

Preliminary Data sheet

NOVOTURN Multi-turn Sensor Non-contacting

MZ1-2200

CAN SAE J1939

Mobile Applications



Special Features

- Non-contacting, magnetic
- Long life
- Housing diameter only 22 mm
- Measuring range 15840° (44 turns)
- True-Power-On system: counts turns even when not powered. Patented non-volatile technology does not require gears or batteries
- Easy mounting
- Protection class IP50 and IP65
- Resolution 16 bits per revolution
- Exceeds European E1 requirements
- Other configurations see separate data sheets

Applications

- Mechanical engineering
- Mobile machinery
- Driveline or steering systems
- Wire-actuated encoders
- Gate drives
- Aircraft seats
- Motor sports

Multi-turn sensors that use the GMR technology (giant magneto resistance), provide absolute position values, do not require any reference signals and need no power supply or buffer battery for detecting the revolutions. The fact that rotations are detected even unpowered and the sensor does not lose its position information during a power failure, makes the MZ1-2200 with its diameter of only 22 mm an extremely compact real True-Power-On rotary sensor.

The sensor operates magnetically and thus contactless allowing an extremely long life.

The sensor is able to detect angular positions over up to 44 revolutions with a high resolution up to 16 bits per revolution.

Description

Material	Housing: high grade, temperature resistant plastic PPS Bushing: CuZn21Si3P Shaft: stainless steel, X8CrNiS18-9 1.4305
Mounting	Central mounting M10 x 0.75 with lock nut (included in delivery)
Fastening torque of mounting	max. 200 Ncm
Bearing	Slide bearing
Electrical connection	Cable 2x 2x 0.34 mm ² (AWG 22), TPE, shielded / Connector M12x1, A-coded with cable L = 0.15 m

Mechanical Data

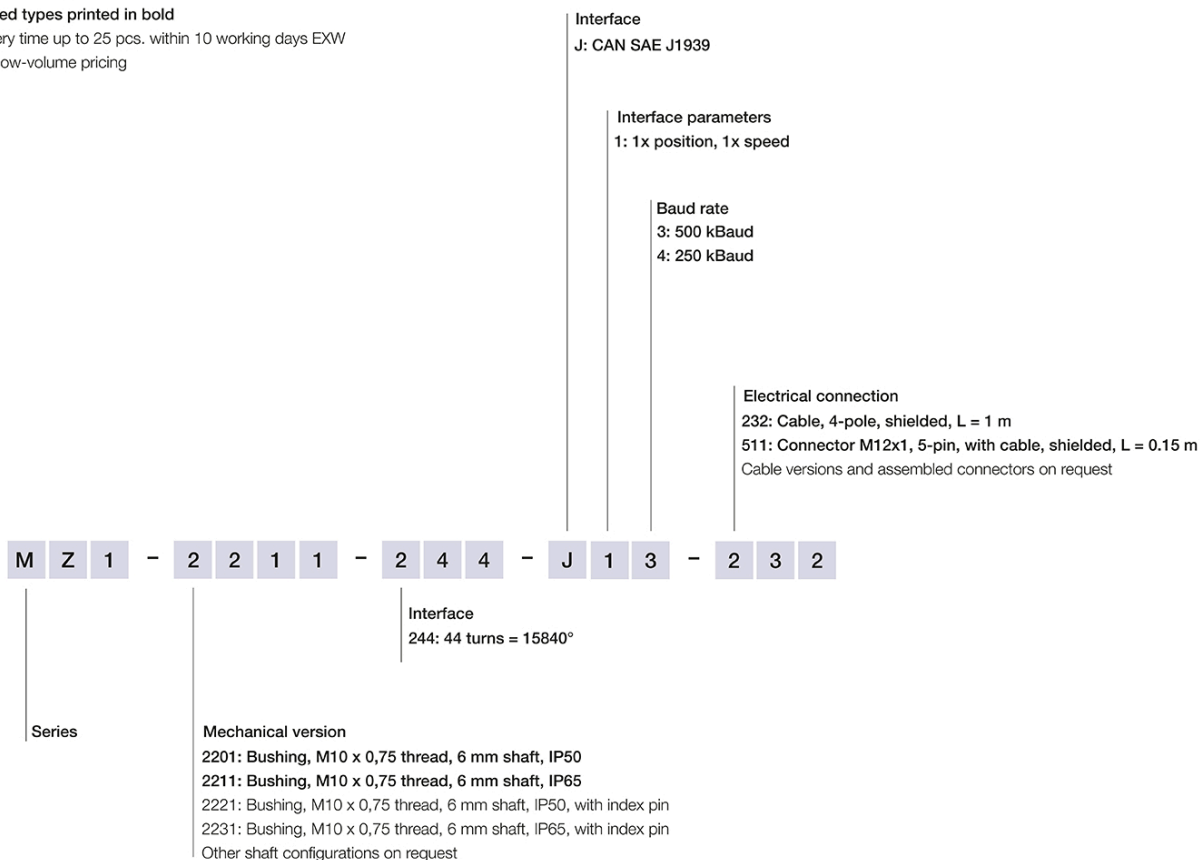
Dimensions	See dimension drawing
Mechanical travel	Continuous
Permitted shaft load static or dynamic	1 N (axial / radial)
Torque	Typ. ≤ 3 Ncm Depending on the environmental temperature and standstill time, the necessary force for the initial operating of the shaft may increase
Weight (w/o connection)	approx. 30 g

Ordering Specifications

Ordering Specifications

Preferred types printed in bold

- Delivery time up to 25 pcs. within 10 working days EXW
- Best low-volume pricing



Accessories included in delivery

- Fastening material (toothed washer, lock nut)

Technical Data

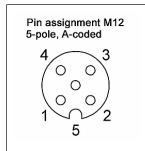
Type	MZ1-22 _ _ _ _ J _ _ _ _ CAN SAE J1939
Measured variables	Position, speed, temperature and supply voltage
Measuring range	44 turns = 15840°
Measuring range speed	0 ... 546 rpm
Protocol	CAN SAE J1939
Programmable parameters	e.g. Preset, counting direction, resolution, baud rate, transmit mode, transmit cycle, source address
Condition monitoring functions	Operating time, temperature, supply voltage
Start-up time	≤ 70 ms
Diagnosis	activated (in case of error, position signal is outside of the plausible signal range)
Source Address	128 ... 247 (dynamic address claiming)
Baud rate	250, 500 kBaud
Signal propagation delay	< 0.3 ms
Resolution (across 360°)	16 bits
Resolution speed	0.1°/s
Linearity	≤ ±1°
Repeatability	≤ ±0.1°
Hysteresis	≤ ±0.5°
Temperature error	±0.36°
Supply voltage Ub	12/24 VDC (8 ... 32 VDC)
Current consumption w/o load	≤ 60 mA
Overvoltage protection	45 VDC (permanent)
Polarity protection	yes (supply lines and outputs)
Short circuit protection	yes (all outputs vs. GND and supply voltage)
Insulation resistance (500 VDC)	≥ 10 MΩ
Bus termination internal	w/o (internal load resistance 120 Ω on request)
Environmental Data	
Max. operational speed	500 rpm
Vibration IEC 60068-2-6	20 g, 5 ... 2000 Hz, Amax = 0.75 mm
Shock IEC 60068-2-27	50 g, 6 ms
Protection class DIN EN 60529	IP50 / IP65 resp. IP67 (housing side)
Operating temperature	-40 ... +85°C -25 ... +85°C (connector M12)
Insensitivity to magnetic DC fields	< 15 mT
Life	typ. > 10 Mio. movements
Functional safety	If you need assistance in using our products in safety-related systems, please contact us
MTTF (IEC 60050)	440 years
Traceability	Serial number on type labeling: production batch of the sensor assembly and relevant sensor components
Conformity/Approval	CE, UKCA see https://www.novotechnik.de/en/downloads/certificates/declarations-of-conformity-eu/uk WEEE see https://www.novotechnik.de/en/downloads/certificates/eu-directive-weee/
EMC Compatibility	
ISO 13766-1 Construction machinery	
ISO 14982 Agricult./forestry machines	
Emission/Immunity E1	E1 compliant
EN 61000-4-2 ESD (contact/air discharge)	4 kV, 8 kV
EN 61000-4-3 Electromagnetic fields (RFI)	30 V/m
EN 61000-4-4 Fast transients (burst)	1 kV
EN 61000-4-6 Cond. disturbances (HF fields)	10 V eff.
EN 55016-2-3 Radiated disturbances	Industrial and residential area

Important:

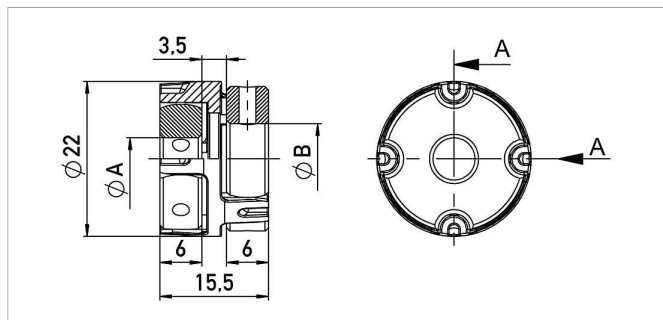
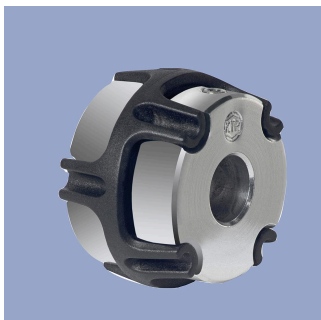
While operation, care should be taken not to rotate the sensor shaft below 0° or above 5760°. Refer to users manual.

Connection Assignment

Signal	Cable code 2_ _	Connector code 5_ _
Supply voltage Ub	WH	Pin 2
GND	BN	Pin 3
CAN_H	YE	Pin 4
CAN_L	GN	Pin 5
CAN_SHLD	Shield	Pin 1
Connect cable shielding to protection earth (Industrial/CE) or GND (mobile applications)		



Sensor Mounting

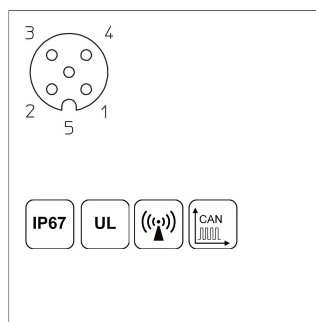
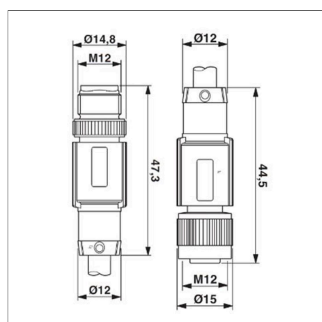


Z-106-G_
Backlash-free, double cardanic shaft coupling for $\varnothing 6$ mm to $\varnothing 6$ mm, $\varnothing 6.35$ mm or $\varnothing 10$ mm, mounting via 2 threaded pins with internal hexagon

Material Aluminium, PEEK
 Operating temp. $-40 \dots +160^\circ\text{C}$
 Transferable torque ≤ 1 Nm
 Displacement rad. ≤ 0.1 mm, angl. $\leq 0.45^\circ$

P/N	Type	$\varnothing A / \varnothing B$ [mm]
400103910	Z-106-G-6	6 / 6
400103912	Z-106-G-6,35	6 / 6.35
400103913	Z-106-G-10	6 / 10

Connector System M12

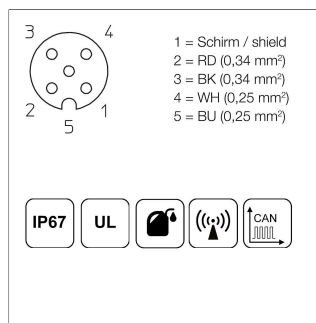
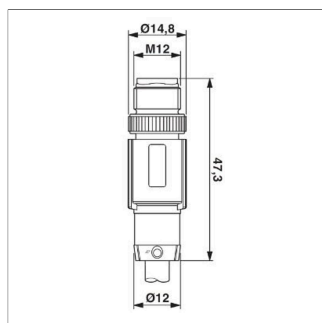


EEM-33-52
M12x1 Mating female/male connector, 5-pin, straight, A-coded, with molded cable, IP67, shielded (shield on knurl), CAN-Bus

Plug housing PUR
Cable sheath PUR, Ø = 6.7 mm, -25 ... +90°C (plug/socket) -20 ... +80°C (cable)

Lead wires PE, 2x0.25 mm²+2x0.34 mm²

P/N	Type	Length
400106373	EEM-33-52	5 m

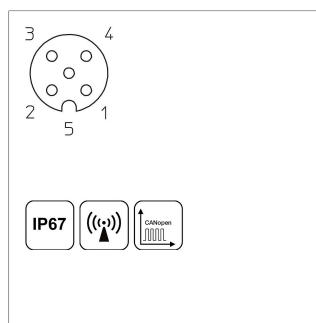
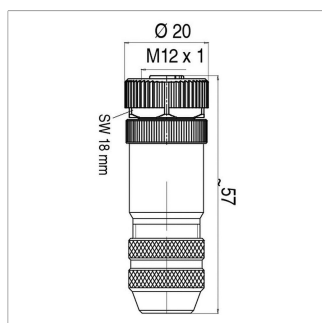


EEM-33-49/50/51
M12x1 Mating female connector, 5-pin, straight, A-coded, with molded cable, IP67, shielded (shield on knurl), open ended

Plug housing TPU
Cable sheath PUR, Ø = 6.7 mm, -25 ... +90°C (socket) -20 ... +80°C (cable)

Lead wires PE, 2x0.25 mm²+2x0.34 mm²

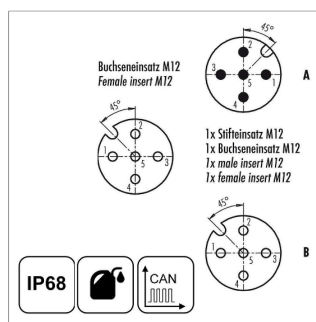
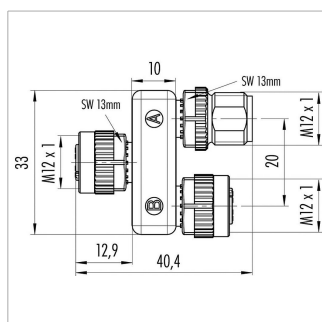
P/N	Type	Length
400106368	EEM-33-49	2 m
400106371	EEM-33-50	5 m
400106372	EEM-33-51	10 m



EEM-33-73
M12x1 Mating female connector, 5-pin, straight, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN bus

Plug housing Metal, -40 ... +85°C
For wire gauge 6 ... 8 mm, max. 0.75 mm²

P/N	Type
400005645	EEM-33-73

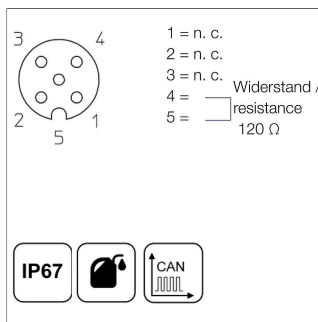
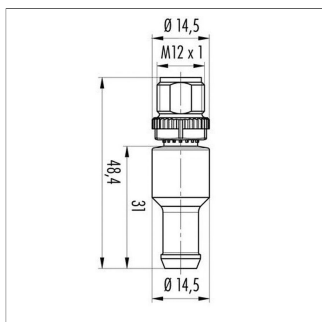


EEM-33-45
M12x1 splitter / T-connector, 5-pin, A-coded, IP68, 1:1 connection, female - male - female, CAN-Bus

Plug housing PUR, -25 ... +85°C

P/N	Type
400056145	EEM-33-45

**Connector System
M12**



EEM-33-47
M12x1 terminating resistor, 5-pin, A-coded,
IP67, 120 Ω resistance, CAN-Bus

Plug housing	PUR, -25 ... +85°C
P/N	Type
400056147	EEM-33-47

IP67 Protection class IP67 DIN EN 60529

IP68 Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibility (EMC) and shield systems

Very good resistance to oils, coolants and lubricants

Suited for applications in dragchains

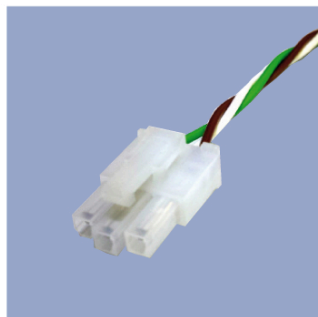
UL UL - approved

CAN-Bus

Connecting Options on request



- M12 connector**
- Customized lengths
 - 3-, 4-, 6- and 8-pole versions
 - Protection class IP68
 - Ordering codes of standard versions see ordering specifications



- Molex Mini Fit jr.**
- Customized length and lead wires
 - 3-, 4- and 6-pole versions
 - On request



- Tyco AMP Super Seal**
- Pin- and bushing housing
 - Customized lengths
 - 3-, 4- and 6-pole versions
 - Protection class IP67
 - On request



- Molex Mini Fit jr.**
- Customized length and lead wires
 - 3-, 4- and 6-pole versions
 - On request



- Deutsch DTM 04**
- Pin- and bushing housing
 - Customized lengths
 - 3-, 4- and 6-pole versions
 - Protection class IP67
 - On request



- ITT Cannon Sure Seal connector**
- Customized lengths
 - 3-, 4- and 6-pole versions
 - Protection class IP67
 - On request

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© Jun 12, 2025

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