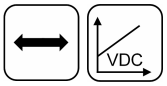
novotechnik
Siedle Group

Project item
Please contact your local distributor

NOVOHALL
Short Stroke
Transducer
5 up to 50 mm
Touchless

TFD-4000
Ratiometric



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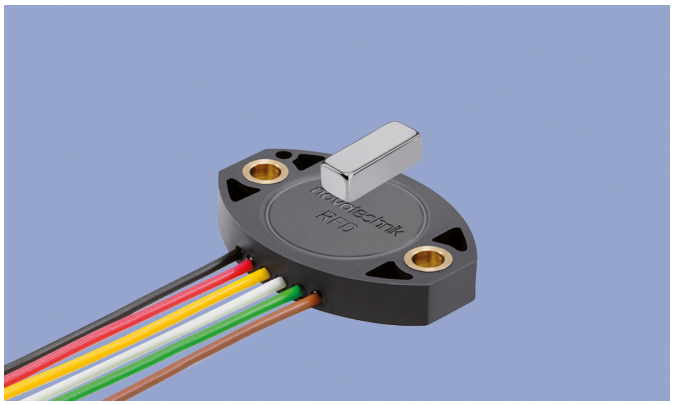


Special Features
- Touchless hall technology
- 2 part design, mechanically decoupled
- High protection class, IP67, IP68, IP69
- Resolution up to 12 bit
- Wear-free
- Temperature range -40 °C up to +125 °C
- One and multi-channel versions
- Optimized for mechanical engineering and mobile applications
- Competitive price / performance ratio
- Extremely flat design
- Customized versions available on request

Applications
- Manufacturing Engineering (textile machinery, packaging machinery, sheet metal and wire machinery)
- Medical Engineering
- Mobile working machines (industrial trucks, construction machinery, agricultural and forestry machinery)
- Marine applications

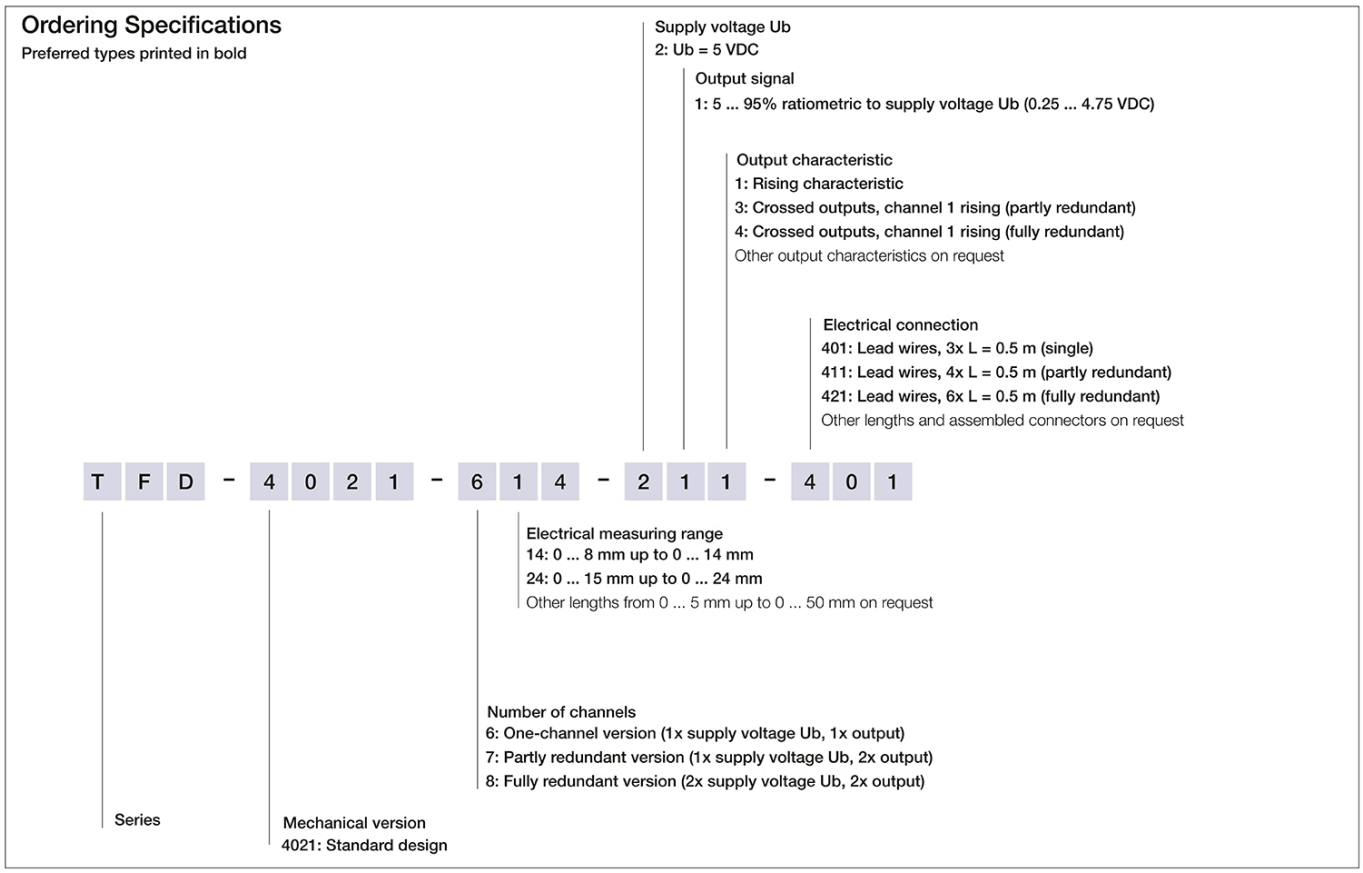
The sensor utilizes a contactless magnetic technology to determine the measured position. A separate magnet or magnetic position marker is attached to the moving element to be measured. The orientation of the magnetic field is measured and an analog voltage representing the stroke is the output signal. The touchless position sensor TFD-4000 is ideally suited for positioning in measuring ranges from 0… 5 to 0… 50 mm.
The very compact physical dimensions allow installation in small spaces. The housing is made of high grade temperature-resistant plastic material. The sensor is sealed and is not sensitive to dust, dirt or moisture.
The 2 part design, with the TFD sensor itself and its magnetic position marker, offers great flexibility when mounting.

The accuracy of linear magnetic sensors is strongly influenced by the installation space. Our many years of experience in development, production and application of magnetic sensors as well as our state-of-the-art simulation tools allow us to provide you with optimal designs to suit your applications.

Description	
Material	Housing: high grade, temperature resistant plastic PBT GF with brass inserts
Mounting	With 2 pan head screws M4x14 (included in delivery)
Fastening torque of mounting	250 ± 50 Ncm
Electrical connection	Lead wires 0.5 mm² (AWG 20), PVC

Mechanical Data	
Dimensions	See dimension drawing
Weight (w/o connection)	approx. 10 g

Ordering Specifications

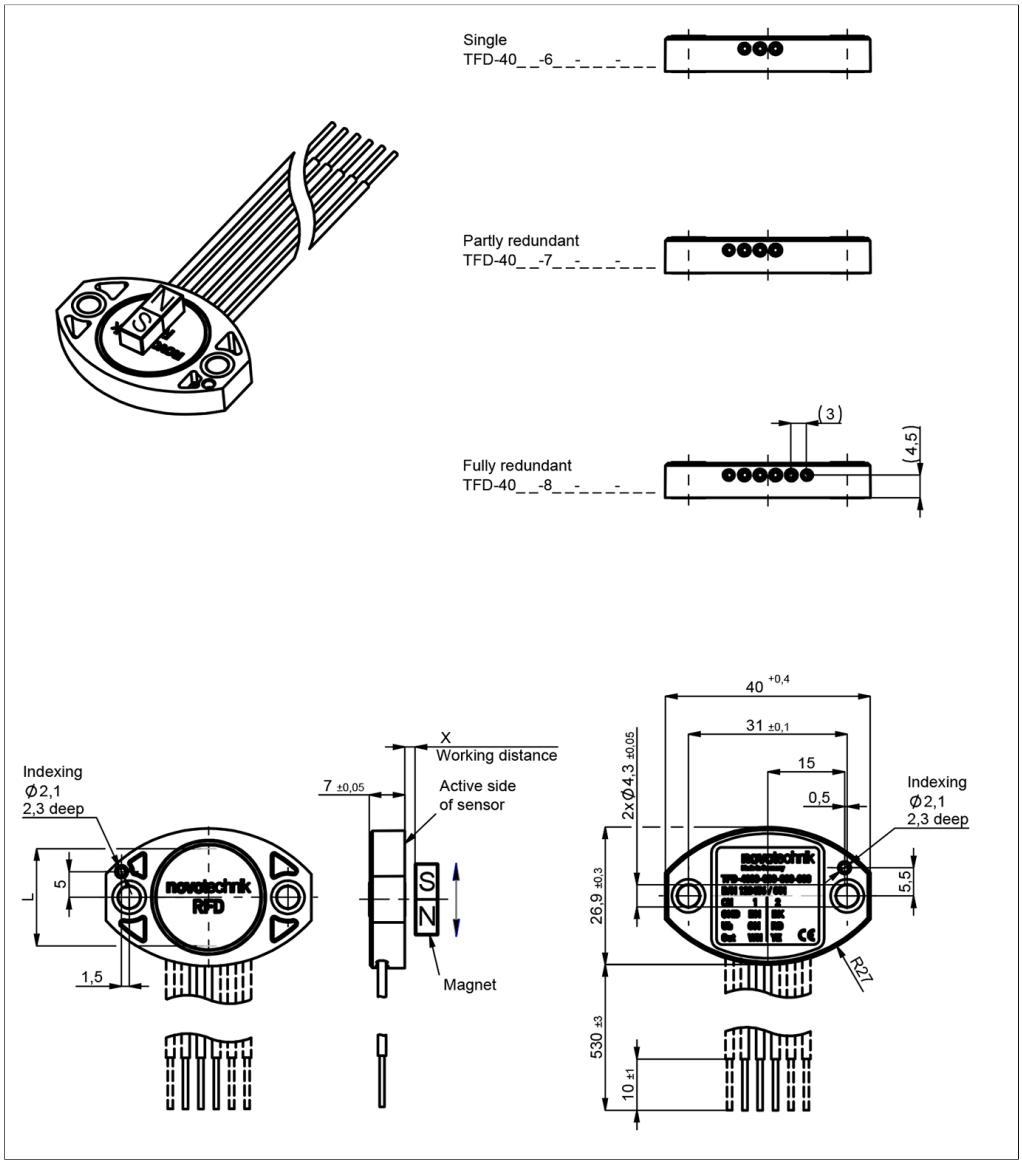


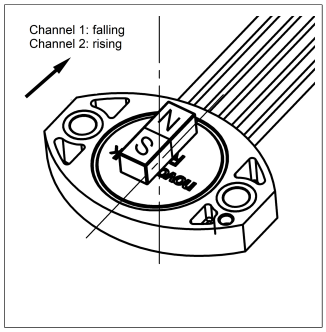
Accessories included in delivery

- 2x Pan head screws M4x14

Drawing

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





If the magnet is located centrally to the sensor, the sensor is near the electrical center position.
Direction of output characteristic with north pole alignment (color marking) or marking according to sketch:
Signal channel 1 falling,
signal channel 2 rising
when moving in direction of the electrical connection.

Technical Data

Type	**TFD-4021-_14-2_ _-_ _ _** **Max. Measuring Range 14 mm**	**TFD-4021-_24-2_ _-_ _ _** **Max. Measuring Range 24 mm**
Output signal	ratiometric to supply voltage Ub 5 ... 95% (0.25 ... 4.75 V) in electrical measuring range (dim. L)	
Load	≥ 10 kΩ	
Number of channels	1 / 2	
Update rate	typ. 2.5 kHz	
Electrical measuring range (dim. L)	0 ... 8 mm up to 0 ... 14 mm	0 ... 15 mm up to 0 ... 24 mm
Resolution	12 bits	
Repeatability	≤ ±0.1 %FS	
Hysteresis	≤ ±0.1 %FS	
Temperature error	±0.5 %FS	
Supply voltage Ub	5 VDC (4.5 ... 5.5 VDC)	
Current consumption w/o load	typ. 15 mA (typ. 8 mA on request)	
Polarity protection	yes (supply lines)	
Short circuit protection	yes (all outputs vs. GND and supply voltage)	
Insulation resistance (500 VDC)	≥ 10 MΩ	
Environmental Data		
Max. operational speed	Mechanically unlimited	
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	IP67 / IP68 / IP69	
Operating temperature	-40 ... +125°C	
Life	Mechanically unlimited	
Functional safety	The sensor is not suitable for use in safety-related applications.	
MTTF (IEC 60050)	9926 years (one-channel), 4441 years (partly redundant, per channel) or 4512 years (fully redundant, per channel)	
EMC Compatibility		
ISO 10605 ESD (Handling/Component)	8 kV / 15 kV	
ISO 11452-2 Radiated HF-fields	200 V/m	
ISO 11452-5 Radiated HF-Fields, stripline	200 V/m	
CISPR 25 Radiated emission	Level 5	
EN 61000-4-4 Fast transients (burst)	1 kV	
EN 61000-4-6 Cond. disturbances (HF fields)	10 V eff.	
EN 61000-4-8 Magnetic fields	30 A/m	

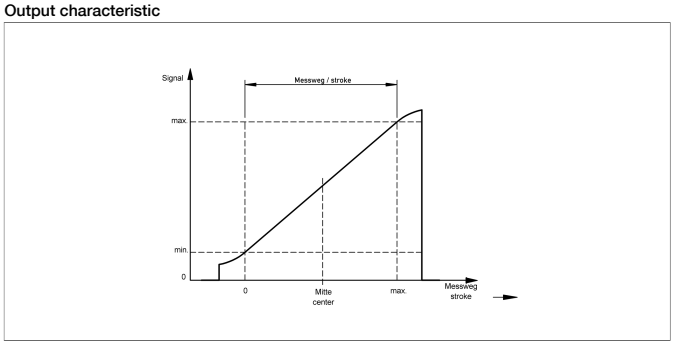
FS = Full scale: Signal span according to electrical measuring range
Available on request: SPI or PWM interface

Connection Assignment

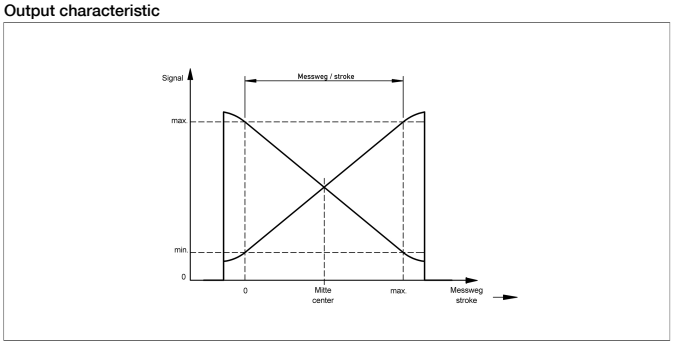
Signal	Lead wires code 40_	Lead wires code 41_	Lead wires code 42_
	One-channel	Partly redundant	Fully redundant
Supply voltage Ub	GN	GN	GN
GND	BN	BN	BN
Signal output	WH	WH	WH
Signal output 2	-	YE	YE
Supply voltage Ub 2	-	-	RD
GND 2	-	-	BK

Technical Data
Output
Characteristics

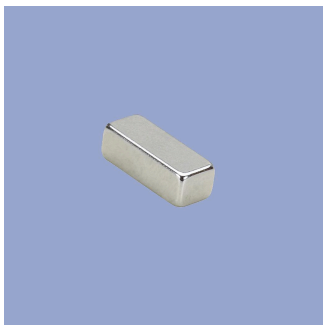
Output characteristic

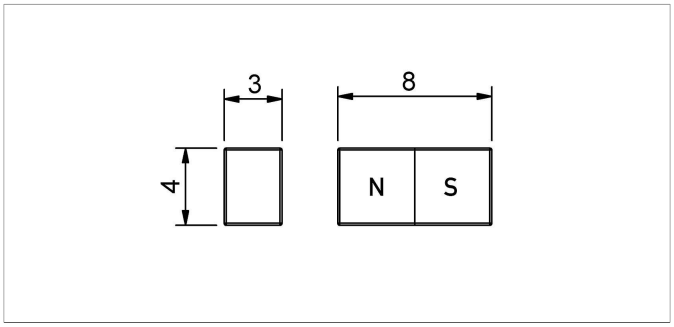


Output characteristic



Position Markers

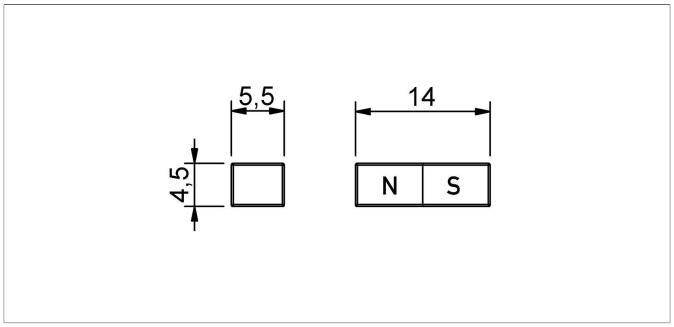




Z-TFC-P03
Magnet for direct application onto customer's shaft (see user manual).
We recommend mounting on non-magnetizable materials, otherwise the specified working distances will vary (e.g. reduction of approx. 20% with axial mounting on a magnetizable shaft).

Measuring range	0 ... 8 mm up to 0 ... 14 mm
Working distance	One-channel 0.7 ± 0.5 mm, redundant 0.3 +0.5/-0.3 mm
Lateral offset	±1 mm
Operating temp.	-40 ... +125°C

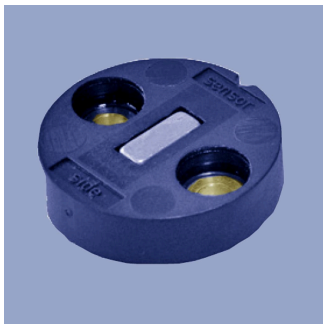
P/N	Pack. unit [pcs]
400104225	1
400109728	50

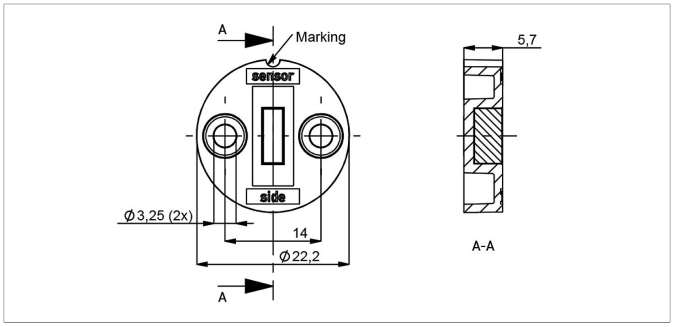


Z-TFC-P04
Magnet for direct application onto customer's shaft (see user manual).
We recommend mounting on non-magnetizable materials, otherwise the specified working distances will vary (e.g. reduction of approx. 20% with axial mounting on a magnetizable shaft).

Measuring range	0 ... 15 mm up to 0 ... 24 mm
Working distance	One-channel 2.5 ± 0.9 mm, redundant 2 ± 0.9 mm
Lateral offset	±1 mm
Operating temp.	-40 ... +125°C

P/N	Pack. unit [pcs]
400104226	1
400109729	50

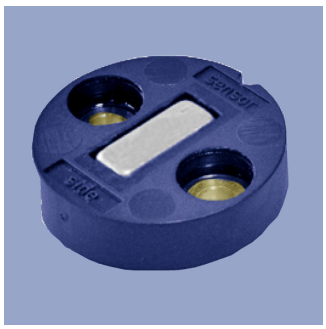


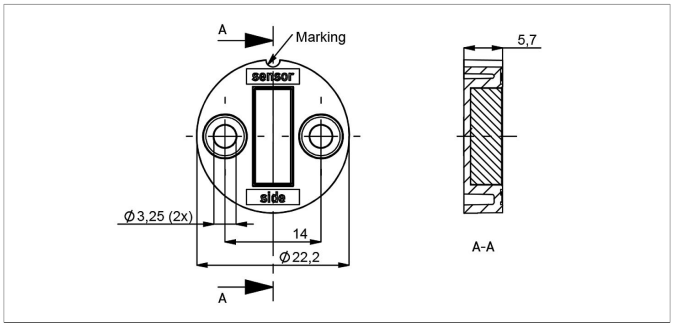


Z-TFC-P30
Position marker for frontal fixation with 2 cylinder screws M3x8 (included in delivery).

Measuring range	0 ... 8 mm up to 0 ... 14 mm
Working distance	One-channel 0.7 ± 0.5 mm, redundant 0.3 +0.5/-0.3 mm
Lateral offset	±1 mm
Material	PBT-GF
Operating temp.	-40 ... +125°C

P/N	Pack. unit [pcs]
400106758	1
400106757	25



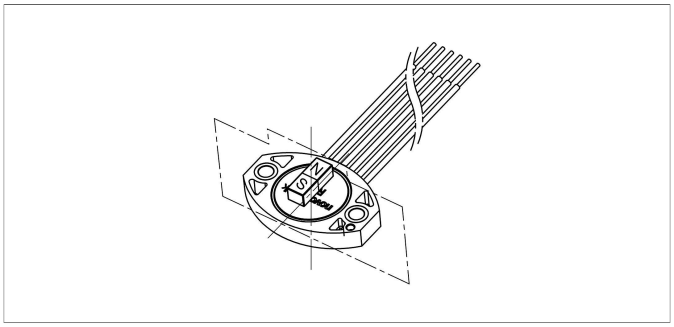


Z-TFC-P31
Position marker for frontal fixation with 2 cylinder screws M3x8 (included in delivery).

Measuring range	0 ... 15 mm up to 0 ... 24 mm
Working distance	One-channel 2.5 ± 0.9 mm, redundant 2 ± 0.9 mm
Lateral offset	±1 mm
Material	PBT-GF
Operating temp.	-40 ... +125°C

P/N	Pack. unit [pcs]
400106760	1
400106759	25

Position Markers



Installation Instruction

The accuracy of linear magnetic sensors is strongly influenced by the installation space. Using the latest simulation tools, we are able to design the measurement system optimally for yourapplication. In order to select the best suitable magnet for your requirements please contact us. Between magnet / sensor unit and surrounding magnetic or magnetizable materials a minimum distance of 12 mm must be ensured. If this is not possible, the accuracy of the system will be affected and the data have to be verified.

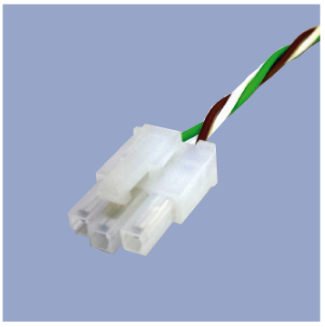
Connecting Options on request

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

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



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

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

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The specifications contained in our datasheets are intended solely for informational purposes. The documented specification values are based on ideal operational and environmental conditions and can vary significantly depending on the actual customer application. Using our products at or close to one or more of the specified performance ranges can lead to limitations regarding other performance parameters. It is therefore necessary that the end user verifies relevant performance parameters in the intended application. We reserve the right to change product specifications without notice.