MAGNET·SCHULTZ

SOLENOIDS AND SOLUTIONS

QUALITY SINCE 1912

InductiveTransducer in Metal Housing

11
Product group

A WE F
Pamphlet

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

- Two designs with limiting frequency 20 Hz and 500 Hz
- Suitable for dry and wet applications
- Pressure-tight tube, designed for 350 bar static pressure
- Mounting by square flange
- Electrical connection and protection rating if mounted properly:
  - Connection with built-on plug by Messrs. Binder M12 x 1 – 713 series
  - Protection to DIN VDE 0470 / EN 60529 – IP 65 with sealed read-out potentiometer
- Electronic zero-point adjustment from the outside
- Threaded pin for fastening the core to the object to be measured
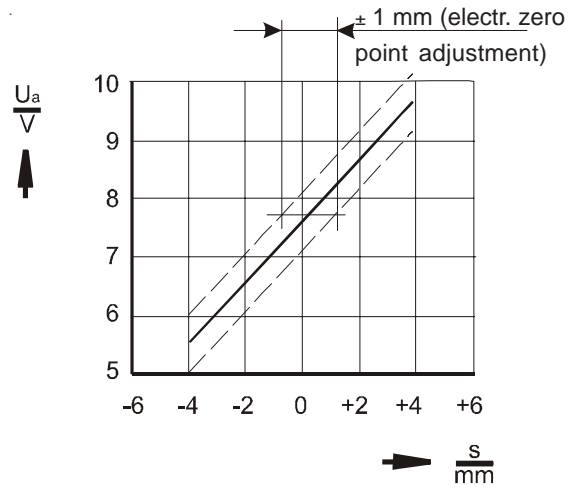- EMC: To EMC guidelin 89/336/EWG

Fig. 1: A WE F 004 A02

Technical data

A WE F 004		A01 A02 A03	A04 A05 A06
Measuring path	(mm)	4	
Supply voltage	($\overline{\cdots}$ V)	24 ± 10 %	
Current consumption	(mA)	< 50	
Sensitivity	$\left(\dfrac{\overline{\cdots}\,V}{mm}\right)$	0.5 ± 1 %	
Output voltage	($\overline{\cdots}$V)	5.5 ... 9.5	
Linearity tolerance	(%)	± 1	
Top limiting frequency (-3 dB)	(Hz)	typ. 20	typ. 500
Reference temper. range	(°C)	0 ... + 50	
Temperature drift	(% / °C)	typ. 0.05	
Load resistance	(kΩ)	> 5	

Fig. 2: Voltage vs stroke diagram for transducer with integrated electronic

Sensitivity

Sensitivity is the change in the output signal (ΔU) with reference to the cange in the measuring path (Δs indicated in V/mm).

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

Linearity error

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

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

Temperature drift

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

$$\text{deviation}_{temp.} = \frac{(U_{temp} - U_{20°\,C})}{U_{voltage\ stroke} \times \Delta T} \times 100\ \%$$
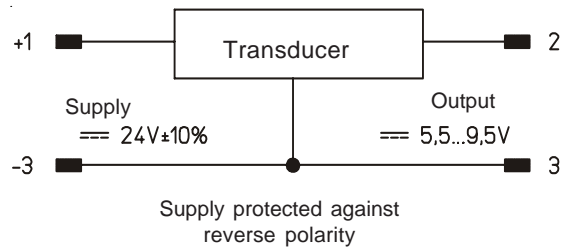
Fig. 3: Block diagram
Built-in electronics protected
against incorrect polarity at 1 and 3

Note on the technical harmonisation guidelines within the EU $\mathbf{C} \mathbf{\epsilon}$
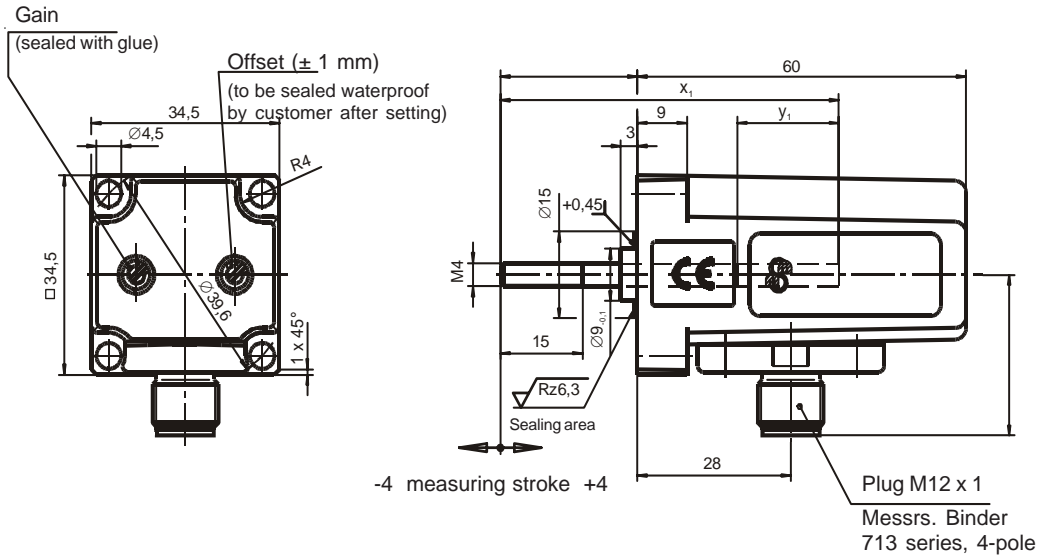
The device has been EMC tested and conforms with the regulations of EU guideline 89/336/EWG.

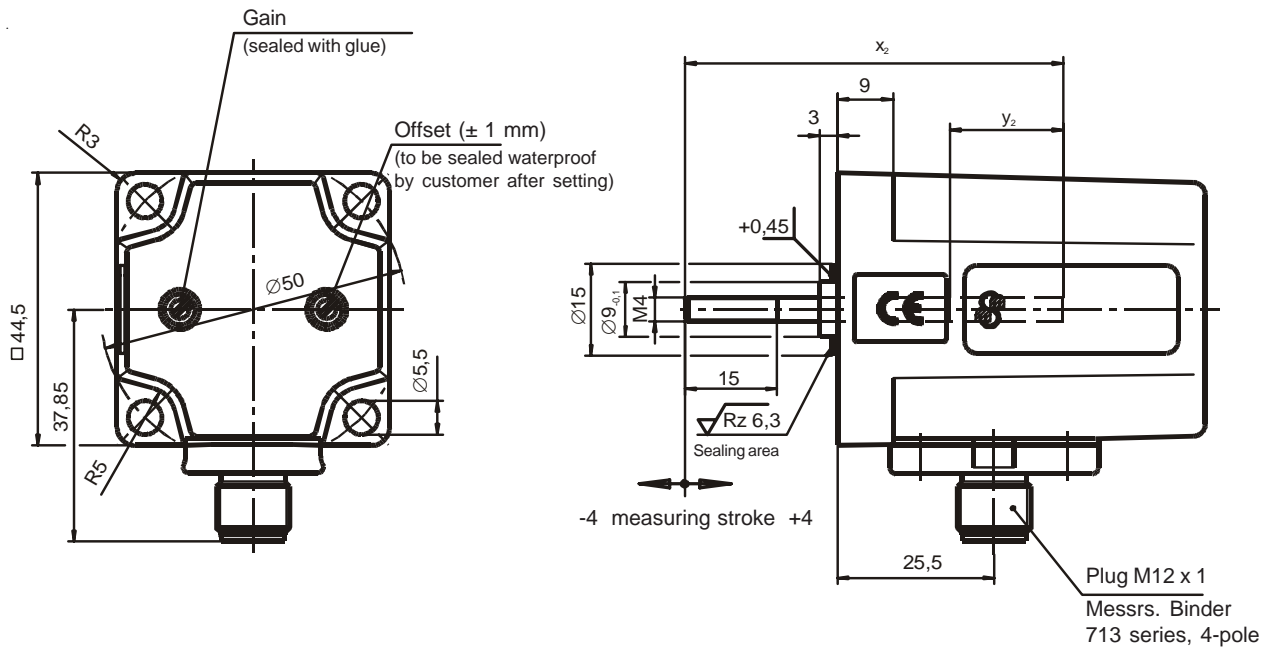On request, conformance with standards can be confirmed.

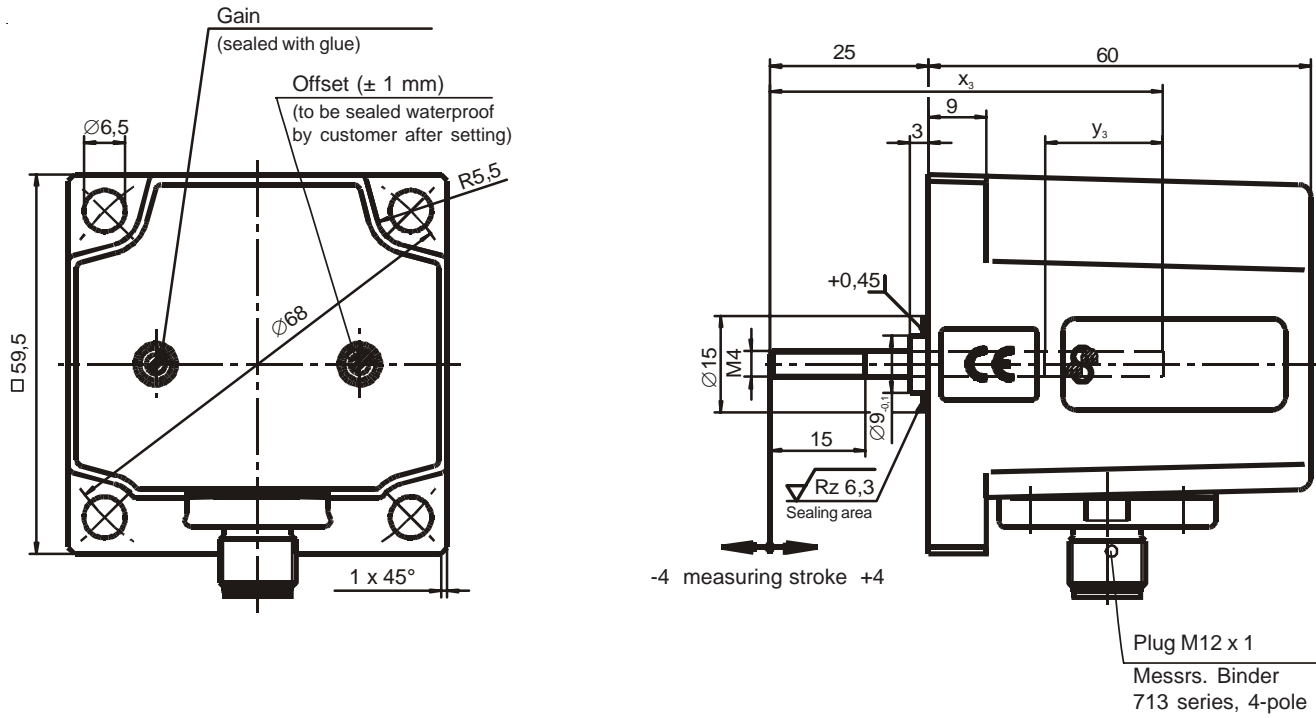High-voltage test: Short-circuited connector pins against housing to DIN VDE 0580.

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Dimensions sheet

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Gain
(sealed with glue)

Offset (± 1 mm)
(to be sealed waterproof
by customer after setting)

34,5

∅4,5

R4

□34,5

∅39,6

1 × 45°

60

x_1

9

3

y_1

∅15 +0,45

M4

∅9 -0,1

15

Rz6,3

Sealing area

28

-4 measuring stroke +4

Plug M12 x 1
Messrs. Binder
713 series, 4-pole

Fig. 4: Types A WE F 004 A01
A WE F 004 A04

Types	x_1	y_1
A WE F 004 A01	61.75	18.5
A WE F 004 A04	68.50	28.0

Gain
(sealed with glue)

Offset (± 1 mm)
(to be sealed waterproof
by customer after setting)

R3

∅50

□44,5

37,85

∅5,5

R5

x_2

9

3

y_2

+0,45

∅15

∅9 -0,1

M4

15

Rz 6,3

Sealing area

-4 measuring stroke +4

25,5

Plug M12 x 1
Messrs. Binder
713 series, 4-pole

Fig. 5: Types A WE F 004 A02
A WE F 004 A05

Types	x_2	y_2
A WE F 004 A02	61.75	18.5
A WE F 004 A05	68.50	28.0

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Gain
(sealed with glue)

Offset (± 1 mm)
(to be sealed waterproof
by customer after setting)

⌀6,5

R5,5

⌀68

□ 59,5

1 x 45°

25   60

x_3

9

3

y_3

+0,45

⌀15
M4
⌀9 -0,1

15

Rz 6,3
Sealing area

-4 measuring stroke +4

Plug M12 x 1
Messrs. Binder
713 series, 4-pole

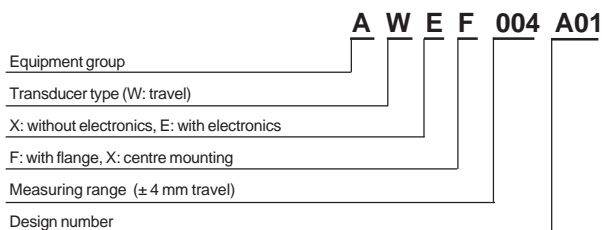| Types	x_3	y_3
A WE F 004 A03	61,75	18,5
A WE F 004 A06	68,50	28,0

Fig. 6: Types A WE F 004 A03
         A WE F 004 A06

R
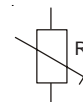
**Electronic zero-
point adjustment**

from the outside

Order Example

Type   A WE F 004 A01
Voltage   ⎓ 24 V DC

Type code

A W E F 004 A01

Equipment group
Transducer type (W: travel)
X: without electronics, E: with electronics
F: with flange, X: centre mounting
Measuring range (± 4 mm travel)
Design number

Specials

Special designs and modifications are available on
request for which full application conditions should
be specified in accordance with our ⑥ -Technical
Explanations.