



Inclination position sensor

DST X710

For mobile hydraulic applications

Description

The Danfoss DST X710 entry 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 X710 series uses contactless MEMS technology for both single and dual axis with measurement ranges up to 360°.

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.

Danfoss DST X710 is designed to be double mounted with specific spacers in order to have a full redundant space-saving version.

Features & benefits

- MEMS technology for almost infinite sensor life time
- Dual axis up to $\pm 85^\circ$, Single axis 360° ($\pm 180^\circ$)
- Output: Analogue or CANopen
- Accuracy: $< \pm 0.5\%$ FS
- Electrical connector: AMP Superseal 6P 282108-1 or cable
- Resolution; 0.01°
- IP protection level IP67 - IPX9K with female mating connector

Ordering

Product code numbers

Ordering type

Type	Output signal	Configurations	Code no.
DST X710	CANopen	Single axis; $\pm 180^\circ$; 36V	098G2500
	CANopen	Dual axis; $\pm 85^\circ$; 36V	098G2501

Others on request

Ordering code - on request

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

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

Measuring range	
(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

Measuring range (Not available)	
(Redundant option not available)	000

Supply voltage	
+5Vdc (only for A1 output)	L
+10...+36Vdc (see output signal for right supply voltage)	H

Output type	
0.5 - 4.5 V DC output (available with supply L = ratiometric output and with supply H = 0.5 - 4.5 V output)	A1
0 - 10 V DC output (powered at 11 - 36 V DC)	A2
4 - 20 mA output (powered at 10 - 36 V DC)	A3
CANopen output (powered at 10 - 36 V DC)	C1

Cable	
Cable without connector (always "0" in case of DST X710 AMP Superseal)	0
Cable (100 mm) + M12, 5-pin male overprinted connector	1

Certificate	
No certificate attached	0
Linearity curve to be attached	L

Version	
Standard	033

Accessories	
No accessories	X
Magnetic pen (PKIT 312)	Y
3 x spacers for redundant version (BUS027)	A

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 X710-A0045000HC10 0033X00

A	AMP Superseal 6P
0	Dual Axis (XY axis)
045	$\pm 45^\circ$
000	NA
H	9 - 36 V DC
C1	CANopen

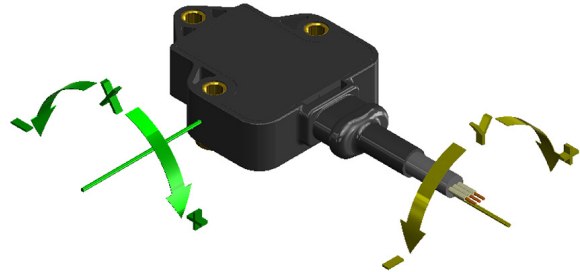
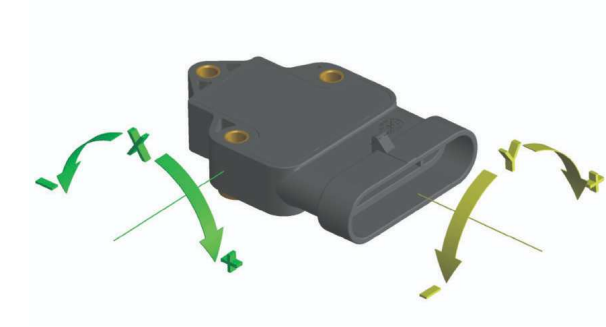
0	AMP version
0	No certificate
033	Standard
X	No accessories
00	Not defined (only cable version)

Note: For a detailed overview of our existing code numbers, please visit the Danfoss Product Store at store.danfoss.com. You can use the filtering options to find the right sensor for your specific needs.

Functions

Zero function

Available for analog single circuit versions in DST X710
XY configuration (dual axis)



To activate the Autozero function make sure that:

- sensor is powered
- fixing surface is free of dust or grease
- sensor is fixed on the horizontal plane with suitable screws



ATTENTION:

The Autozero function can be defined within a maximum range of $\pm 4.5^\circ$ from the original zero position (factory set).
Hold the **magnetic pen** (accessory to order PKIT312) to the **ZERO POINT** indicated on the product label.
Hold the position for **at least 3-5 seconds** so that the operation is successful.

Magnetic pen



Product details

General 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)	$< \pm 0.5\%$ 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	AMP Superseal 6P 282108-1, cable or cable +M12 5P
Output signal	CANopen, Ratiometric 10-90% of Vs, 0.5 - 4.5 V DC, 0-10 V DC or 4-20 mA
Supply voltage	CANopen, 0.5 - 4.5 V DC, 4 - 20 mA: 10 - 36 V DC; 0-10 V DC : 11-36 V DC Ratiometric: 10 - 90% of Vs: 5 V DC
Current consumption	Analogue: < 20 mA (no load) CANopen: < 15 mA (no load)
MTTFd [Years]	CANopen: 496 Analogue: 554

Environmental conditions

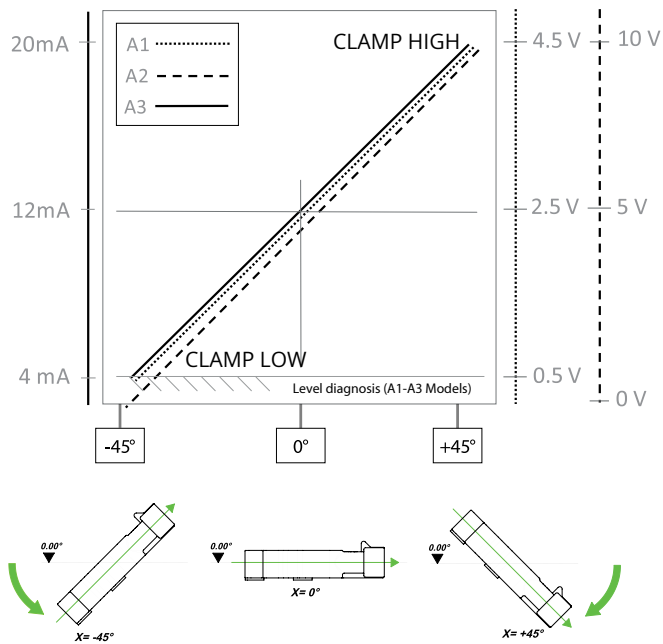
Operating temperature range		-40 – 85 °C	
EMC	Emission		EN 55011
	Immunity		EN 61236-3-2
	Transient on supply lines		ISO 7637-2
	Bulk current injection		ISO 11452-4
Vibration stability	Sinusoidal	20 g, 10 Hz – 2,000 kHz	IEC 60068-2-6
Shock resistance	Impulsive on 3 axes	50 g, 11 ms	IEC 60068-2-27
IP rating			IP67 - IPX9K with female mating connector

Mechanical characteristics

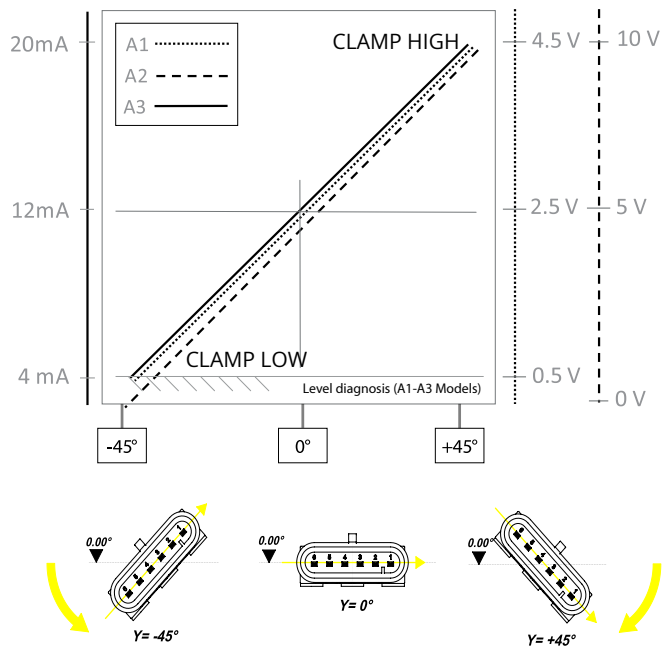
Materials	Enclosure	PBT (Polybutylene terephthalate)
Net weight		0.036 kg (without cable)

Sensor output graph

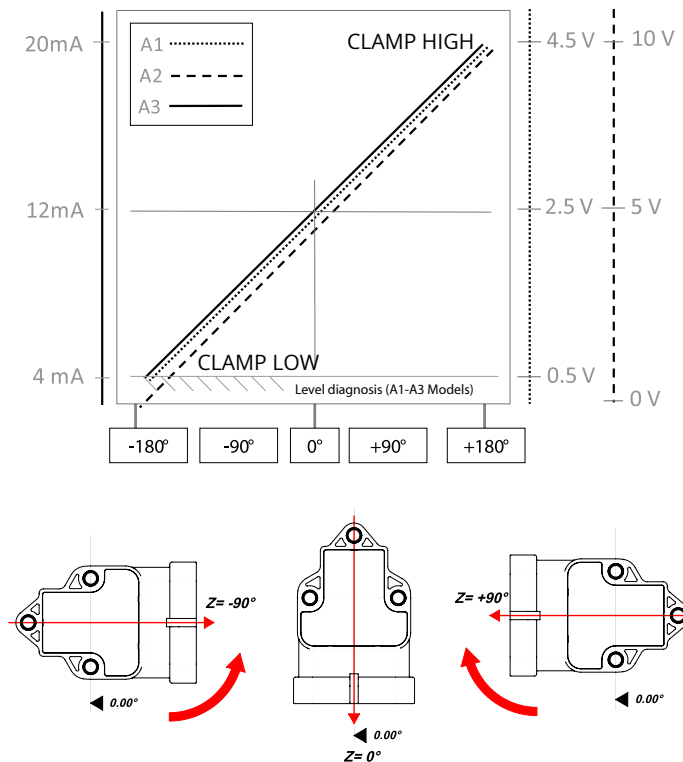
Dual axis tilt sensor (XY) X-axis



Dual axis tilt sensor (XY) - Y-axis



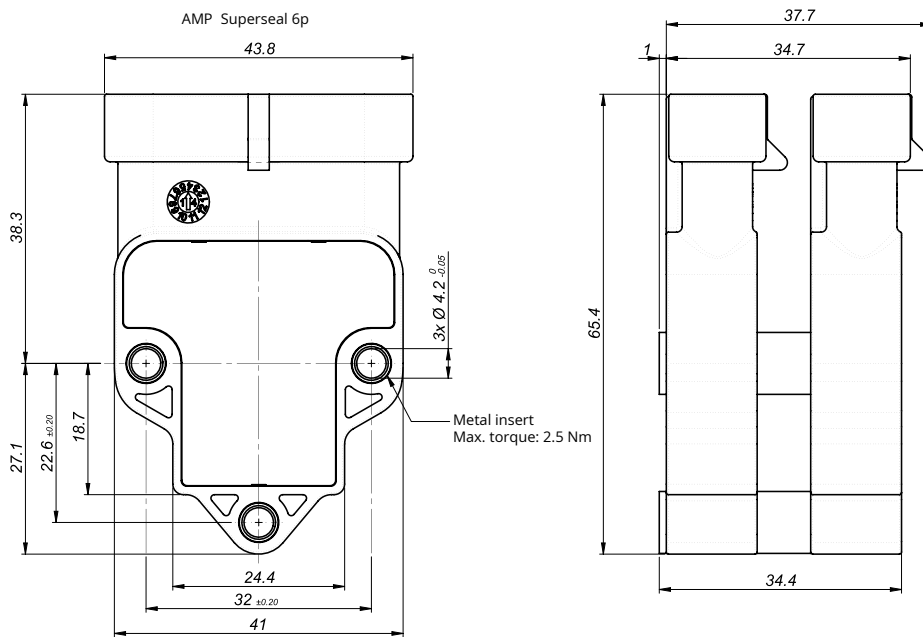
Single axis tilt sensor ($\pm 180^\circ$) - Z-axis



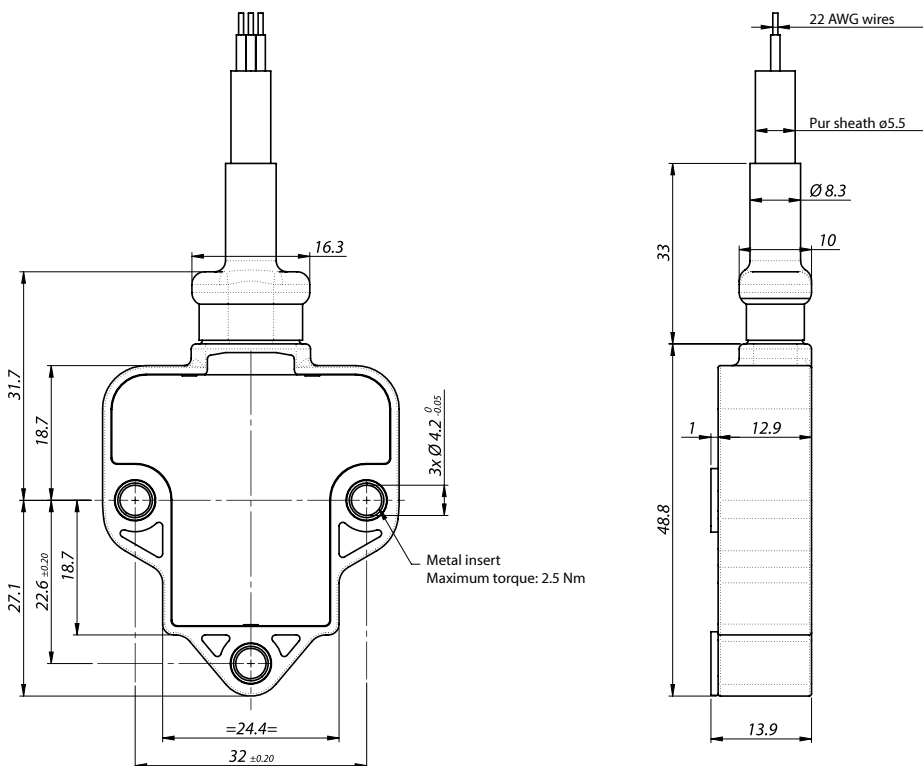
Note: Load conditions: 0.5 - 4.5 V DC output with power + 5 V DC: It is recommended a load resistance > 10 K Ω

Dimensions

AMP version



Cable version



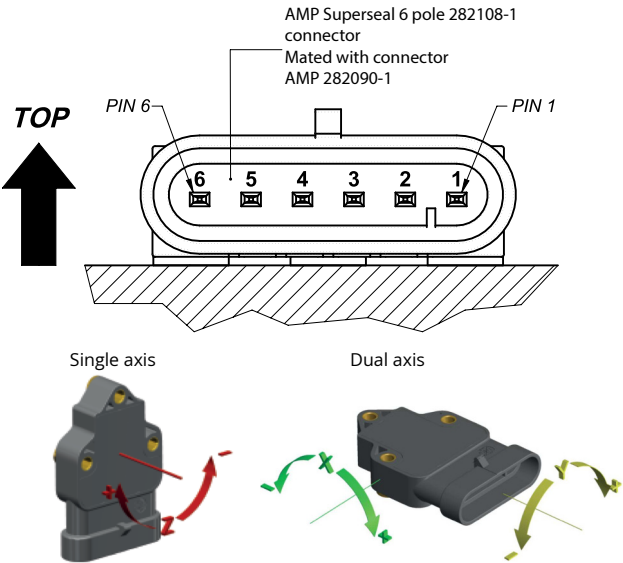
Note: Dimensions are in mm, unless stated otherwise.



Connections

Electrical connections

AMP version



Connections

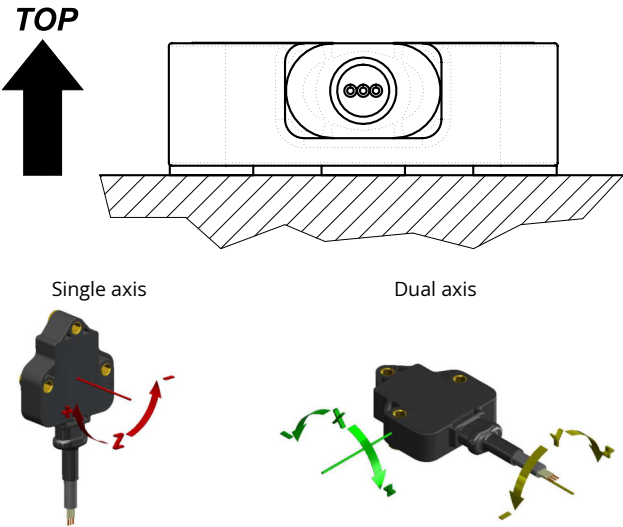
1	Ground
2	± Supply
3	Output X (dual axis)/Z(single axis)
4	Output Y (dual axis)/n.c (single axis)
5	n.c.
6	n.c.

CAN Connections

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

Note: Items marked n.c. should not be connected

Cable version



Connections

Black	Ground
Red	± Supply
Yellow	Output X
Green	Output Y
Blue	n.c.
White	n.c.

CAN Connections

Black	Ground
Red	± Supply
Blue	CAN L
White	CAN H

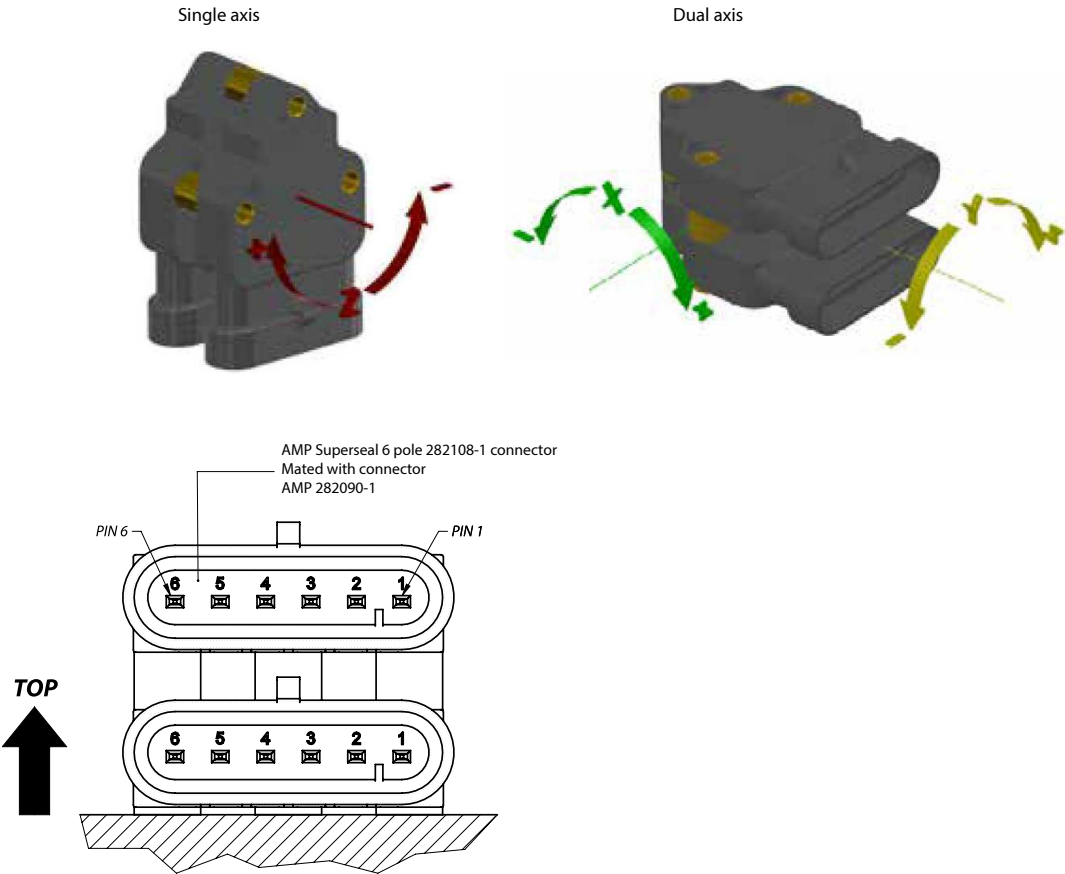
Note: Items marked n.c. should not be connected

AMP full redundant version

Danfoss DST X710 tilt sensor is designed to be double mounted with specific spacers (BUS027) in order to have a full redundant space-saving version.

Please pay attention to how the two DST X710 sensors are installed: **Always position both sensors either facing up or facing down.**

DST X710 sensors



Connections

1	Ground
2	± Supply
3	Output Xn.c.
4	Output Y
5	n.c.
6	n.c.

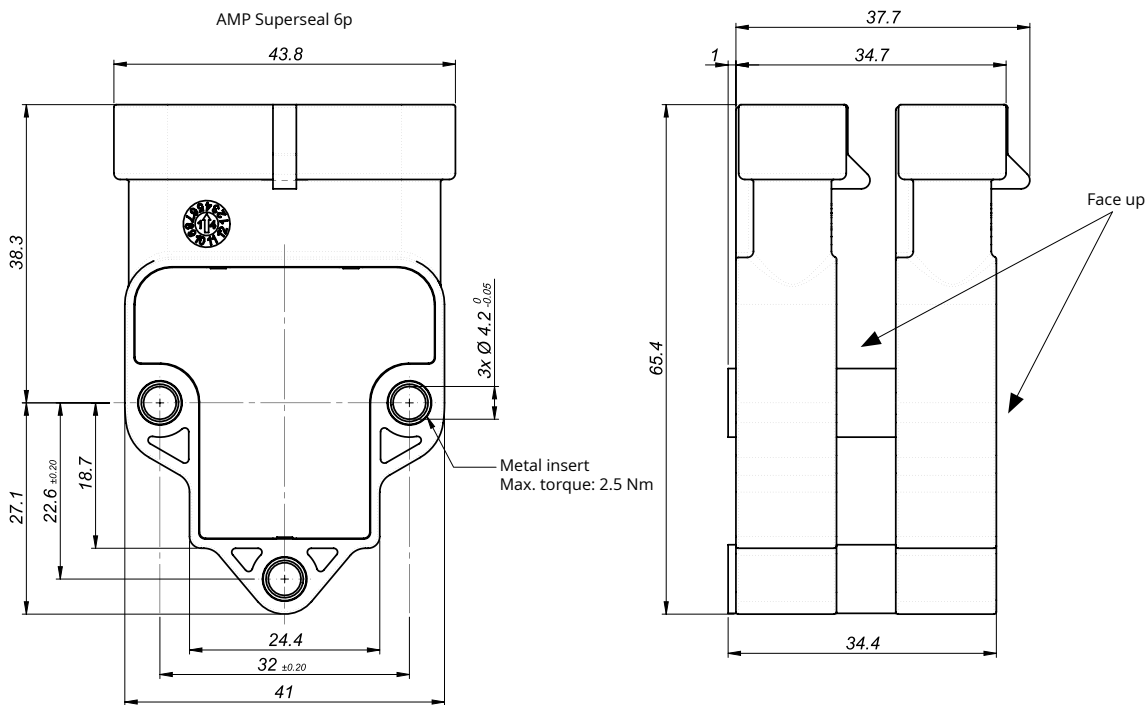
Note: Items marked n.c. should not be connected

CAN Connections

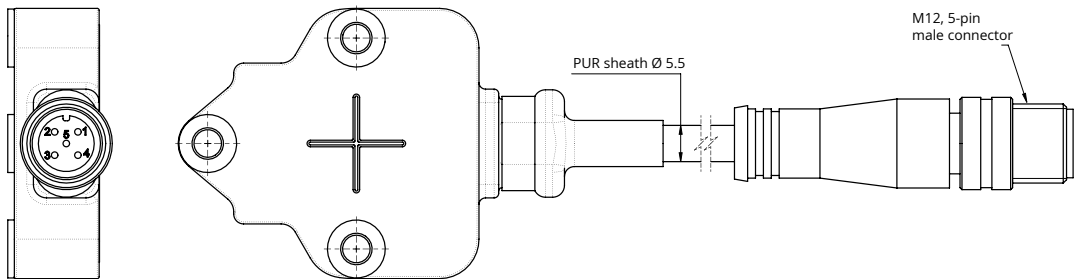
1	Ground
2	± Supply
3	n.c.
4	n.c.
5	CAN L
6	CAN H



AMP Version



M12 connection pin



Analog connection

1	+ Supply
3	Output X
2	Ground
4	Output Y
5	n.c.

CAN connection

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

Note: Items marked n.c. should not be connected

Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
EU-UK Declaration	Danfoss EU-UK 098R0009.04	Danfoss	UK RoHS
UA Declaration	Danfoss UA 2023-01-10 Regulators PL01 PL04	Danfoss	PED
Pressure Safety Certificate	LLC CDC EURO-TYSK UA.TR.089.1015.05-22	LLC CDC EURO TYSK - Ukraine	Pressure
UA Declaration	Danfoss UA 2024-07-25 cooling sensors	Danfoss	EMC
Export Control Declaration	Pressure & Temperature Sensors	Danfoss	
Export Control Declaration	Refrigerant Leakage Sensor	Danfoss	

Contact details

Online support

Danfoss offers a wide range of support along with our products, including digital information, software, mobile apps and expert guidance. See the possibilities below.



The Danfoss Design center

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