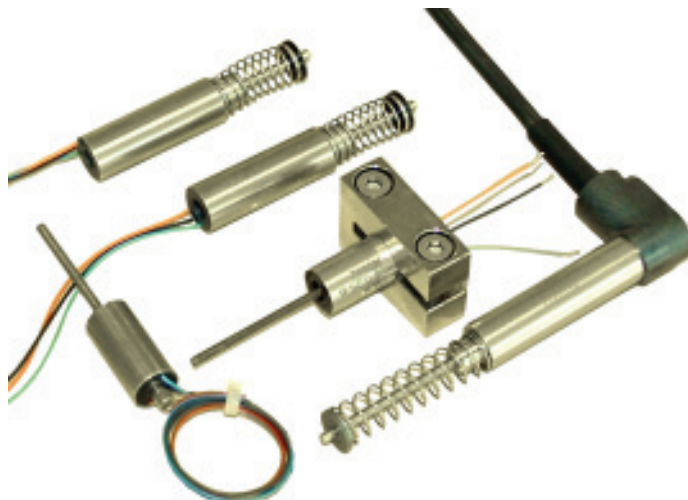


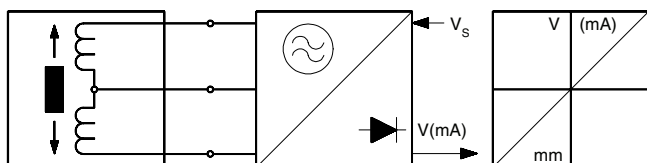
- Model IW 10 : Measuring strokes up to 8 mm
- Model IW 101 : Measuring strokes up to 15 mm
- Contactless, robust sensor system
- Infinite resolution, no hysteresis
  
- Excitation and signal processing by external electronic modules
- Various mechanical configurations
- Protection to IP 66



### Construction and operating principle

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



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

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.

### Standard measuring strokes

- Model IW 10 : 4 and 8 mm
- Model IW 101 : 5, 10 and 15 mm

### Technical Data

- Linearity :  $\leq 0.5 \%$  or  $\leq 0.25 \%$
- Operating temperature ranges
  - IW 10 : - 55°C to + 120°C
  - IW 101 : - 40°C to + 85°C
- Temperature drift :  $\leq \pm 0.01\%/^{\circ}\text{C}$
- Resistance to shock : 20g SRS at 20 to 2000 Hz
- Resistance to vibration : 3g rms at 20 to 2000 Hz
- Protection class : IP 66
- Further data : see table on page 2

### Mechanical variants

The model **IW 10** transducers 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 model **IW 101** transducers have a cylindrical case. They are available either with flat cable or with angular plug connections. The mating plug is either straight or angular shaped (protection to IP 66). A special plug with screened cable (protection to IP 67) is also available.

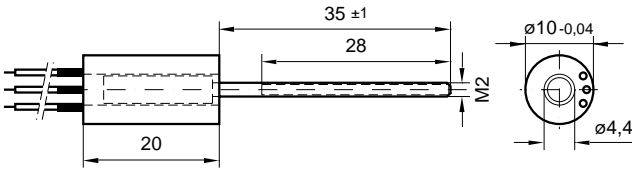
For gauge type applications a spring return is provided.

### Excitation and signal processing

For details please refer to table page 4.

**Dimensions in mm**

**Model IW 10 ( plunger in central position )**

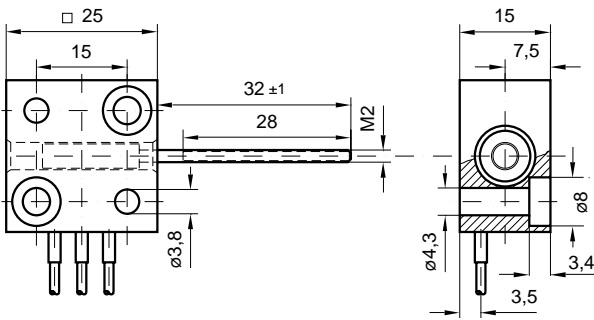


Mass : 9 g

**Materials :**

- Tube : Mu-metal, stainless
- Coil former : Dialylphthalat
- Core : Mu-metal
- Plunger rod : brass
- Leads : 32 AWG Kynar standed wire, 300 mm long
- Encapsulation : Epoxy resin

**Modell IW 10R ( plunger in central position )**

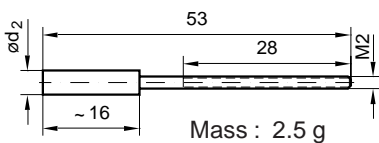


Mass : 61 g

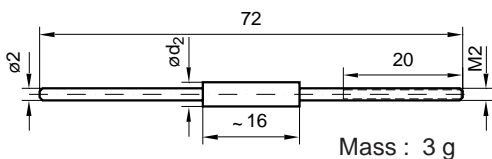
**Materials :**

- Case : Steel, Nickel plated
- Leads : 20 AWG, Kynar standed wire
- Other parts : as for IW 10

**Plunger with core for IW 10 ( standard )**

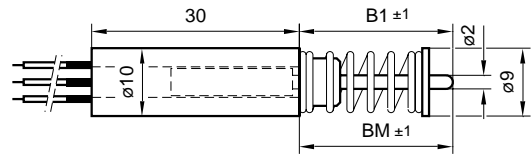


**Double plunger with core for IW 10 ( optional )**



Core diameters  $d_2$  : 3.8 mm (standard) or 3.0 mm (optional). (When 3 mm dia is used the clearence between core and coil increases to allow slight radial play of the plunger.- Additional order code is "B").

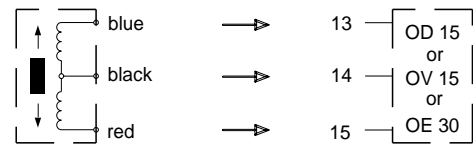
**Model IW 10 ... T (Gauge)**



IW 10 .. T 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.

**Electrical connections**

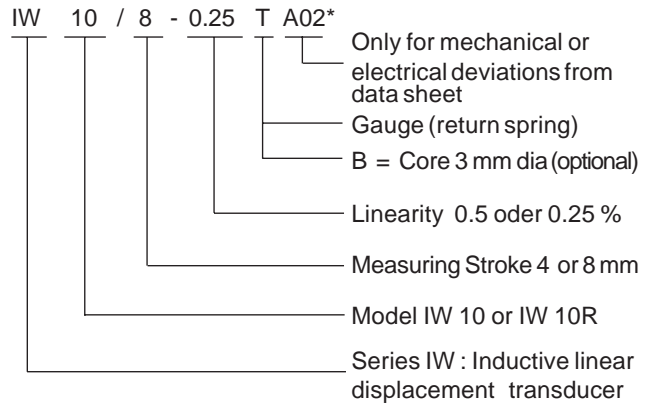


Using these connections a positively increasing signal is obtained when moving the plunger towards the electric exit.

**Nominal sensitivity**

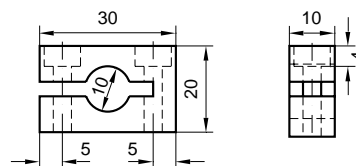
1000 mV / mm, when using module OD 15 (without amplification).

**Order code format**



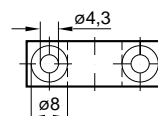
\* The applicable A-No. is allocated after the definition of the deviation when ordering. No A-No. is given for standard versions as specified in the data sheet.

**Mounting block MB10 (Brass, Nickel plated) (to be ordered separately)**



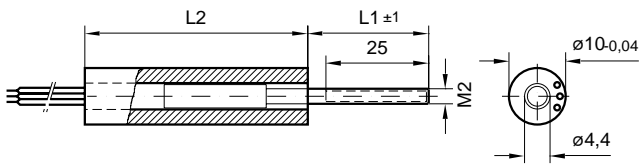
Mass : 33 g

2 hexagon socket screws M4/25 mm long are supplied with each item.



**Dimensions in mm**

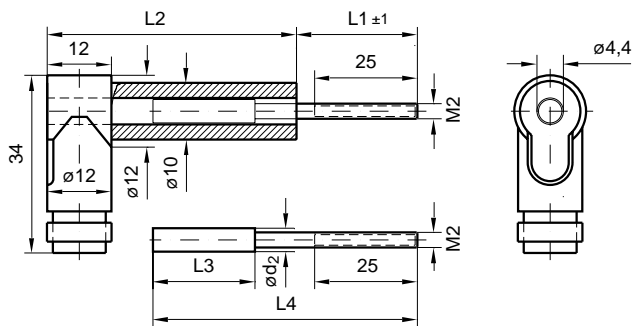
**Model IW 101 ... K (with flat cable 300 mm long)**



**Materials:**

- Tube : Mu-metal, stainless
- Coil former : Delrin
- Core : Mu-metal
- Plunger rod : brass
- Leads : Flate cable 3 x 0.14 mm<sup>2</sup>
- Encapsulation : Epoxy resin

**Model IW 101 ... S (with connector)**

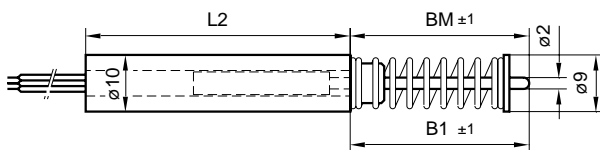


For core diameters d<sub>2</sub> see IW10 / page 2.

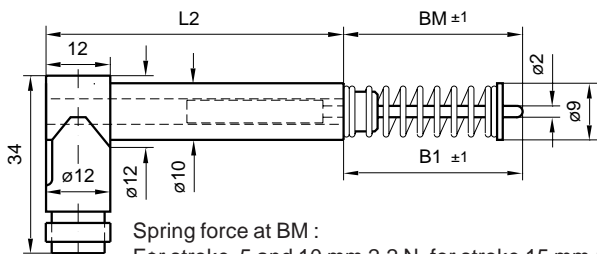
IW 101 stroke ▼	L1 mm	L2 mm	L3 mm	L4 mm	Mass "K" g	Mass "S" g	Plunger Mass g
5 mm	35	40	~ 18	64	14	17	3
10 mm	35	40	~ 18	64	14	17	3
15 mm	35	50	~ 28	74	17	20	4

L1 = Plunger in central position

**Model IW 101 ... KT (gauge)**



**Model IW 101 ... ST**

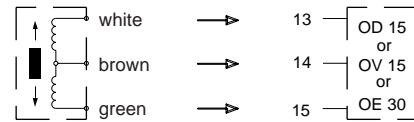


Spring force at BM :  
For stroke 5 and 10 mm 2.2 N, for stroke 15 mm 1.8 N

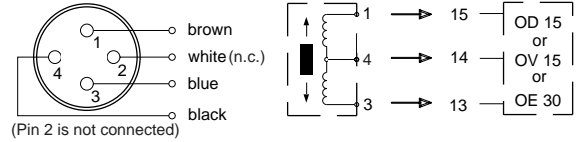
IW 101..T stroke ▼	L2 mm	BM mm	B1 mm	Pre-travel mm	Over-travel mm	Mass "KT" g	Mass "ST" g
5 mm	50	22	36	11.5	8	22	25
10 mm	50	22	36	9	5,5	22	25
15 mm	60	26	40	6.5	7	25	28

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

**Electrical connections for IW 101 ... K**



**Electrical connections for IW 101 ... S**

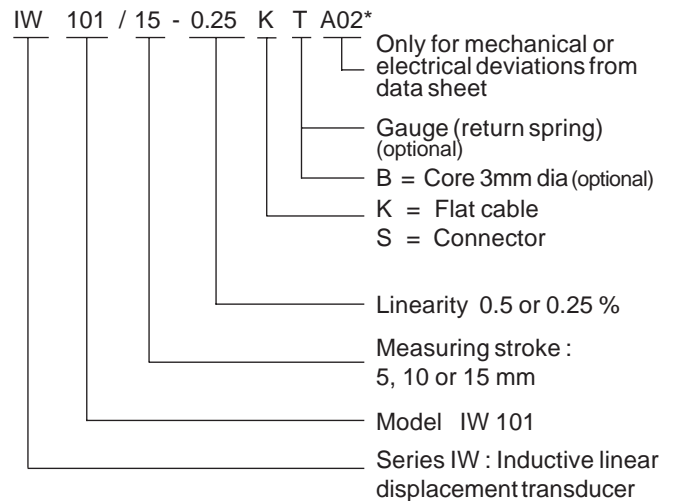


(Pin 2 is not connected)  
Using these connections a positively increasing signal is obtained when moving the plunger towards the electric exit.

**Nominal sensitivity ( using OD 15, without amplification )**

stroke ▶	5	10	15
mV / mm	900	900	670

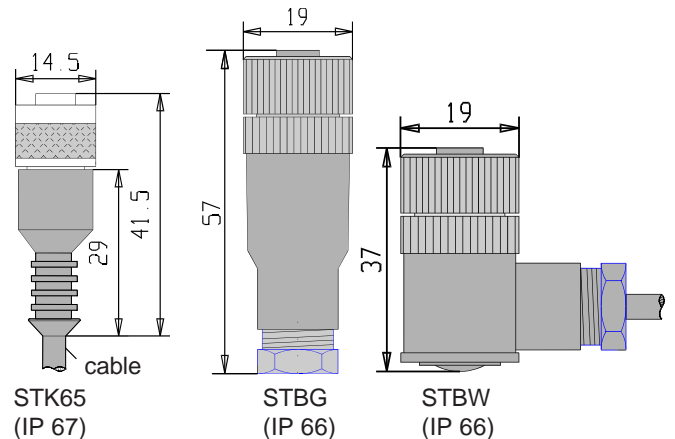
**Order code format**



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

**Plugs for IW 101 ... S**

( to be ordered separately )



The plug STK65 is always supplied with cable :

- length 6.50 m
- 4 wires 0.34 mm<sup>2</sup>
- With common screen
- PVC sheathing
- Outside dia 5 mm

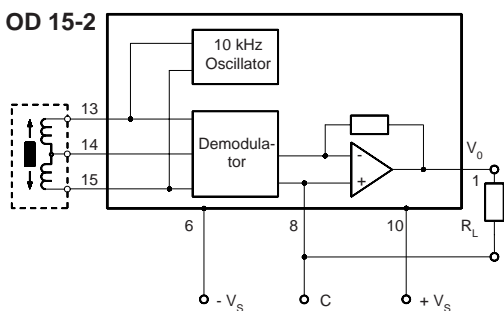
## Electronic Modules for the excitation of Inductive Transducers and for the processing of the output signal

Type of Module ▶	OD 15-2	OV 15-2	OE 30-1 (OE 30-2)
Supply voltage $V_s$	$\pm 11.5 \dots \pm 16$ VDC symmetrical		$+ 21.5 \dots + 32$ VDC
Supply current $I_s$	$\sim 30$ mA	$\sim 30$ mA	$\leq 45$ mA at $I_0 = 20$ mA
Oscillator frequency	10 kHz nominal		
Oscillator voltage	$10 V_{rms}$		
Output signal $V_0(I_0)$	$\pm 2 \dots \pm 5$ VDC depending on type of transducer	up to $\pm 10$ VDC	$0 \dots 20$ mA ( $4 \dots 20$ mA)
Sensitivity	not adjustable	adjustable *	adjustable*
Zero-point	not adjustable	adjustable *	not adjustable
Ripple	$\leq 10$ mV <sub>p-p</sub>	$\leq 5$ mV <sub>p-p</sub>	$\leq 0.01$ mA <sub>p-p</sub>
Attenuation	1% of $V_0$ at measuring frequency 100 Hz		
Load resistance $R_L$	$\geq 2$ k $\Omega$	$\geq 2$ k $\Omega$	500 $\Omega$ max.
Temperatur drift of $V_0(I_0)$	0.005% / °C		
Switch-on drift of $V_0(I_0)$	2 mV / 15 min. (typ.)	1 mV / 15 min. (typ.)	2 $\mu$ A / 15 min. (typ.)
Dependence of $V_0(I_0)$ on $V_s$	at $\Delta V_s \pm 1V \Delta V_0 \pm 0.05\%$		at $\Delta V_s \pm 1V \Delta I_0 \pm 0.05\%$
Operating temperature range	$- 10^\circ \dots + 80^\circ\text{C}$		

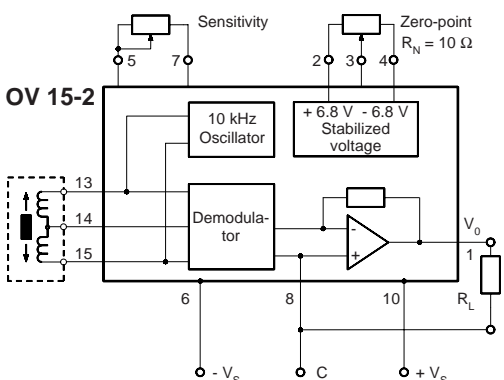
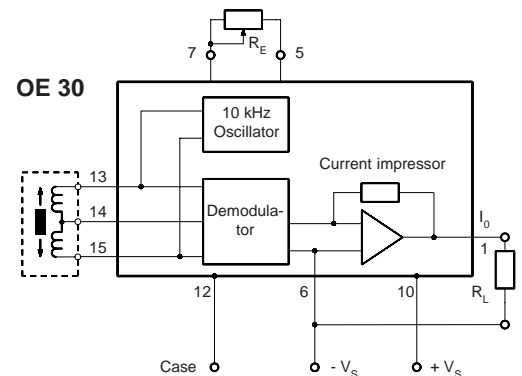
\* Wiring instructions will be supplied with each item.

Series OA and DE-modules as well as Multi-channel PC-boards are described in data sheet 10219AE

### Basic block diagrams



The transmission line between the transducer and the electronic module may measure up to 100 meters. Screened cables should be used to avoid the interference of outside noise.



### Mounting grid 1:1 (5 mm pitch / view of mounting face)

