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Lexium™ LXM 62
Modular Servo Drive System

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System overview

Logic Motion Controller C-based
The Schneider Electric LMC (Logic Motion Controller), complete with a VxWorks real-time operating system, centrally implements both PLC and motion functions. This LMC synchronizes, coordinates and creates the motion functions of a food and packaging machine for:

- 8 Sercos 3 drives (LMC 300 C)
- 16 Sercos 3 drives (LMC 400 C)
- 99 Sercos 3 drives (LMC 600 C)

* Safety PLC according to IEC 61508:1998 and EN ISO 13849:2006

Lexium™ LXM 62
The modular Lexium™ LXM 62 servo drive system is specifically designed for the operation of servo drives in a multi-axis group. The power electronic components of the LXM 62 are fitted inside the switch cabinet, and its central power supply powers the connected servo converters through a common DC bus.

The Lexium LXM 62’s servo converter Single and Double drives provide the necessary phase currents for the position control of the connected servo motors. These Single and Double drives are available in different current strength classes, to meet the requirements of the individual servo axes of the application.

The LXM 62 provides simplified wiring of the devices needed for the initial start-up and service cases. This also applies to the cable connection of the enclosed devices to the field. All connectors that can be connected from the outside (power input, DC bus, 24 Vdc-supply, SERCOS, motor, encoder, IOs, IO-supply, ready and inverter enabled) are designed for fast, simple configuration without tools.
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SH servo motor
Schneider Electric SH AC servo motors are designed to meet the demands of high dynamics and precision. Five flange sizes with different grades of torque provide the right drive solution for specific applications:

- SH3-055
- SH3-070
- SH3-100
- SH3-140
- SH3-205

With its low internal moment of inertia and high overload capability, this SH motor meets rigorous precision, dynamics and efficiency requirements.

Schneider Electric SH servo motors feature:
- High dynamics and precision capabilities
- Compatibility with SM motors
- Single tooth winding
- Small compact size
- High power density
- Low internal moment of inertia
- High overload capability
- High resistance to winding damages
- Low detent torque
### Power Supply

<table>
<thead>
<tr>
<th>Family</th>
<th>Size</th>
<th>Type</th>
<th>Power</th>
<th>Variants</th>
<th>Options</th>
<th>HW release</th>
<th>Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>LXM</td>
<td>62</td>
<td>P</td>
<td>D84</td>
<td>A</td>
<td>1</td>
<td>1</td>
<td>0000</td>
</tr>
</tbody>
</table>

- **Family**: LXM = Lexium
- **Size**: 62 = Lexium 62
- **Type**: P = Power Module
- **Power Out**: Peak Current
  - D84 = 84 A
- **Variants**: A = Power Supply Module
- **Options**: 1 = 1 or 3 Phases x 208 to 480 Vdc
- **Hardware - Release**: 1
- **Internal**: 0000 = Standard

---

Figure 2: Product number configurator for Lexium LXM 62 Power Supply.
### Single/Double Drive

<table>
<thead>
<tr>
<th>Family</th>
<th>Size</th>
<th>Type</th>
<th>Power Out (Peak)</th>
<th>Variants</th>
<th>Options</th>
<th>HW release</th>
<th>Internal</th>
</tr>
</thead>
</table>

**Figure 2:** Product number configurator for Lexium LXM 62 Single/Double Drive.
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## Technical data

### Table 1: Ambient conditions

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Parameters</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation</strong></td>
<td><strong>Class 3K3</strong></td>
<td></td>
<td>IEC/EN 60721-3-3</td>
</tr>
<tr>
<td></td>
<td>Protection class housing</td>
<td>IP 20 with plugged-in connectors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protection class installation site</td>
<td>IP54, if safety circuit with Inverter Enable is used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Degree of pollution</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient temperature</td>
<td>+5°C to +55°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Power reduction at increased ambient temperature</td>
<td>+40°C to +55°C (from +40°C: -2% per K at I_{IN} and I_{SC})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condensation</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Icing</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>another water</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relative humidity</td>
<td>5% to 85%</td>
<td></td>
</tr>
<tr>
<td><strong>Class 3M3</strong></td>
<td>Vibration</td>
<td>10 m/s²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shock</td>
<td>100 m/s²</td>
<td></td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td><strong>Class 2K3</strong></td>
<td></td>
<td>IEC/EN 60721-3-2</td>
</tr>
<tr>
<td></td>
<td>Ambient temperature</td>
<td>-25°C to +70°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condensation</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Icing</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>another water</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relative humidity</td>
<td>5% to 85%</td>
<td></td>
</tr>
<tr>
<td><strong>Class 2M2</strong></td>
<td>Vibration</td>
<td>10 m/s²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shock</td>
<td>300 m/s²</td>
<td></td>
</tr>
<tr>
<td><strong>Long-term storage in transport packaging</strong></td>
<td><strong>Class 1K4</strong></td>
<td></td>
<td>IEC/EN 60721-3-1</td>
</tr>
<tr>
<td></td>
<td>Ambient temperature</td>
<td>-25°C to +55°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condensation</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Icing</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>another water</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relative humidity</td>
<td>5% to 85%</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2: Standards and regulations

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
</table>
| **CE**   | EC Low Voltage Directive 2006/95/EC  
  - EN 61800-5-1:2007  
  - EC EMC Directive 2004/108/EC  
  - EN 61800-3:2004  
  - EC Machinery Directive 2006/42/EC  
  - EN 60529: IP protection  
  - EN 60204-1:2006 |
| **UL**   | UL 508C: Power Conversion Equipment |

### Table 3: Standards and regulations - Functional safety

<table>
<thead>
<tr>
<th>Functional safety</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Functional safety** | EN ISO 13849-1:2006, PLd, Category 3  
  EN 61508:2001, SIL 2 |
## Technical data (continued)

### PacDrive 3

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### Table 4: Mechanical and electrical data - Power supply

<table>
<thead>
<tr>
<th>Name</th>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product configuration</td>
<td>Item name</td>
<td>LXM62PD84</td>
</tr>
<tr>
<td>Power supply</td>
<td>Rated supply voltage $3_{AC}$</td>
<td>Min. 380 Vac (-10%) / Nom. 400 Vac / Max. 480 Vac (+10%)</td>
</tr>
<tr>
<td></td>
<td>Rated supply voltage $3_{AC}$</td>
<td>Min. 208 Vac (-10%) / Nom. 230 Vac / Max. 360 Vac (+10%)</td>
</tr>
<tr>
<td></td>
<td>Adjust the parameter &quot;MainsVoltageMode&quot; of the Power Supply according to the nominal supply voltage.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rated supply voltage $1_{AC}$</td>
<td>Min. 208 Vac (-10%) / Nom. 230 Vac / Max. 270 Vac (+10%)</td>
</tr>
<tr>
<td></td>
<td>Supply frequency</td>
<td>48 to 63 Hz</td>
</tr>
<tr>
<td></td>
<td>Control voltage</td>
<td>24 Vdc (-20 % / +25 %)</td>
</tr>
<tr>
<td></td>
<td>Control current</td>
<td>Max. 50 A (no overload permissible)</td>
</tr>
<tr>
<td>DC circuit</td>
<td>DC Bus Voltage</td>
<td>270 Vdc to 700 Vdc</td>
</tr>
<tr>
<td></td>
<td>DC link capacity</td>
<td>1.36 mF</td>
</tr>
<tr>
<td></td>
<td>Overvoltage</td>
<td>860 Vdc</td>
</tr>
<tr>
<td></td>
<td>Rated current ($I_{AC}$)</td>
<td>21 A for 1AC infeed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42 A for 3AC infeed</td>
</tr>
<tr>
<td></td>
<td>Peak current 1 s ($I_{BC}$)</td>
<td>42 A for 1AC infeed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>84 A for 3AC infeed</td>
</tr>
<tr>
<td></td>
<td>Rated output</td>
<td>22.1 kW for 3 400 Vac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26.6 kW for 3 480 Vac</td>
</tr>
<tr>
<td></td>
<td>Peak power</td>
<td>44.2 kW for 3 400 Vac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>53.2 kW for 3 480 Vac</td>
</tr>
<tr>
<td></td>
<td>$U_{Bleeder}$ ON</td>
<td>830 Vdc</td>
</tr>
<tr>
<td></td>
<td>$U_{Bleeder}$ OFF</td>
<td>810 Vdc</td>
</tr>
<tr>
<td></td>
<td>DC bus unloading time</td>
<td>Max. 15 min</td>
</tr>
<tr>
<td>Internal braking resistor</td>
<td>Resistance</td>
<td>15 Ω</td>
</tr>
<tr>
<td></td>
<td>Permanent power</td>
<td>400 W</td>
</tr>
<tr>
<td></td>
<td>Peak power</td>
<td>46 kW</td>
</tr>
<tr>
<td>Interfaces</td>
<td>Sercos 3</td>
<td>integrated</td>
</tr>
<tr>
<td>Stray power</td>
<td>Electronics power supply</td>
<td>15 W</td>
</tr>
<tr>
<td></td>
<td>Bleeder (internal)</td>
<td>400 W</td>
</tr>
<tr>
<td>Outputs</td>
<td>Relay-outputs</td>
<td>Ready relay, up to 6 A (max) by 150 Vac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ready relay, up to 6 A (max) by 35 Vdc or 1 A (max) by 70 Vdc</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Housing D x W x H</td>
<td>270 mm x 89.5 mm x 310 mm (10.63 in. x 3.52 in. x 12.20 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td>Weight (with packaging)</td>
<td>6.3 kg (7.3 kg)</td>
</tr>
<tr>
<td>Radio interference level</td>
<td>C3 (C2 with additional filter measures)</td>
<td></td>
</tr>
<tr>
<td>Overvoltage category</td>
<td>III (EN 61800-5-1:2007)</td>
<td>II starting a installation altitude of 2000 m</td>
</tr>
<tr>
<td>Degree of pollution</td>
<td>-</td>
<td>2 (EN 61800-5-1:2007)</td>
</tr>
</tbody>
</table>
### PacDrive 3
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Table 5: **Mechanical and electrical data - Single drive**

<table>
<thead>
<tr>
<th>Name</th>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product configuration</strong></td>
<td><strong>Item name</strong></td>
<td>LXM62DU60A LXM62DD15A LXM62DD27A</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>Control voltage / -current</td>
<td>24 Vdc (-20% to +25%)</td>
</tr>
<tr>
<td></td>
<td>Control voltage / control current</td>
<td>24 Vdc (-10% to +6%) / 3 A (max)</td>
</tr>
<tr>
<td></td>
<td>DC_Bus Voltage</td>
<td>250 Vdc to 700 Vdc</td>
</tr>
<tr>
<td></td>
<td>DC link capacity</td>
<td>110 µF</td>
</tr>
<tr>
<td></td>
<td>Overvoltage</td>
<td>900 Vdc</td>
</tr>
<tr>
<td><strong>Motor connection</strong></td>
<td>Rated current (8kHz)</td>
<td>2 A&lt;sub&gt;eff&lt;/sub&gt;</td>
</tr>
<tr>
<td></td>
<td>Peak current</td>
<td>6 A&lt;sub&gt;eff&lt;/sub&gt;</td>
</tr>
<tr>
<td></td>
<td>Cycle frequency</td>
<td>8 kHz (4/16 kHz in preparation)</td>
</tr>
<tr>
<td><strong>Stray power</strong></td>
<td>Electronics power supply (8kHz)</td>
<td>25 W</td>
</tr>
<tr>
<td></td>
<td>Power supply (8kHz)</td>
<td>8.5 W/A</td>
</tr>
<tr>
<td><strong>Interfaces</strong></td>
<td>SERCOS III</td>
<td>integrated</td>
</tr>
<tr>
<td></td>
<td>Hiperface</td>
<td></td>
</tr>
<tr>
<td><strong>Encoder</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Digital Inputs/outputs</strong></td>
<td>Voltage</td>
<td>24 Vdc (-20% to +25%)</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>Supplies 500 mA / max. current consumption 3 A</td>
</tr>
<tr>
<td></td>
<td>Digital inputs</td>
<td>2 inputs with switching level Type I according to EN 61131-2</td>
</tr>
<tr>
<td></td>
<td>Low level</td>
<td>-3 to 5 Vdc</td>
</tr>
<tr>
<td></td>
<td>High level</td>
<td>15 to 30 Vdc</td>
</tr>
<tr>
<td></td>
<td>Filter</td>
<td>1 ms/5 ms (configurable)</td>
</tr>
<tr>
<td></td>
<td>Digital inputs or TP</td>
<td>2 inputs with switching level Type I according to EN 61131-2</td>
</tr>
<tr>
<td></td>
<td>Low level</td>
<td>-3 to 5 Vdc</td>
</tr>
<tr>
<td></td>
<td>High level</td>
<td>15 to 30 Vdc</td>
</tr>
<tr>
<td></td>
<td>Filter</td>
<td>1 ms/5 ms (configurable)</td>
</tr>
<tr>
<td></td>
<td>Filter for TP</td>
<td>100 µs/5 ms (configurable)</td>
</tr>
<tr>
<td></td>
<td>Digital inputs or digital outputs</td>
<td>2 inputs/outputs (bidirectional)</td>
</tr>
<tr>
<td></td>
<td>Input with switching level Type I</td>
<td>according to EN 61131-2</td>
</tr>
<tr>
<td></td>
<td>Low level</td>
<td>-3 to 5 Vdc</td>
</tr>
<tr>
<td></td>
<td>High level</td>
<td>15 to 30 Vdc</td>
</tr>
<tr>
<td></td>
<td>Filter</td>
<td>1 ms/5 ms (configurable)</td>
</tr>
<tr>
<td></td>
<td>Output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High level</td>
<td>(+VL - 3V) &lt; V&lt;sub&gt;out&lt;/sub&gt; &lt; +VL</td>
</tr>
<tr>
<td></td>
<td>Output current</td>
<td>max. 500 mA per output</td>
</tr>
<tr>
<td><strong>Inverter/Enable</strong></td>
<td>Inputs</td>
<td>Number: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STO active: -3 V ≤ U&lt;sub&gt;EX&lt;/sub&gt; ≤5 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>max. downtime 500µs by U&lt;sub&gt;EX&lt;/sub&gt; &gt; 20 V and dynamic control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>max. switching frequency of input signal: max. 1 Hz</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>Housing D x W x H</td>
<td>270 mm x 44.5 mm x 310 mm (10.63 in. x 1.75 in. x 12.20 in.)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Weight (with packaging)</td>
<td>3 kg (4 kg)</td>
</tr>
<tr>
<td><strong>Ventilation</strong></td>
<td>Type of fan</td>
<td>no fan Internal fan Internal fan</td>
</tr>
<tr>
<td><strong>Overvoltage category</strong></td>
<td></td>
<td>III (EN 61800-5-1:2007)</td>
</tr>
</tbody>
</table>
### Technical data (continued)

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**Table 6: Mechanical and electrical data - Double drive**

<table>
<thead>
<tr>
<th>Name</th>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product configuration</strong></td>
<td>Item name</td>
<td>LXM62DU60B</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>Control voltage / current</td>
<td>24 Vdc (-20% to +25%)</td>
</tr>
<tr>
<td></td>
<td>Control voltage/control current w/ holding brake</td>
<td>24 Vdc (-10% to +6%) / 3 A (max)</td>
</tr>
<tr>
<td></td>
<td>DC_Up Voltage</td>
<td>250 Vdc 700 Vdc</td>
</tr>
<tr>
<td></td>
<td>DC link capacity</td>
<td>110 µF</td>
</tr>
<tr>
<td></td>
<td>Overvoltage</td>
<td>900 Vdc</td>
</tr>
<tr>
<td><strong>Motor connection</strong></td>
<td>Rated current (8kHz)</td>
<td>2 x 2 A eff</td>
</tr>
<tr>
<td></td>
<td>Peak current</td>
<td>2 x 6 A eff</td>
</tr>
<tr>
<td></td>
<td>Cycle frequency</td>
<td>8 kHz (4/16 kHz in preparation)</td>
</tr>
<tr>
<td><strong>Stray power</strong></td>
<td>Electronics power supply</td>
<td>25 W</td>
</tr>
<tr>
<td></td>
<td>Power supply (4kHz)</td>
<td>8.5 W/A (per axis)</td>
</tr>
<tr>
<td><strong>Interfaces</strong></td>
<td>SERCOS 3</td>
<td>integrated</td>
</tr>
<tr>
<td></td>
<td>Hiperface</td>
<td></td>
</tr>
<tr>
<td><strong>Digital Inputs/Outputs</strong></td>
<td>Voltage</td>
<td>24 Vdc (-20% to +25%)</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>Supplies 500 mA / max. current consumption 3 A</td>
</tr>
<tr>
<td></td>
<td>Digital inputs</td>
<td>2 x 2 inputs with switching level Type I according to EN 61131-2</td>
</tr>
<tr>
<td></td>
<td>Low level</td>
<td>-3 to 5 Vdc</td>
</tr>
<tr>
<td></td>
<td>High level</td>
<td>15 to 30 Vdc</td>
</tr>
<tr>
<td></td>
<td>Filter</td>
<td>1 ms/5 ms (configurable)</td>
</tr>
<tr>
<td></td>
<td>Digital inputs or TP</td>
<td>2 x 2 inputs with switching level Type I according to EN 61131-2</td>
</tr>
<tr>
<td></td>
<td>Low level</td>
<td>-3 to 5 Vdc</td>
</tr>
<tr>
<td></td>
<td>High level</td>
<td>15 to 30 Vdc</td>
</tr>
<tr>
<td></td>
<td>Filter</td>
<td>1 ms/5 ms (configurable)</td>
</tr>
<tr>
<td></td>
<td>Filter for TP</td>
<td>100 µs/5 ms (configurable)</td>
</tr>
<tr>
<td></td>
<td>Digital inputs or digital outputs</td>
<td>2 x 2 inputs/outputs (bidirectional)</td>
</tr>
<tr>
<td></td>
<td>Inputs</td>
<td>with switching level Type I according to EN 61131-2</td>
</tr>
<tr>
<td></td>
<td>Low level</td>
<td>-3 to 5 Vdc</td>
</tr>
<tr>
<td></td>
<td>High level</td>
<td>15 to 30 Vdc</td>
</tr>
<tr>
<td></td>
<td>Filter</td>
<td>1 ms/5 ms (configurable)</td>
</tr>
<tr>
<td></td>
<td>Outputs</td>
<td>High level: (+VL - 3V) &lt; V_out &lt; +VL</td>
</tr>
<tr>
<td></td>
<td>Output current</td>
<td>max. 500 mA per output</td>
</tr>
<tr>
<td><strong>InverterEnable</strong></td>
<td>Inputs</td>
<td>Number: 2</td>
</tr>
<tr>
<td></td>
<td>STO active:</td>
<td>-3 V ≤ U_{STO} ≤ 5 V</td>
</tr>
<tr>
<td></td>
<td>Input delay:</td>
<td>max. 500 µs at U_{STO} &gt; 20 V and dynamic control</td>
</tr>
<tr>
<td></td>
<td>Output delay:</td>
<td>max. switching frequency of input signal: max. 1 Hz</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>Housing D x W x H</td>
<td>270 mm x 44.5 mm x 310 mm (10.63 in. x 1.75 in. x 12.20 in.)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Weight (with packaging)</td>
<td>3 kg (4 kg)</td>
</tr>
<tr>
<td><strong>Ventilation</strong></td>
<td>-</td>
<td>no fan</td>
</tr>
<tr>
<td><strong>Overvoltage category</strong></td>
<td>III (EN 61800-5-1:2007)</td>
<td></td>
</tr>
</tbody>
</table>
Table 7: Electrical connections - Power supply

<table>
<thead>
<tr>
<th>Connection</th>
<th>Meaning</th>
<th>Connection cross-section [mm²] / [AWG]</th>
<th>Tightening torque [Nm] / [lbf in]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN1</td>
<td>Bus Bar Module</td>
<td>- / -</td>
<td>2.5 / 22.14</td>
</tr>
<tr>
<td>CN2/CN3</td>
<td>SERCOS 3 communication</td>
<td>- / -</td>
<td>- / -</td>
</tr>
<tr>
<td>CN4</td>
<td>Ready relay output</td>
<td>0.2 to 1.5 / 24 to 16</td>
<td>- / -</td>
</tr>
<tr>
<td>CN5</td>
<td>24 Vdc</td>
<td>0.5 to 16 / 20 to 6</td>
<td>- / -</td>
</tr>
<tr>
<td>CN6</td>
<td>Mains connection</td>
<td>0.75 to 16 / 18 to 6</td>
<td>- / -</td>
</tr>
<tr>
<td>CN7</td>
<td>DC bus output</td>
<td>0.2 to 6 / 24 to 10</td>
<td>- / -</td>
</tr>
<tr>
<td>Ground conductor</td>
<td>10 (cable shoe) / 6</td>
<td>3.5 / 30.98</td>
<td></td>
</tr>
</tbody>
</table>

Table 8: Connection CN1 - Bus Bar Module

The DC bus voltage and the 24 Vdc control voltage will be distributed and the protective conductor connected via the Bus Bar Module. A separate cabling is not required.

<table>
<thead>
<tr>
<th>Pn</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Ground conductor</td>
</tr>
<tr>
<td>2</td>
<td>DC-</td>
<td>- DC bus voltage</td>
</tr>
<tr>
<td>3</td>
<td>DC+</td>
<td>DC bus voltage +</td>
</tr>
<tr>
<td>4</td>
<td>24 V</td>
<td>Supply voltage +</td>
</tr>
<tr>
<td>5</td>
<td>0 V</td>
<td>Supply voltage -</td>
</tr>
</tbody>
</table>
The Sercos 3 connection is used for communication between the controller and the power supply drive.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Eth0_Tx+</td>
<td>Positive transmission signal</td>
</tr>
<tr>
<td>1.2</td>
<td>Eth0_Tx+</td>
<td>Negative transmission signal</td>
</tr>
<tr>
<td>1.3</td>
<td>Eth0_Rx+</td>
<td>Positive received signal</td>
</tr>
<tr>
<td>1.4</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>1.5</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>1.6</td>
<td>Eth0_Tx+</td>
<td>Negative received signal</td>
</tr>
<tr>
<td>1.7</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>1.8</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>2.1</td>
<td>Eth1_Tx+</td>
<td>Positive transmission signal</td>
</tr>
<tr>
<td>2.2</td>
<td>Eth1_Tx+</td>
<td>Negative transmission signal</td>
</tr>
<tr>
<td>2.3</td>
<td>Eth1_Rx+</td>
<td>Positive received signal</td>
</tr>
<tr>
<td>2.4</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>2.5</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>2.6</td>
<td>Eth1_Tx+</td>
<td>Negative received signal</td>
</tr>
<tr>
<td>2.7</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>2.8</td>
<td>n.c.</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 9: Connection CN1/CN3 - SERCOS 3
The Sercos 3 connection is used for communication between the controller and the power supply drive.

Following initialization of the Power Supply Drive, the operation ready contact is activated.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Meaning</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RDY1</td>
<td>Ready contact</td>
<td>potential-free contact</td>
</tr>
<tr>
<td>2</td>
<td>RDY2</td>
<td>Ready contact</td>
<td>potential-free contact</td>
</tr>
</tbody>
</table>

Table 10: Connection CN4 - Ready Relay output
Following initialization of the Power Supply Drive, the operation ready contact is activated.

Table 11: Connection CN5 - 24V input
The 24V input supplies the internal logic assemblies as well as the holding brakes of the complete axis group, connected to the axis modules.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 V</td>
<td>Supply voltage</td>
</tr>
<tr>
<td>2</td>
<td>24 V</td>
<td>Supply voltage</td>
</tr>
</tbody>
</table>

The insulation-stripped length of the wires of the 24V input connector is 18 mm (0.71 in.).
The Power Supply is supplied with voltage via the power connection. The rated voltage is 230 V to 480 V.

Table 12: Connection CN6 - Mains connection

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground conductor</td>
<td>Ground conductor</td>
</tr>
<tr>
<td>2</td>
<td>L3</td>
<td>External conductor L3</td>
</tr>
<tr>
<td>3</td>
<td>L2/N</td>
<td>External conductor L2/N</td>
</tr>
<tr>
<td>4</td>
<td>L1</td>
<td>External conductor L1</td>
</tr>
</tbody>
</table>

The insulation-stripped length of the wires of the AC infeed connectors is 18 mm (0.71 in.).

Table 13: Connection CN7 - DC bus output

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC +</td>
<td>DC bus voltage +</td>
</tr>
<tr>
<td>2</td>
<td>not assigned</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>DC-</td>
<td>- DC bus voltage</td>
</tr>
</tbody>
</table>

The insulation-stripped length of the wires of the DC bus connector is 15 mm (0.59 in.).
Table 14: Electrical connections - Single/Double drive

<table>
<thead>
<tr>
<th>Connection</th>
<th>Meaning</th>
<th>Connection cross-section [mm²] / [AWG]</th>
<th>Tightening torque [Nm] / [lbf in]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN1</td>
<td>Bus Bar Module</td>
<td>- / -</td>
<td>2.5 / 22.13</td>
</tr>
<tr>
<td>CN2/CN3</td>
<td>SERCOS 3</td>
<td>- / -</td>
<td>-</td>
</tr>
<tr>
<td>CN4</td>
<td>Digital inputs/outputs</td>
<td>0.25 to 1.5 / 24 to 16</td>
<td>-</td>
</tr>
<tr>
<td>CN5</td>
<td>24 V supply for digital inputs/outputs</td>
<td>0.25 to 1.5 / 24 to 16</td>
<td>-</td>
</tr>
<tr>
<td>CN6</td>
<td>InverterEnable</td>
<td>0.2 to 1.5 / 24 to 16</td>
<td>-</td>
</tr>
<tr>
<td>CN8/CN10</td>
<td>Motor phases</td>
<td>0.2 to 6 / 24 to 10</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>CN8 - axis A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CN10 - axis B (only for double drive)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CN7/CN9</td>
<td>Encoder connector</td>
<td>- / -</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>CN7 - axis A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CN9 - axis B (only for double drive)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>Shielded connector</td>
<td>- / -</td>
<td>3.5 / 30.98</td>
</tr>
</tbody>
</table>

Table 15: Connection CN1 - Bus Bar Module

The DC bus voltage and the 24 Vdc control voltage will be distributed and the protective conductor connected via the Bus Bar Module. A separate cabling is not required.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground conductor</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DC-</td>
<td>- DC bus voltage</td>
</tr>
<tr>
<td>3</td>
<td>DC +</td>
<td>DC bus voltage +</td>
</tr>
<tr>
<td>4</td>
<td>24 V</td>
<td>Supply voltage +</td>
</tr>
<tr>
<td>5</td>
<td>0 V</td>
<td>Supply voltage -</td>
</tr>
</tbody>
</table>
Table 16: Connection CN2/CN3 - SERCOS 3
The Sercos 3 connection is used for communication between the controller and the power supply drive.

<table>
<thead>
<tr>
<th>Pln</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Eth0_Tx+</td>
<td>Positive transmission signal</td>
</tr>
<tr>
<td>1.2</td>
<td>Eth0_Tx+</td>
<td>Negative transmission signal</td>
</tr>
<tr>
<td>1.3</td>
<td>Eth0_Rx+</td>
<td>Positive received signal</td>
</tr>
<tr>
<td>1.4</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>1.5</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>1.6</td>
<td>Eth0_Tx+</td>
<td>Negative received signal</td>
</tr>
<tr>
<td>1.7</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>1.8</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>2.1</td>
<td>Eth1_Tx+</td>
<td>Positive transmission signal</td>
</tr>
<tr>
<td>2.2</td>
<td>Eth1_Tx+</td>
<td>Negative transmission signal</td>
</tr>
<tr>
<td>2.3</td>
<td>Eth1_Rx+</td>
<td>Positive received signal</td>
</tr>
<tr>
<td>2.4</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>2.5</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>2.6</td>
<td>Eth1_Tx+</td>
<td>Negative received signal</td>
</tr>
<tr>
<td>2.7</td>
<td>n.c.</td>
<td>-</td>
</tr>
<tr>
<td>2.8</td>
<td>n.c.</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 17: Connection CN4 - Digital inputs / outputs

<table>
<thead>
<tr>
<th>Pln</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A_Di1</td>
<td>Axis A – digital input 1 - touchprobe</td>
</tr>
<tr>
<td>2</td>
<td>A_Di2</td>
<td>Axis A – digital input 2 - touchprobe</td>
</tr>
<tr>
<td>3</td>
<td>A_Di3</td>
<td>Axis A – digital input 1</td>
</tr>
<tr>
<td>4</td>
<td>A_Di4</td>
<td>Axis A – digital input 2</td>
</tr>
<tr>
<td>5</td>
<td>A_Di5</td>
<td>Axis A – digital input / output 3</td>
</tr>
<tr>
<td>6</td>
<td>A_Di6</td>
<td>Axis A – digital input / output 4</td>
</tr>
<tr>
<td>7</td>
<td>B_Di1</td>
<td>Axis B – Digital input 1 - Touchprobe (only double drive)</td>
</tr>
<tr>
<td>8</td>
<td>B_Di2</td>
<td>Axis B – Digital input 2 - Touchprobe (only double drive)</td>
</tr>
<tr>
<td>9</td>
<td>B_Di3</td>
<td>Axis B – Digital input 1 (only double drive)</td>
</tr>
<tr>
<td>10</td>
<td>B_Di4</td>
<td>Axis B – Digital input 2 (only double drive)</td>
</tr>
<tr>
<td>11</td>
<td>B_Di5</td>
<td>Axis B – Digital input/output 3 (only double drive)</td>
</tr>
<tr>
<td>12</td>
<td>B_Di6</td>
<td>Axis B – Digital input/output 4 (only double drive)</td>
</tr>
</tbody>
</table>

Table 18: Connection CN5 - 24V supply for DIO
The 24V DIO supply connector supplies the digital inputs/outputs of the drives with the required energy.

<table>
<thead>
<tr>
<th>Pln</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 VA</td>
<td>External digital input/output voltage</td>
</tr>
<tr>
<td>2</td>
<td>24 VA</td>
<td>External digital input/output voltage</td>
</tr>
<tr>
<td>3</td>
<td>0 VB</td>
<td>External digital input/output voltage</td>
</tr>
<tr>
<td>4</td>
<td>24 VB</td>
<td>External digital input/output voltage</td>
</tr>
</tbody>
</table>
The Inverter Enable signal supplies the gate driver with voltage. In this way the STO (Safe Torque Off) requirements according to EN 61508:2001 and EN ISO 13849-1:2006 are met. IEA1 is coupled internally with IEA2, and IEB1 is coupled internally with IEB2.

Table 19: Connection CN6 - InverterEnable

<table>
<thead>
<tr>
<th>Pln</th>
<th>Name</th>
<th>Meaning</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IEA1</td>
<td>InverterEnable signal for axis A</td>
<td>18V to 30V</td>
</tr>
<tr>
<td>2</td>
<td>IEA2</td>
<td>InverterEnable signal for axis A</td>
<td>18V to 30V</td>
</tr>
<tr>
<td>3</td>
<td>IEB1</td>
<td>InverterEnable signal for axis B</td>
<td>18V to 30V</td>
</tr>
<tr>
<td>4</td>
<td>IEB2</td>
<td>InverterEnable signal for axis B</td>
<td>18V to 30V</td>
</tr>
</tbody>
</table>

The encoder connection (Hiperface) has been specified by SICK|STEGMANN. The Hiperface connection consists of a standard, differential, digital connection (RS485 = 2 wires), an analog connection (sine- and cosine signal = 4 wires) and a mains connection to supply the encoder (+10V, GND = 2 wires).

Table 20: Connection CN7/CN9 - Encoder connector

<table>
<thead>
<tr>
<th>Pln</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cos</td>
<td>Cosine track axis A/B</td>
</tr>
<tr>
<td>2</td>
<td>RefCos</td>
<td>Reference signal cosine axis A/B</td>
</tr>
<tr>
<td>3</td>
<td>Sin</td>
<td>Sine track axis A/B</td>
</tr>
<tr>
<td>4</td>
<td>RS485+</td>
<td>Positive RS485 signal axis A/B</td>
</tr>
<tr>
<td>5</td>
<td>RS485-</td>
<td>Negative RS485 signal axis A/B</td>
</tr>
<tr>
<td>6</td>
<td>RefSin</td>
<td>Reference signal sine axis A/B</td>
</tr>
<tr>
<td>7</td>
<td>not assigned</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>not assigned</td>
<td>-</td>
</tr>
<tr>
<td>A</td>
<td>P10V</td>
<td>Supply voltage Encoder A/B</td>
</tr>
<tr>
<td>B</td>
<td>GND</td>
<td>Mass A/B</td>
</tr>
</tbody>
</table>

The motor signals U, V and W supply the motor with the required energy. The temperature signals are connected to a temperature sensor to measure the temperature of the motor. The holding brake output supplies the holding brake in the motor with the required energy.

Table 21: Connection CN8/CN10 - Motor connector (Axis A/B)

<table>
<thead>
<tr>
<th>Pln</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MTemp-</td>
<td>Temperature negative signal - Axis A/B</td>
</tr>
<tr>
<td>2</td>
<td>MTemp+</td>
<td>Temperature positive signal - Axis A/B</td>
</tr>
<tr>
<td>3</td>
<td>BR-</td>
<td>Brake negative signal - Axis A/B</td>
</tr>
<tr>
<td>4</td>
<td>BR+</td>
<td>Brake positive signal - Axis A/B</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Protective conductor protective earth ground - Axis A/B</td>
</tr>
<tr>
<td>6</td>
<td>U</td>
<td>Motor phase U - Axis A/B</td>
</tr>
<tr>
<td>7</td>
<td>V</td>
<td>Motor phase V - Axis A/B</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>Motor phase W - Axis A/B</td>
</tr>
</tbody>
</table>

The insulation-stripped length of the wires of the motor connector is 15 mm (0.59 in.). The maximum length of the motor supply cable is 75 m (246.06 ft).
Dimensions

PacDrive 3
Lexium™ LXM 62
Modular Servo Drive System

Power Supply

Figure 4: Dimensions of the Lexium LXM 62 Power Supply (dimensions shown in mm; for conversions, see Length table on page 23)
Figure 5: Dimensions of the Lexium LXM 62 Single/Double Drive (dimensions shown in mm; for conversions, see Length table on page 23)
# Units and Conversion Tables

## PacDrive 3

### Lexium™ LXM 62

### Modular Servo Drive System

## Table 22: Length Conversions

<table>
<thead>
<tr>
<th>In</th>
<th>Ft</th>
<th>Yd</th>
<th>M</th>
<th>Cm</th>
<th>Mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>/ 12</td>
<td>/ 36</td>
<td>* 0.0254</td>
<td>* 2.54</td>
<td>* 25.4</td>
</tr>
<tr>
<td>* 12</td>
<td>-</td>
<td>/ 3</td>
<td>* 0.30479</td>
<td>* 30.479</td>
<td>* 304.79</td>
</tr>
<tr>
<td>* 36</td>
<td>* 3</td>
<td>-</td>
<td>* 0.9144</td>
<td>* 91.44</td>
<td>* 914.4</td>
</tr>
<tr>
<td>/ 0.0254</td>
<td>/ 0.30479</td>
<td>/ 0.9144</td>
<td>-</td>
<td>* 100</td>
<td>* 1000</td>
</tr>
<tr>
<td>/ 2.54</td>
<td>/ 30.479</td>
<td>/ 91.44</td>
<td>/ 100</td>
<td>-</td>
<td>* 10</td>
</tr>
<tr>
<td>/ 25.4</td>
<td>/ 304.79</td>
<td>/ 914.4</td>
<td>/ 1000</td>
<td>/ 10</td>
<td>-</td>
</tr>
</tbody>
</table>

## Table 23: Mass Conversions

<table>
<thead>
<tr>
<th>Lb</th>
<th>Oz</th>
<th>Slug</th>
<th>0.22 Kg</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>* 16</td>
<td>* 0.03108095</td>
<td>* 0.4535924</td>
<td>* 453.5924</td>
</tr>
<tr>
<td>/ 16</td>
<td>-</td>
<td>* 1.942559*10³</td>
<td>* 0.02834952</td>
<td>* 28.34952</td>
</tr>
<tr>
<td>/ 0.03108095</td>
<td>/ 1.942559*10³</td>
<td>-</td>
<td>* 14.5939</td>
<td>* 14593.9</td>
</tr>
<tr>
<td>/ 0.45359237</td>
<td>/ 0.02834952</td>
<td>/ 14.5939</td>
<td>-</td>
<td>* 1000</td>
</tr>
<tr>
<td>/ 453.59237</td>
<td>/ 28.34952</td>
<td>/ 14593.9</td>
<td>/ 1000</td>
<td>-</td>
</tr>
</tbody>
</table>

## Table 24: Force Conversions

<table>
<thead>
<tr>
<th>Lb</th>
<th>Oz</th>
<th>P</th>
<th>Dynes</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>* 16</td>
<td>* 453.55358</td>
<td>* 444822.2</td>
<td>* 4.448222</td>
</tr>
<tr>
<td>/ 16</td>
<td>-</td>
<td>* 28.349524</td>
<td>* 27801</td>
<td>* 0.27801</td>
</tr>
<tr>
<td>/ 453.55358</td>
<td>/ 28.349524</td>
<td>-</td>
<td>* 980.7</td>
<td>* 9.807*10³</td>
</tr>
<tr>
<td>/ 444822.2</td>
<td>/ 27801</td>
<td>/ 980.7</td>
<td>-</td>
<td>/ 100*10⁶</td>
</tr>
<tr>
<td>/ 4.448222</td>
<td>/ 0.27801</td>
<td>/ 9.807*10³</td>
<td>/ 100*10⁶</td>
<td>-</td>
</tr>
</tbody>
</table>

## Table 25: Output Conversions

<table>
<thead>
<tr>
<th>HP</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>* 746</td>
</tr>
<tr>
<td>/ 746</td>
<td>-</td>
</tr>
</tbody>
</table>

## Table 26: Rotation Conversions

<table>
<thead>
<tr>
<th>Min⁻¹(rpm)</th>
<th>Rad/s</th>
<th>Deg/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>* π / 30</td>
<td>* 6</td>
</tr>
<tr>
<td>* 30 / π</td>
<td>-</td>
<td>* 57.295</td>
</tr>
<tr>
<td>/ 6</td>
<td>/ 57.295</td>
<td>-</td>
</tr>
</tbody>
</table>
### Table 27: Torque conversions

<table>
<thead>
<tr>
<th></th>
<th>lb•in</th>
<th>lb•ft</th>
<th>oz•in</th>
<th>Nm</th>
<th>kp•m</th>
<th>kp•cm</th>
<th>dyne•cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb•in</td>
<td>-</td>
<td>/ 12</td>
<td>* 16</td>
<td>* 0.112985</td>
<td>* 0.011521</td>
<td>* 1.1521</td>
<td>* 1.129*10⁶</td>
</tr>
<tr>
<td>lb•ft</td>
<td>* 12</td>
<td>-</td>
<td>192</td>
<td>* 1.355822</td>
<td>* 1.38255</td>
<td>* 13.8255</td>
<td>* 13.558*10⁶</td>
</tr>
<tr>
<td>oz•in</td>
<td>/ 16</td>
<td>/ 192</td>
<td>-</td>
<td>* 7.0616*10⁻³</td>
<td>* 720.07*10⁻⁶</td>
<td>* 72.007*10⁻³</td>
<td>* 70615.5</td>
</tr>
<tr>
<td>Nm</td>
<td>/ 0.112985</td>
<td>/ 1.355822</td>
<td>/ 7.0616*10⁻³</td>
<td>-</td>
<td>* 0.101972</td>
<td>* 10.1972</td>
<td>* 10*10⁶</td>
</tr>
<tr>
<td>kp•m</td>
<td>/ 0.011521</td>
<td>/ 0.138255</td>
<td>/ 720.07*10⁻⁶</td>
<td>/ 0.101972</td>
<td>-</td>
<td>* 100</td>
<td>* 98.066*10⁶</td>
</tr>
<tr>
<td>kp•cm</td>
<td>/ 1.1521</td>
<td>/ 13.8255</td>
<td>/ 72.007*10⁻³</td>
<td>/ 10.1972</td>
<td>/ 100</td>
<td>-</td>
<td>* 0.9806*10⁶</td>
</tr>
<tr>
<td>dyne•cm</td>
<td>/ 1.129*10⁶</td>
<td>/ 13.558*10⁶</td>
<td>/ 70615.5</td>
<td>/ 10*10⁶</td>
<td>/ 98.066*10⁶</td>
<td>/ 0.9806*10⁶</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 28: Moment of inertia conversions

<table>
<thead>
<tr>
<th></th>
<th>lb•in²</th>
<th>lb•ft²</th>
<th>kg•m²</th>
<th>kg•cm²</th>
<th>kg•cm²•s²</th>
<th>oz•in²</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb•in²</td>
<td>-</td>
<td>/ 144</td>
<td>/ 3417.16</td>
<td>/ 0.341716</td>
<td>/ 335.109</td>
<td>* 16</td>
</tr>
<tr>
<td>lb•ft²</td>
<td>* 144</td>
<td>-</td>
<td>/ 3</td>
<td>*0.30479</td>
<td>*30.479</td>
<td>*304.79</td>
</tr>
<tr>
<td>kg•m²</td>
<td>* 3417.16</td>
<td>/ 0.04214</td>
<td>-</td>
<td>*0.9144</td>
<td>*91.44</td>
<td>*914.4</td>
</tr>
<tr>
<td>kg•cm²</td>
<td>* 0.341716</td>
<td>/ 421.4</td>
<td>/ 0.9144</td>
<td>-</td>
<td>*100</td>
<td>*1000</td>
</tr>
<tr>
<td>kg•cm²•s²</td>
<td>* 335.109</td>
<td>/ 0.429711</td>
<td>/0.9144</td>
<td>/100</td>
<td>-</td>
<td>*10</td>
</tr>
<tr>
<td>oz•in²</td>
<td>/ 16</td>
<td>/ 2304</td>
<td>/ 54674</td>
<td>/ 5.46</td>
<td>/ 5361.74</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 29: Temperature conversions

<table>
<thead>
<tr>
<th></th>
<th>°F</th>
<th>max</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>max</td>
<td>°C * 9/5 + 32</td>
<td>-</td>
<td>°C + 273.15</td>
</tr>
<tr>
<td>K</td>
<td>(K - 273.15) * 9/5 + 32</td>
<td>K - 273.15</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 30: Conductor cross-section

<table>
<thead>
<tr>
<th></th>
<th>AWG</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td></td>
<td>42.4</td>
<td>33.6</td>
<td>26.7</td>
<td>21.2</td>
<td>16.8</td>
<td>13.3</td>
<td>10.5</td>
<td>8.4</td>
<td>6.6</td>
<td>5.3</td>
<td>4.2</td>
<td>3.3</td>
<td>2.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>AWG</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm²</td>
<td></td>
<td>2.1</td>
<td>1.7</td>
<td>1.3</td>
<td>1.0</td>
<td>0.82</td>
<td>0.65</td>
<td>0.52</td>
<td>0.41</td>
<td>0.33</td>
<td>0.26</td>
<td>0.20</td>
<td>0.16</td>
<td>0.13</td>
</tr>
</tbody>
</table>