Electromechanical Solutions for ATEX Environments

Explosion-Proof Servo Motors and Electro Cylinder
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## Electromechanical Solutions for ATEX Environments

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Parker Hannifin

The global leader in motion and control technologies

A world class player on a local stage

Global Product Design
Parker Hannifin has more than 40 years experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

Local Application Expertise
Parker has local engineering resources committed to adapting and applying our current products and technologies to best fit our customers’ needs.

Manufacturing to Meet Our Customers’ Needs
Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker’s manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers’ expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia.

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Europe
Littlehampton, United Kingdom
Dijon, France
Offenburg, Germany
Filderstadt, Germany
Milan, Italy

Asia
Wuxi, China
Chennai, India

North America
Rohnert Park, California
Irwin, Pennsylvania
Charlotte, North Carolina
New Ulm, Minnesota

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Parker provides sales assistance and local technical support through a network of dedicated sales teams and authorized technical distributors throughout Europe.

For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com
Electromechanical Solutions for ATEX Environments

Overview

In working in environments which might be at risk from explosive substances the EU ATEX directives must be taken into consideration. The responsible parties must assess the area, where explosive gas/dust mixes may occur and, if necessary, subdivide them into individual zones. This zone classification allows the responsible parties correct selection of suitable machinery and equipment, for use in that area. The table below describes the zone classifications of an installation, where potentially explosive atmospheres may occur.

<table>
<thead>
<tr>
<th>User</th>
<th>Suitable machinery and devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas zone</td>
<td>Dust zone</td>
</tr>
<tr>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>Occasionally approx. 10...1000 h/year</td>
</tr>
<tr>
<td>2</td>
<td>Rarely, for a short period, in the event of an error approx. &lt;10 h/year</td>
</tr>
<tr>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

* Equipment for use in areas (except underground in mining) which might be dangerous due to an explosive atmosphere.

ATEX Classification

Parker ETH – Electro Cylinders with the ATEX version are certified for use in explosive gas atmospheres (device group II, category 2G).

An ETH electro cylinder with the ATEX supplement complies with the requirements of the EC directive 94/9/EC (ATEX 95). You can find here an explanation of the features and areas of usage resulting from the ATEX marking:

EX Series is a range of permanent magnet servo motors designed for use in explosive atmospheres and are CE marked in accordance with ATEX directive 94/9/CE.

ETH032 & ETH050: II 2G c IIC T4

<table>
<thead>
<tr>
<th>Equipment group</th>
<th>Equipment category</th>
<th>Area of application (not mining)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>all areas, except underground (mining)</td>
<td></td>
</tr>
<tr>
<td>2G</td>
<td>Zone 1, 2, gas explosion category II 2G, 3G</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>constructional safety in accordance with DIN EN 13463-5</td>
<td></td>
</tr>
<tr>
<td>IIC</td>
<td>Suitable for explosive region IIA, IIB and IIC</td>
<td></td>
</tr>
<tr>
<td>Typical gases: Hydrogen</td>
<td>Ignition energy: &gt;45 μJoule</td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>Temperature class 4</td>
<td></td>
</tr>
<tr>
<td>Ignition temperature of flammable substances &gt;135 °C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ETH080, ETH100 & ETH125: II 2G c IIB T4

<table>
<thead>
<tr>
<th>Equipment group</th>
<th>Equipment category</th>
<th>Area of application (not mining)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>all areas, except underground (mining)</td>
<td></td>
</tr>
<tr>
<td>2G</td>
<td>Zone 1, 2, gas explosion category II 2G, 3G</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>constructional safety in accordance with DIN EN 13463-5</td>
<td></td>
</tr>
<tr>
<td>IIB</td>
<td>Suitable for explosive region IIA and IIB</td>
<td></td>
</tr>
<tr>
<td>Typical gases: Ethylene</td>
<td>Ignition energy: &gt;160 μJoule</td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>Temperature class 4</td>
<td></td>
</tr>
<tr>
<td>Ignition temperature of flammable substances &gt;135 °C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Serie EX: Gaseous atmospheres: II 2G Ex d IIB T4 IP64

<table>
<thead>
<tr>
<th>Equipment group</th>
<th>Equipment category</th>
<th>Area of application (not mining)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>all areas, except underground (mining)</td>
<td></td>
</tr>
<tr>
<td>2G</td>
<td>Zone 1, 2, gas explosion category II 2G, 3G</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>Flameproof enclosure DIN EN 13463-3</td>
<td></td>
</tr>
<tr>
<td>IIB</td>
<td>Suitable for explosive region IIA and IIB</td>
<td></td>
</tr>
<tr>
<td>Typical gases: Ethylene</td>
<td>Ignition energy: &gt;160 μJoule</td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>Temperature class 4</td>
<td></td>
</tr>
<tr>
<td>Ignition temperature of flammable substances &gt;135 °C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Electromechanical Solutions for ATEX Environments**

**Product Design**

**Ball screw**
A high-quality precision class 7 ball screw in accordance with ISO 3408 is used. The ball bearings between screw and nut ensure a low frictional resistance. This ensures an especially smooth operation over the entire speed range, high service life and excellent efficiency.

**Screw support bearing (front end)**
The front screw support bearing is supported by a polymer sliding bearing. This eliminates vibration and run-out. The result is quieter, smoother motion with better precision, longer screw life, and increased dynamic performance.

**Piston Rod Anti-rotation Guidance**
One of the unique design changes in the ETH is a new anti-rotation device. The high quality, maintenance free polymer bushing offers robust guidance preventing the piston rod from twisting as the rod extends and retracts.

**Extruded cylinder body**
The extrusion design reduces the number of slots or grooves for a cleaner overall design. The only slots are there for sensor mounting and are easily covered to eliminate any area for debris to be trapped. The result is a cleaner, more environmentally friendly design.

**Toothed belt transmission**
The slip and wear free toothed belt transmission for parallel drive cylinders (motor mounted parallel to the cylinder) features a high efficiency and a transmission ratio of 1:1.

**Sensors**
The sensors are directly integrated into the profile; avoiding projecting edges. Cabling is neatly hidden under the yellow cover (fitting sensors available as accessories).

**Easy Lubrication Port**
The integrated lubrication fitting allows quick, simple and easy access to regrease the ball screw. In the event the rear is inaccessible the port can be located in the center of the extrusion (optional) The result is reduced down time for product maintenance yielding a higher ROI and a longer product life.

**Piston Rod Support Bearing & Protection**
The extra long cylinder rod bearing allows high lateral load forces. A wiper ring prevents the ingress of external contamination under normal conditions. In the event of fine dust, a high amount of dirt as well as muds and liquids, special sealing is required, which is available on request.

**Screw Support Bearing (motor end)**
A double stacked set of angular contact bearings allows for high thrust forces in both the extend and retract directions. The result is a design with high force density and minimal clearance when changing directions of motion.

**Permanent magnet**
All electro cylinders are equipped with several permanent magnets integrated into the screw nut. The permanent magnets actuate the sensors, which can be mounted in the longitudinal grooves of the cylinder body.

**Belt tensioning device**
A sophisticated belt tensioning device for parallel motor mounting allows the toothed belt to be pre tensioned precisely.
High Force Electro Thrust Cylinder - ETH

Overview

Description
The ETH electro cylinder closes the gap between pneumatic and hydraulic actuators; it is suitable to replace those in many applications and simultaneously increase the reliability of the production process. Taking the costs for air and oil into consideration, you will find that in most cases an electromechanical system such as the ETH electro cylinder offers the more economical solution. Combined with a wide choice of accessories, it offers many possibilities in a wide variety of fields.

Typical areas of application
• Material handling and feed systems
  • wood and plastic working industry
  • vertical actuators for loading machine tools
  • in the textile industry for tensioning / gripping textile fabrics
  • in the automotive industry for transporting and feeding components
• Testing equipment and laboratory applications
• Valve and flap actuation
• Pressing
• Packaging machinery
• Process automation in the food and beverage industry

Features
• Unrivaled power density - high forces and small frame sizes
• Cabling can be concealed in the profile
• Accessories with integrated force sensors help to allot and even to control forces precisely
• Optimized for safe handling and simple cleaning
• High service life
• Reduced maintenance costs thanks to lubricating access in the cylinder flange
• Easy replacement due to pneumatic ISO flange norm (DIN ISO 15552:2005-12) conformity
• Integrated anti-rotation device
• Reduced noise emission
• All from one source

We offer the complete drive train: Drive controllers, motors and gearboxes to match the Electro Cylinder

Technical Characteristics - Overview

<table>
<thead>
<tr>
<th>Type</th>
<th>ETH Electro Cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame sizes</td>
<td>ETH032 / ETH050 / ETH080 / ETH100 / ETH125</td>
</tr>
<tr>
<td>Screw lead</td>
<td>5, 10, 16, 20, 32 mm</td>
</tr>
<tr>
<td>Stroke</td>
<td>up to 2000 mm</td>
</tr>
<tr>
<td>Traction/thrust force</td>
<td>up to 114 000 N</td>
</tr>
<tr>
<td>Speed</td>
<td>up to 1.7 m/s</td>
</tr>
<tr>
<td>Acceleration</td>
<td>up to 15 m/s²</td>
</tr>
<tr>
<td>Equivalent dynamic</td>
<td>up to 49 600 N</td>
</tr>
<tr>
<td>axial force at a lifetime of 2500 km</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>up to 90 %</td>
</tr>
<tr>
<td>Repeatability</td>
<td>up to 0.03 mm</td>
</tr>
<tr>
<td>Protection classes</td>
<td>IP54, IP65</td>
</tr>
<tr>
<td>Drive</td>
<td>Inline: Axial drive or parallel drive with high performance toothed belt</td>
</tr>
<tr>
<td>Directives</td>
<td>2011/65/EC: Conform to RoHS</td>
</tr>
<tr>
<td></td>
<td>94/9/EC: ATEX</td>
</tr>
<tr>
<td></td>
<td>Equipment group II Category 2</td>
</tr>
<tr>
<td></td>
<td>Suitable for gas environments of Zone 1 or 2</td>
</tr>
<tr>
<td>Classification</td>
<td>ETH032 / ETH050: II 2G c IIC T4</td>
</tr>
<tr>
<td></td>
<td>ETH080 / ETH100, ETH125: II 2G c IIB T4</td>
</tr>
</tbody>
</table>
### Technical Characteristics

#### Cylinder size type

<table>
<thead>
<tr>
<th>Unit</th>
<th>ETH032</th>
<th>ETH050</th>
<th>ETH080</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH032</td>
<td>M05</td>
<td>M10</td>
<td>M16</td>
</tr>
<tr>
<td>ETH050</td>
<td>M05</td>
<td>M10</td>
<td>M20</td>
</tr>
<tr>
<td>ETH080</td>
<td>M05</td>
<td>M10</td>
<td>M32</td>
</tr>
</tbody>
</table>

- **Screw lead [mm]**: 5, 10, 16
- **Screw diameter [mm]**: 16, 20, 32

### Travels, speeds and accelerations

#### Available strokes

<table>
<thead>
<tr>
<th>[mm]</th>
<th>continuous from 50-1000 &amp; standard strokes</th>
<th>continuous from 50-1200 &amp; standard strokes</th>
<th>continuous from 50-1600 &amp; standard strokes</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-400 mm [mm/s]</td>
<td>333 667 1067</td>
<td>333 667 1333</td>
<td>267 533 1707</td>
</tr>
<tr>
<td>600 mm [mm/s]</td>
<td>286 540 855</td>
<td>333 666 1318</td>
<td>267 533 1707</td>
</tr>
<tr>
<td>800 mm [mm/s]</td>
<td>196 373 592</td>
<td>238 462 917</td>
<td>267 533 1707</td>
</tr>
<tr>
<td>1000 mm [mm/s]</td>
<td>146 277 440</td>
<td>177 345 684</td>
<td>264 501 1561</td>
</tr>
<tr>
<td>1200 mm [mm/s]</td>
<td>- - -</td>
<td>139 270 536</td>
<td>207 394 1233</td>
</tr>
<tr>
<td>1400 mm [mm/s]</td>
<td>- - -</td>
<td>- - -</td>
<td>168 320 1006</td>
</tr>
<tr>
<td>1600 mm [mm/s]</td>
<td>- - -</td>
<td>- - -</td>
<td>140 267 841</td>
</tr>
</tbody>
</table>

#### Max. permissible speed at stroke =

- **50-400 mm [mm/s]**: 333, 667, 1067
- **600 mm [mm/s]**: 286, 540, 855
- **800 mm [mm/s]**: 196, 373, 592
- **1000 mm [mm/s]**: 146, 277, 440
- **1200 mm [mm/s]**: -
- **1400 mm [mm/s]**: -
- **1600 mm [mm/s]**: -

### Forces

#### Max. axial traction/thrust force motor inline [N]

| n < 100 min⁻¹ | 3600 |
| n > 100 < 300 min⁻¹ | 2620 |
| n > 300 min⁻¹ | 1820 |

#### Max. axial traction/thrust force depending on the motor speed n

- **Motor parallel**
  - 3.5 5.2 7.7 7.7 (n < 100 min⁻¹)
  - 3.5 3.6 5.4 5.4 (n > 300 min⁻¹)

#### Equivalent dynamic axial force at a lifetime of 2500 km [N]

| 1130 |

### Max. transmissible torque / force constant

| Max. transmissible torque inline motor [Nm] | 3.2 6.5 6.8 8.2 12.4 15.6 15.7 44.4 60.0 |
| Max. transmissible torque depending on the motor speed n [Nm] | 3.5 6.4 9.1 9.3 17.5 22.8 |
| Motor parallel [Nm] | 3.5 3.6 5.4 5.4 17.5 21.1 |

### Mass

| Mass of base unit with zero stroke (incl. Cylinder rod) [kg] | 1.2 1.2 1.3 2.2 2.3 2.5 6.9 7.6 8.7 |
| Mass of additional stroke (incl. Cylinder rod) [kg/m] | 4.8 |
| Weight of cylinder rod with zero stroke [kg] | 0.06 |
| Weight of cylinder rod - additional length [kg/m] | 0.99 |

### Mass moments of inertia

| Motor parallel without stroke [kg.mm²/m] | 8.3 8.8 14.1 30.3 30.6 38.0 215.2 213.6 301.9 |
| Motor inline without stroke [kg.mm²/m] | 7.1 7.6 12.9 25.3 25.7 33.1 166.2 164.5 252.9 |
| Parallel.inline motor per meter [kg.mm²/m²] | 41.3 37.6 41.5 97.7 92.4 106.4 527.7 470.0 585.4 |

### Accuracy: Bidirectional Repeatability (ISO230-2)

| Motor inline [mm] | ±0.03 |
| Motor parallel [mm] | ±0.05 |

### Efficiency

| Motor inline | the efficiency includes all friction torques [%] | 90 |
| Motor parallel | [%] | 81 |

### Ambient conditions

| Operating Temperature [°C] | -10...+70 |
| Ambient temperature [°C] | -10...+40 |
| Storage temperature [°C] | -20...+40 |
| Humidity [%] | 0...95 % (non-condensing) |
| Location height range [m] | max. 3000 |

1) "Order Code" (see ETH catalogue), 2) Intermediate stroke lengths may be interpolated.
3) ATEX on request
4) ATEX not available, 5) The efficiency factors are included in the force constants.
### Electromechanical Solutions for ATEX Environments

#### Technical Characteristics

Technical Data apply under normal conditions and only for the individual operating and load modes. In the case of compound loads, it is necessary to verify in accordance with normal physical laws and technical standards whether individual ratings should be reduced. In case of doubt please contact Parker.

<table>
<thead>
<tr>
<th>Cylinder size type</th>
<th>Unit</th>
<th>ETH100</th>
<th>ETH125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw lead</td>
<td>[mm]</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Screw diameter</td>
<td>[mm]</td>
<td>50</td>
<td>63</td>
</tr>
</tbody>
</table>

### Travels, speeds and accelerations

<table>
<thead>
<tr>
<th>Available strokes</th>
<th>[mm]</th>
<th>continuous from 100-2000 &amp; standard strokes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. permissible speed at stroke =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-200 mm</td>
<td>[mm/s]</td>
<td>400</td>
</tr>
<tr>
<td>500 mm</td>
<td>[mm/s]</td>
<td>400</td>
</tr>
<tr>
<td>600 mm</td>
<td>[mm/s]</td>
<td>333</td>
</tr>
<tr>
<td>800 mm</td>
<td>[mm/s]</td>
<td>241</td>
</tr>
<tr>
<td>1000 mm</td>
<td>[mm/s]</td>
<td>185</td>
</tr>
<tr>
<td>1200 mm</td>
<td>[mm/s]</td>
<td>148</td>
</tr>
<tr>
<td>1400 mm</td>
<td>[mm/s]</td>
<td>122</td>
</tr>
<tr>
<td>1600 mm</td>
<td>[mm/s]</td>
<td>102</td>
</tr>
<tr>
<td>2000 mm</td>
<td>[mm/s]</td>
<td>76</td>
</tr>
<tr>
<td>Max. Acceleration</td>
<td>[m/s²]</td>
<td>8</td>
</tr>
</tbody>
</table>

### Forces

<table>
<thead>
<tr>
<th>Max. axial traction/thrust force motor inline</th>
<th>[N]</th>
<th>ETH100</th>
<th>ETH125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. axial traction/thrust force depending on the motor speed n</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor parallel</td>
<td></td>
<td>54800</td>
<td>56000</td>
</tr>
<tr>
<td>Motor parallel</td>
<td></td>
<td>50800</td>
<td>81400</td>
</tr>
<tr>
<td>n &lt; 100 min⁻¹</td>
<td>[N]</td>
<td>43200</td>
<td>76300</td>
</tr>
<tr>
<td>100 &lt; n &lt; 300 min⁻¹</td>
<td>[N]</td>
<td>35600</td>
<td>61000</td>
</tr>
<tr>
<td>n &gt; 300 min⁻¹</td>
<td>[N]</td>
<td>18410</td>
<td>27100</td>
</tr>
<tr>
<td>Max. transmissible torque / force constant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. transmissible torque inline motor</td>
<td>Nm</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Motor parallel</td>
<td></td>
<td>108</td>
<td>200</td>
</tr>
<tr>
<td>n &lt; 100 min⁻¹</td>
<td>[Nm]</td>
<td>108</td>
<td>170</td>
</tr>
<tr>
<td>100 &lt; n &lt; 300 min⁻¹</td>
<td>[Nm]</td>
<td>140</td>
<td>240</td>
</tr>
<tr>
<td>Motor parallel</td>
<td></td>
<td>565</td>
<td>565</td>
</tr>
<tr>
<td>Force constant motor inline</td>
<td>[N/Nm]</td>
<td>509</td>
<td>254</td>
</tr>
<tr>
<td>Force constant motor parallel</td>
<td>[N/Nm]</td>
<td>509</td>
<td>254</td>
</tr>
</tbody>
</table>

### Weight

<table>
<thead>
<tr>
<th>Mass of base unit with zero stroke (incl. Cylinder rod)</th>
<th>[kg]</th>
<th>ETH100</th>
<th>ETH125</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>23</td>
<td>56</td>
<td>64</td>
</tr>
<tr>
<td>Mass of additional stroke (incl. Cylinder rod)</td>
<td>[kg/m]</td>
<td>39</td>
<td>62</td>
</tr>
<tr>
<td>Weight of cylinder rod with zero stroke</td>
<td>[kg]</td>
<td>1.2</td>
<td>2.9</td>
</tr>
<tr>
<td>Weight of cylinder rod - additional length</td>
<td>[kg/m]</td>
<td>7.8</td>
<td>14.4</td>
</tr>
</tbody>
</table>

### Mass moments of inertia

<table>
<thead>
<tr>
<th>Motor parallel without stroke</th>
<th>[kgmm²]</th>
<th>ETH100</th>
<th>ETH125</th>
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<td>10070</td>
<td>10490</td>
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### Accuracy: Bidirectional Repeatability (ISO230-2)

| Motor inline | [mm] | ±0.03 |
| Motor parallel | [mm] | ±0.05 |

### Efficiency

| Motor inline | the efficiency includes all friction torques [%] | ETH100 | ETH125 |
| Motor parallel | [%] | 90 |
|                | [%] | 81 |

### Ambient conditions

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<td>Humidity</td>
<td>[%]</td>
<td>0…95 % (non-condensing)</td>
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<tr>
<td>Location height range</td>
<td>[m]</td>
<td>max. 3000</td>
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</table>

1) “Order Code” (see ETH catalogue), 2) Intermediate stroke lengths may be interpolated.
5) The efficiency factors are included in the force constants.

Technical Data apply under normal conditions and only for the individual operating and load modes. In the case of compound loads, it is necessary to verify in accordance with normal physical laws and technical standards whether individual ratings should be reduced. In case of doubt please contact Parker.
Electromechanical Solutions for ATEX Environments
Accessories for ETH Electro Cylinder

**Accessories for ETH Electro Cylinder**

**Piston Rod Guide Module**

The rod guiding performs the following tasks:
- Anti-rotation device for higher torques
- Absorption of lateral forces
- Relieves the cylinder of lateral forces

**Mounting Methods**

- Foot mounting
- Mounting Flanges
- Centre trunnion mounting
- Installation flanges
- Rear Clevis
- Rear Eye Mounting

**Rod End**

- with external thread
- with internal thread
- Clevis
- Spherical Rod eye

**Force Sensor**

- Joint head with integrated force sensor
- Rear clevis with force sensor

**Motor and amplifier**

**Servo amplifier**
For additional information please see our product catalog 192-490123 or our website www.parker.com/eme

**Motors and gears**
For additional information on motors please see our website www.parker.com/eme and for gears www.parker.com/eme/gear
Electromechanical Solutions for ATEX Environments
Explosion Proof Servo Motor - EX Series

Overview

Description
EX series is a range of permanent magnet servo motor designed for use in explosive atmospheres. Featuring robust explosion-proof housings, EX motors are capable of bearing internal explosions with no risks of propagation to the neighbouring environment. Two versions are available, conforming with North American or European safety standards. EX servomotors are characterized by excellent motion quality, great acceleration / deceleration capabilities, and high torque output over a wide speed range. Various winding variants and numerous options are available to offer maximum flexibility.

Advantages
• Servo motors with explosion proof housings
• CE or UL versions available
• High dynamic performance
• Compact and robust
• Maintenance free

Applications
• Food, Pharma & Beverage
• Material Forming
• Printing Industry
• Hazardous / Ex Environment
• Painting robots

Features
• Mounting
  • Flange with clearance holes
• Mechanical interface
  • Solid smooth shaft (standard)
  • Solid shaft with key (option)
• Feedback sensors
  • 2 pole resolver (standard)
  • Absolute EnDat encoder (option)
  • Absolute Hiperface encoder (option)
• Thermal protection
  • Thermoswitches and thermofuses integrated in the windings
• Other options
  • Parking brake

Technical Characteristics - Overview

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<th>Parameter</th>
<th>Specification</th>
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## Technical Characteristics

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## Drive Associations

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<th>Motor</th>
<th>Max. Speed[^1] N\textsubscript{max} [min^-1]</th>
<th>Associated Drive Sizes</th>
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<td>Drive with SLVD-N N\textsubscript{max} [min^-1]</td>
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[^1]: Absolute speed limit

Please refer to the document "ETH ATEX Conditions for use" see page 14

**Note:**
Please note in parallel motor mounting to ETH032, ETH050 and ETH080 the maximum radial load on the motor shaft (see relevant information in the operating instructions of the EX motor).
ETH - Electro Thrust Cylinder for ATEX Environment

Parker Hannifin has extended its range of well known ETH - High Force Electro Thrust Cylinder for the use in explosive atmospheres (ATEX). The new ETH ATEX includes all the same advantages as the existing range, offering precise motion, positioning, setting and actuation, but now even in explosive atmospheres.

The ETH ATEX range is ATEX certified for device group II, category 2 in explosive gas atmospheres. In conjunction with the ATEX certified EX series servomotors, Parker Hannifin offers a complete solution for ATEX applications.

Target Markets / Applications

A ATEX environment can contains a mixture of air and flammable substances such as gas, vapor or fluids which are potentially explosive under atmospheric conditions. ATEX certified devices are essential in these conditions.

Typical applications:
- Oil & Gas Industry
- Chemical and pharmaceutical industries
- Food processing (distillery)
- Printing & Plastic Industry
- Energy (Generation of Bio gas, gas turbines)
- Automotive industry (Paint finish)
- Waste processing plants

How to proceed when selecting an ATEX Cylinder

- Select an ETH - Electro Thrust Cylinder by means of ETH catalogue [192-550017].
- Check, whether the selected ETH - Electro Thrust Cylinder corresponds to all ATEX demands in your application using the document "ETH ATEX frame conditions for applications" [192-550006].
- In case the specifications cannot be met, please choose a larger electro cylinder and recheck the application data (e.g. different cycle times).
- An application-specific release is feasible by measuring the self-heating of the cylinder with your application data within our company (see "ETH ATEX frame conditions for applications" [192-550006]).
At Parker, we’re guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further information call 08000 27 27 5374

**Fluid & Gas Handling**

**Key Markets**
- Aerial lift
- Agriculture
- Bulk chemical handling
- Construction machinery
- Fuel & gas delivery
- Industrial machinery
- Life sciences
- Marine
- Mining
- Mobile
- Oil & gas
- Renewable energy
- Transportation

**Key Products**
- Check valves
- Connectors for low pressure fluid conveyance
- Deep sea umbilicals
- Diagnostic equipment
- Hose caulkings
- Industrial hose
- Moring systems & power cables
- PTFE hose & tubing
- Quick couplings
- Rubber & thermoplastic hose
- Tubing & fittings
- Tubing & plastic fittings

**Process Control**

**Key Markets**
- Aerospace
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Marine & shipping
- Medical & dental
- Microelectronics
- Nuclear Power
- Offshore oil & gas
- Oil & gas
- Pharmaceutical
- Power generation
- Pub & paper
- Sheet
- Water/wastewater

**Key Products**
- Actuators
- Flow meters & controls
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural extrusions
- Thermoplastic tubing & fittings
- Vacuum generators, pumps & sensors

**Pneumatics**

**Key Markets**
- Aerospace
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Marine & shipping
- Medical & dental
- Microelectronics
- Nuclear Power
- Offshore oil & gas
- Oil & gas
- Pharmaceutical
- Power generation
- Pub & paper
- Sheet
- Water/wastewater

**Key Products**
- Actuators
- Flow meters & controls
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural extrusions
- Thermoplastic tubing & fittings
- Vacuum generators, pumps & sensors

**Sealing & Shielding**

**Key Markets**
- Aerospace
- Chemical processing
- Construction
- Fluid power
- General industrial
- Information technology
- Life sciences
- Microelectronics
- Military
- Power generation
- Renewable energy
- Telecommunications
- Transportation

**Key Products**
- Dynamic seals
- Elastomeric o-rings
- Electro-mechanical design & assembly
- EMF shielding
- Extruded & precision cut fabricated elastomeric seals
- High temperature metal seals
- Homogeneous & laminated elastomeric seals
- Medical device fabrication & assembly
- Metal & plastic retained compressible seals
- Shielded optical windows
- Silicone tubing & extrusions
- Thermal management
- Vibration dampening

**Aerospace**

**Key Markets**
- Aftermarket services
- Commercial transports
- Engines
- General & business aviation
- Helicopters
- Launch vehicles
- Military aircraft
- Missiles
- Power generation
- Regional transports
- Unmanned aerial vehicles

**Key Products**
- Control systems & actuation products
- Engine systems & components
- Fluid conveyance systems & components
- Fluid metering, delivery & actuation valves
- Fuel systems & components
- Fuel tank routing systems
- Hydraulic systems & components
- Thermal management
- Wheels & brakes

**Climate Control**

**Key Markets**
- Agriculture
- Air conditioning
- Construction Machinery
- Food & beverage
- Industrial machinery
- Life sciences
- Oil & gas
- Precision cooling
- Process
- Refrigeration
- Transportation

**Key Products**
- Accumulators
- Advanced actuators
- DC controls
- Electronic controls
- Filter driers
- Hand shut-off valves
- Heat exchangers
- Hose & fittings
- Pressure regulating valves
- Regenerative distributors
- Safety relief valves
- Smart pumps
- Solenoid valves
- Thermodynamic expansion valves

**Electromechanical**

**Key Markets**
- Aerospace
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Marine & shipping
- Medical & dental
- Microelectronics
- Nuclear Power
- Offshore oil & gas
- Oil & gas
- Pharmaceutical
- Power generation
- Pub & paper
- Sheet
- Water/wastewater

**Key Products**
- Actuators
- Advanced actuators
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**Filtration**

**Key Markets**
- Aerospace
- Food & beverage
- Industrial plant & equipment
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation & renewable energy
- Process
- Transportation
- Water Purification

**Key Products**
- Analytical gas generators
- Compressed air filters & dryers
- Engine air, coolant, fuel & oil filtration systems
- Fluid condition monitoring systems
- Hydraulic & lubrication filters
- Hydrogen, nitrogen & zero air generators
- Instrumentation filters
- Membrane & fiber filters
- Microfiltration
- Stainless steel filters
- Water desalination & purification filters & systems

**Hydraulics**

**Key Markets**
- Aerial lift
- Agriculture
- Alternative energy
- Construction machinery
- Food & beverage
- Industrial machinery
- Marine
- Material handling
- Mining
- Oil & gas
- Power generation
- Refuel vehicles
- Renewable energy
- Trucks & trailers
- Tilt equipment

**Key Products**
- Accumulators
- Carbide valves
- Electrohydraulic actuators
- Human machine interfaces
- Hybrid drives
- Hydraulic cylinders
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Hydraulic steering
- Integrated hydraulic circuits
- Power take-offs
- Power units
- Rotary actuators
- Sensors

**Key Markets**
- Aerospace
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Marine & shipping
- Medical & dental
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**Parker’s Motion & Control Technologies**

**Key Markets**
- Aerospace
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Marine & shipping
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**Rheological systems**

**Key Markets**
- Aerospace
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Marine & shipping
- Medical & dental
- Microelectronics
- Nuclear Power
- Offshore oil & gas
- Oil & gas
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**Key Products**
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**Sealing & Shielding**

**Key Markets**
- Aerospace
- Chemical processing
- Construction
- Fluid power
- General industrial
- Information technology
- Life sciences
- Microelectronics
- Military
- Power generation
- Renewable energy
- Telecommunications
- Transportation

**Key Products**
- Dynamic seals
- Elastomeric o-rings
- Electro-mechanical design & assembly
- EMF shielding
- Extruded & precision cut fabricated elastomeric seals
- High temperature metal seals
- Homogeneous & laminated elastomeric seals
- Medical device fabrication & assembly
- Metal & plastic retained compressible seals
- Shielded optical windows
- Silicone tubing & extrusions
- Thermal management
- Vibration dampening

**Springs**

**Key Markets**
- Aerospace
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Marine & shipping
- Medical & dental
- Microelectronics
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**Key Products**
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**Structural extrusions**

**Key Markets**
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**Thermoplastics**

**Key Markets**
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**Vibration dampening**

**Key Markets**
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**Vacuum generators**

**Key Markets**
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