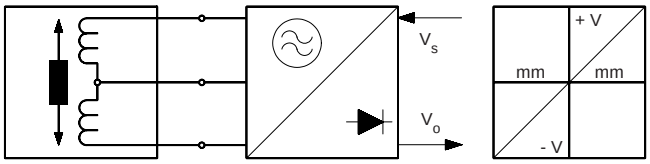
- **Contactless, robust sensor system**
- **Infinite resolution, no hysteresis**
- **Definite repeatability**
- **Linearity tolerances 0.5% or 0.25%**
- **Protection to IP 66**
- **Excitation and signal processing by external electronic modules**

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 120 Transducers are supplied either with connecting leads or with plug and socket connectors. They are also available either with spring returns for gauge application or with ball joints both on the plunger rod and / or on the case.

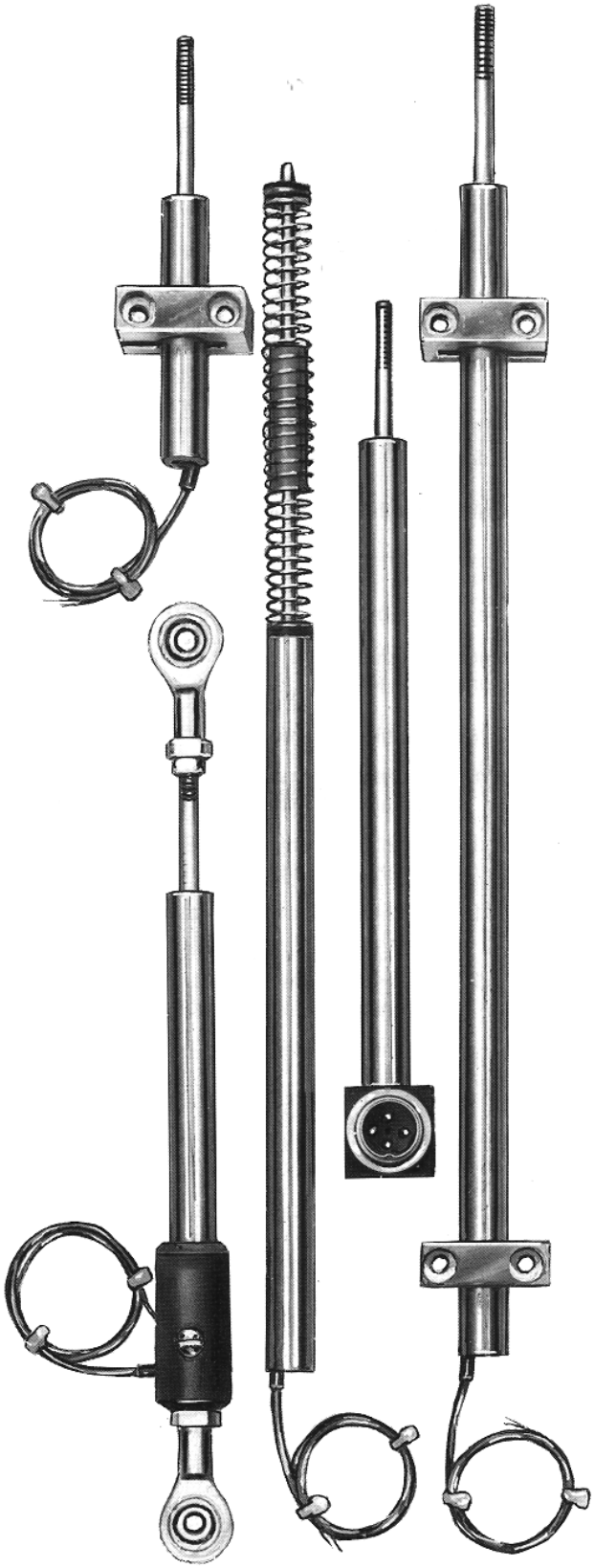
Technical Data

- Linearity : 0.5% or 0.25%
- Sensitivity : see table page 2
- Excitation and signal processing : see pages 2 and 4

- Operating temperature ranges
  - ☐ Standard : -55°C to +100°C
  - ☐ Version S : -40°C to +85°C
- Temperature drift : ± 0.01%/°C
- Resistance to shock : 20g SRS at 20 to 2000 Hz
- Resistance to vibration : 3g rms at 20 to 2000 Hz
- Protection class : IP66
- Further data : see table on page 2

Other items in the TWK range of Inductive Transducers

Angle and Linear Displacement Transducers with integral electronic circuits, supplying calibrated voltage or current output signals ☐ Miniatur Linear Displacement Transducers ☐ Slot Transducers for non-contacting measurement of displacements



Standard version

Electrical connections using kynar standed wires, 300 mm long.

Other versions and accessories

Version S:	Plug, 3-way with gold-plated contacts. Mating connector : Socket Binder 681 (IP 40), included in supplied items. Coupling socket Binder 723M (IP 66), metal case with outer ring connected to ground, must be ordered separately.
Version T:	Gauge type with return spring (available with strokes up to 100 mm).
Version KV:	With ball joint on plunger.
Version KF:	With ball joint on plunger and special guide
Version KH:	With ball joint on case.

Note : The IW 120 Series replaces the previous IW 12 Series which becomes obsolete.

Excitation and signal processing

The following modules can be supplied for the excitation of the IW 120 Transducer and for the processing of the measuring signal (DC in/DC out) :

OD 15 : Oscillator/demodulator.

OV 15 : Oscillator/demodulator/amplifier with zero-point and sensitivity adjustment up to ± 10 VDC.

OE 30 : Oscillator/demodulator with current output 0..20 mA or 4...20 mA and for span adjustment.

OA: Oscillator/demodulator: Various modules for excitation frequencies from 2.5 to 15 kHz. Adjustable to various inductive transducers and for different output signals.

DE 52 : Module with two demodulators. A number of DE 52 modules can be combined with one OA10 into a multi-channel measuring system.

OUK: Multi-channel measuring system with OA10 and DE-52 on one Eurocard for a maximum of 7 transducers, for voltage output 0-5 VDC, 0-10 VDC, or ± 10 VDC.

OIK: Multi-channel measuring system similar to OUK, but with current output signals 0...20 mA or 4...20 mA.

UN 15 : Power supply for 230 V 50 / 60 Hz or 110 V 50 / 60 Hz input and ± 15 VDC output.

For further details refer to table page 4.

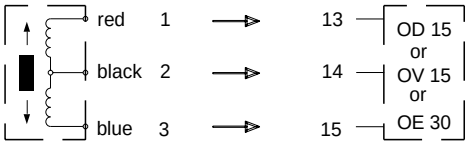
Order code format

IW 120 / 100 - 0.25 - S - T - A02 *

- A02 * : Only for mechanical or electrical deviations from data sheet
- S = plug
- T = gauge (return spring)
- KF = ball joint on plunger with guide
- KV = ball joint on plunger without guide
- KH = ball joint on case
- 0.25 : Linearity : 0.5 or 0.25%
- 100 : Measuring stroke : 12 (±6), 24(±12), 60 (±30), 100 (±50), 150 (±75) mm
- 120 : Series 120 (12 mm dia)
- IW : Model IW : Inductive linear displacement transducer

* 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.

Electrical connections



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

Lengths, sensitivity and mass of standard version

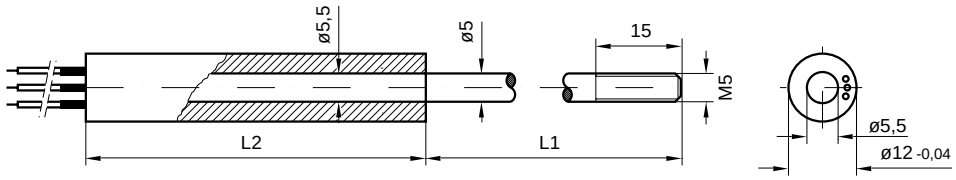
IW 120 / ...		12	24	60	100	150
Measuring stroke	mm	± 6	± 12	± 30	± 50	± 75
Length L1 *	mm	48	60	75	80	125
Length L2	mm	60	100	170	270	350
Sensitivity **	mV/mm	625	400	220	125	100
Mass w/o plunger	g	25	40	65	110	135
Mass of plunger	g	15	20	25	35	45

* Plunger in central position (electrical zero) ± 2mm.

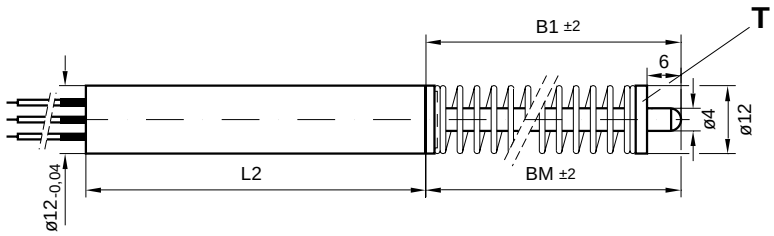
** With electronic module OD 15, without amplification.

Dimensions in mm

Standard version
leads, 300 mm long



Gauge version
leads, 300 mm long

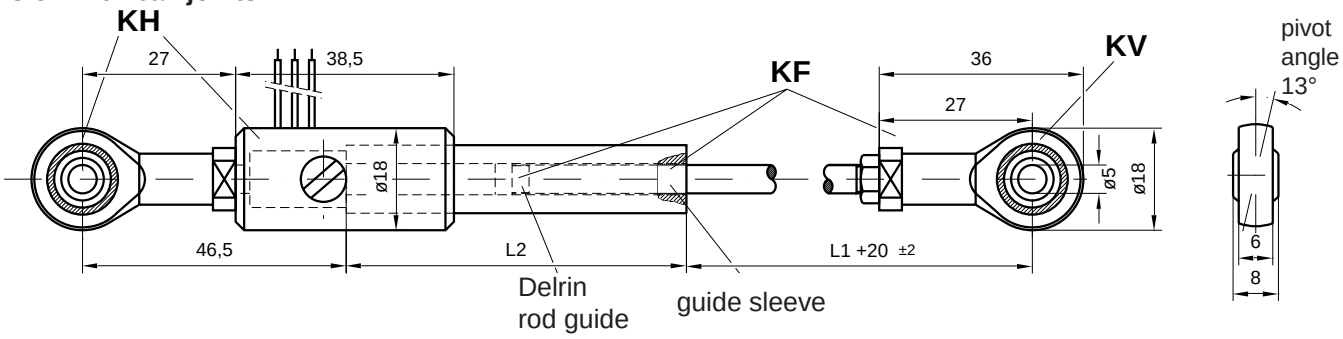


BM = Plunger in central position (electrical zero) .
B1 = Plunger fully extended.

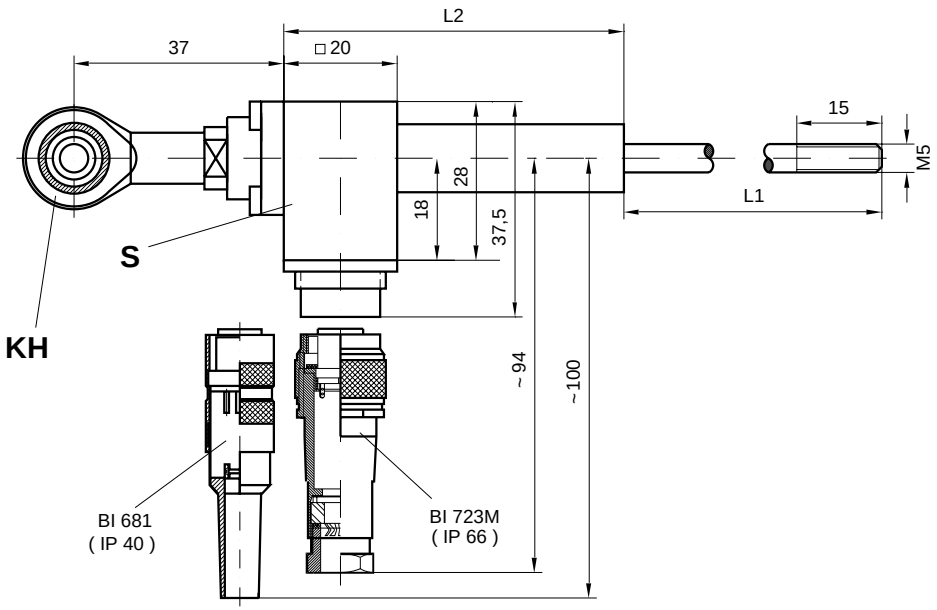
Dimensions for version T (gauge)

IW 120 /..T	12	24	60	100
B1	45	63	11	198
BM	35	45	75	140
pre-travel	4	6	5	8
over-travel	4	8	2	11

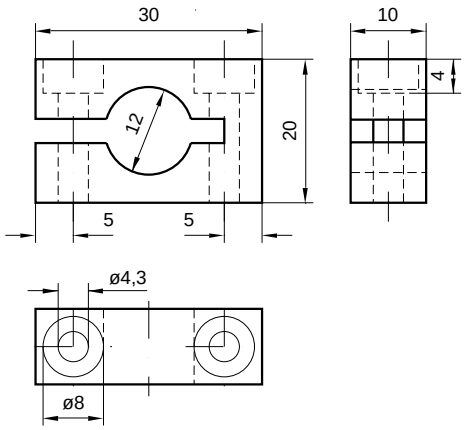
Version with ball joints



Version with plug (optional ball joint)



MB 12 Mounting block
(brass Nickel plated)
(to be ordered separately)



Mass : 36 g

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

TWK

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

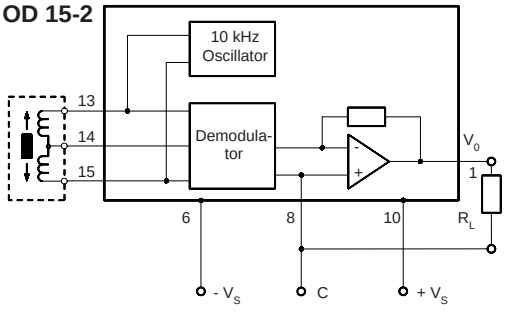
Type of Module ▶	OD 15-2	OV 15-2	OE 30-1 (OE 30-2)
Supply voltage V_S	± 11.5 . . . ± 16 VDC symmetrical		+ 21.5 . . . + 32 VDC
Supply current I_S	~ 30 mA	~ 30 mA	≤ 45 mA at I_0 = 20 mA
Oscillator frequency	10 kHz nominal		
Oscillator voltage	10 V_{rms}		
Output signal V_0(I_0)	± 2 . . . ± 5 VDC depending on type of transducer	up to ± 10 VDC	0 . . . 20 mA (4 . . . 20 mA)
Sensitivity	not adjustable	adjustable *	adjustable*
Zero-point	not adjustable	adjustable *	not adjustable
Ripple	≤ 10 mV_{p-p}	≤ 5 mV_{p-p}	≤ 0.01 mA_{p-p}
Attenuation	1% of V_0 at measuring frequency 100 Hz		
Load resistance R_L	≥ 2 kΩ	≥ 2 kΩ	500 Ω 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 µA / 15 min. (typ.)
Dependence of V_0 (I_0) on V_S	at Δ V_S ±1V Δ V_0 ± 0.05%		at Δ V_S ±1V Δ I_0 ± 0.05%
Operating temperature range	- 10°. . . + 80°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

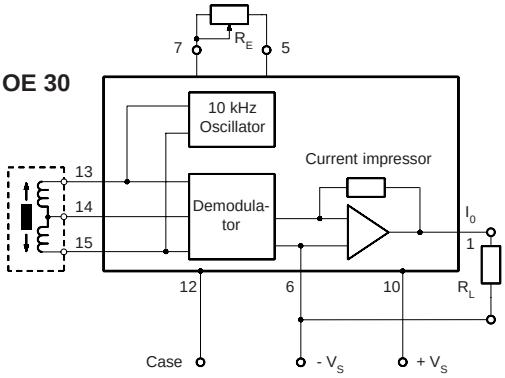
Basic block diagrams

OD 15-2

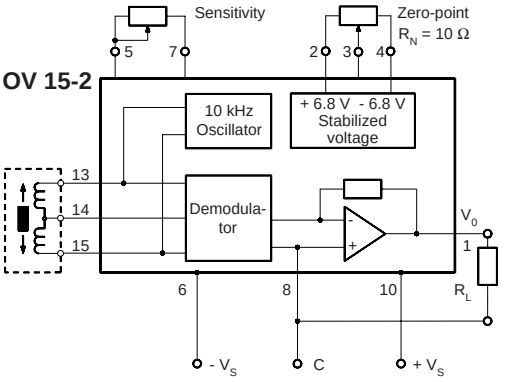


The transmission line between the transducer and the electronic module may measure up to 100 meters. Screened cables should be used to avoid the interference of outside noise.

OE 30



OV 15-2



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