

Inductive Transducers in Cylindrical Metal Housing

11

Product group

A W A F A W A X A W U X

Application

The inductive transducer is a linear system for measuring travel. It can either be flanged to a solenoid or to any other object to be measured. The core, which can be moved within the coils, has to be connected to the object to be measured via the threaded pin. Special features of MSM transducers are high resolution, good linearity and long service life.

In connection with control electronics and a proportional solenoid you get a complete travel-control system. Mounting by centre thread. For applications under pressure, sealing between pressure-tight tube and the solenoid or valve through O-ring.

Function

Function of the inductive transducer is based on the principle function of a differential transformer. The electronics integrated in the device supply the primary coil, evaluates voltage induced in the secondary coils and provides a defined output signal.

Design features

- Limiting frequency 500 Hz
- Suitable for dry and pressure-tight applications
- Pressure-tight tube, designed for 350 bar static pressure
- Mounting by centre thread
- Electrical connection and protection rating if mounted properly:
 - Connection with built-on plug by round plug M12x1, 4-pole
 - Protection to DIN VDE 0470 / EN 60529 – IP 65
- Electronic zero-point adjustment from the outside
- Threaded pin for fastening the core to the object to be measured
- EMC: To EMC guideline 89/336/EWG



Fig. 1: A W A X 004 A01



Technical data

		A WAX 004 A01	A WU X 008 A01
Measuring path	(mm)	± 4	± 8
Supply voltage	(\approx V)	18 ... 32	24 ± 10 %
Current consumption	(mA)	< 60	< 35
Sensitivity	(V/mm)	1	0,25
	(mA/mm)	2	
Output voltage	(\approx V)	10 ... 2	5,5 ... 9,5
Output current	(mA)	20 ... 4	
Linearity tolerance	(%)	± 1	± 1
Top limiting frequency (3 dB)	(Hz)	typ. 500	500
Reference temper. range	(°C)	-20 ... +75	-20 ... +75
Temperature drift	(% / K)	typ. 0,05	typ. 0,05
Load resistance	(kΩ)	> 5 (short-circuit proof)	> 5
Load on output current	(Ω)	< 500	< 500
Declaration of conformity		DC 009361	DC 009454

		A WA X 015 A01	A WA F 025 A01
Measuring path	(mm)	± 15	± 25
Supply voltage	(\approx V)	24 ± 10 %	18 ... 30
Current consumption	(mA)	< 60	< 70
Sensitivity	(V/mm)	0,26	0,16
	(mA/mm)	0,53	0,32
Output voltage	(\approx V)	2 ... 10	2 ... 10
Output current	(mA)	4 ... 20	4 ... 20
Linearity tolerance	(%)	± 1 %	± 1 %
Top limiting frequency (3 dB)	(Hz)	500	500
Reference temper. range	(°C)	-20 ... +75	-20 ... +75
Temperature drift	(% / K)	typ. 0,05	typ. 0,05
Load resistance	(kΩ)	>5	> 5
Load on output current	(Ω)	< 500	< 500
Declaration of conformity		DC 009472	DC 009471

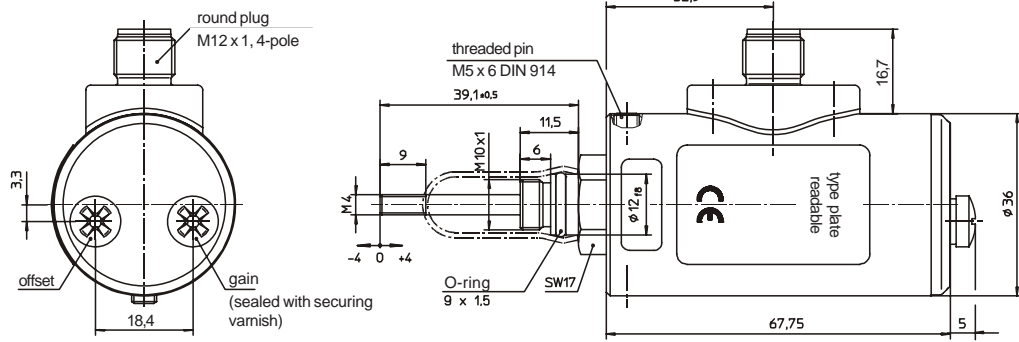


Fig. 2: Types A WA X 004 A01

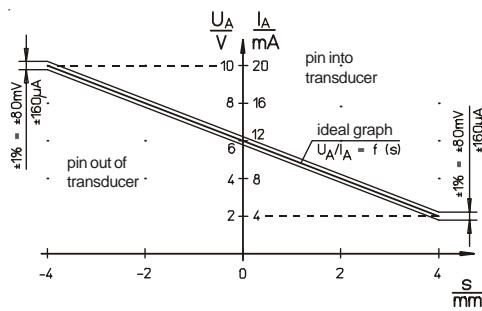


Fig. 3: Current vs voltage diagram for transducer with electronics A WA X 004 A01

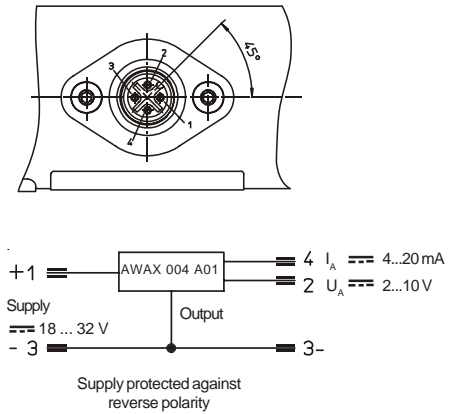


Fig. 4: Block diagram A WA X 004 A01
Built-in electronics protected against incorrect polarity at 1 and 3

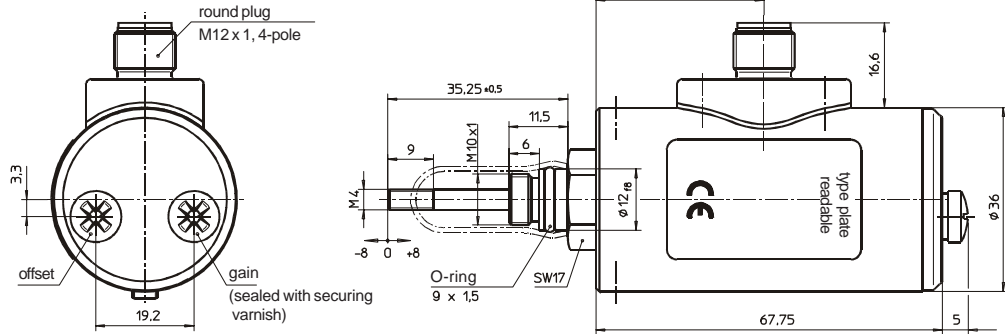


Fig. 5: Type A WU X 008 A01

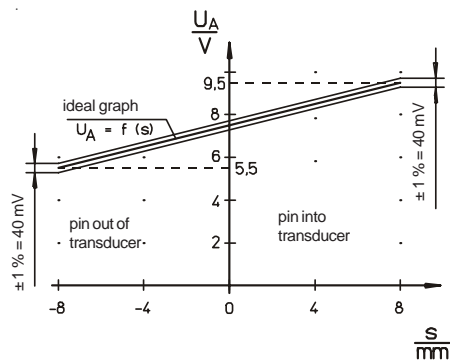


Fig. 6: Current vs voltage diagram for transducer with electronics A WU X 008 A01

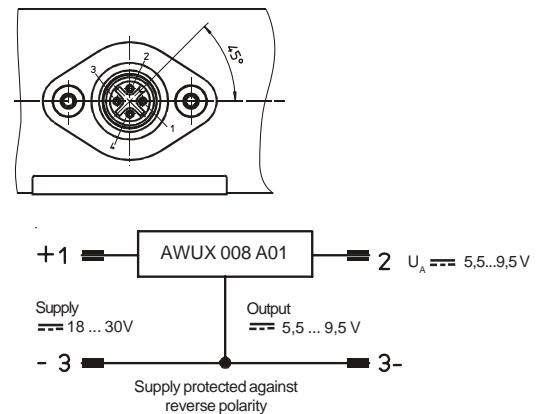


Fig. 7: Block diagram A WU X 008 A01
Built-in electronics protected against incorrect polarity at 1 and 3

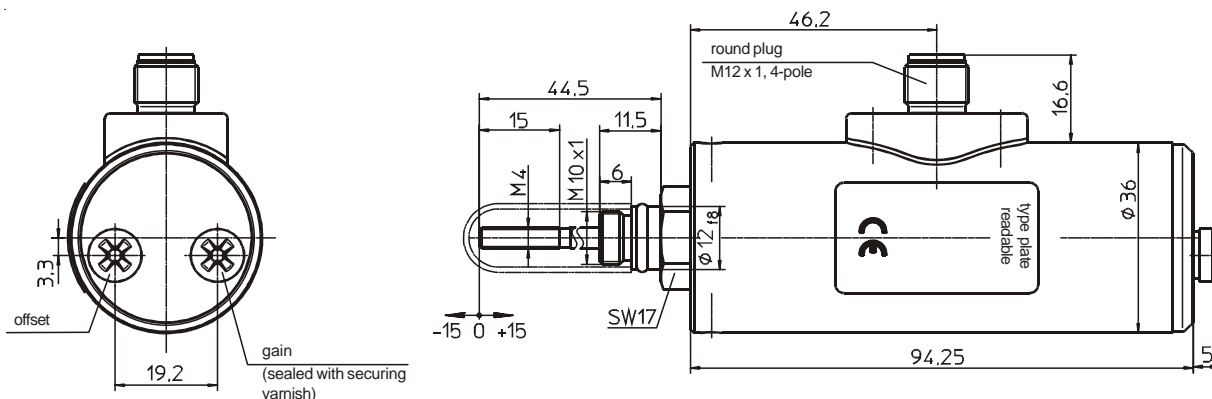


Fig. 8: Type A WA X 015 A01

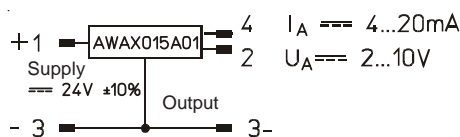
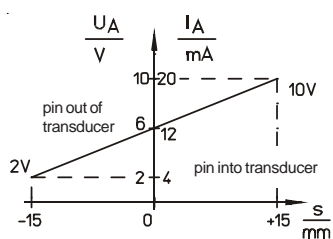


Fig. 9: Voltage vs travel diagram for transducer with electronics A WA X 015 A01

Fig. 10: Connection diagram A WA X 015 A01 Built-in electronics protected against incorrect polarity at 1 and 3

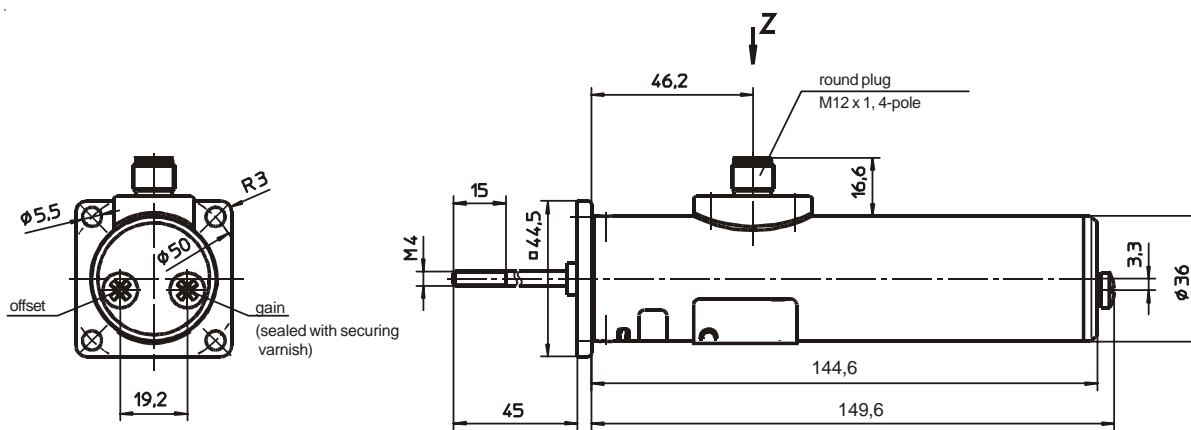


Fig. 11: Type A WA F 025 A01

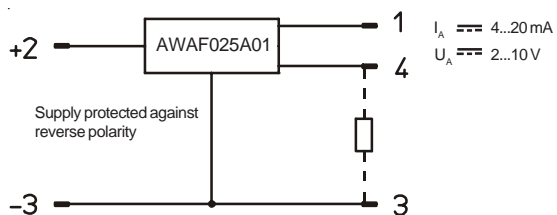


Fig. 12: Connection diagram A WA F 025 A01 Built-in electronics protected against incorrect polarity at 2 and 3

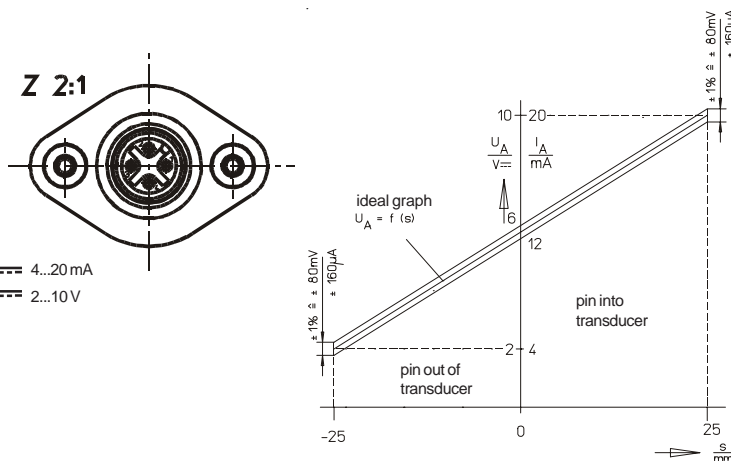


Fig. 13: Voltage vs travel diagram for transducer with electronics A WA F 025 A01

Sensitivity

Sensitivity is the change in the output signal with reference to the change in the measuring path (indicated in V/mm or $\frac{\text{mA}}{\text{mm}}$ resp.).

$$\text{Sensitivity} = \frac{\Delta U}{\Delta s}$$

Linearity error

The linearity error indicates the deviation of the output signal from the ideal graph in per cent.

$$\text{deviation}_{\text{Lin}} = \frac{(U_{\text{actual}} - U_{\text{nominal}})}{U_{\text{voltage stroke}}} \times 100 \%$$

Temperature drift

Temperature drift indicates in per cent the deviation of the output signal per degree of temperature change (shown in % / °K).

$$\text{deviation}_{\text{Temp.}} = \frac{(U_{\text{Temp}} - U_{20^\circ \text{C}})}{U_{\text{voltage stroke}} \times \Delta T} \times 100 \%$$

For voltage values V, also current values I can be put in.

Note on the technical harmonisation guidelines within the EU:



The device has been EMC tested and conforms with the regulations of EU guideline 89/336/EWG.

On request, conformance with standards can be confirmed.

High-voltage test: Short-circuited connector pins against housing to DIN VDE 0580.


Type code

	A	W	A	X	004	A01
Equipment group						
Transducer type (W: travel)						
E: with electronics - X: without electronics - I: Current port						
A: voltage and current port - U: voltage port						
X: centre mounting - F: flange mounting						
Measuring range (± 4 mm travel)						
Design number						

Order Example

Type A W A X 004 A01
Voltage **==** 24 V DC

Specials

Please do not hesitate to ask us for application-oriented problem solutions. In order to find rapidly a reliable solution we need complete details about your application conditions. The details should be specified as precisely as possible in accordance with the relevant  - technical explanations.

If necessary, please request the support of our corresponding technical office.