Tolomatic
EXCELLENCE *IN MOTION*®

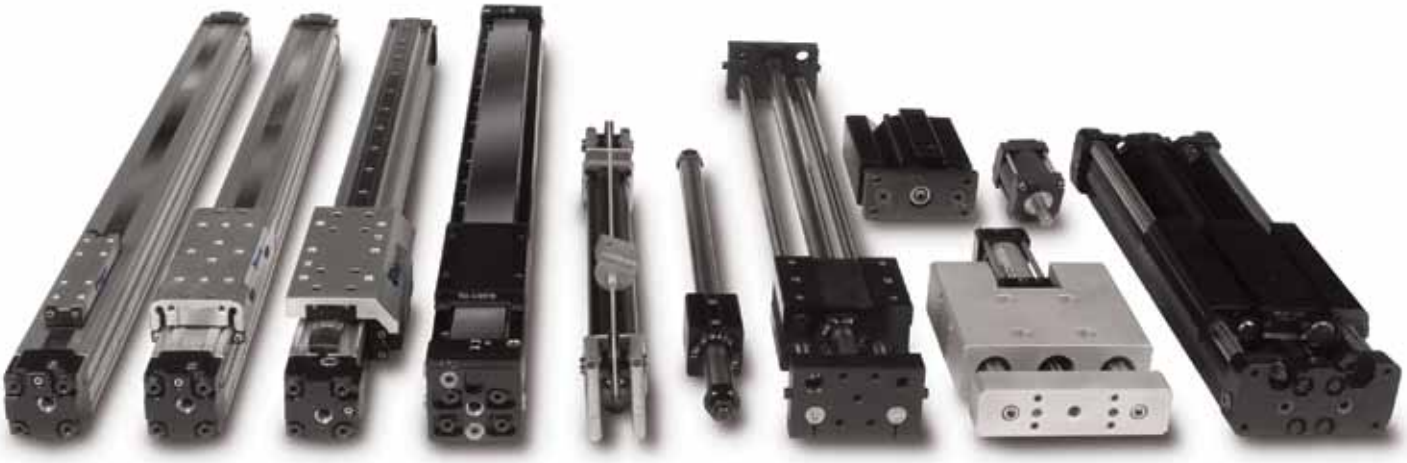
VRX VANE ROTARY ACTUATOR

ENDURANCE TECHNOLOGY℠

CR
Corrosion Resistant External Components

MAXIMUM DURABILITY

WHAT YOU EXPECT FROM THE PNEUMATIC ACTUATOR LEADER:



Tolomatic offers a complete line of linear motion products. We offer more rodless cylinder styles than any other company. Rod style and vane rotary actuators complement our broad line of rodless pneumatic products.

INNOVATIVE RODLESS PRODUCTS

Tolomatic created the rodless cylinder industry when we manufactured the original cable cylinder. We continually add innovative products to our portfolio, offering industry leading pneumatic rodless products. For over 50 years, Tolomatic has been recognized as the rodless cylinder market leader. We earn that distinction daily by satisfying customers like you.

ENDURANCE TECHNOLOGY℠

Every Tolomatic pneumatic product is designed and built with Endurance Technology℠. Material selection, from seals to finish, and every other design element is optimized for long life and excellent performance. The result is the best value and best performing pneumatic product in the market today. As one customer recently told us, "Your cylinders are built like a tank and run like a deer." Thank you!

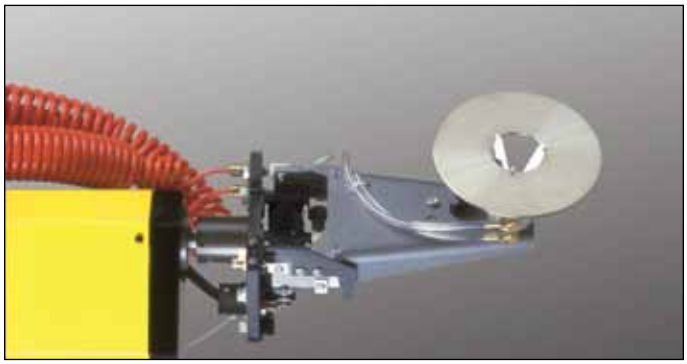
TRUST YOUR APPLICATION TO THE PNEUMATIC ACTUATOR LEADER

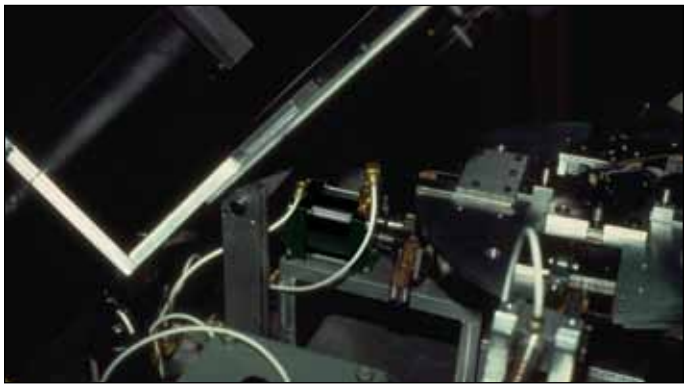
When you want the job done right, go with the experts. Long life. Durability. Ruggedness. Built to your specifications in 5 days or less. Turn to Tolomatic for your motion needs.

Be sure to visit www.tolomatic.com for up-to-date product specifications, free sizing and selection software, and 3D CAD solid files.

APPLICATIONS

With over 50 years of proven application experience, Tolomatic pneumatic products are key components in the following industries and applications:





INDUSTRY INSTALLATIONS

- Packaging
- Automotive
- Food and Beverage
- Material Handling & Conveying
- Plastic Injection Molding
- Metal Processing
- Paper and Textiles
- Medical
- Electronics
- Printing
- Many others

APPLICATIONS

- Material Handling
- Part Transfer
- Parts Feeding
- Pick and Place
- Cutting
- Shutter Motion
- Part Clamping
- Many others

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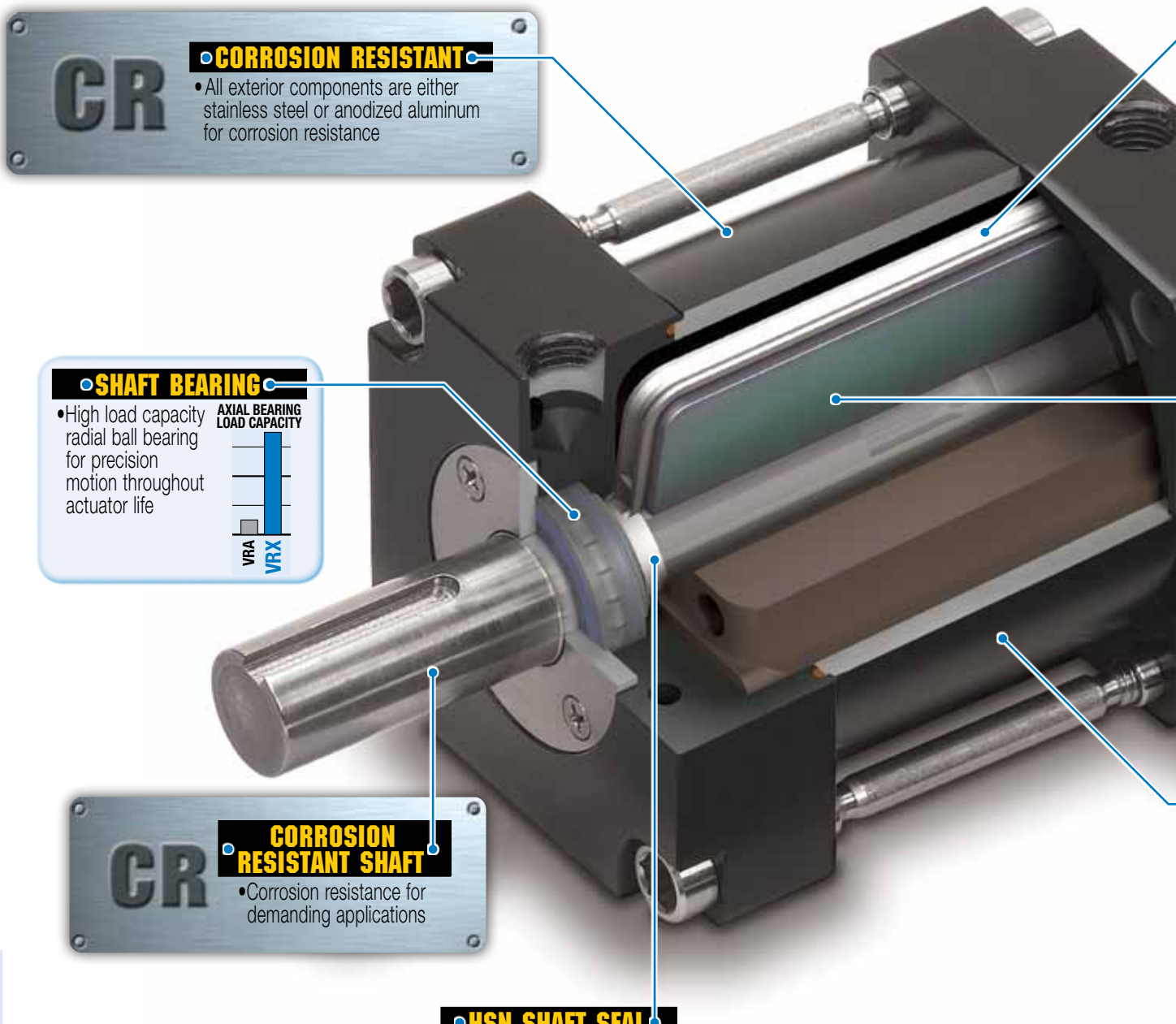
VRX VANE ROTARY ACTUATOR

ENDURANCE TECHNOLOGY℠

Endurance Technology features are designed for maximum durability to provide extended service life.



CR CORROSION RESISTANT

- All exterior components are either stainless steel or anodized aluminum for corrosion resistance

SHAFT BEARING

- High load capacity radial ball bearing for precision motion throughout actuator life

CR CORROSION RESISTANT SHAFT

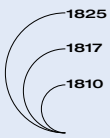
- Corrosion resistance for demanding applications

HSN SHAFT SEAL

- Highly saturated nitrile, self-lubricated seal
- Multiple lobe construction for leak-free operation and greater reliability

VRX

MODEL SIZES



MAXIMUM
TORQUE: 484 in-lbs
ROTATION: 280°

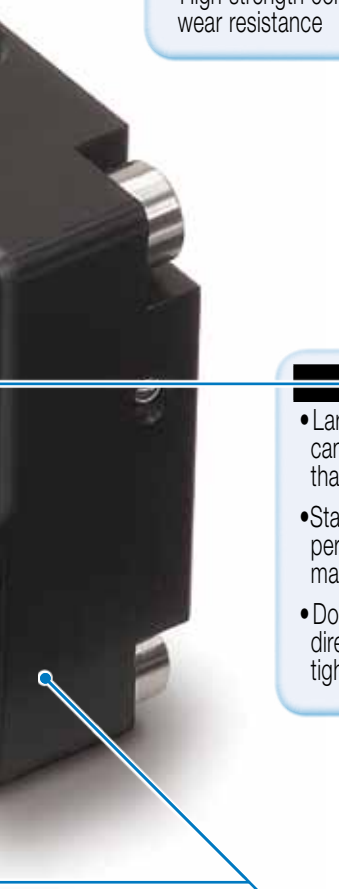
COMPLETE INFORMATION:
www.tolomatic.com

5 DAYS BUILT-TO-ORDER

TOLOMATIC…MAXIMUM DURABILITY

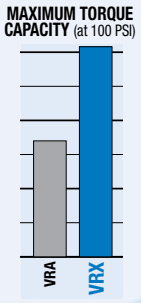
HIGHLY SATURATED NITRILE

- Self-lubricated HSN (Highly Saturated Nitrile) seal material provides 3-5X service life of Buna-N
- High strength compound provides superior wear resistance



HIGH TORQUE VANES

- Large vanes provide significantly higher torque density than competitive models
- Stamped steel vane is permanently bonded to machined grooves on shaft
- Double lip vane seal molded directly onto rotor provides a tight seal with low breakaway



FLEXIBLE MOUNTING

- Compatible with legacy Tolomatic vane rotary actuators (VRA)
- New direct mounting often replaces the need for optional front flange in new installations

ONE MOVING PART

- Zero backlash
- Smooth rotation
- Precise repeatability
- Continuous full torque throughout rotation

ANODIZED ALUMINUM

- Body and machined heads are anodized to ensure long seal life and low breakaway pressure

OPTIONS

SINGLE OR DUAL VANES

- 280° or 100° rotation

SINGLE OR DUAL SHAFTS

- Additional output option

ADJUSTABLE STOP

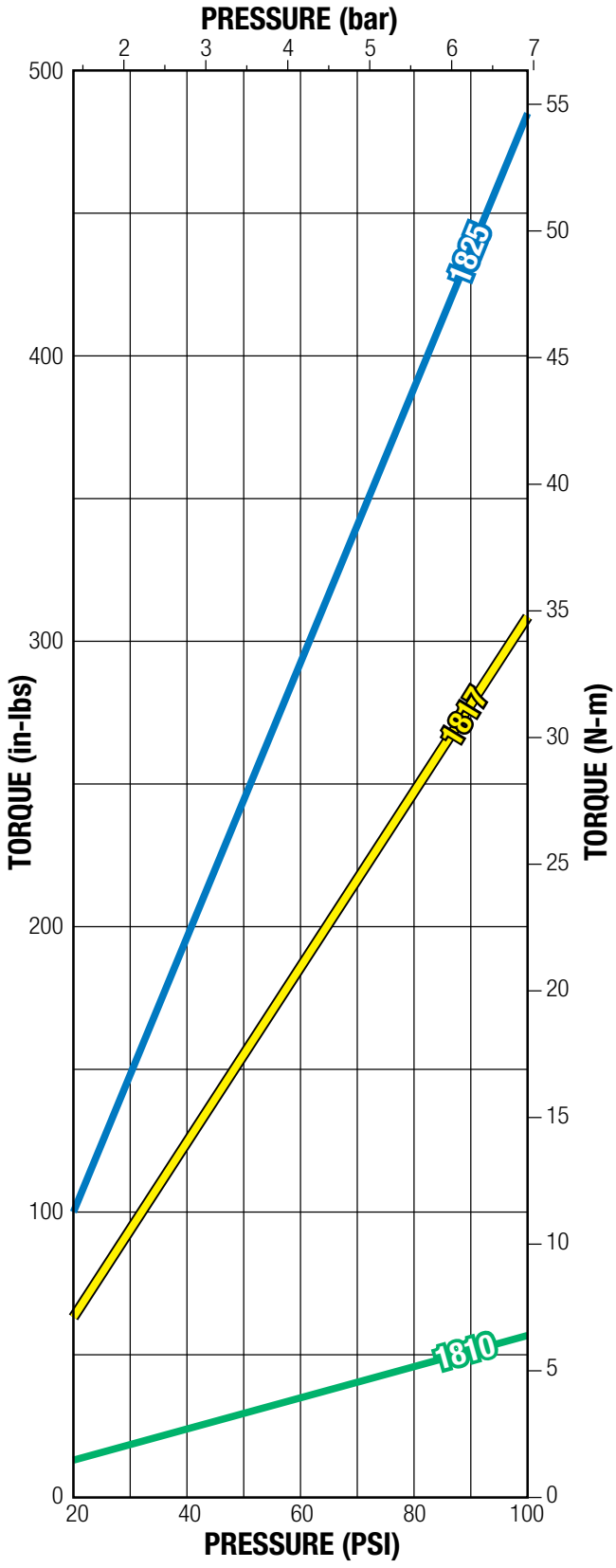
- For rotational stops between 0° to 280°
- Available for 17 and 25 sizes only

FRONT FLANGE MOUNT

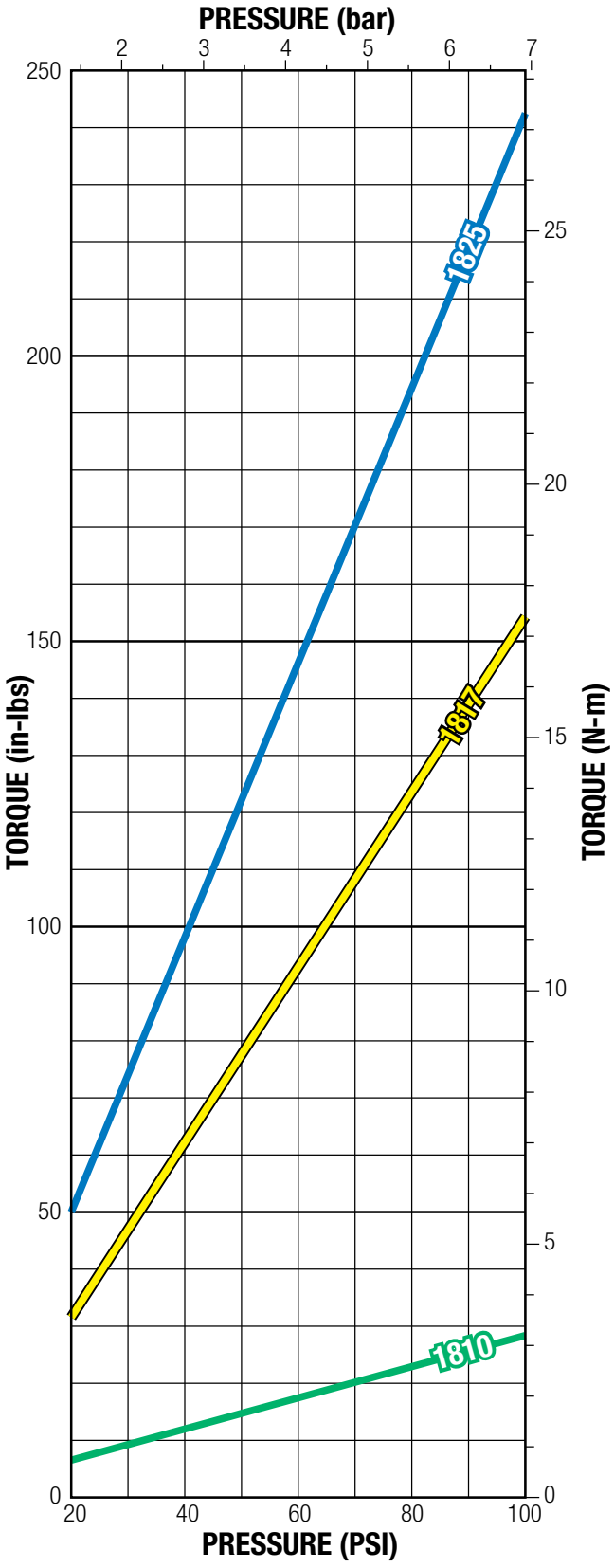
- Additional mounting option
- Drop in replacement for legacy Tolomatic vane rotary actuators (VRA)

TORQUE vs. PRESSURE

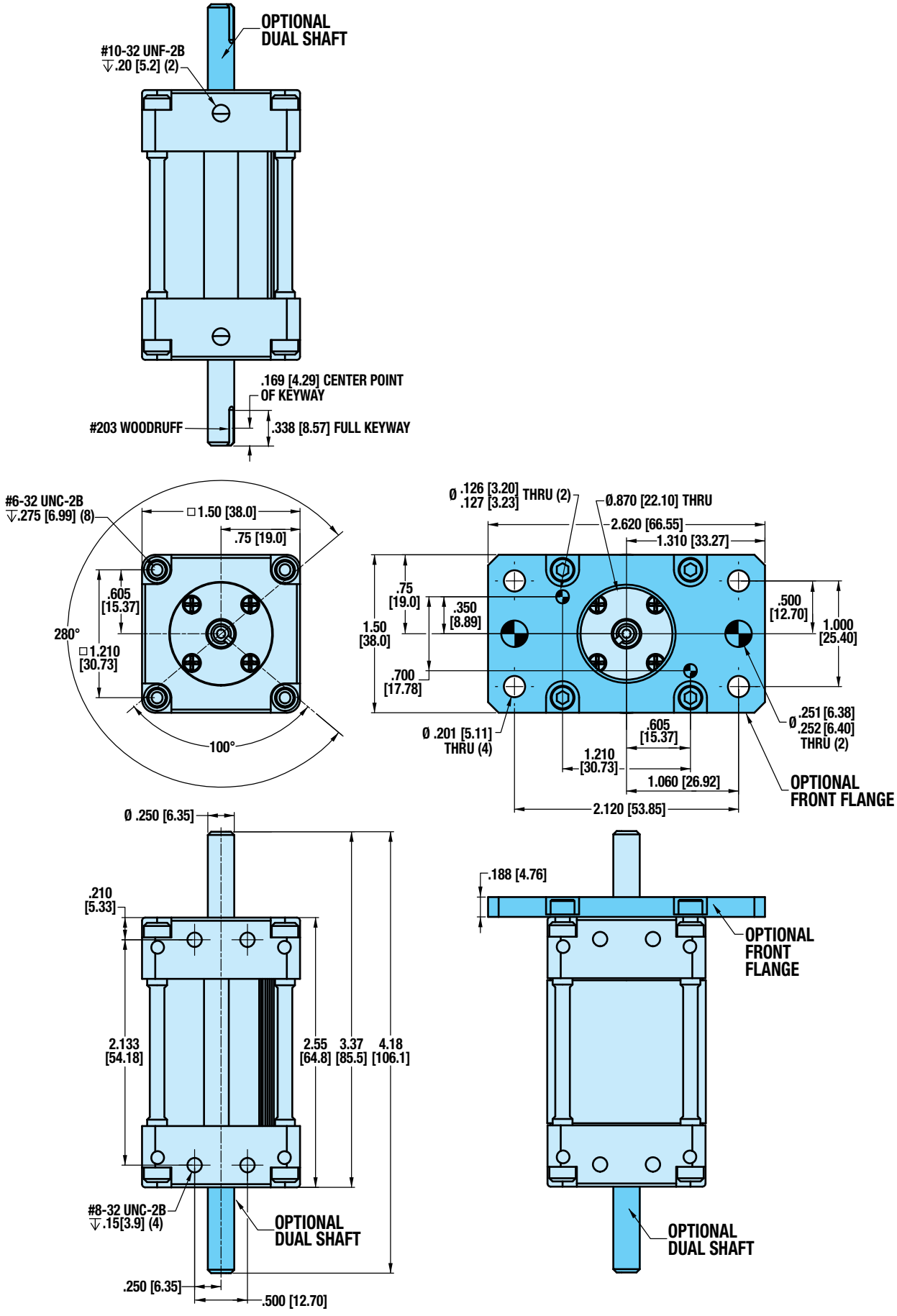
100° ROTATION (DOUBLE VANE)



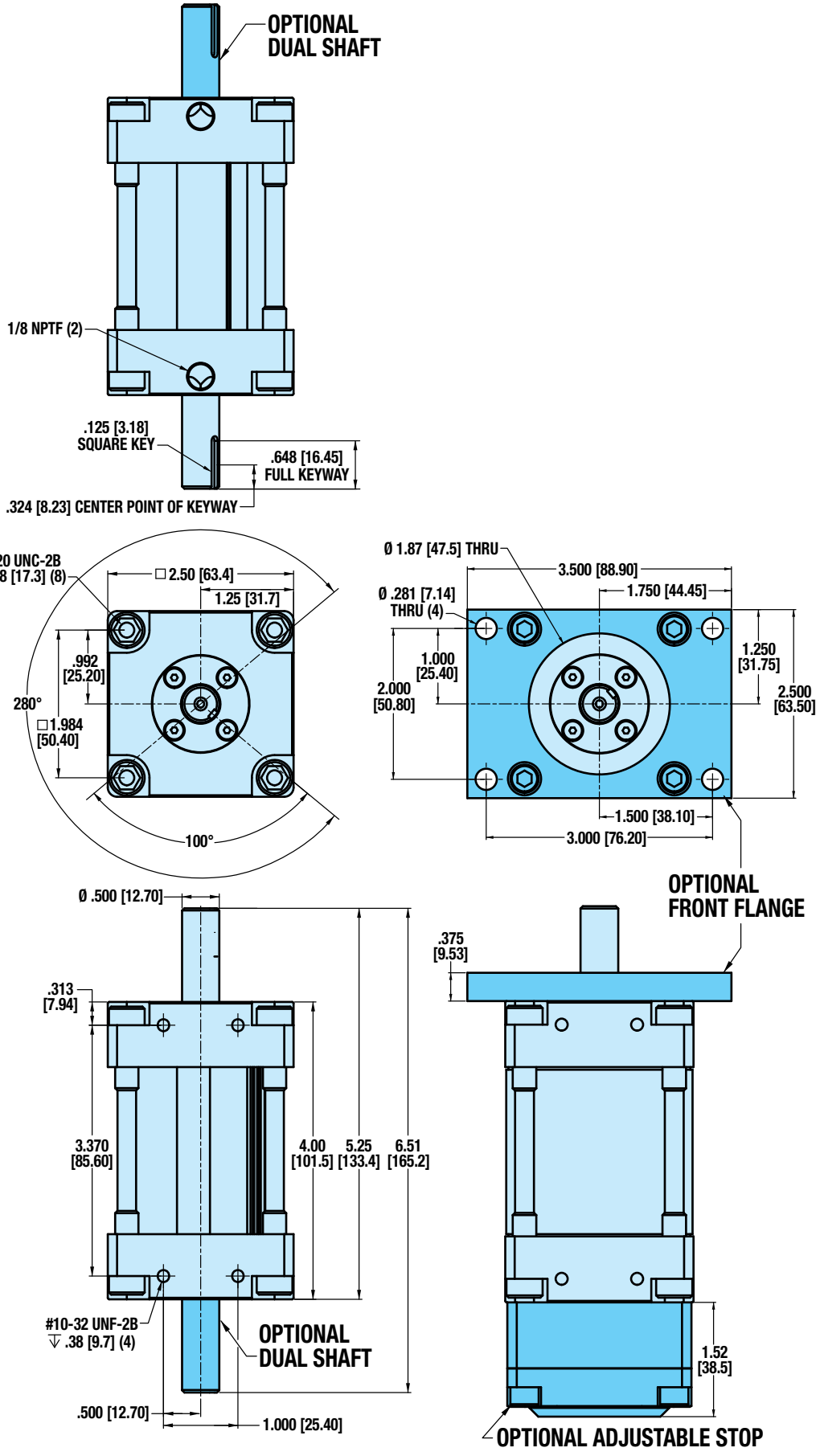
280° ROTATION (SINGLE VANE)



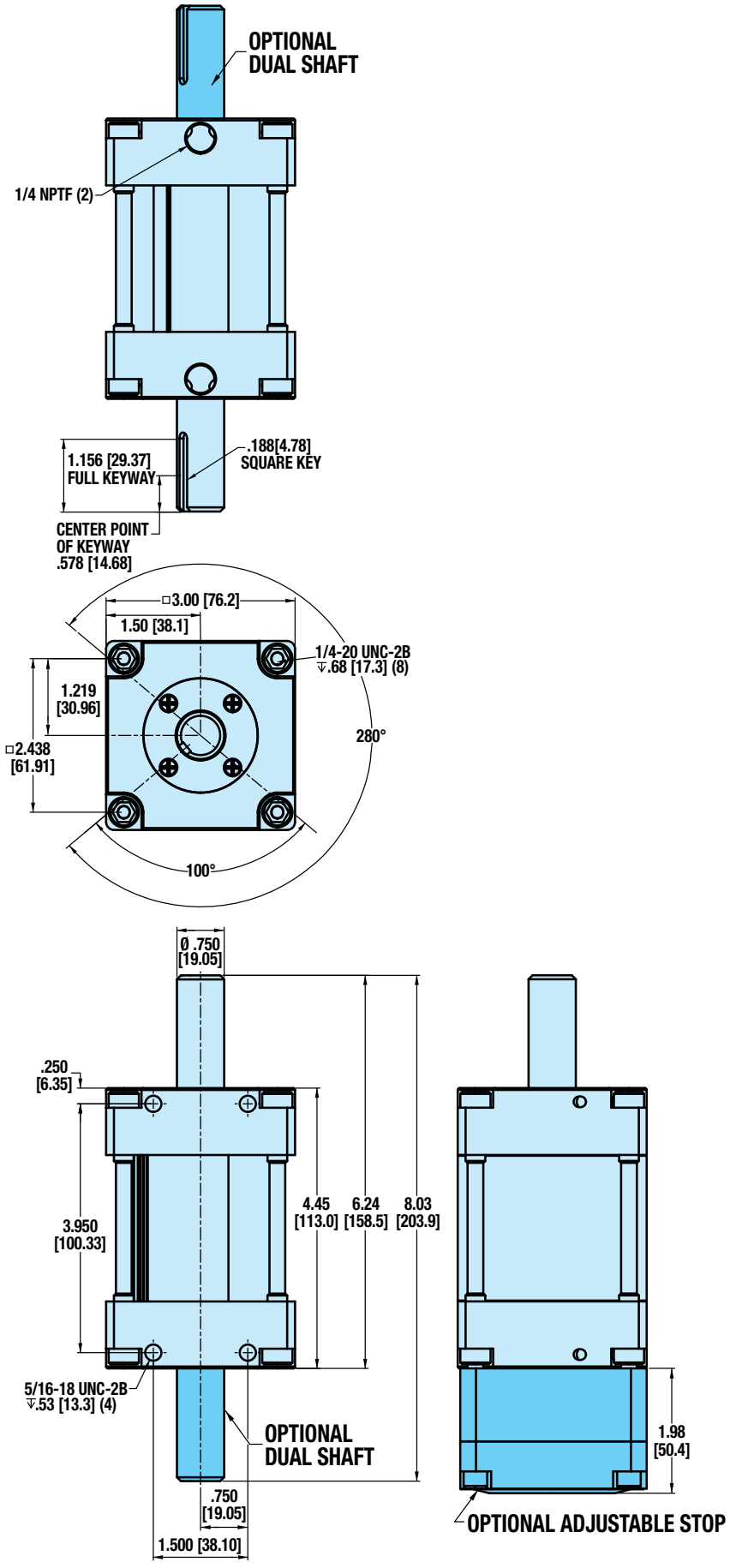
DIMENSIONS: 1810 - 1" BORE



DIMENSIONS: 1817 - 1.75" BORE



DIMENSIONS: 1825 - 2.5" BORE



APPLICATION TIP:

For pneumatic applications metering-out is generally the preferred method of flow control. This allows the air to build a stabilizing pressure at full flow, which may improve smoothness of operation. However, because of the cavity volume vs. the actual travel involved in a vane rotary device, speed control functions may perform better using a meter-in method for vane rotary actuators. Testing speed control methods in the application will indicate the most reliable means of speed control.

A whitepaper from the International Fluid Power Society dealing with many pneumatic accessories and controls can be found at:

http://www.ifps.org/Education/WhitePapers/PneumaticAccessories.htm

SELECTION GUIDELINES

To select a vane rotary actuator, the following application data is required:

- Torque required to rotate the load
- Degree of rotation
- Pressure available (PSI)
- Radial and/or axial loads

1. DETERMINE TORQUE OUTPUT AT AVAILABLE PRESSURE

Refer to the Torque vs. Pressure graph and choose a rotary actuator based on its torque output at the available operating pressure that will rotate the load.

2. DETERMINE ACTUATOR'S BEARING LOAD CAPACITY

Consult the Bearing Load Capacity table. Bearing loads must not exceed the values shown for radial and/or axial loading.

3. CALCULATE KINETIC ENERGY IF APPLICABLE

Kinetic energy comes into play if the actuator will decelerate the load. In these applications, both torque output to rotate the load and kinetic energy absorption to stop the load must be considered to correctly size a rotary actuator.

KINETIC ENERGY BASIC FORMULA

$$KE = \frac{1}{2} J_m \omega^2$$

$$\omega = 0.035 \times \frac{\text{angle traveled (deg.)}}{\text{rotation time (sec.)}}$$

where

KE = Kinetic Energy per stop (in.– lbs.)

J_m = Rotational mass moment of inertia (in.– lbs.– sec.^{2})

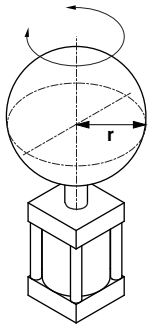
ω = Peak Velocity (rad. / sec.) (assuming twice average velocity)

W = Weight of load (lbs.)

g = Gravitational constant = 386.4 in. / sec.^{2}

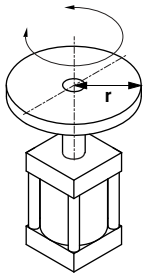
MOMENT OF INERTIA EXAMPLES

SOLID SPHERE
Mounted on center



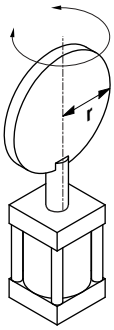
$$J_m = \frac{2}{5} \times \frac{W}{g} \times r^2$$

THIN DISK
Mounted on center



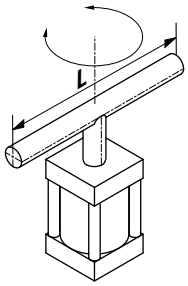
$$J_m = \frac{W}{g} \times \frac{r^2}{2}$$

THIN DISK
End mounted on center



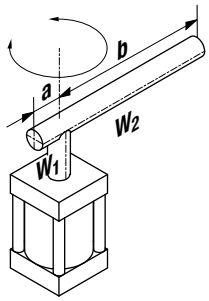
$$J_m = \frac{W}{g} \times \frac{r^2}{4}$$

SLENDER ROD
Mounted on center



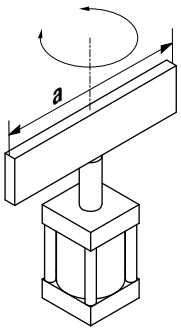
$$J_m = \frac{W}{g} \times \frac{L^2}{12}$$

SLENDER ROD
Mounted off center



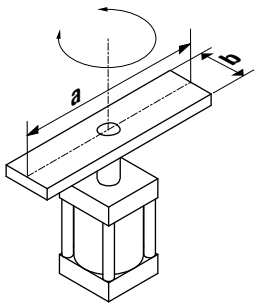
$$J_m = \left(\frac{W_1}{g} \times \frac{a^2}{3}\right) + \left(\frac{W_2}{g} \times \frac{b^2}{3}\right)$$

THIN RECTANGULAR PLATE
End mounted on center



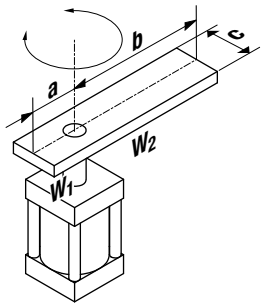
$$J_m = \frac{W}{g} \times \frac{a^2}{12}$$

THIN RECTANGULAR PLATE
Mounted on center



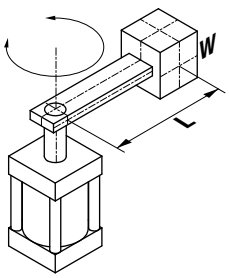
$$J_m = \frac{W}{g} \times \frac{a^2 + b^2}{12}$$

THIN RECTANGULAR PLATE
Mounted off center



$$J_m = \left(\frac{W_1}{g} \times \frac{4a^2 + c^2}{12}\right) + \left(\frac{W_2}{g} \times \frac{4b^2 + c^2}{12}\right)$$

POINT LOAD



$$J_m = \frac{W}{g} \times L^2$$

SPECIFICATIONS

	MODEL	1810	1817	1825
	BORE	1"	1.75"	2.5"
WEIGHT	lb	0.4	2.0	3.2
	kg	*0.2*	*0.9*	*1.5*

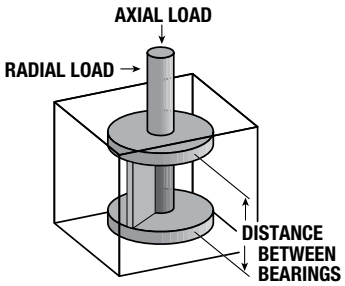
MAXIMUM OPERATING PRESSURE	100 PSI *(6.9 BAR)*
OPERATING TEMPERATURE	0 to 125 °F *(-18 to 52 °C)*

MAXIMUM TORQUE CAPACITY (AT 100 PSI)

	MODEL	1810	1817	1825
	BORE	1"	1.75"	2.5"
100° ROTATION	in-lbs	56	308	484
	N-m	*6.3*	*34.8*	*54.7*
280° ROTATION	in-lbs	28	154	242
	N-m	*3.2*	*17.3*	*27.3*

ORDERING

MODEL NUMBER	BORE SIZE	ROTATION	VANE / STATOR	SHAFT	OPTION
1810-0113	1"	280°	Single	Single	
1810-0112	1"	280°	Single	Dual	
1810-0111	1"	100°	Dual	Single	
1810-0110	1"	100°	Dual	Dual	
1810-0119	1"	280°	Single	Single	Front Flange Mount
1810-0118	1"	280°	Single	Dual	Front Flange Mount
1810-0117	1"	100°	Dual	Single	Front Flange Mount
1810-0116	1"	100°	Dual	Dual	Front Flange Mount
1817-0113	1.75"	280°	Single	Single	
1817-0112	1.75"	280°	Single	Dual	
1817-0111	1.75"	100°	Dual	Single	
1817-0110	1.75"	100°	Dual	Dual	
1817-0119	1.75"	280°	Single	Single	Front Flange Mount
1817-0118	1.75"	280°	Single	Dual	Front Flange Mount
1817-0117	1.75"	100°	Dual	Single	Front Flange Mount
1817-0116	1.75"	100°	Dual	Dual	Front Flange Mount
1817-0115	1.75"	280°	Single	Single	Adjustable Stops
1817-0120	1.75"	100°	Dual	Single	Front Flange Mount, Adjustable Stops
1817-0114	1.75"	100°	Dual	Single	Adjustable Stops
1817-0121	1.75"	280°	Single	Single	Front Flange Mount, Adjustable Stops
1825-0113	2.5"	280°	Single	Single	
1825-0112	2.5"	280°	Single	Dual	
1825-0111	2.5"	100°	Dual	Single	
1825-0110	2.5"	100°	Dual	Dual	
1825-0115	2.5"	280°	Single	Single	Adjustable Stops
1825-0114	2.5"	100°	Dual	Single	Adjustable Stops



BEARING LOAD CAPACITY

	MODEL	1810	1817	1825
	BORE	1"	1.75"	2.5"
RADIAL LOAD	lbf	19.5	36	59
	N	*87*	*160*	*262*
AXIAL LOAD	lbf	8	17.5	23
	N	*36*	*78*	*102*

KINETIC ENERGY RATINGS

KINETIC ENERGY ABSORBTION / STOP	in-lb	0.15	0.35	0.70
	N-m	*0.02*	*0.04*	*0.08*

OPTION NOTES:

DUAL SHAFT
Available on all VRX sizes

FRONT FLANGE MOUNT
Available on 1810 and 1817 (1.00" and 1.75" bore)

ADJUSTABLE STOPS
Available on 1817 and 1825 (1.75" and 2.50" bore)

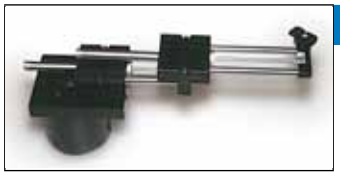
THE TOLOMATIC DIFFERENCE What you expect from the industry leader:

EXCELLENT CUSTOMER SERVICE & TECHNICAL SUPPORT

Our people make the difference! Expect prompt, courteous replies to all of your application and product questions.

INDUSTRY LEADING DELIVERIES

Standard catalog products are built to order and ready-to-ship in 5 days or less. Modified and custom products ship weeks ahead of the competition.



INNOVATIVE PRODUCTS

From standard catalog products... to modified products... to completely unique custom products, Tolomatic designs and builds the best solutions for your challenging applications.

SIZING & SELECTION SOFTWARE

Windows® compatible, downloadable from our website – FREE – the best tool of its kind on the market! Product selection has never been easier.

3D MODELS & 2D DRAWINGS AVAILABLE ON THE WEB

Easy to access CAD files are available in many popular formats.

ALSO CONSIDER THESE OTHER TOLOMATIC PRODUCTS:

PNEUMATIC PRODUCTS

RODLESS CYLINDERS: Band Cylinders, Cable Cylinders, MAGNETICALLY COUPLED CYLINDERS/SLIDES; GUIDED ROD CYLINDER SLIDES
"FOLDOUT" BROCHURE #9900-9075 PRODUCTS BROCHURE #9900-4028 www.tolomatic.com/pneumatic

ELECTRIC PRODUCTS

ROD & GUIDED ROD STYLE ACTUATORS, HIGH THRUST ACTUATORS, SCREW & BELT DRIVE RODLESS ACTUATORS, MOTORS, DRIVES AND CONTROLLERS
"FOLDOUT" BROCHURE #9900-9074 PRODUCTS BROCHURE #9900-4016 www.tolomatic.com/electric

POWER TRANSMISSION PRODUCTS

GEARBOXES: Float-A-Shaft®, Slide-Rite®; DISC CONE CLUTCH; CALIPER DISC BRAKES
"FOLDOUT" BROCHURE #9900-9076 PRODUCTS BROCHURE #9900-4029 www.tolomatic.com/pt

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