

Data sheet

# Top level inclination sensor

## DST X730



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° ( $\pm 180^\circ$ )
- Output: Analogue or CANopen
- Electrical connector: M12, 5-pin or cable
- IP protection IP67, IPX9K
- Accuracy:  $< \pm 0.15\% \text{ FS} \leq \pm 60^\circ$  dual axis and  $180^\circ$  single axis;  $0.3 \text{ FS} \pm 85^\circ$  dual axis
- Resolution 0.01°

### Conformity

- CE
- RoHS

**Technical data**
**Performance**

Measuring range	$\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ \pm 45^\circ \pm 60^\circ \pm 85^\circ$ (single axis Z / XY dual axis) $360^\circ (\pm 180^\circ)$ (single Z axis)
Accuracy (Factory verification @25 °C)	Single axis: $< \pm 0.15\%$ FS Dual axis: $< \pm 0.15\%$ FS in the range $\leq \pm 60^\circ$ , $\pm 0.3\%$ FS otherwise
Temperature coefficient @ 0°	Typical $< \pm 0.006^\circ/\text{°K}$
Long term repeatability	Single axis: Typical $< \pm 0.5^\circ$ in the range $\pm 180^\circ$ Dual axis: Typical $< \pm 0.5^\circ$ in the range $\leq \pm 60^\circ$ , $\pm 2^\circ$ otherwise
Resolution	CANopen output; 0.01°; 12 bit analog output

**Electrical specifications**

Electrical connections	M12 connector or cable
Output signal	CANopen, Ratiometric 10-90% of Vs, 0.5 - 4.5 Vdc, 0-10 Vdc or 4-20mA
Supply voltage	+10 – +36 Vdc or 5 Vdc Ratiometric output

**Environmental conditions**

Operating temperature range		-40 – 85 °C	
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**

Materials	Enclosure	PBT
Net weight	0.245 kg (without cable)	

**Ordering**

Type	Output signal	Cofigurations	Code no.
DST X730	36 V CANopen	1 x M12 5p; Single axis; $\pm 180^\circ$ ; 36V	098G3500
	36 V CANopen	2 x M12 5p; Single axis; Redundant; $\pm 180^\circ$ ; 36V	098G3501
	36 V CANopen	1 x M12 5p; Dual axis; $\pm 85^\circ$ ; 36V	098G3502
	36 V CANopen	2 x M12 5p; Dual axis; Redundant; $\pm 85^\circ$ ; 36V	098G3503

**Ordering code -  
on request**

Electrical connections	
M12 connector output	M
Cable output (specify cable length)	F

Axis type	
Dual axis (XY axis)	O
Single axis (Z axis)	V

Circuit type	
Single	S
Redundant	R

Output 1 Measuring range (Output for single circuit)	
Measuring range (indicate) single axis always 360° dual axis $\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ \pm 45^\circ \pm 60^\circ \pm 85^\circ$	xxx

Output 2 Measuring range (Only for redundant version)	
Measuring range (indicate) single axis always 360° dual axis $\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ \pm 45^\circ \pm 60^\circ \pm 85^\circ$	xxx

Supply voltage	
+5Vdc (only for A1 output)	L
+10...+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 +10...36Vdc)	A3
CANopen output (powered at +10...36Vdc)	C1

Cable	
Cable without connector (always "0" in case of M12 connector version)	0

Certificate	
No certificate attached	0
Linearity curve to be attached	L

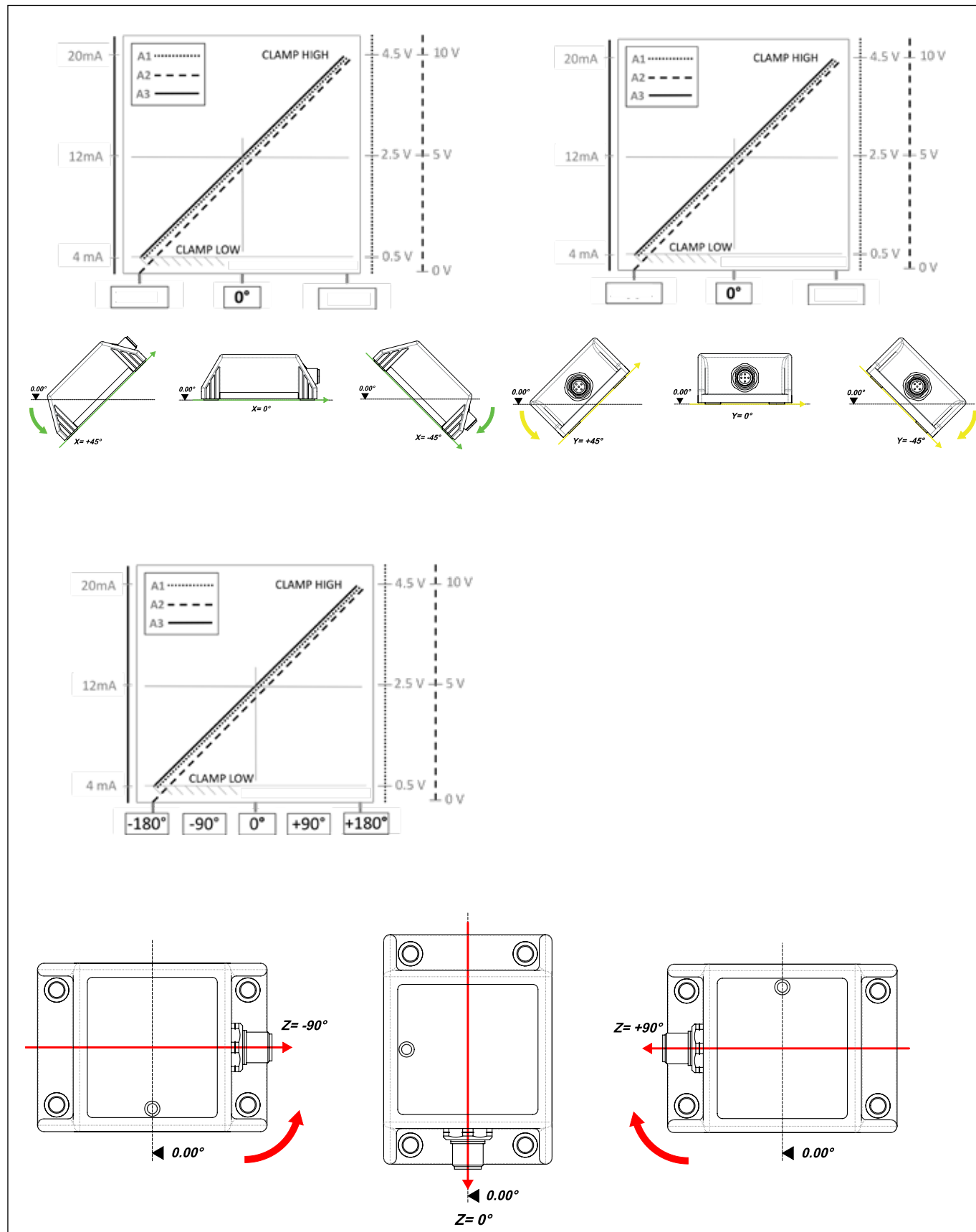
Accessories	
No accessories	X
Magnetic pen (PKIT 312)	Y

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	$\pm 185^\circ$
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)

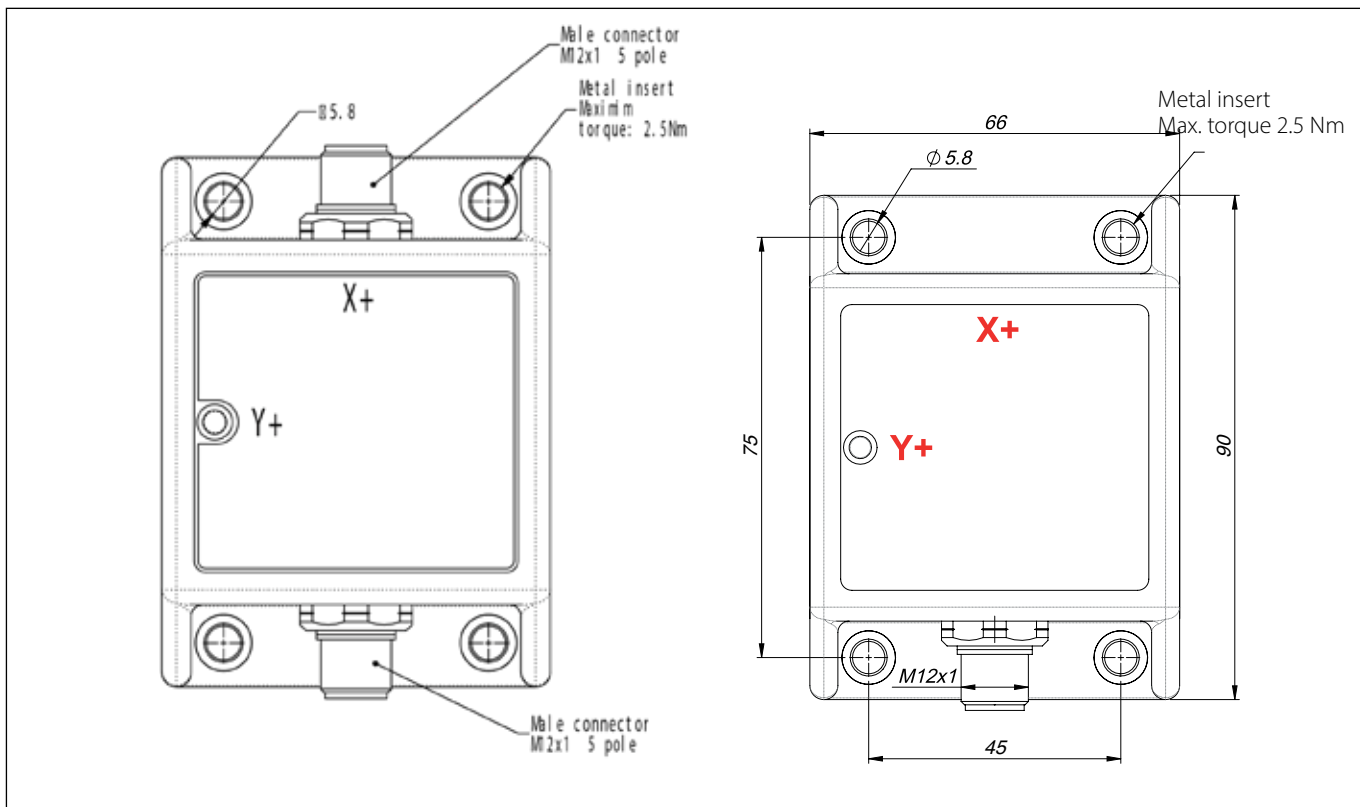
Output signals graphs



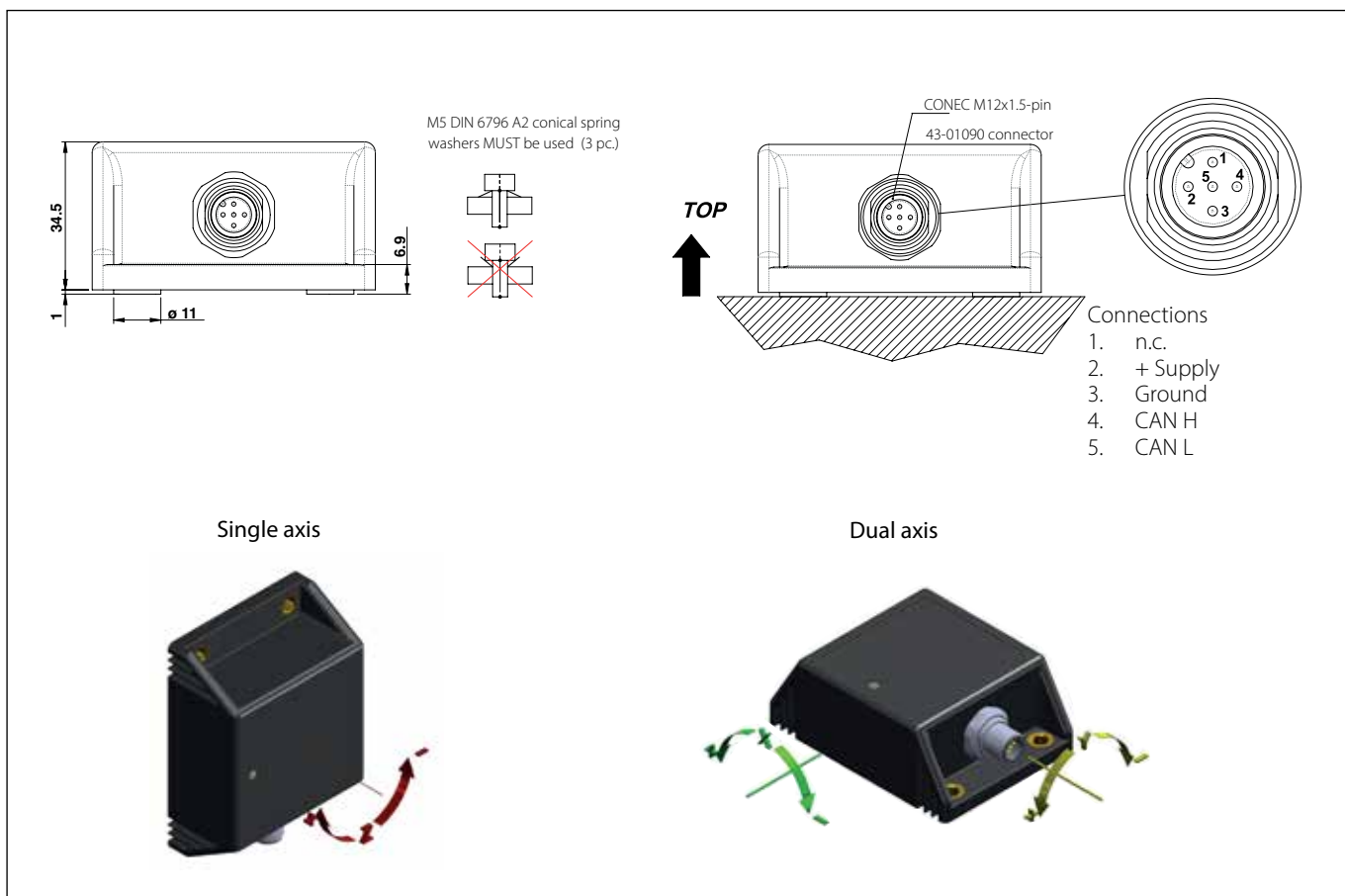
Load conditions

+0.5Vdc...+4.5 Vdc output with power +10...36Vdc and +0...10Vdc output with power +11...36Vdc: apply a load resistance > 100Kohm

Dimensions



Electrical connections



ENGINEERING  
TOMORROW



---

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.

---