Inductive Linear Displacement Transducers

Model IW 260

Measuring strokes: 80 mm, 170 mm, 240 mm, 360 mm

Document no.: IW 10505 JE
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- **Contactless, robust sensor system**
- **Infinite resolution, no hysteresis**
- **Calibrated output signals:**
  0...20 mA, 4...20 mA, ± 10 V, 0...10 V
- **Integral electronics for DC in / DC out**
- **Accuracy up to 0.1 %**
- **Definite repeatability**
- **Protection class IP 66**

Construction and operating principle

The displacement transducer operates according to the principle of fractional inductivity allotment within the hollow coil. Depending on the position of the core the inductivity changes within the corresponding coil section. This kind of layout provides for more position data than the classical half-bridge or LVDT configuration. An integral electronic circuit transforms these data into a signal proportional to the displacement of the plunger core.

The electronic circuits contains an oscillator, demodulator, an amplifier and in some cases a current output source.

Its SMD-design is short-circuit proof and protected against reverse polarity. The sensor system is completely sealed within a non-corrosive steel case to ensure positive protection against vibration, shock, humidity, oil and corrosive matter.

The new principle of fractional inductivity allotment as described above brings about an outstanding increase of the measuring stroke. In comparison to the IW 250 model the useful range of the IW 260 model increases by 70 to 100% based on the same length of the case.

Standard measuring strokes:
80 mm
170 mm
240 mm
360 mm

Special calibration using the standard case lengths can be provided upon request, e.g. measuring stroke 150 mm equals 20 mA at case L_2 = 250 mm.

TWK-ELEKTRONIK GmbH
Heinrichstrasse 85
D-40041 Düsseldorf
Postfach 10 50 63
Tel. +49 211 96117-0
Fax +49 211 637705
info@twk.de
www.twk.de

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Standard versions and calibrations, Technical Data

Standard versions and calibrations

Type	Outputsignal	V_s **	SOutputsense *	Mid-point at
IW 261	0 ... 20 mA	21,5 - 32 VDC	increasing	10 mA
IW 262			decreasing	
IW 263	4 ... 20 mA	21,5 - 32 VDC	increasing	12 mA
IW 264			decreasing	
IW 265	± 10 VDC	± 13 bis ± 16 VDC	increasing	0 V
IW 266			decreasing	
IW 26A	0 ... 10 VDC	21,5 - 32 VDC	increasing	5 V
IW 26B			decreasing	
IW 269	Sonderausführung			

* Increasing means that the output signal increases positively when the plunger is moved in the direction towards the plug.

** Other supply voltages upon request.

Calibration

Both the sensor system and plunger core are calibrated as one unit.
They carry the same serial number.

Technical data

- Supply voltage range V_S: (prot'd against reverse polarity) — 21.5 to 32 VDC or ± 13 to ± 16 VDC
- Accuracy: ± 0.1 % ± 0.25 % ± 0.5 % *
- Temperature drift: < 0.01 % / °C
- Stability: < 0.1 % in 24 hours
- Dalay time: 0.5 ms for 70 % of actual output value
- Operating temperature range: - 10 °C to + 80 °C
- Storage temperature range: - 30 °C to +80 °C
- Resistance to shock: 250 g SRS at 20 to 2000 Hz
- Resistance to vibration: 20 g rms (50 g peak) at 20 to 2000 Hz
- Protection class: IP 66

* For special calibration 0.5 % only.

Current output (IW 261 to IW 264)

- Output signal: 0...20 mA or 4...20 mA
- Supply current I_S: 60 mA max.
- Load resistance R_L: 0...500 Ω
- Ripple : < 0.005 mA_{P-P}
- Dependence on R_L: < 0.001 % for ΔR_L = 100 Ω
- Dependence on V_S: < 0.05 % for ΔV_S = 1 V
- Maximum output current: 25 mA

Voltage output (IW 265 to IW 26B)

- Output signal: ± 10 VDC or 0...10 VDC *
- Supply current I_S: 50 mA max.
- Permissible load R_L: 2 kΩ (short-circuit proof)
- Ripple: < 5 mV_{P-P}
- Dependence on V_S: < 0.05 % for ΔV_S = 1 V

* Residual voltage 0.1 VDC

Note: Unless otherwise stated, all values are valid at + 20 °C ambient temperature and 24 VDC or ± 15 VDC supply voltage, starting 10 minutes after switch-on.

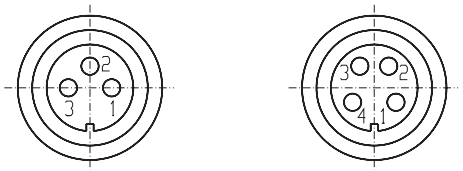
Inductive Linear Displacement Transducers Model IW 260

Electrical connections, Materials

Electrical connections

(with view on the contacts at the transducer case.)

IW 261, IW 262, IW 263, IW 264, IW 26A u. IW 26B	IW 265 and IW 266
1 = + V_S	1 = + V_S
2 = - V_S (0V) - I_O	2 = 0 V (common)
3 = + I_O / U_O(output signal)	3 = - V_S
	4 = + V_O(output signal)



Materials

- External and internal tube: Chrome-nickel steel
- Plunger: Chrome-nickel steel
- Core: Mu-metal
- Connector case: Brass, nickel-plated
- Connector contacts: Gold-plated

Lengths and masses

(refer to drawings page 5)

Type	L1* [mm]	L2 [mm]	without plunger [g]	plunger only [g]
IW 260/80	70	140	240	19
IW 260/170	115	250	380	31
IW 260/240	150	350	540	40
IW 260/360	210	500	720	56
KV or KFN:	22 g	Mating plug BI 681 (IP40): 30 g		
KHN:	55 g	Mating plug BI 723 M (IP66): 75 g		

* L1 = Plunger in central position: I_o = 10 (12) mA, resp. V_o = 0 (5) V.

Inductive Linear Displacement Transducers Model IW 260

Order number, Special Versions, Accesories

IW	262	/ 170	0,1	KFN	KHN	A01	
						01	Electrical and mechanical variants * Standard
					KHN		Ball joint on case (back): Ball joint on case
				KV			Ball joint (in front): Ball joint on plunger, without guide
				KFN			Ball joint on plunger, with guide
			0.1	%			Accuracy:
			0.25	%			
			0.5	%			
		80	mm				Measuring stroke:
		170	mm				
		240	mm				
		360	mm				
	261						Current or voltage output and sense (see page 1)
	262						
	263						
	264						
	265						
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.

Special Versions and accesories

SR: Protective tube in stainless steel, to protect plunger (rod) against lateral stress (ref. to data sheet 11537).

Version KV: With ball joint on plunger without guide.

Version KFN: With ball joint on plunger and special guide.

Version KHN: With ball joint on case (plug end). Can be combined with KFN.

Version PK: With cable exit and gland.

Accesories

Mating plug: Coupling socket BI 681 (to IP 40), must be ordered separately.
Coupling socket BI 723M (to IP 66) metal case with outer ring connected to ground, must be ordered separately.
Version 3 PS (3-way)
Version 4 PS (4-way)
All contacts gold-plated.
Alle Kontakte vergoldet.

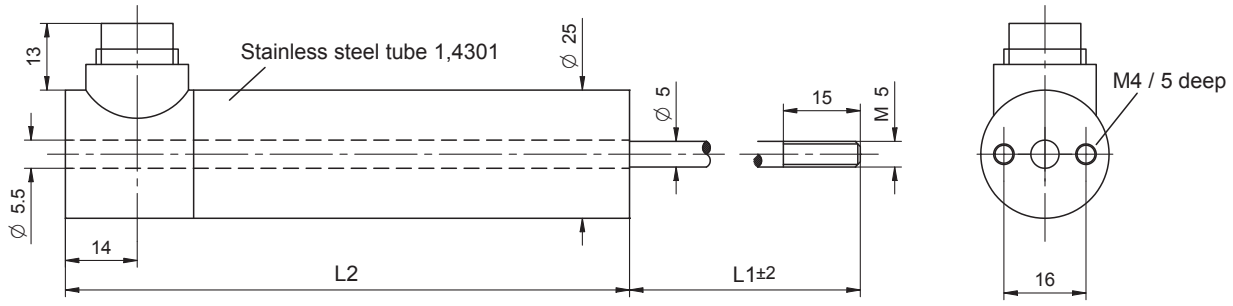
MB 25: Mounting block with clamp fixing (must be ordered separately).

Inductive Linear Displacement Transducers Model IW 260

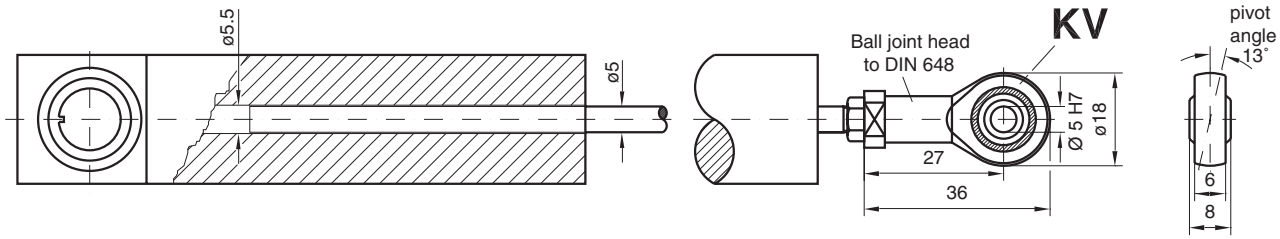
Installation drawings

Dimensions in mm

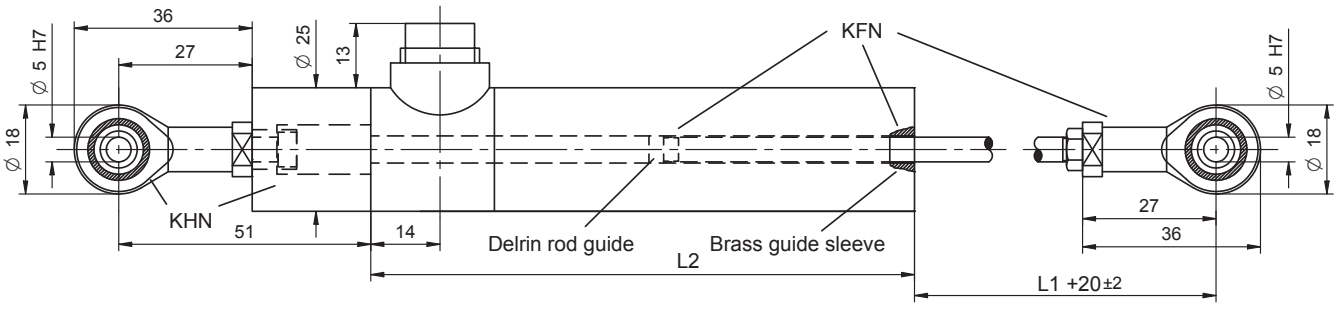
Standard version (without rod guide)



Version with ball joint on plunger (KV) (without rod guide)



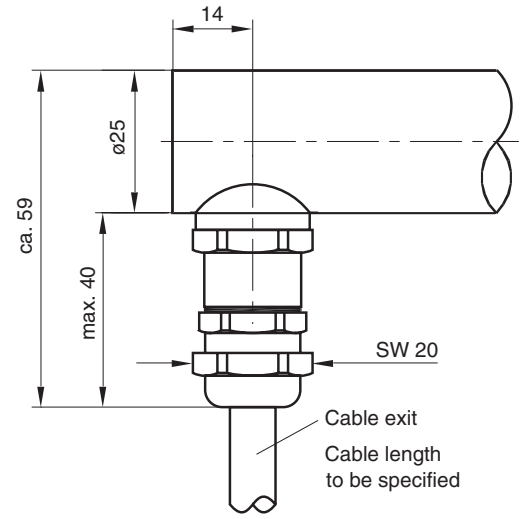
Version with ball joints on plunger (KFN) and on end of case (KFH) (with rod guide, captivated)



Inductive Linear Displacement Transducers Model IW 260

Installation drawings

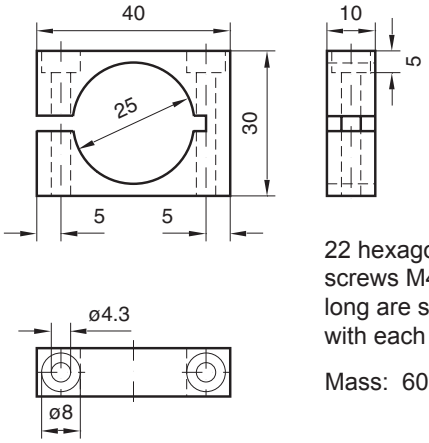
Version PK with cable exit and gland



Electrical connections

IW 261 to IW 264 IW 26A and IW 26B		IW 265 and IW 266	
yellow	+ V_S	brown	+ V_S
blue	- V_S (0V)	yellow	0 V
black	I_0 / V_0	white	- V_S
		green	V_0

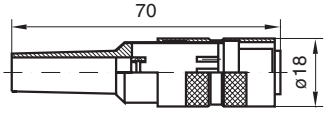
MB 25 Mounting block, brass Nickel plated (to be ordered separately)



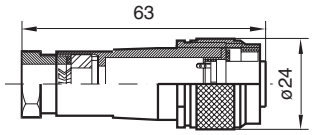
22 hexagon socket screws M4/35 mm long are supplied with each item.

Mass: 60 g

Mating Plugs



Metal case (must be ordered separately)
BI 681 3PS or 4PS (IP 40)



Metal case with outer ring connected to ground (must be ordered separately). BI 723M 3PS or 4PS (IP 66)