# **RIPPED Ironcore** Linear Positioners



Parker Trilogy's RIPPED linear positioners utilize our high-performance RIPPED ironcore linear motors in a pre-engineered, easily integrated, ready-to-run package. These positioners are engineered to achieve high performance at an economical cost while preserving design flexibility to accommodate customization. Combined with RIPPED ironcore motors – with their patentpending anti-cog technology, these linear motor tables produce extremely smooth motion and can be used in many applications where ironless motors traditionally were needed.

Trilogy's positioners utilize high-precision square rail bearings. In addition, they are designed to connect together using transition plates for XY or multi-axis configurations. Options include a variety of cable management systems in addition to bellows and hard covers.

High force capability, multi-axis compatibility, and ease of customization make the RIPPED ironcore linear positioners an optimal choice for high performance and value.

#### **Features**

- Standard lengths to 3 meters
- Extended lengths as standard options
- Incremental length of 60mm for TR10 and TR16
- Incremental length of 80mm for TR07
- Stainless cover options for TR07, TR10 and TR16
- Maximum cover length of 144"
- Optical or magnetic encoders
- Optical encoders; 1.0um, 0.50um, 0.10um
- Magnetic encoder: 5.0um
- Magnetic Home and End-of-Travel limits





open design

**TR07** 

**BR07** bellows design

> 00 0

> > CARRIAGE LENGTH

POSITIVE

DIRECTION OF TRAVEL

В

°Ĉ

õ



59.0 [ 2.321 ]

REFER TO TRILOGY WEB SITE FOR TRAVEL BASE LENGTH = MULTIPLE OF 80 mm UP TO 3040 mm OAL = BASE LENGTH + 9.5 mm

## **SECTION B-B**



Parker Hannifin Corporation Electromechanical Automation Division

SECTION A-A

145.0 [ 5.709 ] MOUNT HOLE SPACING

158.8 [6.250]

BASE WIDTH

- 203

' IRONCORE MOTOR

HEIGHT

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OVERALL WIDTH (OAW)						
IGUS CABLE TRACK	PART NO. DESIGNATOR	TR07 mm [in]	BR07 mm [in]			
07-20-18	Custom	193 [7.6]	214 [8.4]			
07-30-18	3	203 [8.0]	224 [8.8]			
07-40-18	Custom	213 [8.4]	234 [9.2]			
07-50-18	Custom	223 [8.8]	244 [9.6]			
07-64-18	Custom	237 [9.3]	258 [10.2]			

CARRIAGE LENGTH					
COIL SIZE	-1	-2	-3		
TR07/BR07 CARRIAGE	218.2 [8.591]	378.2 [14.890]	538.2 [21.189]		
A (1st MOUNT HOLE)	19.1 [0.752]	9.1 [0.358]	29.1 [1.146]		
NUMBER OF MOUNTING HOLES	12	21	27		
B (DOWEL PIN HOLE)	49.1 [1.933]	99.1 [3.901]	119.1 [4.689]		





# Smooth operation with Anti-Cogging features -

Parker Trilogy's RIPPED Series Ironcore Positioners utilize Parker's patent pending Anti-Cogging techniques for superior smoothness. Traditional ironcore motors exhibit cogging forces when the internal iron laminations exhibit a horizontal force on the motor when trying to line up with their "preferred" positions over the magnets. Cogging limits the overall smoothness of the motion system.

Parker Trilogy has developed an Anti-Cogging technological breakthrough that virtually eliminates cogging and allows ironcore motors to be used in applications where only ironless motors were used before. This offers the user a powerful combination of extremely high force and smooth operation in an economical package.



Typical Ironcore Positioner Cogging Forces







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## PERFORMANCE

ENCODER		LINEAR MAGN	IETIC ENCODER	REN	SHAW OPTICAL ENCOD	ER
		1.0 μm	5.0 μm	0.5 μm	1.0 µm	5.0 μm
Part Number Designator		А	В	М	L	Q
Encoder Model		LME1	LME5	RGH24Z	RGH24X	RGH24D
Peak Velocity	m/s [in/s]	2.5 [100]	7 [275]	3 [120]	5 [200]	5 [200]
Resolution	μm [in]	1.0 [0.00004]	5.0 [0.0002]	0.5 [0.00002]	1.0 [0.00004]	5.0 [0.0002]
Repeatability	μm [in]	±2.0 [±0.00008]	±10.0 [±0.0004]	±1.5 [±0.00006]	±2.0 [±0.00008]	±10.0 [±0.0004]
Accuracy - LME		±(25 μm + 50 μm/m)	±(30 μm + 50 μm/m)			
Accuracy - Renishaw				±(5 μm + 3	0 μm/m)	±(10 μm + 30 μm/m)
Note: For travels less than 1 meter, ac	curacy should be	e calculated at 1 meter			•	
MOTOR MODEL		R07-1	R	07-2	R07	7-3
Peak Force	Ν	587	1	174	17	61
	lb	132		264	3	96
Continuous Force	Ν	154		308	4	62
	lb	35		69	1	04
Peak Power	W	3600	-	7200	10	800
Continuous Power	W	180		360	5	540

#### ACCURACY

Base Length	< 1 meter	> 1 meter
Straightness restrained on a flat surface $\mu m$ [in]	±127µm/m [±0.000127 in/in]	±127µm/m [±0.000127 in/in]
Flatness restrained on a flat surface $\mu m$ [in]	±330 [±0.013]	±76 + 254µm/m [±0.003 +.000254 in/in]

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005 in/ft

# PHYSICAL

COIL SIZE		-1	-2	-3	
Carriage Assembly					
TR07	kg [lb]	3.5 [7.7]	6.3 [13.9]	9.1 [19.9]	
BR07	kg [lb]	3.6 [7.9]	6.5 [14.2]	9.3 [20.4]	
Base Assembly (0.375" thick aluminum)					
TR07A	kg/mm [lb/in]	0.0128 [0.714]	>>	>	
BR07A	kg/mm [lb/in]	0.0131 [0.733]	>>	>	
Base Assembly (0.500" thick aluminum)					
TR07B	kg/mm [lb/in]	0.0141 [0.791]	>>	>	
BR07B	kg/mm [lb/in]	0.0145 [0.810]	>>	>	

#### LOAD (Recommended)

COIL SIZE		-1	-2	-3	
Vertical (Fv) see note 4	kg [lb]	100 [220]	150 [330]	200 [440]	
Side (Fs) see note 4	kg [lb]	50 [110]	75 [165]	100 [220]	
Moments-Roll (Mr) see note 4	N-m [lb-ft]	50 [37]	75 [55]	100 [74]	
Moments-Pitch (Mp) see note 4	N-m [lb-ft]	100 [74]	250 [184]	400 [295]	
Moments-Yaw (My) see note 4	N-m [lb-ft]	100 [74]	250 [184]	400 [295]	

#### NOTES

Maximum base length is 3040 mm (limited by maximum single piece bearing rail).
 Refer to R07 motor data sheet for complete motor specifications.

3. Motor force must be derated by 50% in a "stalled motor" operating condition.

4. Recommended loads based on motor size and typical performance requirements (consult factory if desired loads are greater).

5. Specifications subject to change without notice. Most current brochure available online in PDF format.

6. Refer to website for Ironcore Motor Safe Handling and Cautionary guidelines.

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# **RIPPED** Ironcore **Linear Motor Positioners**



mm [inch]



-LIMIT 2.5 [0.10] FROM END STOP HOME 18 [0.70] FROM END STOP



TRAVEL (mm) = OAL - 66.0 - CARRIAGE LENGTH OVERALL LENGTH (OAL) = MULTIPLE OF 60 mm UP TO 4080 mm





mm [inch] LIMIT LOCATION DEPENDENT ON COMPRESSED BELLOWS LENGTH REFER TO TRILOGY WEB SITE



REFER TO TRILOGY WEB SITE FOR TRAVEL BASE LENGTH = MULTIPLE OF 60 mm UP TO 4080 mm OAL = BASE LENGTH + 12.7 mm

#### SECTION B-B





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OVERALL WIDTH (OAW)						
IGUS CABLE TRACK	PART NO. Designator	TR10 mm [in]	BR10 mm [in]			
07-20-18	Custom	263 [10.4]	284 [11.2]			
07-30-18	3	273 [10.7]	294 [11.6]			
07-40-18	Custom	283 [11.1]	304 [12.0]			
07-50-18	Custom	293 [11.5]	314 [12.4]			
07-64-18	Custom	307 [12.1]	328 [12.9]			

CARRIAGE LENGTH						
COIL SIZE	-1	-2	-3			
TR10/BR10 CARRIAGE	305.5 [12.027]	545.5 [21.475]	785.5 [30.924]			
A (1st MOUNT HOLE)	62.7 [2.470]	47.7 [1.879]	77.7 [3.060]			
NUMBER OF MOUNTING HOLES	9	18	24			
B (DOWEL PIN HOLE)	17.7 [0.699]	92.7 [3.651]	212.7 [8.375]			



# Smooth operation with Anti-Cogging features -

Parker Trilogy's RIPPED Series Ironcore Positioners utilize Parker's patent pending Anti-Cogging techniques for superior smoothness. Traditional ironcore motors exhibit cogging forces when the internal iron laminations exhibit a horizontal force on the motor when trying to line up with their "preferred" positions over the magnets. Cogging limits the overall smoothness of the motion system.





Cogging forces with Parker Trilogy's patent-pending Anti-Cog Technology



Typical Ironcore Positioner Cogging Forces

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#### PERFORMANCE

ENCODER		LINEAR MAGNET	TIC ENCODER	RENISH	IAW OPTICAL ENCODER	1
		1.0 μm	5.0 µm	0.5 µm	1.0 μm	5.0 μm
Part Number Designator		А	В	М	L	Q
Encoder Model		LME1	LME5	RGH24Z	RGH24X	RGH24D
Peak Velocity	m/s [in/s]	2.5 [100]	7 [275]	3 [120]	5 [200]	5 [200]
Resolution	μm [in]	1.0 [0.00004]	5.0 [0.0002]	0.5 [0.00002]	1.0 [0.00004]	5.0 [0.0002]
Repeatability	μm [in]	±2.0 [±0.00008]	±10.0 [±0.0004]	±1.5 [±0.00006]	±2.0 [±0.00008]	±10.0 [±0.0004]
Accuracy - LME		±(25 μm + 50 μm/m)	±(30 μm + 50 μm/m)			
Accuracy - Renishaw				±(5 μm + 30 μm/	m)	±(10 μm + 30 μm/m)
Note: For travels less than 1 meter, Ad	ccuracy should be	calculated at 1 meter				
MOTOR MODEL		R10-1	F	R10-2	R1	0-3
Peak Force	Ν	1366		2731	40	97
	lb	307		614	92	21
Continuous Force	Ν	374		747	11	21
	lb	84		168	2	52
Peak Power	W	6098	1	2196	182	294
Continuous Power	W	305		610	9.	15

#### ACCURACY

Base Length	< 1 meter	> 1 meter
Straightness restrained on a flat surface $\mu m$ [in]	±127µm/m [±0.000127 in/in]	±127µm/m [±0.000127 in/in]
Flatness restrained on a flat surface µm [in]	±330 [±0.013]	±76 + 254μm/m [±0.003 + .000254 in/in]

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005 in/ft

## PHYSICAL

COIL SIZE		-1	-2	-3	
Carriage Assembly					
TR10	kg [lb]	9.5 [20.9]	17.1 [37.5]	24.6 [54.2]	
BR10	kg [lb]	9.7 [21.3]	17.4 [38.2]	25.1 [55.2]	
Base Assembly (0.500" thick aluminum)					
TR10B	kg/mm [lb/in]	0.0186 [1.042]	>>	>	
BR10B	kg/mm [lb/in]	0.0194 [1.084]	>>	>	

# LOAD (Recommended)

COIL SIZE		-1	-2	-3	
Vertical (Fv) see note 4	kg [lb]	200 [440]	250 [550]	300 [660]	
Side (Fs) see note 4	kg [lb]	100 [220]	125 [275]	150 [330]	
Moments-Roll (Mr) see note 4	N-m [lb-ft]	100 [74]	125 [92]	150 [111]	
Moments-Pitch (Mp) see note 4	N-m [lb-ft]	200 [148]	400 [295]	600 [443]	
Moments-Yaw (My) see note 4	N-m [lb-ft]	200 [148]	400 [295]	600 [443]	

#### NOTES

- 1. Maximum base length is 3040 mm (limited by maximum single piece bearing rail).
- Refer to R10 motor data sheet for complete motor specifications.
  Motor force must be derated by 50% in a "stalled motor" operating condition.
- A. Recommended loads based on motor size and typical performance requirements (consult factory if desired loads are greater).
  Specifications subject to change without notice. Most current brochure available online in PDF format.
- 6. Refer to website for Ironcore Motor Safe Handling and Cautionary guidelines.







mm [inch]

-LIMIT 2.5 [0.10] FROM END STOP

HOME 18 [0.70] FROM END STOP



 $\label{eq:transformation} \begin{array}{l} {\sf TRAVEL} \mbox{ (mm)} = {\sf OAL} - 80.0 - {\sf CARRIAGE} \mbox{ LENGTH} \\ {\sf OVERALL} \mbox{ LENGTH} \mbox{ (OAL)} = {\sf MULTIPLE} \mbox{ OF} \mbox{ 60 mm} \mbox{ UP TO} \mbox{ 4080 mm} \\ \end{array}$ 

**R16 IRONCORE MOTOR** SECTION A-A 92.8 [ 3.654 ] 82.0 [ 3.228 ] HEIGHT 285.3 MOUNT HOLE SPACING 304.8 BASE WIDTH - 349 [13.7]

COMPRESSED BELLOWS LENGTH REFER TO TRILOGY WEB SITE

LIMIT LOCATION DEPENDENT ON



**BR16** 

bellows design

mm [inch]

REFER TO TRILOGY WEB SITE FOR TRAVEL BASE LENGTH = MULTIPLE OF 60 mm UP TO 4080 mm OAL = BASE LENGTH + 19.1 mm

# **SECTION B-B**





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OVERALL WIDTH (OAW)					
IGUS CABLE TRACK	PART NO. Designator	TR16 mm [in]	BR16 mm [in]		
07-20-18	Custom	339 [13.3]	357 [14.1]		
07-30-18	3	349 [13.7]	367 [14.4]		
07-40-18	Custom	359 [14.1]	377 [14.8]		
07-50-18	Custom	369 [14.5]	387 [15.2]		
07-64-18	Custom	383 [15.1]	401 [15.8]		

CARRIAGE LENGTH						
COIL SIZE	-1	-2	-3			
TR16/BR16 CARRIAGE	305.5 [12.027]	545.5 [21.475]	785.5 [30.924]			
A (1st MOUNT HOLE)	62.7 [2.470]	47.7 [1.879]	77.7 [3.060]			
NUMBER OF MOUNTING HOLES	9	18	24			
B (DOWEL PIN HOLE)	17.7 [0.698]	92.7 [3.651]	212.7 [8.375]			



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Typical Ironcore Positioner Cogging Forces









# PERFORMANCE

ENCODER		LINEAR MAGNETIC ENCODER			RENISHAW OPTICAL ENCODER	
		1.0 μm	5.0 μm	0.5 μm	1.0 μm	5.0 μm
Part Number Designator		А	В	М	L	Q
Encoder Model		LME1	LME5	RGH24Z	RGH24X	RGH24D
Peak Velocity	m/s [in/s]	2.5 [100]	7 [275]	3 [120]	5 [200]	5 [200]
Resolution	μm [in]	1.0 [0.00004]	5.0 [0.0002]	0.5 [0.00002]	1.0 [0.00004]	5.0 [0.0002]
Repeatability	μm [in]	±2.0 [±0.00008	±10.0 [±0.0004]	±1.5 [±0.00006]	±2.0 [±0.00008]	±10.0 [±0.0004]
Accuracy - LME		±(25 μm + 50 μm/m)	$\pm(30 \ \mu m + 50 \ \mu m/m)$			
Accuracy - Renishaw				±(5 μm	+ 30 μm/m)	±(10 μm + 30 μm/m)
Note: For travels less than 1 meter, Accuracy should be calculated at 1 meter						
MOTOR MODEL		R16-1	i i	R16-2	R10	6-3
Peak Force	Ν	2478		4955	74	433
	lb	557		1114	1	671

	lb	557	1114	1671	
Continuous Force	Ν	743	1487	2230	
	lb	167	334	501	
Peak Power	W	7065	14130	21195	
Continuous Power	W	353	707	1060	

## ACCURACY

Base Length	< 1 meter	> 1 meter
Straightness restrained on a flat surface µm [in]	±127µm/m [±0.000127 in/in]	±127μm/m [±0.000127 in/in]
Flatness restrained on a flat surface $\mu m$ [in]	±330 [±0.013]	$\pm 76 + 254 \mu$ m/m [ $\pm 0.003 + .000254$ in/in]

Note: Straightness/Flatness specifications based on system mounted to surface of flatness ±0.0005 in/ft

## PHYSICAL

COIL SIZE		-1	-2	-3	
Carriage Assembly					
TR16	kg [lb]	14.1 [31.0]	24.7 [54.4]	35.3 [77.7]	
BR16	kg [lb]	14.3 [31.5]	25.0 [55.1]	35.8 [78.8]	
Base Assembly (0.625" thick aluminum)					
TR16E	kg/mm [lb/in]	0.0318 [1.778]	>>	>	
BR16E	kg/mm [lb/in]	0.0327 [1.825]	>>	>	

# LOAD (Recommended)

COIL SIZE		-1	-2	-3	
Vertical (Fv) see note 4	kg [lb]	250 [550]	350 [770]	450 [990]	
Side (Fs) see note 4	kg [lb]	125 [275]	175 [385]	225 [495]	
Moments-Roll (Mr) see note 4	N-m [lb-ft]	125 [92]	175 [129]	225 [166]	
Moments-Pitch (Mp) see note 4	N-m [lb-ft]	250 [184]	500 [369]	750 [553]	
Moments-Yaw (My) see note 4	N-m [lb-ft]	250 [184]	500 [369]	750 [553]	

#### NOTES

1. Maximum base length is 3040 mm (limited by maximum single piece bearing rail).

2. Refer to R16 motor data sheet for complete motor specifications.

3. Motor force must be derated by 50% in a "stalled motor" operating condition.

4. Recommended loads based on motor size and typical performance requirements (consult factory if desired loads are greater).

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How to order - TR07





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