- **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 0.5% or 0.25%**
- **Definite repeatability**
- **Protection class IP 66**

Construction and operating principle

The displacement transducer operates according to the principle of the differential choke, i.e. an inductive half bridge. It consists of two coils which are encapsulated in a stainless steel cylinder. A mu-metal plunger core causes opposing changes of inductance when it is displaced through the centre of the coils. These changes are converted by the integral electronic circuit into a signal proportional to the displacement. The circuit contains an oscillator, demodulator, amplifier and in some cases, a current output source. It is short-circuit proof and protected against reverse polarity.

The transducers are completely sealed to ensure positive protection against vibration, shock, humidity, oil and corrosive matter.

Standard measuring strokes : 20 mm, 40 mm, 100 mm, 200 mm

The following variants can be supplied upon request :

- Extension of above measuring strokes depending on accuracy tolerances as follows (without increase of case length):
  - for 0.5% tolerances : standard stroke + 15 mm
  - for 0.25% tolerances : standard stroke + 10 mm
- Calibration of shorter strokes within the above standard ranges (without change of case length),e.g. IW 251/40 becomes IW 251/30, i.e. 0 to 30 mm equals 0 to 20 mA.

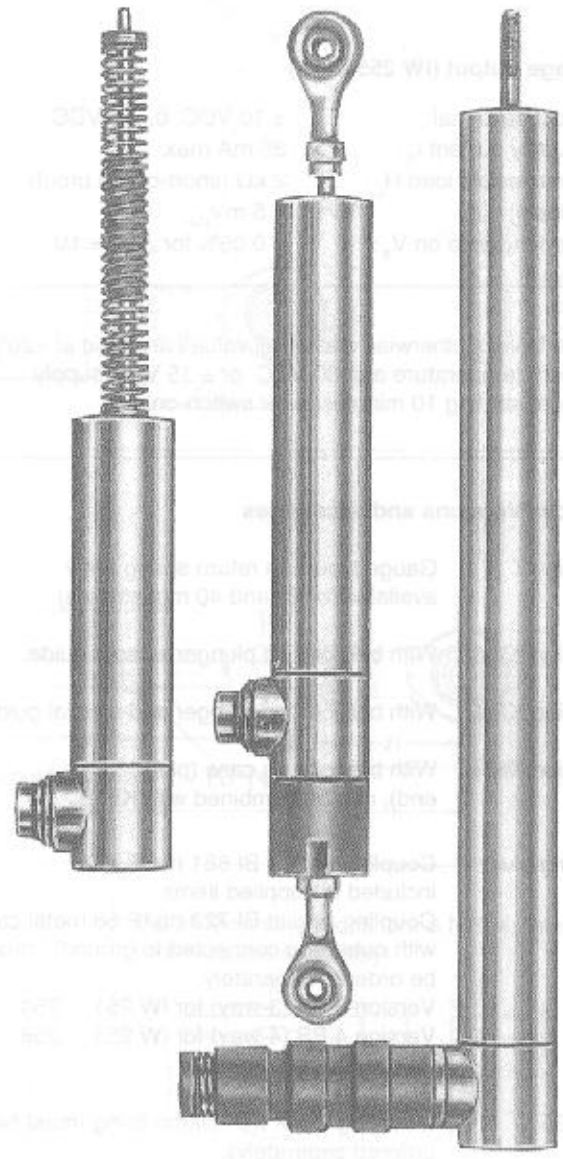
Note : The type IW 255 replaces the previous type IW 25 and is fully interchangeable with it, both mechanically and electrically.

Standard versions and calibrations

Type	Output	Output sense plunger —▷ plug	Mid-point at
IW 251*	**0 ... 20 mA**	**increasing****	**10 mA**
IW 252	0 ... 20 mA	decreasing	10 mA
IW 253	4 ... 20 mA	increasing	12 mA
IW 254	4 ... 20 mA	decreasing	12 mA
IW 255*	**± 10 V**	**increasing**	**0 V**
IW 256	± 10 V	decreasing	0 V
IW 257	0 ... 10 V	increasing	5 V
IW 258	0 ... 10 V	decreasing	5 V
IW 259	Special variants		

* Preferred versions

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



Technical Data

- Supply voltage V_S : 21.5 to 32 VDC or (prot'd against reverse polarity) ± 11.5 to ± 16 V *
- Accuracy : 0.5% or 0.25%
- Temperature drift : < 0.01%/°C
- Stability : < 0.1% in 24 hours
- Measurement frequency : 100 Hz max.
- Operating temperature range : -10°C to +80°C
- Storage temperature range : -30°C to +100°C
- Resistance to shock : 2500 m/s² for 11 ms
- Resistance to vibration : 500 m/s² from 5-2000 Hz
- Protection class : IP 66

* +11 to +17 VDC (unsymmetrical) upon request

IW 2.55

Current output (IW 251...254)

- Current signal : 0...20 mA or 4...20 mA
- Supply current I_S : 50 mA max.
- Load resistance R_L : 0...1000 Ω
- Ripple : < 0.005 mA_{P-P}
- Dependence on R_L : < 0.001% for ΔR_L = 200 Ω
- Dependence on V_S : < 0.02% for ΔV_S = 1 V
- Maximum output current : 25 mA

Voltage output (IW 255...258)

- Voltage signal : ± 10 VDC, 0...10 VDC
- Supply current I_S : 35 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 = 1V

Note: Unless otherwise stated, all values are valid at +20°C ambient temperature and 30 VDC or ± 15 VDC supply voltage, starting 10 minutes after switch-on.

Special Versions and accesories

Version T : Gauge type with return spring (only available for 20 and 40 mm strokes).

Version KV : With ball joint on plunger without guide.

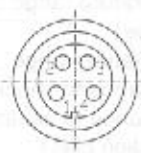
Version KFN : With ball joint on plunger and special guide

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

Mating plug : Coupling socket BI 681 (to IP 40), included in supplied items.
Coupling socket BI 723 (to IP 66 metal case with outer ring connected to ground), must be ordered separately.
Version 3 PS (3-way) for IW 251 ... 254
Version 4 PS (4-way) for IW 255 ... 258
All contacts gold-plated.

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

Electrical connections

Current output (3-way)	Voltage output (4-way)
1 = $+V_s$ 2 = $-V_s$ (0V) $-I_a$ 3 = $+I_a$ (output signal)	1 = $+V_s$ 2 = 0V (common) 3 = $-V_s$ 4 = $+V_a$ (output signal)
	

Order code format

IW 252 / 200 - 0.25 - KFN - KHN - A02*

- A02* : Only for mechanical or electrical deviations from data sheet.
- KHN : Ball joint on case
- KFN : KV = ball joint on plunger, without guide. KFN = ball joint on plunger, with guide.
- 0.25 : T = gauge (only for 20 and 40 mm strokes). Accuracy 0.5% or 0.25%.
- 200 : Measuring stroke : 20, 40, 100, 200 mm.
- 252 : Current or voltage output and sense (see page 1).
- 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.

Materials

- External and internal tube : Chrome-nickel steel
- Plunger : Chrome-nickel steel
- Core : Mu-metal
- Encapsulation : Epoxy resin and silicone rubber
- Connector case : Brass, nickel-plated
- Connector contacts : Gold-plated
- Spring and gauge head : Stainless steel ("T")

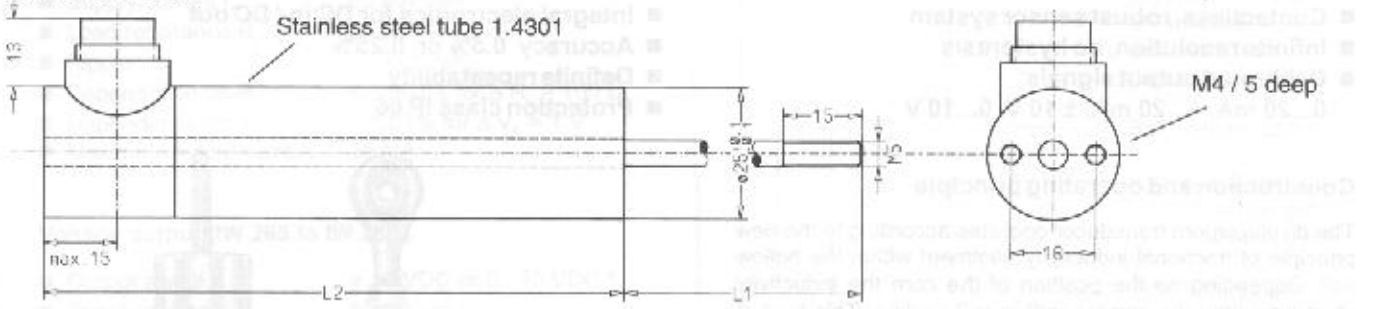
Lengths and masses (refer to drawings page 3)

Type	L1* mm	L2 mm	without plunger g	plunger only g	BM mm	BI mm
IW 250/20	40	110	250	15	70	88
IW 250/40	50	140	290	18	70	98
IW 250/100	80	250	440	13	140	198
IW 250/200	130	500	750	56	-	-
KV or KFN :	20 g	Mating plug BI 681 (IP 40) : 30 g				
KFN :	55 g	Mating plug BI 723 M (IP 66) : 75 g				

* Plunger in central position: I_a = 10 (12) mA, resp. V_a = 0 (5) V.

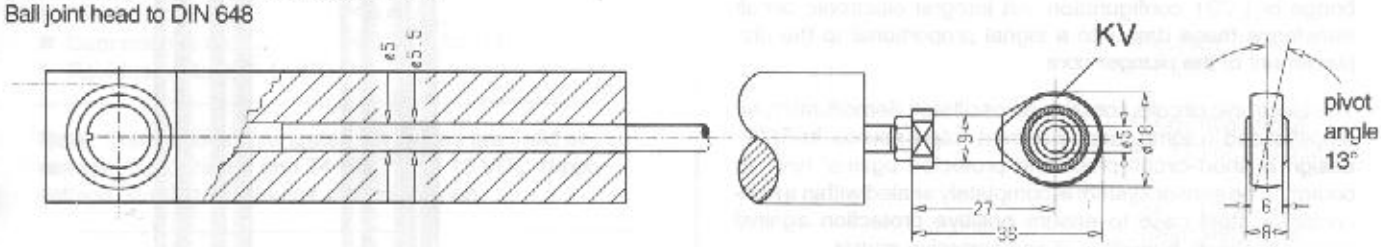
Dimensions in mm

Standard version

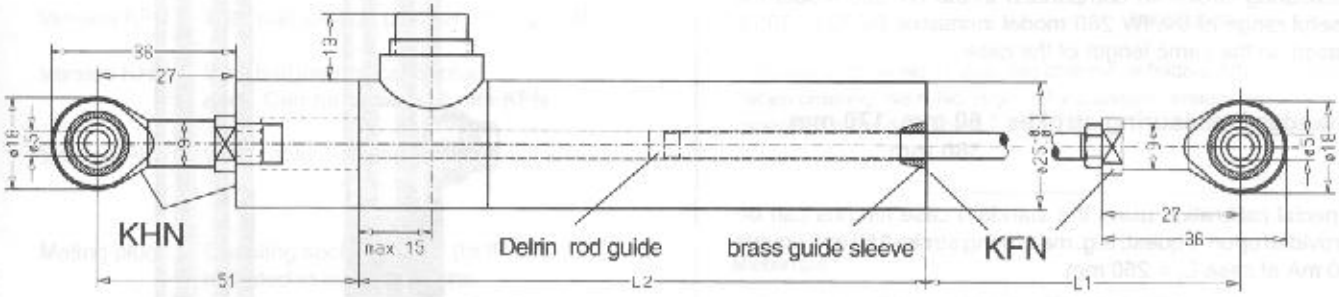


Version with ball joint on plunger (KV)

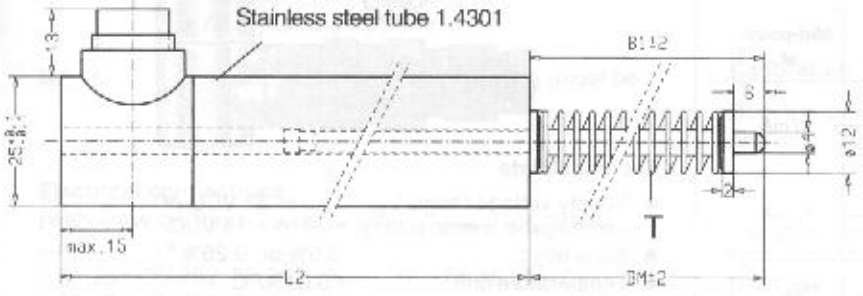
Ball joint head to DIN 648



Version with ball joints on plunger (KFN) and on end of case (KFH)

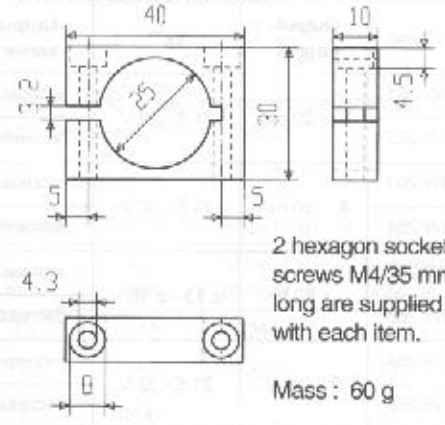


Gauge version (T) with return spring (only up to 100 mm stroke)



BM = Plunger in central position
B1 = Plunger full out

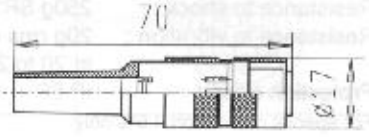
MB 25 Mounting block (brass Nickel plated) (to be ordered separately)



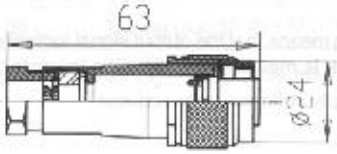
2 hexagon socket screws M4/35 mm long are supplied with each item.

Mass : 60 g

Mating Plugs



Metal case (included in supplied items)
BI 681 3PS or 4PS (IP40)



Metal case with outer ring connected to ground (must be ordered separately) . BI 723M 3PS or 4PS (IP66)