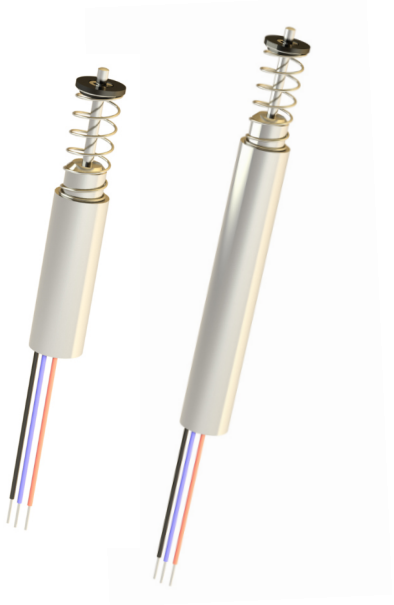
SUPREME SENSORING

Inductive linear displacement transducer Model IW10 / IW101

Document no.:
IW 10278 DE
07.04.2025



- **Model IW 10 : Measuring strokes up to 8 mm**
- **Model IW 101 : Measuring strokes up to 15 mm**
- **Contactless, robust sensor system**
- **Infinite resolution, no hysteresis**
- **Exitation and signal processing by external electronic modules**
- **Various mechanical configurations**
- **Protection up to IP66**

KEY INFORMATION OVERVIEW

DESIGN & FUNCTION

The displacement transducers operate according to the principle of the differential choke, i.e. an inductive half bridge. They consist of two coils which are encapsulated in a stainless steel cylinder ensuring positive protection against vibration, shock, humidity, oil and corrosive matter. A mu-metal plunger core causes opposing changes of inductance when it is displaced through the centre of the coils.

The model IW10 transducers with measuring lengths up to 8 mm are available either with cylindrical or square shaped case.
The plunger travels loose in an open bore. Double ended plungers or plungers with reduced core diameter can be supplied upon request. For gauge type applications a spring return is provided.
The IW 10 transducers are supplied either with connecting leads or with plug and socket connectors. They are also available with spring returns for gauge application.

The model IW101 transducers with measuring lengths up to 15 mm have a cylindrical case. For gauge type applications a spring return is provided.
They are available either with flat cable or with angular plug connections. The mating plug is either straight or angular shaped (protection grade IP66). A special plug with screened cable (protection grade IP67) is also available.

FEATURES INTERFACE

An external electronic oscillator/demodulator and amplifier module produces the carrier frequency and a DC voltage or current output signal. There are several different types of modules and output signals available:

- up to ±10 VDC
- 0 to 20 mA
- 4 to 20 mA

The displacement transducers are designed for a carrier frequency of 10 kHz. Other frequencies can be used but may involve changes of output values.

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TECHNICAL DATA

ELECTRICAL DATA

Standard measuring strokes	Model IW10	4 and 8 mm
	Model IW101	5, 10 and 15 mm
Linearity		≤ ±0.5 % or ≤ ±0.25 %
Temperature drift		≤ ±0.01 %/°C
Nominal sensitivity	Model IW10	1,000 mV / mm
(for OD15 without amplification as example)	Model IW101	900 mV / mm (stroke 5 and 10 mm), 670 mV / mm (stroke 15 mm)

ENVIRONMENTAL DATA

Operating temperature range	IW10	- 55 °C to + 120 °C
	IW101	- 40 °C to + 85 °C
Resistance	To shock	20 g SRS at 20 to 2000 Hz
	To vibration	3 g rms at 20 to 2000 Hz
Protection class		IP66

ELECTRONIC MODULES FOR ONE TRANSDUCER

Type of module	**OD15-2**	**OV15-2**	**OE30-1 (OE30-2)**
Supply voltage V_S	±11.5 to ±16 VDC symmetrical		+21.5 to +32 VDC
Supply current I_S	~ 30 mA	~ 30 mA	≤ 45 mA at I_O = 20 mA
Oscillator frequency	10 kHz nominal		
Oscillator voltage	10 V_{ss} Sinus		
Output signal V_O (I_O)	±2 to ±5 VDC dep. on type of transducer	Up to ±10 VDC	0 to 20 mA (4 to 20 mA)

Further Information see data sheet OD10220.

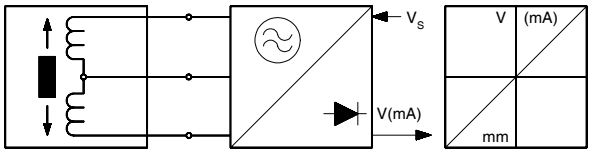
ELECTRONIC MODULES FOR TWO TRANSDUCERS

Type of module	**OE42-1**	**OE42-3**	**OV42-5**	**OV42-A**
Supply voltage V_S	+20 to +32 VDC	+20 to +32 VDC	±13 to ±16 VDC	+20 to +32 VDC
Supply current I_S	~ 110 mA			
Oscillator frequency	10 kHz nominal			
Oscillator voltage	10 V_{ss} Sinus			
Output signal V_O (I_O)	0 to 20 mA	4 to 20 mA	± 10 VDC	0 to 10 VDC

Further Information see data sheet OE11012.

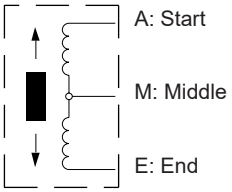
ELECTRICAL CONNECTION

PRINCIPAL CIRCUIT DIAGRAM (WITH ELECTRONIC MODULE)



ELECTRICAL CONNECTION

GENERAL REMARKS



Using these connections a positively increasing signal is obtained when moving the plunger towards the electric exit:

ELECTRICAL CONNECTION FOR IW10

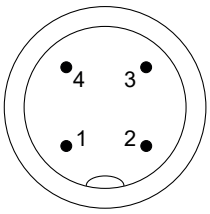
Color	**Signal**
blue	A
black	M
red	E

ELECTRICAL CONNECTIONS FOR IW101...K

Color	**Signal**
white	A
brown	M
green	E

ELECTRICAL CONNECTIONS FOR IW101...S

PIN	**Signal**
1	E
2	not connected
3	A
4	M



Inductive linear displacement transducer Model IW10 / IW101

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ORDER CODE FORMAT

IW	101 /	15 -	0,25 -	K -	T -	A01	STANDARD VERSION

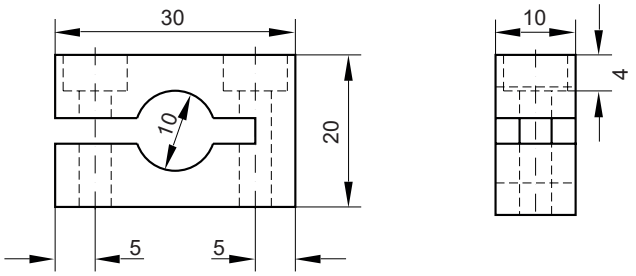
IW	Inductive linear displacement transducer		
101	Design form	10 10R 101	Cylindrical housing 10 mm Square shaped housing 25 mm x 25 mm Cylindrical housing 10 mm
15	Measuring stroke	4 8 5 10 15	4 mm (only for IW10 or IW10R) 8 mm (only for IW10 or IW10R) 5 mm (only for IW101) 10 mm (only for IW101) 15 mm (only for IW101)
0,25	Linearity	0,25 0,5	≤ ±0.25 % ≤ ±0.5 %
K	Electrical connection	K S	Flat cable (only for IW101) Connector (only for IW101) *(IW10 and IW10R are only supplied with leads: leave blank)*
T	Mechanical design	T B	Gauge (with return spring, optional) Core diameter 3.0 mm (optional) *(Versions without gauge and with standard plunger: leave blank)*
A01	Electrical and mechanical variants	A01*	Only for mechanical or electrical deviations from data sheet

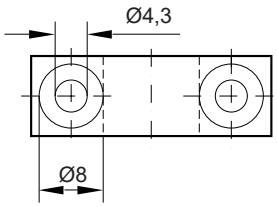
* The applicable A-No. is allocated after the definition of the deviation when ordering. The deviations are documented at TWK. No A-No. is given for standard versions as specified in the data sheet.

ACCESSORIES - TO BE ORDERED SEPARATELY

MOUNTING BLOCK MB10

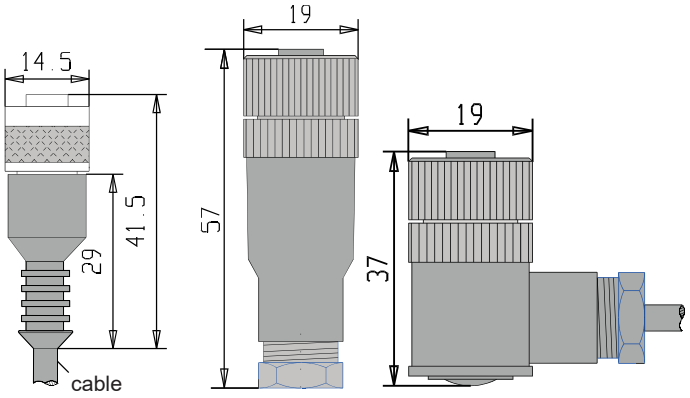
Mass: 33 g, brass nickel plated, 2 hexagon socket screws M4/25 mm long are supplied with each item.





ACCESSORIES - TO BE ORDERED SEPARATELY

MATING PLUGS FOR IW101...S



STK65 (IP 67) | STBG (IP 66) | STBW (IP 66)

The plug STK65 is supplied with moulded cable:

- Length 10 m
- 4 wires 0.34 mm²
- With common screen
- PVC sheathing
- Outside diameter 5 mm

DOCUMENTATION

DOCUMENTATION

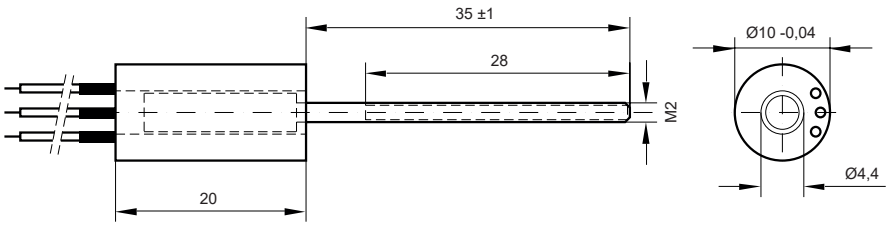
The following documents can be found in the Internet under www.twk.de in the documentation area, model IW.

Data sheet IW10278
Declaration of Conformity CE ZE12467
Declaration of Conformity UKCA: ZE16569
Reach compliant QS15286
RoHS compliant QS13284

INSTALLATION DRAWINGS

MODEL IW10 (PLUNGER IN CENTRAL POSITION)

Dimensions in mm

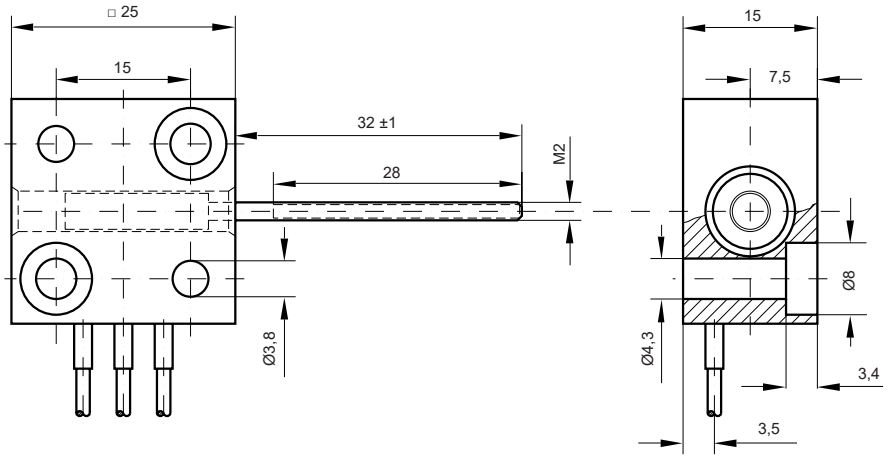


MATERIALS USED

Mass . . . . . 9 g
Tube . . . . . Mu-metal, stainless
Coil former . . . . . Dialylphtalat
Core . . . . . Mu-metal
Plunger rod . . . . . brass
Leads . . . . . 32 AWG, Kynar standed wire, 300 mm long
Encapsulation . . . . . Epoxy resin

MODEL IW10R (PLUNGER IN CENTRAL POSITION)

Dimensions in mm



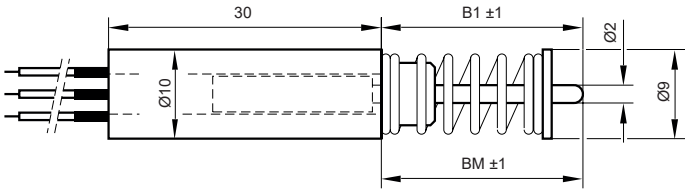
MATERIALS USED

Mass . . . . . 61 g
Case . . . . . Steel, nickel plated
Leads . . . . . 20 AWG, Kynar stranded wire
Other parts . . . . . as for IW 10

INSTALLATION DRAWINGS

MODEL IW10…T (GAUGE)

Dimensions in mm

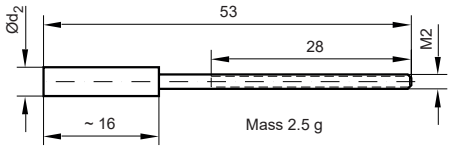


Stroke	BM mm	B1 mm	Pre-travel mm	Over-travel mm	Spring force at BM	Mass g
4 mm	18	23.5	3.5	4.5	1 N	17
8 mm	18	23.5	1.5	2.5	1 N	17

BM = Plunger in central position, B1 = Plunger full out

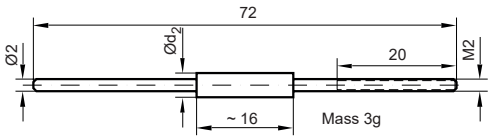
PLUNGER WITH CORE FOR IW10 (STANDARD)

Dimensions in mm



DOUBLE PLUNGER WITH CORE FOR IW10 (OPTIONAL)

Dimensions in mm

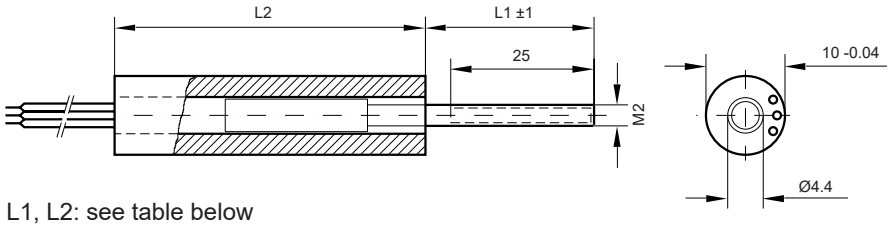


Core diameter d_2: 3.8 mm (standard) or 3.0 mm (optional). When 3 mm diameter is used the clearence between core and coil increases to allow slight radial play of the plunger.

INSTALLATION DRAWINGS

MODEL IW101…K (WITH FLAT CABLE 300 MM LONG)

Dimensions in mm



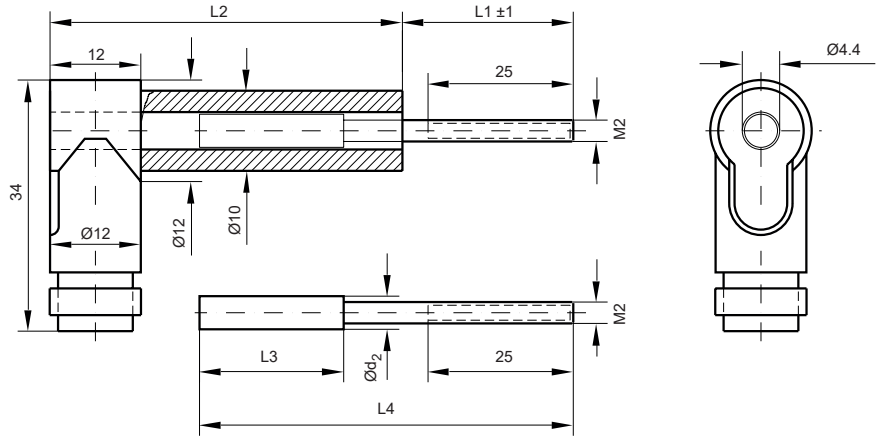
L1, L2: see table below

MATERIALS USED

Tube . . . . . Mu-metal, stainless
Coil former . . . . . Delrin
Core . . . . . Mu-metal
Plunger rod . . . . . brass
Leads . . . . . Flat cable 3 x 0.14 mm²
Encapsulation . . . . . Epoxy resin

MODEL IW101...S (WITH CONNECTOR)

Dimensions in mm



Stroke	L1 mm	L2 mm	L3 mm	L4 mm	Mass „K“ g	Mass „S“ g	Plunger mass, g
5 mm	35	40	~ 18	64	14	17	3
10 mm	35	40	~ 18	64	14	17	3
15 mm	35	50	~ 28	74	17	20	4

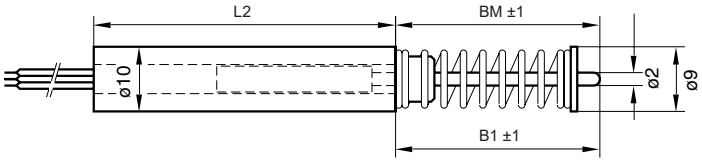
L1 = Plunger in central position

Core diameter d_2: 3.8 mm (standard) or 3.0 mm (optional). When 3 mm diameter is used the clearence between core and coil increases to allow slight radial play of the plunger.

INSTALLATION DRAWINGS

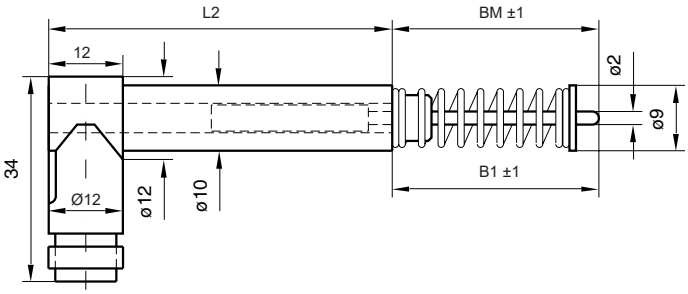
MODEL IW101...K-T (GAUGE)

Dimensions in mm



MODEL IW101...S-T

Dimensions in mm



Stroke	L2 mm	BM mm	B1 mm	Pre-travel mm	Over-travel mm	Spring force at BM	Mass „K-T“ g	Mass „S-T“ g
5 mm	50	22	36	11.5	8	2.2 N	22	25
10 mm	50	22	36	9	5.5	2.2 N	22	25
15 mm	60	26	40	6.5	7	1.8 N	25	28

BM = Plunger in central position, B1 = Plunger full out