motralec Danfoss Rotary position sensor Type DST X510 For mobile hydraul· DEMANDE DE PRIX >
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ENGINEERING TOMORROW

Data Sheet

Rotary position sensor Type **DST X510**

For mobile hydraulic applications



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 on-highway 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

- 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

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Product specification

Technical data

Table 1: Performance

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

Table 2: 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)

Table 3: 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)

Table 4: Mechanical characteristics

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

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Sensor output graph

Figure 1: Clockwise CW single Direction of rotation 1

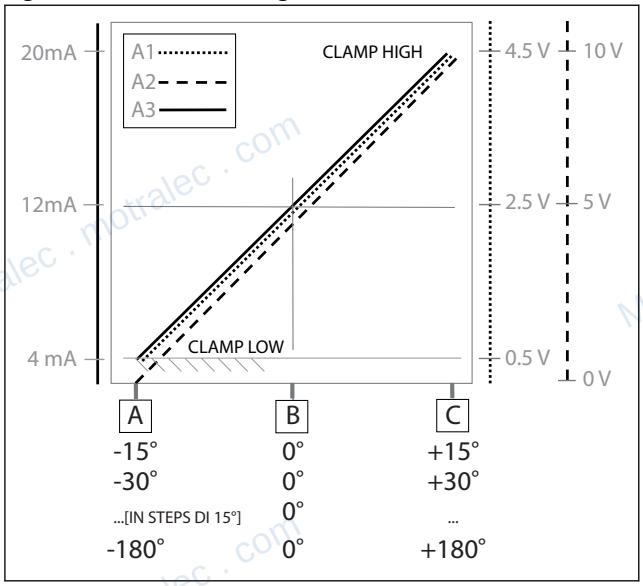


Figure 2: Counterclockwise CCW single Direction of rotation 2

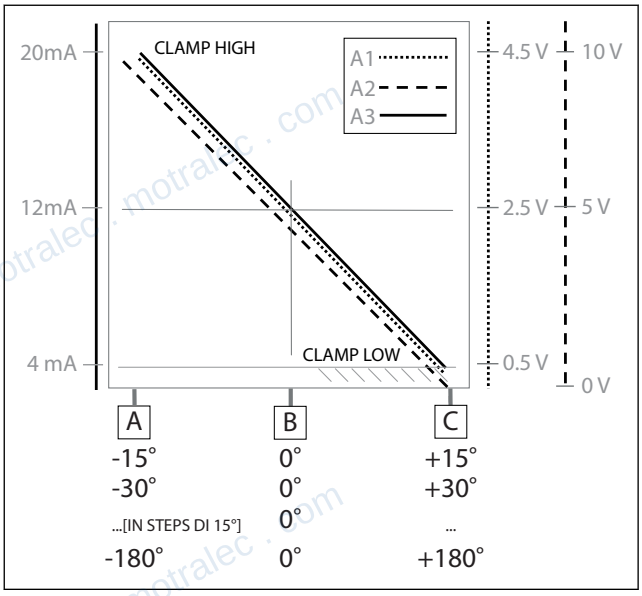


Figure 3: Redundant direction of rotation 1

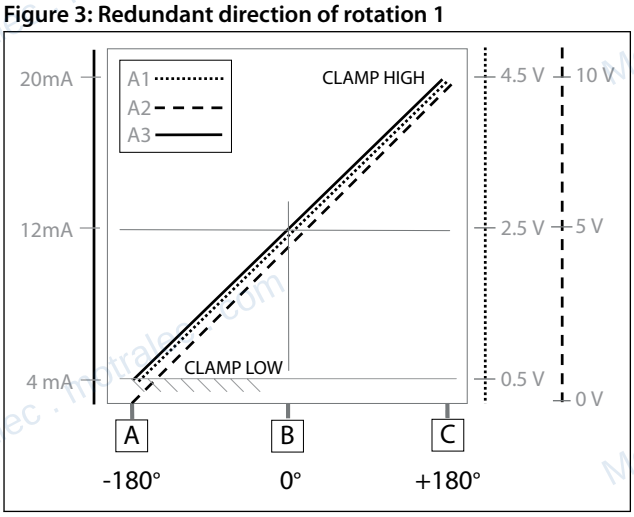


Figure 4: Redundant direction of rotation 2

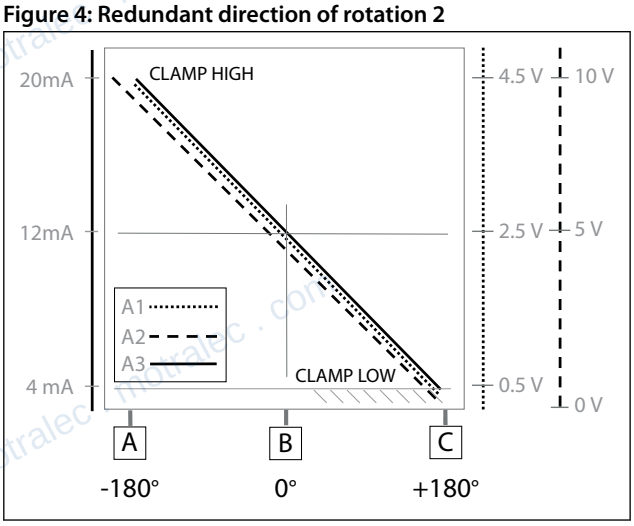


Figure 5: Redundant direction of rotation 3

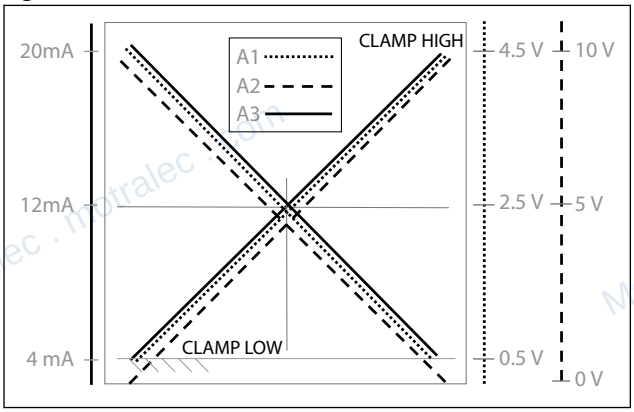
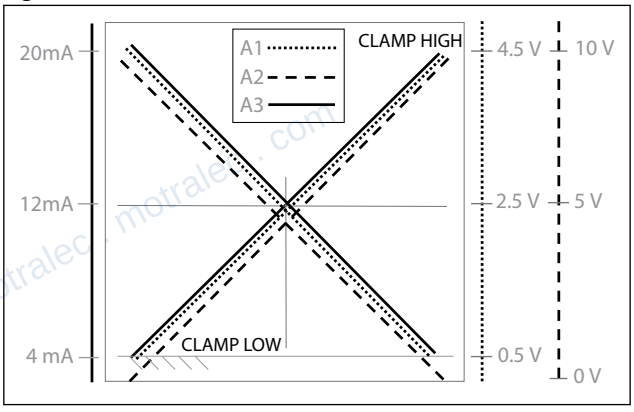


Figure 6: Redundant direction of rotation 4



Load conditions

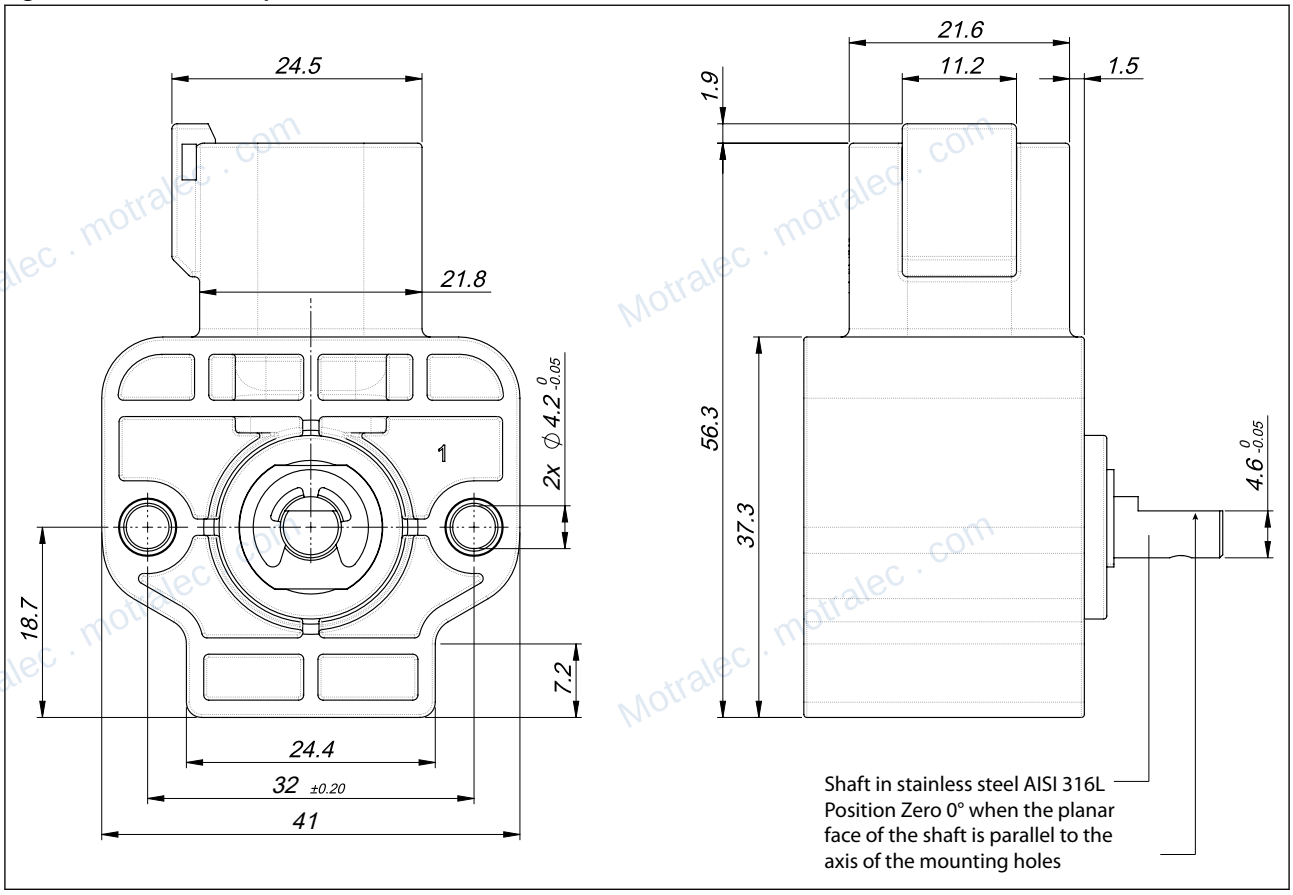
+0.5 V DC - +4.5 V DC output with power + 5 V DC: It is recommended a load resistance > 10 KΩ

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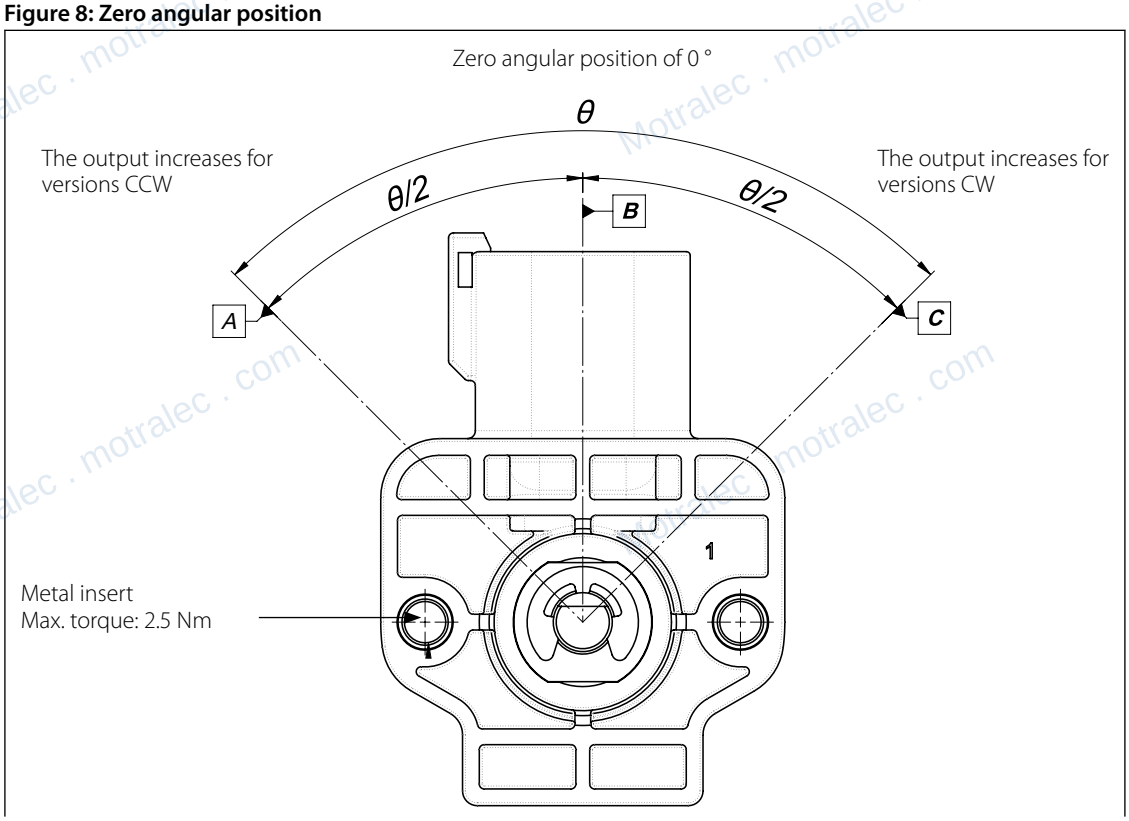
Dimensions

Figure 7: Deutsch DT04-6p



Electrical connections

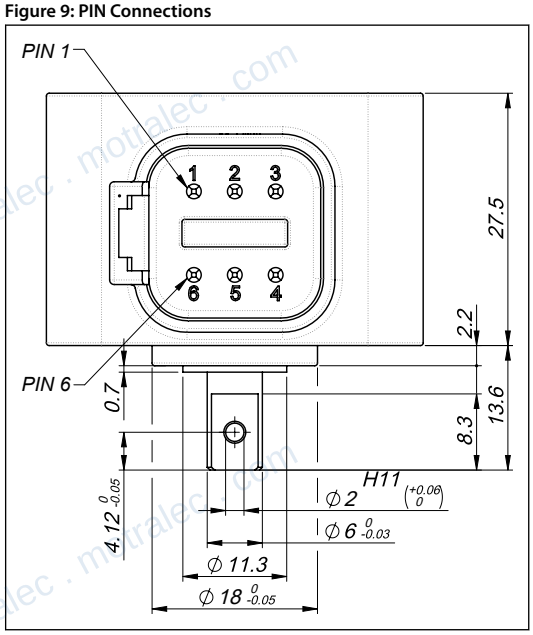
Figure 8: Zero angular position



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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

Figure 9: 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

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Ordering

Ordering standard

Type	Output signal	Cofigurations	Code no.
DST X510	5 V Ratiometric	±180° Clockwise CW	098G1000
	5 V Ratiometric	±180° Counterclokwise 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 ±15°) (CAN/J 1939 = 180)	xxx
Angle/Channel 2 (redundant versions)	
(Analog output A1-A2-A3 programmable in steps of ±15°) (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..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 +/-180° measurement range)	C1
SAE J1939 (powered at +9...36 V DC) (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
Actuator	
Shaft	A
Reserved	
Always	00
Certificate	
No certificate attached	0
Linearity curve to be attached	L
Version	
Standard	033
Accessories	
No accessories	X
AISi 304 LEVER	A
Reserved	
Always	00

Table 5: 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

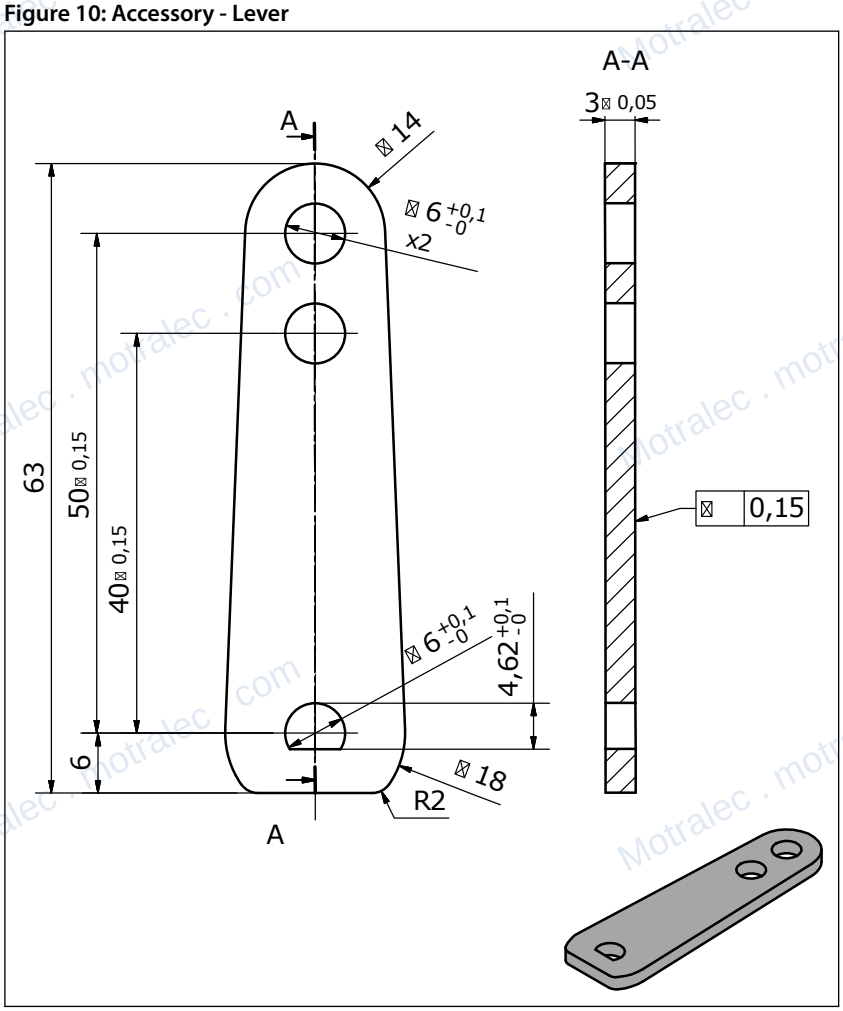
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4	Channel 1: Counterclockwise CCW; Channel 2: Clockwise CW
A	Shaft
00	Reserved
0	No certificate
033	Standard
X	No accessories
00	Reserved

Accessories

Figure 10: 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.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 6: Declarations

Document name	Document type	Document topic	Approval authority
098R0008	EU Declaration	EMCD/ROHS	Danfoss

Approvals and Conformity

- CE
- RoHS
- E1 approved

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