The Danfoss DST X730 high level Inclination sensors are developed to ensure a robust and high-performance solution for applications such as agricultural- and construction machines, as well as material handling equipments. These sensors are typically used in safety applications in order to keep the inclination of a machine, or just a part of it, a safety zone for working people, under control.

Danfoss DST X730 series uses MEMS technology for single and dual axis with measurement ranges up to 360° in both single and redundant versions, with extended resolution and linearity.

All sensors are designed for off-highway applications and resistant to shock and vibrations and with high electromagnetic compatibility and comes with either analogue or CANopen output.

The sensors are produced according to PL d (EN ISO 13849-1:2015), making the complete portfolio suitable for safety-critical applications.

### Features
- MEMS technology for almost infinite sensor life time
- Single or Redundant ranges up to 360° (±180°)
- Output: Analogue or CANopen
- Electrical connector: M12, 5-pin or cable
- IP protection IP67, IPX9K
- Accuracy: <± 0.15% FS ≤ ± 60° dual axis and 180° single axis; 0.3 FS ± 85° dual axis
- Resolution 0.01°

### Conformity
- CE
- RoHS
## Technical data

### Performance

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>±10° ±15° ±20° ±30° ±45° ±60° ±85° (single axis Z / XY dual axis) 360° (±180°) (single Z axis)</th>
</tr>
</thead>
</table>
| Accuracy (Factory verification @25 °C) | Single axis: <± 0.15% FS  
Dual axis: <±0.15% FS in the range ±± 60°, ± 0.3% FS otherwise |
| Temperature coefficient @ 0° | Typical < ±0.006°/°K |
| Long term repeatability | Single axis: Typical <±0.5° in the range ±180°  
Dual axis: Typical <±0.5° in the range ≤± 60°, ± 2° otherwise |
| Resolution | CANopen output; 0.01°; 12 bit analog output |

### Electrical specifications

<table>
<thead>
<tr>
<th>Electrical connections</th>
<th>M12 connector or cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output signal</td>
<td>CANopen, Ratiometric 10-90% of Vs, 0.5 - 4.5 Vdc, 0.10 Volc or 4-20mA</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>+10 – +36 Vdc or 5 Vdc Ratiometric output</td>
</tr>
</tbody>
</table>

### Environmental conditions

<table>
<thead>
<tr>
<th>Operating temperature range</th>
<th>-40 – 85 °C</th>
</tr>
</thead>
</table>
| EMC | Emission EN 55011  
Immunity EN 61236-3-2 |
| Vibration stability | Sinusoidal 20 g, 10 Hz – 2,000 kHz IEC 60068-2-6 |
| Shock resistance | Impulsive on 3 axes 50 g, 11 ms IEC 60068-2-27 |
| Enclosure | IP67, IPX9K |

### Mechanical characteristics

<table>
<thead>
<tr>
<th>Materials</th>
<th>Enclosure</th>
<th>PBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net weight</td>
<td>0.245 kg (without cable)</td>
<td></td>
</tr>
</tbody>
</table>

## Ordering

<table>
<thead>
<tr>
<th>Type</th>
<th>Output signal</th>
<th>Configurations</th>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DST X730</td>
<td>36 V CANopen</td>
<td>1 x M12 5p, Single axis; ±180°; 36V</td>
<td>098G3500</td>
</tr>
<tr>
<td></td>
<td>36 V CANopen</td>
<td>2 x M12 5p, Single axis; Redundant; ±180; 36V</td>
<td>098G3501</td>
</tr>
<tr>
<td></td>
<td>36 V CANopen</td>
<td>1 x M12 5p, Dual axis; ±85°; 36V</td>
<td>098G3502</td>
</tr>
<tr>
<td></td>
<td>36 V CANopen</td>
<td>2 x M12 5p, Dual axis; Redundant; ±85°; 36V</td>
<td>098G3503</td>
</tr>
</tbody>
</table>
### Ordering code - on request

**Electrical connections**

<table>
<thead>
<tr>
<th>Axis type</th>
<th>Circuit type</th>
<th>Output 1 Measuring range (Output for single circuit)</th>
<th>Output 2 Measuring range (Only for redundant version)</th>
<th>Supply voltage</th>
<th>Output type</th>
<th>Certificate</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 connector output</td>
<td>M</td>
<td>Measuring range (indicate) single axis always $360^\circ$</td>
<td>Measuring range (indicate) single axis always $360^\circ$</td>
<td>+5Vdc (only for A1 output)</td>
<td>+0.5...+4.5Vdc output (available with supply L = ratiometric output and with supply H = 0.5...4.5V output)</td>
<td>No certificate attached</td>
<td>No accessories</td>
</tr>
<tr>
<td>Cable output (specify cable length)</td>
<td>F</td>
<td>dual axis $\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ \pm 45^\circ \pm 60^\circ \pm 85^\circ$</td>
<td>dual axis $\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ \pm 45^\circ \pm 60^\circ \pm 85^\circ$</td>
<td>+10...+36Vdc (see output signal for right supply voltage)</td>
<td>0...+10Vdc output (powered at +11...36Vdc)</td>
<td>+5Vdc</td>
<td>Magnetic pen (PKIT 312)</td>
</tr>
<tr>
<td>Dual axis (XY axis)</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>4...20mA output (powered at +10...36Vdc)</td>
<td>360 $\pm 185^\circ$</td>
<td>X</td>
</tr>
<tr>
<td>Single axis (Z axe)</td>
<td>V</td>
<td></td>
<td></td>
<td></td>
<td>CANopen output (powered at +10...36Vdc)</td>
<td>360 $\pm 185^\circ$</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Certificate**

- No certificate attached: 0
- Linearity curve to be attached: L

**Accessories**

- No accessories: X
- Magnetic pen (PKIT 312): Y

**Cable length**

- 100 mm: 01
- 200 mm: 02
- 500 mm: 05
- 1 m: 10
- 2 m: 20
- Other length on request: .......

**Example of ordering:**

DST X730-MVR360360HC10 0033X00

- M: M12 connector
- V: Single (Z axis)
- R: Redundant
- 360: $\pm 185^\circ$
- H: +5 Vdc
- A1: +10...+36 Vdc
- C1: CANopen
- 0: M12 version
- 0: No certificate
- 033: Standard
- X: No accessories
- 00: Not defined (only cable version)
Output signals graphs

Load conditions
+0.5Vdc...+4.5 Vdc output with power +10...36Vdc and +0.10Vdc output with power +11.36Vdc: apply a load resistance > 100Kohm
Dimensions

Metal insert
Max. torque 2.5 Nm

Electrical connections

1. n.c.
2. + Supply
3. Ground
4. CAN H
5. CAN L

MS DIN 6796 A2 conical spring washers MUST be used (3 pc.)

Connections

Single axis

Dual axis