

I-Force Ironless

ML18 Linear Motor



Introducing:

The Newest (and Smallest) Member to the I-Force Ironless Linear Motor Family

The ML18 is the newest addition to Parker's family of Ironless Linear Motors. At a height of 35 mm and width of 18 mm, the ML18 offers a more compact solution for your application needs. Three coil lengths are available providing a peak force up to 50.1 N, and are optimized to run on 24 to 80 volts DC.



The ML18 incorporates the I-Force I-beam shape with overlapping windings allowing for high power density, improved heat removal, and added structural stiffness.

In addition, the ironless linear motor design has no attractive forces allowing for zero cogging, rapid accelerations, and easy installation.

Contact Information:

Parker Hannifin Corporation
Electromechanical Automation Division
5500 Business Park Drive
Rohnert Park, CA 94928

phone: 800.358.9068 / 707.584.7558

fax: 707.584.8029

email: emn_support@parker.com

www.parkermotion.com

Ironless Advantages

- No attractive force between forcer and magnets make it safe and easy to install
- Ironless forcer produces zero cogging for smooth operation
- Ironless forcer means light weight and high rates of acceleration
- Air gap between forcer and magnets is forgiving allowing for easy installation

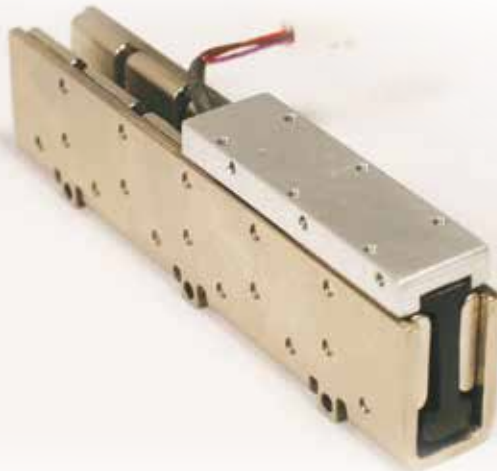


ENGINEERING YOUR SUCCESS.

ML18 I-Force Linear Motors

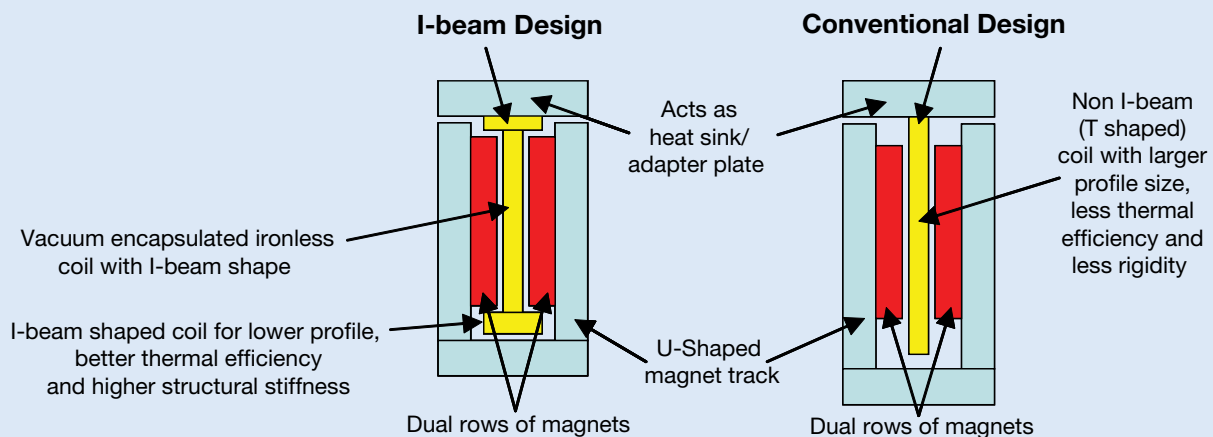
ML18 Features

- **Smallest ironless motor available**— saves valuable space
- **Extremely efficient overlapping winding design** for maximum force density
- **Optimized for operation between 24 to 80 VDC**
- **Internal hall effects and thermal protection** decreases carriage length
- **Low profile, compact design** — cross-section just 35 mm x 18 mm
- **Peak forces to 50 N**
- **Single-piece, ultra-compact folded magnet track** eliminates all unnecessary material
- **Highly efficient mounting tabs** for hassle-free mounting
- **Two lengths of modular track** provide unlimited travel, maximum flexibility
- **CE and RoHS Compliance**



ML18 I-Beam Design Advantage

Parker's I-beam shape provides very high forces in a compact package. In addition, the design is more thermally efficient than tradition ironless motor designs.



Performance

	Units	ML18 Models Sizes		
		ML18-2	ML18-3	ML18-5
Peak Force ¹⁾	N	20.3	33.2	50.1
Continuous Force ²⁾	N	6.8	11.1	16.7
Peak Power	W	400	660	1000
Continuous Power	W	20	33	50

Electrical Performance

Model	Units	ML18-2	ML18-3	ML18-5
Number of Poles		2	3	5
Peak Current ^{3) 4) 5)}	Amps	4.7	5.0	9.3
Continuous Current ²⁾	Amps RMS	1.11	1.17	2.18
Force Constant (Peak) ⁴⁾	N/Amps	4.33	6.67	5.41
Back EMF ^{6) 7)}	V/m/s	5	7.7	6.3
Resistance @25C (Phase to Phase) ⁶⁾	Ohms	4.4	6.3	2.82
Inductance (Phase to Phase) ³⁾	mH	0.75	1	0.38
Electrical Time Constant	millisecs	0.17	0.16	0.13
Motor Constant	N/sqrt (watt)	2.38	3.07	3.72
Maximum Bus Voltage	VDC	80	80	80

Thermal*

Model	Units	ML18-2	ML18-3	ML18-5
Thermal Resistance Wind-Amb	°C/W	8.9	5.53	3.57
Thermal Time Constant (Min)		8	15	10
Maximum Winding Temperature	°C	125	125	125

* Use Parker's MotionSizer software for the most accurate estimate of coil temperature for a particular motion profile.

Mechanical

Model	Units	ML18-2	ML18-3	ML18-5
Coil Weight	kg (lb)	0.04 (0.09)	0.07 (0.15)	0.1 (0.22)
Coil Length	mm (in)	63 (2.48)	83 (3.27)	123 (4.84)
Attractive Force ⁸⁾	N (lbf)	0	0	0
Electrical Cycle Length ⁵⁾	mm (in)	40 (1.57)	40 (1.57)	40 (1.57)

¹⁾ Initial winding temperature must be 60°C or less before Peak Current is applied

²⁾ @ 25°C ambient, 125°C winding temperature

³⁾ ±30%, Line-to-Line, inductance bridge measurement @1 KHz

⁴⁾ Total motor torque per peak of the sinusoidal amps measured in any phase, ±10%

⁵⁾ The distance from the leading edge of a north pole to the leading edge of the next north pole

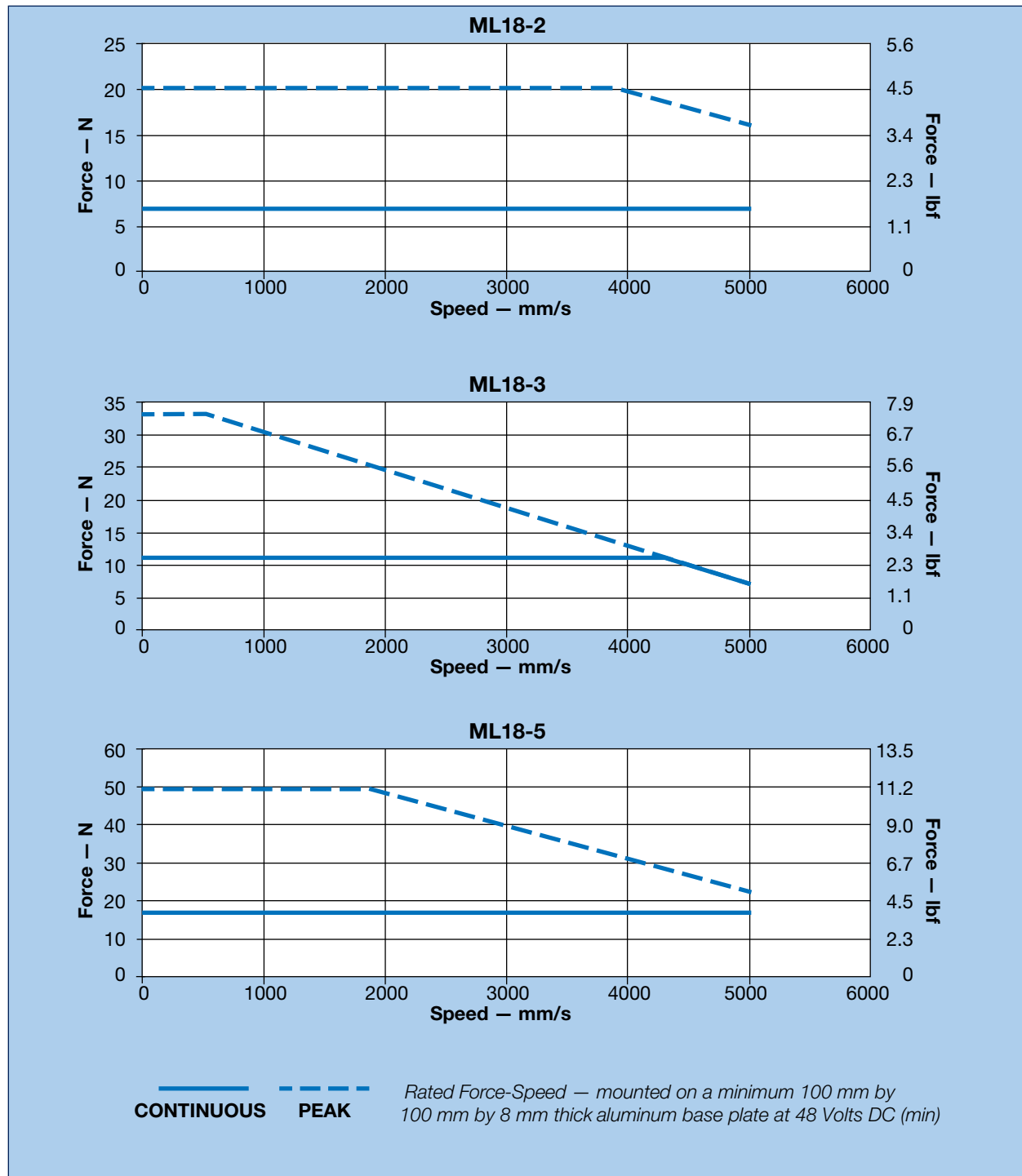
⁶⁾ Measured Line-to-Line, ±10%

⁷⁾ Value is measured peak of sine wave

⁸⁾ Measured with a 0.76 mm gap

ML18 I-Force Linear Motors

Speed-Force Performance

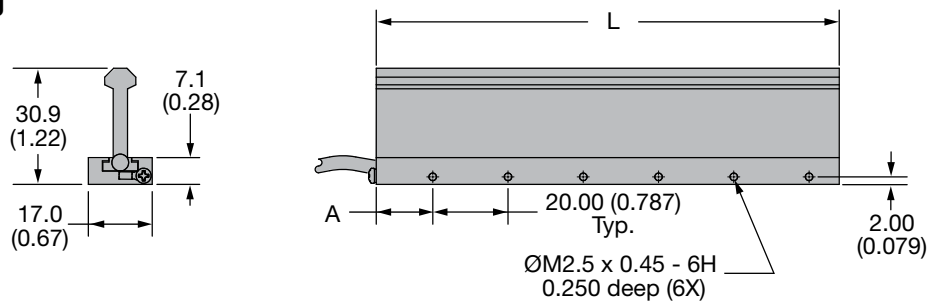


Motor Phase and Hall Leads

Wire Color	Function Name
Red	U Phase
Brown	V Phase
Orange	W Phase
Green/Yellow	PE Ground
Black	Hall +5 V
White	Hall Gnd
Yellow	Hall 1 signal
Blue	Hall 2 Signal
Green	Hall 3 Signal

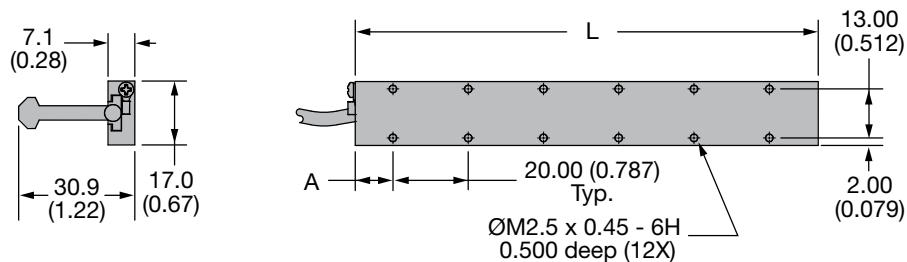
Coil Dimensions — mm (in)

Side Mounting



Coil Size	Dimensions mm (in)		
	L	A	# of Holes
18-2	63 (2.48)	11.5 (0.453)	3
18-3	83 (3.27)	10.0 (0.394)	4
18-5	123 (4.84)	10.0 (0.394)	6

Top Mounting

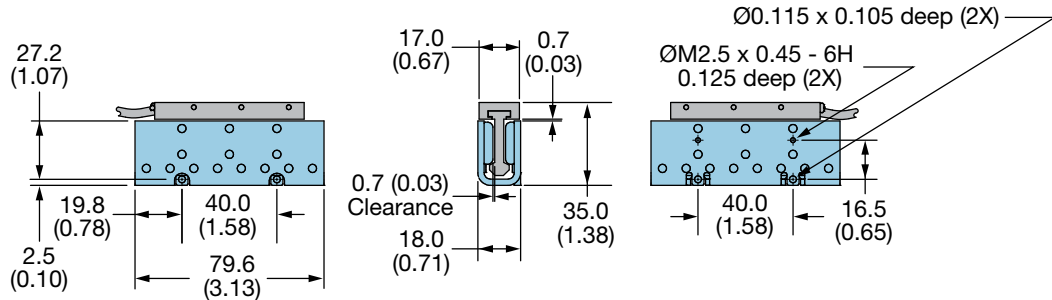


Coil Size	Dimensions mm (in)		
	L	A	# of Hole Pairs
18-2	63 (2.48)	16.5 (0.650)	3
18-3	83 (3.27)	15.0 (0.591)	4
18-5	123 (4.84)	15.0 (0.591)	6

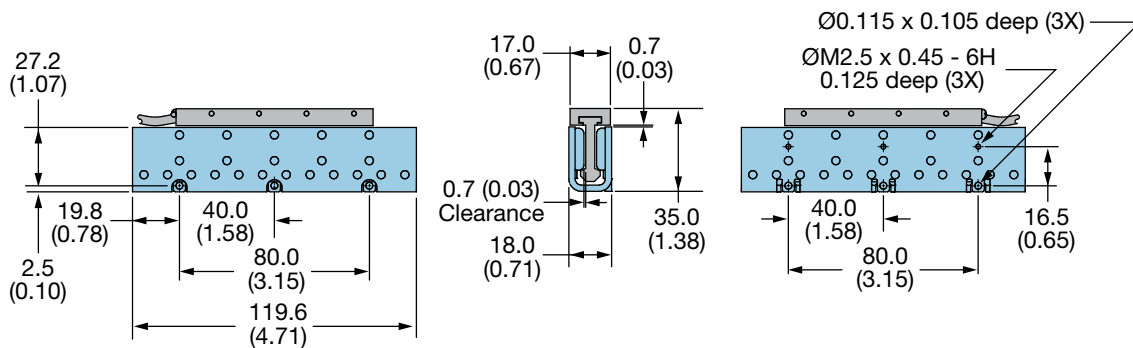
ML18 I-Force Linear Motors

Magnet Track with Coil Dimensions — mm (in)

ML18080



ML18120



ML18 Ordering Information

Select options from each numbered field to create a complete model order code including motor coil and magnet track.

Motor Coil

①	②	③	④	⑤	⑥	⑦
Order Example: ML18 – 1 E – NC – N1 S – 3						
① Series ML18 Mini Linear Motor	⑤ Module Ready N1 No Module, Internal Halls					
② Coil Size 2 2 Pole 3 3 Pole 5 5 Pole	⑥ Winding S Series P Parallel					
③ Mounting E Standard	⑦ Cable 1 1 Meter 3 3 Meter					
④ Cooling NC No Cooling						

Magnet Track

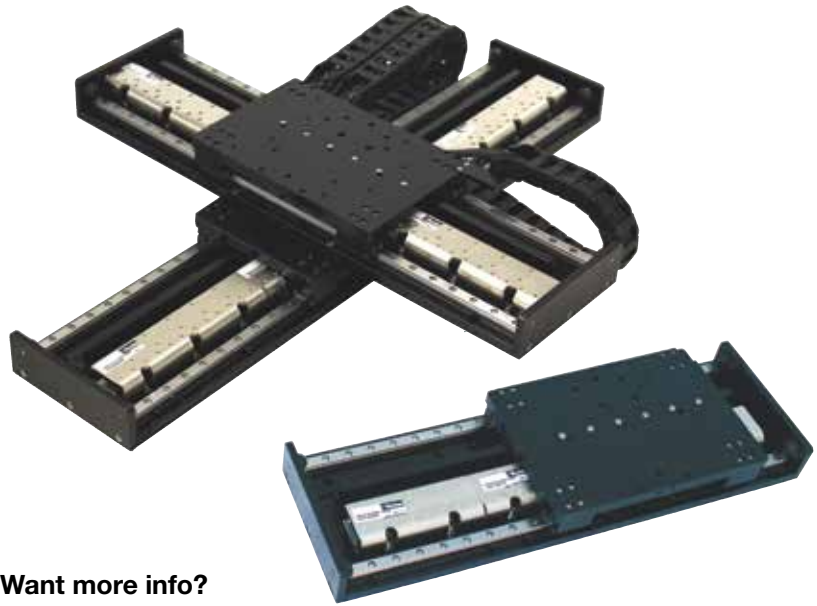
①	②	③	④
Order Example: ML18 - 120 M - N			
① Series ML18 Mini Linear Motor			
② Track Length 080 80 mm 120 120 mm			
③ Modular M Standard			
④ Magnet Coating N Nickel Coating			

Looking for a Super Small Submicron Linear Positioner?

The new Parker mSR100 Series Positioners are driven by ML18 Linear Motors

The new Parker mSR100 miniature positioner incorporates ML18 linear motors into single and multi-axis systems that provide the ideal solution for instrument builders and other applications requiring extremely smooth, submicron positioning capabilities, in a compact package.

The mSR100 has a 100 mm wide profile and is available with stroke lengths from 25 to 500 mm. Maximum load capability is 12 kg (26.5 lb). The mSR100 offers selectable levels of linear encoder technology configured to the application need, including a BiSS-C absolute encoder for installations requiring continuous positional information.



Want more info?

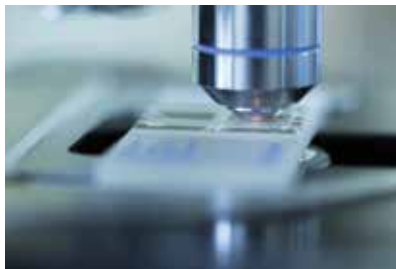
For complete mSR100 features, benefits and specifications, go to: parkermotion.com/msr

Electronics Manufacturing



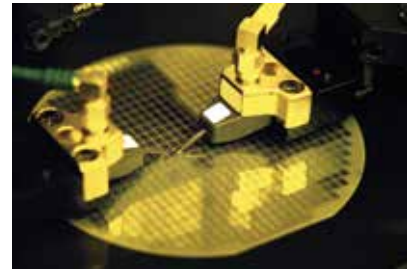
The mSR is an ideal positioning system for high throughput electronics manufacturing equipment, as its design combines high performance linear motor technology with a variety of high resolution feedback devices for quick, precise placement of miniature components. The mSR also provides an extremely robust solution for electronics inspection systems, as its direct drive linear motor technology has been designed to stand the test of time.

Life Sciences - Digital Pathology



Miniature packaging, high precision performance, and quick settling times make the mSR an optimum solution for imaging instruments used in digital pathology. With limited wear components the mSR is a durable stage that will minimize the risk of machine downtime.

Semiconductor Handling and Meteorology



Given the combination of its superior geometric performance and miniature packaging, the mSR series positioner is ideal for semiconductor handling and metrology applications. Regardless of whether you are examining features on the micro or nano-scale – the mSR can be adapted to meet the need with its wide array of encoder options. The mSR also offers a stroke scalable mechanical solution with standard designs up to 500 mm.

EM Sales Offices

Australia

Parker Hannifin (Australia) Pty Ltd.

9 Carrington Road
Castle Hill NSW 2154
Australia

Tel: +61 (0) 2 9634-7777
Fax: +61 (0) 2 9634 3749

Brazil

Parker Hannifin Ind. Com Ltda.

Av. Lucas Nogueira Garcez 2181
Esperança

12325-900 Jacareí, SP

Tel: 12 3954 5100

Fax: 12 3954 5262

Email: automation.brazil@parker.com

Canada

Parker Hannifin (Canada) Inc.

160 Chisholm Dr
Milton, Ontario L9T 3G9

Tel: 905-693-3000

Fax: 905-876-1958

Email: miltoncustservice@parker.com

China

Parker Hannifin Motion & Control

(Shanghai) Co., Ltd
280 Yunqiao Rd. Jin Qiao Export
Processing Zone

Shanghai 201206, China

Tel: (86-21) 50312525

Fax: (86-21) 64459717

France

Parker SSD Parvex

8 avenue du Lac

B.P. 249

F-21007 Dijon Cedex

Tel: +33 (0) 3 80 42 41 40

Fax: +33 (0) 3 80 42 41 23

Germany

Electromechanical Europe

Parker Hannifin GmbH & Co KG

Robert-Bosch-Strasse 22

D-77656 Offenburg

Germany

Tel: +49 (0) 781 509 0

Fax: +49 (0) 781 509 98176

Email: em-motion@parker.com

India

Parker Hannifin India Pvt. Ltd Automation Group-SSD Drives Div.

133 & 151 Developed Plots Estate
Perungudi, Chennai 600 096

Tel: 044-4391-0799

Fax: 044-4391-0700

Italy

Parker Hannifin SpA

Via Gounod 1

20092 Cinsello Balsamo

Milano, Italy

Tel: +39 02 361081

Fax: +39 02 36108400

Email: em-motion@parker.com

Korea

Parker Hannifin Korea

9th Floor KAMCO Yangjae Tower

949-3 Dogok 1-dong Gangnam-gu

Seoul 135-860, Korea

Tel: 82-2-559-0454

Fax: 82-2-556-8187

Mexico

Parker Hannifin de Mexico

Eje uno Norte No.100

Parque Industrial Toluca 2000

Toluca, CP 50100 México

Tel: 52-722-275-4200

Fax: 52-722-279-0316

Singapore

Parker Hannifin Singapore Pte Ltd

11, Fourth Chin Bee Road

Singapore 619702

Tel: (65) 6887 6300

Fax: (65) 6265 5125/6261 4929

Taiwan

Parker Hannifin Taiwan Co., Ltd

No. 40, Wuchiuan 3rd Road

Wuku Industrial Park

Taipei County, Taiwan 248

ROC

Tel: 886 2 2298 8987

Fax: 886 2 2298 8982

Thailand

Parker Hannifin (Thailand) Co., Ltd.

1265 Rama 9 Road
Suanluang, Bangkok 10250
Thailand

Tel: (66) 2 186 7000

Fax: (66) 2 374 1645

UK

Parker Hannifin Ltd.

Tachbrook Park Drive

Tachbrook Park

Warwick CV34 6TU

Tel: +44 (0) 1926 317970

Fax: +44 (0) 1926 317980

USA

Parker Hannifin Electromechanical Automation Division Main Office

5500 Business Park Drive

Rohnert Park, CA 94928 USA

Tel: 707-584-7558

800-358-9070

Fax: 707-584-8015

Email: emn_support@parker.com

Parker Hannifin Electromechanical Automation Division

1140 Sandy Hill Road

Irwin, PA 15642

Tel: 724-861-8200

800-245-6903

Fax: 724-861-3330

Email: emn_support@parker.com



ML18 Series:
Made in the USA



Parker Hannifin Corporation
Electromechanical Automation Div.

5500 Business Park Drive

Rohnert Park, CA 94928 USA

www.parkermotion.com

Tel: 800-358-9070 / 707-584-7558

Fax: 707-584-8015

Email: emn_support@parker.com