

Data sheet

Mid level inclination sensor

DST X720



The Danfoss DST X720 mid 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 X720 series uses MEMS technology for single and dual axis with measurement ranges up to 360° in both single and redundant versions.

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
- Accuracy $< \pm 0.5\%$ FS
- Resolution 0.01°
- IP protection IP67, IPX9K

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 / dual axis XY) $360^\circ (\pm 180^\circ)$ single axis Z
Accuracy (Factory verification @25 °C)	$\leq \pm 0.5\%$ FS
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	0.01° CANopen output; 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
IP rating		IP67, IPX9K	

Mechanical characteristics

Materials	Enclosure	PBT
Net weight		0.26 kg (without cable)

Ordering

Type	Output signal	Cofigurations	Code no.
DST X720	36 V CANopen	1 x M12 5p; Single axis; $\pm 180^\circ$; 36V	098G3000
	36 V CANopen	2 x M12 5p; Single axis; Redundant; $\pm 180^\circ$; 36V	098G3001
	36 V CANopen	1 x M12 5p; Dual axis; $\pm 85^\circ$; 36V	098G3002
	36 V CANopen	2 x M12 5p; Dual axis; Redundant; $\pm 85^\circ$; 36V	098G3003

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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) $\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ \pm 45^\circ \pm 60^\circ \pm 85^\circ$ (single axis Z for analogue output-dual axis XY); $360^\circ (\pm 180^\circ)$ for single Z axis only	xxx

Output 2 Measuring range (Only for redundant version)	
Measuring range (indicate) $\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ \pm 45^\circ \pm 60^\circ \pm 85^\circ$ (single axis Z for analogue output-dual axis XY); $360^\circ (\pm 180^\circ)$ for single Z axis only	xxx

Supply voltage	
+5Vdc (only for A1 output)	L
+10...+36Vdc (see output signal for right supply vol- tage)	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 DST X720 M12 version)	0

Certificate	
No certificate attached	0
Linearity curve to be attached	L

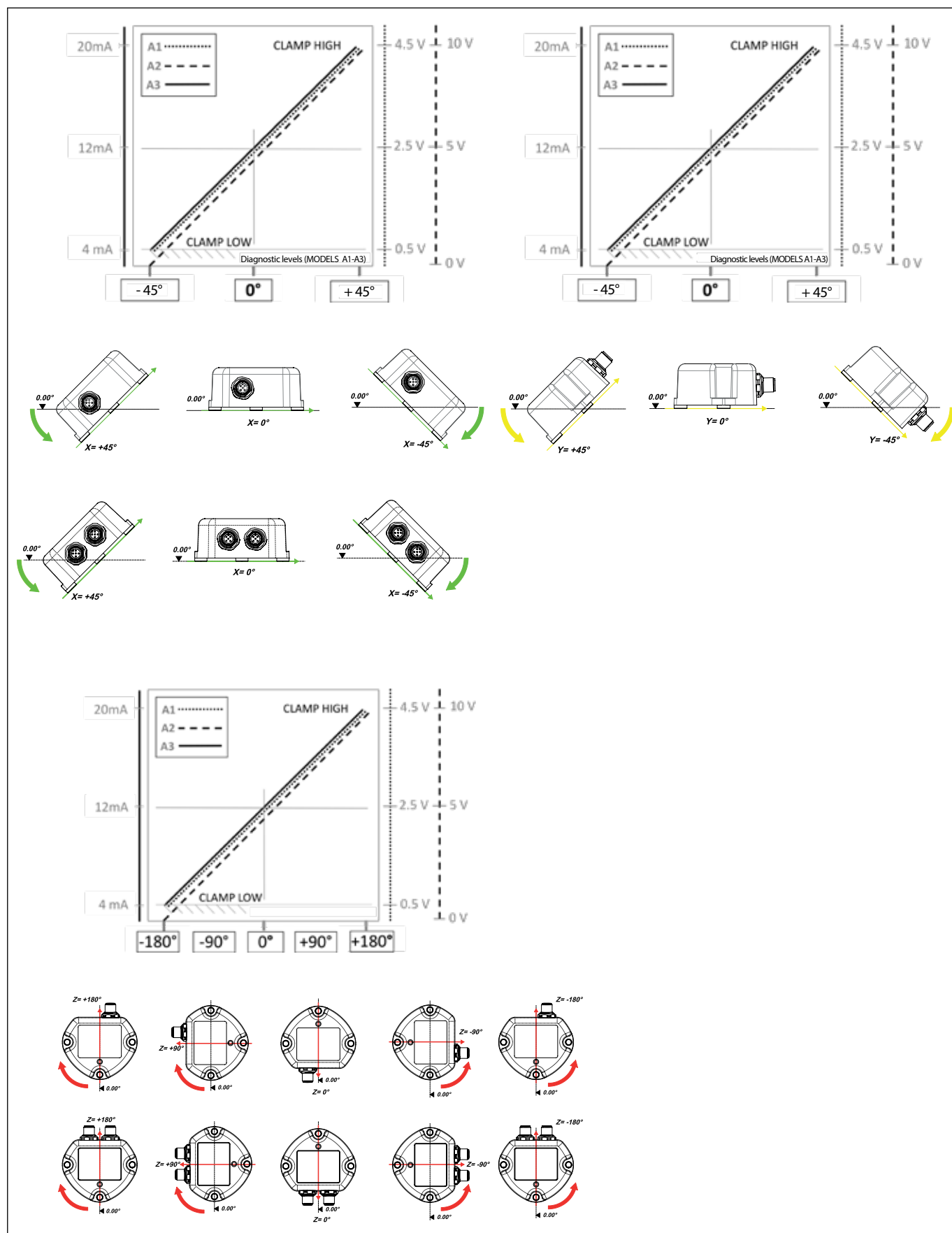
Accessories	
No accessories	X
Magnetic pen (PKIT 312)	Y

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 X720-MOR045045LA10 0033X00

M	M12 connector
0	Dual Axis (XY axis)
R	Redundant
045	$\pm 045^\circ$
045	$\pm 045^\circ$
L	+5 Vdc
A1	+05 - +4.5 Vdc
0	M12 version
0	No certificate
033	Standard
X	No accessories
00	Not defined (only cable version)

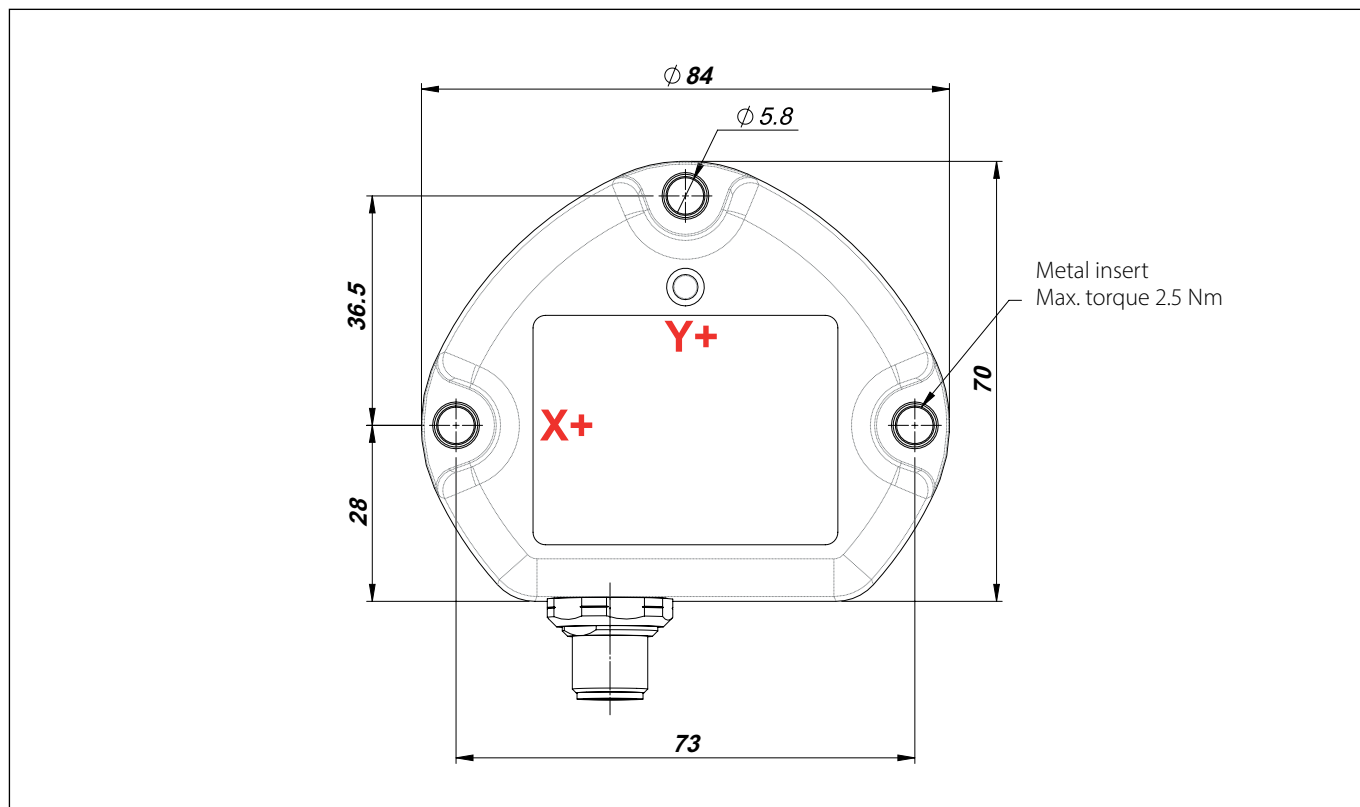
Output signals graphs



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

