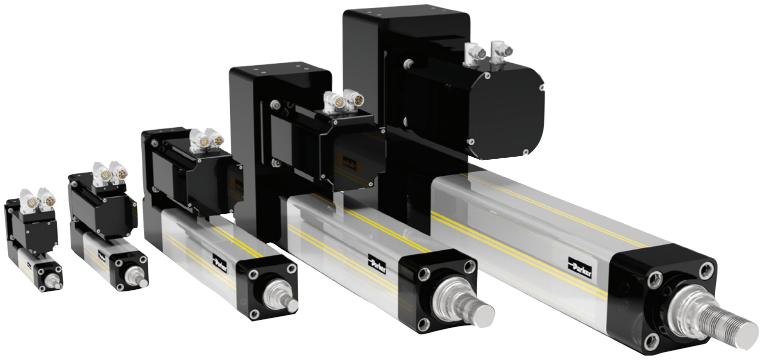
The ETH Series

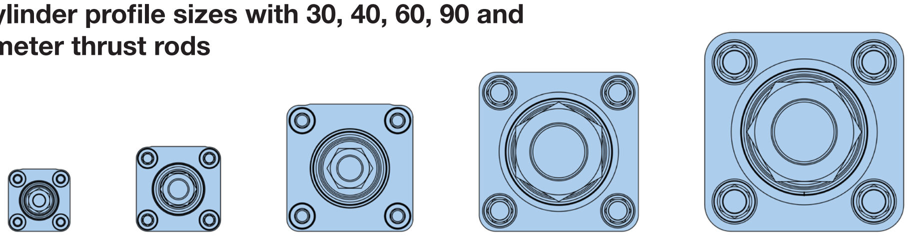
High Force Ballscrew Driven Electric Cylinders

- **Unrivaled power density — high forces and small frame sizes**
- **Sensor cables can be concealed in the profile**
- **Optimized for safe handling and simple cleaning**
- **Long service life**
- **Reduced maintenance costs with lubricating hole in the cylinder flange**
- **Pneumatic ISO flange norm (DIN ISO 15552:2005-12) conformity**
- **Anti-rotation device integrated**
- **Reduced noise emission**
- **Complete system from a single source: parker offers matching controllers, motors and gearheads for all ETH cylinders**



NEW frame sizes available! ETH cylinders are now available in five sizes with 32 up to 125 mm profiles. Both in-line and parallel motor configurations provide stroke lengths up to 2000 mm and speeds to 1.7 m/sec.

- **High mechanical efficiency up to 90%**
- **Strokes up to 2000 mm**
- **High traction/thrust force up to 114,000 N (25,628 lbs)**
- **Repeatability up to ±0.03 mm**
- **Speeds up to 1.7 m/s**
- **Toothed belt drive (for parallel motor mounting)**
- **5 to 32 mm screw leads offering fine resolution or high speed options**
- **Three ISO cylinder profile sizes with 30, 40, 60, 90 and 110 mm diameter thrust rods**
- **Predefined standardized motor and gearhead flanges for simplified selection. The motors are available directly from Parker (all from one source).**
- **Three protection classes available:**
  - **IP54 with galvanized steel hardware**
  - **IP54 with stainless steel hardware**
  - **IP65 epoxy coated cylinder**



ETH032 ETH060 ETH80 ETH100 ETH125

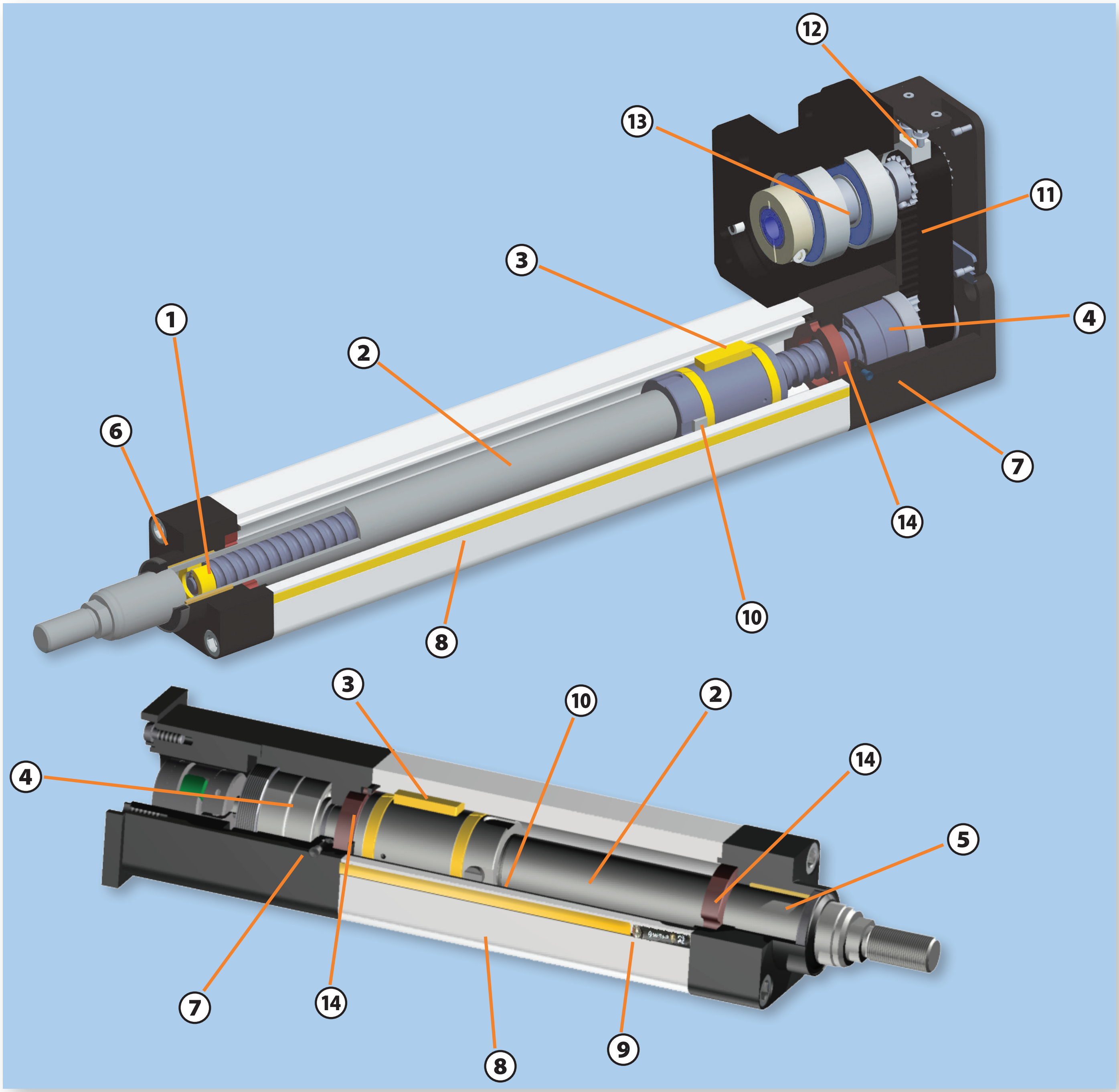
Series	ETH032	ETH060	ETH080	ETH100	ETH125
Maximum Travel (mm)	1,000	1,200	1,600	2,000	2,000
Maximum Payload (N)	3,700	9,300	25,100	56,000	114,000
Maximum Acceleration (m/sec²)	12	15	15	10	10

The Parker ETH series is the next generation version of the well known, widely used ET Series.

The ETH design offers unrivaled power density due to larger screw and bearing designs in smaller packages. The result is a product that offers increased force output from a given frame size or increased product life at the same force output.

The ETH is a user-friendly design offered in a diversified range of configurations in order to meet specific application requirements. Motor and cylinder design versatility and flexibility make the ETH Series the most user-friendly design.

For applications where overall length requirements restrict the actuator's footprint, the parallel motor configurations are the best solution. The parallel mount configuration is offered with multiple motor options, motor locations and motor orientations. This flexibility gives the user multiple smaller package solutions for solving applications that require increased force density in space-restricted applications.



① **Support Bearing**

The non-motor end of the screw is supported by a hardened polymer bushing which eliminates vibration and minimizes noise for smoother, quieter motion. This also improves precision, increases dynamic performance, and lengthens screw life.

② **Precision Ballscrew Drive**

The ETH drive train features a Class 7 ballscrew (ISO 3408) providing low frictional resistance for smooth motion over the entire speed range. This design also ensures longer product life, excellent efficiency and a lower dB rating. The ballscrew drive provides higher speeds and force capabilities than comparably-sized alternative drive mechanisms.

③ **Unique Anti-rotation Guide**

The ETH features a unique piston rod anti-rotation device. This high quality, maintenance free polymer bushing offers robust guidance that prevents the piston rod from twisting as the rod extends and retracts.

④ **Screw Support Bearing**

A set of double stacked angular contact bearings allows high thrust forces in both extend and retract directions. This design provides high force density and minimizes backlash when changing the direction of motion.

(Continued next page)

5 Piston Rod Support Bearing

The piston rod is supported by an extra long rod bushing. This bushing braces the rod in all directions allowing for smooth travel with high side loading capabilities.

6 Combination Lip and Wiper Seal

The lip and wiper seal keeps contaminants out and lubricating grease in for increased actuator life. For harsh environments, the ETH is available in a robust IP65 version for maximum protection.

7 Lubrication Port

The ETH comes standard with an integrated lubrication port located in the rear endcap of the cylinder, making scheduled maintenance quick, simple and easy. An optional lubrication bore is available in the middle of the cylinder body for applications where the integrated lubrication port is inaccessible.

8 Extruded Cylinder Body

The extrusion of the ETH was designed to reduce the number of negative geometry slots and grooves for a cleaner, and more environmentally friendly design. In addition to that, the ETH ships standard with sensor groove covers to help eliminate areas where debris can be trapped.

9 Home/End of Travel Sensors

The ETH was designed to use Parker's Global Series sensors which mount into the dovetail grooves that run the entire length of the cylinder body. The sensors mount flush to the extrusion body, having no effect on the overall product width. The sensor cables can be concealed with dovetail groove covers giving the actuator a clean, aesthetically appealing appearance. The Global Series sensors are compatible with other Parker products, including pneumatics, helping reduce inventory and spare part complexity.

ETH Solutions for Critical Conditions

If you have harsh environmental conditions or critical design specifications, please contact us. We offer many non-standard design options not covered in this brochure that will help match the ETH to your specific application requirements, such as:

- **Oil-splash lubrication**
- **Customized mountings and rod ends**
- **Mounting of customer motors**
- **Hardened cylinder protection for aggressive environmental conditions**
- **Overlong, polished or chrome-plated thrust rods**
- **Rod bellows**

10 Permanent magnets

All ETH cylinders are equipped with several permanent magnets integrated into the screw nut which actuate the home/end of travel sensors.

11 High Force Timing Belt

The parallel mount configuration utilizes a robust toothed timing belt, offering slip-free motion with minimal belt wear. The 1:1 ratio design was designed to transmit higher torques, allowing greater thrust forces at higher speeds. Contact the factory for additional timing belt ratios.

12 Belt Tensioning

A patent-pending belt tensioning station makes the parallel belt tensioning process quick and easy. This unique design allows for precise and repeatable tensioning, allowing for faster installation time and reduced down time.

13 Overhung Load Adaptor

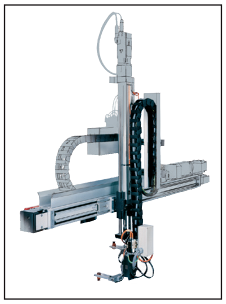
For all parallel mounting options which do not include a gearhead, an Overhung Load Adaptor (OLA) is included as part of the actuator assembly. The OLA simplifies the motor mounting process and protects the bearings of the motor from the radial forces induced by the parallel belt tensioning.

14 Over-stroke Bumpers

Polyurethane over-stroke bumpers are designed in at both ends of the cylinder to protect the internal components from damage as a result of unintended crashes.

Typical ETH Applications

The ETH closes the gap between electromechanical and hydraulic cylinder performance, making it suitable for higher force applications where increased reliability is required in the production process.Taking the costs of the hydraulic system components into consideration, in most cases an electromechanical system such as the ETH electric cylinder offers the more economical solution. Combined with a wide choice of accessories, it offers many possibilities in the following areas of application:



- **Test equipment and laboratory**
- **Valve and flap actuation**
- **Pressing**
- **Packaging machinery**
- **Food and beverage process automation**
- **Material handling and feed systems including: wood and plastic working, vertical actuators for machine tool loading, textile tensioning/gripping, automotive component transport/feeding**

SPECIFICATIONS

Performance by Cylinder Size and Screw Lead*

Cylinder Size		ETH032			ETH050			ETH080		
Screw Lead Designation		**M05**	**M10**	**M16**	**M05**	**M10**	**M20** [1]	**M05**	**M10**	**M32**
Screw Lead	mm	5	10	16	5	10	20	5	10	32
Screw Diameter	mm		16			20			32	
Available Strokes**	mm		50 – 1000			50 – 1200			50 – 1600	
Max. Speed at Designated Stroke:										
50 – 400 mm	mm/s	333	667	1067	333	667	1333	267	533	1707
600 mm	mm/s	286	540	855	333	666	1318	267	533	1707
800 mm	mm/s	196	373	592	238	462	917	267	533	1707
1000 mm	mm/s	146	277	440	177	345	684	264	501	1561
1200 mm	mm/s	–	–	–	139	270	536	207	394	1233
1400 mm	mm/s	–	–	–	–	–	–	168	320	1006
1600 mm	mm/s	–	–	–	–	–	–	140	267	841
Max. Acceleration	m/s^2	4	8	12	4	8	15	4	8	15
Max. Axial Traction/Thrust Force –										
In-Line	N	3600	3700	2400	9300	7000	4400	17,800	25,100	10,600
Parallel (@ "n" rpm Motor Speed) **n < 100**	N		3280	2050	9300	4920	2460		11,620	3630
100 < n < 300	N	3600	2620	1640	7870	3930	1960	17,800	11,620	3630
n > 300	N		1820	1140	5480	2740	1370		10,720	3350
Axial Force – 2500 km Service Life	N	1130	1700	1610	2910	3250	2740	3140	7500	6050
Max. Transmissible Torque –										
In-Line	Nm	3.2	6.5	6.8	8.2	12.4	15.6	15.7	44.4	60.0
Parallel (@ "n" rpm Motor Speed) **n < 100**	Nm	3.5	6.4	6.4	9.1	9.3	9.3	17.5	22.8	22.8
100 < n < 300	Nm	3.5	5.2	5.2	7.7	7.7	7.7	17.5	22.8	22.8
n > 300	Nm	3.5	3.6	3.6	5.4	5.4	5.4	17.5	21.1	21.1
Force Constant* – In-Line**	N/Nm	1131	565	353	1131	565	283	1131	565	177
Force Constant* – Parallel**	N/Nm	1018	509	318	1018	509	254	1018	509	159
Max Torque – No Load	Nm	0.77	0.85	0.94	0.85	1.28	1.70	1.87	2.13	2.38
Weight – (including cylinder rod)										
Base Unit with Zero Stroke	kg	1.2	1.2	1.3	2.2	2.3	2.5	6.9	7.6	8.7
Additional Stroke	kg/m	4.8	4.8	4.8	8.6	8.6	8.6	18.7	18.7	18.7
Weight – (cylinder rod only)										
Base Unit with Zero Stroke	kg		0.06			0.15			0.59	
Additional Stroke	kg/m		0.99			1.85			4.93	
Moments of Inertia										
In-line – without stroke	$kgmm^2$	7.1	7.6	12.9	25.3	25.7	33.1	166.2	164.5	252.9
Parallel – without stroke	$kgmm^2$	8.3	8.8	14.1	30.3	30.6	38.0	215.2	213.6	301.9
In-line/Parallel – per meter stroke	$kgmm^2/m$	41.3	37.6	41.5	97.7	92.4	106.4	527.7	470.0	585.4
Accuracy: Repeatability (ISO230-2)										
In-line	mm					±0.03				
Parallel	mm					±0.05				
Efficiency – (incl. friction torques)										
In-line	%					90				
Parallel	%					81				
Temperature										
Operating	°C					-10 ... +70				
Ambient	°C					-10 ... +40				
Storage	°C					-20 ... +40				
Humidity	%					0 ... 95 % (non-condensing)				
Elevation (Max.)	m					3000				

* Technical data based on normal conditions and only for single cylinder and load mode. For compound loads, please verify in accordance with normal physical laws and technical standards whether individual ratings should be reduced. Please contact Parker with any questions.
** Refer to Ordering Information for standard strokes available for specified model size and type.
***Efficiency factors are included in force constants
[1] ATEX on request

ETH Series Performance by Cylinder Size and Screw Lead*

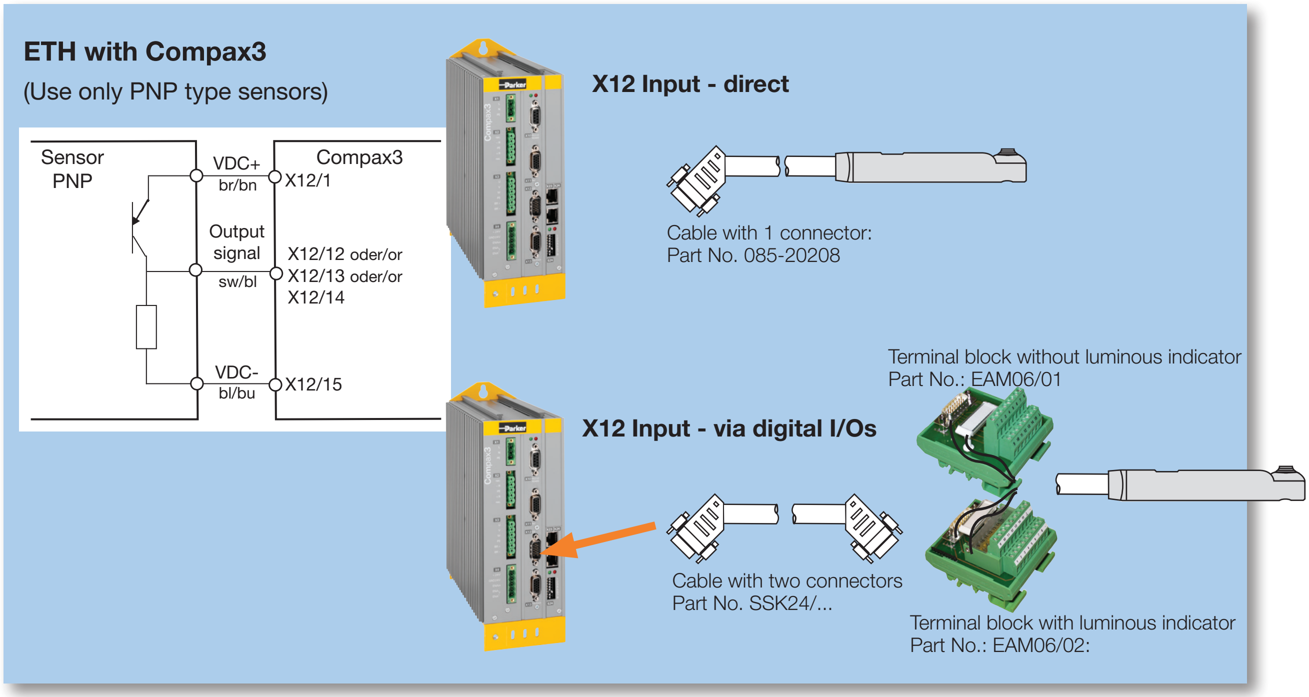
Cylinder Size		ETH100		ETH125	
Screw Lead Designation		**M10**	**M20**	**M10 1)**	**M20 1)**
Screw Lead	mm	10	20	10	20
Screw Diameter	mm	50		63	
Available Strokes**	mm	200 – 2000		200 – 2000	
Max. Speed at Designated Stroke:	mm/s				
200 – 400 mm		400	800	417	833
500 mm		400	747	417	807
600 mm		333	622	395	684
800 mm		241	457	290	514
1000 mm		185	354	224	405
1200 mm		148	284	180	329
1400 mm		122	235	148	275
1600 mm		102	198	125	234
2000 mm		76	148	94	170
Max. Acceleration	m/s^2	8	10	8	10
Max. Axial Traction/Thrust Force –					
In-Line	N	54,800	56,000	88,700	114,000
Parallel **n < 100**			50,800		81,400
(@ "n" rpm **100 < n < 300**	N	54,800	43,200	76,300	73,700
Motor Speed) **n > 300**			35,600		61,000
Axial Force – 2500 km Service Life	N	18,410	27,100	27,100	49,600
Max. Transmissible Torque –					
In-Line	Nm	100	200	150	400
Parallel **n < 100**			200		320
(@ "n" rpm **100 < n < 300**	Nm	108	170	150	290
Motor Speed) **n > 300**			140		240
Force Constant* – In-Line**	N/Nm	565	283	565	283
Force Constant* – Parallel**	N/Nm	509	254	509	254
Max Torque – No Load	Nm	Please consult factory.			
Weight – (including cylinder rod)					
Base Unit with Zero Stroke	kg				
Additional Stroke	kg/m				
Weight – (cylinder rod only)					
Base Unit with Zero Stroke	kg				
Additional Stroke	kg/m				
Moments of Inertia					
In-line – without stroke	$kgmm^2$	2240	2620	12,960	13,400
Parallel – without stroke		5860	6240	17,050	17,990
In-line/Parallel – per meter stroke	$kgmm^2/m$	4270	4710	10,070	10,490
Accuracy: Repeatability (ISO230-2)					
In-line	mm	±0.03			
Parallel	mm	±0.05			
Efficiency – (incl. friction torques)					
In-line	%	90			
Parallel	%	81			
Temperature					
Operating	°C	-10 ... +70			
Ambient	°C	-10 ... +40			
Storage	°C	-20 ... +40			
Humidity	%	0 ... 95 % (non-condensing)			
Elevation (Max.)	m	3000			

* Technical data based on normal conditions and only for single cylinder and load mode. For compound loads, please verify in accordance with normal physical laws and technical standards whether individual ratings should be reduced. Please contact Parker with any questions.
** Refer to Ordering Information (page 52) for standard strokes available for specified model size and type.
***Efficiency factors are included in force constants
1) ATEX on request

Sizing/Selection Design Considerations

Step	Sizing/Selection Design Consideration	Recommendation
1	**Basic Operating Parameters**	Check the basic conditions for the use of the ETH in your application. Use the performance chart and the speed-thrust graphs to confirm the ETH can meet your application's basic performance (e.g. force, velocity, acceleration) mechanical and environmental conditions
2	**Required Space**	Check the space available in your application and choose the appropriate motor mounting option: inline or parallel. Basic cylinder dimensions, along with dimensions for motor mounting options, can be found in the Dimensions section.
3	**Maximum Velocity**	Select the screw lead required to reach the application's maximum velocity
4	**Maximum Acceleration**	Verify that the maximum acceleration does not exceed the cylinder's limits
5	**Axial Forces**	Calculate the axial forces required in the individual segments of the application.
6	**Maximum Force Required**	Determine the maximum required axial force that the electric cylinder must provide.
7	**Select Stroke**	Determine the usable stroke and safety travels required for the application, then: • Select the desired stroke from the list of standard strokes • Or, if standard stroke will not work choose a desired stroke in steps of one mm. Please do not exceed the maximum permissible stroke given for each frame size.
8	**Buckling Risk**	Check that the maximum required axial force does not exceed the rod buckling limitations.
9	**Service Life**	Calculate the service life using the equivalent axial forces, the operational environment (application factor), and the load-life curves.
10	**Lateral Forces/Side Loads**	Determine the lateral forces present in the application and compare them to the permissible lateral forces for the cylinder.
11	**Relubrication**	Determine the lubricating cycle (maintenance schedule) and check that it is suitable.
12	**Motor/Gearhead Selection**	Calculate the required torque needed to the generate the required force of the ETH.
13	**Motor Mounting Flange**	Select a suitable motor mounting flange
14	**Mounting Type**	Select the mounting method of the electric cylinder
15	**Cylinder Rod End**	Select the desired rod end for load mounting
16	**Model number**	Develop model number

ETH Cylinders Connection with Compax3 Drives/Controllers



Xpress Motion Packages

Mounting Code	Motor Part Number	Gearhead Part Number[1]	Recommended Compax3 Servo Drive(s)	Motor Cable	Feedback Cable
XPC	BE233FJ-KPSN	—	C3S063V2F12IxxTxxMxx	P-1A1-xx	F-2C1-xx
XPD	CM233FJ-115027	—			
XPG	BE344LJ-KPSN	—	C3S100V2F12IxxTxxMxx	P-3B1-xx	
XPH	BE344LJ-KPSB	—			
XPL	MPP1003D1E-KPSN	—	C3S150V2F12IxxTxxMxx		
XPM	MPP1003D1E-KPSB	—			
XPN	MPP1003D1E-KPSN	PV34/PV90-003			
XPP	MPP1003D1E-KPSB	PV34/PV90-004			
XPQ	MPP1003R1E-KPSN	—	CS3S063V2F12IxxTxxMxx[2] or C3S075V4F12IxxTxxMxx		
XPR	MPP1003R1E-KPSB	—			
XPS	MPP1003R1E-KPSN	PV34/PV90-003			
XPT	MPP1003R1E-KPSB	PV34/PV90-004			
XPU	MPP1154B1E-KPSN	—	C3S150V2F12IxxTxxMxx		
XPV	MPP1154B1E-KPSB	—			
XPW	MPP1154B1E-KPSN	PV115-003			
XPX	MPP1154B1E-KPSB	PV115-004			
XPY	MPP1154P1E-KPSN	—	CS3S063V2F12IxxTxxMxx[2] or C3S075V4F12IxxTxxMxx		
XPZ	MPP1154P1E-KPSB	—			
XP1	MPP1154P1E-KPSN	PV115-003			
XP2	MPP1154P1E-KPSB	PV115-004			

[1] PV34 will be used for all inline motor mounting configurations. PV90 will be used when the motor is mounted in parallel.
[2] Motors are rated for 460 volts AC. This combination, with the 230 volt drive, will result in motor running at 1/2 its rated speed

ETH032 Speed-Thrust with Motors (170 VDC)

Maximum Thrust with Motor*:

- Parallel motor mount limitation
- Max thrust w/2540 km life (see page 45 for details)

XPC – BE233FJ
- Peak
- Continuous

XPG – BE344LJ
- Peak
- Continuous

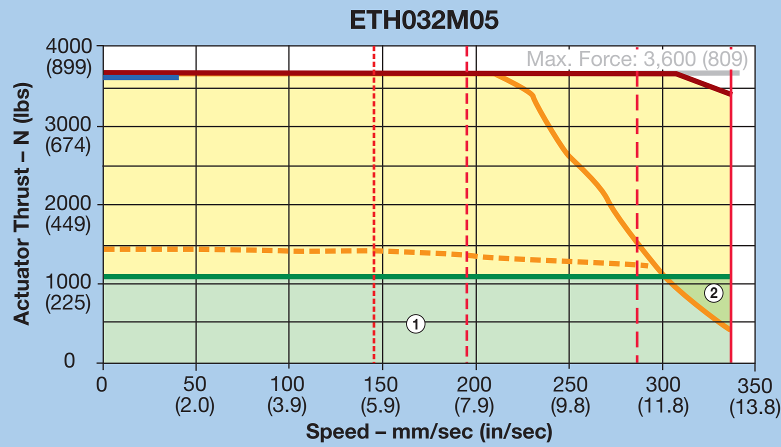
Maximum Speed:
- 1000 mm stroke
- 800 mm stroke
- 600 mm stroke
- Max actuator speed

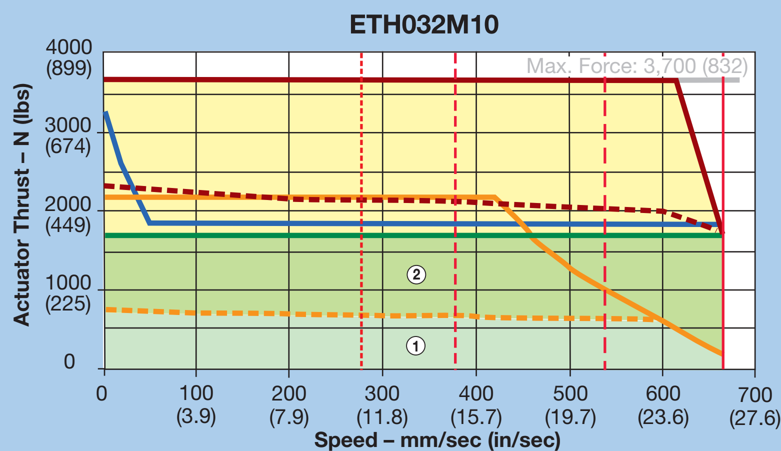
Performance Zones:

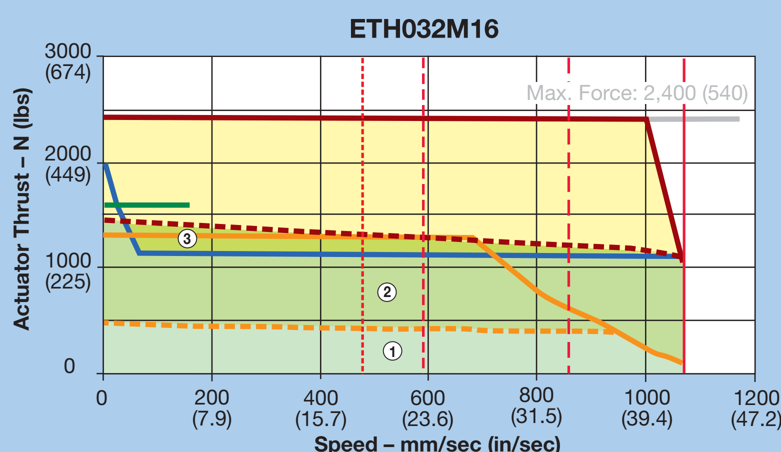
Motor Codes	Continuous Operation ①	②	③
XPC [1]	•		
XPD [2]	•		
XPG [1]	•	•	•*
XPH [2]	•	•	•*

[1] Without brake [2] With brake
* In-line motor mount only

Intermittent Zone – Consult Factory
(operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel motor mount limitation curve)







** Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load. For limitations on column buckling, please see page 43.*

ETH032 Speed-Thrust with Motors (340 VDC)

Maximum Thrust with Motor*:

- Parallel motor mount limitation (blue solid line)
- Max thrust w/2540 km life (see page 45 for details) (green solid line)

XPC – BE233FJ
- Peak (orange solid line)
- Continuous (orange dashed line)

XPG – BE344LJ
- Peak (dark red solid line)
- Continuous (dark red dashed line)

Maximum Speed:

- 1000 mm stroke (red dotted line)
- 800 mm stroke (red short-dashed line)
- 600 mm stroke (red long-dashed line)
- Max actuator speed (red solid line)

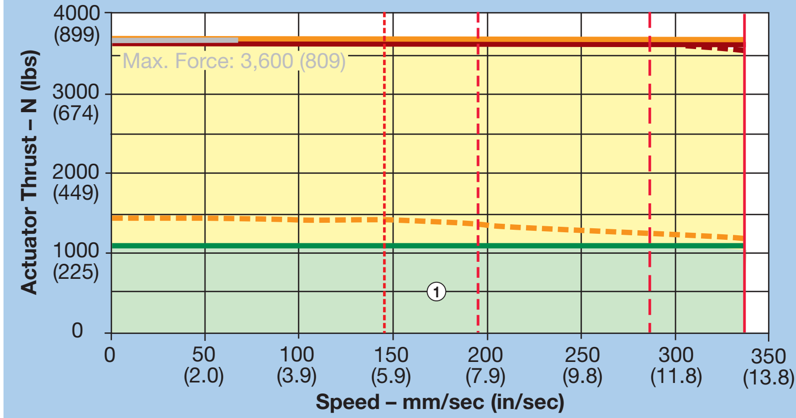
Performance Zones:

Motor Codes	Continuous Operation ①	②	③
XPC (1)	•		
XPD (2)	•		
XPG (1)	•	•	•*
XPH (2)	•	•	•*

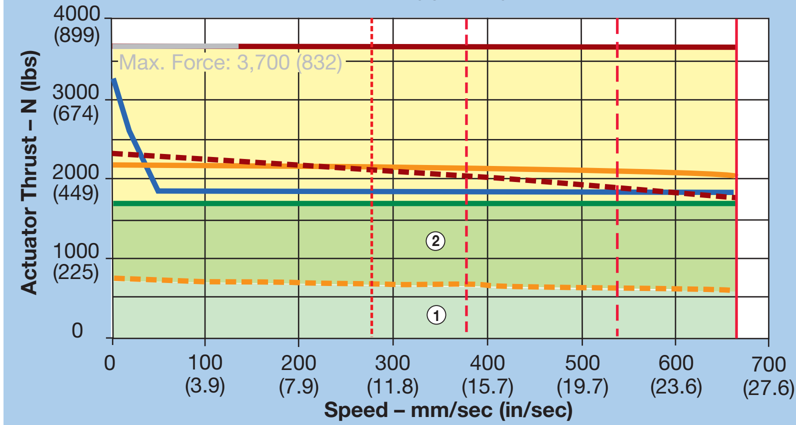
(1) Without brake (2) With brake
* In-line motor mount only

Intermittent Zone – Consult Factory
(operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel motor mount limitation curve)

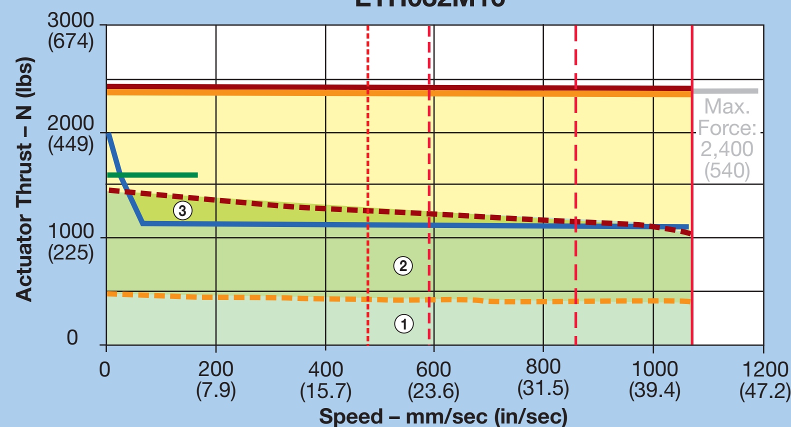
ETH032M05



ETH032M10



ETH032M16



** Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load. For limitations on column buckling, please see page 43.*

Electric Cylinders

ETH050 Speed-Thrust with Motors (170 VDC)

Maximum Thrust with Motor*:

- Parallel motor mount limitation
- Max thrust w/2540 km life (see page 45 for details)

XPG – BE344LJ
- Peak
- Continuous

Maximum Speed:

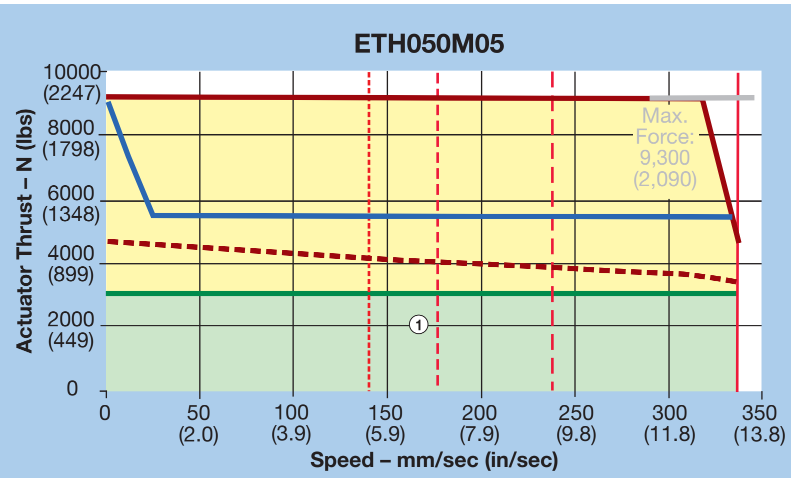
- 1200 mm stroke
- 1000 mm stroke
- 800 mm stroke
- Max actuator speed

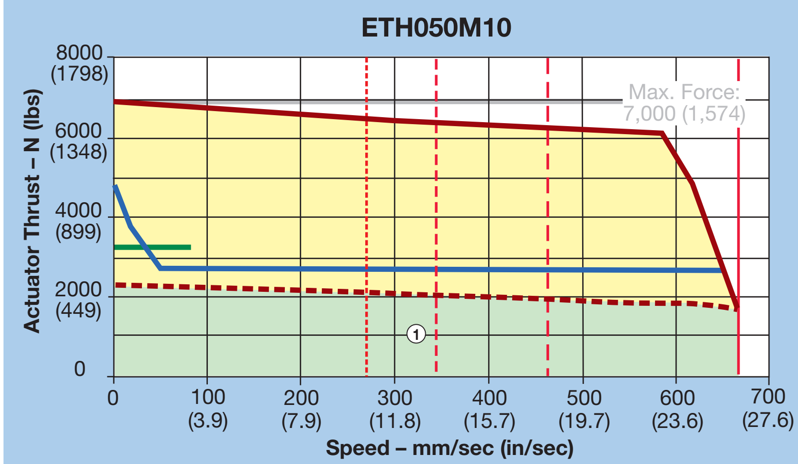
Performance Zones:

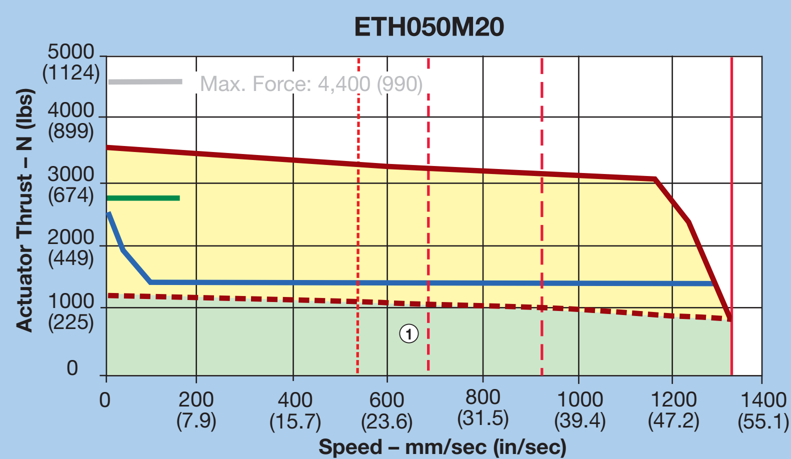
Motor Codes	Continuous Operation
	①
XPG [(1)]	•
XPH [(2)]	•

[(1)] Without brake [(2)] With brake
* In-line motor mount only

Intermittent Zone – Consult Factory
(operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel motor mount limitation curve)







** Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load. For limitations on column buckling, please see page 43.*

ETH050 Speed-Thrust with Motors (340 VDC)

Maximum Thrust with Motor*:

Parallel motor mount limitation

Max thrust w/2540 km life (see page 45 for details)

XPL – MPP1003D1E
Peak
Continuous

XPN – MPP1003D1E (with PV34FE-003)
Peak
Continuous

Maximum Speed:

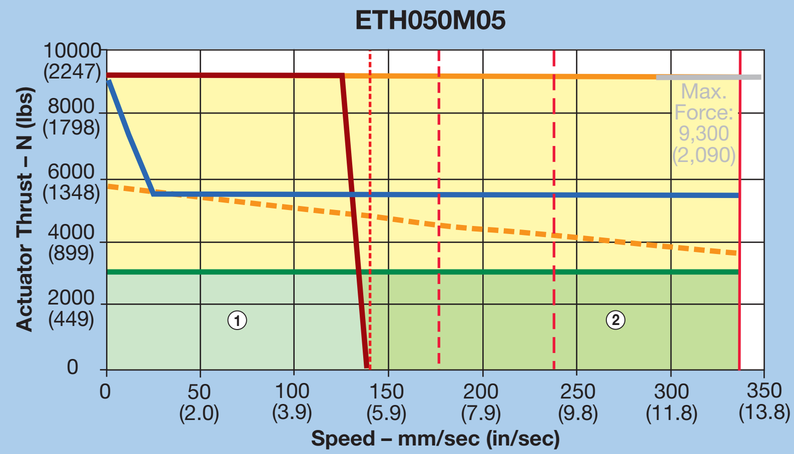
1200 mm stroke
1000 mm stroke
800 mm stroke
Max actuator speed

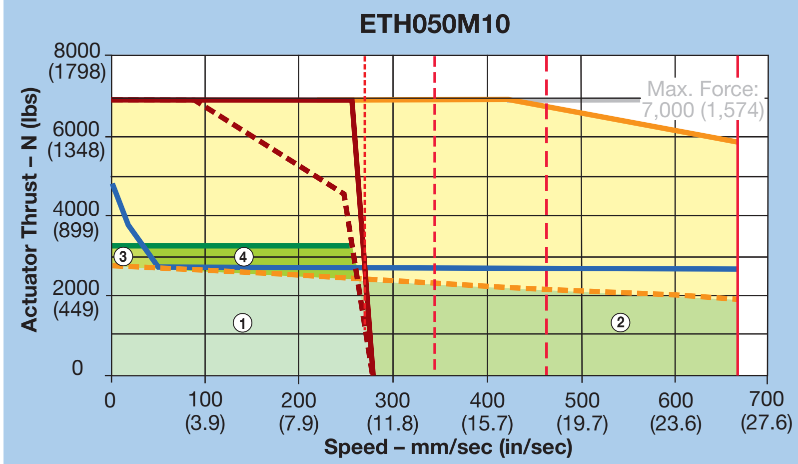
Performance Zones:

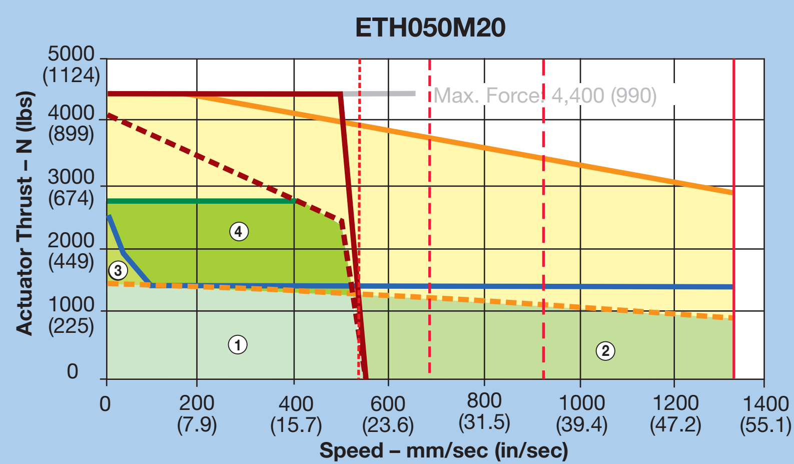
Motor Codes	Continuous Operation			
	①	②	③	④
XPL [1]	•		•	
XPM [2]	•		•	
XPN [1]	•	•		•*
XPP [2]	•	•		•*

[1] Without brake [2] With brake
* In-line motor mount only

Intermittent Zone – Consult Factory
(operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel motor mount limitation curve)







** Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load. For limitations on column buckling, please see page 43.*

Electric Cylinders

ETH050 Speed-Thrust with Motors (680 VDC)

Maximum Thrust with Motor*:

Parallel motor mount limitation

Max thrust w/2540 km life (see page 45 for details)

XPQ – MPP1003R1E
Peak
Continuous

XPS – MPP1003R1E (with PV34FE-003)
Peak
Continuous

Maximum Speed:

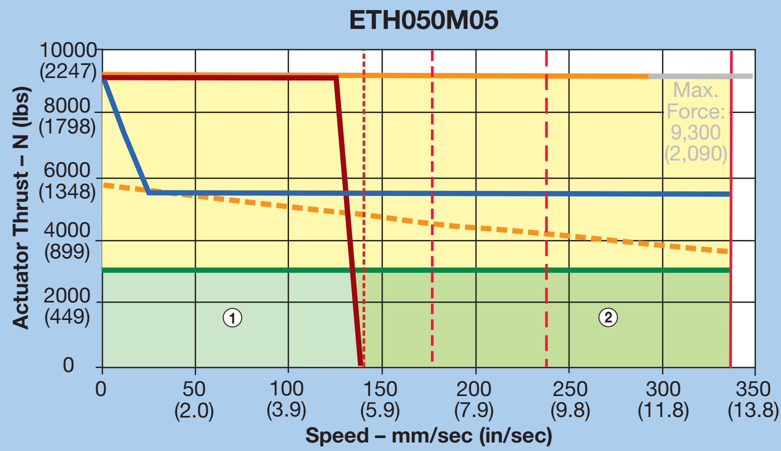
1200 mm stroke
1000 mm stroke
800 mm stroke
Max actuator speed

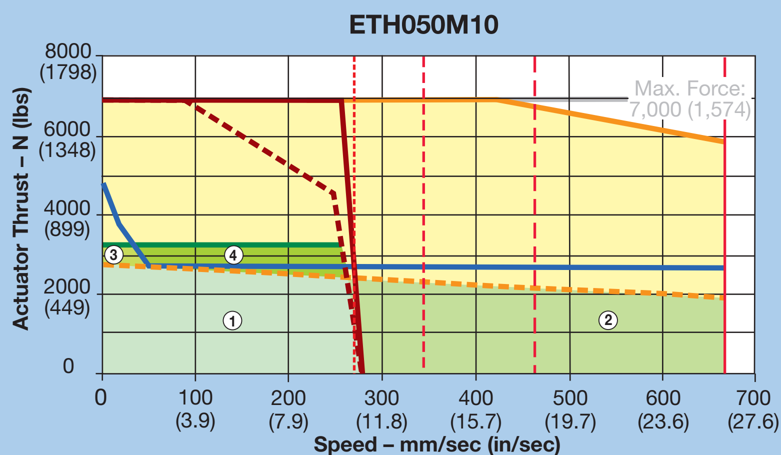
Performance Zones:

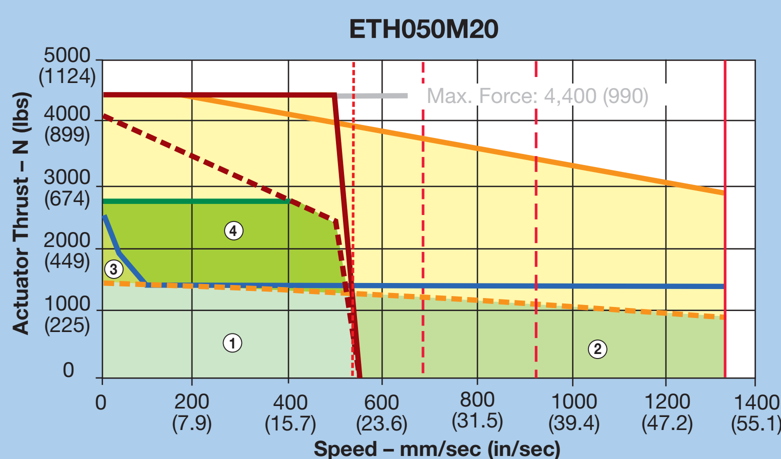
Motor Codes	Continuous Operation ①	②	③	④
XPQ [1]	•		•	
XPR [2]	•		•	
XPS [1]	•	•		•*
XPT [2]	•	•		•*

[1] Without brake [2] With brake
* In-line motor mount only

Intermittent Zone – Consult Factory
(operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel motor mount limitation curve)







** Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load. For limitations on column buckling, please see page 43.*

ETH080 Speed-Thrust with Motors (340 & 680 VDC)

Maximum Thrust with Motor*:

- Parallel motor mount limitation
- Max thrust w/2540 km life (see page 45 for details)

XPQ – MPP1003R1E
- Peak
- Continuous

XPS – MPP1003R1E (with PV34FE-003)
- Peak
- Continuous

XPU – MPP1154B1E
- Peak
- Continuous

XPW – MPP1154B1E (with PV115-003)
- Peak
- Continuous

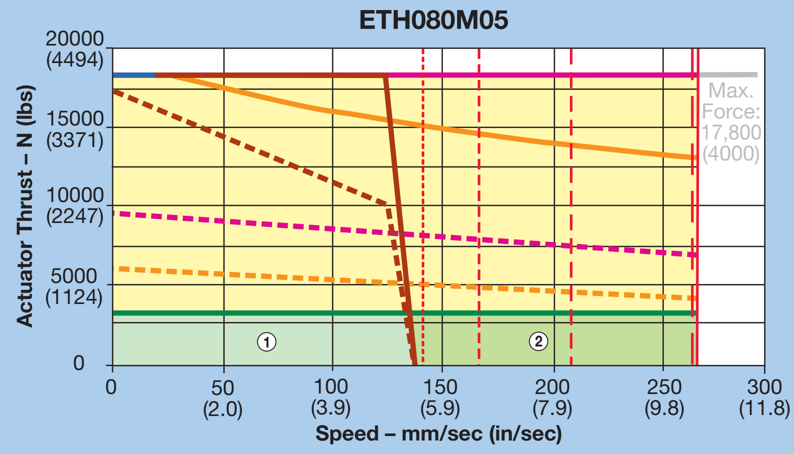
Maximum Speed:
- 1600 mm stroke
- 1400 mm stroke
- 1200 mm stroke
- 1000 mm stroke
- Max actuator speed

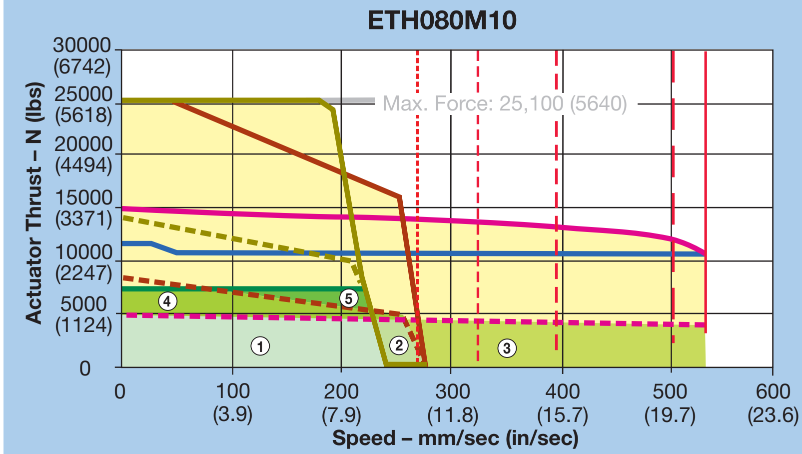
Performance Zones:

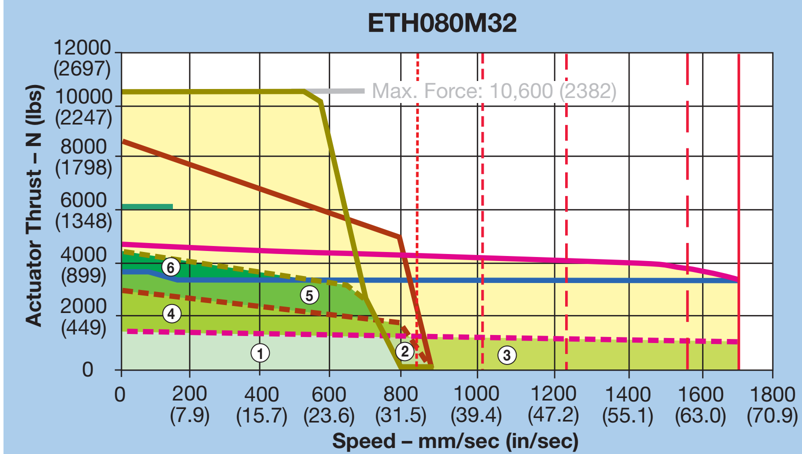
Motor Codes	Continuous Operation					
	①	②	③	④	⑤	⑥
XPQ [1]	•	•	•			
XPR [2]	•	•	•			
XPS [1]	•	•		•		
XPT [2]	•	•		•		
XPU [1]	•	•	•			
XPV [2]	•	•	•			
XPW [1]	•			•	•	•*
XPX [2]	•			•	•	•*

[1] Without brake [2] With brake
* In-line motor mount only

Intermittent Zone – Consult Factory
(operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel motor mount limitation curve)







** Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load. For limitations on column buckling, please see page 43.*

Electric Cylinders

Design Considerations — Calculating Axial Force

Use the equations below to calculate the thrust required to extend and retract the piston rod.

Once the individual segments are calculated, the maximum required axial force can be determined. This maximum axial force is used to determine the size of the cylinder and to check that the buckling load limit is not exceeded (see Permissible Axial Force, next page). Note that the axial forces calculated for each segment are later used as the calculation basis for the service life (see Design Considerations – Service Life).

Calculation of Axial Forces:

Determine the axial forces occurring during each individual segment of the application cycle. (Index "j" for the individual segments of the application cycle.)

Cylinder Rod Extending:

$$F_{x,a,j} = \left| F_{x,ext} + (m_{ext} + m_{Kse} + m_{Ks,0} + m_{Ks,Hub} \bullet Hub) \bullet (a_{K,j} + \sin\alpha \bullet 9{,}81\tfrac{m}{s^2}) \right|$$

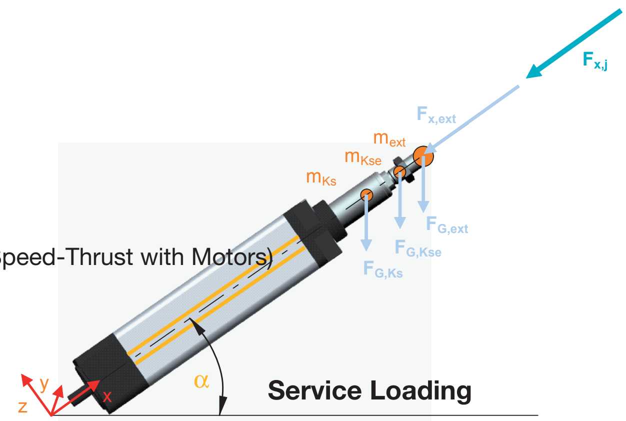
Cylinder Rod Retracting:

$$F_{x,e,j} = \left| - F_{x,ext} + (m_{ext} + m_{Kse} + m_{Ks,0} + m_{Ks,Stroke} \bullet Stroke) \bullet (a_{K,j} + \sin\alpha \bullet 9{,}81\tfrac{m}{s^2}) \right|$$

The values Fx,a,j and Fx,e,j are always positive.

Formula Abbreviations

$F_{x,a,j}$	Axial forces during extension (N)
$F_{x,e,j}$	Axial forces during retraction (N)
$F_{x,ext}$	External axial force (N)
$F_{G,ext}$	Weight force caused by an additional mass (N)
$F_{G,Kse}$	Weight force caused by the cylinder rod end (N)
$F_{G,Ks}$	Weight force caused by the cylinder rod (N)
m_{ext}	Additional mass (kg)
m_{Kse}	Mass of the cylinder rod end (kg) (see "Rod End Options" in Options & Accessories)
$m_{Ks,0}$	Mass of the cylinder rod at zero stroke in kg (see Speed-Thrust with Motors)
$m_{Ks,stroke}$	Mass of the cylinder rod per mm of stroke (kg)
Stroke	Selected stroke (m)
$a_{K,j}$	Acceleration at the cylinder rod (m/s²)
α	Alignment angle (°)
$F_{x,max}$	Maximum permissible axial force (N)

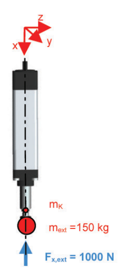


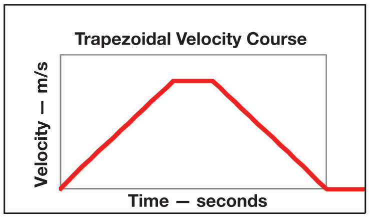
Index "j" for the individual segments of the application cycle

Example Calculation

Vertical Mounting

- ETH50
- Stroke = 500 mm = 0.5 m
- Pitch = 5 mm
- Rod End: External thread
- Trapezoidal velocity course
- Acceleration a_K = 4 m/s²
- m_{ext} = 150 kg
- $F_{x,ext}$ = 1000 N
- m_{Kse} = 0.15 kg
- $m_{Ks,0}$ = 0.15 kg
- $m_{Ks,Stroke}$ = 1.85 kg/m
- Alignment angle α = -90°





Thrust rod extending: Mass is moved downwards

Load case: Acceleration

$$F_{x,1} = \left| 1000N + \left(150kg + 0{,}15kg + 0{,}15kg + 1{,}85\frac{kg}{m} \cdot 0{,}5m\right) \cdot \left(4\frac{m}{s^2} + \sin(-90°) \cdot 9{,}81\frac{m}{s^2}\right) \right| = 121N$$

Load case: Constant Velocity

$$F_{x,2} = \left| 1000N + \left(150kg + 0{,}15kg + 0{,}15kg + 1{,}85\frac{kg}{m} \cdot 0{,}5m\right) \cdot \left(0\frac{m}{s^2} + \sin(-90°) \cdot 9{,}81\frac{m}{s^2}\right) \right| = 484N$$

Load case: Deceleration

$$F_{x,3} = \left| 1000N + \left(150kg + 0{,}15kg + 0{,}15kg + 1{,}85\frac{kg}{m} \cdot 0{,}5m\right) \cdot \left(-4\frac{m}{s^2} + \sin(-90°) \cdot 9{,}81\frac{m}{s^2}\right) \right| = 1088N$$

Thrust rod retracting: Mass is moved upwards

Load case: Acceleration

$$F_{x,4} = \left| -1000N + \left(150kg + 0{,}15kg + 0{,}15kg + 1{,}85\frac{kg}{m} \cdot 0{,}5m\right) \cdot \left(4\frac{m}{s^2} - \sin(-90°) \cdot 9{,}81\frac{m}{s^2}\right) \right| = 1088N$$

Load case: Constant Velocity

$$F_{x,5} = \left| -1000N + \left(150kg + 0{,}15kg + 0{,}15kg + 1{,}85\frac{kg}{m} \cdot 0{,}5m\right) \cdot \left(0\frac{m}{s^2} - \sin(-90°) \cdot 9{,}81\frac{m}{s^2}\right) \right| = 484N$$

Load case: Deceleration

$$F_{x,6} = \left| -1000N + \left(150kg + 0{,}15kg + 0{,}15kg + 1{,}85\frac{kg}{m} \cdot 0{,}5m\right) \cdot \left(-4\frac{m}{s^2} - \sin(-90°) \cdot 9{,}81\frac{m}{s^2}\right) \right| = 121N$$

Design Considerations — Permissible Axial Force

The risk of buckling is dependent on the stroke and mounting method. Use the charts below for the applicable mounting method and cylinder size to verify that the application's maximum axial force (calculations on previous page), is possible with the planned mounting method at the desired stroke. Please note that the retraction forces do not pose a buckling risk.

Method 1

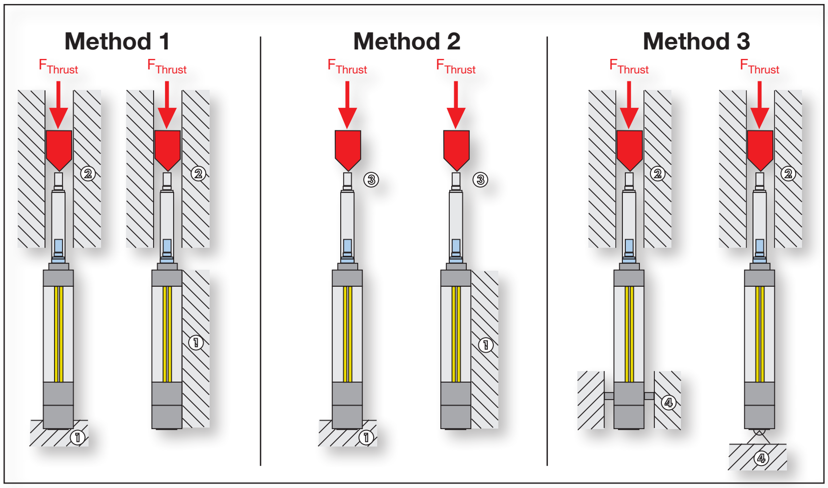
1. Cylinders fixed with mounting flanges, foot mounting or mounting plates
2. Thrust rod with axial guiding

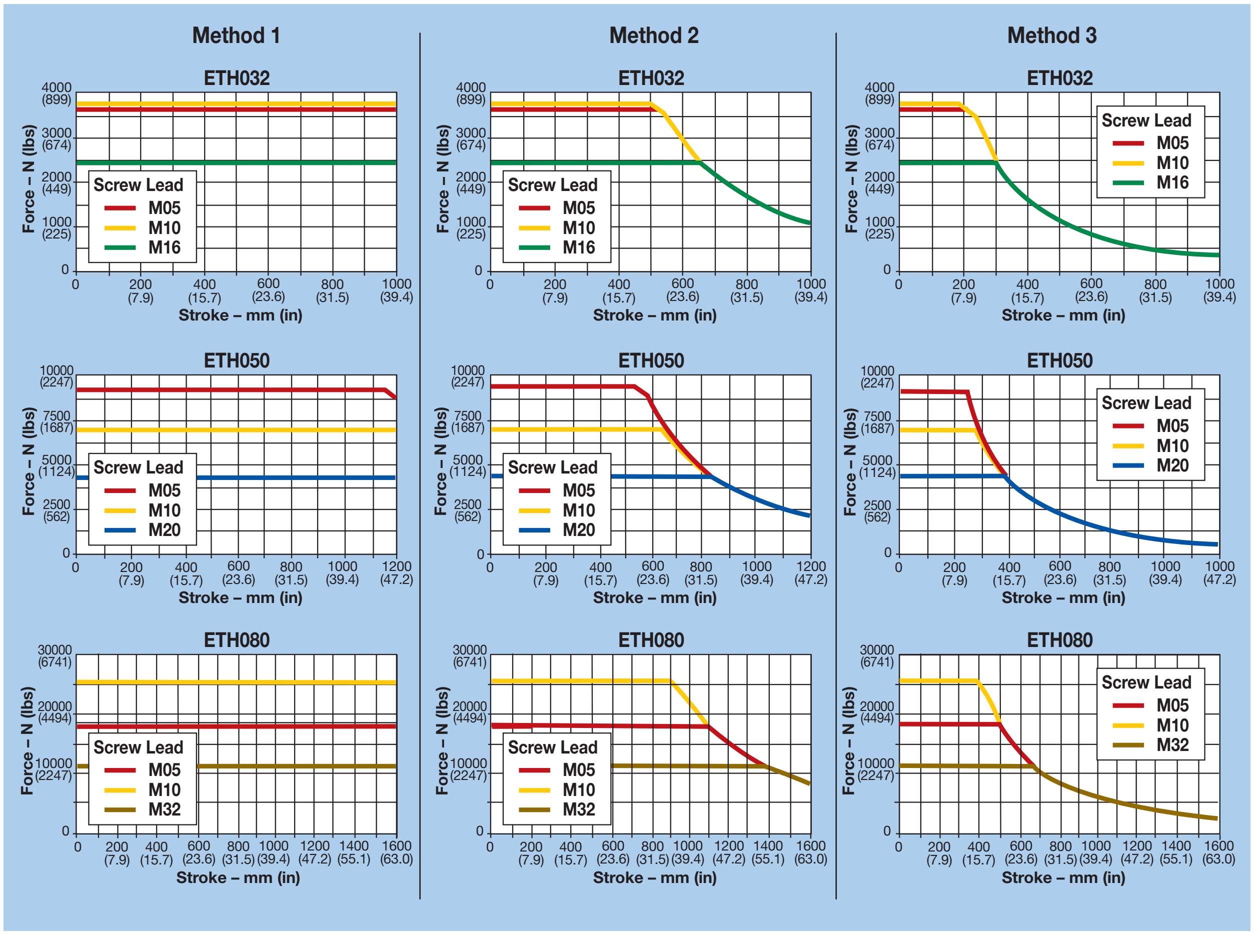
Method 2

1. Cylinders fixed with mounting flanges, foot mounting or mounting plates
3. Thrust rod without axial guiding

Method 3

4. Cylinders mounted via center trunnion or rear clevis
2. Thrust rod with axial guiding





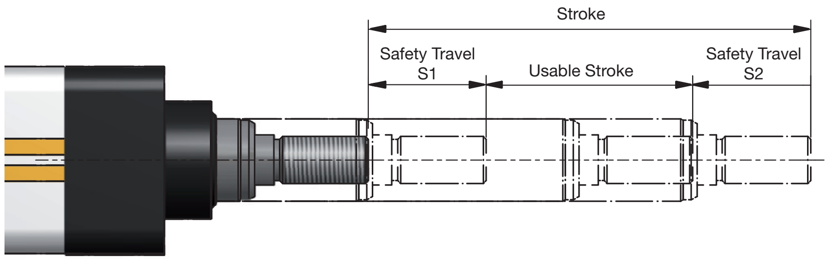
Design Considerations — Stroke, Usable Stroke and Safety Travel

Stroke:

The stroke to be indicated in the order code is the mechanically maximal possible stroke, which is the stroke between the internal end stops.

Usable Stroke:

The usable stroke is the distance needed for the application. It is always shorter than the stroke.



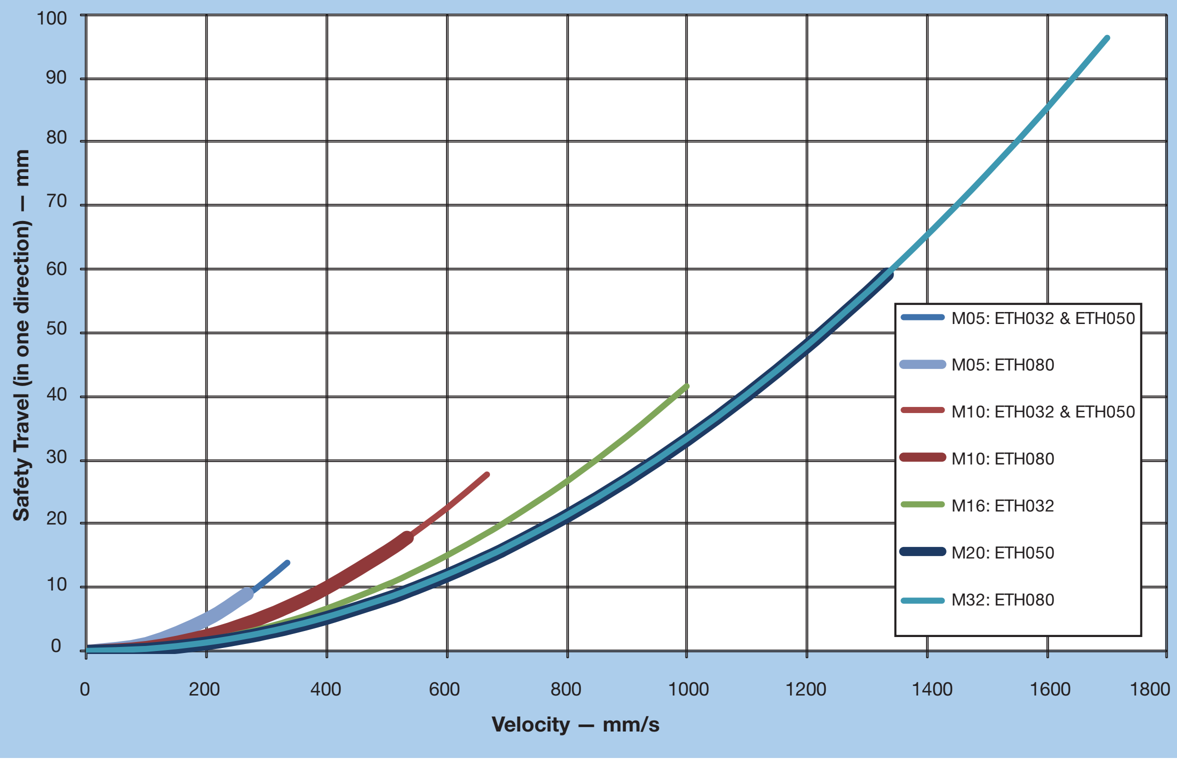
Safety Travel (S1 & S2)

The safety travels are required to slow down the cylinder after it has passed a limit switch, Emergency stop in order to avoid contact with the mechanical limit stops.

Depending on the screw lead and the maximum speed, the following diagram recommends a minimum safety travel, which is sufficient for most applications according to experience.

With demanding applications (great masses and high dynamic), the safety travel has to be calculated and enlarged accordingly (dimensioning on demand).

The safety travel shown in the diagram is for one direction only. The diagram value must be multiplied by two for the total safety travel for both extend and retract directions.



Design Considerations — Service Life

Nominal Service Life[1]

The nominal service life of the electric cylinder can be determined with the aid of the known forces.

The nominal service life is calculated as follows:

The forces calculated for each individual segment of the application cycle must be summarized into an equivalent axial force F_m (see "Calculating Required Axial Force" in previous section).

$$F_m = \sqrt[3]{\frac{1}{s_{ges}} \left(F^3_{x,1} \bullet s_1 + F^3_{x,2} \bullet s_2 + F^3_{x,3} \bullet s_3 + \ldots\right)}$$

(Index "j" for the individual segments of the application cycle. For example, the first segment would be F^3_{x1} where j = 1, the second segment would be F^3_{x2} where j = 2, etc.)

Nominal Service Life Prerequisites

- Bearing and screw temperature between 20°C and 40°C
- No impairment of the lubrication, for example by external particles
- Relubrication in accordance with the specifications
- The given values for thrust force, speed and acceleration must be adhered to at any rate
- No approaching the mechanical end stops (external or internal), no other abrupt loads, as the given maximum force of the cylinder may never be exceeded
- The given lateral forces applied to the cylinder rod must always be respected
- No high exploitation of several power features at a time (for example maximum speed or thrust force)
- No regulating oscillation at standstill

[1] Nominal service life is the service life reached by 90 % of a sufficient number of similar electric cylinders until the first signs of material fatigue occur.

Actual Service Life

The actual service life can only be approximated due to a variety of different effects. The nominal service life L calculation does, for instance, not take insufficient lubrication, impacts and vibrations into consideration. These effects can however be estimated with the aid of the application factor f_w.

The actual service life is calculated as follows:

$$L_{fw} = \frac{L}{f_w^{\,3}}$$

If you need the service life as the number of possible cycles, just divide the service life in kilometers by twice the stroke traveled.

Standstill times are not taken into consideration when determining the equivalent axial force (Fm), as sj=0.

CAUTION: always consider the stroke as well as the return stroke.

Electric Cylinders

Formula Abbreviations

F_m	Equivalent axial force (N)
F_x F_j	Resulting axial force in N (see formula 1 & 2, Calculating Axial Force)
s_j	Travel given a defined force Fx,a,j (mm)
s_{total}	Total travel (mm)
L	Nominal service life in km (see Service Life graphs)
L_{fw}	Service life as a function of the application factor (km)
f_w	Application factor (see "Application Factor F_w" table at right)

Application Factor f_w **

Movement Cycle	Shocks/Vibrations None	Light	Medium	Heavy
More than 2.5 screw rotations	1.0	1.2	1.4	1.7
1.0 to 2.5 screw rotations* (short stroke applications)	1.8	2.1	2.5	3.0

* After max. 10000 movement cycles, a lubrication run must be performed (see lubrication run intervals table).

**** Boundary Conditions for Application Factor f_w:**

- Externally guided electric cylinders
- Accelerations <10 m/s²
- Application factor <1.5
- For other conditions, please contact Parker

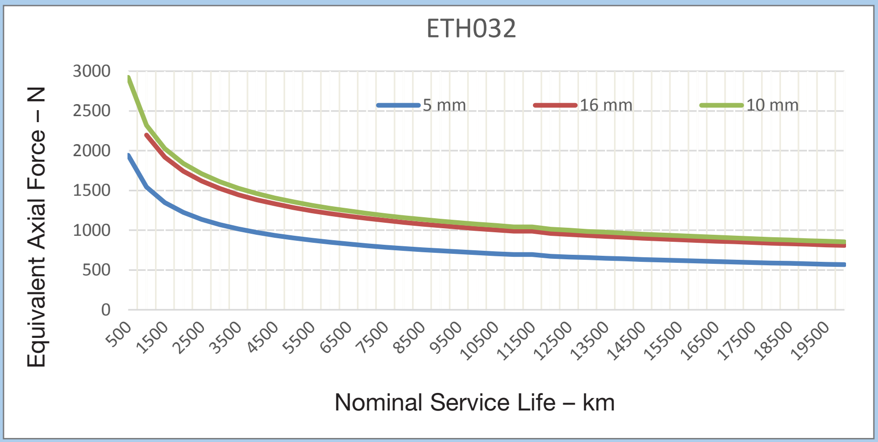
Lubrication Run Lengths for Short Stroke Applications

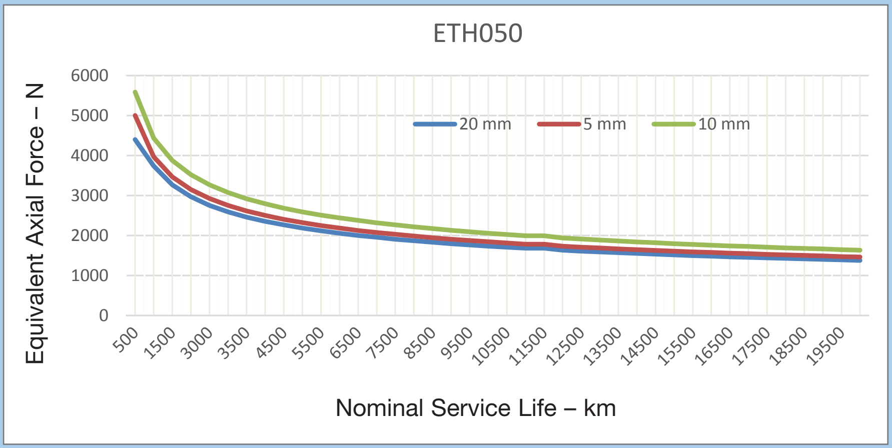
	ETH032			ETH050			ETH080			ETH100		ETH125	
Run Length	M05	M10	M16	M05	M10	M20	M05	M10	M32	M10	M20	M10	M20
mm	>45	>54	>58	>40	>46	>58	>47	>65	>95	>102	>140	>122	>210

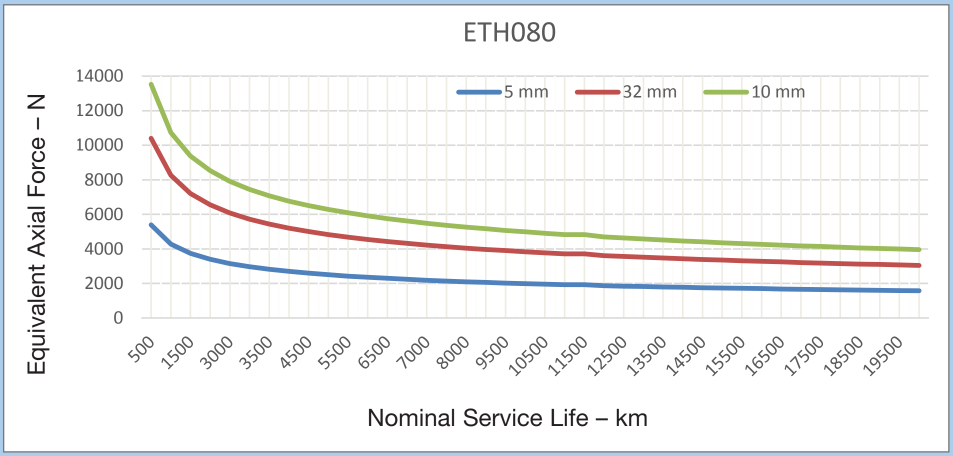
Design Considerations — Service Life

Values are based on following recommended lubrication intervals.

(See Relubrication for details in Sizing & Selection.





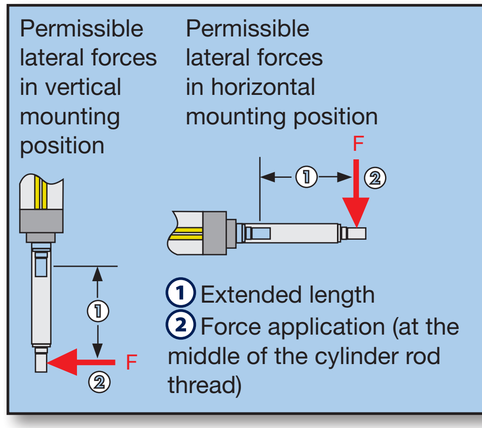


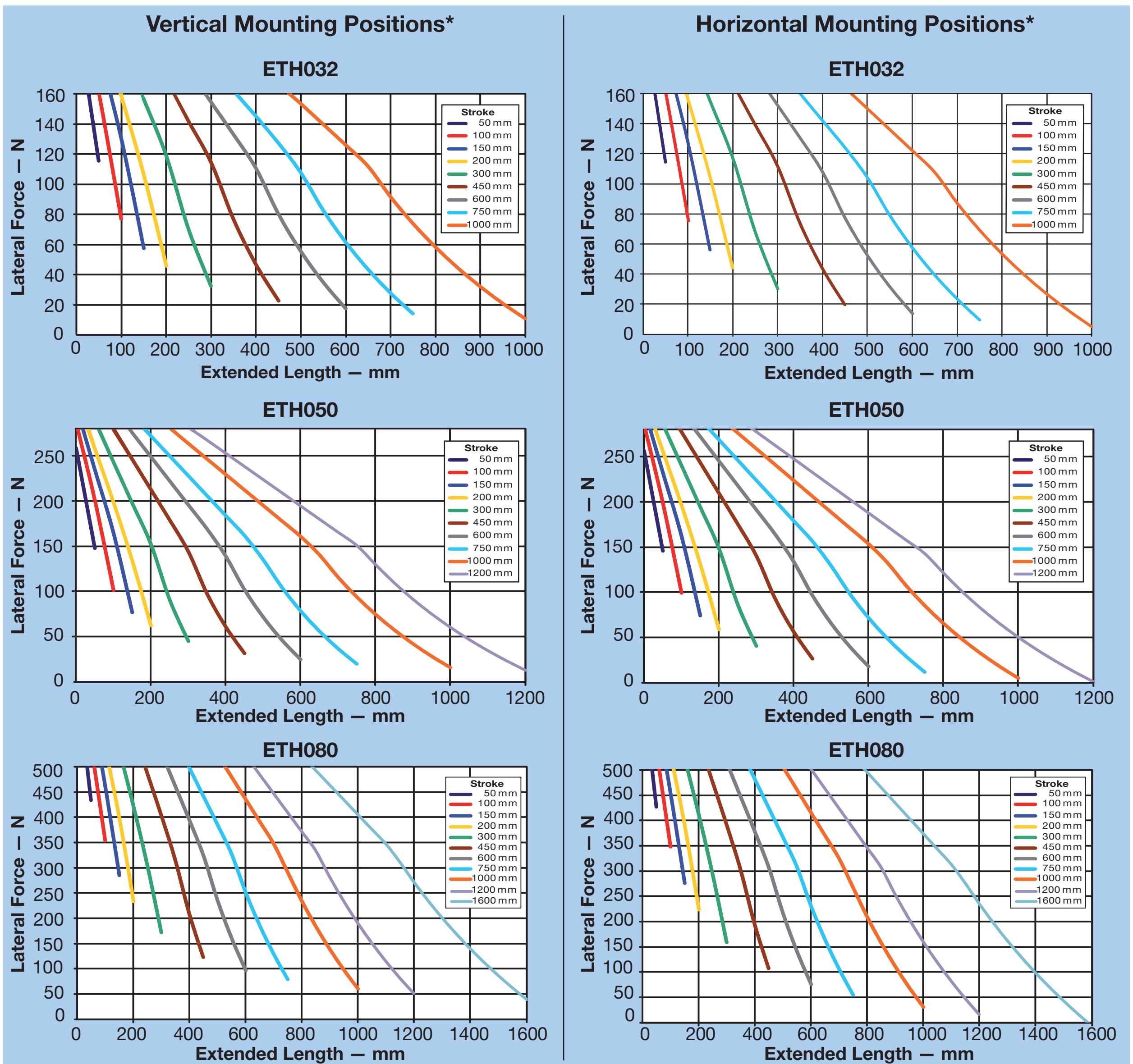
Design Considerations — Permissible Side Load

The electric cylinder features a generously dimensioned cylinder rod and screw nut bearing in the form of high-quality plastic sliding bushings to absorb the lateral force.

Please note that electric cylinders with a longer stroke permit a higher lateral force at the same extension length. It may therefore be useful to choose a longer stroke than required for the application in order to increase the permissible lateral force.

If the permissible lateral forces are exceeded or if the maximum axial force occurs at the same time, the optional outrigger bearing (option R) must be used.

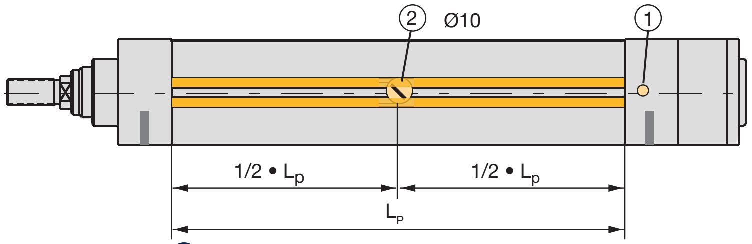




* The diagrams apply for a medium travel speed of 0.5 m/s, an ambient temperature of 20°C and all housing orientations.

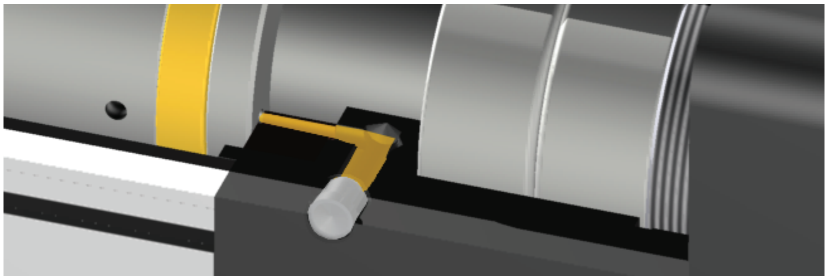
Design Considerations — Relubrication

All frame sizes are designed with a range of lubrication port locations for maximum easy access. Contact factory for special needs not shown.



(1) Central lubrication (standard)
(2) Optional lubrication (possible on all 4 sides):
L_P: Length of profile

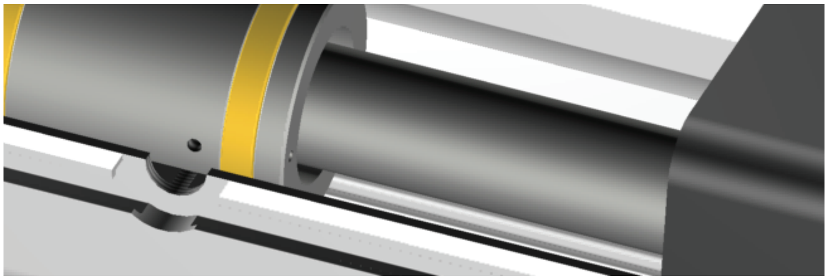
Option 1: Integrated lubrication Port (standard)



Relubrication is simple with the easy access port. Users simply perform a controlled retract of the cylinder approaching the endstop under slow speed and grease the cylinder.

The standard easy access port is always at the 3 o'clock position.

Option 2...5: Lubrication Hole (optional)



If a space constraint does not allow easy access to the standard lubrication port, other options in the part number configuration allow for a port at the center of the extrusion.

Free access to this bore even after integration of the cylinder into a system can be ensured by choosing the corresponding profile orientation (see Ordering Information). The bore is located exactly in the middle of the aluminum profile.

Lubrication Intervals*

Lubrication intervals depend on the operating conditions (nominal size, pitch, speed, acceleration, loads, etc.) and the ambient conditions (e.g. temperature). Ambient influences such as high loads, impacts and vibrations shorten the lubrication intervals.

Under normal operating conditions, the given lubrication intervals apply. If the total travel per year is shorter than the given intervals, the cylinder must be relubricated at least once per year. In the event of small loads and if the application is impact and vibration free, the lubrication intervals can be extended.

The lubricant used is Klüber and is available worldwide.

Normal Operating Conditions:

- Medium screw velocity 2000 rpm
- Operating factor f_W=1.0
- No impacts and vibrations

ETH032			ETH050			ETH080		
M05	M10	M16	M05	M10	M20	M05	M10	M32
300 km	600 km	960 km	300 km	600 km	1200 km	300 km	600 km	1500 km

Design Considerations — Motor and Gearhead Selection

Drive Torque Calculation

The torques to be produced by the motor result from the acceleration, the load and the friction torque. The drive torques must be calculated for all segments of the application cycle (represented by index "j"). Index "j" for the individual segments of the application cycle.

Calculation of the **acceleration torque** with respect to the rotary moments of inertia:

$$M_{B,j} = \left((J_{i/p,0} + J_{i/p,Hub} \bullet Hub) \bullet \frac{1}{\eta_{ETH}} \bullet \boxed{\frac{1}{i_G^{\,2} \bullet \eta_G} + J_G +} J_M \right) \bullet 10^{-3} \bullet \frac{6{,}28 \bullet a_{K,j}}{P_h}$$

(use only with gearhead)

The acceleration forces due to the translatory moved masses are taken into consideration in the calculation of the axial forces (see Design Considerations — Calculating Axial Force.)

The **load torques** result from the occurring axial forces:

$$M_{L,j} = \frac{F_{x,a/e,j}}{\text{Thrust force factor}} \bullet \boxed{\frac{1}{i_G \bullet \eta_G}}$$

(use only with gearhead)

The motor must therefore generate the following **drive torques**:

$$M_{M,j} = M_{B,j} + M_{L,j}$$

The peak torque of the motor must exceed the maximum occurring drive torque.

The **effective torque** can be deduced from the drive torques for all segments of the application cycle:

$$M_{eff} = \sqrt[2]{\frac{1}{t_{ges}} \bullet (M_{M1}{}^2 \bullet t_1 + M_{M2}{}^2 \bullet t_2 + \ldots)}$$

The nominal torque of the motor must exceed the calculated effective torque. Refer to the Motor Mounting Configuration charts (see Dimensions), to verify that the motor is mechanically compatible to the corresponding electric cylinder.

Formula Abbreviations

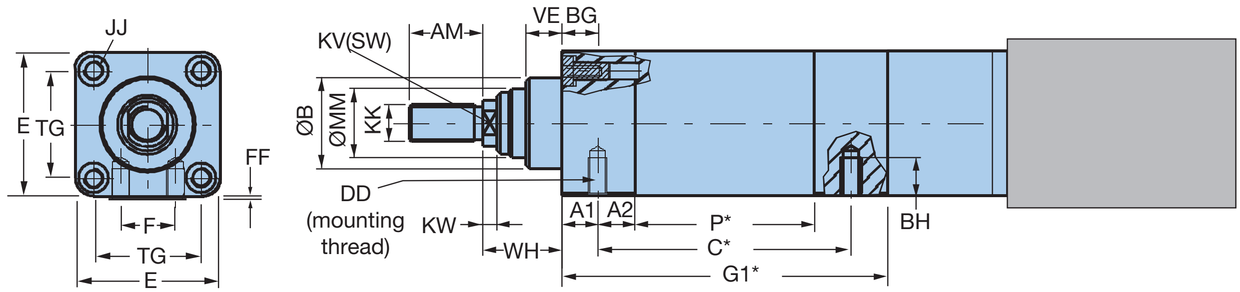
$M_{B,j}$	Variable acceleration torque in Nm
$J_{i/p,0}$	Red. rot. mass moment of inertia at zero stroke for inline/parallel motor configuration in kgmm² (see graphs in Speed/Thrust with Motors)
$J_{i/p,\ stroke}$	Red. rot. mass moment of inertia per mm of stroke for inline/parallel motor configuration in kgmm² (see graphs in Speed/Thrust with Motors)
Stroke	Selected stroke in mm
η_{ETH}	Efficiency of the electric cylinder (0.9 – inline drive configuration; 0.81 – parallel motor)
i_G	Gearhead ratio
ηG	Efficiency of the gearhead (see gearhead manufacturer specifications)
J_M	Motor mass moment of inertia in kgmm² (see motor manufacturer specifications)
J_G	Gearhead mass moment of inertia in kgmm² (see gearhead manufacturer specifications)
$a_{K,j}$	Acceleration at the cylinder rod in m/s²
P_h	Screw pitch in mm
$M_{L,j}$	Load torque in Nm
$F_{x,a/e,j}$	Loads in x direction in N (see Design Considerations — Calculating Axial Force)
$M_{M,j}$	Drive torque in Nm
M_{eff}	Effective value — motor in Nm
t_{total}	Total cycle time in s
t_j	Amount of time in the cycle in s

DIMENSIONS

ETH Motor Mounting Configurations

Download 2D & 3D files from www.parker.com/emn

Inline Dimensions (mm)

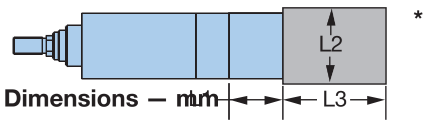


* Specified dimension + selected stroke

Cylinder Size		ETH032			ETH050			ETH080			ETH100		ETH125	
Screw Lead		**M05**	**M10**	**M16**	**M05**	**M10**	**M20**	**M05**	**M10**	**M32**	**M10**	**M20**	**M10**	**M20**
C	IP54	93.5	103.0	106.5	99.5	105.5	117.5	141.5	159.5	189.5	— (2)	— (2)	— (2)	— (2)
	IP65	94.5	103.5	107.5	100.5	106.5	118.5	142.5	160.5	190.5	— (2)	— (2)	— (2)	— (2)
G1	IP54	133.0	142.0	146.0	154.0	160.0	172.0	197.0	215.0	245.0	323.0	361.0	461.0	549.0
	IP65	180.5	189.5	193.5	198.5	204.5	216.5	259.5	277.5	307.5	349.5	387.5	487.5	575.5
P		66.0	75.0	79.0	67.0	73.0	85.0	89.0	107.0	137.0	162.0	200.0	192.0	280.0
A1	IP54	14.0			15.5			21.0			— (2)		— (2)	
	IP65	60.0			58.5			82.0			— (2)		— (2)	
A2		17.0			18.5			32			— (2)		— (2)	
AM		22.0			32.0			40.0			70.0		96.0	
BG		16.0			25.0			26.0			32.0		44.0	
BH		9.0			12.7			18.5			— (2)		— (2)	
DD		M6x1.0			M8x1.25			M12x1.75			— (2)		— (2)	
E		46.5			63.5			95.0			120.0		150.0	
F		16.0			24.0			30.0			— (2)		— (2)	
FF		0.5			0.5			1.0			0		0	
JJ		M6x1.0 (1)			M8x1.25			M10x1.5			M16x2		M20x2.5	
KK		M10x1.25			M16x1.5			M20x1.5			M10x1.5		M20x2.5	
KV		10.0			17.0			22.0			46.0		55.0	
ØMM		22.0			28.0			45.0			70.0		85.0	
TG		32.5			46.5			72.0			89.0		105.0	
KW		5.0			6.5			10.0			10.0		10.0	
VE		12.0			16.0			20.0			20.0		20.0	
WH		26.0			37.0			46.0			51.0		53.0	
ØB		30.0			40.0			60.0			90.0		110.0	

(1) Thru holes should have a minimum diameter of 7 mm on any component attached to the front threaded screw holes on bolt pattern TG.
(2) ETH100 & ETH125 do not have a mounting thread on the underside
For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Inline Mounts with Xpress Motors



Flange & Coupling to Accept Xpress Motor

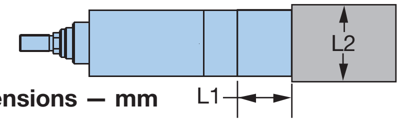
Cylinder Size	Xpress Order Code	Motor (w/Gearhead) Description	Pilot	Bolt Circle	Shaft Ø	Shaft Length	L1	L2	L3
ETH032	XPC	BE233FJ-KPSN	38.10	66.68	9.52	20.8	66.0	58.0	145.0
	XPD	CM233FJ-115027	38.10	66.68	9.52	20.8	66.0	58.0	177.0
	XPG	BE344LJ-KPSN	73.03	98.43	12.70	30.2	65.0	85.0	188.0
	XPH	BE344LJ-KPSB	73.03	98.43	12.70	30.2	65.0	85.0	231.0
ETH050	XPC	BE233FJ-KPSN	38.10	66.68	9.52	31.8	65.0	65.0	145.0
	XPD	CM233FJ-115027	38.10	66.68	9.52	31.8	65.0	65.0	177.0
	XPG	BE344LJ-KPSN	73.03	98.43	12.70	30.2	63.0	85.0	188.0
	XPH	BE344LJ-KPSB	73.03	98.43	12.70	30.2	63.0	85.0	231.0
	XPL [3]	MPP1003D1E-KPSN	95.00	115.00	19.00	40.0	88.0	98.0	175.0
	XPM [3]	MPP1003D1E-KPSB	95.00	115.00	19.00	40.0	88.0	98.0	223.0
	XPN	MPP1003D1E-KPSN [1]	73.03	98.43	12.70	31.8	63.0	100.0	288.0
	XPP	MPP1003D1E-KPSB [1]	73.03	98.43	12.70	31.8	63.0	100.0	336.0
	XPQ [3]	MPP1003R1E-KPSN	95.00	145.00	19.00	40.0	88.0	98.0	175.0
	XPR [3]	MPP1003R1E-KPSB	95.00	145.00	19.00	40.0	88.0	98.0	223.0
	XPS	MPP1003R1E-KPSN [1]	73.03	98.43	12.70	31.8	63.0	100.0	288.0
	XPT	MPP1003R1E-KPSB [1]	73.03	98.43	12.70	31.8	63.0	100.0	336.0
ETH080	XPG	BE344LJ-KPSN	73.03	98.43	12.70	30.2	92.5	98.0	188.0
	XPH	BE344LJ-KPSB	73.03	98.43	12.70	30.2	92.5	98.0	231.0
	XPL	MPP1003D1E-KPSN	95.00	115.00	19.00	40.0	101.5	98.0	175.0
	XPM	MPP1003D1E-KPSB	95.00	115.00	19.00	40.0	101.5	98.0	223.0
	XPN	MPP1003D1E-KPSN [1]	73.03	98.43	12.70	31.8	92.5	100.0	288.0
	XPP	MPP1003D1E-KPSB [1]	73.03	98.43	12.70	31.8	92.5	100.0	336.0
	XPQ	MPP1003R1E-KPSN	95.00	115.00	19.00	40.0	101.5	98.0	175.0
	XPR	MPP1003R1E-KPSB	95.00	115.00	19.00	40.0	101.5	98.0	223.0
	XPS	MPP1003R1E-NPSN [1]	73.03	98.43	12.70	31.8	92.5	100.0	288.0
	XPT	MPP1003R1E-NPSB [1]	73.03	98.43	12.70	31.8	92.5	100.0	336.0
	XPU	MPP1154B1E-KPSN	110.00	130.00	24.00	50.0	111.5	113.0	203.0
	XPV	MPP1154B1E-KPSB	110.00	130.00	24.00	50.0	111.5	113.0	252.0
	XPW	MPP1154B1E-KPSN [2]	110.00	130.00	24.00	50.0	111.5	115.0	352.5
	XPX	MPP1154B1E-KPSB [2]	110.00	130.00	24.00	50.0	111.5	115.0	401.5
	XPY	MPP1154P1E-KPSN [2]	110.00	130.00	24.00	50.0	111.5	115.0	203.0
	XPZ	MPP1154P1E-KPSB [2]	110.00	130.00	24.00	50.0	111.5	115.0	252.0
	XP1	MPP1154P1E-KPSN [2]	110.00	130.00	24.00	50.0	111.5	115.0	352.5
	XP2	MPP1154P1E-KPSB [2]	110.00	130.00	24.00	50.0	111.5	115.0	401.5

[1] With Parker PV34FE-003 gearhead
[2] With Parker PV115FB-003 gearhead
[3] Requires coupling housing on ETH050 with a square dimension of 80 mm to accommodate a larger coupling.
For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

* L1 = Length Coupling Housing + Flange
L2 = Maximum Motor or Gearhead Square Flange
L3 = Length Motor + Gearhead

Electric Cylinders

Inline Mounts for other Parker Motors



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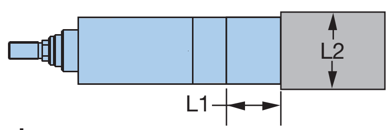
Flange & Coupling to Accept Parker Motor

Dimensions — mm

Cylinder Size	Kit Order Code	Parker Motor Description	Pilot	Bolt Circle	Shaft Ø	Shaft Length	L1	L2
ETH032	**KCB**	SM23X	38.10	66.68	9.52	20.8	60.0	58.0
	KBB	BE23X	38.10	66.68	9.52	31.8	66.0	58.0
	KCA	SM16/BE16	20.00	46.69	6.35	25.0	62.0	58.0
	KEA	LV23/HV23	38.10	66.68	6.35	20.8	60.0	58.0
	KBC	BE34X	73.03	98.43	12.70	30.2	65.0	85.0
	KEB	LV34/HV34	73.03	98.43	12.70	37.1	73.0	85.0
ETH050	**KCB**	SM23X	38.10	66.68	9.52	20.8	57.5	65.0
	KBB	BE23X	38.10	66.68	9.52	31.8	65.0	65.0
	KBC	BE34X	73.03	98.43	12.70	30.2	63.0	85.0
	KAA	MPP92/MPJ92	80.00	100.00	16.00	40.1	74.0	90.0
	KEB	LV34/HV34	73.03	98.43	12.70	37.1	70.0	85.0
	KAB [1]	MPP100/MPJ100	95.00	115.00	19.00	40.1	88.0	98.0
ETH080	**KBC**	BE34X	73.03	98.43	12.70	30.2	92.5	98.0
	KAA	MPP92/MPJ92	80.00	100.00	16.00	40.1	101.5	98.0
	KAB	MPP100/MPJ100	95.00	115.00	19.00	40.0	101.5	98.0
	KAC	MPP115/MPJ115	110.00	130.00	24.00	50.0	111.5	113.0

[1] Requires coupling housing on ETH050 with a square dimension of 80 mm to accommodate a larger coupling.
For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Inline Mounts for Parker Gearheads



*

Flange & Coupling to Accept Parker Gearhead

Dimensions — mm

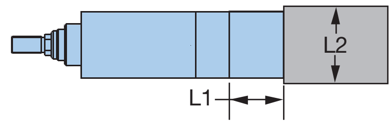
Cylinder Size	Kit Order Code	Parker Gearhead Description	Pilot	Bolt Circle	Shaft Ø	Shaft Length	L1	L2
ETH032	**PAN**	PV60FB/PX60	50.00	70.00	16.00	25.0	61.0	62.0
	PCN	PV23FE/PX23	38.10	66.68	9.52	25.4	60.0	58.0
	PDN	PV34FE/PX34	73.03	98.43	12.70	31.8	65.0	85.0
ETH050	**PAN**	PV60FB/PX60	50.00	70.00	16.00	25.0	60.5	65.0
	PBN [1]	PV90FB/PX90	80.00	100.00	20.00	40.0	93.0	90.0
	PCN	PV23FE/PX23	38.10	66.68	9.52	25.4	57.5	65.0
	PDN	PV34FE/PX34	73.03	98.43	12.70	31.8	63.0	85.0
ETH080	**PBN**	PV90FB/PX90	80.00	100.00	20.00	40.0	101.5	90.0
	PJN	PV115FB/PX115	110.00	130.00	24.00	50.0	111.5	115.0
	PDN	PV34FE/PX34	73.03	98.43	12.70	31.8	92.5	98.0
	PEN	PV42FE/PX42	55.55	125.70	15.88	38.1	100.0	113.0

[1] Requires coupling housing on ETH050 with a square dimension of 80 mm to accommodate a larger coupling.
For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

* L1 = Length Coupling Housing + Flange
L2 = Maximum Motor or Gearhead Square Flange

Inline Mounts for Non-Standard Motors

Inline Mounting Compatible Motor Dimensions – mm



* L1 = Length Coupling Housing + Flange
L2 = Maximum Motor or Gearhead Square Flange

	Maximum Motor Shaft Ø	
Model	**With Key**	**Without Key**
ETH032	16	16
ETH050	24	24
ETH080	28	28

For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Couplers

Order Code	Coupler Size (Motor Shaft Ø)	Compatibility ETH032	ETH050	ETH080
A	No Coupler	•	•	•
B	0.25”	•	•	
C	0.375”	•	•	
D	0.5”	•	•	•
E	0.625”	•	•	•
H	6 mm	•	•	
J	8 mm	•	•	
K	9 mm	•	•	
L	11 mm	•	•	
M	14 mm	•	•	•
N [1]	16 mm	•	•	•
P [1]	19 mm		•	•
Q [1]	20 mm		•	•
R [1]	22 mm		•	•
S [1]	24 mm		•	•

[1] Requires coupling housing on ETH050 with a square dimension of 80 mm to accommodate a larger coupling.
For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Ordering Non-Standard Motor Mounts

Use the appropriate order codes from the charts to build the desired “Flange Only” or “Flange and Coupler” Kit Order Code. Note: all non-standard motor mount kits use three character descriptions beginning with an N, followed by a Coupler and a Flange designator.

Kit Order Code Designators: ① N ② ☐ ③ ☐

① **Non-standard motor mount**
② **Coupler order code**
③ **Flange order code**

Kit Order Code Examples	Kit Order Code
No flange, no coupler	NAA
Flange C (for ETH050), no coupler	NAC
Flange C (for ETH050), 0.5” coupler	NDC

Flanges

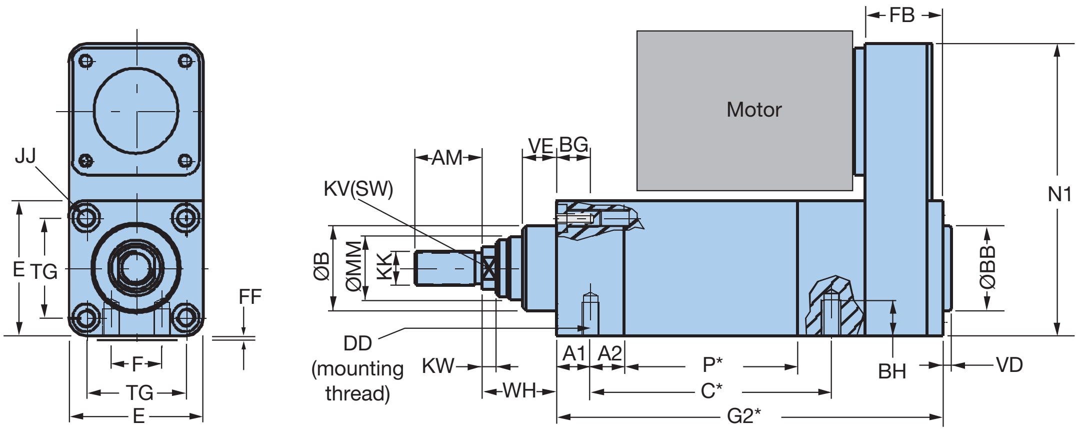
Dimensions — mm

Order Code	Bolt Circle	Bolt Hole	Pilot Ø	Pilot Depth	Motor Shaft Length	Compatibility ETH032 L1	ETH032 L2	ETH050 L1	ETH050 L2	ETH080 L1	ETH080 L2
A			No Flange			0.0		0.0		0.0	
B	46.00	M4	30.00	3.5	25.0	60.0	58.0	—	—	—	—
C	63.00	M5	40.00	3.5	20.0	60.0	58.0	57.5	65.0	—	—
D	70.00	M5	50.00	3.5	30.0	67.0	65.0	65.5	65.0	—	—
E	75.00	M5	60.00	3.5	23.0	60.0	70.0	59.0	70.0	—	—
F	75.00	M5	60.00	3.5	30.0	66.0	70.0	65.5	70.0	—	—
G	90.00	M6	70.00	3.5	40.0	—	—	84.0	96.0	92.5	96.0
H	95.00	M6	50.00	3.5	30.0	76.0	82.0	65.5	82.0	—	—
J	100.00	M6	80.00	3.5	40.0	76.0	89.0	84.0	96.0	94.5	96.0
K	115.00	M8	95.00	3.5	40.0	—	—	84.0	100.0	94.5	100.0
L	130.00	M8	110.00	3.5	50.0	—	—	—	—	104.5	115.0
M	130.00	M8	95.00	3.5	50.0	—	—	—	—	101.5	115.0

For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Electric Cylinders

Parallel Dimensions

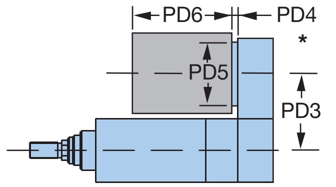


* Specified dimension + selected stroke

Cylinder Size		ETH032			ETH050			ETH080			ETH100		ETH125	
Screw Lead		M05	M10	M16	M05	M10	M20	M05	M10	M32	M10	M20	M10	M20
C	IP54	93.5	103.0	106.5	99.5	105.5	117.5	141.5	159.5	189.5	— [2]	— [2]	— [2]	— [2]
	IP65	94.5	103.5	107.5	100.5	106.5	118.5	142.5	160.5	190.5	— [2]	— [2]	— [2]	— [2]
G2	IP54	180.5	189.5	193.5	194.0	200.0	212.0	257.0	275.0	305.0	451.0	489.0	624.0	712.0
	IP65	228.5	237.5	241.5	239.0	245.0	257.0	320.0	338.0	368.0	478.0	516.0	651.0	739.0
P		66.0	75.0	79.0	67.0	73.0	85.0	89.0	107.0	137.0	162.0	200.0	192.0	280.0
A1	IP54	14.0			15.5			21.0			— [2]		— [2]	
	IP65	60.0			58.5			82.0			— [2]		— [2]	
A2		17.0			18.5			32			— [2]		— [2]	
AM		22.0			32.0			40.0			70.0		96.0	
BG		16.0			25.0			26.0			32.0		44.0	
BH		9.0			12.7			18.5			— [2]		— [2]	
DD		M6x1.0			M8x1.25			M12x1.75			— [2]		— [2]	
E		46.5			63.5			95.0			120.0		150.0	
F		16.0			24.0			30.0			— [2]		— [2]	
FF		0.5			0.5			1.0			0		0	
JJ		M6x1.0 [1]			M8x1.25			M10x1.5			M16x2		M20x2.5	
KK		M10x1.25			M16x1.5			M20x1.5			M42x2		M48x2	
KV		10.0			17.0			22.0			46.0		55.0	
ØMM		22.0			28.0			45.0			70.0		85.0	
TG		32.5			46.5			72.0			89.0		105.0	
KW		5.0			6.5			10.0			10.0		10.0	
N1		126.0			160.0			233.5			347.0		450.0	
FB	IP54	47.5			40.0			60.0			128.0		163.0	
	IP65	48.0			40.5			60.5			128.5		163.5	
VD		4.0			4.0			4.0			4.0		5.0	
ØBB		30.0			40.0			45.0			90.0		110.0	
VE		12.0			16.0			20.0			20.0		20.0	
WH		26.0			37.0			46.0			51.0		53.0	
ØB		30.0			40.0			60.0			90.0		110.0	

[1] Thru holes should have a minimum diameter of 7 mm on any component attached to the front threaded screw holes on bolt pattern TG.
[2] ETH100 & ETH125 do not have a mounting thread on the underside.
For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Parallel Mounts with Xpress Motors



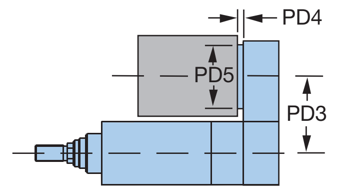
Flange & Coupling to Accept Xpress Motor **Dimensions — mm**

Cylinder Size	Xpress Order Code	Motor (w/Gearhead) Description	Pilot	Bolt Circle	Shaft Ø	Shaft Length	PD3	PD4	PD5	PD6
ETH032	XPC	BE233FJ-KPSN	38.10	66.68	9.52	31.8	67.5	78.5	62.0	145.0
	XPD	CM233FJ-115027	38.10	66.68	9.52	31.8	67.5	78.5	62.0	177.0
	XPG	BE344LJ-KPSN	73.03	98.43	12.70	30.2	67.5	78.5	80.0	188.0
	XPH	BE344LJ-KPSB	73.03	98.43	12.70	30.2	67.5	78.5	80.0	231.0
ETH050	XPC	BE233FJ-KPSN	38.10	66.68	9.52	31.8	87.5	78.5	62.0	145.0
	XPD	CM233FJ-115027	38.10	66.68	9.52	31.8	87.5	78.5	62.0	177.0
	XPG	BE344LJ-KPSN	73.03	98.43	12.70	30.2	87.5	84.0	90.0	188.0
	XPH	BE344LJ-KPSB	73.03	98.43	12.70	30.2	87.5	84.0	90.0	231.0
	XPL	MPP1003D1E-KPSN	95.00	115	19.00	40.0	87.5	92.5	100.0	175.0
	XPM	MPP1003D1E-KPSB	95.00	115	19.00	40.0	87.5	92.5	100.0	223.0
	XPN	MPP1003D1E-KPSN *	73.03	98.43	12.70	31.8	87.5	128.0	100.0	175.0
	XPP	MPP1003D1E-KPSB *	73.03	98.43	12.70	31.8	87.5	128.0	100.0	223.0
	XPQ	MPP1003R1E-KPSN	73.03	98.43	12.70	31.8	87.5	92.5	100.0	175.0
	XPR	MPP1003R1E-KPSB	73.03	98.43	12.70	31.8	87.5	92.5	100.0	223.0
	XPS	MPP1003R1E-KPSN *	73.03	98.43	12.70	31.8	87.5	128.0	100.0	175.0
	XPT	MPP1003R1E-KPSB *	73.03	98.43	12.70	31.8	87.5	128.0	100.0	223.0
ETH080	XPG	BE344LJ-KPSN	73.03	98.43	12.70	30.2	130.0	84.0	90.0	188.0
	XPH	BE344LJ-KPSB	73.03	98.43	12.70	30.2	130.0	84.0	90.0	231.0
	XPL	MPP1003D1E-KPSN	95.00	115.00	19.00	40.0	130.0	95.3	100.0	175.0
	XPM	MPP1003D1E-KPSB	95.00	115.00	19.00	40.0	130.0	95.3	100.0	223.0
	XPN	MPP1003D1E-KPSN **	73.03	98.43	12.70	31.8	130.0	137.0	100.0	175.0
	XPP	MPP1003D1E-KPSB **	73.03	98.43	12.70	31.8	130.0	137.0	100.0	223.0
	XPQ	MPP1003R1E-KPSN	95.00	115.00	19.00	40.0	130.0	95.3	100.0	175.0
	XPR	MPP1003R1E-KPSB	95.00	115.00	19.00	40.0	130.0	95.3	100.0	223.0
	XPS	MPP1003R1E-KPSN **	73.03	98.43	12.70	31.8	130.0	137.0	100.0	175.0
	XPT	MPP1003R1E-KPSB **	73.03	98.43	12.70	31.8	130.0	137.0	100.0	223.0
	XPU	MPP1154B1E-KPSN	110.00	130.00	24.00	50.0	130.0	127.0	115.0	203.0
	XPV	MPP1154B1E-KPSB	110.00	130.00	24.00	50.0	130.0	127.0	115.0	252.0
	XPW	MPP1154B1E-KPSN ***	110.00	130.00	24.00	50.0	130.0	170.0	115.0	203.0
	XPX	MPP1154B1E-KPSB ***	110.00	130.00	24.00	50.0	130.0	170.0	115.0	252.0
	XPY	MPP1154P1E-KPSN	110.00	130.00	24.00	50.0	130.0	127.0	115.0	203.0
	XPZ	MPP1154P1E-KPSB	110.00	130.00	24.00	50.0	130.0	127.0	115.0	252.0
	XP1	MPP1154P1E-KPSN ***	110.00	130.00	24.00	50.0	130.0	170.0	115.0	203.0
	XP2	MPP1154P1E-KPSB ***	110.00	130.00	24.00	50.0	130.0	170.0	115.0	252.0

* With Parker PV34FE-003 gearhead
** With Parker PV90FB-003 gearhead
*** With Parker PV115FB-003 gearhead
For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

* PD4 = Flange + Gearhead/overhung load adaptor
PD5 = Flange + Gearhead/overhung load adaptor
PD6 = Motor only

Electric Cylinders

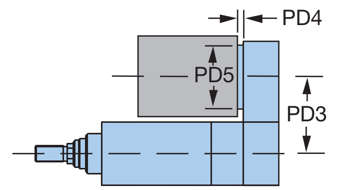


Parallel Mounts for other Parker Motors

Flange & Coupling to Accept Parker Motor **Dimensions — mm**

Cylinder Size	Kit Order Code	Parker Motor Description	Pilot	Bolt Circle	Shaft Ø	Shaft Length	PD3	PD4	PD5
ETH032	KCB	SM23X	38.10	66.68	9.52	20.8	67.5	72.5	62.0
	KBB	BE23X	38.10	66.68	9.52	31.8	67.5	78.5	62.0
	KCA	SM16/BE16	20.00	46.69	6.35	25.0	67.5	72.5	62.0
	KEA	LV23/HV23	38.10	66.68	6.35	20.8	67.5	72.5	62.0
	KBC	BE34X	73.03	98.43	12.70	30.2	67.5	78.5	80.0
	KEB	LV34/HV34	73.03	98.43	12.70	37.1	67.5	78.5	80.0
ETH050	KCB	SM23X	38.10	66.68	9.52	20.8	87.5	72.5	62.0
	KBB	BE23X	38.10	66.68	9.52	31.8	87.5	78.5	62.0
	KBC	BE34X	73.03	98.43	12.70	30.2	87.5	84.0	90.0
	KAA	MPP92/MPJ92	80.00	100	16.00	40.1	87.5	92.5	90.0
	KEB	LV34/HV34	73.03	98.43	12.70	37.1	87.5	92.5	90.0
	KAB	MPP100/MPJ100	95.00	115	19.00	40.1	87.5	92.5	100.0
ETH080	KBC	BE34X	73.03	98.43	12.70	30.2	130.0	87.0	90.0
	KAA	MPP92/MPJ92	80.00	100.00	16.00	40.1	130.0	96.0	90.0
	KAB	MPP100/MPJ100	95.00	115.00	19.00	40.0	130.0	96.0	100.0
	KAC	MPP115/MPJ115	110.00	130.00	24.00	50.0	130.0	127.0	115.0

For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.



Parallel Mounts for Parker Gearheads

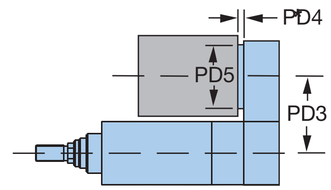
Flange & Coupling to Accept Parker Motor **Dimensions — mm**

Cylinder Size	Kit Order Code	Parker Gearhead Description	Pilot	Bolt Circle	Shaft Ø	Shaft Length	PD3	PD4	PD5
ETH032	PAN	PV60FB/PX60	50.00	70.00	16.00	25.0	67.5	12.0	62.0
ETH050	PAN	PV60FB/PX60	50.00	70.00	16.00	25.0	87.5	12.0	63.5
	PDN	PV34FE/PX34	73.03	98.43	12.70	31.8	87.5	15.0	90.0
ETH080	PBN	PV90FB/PX90	80.00	100.00	20.00	40.0	130.0	18.0	90.0
	PJN	PV115FB/PX115	110.00	130.00	24.00	50.0	130.0	20.0	115.0

For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

* PD4 = Flange + Gearheadoverhung load adaptor
PD5 = Flange + Geahead/overhung load adaptor
PD6 = Motor only

Parallel Mounts for Non-Standard Motors



* PD4 = Flange + Gearheadoverhung load adaptor
PD5 = Flange + Geahead/overhung load adaptor
PD6 = Motor only

Parallel Mounting Compatible Motor Dimensions - mm

Cylinder Size	Max. Shaft Ø With Key	Max. Shaft Ø Without Key	Max. Square Motor Flange
ETH032	—	14 (w/PV60 gearhead)	85
ETH050	—	20 (w/PV90 gearhead} or	100
ETH080	—	24 (w/PV115 gearhead}	150

For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Sleeves

Order Code	Sleeve Size (Motor Shaft Ø)	Compatibility ETH032	ETH050	ETH080
A	No Sleeve			
B	0.25”	•		
C	0.375”	•	•	
D	0.5”	•	•	
E	0.625”	•	•	
H	6 mm	•		
J	8 mm	•		
K	9 mm	•	•	
L	11 mm	•	•	
M	14 mm	•	•	•
N	16 mm		•	•
P	19 mm		•	•
Q	20 mm			•
R	22 mm			•
S	24 mm			•

For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Ordering Non-Standard Motor Mounts

Use the appropriate order codes from the charts to build the desired “Flange Only” or “Flange and Sleeve” Kit Order Code. Note: all non-standard motor mount kits use three character descriptions beginning with an N, followed by a Sleeve and a Flange designator.

Kit Order Code Designators: ① N ② [ ] ③ [ ]

① **Non-standard motor mount**
② **Sleeves order code**
③ **Flange order code**

Kit Order Code Examples	Kit Order Code
No flange, no sleeve	NAA
Flange C (for ETH050), no sleeve	NAC
Flange C (for ETH050), 0.5” sleeve	NDC

Flanges

Dimensions — mm

Order Code	Bolt Circle	Bolt Hole	Pilot Ø	Pilot Depth	Motor Shaft Length	ETH032 PD3	ETH032 PD4	ETH032 PD5	ETH050 PD3	ETH050 PD4	ETH050 PD5	ETH080 PD3	ETH080 PD4	ETH080 PD5
A	No Flange						0.0			0.0			0.0	
B	46.00	M4	30.00	3.5	25.0	67.5	72.5	62.0	—	—	—	—	—	—
C	63.00	M5	40.00	3.5	20.0	67.5	72.5	62.0	87.5	72.5	60.0	—	—	—
D	70.00	M5	50.00	3.5	30.0	67.5	78.5	62.0	87.5	78.5	63.5	—	—	—
E	75.00	M5	60.00	3.5	23.0	67.5	78.5	62.0	87.5	84.0	90.0	—	—	—
F	75.00	M5	60.00	3.5	30.0	67.5	72.5	62.0	87.5	84.0	90.0	—	—	—
G	90.00	M6	70.00	3.5	40.0	—	—	—	87.5	92.5	90.0	130.0	96.0	90.0
H	95.00	M5	50.00	3.5	30.0	67.5	78.5	82.0	87.5	84.0	90.0	—	—	—
J	100.00	M6	80.00	3.5	40.0	—	—	—	87.5	92.5	90.0	130.0	96.0	90.0
K	115.00	M8	95.00	3.5	40.0	—	—	—	87.5	92.5	100.0	130.0	96.0	100.0
L	130.00	M8	110.00	3.5	50.0	—	—	—	—	—	—	130.0	127.0	115.0
M	130.00	M8	95.00	3.5	50.0	—	—	—	—	—	—	130.0	116.0	115.0

For ETH100 and 125 sizes, please consult factory for motor and gearhead mounting options.

Electric Cylinders

How to use Speed Thrust Curves

Option 1: Xpress System Sizing

Parker offers pre-selected motor and motor/gearhead combinations to maximize the power output of each ETH frame size. This option is ideal for customer's working on time-sensitive applications and/or those that value the many benefits of a single-source solution.

To select the system solution, use the Speed/Thrust with Motors graphs in Specifications to locate the application's required linear velocity and thrust.

If the point lies within a green shaded region, and it is not to the right of the relevant critical speed line, then the application can be solved with the motor or motor/gearhead combination corresponding to the number in that region while still getting full rated life (2,540 Km).

If the point is in the yellow intermittent zone, then the actuator will experience a reduced life, in which case another screw lead or a larger profile size is recommended.

If the point falls above the solid blue line, then the application cannot be solved with that actuator profile size and lead combination when using a motor mounted in parallel.

Once a solution is found simply order the ETH with the correct Xpress motor code and pair with the recommended Compax3 drive and motor power and feedback cables from Limit Sensors in Options & Accessories 31 to complete the Xpress system.

Example:

For an application needing 1000 N thrust at 400 mm/sec velocity, both the XPG and XPH motor/gearhead combinations will solve the application. Note: the actuator stroke must be less than approximately 900 mm in order to reach the required speed.

Solution:

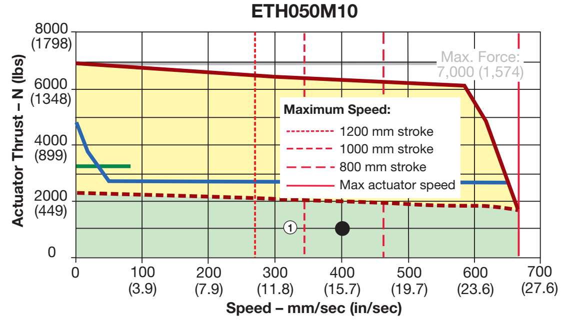
Cylinder: ETH050M10xxXPGxxxxxxxx
Servo motor: BE344LJ-KPSN
Drive: C3S100V2F12IxxTxxMxx
Cables: P-3B1-xx and F-2C1-xx

Performance Zones:

Motor Codes	Continuous Operation
	①
XPG (1)	•
XPH (2)	•

(1) Without brake (2) With brake
* In-line motor mount only

ETH050M10



Option 2: Hybrid Speed/Thrust Graphs

Back by popular demand, Parker has recreated the hybrid speed/thrust graphs for the new ETH Series actuators. These graphs are an ideal way to size an actuator for non-Xpress or third-party motors. These speed/thrust graphs plot linear velocity, linear thrust, required motor velocity, required motor torque, and critical speed.

To select a motor or motor/gearhead combination, use the graphs on the following pages to locate the application's required linear velocity and thrust on the graph.

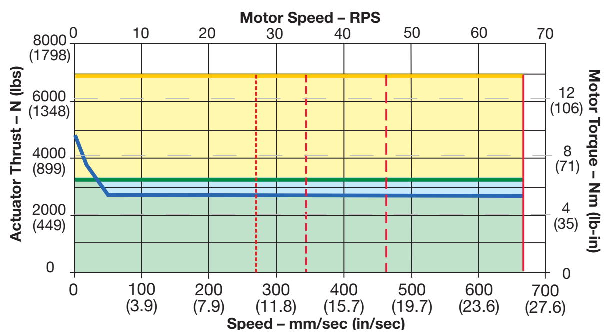
Once that point is determined, extend the lines to the secondary axes to determine the required motor torque and motor speed for the application.

Once the motor requirements are known, simply order the ETH with the proper Parker motor or gearhead mounting kits or use one of the non-standard mounting kit options.

Example:

For an application needing 1000 N thrust at 400 mm/sec linear velocity, and requiring a minimum life of 2,540 Km, the motor would have to be sized for 2 Nm of torque at 40 rps. Note: the actuator stroke must be less than approximately 900 mm to reach the required speed.

ETH050M10



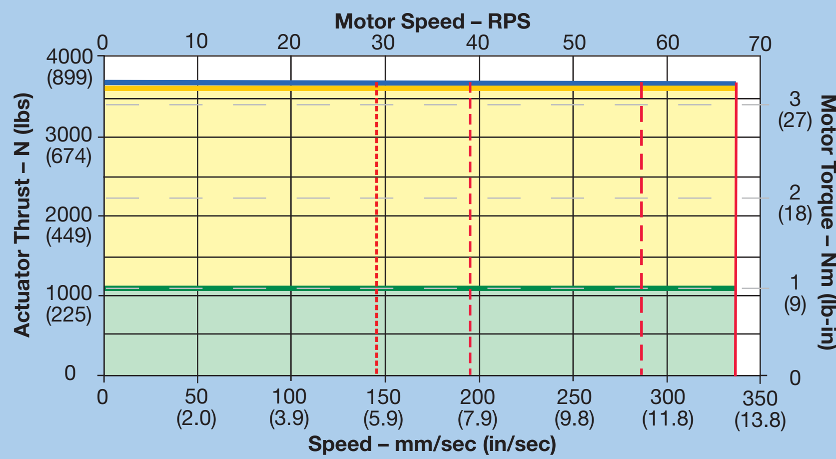
Option 3: Traditional Step-by-step Selection Process

For the most dynamic applications, or to double check critical application elements when using sizing options 1 and 2, the traditional step-by-step process (starting with Sizing/Selection Design Considerations), can be used to size the ETH cylinder.

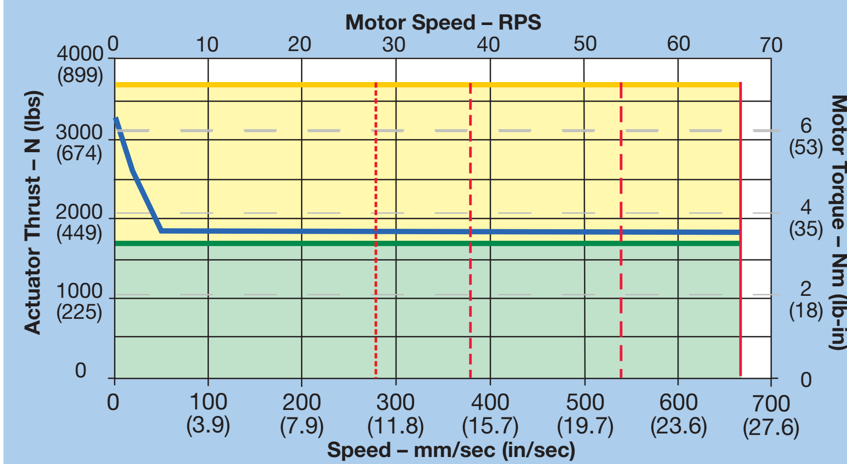
ETH032 Speed-Thrust

See graphs in Sizing & Selection for information on Speed-thrust with Motors.

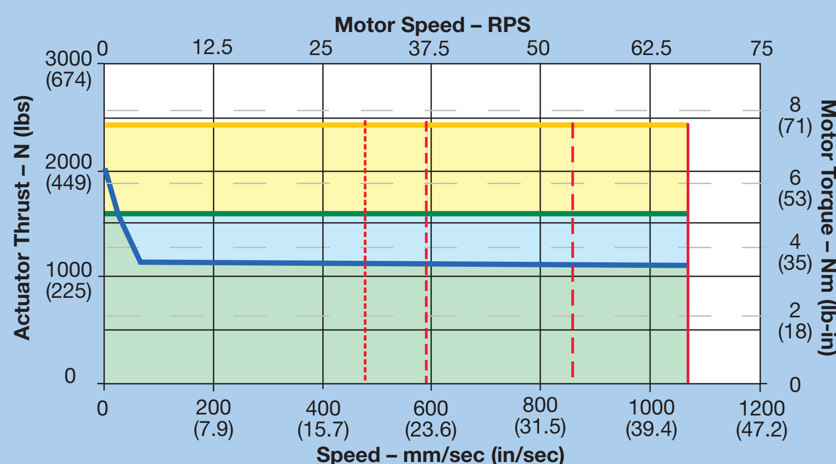
ETH032M05



ETH032M10



ETH032M16



Maximum Thrust*:

- Inline motor mount
- Parallel motor with timing belt limitation
- Max thrust at 2540 km of life (see page 45 for details)

Maximum Speed:

- 1000 mm stroke
- 800 mm stroke
- 600 mm stroke
- Max actuator speed

Performance Zones:

- Full life region (greater than 2540 km of life)
- Acceptable zone for Inline motor mounts only (motor mount option A or B)
- Intermittent zone (operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel limitation curve)

*Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load, for limitations on column buckling, please see page 43.

Electric Cylinders

ETH050 Speed-Thrust

Maximum Thrust*:

- Inline motor mount
- Parallel motor with timing belt limitation
- Max thrust at 2540 km of life (see page 45 for details)

Maximum Speed:

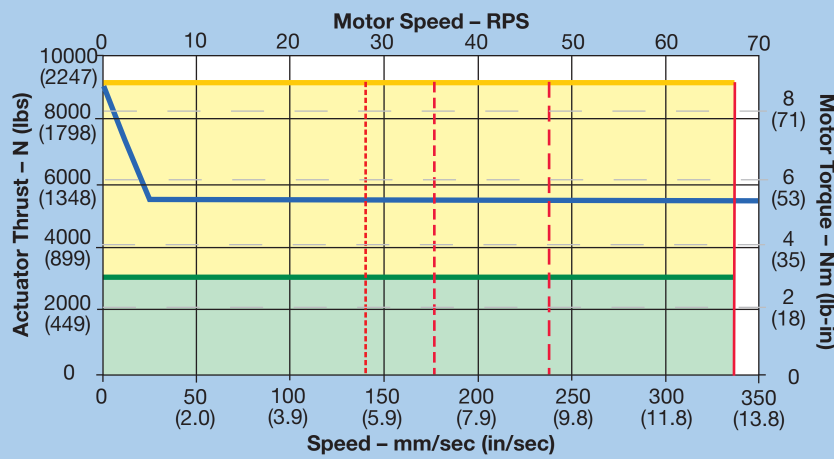
- 1200 mm stroke
- 1000 mm stroke
- 800 mm stroke
- Max actuator speed

Performance Zones:

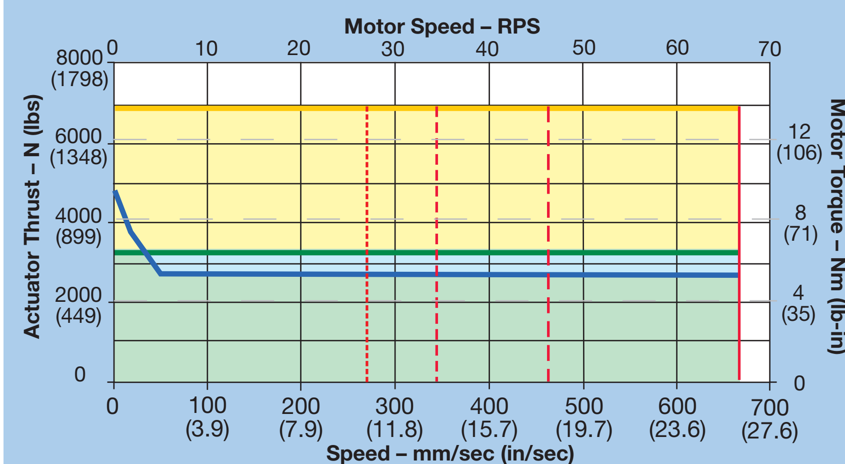
- Full life region (greater than 2540 km of life)
- Acceptable zone for Inline motor mounts only (motor mount option A or B)
- Intermittent zone (operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel limitation curve)

*Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load, for limitations on column buckling, please see page 43.

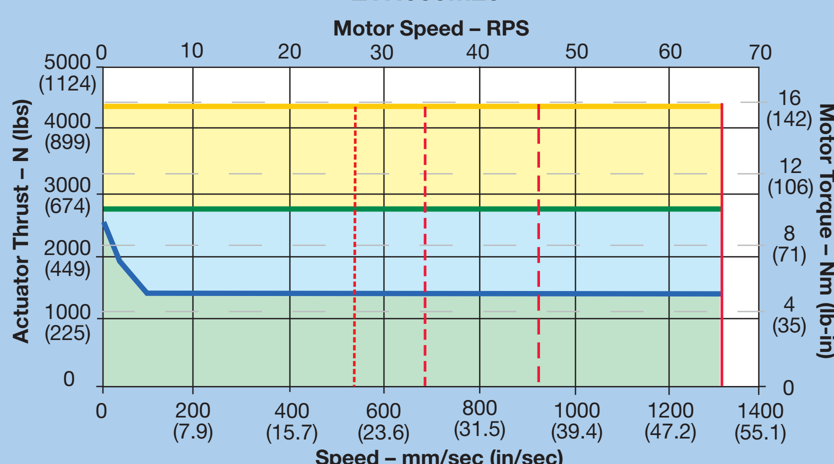
ETH050M05



ETH050M10



ETH050M20



ETH080 Speed-Thrust

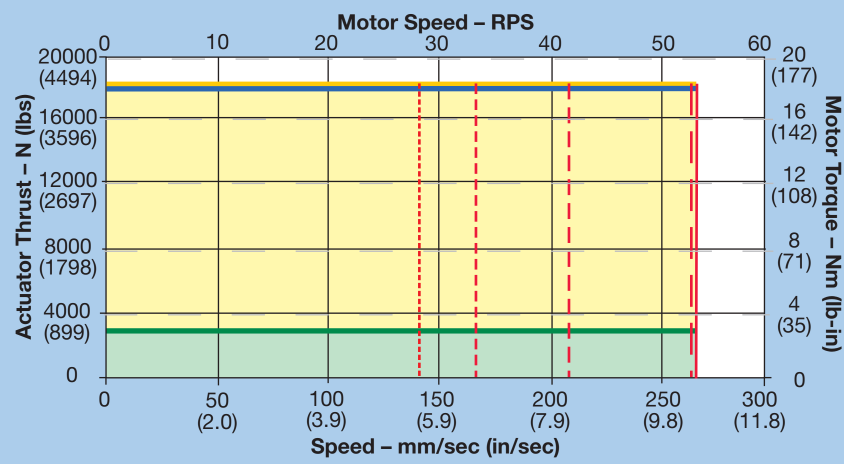
Maximum Thrust*:
- Inline motor mount
- Parallel motor with timing belt limitation
- Max thrust at 2540 km of life (see page 45 for details)

Maximum Speed:
- 1600 mm stroke
- 1400 mm stroke
- 1200 mm stroke
- 1000 mm stroke
- Max actuator speed

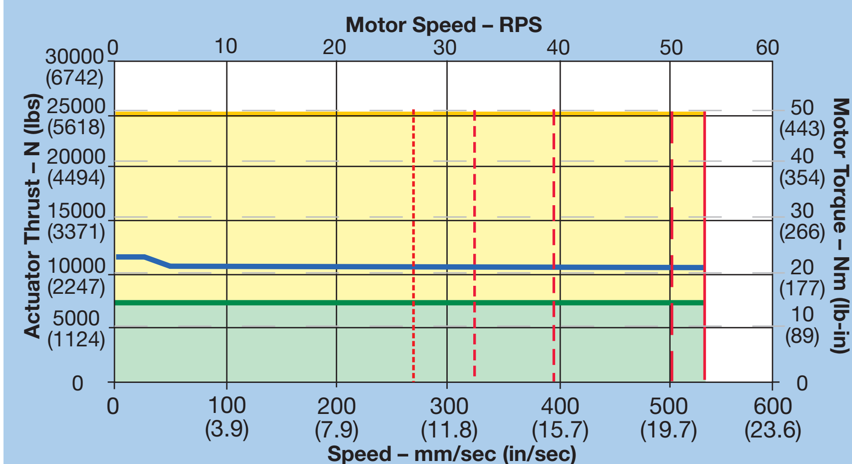
Performance Zones:
- Full life region (greater than 2540 km of life)
- Acceptable zone for Inline motor mounts only (motor mount option A or B)
- Intermittent zone (operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel limitation curve)

*Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load, for limitations on column buckling, please see page 43.

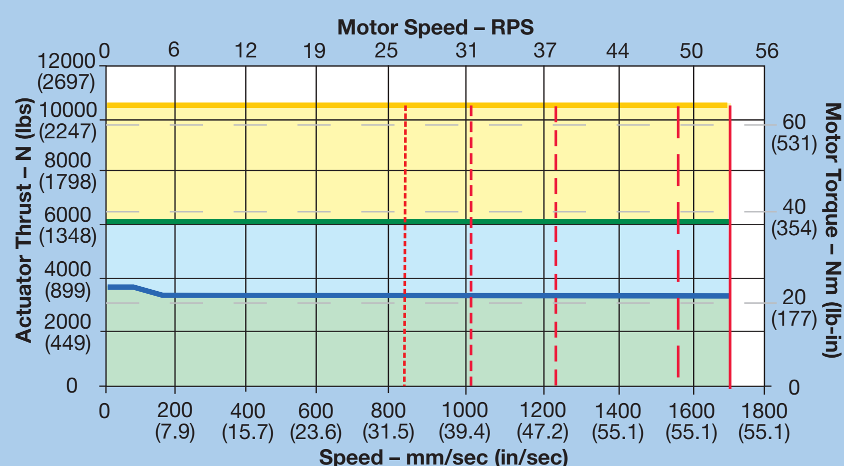
ETH080M05



ETH080M10



ETH080M32



Electric Cylinders

ETH100 Speed-Thrust

Maximum Thrust*:

- Inline motor mount
- Parallel motor with timing belt limitation
- Max thrust at 2540 km of life (see page 45 for details)

Maximum Speed:

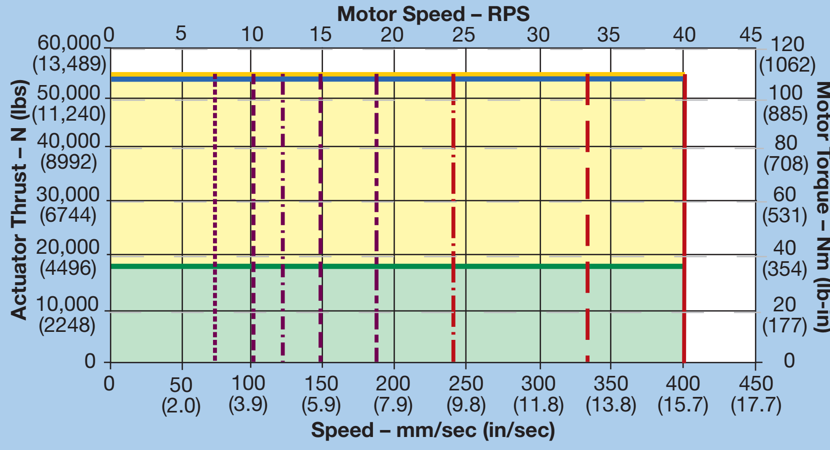
- 2000 mm stroke
- 1600 mm stroke
- 1400 mm stroke
- 1200 mm stroke
- 1000 mm stroke
- 800 mm stroke
- 600 mm stroke
- 500 mm stroke
- Max actuator speed

Performance Zones:

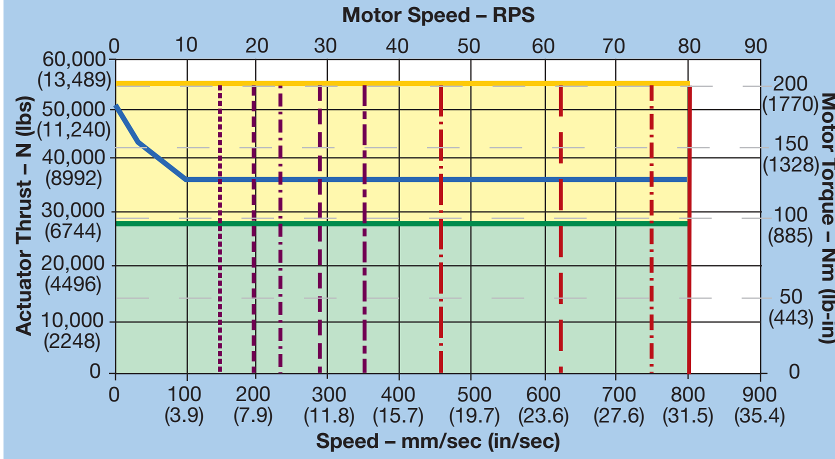
- Full life region (greater than 2540 km of life)
- Acceptable zone for Inline motor mounts only (motor mount option A or B)
- Intermittent zone (operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel limitation curve)

*Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load, for limitations on column buckling, please see page 43.

ETH100M10



ETH100M20

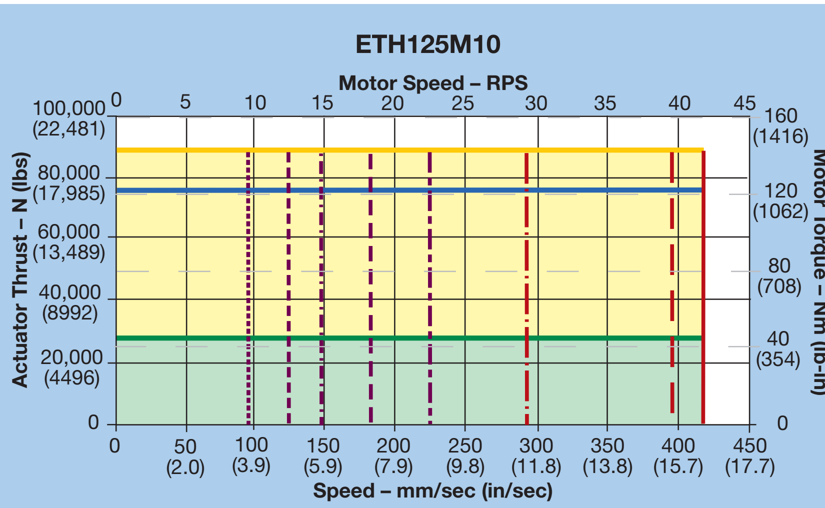


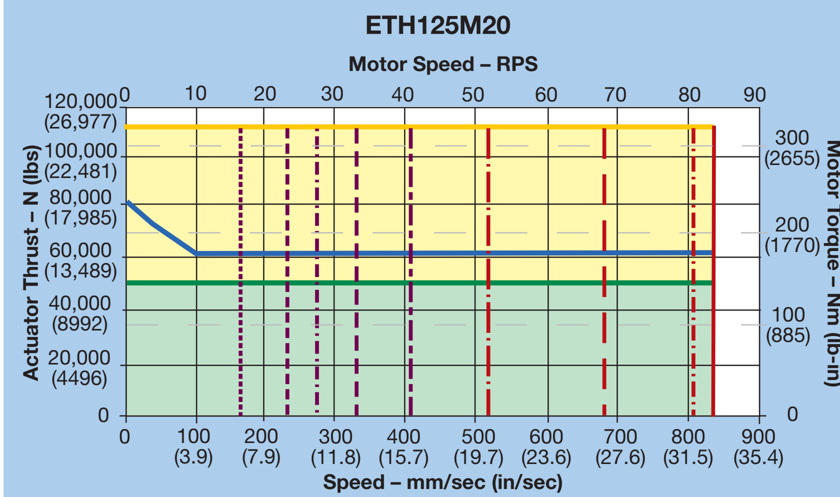
ETH125 Speed-Thrust

Maximum Thrust*:
- Inline motor mount
- Parallel motor with timing belt limitation
- Max thrust at 2540 km of life (see page 45 for details)

Maximum Speed:
- 2000 mm stroke
- 1600 mm stroke
- 1400 mm stroke
- 1200 mm stroke
- 1000 mm stroke
- 800 mm stroke
- 600 mm stroke
- 500 mm stroke
- Max actuator speed

Performance Zones:
- Full life region (greater than 2540 km of life)
- Acceptable zone for Inline motor mounts only (motor mount option A or B)
- Intermittent zone (operation will result in reduced life of the actuator and is not acceptable for parallel motor options if above the parallel limitation curve)





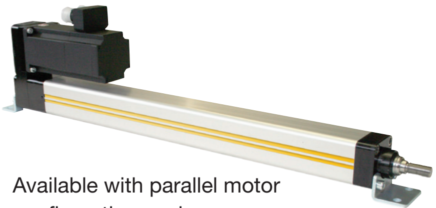
*Maximum thrust assumes a cylinder mounting orientation with a fixed mounting position and a guided load, for limitations on column buckling, please see page 43.

OPTIONS & ACCESSORIES

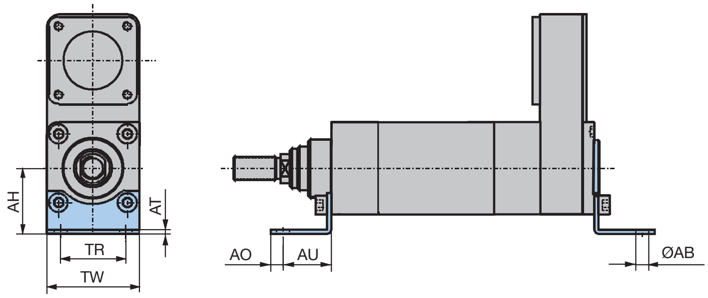
ETH Cylinder Mounting Options

Order
Code

B Foot Mount



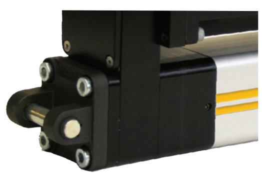
Available with parallel motor configurations only



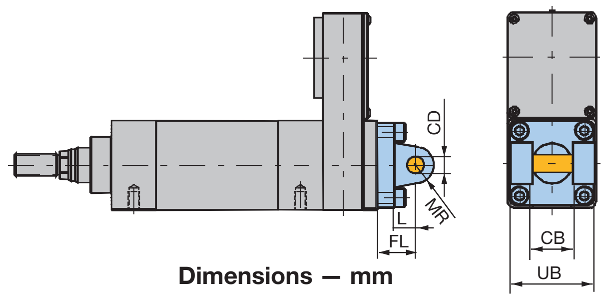
Size	Part Number* (1 piece each) Rear Bracket	Front Bracket	AH	AT	TR	ØAB (H14)	AO	AU	TW
			Dimensions — mm						
ETH032	0111.065		32	4	32	7.0	8	24	48
ETH050	0121.065		45	4	45	9.0	12	32	65
ETH080	0131.065-01	0131.065-02	63	6	63	13.5	15	41	95
ETH100	0142.916		94	14				164	
ETH125	0152.916		114	14				214	

* Use order code when ordering cylinder; use part number for ordering spare replacement parts

C Rear Clevis Mount



Available with parallel motor configurations only

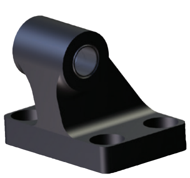


Dimensions — mm

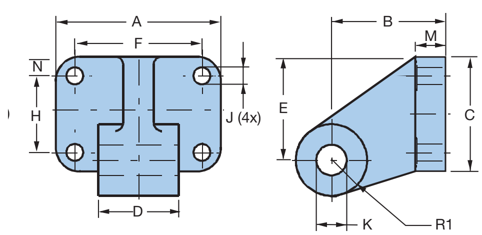
Size	Part Number*	UB (h13)	CB (H14)	ØCD (H9)	MR	L	FL ±0.2
ETH032	0112.031	46.5	26	10	9.5	13	22
ETH050	0122.031	63.5	32	12	12.5	16	27
ETH080	0132.031	95	50	16	17.5	22	36
ETH100	0142.031	120	60.5	30	100	40	65
ETH125	0152.031	150	70.5	50	145	55	90

* Use order code when ordering cylinder; use part number for ordering spare replacement parts

Optional Bearing Block



Mating mount bracket to rear clevis. Please order separately.



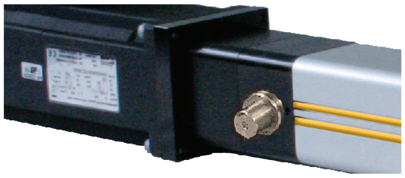
Images shown are for ETH32 and ETH50 units only. See product manuals for other ETH drawings. Dimensional specs in the table for the other units are accurate.

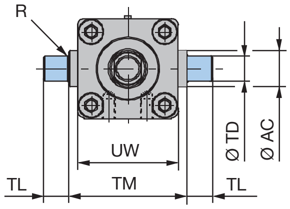
Dimensions — mm

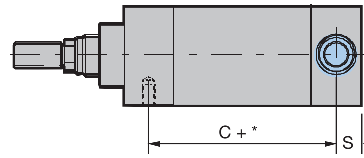
Cylinder Size	Part Number	Mounting Holes	A	B	C	D	E	F	H	H1	ØJ (H13)	ØK (H9)	M	N	R1
ETH032	0112.039	4	55	32	55	26	51.5	38	38	—	9	10	8	8.5	11.0
ETH050	0122.039	4	70	45	70	32	63.5	48	48	—	11	12	12	11	13.0
ETH080	0132.039	8	95	63	150	50	143.0	72	45	40	13	18	16	12.5	16.5
ETH100	0142.039	12	120	95	200	60	215.0					30	25	15	30.0
ETH125	0152.039	16	150	130	350	70	365.0					50	35	20	45.0

Order
Code

D Center Trunnion Mount







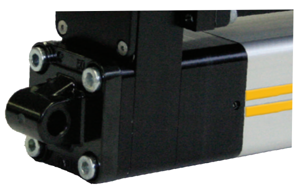
Factory installed. Cannot be ordered separately.

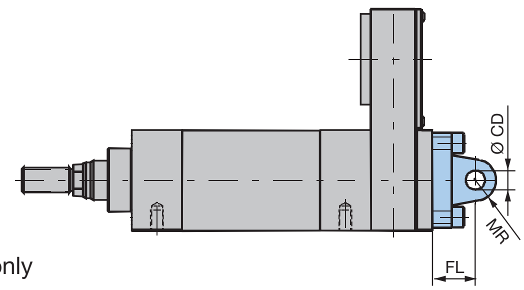
Dimensions — mm

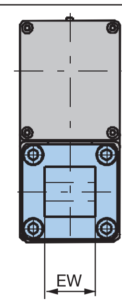
Cylinder Size	UW	ØTD**	R	TL	TM	ØAC	S
ETH032	46.5	12	1	12	50	18	25.5
ETH050	63.5	16	1	16	75	25	39
ETH080	95.3	25	2	25	110	35	34.5
ETH100	120	40	4	40	140	57	57
ETH125	150	50	10	52	160	90	100

* Dimension C+ = Dimension + length of desired stroke (see Stroke, Usable Stroke and Safety Travel in Sizing & Selection for calculating stroke)
**: ØTD in accordance with ISO tolerance zone h8
Note: For relubrication option "1" (Integrated lubrication port) please see mounting method with option "D" center trunnion always on 6 o'clock!

E Rear Eye Mount







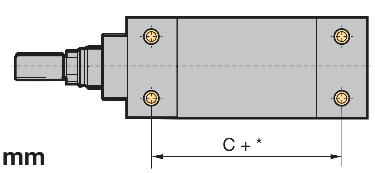
Available with parallel motor configurations only

Cylinder Size	Part Number*	EW	ØCD	MR (H9)	FL ±0.2
		Dimensions — mm			
ETH032	0112.033	26	10	11	22
ETH050	0122.033	32	12	13	27
ETH080	0132.033	50	16	17	36
ETH100	0142.033	60	30	35	80
ETH125	0152.033	70	50	45	115

* Use order code when ordering cylinder; use part number for ordering spare replacement parts

F Tapped Bottom Holes (Standard)

Mounting with 4 threaded holes on bottom of the cylinder.
Available ETH032 – ETH080 only.



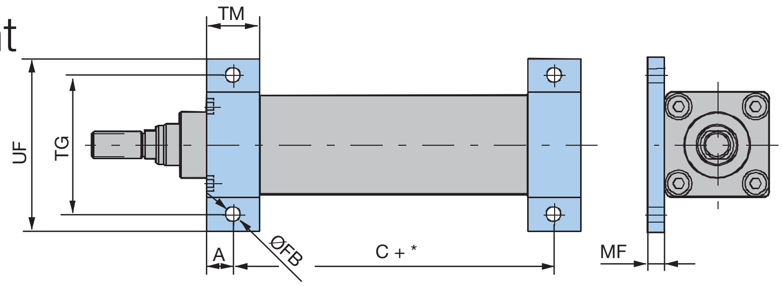
Dimension C + — mm

Cylinder Size		ETH032			ETH050			ETH080		
Screw Lead		**M05**	**M10**	**M16**	**M05**	**M10**	**M20**	**M05**	**M10**	**M32**
C + *	IP54	93.5	103.0	106.5	99.5	105.5	117.5	141.5	159.5	189.5
	IP65	94.5	103.5	107.5	100.5	106.5	118.5	142.5	160.5	190.5

* Dimension C+ = Dimension + length of desired stroke (see Stroke, Usable Stroke and Safety Travel in Sizing & Selection for calculating stroke)

Order Code

G Side Flange Mount

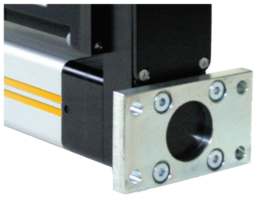


Flanges are stainless steel

Cylinder Size	Part Number**	Dimensions — mm					
		TG	UF	ØFB	TM	MF	A
ETH032	1440.079	62	78	6.6	25	8	12.5
ETH050	1441.093	84	104	9.0	30	10	15.0
ETH080	0131.078	120	144	13.5	40	12	20.0

* Dimension C+ = Dimension + length of desired stroke (see Stroke, Usable Stroke and Safety Travel in Sizing & Selection for calculating stroke)
** Use order code when ordering cylinder; use part number for ordering spare replacement parts (one piece per part number)

H Rear Plate Mount



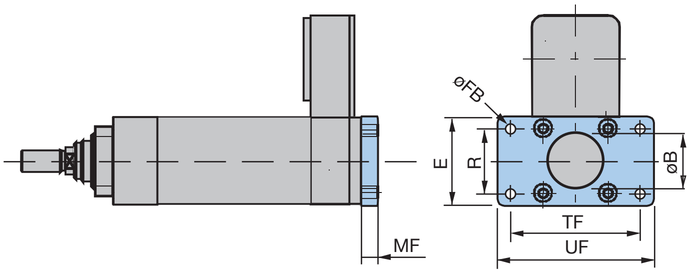


Plate is stainless steel

Cylinder Size	Part Number*	Dimensions — mm						
		MF	UF	TF	E	R	ØFB	ØB
ETH032	0111.064	10	80	64	48	32	7	30
ETH050	0121.064	12	110	90	65	45	9	40
ETH080	0131.064-01	16	150	126	95	63	12	45
ETH100	0142.918	25	258	220	120	80	17.5	90
ETH125	0152.918	40	320	270	150	100	21.5	110

* Use order code when ordering cylinder; use part number for ordering spare replacement parts (one piece per part number)

Order
Code

J Front Plate Mount

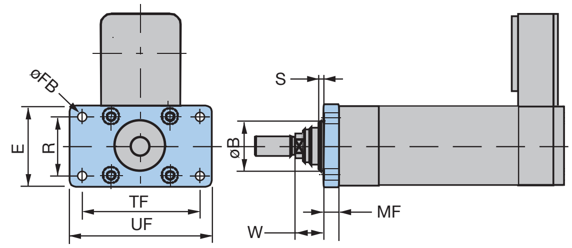
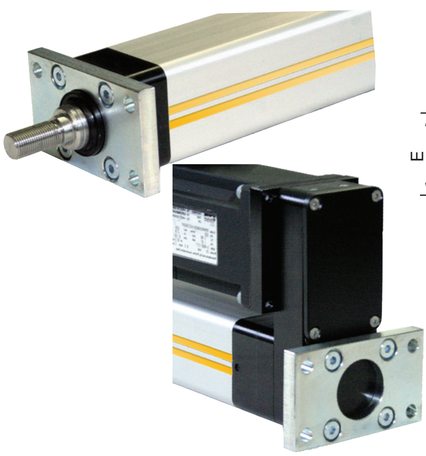


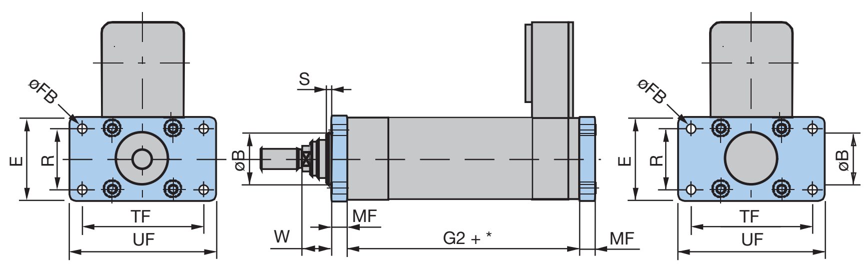
Plate is stainless steel

Cylinder Size	Part Number*	Dimensions — mm								
		S	W	MF	UF	TF	E	R	ØFB	ØB
ETH032	0111.064	2	16	10	80	64	48	32	7	30
ETH050	0121.064	4	25	12	110	90	65	45	9	40
ETH080	0131.064-02	4	30	16	150	126	95	63	12	60

* Use order code when ordering cylinder; use part number for ordering spare replacement parts (one piece per part number)

N Front & Rear Plate Mount





Plates are stainless steel

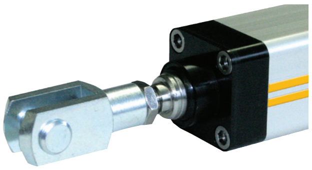
Cylinder Size	Part Number**		Dimensions — mm								
			S	W	MF	UF	TF	E	R	ØFB	ØB
ETH032	Front & Rear	0111.064	2	16	10	80	64	48	32	7	30
ETH050	Front & Rear	0121.064	4	25	12	110	90	65	45	9	40
ETH080	Front	0131.064-02	4	30	16	150	126	95	63	12	60
	Rear	0131.064-01									45
ETH100	Front & Rear	0142.918	-	26	25	258	220	120	80	17.5	90
ETH125	Front & Rear	0152.918	-	13	40	320	270	150	100	21.5	110

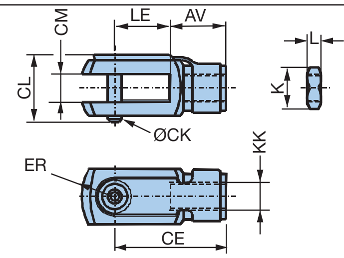
* Dimension G2+ (parallel) or G1+ (inline) = Dimension + length of desired stroke (see Stroke, Usable Stroke and Safety Travel in Sizing & Selection for calculating stroke)
** Use order code when ordering cylinder; use part number for ordering spare replacement parts (one piece per part number)

ETH Rod End Options

Order
Code

C Clevis Rod End

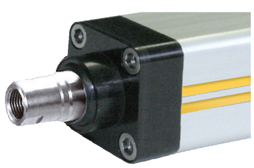


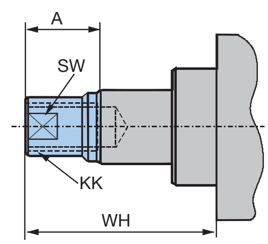


Cylinder Size	Part Number*	Mass [kg]	KK	CL	CM	LE	CE	AV	ER	ØCK (h11/E9)	K	L
			Dimensions — mm									
ETH032	4309	0.09	M10 x 1.25	26.0	10.2 +0.13/-0.05	20	40	20	14	10	17	5
ETH050	4312	0.34	M16 x 1.5	39.0	16.2 +0.13/-0.05	32	64	32	22	16	24	8
ETH080	4314	0.69	M20 x 1.5	52.5	20.1 +0.02/-0.0	40	80	40	30	20	30	10

*Use order code when ordering cylinder; use part number for ordering spare replacement parts (cylinder rod with male thread is required)

F Female Threaded Rod End

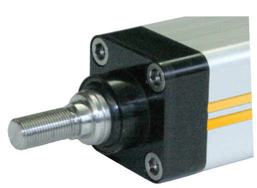


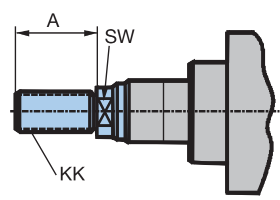


Cylinder Size	Part Number*	Mass [kg]	A	KK	WH	SW**
			Dimensions — mm			
ETH032	0111.029	0.04	14	M10 x 1.25	32	12
ETH050	0121.029	0.14	24	M16 x 1.5	50	20
ETH080	0131.029	0.42	29	M20 x 1.5	59	26

*Use order code when ordering cylinder; use part number for ordering spare replacement parts
** SW = width across flat (position of the flat is not fixed)

M Male Threaded Rod End



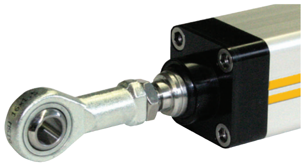


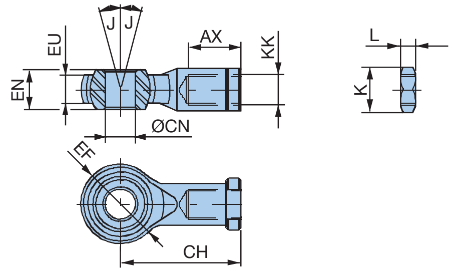
Cylinder Size	Part Number*	Mass [kg]	A	KK	SW**
			Dimensions — mm		
ETH032	0111.028	0.06	22	M10 x 1.25	10
ETH050	0121.028	0.15	32	M16 x 1.5	17
ETH080	0131.028	0.48	40	M20 x 1.5	22

*Use order code when ordering cylinder; use part number for ordering spare replacement parts
** SW = width across flat (position of the flat is not fixed)

Order
Code

S Spherical Rod End

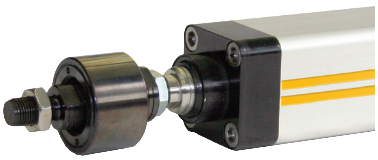




Cylinder Size	Part Number*	Mass [kg]	KK	ØCN (H9)	EN (h12)	EU	AX	CH	ØEF	J°	K	L
				Dimensions — mm								
ETH032	4078-10	0.07	M10 x 1.25	10	14	10.5	20	43	28	13	17	5
ETH050	4078-16	0.23	M16 x 1.5	16	21	15.0	28	64	42	15	24	8
ETH080	4078-20	0.41	M20 x 1.5	20	25	18.0	33	77	50	14	30	10

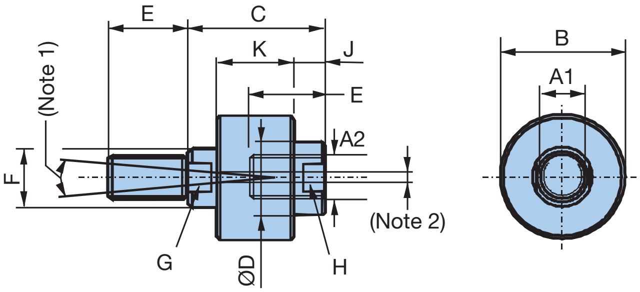
* Use order code when ordering cylinder; use part number for ordering spare replacement parts (cylinder rod with male thread is required)

L Alignment Coupler



The alignment coupler mounts on the end of the cylinder rod to:

- Balance misalignments
- Increase the mounting tolerance
- Simplify cylinder mounting
- Increase cylinder guide service life
- Compensate for offsets between components and relieves guides from lateral force influences
- Maintain traction/thrust force bearing capacity



(1) Angle offset ±5° from centerline (2) Axial offset: ±1.5 mm from centerline

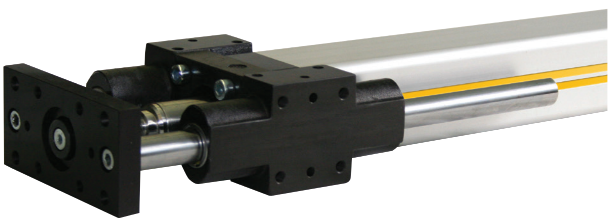
Cylinder Size	Part Number*	Mass [kg]	A1	A2	B	C	ØD	E	F	G	H	J	K
			Dimensions — mm										
ETH032	LC32-1010	0.26	M10x1.25	M10x1.25	40	51	19	19	16	13	16	13	26
ETH050	LC50-1616	0.64	M16x1.5	M16x1.5	54	59	32	29	25	22	29	14	33
ETH080	LC80-2020	1.30	M20x1.5	M20x1.5	54	59	32	29	25	22	29	14	33

*Use order code when ordering cylinder; use part number for ordering spare replacement parts (cylinder rod with male thread is required)

Electric Cylinders

Order
Code

R Linear Guide Module



Linear Guide Module offers:
- Anti-rotation control for higher torques
- Absorption of lateral forces

Additional stability and precision is achieved by:
- 2 hardened stainless steel guiding rods
- 4 linear ball bearings

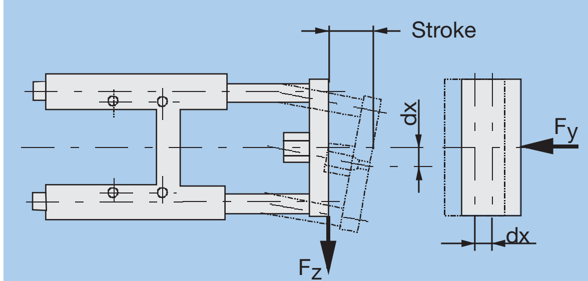
Not available with IP65 models

Linear Guide Module Specifications

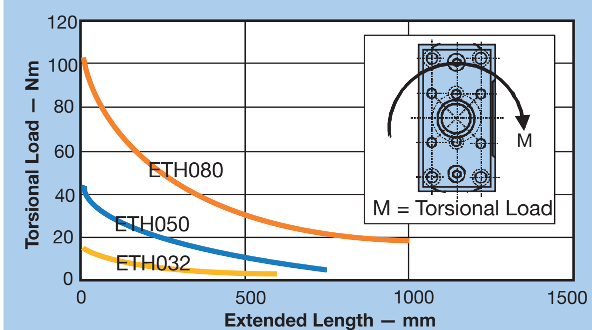
Cylinder Size	Part Number*	Total Mass (w/Zero Stroke) [kg]	Moving Mass (w/Zero Stroke) [kg]	Additional Mass [kg/m]
ETH032	32-2800R-xxxx	0.97	0.60	1.78
ETH050	50-2800R-xxxx	2.56	1.84	4.93
ETH080	80-2800R-xxxx	6.53	4.36	7.71

*Use order code when ordering cylinder; use part number for ordering spare replacement parts replacing xxxx with the desired stroke length. For example, order 50-2800R-0200 for 200 mm stroke. (Be sure to specify the same stroke as ordered on the matching ETH cylinder.)

Deflection*



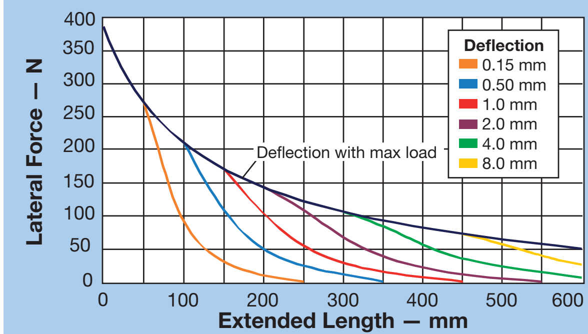
dx: Deflection valid for F_y and F_z



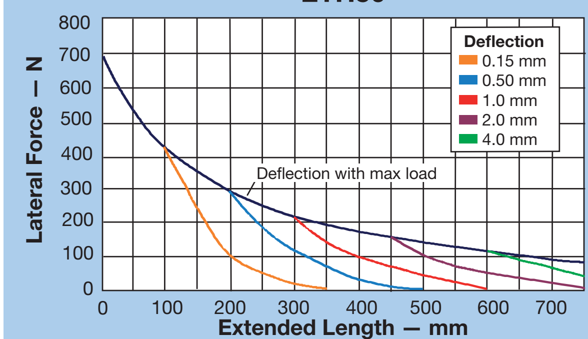
* Deflection curves represent cylinders mounted in any orientation

Cylinder Rigidity with Linear Guide Module

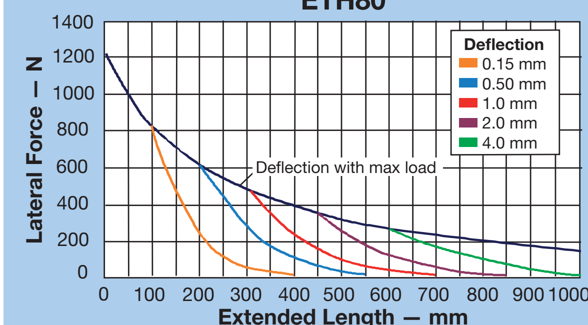
ETH32



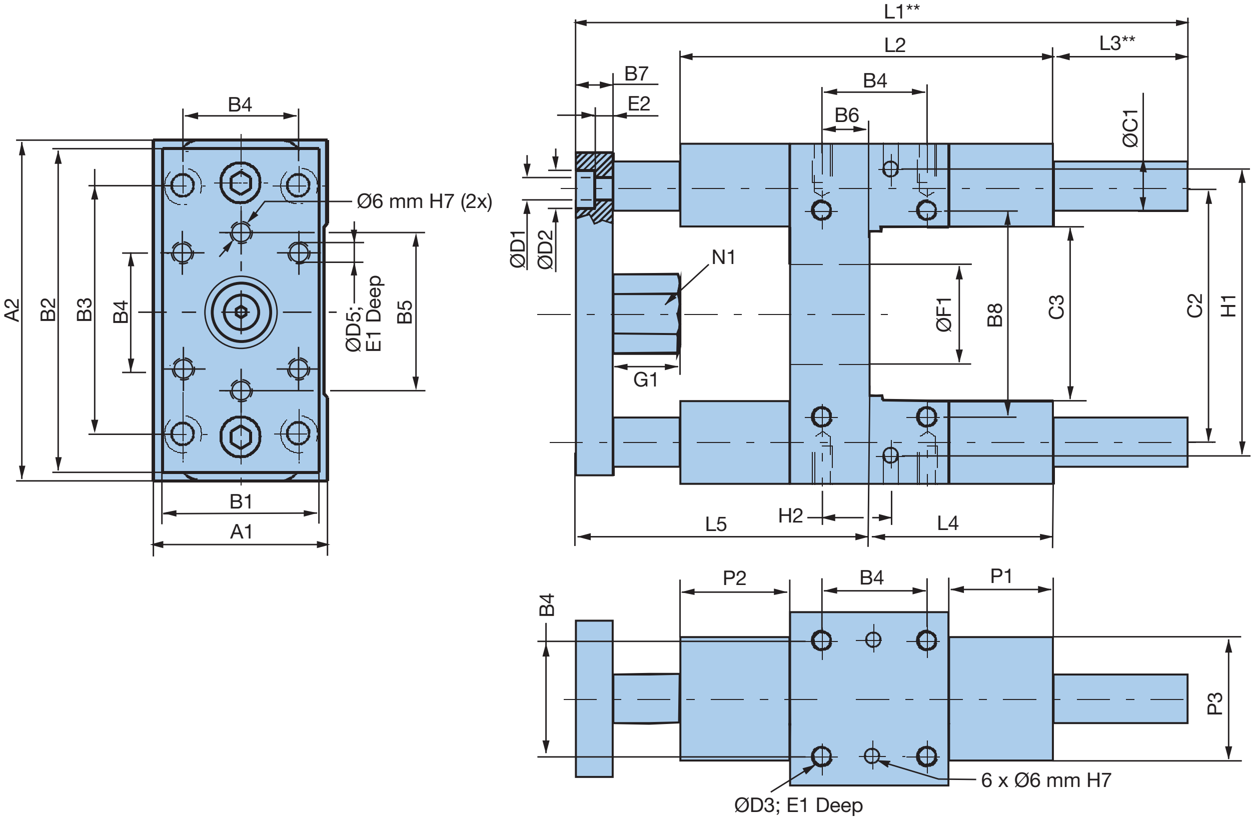
ETH50



ETH80



Linear Guide Module Dimensions



Dimensions — mm

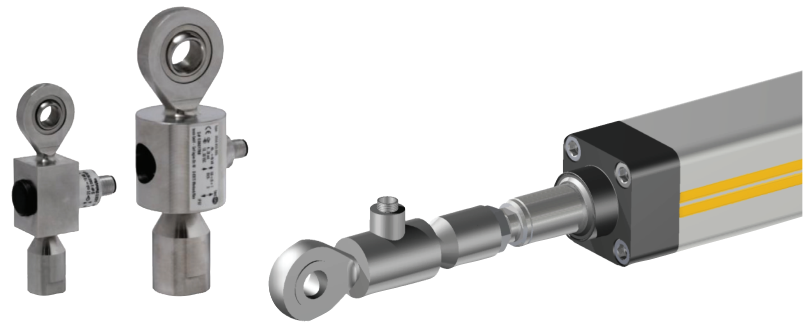
Part Number	A1	A2	B1	B2	B3	B4	B5	B6	B7	B8
32-2800R-xxxx	50.0	97.0	45.0	90.0	78.0	32.5	50.0	4.0	12.0	61.0
50-2800R-xxxx	70.0	137.0	63.0	130.0	100.0	46.5	72.0	19.0	15.0	85.0
80-2800R-xxxx	105.0	189.0	100.0	180.0	130.0	72.0	106.0	21.0	20.0	130.0

Part Number	ØC1	C2	C3	ØD1	ØD2	ØD3	E1 (Depth)	E2 (Depth)	ØF1	G1
32-2800R-xxxx	12.0	73.5	50.0	6.6	11.0	M6 x 1.00	12.0	7.25	30.0	17.0
50-2800R-xxxx	20.0	103.5	70.0	8.4	15.0	M8 x 1.25	16.0	9.25	40.0	27.0
80-2800R-xxxx	25.0	147.0	105.0	10.5	18.0	M10 x 1.50	20.0	11.25	60.0	32.0

Part Number	H1	H2	L1+*	L2	L3+*	L4	L5	N1 **	P1	P2	P3
32-2800R-xxxx	81.0	16.0	152.0	120.0	17.0	71.0	64.0	17.0	36.0	31.0	40.0
50-2800R-xxxx	119.0	23.0	193.0	150.0	25.0	79.0	89.0	24.0	42.0	44.0	50.0
80-2800R-xxxx	166.0	36.0	253.0	200.0	30.0	113.0	110.0	30.0	50.0	52.0	70.0

* L1+ and L3+ = Dimension + length of desired stroke (see see Stroke, Usable Stroke and Safety Travel in Sizing & Selection for calculating stroke)
** N1: Hexagon head; Linear guide module not available on IP65 models

Force Sensor Rod End



Jointed swivel head design with integrated force sensor

Swivel heads are important construction components with respect to rotary, pivoting and tilting movements. Force measurements are more and more frequently required in those applications.

The force transducers are suitable for direct mounting on the cylinder rod. They can, for example, be used to measure contact forces or overloads.

Thanks to thin film technology, the swivel head force transducers are very robust and long time stable. An integrated amplifier emits an output signal of 4 - 20 mA.

The sensors correspond to the EN 61326 standard for electromagnetic compatibility (EMC) and are sense both thrust and traction forces.

Requires male thread rod end option "M", see Plate Mounts in Options & Accessories 22.

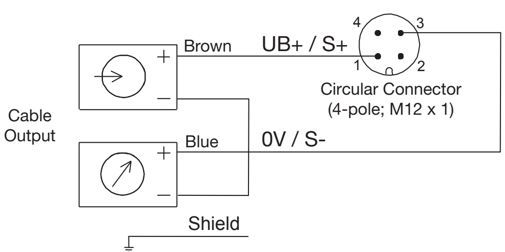
Features

- **Measuring range: traction/ thrust forces up to ±25 kN**
- **Thin film implants (instead of conventional bonded foil strain gauges)**
- **Corrosion resistant stainless steel version**
- **Integrated amplifier**
- **Small temperature drift**
- **High long term stability**
- **High shock and vibration resistance**
- **For dynamic or static measurements**
- **Good repeatability**
- **Simple mounting**

	ETH032		ETH050			ETH080			ETH100	ETH125	
	M05/M10	M16	M05	M10	M20	M05	M10	M32	M10/M20	M10	M20
Part Number	0111.916	0111.917	0121.916	0121.917	0121.918	0131.916	0131.917	0131.918	0131.918	0131.918	0131.918
Accuracy – %	2								1	1	1
Material	Stainless steel										
Protection class	IP67										
Calibration – kN	±3.7	±2.4	±9.3	±7.0	±4.4	±17.8	±25.1	±10.6	±56	±88.7	±114.0
Accuracy – N	14.8	9.6	37.2	28.0	17.6	71.2	100.4	42.4	1120	1774	2280

Electrical Connection

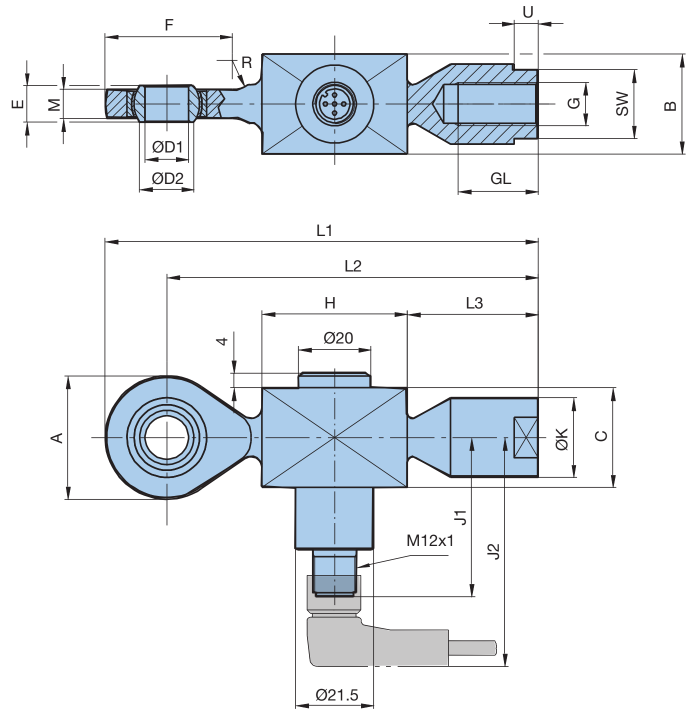
Analog output 4...20 mA (two-wire technology)



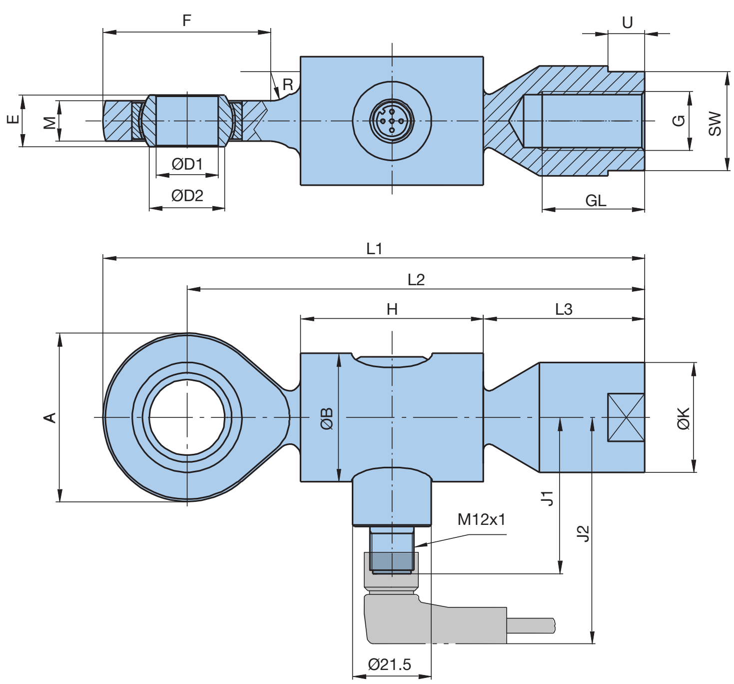
Force Sensor Cables

Part Number	Description
080-900456	2M sensor cable, 90 degree (symbol) angled connector, M12 to flying leads
080-900457	5M sensor cable, 90 degree (symbol) angled connector, M12 to flying leads

Force Sensor Rod End for ETH032



Force Sensor Rod End for ETH050 & ETH080



Dimensions — mm

Cylinder Size	A	B	ØB	C	ØD1	ØD2 0.008	E	F	G	GL	H	J1	J2	ØK	L1	L2	L3	M	SW*	U
ETH032	34	27	—	27	12	15	10	35	M10x1.25	22	40	44	63	22	119	102	36	8	19	8
ETH050	46	—	35	—	17	20.7	14	46	M16x1.5	28	50	43	62	30	148	125	44	11	27	12
ETH080	53	—	54	—	20	24.2	16	54	M20x1.5	33	54	44	63	35	171	144.5	54	13	32	13

*SW = width across flat

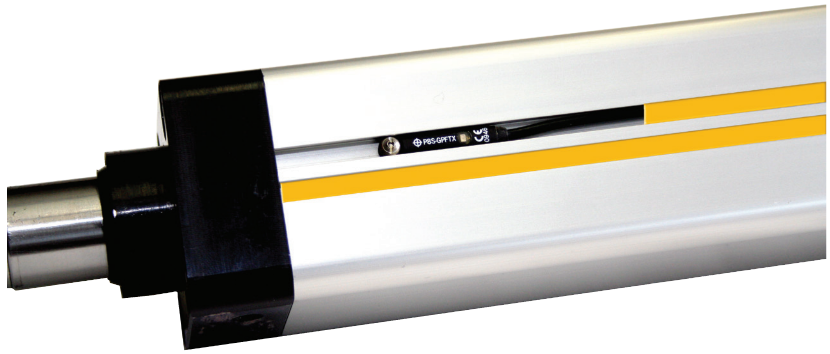
Electric Cylinders

Limit Sensors

The ETH uses the Parker Global Sensor which can be mounted in the longitudinal grooves running along the cylinder body. These new sensors mount flush to the extrusion body, minimizing the overall width of the actuator.

The sensor cable can be concealed under the yellow T-slot covers which are provided with each unit.

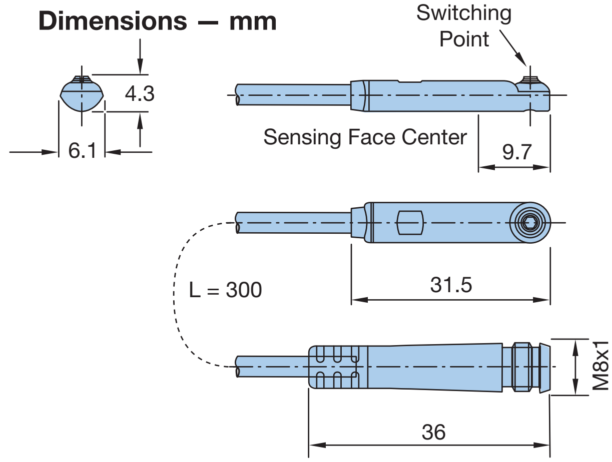
Permanent magnets integrated into the screw nut actuate the sensors as the rod extends and retracts.



ETH032 and ETH050 sizes have two grooves on opposite sides of the cylinder; the ETH080 has two grooves on all four sides of the cylinder.

Note: Only PNP logic sensors are compatible with Compax3.

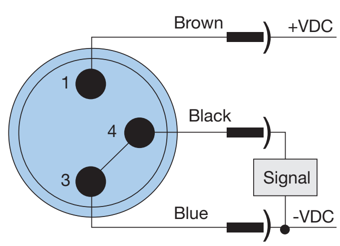
Dimensions — mm



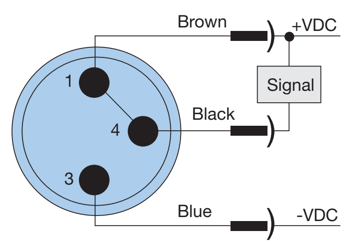
Common Specifications:

Electric current drain: 100 mA (max)
Switching current: 10 mA (max)
Supply voltage: 10 – 30 VDC
Switching Frequency: 5 kHz

PNP Wiring



NPN Wiring



Magnetic LED Cylinder Sensors

Model Number	Function	Logic	Cable	Compatible w/ Compax3
P8S-GPFAX	N.O.	PNP	3 m	Yes
P8S-GNFAX		NPN		No
P8S-GPCHX		PNP	0.3 m cable with M8 connector*	Yes
P8S-GNCHX		NPN		No
P8S-GQFAX	N.C.	PNP	3 m	Yes
P8S-GMFAX		NPN		No
P8S-GQCHX		PNP	0.3 m cable with M8 connector*	Yes
P8S-GMCHX		NPN		No

* 003-2918-01 is a 5 m extension cable to flying leads for these cables

ORDERING INFORMATION
ETH Series

Fill in an order code from each of the numbered fields to create a complete ETH model order code. Refer to the section listed for further details.

	①	②	③	④	⑤	⑥	⑦	⑧		⑨	⑩	
Order Example:	ETH	032	M05	A	2	XPC	B	C	N	0200	C	B

① **Series**
ETH

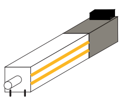
② **Frame Size**
(see "Performance by Cylinder Size and Screw Lead" chart and graphs in Specifications)

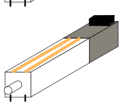
032	ISO32 cylinder size
050	ISO50 cylinder size
080	ISO80 cylinder size
100	ISO100 cylinder size
125	ISO125 cylinder size

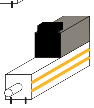
③ **Drive Screw**
(see "Performance by Cylinder Size and Screw Lead" chart in Specifications)

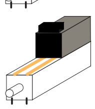
M05	5 mm metric ballscrew
M10	10 mm metric ballscrew
M16	16 mm metric ballscrew (size ETH032 only)
M20	20 mm metric ballscrew (size ETH050 only)
M32	32 mm metric ballscrew (size ETH080 only)

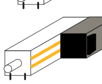
④ **Motor Mount/Cylinder Orientation**

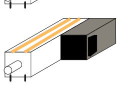
A  Inline w/groove for Initiator 3 & 9 o'clock

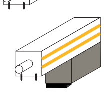
B  Inline w/groove for Initiator 6 & 12 o'clock

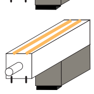
C  Parallel 12 o'clock w/groove for Initiator 3 & 9 o'clock

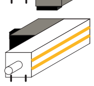
D  Parallel 12 o'clock w/groove for Initiator 6 & 12 o'clock

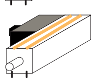
E  Parallel 3 o'clock w/groove for Initiator 3 & 9 o'clock*

F  Parallel 3 o'clock w/groove for Initiator 6 & 12 o'clock*

G  Parallel 6 o'clock w/groove for Initiator 3 & 9 o'clock

H  Parallel 6 o'clock / groove for Initiator 6 & 12 o'clock

J  Parallel 9 o'clock / groove for Initiator 3 & 9 o'clock

K  Parallel 9 o'clock w/groove for Initiator 6 & 12 o'clock

*When ordered with a lubrication bore option (item 5, order code 3), check to make sure the motor/gearbox length does not block the lubrication port option. This will be an issue for shorter strokes.

⑤ **Lubrication Bore Option**
(see Relubrication Section for details in Sizing & Selection)

1	Integrated lubrication port*
2	Lubrication hole at center of extrusion 12 o´clock
3	Lubrication hole at center of extrusion 3 o´clock
4	Lubrication hole at center of extrusion 6 o´clock
5	Lubrication hole at center of extrusion 9 o´clock

* Not available with Motor Mount/Cylinder Orientation with 3 o'clock orientation (order codes E and F)

⑥ **Motor Mounting Configurations**
Motor-specific mounting configurations are categorized into four primary groups:

"XP": With Parker Xpress motor systems (listed below)

"K": Flange & coupling kits for other Parker motor

"P": Flange & coupling kits for Parker Gearheads

"N": Kits for Non standard motors

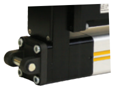
(Refer to Dimensions for appropriate order codes and mounting specifications for available inline and parallel motor mounting configurations)

Parker Xpress Motor Systems		ETH032	ETH050	ETH080
XPC	BE233FJ-KPSN	•	•	
XPD	CM233FJ-115027	•	•	
XPG	BE344LJ-KPSN	•	•	•
XPH	BE344LJ-KPSB	•	•	•
XPL	MPP1003D1E-KPSN		•	•
XPM	MPP1003D1E-KPSB		•	•
XPN	MPP1003D1E-KPSN *		•	•
XPP	MPP1003D1E-KPSB *		•	•
XPQ	MPP1003R1E-KPSN		•	•
XPR	MPP1003R1E-KPSB		•	•
XPS	MPP1003R1E-KPSN *		•	•
XPT	MPP1003R1E-KPSB *		•	•
XPU	MPP1154B1E-KPSN			•
XPV	MPP1154B1E-KPSB			•
XPW	MPP1154B1E-KPSN **			•
XPX	MPP1154B1E-KPSB **			•
XPY	MPP1154P1E-KPSN			•
XPZ	MPP1154P1E-KPSB			•
XP1	MPP1154P1E-KPSN **			•
XP2	MPP1154P1E-KPSB **			•

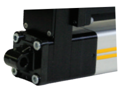
* With PV34FE-003 gearhead on all inline and parallel sizes <u>except size ETH080 parallel</u> which comes with PV90FB-003
** With PV115FB-003 gearhead

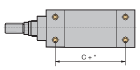
⑦ Cylinder Mounting Options
(see Options & Accessories for details)

B  Foot mount

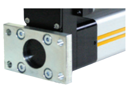
C  Rear clevis

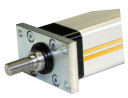
D  Center trunnion

E  Rear eye

F  Bottom tapped (standard)

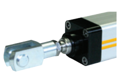
G  Side flange mount

H  Rear flange plate

J  Front flange plate

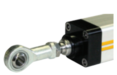
N Front and rear flange plates (combining H and J options

⑧ Rod End Mounting Options
(see Options & Accessories for details)

C  Clevis

F  Female thread

M  Male thread

S  Spherical rod end

L  Alignment coupler

R  Linear guide module

⑨ Stroke
For fastest delivery please choose a standard stroke length from the chart below. (See page 43 “Stroke, Usable Stoke and Safety Travel” to calculate appropriate stroke length.)

=32023Custom Lengths

	ETH032	ETH050	ETH080	ETH100	ETH125
XXXX	50 – 1000	50 – 1200	50 – 1600	200 – 1600	200 – 1600

(Customized length in 1 mm increments)

Standard Lengths

	ETH032	ETH050	ETH080	ETH100	ETH125
0050	•	•			
0100	•	•	•		
0150	•	•	•		
0200	•	•	•	•	•
0300	•	•	•	•	•
0400	•	•	•	•	•
0600	•	•	•	•	•
0900		•	•		
1000	•				•
1200		•	•	•	•
1600			•	•	•

⑩ IP Rating
A IP54 with galvanized steel hardware
B IP54 with stainless steel hardware
C IP65 epoxy coated cylinder

Free sizing and selection support from Virtual Engineer at parker.com/VirtualEngineer