RCS SERIES

ROD CYLINDER SLIDE

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TOL-O-MATIC, INC.

FEATURES

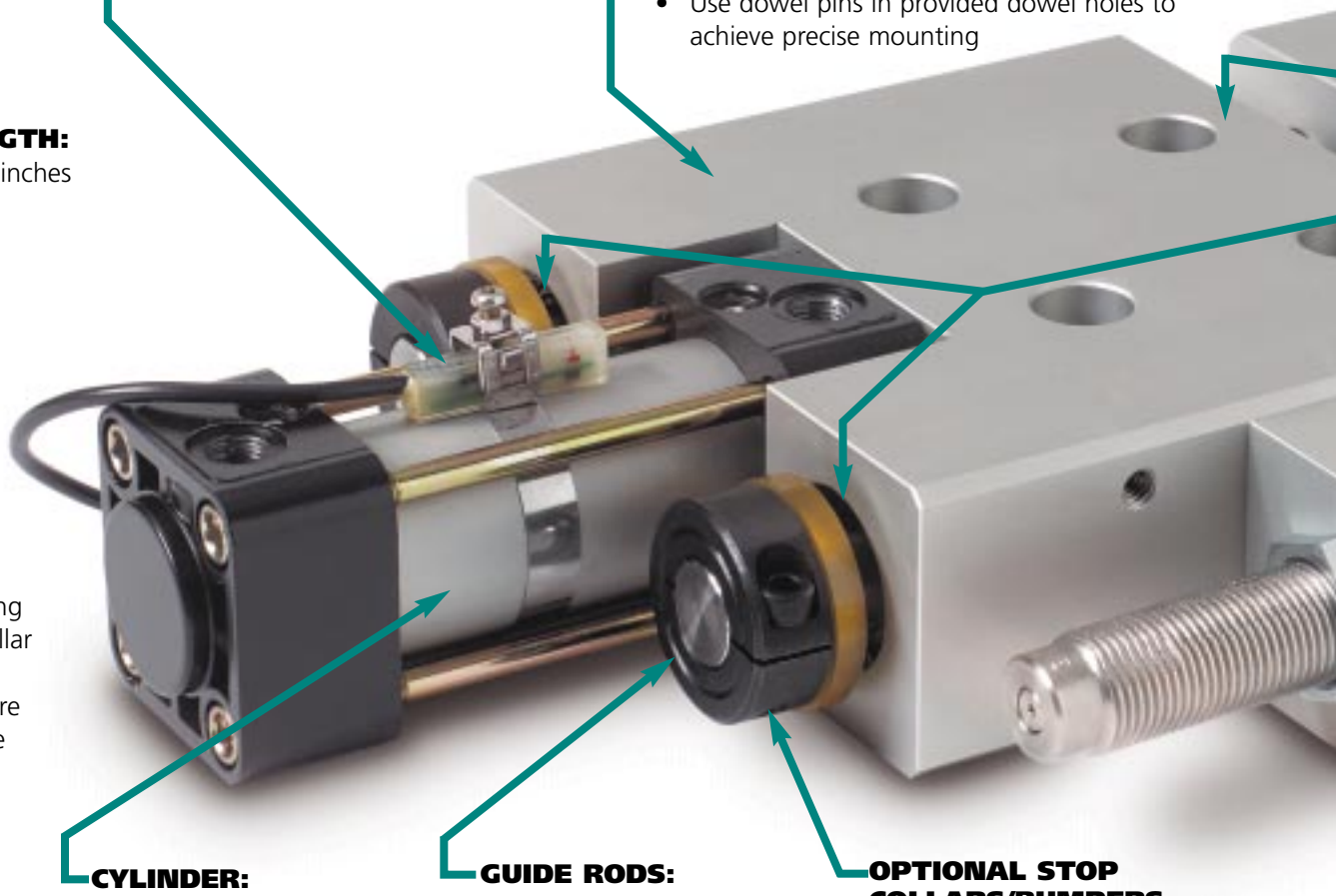
AVAILABLE IN 5 BORE SIZES:
- 20mm, 25mm, 32mm, 40mm, 50mm

STROKE LENGTH:
- From 1 to 12 inches in one inch increments.

SINGLE SIDE ACCESS:
- Ports, mounting holes, stop collar and switch adjustments are located on the same side for easy access.

OPTIONAL SWITCHES:
- Tol-O-Matic universal switches available in DC Reed, Hall-effect and AC Triac.
- Available with quick-disconnect couplers.

SLIDE BODY:
- Precision machined mounting surfaces.
- Flexible mounting for easy integration into new or existing applications.
- Lightweight, low profile, durable design.
- Use dowel pins in provided dowel holes to achieve precise mounting



CYLINDER:
- Industry standard ISO repairable tie rod cylinder.
- Integral air cushions to improve cylinder life.

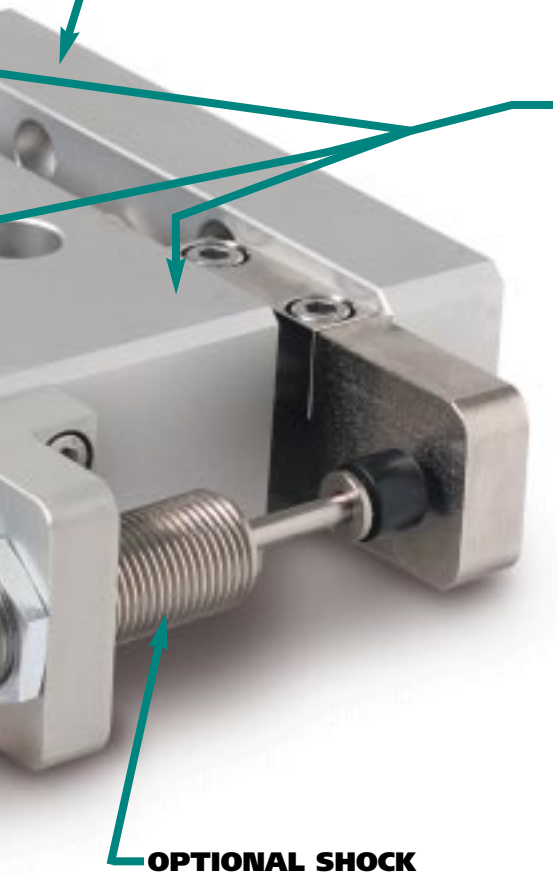
GUIDE RODS:
- Hardened, precision ground steel.
- Available in standard size for use with linear ball bearings and oversized for use with composite bearings.
- Shares the industry's highest rating for load capacity.

OPTIONAL STOP COLLARS/BUMPERS:
- Often used in high impact applications.
- Used to adjust stroke length.

EXAMPLE:

TOOLING PLATE:

- Precision machined mounting surfaces.
- Flexible mounting option for easy integration into new or existing applications.
- Use dowel pins in provided dowel holes to achieve precise mounting



BEARINGS:

- Each guide rod has two precision bearings optimally located for greatest stability.
- Choose either linear ball bearings or composite bearings to get the best value with the least possible deflection.
- Combined with hardened precision ground guide rods these rugged bearings provide smooth, precise linear motion.
- Standard internal wicks are saturated to provide permanent lubrication

LINEAR BALL BEARINGS

- Provide greatest tooling plate accuracy
- Longest life.
- Lowest friction - most efficient.
- Best choice for low contaminant environments.

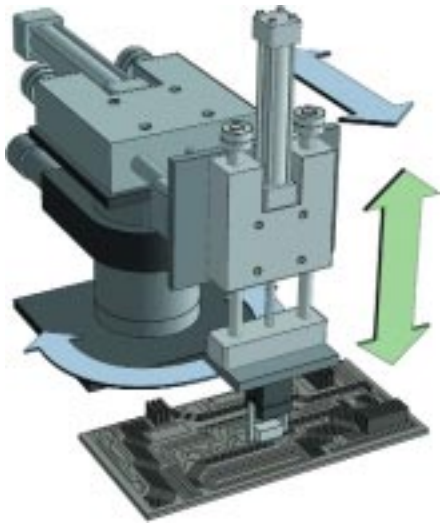
COMPOSITE BEARINGS

- Use oversized guide shafts to provide maximum rigidity and less deflection
- Thin profile bearing allows use of oversize guide rods without enlarging the slide body.
- Best choice for high contaminant or high impact environments.

OPTIONAL SHOCK ABSORBERS:

- Smoother deceleration.
- Self-compensates for load changes.
- Use for increased operating speeds and higher productivity.

PICK AND PLACE



APPLICATION DESCRIPTION:

A manufacturer of washing machines needed a method of attaching parts onto a control board. Each part would be guided and supported by the actuator. Speed is critical, end position must be consistent.

APPLICATION REQUIREMENTS:

- Fast response; part must be picked from bin and placed onto board in 2 seconds
- End-of-stroke picking of part from bin and end-of-stroke placement of part onto board requires repeatability of ±0.01"
- Low cost
- End-of-stroke sensors

TOL-O-MATIC SOLUTION:

A RCS50 was chosen for the horizontal movement with a RCS20 for the vertical movement. A GPP063 parallel gripper with fingers made to conform to the part's shape was chosen to hold and place the part. This was placed onto an existing fixture that supplied the rotary motion.

RCS SPECIFICATIONS:

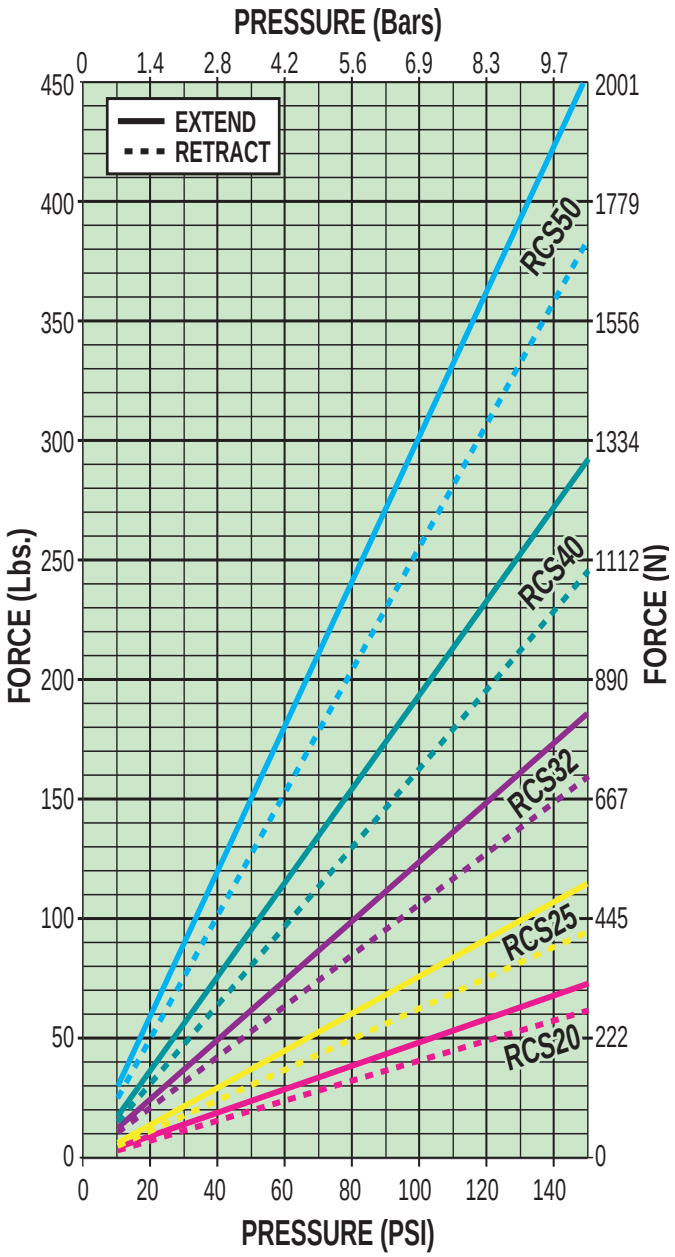
STANDARD FEATURES:

Single Side Access to:	Mounting Holes, Stop Collar,, Ports, Switches
ISO Repairable Cylinder	
Internal Cushions	
Guide Rods	Hardened Steel
Bearings	Linear or Composite
Stroke Length	1" to 12" in 1" increments

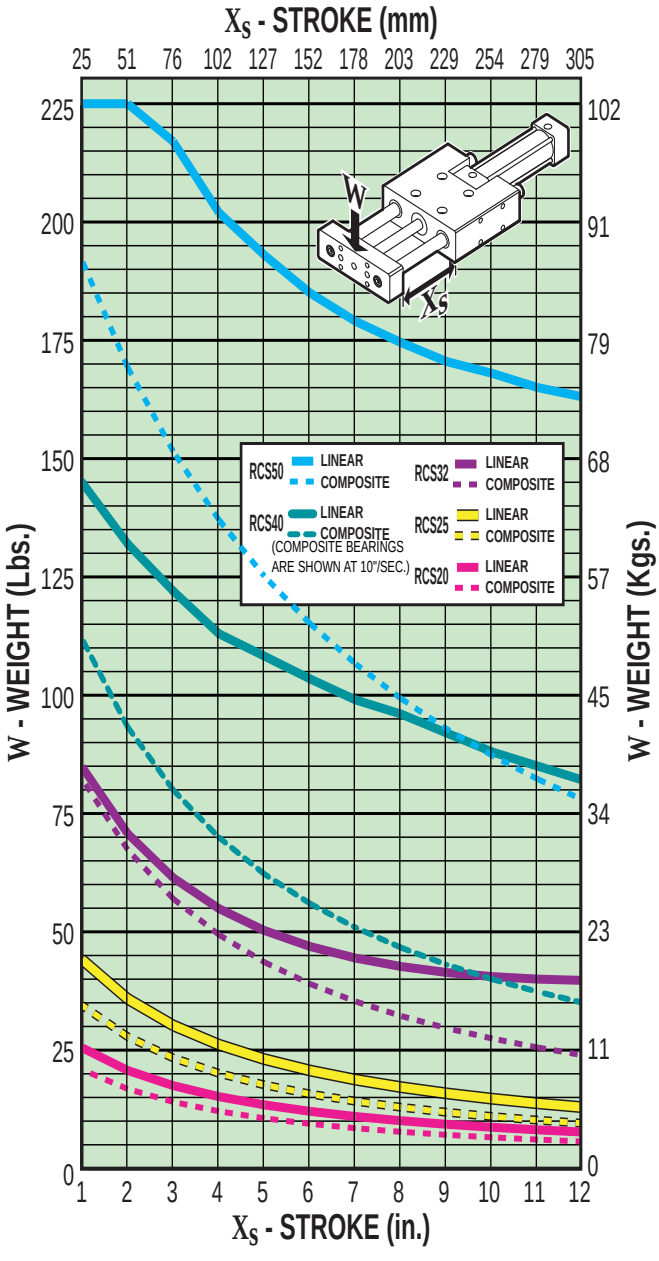
OPTIONAL FEATURES:

Stop Collars / Bumpers
Shock Absorbers
dc Reed Switches
dc Hall-effect Switches
ac Triac Switches

FORCE VS PRESSURE

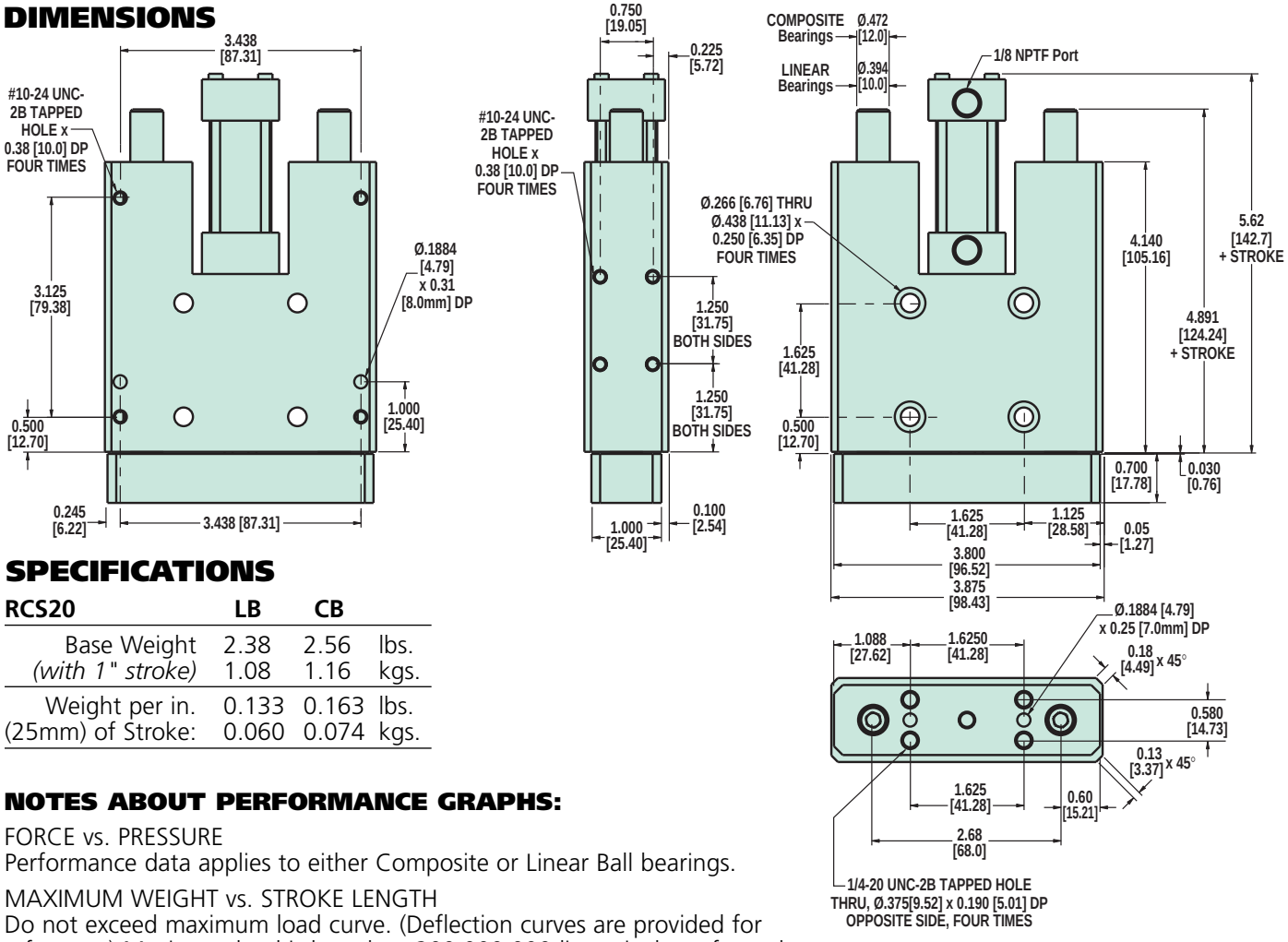


WEIGHT vs STROKE LENGTH



RCS20 - 0.75" (20MM) BORE

DIMENSIONS



SPECIFICATIONS

RCS20	LB	CB	
Base Weight	2.38	2.56	lbs.
(with 1" stroke)	1.08	1.16	kgs.
Weight per in.	0.133	0.163	lbs.
(25mm) of Stroke:	0.060	0.074	kgs.

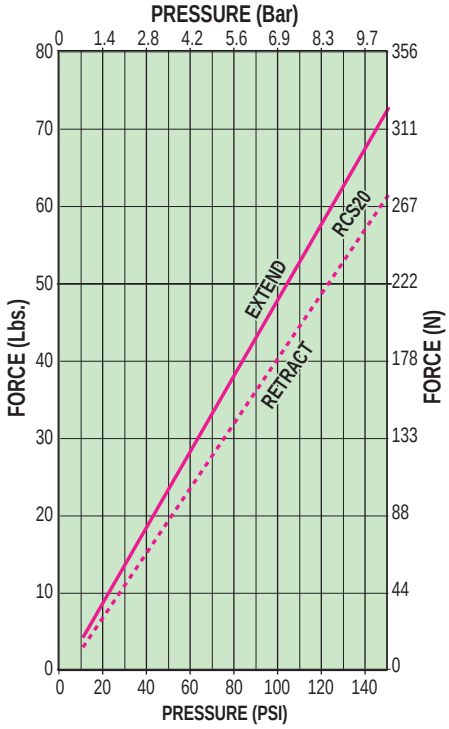
NOTES ABOUT PERFORMANCE GRAPHS:

FORCE vs. PRESSURE
Performance data applies to either Composite or Linear Ball bearings.

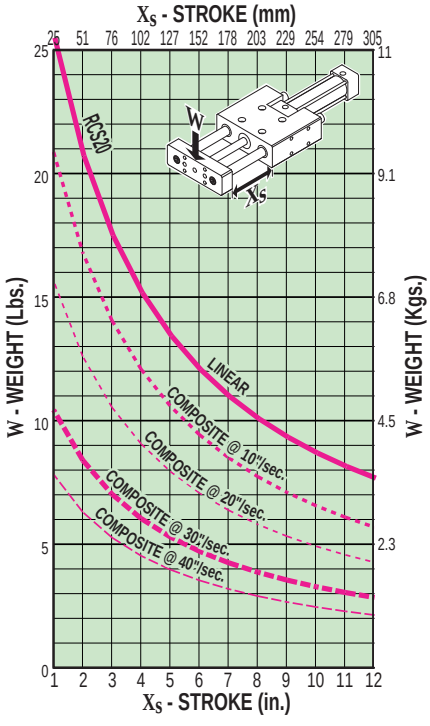
MAXIMUM WEIGHT vs. STROKE LENGTH
Do not exceed maximum load curve. (Deflection curves are provided for reference.) Maximum load is based on 200,000,000 linear inches of travel.

PERFORMANCE

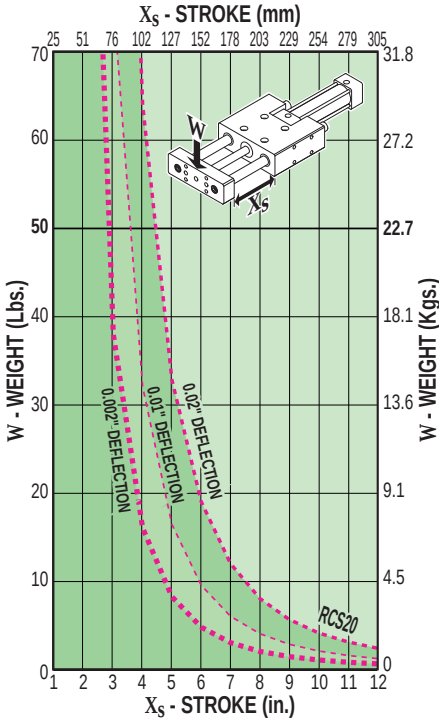
FORCE VS PRESSURE



MAXIMUM WEIGHT vs STROKE LENGTH

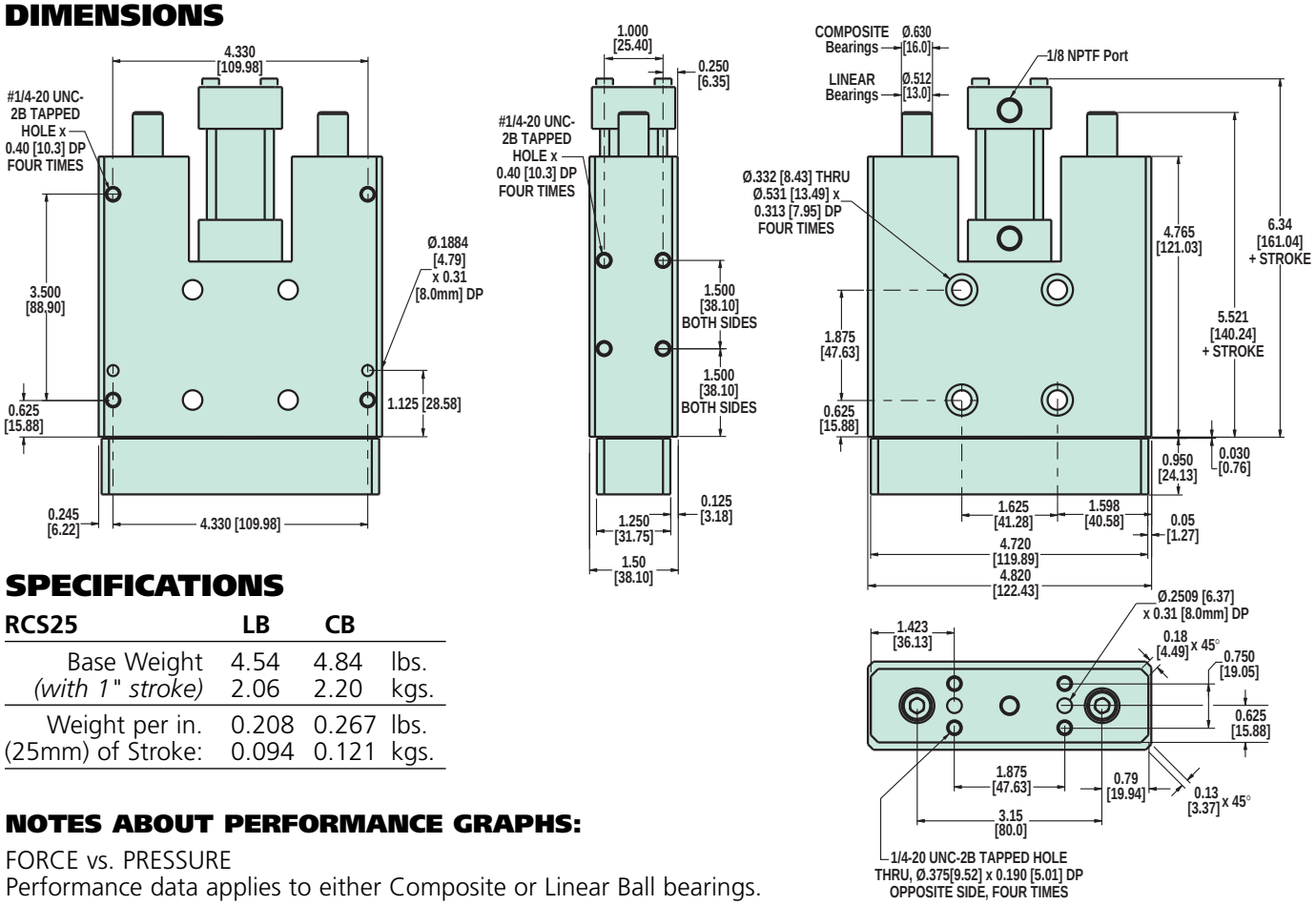


DEFLECTION vs STROKE LENGTH



RCS25 - 1.0" (25MM) BORE

DIMENSIONS



SPECIFICATIONS

RCS25	LB	CB	
Base Weight	4.54	4.84	lbs.
(with 1" stroke)	2.06	2.20	kgs.
Weight per in.	0.208	0.267	lbs.
(25mm) of Stroke:	0.094	0.121	kgs.

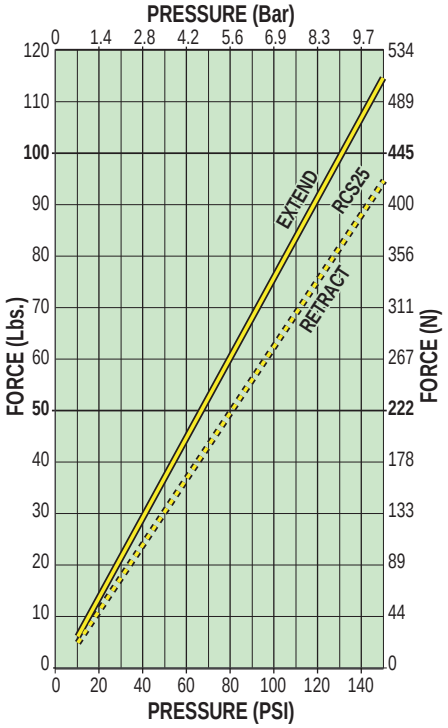
NOTES ABOUT PERFORMANCE GRAPHS:

FORCE vs. PRESSURE
Performance data applies to either Composite or Linear Ball bearings.

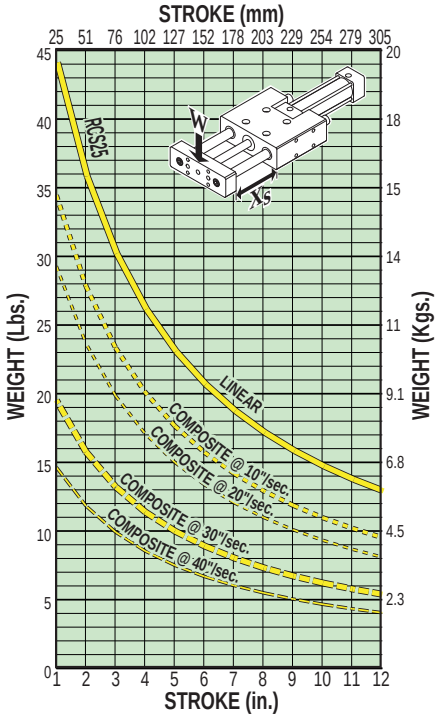
MAXIMUM WEIGHT vs. STROKE LENGTH
Do not exceed maximum load curve. (Deflection curves are provided for reference.) Maximum load is based on 200,000,000 linear inches of travel.

PERFORMANCE

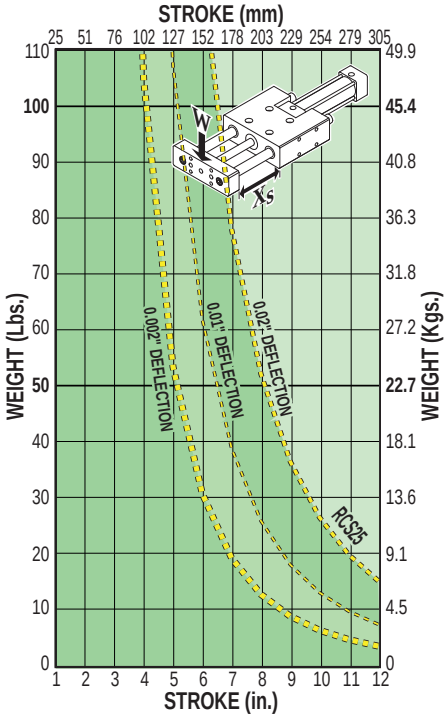
FORCE VS PRESSURE



MAXIMUM WEIGHT vs STROKE LENGTH

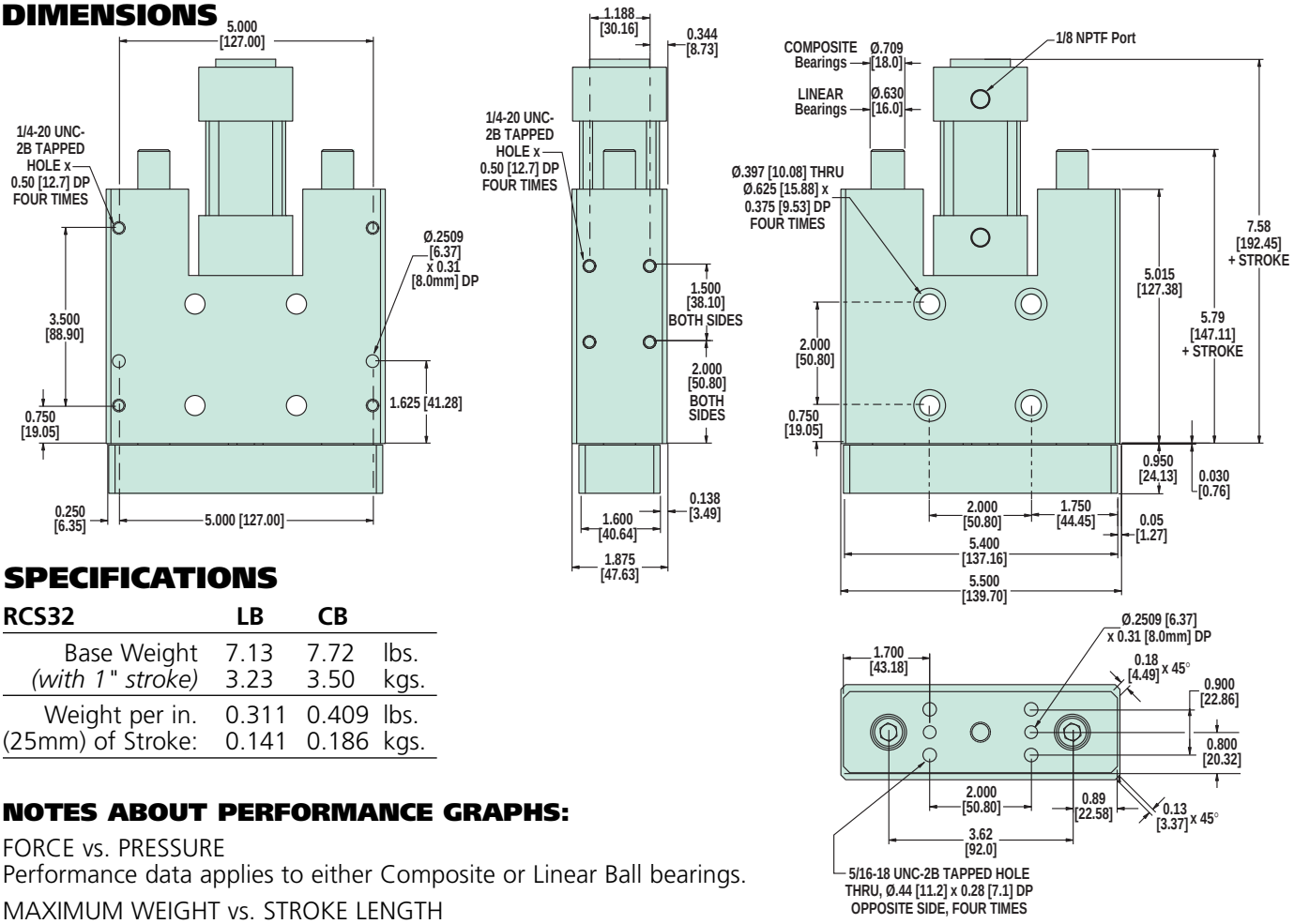


DEFLECTION vs STROKE LENGTH



RCS32 - 1.25" (32MM) BORE

DIMENSIONS



SPECIFICATIONS

RCS32	LB	CB	
Base Weight	7.13	7.72	lbs.
(with 1" stroke)	3.23	3.50	kgs.
Weight per in.	0.311	0.409	lbs.
(25mm) of Stroke:	0.141	0.186	kgs.

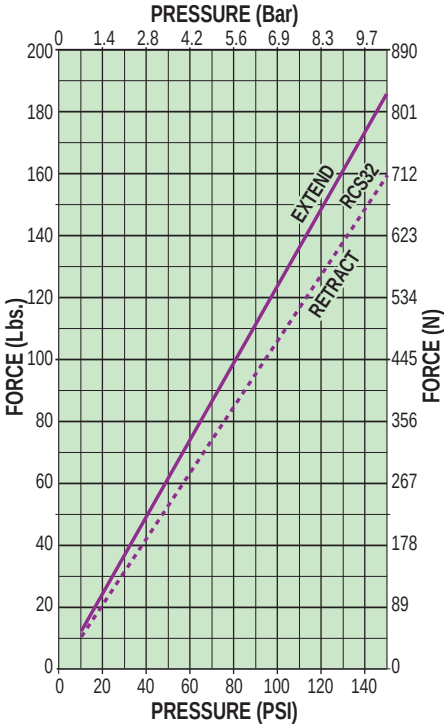
NOTES ABOUT PERFORMANCE GRAPHS:

FORCE vs. PRESSURE
Performance data applies to either Composite or Linear Ball bearings.

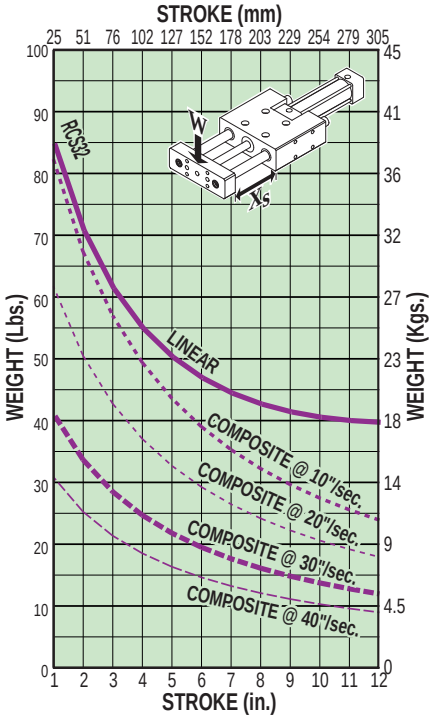
MAXIMUM WEIGHT vs. STROKE LENGTH
Do not exceed maximum load curve. (Deflection curves are provided for reference.) Maximum load is based on 200,000,000 linear inches of travel.

PERFORMANCE

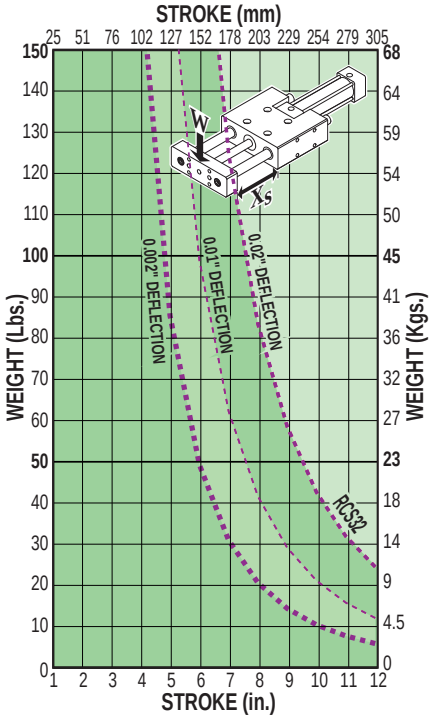
FORCE VS PRESSURE



MAXIMUM WEIGHT vs STROKE LENGTH

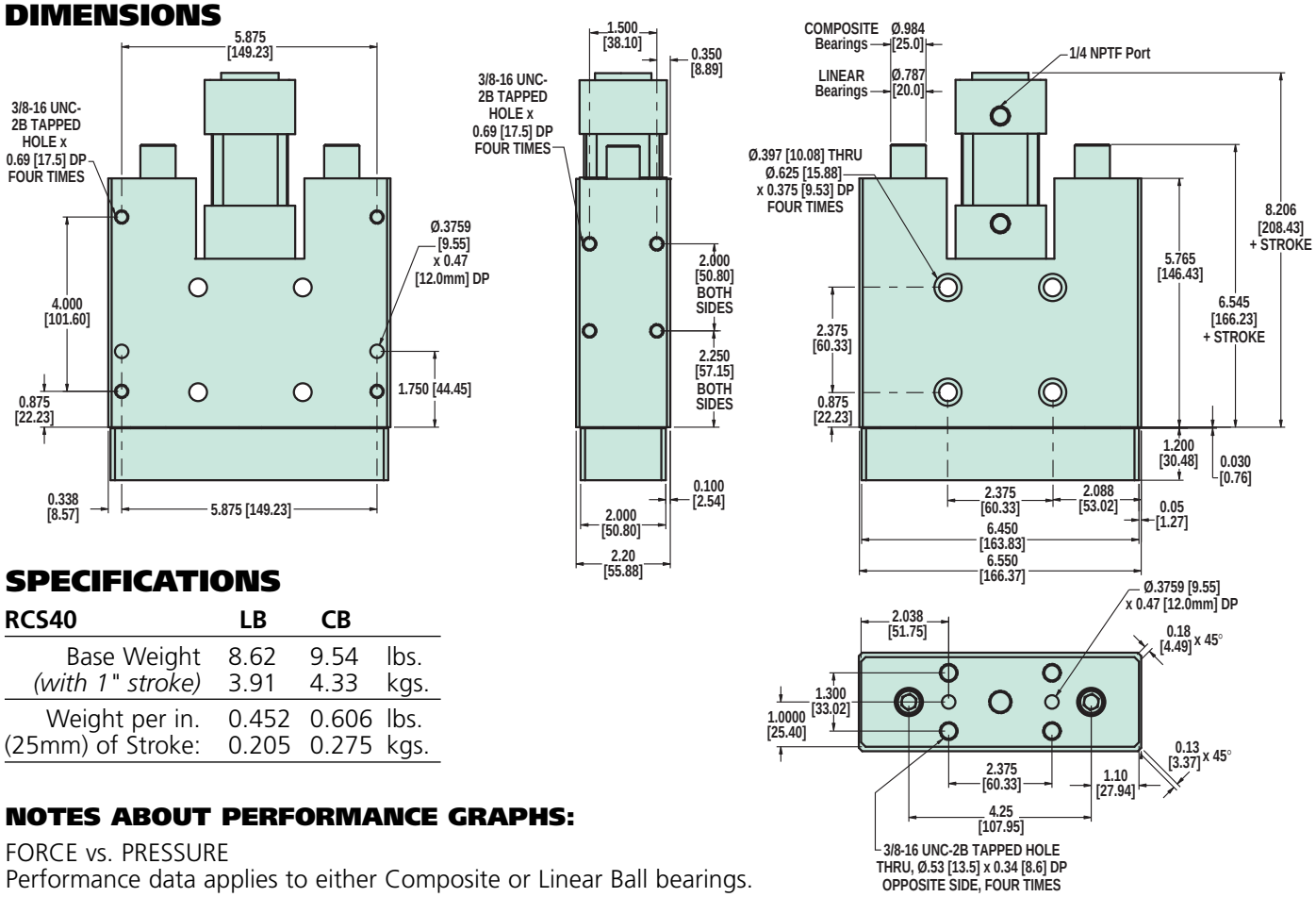


DEFLECTION vs STROKE LENGTH



RCS40 - 1.5" (40MM) BORE

DIMENSIONS



SPECIFICATIONS

RCS40	LB	CB	
Base Weight	8.62	9.54	lbs.
(with 1" stroke)	3.91	4.33	kgs.
Weight per in.	0.452	0.606	lbs.
(25mm) of Stroke:	0.205	0.275	kgs.

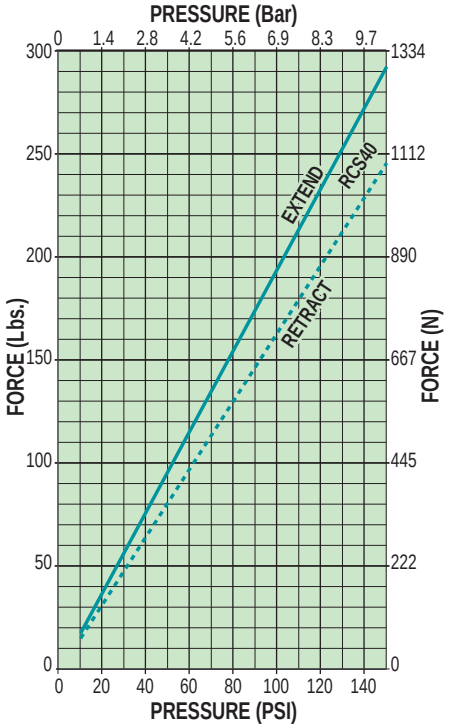
NOTES ABOUT PERFORMANCE GRAPHS:

FORCE vs. PRESSURE
Performance data applies to either Composite or Linear Ball bearings.

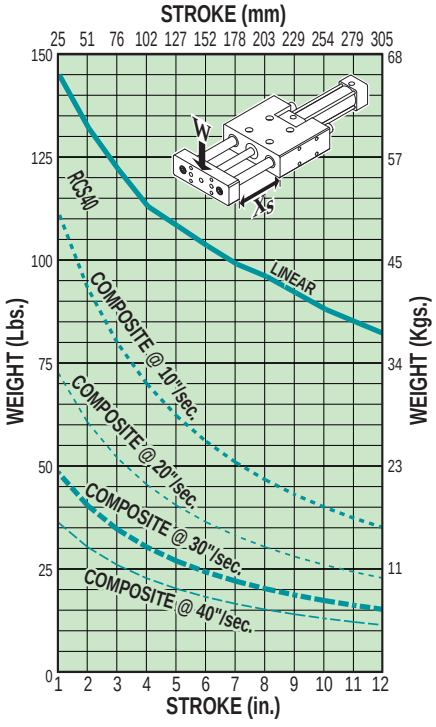
MAXIMUM WEIGHT vs. STROKE LENGTH
Do not exceed maximum load curve. (Deflection curves are provided for reference.) Maximum load is based on 200,000,000 linear inches of travel.

PERFORMANCE

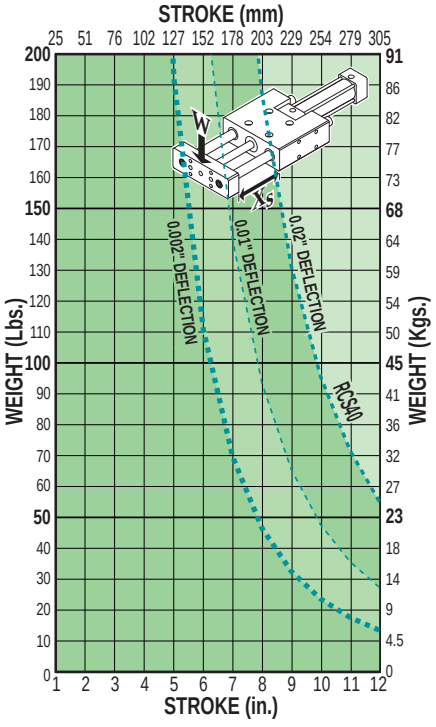
FORCE VS PRESSURE



MAXIMUM WEIGHT vs STROKE LENGTH

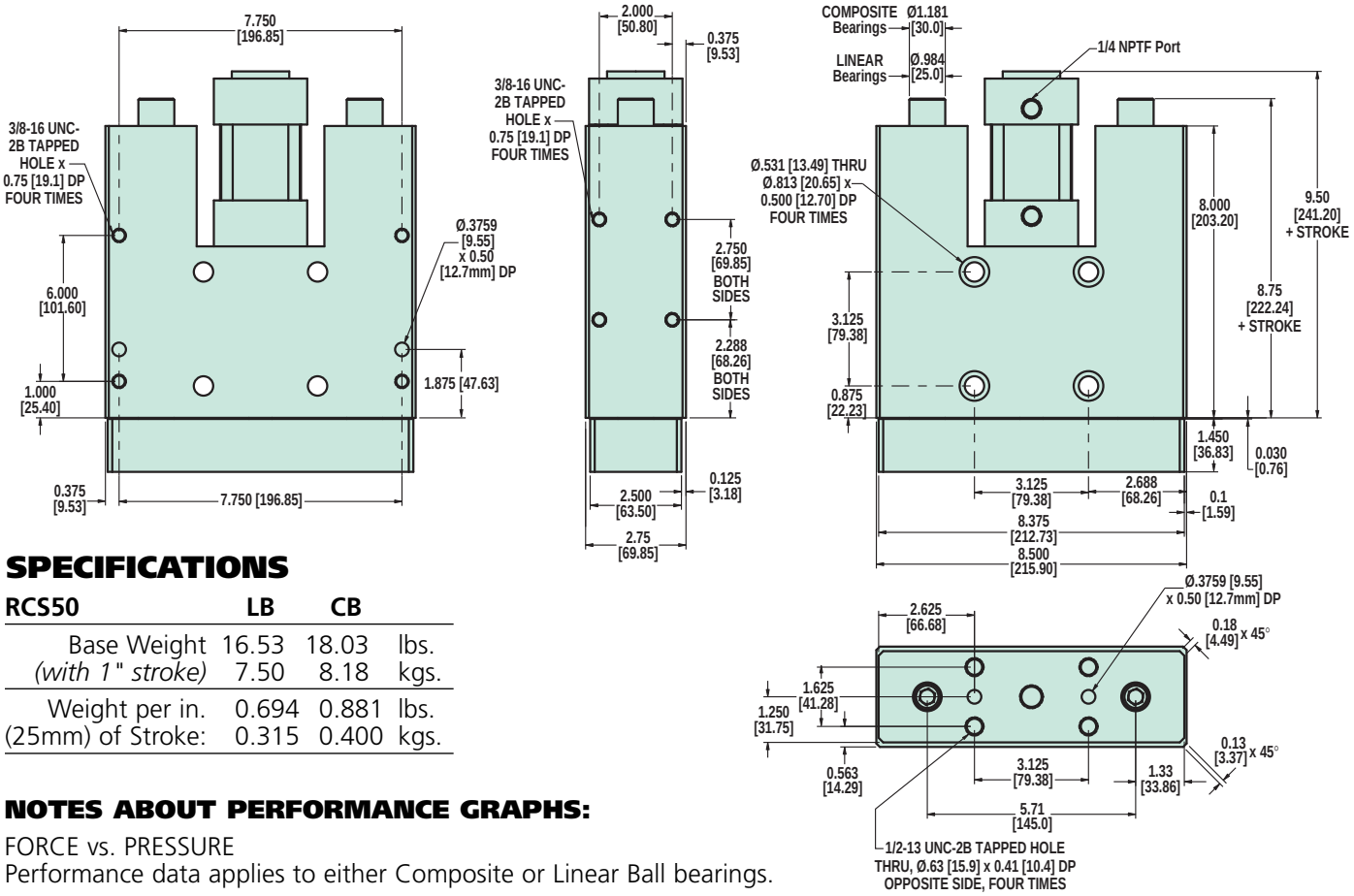


DEFLECTION vs STROKE LENGTH



RCS50 - 2" (50MM) BORE

DIMENSIONS



SPECIFICATIONS

RCS50	LB	CB	
Base Weight	16.53	18.03	lbs.
(with 1" stroke)	7.50	8.18	kgs.
Weight per in.	0.694	0.881	lbs.
(25mm) of Stroke:	0.315	0.400	kgs.

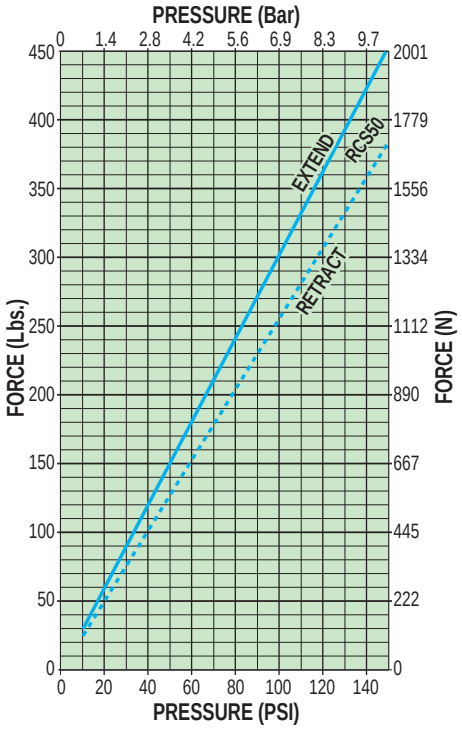
NOTES ABOUT PERFORMANCE GRAPHS:

FORCE vs. PRESSURE
Performance data applies to either Composite or Linear Ball bearings.

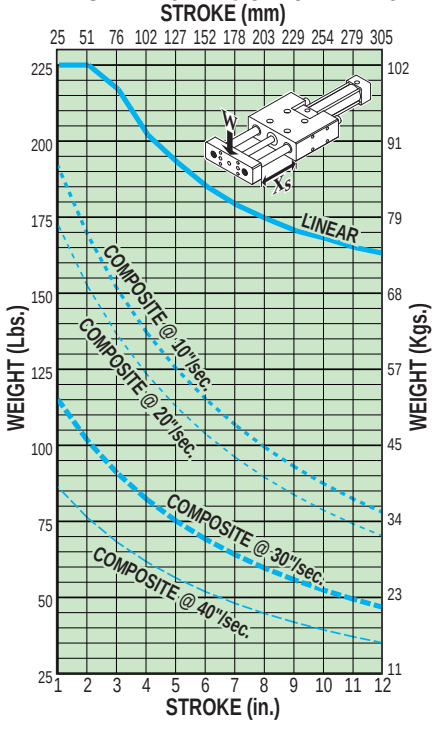
MAXIMUM WEIGHT vs. STROKE LENGTH
Do not exceed maximum load curve. (Deflection curves are provided for reference.) Maximum load is based on 200,000,000 linear inches of travel.

PERFORMANCE

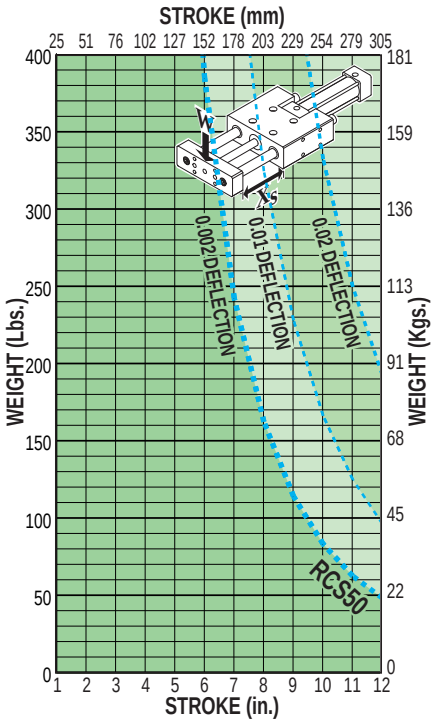
FORCE VS PRESSURE



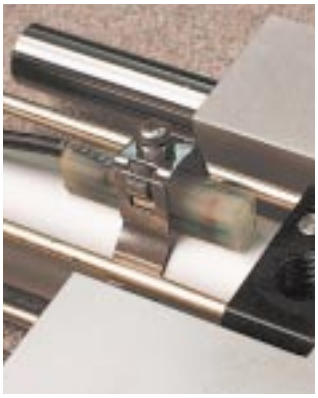
MAXIMUM WEIGHT vs STROKE LENGTH



DEFLECTION vs STROKE LENGTH



SWITCHES



Commonly used for end-of-stroke signalling to programmable controllers, these switches are activated by the magnet on the piston inside the cylinder.

If necessary to remove factory installed switches, be sure to reinstall with scored face of switch toward internal magnet.

Switches contain reverse polarity protection. Switch cable is **unshielded** for switches that DO NOT incorporate the quick-disconnect feature. Switches with quick-disconnect coupler have **shielded** cable from the female quick-disconnect coupler to the flying leads. Shield should be terminated at flying lead end.

**QUICK-DISCONNECT COUPLERS SPEED INSTALLATION*

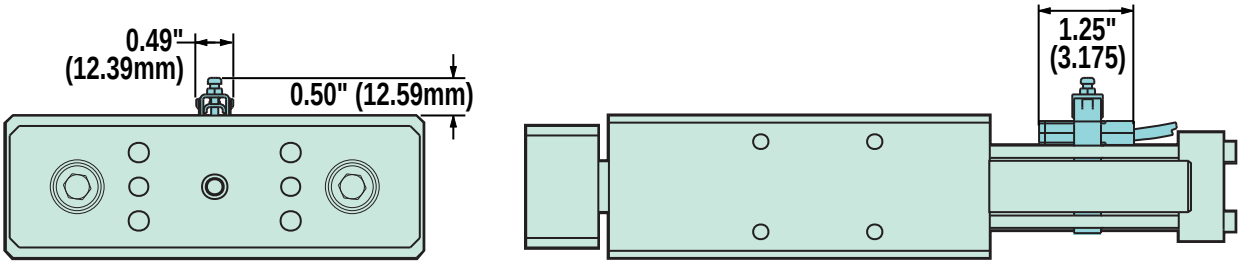
DC REED and AC TRIAC REED SWITCHES

These are mechanical switches with direct coil. They can be used to operate dc relays and solenoids if a protection circuit is used and if current and voltage limits are observed.

DC HALL-EFFECT SWITCHES

Available in either sinking type (NPN), or sourcing type (PNP). These are solid state switches with zero bounce. They can signal dc loads, and TTL or CMOS circuits.

SWITCH DIMENSIONS



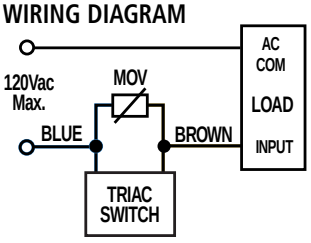
NOTE: The scored face of the switch indicates the sensing surface and must face toward the magnet.

CAUTION: Overtightening could result in switch damage.

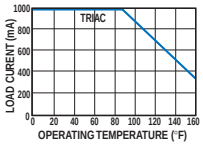
AC TRIAC SWITCH PERFORMANCE DATA

SPECIFICATIONS	
CONTACTS	SINGLE-POLE, SINGLE-THROW, NORMALLY-OPEN
INPUT VOLTAGE	120VAC MAXIMUM
FREQUENCY	47 - 63 HZ
CONTINUOUS CURRENT	1 AMP AT 86° F (30° C) 0,5 AMP AT 140° F (60° C)
PEAK SURGE CURRENT	10 AMP
OPERATING TEMP.	-40° F (-40 C) TO 158° F (70° C)
INDICATOR	NONE
CABLE MINIMUM BEND RADIUS	**5M CABLE WITH PVC JACKET:** 0.630"(16MM) STATIC, DYNAMIC NOT RECOMMENDED **5M QUICK-DISCONNECT STYLE CABLE WITH PVC JACKET:** 0.630"(16MM) STATIC, 1.260 (32MM) DYNAMIC
LIFE EXPECTANCY	UP TO 200,000,000 CYCLES (DEPENDING ON LOAD CURRENT, DUTY CYCLE AND ENVIRONMENTAL CONDITIONS)

TRIAC REED SWITCH WIRING DIAGRAM



TRIAC REED SWITCH TEMPERATURE vs CURRENT



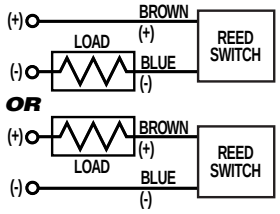
OPTION

SWITCHES

DC REED SWITCH PERFORMANCE DATA

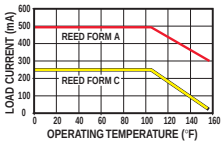
SPECIFICATIONS		
RESISTANCE	0.1 Ω INITIAL (MAXIMUM)	
RELEASE TIME	1.0 MSEC. MAXIMUM	
OPERATING TEMP.	-40° F (-40 C) TO 158° F (70° C)	
CABLE MINIMUM BEND RADIUS	**5M CABLE WITH PVC JACKET:** 0.630"(16MM) STATIC, DYNAMIC NOT RECOMMENDED **5M QUICK-DISCONNECT STYLE CABLE WITH PVC JACKET:** 0.630"(16MM) STATIC, 1.260 (32MM) DYNAMIC	
LIFE EXPECTANCY	UP TO 200,000,000 CYCLES (DEPENDING ON LOAD CURRENT, DUTY CYCLE AND ENVIRONMENTAL CONDITIONS)	
	FORM A	**FORM C**
CONTACTS	SINGLE-POLE, SINGLE-THROW, NORMALLY-OPEN	SINGLE-POLE, DOUBLE-THROW, NORMALLY-OPEN / NORMALLY-CLOSED
CONTACT RATING	10 WATTS, MAXIMUM CURRENT 500MA (NOT TO EXCEED 10VA) (REFER TO TEMPERATURE VS. CURRENT AND VOLTAGE DERATING CHARTS.)	3 WATTS, MAXIMUM CURRENT 250MA (NOT TO EXCEED 3VA) (REFER TO TEMPERATURE VS. CURRENT AND VOLTAGE DERATING CHARTS.)
VOLTAGE DROP	2.6V TYPICAL @ 100MA	NA
INPUT VOLTAGE	200VDC MAXIMUM	120VDC MAXIMUM
OPERATING TIME	0.6 MSEC. MAXIMUM (INCLUDING BOUNCE)	0.7 MSEC. MAXIMUM (INCLUDING BOUNCE)
INDICATOR	RED LED LIT WHEN 4MA MIN. (AT 24V) FLOWS THROUGH CONTACTS	NONE

REED SWITCH, FORM A WIRING DIAGRAM

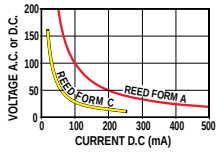


REED SWITCH, FORM C WIRING DIAGRAM

REED SWITCH TEMPERATURE vs CURRENT



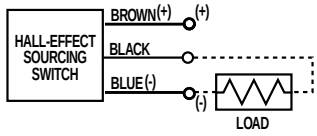
REED SWITCH VOLTAGE DERATING



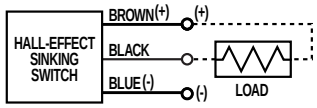
DC HALL-EFFECT SOURCING AND SINKING SWITCH PERFORMANCE DATA

SPECIFICATIONS	
INPUT VOLTAGE	5 TO 25VDC
OUTPUT	OPEN COLLECTOR TRANSISTOR SWITCH
OUTPUT RATING	25VDC, 200MA DC
ON TRIP POINT	150 GAUSS MAXIMUM
OFF TRIP POINT	40 GAUSS MINIMUM
OPERATING TEMP.	0° F (-18 C) TO 150° F (66° C)
OPERATING SPEED	<10 MICRO SEC..
INDICATOR	RED LED LIT WHEN SENSOR IS ACTIVATED
CABLE MINIMUM BEND RADIUS	**5M CABLE WITH PVC JACKET:** 0.630"(16MM) STATIC, DYNAMIC NOT RECOMMENDED **5M QUICK-DISCONNECT STYLE CABLE WITH PVC JACKET:** 0.630"(16MM) STATIC, 1.260 (32MM) DYNAMIC

HALL-EFFECT SOURCING SWITCH WIRING DIAGRAM



HALL-EFFECT SINKING SWITCH WIRING DIAGRAM



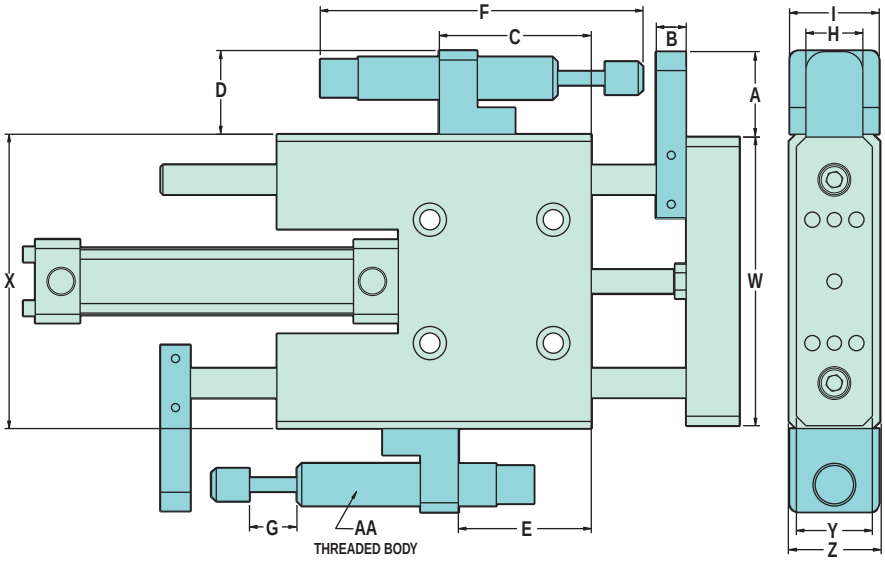
SHOCK ABSORBERS

Advantages of Shock Absorbers:

- Increased operating speed
- Smoother deceleration
- Self-compensates for load changes
- Minimizes shock load to equipment
- Reduces equipment maintenance
- Higher equipment productivity

SHOCK ABSORBER DIMENSIONS

SHOCK ABSORBER MOUNTED IN RETRACT POSITION



SHOCK ABSORBER MOUNTED IN EXTEND POSITION

MODEL	BORE	A	B*	C	D	E	F	G	H	I	AA	W	X	Y	Z
RCS20	0.75	1.13	0.39	2.00	1.10	1.75	4.25	0.63	0.75	1.18	9/16-18 UNF	3.80	3.88	1.00	1.20
RCS25	1.00	1.46	0.44	2.25	1.51	2.46	5.38	0.88	1.00	1.50	3/4-16 UNF	4.72	4.82	1.25	1.50
RCS32	1.25	1.66	0.50	2.75	1.38	2.75	5.38	0.88	1.25	1.75	3/4-16 UNF	5.40	5.50	1.60	1.88
RCS40	1.50	1.92	0.60	3.38	1.72	3.13	5.38	0.88	1.50	2.20	3/4-16 UNF	6.45	7.16	2.00	2.20
RCS50	2.00	2.40	0.75	4.06	2.35	4.06	5.75	1.00	1.75	2.72	1-12 UNF	8.38	8.60	2.50	2.75

DIMENSIONS IN INCHES

MODEL	BORE	A	B*	C	D	E	F	G	H	I	AA	W	X	Y	Z
RCS20	20	28.70	9.91	50.80	27.94	44.45	107.95	16.00	19.05	29.97	9/16-18 UNF	96.52	98.55	25.40	30.48
RCS25	25	37.08	11.18	57.15	38.35	62.48	136.65	22.35	25.40	38.10	3/4-16 UNF	119.89	122.43	31.75	38.10
RCS32	32	42.16	12.70	69.85	35.05	69.85	136.65	22.35	31.75	44.45	3/4-16 UNF	137.16	139.70	40.64	47.75
RCS40	40	48.77	15.24	85.85	43.69	79.50	136.65	22.35	38.10	55.88	3/4-16 UNF	163.83	181.86	50.80	55.88
RCS50	50	60.96	19.05	103.12	59.69	103.12	146.05	25.40	44.45	69.09	1-12 UNF	212.85	218.44	63.50	69.85

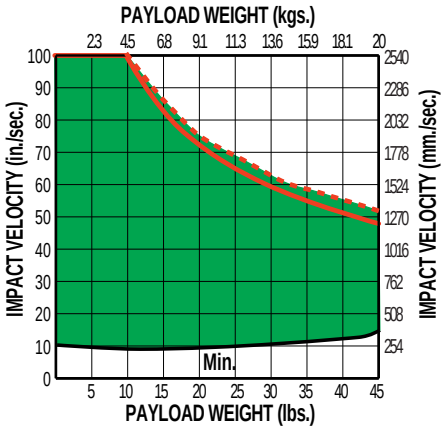
DIMENSIONS IN MILLIMETERS

*NOTE: Stroke will be reduced by this dimension when shock absorber is used in the retract position

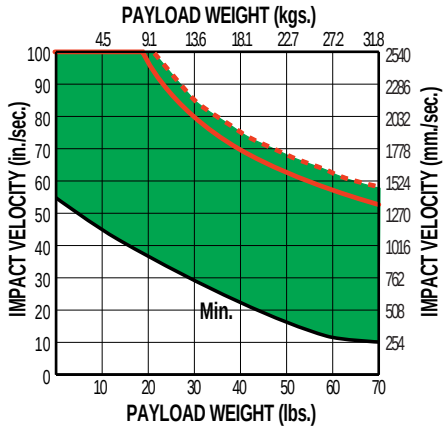
OPTION

SHOCK ABSORBER PERFORMANCE DATA

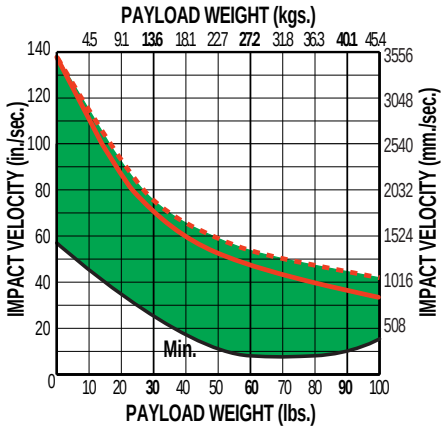
RCS20



RCS25



RCS32, RCS40, RCS50



Horizontal Max. Vel. — Vertical Max. Vel.

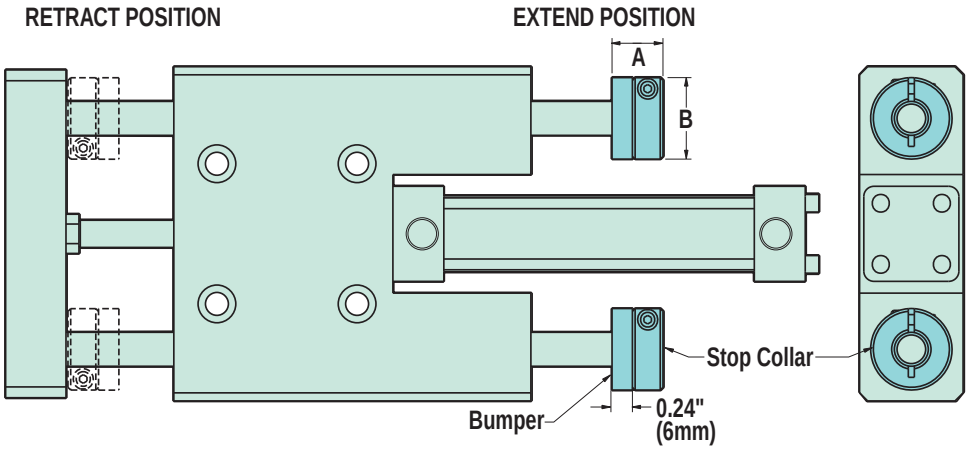
NOTE: If final (or impact) velocity cannot be calculated directly, a reasonable guideline to use is 2 x average velocity.

BUMPERS / STOP COLLARS

Bumper / stop collar kits contain 2 bumpers and 2 stop collars. Bumpers are made of polyurethane and are designed to prevent metal to metal contact and absorb impact shock for both extension and retraction.

NOTE: When used in retract position, stop collar/bumper kit will reduce effective stroke by dimension "A".

BUMPERS / STOP COLLARS DIMENSIONS



LINEAR BEARINGS

	A		B	
Model	in.	mm	in.	mm
RCS20LB	0.59	15.0	0.95	24.0
RCS25LB	0.67	17.0	1.10	28.0
RCS32LB	0.75	19.1	1.34	34.0
RCS40LB	0.83	21.0	1.58	40.0
RCS50LB	0.83	21.0	1.77	45.0

COMPOSITE BEARINGS

	A		B	
Model	in.	mm	in.	mm
RCS20CB	0.67	17.0	1.10	28.0
RCS25CB	0.75	19.0	1.34	34.0
RCS32CB	0.83	21.0	1.58	40.0
RCS40CB	0.83	21.0	1.77	45.0
RCS50CB	0.83	21.0	2.13	54.0

ORDERING

CONFIGURATOR EXAMPLE:

MODEL, BORE, STROKE, AND BEARING				ACCESSORIES AND OPTIONS			
1.	2.	3.	4.	5.	6.	7.	8.
RCS	20	SK09	CB	TT1	BPR	SHE	POB

The above example describes a RCS Rod Cylinder Slide with a 0.75 " bore, a stroke length of 9.0* inches and composite bearings. Options include one Hall-effect (sourcing) switch with 5 meter lead, bumper/stop collar kit in retract position, one shock used in extend position and port orientation on bottom.

Boxes above represent the number of fields available for each section and not all of them will be used in every application. Omit empty boxes when you construct your configurator number (placeholders are not required). For the above example, the order string as it is typed would appear as follows: **RCS20SK09CBTT1BPRSHEPOB.**

1. MODEL TYPE

Enter:

RCS Rod Cylinder Slide

2. CYLINDER BORE DIAMETER

Enter:

20 for (20mm) ¾"
25 for (25mm) 1"
32 for (32mm) 1¼"
40 for (40mm) 1½"
50 for (50mm) 2"

3. STROKE LENGTH

Enter:

SK then required stroke length in inches from 01 to 12 in 1" increments

Example: SK09 for 9.0 inch stroke

4. BEARING TYPE

Enter:

LB for linear bearings **CB** for composite bearings

Leave remaining fields blank if the options are not required.

5. SWITCHES [1]

Enter:

BT for Form C Reed Switch 5-m *(meter)* lead.
BM for Form C Reed Switch 5-m lead QD *(quick-disconnect)*
RT for Form A Reed Switch 5-m lead.
RM for Form A Reed Switch 5-m lead QD
CT for AC Triac Reed Switch 5-m lead
CM for AC Triac Reed Switch 5-m lead QD
KT for Hall-Effect (Sinking) 5-m lead
KM for Hall-Effect (Sinking) 5-m lead QD
TT for Hall-Effect (Sourcing) 5-m lead
TM for Hall-Effect (Sourcing) 5-m lead QD

Then enter:

The number of switches required.

[1] **NOTE:** Switch magnet is a standard feature on all RCS rod cylinder slides.

6. BUMPER / STOP COLLAR KIT

Enter:

BPE for bumper/stop collar kit in extend position
[2]**BPR** for bumper/stop collar kit in retract position
[2]**BPB** for bumper/stop collar kits in extend & retract positions
[2]**RB** for bumpers Only in retract position

[2] **NOTE:** When used in retract position bumper/stop collar kit will reduce overall stroke see page 13.

7. SHOCK ABSORBERS

Enter:

SHE for shock absorber, in extend position
[3]**SHR** for shock absorber, in retract position
[3]**SHB** for shock absorbers, in extend & retract positions
SDE for shock hardware, in extend position
[3]**SDR** for shock hardware, in retract position
[3]**SDB** for shock hardware, in extend & retract positions

[3] **NOTE:** When used in retract position shock stop will reduce overall stroke see page 12.

8. PORT ORIENTATION

Enter:

POB for port orientation on bottom
Blank for port orientation on top

TERMS AND CONDITIONS OF SALE

1. **ORDER ACCEPTANCE.** All orders or services are subject to acceptance in Minnesota by the written approval of an authorized official of Tol-O-Matic, Inc.. Any such order shall be subject to these Terms and Conditions of Sale, and acceptance shall be conditioned on Purchaser's assent to such conditions. Purchaser's assent shall be deemed given unless Purchaser shall expressly notify Tol-O-Matic, Inc. in writing to the contrary within five (5) days after receipt of acknowledgment to confirmation of an order.

2. **CANCELLATION AND CHANGES.** No order accepted by Tol-O-Matic, Inc. may be modified in any manner by Purchaser unless agreed to in writing, by an authorized official of Tol-O-Matic, Inc.. Order cancellations, including reductions to order quantities, and changes shall be governed by the following:

   a. Any standard product order scheduled for shipment within five (5) working days of purchaser's request to cancel or modify will be shipped as previously acknowledged and purchaser agrees to accept shipment and payment responsibility, in full, at the price agreed upon.

   b. "Customer Special" orders scheduled for shipment within twenty (20) working days of purchaser's request to cancel or modify will be shipped as previously acknowledged and purchaser agrees to accept shipment and payment responsibility, in full, at the price agreed upon.

   c. All work in connection with "Customer Special" orders, not covered under Paragraph b, will be stopped immediately upon notification, and purchaser agrees to reimburse Tol-O-Matic, Inc. for all work-in-process and any materials or supplies used, or for which commitments have been made by Tol-O-Matic, Inc. in connection therewith.

3. **QUOTATIONS AND PRICES.** Written quotations automatically expire 30 calendar days from the date issued unless terminated sooner by written notice. (Verbal quotations expire, unless accepted in writing, the same day.)

   All published prices and discounts are subject to change without notice. In the event of a net price change, the price of product(s) on order will be the price in effect on the date of order acknowledgment. Any addition to an outstanding order will be accepted at prices in effect when the addition is made.

4. **MINIMUM BILLING.** Orders amounting to less than $35.00 net will be billed at $35.00

5. **TAXES.** Any Manufacturer's Tax, Retailers Occupation Tax, Use Tax, Sales Tax, Excise Tax, Duty, Customer, Inspection or Testing Fee, or any other tax, fee or charge of any nature whatsoever, imposed by any government authority, on or measured by any transactions between Tol-O-Matic, Inc. and Purchaser shall be paid by the Purchaser in addition to the prices quoted or involved. In the event Tol-O-Matic, Inc. shall be required to pay any such tax, fee or charge, Purchaser shall reimburse therefore.

6. **TERMS OF PAYMENT.** Net invoice amount is due within 30 days from date of invoice subject to credit approval. A 2% per month service charge shall apply to all invoices not paid within 30 days. All clerical errors are subject to correction. Any invoice in not paid within 60 days will subject that account to an immediate shipping hold.

7. **F.O.B. POINT.** All sales are F.0.B. Tol-O-Matic, Inc.'s facility in Hamel, Minnesota, unless quoted otherwise.

8. **DELIVERY.** Delivery of product(s) by Tol-O-Matic, Inc. to a carrier shall constitute delivery to Purchaser, and regardless of freight payment, title and all risk or loss or damage in transit shall pass to Purchaser at that time.

   Should shipment be held beyond scheduled date, upon request of Purchaser, product will be billed and Purchaser agrees to accept any charges for warehousing, trucking and other expenses as may be incident to such delay.

   Great care is taken by Tol-O-Matic, Inc. in crating its product. Tol-O-Matic, Inc. cannot be held responsible for breakage after having received "In Good Order" receipts from the transporting carrier. All claims for loss and damage must be made by Purchaser to the carrier within 14 days from receipt of goods. Tol-O-Matic, Inc. will assist insofar as practical in securing satisfactory adjustment of such claims wherever possible.

   Claims for shortages or other errors must be made, in writing, within ten (10) days to Tol-O-Matic, Inc. and any additional expense of the method or route of shipment specified by Purchaser shall be borne by the Purchaser.

9. **SHIPPING SCHEDULES.** All quoted shipping schedules are approximate and will depend upon prompt receipt from Purchaser of confirming copy of Purchase Order. Dimensional drawings and specifications submitted by Tol-O-Matic, Inc. to Purchaser for approval must be returned to Tol-O-Matic, Inc. within 10 working days, with approval granted, and any exceptions noted, in order to avoid delay in manufacturing schedules.

   Orders which include penalty clauses for failure to meet shipping schedules will not be acceptable, except in those cases specifically approved in writing by the General Manager of Tol-O-Matic, Inc..

   Tol-O-Matic, Inc. shall not be liable for damage as a result of any delay due to any cause beyond Tol-O-Matic, Inc.'s reasonable control, including, without limitation, an Act of Nature; act of Purchaser; embargo, or other government act, regulation or request; fire; accident; strike; slow down; war; riot; flood; delay in transportation; and inability to obtain necessary labor, materials or manufacturing facilities. In the event of any such delay, the date of delivery shall be extended for a period equal to the time loss by reason of the delay. The acceptance of the product when delivered shall constitute a waiver of all claims for damages caused by any such delays.

10. **RETURN OF PRODUCT.** No product may be returned without first obtaining a Return Goods Authorization form and confirming memorandum from Tol-O-Matic, Inc.. Product, if accepted for credit, shall be subject to a minimum service charge of 35% of the invoice price and all transportation charges shall be prepaid by the Purchaser; however, assembled products classified as "special," such as Cable Cylinders and other products which have been modified or built as "Customer Specials," are not returnable to Tol-O-Matic, Inc..

11. **WARRANTY.** Tol-O-Matic, Inc., WARRANTS PRODUCT MANUFACTURED BY IT TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF SHIPMENT BY Tol-O-Matic, Inc.. IF WITHIN SUCH PERIOD ANY SUCH PRODUCT SHALL BE PROVED TO Tol-O-Matic, Inc.'S SATISFACTION TO BE SO DEFECTIVE, SUCH PRODUCT SHALL EITHER BE REPAIRED OR REPLACED AT Tol-O-Matic, Inc.'S OPTION.

    THIS WARRANTY SHALL NOT APPLY:

    a. TO PRODUCT NOT MANUFACTURED BY Tol-O-Matic, Inc. WITH RESPECT TO PRODUCT NOT MANUFACTURED BY Tol-O-Matic, Inc.. THE WARRANTY OBLIGATIONS OF Tol-O-Matic, Inc. SHALL IN ALL RESPECTS CONFORM AND BE LIMITED TO THE WARRANTY ACTUALLY EXTENDED TO Tol-O-Matic, Inc. BY ITS SUPPLIER.

    b. TO PRODUCT WHICH SHALL HAVE BEEN REPAIRED OR ALTERED BY PARTIES OTHER THAN Tol-O-Matic, Inc. SO AS, IN Tol-O-Matic, Inc.'s JUDGMENT, TO AFFECT THE SAME ADVERSELY, OR

    c. TO PRODUCT WHICH SHALL HAVE BEEN SUBJECT TO NEGLIGENCE, ACCIDENT, OR DAMAGE BY CIRCUMSTANCES BEYOND THE CONTROL OF Tol-O-Matic, Inc. OR TO IMPROPER OPERATION MAINTENANCE OR STORAGE, OR TO OTHER THAN NORMAL USE AND SERVICE.

    THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES WHATSOEVER, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, Tol-O-Matic, Inc. SHALL NOT BE SUBJECT TO ANY OTHER OBLIGATIONS OR LIABILITIES WHATSOEVER WITH RESPECT TO PRODUCT MANUFACTURED OR SUPPLIED BY Tol-O-Matic, Inc. OR SERVICE RENDERED BY IT.

12. **CONSEQUENTIAL DAMAGE.** Tol-O-Matic, Inc., shall not, under any circumstances be liable for consequential damages.

13. **SERVICE CHARGES.** Should the Purchaser request the service of any erector, demonstrator or service man (except as specifically provided for and included in the price of the product) such service will be rendered at the rate outlined in the schedule of field service charges in effect at the date of request.

TOL-O-MATIC MAKES PRODUCTS FOR ANYTHING THAT MOVES!

PNEUMATIC

BC2 Band Cylinder
CATALOG NUMBER 9900-4000

PNEUMATIC

BC3 Band Cylinder
CATALOG NUMBER 9900-4000

PNEUMATIC

BC4 Band Cylinder
CATALOG NUMBER 9900-4000

PNEUMATIC

LS Linear Slide
CATALOG NUMBER 9900-4000

PNEUMATIC

MGS Mag. Coupled Slide
CATALOG NUMBER 9900-4000

PNEUMATIC

PB Power-Block Rod Cylinder Slide
CATALOG NUMBER 9900-4000

PNEUMATIC

RCS Rod Cylinder Slide
CATALOG NUMBER 9900-4000

PNEUMATIC

MG Mag. Coupled Cylinder
CATALOG NUMBER 9900-4000

PNEUMATIC

PB2 Power-Block2 Rod Cylinder Slide
CATALOG NUMBER 9900-4000

PNEUMATIC / HYDRAULIC

CC Cable Cylinder
CATALOG NUMBER 9900-4000

PNEUMATIC

RA Rack & Pinion Rotary Actuator
CATALOG NUMBER 9900-4000

PNEUMATIC

PAS PrecisionAire™ Systems
CATALOG NUMBER 3604-4134

PNEUMATIC

GP Angular & Parallel Grippers
CATALOG NUMBER 9900-4000

PNEUMATIC

Vane Rotary Actuator
CATALOG NUMBER 9900-4000

PNEUMATIC

RG RotoGripper
CATALOG NUMBER 9900-4000

POWER TRANSMISSION

Caliper Disc Brakes
CATALOG NUMBER 9900-4009

POWER TRANSMISSION

Adam & Disc Cone Clutches
CATALOG NUMBER 9900-4009

POWER TRANSMISSION

Float-A-Shaft Gear Drives
CATALOG NUMBER 9900-4009

AXIDYNE ELECTRIC

BCS Screw-Drive Linear Actuator
CATALOG NUMBER 3600-4609

AXIDYNE ELECTRIC

B3B Belt-Drive Linear Actuator
CATALOG NUMBER 3600-4609

POWER TRANSMISSION

Slide Rite™ Gearbox
CATALOG NUMBER 0100-4000

AXIDYNE ELECTRIC

Controllers. Drives, Interfaces
CATALOG NUMBER 3600-4609

AXIDYNE ELECTRIC

GSA Guided Screw Actuator
CATALOG NUMBER 3600-4609

AXIDYNE ELECTRIC

B3S Screw-Drive Linear Actuator
CATALOG NUMBER 3600-4609

AXIDYNE ELECTRIC

TKS/B TruTrack Linear Actuator
CATALOG NUMBER 3600-4613

AXIDYNE ELECTRIC

MRV, MRS, MRB Motors
CATALOG NUMBER 3600-4609

AXIDYNE ELECTRIC

SLS Screw-Drive Linear Actuator
CATALOG NUMBER 3600-4609

AXIDYNE ELECTRIC

RSA Rod Screw Actuator
CATALOG NUMBER 3600-4609

TOL-O-MATIC

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