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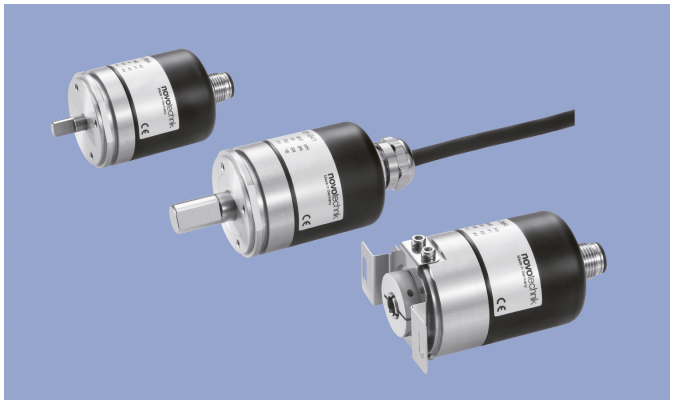
Siedle Group

Preliminary Data sheet

NOVOTURN
Multi-turn Sensor
Non-contacting

MB1-3600
IO-Link
Industrial



Special Features
- Non-contacting, magnetic
- Long life
- 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
- Solid shaft or hollow shaft
- Resolution 16 bits per revolution
- Protection class IP67, IP69K
- Other configurations see separate data sheets

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

Non-contacting Rotary Sensor in very robust design including a double bearing system in a compact OD 36 mm full metal housing. The magnetic True-Power-On Multi-Turn utilizes the GMR technology (Giant Magneto Resistance) for measurements of 44 revolutions. The heavy-duty version in IP69K ingression protection version is well suited for extreme environment applications including high bearing loads. The semi-hollow shaft version with its integrated stator coupling obsoletes a costly separate shaft coupling.

Description

Type	Ø6 mm shaft MB1-3601-_ _ _-_ _ _-_ _ _	Ø10 mm shaft Heavy Duty MB1-3624-_ _ _-_ _ _-_ _ _	Ø6 mm hollow shaft MB1-3607-_ _ _-_ _ _-_ _ _
Material	Flange: aluminium AlSiMgBi, anodized **Galvanized stainless steel**, ST 12 1.0330 Shaft: stainless steel X10CrNiS18-9 1.4305		Flange: aluminium AlSiMgBi, anodized **Galvanized stainless steel**, ST 12 1.0330 Shaft: stainless steel X10CrNiS18-9 1.4305 Coupling: stainless steel X10CrNiS18-8 1.4310
Mounting	With 3 mounting clamps Z1-15 (included in delivery) or via frontal thread 4 x M3		Stator coupling
Bearing	Ball bearings		
Electrical connection	Connector M12x1, 4-pin, A-coded		

Mechanical Data

Type	**Ø6 mm shaft** **MB1-3601-_ _ _-_ _ _-_ _ _**	**Ø10 mm shaft Heavy Duty** **MB1-3624-_ _ _-_ _ _-_ _ _**	**Ø6 mm hollow shaft** **MB1-3607-_ _ _-_ _ _-_ _ _**
Dimensions	See dimension drawing		
Mechanical travel	Continuous		
Weight (w/o connection)	approx. 100 g		
Torque*	Typ. 0.3 Ncm	Typ. 3 Ncm	Typ. 0.5 Ncm
Permitted shaft load static or dynamic	40 N (axial) / 50 N (radial)	100 N (axial / radial)	40 N (axial) / 50 N (radial)
	*) Depending on the environmental temperature and standstill time, the necessary force for the inital operating of the shaft may increase.		

Ordering Specifications

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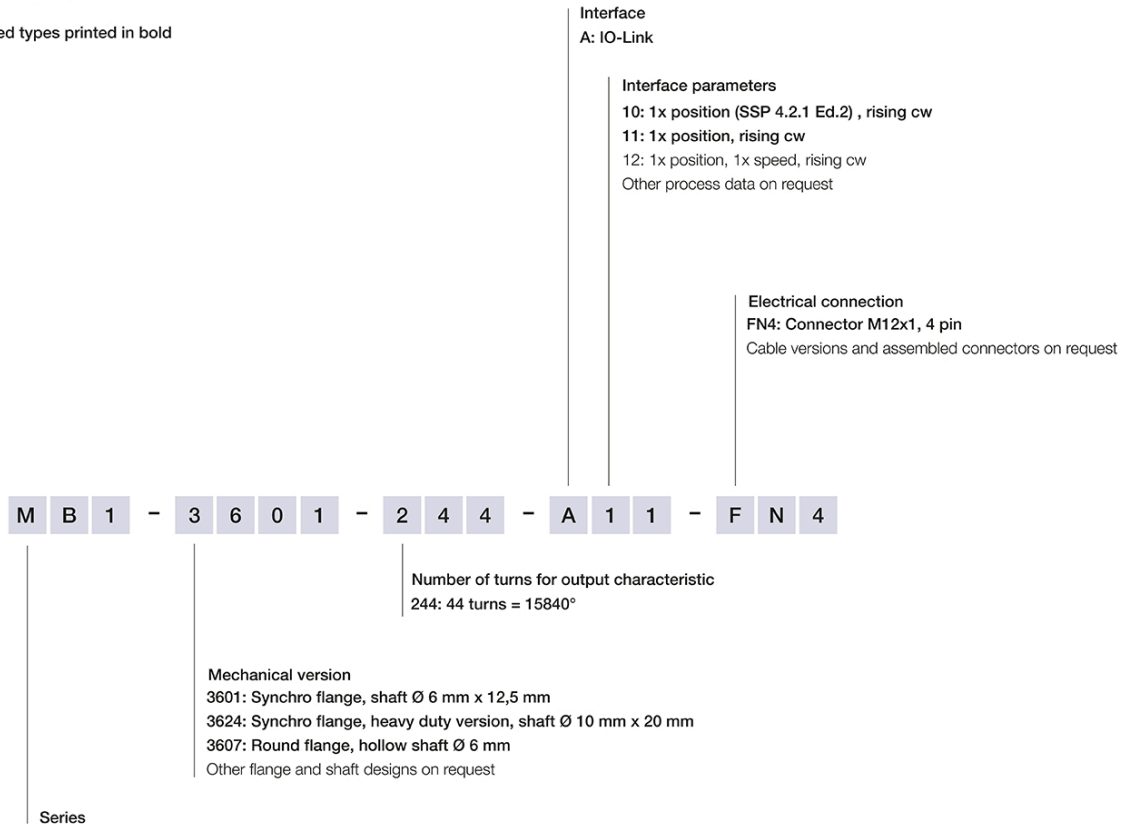
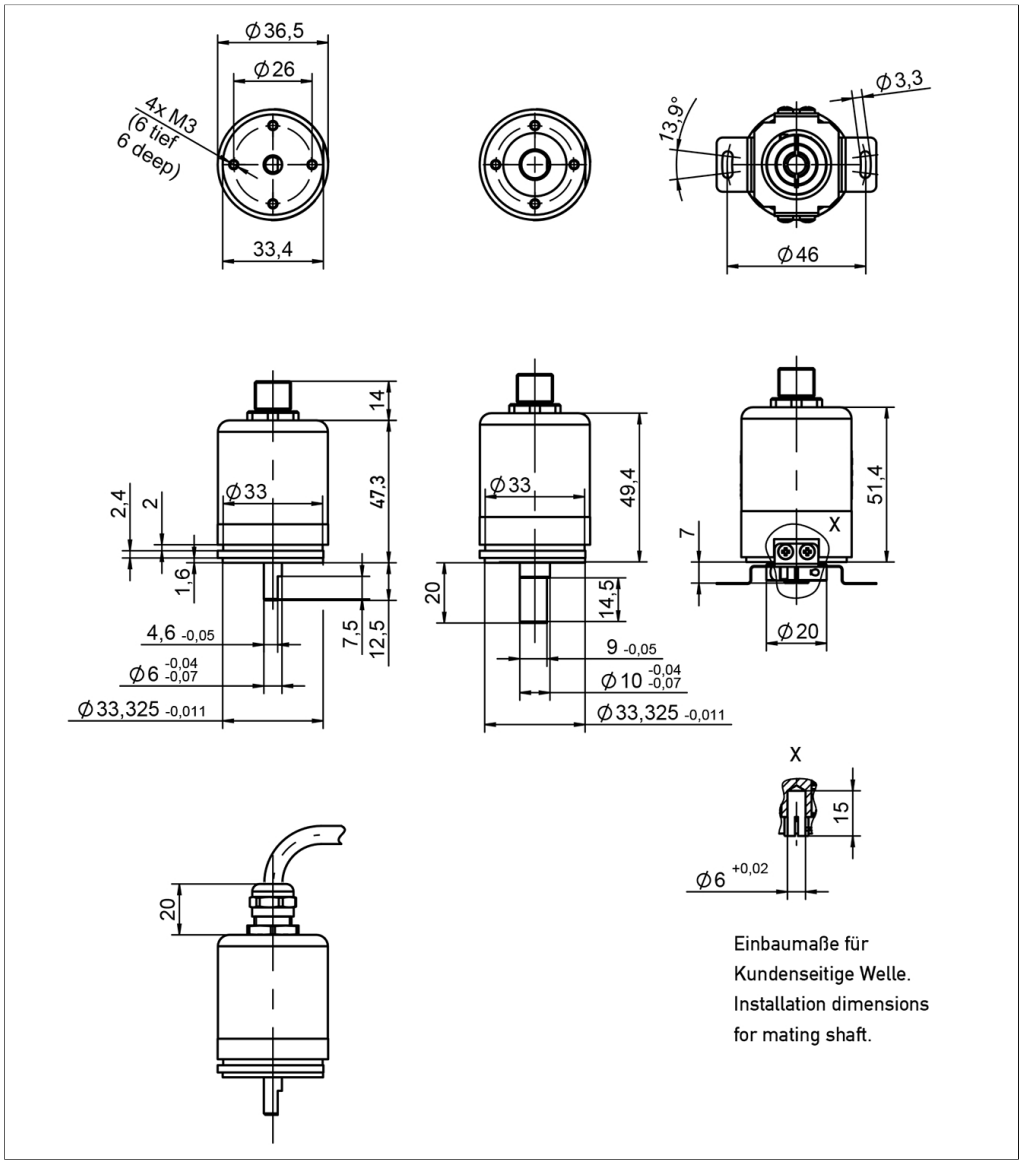
Preferred types printed in bold



Accessories included in delivery
3x fixing clamp Z1-15

Drawing



CAD data see
www.novotechnik.de/en/download/cad-data/

When the marking of the shaft is pointing towards the flattening on the housing flange, the sensor output is located on an integer turn position.

Technical Data

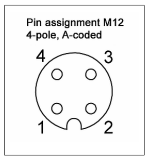
IO-Link

Type	**MB1-36_ _-_ _ _-A_ _-_ _ _** **IO-Link**		
Measured variables	Position, speed, temperature and supply voltage		
Measuring range	44 turns = 15840°		
Measuring range speed	0 ... 546 rpm		
Number of channels	1		
Protocol	IO-Link Spec V1.1 to IEC 61131-9, Smart Sensor Profile Ed. 2 Digital Measuring Sensor SSP 4.2.1 (V1.0 compatible)		
Programmable parameters	e.g. Null point offset, resolution, rotating direction, switches, work area, operating modes		
Condition monitoring functions	Statistical data on temperature, operating time, supply voltage, running performance		
Diagnosis	activated (in case of error, position signal is outside of the plausible signal range)		
Resolution position (across 360°)	A11/A12: 16 bits, A10: 0,01°/LSB		
Resolution speed	0.1°/s		
Update rate	1 kHz		
Signal propagation delay	< 0.2 ms		
Transfer rate	COM 3 (230.4 kBaud)		
Frame type	2.2		
Minimum cycle time	1 ms		
Absolute linearity	≤ ±1°		
Repeatability	≤ ±0.1°		
Hysteresis	≤ ±0.5°		
Temperature error	±0.1 %FS		
Supply voltage Ub	24 VDC (16 ... 30 VDC)		
Current consumption w/o load	≤ 30 mA @24 V		
Power drain w/o load	< 0.72 W		
Polarity protection	yes (supply lines and outputs)		
Short circuit protection	yes (output vs. GND and supply voltage up to 40 VDC)		
Overvoltage protection	36 VDC (permanent)		
Insulation resistance (500 VDC)	≥ 10 MΩ		
Environmental Data			
Type	Ø6 mm shaft MB1-3601-_ _ _-_ _ _-_ _ _	Ø10 mm shaft Heavy Duty MB1-3624-_ _ _-_ _ _-_ _ _	Ø6 mm hollow shaft MB1-3607-_ _ _-_ _ _-_ _ _
Max. operational speed	12,000 rpm	6,000 rpm	12,000 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 ISO 20653	IP65 (shaft side) IP67 (housing incl. electronics)	IP67 (shaft side) IP69K (housing incl. electronics)	IP65 (shaft side) IP67 (housing incl. electronics)
Operating temperature	-30 ... +85°C		
Insensitivity to magnetic DC fields	< 15 mT		
Bearing lifetime	typ. > 100 Mio. movements		
Functional safety	If you need assistance in using our products in safety-related systems, please contact us		
MTTF (IEC 60050)	591 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			
IO-Link Interface and System	V1.1.3		
EN 61000-4-2 ESD (contact/air discharge)	4 kV, 8 kV		
EN 61000-4-3 Electromagnetic fields (RFI)	10 V/m		
EN 61000-4-4 Fast transients (burst)	2 kV		
EN 61000-4-6 Cond. disturbances (HF fields)	10 V eff.		
EN 55016-2-3 Radiated disturbances	Industrial and residential area		

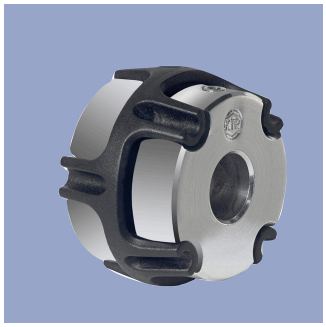
Important:
While operation, care should be taken not to rotate the sensor shaft below 0° or above 15840°. Refer to users manual.
FS = Full scale: Signal span according to electrical measuring range

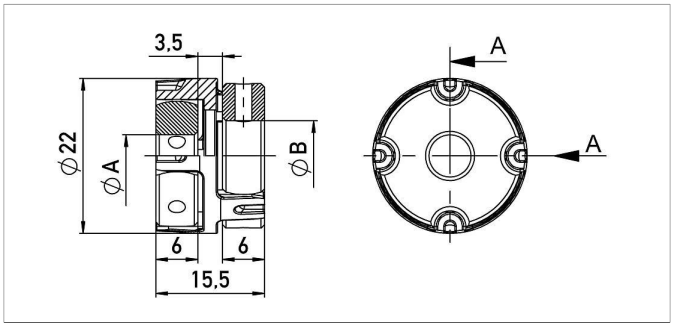
Connection Assignment

Signal	Connector
Supply voltage Ub (L+)	Pin 1
GND (L-)	Pin 3
C/Q	Pin 4
Do not connect (alt. GND)	Pin 2



Sensor Mounting



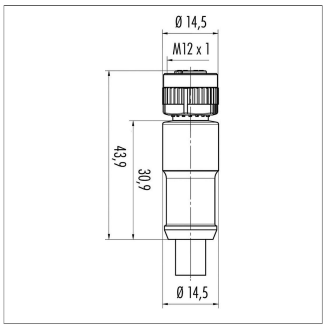


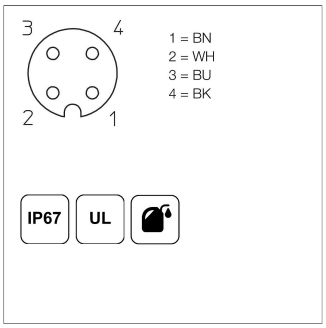
Z-106-G-_
Backlash-free, double cardanic shaft coupling for Ø6 mm to Ø6 mm, Ø6.35 mm or Ø10 mm, mounting via 2 threaded pins with internal hexagon

Material	Aluminium, PEEK
Operating temp.	-40 ... +160°C
Transferable torque	≤ 1 Nm
Displacement	rad. ≤ 0.1 mm, angl. ≤ 0.45°

P/N	Type	ØA / ØB [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



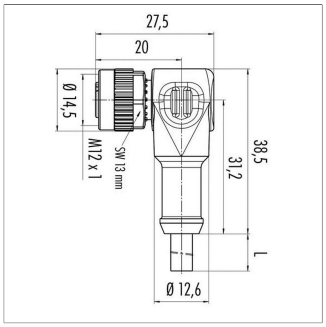


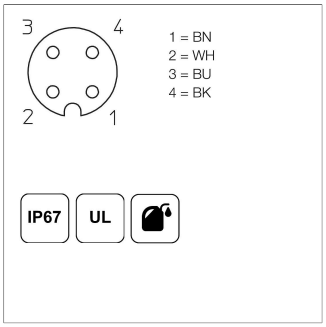
EEM-33-35/36/37

M12x1 Mating female connector, 4-pin, straight, A-coded, with molded cable, not shielded, IP67, open ended

Plug housing	PA
Cable sheath	PUR, Ø = max. 6 mm, -40 ... +85°C (fixed)
Lead wires	PP, 0.34 mm²

P/N	Type	Length
400056135	EEM-33-35	2 m
400056136	EEM-33-36	5 m
400056137	EEM-33-37	10 m





EEM-33-38/39/40

M12x1 Mating female connector, 4-pin, angled, A-coded, with molded cable, not shielded, IP67, open ended

Plug housing	PA
Cable sheath	PUR, Ø = max. 6 mm, -40 ... +85°C (fixed)
Lead wires	PP, 0.34 mm²

P/N	Type	Length
400056138	EEM-33-38	2 m
400056139	EEM-33-39	5 m
400056140	EEM-33-40	10 m

IP67 Protection class IP67 DIN EN 60529

IP68 Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibiliy (EMC) and shield systems

Very good resistance to oils, coolants and lubricants

Suited for applications in dragchains

UL UL - approved

CAN CAN-Bus

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