

# KINAX 2W2

## Programmable transmitter for angular position

### For installation

KINAX 2W2 is a compact, programmable 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, the variety of connection options and free parameterising offer 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
- Explosion protection acc. ATEX and IECEx intrinsic safety "ia" (gas)

##### SAFE, FREE OF MAINTENANCE

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

##### EASY AND FAST COMMISSIONING

- No wear, low annual maintenance
- Measuring range, sense of rotation, characteristic and switch point can be parameterised via programming software
- Measured value simulation already during installation is possible

### Technical data

#### General

Measured quantity: Angle of rotation  
 Measuring principle: Capacitive method

#### Measuring input

Angle measuring range: programmable 0 ... 50° or 0 ... 350°  
 Drive shaft diameter: Ø 2 mm [0.078"], Ø 6 mm [0.236"], 1/4"  
 Starting torque: max. 0.001 Nm [0.141 in-oz] with shaft Ø 2 mm [0.078"]  
 max. 0.03 Nm [4.248 in-oz] with shaft Ø 6 mm [0.236"] resp. 1/4"  
 Sense of rotation: clockwise or counter-clockwise (in view of drive shaft)

#### Measuring output

Output variable  $I_A$ : Load-independent DC current, proportional to the input angle  
 Zero point variation: approx. ± 5 %  
 Final value variation: approx. + 5 %  
 Current limitation:  $I_A$  max. 40 mA  
 Standard range: 4...20 mA, 2-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  $C_i$ : 6.6 nF

max. internal inductance  $L_i$ : is negligible

Residual ripple in output current:

0.3 % p.p.

Response time:

< 5 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

#### Accuracy data

Basic accuracy:  
 Adjustments

0.5 % with characteristic linear  
 350° version  
 measuring range > 50...350°  
 characteristic linear  
 50° version  
 measuring range ≥ 10...50°  
 characteristic linear

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Additional errors (cumulative):

Characteristic	Definition	Additional error
	Programmed Angle max. = MW Angle min. = 0°  $[f_{Add}] = \%$	Device version 350°: $f_{Add} = \left( \frac{0.18^\circ}{MS} \times 100 - 0.05 \right)$  Device version 50°: $f_{Add} = \left( \frac{0.05^\circ}{MS} \times 100 - 0.05 \right)$
ex. with MW=180°: $f = f_{Add} + f_{Abs} = 0.05\% + 0.5\% = 0.55\%$		
	Programmed Angle max. = MW Angle min. = 0°  $[f_{Add}] = \%$	Device version 350°: $f_{Add} = \left( \frac{0.18^\circ}{MS} \times 100 \right)$  Device version 50°: $f_{Add} = \left( \frac{0.05^\circ}{MS} \times 100 \right)$
	$MS = (\text{angle max.}) - (\text{angle min.})$ Angle max. = ± final angle Angle min. = > 0°  $[f_{Add}] = \%$	Device version 350°: $f_{Add} = \left( \frac{0.25^\circ}{MS} \times 100 \right)$  Device version 50°: $f_{Add} = \left( \frac{0.09^\circ}{MS} \times 100 \right)$
	$MS = (\text{angle max.}) - (\text{angle min.})$  $[f_{Add}] = \%$	Device version 350°: $f_{Add} = \left( \frac{0.25^\circ}{MS} \times 100 \right)$  Device version 50°: $f_{Add} = \left( \frac{0.09^\circ}{MS} \times 100 \right)$

Reproducibility: < 0.2 %  
 Influence of temperature output current (-40 ... +75 °C): [-40 ... +167 °F] ± 0.2 % / 10 K

### Installation data

Housing: Aluminium, surface alodine 400  
 Mounting position: Any  
 Connections: Soldering terminals resp. screw terminals  
 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 Weight: ± 0.1 %  
 Approx. 0.1 kg

### Regulations

Spurious radiation: EN 61000-6-3  
 Immunity: EN 61000-6-2

Test voltage: 750 V DC, 50 Hz, 1 min.  
 All connections against housing

Admissible common-mode voltage: 100 V AC, 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: Standard (NEx):  
 Temperature -25 ... +75 °C [-13 ... +167 °F]  
 Rel. humidity ≤ 90 % non-condensing  
Version with improved climatic rating  
 Temperature -40 to +75 °C [-40 ... 167 °F]  
 Annual mean relative humidity ≤ 95 %

#### Ex version

Max. performance	Temperature class			
	Pi	T6	T5	T4
1000 mW	40 °C [104 °F]	55 °C [131 °F]	75 °C [167 °F]	
900 mW	44 °C [111 °F]	59 °C [138.2 °F]	75 °C [167 °F]	
800 mW	49 °C [120.2 °F]	64 °C [147.2 °F]	75 °C [167 °F]	
700 mW	54 °C [129.2 °F]	69 °C [156.2 °F]	75 °C [167 °F]	
660 mW	56 °C [132.8 °F]	71 °C [159.8 °F]	75 °C [167 °F]	

Permissible vibration: 0...200 Hz, 10 g continuous, 15 g for 2 h  
 200...500 Hz, 5 g continuous, 10 g for 2 h  
 Shock: 3 × 50 g every 10 impulses in all axes

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

### Dimensional drawing

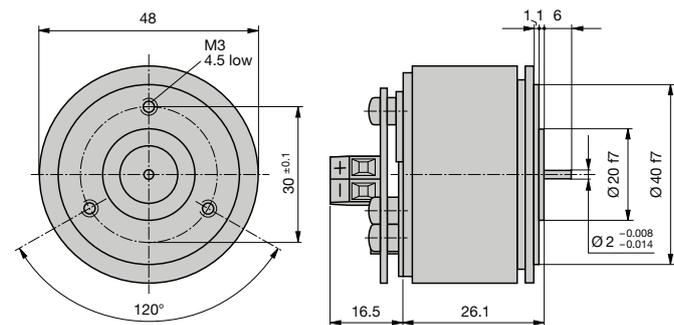


Fig. 1. KINAX 2W2 with standard drive shaft at front **only**, dia. 2 mm, length 6 mm, screw terminal versions

## Programmable transmitter for angular position

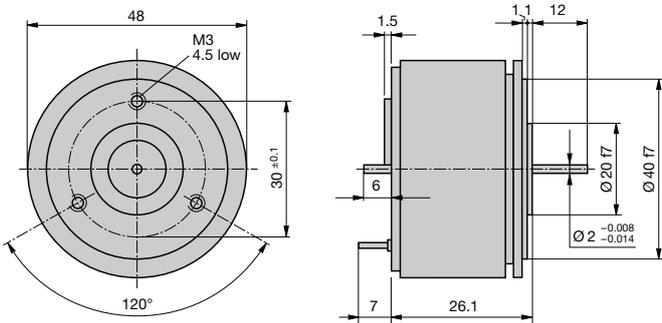


Fig. 2. KINAX 2W2 with special shaft drive at front **and** rear.  
At front: dia. 2 mm, length 12 mm. At rear: dia. 2 mm, length 6 mm.

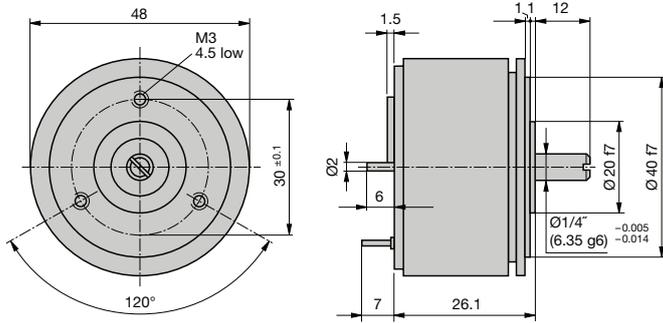


Fig. 6. KINAX 2W2 with special drive shaft at front **and** rear.  
At front dia. 1/4", length 12 mm. At rear dia. 2 mm, length 6 mm.

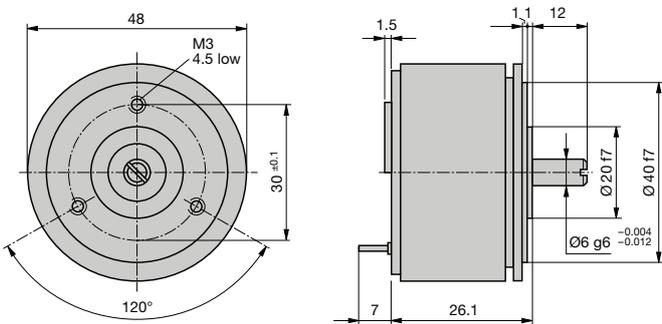


Fig. 3. KINAX 2W2 with special drive shaft at front **only**,  
dia. 6 mm, length 12 mm.

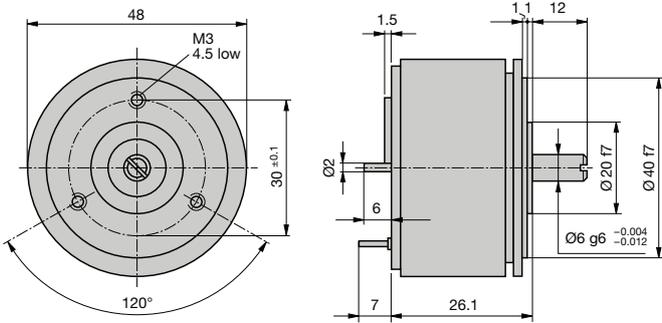


Fig. 4. KINAX 2W2 with special drive shaft at front **and** rear.  
At front: dia. 6 mm, length 12 mm. At rear dia. 2 mm, length 6 mm.

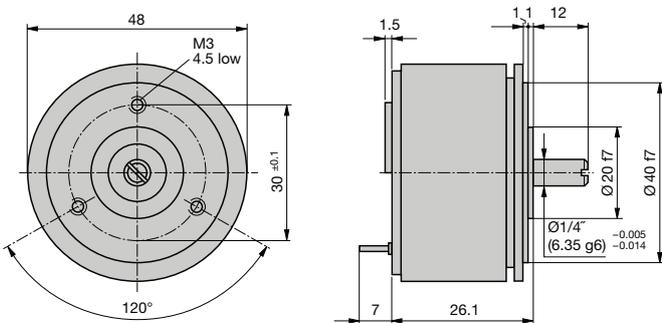


Fig. 5. KINAX 2W2 with special drive shaft at front **only**,  
dia. 1/4", length 12 mm.

### 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 <sup>2</sup>		Drilling and cut-out diagrams for mounting transmitters)	
directly			
with 3 clamps			

### Electrical connections

Connection to soldering plugs	Connection to screw terminals
$R_{ext}$ = External resistance	H = power supply 12 ... 33 V DC resp. 12 ... 30 V DC Ex version

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## Programmable transmitter for angular position

### Programming

A PC, the programming cable PK 610 plus ancillary cable and the configuration software 2W2 are required to program the transmitter. (Details of the programming cable and the software are to be found in the separate data sheet: PK 610 Le.)

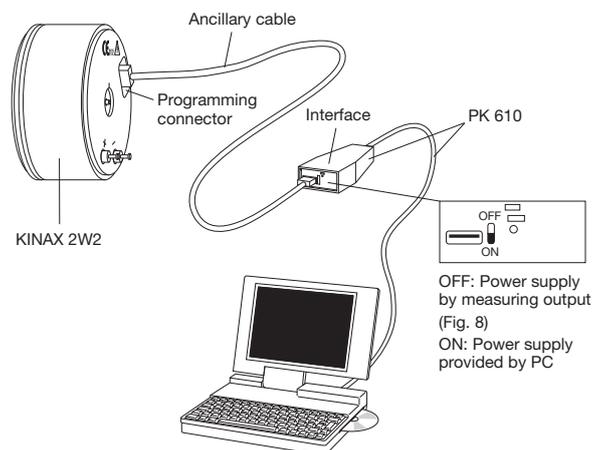


Fig. 7. Example of the set-up for programming a KINAX 2W2 without the power supply. For this case the switch on the interface must be set to "ON".

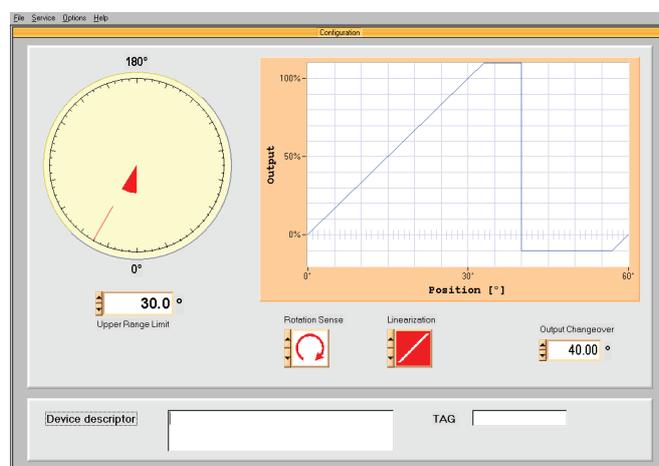


Fig. 8. Print screen example of the menu-controlled programming software.

### Basic configuration

The transmitter KINAX 2W2 is also available already programmed with a **basic** configuration which is especially recommended in cases where the programming data is not known at the time of ordering (see "Table 1: Specification and ordering information" feature 7).

**Basic** configuration:

Order Code	Mechanical angle range	Measuring range	Switching point	Sense of rotation	Characteristic of output variable
760 - 1111 100	50°	0 ... 50°	55	Clockwise	Linear
760 - 1211 100	350°	0 ... 350°	355°	Clockwise	Linear

### Table 1: Specification and ordering information

Description	*Blocking code	No-go with blocking code	Article No./ Feature
<b>KINAX 2W2</b>	<b>Order Code 760 - xxxx xxxx xxxx</b>		760 -
<b>Features, Selection</b>			
<b>1. Version of the transmitter</b>			
Standard, measuring output non intrinsically safe			1
Ex ia IIC T6, CENELEC/ATEX, measuring output intrinsically safe			2
<b>2. Mechanical angle range</b>			
Angle range, to 50°			1
Angle range > 50 to 350°			2
<b>3. Drive shaft</b>			
Standard, dia. 2 mm at front, length 6 mm			1
Special, dia. 2 mm at front, length 12 mm, dia. 2 mm at rear, length 6 mm			2
Special, dia. 6 mm at front, length 12 mm			3
Special, dia. 6 mm at front, length 12 mm, dia. 2 mm at rear, length 6 mm			4

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Description	*Blocking code	No-go with blocking code	Article No./ Feature
<b>KINAX 2W2</b> <span style="float: right;"><b>Order Code 760 - xxxx xxxx xxxx</b></span>			760 –
<b>Features, Selection</b>			
Special, dia. 1/4", length 12 mm			5
Special, dia. 1/4", length 12 mm, dia. 2 mm at rear, length 6 mm			6
<b>4. Output variable</b> Current, 4 ... 20 mA, 2-wire connection			1
<b>5. Electrical connection</b> Connection to soldering terminals			1
Connection to screw terminals			2
<b>6. Test certificate</b> Without test certificate			0
Test certificate in German			D
Test certificate in English			E
<b>7. Configuration</b> Basic configuration programmed (specification complete!)	G		0
Programmed to order			1
Programmed to order, with zero position mark on the drive shaft disk Required if the device is to be installed without 2W2 software.			2
<b>8. Sense of rotation</b> Programmed for sense of rotation clockwise	J		0
Programmed for sense of rotation counterclockwise	J	G	1
Programmed for "V" characteristic	K	G	2
<b>9. Measuring range</b> [° angle] <span style="float: right;">0 ... final value</span> Switching point: <span style="float: right;">[ ]</span>		K	9
Admissible values: Final value: $\geq 10$ to $50^\circ$ with selected angle range $50^\circ$ $> 50$ to $350^\circ$ with selected angle range $350^\circ$ Switching point: $>$ Final value, max. $60^\circ$ with angle range $50^\circ$ $>$ Final value, max. $360^\circ$ with angle range $350^\circ$ $\geq 105\%$ final value with non-linear characteristic			
"V" characteristic [ $\pm^\circ$ angle] <span style="float: right;">Min. [ ]</span> <span style="float: right;">Max. [ ]</span>		GJ	Z
Admissible values: Minimum value: [ $\pm^\circ$ angle] $\geq 0$ Maximum value [ $\pm^\circ$ angle] $\leq 25^\circ$ with angle range $50^\circ$ , span (max. – min.) $\geq 5^\circ$ $> 25^\circ$ to $175^\circ$ with angle range $350^\circ$ , span $\geq 25^\circ$ symmetrical about the center line, e.g. [ $\pm^\circ$ angle], min. value = 15; max. value = 120, $\cong -120 \dots -15 \dots 0 \dots 15 \dots 120^\circ$ (input) and $+ 20 \dots 4 \dots < 4 \dots 4 \dots + 20$ mA (output)			
<b>10. Characteristic of output variable</b> Linear			0
Function X to the power of 1/2		GK	1
Function X to the power of 3/2		GK	2

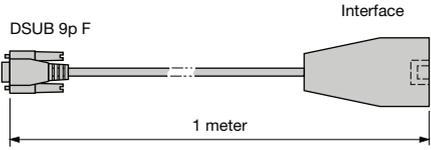
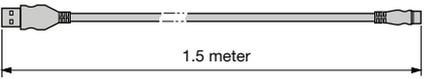
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Description	*Blocking code	No-go with blocking code	Article No./ Feature
<b>KINAX 2W2</b>	<b>Order Code 760 - xxxx xxxx xxxx</b>		760 -
<b>Features, Selection</b>			
Function X to the power of 5/2		GK	3
Customized		GK	4
Give an algorithm or fixed points (23 values in 5 % steps from - 5 % to 105 % of the measuring range. Output continuously variable 0 to 100 %)			
Lines 1 to 4: Not possible with "V" characteristic (line 2 in feature 8, sense of action)			
<b>11. Climatic rating</b>			
Standard climatic rating (annual mean relative humidity ≤ 90 %)			0
Improved climatic rating (annual mean relative humidity ≤ 95 %)		G	1
<b>12. Marine version</b>			
Without			0

\* Lines with letter(s) under "No-go" cannot be combined with preceding lines having the same letter under "Blocking code".

### Accessories

Description	Order No.
Programming cable PK 610 	137 887
Ancillary cable 	141 440
Configuration software 2W2 Windows 95 or higher on CD in German and English <b>(download free of charge under <a href="http://www.camillebauer.com">http://www.camillebauer.com</a>)</b> In addition, the CD contains all configuration programmes presently available for Camille Bauer products	146 557
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

### Scope of delivery

- 1 Transmitter for angular position KINAX 2W2 (according to Order)
- 1 3 clamps
- 1 Operating instructions in German, French, English and Russian
- 1 Type examination certificate, only with ATEX-approval

You find power supply units for KINAX 2W2 in our process instrumentation product range.

SINEAX B812 1-channel power supply unit	SINEAX B811 1-channel power supply unit
	

### Approvals

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

 **CAMILLE BAUER**

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