The Danfoss DST X520 rotary position sensors without shaft are designed for use in mobile hydraulic applications.

Danfoss DST X520 series uses contactless Hall technology with measurement ranges up to 360°.

All sensors are E1 approved and are designed for off-highway applications and resistant to shock and vibrations and with high electromagnetic compatibility, and comes with either analogue, CANopen or SAE J1939 output.

Single and redundant sensor types are available and are produced according to PL d (EN ISO 13849-1:2015), making the complete portfolio suitable for safety-critical applications.

**Features**
- Contactless Hall technology for almost infinite sensor life time
- Single or Redundant ranges up to 360° (±180°)
- Output: Analogue, CANopen and SAE J1939
- Linearity: < ± 0.5% FS
- Resolution:
  - 12 bit (analog)
  - 14 bit (CANopen/SAE J1939)
- IP protection level I67 - IP69K with female mating connector
- High quality 10 mm magnet (PKIT384) included

**Approvals and Conformity**
- CE
- RoHS
- E1 approved
## Technical data

<table>
<thead>
<tr>
<th>Performance</th>
<th>360° (±180°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td></td>
</tr>
<tr>
<td>Linearity</td>
<td>≤ ± 0.5% FS</td>
</tr>
<tr>
<td>Resolution and speed of rotation</td>
<td>120 rpm max.</td>
</tr>
<tr>
<td>12 bit (analog output)</td>
<td></td>
</tr>
<tr>
<td>14 bit (CANopen/SAE J1939 output)</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td>No wear through the use of permanent external magnet</td>
</tr>
</tbody>
</table>

### Electrical specifications

<table>
<thead>
<tr>
<th>Electrical connections</th>
<th>AMP Superseal 6p 282108-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output signal</td>
<td>0.5-4.5 V Ratiometric; CANopen / SAE J1939</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>Ratiometric + 5 Vdc; CANopen/J1939: +9 – +36 Vdc</td>
</tr>
</tbody>
</table>

### Environmental conditions

| Operating temperature range       | -40 – 85 °C |
| Thermal drift temperature         | < 50 ppm/°C |
| EMC                               |             |
| Emission                          | EN 55011 and CISPR 25 |
| Immunity                          | EN 61236-3-2 and ISO 11452-2 |
| Transient on supply lines         | ISO 7637-2   |
| Bulk current injection            | ISO 11452-4  |
| 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 |
| IP protection                     | IP67 - IP69K (with female mating connector) |

### Mechanical characteristics

<table>
<thead>
<tr>
<th>Materials</th>
<th>Enclosure</th>
<th>PBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net weight</td>
<td>0.036 kg</td>
<td></td>
</tr>
</tbody>
</table>
Sensor output graph

Clockwise CW single
Direction of rotation 1

Counter-clockwise CCW single
Direction of rotation 2

Redundant direction of rotation 1

Redundant direction of rotation 2

Redundant direction of rotation 3

Redundant direction of rotation 4

Load conditions

+0.5 Vdc - +4.5 Vdc output with power + 5Vdc: It is recommended a load resistance > 10 KΩ
## Ordering

<table>
<thead>
<tr>
<th>Type</th>
<th>Output signal</th>
<th>Configurations</th>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DST X 520 incl. PKIT magnet</td>
<td>5V Ratiometric</td>
<td>±180° Clockwise CW</td>
<td>098G1500</td>
</tr>
<tr>
<td></td>
<td>5V Ratiometric</td>
<td>±180° Counterclockwise CCW/CH2 clockwise CW</td>
<td>098G1501</td>
</tr>
<tr>
<td></td>
<td>36 V CANopen</td>
<td>±180° Clockwise CW</td>
<td>098G1502</td>
</tr>
<tr>
<td></td>
<td>36 V SAE J1939</td>
<td>±180° Clockwise CW</td>
<td>098G1503</td>
</tr>
</tbody>
</table>

### Ordering code - on request

#### Electrical connections
- AMP Superseal 6P connector: A
- Cable (specify cable length): F

#### Circuit type
- Single Analog or CAN/J 1939: S
- Redundant Analog: R

#### Angle/Channel 1 (output for single channel)

#### Angle/Channel 2 (redundant versions)

#### Supply voltage
- +5VdC (only for A1 output): L
- +9...+36VdC (see output signal for right supply voltage): H

#### Output type
- +0.5...+4.5VdC output (available with supply L = ratiometric output and with supply H = 0.5...4.5V output): A1
- 0...+10VdC output (powered at +11...36VdC): A2
- 4...20mA output (powered at +9...36VdC): A3
- CANopen output (powered at +9...36VdC) (available in single version with +/-180° measurement range): C1
- SAE J1939 (powered at +9...36VdC) (available in single version with +/-180° measurement range): C2

#### Rotation direction
- Clockwise CW (single) both clockwise CW (redundant or CAN/J1939): 1
- Counterclockwise CCW (single) both counterclockwise CCW (redundant or CAN/J1939): 2
- CHANNEL 1 clockwise CW and CHANNEL 2 counterclockwise CCW (only for redundant version and CAN/J1939): 3
- CHANNEL 1 counterclockwise CCW and CHANNEL 2 clockwise CW (only for redundant version and CAN/J1939): 4

#### Cable
- Single cable without connector (always "0" in case of DST X520 A version): 0
- Cable (100 mm) + M12, 5-pin male overprinted connector: 1

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

#### Accessories
- No accessories: X
- Shaft kit + magnet D 15 M10 hexagonal (PKIT 384): A
- Shaft kit to insert + magnet D 15 (PKIT 389): B
- Kit magnet Ø15 (PKIT 418): C

#### Example of ordering:
DST X520-AS180000HC14000 0033A00

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

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Dimensions

AMP version

Axis X-Y offset
Max Ø 2mm tolerance zone axis position magnet. Note each offset from the axis misalignment or magnetic will increase the non-linearity.

PKIT384 Shaft kit + magnet D15 M10 Hexagonal
Magnet M10 CH17
Air gap 2-7 mm axis offset Ø4 mm
Electrical connections

The output increases for versions CCW

The output increases for versions CW

Metal insert
Max. torque: 2.5 Nm

Ref. | CW output | CWW output
--- | --- | ---
A | 0.5 Vdc | 4.5 Vdc
B | Zero angular position of 0° | Zero angular position of 0°
C | 4.5 Vdc | 0.5 Vdc

Connections
1. Ground 1
2. + Supply 1
3. Output 1
4. Ground 2
5. + Supply 2
6. Output 2

Connections - CAN/J 1939
1. OV (GND)
2. + Vs (+9 - 36 Vdc)
3. NC
4. NC
5. CAN-L
6. CAN-H