

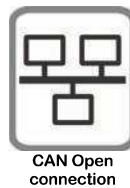


- Programmable digital device to measure tilt on 360° degrees
- Two analog outputs, X and Y axes
- Working range $\pm 20^\circ$
- MEMS technology angular sensor (no moving parts)
- Factory programmed on custom request
- Voltage, current, ratiometric or CAN bus output
- Double version in the same shell (CAN bus version only) for systems that require redundant signals
- Hardware and software filters to remove vibrations and interferences
- Inputs/outputs protected against polarity reversal, over voltages and short circuits
- Housed in a tough and compact shell made of glass fiber reinforced Nylon 6
- Electrical connection with M12x1 connectors

On request:

- Working range configurable
- Temperature compensation
- Vertical installation (factory set)

Typical fields of application: mounted cranes, mobile cranes, aerial platforms, industrial automation and generic mobile machines.



Technical data

Power supply	$5 \pm 0.2 V_{DC}$	from 9 to 33 V_{DC}		
Outputs	10% to 90% V_{IN} ratiometric	$0.5 \div 4.5 V_{DC}$	CAN bus	from 4 to 20 mA
Maximum output current	10 mA	10 mA	-	-
Current consumption ⁽¹⁾ [double]	10 [20] mA	30 [60] mA		30+20 [60+40] mA

⁽¹⁾ Device supply current (and max output load for 4 to 20 mA version) for single and double channel version

Intervention range	from -20 to +20 degrees
Transducer (linearity, hysteresis, repetibility) accuracy	0.5% FS for angles lower than $\pm 10^\circ$ and 1.0% FS over $\pm 10^\circ$ and until $\pm 20^\circ$ (FS=40°)
Angular transducer resolution	0.025 degrees (0.015 degrees for CAN bus version)
Angular transducer temperature drift (zero point)	± 0.008 degrees/ $^\circ C$ ⁽²⁾ (typical)
Standard cable length	30 cm
Operating temperature	from -40 to +80 °C
Maximum weight	0.25 kg
Housing material	glass fiber reinforced Nylon 6
Coating	Two components polyurethane
Standard protection grade	IP66 / IP67
CE conformity	EMC Directive: 2014/30/EU
EMC: Immunity Emission	EN 61000-6-2 EN61000-6-3 EN 13309 ⁽³⁾
Vibration resistance: Sinus	EN 60068-2-6: 10 g, 10 – 150 Hz
Shock resistance: Shock	EN 60068-2-27: 200 g, 6 ms
MTTFd (electronic board)	EN 13849-1: ≥ 100 years (for every channel)

⁽²⁾ For compensated devices, zero point: ± 0.002 degree/ $^\circ C$. For compensated devices, gain: ± 0.001 degree/ $^\circ C$

⁽³⁾ Excluding Pulse 5 (ISO 7637)

Ordering Code

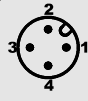
SP	S	20/20	9	M35	N	N	N
Transducer type	Channels	Axes angle range	Output type	Electrical connection	CAN termination	Mechanical fitting	Thermal compensation

Channels	S D	Single channel Double channel (CAN only)
Axes angle range	2 0 / 2 0	Maximum angle equal to 20/20 degrees
Output type	4 _ 5 _ 7 _ 9 _	Current output: 4 to 20 mA Ratiometric output: 10% to 90% V_{IN} , $V_{IN}=+5 V_{DC}$ CAN output: CAN Open (77 if double) Voltage output: $0.5 \div 4.5 V_{DC}$, $V_{IN}=9 \div 33 V_{DC}$
Electrical connection	c a b	Electrical wiring harness code (see "Electrical connections" on the right)
CAN termination	N	Without embedded CAN bus termination
Mechanical fitting	N	Standard (see drawing below)
Thermal compensation	N	Not compensated


Custom configurations are available on request.

Electrical connections

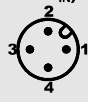
Current output (4 to 20 mA)
M12 plug
 Code: **M60** single channel
 1: $V_{IN}=9$ to $33 V_{DC}$
 2: Negative power supply
 3: X axis
 4: Y axis




Voltage output (0.5 to 4.5 V_{DC})
M12 plug
 Code: **M35** single channel
 1: $V_{IN}=9$ to $33 V_{DC}$
 2: Negative power supply
 3: X axis
 4: Y axis




Ratiometric output (10% to 90% V_{IN})
M12 plug
 Code: **M49** single channel
 1: $V_{IN}=+5 V_{DC}$
 2: Negative power supply
 3: X axis
 4: Y axis



CAN Open output

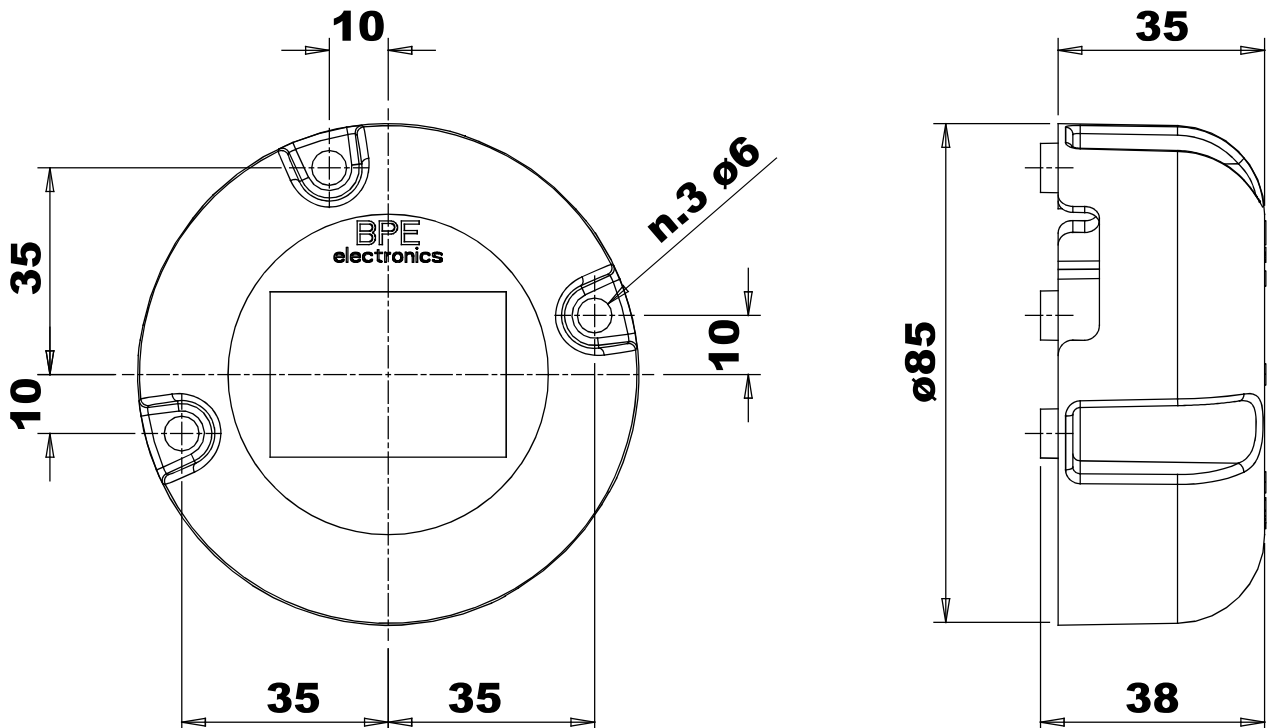


M12 plug
 Code: **M07** single or double channel
 1: Cable shield
 2: $V_{IN}=9$ to $33 V_{DC}$
 3: Negative power supply
 4: CH
 5: CL



M12 receptable

Dimensions [mm]



Accessories

Type	Description	Code	Notes
Counterpart Connector	M12 receptacle connector: loose connector with 4pin, screw terminals.	7.003.045	
Extension cable	Length 5000mm, multipolar cable for dynamic installations, 4 conductors (brown, grey, black, yellow/green) sections 0.5mm ² , external grey jacket with excellent resistance to abrasive action, ordinary industrial oils and chemical agents. M12 4pin receptacle connector.	7.180.431	
Extension cable	Length 10000mm, multipolar cable for dynamic installations, 4 conductors (brown, grey, black, yellow/green) sections 0.5mm ² , external grey jacket with excellent resistance to abrasive action, ordinary industrial oils and chemical agents. M12 4pin receptacle connector.	7.180.433	
CAN Counterpart Connector	M12 receptacle connector: loose connector with 5pin, screw terminals.	7.003.059	
CAN Extension cable	Length 5000mm, multipolar cable for dynamic installations, 2x2xAWG22 conductors (brown, white, yellow, green) , external purple jacket with excellent resistance to abrasive action, ordinary industrial oils, chemical agents and UV. M12 5pin receptacle connector.	7.180.469	
CAN Extension cable	Length 10000mm, multipolar cable for dynamic installations, 2x2xAWG22 conductors (brown, white, yellow, green), external purple jacket with excellent resistance to abrasive action, ordinary industrial oils, chemical agents and UV. M12 5pin receptacle connector.	7.180.409	
CAN Counterpart Connector	M12 plug connector: loose connector with 5pin, screw terminals.	7.003.071	
CAN Extension cable	Length 5000mm, multipolar cable for dynamic installations, 2x2xAWG22 conductors (brown, white, yellow, green), external purple jacket with excellent resistance to abrasive action, ordinary industrial oils, chemical agents and UV. M12 5pin plug connector.	7.180.486	
CAN Extension cable	Length 10000mm, multipolar cable for dynamic installations, 2x2xAWG22 conductors (brown, white, yellow, green), external purple jacket with excellent resistance to abrasive action, ordinary industrial oils, chemical agents and UV. M12 5pin plug connector.	7.180.514	
CAN Network Termination	M12 5 pin receptacle connector cap with CAN network termination.	7.003.069	
CAN Network Termination	M12 5 pin plug connector cap with CAN network termination.	7.003.070	