# Torque Sensors

## Static Torque Sensors

<table>
<thead>
<tr>
<th>Package</th>
<th>CS1060</th>
<th>CS1120</th>
<th>CS1210</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Mode</td>
<td>Square male coupling</td>
<td>Keyed shaft connections</td>
<td>Collar mechanical fittings</td>
</tr>
<tr>
<td>Unique Features</td>
<td>Reaction</td>
<td>Reaction</td>
<td>Reaction</td>
</tr>
<tr>
<td></td>
<td>• Optional high level output</td>
<td>• Optional high level output</td>
<td>• High stiffness</td>
</tr>
<tr>
<td></td>
<td>• Keyed shaft connection</td>
<td>• Keyed shaft connection</td>
<td>• Low transverse sensitivity</td>
</tr>
<tr>
<td></td>
<td>• Static measurements</td>
<td>• Static measurements</td>
<td>• Optional high temp option</td>
</tr>
<tr>
<td>FS Ranges</td>
<td>±5 to ±7,000 Nm</td>
<td>±5 to ±2,500 Nm</td>
<td>±160 to ±10,000 Nm</td>
</tr>
<tr>
<td></td>
<td>±4 to ±5,600 lbf-ft</td>
<td>±4 to ±2,000 lbf-ft</td>
<td>±128 to ±8,000 lbf-ft</td>
</tr>
<tr>
<td>Max. Over-range</td>
<td>1.5X FS</td>
<td>1.5X FS</td>
<td>1.5X FS</td>
</tr>
<tr>
<td>Output/Span</td>
<td>±20 mV , 0.5-4.5V</td>
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</tr>
<tr>
<td></td>
<td>&lt; ±0.25% FS</td>
<td>&lt; ±0.25% FS</td>
<td>&lt; ±0.25% FS</td>
</tr>
<tr>
<td>Combined Non-</td>
<td>-20°C to 100°C</td>
<td>-20°C to 100°C</td>
<td>-40°C to 150°C</td>
</tr>
<tr>
<td>linearity &amp; Hysteresis</td>
<td>Application dependent</td>
<td>Application dependent</td>
<td>Application dependent</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Applications</td>
<td>Non-rotating parts torque measurement, robotics and effectors, laboratory and research</td>
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</tr>
</tbody>
</table>

Specifications subject to change. Dimensions for reference purpose only.
### DYNAMIC TORQUE SENSORS

**CD1050**
- **Package**: Square male couplings
- **Operating Mode**: Dynamic rotary
- **Unique Features**:
  - Optional high level output
  - Rugged
  - Slip ring measurement interface
- **FS Ranges**:
  - ±5 to ±7,000 Nm
  - ±4 to ±5,600 lbf-ft
- **Max. Over-range**: 1.5X FS
- **Output/Span**: ±20 mV, 0.5-4.5V
- **Combined Non-linearity & Hysteresis**: < ±0.25% FS
- **Operating Temp.**: -20°C to 80°C
- **Dimensions (mm)**: Application dependent
- **Typical Applications**: Engine efficiency, robotics and effectors, laboratory and research

**CD1095**
- **Package**: Keyed shaft couplings
- **Operating Mode**: Dynamic rotary
- **Unique Features**:
  - High accuracy
  - Built-in amplifier
  - Bi-directional measurement
- **FS Ranges**:
  - ±5 to ±2,500 Nm
  - ±4 to ±2,000 lbf-ft
  - ±0.05 to ±2 Nm
  - ±0.04 to ±1.6 lbf-ft
- **Max. Over-range**: 1.5X FS
- **Output/Span**: ±20 mV, 0.5-4.5V
- **Combined Non-linearity & Hysteresis**: < ±0.25% FS
- **Operating Temp.**: -20°C to 80°C
- **Dimensions (mm)**: Application dependent
- **Typical Applications**: Process control equipment, robotics and effectors, test and measurement

**CD1110**
- **Package**: Keyed shaft couplings
- **Operating Mode**: Dynamic rotary
- **Unique Features**:
  - Low range measurements
  - Bi-directional measurement
  - Mechanical over-range stops
- **FS Ranges**:
  - ±0.05 to ±2 Nm
  - ±0.04 to ±1.6 lbf-ft
- **Max. Over-range**: 10X FS
- **Output/Span**: ±20 mV, 0.5-4.5V
- **Combined Non-linearity & Hysteresis**: < ±0.25% FS
- **Operating Temp.**: -20°C to 80°C
- **Dimensions (mm)**: Application dependent
- **Typical Applications**: Process control equipment, robotics and effectors, test and measurement

### CONTACTLESS TORQUE SENSORS

**CD1140**
- **Package**: Keyed shaft couplings
- **Operating Mode**: Contactless
- **Unique Features**:
  - High accuracy
  - Built-in amplifier
  - Speed and angle detection
- **FS Ranges**:
  - ±0.05 to ±20,000 Nm
  - ±0.04 to ±16,000 lbf-ft
- **Max. Over-range**: 2X FS
- **Output/Span**: ±10 V (60 pulses/rev)
- **Combined Non-linearity & Hysteresis**: ±0.1% FS
- **Operating Temp.**: 0°C to 60°C
- **Dimensions (mm)**: Application dependent
- **Typical Applications**: Process control equipment, robotics and effectors, test and measurement

**CD9515**
- **Package**: Keyed shaft couplings
- **Operating Mode**: Contactless
- **Unique Features**:
  - Economical
  - Small form factor
  - Speed and angle detection
- **FS Ranges**:
  - ±5 to ±1,000 Nm
  - ±4 to ±738 lbf-ft
  - ±0.5 to ±10,000 Nm
- **Max. Over-range**: 2X FS
- **Output/Span**: ±5 V (60 pulses/rev)
- **Combined Non-linearity & Hysteresis**: ±0.3% FS
- **Operating Temp.**: 0°C to 60°C
- **Dimensions (mm)**: Application dependent
- **Typical Applications**: Process control equipment, robotics and effectors, test and measurement

### AUTOMOTIVE TEST TORQUE SENSORS

**FCA7300**
- **Package**: Steering wheel adaptable
- **Operating Mode**: Multi-sensing adaptable
- **Unique Features**:
  - Dual torque/angle range
  - Steering velocity measurement
  - Fits all road vehicles
- **FS Ranges**:
  - 10 to 200 Nm (7 lbf-ft to 150 lbf-ft)
  - 20,000 Nm 16,000 lbf-ft
- **Max. Over-range**: 10X FS
- **Output/Span**: ±10 V
- **Combined Non-linearity & Hysteresis**: ±0.1% FS
- **Operating Temp.**: -20°C to 80°C
- **Dimensions (mm)**: Ø195 x 50
- **Typical Applications**: On-car road test, truck and buses steering test, armored vehicles steering test

**CD1124T**
- **Package**: Steering wheel adaptable
- **Operating Mode**: Contactless
- **Unique Features**:
  - Heavy duty vehicles
  - Telemetry based
  - Gearbox to engine shaft measurement
- **FS Ranges**:
  - 20,000 Nm 16,000 lbf-ft
- **Max. Over-range**: 1.5X FS
- **Output/Span**: ±10 V
- **Combined Non-linearity & Hysteresis**: ±1% FS
- **Operating Temp.**: -20°C to 80°C
- **Dimensions (mm)**: Ø195 x 35
- **Typical Applications**: Automotive test benches for engine shaft torque measurement