



Rotary position sensor

DST X510

For mobile hydraulic applications



Description

The Danfoss DST X510 rotary position sensors with shaft are designed for use in mobile hydraulic applications.

Danfoss DST X510 series uses contactless Hall technology with measurement ranges up to 360°.

The Sensors are designed for off-higway applications and resistant to shock and vibrations and with high electromagnetic compatibility. They are E1 approved for onhighway applications. They comes with either analogue, CANopen or SAE J1939 output.

Single and redundant sensor types are available, making the complete portfolio suitable for safetycritical applications.

Features & benefits

- 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 IP67 - IP69K with female mating connector

Ordering

Product code numbers

Ordering standard

Type	Output signal	Cofigurations	Code no.
DST X510	5 V Ratiometric	±180° Clockwise CW	098G1000
	5 V Ratiometric	±180° Counterclockwise CCW/CH2 clockwise CW	098G1001
	36 V CANopen	±180° Clockwise CW	098G1002
	36 V SAE J1939	±180° Clockwise CW	098G1003

Ordering code - on request

Electrical connections	
AMP Superseal 6P connector	A
Deutsch 6P connector	D
Circuit type	
Single Analog or CAN/J 1939	S
Redundant Analog	R
Angle/Channel 1 (output for single channel)	
(Analog output A1-A2-A3 programmable in steps of $\pm 15^\circ$) (CAN/J 1939 = 180)	xxx
Angle/Channel 2 (redundant versions)	
(Analog output A1-A2-A3 programmable in steps of $\pm 15^\circ$) (CAN/J 1939 = 180)	xxx
Supply voltage	
+5 V DC (only for A1 output)	L
+9...+36 V DC (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 3x 36 V DC)	A2
4...20 mA output (powered at +9...36 V DC)	A3
CANopen output (powered at +9...36 V DC) (available in single version with $\pm 180^\circ$ measurement range)	C1
SAE J1939 (powered at +9...36 V DC) (available in single version with $\pm 180^\circ$ 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
Actuator	
Shaft	A
Reserved	
Always	00
Certificate	
No certificate attached	0
Linearity curve to be attached	L
Version	
Standard	033
Accessories	
No accessories	X
AlSi 304 LEVER	A
Reserved	
Always	00

Example of ordering: DST X510-DS180000HC14A00 0033X00

D	Deutsch 6P
S	Single Analog or CAN/J 1939
180	±180°
000	000
H	+9 ... +36 V DC
C1	CANopen
4	Channel 1: Counterclockwise CCW; Channel 2: Clockwise CW
A	Shaft
00	Reserved
0	No certificate
033	Standard
X	No accessories
00	Reserved

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.

Product details

General data

Technical data

Performance

Measuring range	360° (±180°)
Linearity	≤ ± 0.5% FS
Resolution and speed of rotation	12 bit (analog output) 14 bit (CANopen/SAE J1939 output)
Durability (stroke ±75°)	120 rpm max. 35 M operations

Electrical specifications

Electrical connections	Deutsch 6P DT04-6P or AMP Superseal 6P 282108
Output signal	CANopen / SAE J1939, Ratiometric 10-90% of Vs, 0.5–4.5 V DC, 0–10 V DC or 4–20 mA
Supply voltage	CANopen/J1939, 0.5–4.5 V DC, 4–20 mA: 9–36 V DC; 0–10 V DC: 11–36 V DC; Ratiometric: 10-90% of Vs: 5 V DC
Current consumption	Analogue: < 10 mA/ pr. channel (no load) CANopen/J1939: < 15 mA (no load)
MTTFd [Years]	CANopen/J1939: 336 Analogue: 406 (Single Channel)

Environmental conditions

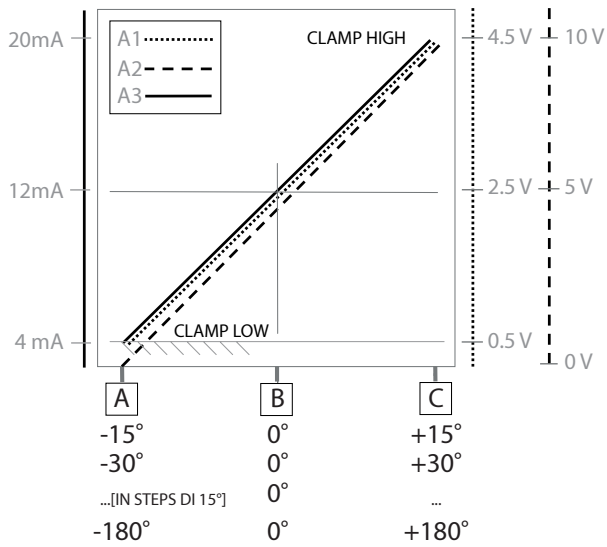
Operating temperature range			-40 °C – 85 °C
Thermal drift temperature			< 50 ppm/°C
EMC	Emission		EN 55011 and CISPR 25
	Immunity		EN 61236-3-2 and ISO 11452-2
	Transient on supply lines		ISO 7637-2
	Bulk current injection		ISO 11452-4
Vibration stability	Sinusoidal	20 g, 10 Hz – 2,000 kHz	IEC 60068-2-6
Shock resistance	Impulsive on 3 axes	50 g, 11 ms	IEC 60068-2-27
IP protection			IP67 - IP69 (with mating connector)

Mechanical characteristics

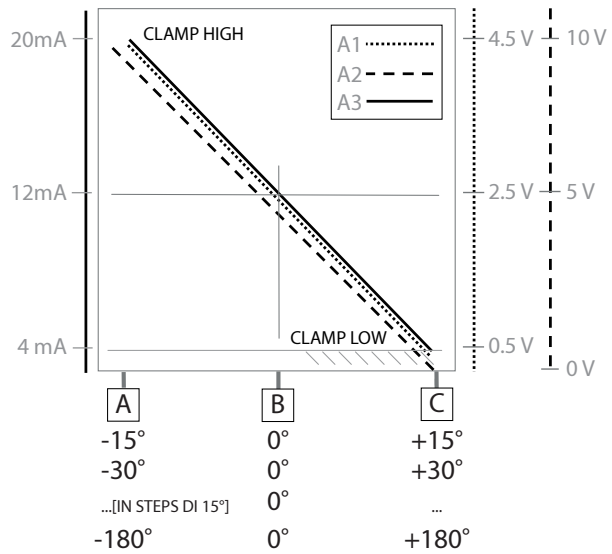
Materials	Enclosure	PBT (Polybutylene terephthalate)
	Shaft	AISI 316L
Net weight	0.07 kg	

Sensor output graph

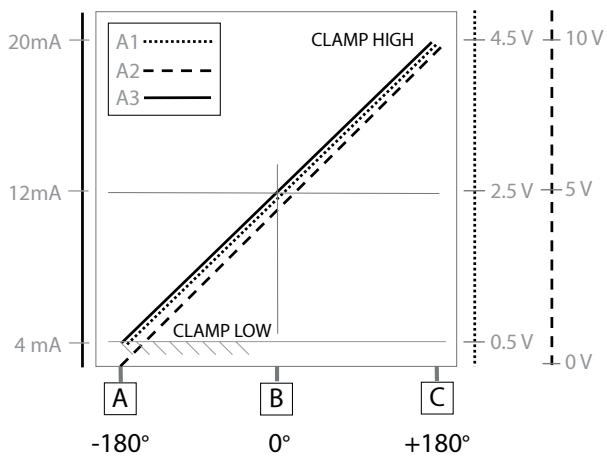
Clockwise CW single Direction of rotation 1



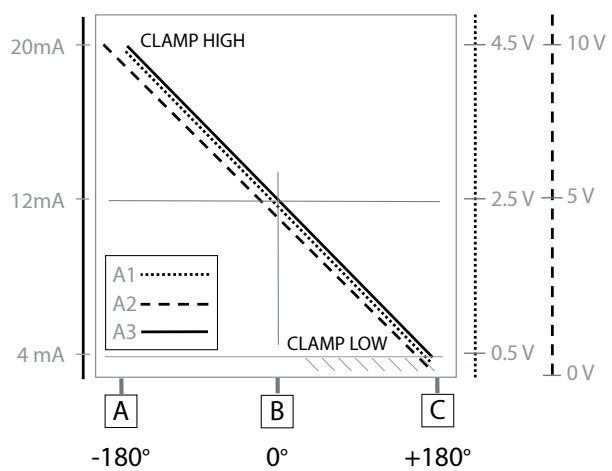
Counterclockwise CCW single Direction of rotation 2



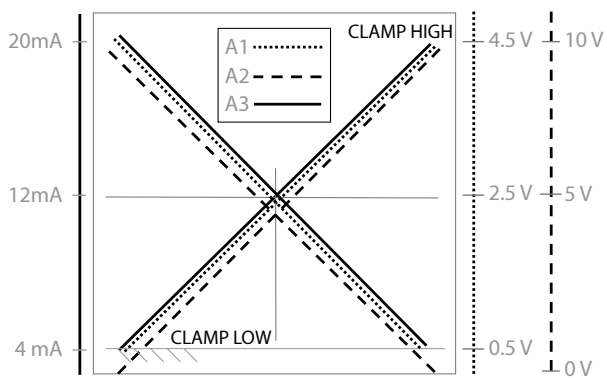
Redundant direction of rotation 1



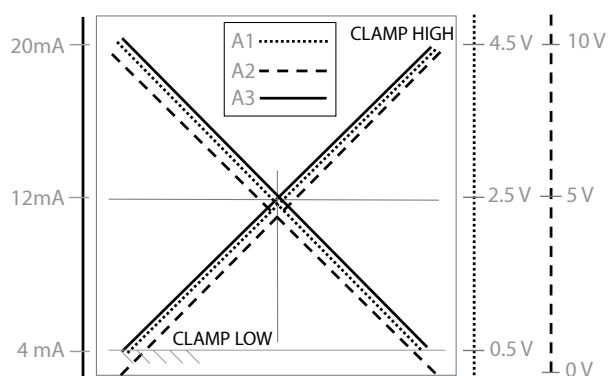
Redundant direction of rotation 2



Redundant direction of rotation 3



Redundant direction of rotation 4

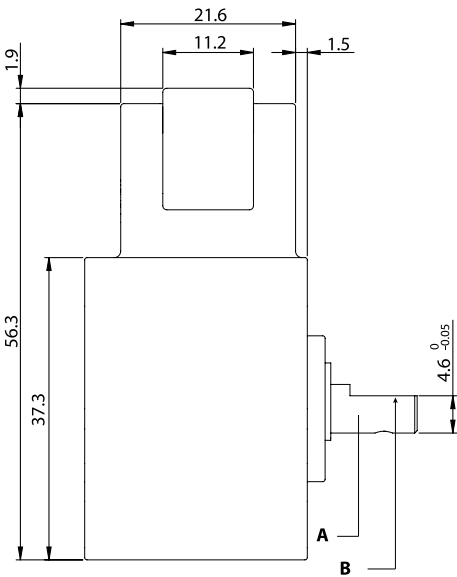
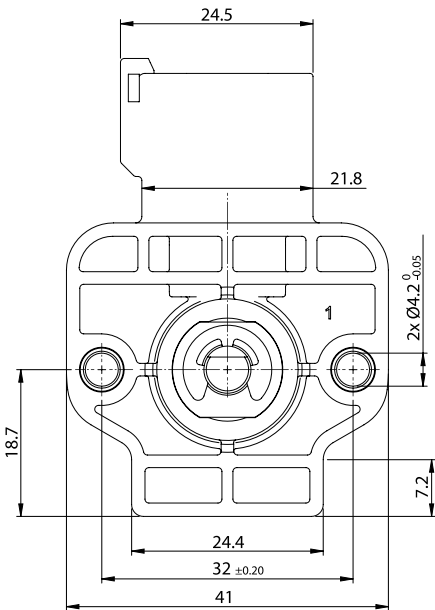


Load conditions: +0.5 V DC - +4.5 V DC output with power + 5 V DC: It is recommended a load resistance > 10 kΩ



Dimensions

Deutsch DT04-6p



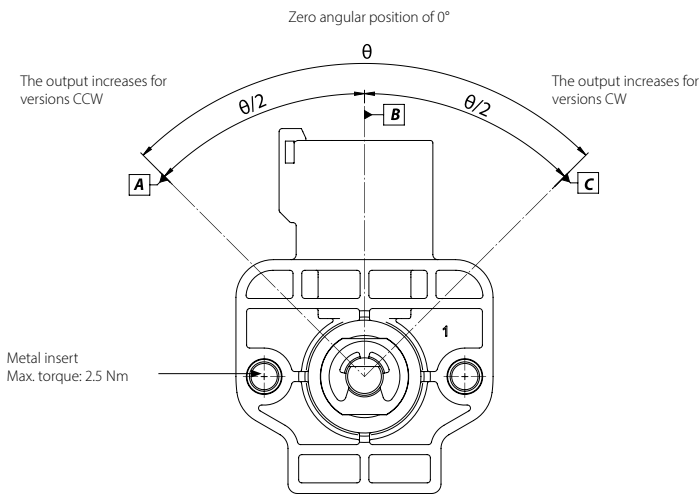
A - Shaft in stainless steel AISI 316L
B - Position Zero 0° when the planar face of the shaft is parallel to the axis of the mounting holes

Note: Dimensions are in mm, unless stated otherwise.

Connections

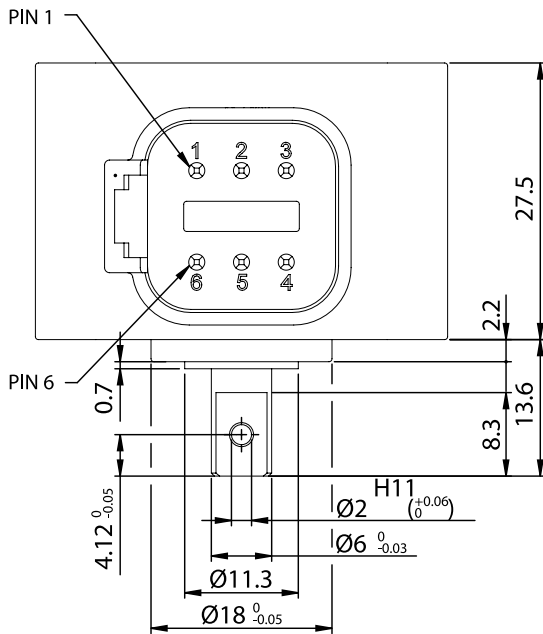
Electrical connections

Zero angular position



Ref.	CW output	CWW output
A	0.5 V DC	4.5 V DC
B	Zero angular position of 0°	Zero angular position of 0°
C	4.5 V DC	0.5 V DC

PIN Connections



Connections

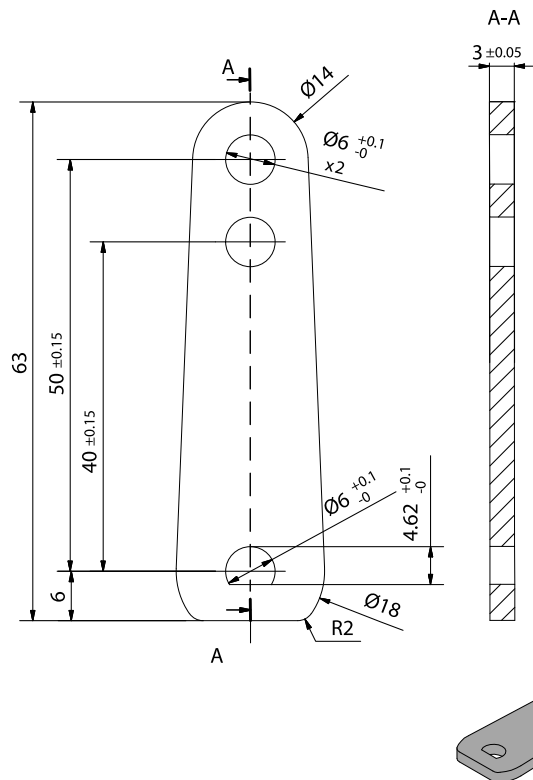
1. Ground 1
2. + Supply 1
3. Output 1
4. Ground 2
5. + Supply 2
6. Output 2

Connections - CAN/J 1939

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

Accessories

Accessory - Lever



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	Issuer	Approval topic
EU-UK Declaration	Danfoss EU-UK 098R0008.04	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.



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