MAGNET-SCHULTZ

SPECIALISTS FOR ELECTROMAGNETIC ACTUATORS AND SENSORS

QUALITY SINCE 1912

Inductive transducer in round metal housing

11
Product group

A WX X

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.

Construction characteristics

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

Fig. 1: A WX X 010 A01

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	$\left[\dfrac{mV}{V \cdot mm}\right]$	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 signal ΔU referring to the change of the measurement path Δs and the supply voltage U_B

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

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

Linearity error

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

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

Temperature drift

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

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

Sensitivity for A WX X 010 A01

The sensitivity is the change of the output signal ΔU referring to the change of the measurement path Δs

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

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

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

190 +10

59.2

27.7

16.4

Readable

Ø 8 s6

Ø 3 i7

Ø 18

Ø 6 i9

30°

0.5

39

61 ±0.2

-7.5 0 +7.5

1 red   blue 4

2 black   brown 3
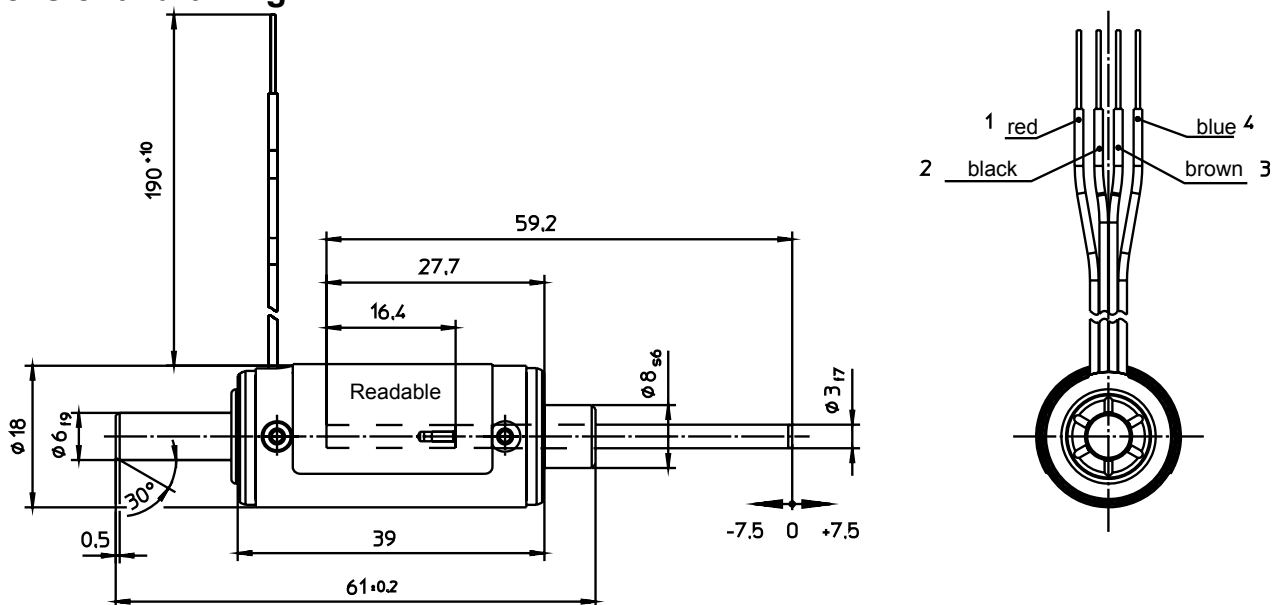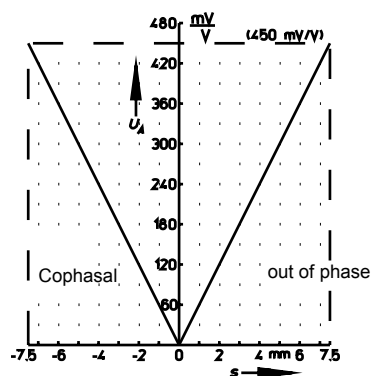
Fig. 3: voltage path diagram for transducer A WX X 007 A01

480 mV/V (450 mV/V)

420

360

U

300

240

180

120

60

Cophasal   out of phase

-7.5 -6 -4 -2 0 2 4 mm 6 7.5

s
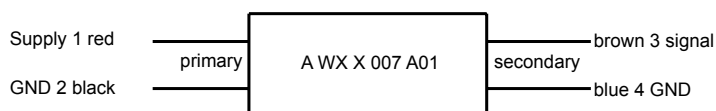
Fig. 4: Connection diagram A WX X 007 A01

Supply 1 red   primary   A WX X 007 A01   secondary   brown 3 signal

GND 2 black   blue 4 GND

Fig. 5: Type A WX X 010 A01

5

2 2

Z

Ø 11.5 +0.06/-0.033

Ø 9 +0.02

12 ±2

5

60 +5

Ø 4.8 ±0.05

47.8

22.8

14.5

Z

M 4

Ø 3

Ø 16

-10 0 +10

22.6

39.4

54.2

85.4 ... 87.4

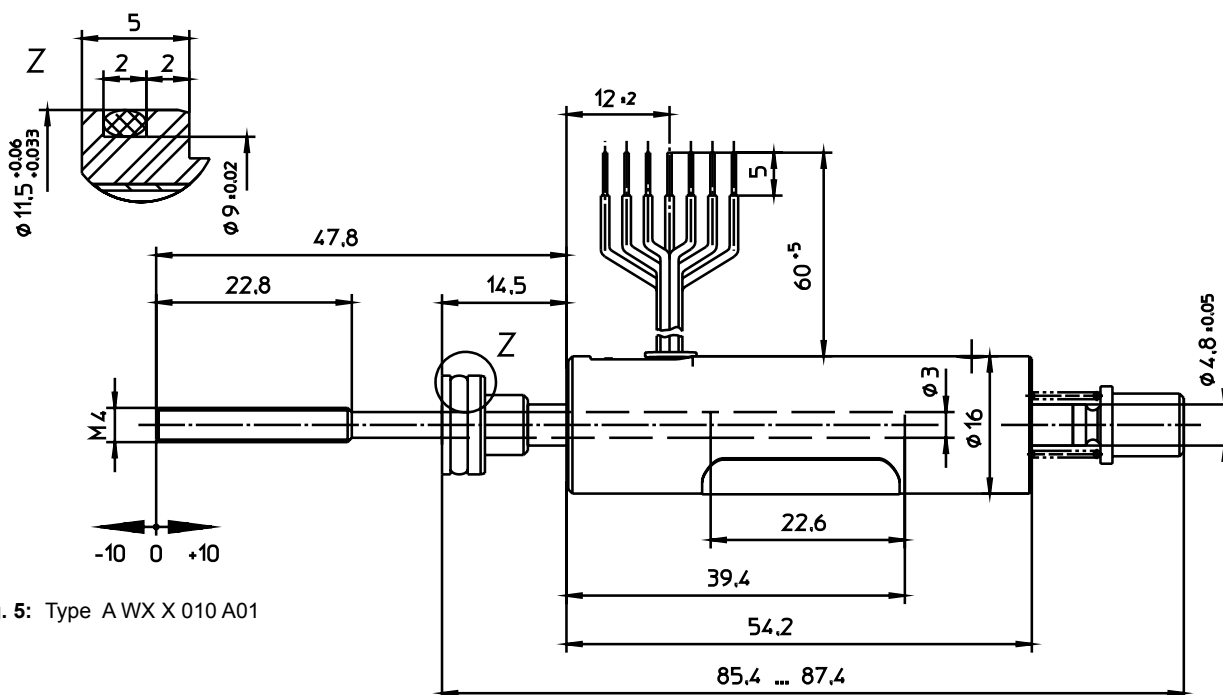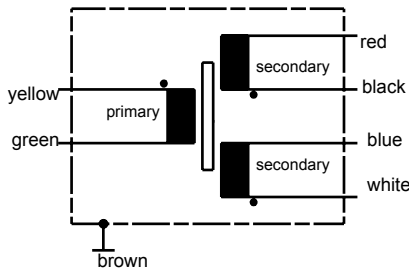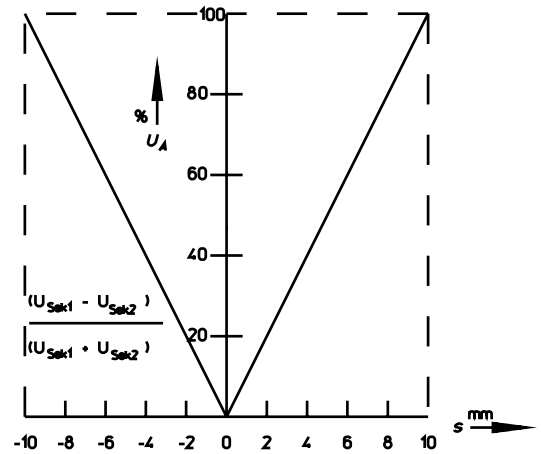**Fig. 6:** Connection diagram A WX X 010 A01

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

This part list is a document for technically qualified personnel. The present publication is for informational purposes only and shall not been construed as mandatory illustration of the products unless otherwise confirmed expressively.
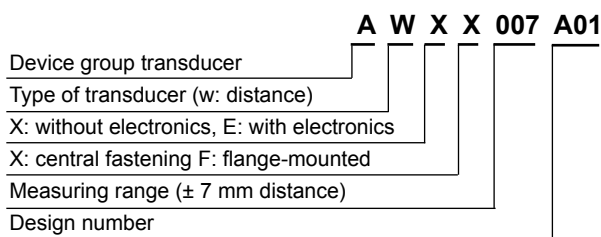
Please make sure that the described devices are suitable for your application. Supplementary information concerning its duly assembly can be found also in ⚙-Technical Explanations, in the effective DIN VDE0580 as well as in the relevant specifications.

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

Note on the RoHS Directive

The devices presented in this document do not fall into the scope of RoHS Directive and to our knowledge they do not become part of products which fall into this scope. In case of surfaces zinc coating with yellow chromating and zinc iron with black chromating separate agreements are necessary for applications within the scope of RoHS.

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 examples:

Type   A WX X 007 A01

Specials designs

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.

Subject to general conditions. For the supply of products and services. Of the electical and electronics industry and ⚙ sales terms.

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