KINAX WT 707
Transmitter for angular position

CAMILLE BAUER

Ruggedized version

CE 0102 Ex II 2 G GL

Application

The KINAX WT 707 (Figs. 1 to 6) converts the angular position of a shaft into a **load-independent** direct current signal, proportional to the angular position. The unit is **contact free.** The robust housing has made this unit ideal for machines and ship building.

Fig. 1. KINAX WT 707 with plug-in connector.

Fig. 2. KINAX WT 707 with plug-in connector and foot.

Features / Benefits

- **Measuring input: Angular position**

Measured variable	Measuring range limits
Angular position	0...5 to 0...270 ∢°

- **Measuring output: DC current signal (load-independent, 2-, 3- or 4-wire connection)**
- **Potentiometer for adjusting span / Optimum matching of desired measuring range**
- **Direction of rotation: output signal increases for clockwise or counter-clockwise rotation**
- **Capacitive scanning system / No wear and low annual maintenance**
- **Continuous shaft rotation / No damage when overshooting angle measuring range**
- **Available with type of protection "Intrinsic safety" EEx ia IIC T6 / Can be mounted in hazardous areas** (see "Table 4: Data on explosion protection")
- **Ancillary unit in ruggedized housing / Vibration and shock-resistant, for applications on large machines and in ship building**
- **Marine version also available as per Lloyd's Register of Shipping**

KINAX WT 707- 144D A150

Fig. 3. KINAX WT 707 with screw terminals, cable glands and foot.

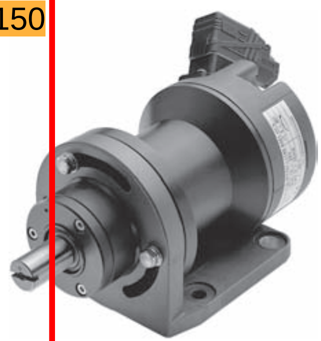

Fig. 4. KINAX WT 707 with additional gear, plug-in connector and foot.

Fig. 5. KINAX WT 707 with additional gear, plug-in connector and mounting flange.

Fig. 6. KINAX WT 707 with additional gear, screw terminals, cable glands and foot.

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Technical data

Measuring input

Measured quantity: Angle of rotation α ∢°

Measuring principle: Capacitive method
Differential capacitor with contact-free, non-wearing positional pick-up. Drive shaft fully rotatable without mechanical stops

Measuring ranges: 0…≥ 5 to 0… ≤ 270 ∢°
(without gear)

Preferred ranges
0…10, 0…30, 0…60, 0…90, 0…180 or 0…270 ∢°

0…≥ 10 ∢° to 0…1600 turns
(with additional gear)

Frictional torque: Approx. 25 Ncm

Sense of rotation: Clockwise or counterclockwise (seen from the shaft side).

The same transmitter can be used for both directions of rotation. A switch has to be changed, however, to reverse the direction on transmitters with ranges 0…> 150 to 0…≤ 270 ∢°, see “Settings”.

See Feature 13 and 14 in “Table 3: Specification and ordering information” for direction of rotation on transmitters with additional gear.

Measuring output

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

Zero point correction: Approx. ± 5%

Span adjustment: Approx. + 5 / – 30%, see “Feature 9”

Current limitation: I_A max. 40 mA

Standard ranges: 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

0…20 mA, 4-wire connection

Non-standard ranges: 0…> 1.00 to 0…< 20 mA
3- or 4-wire connection

External resistance (load): R_{ext} max. $[k\Omega] = \dfrac{12\text{ V}}{I_A\text{ [mA]}}$

(for instruments with **DC/AC** power supply by AC/DC power pack, **with** electric isolation)

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

(for instruments with **DC** power supply, **without** electric isolation)

I_A = Output signal end value

Residual ripple in output current: < 0.3% p.p.

Response time: < 5 ms

Accuracy

Reference value: Measuring range

Basic accuracy: Limit of error ≤ 0.5% for ranges 0…≤ 150 ∢°

Limit of error ≤ 1.5% for ranges from 0…> 150 to 0…270 ∢°

Reproducibility: < 0.2%

Reference conditions:

Ambient temperature: 23 °C ± 2 K

Power supply: H = 18 V

External resistance: R_{ext} = 0 Ω

Influence effects (maxima):
(included in basic error)

Linearity error: ± 0.4% for ranges 0…≤ 150 ∢°
± 1.4% for ranges from 0…> 150 to 0…270 ∢°

Dependence on external resistance ΔR_{ext} max.: ± 0.1%

Power supply influence: ± 0.1%

Additional errors (maxima):

Temperature influence (–25…+ 70°C): ± 0.2% / 10 K

Bearing play influence: ± 0.1%

Power supply H

DC **and** AC voltage: Nominal voltages and tolerances see “Table 1”

Table 1:

Nominal voltages U_N	Tolerances
24… 60 V DC / AC	DC – 15…+ 33% AC ± 15%
85…230 V DC / AC	

(only possible with standard version, non-Ex, **with** electric isolation, with AC/DC power pack (DC and 45…400 Hz)

Power consumption:	< 0.9 W resp. < 1.8 VA
Power supply effect on accuracy:	≤ 0.1% within the admissible power supply tolerance
DC voltage **only**[1]:	12…33 V (possible with standard version, non-Ex, **without** electric isolation) 12…**30 V** (necessary with **Ex** version, type of protection “Intrinsic safety” EEx ia IIC T6, **without** electric isolation)
Max. residual ripple:	10% p.p.
Max. current consumption:	Approx. 5 mA + I_A
Power supply effect on accuracy:	< 0.2% within the admissible power supply tolerance

Mechanical withstand

Permissible vibration: (without additional 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
Mounting position:	Any

Housing data

Material of housing: (main part)	Steel Finish QPQ (nitro-carbonated)
Material of back:	**Plastic** (polyester), when **plug-in cable** specified or **metal** (aluminium), when cable access via **screw terminals** and **cable glands**
Material of plug-in connector:	Plastic
Material of cable glands:	Metal

The **plug-in connector** consists of a socket mounted on the transmitter and plug on the end of the connecting cable (screw gland) with 7 screw terminals (wire gauges up to 1 mm²). The socket can be mounted so that the cable is routed to either the rear (see Fig. 7) or the front (see Fig. 8).

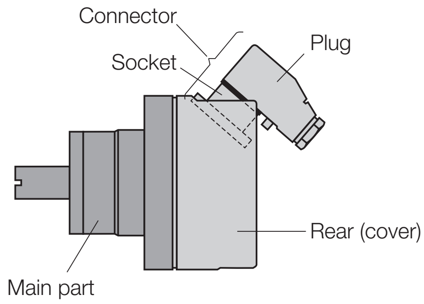

Fig. 7. Cable routed to rear.

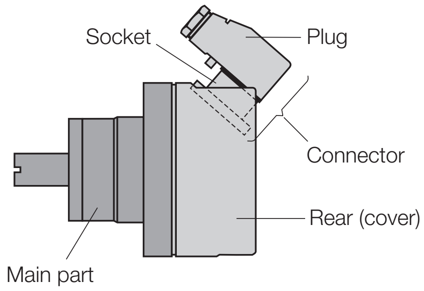

Fig. 8. Cable routed to front.

On units with **screw terminals** and **cable glands PG 11** (see Fig. 9) there are 4 screw terminals and a grounding terminal in the rear cover. The screw terminals accept gauges up to 1.5 mm² and are accessible after removing the cover.

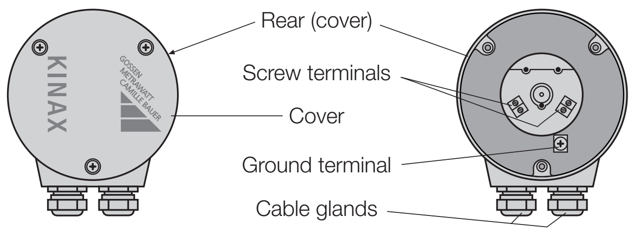

Fig. 9. KINAX WT 707 with screw terminals and cable glands.

Mounting:	Directly (instrument without foot, without flange) Mounting with foot Mounting with flange
Weight:	See Table 2

Table 2:

Weight	Description of parts
Approx. 2.9 kg	KINAX WT 707 **without** additional gear (also without foot or without flange)
Approx. 3.9 kg	KINAX WT 707 **with** additional gear (also without foot or without flange)
0.5 kg	Foot (on its own)
0.5 kg	Flange (on its own)

[1] *Polarity reversal protection. The voltage must not fall below 12 V.*

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Regulations

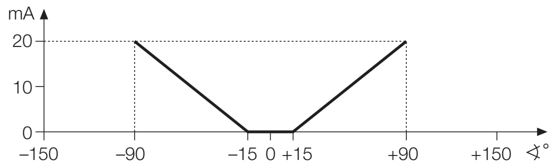
Electromagnetic compatibility:	The standards DIN EN 50 081-2 and DIN EN 50 082-2 are observed
Intrinsic safety:	Acc. to EN 50 020: 1994
Test voltage:	2.2 kVrms, 50 Hz, 1 min. between… … power supply and housing … power supply and measuring output (with DC/AC power supply, with electric isolation) 500 Vrms, 50 Hz, 1 min. all electrical connections to housing (with DC power supply, without electric isolation)
Housing protection:	IP 66 acc. to EN 60 529
Impulse voltage withstand:	1 kV, 1.2/50 μs, 0.5 Ws IEC 255-4, Cl. II
Permissible common-mode voltage:	100 V, 50 Hz

Environmental conditions

Climatic rating:	Standard version Temperature –25 to + 70 °C Annual mean relative humidity ≤ 90% or version with improved climatic rating Temperature –40 to + 70 °C Annual mean relative humidity ≤ 95% Ex-version Temperature – 40 to + 60 °C at T6 resp. – 40 to + 75 °C at T5
Transportation and storage temperature:	–40 to 80 °C

Table 3: Specification and ordering information

Order Code **707 –**			
Features, Selection	*SCODE	no-go	
1. Version of the transmitter			
1) Standard, Measuring output non intrinsically safe	A		1 . . . .
2) EEx ia IIC T6, ATEX Measuring output intrinsically safe	B		2 . . . .
6) Ex ia IIC T6, FTZU (Czech republic) Measuring output intrinsically safe	B		6 . . . .
9) Other versions on request	B		9 . . . .
2. Sense of rotation			
1) Clockwise	D		. 1 . . . . . .
2) Counterclockwise	D		. 2 . . . . . .
3) V characteristic	E		. 3 . . . . . .
4) Both senses of rotation, marked and calibrated	M		. 4 . . . . . .
Lines 1 and 2: Instruments with ranges 0…≥ 5 to 0…≤ 150 ∢° are usable in both senses of rotation. Instruments with ranges 0…> 150 to 0…≤ 270 ∢° 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" Line 3: V characteristic not possible for instruments with gear Line 4: For measuring ranges ≤ 90° only			

Order Code **707 –**			
Features, Selection	*SCODE	no-go	
3. Measuring range (measuring input)			
1) 0... 10 ∢°		E	1 . . . .
2) 0... 30 ∢°		E	2 . . . .
3) 0... 60 ∢°		E	3 . . . .
4) 0... 90 ∢°		E	4 . . . .
5) 0...180 ∢°		EM	5 . . . .
6) 0...270 ∢°		EM	6 . . . .
9) Non-standard [∢°] 0... ≥ 5 to 0...< 270		E	9 . . . .
A) V characteristic [± ∢°]		DM	A . . . .
Line A: 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!  Example of a "V" characteristic for the measuring range [±∢°] 15 / 90 and an output range of 0...20 mA Line 9: With both senses of rotation calibrated, non-standard range: 0 to ≥ 5 till 0 to < 90°			
4. Output signal (measuring output)			
A) 0… 1 mA, 3- or 4-wire connection			. A . . . . . .
B) 0… 5 mA, 3- or 4-wire connection			. B . . . . . .
C) 0…10 mA, 3- or 4-wire connection			. C . . . . . .
D) 4…20 mA, 2-wire connection or 0…20 mA, 3- or 4-wire connection (adjustable with potentiometer)	H		. D . . . . . .
E) 4…20 mA, 3- or 4-wire connection			. E . . . . . .
F) 0…20 mA, 4-wire connection	L		. F . . . . . .
Z) Non-standard, 3- or 4-wire connection [mA] 0… > 1.00 to 0… < 20			. Z . . . . . .
Lines A to Z: R_{ext} max. see Section "Technical data". 4-wire connection, **with** electric isolation only possible with DC/AC power supply (AC/DC power pack). 2-, 3- or 4-wire connection, **without** electric isolation only possible with DC power supply. Line F: Only possible with DC/AC power supply (AC/DC power pack)			
5. Power supply			
1) 24 … 60 V DC/AC, **with** electric isolation	F	BH	. . 1 . . . . .
2) 85 … 230 V DC/AC, **with** electric isolation	F	BH	. . 2 . . . . .
A) 12 … 33 V DC, **without** electric isolation	K	BL	. . A . . . . .
B) 12 … **30** V DC (**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"!			

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Order Code **707 –**

Features, Selection	*SCODE	no-go	
6. Mounting mode			
0) Without foot, without flange			0 . . . .
1) With foot (mounted)			1 . . . .
2) With flange (mounted)			2 . . . .
7. Material of transmitter rear cover / Routing of connecting cable			
1) Plastic / connector **less** cable plug, socket mounted for cable routed to the **rear** (see Fig. 7, but less plug)			. 1 . . . . . .
2) Plastic / connector **less** cable plug, socket mounted for cable routed to the **front** (see Fig. 8, but less plug)			. 2 . . . . . .
3) Plastic / connector **with** cable plug, cable routed to the **rear** (see Fig. 7)			. 3 . . . . . .
4) Plastic / connector **with** cable plug, cable routed to the **front** (see Fig. 8)			. 4 . . . . . .
5) Metal / screw terminals and PG 11 glands (see Fig. 9)			. 5 . . . . . .
Line 5: Recommended for DC/AC power supply, 4-wire connection **with** electric isolation			
8. Special features			
0) Without	Y		. . 0 . . . . .
1) With			. . 1 . . . . .
Without special features (line 0): Order code complete. With special features (line 1): The features to be omitted must be replaced by an oblique stroke (/) in the order code until reaching the required features			
9. Settings (span adjustment)			
A) Extended setting range + 5% / – 60% Restriction: for angle ≥ 60°, supplementary error 0.2% (also possible on versions with additional gear)		Y	. . . A . . . .
10. Improved climatic rating			
H) Temperature – 40 to + 70 °C, annual mean relative humidity ≤ **95%**		BY	. . . . H . . .
J) With **Ex** version Temperature **– 40** to **+ 60** °C at T6 resp. – 40 to + 75 °C at T5, annual mean relative humidity ≤ **95%**		AY	. . . . J . . .
11. Marine version			
L) Version GL ("Germanischer Lloyd")		Y	. . . . . L . .
12. Increased vibration resistance			
M) Version with DC power supply, **without** electric isolation	G	FY	. . . . . . M .
N) Version **with** DC/AC power supply (AC/DC power pack), **with** electric isolation	G	KY	. . . . . . N .
0…200 Hz, **25 g** continuous, **30 g** for 2 h 200…500 Hz, **15 g** continuous Not possible with additional gear			

Order Code **707 –**		
Features, Selection	*SCODE	no-go

13. Additional gear 2 : 1 to 144 : 1

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:

$$i = \frac{n \cdot 360\ [∢°]}{ME\ [∢°]}$$

i = Reduction ratio
n = 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 then 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

$$F\ \% = \frac{100\% \cdot j \cdot i}{n \cdot 360°} = \frac{100 \cdot 1{,}0 \cdot 10}{4{,}1 \cdot 360} = \text{approx. } 0.68\ \%\ \text{error of the hysteresis}$$

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

Selection		*SCODE	no-go	
1) Transformation 2 : 1	→ / →	J	EGY	1 . . . .
2) Transformation 4 : 1	→ / →	J	EGY	2 . . . .
3) Transformation 5 : 1	→ / ←	J	EGY	3 . . . .
4) Transformation 6 : 1	→ / ←	J	EGY	4 . . . .
5) Transformation 8 : 1	→ / ←	J	EGY	5 . . . .
A) Transformation 10 : 1	→ / →	J	EGY	A . . . .
B) Transformation 12 : 1	→ / →	J	EGY	B . . . .
C) Transformation 12,5 : 1	→ / ←	J	EGY	C . . . .
D) Transformation 15 : 1	→ / →	J	EGY	D . . . .
E) Transformation 16 : 1	→ / →	J	EGY	E . . . .
F) Transformation 20 : 1	→ / ←	J	EGY	F . . . .
G) Transformation 22 : 1	→ / ←	J	EGY	G . . . .
H) Transformation 24 : 1	→ / ←	J	EGY	H . . . .
J) Transformation 25 : 1	→ / →	J	EGY	J . . . .
K) Transformation 30 : 1	→ / →	J	EGY	K . . . .
L) Transformation 32 : 1	→ / ←	J	EGY	L . . . .
M) Transformation 36 : 1	→ / →	J	EGY	M . . . .
N) Transformation 40 : 1	→ / →	J	EGY	N . . . .
O) Transformation 50 : 1	→ / ←	J	EGY	O . . . .
P) Transformation 60 : 1	→ / ←	J	EGY	P . . . .
Q) Transformation 64 : 1	→ / →	J	EGY	Q . . . .
R) Transformation 72 : 1	→ / ←	J	EGY	R . . . .
S) Transformation 75 : 1	→ / →	J	EGY	S . . . .
T) Transformation 80 : 1	→ / ←	J	EGY	T . . . .
U) Transformation 100 : 1	→ / →	J	EGY	U . . . .
V) Transformation 120 : 1	→ / →	J	EGY	V . . . .
W) Transformation 144 : 1	→ / →	J	EGY	W . . . .

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Features, Selection	*SCODE	no-go	
14. Additional gear 150 : 1 to 1600 : 1 Additional gear built-in:			
1) Transformation 150 : 1 → / ←		EGJY	1 . . . .
2) Transformation 160 : 1 → / →		EGJY	2 . . . .
3) Transformation 180 : 1 → / ←		EGJY	3 . . . .
4) Transformation 200 : 1 → / ←		EGJY	4 . . . .
A) Transformation 240 : 1 → / ←		EGJY	A . . . .
B) Transformation 250 : 1 → / →		EGJY	B . . . .
C) Transformation 300 : 1 → / →		EGJY	C . . . .
D) Transformation 330 : 1 → / ←		EGJY	D . . . .
E) Transformation 360 : 1 → / →		EGJY	E . . . .
F) Transformation 375 : 1 → / ←		EGJY	F . . . .
G) Transformation 400 : 1 → / →		EGJY	G . . . .
H) Transformation 450 : 1 → / ←		EGJY	H . . . .
J) Transformation 480 : 1 → / →		EGJY	J . . . .
K) Transformation 500 : 1 → / ←		EGJY	K . . . .
L) Transformation 550 : 1 → / →		EGJY	L . . . .
M) Transformation 600 : 1 → / ←		EGJY	M . . . .
N) Transformation 660 : 1 → / →		EGJY	N . . . .
O) Transformation 720 : 1 → / ←		EGJY	O . . . .
P) Transformation 750 : 1 → / →		EGJY	P . . . .
Q) Transformation 800 : 1 → / ←		EGJY	Q . . . .
R) Transformation 880 : 1 → / →		EGJY	R . . . .
S) Transformation 900 : 1 → / →		EGJY	S . . . .
T) Transformation 1000 : 1 → / →		EGJY	T . . . .
U) Transformation 1024 : 1 → / →		EGJY	U . . . .
V) Transformation 1200 : 1 → / →		EGJY	V . . . .
W) Transformation 1600 : 1 → / →		EGJY	W . . . .
→ / → The direction of rotation specified under 2. is **not reversed** by the reduction gear; → / ← The direction of rotation specified under 2. is **reversed** by the reduction gear!			

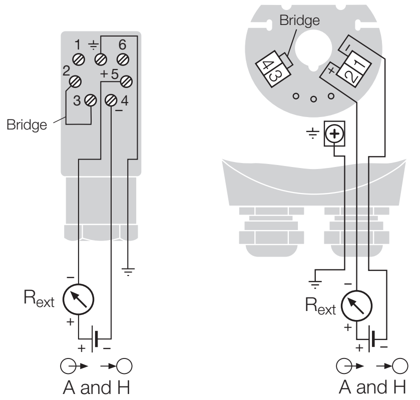
**Lines with letter(s) under “no-go” cannot be combined with preceding lines having the same letter under “SCODE”.*

Table 4: Data on explosion protection Ex II 2 G

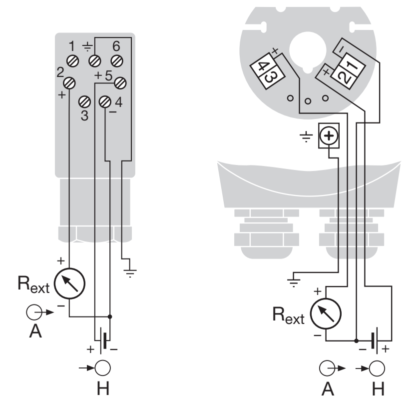
Order Code	Type of protection “Intrinsic safety” Marking Instrument	Type of protection “Intrinsic safety” Marking Measuring output	Certificates	Mounting location of the instrument
707 - 2 …	EEx ia IIC T6	U_i = 30 V I_i = 160 mA P_i = 1 W C_i ≤ 10 nF L_i = 0	Type Examination Certificate PTB 97 ATEX 2271	**Within** the hazardous area
707 - 6 …	Ex ia IIC T6		Czech republic FTZU 98 Ex 0280	

Electrical connections

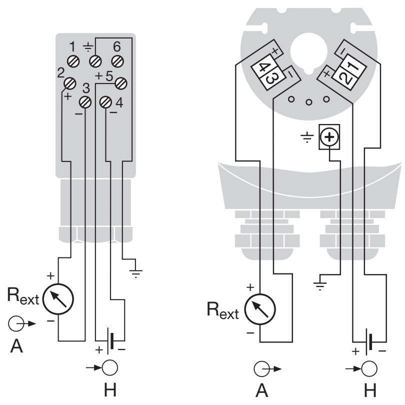
2-, 3- or 4-wire connection **without** electric isolation



2-wire connection (4...20 mA)



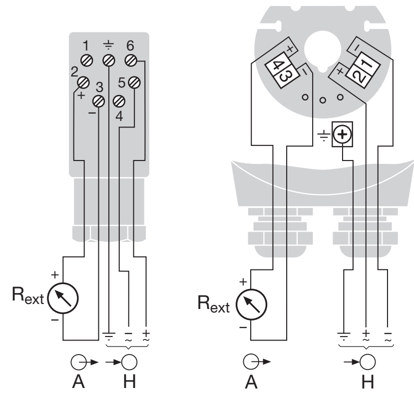
3-wire connection (different mA signals)



4-wire connection (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_{ext} = External resistance

4-wire connection **with** electric isolation



4-wire connection (different mA signals)

A = Measuring output
H = **AC/DC** power supply
R_{ext} = External resistance

Settings

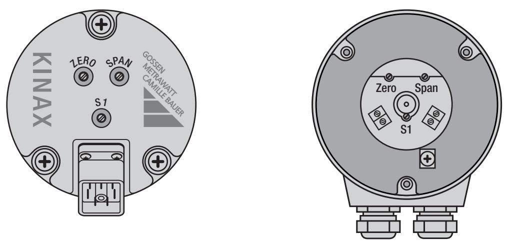


Fig. 10. Position of settings.
Left: Transmitter with plug-in connector.
Right: Transmitter with screw terminals and cable glands.
ZERO = Potentiometer for zero point
SPAN = Potentiometer for measuring range end value
S1 = Switch for reversing direction of rotation for ∢ >150º.

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 ∢° for reversing the direction of rotation. It is marked S1.

Standard accessories

1 Operating Instructions in three languages: German, French, English
1 Ex approval, for instruments in Ex version only

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Dimensional drawings

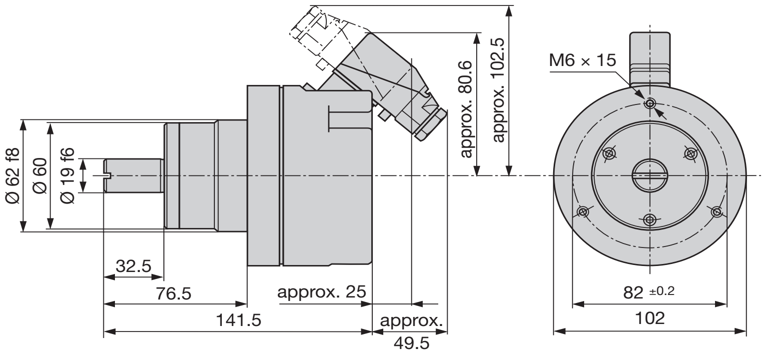

Fig. 11. KINAX WT 707 with plug-in connector.

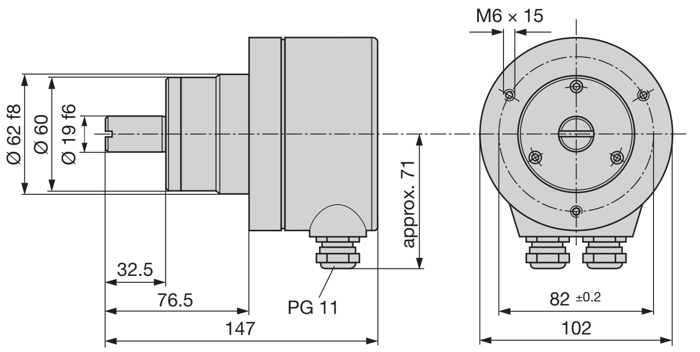

Fig. 12. KINAX WT 707 with screw terminals and cable glands.

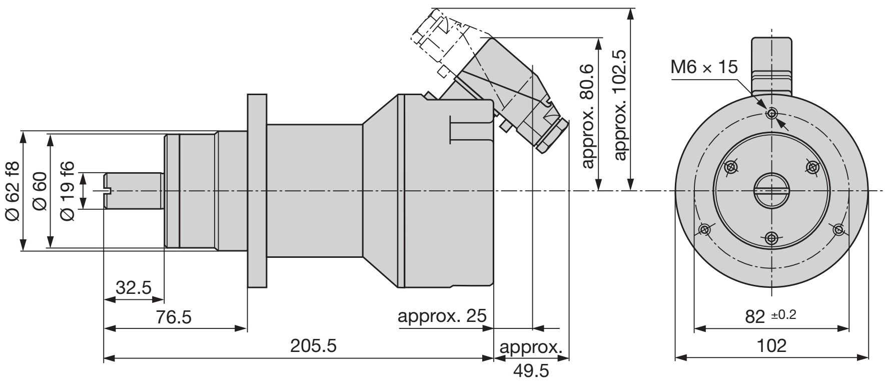

Fig. 13. KINAX WT 707 with additional gear and plug-in connector.

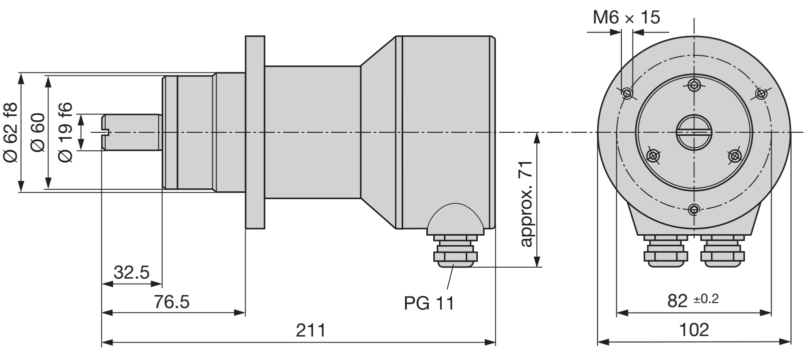

Fig. 14. KINAX WT 707 with additional gear, screw terminals and cable glands.

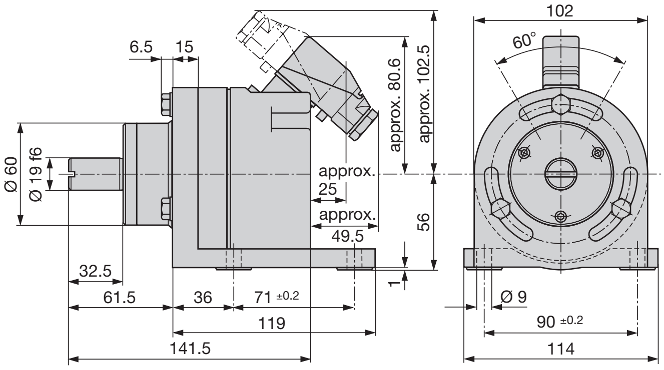

Fig. 15. KINAX WT 707 with plug-in connector and foot.

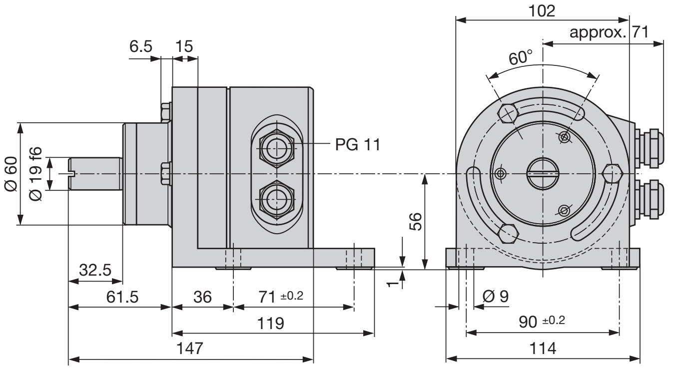

Fig. 16. KINAX WT 707 with screw terminals, cable glands and foot.

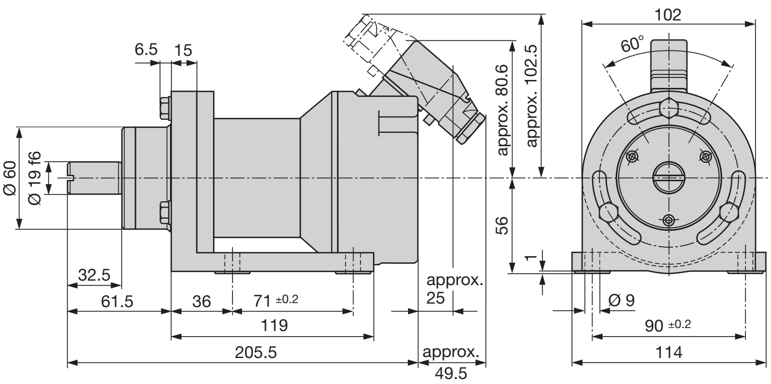

Fig. 17. KINAX WT 707 with additional gear, plug-in connector and foot.

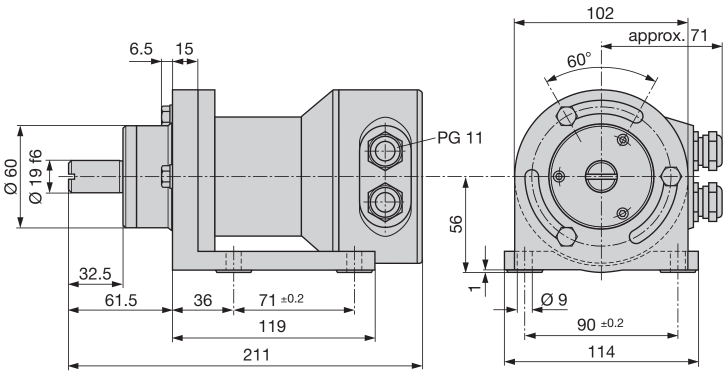

Fig. 18. KINAX WT 707 with additional gear, screw terminals, cable glands and foot.

KINAX WT 707
Transmitter for angular position

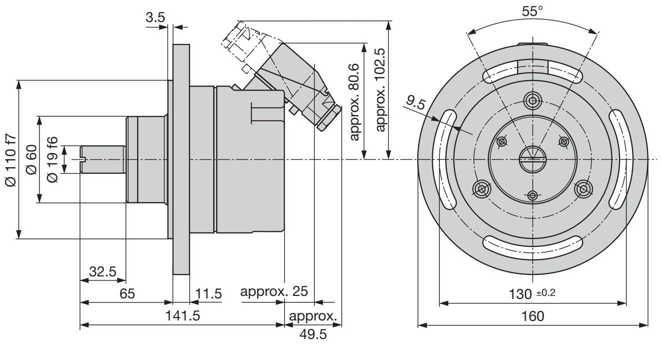

Fig. 19. KINAX WT 707 with plug-in connector and flange.

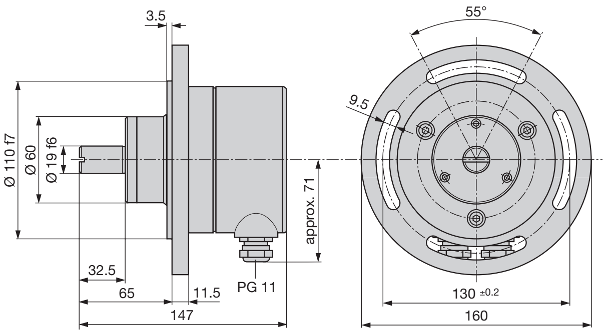

Fig. 20. KINAX WT 707 with screw terminals, cable glands and flange.

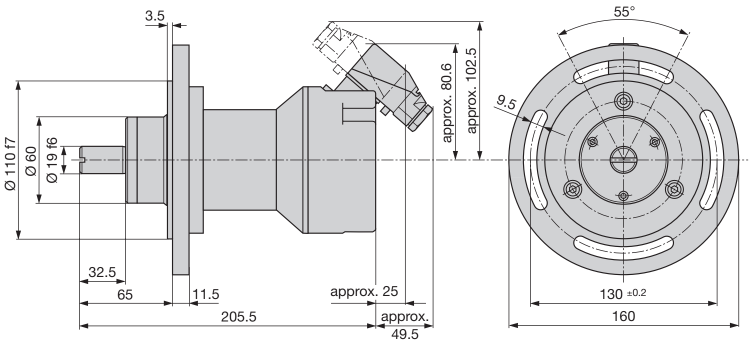

Fig. 21. KINAX WT 707 with additional gear, plug-in connector and flange.

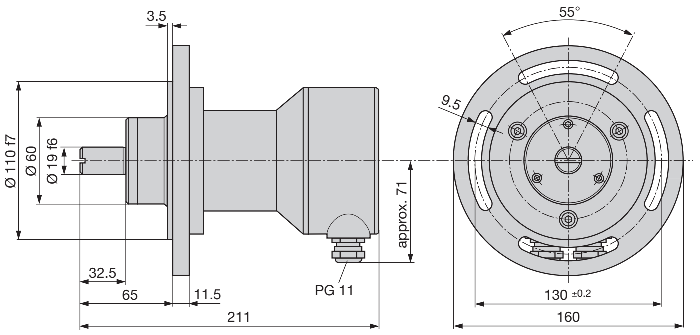

Fig. 22. KINAX WT 707 with additional gear, screw terminals, cable glands and flange.

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CAMILLE BAUER

Operating Instructions
Transmitter for angular position KINAX WT 707

Contents

1. Read first and then …

The proper and safe operation of the device assumes that the Operating Instructions are **read carefully** and the safety warnings given in the various Sections

6. **Mounting**
7. **Electrical connections**
8. **Setting the beginning and end of the measuring range**
10. **Reversing the rotation for instruments with measuring ranges 150 ∢°**

are **observed**.

The device should only be handled by appropriately trained personnel who are familiar with it and authorised to work in electrical installations.

The instrument must only be opened to make the electrical connections (Section 7.2), for setting the beginning and end (Section 8) and for reversing the rotation (Section 10).

The guarantee is no longer valid if the instrument is further tampered with!

2. Brief description

The KINAX WT 707 converts the angular position of a shaft into a **load-independent** direct current signal, proportional to the angular position.

Explosion-proof **"Intrinsically safe"** versions with I.S. measuring output rounds off this series of transmitters.

3. Scope of supply

Transmitter, one of the twelve versions (Fig. 1)

1 Operating Instructions (Fig. 2), in three languages: German, French, English

1 Ex approval (Fig. 2), only for Ex version devices

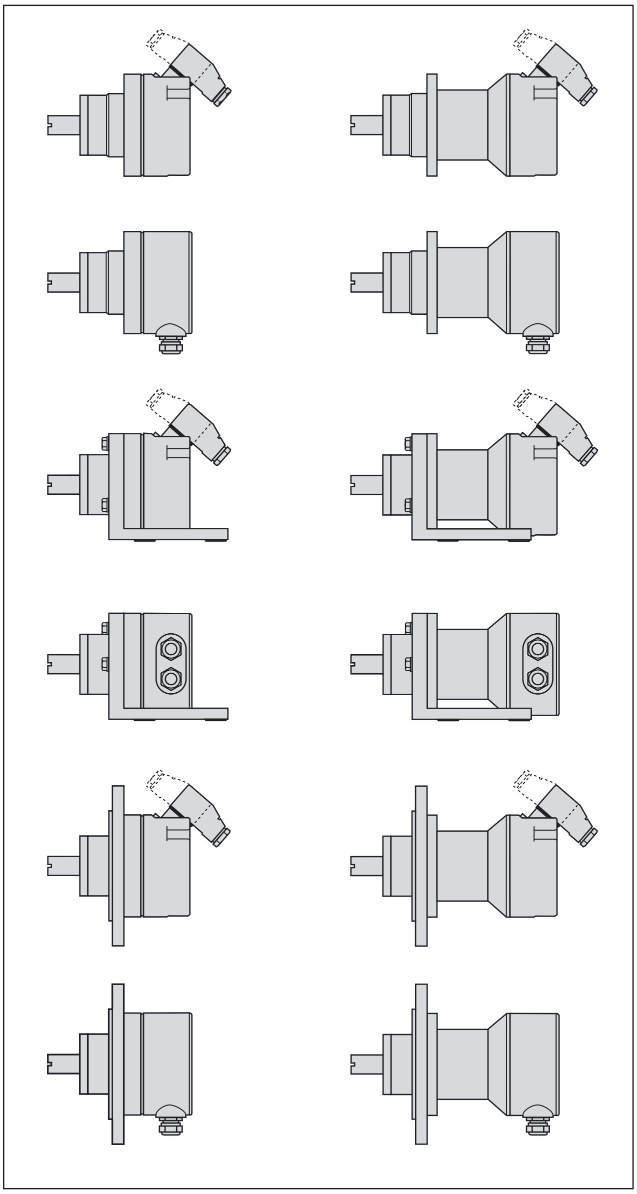


Fig. 1

Fig. 2

4. Specification and ordering information

Significance of digits 1. to 7.

Order Code	707 –
1. Version of the transmitter	
Standard, Measuring output non-intrinsically safe	1
EEx ia IIC T6, ATEX Measuring output intrinsically safe	2
Ex ia IIC T6, FTZU (Czech republic), Measuring output intrinsically safe	6
2. Sense of rotation	
Calibrated for sense of rotation clockwise	1
Calibrated for sense of rotation counterclockwise	2
V characteristic	3
Calibrated for both senses of rotation	4
3. Measuring range (measuring input)	
0 … 10 ∢°	1
0 … 30 ∢°	2
0 … 60 ∢°	3
0 … 90 ∢°	4
0 … 180 ∢°	5
0 … 270 ∢°	6
Non-standard 0...≥5 to 0...< 270 ∢°	9
V characteristic	A
4. Output signal (measuring output)	
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	D
4 … 20 mA, 3 or 4-wire connection	E
0 … 20 mA, 4-wire connection	F
Non-standard, 3 or 4-wire connection 0 … > 1.00 to 0 … < 20 mA	Z

Order Code	707 –
5. Power supply	
24 … 60 V DC/AC, **with** electric isolation	1
85 … 230 V DC/AC, **with** electric isolation	2
12 … 33 V DC, **without** electric isolation	A
12 … **30** V DC (**Ex**), **without** electric isolation	B
6. Mounting mode	
Without foot, without flange	0
With foot (mounted)	1
With flange (mounted)	2
7. Material of transmitter rear cover / Routing of connecting cable	
Plastic / connector **less** cable plug, socket mounted for cable routed **to the rear**	1
Plastic / connector **less** cable plug, socket mounted for cable routed **to the front**	2
Plastic / connector **with** cable plug, cable routed **to the rear**	3
Plastic / connector **with** cable plug, cable routed **to the front**	4
Metal / screw terminals and cable glands	5

Note
The remaining order code digits concern special features, e.g. the ancillary gear for extending the measuring ranges.

5. Technical data

Measuring input

Measuring ranges: 0…≥ 5 to 0… ≤ 270 ∢° (without gear)

Preferred ranges 0…10, 0…30, 0…60, 0…90, 0…180 or 0…270 ∢°

0…≥ 10 ∢° to 0…1200 turns (with additional gear)

Measuring output

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

Standard ranges:

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

0…20 mA, 4-wire connection

Non-standard ranges: 0…> 1.00 to 0…< 20 mA 3 or 4-wire connection

External resistance (load):

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

(for instruments with **DC/AC** power supply by AC/DC power pack, **with** electric isolation)

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

(for instruments with **DC** power supply, **without** electric isolation)

I_A = Output signal end value

Accuracy

Reference value: Measuring range

Basic accuracy: Limit of error ≤ 0.5% for ranges 0…≤ 150 ∢°

Limit of error ≤ 1.5% for ranges from 0…> 150 to 0…270 ∢°

Power supply H →◯

DC **and**
AC voltage: Nominal voltages and tolerances see “Table 1”

Table 1:

Nominal voltages U_N	Tolerances
24 - 60 V DC / AC	DC – 15 to + 33% AC ± 15%
85 - 230 V DC / AC	

(only possible with standard version, non-Ex, **with** electric isolation, with AC/DC power pack (DC and 45…400 Hz)

DC voltage **only**[1]: 12…33 V (possible with standard version, non-Ex, **without** electric isolation)

12…**30 V** (necessary with **Ex** version, type of protection “Intrinsic safety” EEx ia IIC T6, **without** electric isolation)

Max. residual ripple: 10% p.p.

Max. current cosumption: Approx. 5 mA + I_A

Mechanical withstand

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

Mounting position: Any

Material

Housing (main part): Steel
Finish QPQ
(nitro-carbonated)

Rear (cover): **Plastic** (polyester), when **plug-in cable** specified

or

metal (aluminium), when cable access via **screw terminals** and **cable glands**

Plug-in connector: Plastic

Cable glands: Metal

Regulations

Test voltage: 2.2 kVeff, 50 Hz, 1 min. between…

… power supply and housing

… power supply and measuring output

(with DC/AC power supply, with electric isolation)

500 Veff, 50 Hz, 1 min.
all electrical connections against housing
(with DC power supply, without electric isolation)

Housing protection: IP 66 acc. to EN 60 529

Environmental conditions

Climatic rating: Standard version
Temperature – 25 to + 70 °C
Annual mean relative humidity ≤ 90%
or

Version with improved climatic rating
Temperature – 40 to + 70 °C
Annual mean relative humditiy ≤ 95%
Ex version
Temperature – 40 to + 60 °C at T6
resp. – 40 to + 75 °C at T5

Transportation and storage temperature: – 40 to 80 °C

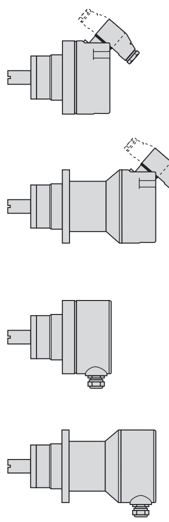
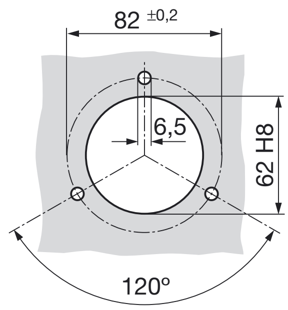
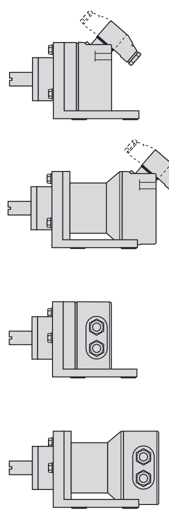
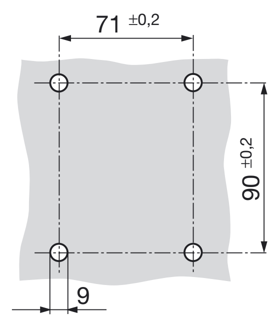
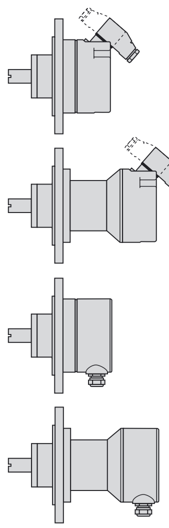
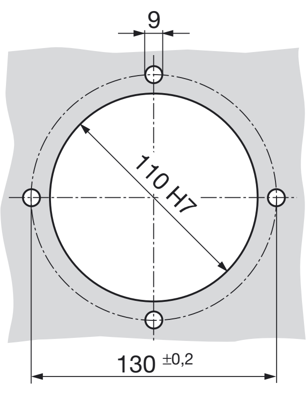
Altitude: 2000 m max.

[1] Polarity reversal protection.The voltage must not fall below 12 V.

6. Mounting

The twelve versions of the transmitter differ in their mechanical design. **Four** of them are intended for mounting **directly** on the device being measured. The others are equipped with a **mounting bracket** or a **flange**. The relationship between the three types of mounting, or more precisely the corresponding cut-out diagrams and the different versions of the transmitter can be seen from Table 2.

Table 2:

Transmitter versions	Drilling and cut-out diagrams for mounting transmitters …	
	… directly	
	… with a bracket	
	… with a flange	

The **M6** screws are needed for the **“directly”** mounted versions and four **M8** nuts and bolts for those **“with a bracket”** or **“with a flange”**. The screws, respectively nuts and bolts are not supplied, because the required length varies according to the thickness of the mounting surface.

When deciding where to install the transmitter (measuring location), take care that the **ambient conditions** given in Section 5 “Technical data” are **not exceeded**.

When installing or servicing intrinsically safe (Ex) instruments with enclosure made from synthetic material, care must be taken to avoid electrostatic charges.

Make the cut-out or drill the holes in the item onto which the transmitter is to be mounted according to the **correspon-ding** drilling and cut-out diagram given in Table 2 and then fit the transmitter.

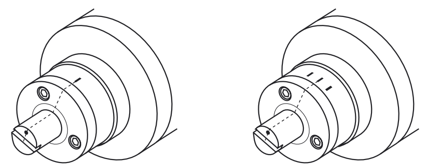
Pay attention when aligning and tightening the transmitter that the electrical **zero** and the **zero** of the item being measured **coincide**.

The holes in the mounting bracket and the flange are elongated for this purpose and permit the transmitter to be rotated in order to adjust the electrical zero to coincide with the zero of the measured device.

Similarly, it is advisable to elongate the three holes (6.5 mm diam.) drilled for **“directly”** mounted versions (see upper drilling and cut-out diagram in Table 2).

The **electrical zero** of the transmitter is marked on the end of the shaft and on the outside of the casing (see diagrams):

– left for rotation transmitters with the range of 0 to … ∢°
– right for rotation transmitters with V characteristic ranges.



7. Electrical connections

Either a **plug-in connector** or **screw terminals** and **cable glands** are provided for making the electrical connections to the transmitter. Of the twelve versions of the transmitter, six have connectors and six screw terminals and cable gland (see Table 2).

Make sure that the cables are not live when making the connections!

The 230 V power supply is potentially dangerous!

Also note that, …

… the data required to carry out the prescribed measurement must correspond to those marked on the nameplate (Fig. 3) of the KINAX WT 707 (measuring input, measuring output, power supply)!

… the total loop resistance connected to the output (receiver plus leads) **does not** exceed the maximum permissible value R_{ext}! See **"Measuring output"** in Section 5 "Technical data" for the maximum values of R_{ext}!

… twisted cores must be use for the measured variable input and output leads and routed as far away as possible from power cables!

In all other respects, observe all local regulations when selecting the type of electrical cable and installing them!

In the case of **"Intrinsically safe"** explosion-proof versions with I.S. measuring output, the supplementary information given on the Ex approval and also local regulations applicable to electrical installations in explosion hazard areas must be taken into account!

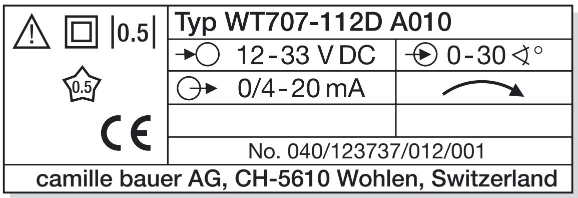


Fig. 3. Example of a nameplate.

7.1 Connecting transmitters with plug-in connector

The **plug-in connector** (1) consists of a socket (1.1) mounted on the rear (2) of the transmitter and plug (1.2) on the end of the connecting cable (screw gland PG 11) and 7 screw terminals (wire gauges up to max. 1 mm²). The socket can be mounted so that the cable is routed to either the rear (Fig. 4, left) or the front (Fig. 4, right).

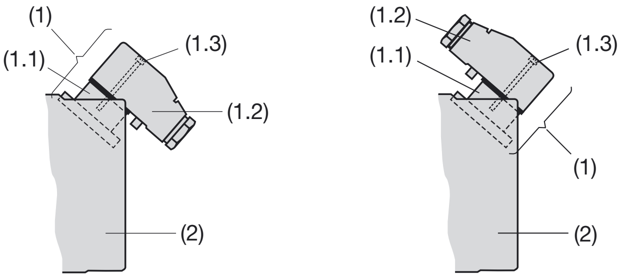


Fig. 4. Rear (2) with plug-in connector (1).
Left: Plug-in connector routed to rear.
Right: Plug-in connector routed to front.

Remove the screw (1.3) and the connector casing.

Slightly lift the spring latch (1.6) and remove the cover (1.4) from the body (1.5) of the connector casing.

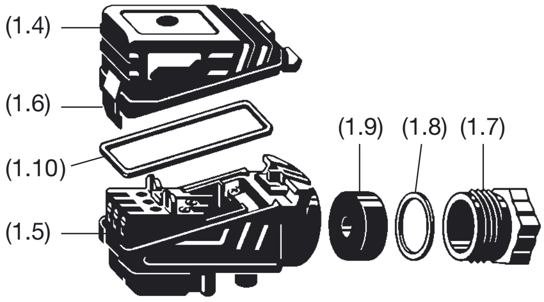


Fig. 5. Plug (1.2).

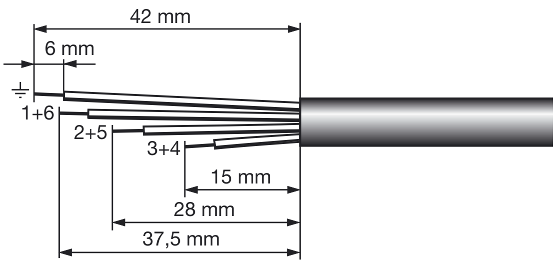


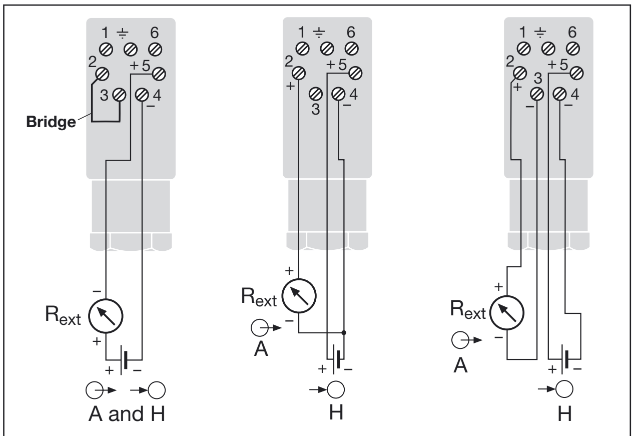
Fig 6

Strip the leads as shown in Fig. 6. Pass the leads through the gland nut (1.7) pinch ring (1.8) and seal (1.9). Insert the leads into the body. **Connect** the cores according to the **respective wiring diagram** (Fig. 7 or 8).

Push the seal and the pinch ring which are loose on the leads into the body. Fit and tighten the gland nut on the body.

Align the seal (1.10) on the sealing surface of the body. Reassemble the cover and the body and press the cover into place until the latch (1.6) audibly clicks.

Finally, insert the connector into the socket plug at the rear of the transmitter.



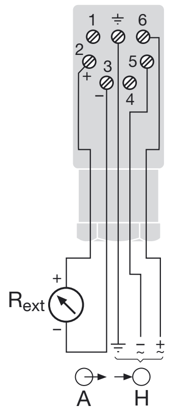
2-wire connection (4…20 mA) — 3-wire connection (different mA-signals) — 4-wire connection (different mA-signals)

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_{ext} = External resistance

Fig. 7. Connection diagrams for 2, 3 or 4-wire connection, **without** electric isolation, **DC** power supply.



4-wire connection (different mA-signals)

A = Measuring output
H = **DC/AC** power supply
R_{ext} = External resistance

Fig. 8. Connection diagram for 4-wire connection,
with electric isolation, **DC/AC** power supply.

7.2 7.2 Connecting transmitter with screw terminals and cable glands

In the case of transmitters fitted with **screw terminals** and **cable glands,** there are 4 screw terminals (4.1) plus 1 ground terminal (4.2) which are accessible after removing the cover (3.1) (see Fig. 9). The maximum wire gauge the terminals can accept is 1.5 mm^2.

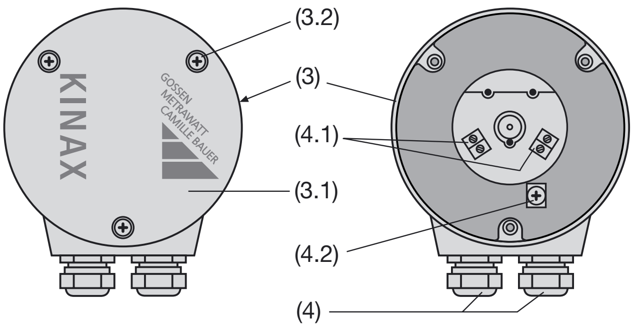


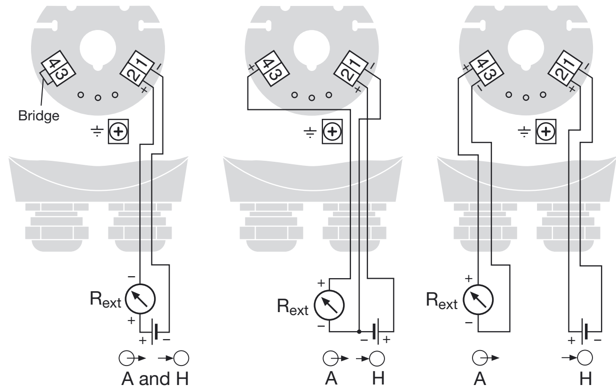
Fig. 9. Rear (3) with terminals (4.1) and (4.2) and cable glands (4).
Left: Cover (3.1) closed.
Right: Exposed.

Remove the 3 screws (3.2) and take off the cover (3.1).

Undo the gland nut and remove the pinch ring and seal from the gland opening. Place these parts over the cable in the correct order and pass the end of the cable through the gland hole into the rear of the transmitter.

Strip the insulation from a suitable length of the leads and **connect** them to the terminals (4.1) and (4.2) according to the **respective wiring diagram** (Fig. 10 or 11).

Then fit the gland seal, pinch ring and nut. Tighten the gland nut and replace the cover.



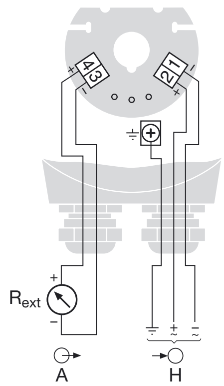
2-wire connection (4…20 mA)	3-wire connection (different mA-signals)	4-wire connection (different mA-signals)

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_{ext} = External resistance

Fig. 10. Connection diagrams for 2, 3 or 4-wire connection,
without electric isolation, **DC** power supply.



4-wire connection (different mA-signals)

A = Measuring output
H = **DC/AC** power supply
R_{ext} = External resistance

Fig. 11. Connection diagram for 4-wire connection,
with electric isolation, **DC/AC** power supply.

8. Setting the beginning and end of the measuring range

The coarse adjustment of the beginning of the measuring range consists in aligning the zero of the measured device with the external zero mark on the transmitter. The procedure was described in Section 6 "Mounting". This Section concerns the **fine adjustment** not only of the beginning of the range (ZERO), but also of the end of the scale (SPAN).

Firstly, switch on the power supply to the transmitter.

For versions …

… with **plug-in connector** remove the ZERO/SPAN sealing screws (2.2) (Fig. 12, left).

… with **screw terminals** and **cable glands,** remove the 3 screws (3.2) and the cover (3.1) (Fig. 9, left).

> Caution! The screw terminals (4.1) are live.
>
> **The 230 V power supply is potentially dangerous!**

Place the measured device at its **zero position,** i.e. the position at which the KINAX WT 707 should produce 0 mA (three or four-wire connection), respectively 4 mA (two-wire connection) at its output.

Should the output current differ by more than 2% from its initial value, repeat the coarse zero setting procedure described in Section 6 "Mounting".

Then adjust the "ZERO" potentiometer (Fig. 12, right or Fig. 13) using a watchmaker's screwdriver (2.3 mm diam.) so that the desired output current flows.

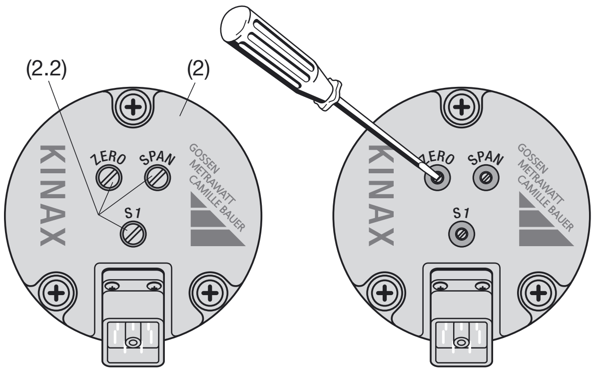


Fig. 12. Rear (2) of the transmitter with the adjustments "ZERO", "SPAN" and "S1".
Left: Adjustments covered by the sealing screw (2.2).
Right: Adjustments exposed.

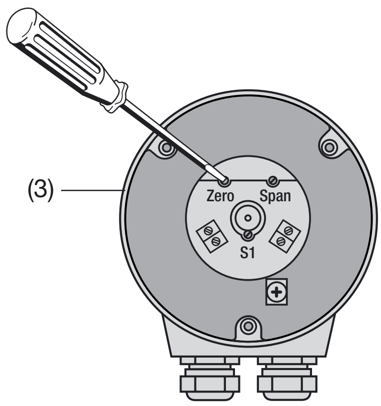


Fig. 13. Rear (3) of the transmitter with the adjustments "ZERO", "SPAN" and "S1".

Now rotate the measured device to its opposite **limit position,** i.e. the position at which the KINAX WT 707 should produce the prescribed full-scale output current (see rating plate).

Adjust the "SPAN" potentiometer with the screwdriver as before until precisely the prescribed full-scale output current is measured at the output.

Then recheck the zero point and correct on the ZERO potentiometer if necessary. Check the full-scale value again. Repeat both adjustments until both zero point and full-scale value are precise.

9. Adaptation from 2-wire connection to 3 or 4-wire connection and vice versa

Transmitters with the ordering code 707 – ...**D** (see Section 4 "Specification and ordering information") are designed for either a two-wire connection with an output range of 4…20 mA or a three or four-wire connection with an output range of 0…20 mA.

If, however, a transmitter be changed from one to the other (see wiring diagrams in Fig. 7 and 10), the beginning and end of the measuring range must be readjusted.

10. Reversing the rotation for instruments with measuring ranges 150 ∢°

A switch is provided on angular transmitters with a measuring range > 150 ∢° for reversing the direction of rotation. It is marked S1 (Fig. 12 and Fig. 13).

At the version …

… with **plug-in connector** remove the S1 sealing screw (2.2) (Fig. 12, left).

… with **screw terminals** and **cable glands,** remove the 3 screws (3.2) and the cover (3.1) (Fig. 9, left).

> Caution! The screw terminals (4.1) are live.
>
> **The 230 V power supply is potentially dangerous!**

Then operate the switch by turning it a quarter of a turn with a watchmakers screwdriver (2.3 mm diam.) and reset the beginning and end of the measuring range.

> Attention! In instruments with measuring range **less than 150** ∢° the switch S1 is not existing.
>
> 
>
>
> Forcing a watchmaker's screwdriver into the opening will damage the PCB.

11. Spare parts

11.1 Parts common to *both* versions, i.e. with *plug-in connector* and with *screw terminals* and *cable glands*

Description[1]	Order No
Foot for fixing the KINAX WT 707 with … … 3 hexagon bolts M6 × 30 … 3 spring washers B6 … 3 washers 6.4/12.5 × 1.6	997 182
Flange for fixing the KINAX WT 707 with … … 3 Allen socket screws, M6 × 20 … 3 spring washers B6 … 3 washers 6.4/12.5 × 1.6	997 190
Seal between rear (2) or (3) (cover) and housing (main part) as O ring 94.97 × 1.78	991 861

11.2 Parts *only* for versions with *plug-in connectors*

Description[1]	Order No
Rear (2) (cover) in plastic, **black**, **without** securing screws, connector (1) and sealing screws (2.2)	988 454
Rear (2) (cover) in plastic, **blue** (for Ex version), **without** securing screws, connector (1) and sealing screws (2.2)	988 909
Plug (1.1) **with** leads to the measuring transmitter, **without** connector case (1.2) and securing screws	988 785
4 securing screws K30 × 9.5, for fixing the plug (1.1)	982 216
Connector case (1.2) **without** plug (1.1)	988 470
Set of securing parts and seals consisting of … … 3 Philips screws 2 × M6×25, 1×M6×12, for fixing the rear (2) … 3 sealing rings for Philips screws above … 4 securing screws K30 × 9.5, for fixing the plug (1.1) … 3 sealing screws (2.2) M5 × 10, for covering the ZERO, SPAN and S1 settings	996 879

[1] The numbers in brackets, e.g. (1.1), are item numbers used in the figures and text above.

Description[1]	Order No
Switching supply unit	
24 … 60 V DC/AC, not moulded, with socket	988 420
85 … 230 V DC/AC, not moulded, with socket	988 462
24 … 60 V DC/AC, moulded, with socket	991 978
85 … 230 V DC/AC, moulded, with socket	991 986

11.3 Parts *only* for versions with *screw terminals* and *cable glands*

Description[1]	Order No
Rear (3) (cover) in metal (aluminium), black, **without** securing screws, cover (3.1) and cable glands (4)	995 300
Rear (3) (cover) in metal (aluminium), black, **with** securing screws (3 small-headed cylindric screws M6 × 10), **without** cover (3.1) and cable glands (4)	997 231
Cover (3.1) for rear (3) with … … flat cover seal … 3 lens-headed screws M4 × 12 … 3 screw sealing rings … 3 O rings CR 3.0 × 1 for screws	997 207
Switching supply unit	
24 … 60 V DC/AC, not moulded, and connecting PCB with 4 screw terminals (4.1)	995 425
85 … 230 V DC/AC, not moulded, and connecting PCB with 4 screw terminals (4.1)	994 815
24 … 60 V DC/AC, moulded, and connecting PCB with 4 screw terminals (4.1)	995 508
85 … 230 V DC/AC, moulded, and connecting PCB with 4 screw terminals (4.1)	994 823
Connecting PCB with 4 screw terminals on its own (4.1)	995 433

11.4 Complete conversion kits

Description	Order No
Rear of the transmitter (cover) in plastic, black, with connector (only for instruments in standard version)	137 043
Rear of the transmitter (cover) metal/screw terminals and cable glands (only for instruments in standard version)	137 069

12. Declaration of conformity

EG - KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY

Dokument-Nr./
Document.No.: WT707.DOC

Hersteller/
Manufacturer: **Camille Bauer AG**
Switzerland

Anschrift /
Address: **Aargauerstrasse 7**
CH-5610 Wohlen

Produktbezeichnung/
Product name: **Messumformer für Drehwinkel**
Transmitter for angular position

Typ / Type: **KINAX WT 707**

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein, nachgewiesen durch die Einhaltung folgender Normen:

The above mentioned product has been manufactured according to the regulations of the following European directives proven through compliance with the following standards:

Nr. / No.	Richtlinie / Directive	
89/336/EWG 89/336/EEC	Elektromagnetische Verträglichkeit - EMV - Richtlinie Electromagnetic compatibility -EMC directive	
EMV / EMC	Fachgrundnorm / Generic Standard	Messverfahren / Measurement methods
Störaussendung / Emission	EN 50 081-2 : 1993	EN 55011 : 1992
Störfestigkeit / Immunity	EN 50 082-2 : 1994	IEC 1000-4-2 : 1991 IEC 1000-4-3 : 1995 IEC 1000-4-4 : 1995 IEC 1000-4-5 : 1988 IEC 1000-4-6 : 1995 IEC 1000-4-11 : 1993

Nr. / No.	Richtlinie / Directive
73/23/EWG 73/23/EEC	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen - Niederspannungsrichtlinie - CE-Kennzeichnung : 95 Electrical equipment for use within certain voltage limits - Low Voltage Directive - Attachment of CE mark : 95
EN/Norm/Standard	IEC/Norm/Standard
EN 61 010-1 : 1993	IEC 1010-1 : 1990 + A1 : 1992

Die explosionsgeschützte Ausführung dieses Produkts stimmt mit der Europäischen Richtlinie 94/9/EG überein.

The explosion protected variant of this product has been manufactured according the European directive 94/9.

Ort, Datum /
Place, date: Wohlen, den 24. August 2000

Unterschrift /
Signature: M.Ulrich

Leiter Entwicklung

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der mitgelieferten Produktdokumentationen sind zu beachten.

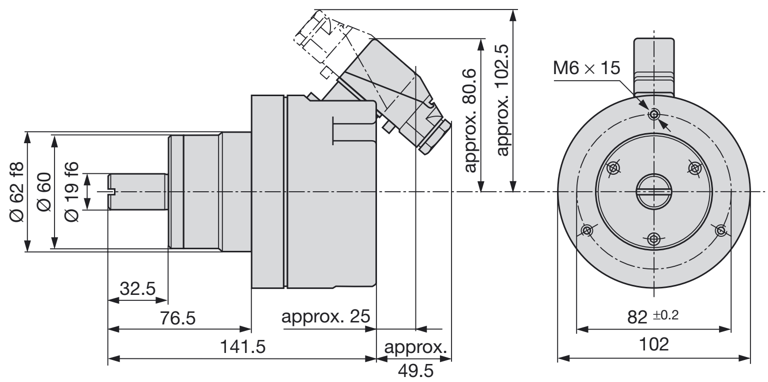
This declaration certifies compliance with the above mentioned directives but does not include a property assurance. The safety notes given in the product documentations, which are part of the supply, must be observed.

Mass-Skizzen / Croquis d’encombrements / Dimensional drawings

KINAX WT 707
mit Steckverbinder.

KINAX WT 707
avec connecteur à fiche.

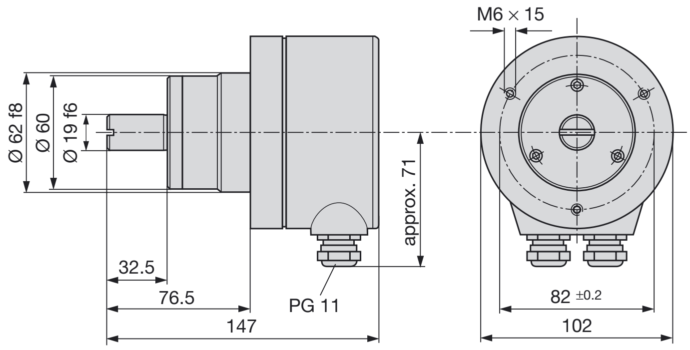
KINAX WT 707
with plug-in connector.



KINAX WT 707
mit Schraubklemmen und
Stopfbuchsen.

KINAX WT 707
avec bornes à vis
et presse-étoupes.

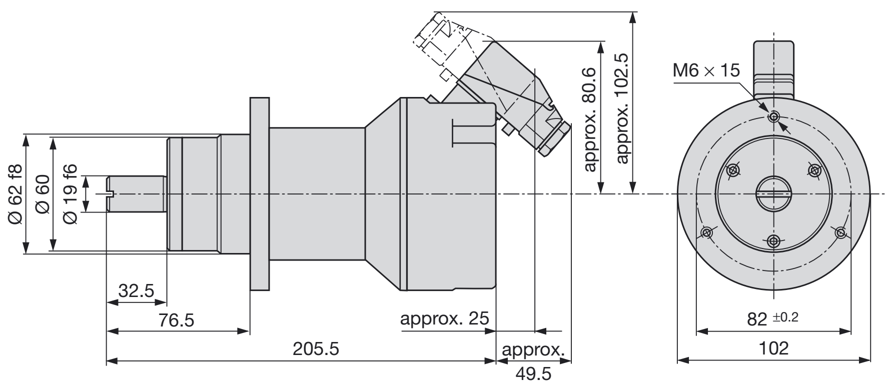
KINAX WT 707
with screw terminals
and glands.



KINAX WT 707
mit Zusatzgetriebe
und Steckverbinder.

KINAX WT 707
avec engrenage additionnel
et connecteur à fiche.

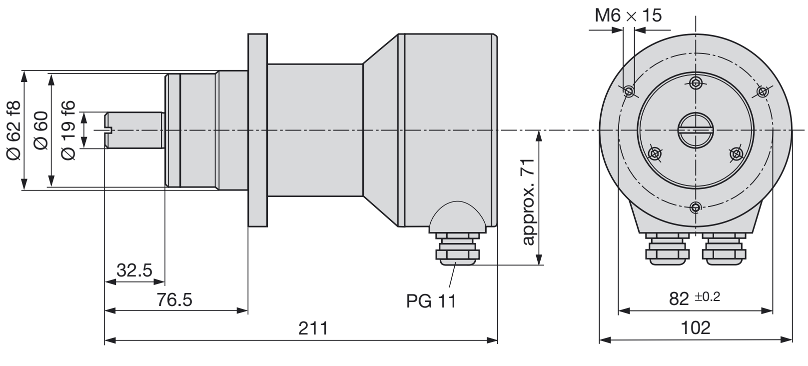
KINAX WT 707
with additional gear
and plug-in connector.



KINAX WT 707
mit Zusatzgetriebe
und Schraubklemmen
sowie Stopfbuchsen.

KINAX WT 707
avec engrenage additionnel
et bornes à vis,
ainsi que presse-étoupes.

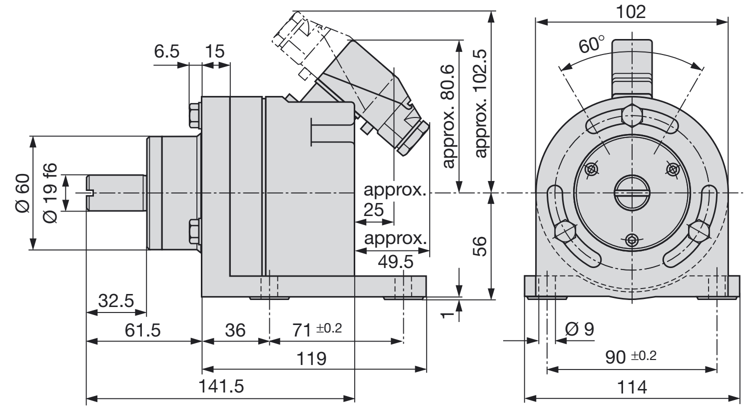
KINAX WT 707
with additional gear,
screw terminals
and glands.



KINAX WT 707
mit Steckverbinder und Fuss.

KINAX WT 707
avec connecteur à fiche
et pied.

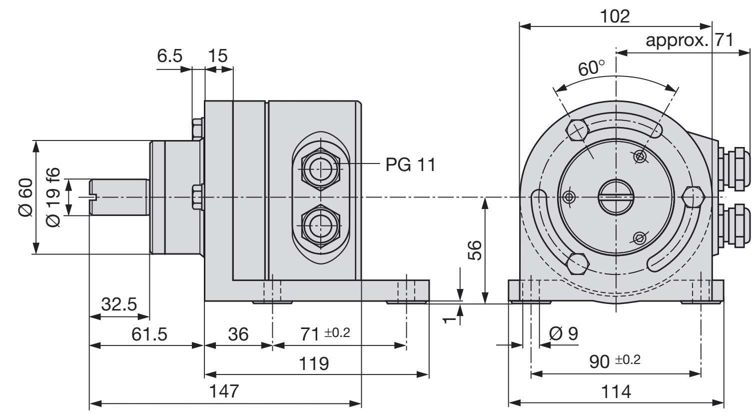
KINAX WT 707
with plug-in connector
and foot.



KINAX WT 707
mit Schraubklemmen sowie
Stopfbuchsen und Fuss.

KINAX WT 707
avec bornes à vis, ainsi que
presse-étoupes et pied.

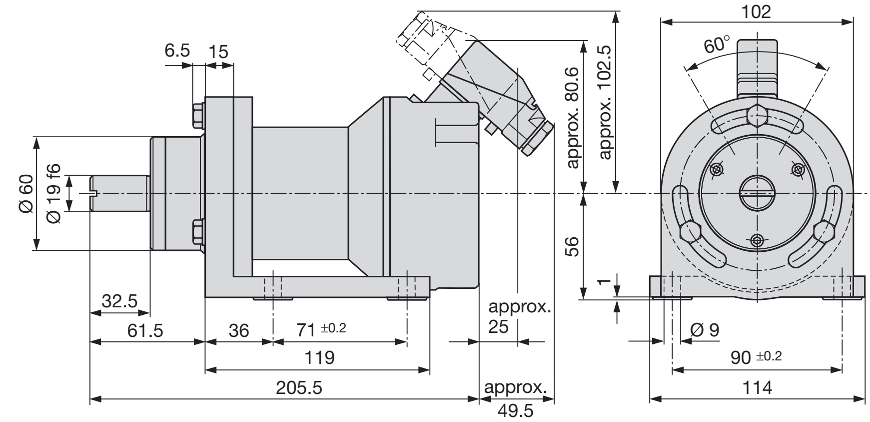
KINAX WT 707
with screw terminals, cable
glands and foot.



KINAX WT 707
mit Zusatzgetriebe,
Steckverbinder und Fuss.

KINAX WT 707
avec engrenage additionnel,
connecteur à fiche et pied.

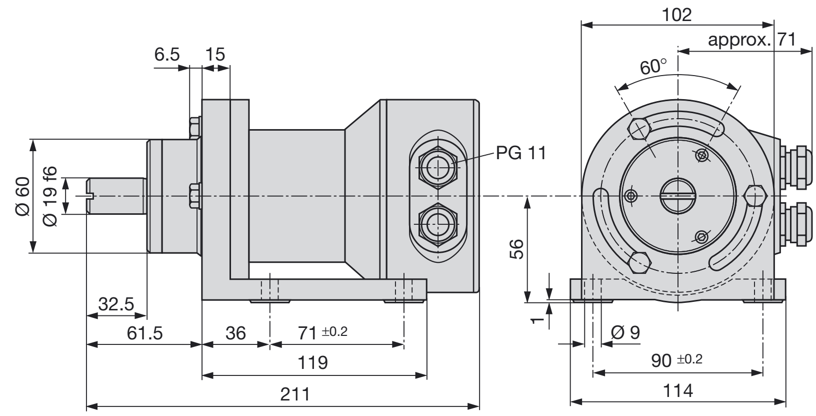
KINAX WT 707
with additional gear,
plug-in connector and foot.



KINAX WT 707
mit Zusatzgetriebe,
Schraubklemmen sowie
Stopfbuchsen und Fuss.

KINAX WT 707
avec engrenage additionnel,
bornes à vis, ainsi que
presse-étoupes et pied.

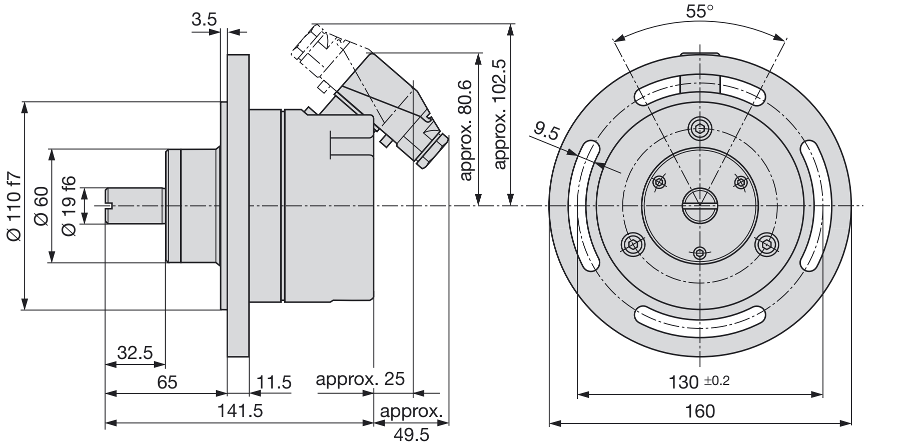
KINAX WT 707
with additional gear,
screw terminals, cable
glands and foot.



KINAX WT 707
mit Steckverbinder
und Flansch.

KINAX WT 707
avec connecteur à fiche
et flasque.

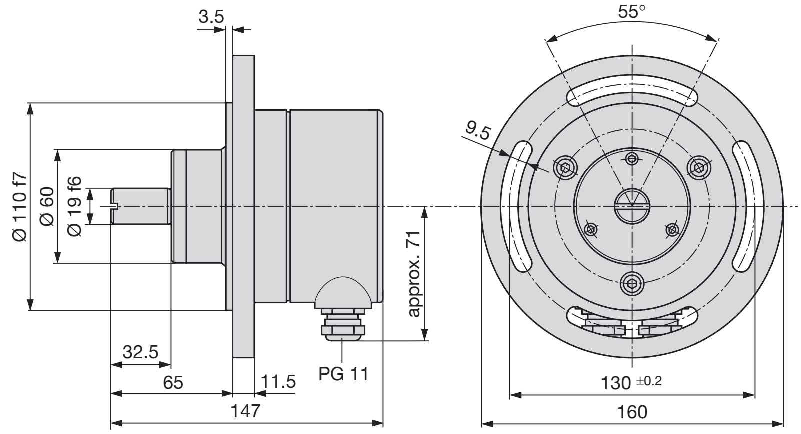
KINAX WT 707
with plug-in connector
and flange.



KINAX WT 707
mit Schraubklemmen
sowie Stopfbuchsen
und Flansch.

KINAX WT 707
avec bornes à vis,
ainsi que presse-étoupes
et flasque.

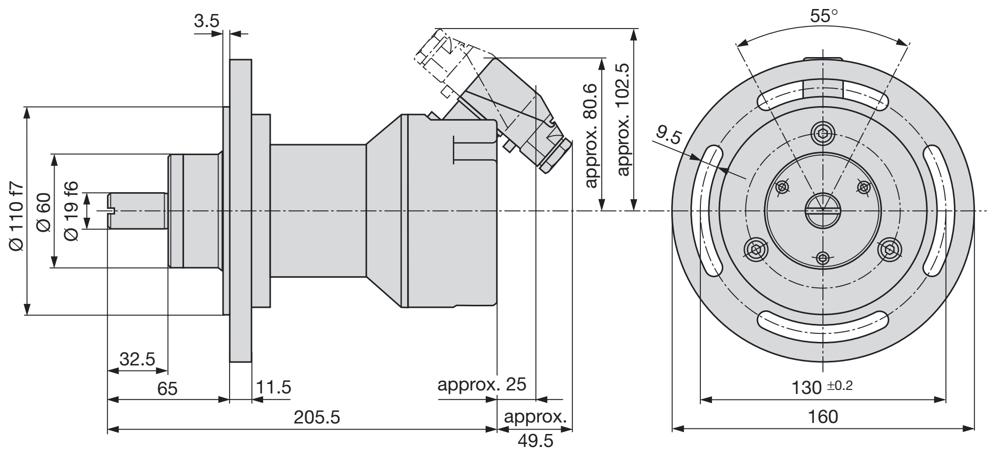
KINAX WT 707
with screw terminals,
cable glands and flange.



KINAX WT 707
mit Zusatzgetriebe,
Steckverbinder
und Flansch.

KINAX WT 707
avec engrenage
additionnel,
connecteur à fiche
et flasque.

KINAX WT 707
with additional gear,
plug-in connector
and flange.



KINAX WT 707
mit Zusatzgetriebe,
Schraubklemmen sowie
Stopfbuchsen
und Flansch.

KINAX WT 707
avec engrenage
additionnel, bornes à vis,
ainsi que presse-étoupes
et flasque.

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