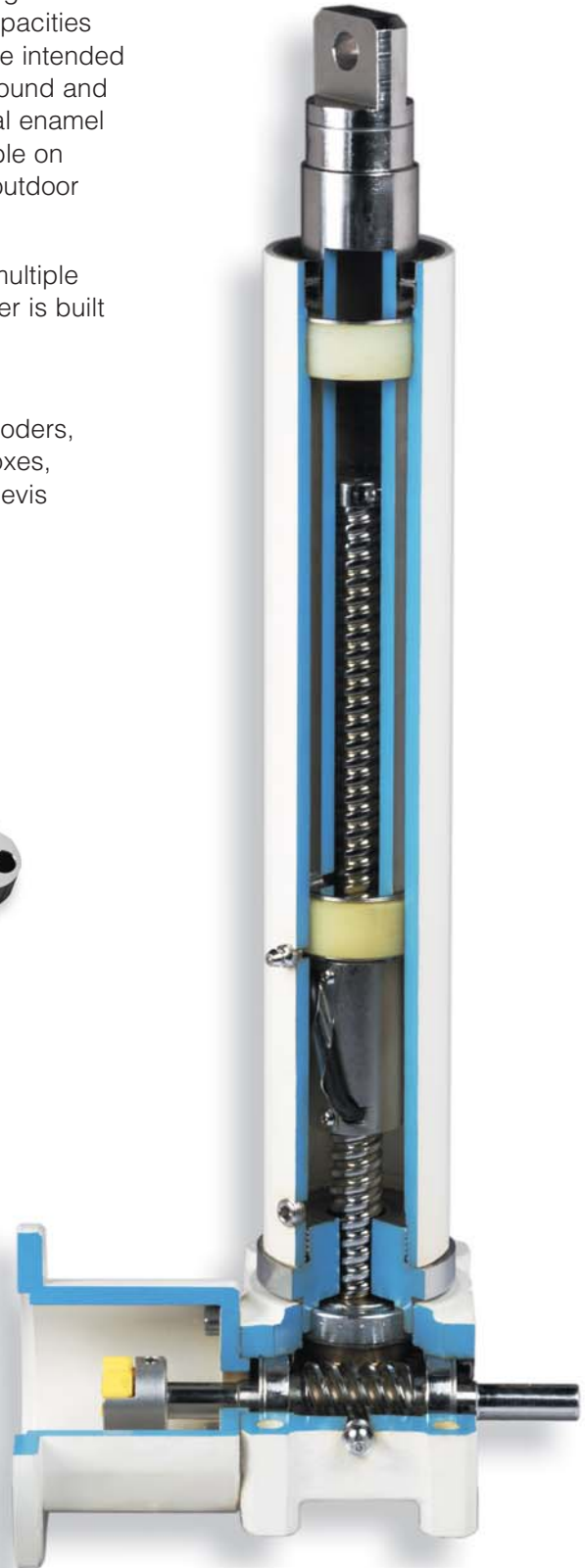
## ACTIONJAC™ ELECTRIC CYLINDERS

ActionJac™ Electric Cylinders are ruggedly designed and produced in standard models with thrust capacities from 500 lbs. to 40,000 lbs. Electric Cylinders are intended for use in industrial environments and feature ground and hard chrome plated actuator tubes with industrial enamel paint on exterior surfaces. Epoxy paint is available on request. Electric Cylinders can be supplied for outdoor applications.

These cylinders may be used individually or in multiple arrangements. Each ActionJac™ Electric Cylinder is built to specification.

### ACCESSORIES

Accessories such as motors, motor mounts, encoders, hand wheels, counters, couplings, miter gear boxes, boots, limit switches, clevises, clevis pins and clevis brackets are available.







# REFERENCE NUMBER SYSTEM: DD & RAD ELECTRIC CYLINDERS

**ELECTRIC  
CYLINDERS**

## RAD-2566-HL / 10BT-1 / 2CA-4C / CC / 24.5 / SER

### SERIES 100 OR 200 MODEL

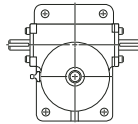
Refer to pages 357 to 359 for available models.

### FIRST SHAFT EXTENSION

- SSE-1** = Standard Shaft Extension, Position 1
- SSE-2** = Standard Shaft Extension, Position 2
- 000-1** = Delete Shaft Extension, Position 1
- 000-2** = Delete Shaft Extension, Position 2

POSITION (see page 376)  
ORDER CODE

**Input Shaft (CCW)**  
Positions 1, 3, 5, 7



**Input Shaft (CW)**  
Positions 2, 4, 6, 8

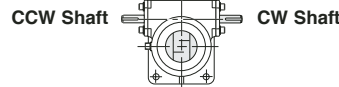
### SHAFT ORDER CODE

CCW Position 1  
CW Position 2

### ORDER CODES (Must Include A Position)

#### NO ACCESSORY

- SSE-\_\_** = Standard Shaft Extension, Position 1 or 2
- 000-\_\_** = Delete Shaft Extension, Position 1 or 2
- SPC-\_\_** = Special Modified Shaft Extension, Position 1 or 2



#### Motor Mounts Without Motor

For DD, position 1 or 2  
For RAD, position 1 through 8

see page 376 for standard motor mount order codes

#### Motor Mounts With Motors

For DD, position 1 or 2  
For RAD, position 1 through 8

see page 376 & 377 for available motors

#### EXAMPLE:

**02BS-2** = 1/4 Hp-1 ph internally wired Brake Motor in Position 2

Used on DD-10 to DD-200

#### Rotary Limit Switch

(Position 1 C or E through 8 C or E)

see page 380 and 381 for available rotary limit switches

**NOTE:** A Limit Switch must include a close or extended mount.

#### EXAMPLE:

**4CA-6E** = 4 Circuit Limit Switch, SPDT with an extended mount in Position 6

Used on DD-25 to DD-200

**NOTE:** Both Shaft Extensions Must Be Specified

### SECOND SHAFT EXTENSION

Refer to First Shaft Extension Above.

**NOTE:** Both Shaft Extensions Must Be Specified

### HOUSING CONFIGURATION

**F** = Standard Flange Base      **C** = Clevis Base

### SCREW CONFIGURATION

**T** = Threaded End      **P** = Top Plate  
**C** = Clevis End  
**D** = Threaded rod end with female clevis installed

### TRAVEL

Travel in inches.

### MODIFIER LIST

#### E, B and/or R

- E** = In-Line Encoder (See page 375)
- B** = Bellows Boots (See pages 280 – 281)
- R** = Rod Type Limit Switch (See page 382)

#### Optional S or M Required

- S** = Standard, no additional description required
- M** = Modified, additional description required

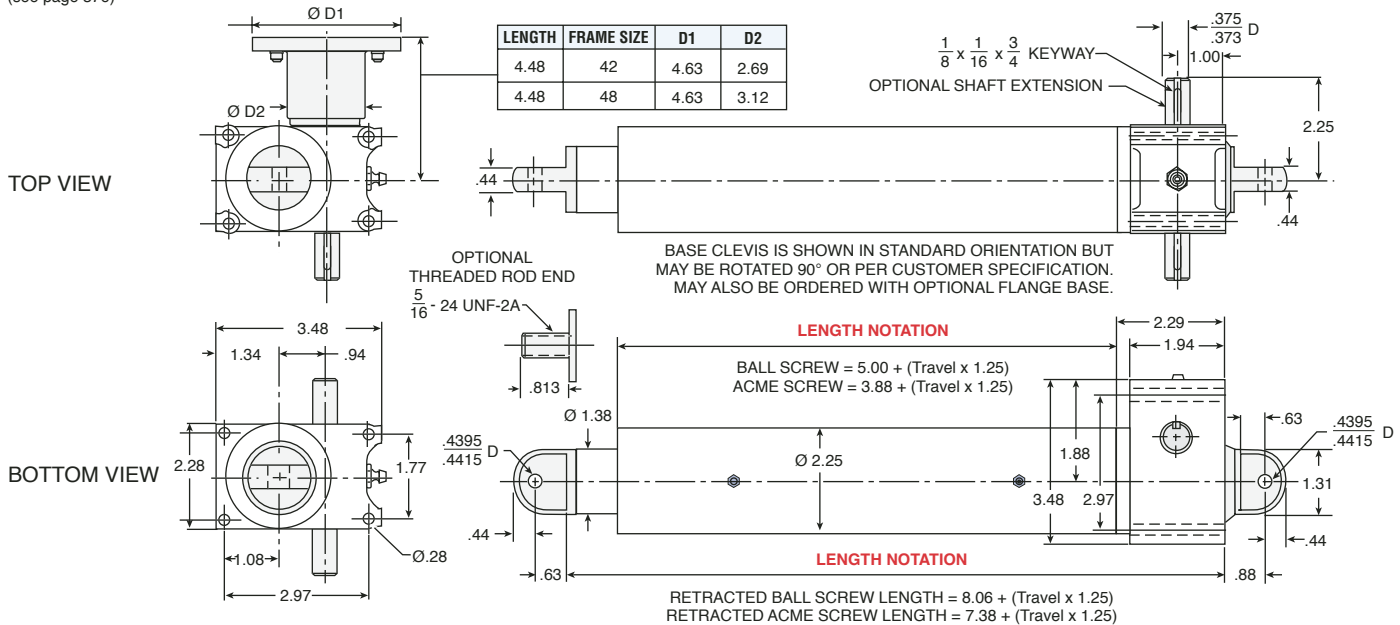
**NOTE: NOT ALL OPTIONS AVAILABLE FOR ALL SIZES**

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# SERIES DD-5



MOTOR MOUNT IS SHOWN IN POSITION 1  
Motor may be mounted to either side of cylinder (see page 376)



DD AND RAD ELECTRIC CYLINDERS

DD-5 BALL SCREW MODELS					
MODEL NUMBER	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	MAX. MOTOR HP RATING [ref.]	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
DD-55-HL / T03	1,000	6.9	.33	89	12
DD-520-HL / T06	1,000	4.1	.16	89	12
DD-55-HD / T03	1,000	.47	.33	35	12
DD-520-HD / T06	1,000	.47	.16	35	12

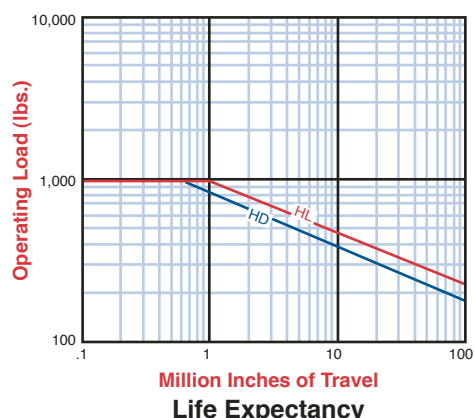
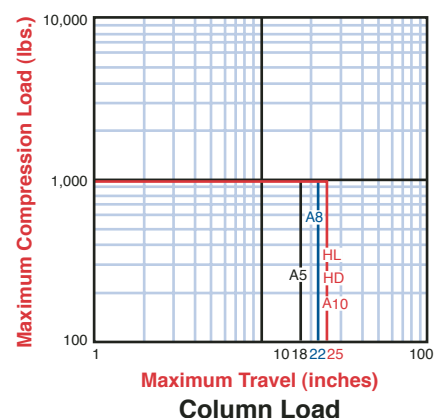
DD-5 ACME SCREW MODELS				
MODEL NUMBER	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]*	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
DD-55-A5 / T03	1,000	.33	72	11
DD-55-A8 / T03	1,000	.33	58	11
DD-55-A10 / T03	1,000	.33	53	11
DD-520-A5 / T06	1,000	.16	72	11
DD-520-A8 / T06	1,000	.16	58	11
DD-520-A10 / T06	1,000	.16	53	11

\*no brake

**BALL SCREW MODELS:**  
 TOTAL WEIGHT = (0.65)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**ACME SCREW MODELS:**  
 TOTAL WEIGHT = (0.64)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.



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# SERIES DD-10

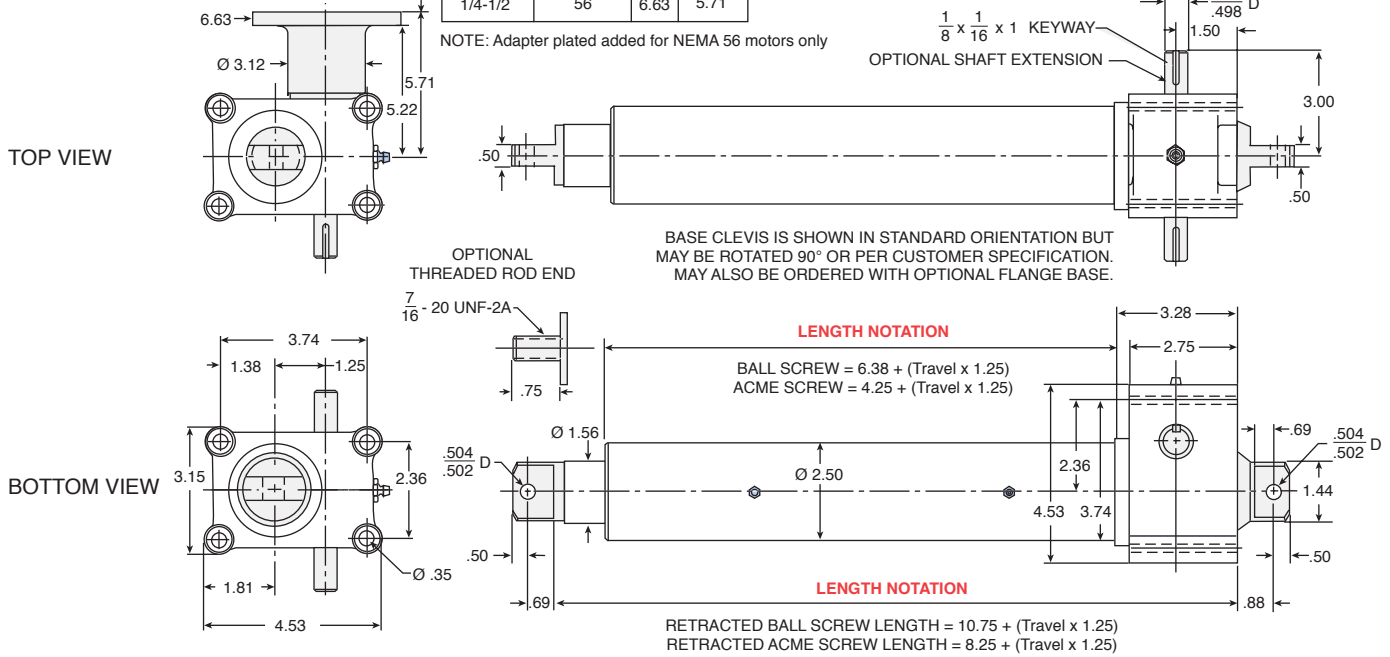
**ELECTRIC CYLINDERS**

MOTOR MOUNT IS SHOWN IN POSITION 1  
Motor may be mounted to either side of cylinder (see page 376)

MOTOR DIMENSIONS (For most up-to-date detailed motor dimensions, see www.nookindustries.com)

HP	FRAME SIZE	DIA	LENGTH
1/4-1/2	56	6.63	5.71

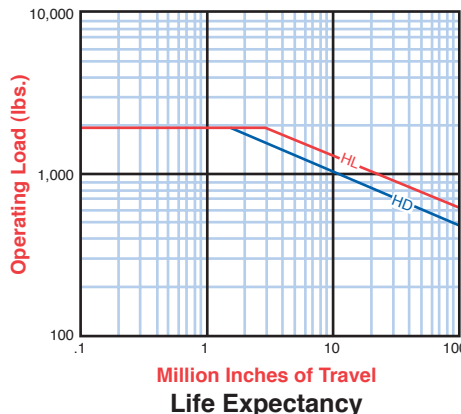
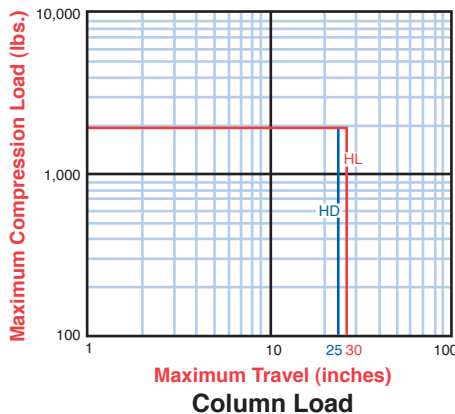
NOTE: Adapter plated added for NEMA 56 motors only



DD AND RAD ELECTRIC CYLINDERS

DD-10 BALL SCREW MODELS									
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
DD-105-HL / 05XX	173	750	46	.50	3	.20	.38	67	19
DD-1020-HL / 02XX	43	800	39	.25	3	.80	.15	71	19
DD-105-HD / 05XX	69	1900	.19	.50	3	.05	.06	67	19
DD-1020-HD / 02XX	17	2000	.17	.25	3	.02	.02	71	19

DD-10 ACME SCREW MODELS							
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
DD-105-A5 / 05XX	69	850	.50	3	.08	79	15
DD-1020-A5 / 02XX	17	900	.25	3	.02	84	15



**BALL SCREW MODELS:**  
TOTAL WEIGHT = (0.77)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**ACME SCREW MODELS:**  
TOTAL WEIGHT = (0.76)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.

The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

# SERIES DD-25



MOTOR IS SHOWN IN POSITION 1  
Motor may be mounted to either side of cylinder (see page 376)

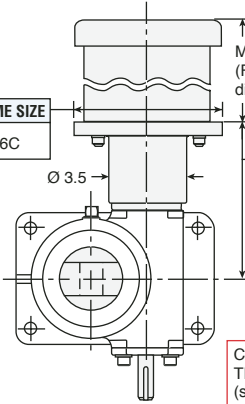
MOTOR DIMENSIONS  
(For most up-to-date detailed motor dimensions, see www.nookindustries.com)

THE DIMENSIONS ON THESE VIEWS ARE COMMON TO BOTH DD & RAD MODELS

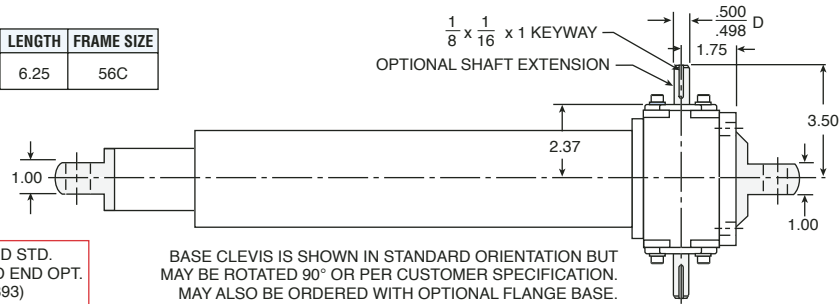
HP	DIA	FRAME SIZE
1/4-2	6.62	56C

HP	LENGTH	FRAME SIZE
1/4-2	6.25	56C

TOP VIEW

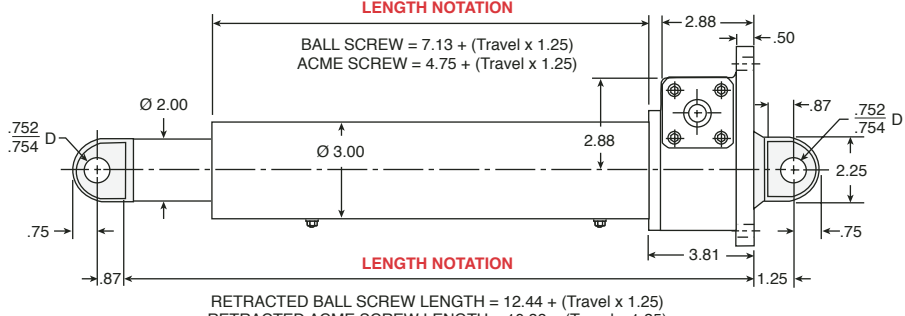
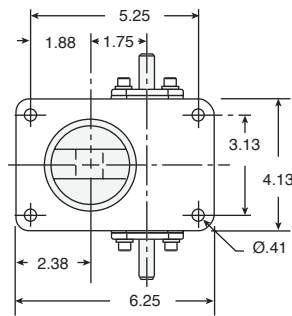


CLEVIS END STD. THREADED END OPT. (see page 393)



BASE CLEVIS IS SHOWN IN STANDARD ORIENTATION BUT MAY BE ROTATED 90° OR PER CUSTOMER SPECIFICATION. MAY ALSO BE ORDERED WITH OPTIONAL FLANGE BASE.

BOTTOM VIEW



RETRACTED BALL SCREW LENGTH = 12.44 + (Travel x 1.25)  
RETRACTED ACME SCREW LENGTH = 10.38 + (Travel x 1.25)

## DD-25 BALL SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
DD-256-HL / 10XX	288	900	13.5	1	6	.26	.44	159	33
DD-256-HL / 20XX	288	1,800	1.69	2	10	.43	.74	318	33
DD-2512-HL / 10XX	144	1,500	2.91	1	6	.25	.35	265	33
DD-256-ML / 15XX	144	1,800	7	1.5	6	.25	.43	159	33
DD-256-ML / 20XX	144	3,600	.9	2	10	.21	.42	318	33
DD-256-HD / 10XX	72	3,600	.09	1	6	.12	.21	159	33
DD-256-HD / 07XX	72	2,000	4.1	.75	6	.06	.09	89	33
DD-2512-HD / 07XX	36	4,450	.38	.75	6	.03	.04	197	33
DD-2512-HD / 05XX	36	2,000	4.1	.5	3	.04	.06	89	33
DD-2524-HD / 05XX	18	4,450	.38	.5	3	.02	.03	197	33
DD-2524-HD / 03XX	18	1,500	9.9	.33	3	.02	.02	66	33

## DD-25 ACME SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
DD-256-A2 / 15XX	144	1,725	1.5	6	.30	240	30
DD-256-A4 / 15XX	72	2,280	1.5	6	.15	239	30
DD-2512-A4 / 07XX	36	1,900	.75	6	.06	197	30
DD-2512-A4 / 10XX	36	2,500	1	6	.06	263	30
DD-2524-A4 / 05XX	18	1,880	.5	3	.02	197	30

Specifications on these charts are for standard units only and may change for modified non-standard units!

For Actuators without motors see page 376 for product specifications

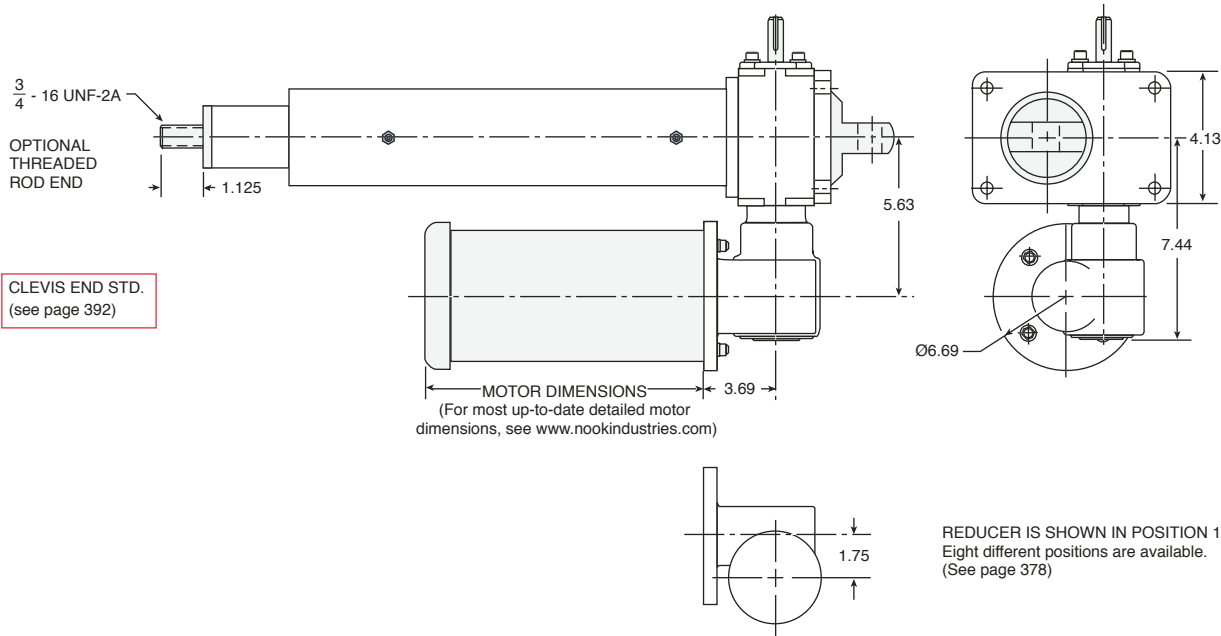
**BALL SCREW MODELS:** TOTAL WEIGHT = (1.05)T + BASIC WEIGHT, where T = TRAVEL IN INCHES  
**ACME SCREW MODELS:** TOTAL WEIGHT = (1.0)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.



# SERIES RAD-25

**ELECTRIC CYLINDERS**



DD AND RAD ELECTRIC CYLINDERS

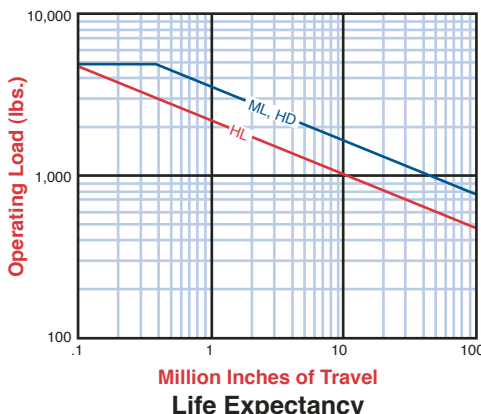
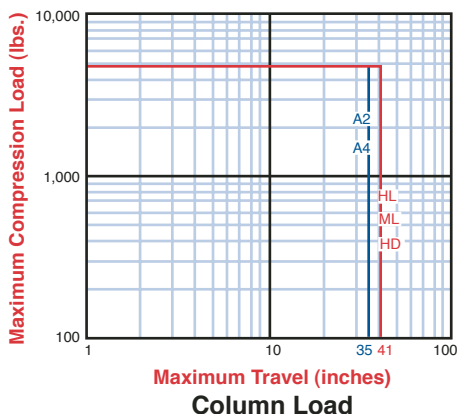
## RAD-25 BALL SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
RAD-2566-HL / 10XX	48	3,550	.22	1	6	.08	.08	628	46
RAD-2562-HL / 10XX	24	5,000	.08	1	6	.04	.04	885	46
RAD-2566-ML / 05XX	24	5,000	.33	.5	3	.014	.014	443	46
RAD-2562-HD / 03XX	6	5,000	.27	.33	3	.007	.007	221	46
RAD-2546-HD / 03XX	3	5,000	.27	.25	3	.003	.003	221	46

## RAD-25 ACME SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
RAD-2566-A4 / 07XX	12	5,000	.75	6	.02	525	44
RAD-2562-A4 / 05XX	6	5,000	.5	3	.005	525	44
RAD-2546-A4 / 03XX	3	5,000	.33	3	.004	525	44

### SERIES 25 DD & RAD



**ALL SCREW MODELS:**  
 TOTAL WEIGHT = (1.05)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**ACME SCREW MODELS:**  
 TOTAL WEIGHT = (1.0)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.

The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

# SERIES DD-30



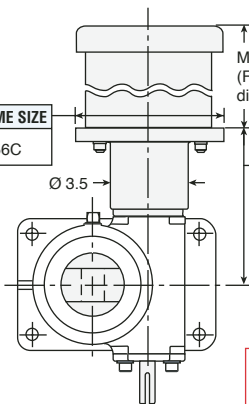
MOTOR IS SHOWN IN POSITION 1  
Motor may be mounted to either side of cylinder (see page 376)

HP	DIA	FRAME SIZE
1/4-2	6.62	56C

MOTOR DIMENSIONS  
(For most up-to-date detailed motor dimensions, see www.nookindustries.com)

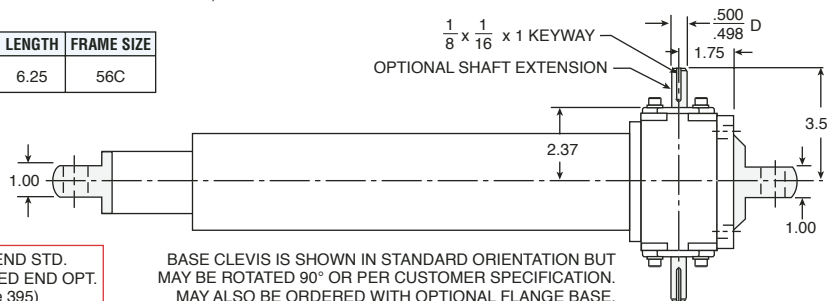
HP	LENGTH	FRAME SIZE
1/4-2	6.25	56C

TOP VIEW



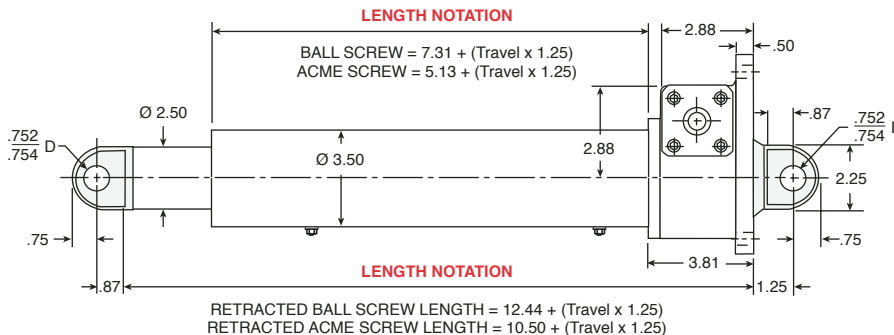
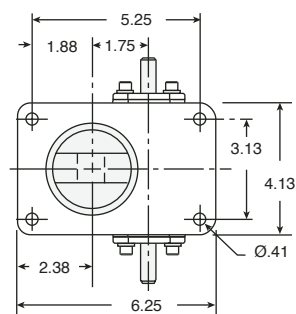
CLEVIS END STD. THREADED END OPT. (see page 395)

THE DIMENSIONS ON THESE VIEWS ARE COMMON TO BOTH DD & RAD MODELS



BASE CLEVIS IS SHOWN IN STANDARD ORIENTATION BUT MAY BE ROTATED 90° OR PER CUSTOMER SPECIFICATION. MAY ALSO BE ORDERED WITH OPTIONAL FLANGE BASE.

BOTTOM VIEW



DD AND RAD ELECTRIC CYLINDERS

## DD-30 BALL SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
DD-306-HD / 15XX	120	3,275	1.68	1.5	6	.25	.83	239	38
DD-3012-HD / 10XX	60	3,600	1.26	1.0	6	.10	.16	263	38
DD-3012-HD / 07XX	60	2,500	3.78	.75	6	.05	.07	183	38
DD-3024-HD / 05XX	30	2,700	3.00	.5	3	.03	.05	197	38

## DD-30 ACME SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
DD-306-A4 / 15XX	72	2,100	1.5	6	.15	240	33
DD-3012-A4 / 10XX	36	2,200	1	6	.06	263	33
DD-3024-A4 / 05XX	18	1,200	.5	3	.02	140	33

Specifications on these charts are for standard units only and may change for modified non-standard units!  
For Actuators without motors see page 376 for product specifications

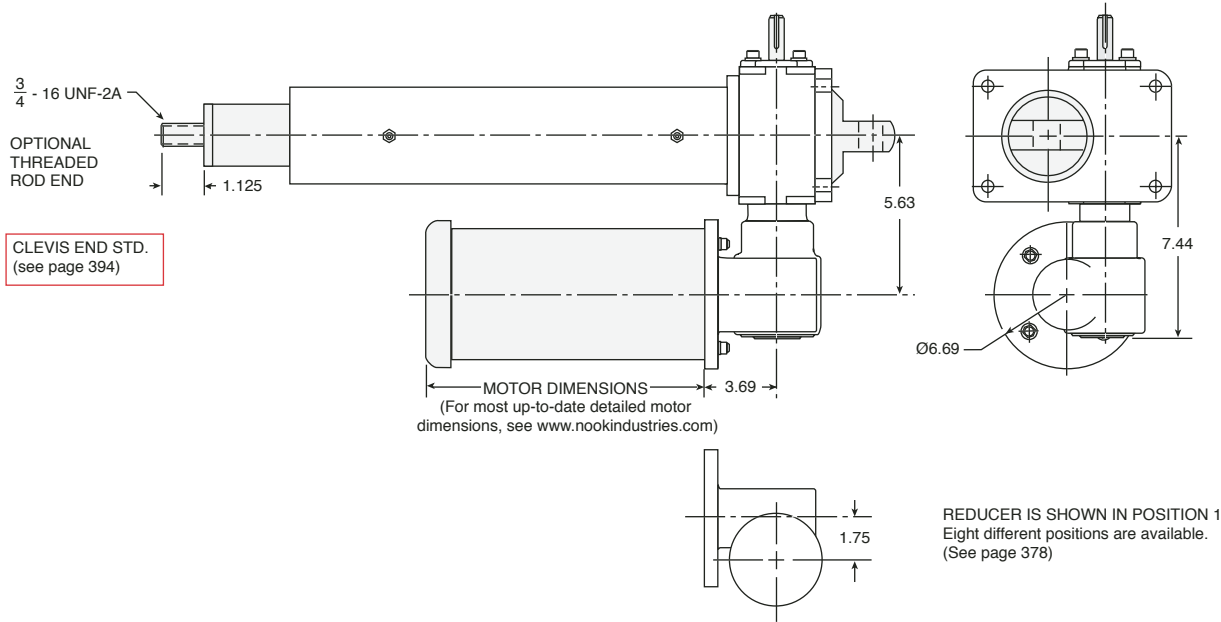
**BALL SCREW MODELS:** TOTAL WEIGHT = (1.31)T + BASIC WEIGHT, where T = TRAVEL IN INCHES  
**ACME SCREW MODELS:** TOTAL WEIGHT = (1.38)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.



# SERIES RAD-30

**ELECTRIC CYLINDERS**



DD AND RAD ELECTRIC CYLINDERS

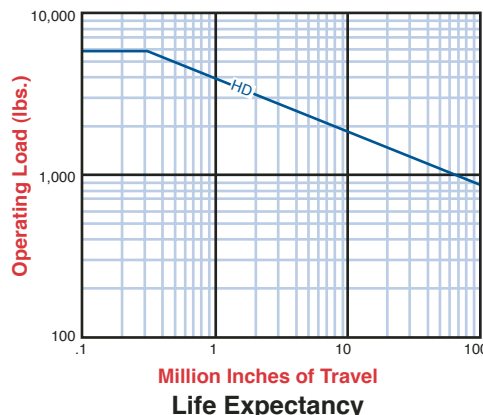
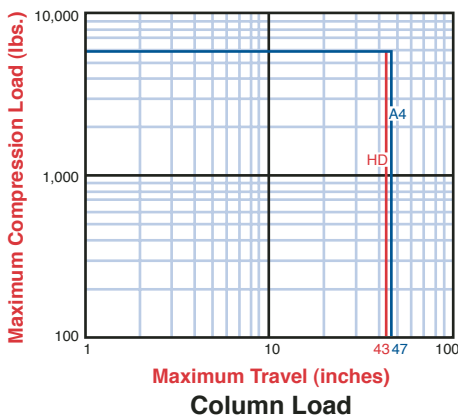
## RAD-30 BALL SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
RAD-3066-HD / 05XX	20	4,775	.54	.5	3	.02	.02	349	51
RAD-3062-HD / 03XX	10	5,250	.40	.33	3	.012	.012	383	51
RAD-3022-HD / 03XX	5	6,000	.27	.33	3	.006	.006	439	51

## RAD-30 ACME SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
RAD-3066-A4 / 10XX	12	6,000	1	6	.02	702	47
RAD-3062-A4 / 07XX	6	4,925	.75	3	.005	575	47
RAD-3022-A4 / 05XX	3	6,000	.5	3	.004	702	47

### SERIES 30 DD & RAD



**BALL SCREW MODELS:**

TOTAL WEIGHT = (1.31)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**ACME SCREW MODELS:**

TOTAL WEIGHT = (1.38)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

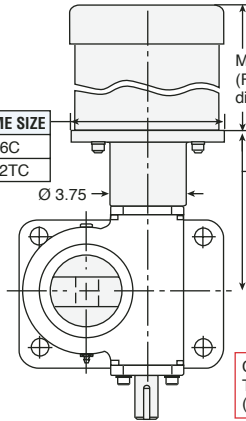
**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.

The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

# SERIES DD-50



MOTOR IS SHOWN IN POSITION 1  
Motor may be mounted to either side of cylinder (see page 376)



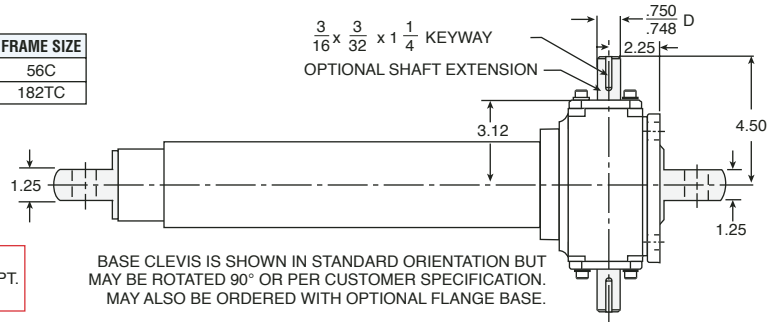
**MOTOR DIMENSIONS**  
(For most up-to-date detailed motor dimensions, see www.nookindustries.com)

HP	DIA	FRAME SIZE
3/4-2	6.75	56C
3	9.25	182TC

HP	LENGTH	FRAME SIZE
3/4-2	7.25	56C
3	8.00	182TC

TOP VIEW

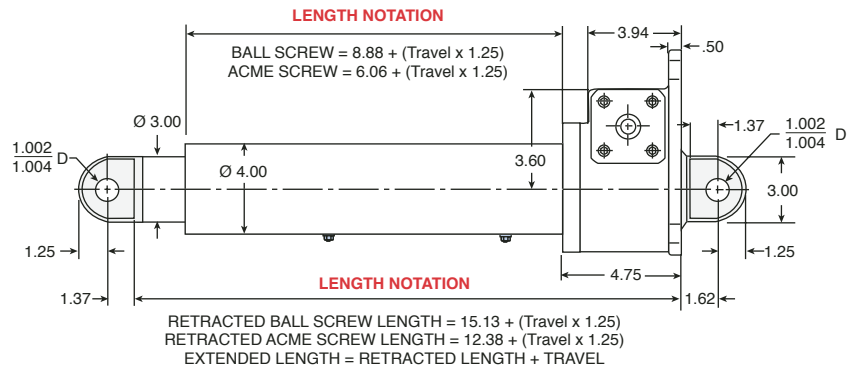
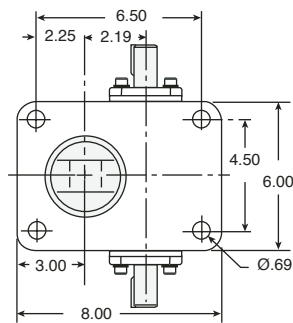
THE DIMENSIONS ON THESE VIEWS ARE COMMON TO BOTH DD & RAD MODELS



CLEVIS END STD. THREADED END OPT. (see page 397)

BASE CLEVIS IS SHOWN IN STANDARD ORIENTATION BUT MAY BE ROTATED 90° OR PER CUSTOMER SPECIFICATION. MAY ALSO BE ORDERED WITH OPTIONAL FLANGE BASE.

BOTTOM VIEW



DD AND RAD ELECTRIC CYLINDERS

## DD-50 BALL SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
DD-506-SL / 20XX	539	950	110	2	10	.8	1.7	501	63
DD-506-HL / 20XX	288	2,000	73	2	10	.43	1.07	320	63
DD-506-HL / 30XX	288	2,500	21	3	15	.74	1.48	480	63
DD-506-HD / 20XX	136	4,000	18	2	10	.20	.46	320	63
DD-506-HD / 30XX	136	5,750	5.4	3	15	.35	.66	480	63
DD-5024-HD / 07XX	34	3,000	19	0.75	6	.03	.04	314	63

## DD-50 ACME SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
DD-506-A2 / 20XX	144	1,900	2	10	.21	476	53
DD-506-A3 / 10XX	108	1,000	1	6	.19	143	53
DD-506-A3 / 20XX	108	2,200	2	10	.16	288	53
DD-506-A3 / 30XX	108	2,900	3	15	.28	432	53
DD-508-A4 / 20XX	54	3,000	3	15	.08	455	53
DD-5024-A3 / 07XX	27	1,900	.75	6	.02	285	53

Specifications on these charts are for standard units only and may change for modified non-standard units!

For Actuators without motors see page 376 for product specifications

**BALL SCREW MODELS:** TOTAL WEIGHT = (1.92)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**ACME SCREW MODELS:** TOTAL WEIGHT = (1.87)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

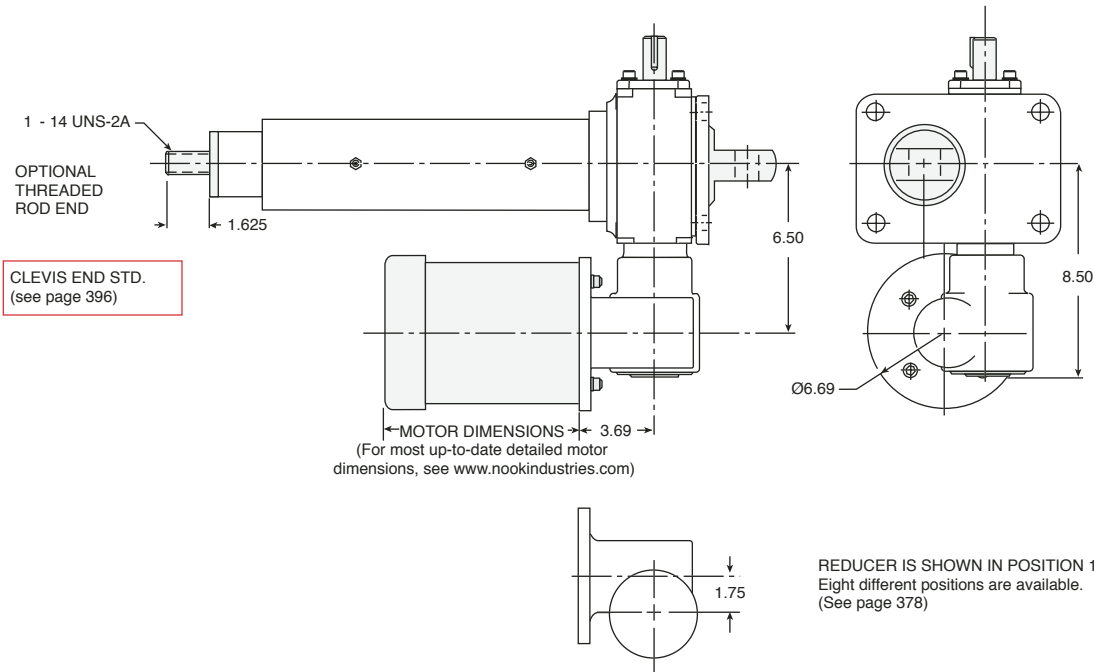
**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.





# SERIES RAD-50

**ELECTRIC CYLINDERS**

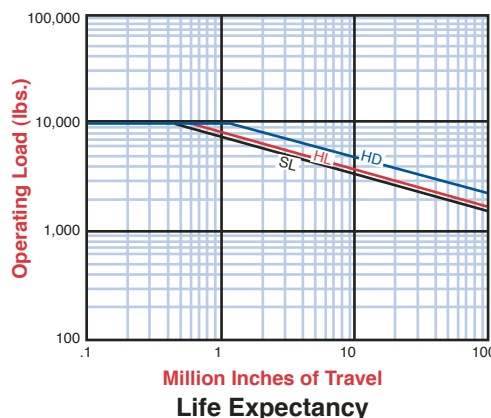
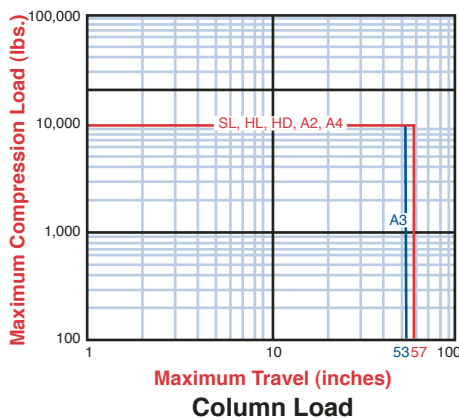


DD AND RAD ELECTRIC CYLINDERS

RAD-50 BALL SCREW MODELS									
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
RAD-5066-HL / 10XX	48	4,000	22	1	6	.08	.08	478	77
RAD-5066-HD / 10XX	23	5,000	5.6	1	6	.04	.04	475	77
RAD-5046-HL / 10XX	12	8,000	1.5	1	6	.02	.02	1,179	77
RAD-5062-HD / 10XX	11	9,000	1.4	1	6	.02	.02	754	77
RAD-5046-HD / 10XX	6	9,000	1.4	1	6	.02	.01	754	77

RAD-50 ACME SCREW MODELS								
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]	
RAD-5066-A3 / 10XX	18	2,700	1	6	.03	402	66	
RAD-5062-A3 / 10XX	9	4,500	1	6	.02	670	66	
RAD-5046-A3 / 10XX	4.5	7,200	1	6	.01	1,073	66	

## SERIES 50 DD & RAD



**BALL SCREW MODELS:**  
TOTAL WEIGHT = (1.92)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**ACME SCREW MODELS:**  
TOTAL WEIGHT = (1.87)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.

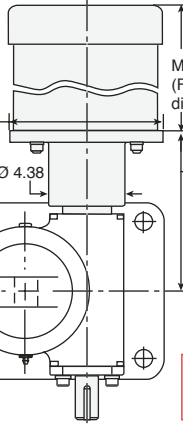
The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

# SERIES DD-100



MOTOR IS SHOWN IN POSITION 1  
Motor may be mounted to either side of cylinder (see page 376)

HP	DIA	FRAME SIZE
1-2	6.75	56C
3-5	9.25	184TC



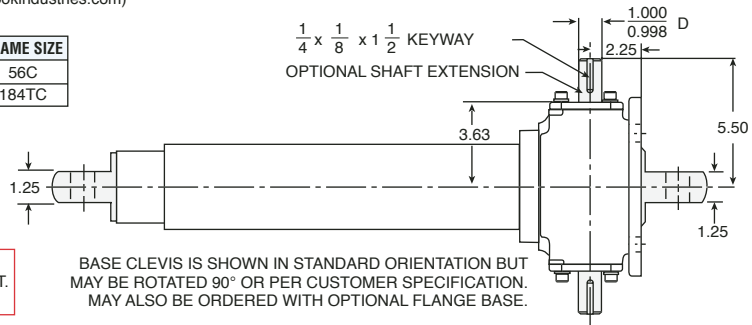
**MOTOR DIMENSIONS**  
(For most up-to-date detailed motor dimensions, see www.nookindustries.com)

HP	LENGTH	FRAME SIZE
1-2	8.25	56C
3-5	9.00	184TC

TOP VIEW

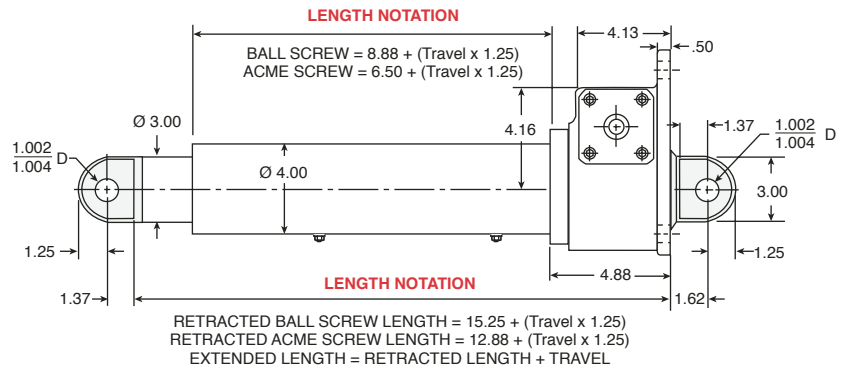
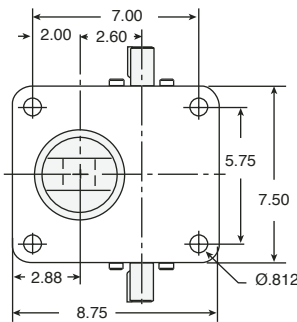
CLEVIS END STD.  
THREADED END OPT.  
(see page 399)

THE DIMENSIONS ON THESE VIEWS ARE COMMON TO BOTH DD & RAD MODELS



BASE CLEVIS IS SHOWN IN STANDARD ORIENTATION BUT MAY BE ROTATED 90° OR PER CUSTOMER SPECIFICATION. MAY ALSO BE ORDERED WITH OPTIONAL FLANGE BASE.

BOTTOM VIEW



DD AND RAD ELECTRIC CYLINDERS

## DD-100 BALL SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
DD-1008-SL / 20XX	404	1,150	240	2	10	.6	.9	385	80
DD-1008-HL / 20XX	216	2,175	42	2	10	.3	.5	385	80
DD-1008-HL / 50XX	216	5,400	2.7	5	15	.7	1.3	956	80
DD-1008-HD / 20XX	102	4,600	10.4	2	10	.2	.2	385	80
DD-1008-HD / 30XX	102	7,500	2.4	3	15	.3	.4	628	80
DD-1008-HD / 50XX	102	12,000	.59	5	15	.3	.7	1005	80
DD-10024-HL / 15XX	72	2,700	22	1.5	6	.15	.16	478	80
DD-10024-HD / 15XX	34	7,150	2.8	1.5	6	.07	.09	598	80

## DD-100 ACME SCREW MODELS

MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
DD-1008-A2 / 20XX	108	2,000	2	10	.6	398	77
DD-1008-A2 / 30XX	108	3,000	3	15	.3	597	77
DD-1008-A2 / 50XX	108	4,500	5	15	.7	896	77
DD-1008-A4 / 20XX	54	2,000	2	10	.2	362	77
DD-10024-A2 / 15XX	36	2,000	1.5	6	.3	398	77

Specifications on these charts are for standard units only and may change for modified non-standard units!

For Actuators without motors see page 376 for product specifications

**BALL SCREW MODELS:** TOTAL WEIGHT = (1.92)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

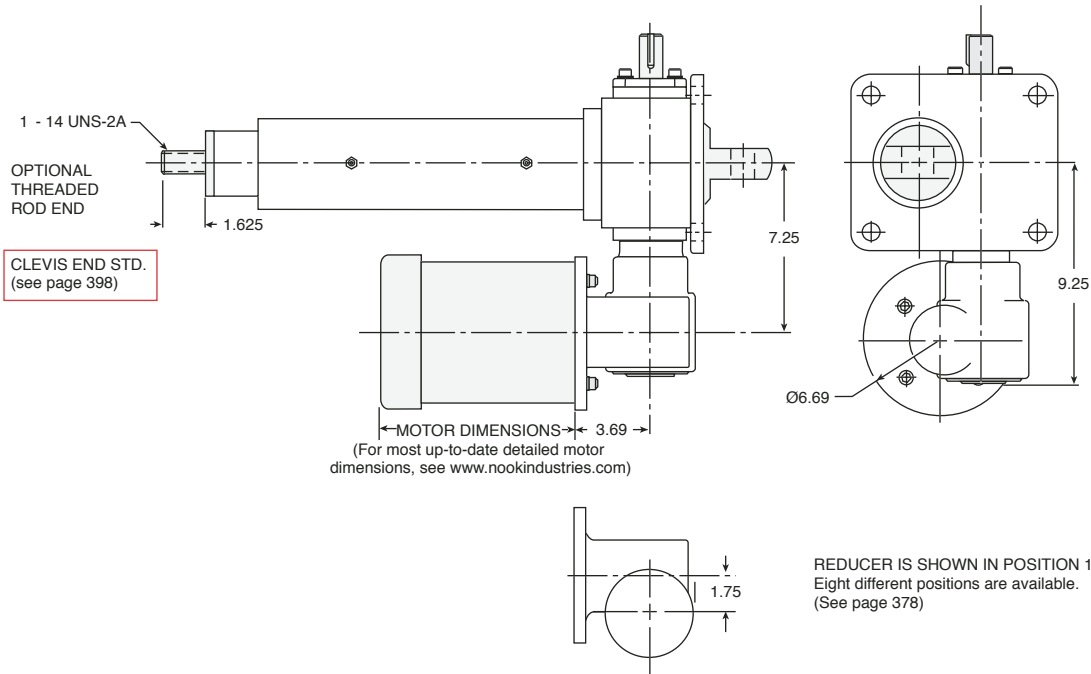
**ACME SCREW MODELS:** TOTAL WEIGHT = (2.5)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.



# SERIES RAD-100

**ELECTRIC CYLINDERS**

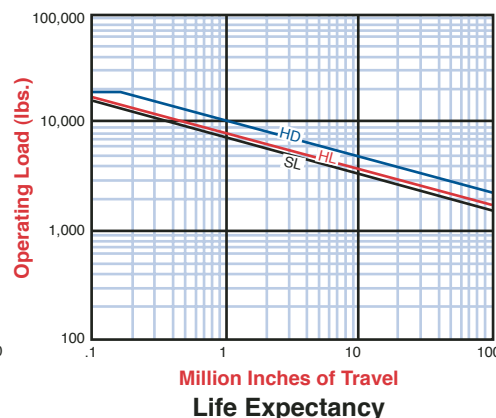
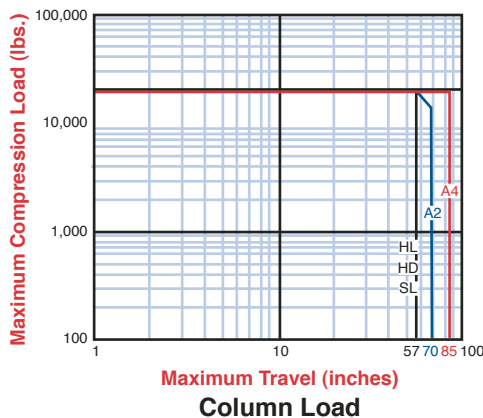


DD AND RAD ELECTRIC CYLINDERS

RAD-100 BALL SCREW MODELS									
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
RAD-10086-HL / 10XX	36	4,275	5.5	1	6	.06	.06	758	93
RAD-10086-HD / 10XX	17	10,000	1.0	1	6	.03	.03	837	93
RAD-10046-HL / 10XX	12	9,750	.47	1	6	.02	.02	1,226	93
RAD-10082-HD / 10XX	9	15,000	.3	1	6	.01	.01	1,258	93
RAD-10046-HD / 10XX	6	18,750	.15	1	6	.01	.01	1,571	93

RAD-100 ACME SCREW MODELS							
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
RAD-10086-A2 / 10XX	18	3,800	1	6	.06	756	89
RAD-10082-A2 / 10XX	9	6,275	1	6	.07	1,249	89
RAD-10046-A2 / 10XX	6	7,800	1	6	.03	1,552	89

## SERIES 100 DD & RAD



### BALL SCREW MODELS:

TOTAL WEIGHT = (1.92)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

### ACME SCREW MODELS:

TOTAL WEIGHT = (2.5)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.

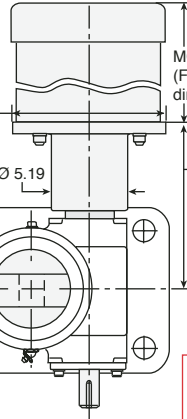
The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

# SERIES DD-200



MOTOR IS SHOWN IN POSITION 1  
Motor may be mounted to either side of cylinder (see page 376)

HP	DIA	FRAME SIZE
2	6.75	56C
3-5	9.25	184TC
7.5	9.25	213TC



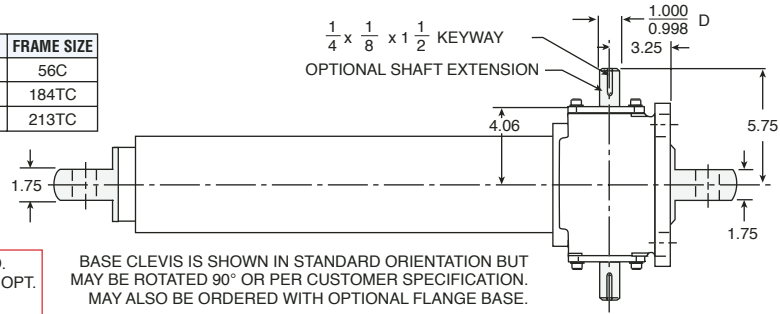
TOP VIEW

MOTOR DIMENSIONS  
(For most up-to-date detailed motor dimensions, see www.nookindustries.com)

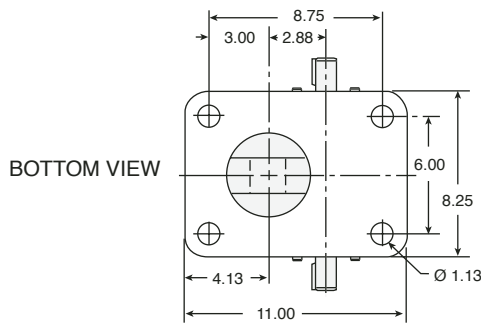
HP	LENGTH	FRAME SIZE
2	8.65	56C
3-5	9.00	184TC
7.5	9.65	213TC

CLEVIS END STD.  
THREADED END OPT.  
(see page 401)

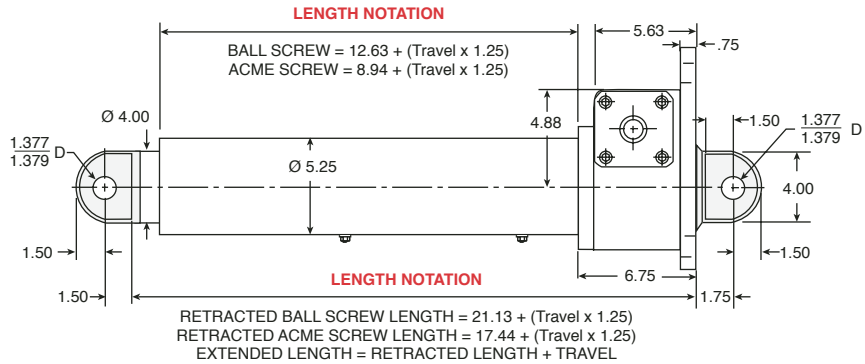
THE DIMENSIONS ON THESE VIEWS ARE COMMON TO BOTH DD & RAD MODELS



BASE CLEVIS IS SHOWN IN STANDARD ORIENTATION BUT MAY BE ROTATED 90° OR PER CUSTOMER SPECIFICATION. MAY ALSO BE ORDERED WITH OPTIONAL FLANGE BASE.



BOTTOM VIEW



DD AND RAD ELECTRIC CYLINDERS

DD-200 BALL SCREW MODELS									
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
DD-2008-HL / 70XX	216	8,000	36	7.5	25	.4	.6	1,416	154
DD-2008-HD / 70XX	108	16,600	2.1	7.5	25	.2	.3	1,469	154
DD-2008-HD / 50XX	108	11,000	7.3	5	15	.4	.7	979	154
DD-20024-HL / 20XX	72	4,000	292	2	10	.1	.1	708	154
DD-20024-HD / 20XX	36	7,000	28	2	10	.1	.1	620	154
DD-20024-HD / 30XX	36	10,000	9.7	3	15	.1	.1	885	154

DD-200 ACME SCREW MODELS								
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
					NO LOAD			
DD-2008-A2 / 70XX	108	4,250	7.5	15	.4		995	138
DD-2008-A3 / 70XX	72	4,620	7.5	15	.24		979	138
DD-20024-A2 / 20XX	36	2,500	2	10	.05		585	138
DD-20024-A2 / 30XX	36	3,500	3	15	.09		819	138

Specifications on these charts are for standard units only and may change for modified non-standard units!

For Actuators without motors see page 376 for product specifications

**BALL SCREW MODELS:** TOTAL WEIGHT = (3.31)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

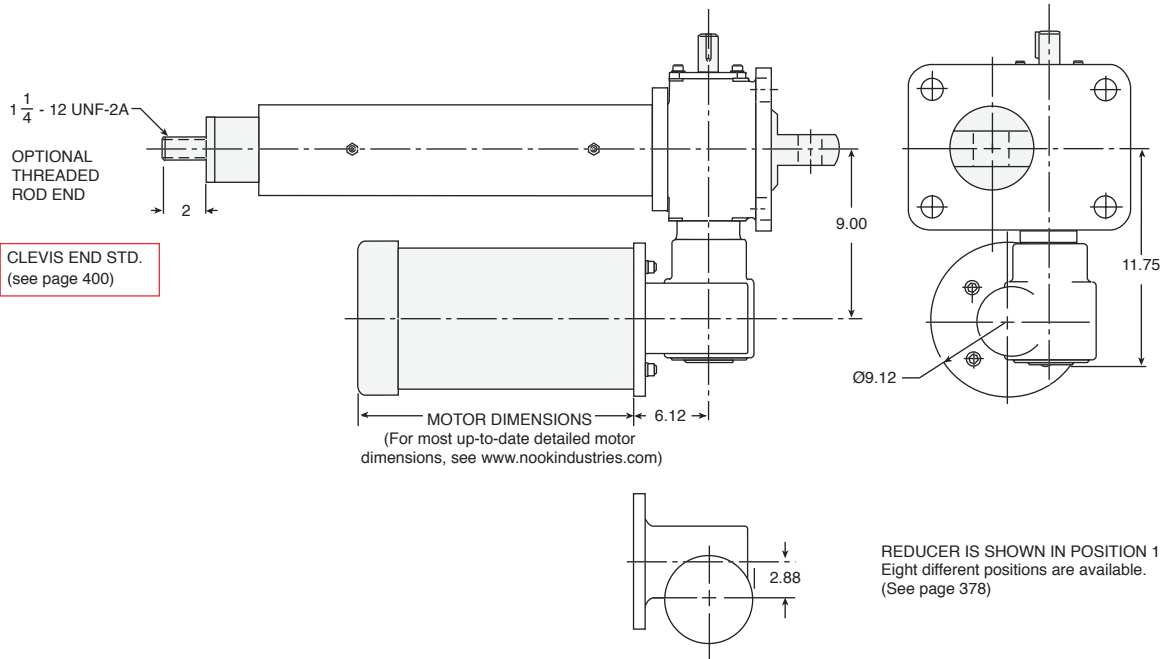
**ACME SCREW MODELS:** TOTAL WEIGHT = (3.6)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.



# SERIES RAD-200

**ELECTRIC CYLINDERS**

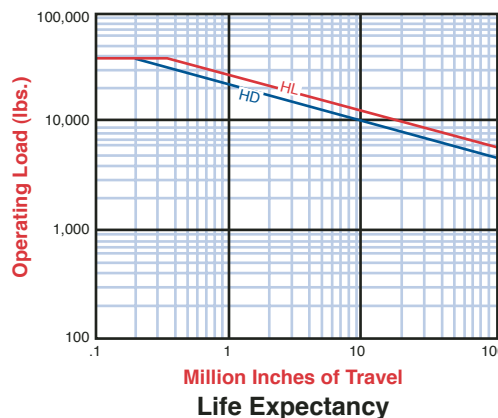
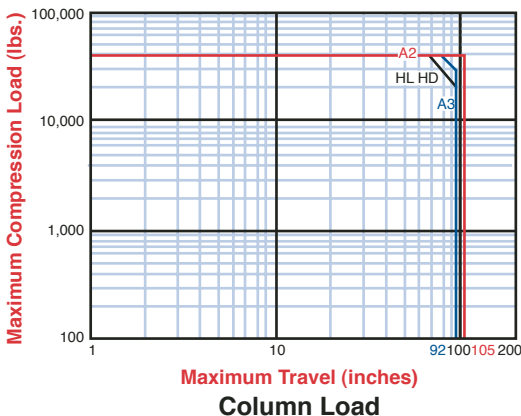


DD AND RAD ELECTRIC CYLINDERS

RAD-200 BALL SCREW MODELS									
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lb.]	RATED LIFE [in. x 10 <sup>6</sup> ]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.]		MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]
						No Load	Full Load		
RAD-20088-HL / 50XX	27	30,000	.69	5	15	.09	.09	5,300	202
RAD-20088-HD / 30XX	13.5	35,000	.23	3	15	.03	.03	3,098	202
RAD-20048-HL / 30XX	9	35,000	.44	3	15	.02	.02	6,195	202
RAD-20048-HD / 20XX	4.5	40,000	.15	2	10	.01	.01	3,540	202

RAD-200 ACME SCREW MODELS								
MODEL NUMBER	TRAVEL RATE [in./min.]	DYNAMIC CAPACITY [lbf.]	STD. MOTOR HP RATING [ref.]	STD. BRAKE TORQUE [ft.-lb.]	APPROX. STOPPING DISTANCE [in.] NO LOAD	MAXIMUM ROD REACTION TORQUE [in.-lb.]	BASIC WEIGHT [lbs.]	
RAD-20088-A2 / 70XX	13.5	31,000	7.5	25	.03	7,254	187	
RAD-20088-A3 / 50XX	9	22,500	5	15	.03	4,770	187	
RAD-20048-A2 / 30XX	4.5	12,500	3	15	.01	2,925	187	

## SERIES 200 DD & RAD



**BALL SCREW MODELS:**  
TOTAL WEIGHT = (3.31)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**ACME SCREW MODELS:**  
TOTAL WEIGHT = (3.6)T + BASIC WEIGHT, where T = TRAVEL IN INCHES

**WARNING!** UNITS ARE NOT TO BE USED AS PERSONNEL SUPPORT OR MOVEMENT. BALL SCREW MODELS ARE SELF-LOWERING.

The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.



## ILA-100-HD / X05 / TC / 24.5 / S

### SERIES ILA MODEL

Refer to product pages for available models.

**ILA** = Standard In-Line Actuator  
**ILAK** = Keyed In-Line Actuator

### MOTOR MOUNT CODES \*

Motor Mounts Without Motor (Refer to product pages for available models.)

#### NEMA Frame Mounts

**X04** = (48C) ILA-5, ILAK-5, ILA-10, ILAK-10  
**X05** = (56C) All models except ILA-200, ILAK-200  
**X14** = (140TC) All models except ILA-5, ILAK-5, ILA-10, ILAK-10  
**X18** = (180TC) ILA-100, ILAK-100, ILA 200, ILAK-200  
**X21** = (210TC) ILA-100, ILAK-100, ILA 200, ILAK-200

#### IEC Frame Mounts

**56B5** = ILA-5, ILAK-5  
**56B14** = ILA-5, ILAK-5  
**63B5** = ILA-10, ILAK-10  
**63B14** = ILA-10, ILAK-10  
**71B5** = ILA-10, ILAK-10, ILA-25, ILAK-25  
**71B14** = ILA-10, ILAK-10, ILA-25, ILAK-25  
**80B5** = ILA-25, ILAK-25, ILA-100, ILAK-100  
**80B14** = ILA-25, ILAK-25, ILA-100, ILAK-100  
**90B5** = ILA-100, ILAK-100  
**90B14** = ILA-100, ILAK-100  
**100B5** = ILA-100, ILAK-100, ILA0-200, ILAK-200  
**100B14** = ILA 100, ILAK-100, ILA0-200, ILAK-200

\*Unless specified at the time of order, the electric cylinder will be supplied with a jaw-type coupling that may reduce the allowable torque input. For more information please contact Nook application engineers.

### HOUSING CONFIGURATION

**T** = Standard Trunnion Mount

### ROD CONFIGURATION

**T** = Threaded End                      **P** = Top Plate  
**C** = Clevis End  
**D** = Threaded rod end with female clevis installed

### TRAVEL

Travel in inches

### MODIFIER LIST

Always **S**, **B** or **M**

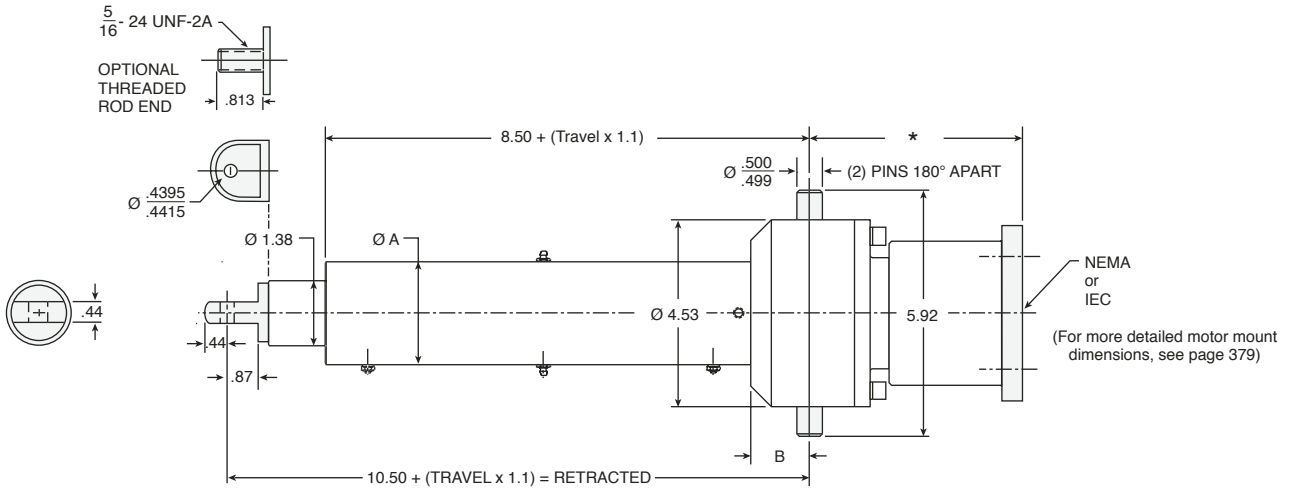
**S** = Standard, no additional description required  
**B** = Bellows Boots (See pages 280-281)  
**M** = Modified, additional description required





# SERIES ILA-5 & ILAK-5

**IN-LINE ELECTRIC CYLINDERS**



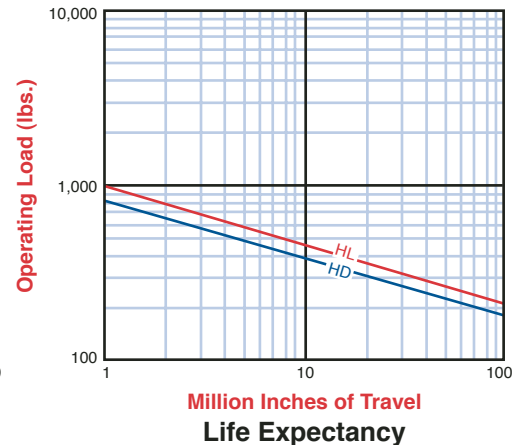
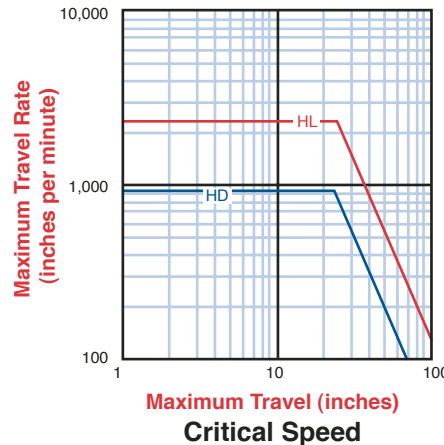
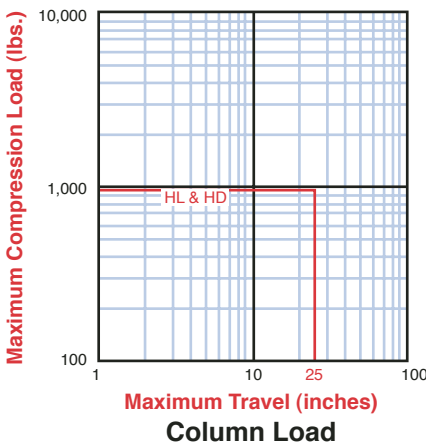
\* DIMENSION BASED ON MOTOR MOUNT, contact factory with your specific requirements.

ILA-5 & ILAK-5 BALL SCREW MODELS							
MODEL NUMBER	MAXIMUM LOAD [lb.]	MAX. INPUT TORQUE [in.-lb.]	MAX. TRAVEL RATE [in./min.]	BALL SCREW	TORQUE PER LB. [in.-lb.]	DIMENSIONS	
						A	B
ILA-5 HL	1,000	88	2,377	0631-0500 SRT	0.088	2.25	1.38
ILA-5 HD	1,000	35	951	0631-0200 SRT	0.035	2.25	1.38
ILAK-5 HL (Keyed)	1,000	88	2,377	0631-0500 SRT	0.088	3.50	1.10
ILAK-5 HD (Keyed)	1,000	35	951	0631-0200 SRT	0.035	3.50	1.10

**ROD REACTION TORQUE** = TORQUE PER LB. x LOAD

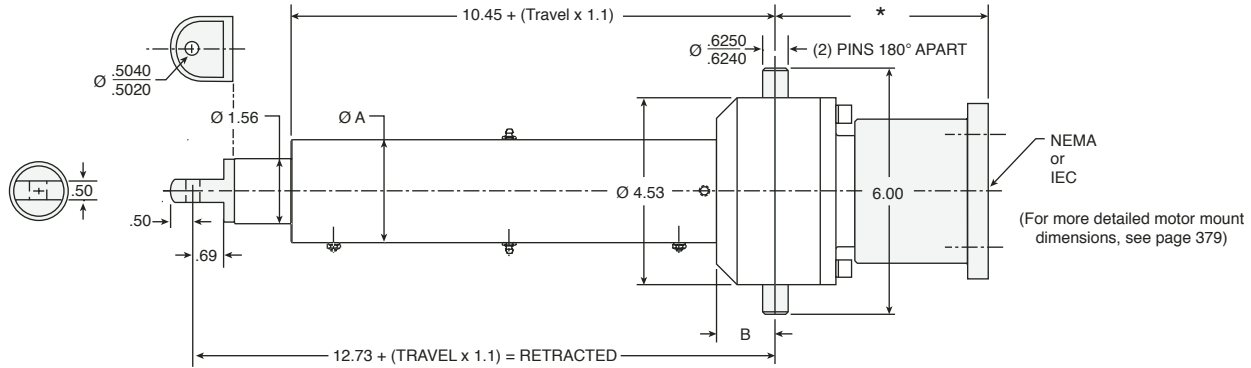
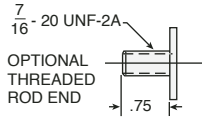
**NOTE:** CYLINDER IS SELF-LOWERING. INPUT SHAFT MUST BE SECURED TO PREVENT ROTATION.

## SERIES ILA-5 & ILAK-5



The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

# SERIES ILA-10 & ILAK-10



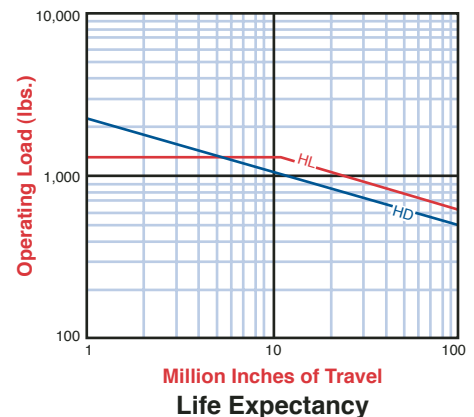
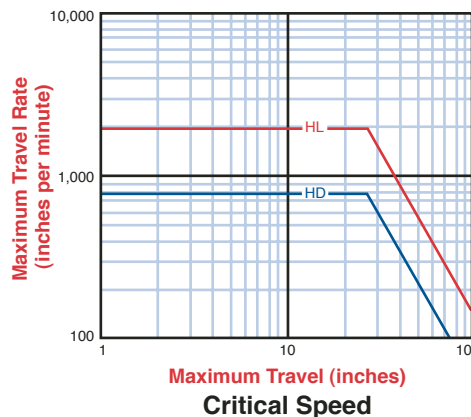
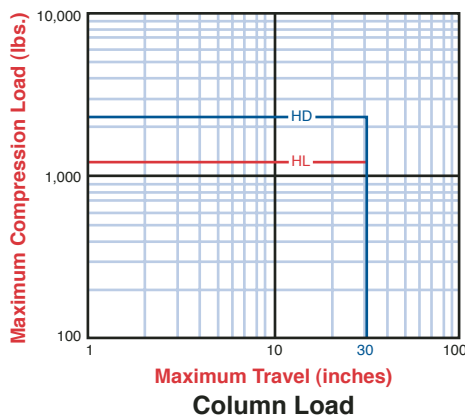
\* DIMENSION BASED ON MOTOR MOUNT, contact factory with your specific requirements.

IN-LINE ELECTRIC CYLINDERS

ILA-10 & ILAK-10 BALL SCREW MODELS							
MODEL NUMBER	MAXIMUM LOAD [lb.]	MAX. INPUT TORQUE [in.-lb.]	MAX. TRAVEL RATE [in.-min.]	BALL SCREW	TORQUE PER LB. [in.-lb.]	DIMENSIONS	
						A	B
ILA-10 HL	1,200	105	2,000	0750-0500 SRT	0.088	2.50	1.44
ILA-10-HD	2,200	77	800	0750-0200 SRT	0.035	2.50	1.44
ILAK-10 HL (Keyed)	1,200	105	2,000	0750-0500 SRT	0.088	4.00	1.25
ILAK-10 HD (Keyed)	2,200	77	800	0750-0200 SRT	0.035	4.00	1.25

**ROD REACTION TORQUE** = TORQUE PER LB. x LOAD

## SERIES ILA-10 & ILAK-10

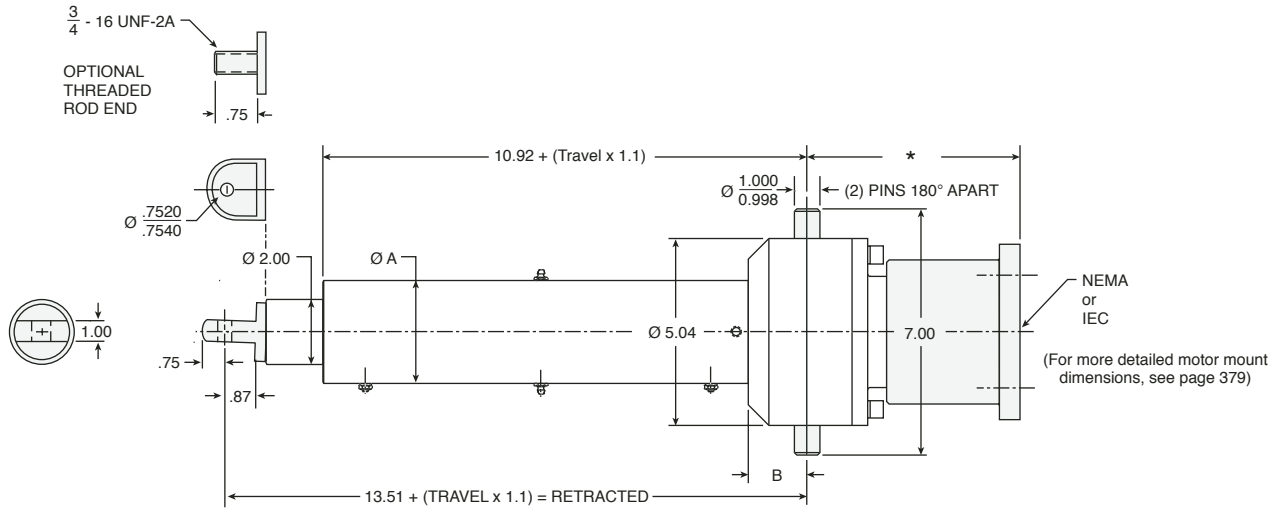






# SERIES ILA-25 & ILAK-25

**IN-LINE ELECTRIC CYLINDERS**

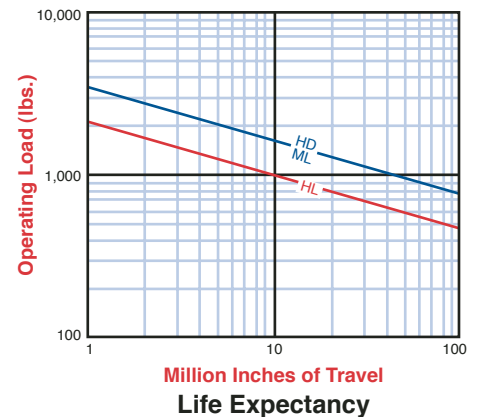
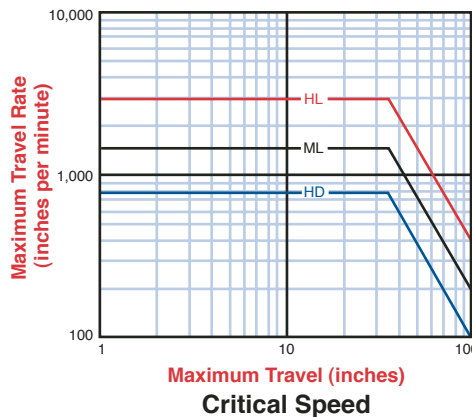
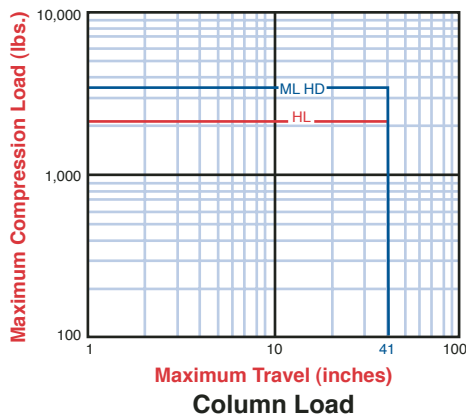


\* DIMENSION BASED ON MOTOR MOUNT, contact factory with your specific requirements.

ILA-25 & ILAK-25 BALL SCREW MODELS							
MODEL NUMBER	MAXIMUM LOAD [lb.]	MAX. INPUT TORQUE [in.-lb.]	MAX. TRAVEL RATE [in./min.]	BALL SCREW	TORQUE PER LB. [in.-lb.]	DIMENSIONS	
						A	B
ILA-25 HL	2,200	390	3,000	1000-1000 SRT	0.177	3.00	1.50
ILA-25-ML	3,500	308	1,500	1000-0500 SRT	0.088	3.00	1.50
ILA-25-HD	3,500	154	750	1000-0250 SRT	0.035	3.00	1.50
ILAK-25 HL (Keyed)	2,200	390	3,000	1000-1000 SRT	0.177	4.00	1.25
ILAK-25-ML (Keyed)	3,500	308	1,500	1000-0500 SRT	0.088	4.00	1.25
ILAK-25-HD (Keyed)	3,500	154	750	1000-0250 SRT	0.035	4.00	1.25

**ROD REACTION TORQUE** = TORQUE PER LB. x LOAD

## SERIES ILA-25 & ILAK-25

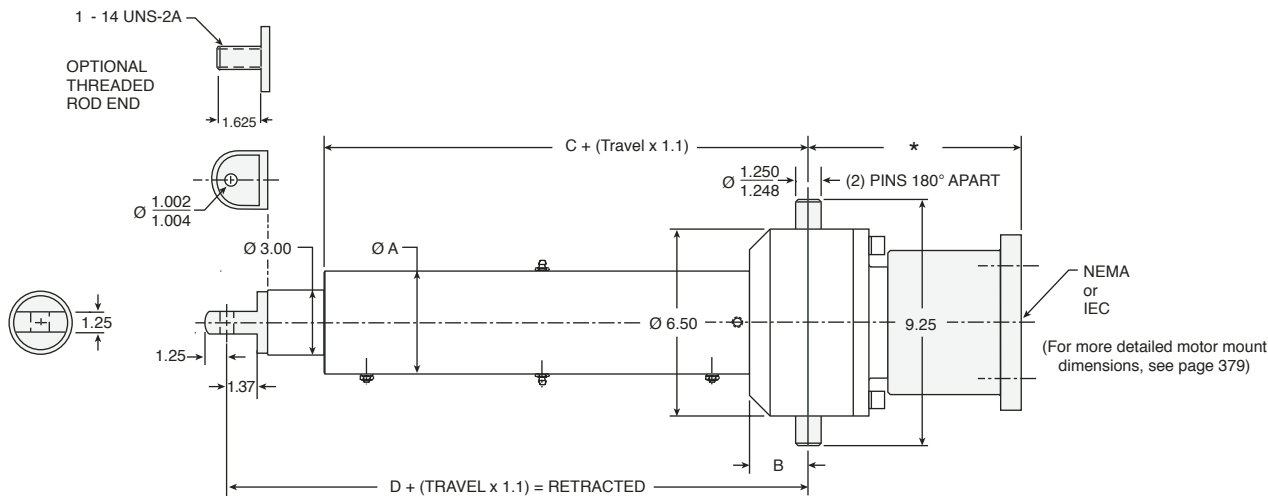


The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.

# SERIES ILA-100 & ILAK-100



IN-LINE ELECTRIC CYLINDERS



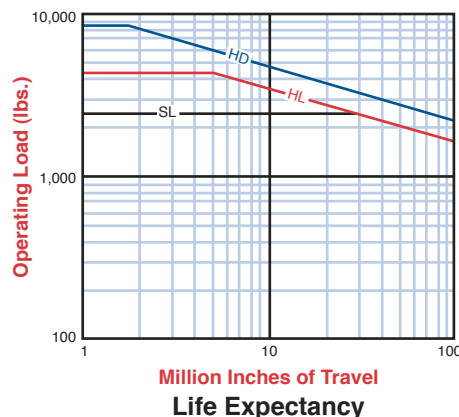
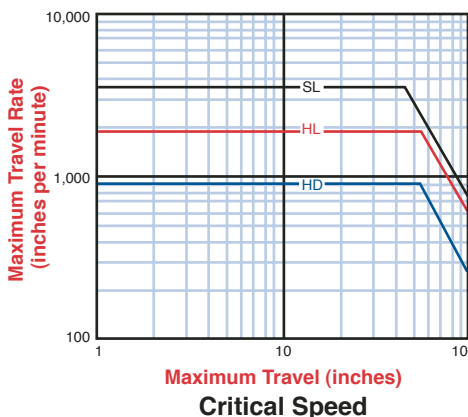
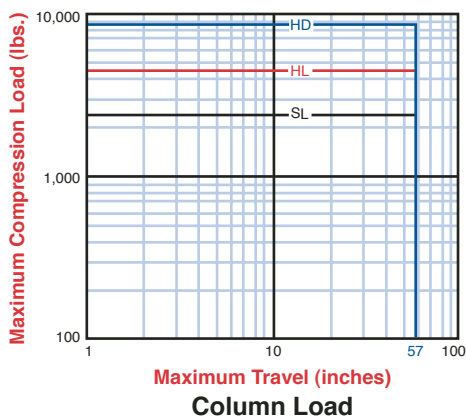
\* DIMENSION BASED ON MOTOR MOUNT, contact factory with your specific requirements.

ILA-100 & ILAK-100 BALL SCREW MODELS									
MODEL NUMBER	MAXIMUM LOAD [lb.]	MAX. INPUT TORQUE [in.-lb.]	MAX. TRAVEL RATE [in.-min.]	BALL SCREW	TORQUE PER LB. [in.-lb.]	DIMENSIONS			
						A	B	C	D
ILA-100 SL	2,500	830	3,750	1500-1875 SRT	0.332	4.00	2.50	16.00	19.00
ILA-100-HL	4,600	814	2,000	1500-1000 SRT	0.177	4.00	2.50	14.18	17.14
ILA-100-HD	9,000	756	946	1500-0473 SRT	0.084	4.00	2.50	14.18	17.14
ILAK-100 SL (Keyed)	2,500	830	3,750	1500-1875 SRT	0.332	6.50	2.00	17.50	20.50
ILAK-100-HL (Keyed)	4,600	814	2,000	1500-1000 SRT	0.177	6.50	2.00	14.18	17.14
ILAK-100-HD (Keyed)	9,000	756	946	1500-0473 SRT	0.084	6.50	2.00	14.18	17.14

**ROD REACTION TORQUE** = TORQUE PER LB. x LOAD

**NOTE:** CYLINDER IS SELF-LOWERING. INPUT SHAFT MUST BE SECURED TO PREVENT ROTATION.

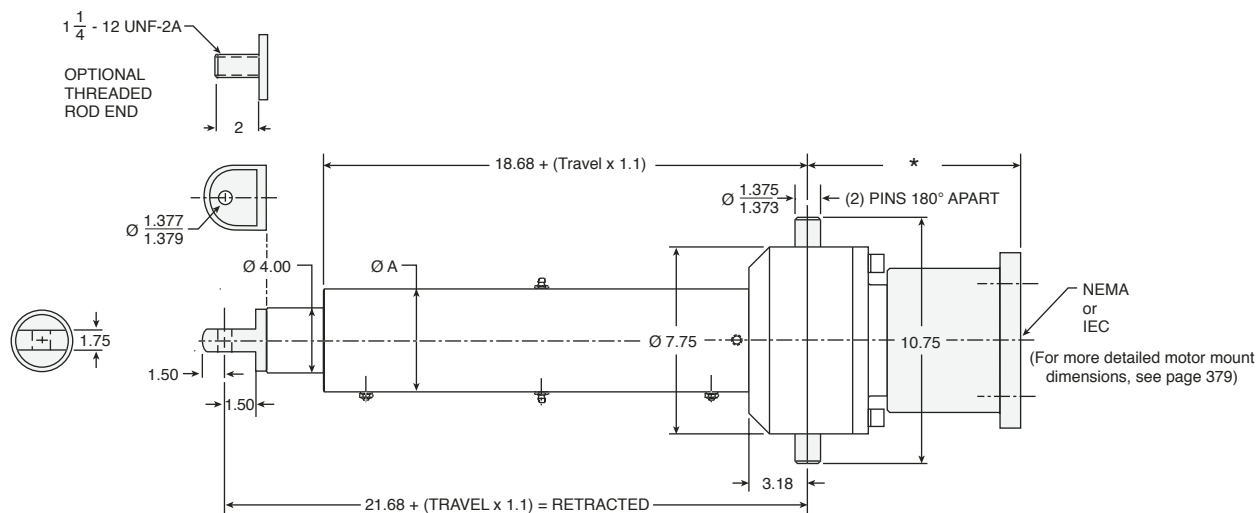
## SERIES ILA-100 & ILAK-100





# SERIES ILA-200 & ILAK-200

**IN-LINE ELECTRIC CYLINDERS**



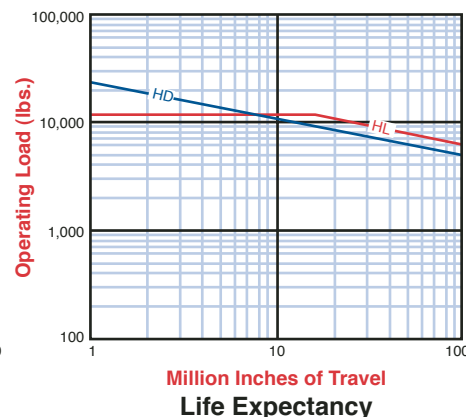
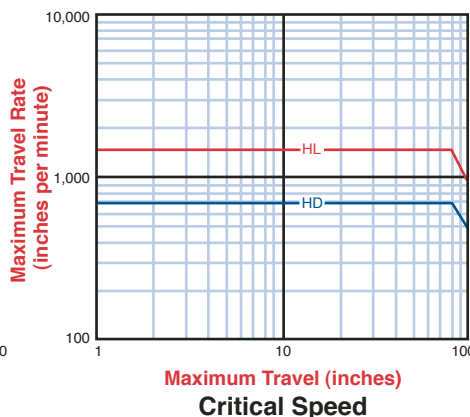
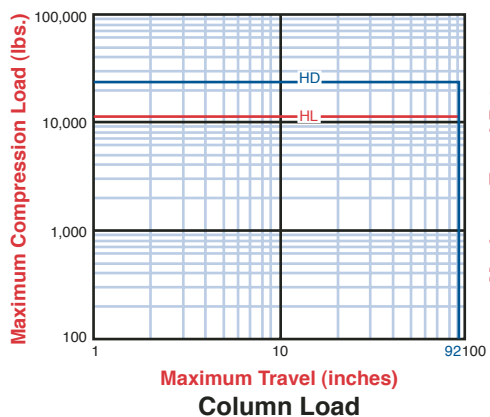
\* DIMENSION BASED ON MOTOR MOUNT, contact factory with your specific requirements.

ILA-200 & ILAK-200 BALL SCREW MODELS						
MODEL NUMBER	MAXIMUM LOAD [lb.]	MAX. INPUT TORQUE [in.-lb.]	MAX. TRAVEL RATE [in.-min.]	BALL SCREW	TORQUE PER LB. [in.-lb.]	DIMENSIONS
						A
ILA-200 HL	11,000	1,947	1,333	2250-1000 SRT	0.177	5.25
ILA-200-HD	21,000	1,848	667	2250-0500 SRT	0.088	5.25
ILAK-200 HL (Keyed)	11,000	1,947	1,337	2250-1000 SRT	0.177	7.50
ILAK-200 HD (Keyed)	21,000	1,848	667	2250-0500 SRT	0.088	7.50

**ROD REACTION TORQUE** = TORQUE PER LB. x LOAD

**NOTE:** CYLINDER IS SELF-LOWERING. INPUT SHAFT MUST BE SECURED TO PREVENT ROTATION.

## SERIES ILA-200 & ILAK-200



The specifications and data in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of Nook Industries products for a specific application. While defective products will be replaced without charge if promptly returned, no liability is assumed beyond such replacement.