MAGNET-SCHULTZ

Your Specialists for electromagnetic Solutions

Inductive transducer in round metal housing

Application

The inductive transducer is used for measuring of displacements. It can either be flange-mounted at a solenoid and at other measuring objects. The core which can be moved within the coils has to be connected to the measuring object with a threaded rod. The MSM transducers are characterized by high resolution, good linearity and long service life.

In conjunction with a control and a proportional solenoid the result is a complete displacement control system.

Function

The function of the inductive transducer bases on the principle of the differential transformer. The device has to be connected to AC voltage. The difference of the voltage induced in the secondary coils - under consideration of the phase position - is a unit of measurement for the position of the core.

Fig. 1: A WX X 010 A01

Construction characteristics

- Optimized temperature drift
- Suitable for dry and pressure-tight applications
- Pressure-tight tube, designed for 350 bar static pressure
- Mounting via fit at the tube
- Electrical connection and protection class when properly installed:
  - Connection via free lead ends with contacts and connector housing
    Protection class according to DIN VDE 0470/ DIN EN 60529 – IP 54
- Threaded rod for fastening the core with the measuring object
- Version according to ATEX on request

Technical data

		A WX X 007 A01	A WX X 010 A01
Measuring path	(mm)	± 4.5 / ± 7.5 mm	± 10
Supply voltage U_B (recommended)	(~ $V_{r\,ms}$)	3.54	3
Supply frequency	(kHz)	5	2.5
Sensitivity	$\left(\frac{mV}{mm}\right)$	60 ± 5 %	27 ± 5 %
Output voltage (effective value)	(~ $V_{r\,ms}$)	0 ... 1.59	0 ... 0.27
Input impedance (impedance of the primary bobbin)	(Ω)	≥ 380	≤ 160
Output impedance (impedance of the secondary bobbin)	(Ω)	≤ 1500	≤ 400
Linearity tolerance	(%)		± 1
Up to s = 4.5 mm	(%)	± 0.6	
Up to s = 7.5 mm	(%)	± 3	
Reference temperature range	(°C)	- 20 ... + 90°	- 20 ... + 90°
Temperature drift	(% / K)	0.015	0.007

Sensitivity for A WX X 007 A01

The sensitivity is the change of the output voltage ΔU, referring to the change of the measurement path Δs and the supply voltage U_B

(indicated in $\left[\frac{mV}{V \cdot mm}\right]$).

$$\text{Sens.} = \frac{\Delta U}{U_B \times \Delta s} = \frac{U_{A1} - U_{A2}}{U_B \times (s_1 - s_2)}$$

Tolerance of the linearity

The Tolerance of the linearity indicates the deviation in per cent of the output signal of the ideal straight line.

$$\text{Dev.}_{Lin} = \frac{|U_{actual} - U_{target}|}{U_{Voltage\ stroke}} \times 100\ \%$$

Temperature drift

The temperature drift indicates the deviation in per cent of the output signal per degree of temperature change (indicated in % / K)

$$\text{Dev.}_{Temp.} = \frac{|U_{Temp} - U_{20°\ C}|}{U_{Voltage\ stroke} \times |\Delta T|} \times 100\ \%$$

Sensitivity for A WX X 010 A01

The sensitivity is the change of the output voltage ΔU, referring to the change of the measurement path Δs.

(indicated in $\left[\frac{mV}{mm}\right]$).

$$\text{Sens.} = \frac{\Delta U}{\Delta s} = \frac{U_{A1} - U_{A2}}{s_1 - s_2}$$

Output voltage for A WX X 010 A01

The output voltage U_A is calculated from the secondary voltages (U_{sek1} ; U_{sek2})

$$\text{Output signal } U_A = \frac{(U_{sek1} - U_{sek2})}{(U_{sek1} + U_{sek2})}$$
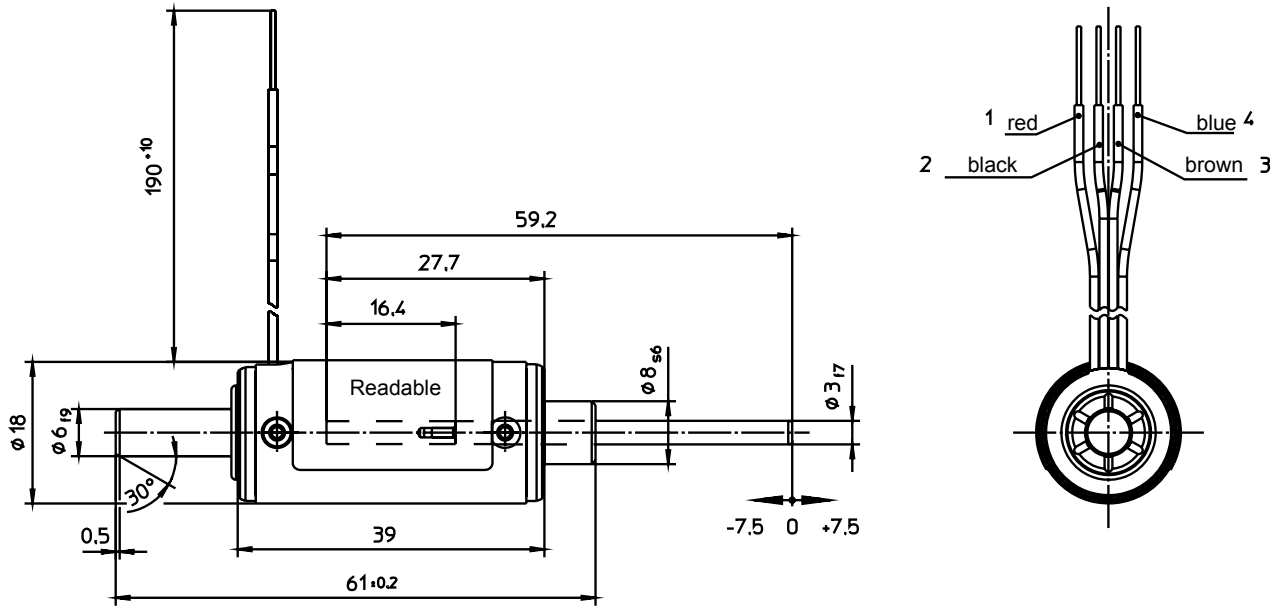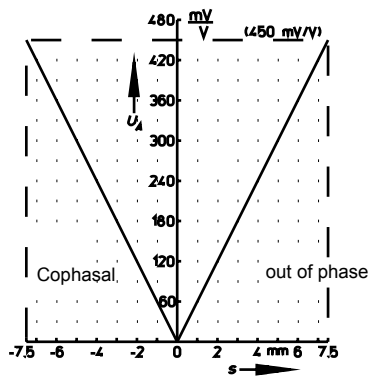
Dimensional drawing

Fig. 2: Type A WX X 007 A01

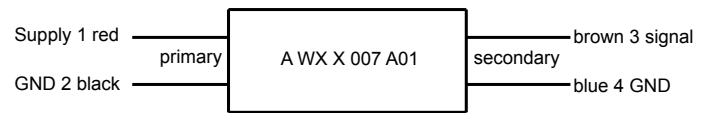**Fig. 3:** voltage path diagram for
transducer A WX X 007 A01

Supply 1 red — primary — A WX X 007 A01 — secondary — brown 3 signal
GND 2 black — — — blue 4 GND

Fig. 4: Connection diagram A WX X 007 A01

1 red   blue 4
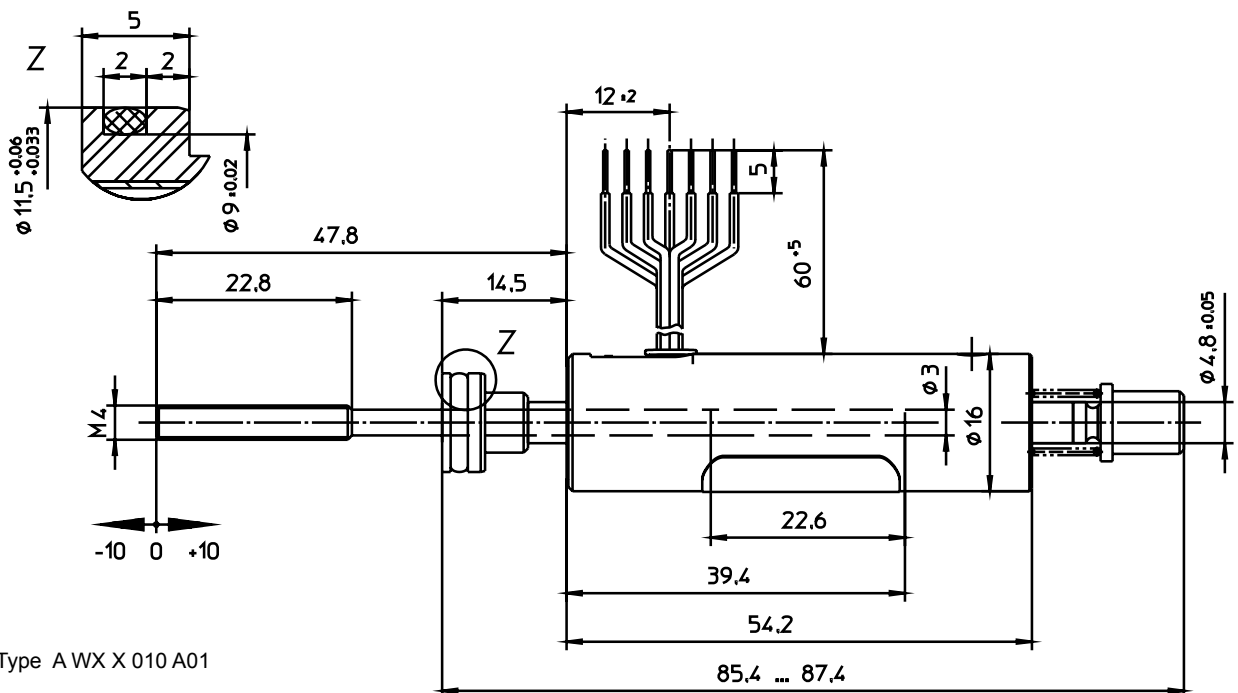2 black   brown 3

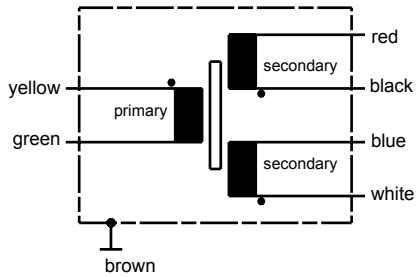Cophasal   out of phase

Fig. 5: Type A WX X 010 A01

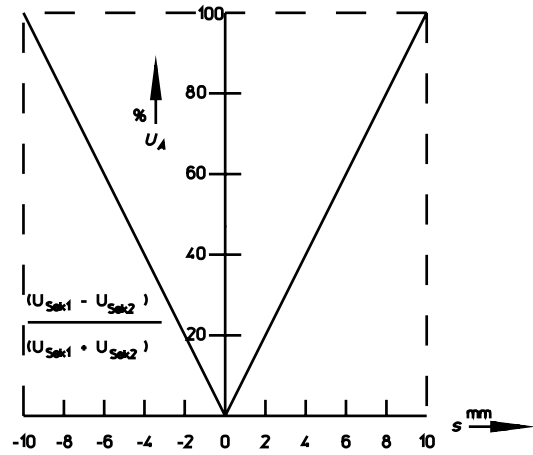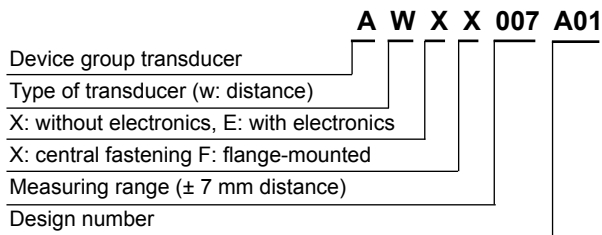**Fig. 6:** Connection diagram A WX X 010 A01

Fig. 7: Voltage vs displacement diagram
for transducer A WX X 010 A01

Information and remarks concerning European directives can be taken from the correspondent information sheet which is available under *Produktinfo.Magnet-Schultz.com*.

Please make sure that the described devices are suitable for your application. Our offers for these devices are based on the assumption of maximal 8 in an FMEA severity table, i. e. in case of malfunction of the device model as offered, there is, amongst others, no jeopardy of life or limb. Supplementary information concerning its proper installation can be taken also from the ⬤ –Technical Explanation, the effective DIN VDE0580 as well as the relevant specifications.

This part list is a document for technically qualified personnel.

The present publication is for informational purposes only and shall not be construed as mandatory illustration of the products unless otherwise confirmed expressively.

Type code

```
                    A  W  X  X  007  A01
Device group transducer
Type of transducer (w: distance)
X: without electronics, E: with electronics
X: central fastening F: flange-mounted
Measuring range (± 7 mm distance)
Design number
```

Order example

Type   A WX X 007 A01

Specials designs

Please do not hesitate to ask for our assistance with the solution of your application-oriented task. 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.