

KINAX 3W2

Transmitter for angular position

For installation

KINAX 3W2 is a compact transmitter for angular position for installation in devices and apparatus. Due to its unique capacitive measuring principle, it acquires the angular position of a shaft without contact and virtually reactionless, and converts the same into an impressed direct current proportional to the measured value.

The easy assembly via synchronous flange or flange adapter and the variety of connection options offers the highest degree of quality and flexibility in application and installation.



Your customer benefit

LOW LIFE-CYCLE COSTS DUE TO:

TESTED TOP QUALITY

- Capacitive Measuring principle
- With maritime execution (formerly GL, Germanischer Lloyd) available
- Explosion protection acc. ATEX and IECEx intrinsic safety "ia" (gas)

SAFE, FREE OF MAINTENANCE

- 0/4...20 mA analog output signal with 2-, 3- or 4-wire connection
- Drive shaft without stops, rotating
- Low starting torque
- High immunity against magnetic fields

EASY AND FAST COMMISSIONING

- No wear, low annual maintenance
- Defined angle value

Technical data

General

Measured quantity: Angle of rotation
 Measuring principle: Capacitive method

Measuring input

Angle measuring range: $0 \dots \geq 5^\circ$ to $0 \dots \leq 270^\circ$
 Preferred ranges
 $0 \dots 10^\circ$, $0 \dots 30^\circ$, $0 \dots 60^\circ$, $0 \dots 90^\circ$,
 $0 \dots 180^\circ$ or $0 \dots 270^\circ$

Drive shaft diameter: $\varnothing 2 \text{ mm}$ [0.078"], $\varnothing 6 \text{ mm}$ [0.236"], 1/4"
 Starting torque: max. 0.001 Nm [0.141 in-oz] with shaft $\varnothing 2 \text{ mm}$ [0.078"]
 max. 0.03 Nm [4.248 in-oz] with shaft $\varnothing 6 \text{ mm}$ [0.236"] resp. 1/4"

Sense of rotation: selectable when ordering

Measuring output

Output variable I_A : Load-independent DC current, proportional to the input angle

Zero point variation: approx. $\pm 5 \%$

Final value variation: approx. $+ 5 \%$ / -30%
 (see criterion of choice 6)

Current limitation: I_A max. 40 mA

Standard range:

0...1 mA, 3- or 4-wire connection
 0...5 mA, 3- or 4-wire connection
 0...10 mA, 3- or 4-wire connection
 4...20 mA, 2-wire connection or
 0...20 mA, 3- or 4-wire connection
 (adjustable with potentiometer)
 4...20 mA, 3- or 4-wire connection

Non standard:

$0 \dots > 1 \text{ mA}$ to $0 \dots < 20 \text{ mA}$,
 3- or 4-wire connection

Power supply:

Standard (Non-Ex):
 input voltage U_i : 12...33 V

Explosion protection intrinsic ia:

input voltage U_i : 12 ... 30 V
 max. input current I_i : 160 mA
 max. input power P_i : 1 W
 max. internal capacitance C_i : 10 nF
 max. internal inductance L_i : is negligible

Residual ripple in output current:

$< 0.3 \%$ p.p.

Response time:

$< 3.5 \text{ ms}$

External resistance: (load)

$$R_{\text{ext max.}} [\text{k}\Omega] = \frac{H [\text{V}] - 12 \text{ V}}{I_A [\text{mA}]}$$

H = Power supply

I_A = Output signal end value

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Accuracy data

| | |
|--|---|
| Basic accuracy: | ≤ 0.5 % for ranges 0...≤ 150° ≤ 1.5 % for ranges from 0...> 150° to 0...270° |
| Reproducibility: | < 0.2 % |
| Influence of temperature output current (-40 ... +70 °C): [-40 ... +158 °F] | ± 0.2 % / 10 K |

Installation data

| | |
|--------------------|---|
| Housing: | Aluminium, surface alodine 400 |
| Mounting position: | Any |
| Connections: | Soldering terminals or Wiring print with pads Wiring print with screw terminals Wiring print with AMP-connections Wiring print with trans-zorb-diode Protection class IP 00 acc. to IEC 60 529 |

Admissible static loading of shaft:

| Direction | Drive shaft Ø | |
|-------------|---------------|-----------------|
| | 2 mm | 6 mm resp. 1/4" |
| radial max. | 16 N | 83 N |
| axial max. | 25 N | 130 N |

Bearing play influence: ± 0.1 %
Weight: Approx. 0.1 kg

Regulations

| | |
|---------------------------------|--|
| Spurious radiation: | EN 61000-6-3 |
| Immunity: | EN 61000-6-2 |
| Test voltage: | 500 V DC, 50 Hz, 1 min. All connections against housing |
| Admissible common-mode voltage: | 100 V, 50 Hz |
| Impulse voltage withstand: | 1 kV, 1.2/50 µs, 0.5 Ws, CAT II |
| Housing protection: | IP 50 acc. to EN 60 529 |

Environmental conditions

| | |
|------------------|--|
| Climatic rating: | <u>Standard (NEx):</u> Temperature -25 ... +70 °C [-13 ... +158°F] Rel. humidity ≤ 90 % non-condensing |
| | <u>Version with improved climatic rating</u> Temperature -40 to +70 °C [-40...158 °F] Annual mean relative humidity ≤ 95% |
| | <u>Ex version</u> - 40 to + 55 °C [-40 ... +131 °F] at T6 resp. - 40 to + 70°C [-40...+158 °F] at T5 resp. - 40 to + 75°C [-40...+167 °F] at T4 |

| | |
|--|---|
| Permissible vibration: (without addit. gear): | 0...200 Hz, 5 g per 2h in 3 directions |
| Shock: | 3 x 50 g every 10 impulses in all directions |

Transportation and storage temperature: -40 ... +80 °C [-40 ... +176 °F]

Operation in potentially explosive environments

| | | |
|---------------------------|--------------------------------------|--|
| Gas explosion prevention: | Labeling: | Ex ia IIC T6 Gb |
| | Conform to standard: | ATEX: EN 60079-0:2012 EN 60079-11:2012 IECEX: IEC 60079-0:2011 IEC 60079-11:2011-06 |
| | Type of protection: | ia |
| | Temperature class: | T6, T5, T4 |
| | Group according to EN 60079-00:2012: | II |

Dimensional drawing

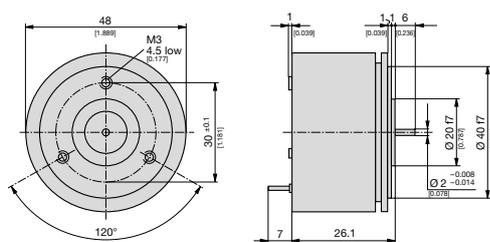


Fig. 1. KINAX 3W2 with standard drive shaft at front only, Ø 2 mm [0.078"], length 6 mm [0.236"].

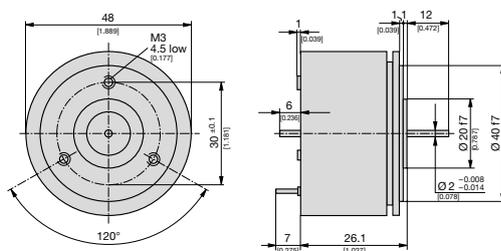


Fig. 2. KINAX 3W2 with special drive shaft at front and at rear. At front: Ø 2 mm [0.078"], length 12 mm [0.472"]. At rear: Ø 2 mm [0.078"], length 6 mm [0.236"].

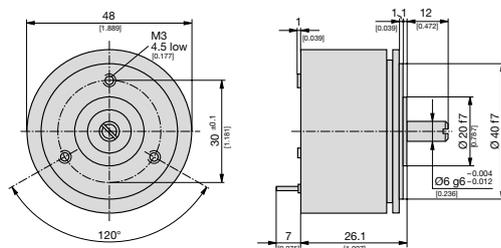


Fig. 3. KINAX 3W2 with special drive shaft at front only, Ø 6 mm [0.236"], length 12 mm [0.472"].

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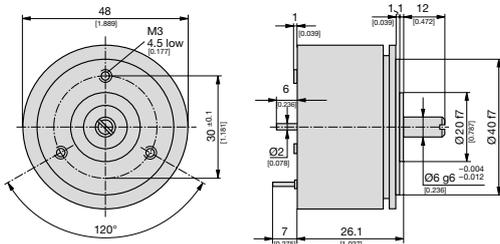


Fig. 4. KINAX 3W2 with special drive shaft at front and at rear.
At front: \varnothing 6 mm [0.236"], length 12 mm [0.472"]. At rear: \varnothing 2 mm [0.078"], length 6 mm [0.236"].

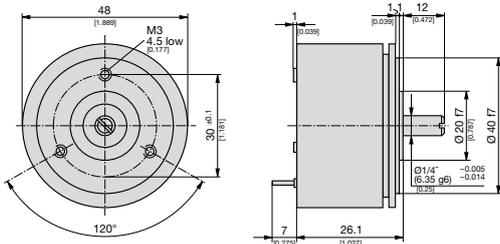


Fig. 5. KINAX 3W2 with special drive shaft at front only,
 \varnothing 1/4", length 12 mm [0.472"].

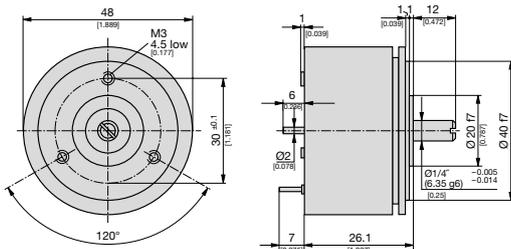


Fig. 6. KINAX 3W2 with special drive shaft at front and at rear.
At front: \varnothing 1/4", length 12 mm [0.472"]. At rear: \varnothing 2 mm [0.078"], length 6 mm [0.236"].

Montage

All versions of the transmitter can be mounted either directly or by means of 3 mounting clips to the item being measured. The screws are not supplied, because the required length varies according to the thickness of the mounting surface. Both methods of mounting and the relevant drilling and cut-out plans can be seen from table:

| | Mounting versions ² | Drilling and cut-out diagrams for mounting transmitters) |
|---------------|--------------------------------|--|
| directly | | |
| with 3 clamps | | |

Electrical connections

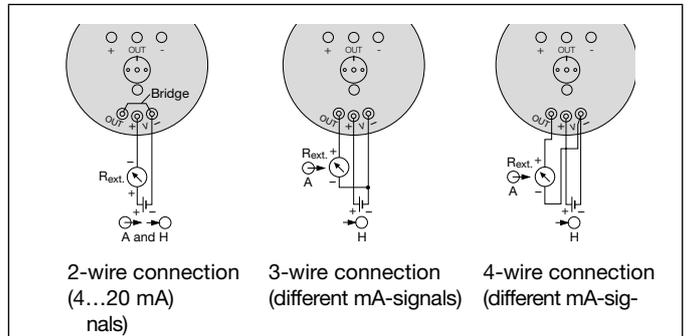


Fig. 7. Electrical connection via soldering terminals

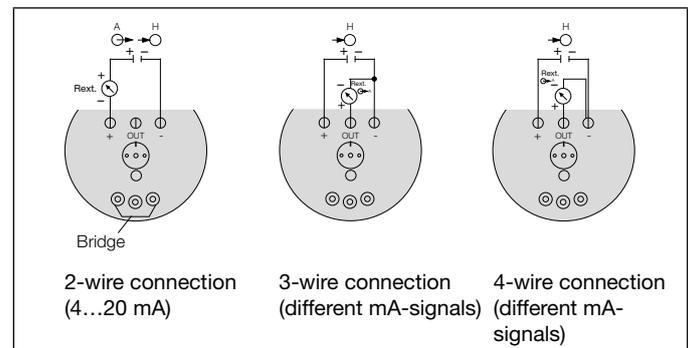


Fig. 8. Electrical connection via pads. Only for NEX version.

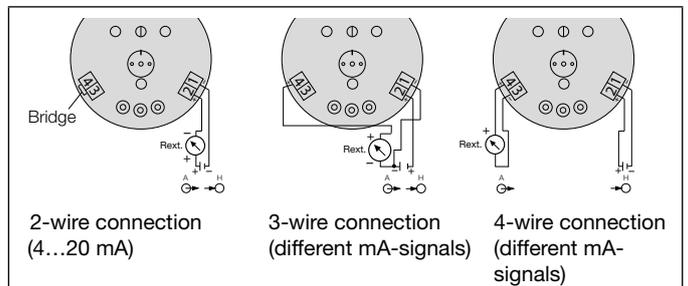


Fig. 9. Electrical connection via screw terminals. Only for NEX and ATEX version.

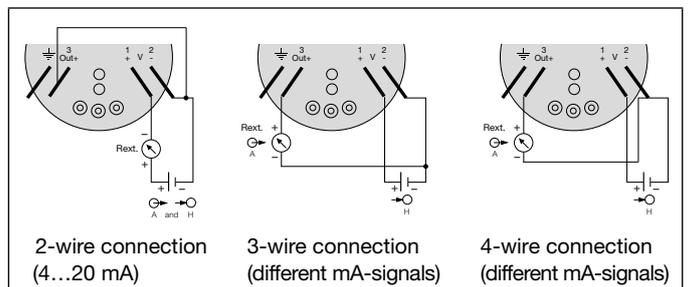


Fig. 10. Electrical connection via AMP-connections. Only for NEX version.

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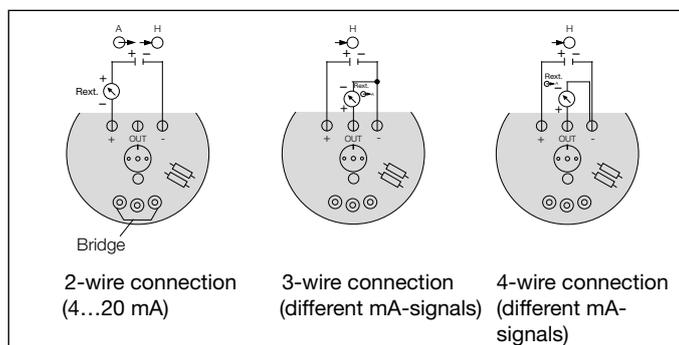


Fig 11. Electrical connection via trans-zorb-diode. Only for NEX version.

Table 2: Specification and ordering information

| Features, Selection | *Blocking code | no-go with blocking code | Article No./ Feature |
|--|--|--------------------------|----------------------|
| KINAX 3W2 | Order Code 708 - xxxx xxxx xxxx | | 708 - |
| Features, Selection | | | |
| 1. Version of the transmitter (with standard shaft dia. 2 mm, at front only , length 6 mm*) | | | |
| Standard, measuring output non intrinsically safe | A | | 1 |
| Version ATEX II 2 G Ex ia IIC T6 Gb, measuring output intrinsically safe | B | | 2 |
| Version IECEx Ex ia IIC T6 Gb | C | | A |
| 2. Sense of rotation | | | |
| Calibrated for sense of rotation clockwise | D | | 1 |
| Calibrated for sense of rotation counterclockwise | D | | 2 |
| For "V" characteristic | E | | 3 |
| Both senses of rotation, calibrated and marked (for measuring ranges $\leq 90^\circ$ only) | M | | 4 |
| Lines 1 and 2: Angle $\leq 150^\circ$ usable in both senses of rotation. Angle $> 150^\circ$ to $\leq 270^\circ$ switchable to the other direction. | | | |
| 3. Measuring range (measuring input) \rightarrow | | | |
| 0 ... 10° | | E | 1 |
| 0 ... 30° | | E | 2 |
| 0 ... 60° | | E | 3 |
| 0 ... 90° | | E | 4 |
| 0 ... 180° | | EM | 5 |
| 0 ... 270° | | EM | 6 |
| Non-standard 0 ... $\geq 5^\circ$ to 0 ... $< 270^\circ$ [°] | | E | 9 |
| With both senses of rotation calibrated, non-standard range, 0 to ≥ 5 till 0 to $< 90^\circ$ | | | |

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| Features, Selection | *Blocking code | no-go with blocking code | Article No./ Feature |
|---|----------------|--------------------------|----------------------|
| KINAX 3W2 Order Code 708 - xxxx xxxx xxxx | | | 708 - |
| Features, Selection | | | |
| <p>“V” characteristic [± °] <input type="text"/></p> <p>Specify start M_A and end M_E of measuring range! Observe the limits for (M_A [± °] ≥ 10 and M_E [± °] ≤ 150) and give both angles separated by an oblique stroke, e.g. [± °] 15/90!</p> <p>Example of a “V” characteristic for the measuring range [± °] 15/90 and an output range of 0...20 mA</p> | | DM | A |
| 4. Output signal (measuring output) $\odot \rightarrow$ / Connecting version | | | |
| Power supply (12 ... 33 V DC resp. 12 ... 30 V DC with Ex version) | | | |
| 0 ... 1 mA / 3- or 4-wire connection | | | A |
| 0 ... 5 mA / 3- or 4-wire connection | | | B |
| 0 ... 10 mA / 3- or 4-wire connection | | | C |
| 4 ... 20 mA / 2-wire connection or 0 ... 20 mA / 3- or 4-wire connection (adjustable with potentiometer) | | | D |
| 4 ... 20 mA / 3- or 4-wire connection | | | E |
| Non-standard, 3- or 4-wire connection | | | |
| 0 ... > 1.00 mA to 0 ... < 20 mA [mA] <input type="text"/> | | | Z |
| R_{ext} max. see section “Technical data”, output signal | | | |
| 5. Special features | | | |
| Without (order code complete) | Y | | 0 |
| With special feature The features to be omitted must be marked hereafter with / (slant line) in the order code until reaching the required feature! | | | 1 |
| 6. Adjustability (span adjustment) | | | |
| Without | | | 0 |
| Increased adjustability + 5 % / – 60 % Restriction: for angle ≥ 60°, additional error 0.2 % | | Y | A |
| 7. Drive shaft special | | | |
| Standard | | | 0 |
| Dia. 2 mm at front, length 12 mm, dia. 2 mm rear, length 6 mm | | YF | C |
| Dia. 6 mm at front, length 12 mm | | Y | D |
| Dia. 6 mm at front, length 12 mm, dia. 2 mm rear, length 6 mm | | YF | E |
| Dia. 1/4 " at front, length 12 mm | | Y | F |
| Dia. 1/4 " at front, length 12 mm, dia. 2 mm rear, length 6 mm | | YF | G |

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| Features, Selection | *Blocking code | no-go with blocking code | Article No./ Feature |
|--|--|--------------------------|----------------------|
| KINAX 3W2 | Order Code 708 - xxxx xxxx xxxx | | 708 – |
| Features, Selection | | | |
| 8. Improved climatic rating | | | |
| Without improved climatic rating | | | 0 |
| Improved climatic rating (standard version) | | BCY | H |
| Improved climatic rating (Ex/Ex i version) | | AY | J |
| 9. Marine version | | | |
| Without | | | 0 |
| Maritime execution (formerly Germ. Lloyd) | | Y | L |
| 10. Wiring print | | | |
| Standard | | | 0 |
| Wiring print with pads, only for NEX | F | BCY | 1 |
| Wiring print with screw terminals, only for NEX and ATEX | | CY | 2 |
| Wiring print with AMP-connections, only for NEX | F | BCY | 3 |
| Wiring print with trans-zorb-diode, only for NEX | F | BCY | 4 |
| 11. Test protocole | | | |
| Without | | | 0 |
| German | | | D |
| English | | | E |

* Lines with letter(s) under «no-go» cannot be combined with preceding lines having the same letter under «Blocking code».

Accessories

| Description | Order No. |
|--|-----------|
| Kit mounting clamp for 2W2 and 3W2 | 168 387 |
| Different bellow couplings | xxx xxx |
| Different helical and cross-slotted coupling | xxx xxx |
| Different spring washer coupling | xxx xxx |

| | |
|--|--|
| You find power supply units for KINAX 3W2 in our process instrumentation product range. | |
| SINEAX B812 1-channel power supply unit | SINEAX B811 1-channel power supply unit |
|   |   |

Scope of delivery

- 1 Transmitter for angular position KINAX 3W2 (according to Order)
- 1 3 clamps
- 1 Operating instructions in German, French, English
- 1 Type examination certificate, only with ATEX-approval

Subject to change without notice • Edition 08.22 • Data sheet 3W2 Le

Approvals

| Approval | Identification |
|---|--------------------------|
|  Explosion protection according to IECEX | Ex ia IIC T6 Gb |
|  Explosion protection according to ATEX | Ex II 2G Ex ia IIC T6 Gb |

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