Load measuring shackle F9222

for load measuring in lifting machines

with integrated amplifier

Optional **ATEX/IECEX**
II 2G Ex ib IIC T4/T3

Optional **for SIL3-Applications**
with 2-channel computer monitoring

Description

The shackle load cell F9222 has been developed to measure the tension while lifting loads as well as to measure forces working in riggings, wirings, tension ropes and similar objects. The shackle load cell consists of a shackle and a force transducer.
In case of maintenance it is possible to exchange the axis - which is the part of the shackle where the force transducer is implemented - without having to adjust it (accuracy <5% F.S.).

The space-saving construction is another benefit of this novel shackle load cell. This allows to implement the shackle easily in allready existing constructions or to use it in limited space.

SIL-3 (Option)

In cooperation with TÜV SÜD, safety electronics have been developed, especially for the use in stage technology. In combination with a 2-channel computing system those meet the SIL 3 security standard.

Features

- special for measuring in wire ropes
- shear force non-sensitive
- accuracy ±5% F.S.
- ideal for retrofit applications
- integrated amplifier
- protection type IP 67
- stainless Steel type
- small temperateness
- high long term stability
- high shock and vibration resistance
- for dynamic and statical measuring
- good reliability
- simple monitoring
- opt. with ATEX-approval

ATEX/IECEX (Option)

- for Category 1 und 2
- II 2G Ex ib IIC T4/T3

SIL-3 (Option)

- savety electronics
- In combination with 2 channel computer monitoring SIL-3-approval
- Approval: TÜV-Süd-Nr. 2005-08-11/tecsis

Measuring ranges

- 30 kN
- other ranges on request

Applications

- measuring of tensile loads

Applications with SIL-3 (Option)

- Theatre and Stage Technology:
- Fly system
- Theatrical rigging

Model: F9222

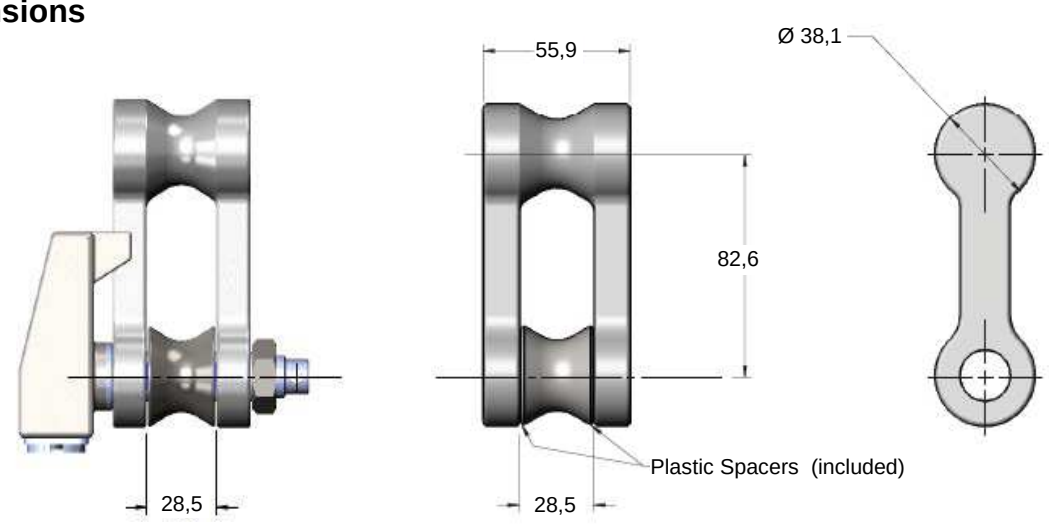
tecsis GmbH
Carl-Legien Str. 40
D-63073 Offenbach / Main
Tel.: +49 69 5806-0
Vertrieb National
Fax: +49 69 5806-8002394
Vertrieb International
Fax: +49 69 5806-8002394
e-Mail: info@tecsis.de
Internet: www.tecsis.de

Technical data

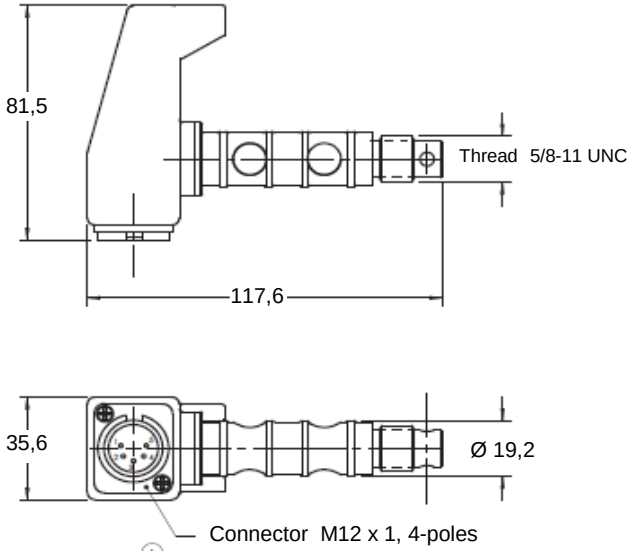
Model	F9222	F92C2SIL-3 (Option)
Nominal load F_{nom}	30 kN	
Combined error	±5% F.S.	±5% F.S.
Using load	150% F_{nom}	
Breaking load	>300% F_{nom}	
Nominal temperature range	+15 bis 70°C	
Service temperature range	-45 bis +120°C	- 20 bis +80°C
Temperature effect - span - zero	 ≤±0,1% actual value/ 10K ≤±0,1% F.S./ 10K	 ≤±0,2% actual value / 10K ≤±0,2% F.S. / 10K
Protection type acc.to EN 60 529 / IEC 529	IP 67	
Noise emission		Acc. EN 61326
Noise immunity		Acc. EN 61326
Insulation reistance	> 5 x 10^9 Ω	> 5 x 10^9 Ω bzw. >5 GΩ / 50 V
Electrical protection		Reverse current protection Overvoltage-and Short-circuit protection
Analogue output - Output signal - Power supply - zero - electrical connection	 4…20mA 3-wire Span 16mA, ±2% 12…40 VDC ± 2% F.S. Plug connection M12 x 1,4-pin	 4…16mA ; 3-wire system Signal shift 4mA ±0,2 mA, others on request; via inline amplifierr 10…30VDC; supply unit SIL3-Relay 24VDC (+50%/-20%),power consuption. ca. 100 mW - Plug connection M12x1, 4-pin
Certifications / Approvals		TÜV: 2005-08-11/tecsis
Material	Stainless steel (force transducer and amplifier housing)	

F.S. = fullscale output

Dimensions



All dimensions in mm



All dimensions in mm

Electric connection

Analog output 4..20mA (3-wire system)

PIN configuration M12x1 (4-pin) /
open cable outlet of the tecsis standard connection cable (STL 288, black)

Analogoutput electr. Connection	4...20 mA (3–wire)	
	Pin	cable outlet
Supply : UB+	2	white
Supply: 0V	3	blue
Signal: S+	4	black
Signal: S-	3	blue
Shielding	Thread M12x1	shield

Analog output with SIL-3 option

PIN configuration M12x1 (4-pin) /
inline amplifier with 4…20 mA (3-wire system) or 0…10 V (3-wire system), open cable outlet of the tecsis standard connection cable (STL 288, black)

Analogoutput electr. Connection	SIL3 4…20mA or 0…10V (3-wire)	
	Pin	cable outlet
Supply : UB+	1	brown
Supply: 0V	3	blue
Supply Relay: UR	2	white
Supply Relay: 0V	3	blue
Signal: S+	4	black
Signal: S-	3	blue
⏚ Shielding	Thread M12x1	shield

Short Description SIL-3

Amplifier 4...20mA bzw. 0...10V
For SIL-3 Applications mit 2-channel computer control
(certificated byTÜV SÜD)

Zertifikat-Nr.: 2005-08-11/tecsis

To construct Load Cells based on resistance straing gauges, four variable resistances (R1…R4) are connected to a Wheatstone-Bridge. When the object is being deformed the opposed resistances get either tensed or compressed in the same way. On this way the diagonal voltage U_o occurs and the Wheatstone-Bridge is detuned.

The test resistor R7 is important to monitor the amplifier and the signal pathes. As soon as the excitation voltage U_r is applied the relay contact (a) connects R7 parallel to the resistance R5 (fig. 1).

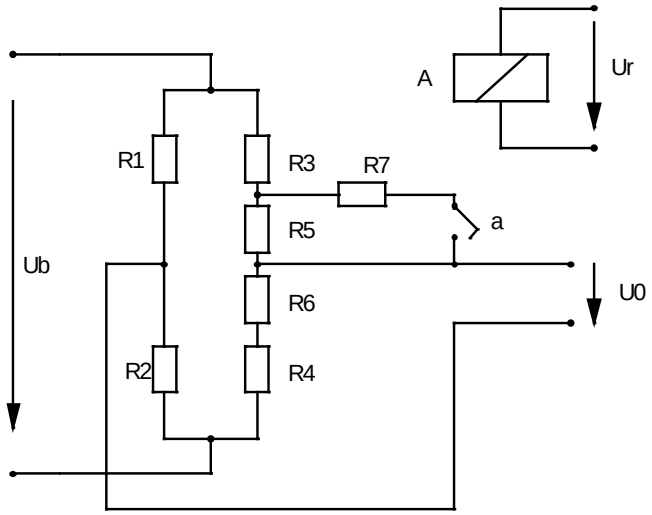
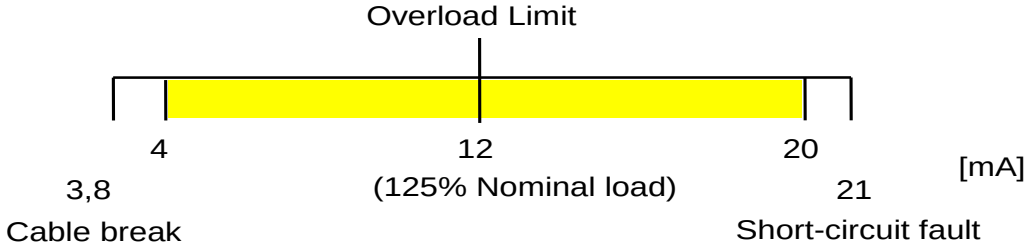


fig. 1

Applying R7 causes a defined, static detuning of the zero point (diagonal voltage) of the whatstone-bridge. Using an extern control, which is independend of the load cell (because of security reasons it has to have 2-channels), it's possible to activate the relay A and to change the output signal of the load cell in a defined way.
The signal path between wheatstone-bride, amplifier and output is correct if the change of the output signal correlates to its expected change. If no change occurs it's most possible that there is an error in the signal path.

As example the default setting of the loa cell with power output 4…20 mA for overload recognition:



Adjusting the signal shift to 8 mA after activating the test relay the overload limit is overtraversed in every operating status. But as the upper range limit of 20 mA isn't reached its possible to check the signal swing.