

Air-Oil Systems, Inc. www.airoil.com

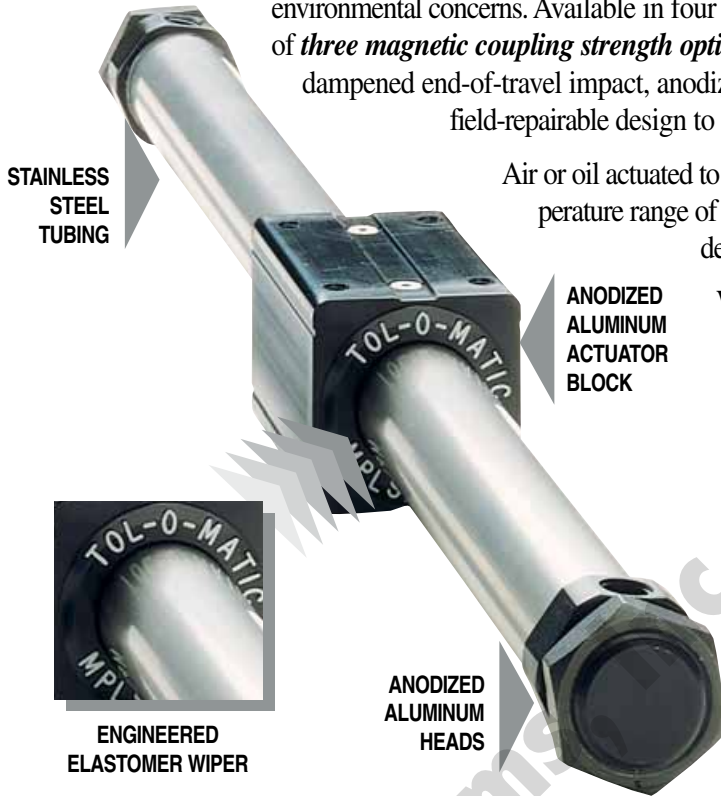
MAGNETICALLY COUPLED ACTUATORS

MAGNETICALLY COUPLED



MAGNETICALLY COUPLED CYLINDERS

With magnetically coupled cylinders there is no mechanical connection of the carrier to the piston. The fully enclosed actuator body prevents contaminants from entering or escaping the actuator body. Its the perfect choice for applications where there are environmental concerns. Available in four bore sizes, these actuators feature a choice of *three magnetic coupling strength options*, internal polyurethane bumpers for dampened end-of-travel impact, anodized aluminum heads and actuator block, and a field-repairable design to practically eliminate maintenance downtime.



Air or oil actuated to 100 PSIG, these actuators operate in a temperature range of 0°F to 170°F to accommodate even the most demanding application environments.

With no mechanical piston connection, the actuator block can be easily rotated for increased mounting flexibility.

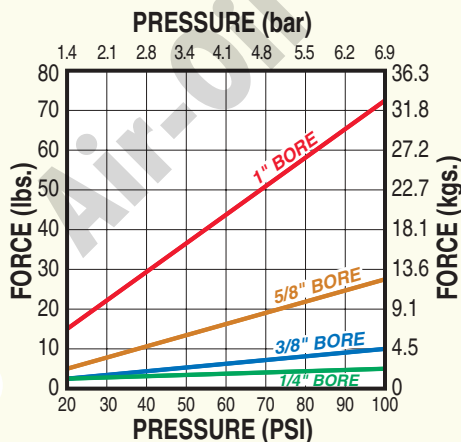
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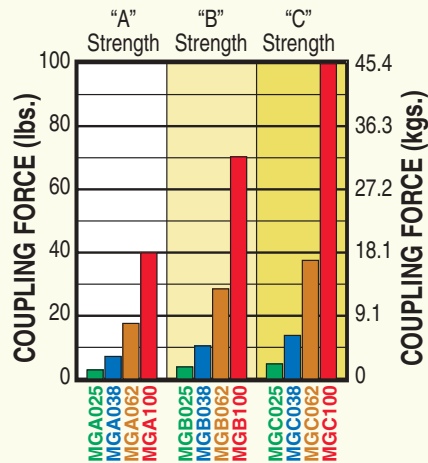
MAGNETICALLY COUPLED

PERFORMANCE DATA

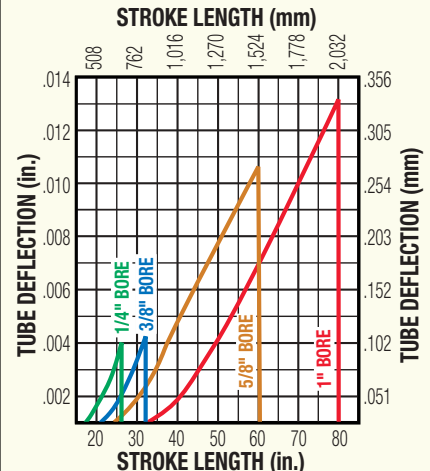
THEORETICAL FORCE vs PRESSURE



MAGNETIC COUPLING STRENGTH



TUBE DEFLECTION

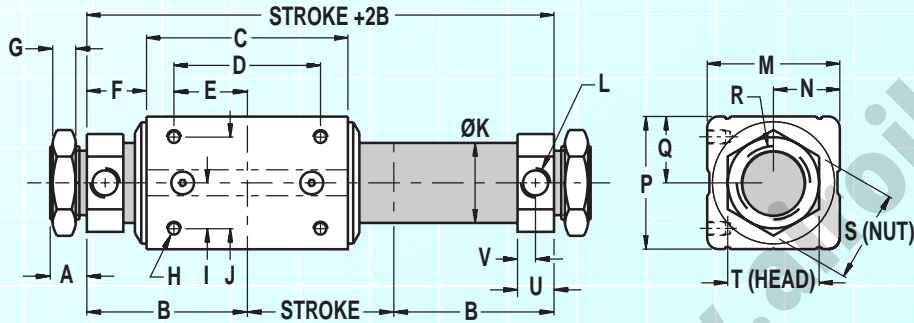


NOTES REGARDING MAGNETIC COUPLING

- 1) DE-COUPLING WILL OCCUR IF COUPLING FORCE IS EXCEEDED.
- 2) ALL COUPLING FORCES LISTED ARE FOR HORIZONTAL APPLICATIONS. FOR VERTICAL APPLICATIONS, TOL-O-MATIC RECOMMENDS USING A 2-TO-1 COUPLING FORCE SAFETY FACTOR.

MAGNETICALLY COUPLED CYLINDERS

DIMENSIONAL DATA



MAGNETICALLY COUPLED

MODEL	BORE	A	B	B*	C	C*	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U	V
MG_025	0.250	0.38	1.25	1.32	1.56	1.70	1.00	0.50	0.47	0.23	#5-40UNC x .18	0.20	0.39	Ø.31	#10-32	0.67	0.34	0.67	0.34	3/8-24UNF	0.56	0.56	0.41	0.21
MG_038	0.375	0.38	1.25	1.35	1.50	1.70	1.12	0.56	0.50	0.23	#5-40UNC x .18	0.31	0.63	Ø.44	#10-32	0.98	0.49	0.98	0.49	3/8-24UNF	0.56	0.56	0.41	0.21
MG_062	0.625	0.38	1.62	1.75	1.92	2.19	1.50	0.75	0.67	0.23	#8-32UNC x .24	0.37	0.75	Ø.69	#10-32	1.38	0.69	1.38	0.69	3/8-24UNF	0.56	0.75	0.44	0.22
MG_100	1.000	0.50	2.19	2.40	2.75	3.17	2.00	1.00	0.81	0.32	#10-32UNC x .25	0.62	1.25	Ø1.09	1/8 NPT	1.81	0.91	1.81	0.91	1-12UNF	1.25	1.25	0.50	0.25

Above dimensions in inches

MODEL	BORE	A	B	B*	C	C*	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U	V
MG_025	6.4	9.7	31.8	33.5	39.6	43.2	25.4	12.7	11.9	5.8	#5-40UNC x .18	5.1	9.9	7.9	#10-32	17.0	8.6	17.0	8.6	3/8-24UNF	14.2	14.2	10.4	5.3
MG_038	9.5	9.7	31.8	34.3	38.1	43.2	28.4	14.2	12.7	5.8	#5-40UNC x .18	7.9	16.0	11.2	#10-32	24.9	12.4	24.9	12.4	3/8-24UNF	14.2	14.2	10.4	5.3
MG_062	15.9	9.7	41.1	44.5	48.8	55.6	38.1	19.1	17.0	5.8	#8-32UNC x .24	9.4	19.1	17.5	#10-32	35.1	17.5	35.1	17.5	3/8-24UNF	14.2	19.1	11.2	5.6
MG_100	25.4	12.7	55.6	61.0	69.9	80.5	50.8	25.4	20.6	8.1	#10-32UNC x .25	15.7	31.8	27.7	1/8 NPT	46.0	23.1	46.0	23.1	1-12UNF	31.8	31.8	12.7	6.4

* For "C strength" configurations only.

Above dimensions in millimeters

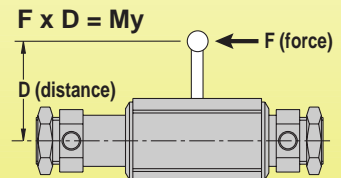
MAXIMUM STROKE LENGTHS

MODEL	BORE SIZE Inches	MAXIMUM STROKE	
		Inches	Millimeters
MG_025	.250	26.00	660.4
MG_038	.375	32.00	812.8
MG_062	.625	60.00	1,524.0
MG_100	1.000	80.00	2,032.0

WEIGHTS

MODEL	Bore SIZE Inches	Base WEIGHT Lbs. (Kgs.)	weight / INCH (25mm) Lbs. (Kgs.)
MGA025	.250	0.12 (0.05)	0.01 (0.005)
MGB025	.250	0.12 (0.05)	0.01 (0.005)
MGC025	.250	0.13 (0.06)	0.01 (0.005)
MGA038	.375	0.20 (0.09)	0.01 (0.005)
MGB038	.375	0.21 (0.10)	0.01 (0.005)
MGC038	.375	0.24 (0.11)	0.01 (0.005)
MGA062	.625	0.49 (0.22)	0.02 (0.009)
MGB062	.625	0.51 (0.23)	0.02 (0.009)
MGC062	.625	0.57 (0.26)	0.02 (0.009)
MGA100	1.000	1.52 (0.69)	0.04 (0.018)
MGB100	1.000	1.55 (0.70)	0.04 (0.018)
MGC100	1.000	1.79 (0.81)	0.04 (0.018)

BENDING MOMENTS



MODEL	BORE SIZE Inches	MAX. BENDING MOMENT (My)	
		in.-lbs.	N-m
MG_025	.250	3.00	0.339
MG_038	.375	4.00	0.452
MG_062	.625	9.00	1.017
MG_100	1.000	35.00	3.954

For Assistance Call
1-800-328-2174
(Toll Free U.S. and Canada)
or
763-478-8000
Fax 763-478-8080

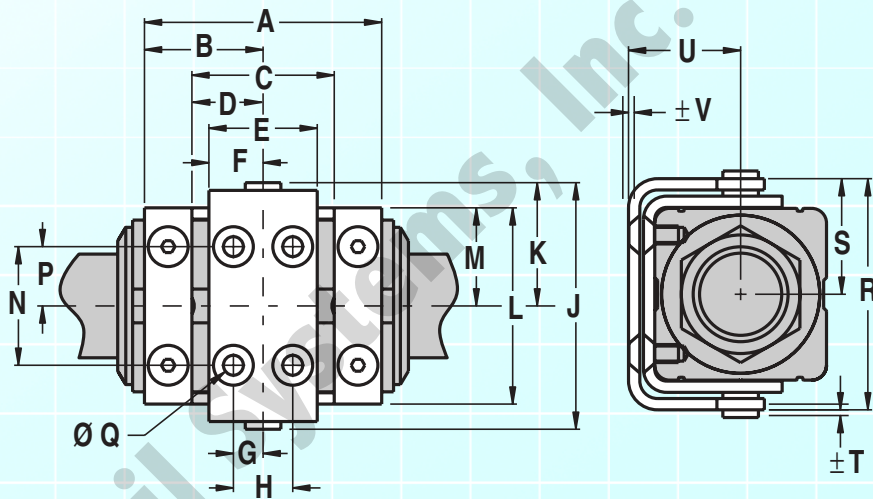
FLOATING MOUNT BRACKET



The integral floating mount bracket is available for applications in which a load is externally guided and supported and there is a need to compensate for non-parallelism between the cylinder and the independently-guided load.

Loads which are not parallel to the cylinder may result in the cylinder binding if the floating mount bracket is not used. Also, use of the floating mount is highly recommended to provide easier set-up of guide/support system and to help increase actuator block bearing life.

DIMENSIONAL DATA



MODEL	BORE SIZE Inches	WEIGHT	
		Pounds	(Kilograms)
MG_025	.250	0.06	(0.027)
MG_038	.375	0.08	(0.036)
MG_062	.625	0.18	(0.082)
MG_100	1.000	0.33	(0.150)

MODEL	BORE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
MG_025	0.250	1.34	0.67	0.66	0.33	0.63	0.31	0.16	0.31	1.26	0.63	0.87	0.43	0.37	0.18	Ø.14	1.14	0.57	0.04	0.53	0.08
MG_038	0.375	1.47	0.73	0.78	0.39	0.69	0.34	0.16	0.31	1.57	0.78	1.18	0.59	0.63	0.31	Ø.14	1.45	0.72	0.04	0.69	0.08
MG_062	0.625	1.88	0.94	1.12	0.56	0.79	0.39	0.19	0.38	2.09	1.05	1.64	0.82	0.75	0.38	Ø.19	1.99	0.99	0.04	0.93	0.08
MG_100	1.000	2.50	1.25	1.50	0.75	1.14	0.57	0.31	0.62	2.60	1.30	2.07	1.03	1.25	0.63	Ø.248	2.44	1.22	0.06	1.20	0.08

Above Dimensions in Inches

MODEL	BORE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
MG_025	6.4	34.0	17.0	16.8	8.4	16.0	7.9	4.1	7.9	32.0	16.0	22.1	10.9	9.4	4.6	3.6	29.0	14.5	1.0	13.5	2.0
MG_038	9.5	37.3	18.5	19.8	9.9	17.5	8.6	4.1	7.9	39.9	19.8	30.0	15.0	16.0	7.9	3.6	36.8	18.3	1.0	17.5	2.0
MG_062	15.9	47.8	23.9	28.4	14.2	20.1	9.9	4.8	9.7	53.1	26.7	41.7	20.8	19.1	9.7	4.8	50.5	25.1	1.0	23.6	2.0
MG_100	25.4	63.5	31.8	38.1	19.1	29.0	14.5	7.9	15.7	66.0	33.0	52.6	26.2	31.8	16.0	6.3	62.0	31.0	1.5	30.5	2.0

Above Dimensions in Millimeters

MAGNETICALLY COUPLED

FOOT MOUNT



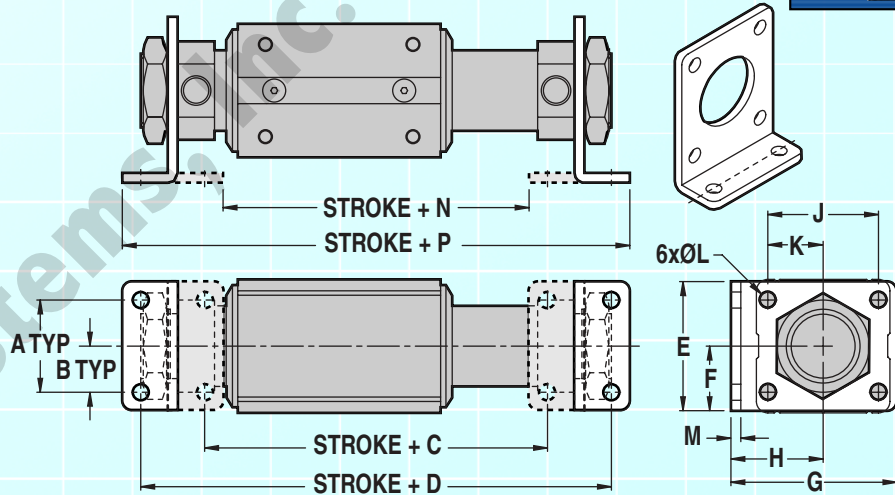
Foot mounts are an excellent mounting alternative. Made from plated stamped steel, foot mounts are attached to cylinder heads as shown in the dimension drawing, below. (NOTE: Foot mounts may be ordered for one or both ends of the cylinder). Foot mounts can then be attached to almost any surface at a 90° angle to provide solid support without affecting stroke.

MAGNETICALLY COUPLED

DIMENSIONAL DATA



MODEL	BORE SIZE Inches	WEIGHT	
		Pounds	(Kilograms)
MG_025	.250	0.07	(0.032)
MG_038	.375	0.07	(0.032)
MG_062	.625	0.17	(0.077)
MG_100	1.000	0.28	(0.127)



MODEL	BORE	A	B	C	C*	D	D*	E	F	G	H	J	K	L	M	N	N*	P	P*
MG_025	.250	1.13	0.56	2.06	2.20	3.06	3.20	1.50	0.75	1.16	0.72	0.50	0.25	Ø.17	0.06	1.49	1.89	3.36	3.23
MG_038	.375	1.13	0.56	2.06	2.26	3.06	3.26	1.50	0.75	1.16	0.72	0.50	0.25	Ø.17	0.06	1.49	1.95	3.36	3.29
MG_062	.625	1.13	0.56	2.80	3.07	3.80	4.07	1.50	0.75	1.16	0.72	0.50	0.25	Ø.17	0.06	2.50	2.77	4.12	4.39
MG_100	1.000	1.25	0.63	3.65	4.07	5.38	5.80	1.75	0.88	2.25	1.25	1.50	0.75	Ø.22	0.13	3.15	3.58	5.88	6.31

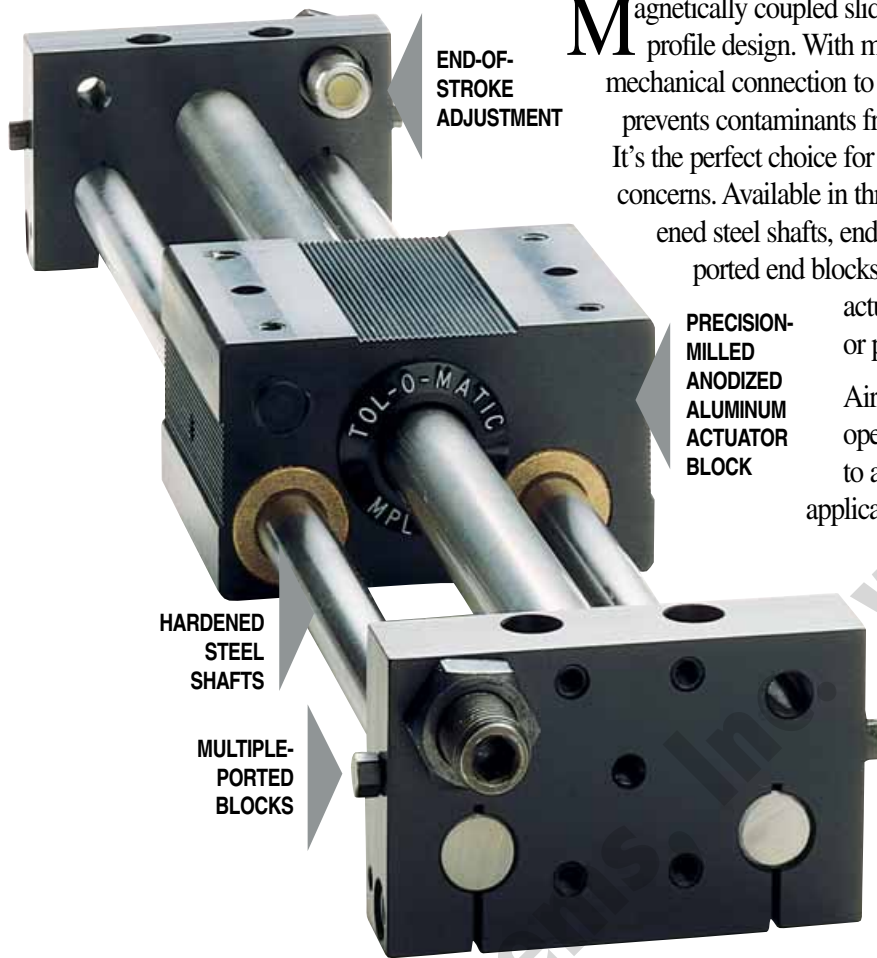
Above Dimensions in Inches

MODEL	BORE	A	B	C	C*	D	D*	E	F	G	H	J	K	L	M	N	N*	P	P*
MG_025	6.4	28.7	14.2	52.3	55.9	77.7	81.3	38.1	19.1	29.5	18.3	12.7	6.4	4.3	1.5	37.8	48.0	85.3	82.0
MG_038	9.5	28.7	14.2	52.3	57.4	77.7	82.8	38.1	19.1	29.5	18.3	12.7	6.4	4.3	1.5	37.8	49.5	85.3	83.6
MG_062	15.9	28.7	14.2	71.1	78.0	96.5	103.4	38.1	19.1	29.5	18.3	12.7	6.4	4.3	1.5	63.5	70.4	104.6	111.5
MG_100	25.4	31.8	16.0	92.7	103.4	136.7	147.3	44.5	22.4	57.2	31.8	38.1	19.1	5.6	3.3	80.0	90.9	149.4	160.3

Above Dimensions in Millimeters

* For "C" strength configurations only.

MAGNETICALLY COUPLED SLIDES



Magnetically coupled slides provide exceptional rigidity in a low profile design. With magnetically coupled slides there is no mechanical connection to the piston. The fully enclosed actuator body prevents contaminants from entering or escaping the actuator body. It's the perfect choice for applications where there are environmental concerns. Available in three bore sizes, these actuators feature hardened steel shafts, end-of-stroke adjustment (standard), multiple-ported end blocks, precision-machined anodized aluminum actuator block and a choice of sintered bronze or precision linear ball bearings.

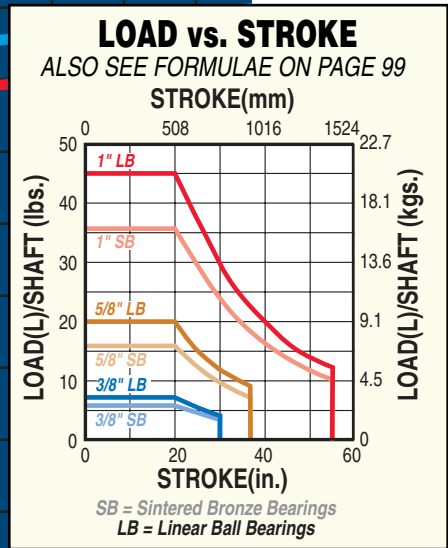
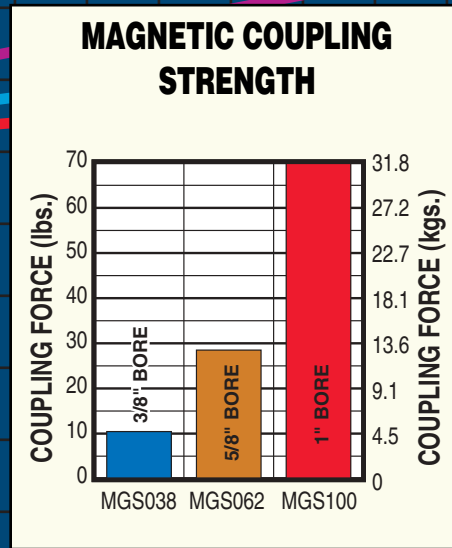
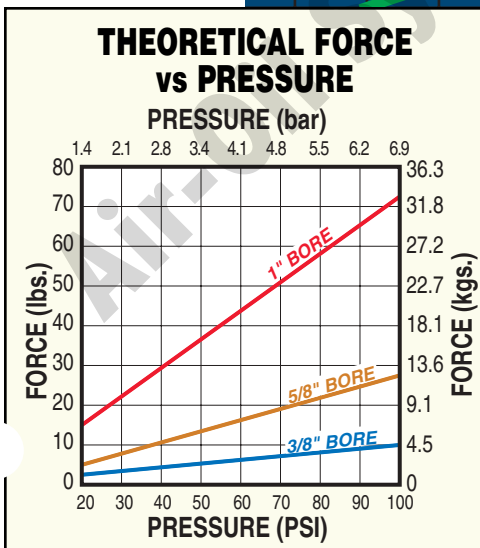
Air or oil actuated to 100 PSIG, these actuators operate in a temperature range of 0°F to 170°F to accommodate even the most demanding application environments.

Use this Magnetically Coupled Slide if your application requires end-of-stroke adjustment or shock absorbers.

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MAGNETICALLY COUPLED

PERFORMANCE DATA



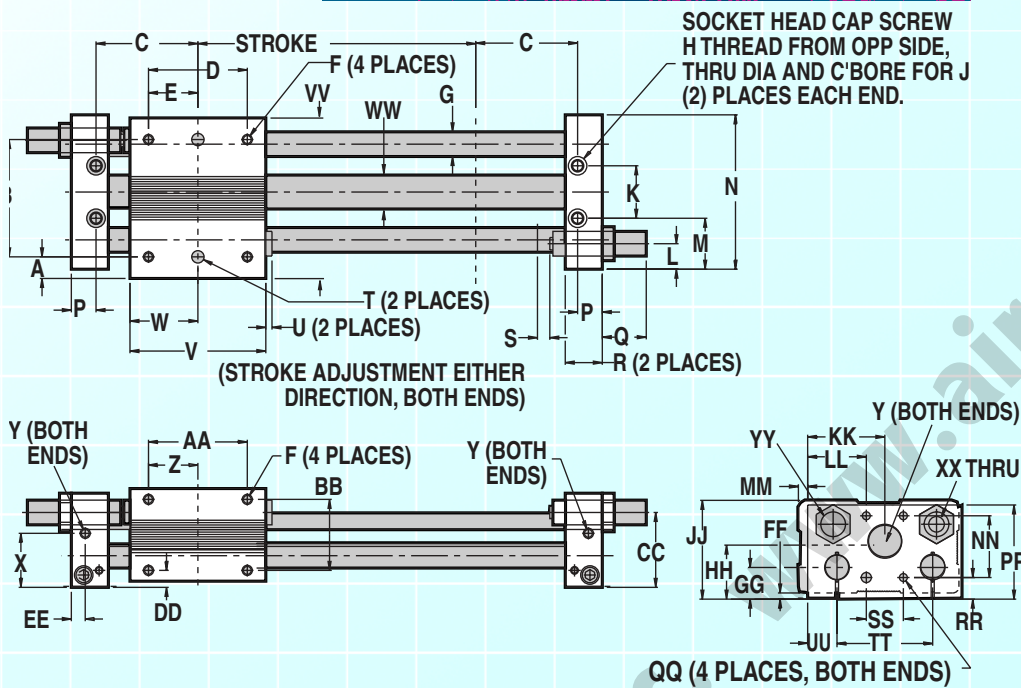
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MAG SLIDES

DIMENSIONAL DATA

2D CAD AVAILABLE AT
WWW.TOLOMATIC.COM



MODEL	BORE	A	B*	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
MGS038	0.375	0.30	1.875	1.66	1.19	0.59	10-24 x .38 DP	0.38	1/4-20 x .50 DP	#8	0.75	0.45	0.81	2.38	0.41	1.26 max.	0.63	0.25	2495/2500 x .20 DP	0.13	2.00	1.00
MGS062	0.625	0.44	2.375	2.06	2.00	1.00	10-24 x .38 DP	0.50	1/4-20 x .50 DP	#10	1.06	0.52	1.03	3.12	0.50	1.14 max.	0.75	0.25	2495/2500 x .20 DP	0.13	2.75	1.38
MGS100	1.000	0.42	3.250	2.28	2.50	1.25	10-24 x .38 DP	0.63	1/4-20 x .50 DP	#10	1.63	0.63	1.22	4.06	0.53	1.14 max.	0.75	0.25	2495/2500 x .20 DP	0.13	3.25	1.63

MODEL	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM	NN	PP	QQ	RR	SS	TT	UU	VV	WW	XX	YY
MGS038	1.03	#10-32 Port	0.81	1.63	1.06	1.34	0.44	0.19	0.25	0.66	1.08	1.69	1.19	0.81	0.16	0.75	1.62	8-32 x .31 DP	0.56	0.75	1.44	0.47	2.47	0.44	M8-1	3/8-32 Thru, 0.500x.31DP
MGS062	1.09	#10-32 Port	1.00	2.00	1.44	1.52	0.34	0.28	0.13	0.64	1.08	2.00	1.56	1.19	0.19	1.25	1.91	10-24 x .38 DP	0.44	0.75	1.94	0.59	3.25	0.69	M8-1	1/2-20 Thru, 0.625x.33DP
MGS100	1.31	1/8-27 Port	1.00	2.00	1.69	1.75	0.34	0.28	0.13	0.81	1.31	2.34	2.08	1.47	0.09	1.13	2.22	10-24 x .38 DP	0.75	1.13	2.63	0.72	4.09	1.09	M8-1	9/16-18 Thru, 0.688x.31DP

*Tolerance between dowel pins is ±.001"

Above dimensions in inches

MODEL	BORE	A	B*	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
MGS038	9.5	7.6	47.6	42.2	30.2	15.0	10-24 x .38 DP	9.7	1/4-20 x .50 DP	#8	19.1	11.4	20.6	60.5	10.4	1.26 max.	16.0	6.4	2495/2500 x .20 DP	3.3	50.8	25.4
MGS062	15.9	11.2	60.3	52.3	50.8	25.4	10-24 x .38 DP	12.7	1/4-20 x .50 DP	#10	26.9	13.2	26.2	79.2	12.7	1.14 max.	19.1	6.4	2495/2500 x .20 DP	3.3	69.9	35.1
MGS100	25.4	10.7	82.6	57.9	63.5	31.8	10-24 x .38 DP	16.0	1/4-20 x .50 DP	#10	41.4	16.0	31.0	103.1	13.5	1.14 max.	19.1	6.4	2495/2500 x .20 DP	3.3	82.6	41.4

MODEL	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM	NN	PP	QQ	RR	SS	TT	UU	VV	WW	XX	YY
MGS038	26.2	#10-32 Port	20.6	41.4	26.9	34.0	11.2	4.8	6.4	16.8	27.4	42.9	30.2	20.6	4.1	19.1	41.1	8-32 x .31 DP	14.2	19.1	36.6	11.9	62.7	11.2	M8-1	3/8-32 Thru, 0.500x.31DP
MGS062	27.7	#10-32 Port	25.4	50.8	36.6	38.6	8.6	7.1	3.3	16.3	27.4	50.8	39.6	30.2	4.8	31.8	48.5	10-24 x .38 DP	11.2	19.1	49.3	15.0	82.6	17.5	M8-1	1/2-20 Thru, 0.625x.33DP
MGS100	33.3	1/8-27 Port	25.4	50.8	42.9	44.5	8.6	7.1	3.3	20.6	33.3	59.4	52.8	37.3	2.3	28.7	56.4	10-24 x .38 DP	19.1	28.7	66.8	18.3	103.9	27.7	M8-1	9/16-18 Thru, 0.688x.31DP

*Tolerance between dowel pins is ±.025mm

Above dimensions in millimeters

Maximum Allowable Stroke

MODEL	BORE SIZE Inches	MAXIMUM ALLOWABLE STROKE	
		Inches	(Millimeters)
MGS038	.375	30.00	(762.0)
MGS062	.625	37.00	(939.8)
MGS100	1.000	55.00	(1397.0)

Magnetically Coupled Slide Weights

MODEL	BORE SIZE Inches	BASE WEIGHT Lbs. (Kgs.)	WEIGHT / INCH (25mm) Lbs. (Kgs.)
MGS038	.375	1.24 (0.56)	0.004 (0.002)
MGS062	.625	3.14 (1.42)	0.130 (0.059)
MGS100	1.000	4.89 (2.22)	0.180 (0.082)

For Assistance Call
1-800-328-2174
(Toll Free U.S. and Canada)
or
763-478-8000
Fax 763-478-8080

MAGNETICALLY COUPLED

MG-ORDERING

MAGNETICALLY COUPLED CYLINDER CONFIGURATOR EXAMPLE

MODEL, BORE, AND STROKE

1. 2. 4.

M G B 0 3 8 S K 1 4 . 2 5

ACCESSORIES AND OPTIONS

5.

F M 2 B T 2

The order example shown above is for a magnetically coupled CYLINDER with MEDIUM COUPLING FORCE, a 3/8" BORE, and a 14-1/4" STROKE LENGTH equipped with optional two FOOT MOUNT BRACKETS and two FORM C REED SWITCHES (5 meter lead). NOTE: Internal Bumpers are Standard

1. MODEL & COUPLING STRENGTH

Enter: INTERNAL BUMPERS ARE STANDARD

MGA for low coupling strength
MGB for medium coupling strength
MGC for high coupling strength

2. TUBE BORE DIAMETER

Enter:

025 for 1/4" bore 038 for 3/8" bore
062 for 5/8" bore 100 for 1" bore

4. STROKE LENGTH

Enter:

SK, then the desired stroke in decimal inches.
(Leave unused boxes blank.)

5. ACCESSORIES AND OPTIONS

Once the model, bore size and stroke have been determined, you can add any of the options or accessory items shown below in any order. If the optional item indicates an "x", specify quantity.

When ordered with any MG Series model, all options and accessories listed will be factory installed unless specified. For special model and option requirements not shown, consult Tol-O-Matic, Inc.

OPTIONS AND ACCESSORIES CODES (x= Quantity)

FL Floating Mount
FMx Foot Mount
BTx Form C Reed Switch 5-meter lead.
BMx Form C Reed Switch 5-meter lead Quick-disconnect
RTx Form A Reed Switch 5-meter lead.
RMx Form A Reed Switch 5-meter lead Quick-disconnect
CTx AC Triac Reed Switch 5-meter lead
CMx AC Triac Reed Switch 5-meter lead Quick-disconnect
KTx Hall-Effect (Sinking) 5-meter lead
KMx Hall-Effect (Sinking) 5-meter lead Quick Disconnect
TTx Hall-Effect (Sourcing) 5-meter lead
TMx Hall-Effect (Sourcing) 5-meter lead Quick Disconnect

Magnetically Coupled Cylinder Field Retrofit Kits

Floating Mount Kit	Ass'y. No.
MG025	2402-9005
MG038	2403-9005
MG062	2406-9005
MG100	2410-9005

Foot Mount Kit	Ass'y. No.
MG025	2402-9011
MG038	2402-9011
MG062	2402-9011
MG100	2410-9011

¹Includes two (2) brackets.

Switch Hardware	Ass'y. No.
MG025	2402-9999
MG038	2403-9999
MG062	2406-9999
MG100	2410-9999

Magnetically Coupled Slide Field Retrofit Kits

Shock Absorbers	Ass'y. No.
MGS038 Light Duty	2403-1062
MGS038 Heavy Duty	0605-1006
MGS062 Light Duty	2406-1063
MGS062 Heavy Duty	2406-1062
MGS100 Light Duty	0910-1479
MGS100 Heavy Duty	0910-1480

Proximity Switches	Ass'y. No.
PNP sourcing	2410-1053
NPN sinking	2410-1048

Switch Rail	Ass'y. No.
MGS038S (specify stroke)	2403-8888
MGS062S (specify stroke)	2406-8888
MGS100S (specify stroke)	2410-8888

Magnet	Ass'y. No.
MGS038, 062, 100	2410-9020

Field Retrofit Switches

- Replacing an existing switch on actuator manufactured AFTER 7/1/97:
Order from part numbers on table page 98

- Replacing an existing switch on actuator manufactured BEFORE 7/1/97:
Order via configurator code on page 98.
(For Mag Slide also order switch rail.)

- Adding switch to an actuator that has not had a switch in the past:
Order via configurator at right. (For Mag Slide also order switch rail and magnet.)

(NOTE: If replacing a quick-disconnect switch manufactured before 7-1-97 it will also be necessary to replace or rewire the female-end coupler with the in-line splice. See page 175.

MGS - ORDERING

MAGNETICALLY COUPLED SLIDE CONFIGURATOR EXAMPLE

MODEL AND STROKE												ACCESSORIES AND OPTIONS																	
1.	2.	3.		4.	5.																								
M	G	S	0	6	2	S	K	1	0	.	6	2	5	S	B	S	H	2	B	T	2								

The order example shown above is for a magnetically coupled **SLIDE** with a **5/8" BORE**, a **10-5/8" STROKE LENGTH**, and **SINTERED BRONZE BEARINGS**. Options include two **HEAVY DUTY SHOCK ABSORBERS** and two **FORM-C REED SWITCHES**, (no proximity sensors are required in this sample application).

1. MODEL STANDARD MGS DOES NOT INCLUDE END-OF-STROKE DECELERATION

Enter:
MGS for Magnetically Coupled Slide

2. TUBE BORE DIAMETER

Enter:
038 for 3/8" bore 062 for 5/8" bore 100 for 1" bore

3. STROKE LENGTH

Enter:
SK, then the desired stroke in **decimal inches**.

4. BEARING TYPE BE SURE TO SPECIFY BEARING TYPE

Enter:
SB for **sintered bronze** bearings, OR LB for **linear** bearings.

5. ACCESSORIES AND OPTIONS

Once the model, bore size and stroke have been determined, you can add any of the options or accessory items shown below in any order. If the optional item indicates an "x", specify quantity.

When ordered with any MGS Series model, all options and accessories listed will be factory installed unless specified. For special model and option requirements not shown, consult Tol-O-Matic, Inc.

OPTIONS AND ACCESSORIES CODES (x= Quantity)

- SLx Standard Shock, Light Duty (ea.)
- SHx Standard Shock, Heavy Duty (ea.)
- NPx Proximity Sensor sinking type (NPN)
- PNx Proximity Sensor sourcing type (PNP)
- BTx Form C Reed Switch 5-meter lead.
- BMx Form C Reed Switch 5-meter lead Quick-disconnect
- RTx Form A Reed Switch 5-meter lead.
- RMx Form A Reed Switch 5-meter lead Quick-disconnect
- CTx AC Triac Reed Switch 5-meter lead
- CMx AC Triac Reed Switch 5-meter lead Quick-disconnect
- KTx Hall-Effect (Sinking) 5-meter lead
- KMx Hall-Effect (Sinking) 5-meter lead Quick Disconnect
- TTx Hall-Effect (Sourcing) 5-meter lead
- TMx Hall-Effect (Sourcing) 5-meter lead Quick Disconnect

Field Retrofit Switches (continued)

KIT (HARDWARE & SWITCH)	DESCRIPTION	SWITCH ONLY (NO HARDWARE)
BT	Form C Reed Switch with 5 meter lead	3600-9084
BM	Form C Reed Switch with Quick-disconnect Coupler (Male)	3600-9085
RT	Form A Reed Switch with 5 meter lead	3600-9082
RM	Form A Reed Switch with Quick-disconnect Coupler (Male)	3600-9083
CT	ac Triac Reed Switch with 5 meter lead	3600-9086
CM	ac Triac Reed Switch with Quick-disconnect Coupler (Male)	3600-9087
KT	Hall-effect (Sinking) Switch with 5 meter lead	3600-9090
KM	Hall-effect (Sinking) Switch with Quick-disconnect Coupler (Male)	3600-9091
TT	Hall-effect (Sourcing) Switch with 5 meter lead	3600-9088
TM	Hall-effect (Sourcing) Switch with Q-D Coupler (Male)	3600-9089
	Connector (Female) 5 meter lead	2503-1025

OPTION	MODEL	SWITCH
S	M	R
W	G	T
	S	
	1	
	0	
	0	

To order field retrofit switch and hardware kits for all Tol-O-Matic actuators: SW (Then the model and bore size, and type of switch needed)

Example: SWMGS100RT
(Hardware and Form A Reed switch with 5 meter lead for 1" bore Magnetically Coupled Slide)

Because this switch is replacing an older style switch, a rail and rail hardware kit #2410-8888 also needs to be ordered.

SELECTION MGS, TC

MAGNETICALLY COUPLED SLIDE / TRACK CABLE CYLINDER SELECTION PROCEDURE:

1. COMPILE APPLICATION REQUIREMENTS

To determine the appropriate Magnetically Coupled Slide or Track Cable Cylinder model for an application, compile the following information:

- Available pressure (PSI)
- Weight of load (lbs. or kgs.)
- Orientation of load (lbs. or kgs.)
- Velocity of load (in./sec. or mm/sec.)
- Stroke length (in. or mm)

2. SELECT CYLINDER SIZE

- Consult the Theoretical Force vs. Pressure charts.
- Cross-reference the load force (or load weight if force is not known) and the available operating pressure. If the intersection falls below the diagonal line, and if moments do not exceed maximum values listed for that model (see Step 3), the actuator will accommodate the application. If the intersection is above the diagonal line, a larger cylinder bore size should be considered.

NOTE: Additional force may be required to obtain the necessary acceleration for vertical or horizontal loads.

3. KEEP UNDER MAXIMUM STROKE LENGTH

There are specific maximum stroke lengths for each model. See table:

Model	MGS038	MGS062	MGS100	TC05	TC07	TC10	TC15
Bore	0.375	0.625	1.00	0.50	0.75	1.00	1.50
Max. Stroke Length	30.00	37.00	55.00	78.00	78.00	78.00	78.00

4. DETERMINE NATURE OF LOAD AND THE EFFECT OF BENDING MOMENTS

If the actuator will guide and support a load located directly over the center of carrier, bending moments will not be a factor in the actuator selection. Track Cable Cylinders and Magnetically Coupled Slides perform best that way. See the Bending Moments Formulae below if your application requires the load to be away from center of the carrier.

5. DETERMINE THE BEARING ROD LOAD CAPACITY

Determine whether the Load Weight and Stroke Length will be within the load capacity for the bearing rods.

Cross reference the load weight and stroke on the Load Weight vs. Stroke chart for the selected bore size. (Page 95 and repeated on next page) If the intersection falls within the curve, the

cylinder will accommodate the application requirements. If the intersection falls outside the curve, consult the chart of a larger bore size that will accommodate the required load weight and stroke for your application.

The weight on the bearing rods causes them to bend or deflect slightly over their length. This deflection is increased for longer rods and/or higher weights on the bearing block. For proper operation, rod deflection must not exceed .30 of an inch.

6. DETERMINE COUPLING FORCE REQUIRED (MAG SLIDE ONLY)

- Consult the Mag Coupling Strength chart (page 95). If the load value is less than the coupling force for the chosen actuator, it may be used for the application. If the load value is greater than the coupling force for the chosen actuator, select a larger actuator.

7. DETERMINE INTERNAL CUSHION CAPACITY

- Consult the Cushion Data chart (Bumper Data for Magnetically Coupled Slides page 186) for the model selected. The velocities listed on the cushion charts are final or cushion impact velocities (refer to "Application Guidelines" page 197 - #2 and #4).

SELECTION - MGS, TC

Bending Moments

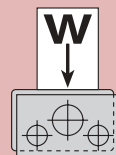
(See MGS Load vs Stroke graph on page 95)

Loading Equation Data

MODEL	BORE SIZE	A (in.)	D (in.)	F (lbs.)	G (lbs.)
MGS038	3/8"	1.44	1.13	14.00	11.00
MGS062	5/8"	1.94	1.50	40.00	32.00
MGS100	1"	2.62	2.00	90.00	72.00
TC05	1/2"	1.09	1.0	14.00	-
TC07	3/4"	1.09	1.0	14.00	-
TC10	1"	1.09	1.0	14.00	-
TC15	1-1/2"	1.68	2.31	90.00	-

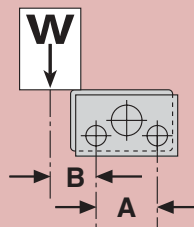
"L" MOMENT

$$L = \frac{W}{2}$$



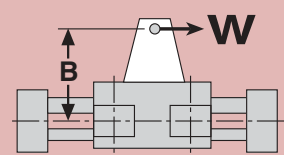
"Mx" MOMENT

$$L = \frac{WB}{A}$$



"My" / "Mz" MOMENT

$$F \text{ or } G = 2L = \frac{WB}{D}$$



L should be below curve for the corresponding slide on the "Load vs. Stroke" chart (for sintered bronze or linear bearings - Mag Coupled Slides).

Loading Equation Key

A = Distance between shaft centers.

B = Distance from load center to center of nearest shaft (in.); determined by application.

L = Load per shaft (lbs.).

W = Payload weight (lbs.).

D = Axial distance between center of bearings (in.).

F = Max. bearing sliding load (linear bearings) (lbs.).

G = Max. bearing sliding load (sintered bronze bearings) (lbs.).

SELECTION MGS, TC

SELECTION EXAMPLE: MGS

The procedure for selection of track cable cylinder and magnetically coupled slide are very similar. For illustrative purposes, charts for the MGS100 model are used in this example.

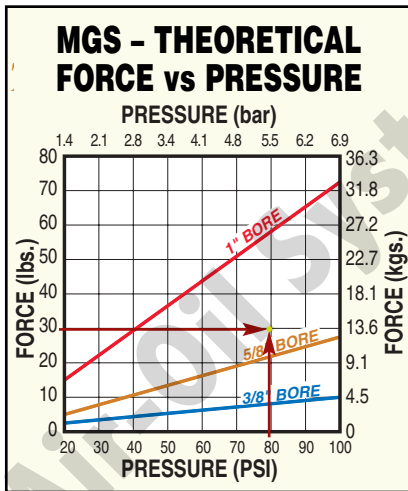
1. COMPILE APPLICATION REQUIREMENTS

- Available pressure 80 psi
- Weight of load 30 lbs.
- Orientation of load horiz.
- Final velocity* of load 10" per sec
- Stroke length 28"

*2x average velocity, see page 197

2. SELECT CYLINDER SIZE

- Consult the Theoretical Force vs. Pressure charts.



Cross-reference the load force and the available operating pressure.

3. KEEP UNDER MAXIMUM STROKE LENGTH

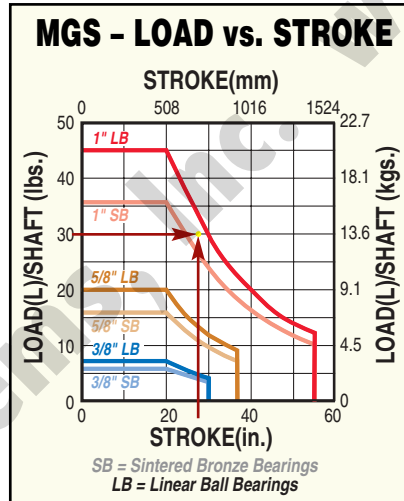
Maximum stroke for MGS100 is 55", so MGS100 will work for this application. (From table page 99)

4. DETERMINE NATURE OF LOAD AND THE EFFECT OF BENDING MOMENTS

In this application the load will be centered over the carrier so bending moments are not a consideration.

5. DETERMINE THE BEARING ROD LOAD CAPACITY

Cross reference the load weight and stroke on the Load Weight vs. Stroke chart for the selected bore size. The



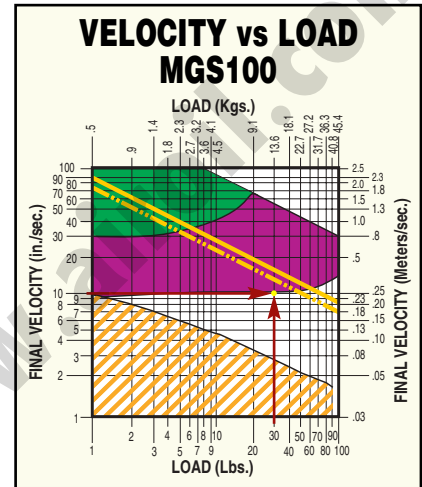
intersection falls within the curve, for the MGS100 with Linear Bearings.

6. DETERMINE COUPLING FORCE REQUIRED (MAG SLIDE ONLY)

- Consult the Coupling Force chart. (at right) The load value is less than the coupling force for the chosen actuator, so the MGS100 may be used for the application.

7. DETERMINE INTERNAL CUSHION CAPACITY

- Consult the Bumper Data graph for Magnetically Coupled Slide for the



MGS100. The final velocity exceeds the limits for the bumpers so external shock absorbers will be required for this application.

8. CONSIDER OPTIONS

This application will use Form C dc Reed switches to signal other units in this automated system.

The final configured string will appear as follows:

MGS100SSK28.000LBSL2BM2

