

# KINAX WT707

## Transmitter for angular position

Residual ripple in output current:	< 0.3 % p.p.
Response time:	< 5 ms
External resistance: (load)	$R_{\text{ext max.}} [\text{k}\Omega] = \frac{12 \text{ V}}{I_A [\text{mA}]}$
	(for instruments with DC/AC power supply, with electric isolation)
	$R_{\text{ext max.}} [\text{k}\Omega] = \frac{H [\text{V}] - 12 \text{ V}}{I_A [\text{mA}]}$
	(for instruments with DC power supply, without electric isolation)
	H = Power supply
	I <sub>A</sub> = Output signal end value

### 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...+85 °C): [-40 ... +167 °F]	± 0.2 % / 10 K

### Installation data

Housing (main part):	Steel (finish QPQ) standard High-grade steel 1.4462 sea-water
Rear (cover):	Plastic (polyester), when plug-in cable or aluminium (silafont), when screwed cable gland
Connections:	Plug connector plastic or screwed cable gland metal

The **plug-in connector** (1) consists of a socket and plug (1.2) on the end of the connecting cable (screw gland PG 11) and 7 screw terminals.

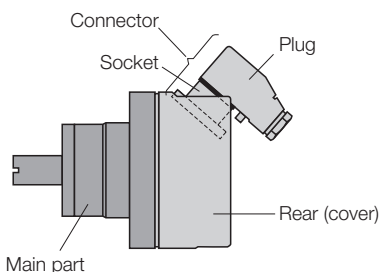


Fig. 1. Cable outlets towards the back

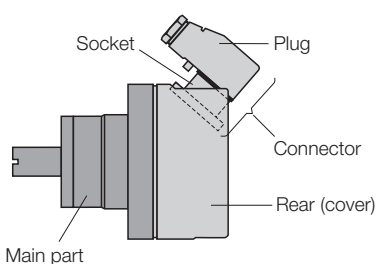


Fig. 2. Cable outlets towards the front

On units with **screw terminals** and **cable glands PG 11** (see Fig. 3) there are 4 screw terminals and a grounding terminal in the rear cover. The screw terminals accept gauges up to 1,5 mm<sup>2</sup> and are accessible after removing the cover.

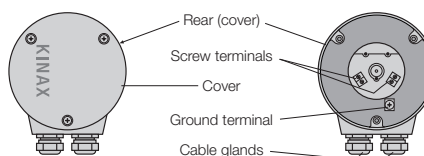


Fig. 3. Screw terminals / screwed cable gland

Mounting position:	Any
Fastening types:	Immediate fastening (Device without foot, without flange) Fastening with foot or flange
Weight:	Approx. 2.9 kg (without additional gear) Approx 3.9 kg (with additional gear) every 0.5 kg for foot or flange

### Regulations

Spurious radiation:	EN 61000-6-3
Immunity:	EN 61000-6-2
Test voltage:	2.2 kV <sub>eff</sub> , 50 Hz, 1 min. between power supply and housing or power supply and measuring output (DC/AC power supply, with electrical isolation) 500 V <sub>eff</sub> , 50 Hz, 1 min. All connections against housing (DC power supply, without electrical isolation)
Admissible common-mode voltage:	100 VAC, 50 Hz, CAT II
Impulse voltage withstand:	1 kV, 1.2/50 μs, 0.5 Ws
Housing protection:	IP 66 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> Temperature -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
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Permissible vibration: (without addit. gear):	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 3 axes
Permissible static load on the shaft:	Max. 1000 N (radial) Max. 500 N (axial)  If subjected to vibration the shaft load should be as low as possible to ensure optimum life of the bearing
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
Group according to EN 60079-00:2012:	II

### Dimensional drawing

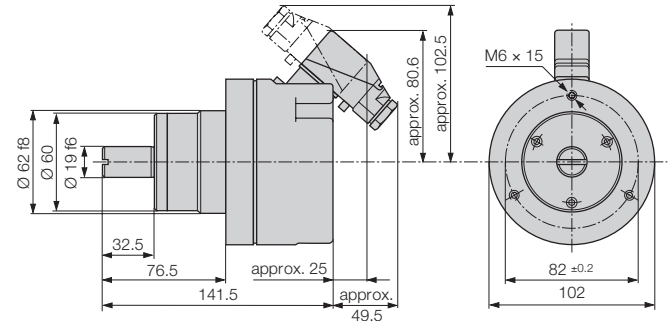


Fig. 4. KINAX WT 707 with plug connector.

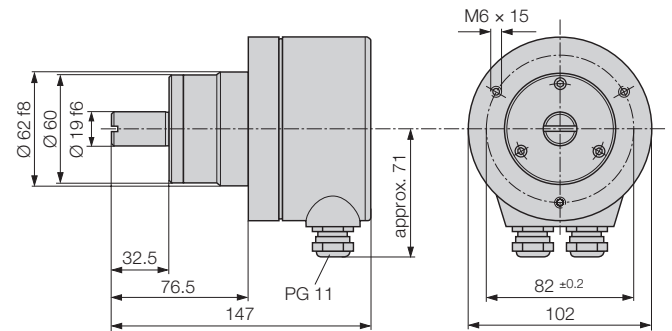


Fig. 5. KINAX WT 707 with screw terminals and cable glands.

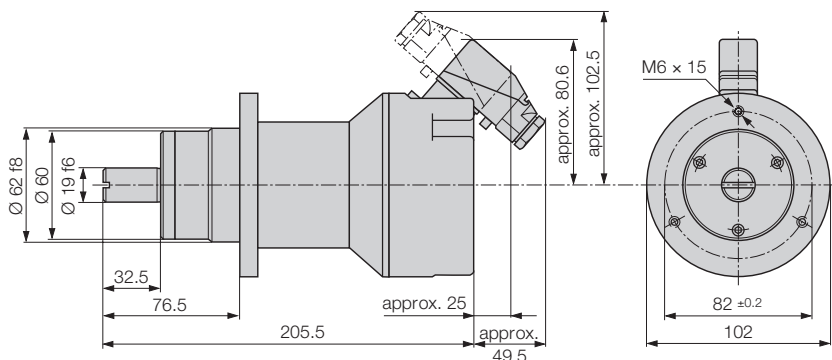


Fig. 6. KINAX WT 707 with additional gear and plug connector.

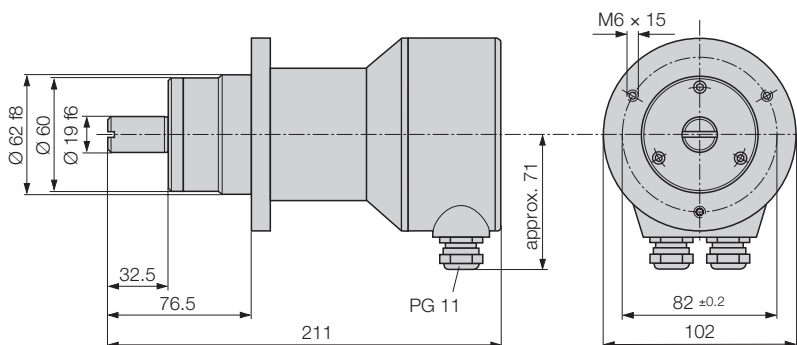


Fig. 7. KINAX WT 707 with additional gear, screw terminals and cable glands.

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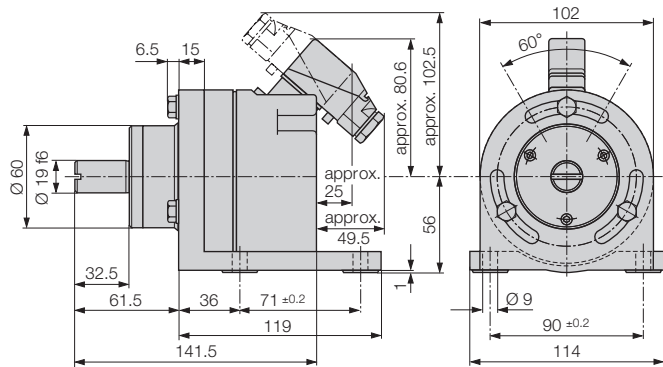


Fig. 8. KINAX WT 707 with plug connector and foot.

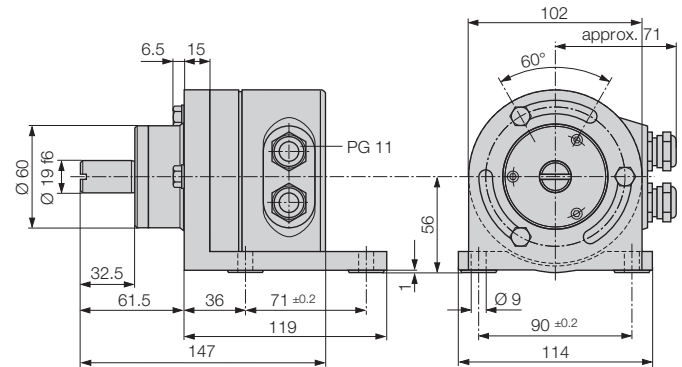


Fig. 9. KINAX WT 707 with screw terminals, cable glands and foot.

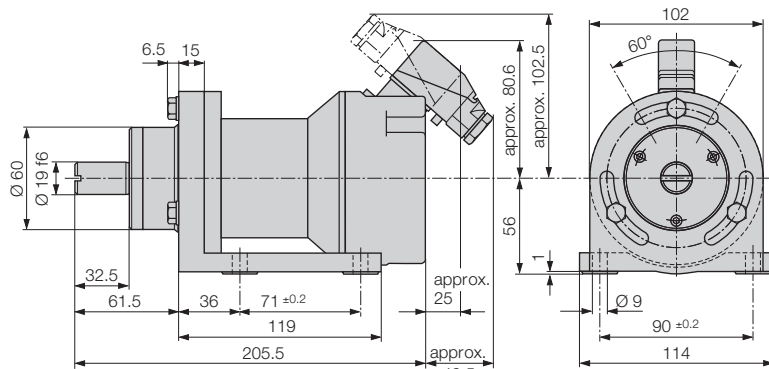


Fig. 10. KINAX WT 707 with additional gear, plug connector and foot.

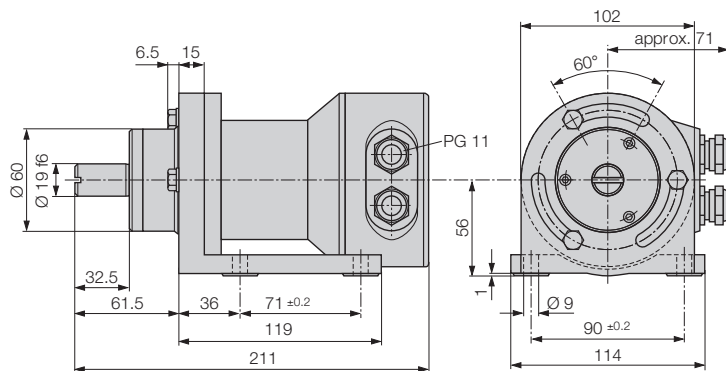


Fig. 11. KINAX WT 707 with additional gear, screw terminals, cable glands and foot.

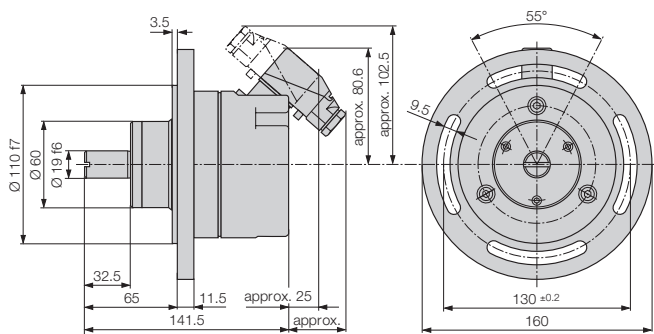


Fig. 12. KINAX WT 707 with plug connector and flange.

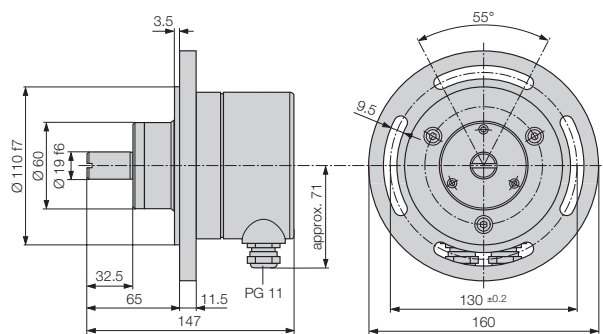


Fig. 13. KINAX WT 707 with screw terminals, cable glands and flange.

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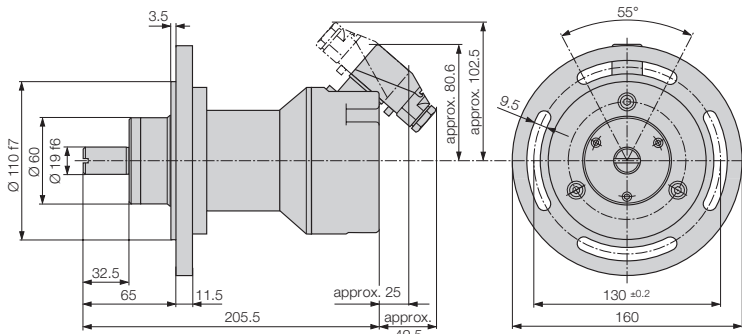


Fig. 14. KINAX WT 707 with additional gear, plug connector and flange.

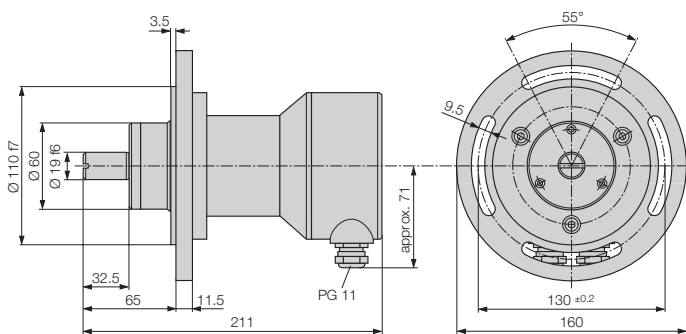
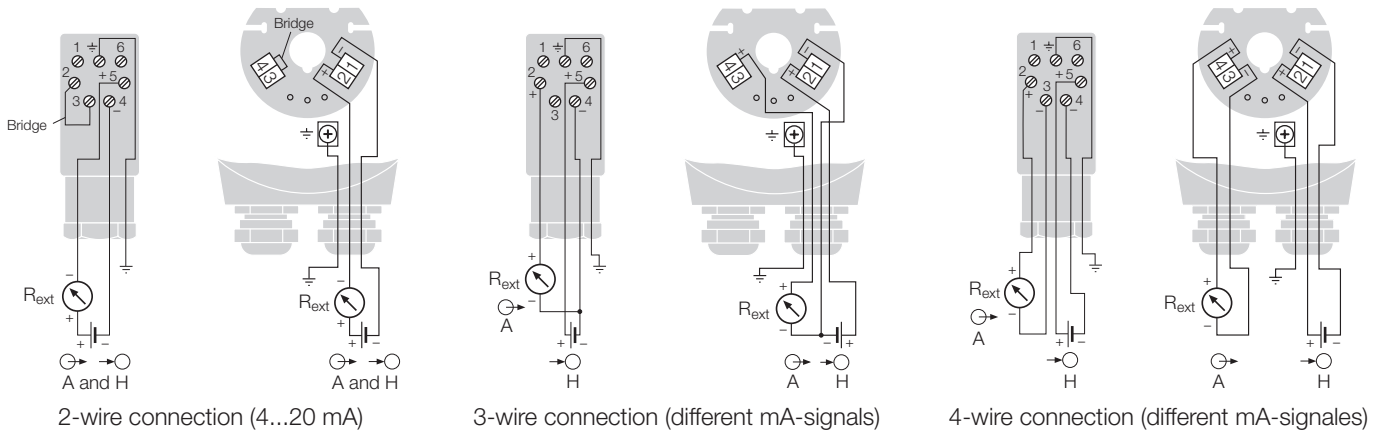


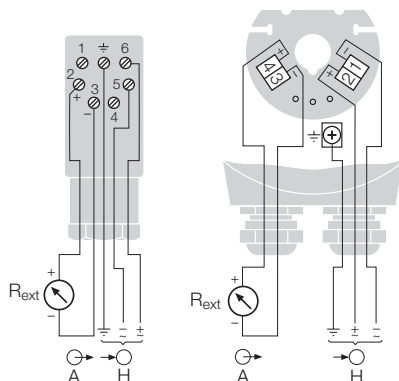
Fig. 15. KINAX WT 707 with additional gear, screw terminals, cable glands and flange.

### Electrical connections

2-, 3- or 4-wire connection without electrical isolation



4-wire connection with electrical isolation (different mA-signals)



A = Measuring output ...  
 ... as 2-wire connection (4...20 mA, signal in output/powering circuit)  
 ... as 3- or 4-wire connection (different mA-signals)

H = DC-power supply H = 12...33 V  
 resp. H = 12...30 V with Ex-version

R<sub>ext</sub> = External resistance

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## Transmitter for angular position

### Einstell-Elemente

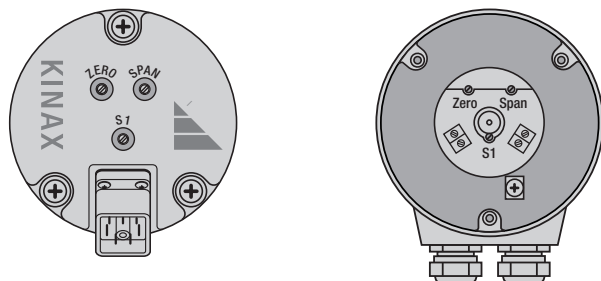


Fig 16. Position of settings

ZERO = Potentiometer for zero point

SPAN = Potentiometer for measuring range end value

S1 = Switch for reversing direction of rotation for  $\angle > 150^\circ$ .

Transmitters with the ordering code 707 – ...D (see “Table 3: Specification and ordering information”) are designed for either a 2-wire connection with an output range of 4...20 mA or a 3- or 4-wire connection with an output range of 0...20 mA.

If, however, a transmitter be changed from one to the other (see “Electrical connections”), the beginning and end of the measuring range, ZERO and SPAN must be readjusted.

A switch is provided on angular transmitters with a measuring range  $> 150^\circ$  for reversing the direction of rotation. It is marked S1.

### Specification and ordering information

Desription	Blocking code	No-go with blocking code	Order-Code
<b>KINAX WT707</b>	<b>Order-Code 707 - xxxx xxxx xxxx xx</b>		<b>707-</b>
<b>1. Version of the transmitter</b>			
Standard	A		1
ATEX EX II 2G Ex ia IIC T6 Gb	B		2
Sea water version	N		3
Sea water version with gear	O		4
ATEX EX II 2G Ex ia IIC T6 Gb, sea water version	BN		7
ATEX EX II 2G Ex ia IIC T6 Gb, sea water version with gear	BO		8
IECEX Ex ia IIC T6 Gb	B		A
IECEX Ex ia IIC T6 Gb, sea water version	BN		B
IECEX Ex ia IIC T6 Gb, sea water version with gear	BO		C
<b>2. Sense of rotation</b>			
Calibrated for sense of rotation clockwise	D		1
Calibrated for sense of rotation counter-clockwise	D		2
For V-characteristic (not possible for instruments with additional gear).	E		3
Calibrated for both senses of rotation (for measuring ranges $\leq 90^\circ$ only)	M		4
Lines 1 and 2: Instruments with ranges $0 \dots \geq 5$ to $0 \dots \leq 150^\circ$ are usable in both senses of rotation. Instruments with ranges $0 \dots > 150^\circ$ to $0 \dots \leq 270^\circ$ can be changed to the other direction (Beginning and end of the measuring range must be readjusted). Sense of rotation for transmitters with additional gear see “Feature 13 and 14”.			
<b>3. Measuring range (measuring input)</b>			
0...10° angle			1
0...30° angle			2
0...60° angle			3
0...90° angle			4
0...180° angle			5
0...270° angle			6
Non-standard (0 to $\geq 5^\circ$ to 0 to $< 270^\circ$ ) [angle]			9
V-characteristic [±angle]			A

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Description	Blocking code	No-go with blocking code	Order-Code
<b>KINAX WT707</b> <span style="float: right;"><b>Order-Code 707 - xxxx xxxx xxxx xx</b></span>			<b>707-</b>
Line 9: Non standard 0... $\geq 5$ to 0... $< 270$ Calibrated for both senses of rotation, non standard range 0... $\geq 5$ to 0... $< 90^\circ$  Line A: Specify start $M_A$ and end $M_E$ of measuring range! Observe the limits for ( $M_A [\pm \text{ }^\circ] \geq 10$ and $M_E [\pm \text{ }^\circ] \leq 150$ ) and give both angles separated by an oblique stroke, e.g. $[\pm \text{ }^\circ] 15 / 90!$			
<b>4. Output signal (measuring output) / Connection version</b>			
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)	H		D
4...20 mA, 3- or (4)-wire connection			E
0...20 mA, 4-wire connection (only possible with AC/DC-power supply (DC-, AC-power pack))	L		F
Non standard, 3- or (4)-wire connection 0... $>1.00$ mA to 0... $<20$ mA [mA]			Z
Lines A to Z: $R_{\text{ext}}$ max. see Section "Technical data", 4-wire connection, <b>with</b> electric isolation only possible with DC/AC power supply (AC/DC power pack).  2-, 3- or 4-wire connection, <b>without</b> electric isolation only possible with DC power supply.			
<b>5. Power supply</b>			
24...60 VAC/DC, with electric isolation	F	BH	1
85...230 VAC/DC, with electric isolation	F	BH	2
12...30 VDC, without electric isolation	K	BL	A
12...30 VDC (Ex), without electric isolation	K	AL	B
Lines 1 and 2: Not possible for DC/AC power supply at output signal "Feature 4, line D"!			
<b>6. Mounting mode</b>			
Without foot/flange			0
With foot (mounted)			1
With flange (mounted)			2
<b>7. Material of transmitter rear cover / Routing of connection cable</b>			
Plastic / connector less cable plug, socket mounted for cable routed to the rear	P		1
Plastic / connector less cable plug, socket mounted for cable routed to the front	P		2
Plastic / connector with cable plug, socket mounted for cable routed to the rear	P		3
Plastic / connector with cable plug, socket mounted for cable routed to the front	P		4
Metal / 2 glands PG11 Recommended for AC/DC power supply, 4-wire connection with electric isolation			5
<b>8. Special features</b>			
Without (order code complete)	Y		0
With			1
<b>9. Settings (span adjustment)</b>			
Without extended setting range			0
Extended setting range + 5 % /-60 %		Y	A
Restriction: for angle $\geq 60^\circ$ , supplementary error 0.2 % also possible on versions with additional gear			

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## Tansmitter for angular position

Desription	Blocking code	No-go with blocking code	Order-Code
<b>KINAX WT707</b>	<b>Order-Code 707 - xxxx xxxx xxxx xx</b>		<b>707-</b>
<b>10. Improved climatic rating</b>			0
Without improved climatic rating			0
Temperature -40 to +70 °C, annual mean relative humidity ≤ 90 %		BY	H
With Ex version, temperature -40 to +55 °C at T6 resp. -40 to +70 °C at T5 resp. -40 to +75 °C at T4, annual mean relative humidity ≤ 95 %		AY	J
<b>11. Marine version</b>			0
Without GL		Y	0
Version GL (Germanischer Lloyd)		Y	L
<b>12. Increased vibration restistance</b>			0
Standard	G	FYO	0
Version with DC power supply, without electric isolation	G	KYO	M
Version with AC/DC power supply (AC/DC power pack), with electric isolation			N
0 ... 200 Hz, <b>25 g</b> continuous, <b>30 g</b> for 2 h 200 ... 500 Hz, <b>15 g</b> continuous Not possible with additional gear!			
<b>13. Additional gear 2 : 1 to 144 : 1</b>			
Choose the full scale value of KINAX WT 707 (without gear) ME ≤ 150°. Limit of error: ≤ 0,5 % for ME ≤ 150° and ≤ 1,5 % for ME ≥ 150°.  Determine the required reduction ratio to the following formula:  $i = \frac{n \cdot 360 [^\circ]}{ME [^\circ]}$ $i = \text{Reduction ratio}$ $n = \text{No. of turns (end of range of object being measured)}$ ME = Full scale value of KINAX WT 707 (without gear). If "ME" is higher but max. ≤ 150°) and "i" is as small as possible the the hysteresis error will be smaller. Example of calculation of the error of the hysteresis; known are: n = 4.1 rotations, i = 10, ME = 147.6° and j = approx. 1.0° j = gear backlash $F \% = \frac{100\% \cdot j \cdot i}{n \cdot 360^\circ} = \frac{100 \cdot 1.0 \cdot 10}{4.1 \cdot 360} = \text{approx. } 0.68\% \text{ error of the hysteresis}$ Gear backlash approx. 1.0° for 2 ≤ i ≤ 12.5 approx. 1.5° for 12.5 < i ≤ 60 approx. 2.0° for 60 < i ≤ 1600			
Without gear 2 : 1 - 144 : 1			0
Transformation 2 : 1	J	EGYN	1
Transformation 4 : 1	J	EGYN	2
Transformation 5 : 1	J	EGYN	3
Transformation 6 : 1	J	EGYN	4
Transformation 8 : 1	J	EGYN	5
Transformation 10 : 1	J	EGYN	A
Transformation 12 : 1	J	EGYN	B
Transformation 12.5 : 1	J	EGYN	C
Transformation 15 : 1	J	EGYN	D
Transformation 16 : 1	J	EGYN	E
Transformation 20 : 1	J	EGYN	F
Transformation 22 : 1	J	EGYN	G

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<b>KINAX WT707</b>	<b>Order-Code 707 - xxxx xxxx xxxx xx</b>		<b>707-</b>
Transformation 24 : 1	J	EGYN	H
Transformation 25 : 1	J	EGYN	J
Transformation 30 : 1	J	EGYN	K
Transformation 32 : 1	J	EGYN	L
Transformation 36 : 1	J	EGYN	M
Transformation 40 : 1	J	EGYN	N
Transformation 50 : 1	J	EGYN	O
Transformation 60 : 1	J	EGYN	P
Transformation 64 : 1	J	EGYN	Q
Transformation 72 : 1	J	EGYN	R
Transformation 75 : 1	J	EGYN	S
Transformation 80 : 1	J	EGYN	T
Transformation 100 : 1	J	EGYN	U
Transformation 120 : 1	J	EGYN	V
Transformation 144 : 1	J	EGYN	W
<b>14. Additional gear 150: 1 to 1600 : 1</b>			
Without gear 150 : 1 - 1600 : 1			0
Transformation 150 : 1		EGJYN	1
Transformation 160 : 1		EGJYN	2
Transformation 180 : 1		EGJYN	3
Transformation 200 : 1		EGJYN	4
Transformation 240 : 1		EGJYN	A
Transformation 250 : 1		EGJYN	B
Transformation 300 : 1		EGJYN	C
Transformation 330 : 1		EGJYN	D
Transformation 360 : 1		EGJYN	E
Transformation 375 : 1		EGJYN	F
Transformation 400 : 1		EGJYN	G
Transformation 450 : 1		EGJYN	H
Transformation 480 : 1		EGJYN	J
Transformation 500 : 1		EGJYN	K
Transformation 550 : 1		EGJYN	L
Transformation 600 : 1		EGJYN	M
Transformation 660 : 1		EGJYN	N
Transformation 720 : 1		EGJYN	O
Transformation 750 : 1		EGJYN	P
Transformation 800 : 1		EGJYN	Q
Transformation 880 : 1		EGJYN	R
Transformation 900 : 1		EGJYN	S
Transformation 1000 : 1		EGJYN	T
Transformation 1024 : 1		EGJYN	U
Transformation 1200 : 1		EGJYN	V
Transformation 1600 : 1		EGJYN	W
<b>15. Test Protocole</b>			
Without protocole			0
Protocole in German			D
Protocole in English			E