

**NOVOHALL
Transducer
5 up to 50 mm
touchless**

Series TFD-4000



Special features

- Hall technology
- 2-part, mechanically decoupled
- High protection class, IP67, IP68, IP69
- Resolution up to 12 bit
- Wear-free
- Temperature range -40 °C up to +125 °C
- Single and redundant versions
- Optimized for mechanical engineering and mobile applications
- Favourable price / performance ratio
- Extremely flat design
- Customized versions

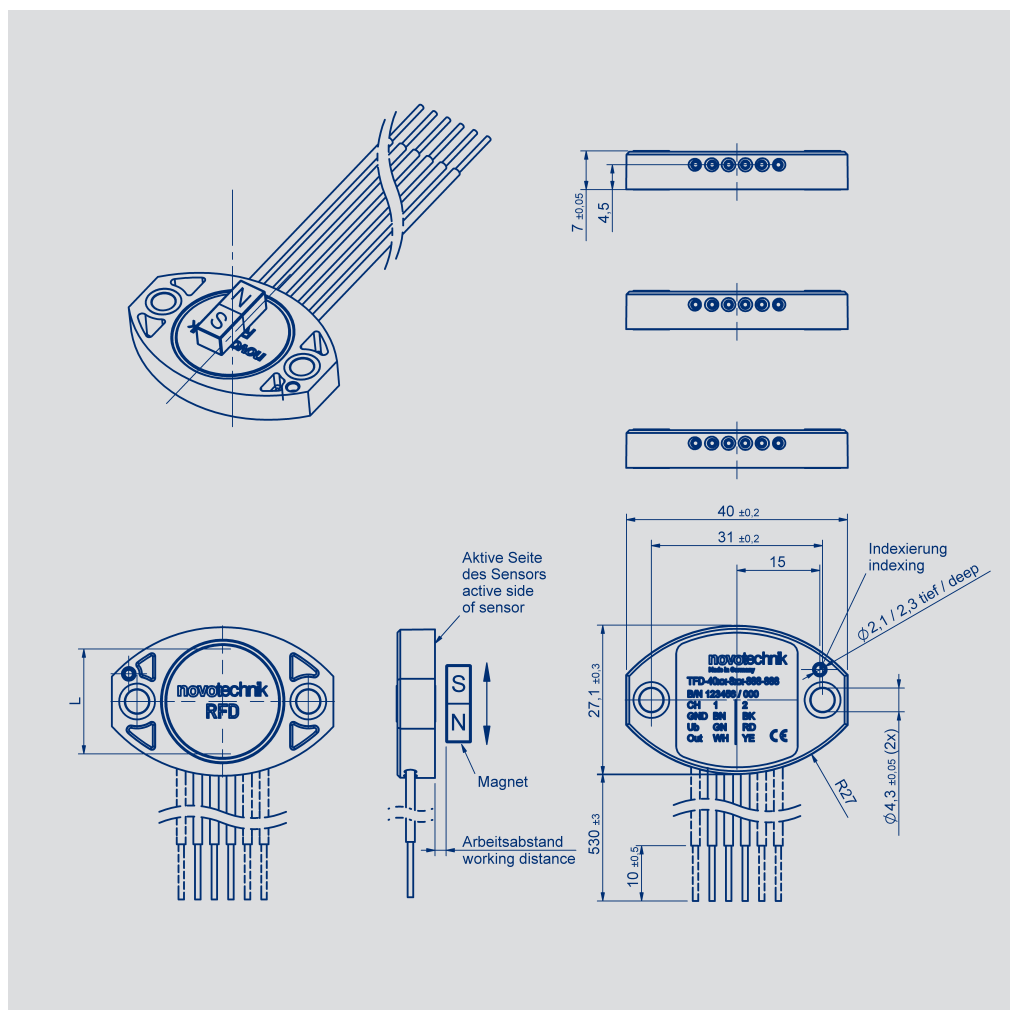
Applications

- Mechanical engineering
 - Textile machinery
 - Packaging machinery
 - Sheet metal and wire working machinery
- Medical applications
- Mobile machinery
 - Industrial trucks
 - Construction machinery
 - Agricultural and forestry machinery
 - Railway technology
- Navy applications

Contents

Dimension drawing	3
Mechanical data	4
Output characteristics	5
Analog versions	
Technical data	6
Ordering specifications	7
Accessories	
Position markers	8
Signal processing	9
Customized versions	
Connecting options	10

Dimension Drawing



Magnet alignment

The north pole of the magnet (color marking) must show in direction of the electrical connection.

If the magnet is located centrally to the sensor, the sensor is near the electrical center position.

Characteristic directions

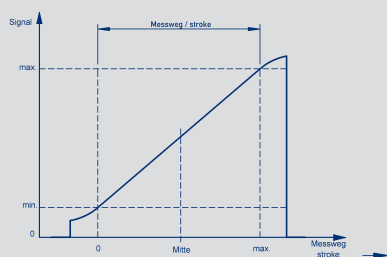
Signal channel 1 rising, signal channel 2 falling when moving away from electrical connection.

Mechanical Data

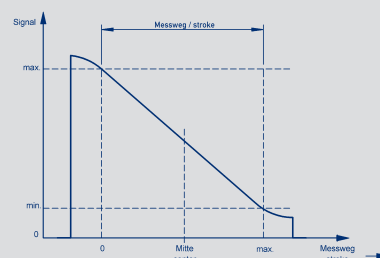
Description		
Housing	High grade, temperature resistant plastic, Thermoplast with brass inserts	
Electrical connections	Lead wires, 0.5 mm ² (AWG 20), PVC insulated	
Mechanical Data		
Dimensions	See dimension drawing	
Mounting	2 round-head screws with hexagon socket M4x14 (included in delivery)	
Fastening torque of mounting screws	200 ... 300	Ncm
Maximum operational speed	Mechanically unlimited	
Weight (w/o connection)	approx. 10	g
Vibration (IEC 60068-2-6)	5 ... 2000	Hz
	Amax = 0.75	mm
	amax = 20	g
Shock (IEC 60068-2-27)	50 (6 ms)	g
Life	Mechanically unlimited	
Protection class (DIN EN 60529 / DIN 40050)	IP67 / IP68 / IP69	
Operating temperature	-40 ... +125	°C

Output Characteristics

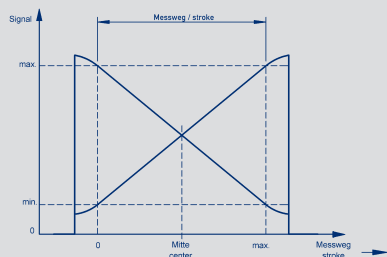
One channel, rising



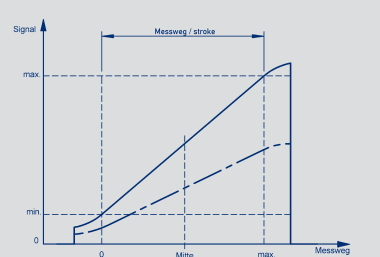
On request: one channel, falling



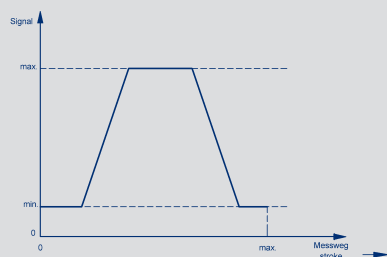
Crossed characteristics, channel 1 rising



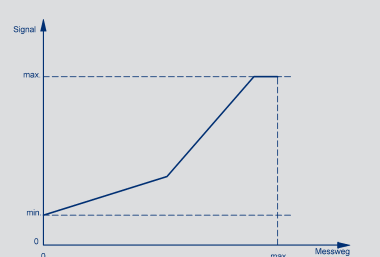
On request: two channels, signal 2 = 0.5 x signal 1



On request: Trapeze characteristic



On request: different gradients



On request: Parable characteristic



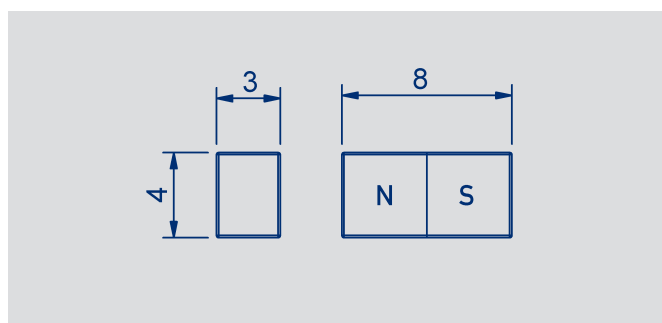
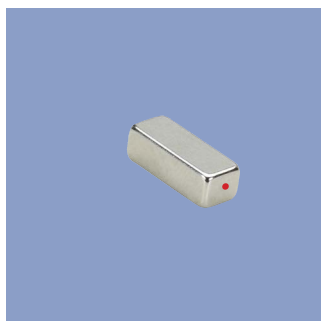
Technical Data

Technical Data			
Type designations	TFD-4021- _ _ _ - 2 _ _ - _ _ _ ratiometric		
Electrical Data			
Supply voltage Ub	5 (4.5 ... 5.5)		VDC
Current consumption (w/o load)	typical 15 (typical 8 on request) per channel		mA
Reverse voltage	yes, supply lines		
Short circuit protection	yes, all outputs vs. GND and supply voltage		
Measuring range (dimension L)	standard 14 and 24, other lengths from 5 up to 50 mm on request		mm
Number of channels	1 / 2		
Update rate	typical 2.5		kHz
Resolution	12		bit
Repeatability	≤ 0.1		±% FS
Hysteresis	≤ 0.1		±% FS
Output signal	ratiometric to supply voltage 5 ... 95 % (0.25 ... 4.75 V at 5 V) (load ≥10 kΩ)		
Temperature error	≤ 0.5		±% FS
Insulation resistance (500 VDC)	≥ 10		MΩ
Environmental Data			
MTTF (DIN EN ISO 13849-1 parts count method, w/o load, wc)	675 (single channel) 512 (per channel) partly redundant 516 (per channel) fully redundant		years years years
Functional Safety	If you need assistance in using our products in safety-related systems, please contact us		
EMC compatibility	ISO 11452-2 Radiated EM HF-Fields, Absorber Hall: 100 V/m ISO 11452-5 Radiated EM HF-Felds, Stripline 200 V/m ISO TR10605 Packaging und Handling + Component Test: 8 kV, 15 kV CISPR 25 Radiated Emission (conducted / field) class 5 EN 61000-4-4 fast transients (burst) EN 61000-4-6 conducted disturbances, induced by RF fields EN 61000-4-8 power frequency magnetic fields		
			
Connection assignment			
Colour	single channel code 6 _ _	partly redundant code 7 _ _	fully redundant code 8 _ _
GN	Supply voltage Ub	Supply voltage Ub	Supply voltage Ub 1
BN	GND	GND	GND 1
WH	Signal output	Signal output 1	Signal output 1
RD	–	-	Supply voltage Ub 2
BK	–	-	GND 2
YE	–	Signal output 2	Signal output 2

Ordering
Specifications
Analog Versions

Ordering specifications			Supply voltage Ub		
Preferred types printed in bold			2: 5 V (4.5 ... 5.5 V)		
			Output signal		
			1: 0.25 ... 4.75 V ratiometric to supply voltage		
			Other signal levels on request		
			Output characteristic		
			1: Rising		
			3: Crossed output channel 1 rising (partly redundant)		
			4: Crossed output channel 1 rising (fully redundant)		
			Other characteristics on request		
			Electrical connections		
			401: Lead wires 3 x L = 0.5 m, single		
			411: Lead wires 4 x L = 0.5 m, partly redundant		
			421: Lead wires 6 x L = 0.5 m, fully redundant		
			Other lengths and assembled connectors on request		
T	F	D	-	4	0
				2	1
			-	6	2
				4	-
				2	1
				1	-
				4	0
				1	1
			Electrical measuring range		
			14: 14 mm		
			24: 24 mm		
			Other lengths from 5 up to 50 mm on request		
			Number of channels		
			6: single channel 1 x Ub / 1 x output		
			7: partly redundant 1 x Ub / 2 x output		
			8: fully redundant 2 x Ub / 2 x output		
Series			Mechanical specification		
			4021: Standard		

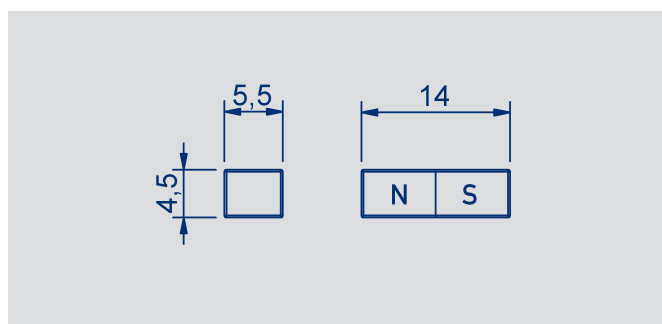
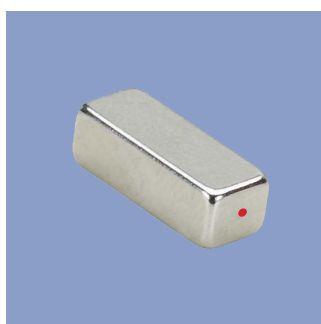
Position markers



Z-TFC-P03

Magnet for direct application

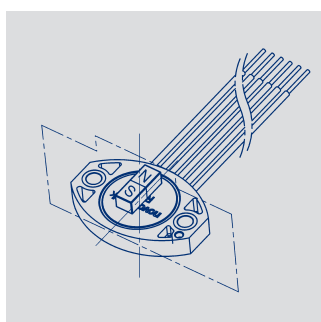
- for measuring range 8 ... 14 mm
- working distance
 - single 0.7 ± 0.5 mm
 - redundant $0.3 + 0.5$ mm / -0.3 mm
- max. permitted offset parallel to the sensing direction ± 1 mm
- P/N 104225



Z-TFC-P04

Magnet for direct application

- for measuring range 15 ... 24 mm
- working distance
 - single 2.5 ± 0.9 mm
 - redundant 2.0 ± 0.9 mm
- max. permitted offset parallel to the sensing direction ± 1 mm
- P/N 104226



Important instructions for magnet installation

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 your application. 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.