



Model F7

Tension force transducer

with thin film sensor or strain gauge

- Accuracy:** $\leq 0.25\%$
- Measuring range:** 5 kN to 10,000 kN
- Safety:** acc. to IEC 61508 and EN 13849-1
SIL 1 to SIL 3, PL c to PL e
- Output:** 4-20mA, 0-10V
CANopen®, CANopen® Safety
- Optional:** ATEX / IECEx, UL, GL
- Version:** available acc. to



Tension force transducers from tecsis are manufactured to suit our customers' specific requirements using either high tensile stainless steel or fine grain steel with high quality surface coating. The measuring body is designed using up-to-date FEM (Finite Element Method) designing techniques which allow to predict the expected accuracy of the tension force transducer in the application with precision.

tecsis force transducers use innovative thin film technology to measure tensile forces. Miniaturisation allows the placement of the thin film sensor right in the flow of force thereby delivering highly accurate measurements. Since also redundant thin film sensors can be integrated in the tightest of spaces, our customers are able to easily upgrade to two-channel force transducers to fulfil enhanced safety requirements, such as compliance to EN13849, without altering the external geometry of the tension force transducer.



Description

- Thin film sensors (optional strain gauge)
- Stainless steel version (1.4542) or fine grain structural steel with surface coating
- High long term stability
- High shock and vibration resistance
- For dynamic or static measurements
- Excellent repeatability
- Minimal temperature gradient influence



Measuring range

- 5 kN to 10,000 kN



Applications

- Crawler crane, mobile crane, harbour crane for recording load and torque
- Conveyor systems on drives and winches
- Rope tension measuring
- Ship-lift facility

ATEX/IECEx (Option)

- Drilling machines
- Offshore
- Chemical and petrochemical industries
- Dedusting and filtration units



Fig.1 Tension force transducer, stainless steel, redundant

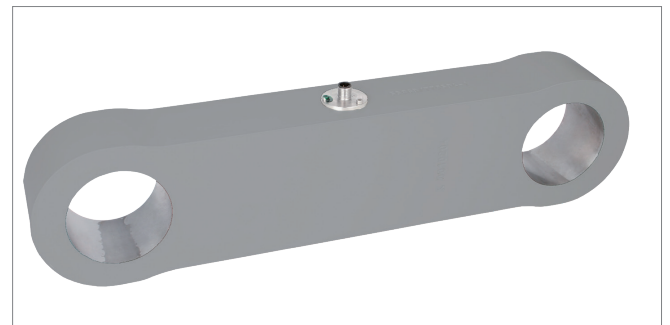


Fig.2 Tension force transducer, fine grain steel



Fig.3 Tension force transducer, stainless steel, 250 kN



Fig.4 Tension force transducer with integrated swivel head, 60t



Fig.5 Tension force transducer, fine grain steel, 150t



Model F7

Model	F7	Optional
Accuracy class	0.25	
Nominal load F_{nom}	5 k N to 10,000 kN	
Limit Load	150% F_{nom} *	
Breaking load	> 300% F_{nom} *	
Linearity	≤ 0.25% of F.S.*	
Relative reversibility error (Hysteresis)	≤ 0.25% of F.S.*	
Reproducibility	≤ 0.10% of F.S.	
Creep 30 min.at F_{nom}	≤ 0.10% of F.S.	
Nominal temperature range	-40°C ... +80°C	-40°C ... +120°C
Storage temperature	-50°C ... +100°C	-50°C ... +125°C
Temperature effect		
span	< ± 0.2 % of F.S. / 10 K	< ± 0.035 % of F.S. / 10 K
zero	< ± 0.2 % of F.S. / 10 K	< ± 0.035 % of F.S. / 10 K
Vibration resistance	20g, 100h, 50...150Hz acc. to DIN EN 60068-2-6	
Protection type	IP67 / IP69k acc. to EN 60 529 / IEC 529	
Emission	DIN EN 55025 DIN EN 61000-6-4	
Immunity	DIN EN 61326-1 DIN EN 61000-4-2, -3, -4, -5, -6	DIN ISO 7637-2, -3 ISO 11452-2, -4, -5
Safety level acc.to EN 13849-1 and IEC 61508	PL c, PL d, PL e SIL 1, 2, 3	
Electrical protection	Reverse voltage, overvoltage and short circuit protection	
Output signal analogue	4 ... 20mA; 2- and 3-wire 0 ... 10 V; 3-wire *	2x4...20mA*
Output signal digital	CANopen® (CiA® DS-301, DS-404), CANopen®-safety (CiA® DS-304)*	
Current consumption	2-wire < 3mA, 3-wire < 40mA Voltage output: < 10mA	
Power requirement	9 ... 36 VDC for output 4...20mA 14 ... 30V for output 0 ... 10 V	
Load resistance	≤ (UB-6 V)/0.024 A for output 4...20 mA 10 kΩ for output 0 ... 10V	
Response time	up to ≤ 1ms (within 10 % ... 90 % of F.S.)	
Electrical connection	Circular connector M12x1, 4- or 5-pin, Bayonet CIR02R-14S-7P, Bayonet DIN 72585*, Cable with IP69K-screw connection	
Material	Fine grain steel with surface protection, Stainless steel	
Certification		UL, GL, SIL 3, ATEX/IECEX II 2G Ex ib IIC T4/T31 ¹⁾ , SIL 3 Approval: Security electronic with 2-channel PC control for stage machinery

* others on request

of F.S. = of Full Scale; F_{nom} = Nominal Load

1) The force transducers with ignition protection type "ib" must only be supplied using galvanically-isolated power supplies.
Suitable supply isolators are also optionally available: EZE08X030003 (1-channel) und EZE08X03000x (2-channel).

Standard pin configuration M12x1 (4 or 5-pin)*, Open cable outlet of the tecsisis standard connection cable (STL 288, black)

Pin	Cable	4 ... 20 mA (2-wire)	4 ... 20 mA (3-wire)	0 ... 10 V (3-wire)	Pin	CANopen®
1	brown	9-36VDC/+	9-36VDC/+	14-30VDC/+	1	Screen
2	white				2	9-36VDC/+
3	blue	4-20mA/-	Ground/-	Ground/-	3	Ground/-
4	black		4-20mA	0-10V	4	CAN high
5	-				5	CAN low
Thread M12x1	Screen	Screen	Screen	Screen	Thread M12x1	Screen