

MAGNETIC
TECHNOLOGIES LTD.
www.magtork.com
MODEL MTL 5-219
SER No. 00022

Transmitting Torque
Through Air

Model 1035

Torque range : 0.001 – 0.014 Nm

Weight : 0.07 kg

Inertia : 2.1×10^{-7} kgm sec²

Heat Dissipation : 2.2 Watts



Model MTL 0.5

Torque range : 0.003 – 0.05 Nm

Weight : 0.16 kg

Inertia : 1.7×10^{-6} kgm sec²

Heat Dissipation : 5.5 Watts

Model MTL 1.25

Torque range : 0.007 – 0.14 Nm

Weight : 0.33 kg

Inertia : 6.3×10^{-6} kgm sec²

Heat Dissipation : 13 Watts



Model MTL 2.25

Torque range : 0.03 – 0.25 Nm

Weight : 0.33 kg

Inertia : 6.3×10^{-6} kgm sec²

Heat Dissipation : 13 Watts

Model MTL 5

Torque range : 0.02 – 0.56 Nm

Weight : 1.05 kg

Inertia : 2.55×10^{-5} kgm sec²

Heat Dissipation : 18 Watts



Model MTL 10

Torque range : 0.06 – 1.2 Nm

Weight : 1.6 kg

Inertia : 10.94×10^{-5} kgm sec²

Heat Dissipation : 28 Watts

Model MTL 25

Torque range : 0.11 – 2.83 Nm

Weight : 4.04 kg

Inertia : 50.7×10^{-5} kgm sec²

Heat Dissipation : 75 Watts



Model MTL 50

Torque range : 0.2 – 5.6 Nm

Weight : 5.7 kg

Inertia : 46.8×10^{-5} kgm sec²

Heat Dissipation : 120 Watts



Model MTL 70

Torque range : 0.33 – 7.9 Nm

Weight : 6.51 kg

Inertia : 158.4×10^{-5} kgm sec²

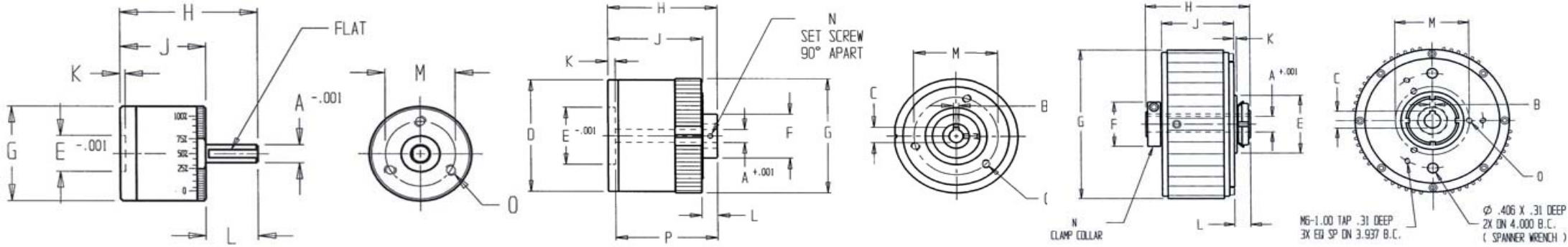
Heat Dissipation : 150 Watts



**MTL 1035, 0.5
(Shaft Design)**

**MTL 1.25, 2.25, 5, 10 ,25 and 50
(Hollow Thru)**

**MTL 70
(Hollow Thru)**



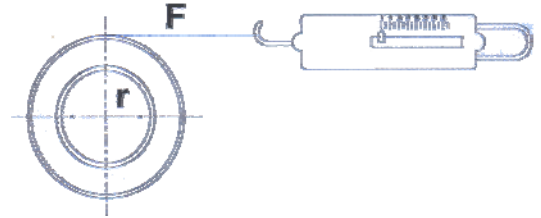
Model	TORQUE	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P
1035-3/16	0.01 ~ 0.13 lb-in	4.750	-	-	-	10.0	-	25.9	34.6	21.1	1.0	13.5	15.5	-	M3 X 4.5 DP	-
1035-001	0.001 ~ 0.014 Nm	5.000	-	-	-	10.0	-	25.9	34.6	21.1	1.0	13.5	15.5	-	M3 X 4.5 DP	-
MTL 0.5-8	0.026 ~ 0.44 lb-in 0.003 ~ 0.05 Nm	8.000	-	-	-	14.0	-	36.0	45.0	25.5	2.0	19.5	24.0	-	M3 X 5.5 DP	-
MTL 1.25-1/4	0.06 ~ 1.25 lb-in	6.350	-	-	-	14.0	-	36.0	45.0	25.5	2.0	19.5	24.0	-	M3 X 5.5 DP	-
MTL 1.25-6	0.007 ~ 0.14 Nm	6.000	-	-	47.5	22.0	19.1	49.5	41.9	36.1	2.0	5.8	32.0	M4	M4 X 7.874 DP	39.1
MTL 2.25-1/4	0.25 ~ 2.25 lb-in	6.350	-	-	47.5	22.0	19.1	49.5	41.9	36.1	2.0	5.8	32.0	M4	M4 X 7.874 DP	39.1
MTL 2.25-6	0.03 ~ 0.25 Nm	6.000	-	-	47.5	22.0	19.1	49.5	41.9	36.1	2.0	5.8	32.0	M4	M4 X 7.874 DP	39.1
MTL 5-3/8	0.18 ~ 5.0 lb-in	9.525	-	-	68.8	35.0	26.9	70.1	62.0	53.8	2.0	8.1	48.0	M4	M4 X 9.906 DP	57.9
MTL 5-8	0.02 ~ 0.56 Nm	8.000	3.00	9.40	68.8	35.0	26.9	70.1	62.0	53.8	2.0	8.1	48.0	M4	M4 X 9.906 DP	57.9
MTL 10-3/8	0.5 ~ 10.6 lb-in	9.525	-	-	82.0	47.0	37.1	84.1	64.0	55.9	2.0	8.1	60.3	M5	M5 X 9.906 DP	59.9
MTL 10-1/2	0.06 ~ 1.20 Nm	12.700	3.18	14.22	82.0	47.0	37.1	84.1	64.0	55.9	2.0	8.1	60.3	M5	M5 X 9.906 DP	59.9
MTL 10-5/8		15.875	4.75	18.01	82.0	47.0	37.1	84.1	64.0	55.9	2.0	8.1	60.3	M5	M5 X 9.906 DP	59.9
MTL 10-16		16.000	5.00	18.31	82.0	47.0	37.1	84.1	64.0	55.9	2.0	8.1	60.3	M5	M5 X 9.906 DP	59.9
MTL 25-3/8	1 ~ 25 lb-in	9.525	-	-	116.1	62.0	35.1	118.9	79.0	67.8	2.0	11.2	76.2	M5	M5 X 11.938 DP	73.9
MTL 25-1/2	0.11 ~ 2.83 Nm	12.700	3.18	14.22	116.1	62.0	35.1	118.9	79.0	67.8	2.0	11.2	76.2	M5	M5 X 11.938 DP	73.9
MTL 25-5/8		15.875	4.75	18.01	116.1	62.0	35.1	118.9	79.0	67.8	2.0	11.2	76.2	M5	M5 X 11.938 DP	73.9
MTL 25-3/4		19.050	4.75	21.26	116.1	62.0	35.1	118.9	79.0	67.8	2.0	11.2	76.2	M5	M5 X 11.938 DP	73.9
MTL 25-7/8		22.225	4.75	22.49	116.1	62.0	35.1	118.9	79.0	67.8	2.0	11.2	76.2	M5	M5 X 11.938 DP	73.9
MTL 25-1.0		25.400	6.35	27.18	116.1	62.0	35.1	118.9	79.0	67.8	2.0	11.2	76.2	M5	M5 X 11.938 DP	73.9
MTL 25-16		16.000	5.00	18.31	116.1	62.0	35.1	118.9	79.0	67.8	2.0	11.2	76.2	M5	M5 X 11.938 DP	73.9
MTL 50-3/8	2 ~ 50 lb-in	9.525	-	-	131.8	62.0	35.1	134.1	79.0	67.8	2.0	8.9	76.2	M5	M5 X 11.938 DP	73.9
MTL 50-1/2	0.2 ~ 5.6 Nm	12.700	3.18	14.22	131.8	62.0	35.1	134.1	79.0	67.8	2.0	8.9	76.2	M5	M5 X 11.938 DP	73.9
MTL 50-5/8		15.875	4.75	18.01	131.8	62.0	35.1	134.1	79.0	67.8	2.0	8.9	76.2	M5	M5 X 11.938 DP	73.9
MTL 50-3/4		19.050	4.75	21.26	131.8	62.0	35.1	134.1	79.0	67.8	2.0	8.9	76.2	M5	M5 X 11.938 DP	73.9
MTL 50-7/8		22.225	4.75	22.49	131.8	62.0	35.1	134.1	79.0	67.8	2.0	8.9	76.2	M5	M5 X 11.938 DP	73.9
MTL 50-1.0		25.400	6.35	27.18	131.8	62.0	35.1	134.1	79.0	67.8	2.0	8.9	76.2	M5	M5 X 11.938 DP	73.9
MTL 50-16		16.000	5.00	18.31	131.8	62.0	35.1	134.1	79.0	67.8	2.0	8.9	76.2	M5	M5 X 11.938 DP	73.9
MTL 70-5/8	3 ~ 70 lb-in	15.875	4.75	18.01	-	62.0	41.1	160.0	104.6	71.4	3.8	17.8	73.0	Clamp Collar	1/4-20 X 7.874 DP	-
MTL 70-3/4	0.33 ~ 7.90 Nm	19.050	4.75	21.26	-	62.0	44.5	160.0	104.6	71.4	3.8	17.8	73.0	Clamp Collar	1/4-20 X 7.874 DP	-
MTL 70-7/8		22.225	-	-	-	62.0	47.5	160.0	104.6	71.4	3.8	17.8	73.0	Clamp Collar	1/4-20 X 7.874 DP	-
MTL 70-16		16.000	5.00	18.31	-	62.0	41.9	160.0	104.6	71.4	3.8	17.8	73.0	Clamp Collar	1/4-20 X 7.874 DP	-
MTL 70-19		19.000	5.99	21.79	-	62.0	45.0	160.0	104.6	71.4	3.8	17.8	73.0	Clamp Collar	1/4-20 X 7.874 DP	-

Selection Criteria and Calculations

FOR EVERY APPLICATION YOU MUST DETERMINE THE REQUIRED TORQUE, AND SAFE OPERATION RPM.

Torque (T) Nm. = Force (F) kg. X Radius (r) m.

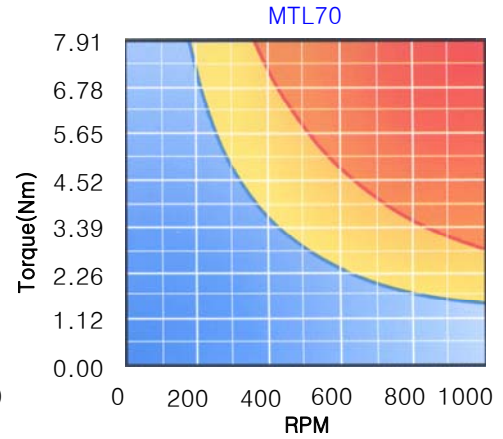
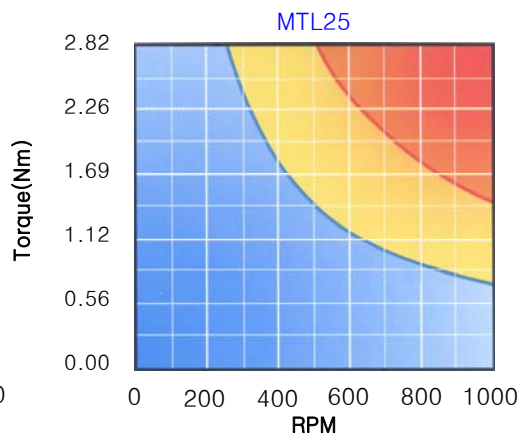
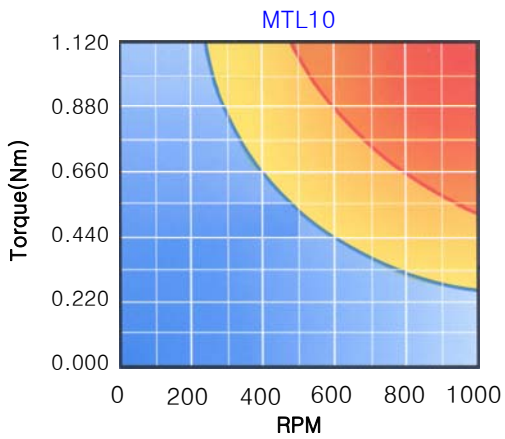
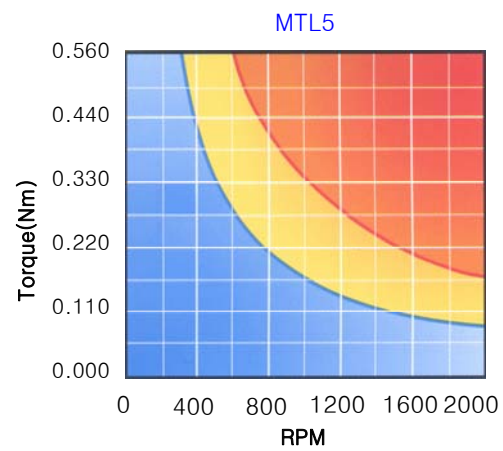
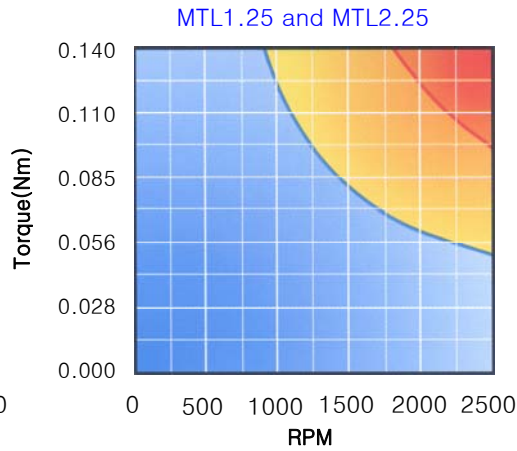
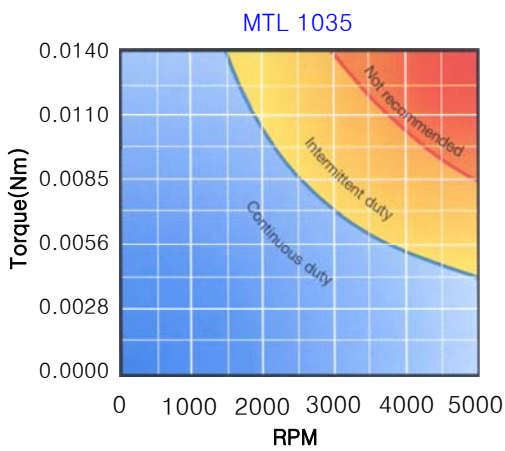
Note : Force often is the tension



Operating Curves : When you turn the rotor of a magnetic clutch, you convert mechanical energy into thermal energy(watts). The amount of thermal energy(watts) is a function of the RPM and the TORQUE SETTING.

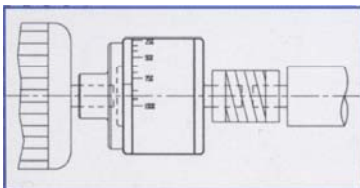
How to use the charts : Find the slip rpm on the X axis and torque on the Y axis. The Blue area represents safe continuous duty. The area between the two curves Yellow represents incermittent duty. Example is five minutes on, five minutes off. Operating in the red zone for any period of time will cause overheating and could damahe unit.

OPERATION CURVES



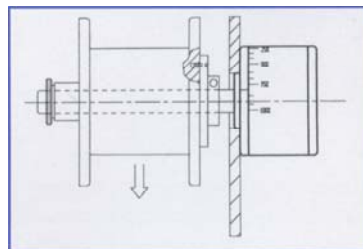
TYPICAL MOUNTING

As a Coupling :



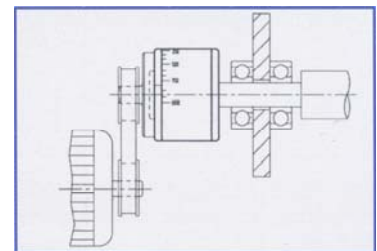
For load protection or torque limiting, the clutch fitted onto the motor shaft and connected via a flexible coupling to the load

As a Clutch :



The clutch housing is driven by a belt or chain and the rotor connected to the load. Shown here is a small custom adapter mounted on the housing.

As a Pay-Off Brake :



For relatively light loads, a shaft can be fitted to the rotor and a small spool of material directly payed off.

Applications Examples

Example 1 OVERLOAD PROTECTION / TORQUE LIMITING / SOFT START

Information Required :

Motor HP = 1/10 HP

Motor RPM = 900 RPM

How to size :

$$\text{Torque(N.m)} = \frac{\text{HP} \times 7162}{\text{RPM}} = \frac{1/10 \times 7162}{900} = 0.79 \text{ Nm}$$

Select MTL 25 based on 0.79 Nm. At 900 RPM. until it will operate at maximum limit of continuous duty range.



Material Handling (conveyor)

Example 2 NIP ROLL OR PULLEY TENSION CONTROL

Information Required :

Nip roll or pulley diameter (m.) = 0.07 m

Tension (N.) = 10 N

Velocity (m/min.) = 150 m/min

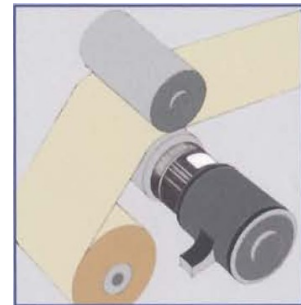
How to size :

$$\text{Torque(N.m)} = \text{Tension(N)} \times \frac{\text{Pulley/Roll Dia}}{2} = 10 \times \frac{0.07}{2} = 0.35 \text{ Nm}$$

$$\text{Check Operating RPM} = \frac{\text{Velocity(m/min)}}{\pi \times \text{Roll Dia(m)}} = \frac{150}{3.14 \times 0.07} = 682 \text{ RPM}$$

$$\text{Slip watts} = \frac{\text{Tension(N)} \times \text{Velocity(m/min)}}{60} = \frac{10 \times 150}{60} = 25 \text{ watts}$$

Select MTL 10 based on 0.35 Nm. At 682 RPM. until will operate within continuous duty range.



Film Tensioning (paper, film or foil)

Example 3 CYCLING

Information Required :

Slip RPM = 350 RPM

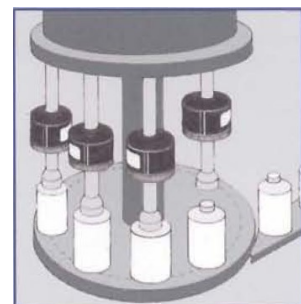
Torque (Nm) = 0.9 Nm

Duty cycle = 25%(slip time of total cycle time)

How to size :

$$\text{watts} = 0.1049 \times \text{torque(Nm)} \times \text{slip RPM} \times \text{duty cycle} = 0.1049 \times 0.9 \times 350 \times 0.25 = 8.26 \text{ watts}$$

Select MTL 10 based on 0.9 Nm. In. at 350 RPM. until will operate within intermittent duty range (25% duty cycle).



Capping(syringes or bottles)

Example 4 UNWIND TENSION CONTROL

Information Required :

Full roll diameter (m.) = 0.15 m

Empty (core) diameter (m.) = 0.076 m

Average tension (N.) = 4.5 N

Velocity (m/min.) = 45.7 m/min

How to size :

$$\text{Avg. Diameter(m)} = \frac{\text{Full Roll Dia(m)} + \text{Empty Dia(m)}}{2} = \frac{0.15 + 0.076}{2} = \frac{0.226}{2} = 0.113 \text{ m}$$

$$\text{Avg. Radius(m)} = \frac{\text{Avg. Dia(m)}}{2} = \frac{0.113}{2} = 0.057 \text{ m}$$

$$\text{Avg. Torque(Nm)} = \text{Avg. Tension(N)} \times \text{Avg. Radius(m)} = 4.5(\text{N}) \times 0.057(\text{m}) = 0.25 \text{ Nm}$$

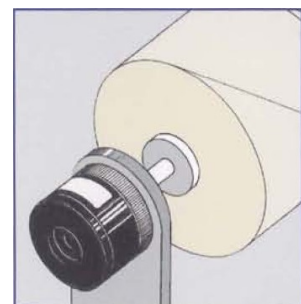
$$\text{Check Operating RPM} = \frac{\text{Velocity(m/min)}}{\pi \times \text{Core Dia(m)}} = \frac{45.7}{3.14 \times 0.076} = 191 \text{ RPM}$$

$$\text{Max. Tension(Nm)} = \text{Torque(Nm)} \times \frac{2}{\text{Empty Dia(m)}} = 0.25 \times \frac{2}{0.076} = 6.58 \text{ N}$$

$$\text{Min. Tension(Nm)} = \text{Torque(Nm)} \times \frac{2}{\text{Full roll Dia(m)}} = 0.25 \times \frac{2}{0.15} = 3.33 \text{ N}$$

$$\text{Slip watts} = \frac{\text{Max tension(N)} \times \text{Velocity(m/min)}}{60} = \frac{6.58 \times 45.7}{60} = 5.0 \text{ watts}$$

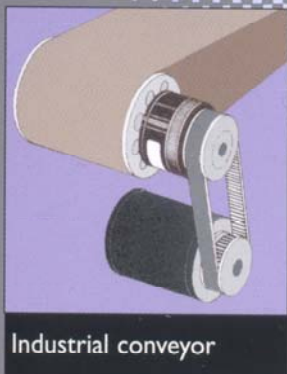
Select MTL 5 based on torque 0.25 Nm. In. at 191 RPM. until will operate within continuous duty range.



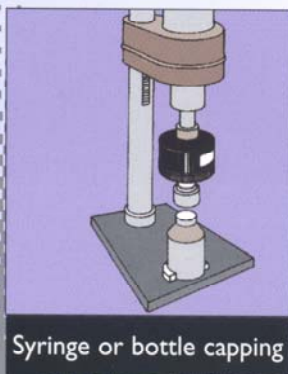
Pay-Off (film or wire)

Transmitting torque through air is our business.

APPLICATIONS

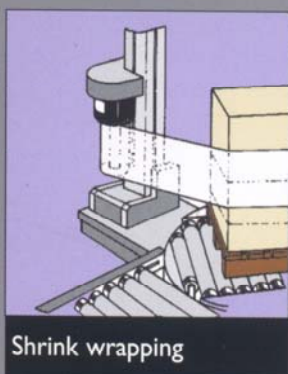


Industrial conveyor

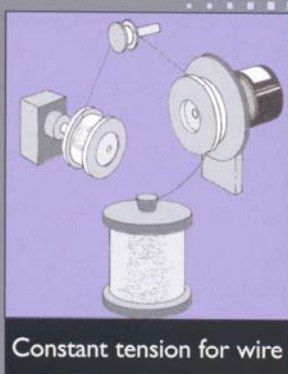


Syringe or bottle capping

Non-electrical
No wearing parts
Incredibly accurate
Repeatable torque control
Easy to adjust
Easy to apply
Set'em and forget'em!
Perfect for continuous slip
Zero "stick slip"
Smooth, no friction



Shrink wrapping



Constant tension for wire



Labeling or film unwind

Engineering Excellence

Smart design work and the best materials for the job is what we give you. Our operators have years of programming experience on the latest, state-of-the-art CNC lathes and machining centers. Our Quality Control and Assembly personnel have over a quarter of a century of experience building, testing and working with magnetic brakes and clutches. This is why our parts fit better, and our assemblies run truer. The result is smoother, longer lasting applications. Feel the difference of our uncompromising designs.



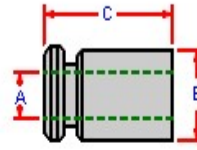
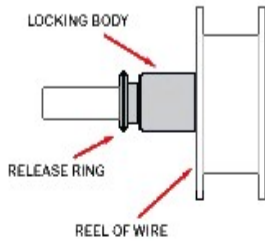
**MAGNETIC
TECHNOLOGIES LTD.**

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FastLock

▶ Shaft Locking Collars



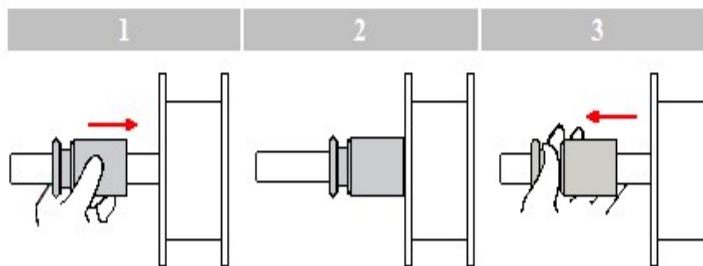
Metric (mm)

Dimensions

English (in)

Dimensions

Model	A	B	C	kg	Model	A	B	C	lb
FL-10mm	10	22	45	0.08	FL-0.250	0.250	0.73	1.00	0.06
FL-15mm	15	28	45	0.13	FL-0.312	0.312	0.73	1.00	0.06
FL-16mm	16	28	45	0.13	FL-0.375	0.375	0.85	1.78	0.19
FL-18mm	18	31.2	45.2	0.14	FL-0.437	0.437	0.85	1.78	0.18
FL-20mm	20	37	45	0.24	FL-0.500	0.500	1.10	1.78	0.23
FL-22mm	22	37	45	0.22	FL-0.562	0.562	1.10	1.78	0.26
FL-25mm	25	37	45	0.19	FL-0.625	0.625	1.10	1.78	0.28
FL-30mm	30	50	45	0.39	FL-0.750	0.750	1.23	1.78	0.31
FL-32mm	32	57	48	0.53	FL-0.875	0.875	1.45	1.78	0.37
FL-35mm	35	57	48	0.47	FL-1.00	1.000	1.45	1.78	0.39
FL-40mm	40	63	48	0.56	FL-1.25	1.250	2.23	1.87	0.79
FL-45mm	45	70	48	0.67	FL-1.37	1.370	2.23	1.87	0.93
FL-50mm	50	70	48	0.54	FL-1.50	1.500	2.23	1.87	0.89
FL-56mm	56	70	48	0.39	FL-1.625	1.625	2.35	1.87	0.91
* 위 size외 기타 size도 공급 가능합니다. (별도 문의 바랍니다.)					FL-1.75	1.750	2.72	1.87	1.51
					FL-1.875	1.875	2.72	1.87	1.37
					FL-2.0	2.000	2.95	1.87	1.18
					FL-2.5	2.500	3.47	1.87	1.00
					FL-3.0	3.000	3.47	1.87	0.90



Slide locking collar as shown

Locking collar holds reel.

To release, hold body and pull release ring. This makes the "gap" between the body and ring larger allowing the FastLock to slide off easily.