

Eddy Current

Eddy current distance and displacement transducer



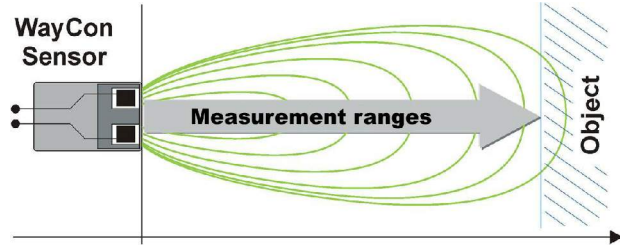
Series TX

- **Measurement ranges 0,5...10 mm**
- **One or dual-channel device**
- **Outputs: 10V, 5V, $\pm 5V$, (0)4...20 mA, CAN**
- **Linearity $\pm 0,25\%$ of FS**
- **High frequency measurements (35 kHz)**
- **Operating temperature: -35...+185°C**
- **Unaffected of non-metallic media in the measurement room (e.g. water, oils, fouling, synthetics)**
- **Distance measurement on static and rotating objects**
- **Measurement of unbalance and vibration**
- **Contactless quality check in automation**

Introduction

WayCon Positionsmesstechnik GmbH is a manufacturer of high quality eddy current displacement transducer for industrial use. These devices measure contactless and high-vibrantly distances, vibration and rotation of metallic conducting objects irrespective non-metallic media in the measurement room (e.g. oil)

The fundamental measurement principle is based on the fact that the coil in the probe produces an alternating magnetic field. The streamlines of the field leave the probe, pass the object and close together. Thereby the alternating magnetic field induces eddy currents in the electroconductive object which causes energetic losses. This eddy current loss in the object rises with less distance of the probe. At the front-end of the sensor coil this extraction of eddy current loss is evaluated via the changing of the complex input- impedance.



The microcontroller, used by WayCon, provides to handle only certain spectral components within a strictly limited bandwidth. Interferences from other spectral ranges are extracted. The analog output signal is conditioned and issued via the microcontroller.

Overview

The eddy current basic module can be constructed in one or dual-channel way. It is possible, to use different ranges (probes) in connection with a 2-channel basic module.

- DSP on board
 - One or dual-channel construction
 - Low power-architektur (1,9 V Core)
 - CAN on board
- Possibilities of software
 - Cascading, multiplexing, master/slave function
 - Adaptation of material
 - Form factor
 - cable length compensation
 - Customized linearisation
 - Data storage
 - CAN-Bus-transfer
 - Teach-In, Min-Max, Peak, threshold alarm, filter



- Probes
 - Enlarged measurement ranges
 - Pressure resistant construction
 - Special casing/integration in customers periphery

Applications

- Axial and radial wave displacement
- Unbalance, vibration and shock
- Measurement of roundness, ovality
- Bending and deformation
- Measurement of bearing clearance and detection of bearing erosion
- Measurement of split lube at oil pressure
- Detection of tooth flanks
- Detection of tappets and tappet travel
- Detection of slots and measurement of depth of slots
- press gaps
- carriage forming, form checking
- Measurement of thickness of foils and non-conductive media

Technical data

typ	T05	T2	T3	T4	T5	T10
measurement ranges FS	0...0,5 mm	0...2 mm	0...3 mm	0...4 mm	0...5 mm	0...10 mm
housing dimensions	ø 5 mm	ø 8 mm	ø 12 mm	ø 14 mm	ø 18 mm	ø 30 mm
resolution*	10 Hz: 0,007%, 1 kHz: 0,018%, 35 kHz: 0,1%					
linearity	±0,25% v. MB					
filter corner frequency	10 Hz / 100 Hz / 1 kHz / 10 kHz / 35 kHz (-3 dB)					
dynamics	output rate 120 kHz (1-Kanal), 70kHz (2-Kanal)					
output	0...10 V / 0...5 V / ±5 V / 0...20 mA / 4...20 mA					
temperature range probe	-35...185°C					
temp. range electronics	-10...70°C					
supply	9...36 VDC wide input					
max. power consumption	190 mA (24V), 300 mA (12V), 390 mA (9V)					
short circuit resistance	yes					
resist. reverse polarity	yes					
case material (probe)	stainless steel 1.4305, probe head PEEK (p#olyetheretherketon)					
sensor cable	PTFE-Koax, length 3m/6m and customized length					
protection class probe	IP67/IP68					
prot. class electronics	IP40					

* 99,0% confidence interval, midrange

Connection diagramm

Digital IN OUT/CAN (D-SUB 9-pin MALE)

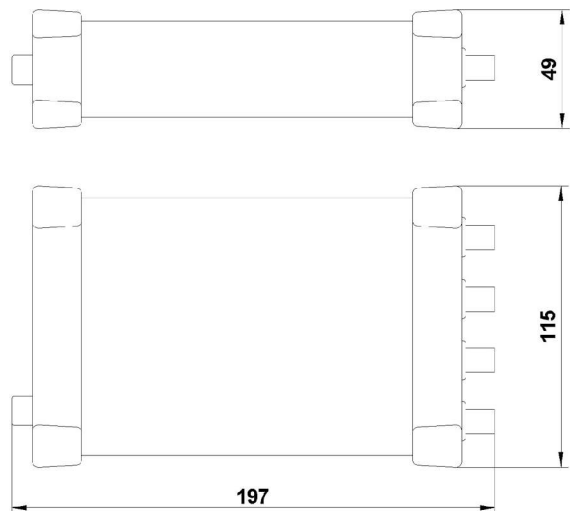
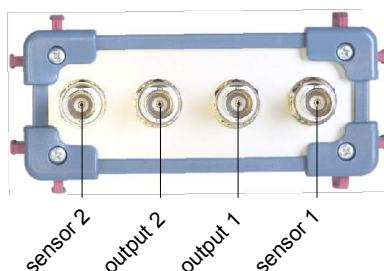
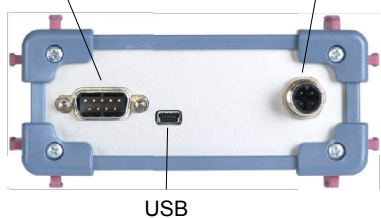
pin	name	description
1	EXT OPTO OUT1	digital output I/O 1
2	CAN L	CAN low signal
3	CAN GND	CAN ground
4	EXT IN 1	digital input I/O 1
5	EXT IN 2	digital input I/O 2
6	IN GND	ground I/O
7	CAN H	CAN high signal
8	EXT OPTO OUT2	digital output I/O 2
9	CAN GND	CAN ground

supply M12
 2 white: n.c. 1 brown: V+ (9...36 VDC)
 3 blue: GND 4 black: n.c.

note: all in- and outputs are galvanically separated via optoelectronic coupler

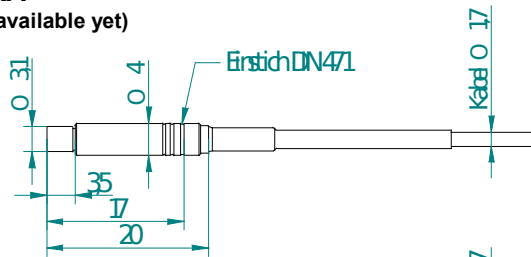
Technical drawings electronics

D-SUB 9-pin MALE supply M12 connector

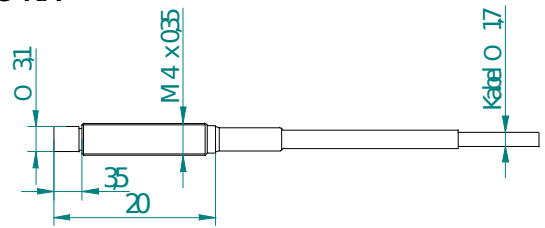


T04-S-KA

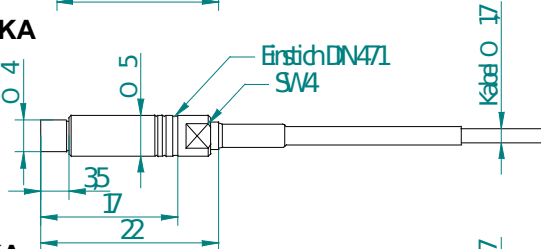
(T04 not available yet)



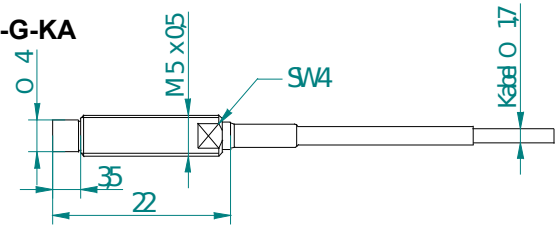
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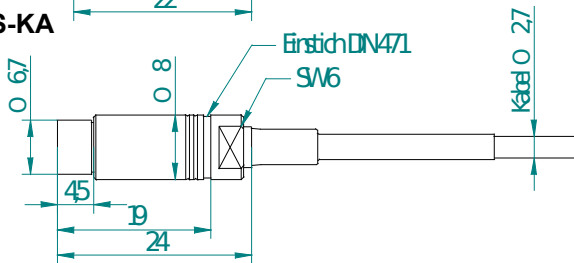
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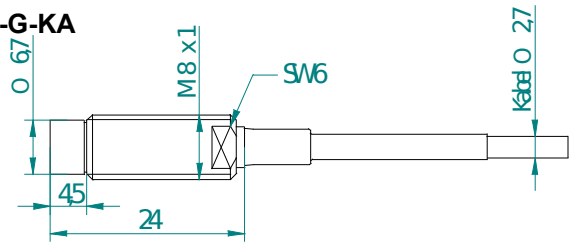
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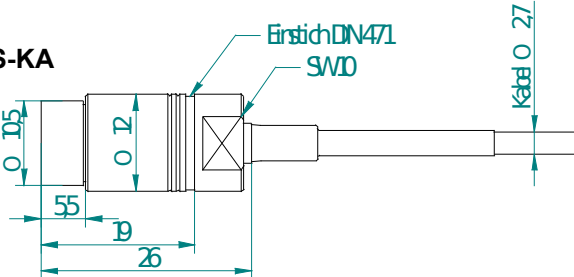
T2-S-KA



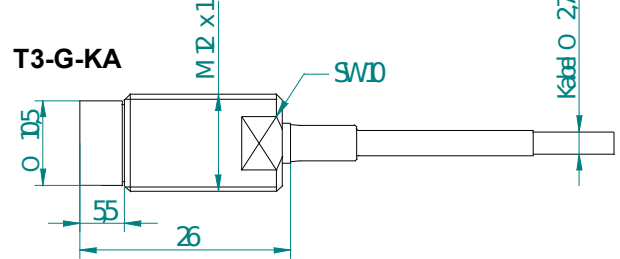
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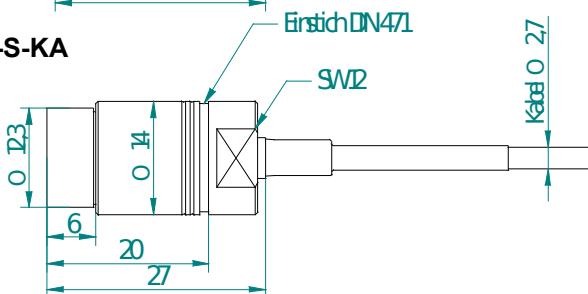
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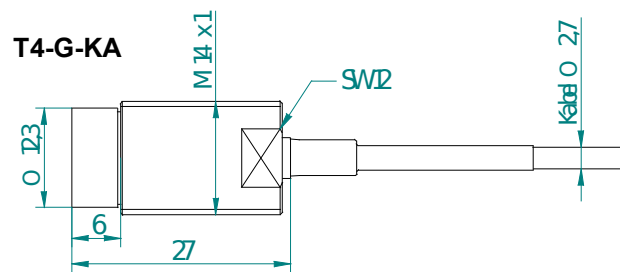
T3-G-KA



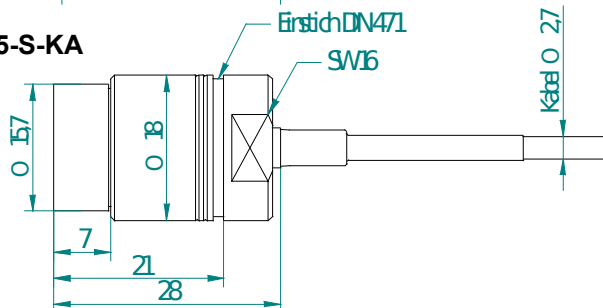
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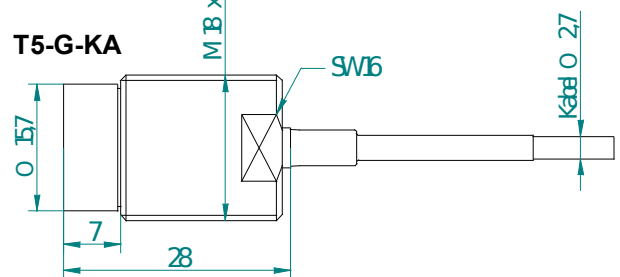
T4-G-KA



T5-S-KA

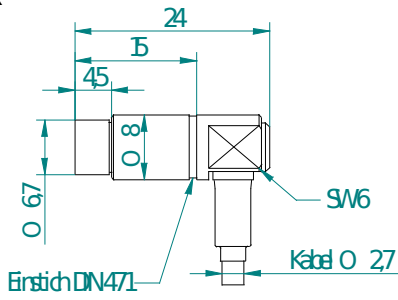


T5-G-KA

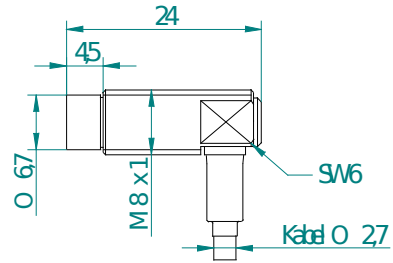


note: drawing of T10 on request

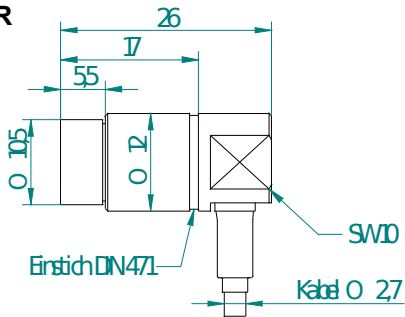
T2-S-KR



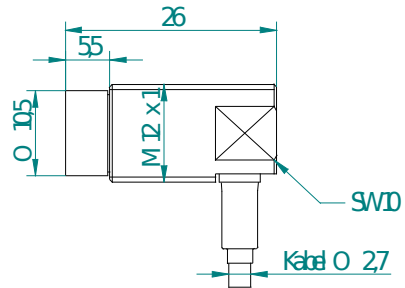
T2-G-KR



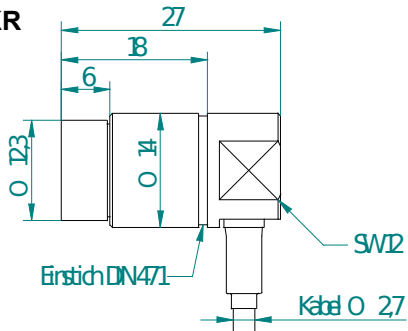
T3-S-KR



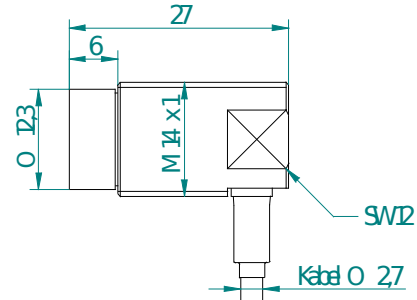
T3-G-KR



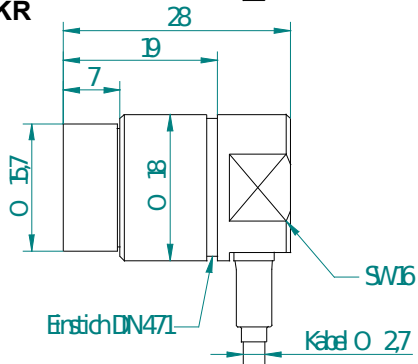
T4-S-KR



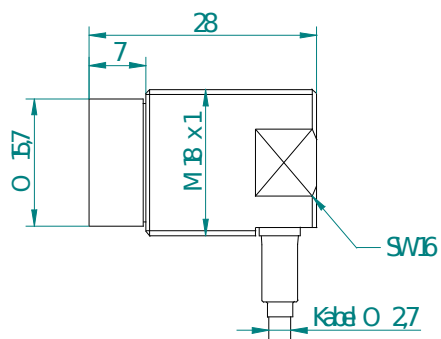
T4-G-KR



T5-S-KR



T5-G-KR



note: drawing of T10 on request

Order code

Probe

Measurement ranges 0,5/2/3/4/5/10 mm		e.g. 2		T ☐ - ☐ - ☐ - ☐	IP67 P15	Options water protection IP67 pressure sealed up to 15 bar
Case shaft thread flange		S G F*				
				KR* KA	Cable output radial axial	

* customized version, available on request

Order code

Eddy current basic module

Number of channels 1 channels 2 channels		1 2		TX ☐ - ☐ - ☐ - ☐ - ☐	D** IN	Options tft display touch screen inverted output
Supply 24 V wide input (9...36 VDC)		12 24				
Resolution 16 bit AD/DA		16				
				10V 5V ±5V 420A 020A	Analogue output / channel 0...10V 0...5V -5...+5V 4...20mA 0...20mA	

** approximately available in 9/09

Accessories

Supply cable with M12 mating connector

K4P2M-S-M12	2 m, straight connector
K4P5M-S-M12	5 m, straight connector
K4P10M-S-M12	10 m, straight connector
K4P2M-SW-M12	2 m, angular connector
K4P5M-SW-M12	5 m, angular connector
K4P10M-SW-M12	10 m, angular connector



BNC cable for output signal (IEC 61010)

XLAM-446/SC
(high flexible, length 1,6 m)

