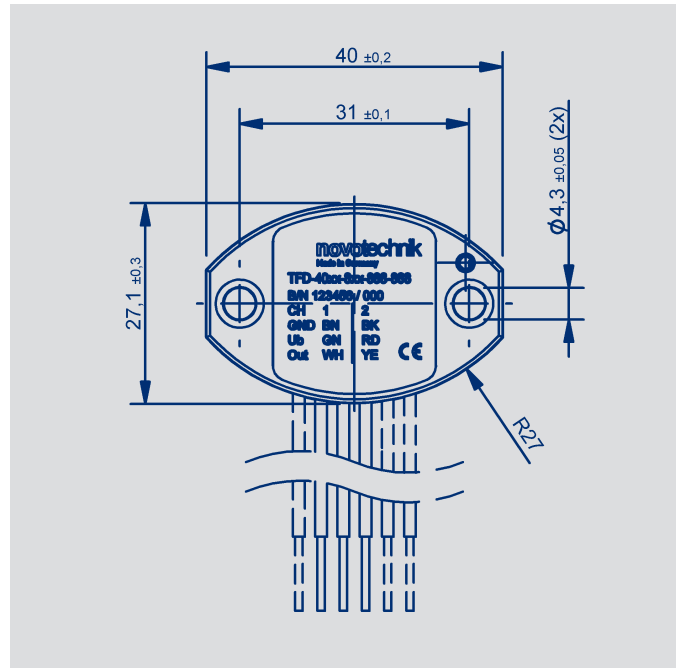
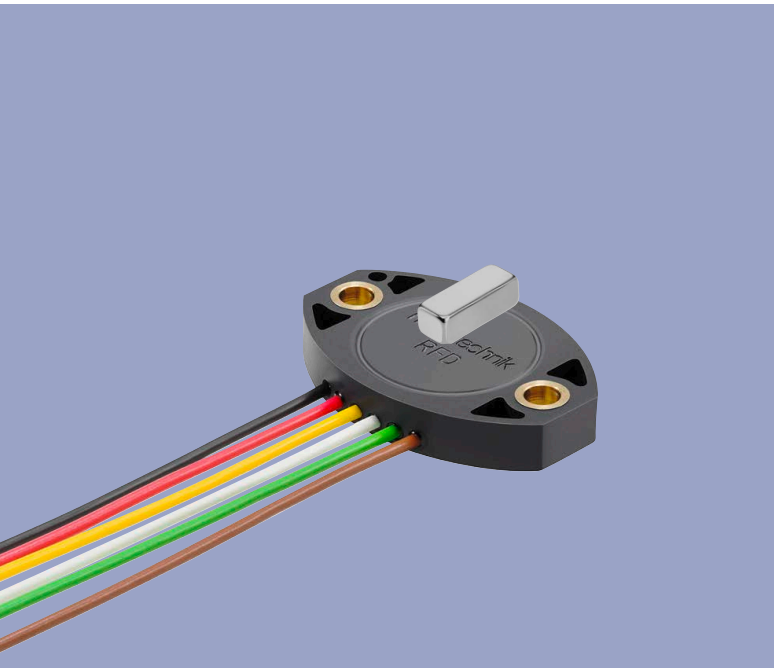


**NOVOHALL  
Transducer  
5 up to 50 mm  
touchless**

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

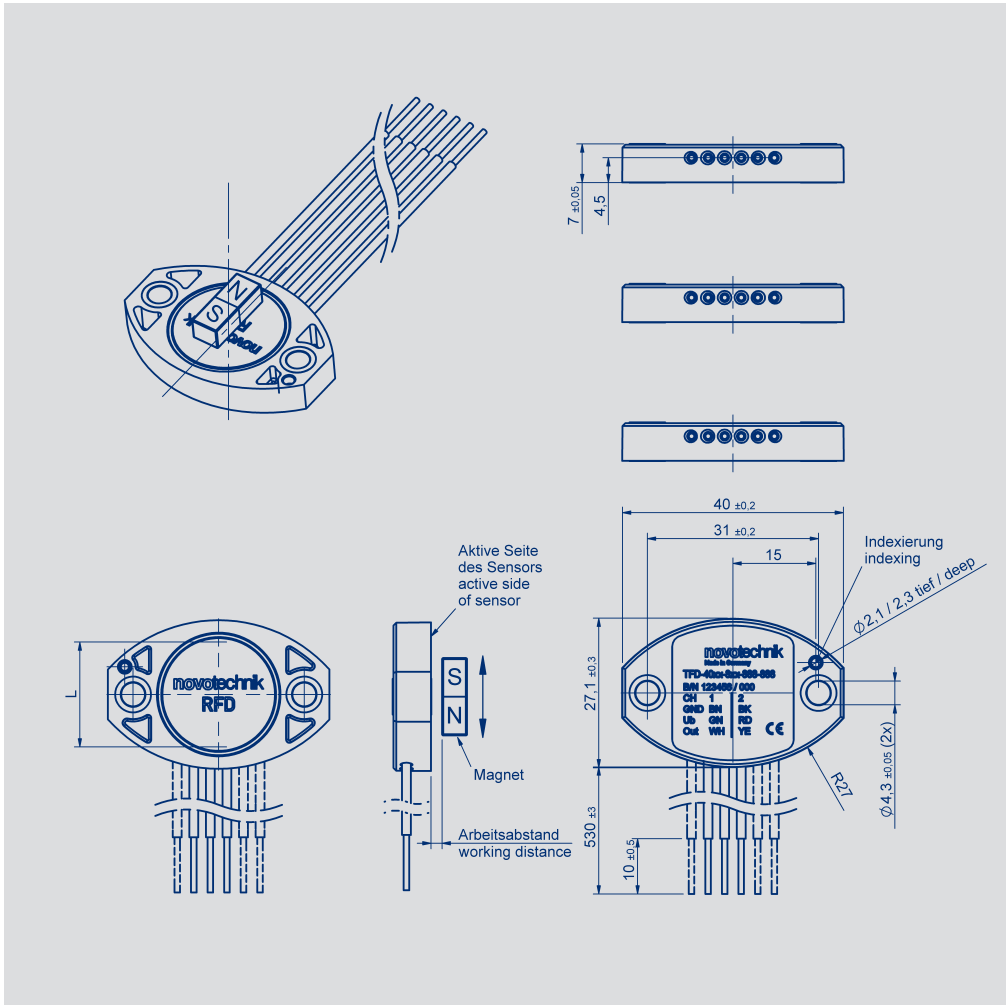
**Project item**

Please contact your local distributor or our technical support  
Phone (+49) 711 4489-250  
support@novotechnik.de

## Contents

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

**Dimension Drawing**



CAD data see  
[www.novotechnik.de/en/download/cad-data/](http://www.novotechnik.de/en/download/cad-data/)

**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**

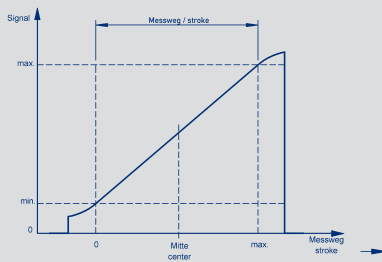
Signal channel 1 rising, signal channel 2 falling when moving away from electrical connection.

## Mechanical Data

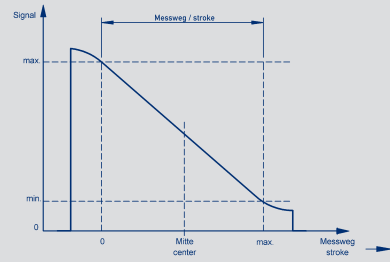
<b>Description</b>		
Housing	High grade, temperature resistant plastic, Thermoplast with brass inserts	
Electrical connections	Lead wires, 0.5 mm <sup>2</sup> (AWG 20), PVC insulated	
<b>Mechanical Data</b>		
Dimensions	See dimension drawing	
Mounting	2 round-head screws with hexagon socket M4x14 (included 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 Amax = 0.75 amax = 20	Hz mm 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

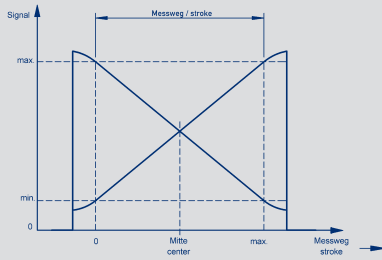
One channel, rising



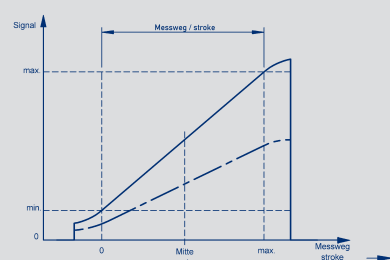
On request: one channel, falling



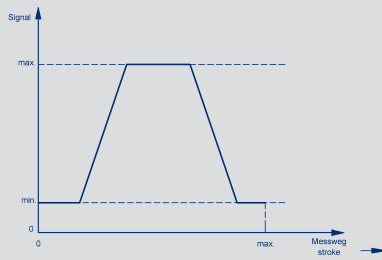
Crossed characteristics, channel 1 rising



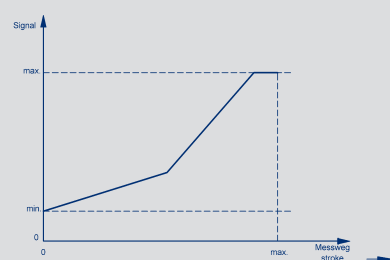
On request: two channels, signal 2 = 0.5 x signal 1



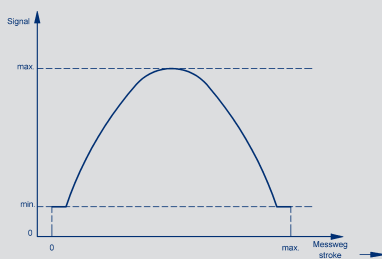
On request: Trapeze characteristic



On request: different gradients



On request: Parable characteristic



## Technical Data

Technical Data		
<b>Type designations</b>	TFD-4021- _ _ _ - 2 _ _ - _ _ _ ratiometric	
<b>Electrical Data</b>		
Supply voltage $U_b$	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	$\leq 0.1$	$\pm\%$ FS
Hysteresis	$\leq 0.1$	$\pm\%$ FS
Output signal	ratiometric to supply voltage 5 ... 95 % (0.25 ... 4.75 V at 5 V) (load $\geq 10$ k $\Omega$ )	
Temperature error	$\leq 0.5$	$\pm\%$ FS
Insulation resistance (500 VDC)	$\geq 10$	M $\Omega$
<b>Environmental Data</b>		
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-Fields, 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 $U_b$	Supply voltage $U_b$	Supply voltage $U_b$ 1
BN	GND	GND	GND 1
WH	Signal output	Signal output 1	Signal output 1
RD	_	-	Supply voltage $U_b$ 2
BK	_	-	GND 2
YE	_	Signal output 2	Signal output 2

## Ordering Specifications Analog Versions

### Ordering specifications

Preferred types printed in bold

Supply voltage  $U_b$   
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**

Series

Mechanical specification  
4021: Standard

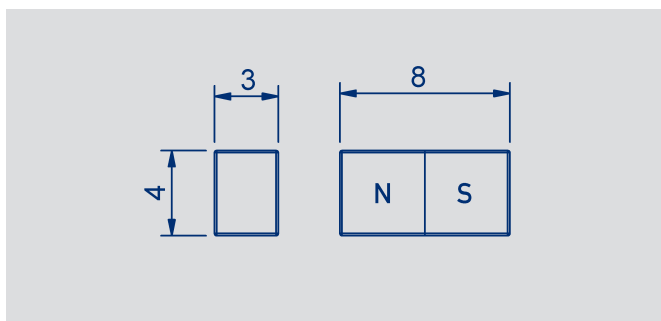
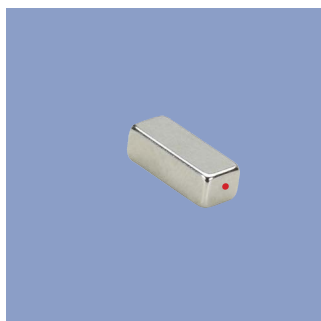
#### Electrical measuring range

14: 14 mm  
24: 24 mm  
Other lengths from 5 up to 50 mm on request

#### Number of channels

6: single channel 1 x  $U_b$  / 1 x output  
7: partly redundant 1 x  $U_b$  / 2 x output  
8: fully redundant 2 x  $U_b$  / 2 x output

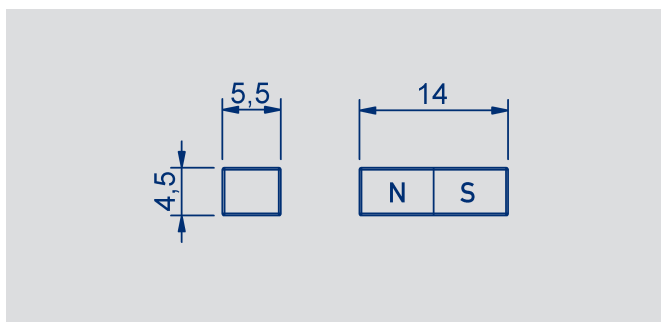
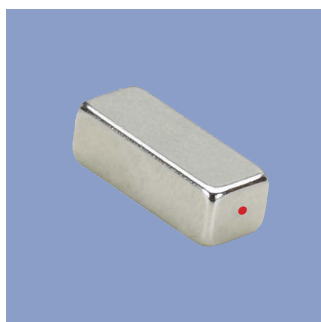
## Position markers



### Z-TFC-P03

Magnet for direct application

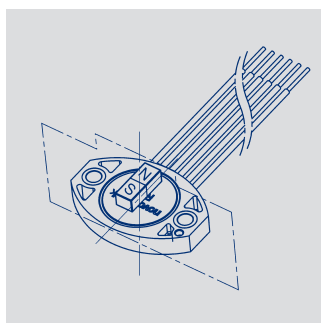
- for measuring range 8 ... 14 mm
- working distance
  - single  $0.7 \pm 0.5$  mm
  - redundant  $0.3 + 0.5$  mm /  $-0.3$  mm
- max. permitted offset parallel to the sensing direction  $\pm 1$  mm
- P/N 104225



### Z-TFC-P04

Magnet for direct application

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



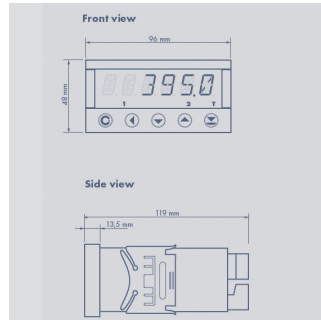
### Important instructions for magnet installation

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.



**Multifunctional  
Measuring Device  
with Display  
Series MAP-4000**



**Special features**

- Supply voltage 10 ... 30 VDC, 80 ... 250 V DC or AC
- high accuracy
- direct connection of potentiometric and standardized signals
- adjustable supply voltage for sensors 5 ... 24 V
- Temperature coefficient 100 ppm/K
- optional RS 232, RS 485, analog output, limited switch
- complete data see separate data sheet MAP-4000

**Ordering specifications**

**Number comparator relays**

- 0: none
- 2: 2 relays
- 4: 4 relays

**Analog output**

- 0: no analog output
- 1: analog output present

**Interface**

- 0: no interface
- 1: RS 232
- 2: RS 485

**M A P - 4 0 1 0 - 0 0 0 - 1 0 1**

Series

**Supply voltage**  
00: 10 ... 30 V AC/DC  
10: 80 ... 250 V AC

**Adjustable supply voltage (5 ... 24 V/Max. 1,2 W)**  
1: with supply voltage

**Display colour**  
1: red

**Data storage (only with interface)**  
0: not storage  
1: RTC storage  
2: FAST storage

## Connecting Options on request



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### Tyco AMP Super Seal

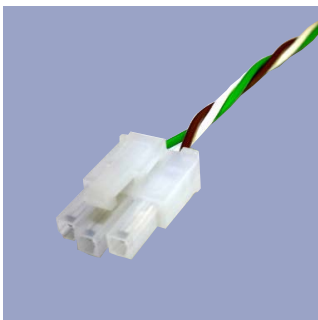
- Pin- and bushing housing
- Customized lengths
- 3-, 4- and 6-pol. versions
- Protection class IP67
- on request



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### Deutsch DTM 04

- Pin- and bushing housing
- Customized lengths
- 3-, 4- and 6-pol. versions
- Protection class IP67
- on request



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### Molex Mini Fit jr.

- Customized length and lead wires
- 3-, 4- and 6-pol. versions
- on request



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### Molex Mini Fit

- Customized length and lead wires
- 3-, 4-, 6- and 8-pol. versions
- on request

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.