Absolute linear transducer
Model series PWA

SUPREME SENSORING
TWK

Data sheet No.: PWA 13535 NE
Date: 11.11.2021

- **Contactless, wear-free sensor system**
- **Measuring length: 200 mm**
- **Housing material: Aluminium**
- **Protection type IP67 / IP54**
- **Housing cross-section: 25 mm x 25 mm**
- **Accuracy: ± 0.1%**
- **Programmable measuring range**

Design

The linear transducer model PWA measures the absolute position of the plunger without contact or wear using an inductive resonator measuring system. This consists of an excitation coil which causes an oscillating resonance circuit (moving target) fastened to the plunger to oscillate. This in turn excites the receiver coils fixed in the housing, which are printed on a printed circuit board. The integrated electronics transform these signals (sin/cos) into a signal proportionate to the linear travel. The measuring system is insensitive to electrical and magnetic fields. 0(4) to 20 mA and 0 to 10 VDC are available as standard as analogue signal outputs. CANopen, IO link and SSI are in preparation.

The sensor is equipped with ball joints at the front and rear.

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Technical data, electrical data, mechanical data, environmental data

Technical data

- Sensor system: Inductive resonator measuring system
- Operating voltage range V_S: + 15 VDC to + 30 VDC
- Power consumption: Max. 1.8 W
- Accuracy: ± 0.1%
- Repeatability: ± 0.02%
- Temperature drift: Typ. 0.01% / K
- Measuring frequency / Delay time: 100 Hz / 5 ms
- Measuring length: 200 mm
  (other measuring lengths on request)

Measuring length [mm]	Accuracy [µm]	Repeatability [µm]
200	± 200	± 40

Electrical data

- Current output B: B: 4 to 20 mA
  Burden: 0 ... 400 Ω
- Voltage output C C: 0 to 10 VDC
  Output current: max. 5 mA corresp. to load resistance ≥ 2 kΩ, resistant to short-circuit
- Signal path: 1 = increasing: the output signal increases
  when the plunger is shifted in the direction of the connector.
  2 = decreasing: the output signal decreases
  when the plunger is shifted in the direction of the connector.

Mechanical data

- Mass with 200 mm measuring length: 0.26 kg

Environmental data

- Operating temperature range: - 40 °C to + 85 °C (IP54)
  - 25 °C to + 70 °C (IP67)
- Storage temperature range: - 40 °C to + 85 °C (IP54)
  - 25 °C to + 70 °C (IP67)
- Resistance
  - ☐ To shock: 300 m/s²; 9 ms
    DIN EN 60068-2-27
  - ☐ To vibration: 100 m/s²; 5 Hz ... 2000 Hz
    DIN EN 60068-2-64
- EMC Standards: DIN EN 61 000 - 4 - 2 Immission (ESD)
  DIN EN 61 000 - 4 - 4 Immission (Burst)
  DIN EN 61 000 - 4 - 5 Immission (Surge)
  DIN EN 61 000 - 6 - 4 Emission
- Protection type: IP 67 / IP 54

- Maximum speed of plunger:
  - ☐ IP 67: 0.5 m/s
  - ☐ IP 54: 6 m/s

Temperature	25 °C	40 °C	70 °C
MTTF value	162 years	124 years	59.25 years

Further interfaces (in preparation)

- CANopen: Model PWN
- IO link: Model PWL
- SSI: Model PWE

Order number

PWA	200	-	0,1	-	1	-	KFN	-	KHN	-	R	S	-	67	-	B	01

Electrical and / or mechanical variants*
01 Standard

Electrical output:
B 4 to 20 mA
C 0 to 10 VDC

Protection type:
67 IP 67
54 IP 54

Plug connection:
S Connector **

Connection plug:
R radial

Mounted at rear:
KHN Rear ball joint (see page 5)

Mounted on the plunger:
KFN Ball joint on the plunger (see page 5)

Signal path:
1 = increasing: the output signal increases when the plunger is shifted in the direction of the connector.
2 = decreasing: the output signal decreases when the plunger is shifted in the direction of the connector.

Accuracy:
0,1 ± 0.1%

Measuring stroke:
200 200 mm

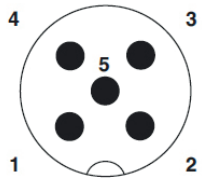
Model:
PWA Analogue linear transducer □ 25 mm

* The basic versions according to the data sheet bear the number 01. Deviations are identified with a variantnumber and are documented in the factory.

** M12×1 standard plug connector, 5-pin, A-coded

Electrical connections, accessories

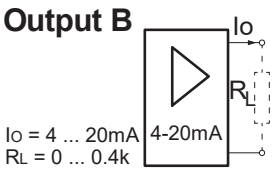
Diagram of pin configuration connector M12x1 (view of connector side)



Pins, 5-pin, A-coded

Connector assignment	
Pin	Function
1	$+V_S$
2	I_O
3	$-V_S$ (GND)
4	V_O
5	Teach pin

Output circuits



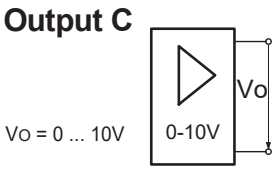


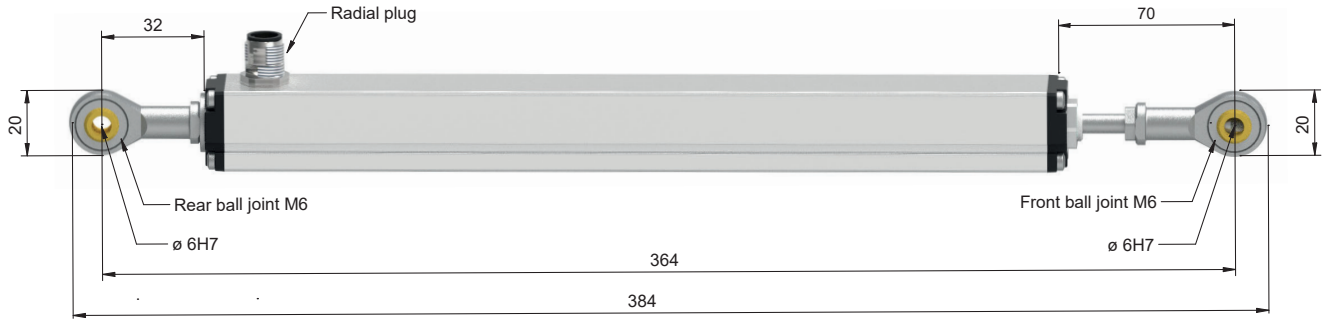
Table for Teach In input (Pin 5)			
Function	Action	Time	Note
Set LOW-value of measurement range	Connect Pin 5 and Pin 3 (GND)	2 sec	On the current position the signal will be set to the LOW-value (e.g. 4mA) of the measurement range *
Set HIGH-value of measurement range	Connect Pin 5 and Pin 1 ($+V_S$)	2 sec	On the current position the signal will be set to the HIGH-value (e.g. 20mA) of the measurement range *
Set default value inverted	Connect Pin 5 and Pin 3 (GND)	10 sec	All settings of LOW-value and HIGH-value of measurement range are resetted an the signal will be inverted
Set default value	Connect Pin 5 and Pin 1 ($+V_S$)	10 sec	All settings of LOW-value and HIGH-value of measurement range are resetted

* When the LOW or HIGH position value is set, the respective opposite position value for HIGH or LOW is maintained. The measuring range changes accordingly in both cases.

Installation drawing

Dimensions in mm

PWA 200 with front and rear ball joint (KFN-KHN)



Press-travel	=	5 mm
Over-travel	=	5 mm

Accessories (to be ordered separately)

■ Mating connectors

Model	No. of pins	Order number	Ø cable (mm)	Contact design	Connector design	Housing material (screening on the housing)
PWA	5	STK 5GS 56	(4 - 6)	socket	Straight	Metal (nickel-plated brass)
	5	STK 5WS 58	(4 - 6)	socket	Angled	Metal (nickel-plated brass)

Kabel - X - 234

Cable

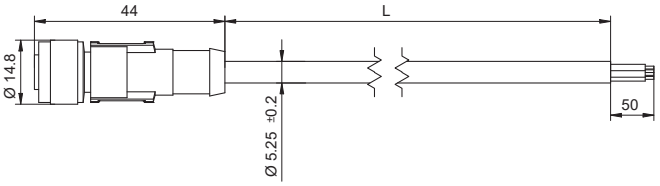
■ Type of cable: M12, 5-pole, female, A-coded with open wire end cable

■ Cable configuration: PUR, 5 x 0.34 mm² (AWG 22), shielded

■ Cable outside diameter: 5.25 mm

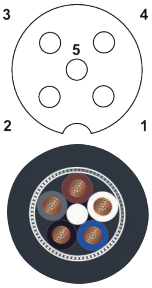
■ Protection grade: IP 67

■ Kabel - X - 234: Data sheet 16235



Order code format

Kabel	- X	- 234
		Cable length (L):
	1,5	1500 mm
	3	3000 mm
	5	5000 mm
	10	10,000 mm
	20	20,000 mm



M12-Connector, socket	Color of wire
1	brown
2	white
3	blue
4	black
5	gray