

LESIKAR

Lesikar[®]
SENSORS

SELECTION GUIDE_

Welcome	03
Sensors Overview	04
Products Application	05
Application References	06
Research Offer	07
 Rotational Speed Sensors	 08
M 03	09
M 048	10
M 051	11
M 60	12
 Position Sensors	 13
M 004 – M 007	14
M 010	15
M 018	16
M 019	17
M 039	18
M 042	19
M 473	20
 Inductive Sensors	 21
M 017	22
 Angle Sensors	 23
M 027	24
M 028	25
 Level Sensors	 26
H 040	27

WELCOME TO LEŠIKAR SENSORS

Machinery equipment, automotive intelligence as well as many other industrial applications are based on precise regulation and control of it's vital functions. Smooth performance of a given system can be based on the ability to measure speed, to know the exact position, to indicate levels or to sense flow of a fluid.

LEŠIKAR Sensors represent simple and innovative approach to the contactless magnetical sensing, measurement and regulation. With various applications the LEŠIKAR brand has over 15 years of tradition.

The portfolio ranges from a series of contactless position sensors, rotational and speed sensors to level and angle sensors, various contactless switches and evaluation electronics. Standard products can be customized for special applications. Our customers need exact and real time sensing, durability and stability of function in a wide temperature range, replacement of mechanical switches, relays etc. Our latest generation of sensors is programmable which among other advantages enables the users to change some of the characteristics from the outside after assembly.

LEŠIKAR R&D center makes sure that we offer up-to-date solutions, several of which are patented.

The company is both ISO 9001 and ISO 14001 certified since 2001 and also holds NATO security clearance.

Come and explore the endless possibilities at LEŠIKAR!

Jana Lešikarová
LEŠIKAR AB

SENSORS OVERVIEW

Sensing of	Type	Reacts to Magnet (M) Ferrous Metal (F)	Sensitivity (Air Gap)	Supply Voltage	Supply Current	Output SW (switch)	Temperature Range	Operating Speed	Cable (CA) / Built-in Connector (CO)
Rotation/speed	M03	F	0,5 – 1,5 mm	4,5 – 30 VDC	10 – 30 mA	SW two NPN inverse signals	-40 to +125°C	10 – 10 000 Hz	CO
Rotation/speed	M048	F	0,1 – 1,6 mm	5 – 30 VDC	up to 30 mA	SW two NPN (incremental)	-40 to +150°C	10 – 20 000 Hz	CA
Rotation/speed	M051	M	up to 6 mm	12,5 – 30 VDC	up to 30 mA	SW Indication of reverse direction	-40 to +85°C	2 000 Hz	CA
Rotation/speed	M60	F	0,15 – 1,5 mm	4,5 – 30 VDC	up to 25 mA	SW 20 mA (NPN or PNP)	-40 to +120°C	10 – 10 000 Hz	CA / CO
Position	M004-M007	M	15 mm	10 – 30 VDC	20 mA	SW digital 1,4 A	-40 to +85°C	0 – 10 000 Hz	CA
Position	M010	F	vane switch	4,5 – 30 VDC	10 mA	SW vane switch NPN/20 mA	-40 to +85°C	50 000 Hz max	CA
Position	M018	M	5 – 10 mm	10,8 – 30 VDC	20 mA	SW NPN/NC 100 mA	-40 to +80°C	0 – 10 000 Hz	CA
Position	M019	M	4,5 mm	21,6 – 30 VDC	up to 30 mA	SW dual NPN inverse / 1,4 A	-40 to +120°C	-	CA
Position	M039	F	3 mm	10 – 30 VDC	up to 20 mA	SW NPN/NO 150 mA	-30 to +70°C	5 000 Hz	CA
Position	M042	F	8 mm	10 – 30 VDC	15 mA	SW NPN/NO 1,4 A	-30 to +70°C	-	CA
Position	M473	M	5 – 15 mm	10 – 30 VDC	20 mA	SW PNP 100 mA	-40 to +150°C	0 – 10 000 Hz	CA
Inductive	M017	M	> 10 cm	-	-	-	-40 to +150°C	-	CA
Angle	M027	inclination	angulation 7°	10 – 30 VDC	to 20 mA	SW NPN / 1,4 A	-20 to +85°C	-	CA
Angle	M028	M - angle	10 mm ±90°	10 – 30 VDC	up to 15 mA	NPN/ 100 mA	-40 to +85°C	PWM 150 Hz	CA
Level	H040	capacity	oil, water	10 – 30 VDC	to 20 mA	SW NPN/NC	-30 to +125°C	-	CO

PRODUCTS APPLICATION_

Type	Function	Application example
M03	sensing of the metal target rotation	tachographs
M048	sensing of speed and direction of the metal target rotation	engine regulators for tractors and fork lift trucks
M051	reverse rotation indication and RPM sensing of the magnet mark	shaft reverse rotation indicator
M60	sensing of the metal target rotation	tachometers, control systems of ignition and injection
M004-M007	magnet position sensor	door position control, end position control
M010	vane switch	needle position check in the textile machines
M018	magnet position switch with long durability	door position control
M019	magnet position sensor and switch	switching of the valves in the gear boxes, replacement of relay
M039	ferrous metal position sensor and switch	switch for the clutch pedal
M042	ferrous metal position programmable sensor and switch	end position sensor and switch for the wheelchair ramp in the bus
M473	magnet position sensor	position sensing in high temperatures, for example on the hydraulic cylinder pistons
M017	inductive sensor	rotation sensor for the turbochargers
M027	inclination sensor	sensing of the angle from the vertical position. for the dump body
M028	180° angle sensor on the high distance, alignment of magnet and sensor not necessary	angle sensing in articulated buses
H040	oil or water level sensor	programmable oil level switch for the engines

APPLICATION REFERENCES

TRUCKS

- EURO 2 injection regulation system to meet EURO 3 emission limits (patented)
- heavy duty sensors for turbochargers and measuring set for turbochargers analytics
- speed sensor for additional heater in diesel engine trucks
- set of tachograph sensors
- engine sensor for retarder and speedometer
- truck cabin position sensor
- differential position sensor
- sensor of reduction shift in gearbox
- steering-angle sensor for EURO 3 engine
- slope (inclination) sensor for trucks
- oil level sensor

BUSES

- set of door position sensors
- sensor in vehicle lifting platform for disabled
- reverse driving signalization
- angle sensor for articulated buses
- clutch pedal position sensor

CARS

- safety belt position sensor
- intelligent linear sensor of accelerator pedal
- actuator sensor

COMMERCIAL AND UTILITY VEHICLES

- wheel synchronization electronics for utility and heavy duty vehicles
- engine speed control system (electronics + sensors)
- refuse collecting vehicle position sensors
- speed sensor for fork lift engines
- analog level sensor
- contact level sensor for public utility vehicle
- speedometer and regulating units for tractors
- position and speed sensors for gritting vehicles
- military vehicles speed sensors
- position sensors for fire fighting and rescue trucks

OTHER MEANS OF TRANSPORT

- set of elevator position sensors
- sensor and electronics for load fastener

TEXTILE INDUSTRY

- electronic contactless needle position sensing
- position sensor with analog output and temperature compensation for textile machines

WASHING MACHINES

- high sensitivity door position sensing for industrial washing machines

MACHINE TOOLS

- speedometer for machine drills

PRODUCTION LINES

- position sensors for galvanization line
- concrete construction elements – hydrofobization line management system

HYDRAULIC AND PNEUMATIC CYLINDERS

- position sensors for high operating temperatures for hydraulic and pneumatic cylinders

CONSTRUCTION BUILDING

- complete position sensing and control of placing subway tunnel into the river

GAS PUMPS

- contactless electronic fuel flow-meter

VENTILATION, TURBINES

- valve position sensor for water turbine
- sensor for shaft reverse rotation indication

MEDICAL AND HEALTHCARE

- position sensors for health-care and nursing beds

RESEARCH AND DEVELOPMENT OFFER_

RESEARCH AND DEVELOPMENT OFFER

As a customer of LEŠIKAR SENSORS you can either: choose a product from the standard range, it's clones (i. e. modification of certain features like encapsulation, connectors, cables etc.) or a product developed according to your specific requirements.

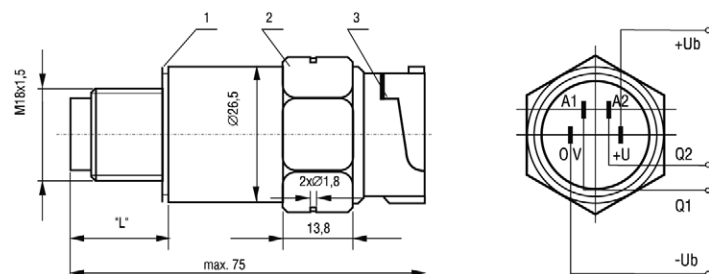
If you decide for the R&D project, our team goes from proof of concept, functional sample, prototype to implementation into the series production. Being quick is our way to help you reduce your time to market. By deliveries on time we try to reduce uncertainty related to the innovation process.

Our offer is based on sensor platforms, knowledge of advanced sensor solutions, experience from "tough" industrial projects and our ability to industrialize new products. You will become our partner in an intensive communication targeted to bring something new and better into life together. The more challenging tasks the better!



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ROTATIONAL SPEED SENSORS_



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SENSOR FOR TACHOGRAPHS M 03_

features:

Sensor accurately senses the movement of ferrous metal target / comes in a built in metal package with 4-pin connector for tachograph / digital current sinking (NPN) output (two inverse signals, open collector) / measurement part L has the available lengths: 19,8 mm (type M031); 25 mm (type M032); 35 mm (type M033); 63,2 mm (type M034); 90 mm (type M035); 115 mm (type M036) / Zn surface finish / surge and vibration (20 g) resistant, chemical resistance (DIN 50 021) / parameters are verified by type test

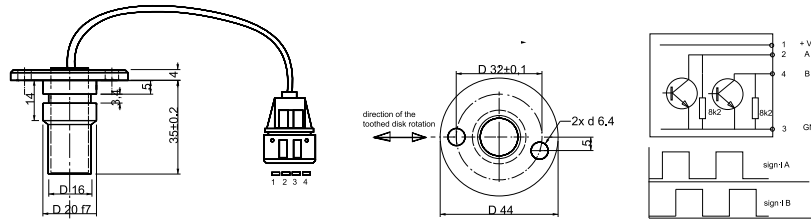
specification:

Air Gap	0,5 – 1,5 mm
Operating Speed	10 – 10 000 Hz
Supply Voltage	4,5 – 30 VDC
Output Voltage	4,5 – 24 VDC
Supply Current	20 mA (max at 30 VDC)
	10 mA (max with Tachograph)
Output Current	10 mA
Temperature Range	-40 to +125°C (front end of sensor 150°C)
Sealing	IP 56K
Tightening Torque max	50 Nm

mounting dimension:

position:

- 1 Washer (Cu)
- 2 Sensor's body with hexagonal section
- 3 Connector



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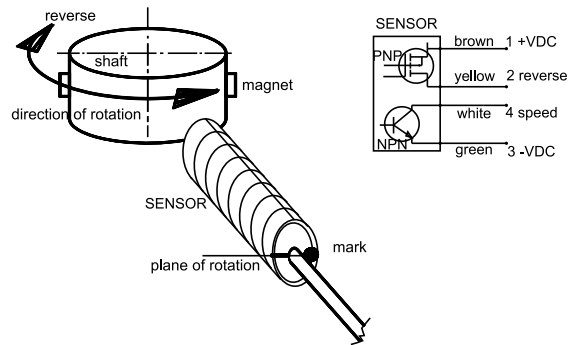
ROTATIONAL (RPM) SENSOR WITH INCREMENTAL OUTPUT M 048 _

features:

Sensor gives exact information about speed and direction of the rotation of the cog-wheel / two phase-shifted NPN output impulses with open collector / sensor is designed for the industrial, agriculture, as well as the automotive industry and other applications / high accuracy, sensitivity, resistance to high temperatures, EMC and ESD / vibrations, moisture and oil resistance.

specification:

Supply Voltage	5 to 30 VDC
Supply Current	up to 30 mA
Output Current	max. 20 mA (each channel)
Leakage Voltage During Switching	max. 0,5 VDC
Entering Pulse Edge	max. 2 μs
Frequency	10 – 20 000 Hz
Working Temperature	-40 to +150°C (limit temperature 170°C)
Output Signals Phase-Shift	90°±20% (depends on the dimensions of the cog-wheel tooth)
Sensitivity	0,1 to 1,6 mm
Cog-wheel Dimension (tooth/space)	min. 2 mm
Sealing	IP68



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REVERSE ROTATION INDICATION AND REVOLUTIONS (RPM) SENSOR M 051 _

features:

Sensor evaluates revolutions and the direction of the shaft (with magnetical marks) rotation / it is necessary to mount the sensor in the orientated position – arrow mark on the sensor regarding the direction of the magnetical mark on the shaft movement / for display of revolutions it is necessary to connect the revolution counter to the output (4) / to switch off the indication of the reverse rotation is possible by switching off and on the input voltage or by moving the magnetical marks in the correct direction / sensor is designed for demanding conditions of operation

specification:

Supply Voltage 12,5 to 30 VDC

Supply Current up to 25 mA

Working Temperature -40 to +85°C

Sensitivity (Working Distance) up to 6 mm (with magnet D7 x d3 x 4)

Sealing IP68

EMC – electrical disturbance by conduction and coupling according to CSN ISO 7637-2 test puls 2, level IV; test puls 3a, level IV; test puls 3b, level IV.

Mechanical resistance against surge and vibration. Moisture and oil resistance.

Connection to the terminal board with 4-wire cable with length at the request.

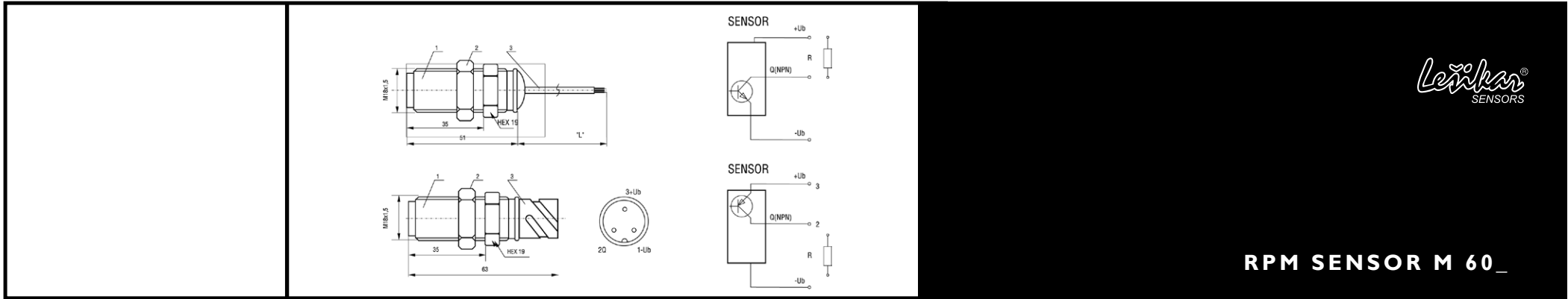
Orientation of the sensor regarding the shaft rotation is marked with arrow on the top of the sensor.

Output During Reverse Rotation (2)

One direction of the shaft movement (marked on the sensor with arrow) is evaluated by the sensor as correct and there is 0 at the output (open). The other direction of rotation is reverse and the transistor output switches SPST positive input voltage on load (PNP with open collector type). Output Current (when reversing) up to 1,5 A.

Output for Revolutions Counter (4):

NPN transistor switch SPST (open collector), 5 to 30 VDC / 100 mA, max. circumference speed 50 m/s, one impulse on the rotation (for 2 marks – magnets – on the rotating shaft). With this transistor SPST switch it is necessary to comply with the polarity of the output load.



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RPM SENSOR M 60_

features:

Sensor accurately senses movement of ferrous metal cog-wheel / orientation to wheel's movement direction is not necessary / built in metal package; nut for exact setting of desired air gap / digital output (NPN or PNP); 3-wire or with connector / Zn surface finish / surge and vibration (20 g) resistant, chemical resistance (DIN 50 021) / typical applications in counters, regulators, tachometers; source of impulses for control systems of ignition and injection etc. / parameters are verified by type test

specification:

Air Gap	0,15 – 1,5 mm
Operating Speed	10 – 10 000 1/min
Supply Voltage	4,5 – 30 VDC
Supply Current	25 mA max
Output Current	20 mA max
Temperature Range	-40 – +120 °C (+150 °C)
Sealing	IP 56K
Tightening Torque max	50 Nm

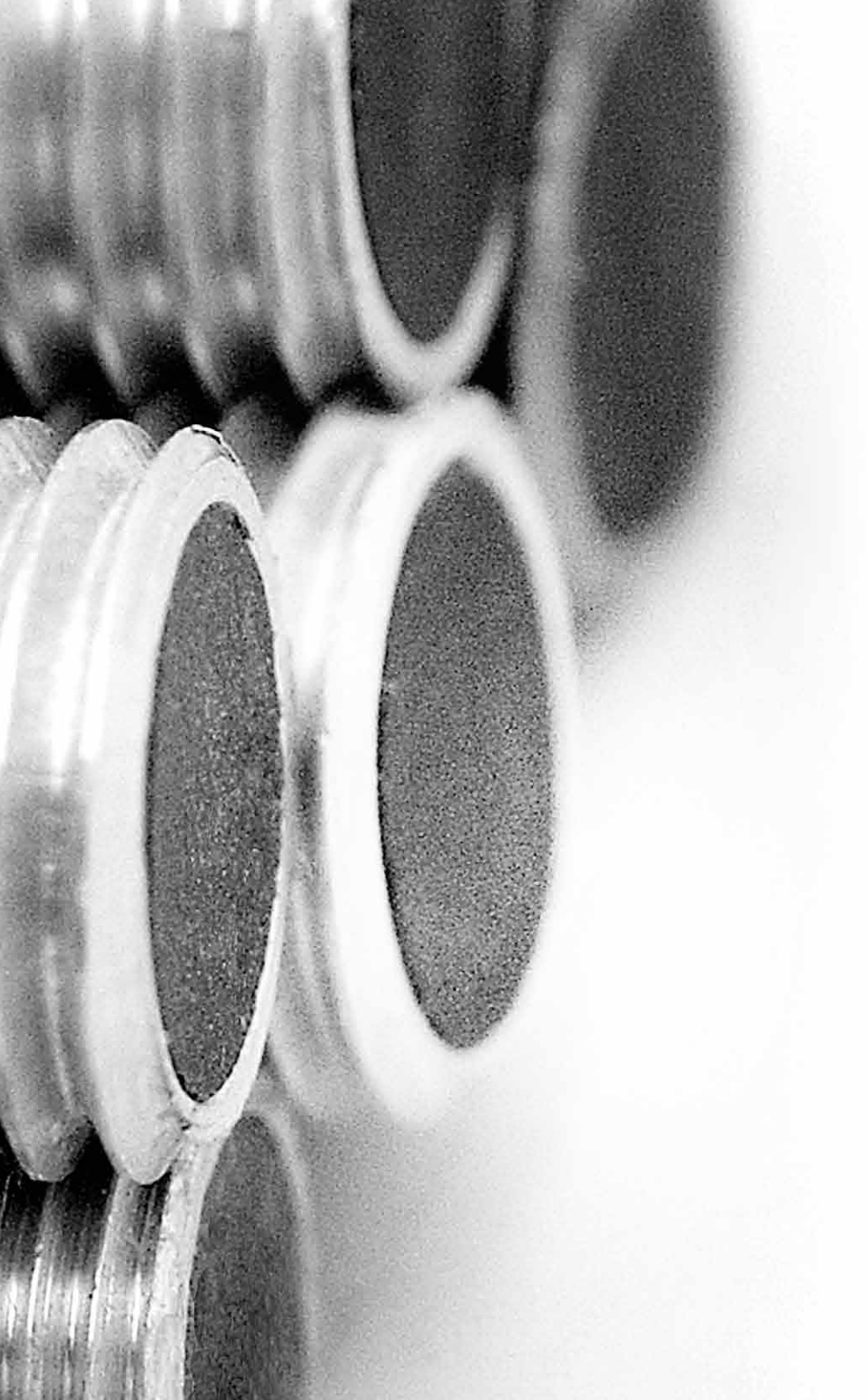
type listing:

Output	NPN	PNP
Connector	M61	M64
Wire	M62	M63

mounting dimension:

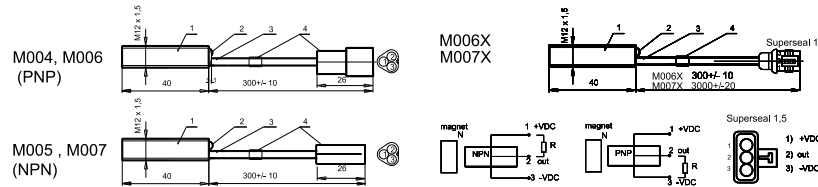
position:

- 1 Sensor's Body
- 2 Nut
- 3 Connector / Wire 3 x 0,35 mm²



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POSITION SENSORS_



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POSITION SENSOR M 004 – M 007_

features:

Sensor is operated by the magnetic field from a permanent magnet / built in aluminium package with 3-pin digital current sinking (NPN) or current sourcing (PNP) output / sensor's activation indicated by built-in LED / protection against pulse interference of supply voltage, against output short circuit and against overheating over 150°C / surge and vibration resistant, moisture and chemical resistance / typical applications are as a position sensor, for example position of doors in buses etc.

specification:

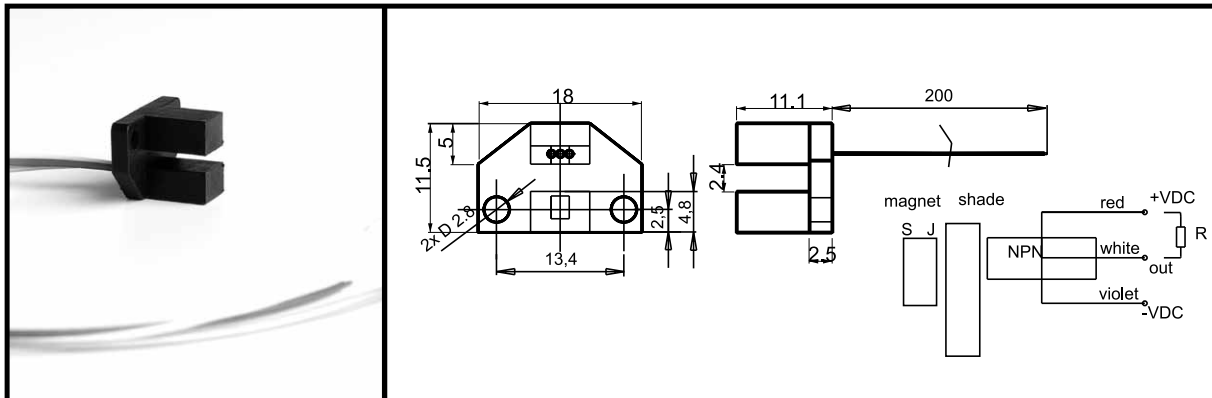
Air Gap	15 mm
Operating Speed	0 – 10 000 Hz
Supply Voltage	10 – 30 VDC
Output Leakage Voltage	0,5 VDC (cable 30 cm long, current 1 A)
Supply Current	20 mA
Output Current	1,4 A (safety fuse 5 A)
Temperature Range	-40 – + 85 °C
Sealing	IP 55 (EN 60 529)

type listing:

Type	Magnet Polarity	OutputSupply	Voltage [VDC]	Color Code	Output Voltage if Activated
M004	North	PNP / NC	10 - 30	Yellow	0 VDC
M005	North	NPN / NC	10 - 30	Red	0 VDC
M006	North	PNP / NO	10 - 30	Green	+ VDC
M007	North	NPN / NO	10 - 30	Red	+ VDC

mounting dimension:

position: 1 Al housing 4 Cable
2 LED 5 Connector
3 Codes



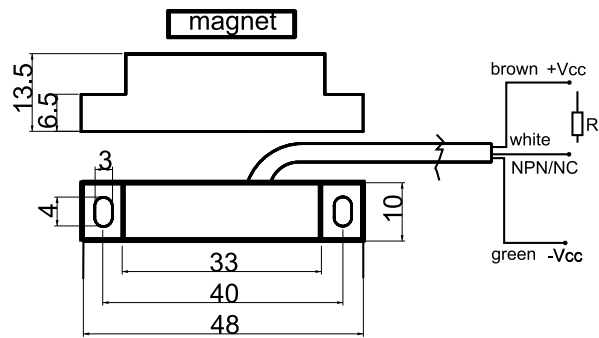
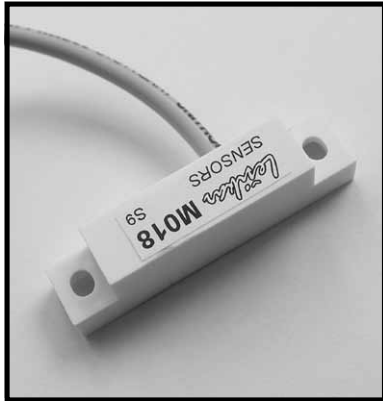
VANE POSITION SWITCH M 010_

features:

Evaluates effects of passing a vane through the gap between sensor and magnet / built in plastic package / digital current sinking (NPN) output (open collector) / no reliability and accuracy limitations by number of switches or switching frequency / typical applications replace micro-switches, limit switches etc.

specification:

Operating Speed	50 000 Hz max
Hysteresis	$2 \pm 0,5$ mm
Supply Voltage	4,5 – 30 VDC
Output Voltage	4,5 – 30 VDC
Supply Current	10 mA
Output Current	20 mA (max 50 mA)
Output Leakage Current max	10 μ A
Temperature Range	-40 to +85°C



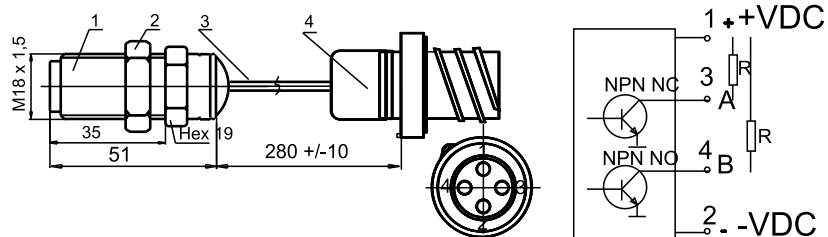
POSITION SENSOR M 018 _

features:

Sensor reacts to the presence of both poles of the permanent magnet with switching off the NPN output / typical application for position sensing, replacement of micro-switches, switches etc. / built in plastic package with three wire cable / climate as well as mechanical resistance / protection against inductive load

specification:

Sensitivity	5 – 10 mm (depending on the used magnet)
Frequency	0 – 10 000 Hz max.
Supply Voltage	10,8 – 30 VDC
Output Leakage Voltage	max. 0,5 VDC with 100 mA
Supply Current	20 mA
Output Current	100 mA NPN/NC
Temperature Range	-40 – +80°C
Sealing	IP 68



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POSITION SENSOR M 019_

features:

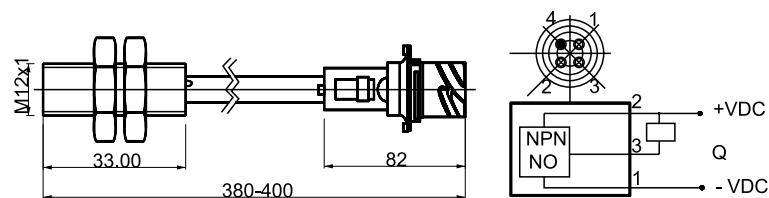
Contactless magnetic sensor reacts to the magnet which is set in the soft iron holder / two independent outputs (one open, second closed) change their state when the south pole of the magnet comes near / both outputs are independent on each other / the sensor is designed for gearboxes / metal package of the sensor with dimensions M 18 x 1,5 x 50 mm / four wired cable has DIN 72 585T I connector / resistance against vibrations, gearbox oil, water, abrasion and noise voltage / protection against reverse polarity and short-circuit

specification:

Sensitivity	4,5 ⁺² mm (for magnet D 10 x 4 mm)
Hysteresis	2 ⁺¹ mm
Supply Voltage	24 VDC
Voltage Range	21,6 – 30 VDC
Supply Current	up to 30 mA
Output A	NPN/NC
Output B	NPN/NO
Output Current	up to 1,4 A (each output)
Character of the Load	Inductive
Tightening Torque max	25 Nm
Temperature Range	-40 °C – +120 °C
Sealing	IP68

mounting dimension:

position: 1 Package 3 Cable
2 Nut 4 Connector



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POSITION SENSOR M 039_

features:

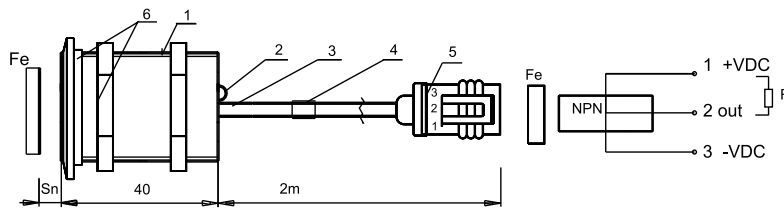
Sensor senses the position of the ferromagnetic mark / output NPN switches off when mark moves away from the sensor / placed in case with thread M12x1 and length 33 mm / 3 wires cable protected with outside tube and with DIN 72 585 connector

specification:

Supply Voltage	10 - 30 VDC
Supply Current	up to 20 mA
Output Current	up to 150 mA
Working Temperature	-30 to +70°C
Sensitivity (distance from the sensor)	0 – 3 mm
Hysteresis	up to 30%
Sealing	IP 68
Frequency	5 kHz
Resistance against	surge and vibration; water and oil products

mounting:

Fastening nut has to be placed min. 5 mm from the head of the sensor.



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POSITION SWITCH M 042_

features:

Sensor indicates presence of ferromagnetic material (Fe) by switching output on / sensitivity preset by a program / NPN open collector output / easy signal processing of digital output / robust plastic housing with M30x1,5x40 mm thread / 2 m cable, Superseal 1,5 female 3 pole connector / 2 plastic nuts and 1 aluminium spacing ring / reverse polarity protection / surge, vibration, pressure, oil and water resistance

specification:

Sensitivity	8 mm
Supply Voltage	10 – 30 VDC
Supply Current	15 mA
Output Current	max. 1,4 A
Operating temperatures	-30 to +70 °C
Sealing	IP 68
Tightening Torque	50 Nm max.

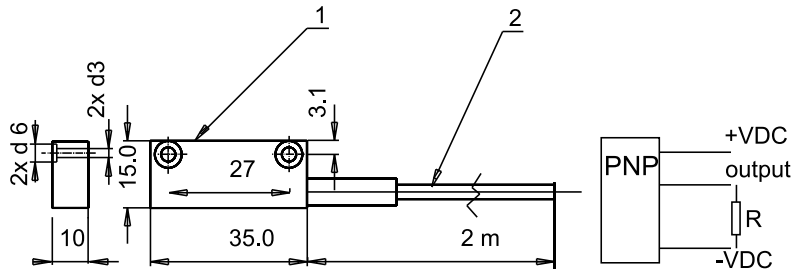
mounting dimension:

position:

1 Sensor's Body
2 LED

3 Cable
4 Codes

5 Connector
6 Plastic / Aluminium Nuts



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POSITION SENSOR M 473_

features:

Sensor with increased sensitivity designed for air and hydraulic cylinders with built-in magnet / sensor switches when magnet gets to the predefined place / when using strong magnets, the minimum distance between magnet and sensor must be kept so as to avoid double switching of the sensor / working temperature up to 150°C / evaluates the change of the magnetic flux (during the movement of the magnet on the hydraulic piston) / built in the metal package / 3-wire connection, digital PNP output / input voltage reverse polarity protection and snap short-circuit protection / surge, vibration and oil resistance / typical application as a position sensor for wide working temperature range

specification:

Air Gap	min. 5 to 15 mm (depends on the magnet)
Operating Speed	0 to 10 000 Hz
Supply Voltage	10 to 30 VDC
Supply Current	20 mA
Output Current	up to 100 mA
Temperature Range	-40 to +150°C
Sealing	IP 68

mounting dimension:

position:

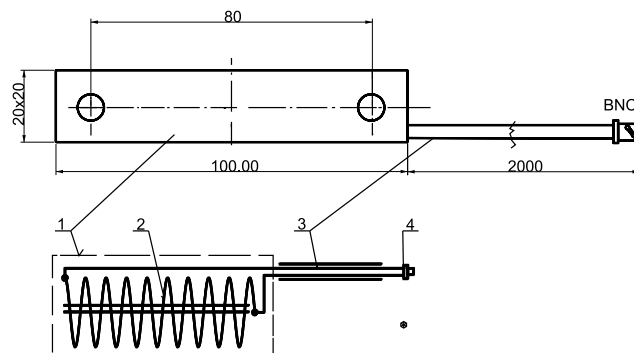
1 Sensor's Body

2 Cable



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INDUCTIVE SENSORS_



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SENSORS

INDUCTIVE SENSOR M 017_

features:

Accurately senses movement of permanent magnet / built in stainless steel package 20 x 20 x 80 mm / 2-wire screened cable output / surge and vibration resistant, weather-proof, chemical resistance / typical application: rotational sensor in turbochargers

specification:

Coil Resistance	350 – 450 Ω
Coil Inductance	1,6 – 1,8 H
Temperature Range	-40 to +150°C
Sensitivity	depends on the used magnet
Sealing	IP 68

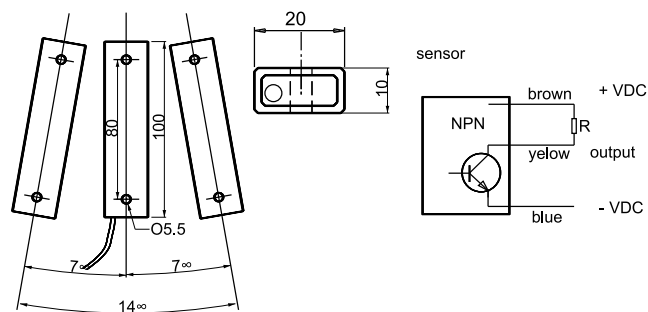
mounting dimension:

Stainless steel package 20 x 20 x 80 mm
Wire teflon or silicon insulation

A black and white photograph of a rectangular metal angle sensor. The sensor has a brushed metal finish and a small circular hole on its top surface. A black cable is connected to the sensor and extends into the background. The sensor is resting on a light-colored surface.

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ANGLE SENSORS_



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INCLINATION SENSOR M 027_

features:

Sensor permanently switches on the buzzer / when 7° from the vertical position is overreached the NPN circuit switches off the buzzer / the value of the angle can be programmed from the outside / placed in stainless steel package 20 x 10 x 100 mm with two 5,5 mm diameter holes for mounting and three wire cable / vibrations, moisture and oil resistance

specification:

Sensed angle from the vertical position > 7°

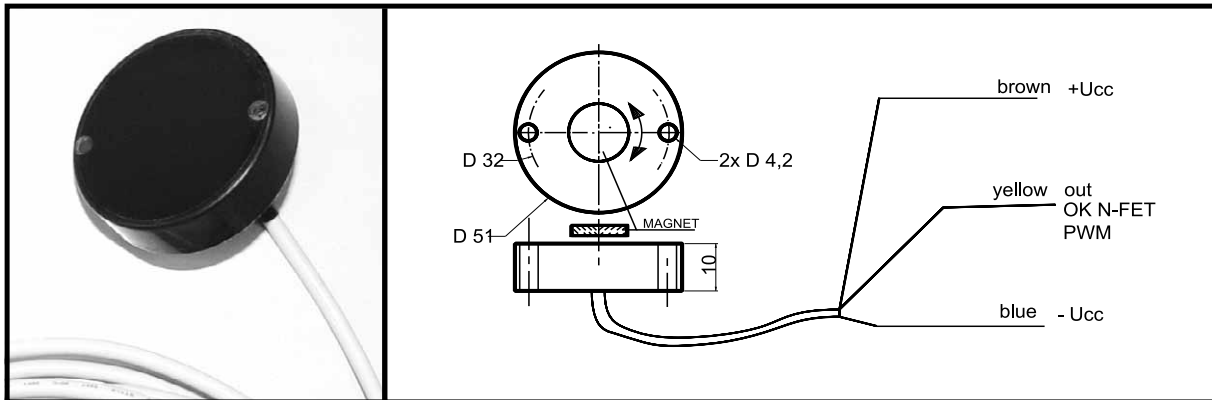
Supply Voltage 10 – 30 VDC

Output Current up to 1,4 A

Accuracy ± 2°

Temperature Range -20 – +85 °C

Sealing IP 68



ANGLE SENSOR M 028_

features:

Sensor reacts to the rotation of the cross magnetised magnet which is placed in the axis of the sensor and in the axis of the rotation of the sensed element / it's advantage is big sensitivity – up to 10 mm between sensor and magnet / the axis of the rotating element can swing out for several mm without effect on the function of the sensor / sensed value is absolute / moisture and oil products resistance / reverse polarity and overvoltage protection / not protected against current overload

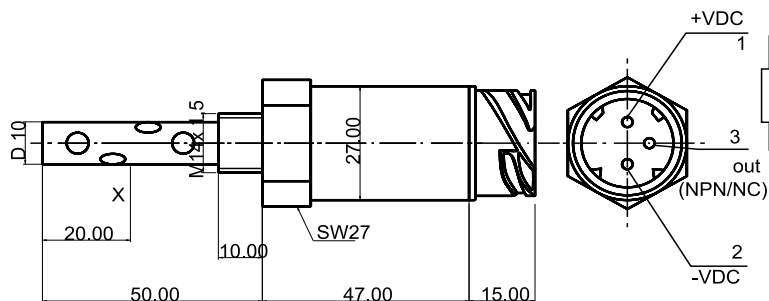
specification:

Sensitivity	0 to 10 mm (depending on the intensity of the magnetical field of the magnet)
Supply Voltage	10 – 30 VDC
Supply Current	up to 15 mA
Output Current	up to 100 mA
PWM Output	frequency 150 Hz, PWM, open collector NPN
Voltage Output	0,2 – 4,75 VDC
Rotation Angle (anticlockwise)	0 to 180°
Temperature Range	-40 – + 85°C (125°C)
Sealing	IP 68



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LEVEL SENSORS_



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OIL LEVEL SENSOR H 040_

features:

Capacity oil level switch is designed for motor vehicles but can be used in other applications / M14x1,5 mm mounting-thread; zinc coated ferrous case; 3-pin bayonet connector DIN 72585; tightening torque 25 Nm; weight 120 g / minimum-operating current (oc); low side switch / function delay 2 sec., response delay 7 sec. / IP 68

specification:

Operating Voltage	12/24 VDC (10/30 VDC)
Current Consumption	up to 20 mA
Voltage Drop	<0,5 V / 1 A
Signal Output Switching Current	1,4 A
Working Temperature	-30 to +125°C
Switch Point Vertically Mounted	20 mm +/- 6 mm
Switch Point Horizontally Mounted	2,5 mm +/- 1 mm
Switch Point Hysteresis	typ. < 3 mm
Response Delay	7 sec.
Function Delay	2 sec.



SALES AGENT'S CONTACT DETAILS

A dashed rectangular box intended for the sales agent's contact details.