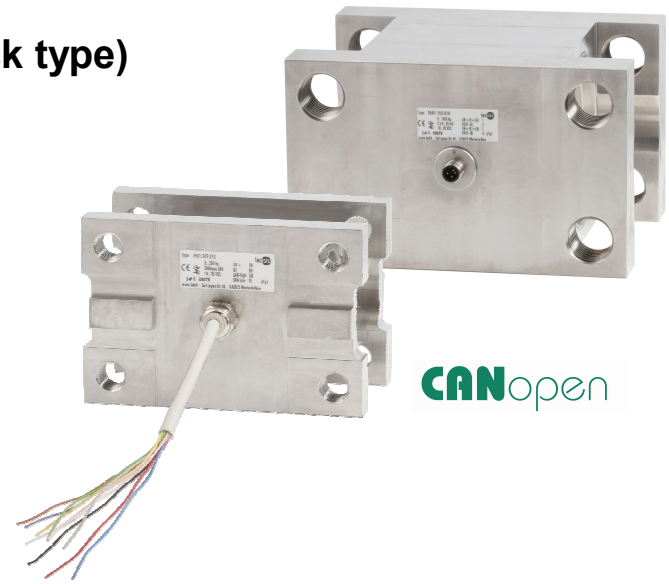
Special force transducer with thin film sensor for aerial working platforms (block type)

Accuracy: **< 1 %**
Output signal: **2 x 4...20 mA, 2- wire**
2 x CANopen



Description

The force transducer was especially designed for overload protection of aerial working platforms.

According to EN 280 every movable aerial working platform has to be equipped with an overload protection system. This has to work independently of the load position in the basket.

The switch–off happens normally at 110% of nominal load with an accuracy of +/-10%.

The force transducer is provided with two completely separated measuring circuits. Because of this it fulfils the criteria of EN 954-1 for safety-related parts of control systems (category 3). I.e. a single fault in one of the two measuring circuits shall be detected at or before the next demand about the safety function. The check is done by a higher control system (PLC). In the case of failure an alarm is activated.

The force transducer, which is used as connection between the jib and the platform, is available with nominal loads of 350 kg, 550 kg, 750 kg or 1,500 kg. The force transducer uses two thin-film sensors instead of standard strain gauges. The amplifier is protected inside the measurement block, which is made from stainless steel. With a protection class of IP67 and an operating temperature range from -40 °C to +80 °C the force transducer is ideally suited for outside applications.

For fixing of the force transducer screws (M16:350kg/550kg/750kg-cell and M30: 1500kg-cell) of the quality 10.9 are recommended. Choose the value of the fastening torque according to corresponding tables.

Features

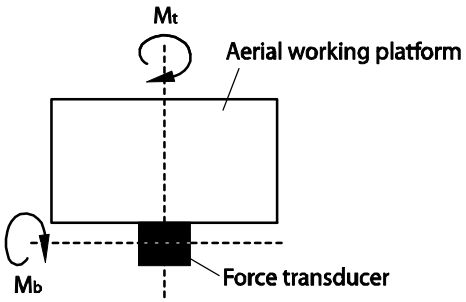
- Compact design
- Stainless steel
- Redundant version
- Integrated amplifiers
- Thin film implants (instead of conventional glued strain gages)
- Optional CANopen-interface
- Optional CANopen Safety - redundant
- Optional isolation voltage resistant acc. to DIN VDE 0682-742, only CANopen-interface

Measuring ranges

- 350, 550, 750, 1500 kg

Applications

- Aerial work platforms



Top view
350 kg / 550 kg / 750kg / 1500kg

Model: F9301

Technical data

Model	**F9301**			
Analogue output	**2x 4…20 mA, 2-wire-output**			
Nominal load G_{nom}/Calibration range	350kg	550kg	750kg	1500kg
Accuracy	< ±1% Cn			
Limit load/Limit moment - M_b - M_t	525kg 2250 Nm 2500 Nm	825kg 9900 Nm 6600 Nm	1125kg 13500 Nm 9000 Nm	2250kg 28000 Nm 12000 Nm
Fracture load/Fracture moment - M_b - M_t	> 1050 kg >4500Nm >5000Nm	> 1650 kg >19800Nm >13200Nm	> 2250 kg >27000Nm >18000Nm	> 4500 kg >56000Nm >24000Nm
Combined error	≤± 1% Cn			
Influence of moments	≤ ±5% Cn			
Nominal temperature range	-40 °C … +80 °C			
Service temperature range	-40 °C … +80 °C			
Storage temperature range	-40 °C … +85 °C			
Temperature influence - zero	≤± 0,15 % per 10K (-40°C…+80°C)			
Vibration resistance	20g, 100h, 50...150Hz acc. to DIN EN 60068-2-6			
Protection type (acc. to EN 60 529 / IEC 529)	IP 67			
Noise emission	acc. to EN 61326			
Noise immunity	acc. to EN 61326			
Insulation resistance	> 5 GΩ / 50 V			
Electrical protection	Reverse voltage, over voltage and short circuit protection			
Analogue output - output signal C_n - current consumption - power requirement - burden - response time - electrical connection	2 x 4 … 20 mA; 2-wire signal current 10 … 30 V DC ≤ (UB-6V) / 0,024 A ≤ 1 ms (within 10% … 90% F_{nom}) circular connection M 12x1, 4-pin			
Weight	~ 3 kg	~ 6kg	~ 9kg	~ 18kg
Screw quality	10.9/M16	10.9/M16	10.9/M16	10.9/M30
Screw clamping torque, μ=0,12	280 Nm	280 Nm	280 Nm	1900 Nm
Material of measuring device	Measuring device made of stainless steel 1.4542			
CANopen – not separately specified data correspond to the technical data with analogue output				
Used protocols and services	Redundant (2*CANopen output) CANopen protocol acc. To CiA 301, Device profile 404, Communication service LSS (CiA 305), Configuration of device address and baud rate Sync/Async, Node/Lifeguarding, Heartbeat			
Repeatability	≤± 0,1 % C_n			
Stability (annual)	≤± 1 % C_n in rated conditions			
Supply voltage	12 ... 30 VDC			
Power consumption	< 1 W (with galvanic isolation)			
Adjustment	Zero point and span to ±10% by entries into object directory			
Response time	1 ms within 10 % … 90 % of F.S.			
Electrical connection	PG-connection, incl. 5m cable, or M12*1 (5-pin)			

Other dimensions on request

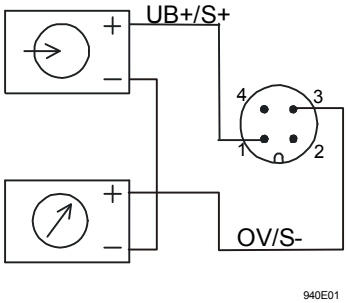
Electrical connection

4 … 20 mA

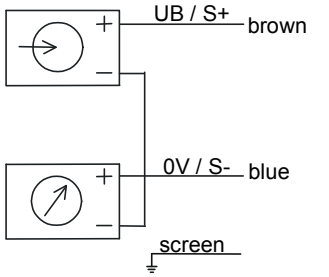
Electrical connection	**Measuring circuit 1**		**Measuring circuit 2**	
	Plug M12x1	**Cable outlet**	**Plug M12x1**	**Cable outlet**
Supply: UB+	1	brown	1	brown
Supply: 0V	3	blue	4	black
Signal: S+	1	brown	1	brown
Signal: S-	3	blue	4	black
⏚	thread M12x1	screen	thread M12x1	screen

Measuring circuit 1 **output 4..20mA (2-wire)**

Circular connector M12x1, 4-pin

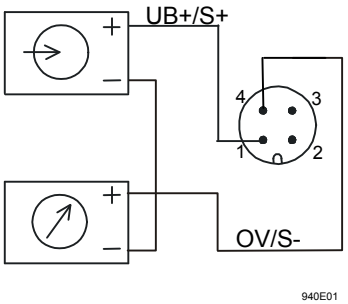


Cable outlet

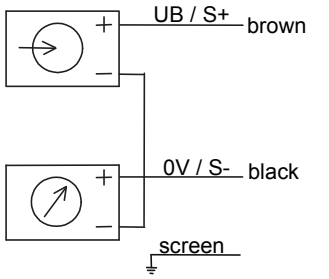


Measuring circuit s 2 **output 4..20mA (2-wire)**

Circular connector M12x1, 4-pin



Cable outlet



CANopen

Pin configuration M12x1 (5-pin)

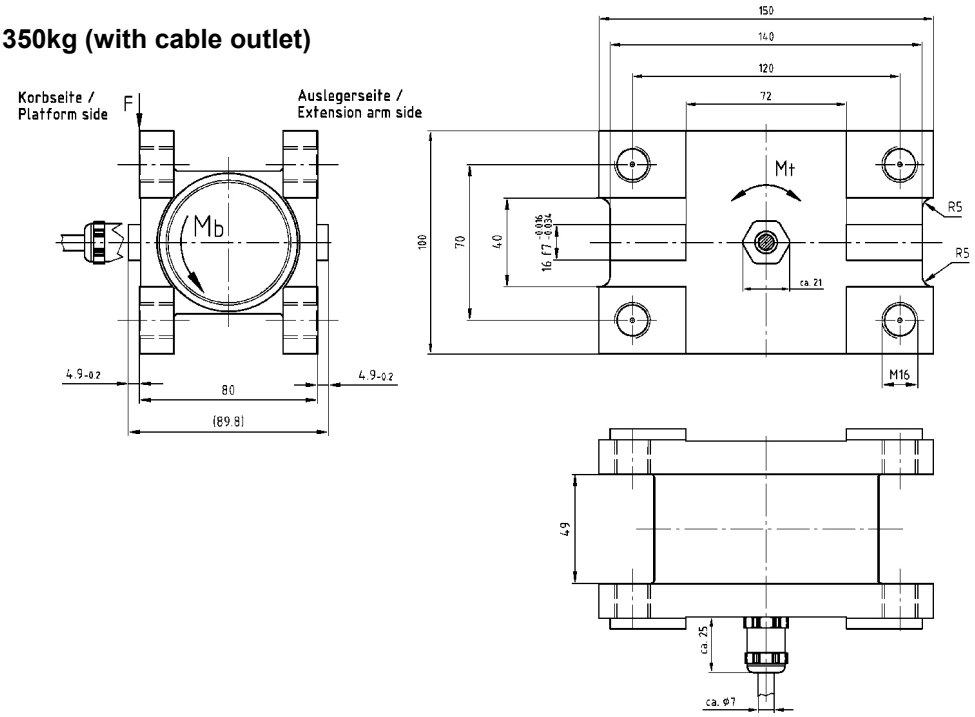
CANopen	Pin
UB+	2
UB-	3
Bus signal CAN-High	4
Bus signal CAN-Low	5
CAN GND	1

You will find supplementary documentation as operating manual and software for CANopen on our internet:

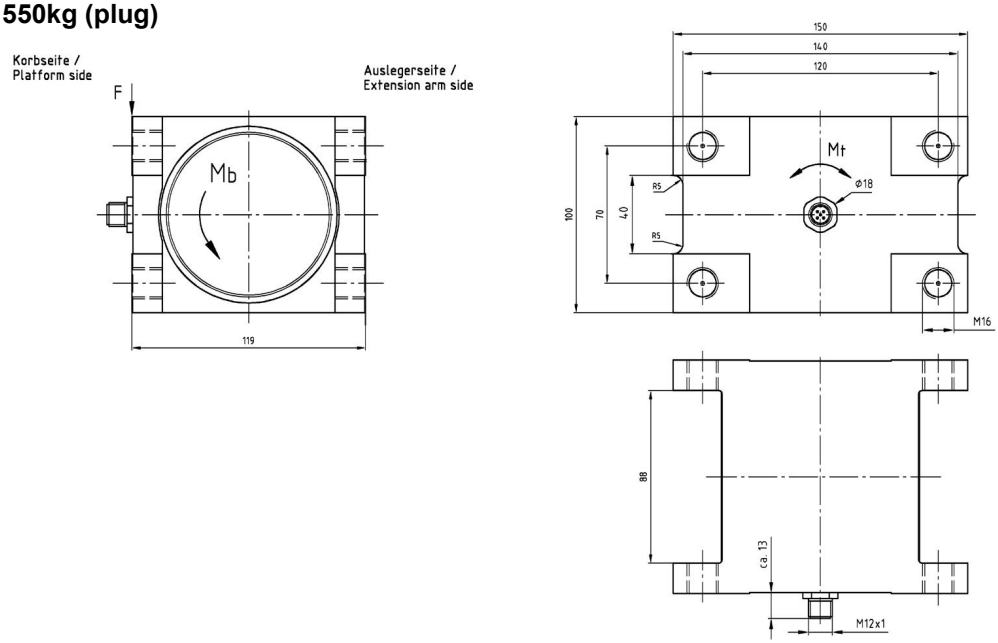
www.tecsis.de

Dimensions force transducer

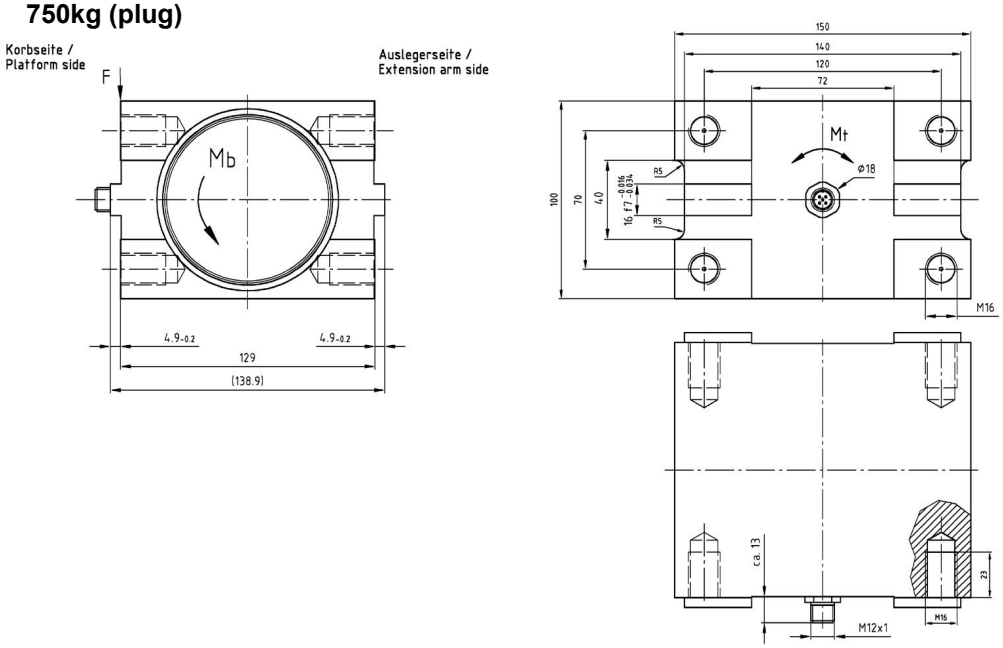
350kg (with cable outlet)



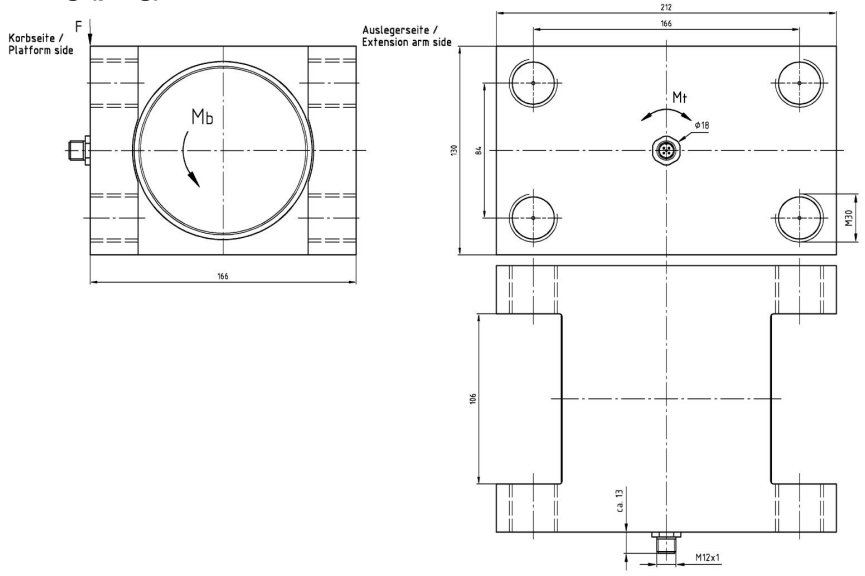
550kg (plug)



750kg (plug)



1500kg (plug)



Subject of technical changes