Linear Actuator with Ball Screw and Extending Rod Series OSP-E..SBR

Contents

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>103-106</td>
</tr>
<tr>
<td>Technical Data</td>
<td>107-109</td>
</tr>
<tr>
<td>Dimensions</td>
<td>110</td>
</tr>
</tbody>
</table>
ELECTRIC LINEAR ACTUATOR
FOR PRECISE AND HIGH SPEED POSITIONING OF HIGH MASSES

A completely new generation of linear drives which can be integrated into any machine layout neatly and simply.

Linear Actuator with Ball Screw and Extending Rod

Advantages
- High output force
- Excellent running characteristics
- Accurate path and position control
- High levels of repeatability

Features
- Extending drive rod
- Ball spindle
- Non-rotating drive rod
- Continuous duty operation
- Large range of accessories

Drive rod thread according to ISO 15552 (6431)
End cap screws with in-line thread
Stainless steel drive rod
Stainless steel sealing band
Permanent magnet for positioning sensing
Slotted profile with dovetail grooves
Drive shaft
Ball screw
Hollow shaft with inline ball nut
Double row angular contact ball bearings
Permanent magnet for positioning sensing
Slotted profile with dovetail grooves
OPTIONS AND ACCESSORIES

SERIES OSP-E, BALL SCREW DRIVEN WITH EXTENDING ROD

STANDARD VERSIONS
OSP-E..SBR
Pages 107-109
Standard carrier with integral guidance. Dovetail profile for mounting of accessories and the actuator itself.

FLANGE MOUNTING C
Page 111
For end-mounting the actuator on the extending rod side

DRIVE ROD EYE
Page 113

TRUNNION MOUNTING – EN
Page 112
For pivoted support
Trunnion mounting with pivot – steplessly adjustable in axial direction.

DRIVE ROD COMPENSATING COUPLING
Page 113
For compensating of radial and angular misalignments

MOUNTINGS FOR
OSP-E25SBR TO E50SBR

END CAP MOUNTING
Page 110
For end-mounting the actuator on the extending rod side

Page 95
For mounting the actuator on the dovetail grooves and on the motor end

DRIVE ROD CLEVIS
Page 113

ACCESSORIES
SERIES RS AND ES
Page 130
For electrical sensing of end and intermediate carrier positions.

The right to introduce technical modifications is reserved
Linear Actuator
with Ball Screw
and Extending Rod
Series OSP-E..SBR
Size 25, 32, 50

Standard Version:
- Dovetail grooves for mounting accessories and the drive itself
- Travel per rotation of threaded spindle
  Type OSP-E25SBR: 5 mm
  Type OSP-E32SBR: 5, 10 mm
  Type OSP-E50SBR: 5, 10, 25 mm

Installation Instructions
Use the threaded holes in the free end cap and a mid-section support close to the motor end for mounting the linear actuator.
The linear actuator can be fitted in any position. To prevent contamination such as fluid ingress, the actuator should be fitted with its sealing band facing downwards.

Maintenance
All moving parts are long-term lubricated for a normal operational environment. We recommend a check and lubrication of the linear actuator, and if necessary a change of worn parts, after every 12th month or 3000 km travel of distance, depending on the type of application. Please see separate instructions.

Commissioning
The products in this datasheet should not be operated until the machine/application in which they are used has passed necessary inspection.

Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Symbol</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
</table>
| General Features
Type | Linear drive with ball screw and piston rod |
Series | OSP-E..SBR |
Mounting | see drawings |
Operating temperature range | \( T_{min} \) \( T_{max} \) \( \) | \( -20 \) \( +80 \) |
Weight (Mass) | kg | see table |
Installation | in any position |
Material
Slotted profile | Al anodized |
Ball screw | Steel |
Ball nut | Steel |
Piston rod | Stainless steel |
Sealing band | Hardened stainless steel |
Guide bearings | Low friction plastic |
Screws, nuts | Zinc plated steel |
Mountings | Zinc plated steel and aluminium |
Encapsulation class | IP | 54 |

Weight (Mass) kg and Inertia

<table>
<thead>
<tr>
<th>Series</th>
<th>Weight (Mass) kg</th>
<th>Moving Mass [kg]</th>
<th>Inertia(x 10^-6 kgm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SBR</td>
<td>0.7 0.9 1.2</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td>OSP-E32SBR</td>
<td>1.7 5.9 50.0</td>
<td>225.0</td>
<td></td>
</tr>
<tr>
<td>OSP-E50SBR</td>
<td>4.5 10.8 26.6</td>
<td>122.0</td>
<td></td>
</tr>
</tbody>
</table>
Performance overview

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSP-E25SBR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSP-E32SBR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSP-E50SBR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitch</td>
<td>(mm)</td>
<td>5 3 5 10 5 10</td>
</tr>
<tr>
<td>Max. speed</td>
<td>(m/s)</td>
<td>0.25 0.25 0.35 0.35 0.35 0.25</td>
</tr>
<tr>
<td>Linear motion per revolution, drive shaft</td>
<td>(mm)</td>
<td>5 5 10 5 10 5</td>
</tr>
<tr>
<td>Max. rpm drive shaft</td>
<td>(min⁻¹)</td>
<td>3000 3000 3000</td>
</tr>
<tr>
<td>Max. effective action force Fₑ</td>
<td>(N)</td>
<td>240 350 1090 750 990 1680</td>
</tr>
<tr>
<td>Corresponding torque drive shaft</td>
<td>(Nm)</td>
<td>0.3 0.35 0.2 0.3 0.3 0.3</td>
</tr>
<tr>
<td>Max. load torque</td>
<td>(Nm)</td>
<td>0.2 0.2 0.2 0.3 0.3 0.3</td>
</tr>
<tr>
<td>Max. allowable torque on drive shaft</td>
<td>(Nm)</td>
<td>0.6 1.5 1.5 1.5 1.5 1.5</td>
</tr>
<tr>
<td>Max. allowable acceleration</td>
<td>(m/s²)</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Typical repeatability</td>
<td>(mm/m)</td>
<td>±0.05 ±0.05 ±0.05</td>
</tr>
<tr>
<td>Max. Standard stroke length</td>
<td>(mm)</td>
<td>500 500 500</td>
</tr>
</tbody>
</table>

Maximum rpm – Stroke

At longer strokes the speed has to be reduced according to the adjacent graphs.

Transverse Force/stroke

The permissible transverse force is reduced with increasing stroke length.

Sizing of Linear Actuator

The following steps are recommended for selection:

1. Check that the maximum values in the adjacent chart and transverse force/stroke graph below are not exceeded.
2. Check the lifetime/travel distance in graph below.
3. When sizing and specifying the motor, the RMS-average torque must be calculated using the cycle time in application.

Maximum rpm – Stroke

![Graph showing maximum rpm versus stroke]

Transverse Force / Stroke

![Graph showing transverse force versus stroke]
Linear Actuator with Ball Screw and Extending Rod – Basic Unit
Series OSP-E25SBR, OSP-E32SBR, OSP-E50SBR

 dimension Table (mm)

Series | ØKB | KC | KL | KM | KO | KP | P9 | KR
---|---|---|---|---|---|---|---|---
OSP-E25SBR | 6 | 6 | 8 | 17 | 24 | 2 | 2 | 12
OSP-E32SBR | 10 | 11.2 | 31 | 41 | 2 | 5 | 3 | 16
OSP-E50SBR | 15 | 17 | 43 | 58 | 3 | 6 | 5 | 28

**Option 3: Keyway**

**Option 4: Keyway, long version**

* The end of stroke must not be used as a mechanical stop. Allow an additional safety clearance of minimum 25 mm at both ends. The use of an AC motor with frequency converter normally requires a larger safety clearance than that required for servo systems.

For advice, please contact your local HOERBIGER-ORIGA technical support department.

**Stroke Length:**
The stroke lengths of the linear actuators are as standard available in multiples of 1 mm up to 500 mm. Other stroke lengths on request.

### Dimension Table (mm)

<table>
<thead>
<tr>
<th>Series</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>G</th>
<th>H</th>
<th>K</th>
<th>L</th>
<th>AM</th>
<th>DCP</th>
<th>CG</th>
<th>FB</th>
<th>DKB</th>
<th>KK</th>
<th>KL</th>
<th>KM</th>
<th>ØKH</th>
<th>ØNS</th>
<th>ØTS</th>
<th>KT</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SBR</td>
<td>22</td>
<td>44</td>
<td>37</td>
<td>48</td>
<td>10</td>
<td>21.5</td>
<td>110</td>
<td>20</td>
<td>22</td>
<td>26</td>
<td>40</td>
<td>39.5</td>
<td>M10x1.25</td>
<td>17</td>
<td>2</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSP-E32SBR</td>
<td>25.5</td>
<td>52</td>
<td>36</td>
<td>48</td>
<td>12</td>
<td>28.5</td>
<td>175.5</td>
<td>20</td>
<td>28</td>
<td>26</td>
<td>52</td>
<td>51.7</td>
<td>M10x1.25</td>
<td>31</td>
<td>2</td>
<td>20</td>
<td>33</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>OSP-E50SBR</td>
<td>33</td>
<td>87</td>
<td>70</td>
<td>96</td>
<td>12</td>
<td>43</td>
<td>206</td>
<td>32</td>
<td>38</td>
<td>37</td>
<td>76</td>
<td>77</td>
<td>M16x1.5</td>
<td>43</td>
<td>3</td>
<td>26</td>
<td>44</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Linear Drive Accessories
End Cap Mountings

Size 25, 32, 50

For Linear Drive with Trapezoidal Screw and extending rod
- Series OSP-E..SR
- Series OSP-E..SBR

On the end-face of each end cap there are four threaded holes for mounting the actuator. The hole layout is square, so that the mounting can be fitted to the bottom, top or either side.

Material:
Series OSP-25 to 32: Galvanised steel.
Series OSP-50: Anodized aluminium.

The mountings are supplied singly.

### Dimension Table (mm)

<table>
<thead>
<tr>
<th>Series</th>
<th>E</th>
<th>øU</th>
<th>AB</th>
<th>AC</th>
<th>AD</th>
<th>AF</th>
<th>CL</th>
<th>DG</th>
<th>øKU</th>
<th>KV</th>
<th>Order No. *</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SR(SBR)</td>
<td>27</td>
<td>5.8</td>
<td>16</td>
<td>22</td>
<td>18</td>
<td>22</td>
<td>2.5</td>
<td>39</td>
<td>–</td>
<td>–</td>
<td>12263</td>
</tr>
<tr>
<td>OSP-E32SR(SBR)</td>
<td>36</td>
<td>6.6</td>
<td>18</td>
<td>20</td>
<td>18</td>
<td>30</td>
<td>4</td>
<td>50</td>
<td>–</td>
<td>–</td>
<td>12264</td>
</tr>
<tr>
<td>OSP-E50SR(SBR)</td>
<td>70</td>
<td>9</td>
<td>40</td>
<td>48</td>
<td>30</td>
<td>48</td>
<td>–</td>
<td>86</td>
<td>15</td>
<td>15</td>
<td>12265</td>
</tr>
</tbody>
</table>

* Important:
With the OSP-E Screw series, the end cap mounting can only be used at the end opposite to the drive shaft.

We recommend the application of two mid-section supports (page 95) at the drive shaft end of the actuator.
### Linear Drive Accessories

**Flange Mounting C**

*Size 25, 32, 50*

**For Linear Drive with Trapezoidal Screw and extending rod**

- Series OSP-E..SR
- Series OSP-E..SBR

The flange mounting C-E can only be mounted at the piston rod end of the linear drive.

**Material:**

Aluminium

---

#### Dimension Table (mm) for Flange Mounting C-E..

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>ø FB</th>
<th>E</th>
<th>MF</th>
<th>R</th>
<th>TF</th>
<th>UF</th>
<th>W</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SR (SBR)</td>
<td>C-E25</td>
<td>7</td>
<td>50</td>
<td>10</td>
<td>32</td>
<td>64</td>
<td>79</td>
<td>16</td>
<td>12232</td>
</tr>
<tr>
<td>OSP-E32SR (SBR)</td>
<td>C-E32</td>
<td>9</td>
<td>56</td>
<td>10</td>
<td>36</td>
<td>72</td>
<td>90</td>
<td>16</td>
<td>12233</td>
</tr>
<tr>
<td>OSP-E50SR (SBR)</td>
<td>C-E50</td>
<td>12</td>
<td>100</td>
<td>16</td>
<td>63</td>
<td>126</td>
<td>153</td>
<td>21</td>
<td>12234</td>
</tr>
</tbody>
</table>
Linear Drive Accessories
Trunnion Mounting EN
Size 25, 32, 50

For Linear Drive with Trapezoidal Screw and extending rod
• Series OSP-E..SR
• Series OSP-E..SBR

The trunnion mounting is fitted to the dovetail rails of the actuator profile
The mountings are supplied in pairs.

Dimension Table (mm) for Trunnion Mounting EN

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>TD</th>
<th>TL</th>
<th>LW</th>
<th>XV</th>
<th>XV+1/2 stroke</th>
<th>XV+ max stroke</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SR (SBR)</td>
<td>EN-E25</td>
<td>50</td>
<td>12</td>
<td>63</td>
<td>73</td>
<td>42</td>
<td>73</td>
<td>PD 23335</td>
</tr>
<tr>
<td>OSP-E32SR (SBR)</td>
<td>EN-E32</td>
<td>50</td>
<td>16</td>
<td>75</td>
<td>87</td>
<td>52</td>
<td>90</td>
<td>PD 23336</td>
</tr>
<tr>
<td>OSP-E50SR (SBR)</td>
<td>EN-E50</td>
<td>50</td>
<td>20</td>
<td>108</td>
<td>110</td>
<td>87</td>
<td>110</td>
<td>PD 23337</td>
</tr>
</tbody>
</table>

Material: Aluminium

Pivot EL for Trunnion Mounting EN
Size 25, 32, 50

For Linear Drive with Trapezoidal Screw and extending rod
• Series OSP-E..SR
• Series OSP-E..SBR

Dimension Table (mm) for Pivot EL

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Weight (kg)</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SR (SBR)</td>
<td>EL-032</td>
<td>55</td>
<td>26</td>
<td>26</td>
<td>12</td>
<td>13.5</td>
<td>0.06</td>
<td>PD 23381</td>
</tr>
<tr>
<td>OSP-E32SR (SBR)</td>
<td>EL-040/050</td>
<td>55</td>
<td>26</td>
<td>26</td>
<td>16</td>
<td>13.5</td>
<td>0.06</td>
<td>PD 23382</td>
</tr>
<tr>
<td>OSP-E50SR (SBR)</td>
<td>EL-063/080</td>
<td>65</td>
<td>30</td>
<td>30</td>
<td>15</td>
<td>16.5</td>
<td>0.10</td>
<td>PD 23383</td>
</tr>
</tbody>
</table>

Material: Aluminium
Piston Rod Clevis according to ISO 8140 (CETOP RP102P)
Type: GK-..

Order Instructions, Dimension Table (mm), Weight

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>CK</th>
<th>CE</th>
<th>CM</th>
<th>KK</th>
<th>LE</th>
<th>W</th>
<th>Mass (kg)</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SR (SBR)</td>
<td>GK-M10 x 1.25</td>
<td>10</td>
<td>40</td>
<td>20</td>
<td>10</td>
<td>M10 x 1.25</td>
<td>20</td>
<td>52</td>
<td>0.08</td>
</tr>
<tr>
<td>OSP-E32SR (SBR)</td>
<td>GK-M10 x 1.25</td>
<td>10</td>
<td>40</td>
<td>20</td>
<td>10</td>
<td>M10 x 1.25</td>
<td>20</td>
<td>52</td>
<td>0.08</td>
</tr>
<tr>
<td>OSP-E50SR (SBR)</td>
<td>GK-M16 x 1.5</td>
<td>16</td>
<td>64</td>
<td>32</td>
<td>16</td>
<td>M16 x 1.5</td>
<td>32</td>
<td>83</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Piston Rod Eye according to ISO 8139 (CETOP RP103 P)
Type: GA-..

Order Instructions, Dimension Table (mm), Weight

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>C</th>
<th>CE</th>
<th>CN</th>
<th>EN</th>
<th>ER</th>
<th>KK</th>
<th>LE</th>
<th>SW</th>
<th>U</th>
<th>W</th>
<th>øZ</th>
<th>Mass (kg)</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SR (SBR)</td>
<td>GA-M10 x 1.25</td>
<td>20</td>
<td>14</td>
<td>10</td>
<td>14</td>
<td>14</td>
<td>M10 x 1.25</td>
<td>20</td>
<td>52</td>
<td>0.07</td>
<td>10</td>
<td>1.172</td>
<td>KY6145</td>
<td></td>
</tr>
<tr>
<td>OSP-E32SR (SBR)</td>
<td>GA-M10 x 1.25</td>
<td>20</td>
<td>14</td>
<td>10</td>
<td>14</td>
<td>14</td>
<td>M10 x 1.25</td>
<td>20</td>
<td>52</td>
<td>0.07</td>
<td>10</td>
<td>1.172</td>
<td>KY6145</td>
<td></td>
</tr>
<tr>
<td>OSP-E50SR (SBR)</td>
<td>GA-M16 x 1.5</td>
<td>20</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>M16 x 1.5</td>
<td>20</td>
<td>52</td>
<td>0.07</td>
<td>10</td>
<td>1.172</td>
<td>KY6156</td>
<td></td>
</tr>
</tbody>
</table>

Linear Drive Accessories
Piston Rod Elements
Size 25, 32, 50

- Piston Rod Clevis according to ISO 8140
- Piston Rod Eye according to ISO 8139
- Piston Rod Compensating Coupling
- Series OSP-E..SR
- Series OSP-E..SBR
Piston Rod Compensating Coupling
Type: AK-..

Order Instructions, Dimension Table (mm), Weight

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>OF</th>
<th>KK</th>
<th>SW1</th>
<th>SW2</th>
<th>SW3</th>
<th>SW4</th>
<th>SW5</th>
<th>Mass (kg)</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSP-E25SR (SBR)</td>
<td>AK-M10x1.25</td>
<td>20</td>
<td>23</td>
<td>70</td>
<td>31</td>
<td>21.5 M10x1.25</td>
<td>12</td>
<td>30</td>
<td>19</td>
<td>17</td>
<td>0.218</td>
<td>KY 1129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSP-E25SR (SBR)</td>
<td>AK-M10x1.25</td>
<td>20</td>
<td>23</td>
<td>70</td>
<td>31</td>
<td>21.5 M10x1.25</td>
<td>12</td>
<td>30</td>
<td>19</td>
<td>17</td>
<td>0.218</td>
<td>KY 1129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSP-E50SR (SBR)</td>
<td>AK-M16x1.5</td>
<td>40</td>
<td>32</td>
<td>112</td>
<td>45</td>
<td>33.5 M16x1.5</td>
<td>19</td>
<td>41</td>
<td>30</td>
<td>30</td>
<td>0.637</td>
<td>KY 1133</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>