

SENSORS



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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°) 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 $PL_r = c$
 - easy assembling of dual device for systems having $PL_r = d$
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)
EN 61000-6-3 (Emissions)

SPECIFICATIONS

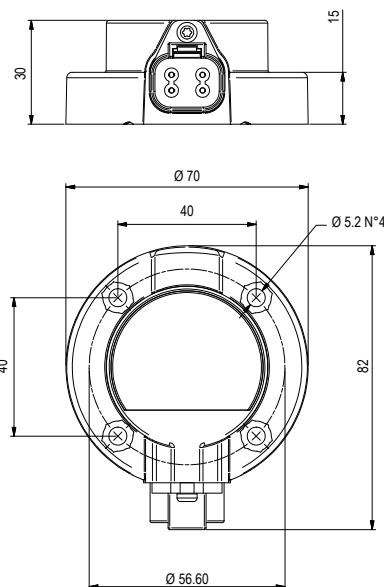
Operating voltage:	8 ÷ 32 VDC
Max current consumption:	70 mA @ 12V
CANbus physical layer:	ISO 11898, 250 kbit/s (adjustable bus speed)
CANbus protocol:	J1939 (option: CANOpen)
Max working angle	±180°
Resolution:	0.01°
Stability:	0.2° @ 25°C
Dynamic:	125°/s
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 68
Connector type:	Deutsch DT04-4P or M12
Fixing screws included:	n.4 - M5x20
Weight:	120 g (screws included)

APPLICATIONS

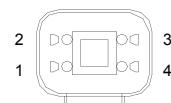
- 12 VDC and 24 VDC systems.
- Automatic basket self levelling for aerial platforms, agricultural machines and lift equipment.
- Automatic bucket self levelling for wheel loaders.



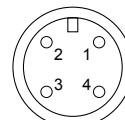
DIMENSIONS



CONNECTIONS



Deutsch DT04-4P



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

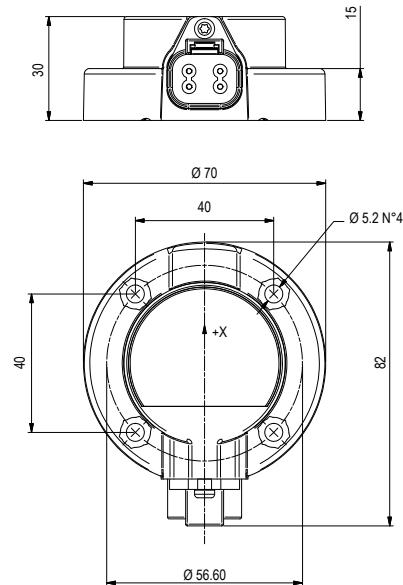
Signal output is linearly proportional to the tilt angle to the ground. With a measurement range of $\pm 90^\circ$ this device provides a 0.5 to 4.5 VDC output signal over its range with a nominal 2.5 VDC at 0 degree. It is normally used to control the inclination of a mechanical structure respect to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



DIMENSIONS



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
Weight:	120 g (screws included)

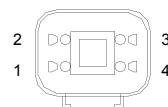
APPLICATIONS

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

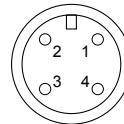
Ordering Code

20.0401.016 with Deutsch connector
20.0401.018 with M12 connector

CONNECTIONS



Deutsch DT04-4P



M12

1 +VBATT	1 +VBATT
2 GND	2 GND
3 OUTPUT X AXIS	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
Weight:	120 g (screws included)

APPLICATIONS

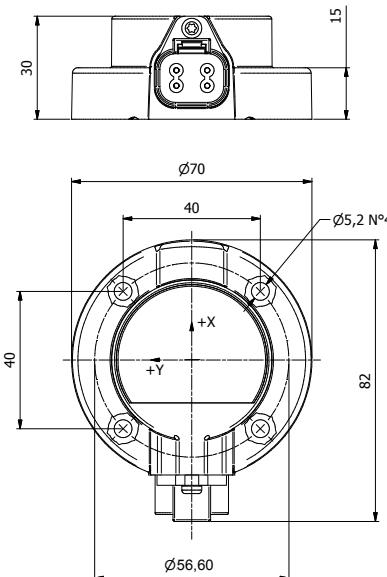
- 12 VDC and 24 VDC systems.
- Automatic self levelling system for trucks, agricultural machines and lift equipment.
- Vehicle tilt monitoring.

Ordering Code

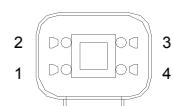
20.0401.012/A with Deutsch connector
20.0401.019/A with M12 connector



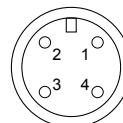
DIMENSIONS



CONNECTIONS



Deutsch DT04-4P



M12

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

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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

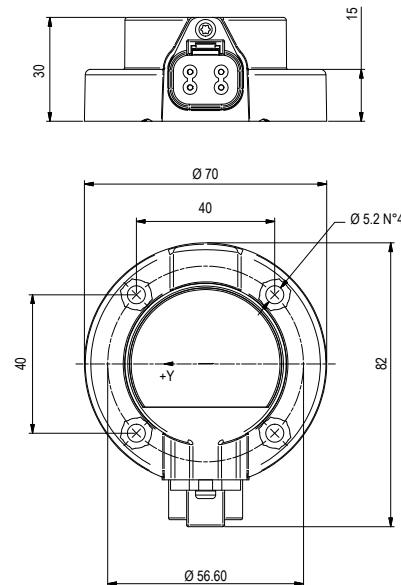
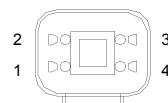
Operating voltage:	8-32 VDC
Max current consumption:	40 mA
CANbus physical layer:	ISO 11898, 250 kbit/s
CANbus protocol:	J1939
Max working angle for each axis:	$\pm 90^\circ$
Resolution:	0.25°
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 68
Connector type:	Deutsch DT04-4P or M12
Fixing screws included:	n.4 - M5x20
Weight:	120 g (screws included)

APPLICATIONS

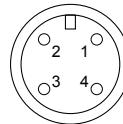
- 12 VDC and 24 VDC systems.
- Inclination sensor for telescopic or articulated cranes, and aerial platforms.
- Load and moment limiting systems.

Ordering Code

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

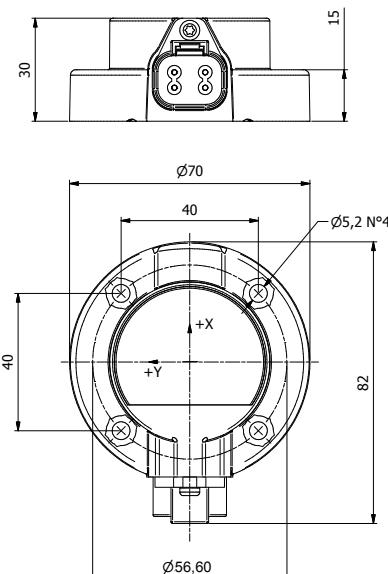
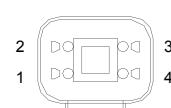
Operating voltage:	8-32 VDC
Max current consumption:	40 mA
CANbus physical layer:	ISO 11898, 250 kbit/s
CANbus protocol:	J1939
Max working angle for each axis:	$\pm 30^\circ$
Resolution:	0.10°
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 68
Connector type:	Deutsch DT04-4P or M12
Fixing screws included:	M4 - M5x20
Weight:	120 g (screws included)

APPLICATIONS

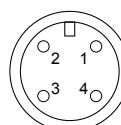
- 12 VDC and 24 VDC systems.
- Automatic self levelling system for trucks, agricultural machines and lift equipment.
- Vehicle tilt monitoring.

Ordering Code

20.0401.045 (Deutsch connector)
20.0401.046 (M12 connector)

**DIMENSIONS****CONNECTIONS**

Deutsch DT04-4P



M12

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

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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 ± 7.5 mm.
Slip-in assembly.

OPERATION

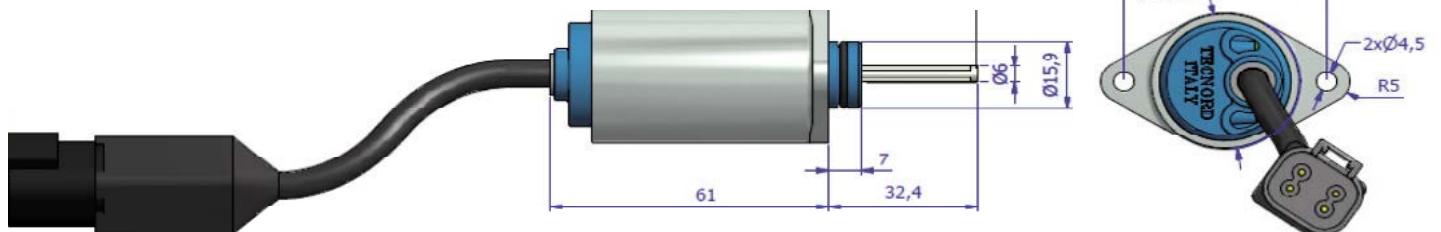
Signal output is linearly proportional to the stroke. With a measurement range of ± 7.5 mm this device provides a 1 to 4 VDC output signal over its range with a nominal 2.5 VDC in the neutral position. It can be used as a safety device in conjunction with Tecnord's MMS electronic units (e.g. MMS 1521).

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

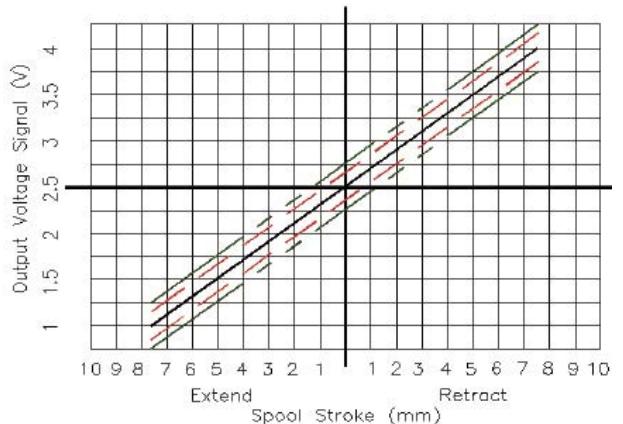
Operating voltage:	6÷32 VDC
Max current consumption:	<15mA
Operating temperature:	-40°C / +85°C
Degree of protection:	IP 67
Maximum operating pressure:	45 bar
Output signal:	1÷2.5÷4 VDC
Tolerance on output signal:	± 0.2 VDC
Electrical stroke linearity range:	± 7.5 mm
Maximum mechanical stroke:	± 8 mm
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

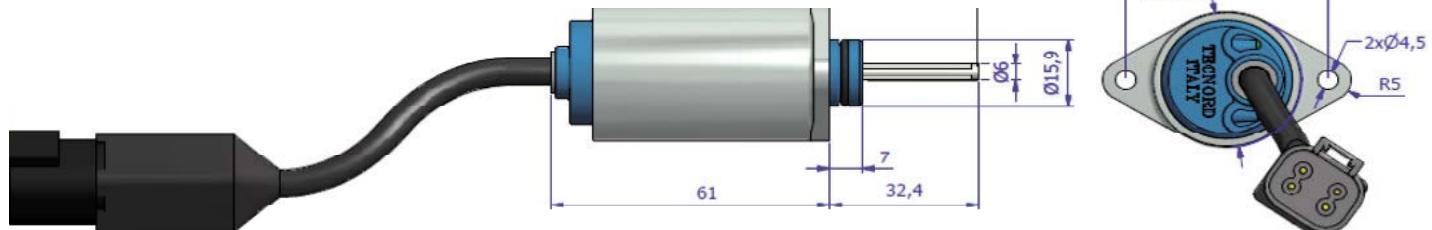
The sensor provides two directional signal outputs, each output becomes active when a movement is detected in its corresponding direction. Outputs are active low. Two low outputs means fault. It can be used as a safety device in conjunction with Tecnord's MMS electronic units (e.g. MMS 1521).

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)

SPECIFICATIONS

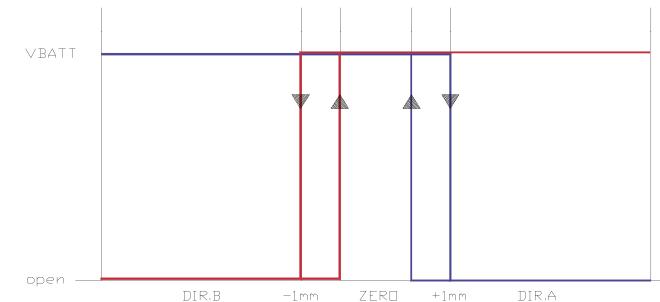
Operating voltage (VBATT):	6÷32 VDC
Max current consumption:	<15mA
Operating temperature:	-40°C / +85°C
Degree of protection:	IP 67
Maximum operating pressure:	45 bar
Output signal (inactive):	open collector (pnp)
Output signal (active):	VBATT
Switching threshold:	1 mm
Maximum mechanical stroke:	±8 mm
Connector pins:	1 +V (POWER SUPPLY) 2 -V (POWER SUPPLY) 3 OUT A 4 OUT B
Connector type:	Deutsch DT04-4P

DIMENSIONS**APPLICATIONS**

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

Ordering Code

20.0204.006

**OUTPUT SIGNAL**

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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

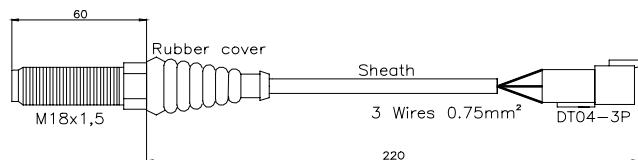
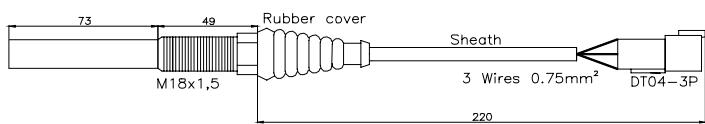
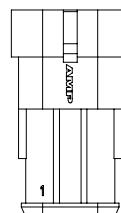
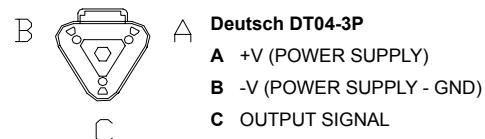
Operating voltage:	4÷26 VDC
Max current consumption:	11 mA
Max current output:	20 mA
Operating temperature:	-40°C / +150°C
Degree of protection:	IP68
Mechanical connection:	M18x1.5
Detecting distance:	0.1 - 2 mm
Max frequency for tooth detection:	8 kHz
Output signal:	0 VDC - max V supply
Output type:	NPN or PNP
3 wires cable, 0.75 mm ² 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**

Amp Superseal 3 poles
1 +V (POWER SUPPLY)
2 -V (POWER SUPPLY - GND)
3 OUTPUT SIGNAL

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EC-SNR-MDS-H MATERIAL DETECTION SENSOR

DESCRIPTION

Material Detection Sensor based on an optical device, designed for use in an extremely harsh environment, mainly on road salt spreader machines.

OPERATION

When the material from the "Spinner" flows in front of the optical device the output signal goes ON (+V). When no material flows, the output signal goes OFF (open). Above all used in conjunction with the Tecnord Ecomatic salt spreader control systems.

FEATURES

- Supply line protected against reversed polarity and overvoltage.
- Output protected against short circuits to GND and supply.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity)
EN 61000-6-3 (Emissions)

SPECIFICATIONS

Operating voltage:	10÷36 VDC
Max current consumption:	25mA
Operating temperature:	-25°C / +80°C
Degree of protection:	IP 67
Digital output:	PNP type
Max output current:	150mA
Detection zone:	<200 mm
Connection:	3 Wire leads colored

APPLICATIONS

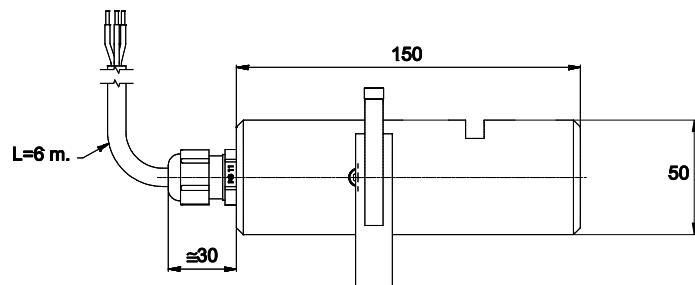
- MDS sensor for salt spreader systems.
- MDS sensor for agricultural spreader systems (e.g. fertilizers).

Ordering Code

20.0401.055/A



DIMENSIONS



CONNECTIONS

Flying wires

BROWN +V (POWER SUPPLY)

BLUE -V (POWER SUPPLY - GND)

BLACK OUTPUT SIGNAL

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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

