



- **Contactless, robust sensor system**
- **Internal electronics**
- **Standard measuring strokes:
80, 170, 240 or 360 mm**
- **Resolution 12 bit / binary**
- **Interface according to CANopen Application Layer and Communication Profile, CiA Draft Standard 301, Version 4.1 and to Device Profile for Encoders CiA Draft Standard Proposal 406 Version 3.0**
- **CANopen Layer Setting Services (LSS) for address and Baud rate**
- **Protection class IP 66**



KEY INFORMATION OVERVIEW

DESIGN & FUNCTION

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 more position data than the classical half-bridge or LVDT configuration on the same length of the transducer. An internal 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 a micro-processor with integral CAN interface.

The 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.

The power supply pins are 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 electrical connection is provided via M12 connector or via cable exit.

Versions with spring and gauge head (both stainless steel) are available on request.

FEATURES INTERFACE

The IWN transducer is conform to the CANopen interface for Encoders to the CiA specification DSP 406 / Class 1 and Class 2.

Besides administrative and predefined messages such as Emergency-Messages and Synchronization, support is given by Service Data Objects (SDOs) and Process Data Objects (PDOs).

PDOs are used for data exchange between master and slave, SDOs are used for direct reading and writing access to object registers between master and slave. The main application of SDOs is the device configuration, e.g. modification of the transmission type Tx-PDO-Object 1800_h.

TECHNICAL DATA

ELECTRICAL DATA*

Sensor system	inductive
Operating voltage	+ 21.5 to + 30 VDC
Operating current	60 mA typ. / 90 mA max.
Independant linearity	0.5 % or 0.25 %
Measuring frequency	100 Hz max.
Temperature drift	< 0.01 %/K
Dependence from V_S	< 0.05 % at $\Delta V_S = 1 V$
Stability	< 0.1 % within 24 h
Resolution	12 bits at full scale
Output code	Natural binary

CANOPEN FEATURES

CAN-interface	ISO/DIS 11898 (physical)
Terminating resistance	to install externally by customer
Max. transfer length	200 m **
NMT Master	no
NMT-Slave	yes
Maximum boot up	no
Minimum boot up	yes
COB ID distribution	Default, SDO
Node ID distribution	via Index 2000 oder LSS
No of PDOs	2 Tx
PDO modes	sync, async, cyclic, acyclic
Variable PDO-mapping	no
Emergency message	yes
Heartbeat	yes
No. of SDOs	1 Rx / 1 Tx
Device profile	CiA DSP 406 Version 3.0
Datarate (Object 2001)	20, 50, 125, 250, 500, 800 kBaud or 1 MBaud (adjustable via LSS), default: 20 kBaud
Node address (Object 2000)	1-127 (adjustable via LSS), default: 1
Cycle time	0 to 65,535 ms
Alarms	Device specific error (e.g. EEPROM-error, CRC-error, internal-error, sensor-error, ...)

ENVIRONMENTAL DATA

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	IP66
Standard measuring strokes	80 mm, 170 mm, 240 mm, 360 mm

MATERIALS

External and internal tube	Chrome-nickel steel
Plunger	Chrome-nickel steel
Core	Mu-metal
Sealing plug	Delrin

CALIBRATION

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

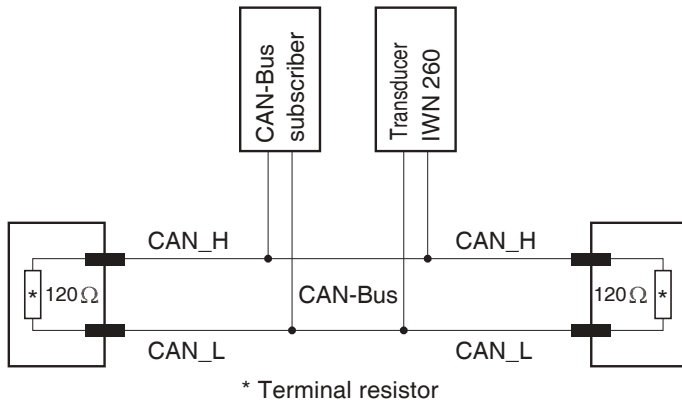
Up on request the measuring stroke can be reduced without affecting neither the resolution nor the case length, e.g. 200 mm measuring stroke (IWN 260/200) will be generated by using IWN 260/240.

The measuring signal increases when the plunger moves in direction of the connector. Upon request the reverse action can be calibrated before delivery. The measuring direction can also be switched in the CANopen parameters.

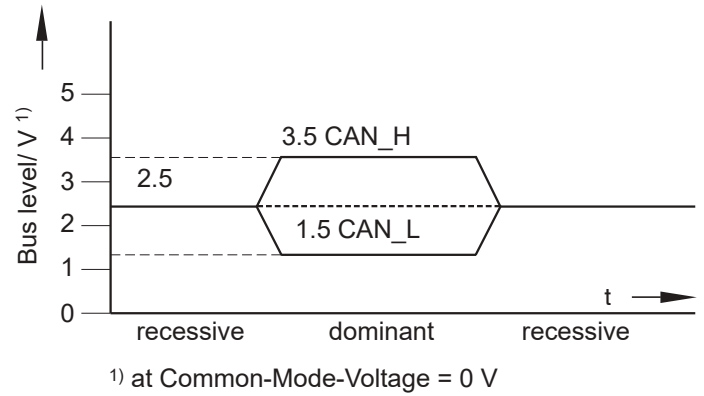
* Unless otherwise stated, all values are valid at + 20 °C ambient temperature and + 24 VDC supply voltage, 10 minutes after switch-on.
 ** No electrical separation between supply voltage and bus lines (ref. CiA DS301).

PRODUCT CHARACTERISTICS

BUS CONNECTION AS PER ISO/DIS 11898



OUTPUT LEVEL AS PER ISO/DIS 11898



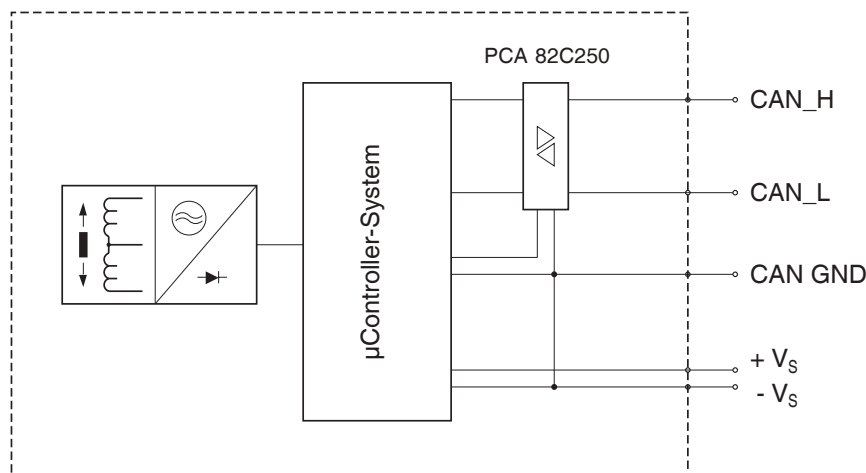
DATA FORMAT

Byte 0								Byte 1							
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
												0	0	0	0
LSB								MSB							

data position

TECHNICAL DATA

PRINCIPAL CIRCUIT DIAGRAM



TECHNICAL DATA

LENGTHS AND MASSES

(refer to installation drawings [page 7](#))

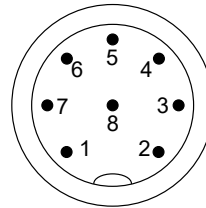
Type	L1* [mm]	L2 [mm]	without plunger [g]	plunger only [g]
IWN260/80	70	140	240	19
IWN260/170	115	250	380	31
IWN260/240	150	350	540	40
IWN260/360	210	500	720	56
KV or KFN				22
KHN				55

ELECTRICAL CONNECTION - PINOUT

IWN260 WITH CONNECTOR M12, A-CODED, 8-POLE, PINS

View of plug-in side.

Pin	Signal
1	+V _S (24 VDC)
2	-V _S (0 VDC)
3	CAN +
4	CAN -
5	CAN GND (bridged with -V _S)
6	Reserved
7	Reserved
8	Screen



IWN260 WITH CABLE EXIT

Transducers with cable exit are delivered with an additional Sub-D connector for testing purposes.

Color	Signal	Pin on Sub-D
Red	+V _S	6
Blue	-V _S (0V, CAN_GND)	7
White	CAN_H	1
Brown	CAN_L	2

* L1 = Plunger in central position: 2048 steps

ORDER CODE FORMAT

IWN260 / **170** - **0,5** - **KFN** - **KHN** - **K2** - **C2** - **N01** | **STANDARD VERSION**

IWN260	Inductive linear displacement transducer		
170	Measuring stroke	80 170 240 360	Measuring stroke in mm
0,5	Accuracy	0,25 0,5	0.25 % 0.5 %
KFN	Ball joint (front)	KV KFN	Ball joint on plunger, without guide Ball joint on plunger, with guide (Versions without ball joint at front: leave blank)
KHN	Ball joint on case (back)	KHN	Ball joint on case (Versions without ball joint at back: leave blank)
K2	Cable	Kx	Cable exit (x: length in m) (Versions with plug M12: leave blank)
C2	Profile	C2	CANopen - profile C2 CIA DSP 406 revision 3.0
N01	Electrical and mechanical variants*	01	Standard

ACCESSORIES (SELECTION) - TO BE ORDERED SEPARATELY

MATING CONNECTORS

STK8GS53 Counter connector straight, plastic, see datasheet [14568](#))

STK8GS54 Counter connector straight, metal, see datasheet [14567](#))

MOUNTING BLOCK

MB 25 Mounting block with clamp fixing ([page 8](#))

PROTECTIVE TUBE

SR Protective tube in stainless steel, to protect plunger (rod) against lateral stress, see datasheet [11537](#))

* The basic versions according to the data sheet bear the number 01. Deviations are identified with a variant number and are documented at TWK.

DOCUMENTATION

DOCUMENTATION

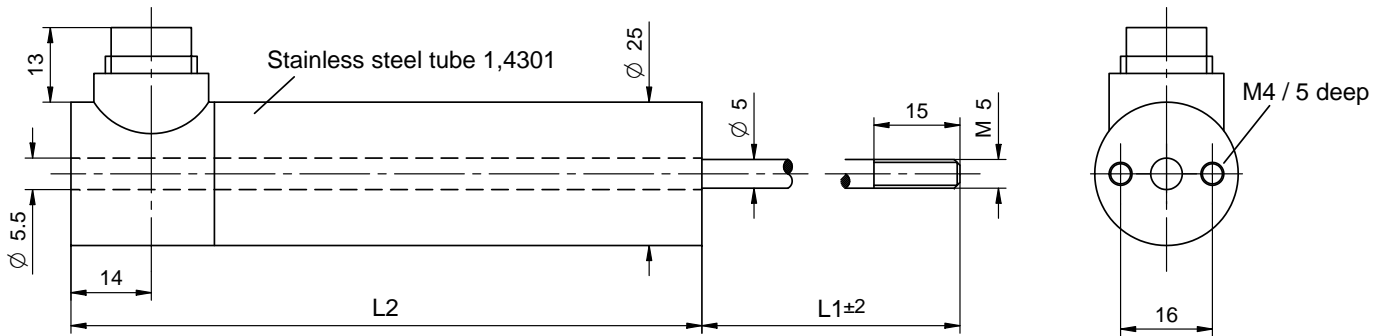
The following documents can be found in the Internet under www.twk.de/en in the documentation area, model IWN260.

Data sheet	IWN17220
Manual	IWN11307
Reach compliant	QS15286
RoHS compliant	QS13284
CE Declaration of conformity	ZE12467
UKCA Declaration of conformity	ZE16569
EDS-file	upon request

INSTALLATION DRAWINGS

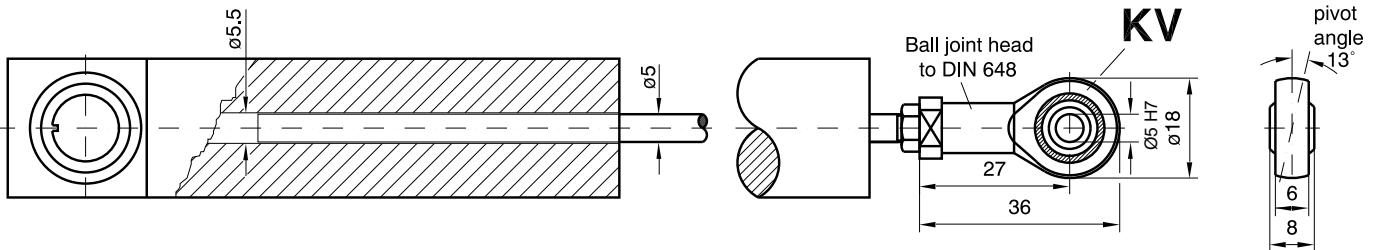
STANDARD VERSION (WITHOUT ROD GUIDE)

Dimensions in mm



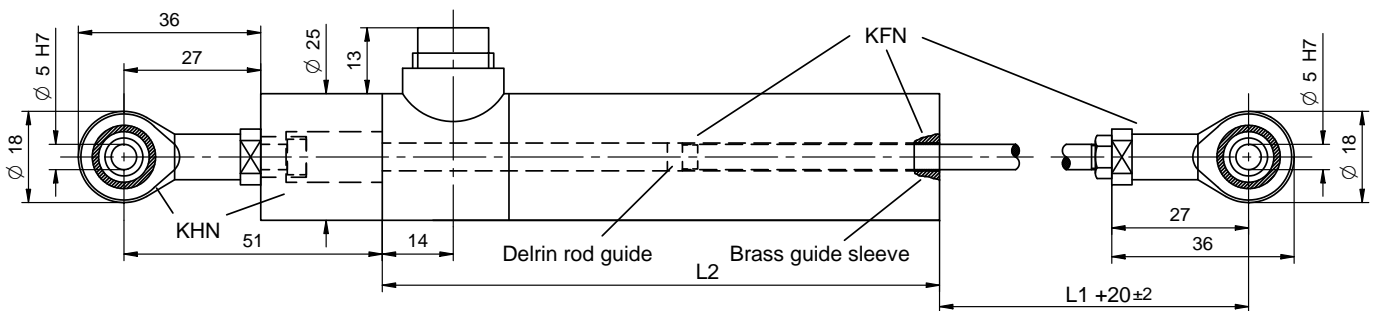
VERSION WITH BALL JOINT ON PLUNGER (KV) (WITHOUT ROD GUIDE)

Dimensions in mm



VERSION WITH BALL JOINTS ON PLUNGER (KFN) AND ON END OF CASE (KHN) (WITH ROD GUIDE, CAPTIVATED)

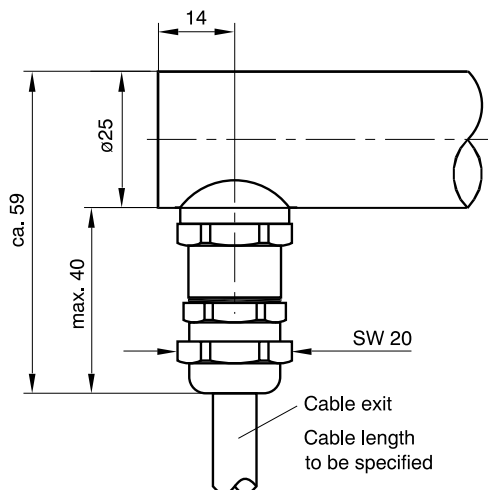
Dimensions in mm



INSTALLATION DRAWINGS

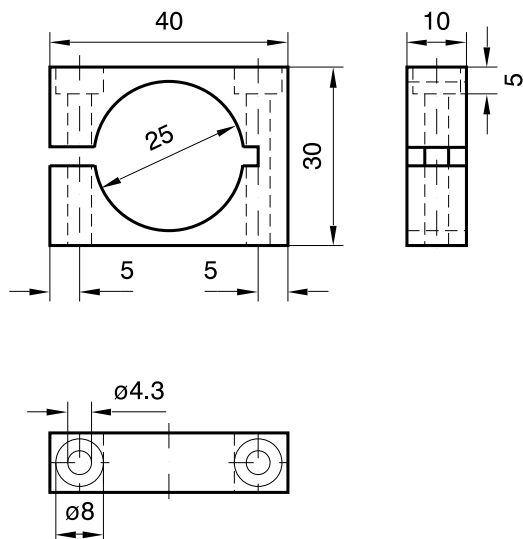
VERSION KX WITH CABLE EXIT AND GLAND

Dimensions in mm



MB25 MOUNTING BLOCK, BRASS NICKEL PLATED (TO BE ORDERED SEPARATELY)

Dimensions in mm



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

Mass: 60 g