

SENSORS



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MODEL	DESCRIPTION	PAGE
EC-SNR-ANG-G360-H	Single axis inclinometer with gyroscope	SN3
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EC-SNR-EOM-H	Material sensor	SN13
Accessories	Accessories	SN14

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TECNORD

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**NEW****EC-SNR-ANG-G360-H SINGLE AXIS INCLINOMETER WITH GYROSCOPE****DESCRIPTION**

Absolute single axis (roll) inclinometer with combined gyroscope and accelerometer.

**OPERATION**

Signal output is linearly proportional to the angle and highly insensitive to high shock, acceleration and random vibrations. The gyroscope allows a fast measure of the angle without the need of the heavy filtering which is typical of plain accelerometer-based devices.

With a measurement range of  $\pm 180^\circ$  ( $360^\circ$ ) this device is designed to be connected in a CANbus network (J1939 or CANOpen). It is well-suited for self-levelling applications of systems needing a precise dynamic response and high accuracy.

**FEATURES**

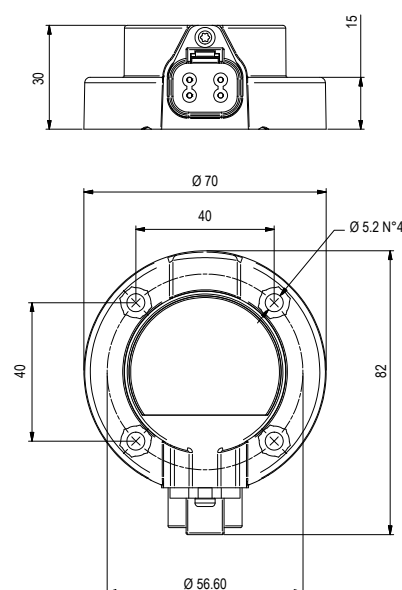
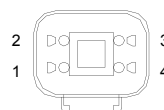
- Supply line is protected against reversed polarity and load dump.
- CAN Bus line is protected against short circuits to GND and battery voltage.
- Microprocessor based, with dedicated Kalman filters.
- Vibration and shock resistant.
- Combination of gyroscope and accelerometer.
- Safety requirements:
  - the single device designed for systems having PLr = c
  - easy assembling of dual device for systems having PLr = d
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
EN 61000-6-3 (Emissions)

**SPECIFICATIONS**

Operating voltage:	8 $\pm$ 32 VDC
Max current consumption:	70 mA @ 12V
CANbus physical layer:	ISO 11898, 250 kbit/s (adjustable bus speed)
CANbus protocol:	J1939 (option: CANOpen)
Max working angle	$\pm 180^\circ$
Resolution:	0.01°
Stability:	0.2° @ 25°C
Dynamic:	125°/s
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 68
Connector type:	Deutsch DT04-4P or M12
Fixing screws included:	n.4 - M5x20

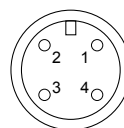
**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- Automatic basket self levelling for aerial platforms, agricultural machines and lift equipment.
- Automatic bucket self levelling for wheel loaders.

**DIMENSIONS****CONNECTIONS**

Deutsch DT04-4P

- 1 +VBATT
- 2 GND
- 3 CAN-H
- 4 CAN-L



M12

**Ordering Code**

20.0401.043 (DEUTSCH CONNECTOR)

20.0401.044 (M12 CONNECTOR)

**EC-SNR-ANG-S9090-H SINGLE AXIS INCLINOMETER**

**DESCRIPTION**

Absolute single axis inclinometer sensor based on earth's gravity.

**OPERATION**

Signal output is linearly proportional to the tilt angle to the ground. With a measurement range of  $\pm 90^\circ$  this device provides a 0.5 to 4.5 VDC output signal over its range with a nominal 2.5 VDC at 0 degree. It is normally used to control the inclination of a mechanical structure respect to the earth line.

**FEATURES**

- Supply line is protected against reversed polarity and load dump.
- Outputs are protected against short circuits to GND and supply.
- Vibration and shock resistant.
- Anti-debouncing software filter.
- CE certification.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
EN 61000-6-3 (Emissions)

**SPECIFICATIONS**

Operating voltage:	8.5÷30 VDC
Max current consumption:	20 mA
Output signal:	0.5÷2.5÷4.5 VDC
Max current output:	10 mA
Max working angle:	$\pm 90^\circ$
Resolution:	0.25°
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 68
Connector type:	Deutsch DT04-4P or M12
Fixing screws included:	n.4 - M5x20

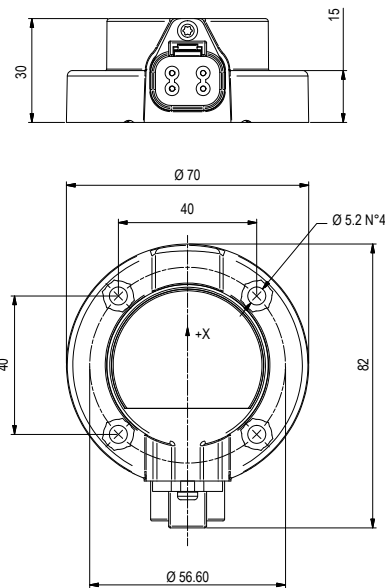
**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- Inclination sensor for articulated cranes and aerial platforms.

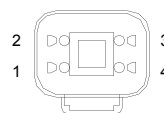
<b>Ordering Code</b>
20.0401.016 with Deutsch connector
20.0401.018 with M12 connector



**DIMENSIONS**

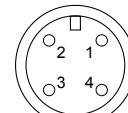


**CONNECTIONS**



Deutsch DT04-4P

- 1 +VBATT
- 2 GND
- 3 OUTPUT X AXIS



M12

- 1 +VBATT
- 2 GND
- 3 OUTPUT X AXIS

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**EC-SNR-ANG-D3030-H DUAL AXIS INCLINOMETER (TILT DEVICE)****DESCRIPTION**

Absolute dual axis inclinometer sensor based on earth's gravity.

**OPERATION**

Signal outputs are linearly proportional to the tilt angle to the ground. With a measurement range of  $\pm 30^\circ$  this device provides a 0.5 to 4.5 VDC output signal over its range with a nominal 2.5 VDC at 0 degree. It is normally used to control the planarity of chassis or mechanical structure respect to the earth line.

**FEATURES**

- Supply line is protected against reversed polarity and load dump.
- Outputs are protected against short circuits to GND and supply.
- Microprocessor based.
- Vibration and shock resistant.
- Anti-debouncing software filter.
- CE certification.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
EN 61000-6-3 (Emissions)

**SPECIFICATIONS**

Operating voltage:	8.5÷30 VDC
Max current consumption:	20 mA
Output signal:	0.5÷2.5÷4.5 VDC
Max current output:	10 mA
Max working angle for each axis:	$\pm 30^\circ$
Resolution:	0.10°
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 68
Connector type:	Deutsch DT04-4P or M12
Fixing screws included:	n.4 - M5x20

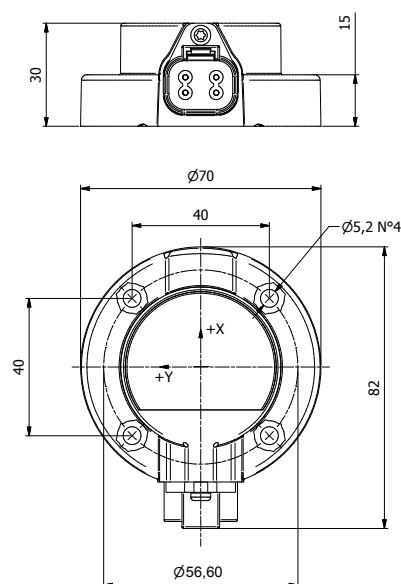
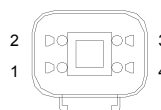
**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- Automatic self levelling system for trucks, agricultural machines and lift equipment.
- Vehicle tilt monitoring.

**Ordering Code**

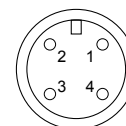
20.0401.012/A with Deutsch connector

20.0401.019/A with M12 connector

**DIMENSIONS****CONNECTIONS**

Deutsch DT04-4P

- 1 +VBATT
- 2 GND
- 3 OUTPUT X AXIS
- 4 OUTPUT Y AXIS



M12

- 1 +VBATT
- 2 GND
- 3 OUTPUT X AXIS
- 4 OUTPUT Y AXIS

**EC-SNR-ANG-S9090-H J1939 SINGLE AXIS INCLINOMETER - CANBUS INTERFACE**

**DESCRIPTION**

Absolute single axis inclinometer sensor based on earth's gravity.

**OPERATION**

Signal output is linearly proportional to the tilt angle to the ground. With a measurement range of  $\pm 90^\circ$  this device is designed to be connected in a CANbus J1939 network (CANOpen optional). It is normally used to control the inclination of a mechanical structure respect to the earth line (e.g. a crane's boom).

**FEATURES**

- Supply line is protected against reversed polarity and load dump.
- Outputs are protected against short circuits to GND and supply.
- Microprocessor based.
- Vibration and shock resistant.
- Anti-debouncing software filter.
- Compatible with safety requirements:  
 $PL = c$   
 $PL = d$  when two inclinometers are installed
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
 EN 61000-6-3 (Emissions)

**SPECIFICATIONS**

Operating voltage:	8-32 VDC
Max current consumption:	40 mA
CANbus physical layer:	ISO 11898, 250 kbit/s
CANbus protocol:	J1939
Max working angle for each axis:	$\pm 90^\circ$
Resolution:	0.25°
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 68
Connector type:	Deutsch DT04-4P or M12
Fixing screws included:	n.4 - M5x20

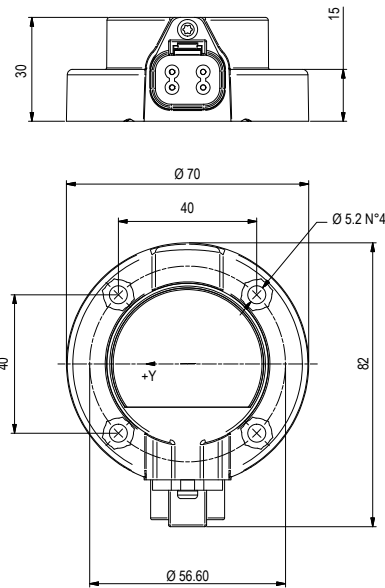
**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- Inclination sensor for telescopic or articulated cranes, and aerial platforms.
- Load and moment limiting systems.

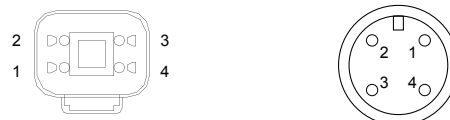
<b>Ordering Code</b>
20.0401.047 with Deutsch connector
20.0401.048 with M12 connector



**DIMENSIONS**



**CONNECTIONS**



- |                 |          |
|-----------------|----------|
| Deutsch DT04-4P | M12      |
| 1 +VBATT        | 1 +VBATT |
| 2 GND           | 2 GND    |
| 3 CAN-H         | 3 CAN-H  |
| 4 CAN-L         | 4 CAN-L  |

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**EC-SNR-ANG-D3030-H J1939 DUAL AXIS INCLINOMETER (TILT DEVICE) - CANBUS INTERFACE**

**DESCRIPTION**

Absolute dual axis inclinometer sensor based on earth's gravity.

**OPERATION**

Signal outputs are linearly proportional to the tilt angle to the ground. With a measurement range of  $\pm 30^\circ$  this device is designed to be connected in a CANbus J1939 network (CANOpen optional). It is normally used to control the planarity of chassis or mechanical structure respect to the earth line. Contact Tecnord for the  $\pm 90^\circ$  option.

**FEATURES**

- Supply line is protected against reversed polarity and load dump.
- Outputs are protected against short circuits to GND and supply.
- Microprocessor based.
- Vibration and shock resistant.
- Anti-debouncing software filter.
- Compatible with safety requirements:  
 PL = c  
 PL = d when two inclinometers are installed
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
 EN 61000-6-3 (Emissions)

**SPECIFICATIONS**

Operating voltage:	8-32 VDC
Max current consumption:	40 mA
CANbus physical layer:	ISO 11898, 250 kbit/s
CANbus protocol:	J1939
Max working angle for each axis:	$\pm 30^\circ$
Resolution:	0.10°
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 68
Connector type:	Deutsch DT04-4P or M12
Fixing screws included:	n.4 - M5x20

**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- Automatic self levelling system for trucks, agricultural machines and lift equipment.
- Vehicle tilt monitoring.

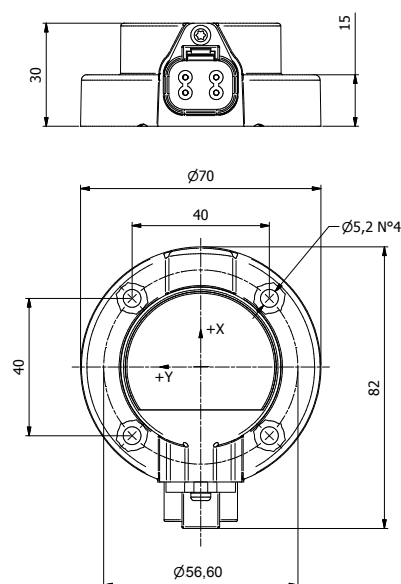
**Ordering Code**

20.0401.045 (Deutsch connector)

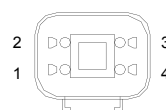
20.0401.046 (M12 connector)



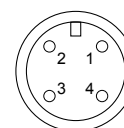
**DIMENSIONS**



**CONNECTIONS**



Deutsch DT04-4P



M12

- 1 +VBATT
- 2 GND
- 3 CAN-H
- 4 CAN-L

- 1 +VBATT
- 2 GND
- 3 CAN-H
- 4 CAN-L

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**EC-SNR-LA-1290-H LENGHT AND ANGLE SENSOR**

**DESCRIPTION**

Heavy duty, high protection length and angle sensor with redundant output signals.

**OPERATION**

It can be used for monitoring the position of a telescopic boom. The "double sensors" system provides the highest safety features, as required for load limiter control systems.

It is normally used in conjunction with other MMS electronic units with the double microprocessor technology to implement safety functions according to ISO 13849.

**FEATURES**

- Supply line is protected against reversed polarity and load dump.
- Outputs are protected against short circuits to GND and supply.
- Cable entry on the left or on the right.
- CE certification.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
EN 61000-6-3 (Emissions)



**SPECIFICATIONS**

Operating temperature:	-25°C / +85°C
Degree of protection:	IP 65
Connector type:	Deutsch DT04-8P

**Angle sensor**

Operating voltage:	8.5÷30 VDC
Max current consumption:	20 mA
Output signal:	0.5÷2.5÷4.5 VDC
Max working angle:	±90°
Redundancy:	YES (dual angle sensor)

**Length sensor**

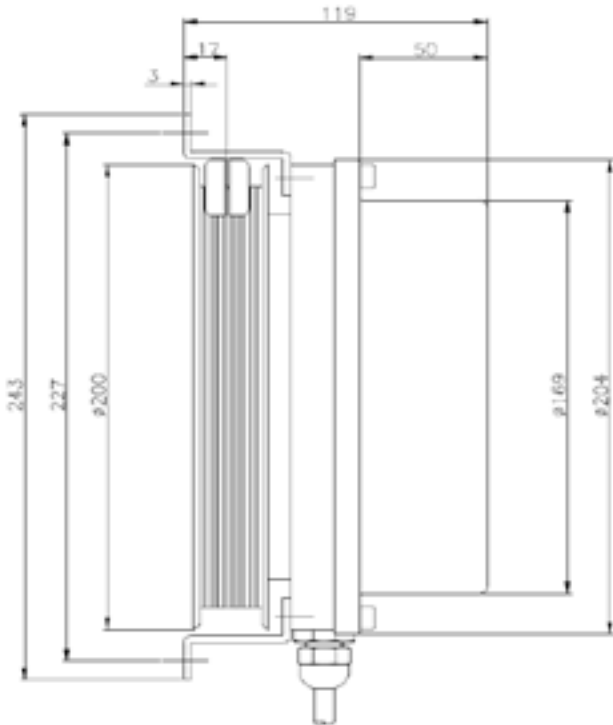
Operating voltage:	5 VDC
Output signal:	0÷5 V
Max working length:	12 meters
Potentiometer resistance:	5kΩ
Redundancy:	YES (dual angle sensor)

**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- Load limiter and/or area control systems for cranes and aerial platforms.

<b>Ordering Code</b>
21.0809.010 cable entry on the left
21.0809.014 cable entry on the right

**DIMENSIONS**



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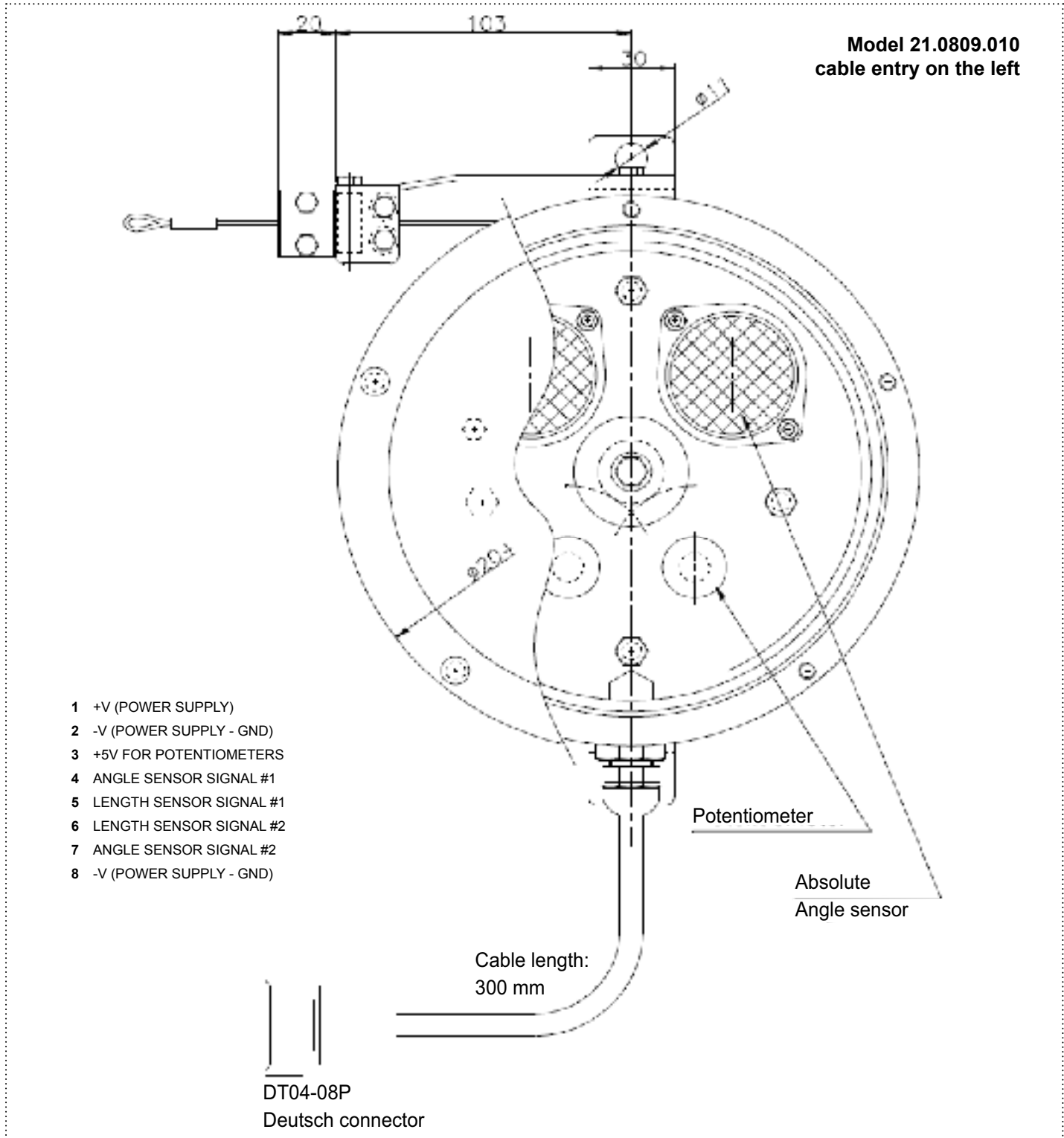


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EC-SNR-LA-1290-H LENGHT AND ANGLE SENSOR

WIRING DIAGRAM



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**EC-SNR-POS-75S-H SLIP-IN SPOOL POSITION TRANSDUCER**

**DESCRIPTION**

Position transducer based on Hall effect sensor to detect a stroke of  $\pm 7.5$  mm. Slip-in assembly.

**OPERATION**

Signal output is linearly proportional to the stroke. With a measurement range of  $\pm 7.5$  mm this device provides a 1 to 4 VDC output signal over its range with a nominal 2.5 VDC in the neutral position. It can be used as a safety device in conjunction with Tecnord's MMS electronic units (e.g. MMS 1521).

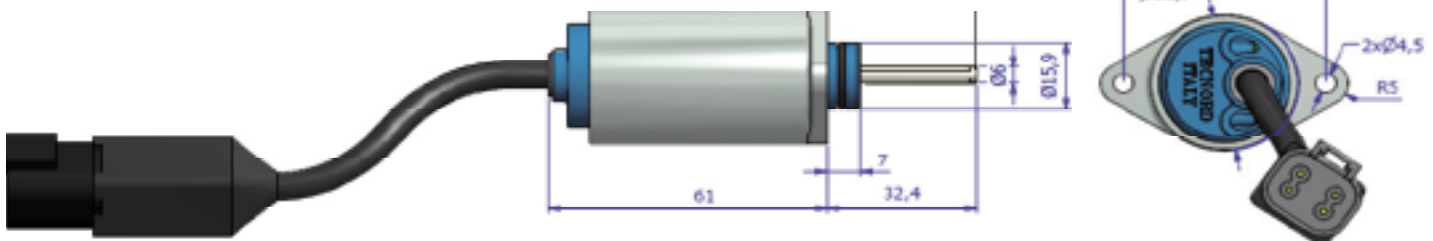
**FEATURES**

- Power supply line is protected against reversed polarity and overvoltage.
- Output protected against short circuits to GND and supply.
- Redundant version (dual electronics) available.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
EN 61000-6-3 (Emissions)

**SPECIFICATIONS**

Operating voltage:	6 $\pm$ 32 VDC
Max current consumption:	<15mA
Operating temperature:	-40°C / +100°C
Degree of protection:	IP 67
Maximum operating pressure:	45 bar
Output signal:	1 $\pm$ 2.5 $\pm$ 4 VDC
Tolerance on output signal:	$\pm$ 0.2 VDC
Electrical stroke linearity range:	$\pm$ 7.5 mm
Maximum mechanical stroke:	$\pm$ 8 mm
Connector pins:	1 +V (POWER SUPPLY) 2 -V (POWER SUPPLY-GND) 3 Output signal 4 Not used
Connector type:	Deutsch DT04-4P

**DIMENSIONS**



**APPLICATIONS**

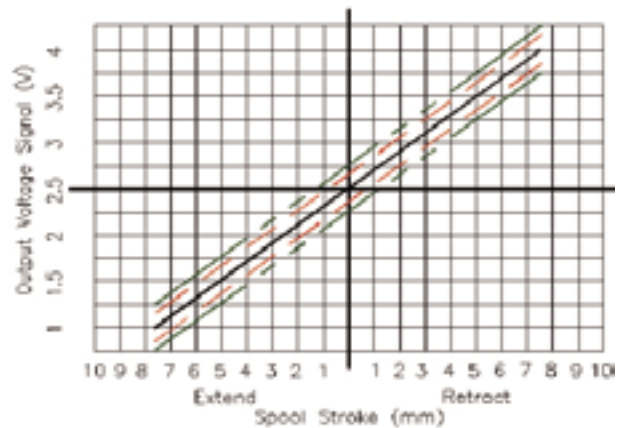
- 12 VDC and 24 VDC systems.
- Spool position detect for electrohydraulic manifolds.

**Ordering Code**

20.0204.007



**OUTPUT SIGNAL**



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**EC-SNR-POS-750-H SLIP-IN SPOOL POSITION TRANSDUCER**

**DESCRIPTION**

Position transducer based on Hall effect sensor to detect a movement from the neutral (zero) position. Slip-in assembly.

**OPERATION**

The sensor provides two directional signal outputs, each output becomes active when a movement is detected in its corresponding direction. Outputs are active low. Two low outputs means fault. It can be used as a safety device in conjunction with Tecnord's MMS electronic units (e.g. MMS 1521).

**FEATURES**

- Power supply line is protected against reversed polarity and overvoltage.
- Output protected against short circuits to GND and supply.
- Redundant version (dual electronics) available.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
EN 61000-6-3 (Emissions)

**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- Spool position detect for electrohydraulic manifolds.

**Ordering Code**

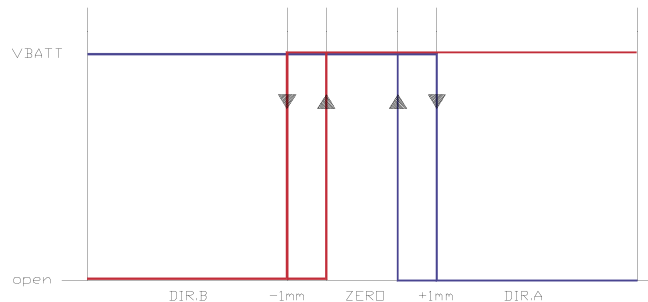
20.0204.006



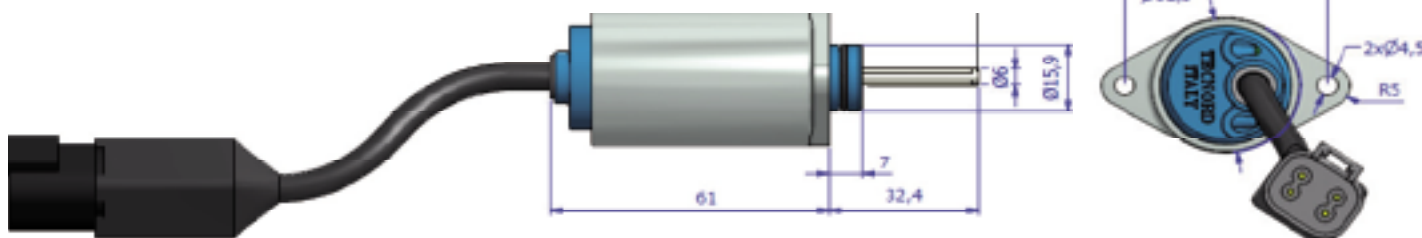
**SPECIFICATIONS**

Operating voltage (VBATT):	6÷32 VDC
Max current consumption:	<15mA
Operating temperature:	-40°C / +100°C
Degree of protection:	IP 67
Maximum operating pressure:	45 bar
Output signal (inactive):	open collector (pnp)
Output signal (active):	VBATT
Switching threshold:	1 mm
Maximum mechanical stroke:	±8 mm
Connector pins:	1 +V (POWER SUPPLY) 2 -V (POWER SUPPLY) 3 OUT A 4 OUT B
Connector type:	Deutsch DT04-4P

**OUTPUT SIGNAL**



**DIMENSIONS**



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**EC-SNR-PRX-0102-H PROXIMITY SENSOR**

**DESCRIPTION**

Heavy duty, high protection proximity sensor based on hall effect.

**OPERATION**

The sensor can be used to detect the presence of gear teeth and can be used to measure the speed of a rotating shaft.

**FEATURES**

- Supply line is protected against reversed polarity.

**SPECIFICATIONS**

Operating voltage:	4÷26 VDC
Max current consumption:	11 mA
Max current output:	20 mA
Operating temperature:	-40°C / +150°C
Degree of protection:	IP68
Mechanical connection:	M18x1.5
Detecting distance:	0.1 - 2 mm
Max frequency for tooth detection:	8 kHz
Output signal:	0 VDC - max V supply
Output type:	NPN or PNP

3 wires cable, 0.75 mm<sup>2</sup> section, 200 mm length

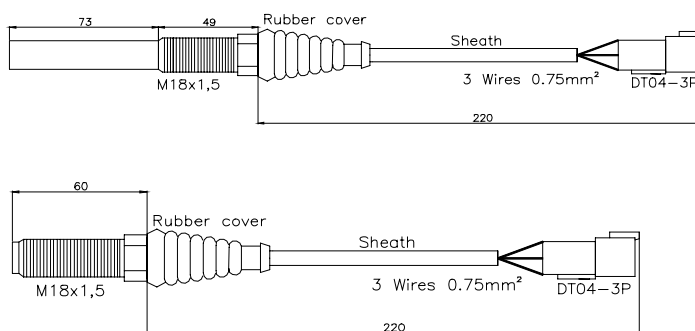
**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- Transmission speed measurement.
- Stop motion detector and tachometer.

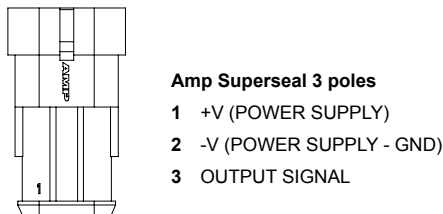
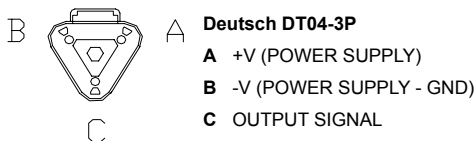
Ordering Code
20.0401.006 Type: 68 mm - NPN - Deutsch
20.0401.007 Type: 130 mm - NPN - Deutsch
20.0401.020/A Type: 68 mm - PNP - Amp



**DIMENSIONS**



**CONNECTIONS**



**WARNING:** the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



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**EC-SNR-EOM-H MATERIAL SENSOR****DESCRIPTION**

End of material sensor based on a piezoelectric device designed for use in the extremely harsh environment associated with the rear of a mobile road salt spreader.

**OPERATION**

When the material from the "Spinner" hits the stainless steel probe, the sensor is activated and turn the output signal ON (+V).

When no material is detected hitting the probe, the sensor turns the output signal OFF (open). It can be used as an auxiliary device in conjunction with the Tecnord Ecomatic salt spreader control unit.

**FEATURES**

- Supply line is protected against reversed polarity and overvoltage.
- Output protected against short circuits to GND and supply.
- No requirements for "screened" wires between the sensor and the control unit in cab.
- No extra electronics needed for the sensor to operate.
- High quality stainless steel probe for extended operational life.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)  
EN 61000-6-3 (Emissions)

**SPECIFICATIONS**

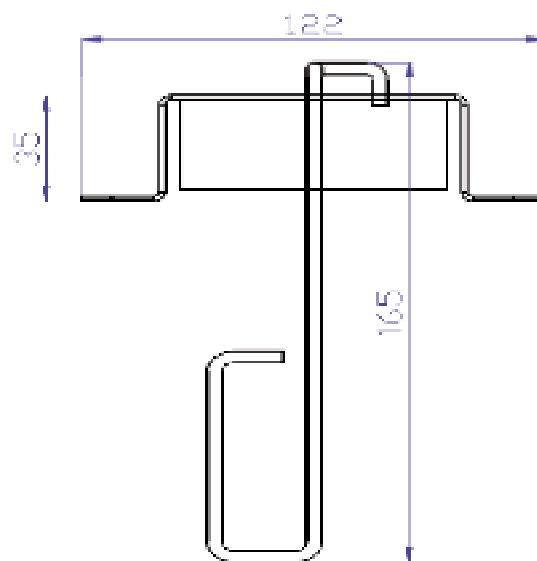
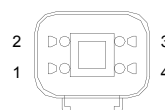
Operating voltage:	8+32 VDC
Max current consumption:	20mA
Operating temperature:	-25°C / +85°C
Degree of protection:	IP 67
Digital output:	PNP type
Max output current:	250mA
Connector type:	Deutsch DT04-4P

**APPLICATIONS**

- 12 VDC and 24 VDC systems.
- End of material sensor for salt spreader systems.
- EOM sensor for agricultural spreader systems (e.g. fertilizers).

**Ordering Code**

20.0401.041/A

**DIMENSIONS****CONNECTIONS****Deutsch DT04-4P**

- 1 +V (POWER SUPPLY)
- 2 -V (POWER SUPPLY - GND)
- 3 OUTPUT SIGNAL
- 4 NOT USED

## CONNECTOR KITS

## ACCESSORIES

**3 POLES AMP SUPERSEAL**

**Kit includes:** male connector, female contacts, and fillers.

**Available for sensor:** EC-SNR-POS-55-H

**ORDERING CODE: 13.0310.127**

**4 POLES AMP SUPERSEAL**

**Kit includes:** male connector, female contacts, and fillers.

**Available for sensor:** EC-SNR-POS-75-H

**ORDERING CODE: 13.0310.542**

**3 POLES DEUTSCH DT06-3S**

**Kit includes:** male connector, female contacts, secondary lock and fillers.

**Available for sensor:** EC-SNR-PRX-0102-H

**ORDERING CODE: 13.0310.394**

**4 POLES DEUTSCH DT06-4S**

**Kit includes:** male connector, female contacts, secondary lock and fillers.

**Available for sensor:** EC-SNR-ANG-S9090-H, EC-SNR-ANG-D3030-H, EC-SNR-EOM-H

**ORDERING CODE: 13.0310.132**

**8 POLES DEUTSCH DT06-8S**

**Kit includes:** male connector, female contacts, secondary lock and fillers.

**Available for sensor:** EC-SNR-LA-1290-H

**ORDERING CODE: 13.0310.432**



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