

Tension/compression force transducer S-type

with thin film sensor

Accuracy: 0.2 %
Output signals: 4...20 mA; 2-wire system,
 0...10 VDC; 3-wire system

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



Description

The S-type is a conventional design of tension/compression force transducer. It has internal threads which allow force to be easily introduced via suitable swivel heads.

The factory-internal calibration is performed in tension and compression directions: 4...20 mA and 0...10 V respectively. The zero signal is thus around 12 mA and 5V respectively. Calibrations in the tension or compression direction only are of course possible at no extra charge.

The S-type has a connector plug on the broad side of the body. With an angled cable socket, the cable runs parallel to the direction of force. This allows space-saving and protected installation on plant and machinery.

A variant of the S-type with integrated overload protection and a selectable measuring range is available especially for applications in measurement engineering. With the aid of the EPE01 programming unit, any of three different measuring ranges (100%, 50% and 30%) can be selected without having to remove the force transducer. Calibration characteristics stored in the digital amplifier allow an accuracy of 0.2% of FSD for each measuring range. The overload protection is rated for 250% of the maximum nominal load.

ATEX/IECEX (Option)

Only equipment and protective systems with the corresponding certification and markings are to be put into operation in potentially explosive areas. Our force transducers with a thin-film measuring cell and integrated amplifier now have approval according to directive 94/9/EC in equipment group II (non-mining products), category 2G for zones 1 and 2 (gases). Other zones on request.

UL-Certification (Option)


tecsis force transducers are also available with UL approval.

FM and CSA Approval submitted.

Features

- Thin film implants
- Integrated amplifier
- Measuring range selection with manual programming unit EPE01 (optional)
- Integrated overload protection for tension & compression direction (optional)
- Small temperature drift
- High long term stability
- High shock and vibration resistance
- For dynamic or static measurements
- Good repeatability
- Easy assembly

ATEX/IECEX (Option)

- for Zone 1 and 2
-  II 2G Ex ib IIC T4/T3

Measuring ranges

Tension/compression forces from (0.75 kN) 2 kN to 50 kN

Applications

- Hoisting gear
- Engagement forces in machinery
- Automated manufacturing
- Construction of plant and machinery

ATEX/IECEX (Option)

- Mining
- Chemical and petrochemical industries
- Dedusting and filtration units

Model: F2351, F23CA

Technical data

Model	F2351		F23CA ATEX/IECEx ¹⁾ (Option)
Overload protection	without	with	without
Adjustable measuring range	without	with (see table)	without
Nominal force F_{nom}	2 / 3 / 5 / 10 / 20 / 30 / 50 kN		
Combined error	$< 0.2\% C_n$		
Limiting force	$150\% F_{nom}$	$250\% F_{nom}$	$150\% F_{nom}$
Breaking strength	$> 300\% F_{nom}$	$> 600\% F_{nom}$	$> 300\% F_{nom}$
Composite error	$\leq \pm 0.2\%$ of FS		
Relative reversal span (hysteresis)	$< \pm 0.1\%$ of FS C_n		
Permissible oscillation width	$\pm 50\% F_{nom}$ accord. to DIN 50100		
Creep, 30 min. at F_{nom}	$\leq \pm 0.1\%$ of FS C_n		
Nominal measuring distance	< 0.5 mm		
Nominal temperature range	$-20 \dots +80^\circ\text{C}$		
Working temperature range	$-40 \dots +80^\circ\text{C}$		
Storage temperature range	$-40 \dots +85^\circ\text{C}$		
Temperature sensitivity - characteristic - zero signal	$\leq \pm 0.2\%$ of FS /10K $\leq \pm 0.2\%$ of FS /10K		
Vibration immunity	20g, 100h, 50...150Hz accord. to DIN EN 60068-2-6		
Degree of protection (accord. to EN 60 529 / IEC 529)	IP 67		
Emitted interference	to EN 61326		
Interference immunity	to EN 61326		
Insulation resistance	$> 5 \text{ G}\Omega / 50\text{V}$		
Types of electrical protection	Reversed polarity, overvoltage and short-circuit protection		
Analogue output			
- Output signal (output signal range: C_n)	4 ... 20 mA – 2-wire system (4 (compression) ... 20 (tension) mA) 0 ... 10 V – 3-wire system (0 (compression) ... 10 (tension) V)		4 ... 16 mA – 2-wire; (4 (compression) ... 16 (tension) mA) 0 ... 7 V – 3-wire (0 (compression) ... 7 (tension) V)
- Current consumption	Current output 4 ... 20 mA: signal current ; Voltage output approx. 8 mA		
- Power requirement	10 ... 30 V DC for current output 14 ... 30 V DC for voltage output		
- Burden	$\leq (U_B - 6 \text{ V}) / 0.024 \text{ A}$ for current output $> 10 \text{ k}\Omega$ for voltage output		
- Response time	$\leq 1 \text{ ms}$ (within 10% to 90% F_{nom})		$\leq 5 \text{ ms}$ (within 10% ... 90% F_{nom})
- Electrical connection	Round connector M 12x1, 4-pole		
Material of measuring body	Stainless steel		
Certification	II 2G Ex ib IIC T4/T3		

Measuring element of stainless steel 1.4542 FS = measuring range full-scale value

¹⁾ The force transducers with ignition protection type "ib" must only be supplied using galvanically-isolated power supplies.

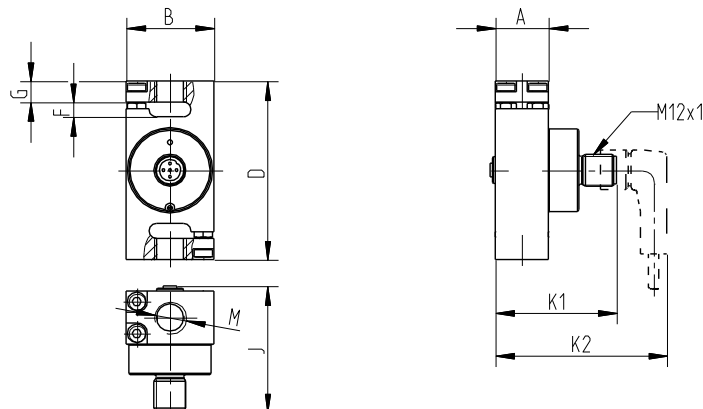
Suitable supply isolators are also optionally available: EZE08X030003 (1-channel) und EZE08X03000x (2-channel).

Measuring range switching

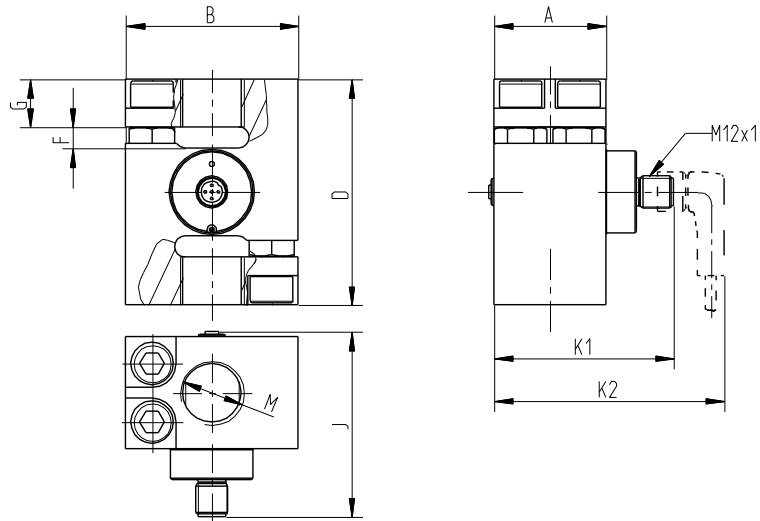
Nom. load	Switchable to	
2 kN	1 kN	0.75 kN
3 kN	2 kN	1 kN
5 kN	3 kN	2 kN
10 kN	5 kN	3 kN
20 kN	10 kN	7.5 kN
30 kN	20 kN	10 kN
50 kN	30 kN	20 kN

Dimensions

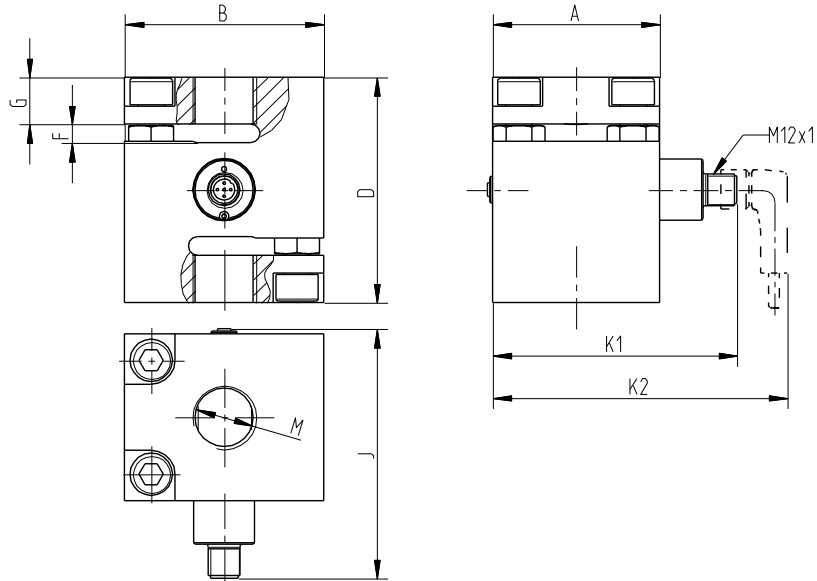
Variant
2 - 5 kN



Variant
10 - 30 kN



Variant
50 kN

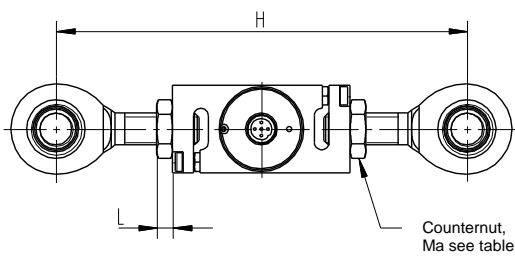


Nom. force in kN	A	B	D	F	G	H	J	K1	K2	L	M	Ma (Nm)*
2 / 3 / 5	20	33	67	5.6	7.9	155±2	47.4	45.5	64.5	6	M12	max. 60
10 / 20 / 30	42.2	65	85	8	18	233±2	69.6	67.7	86.7	12	M24x2	max. 500
50	63	75	85	7	17.8	233±2	94.1	92.2	111.2	12	M24x2	max. 500

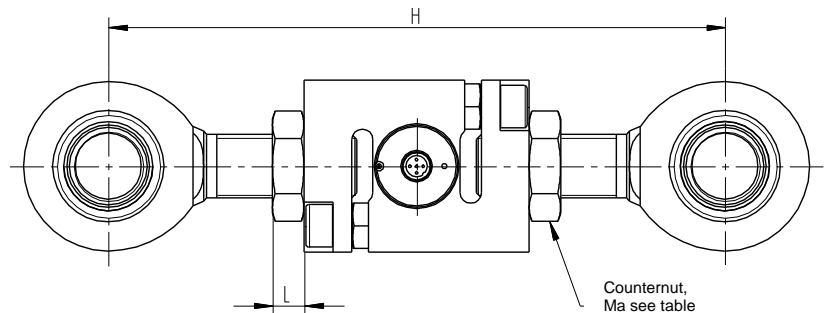
* Do not transfer torque via the force transducer

Fitting dimensions

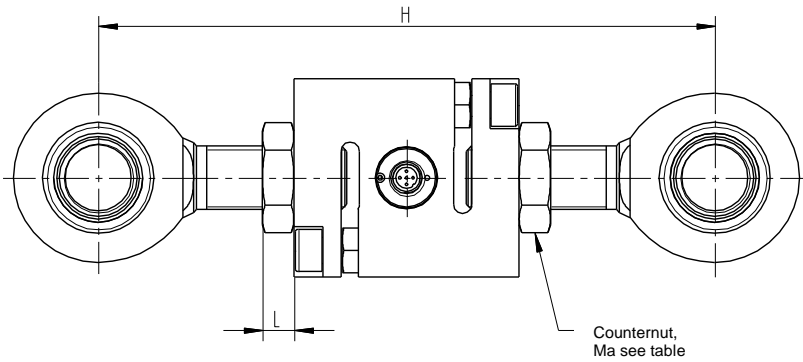
Variant
2 - 5 kN



Variant
10 - 30 kN



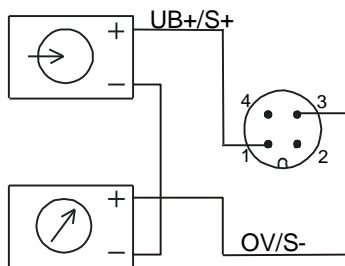
Variant
50 kN



Electrical connection

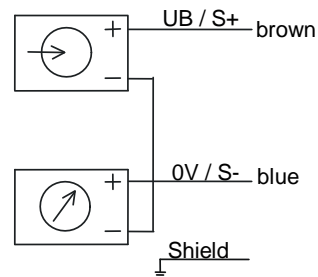
Output 4...20mA (2-wire system)

Round connector M12x1, 4-pole



940E01

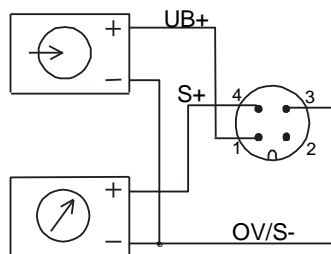
Cable outlet



940E03

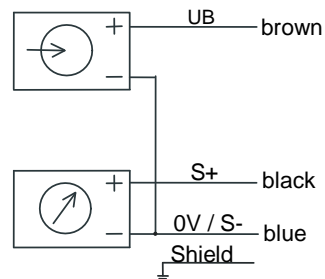
Output 0...10V (3-wire system)

Round connector M12x1, 4-pole



940E04

Cable outlet



940E06

Connector pin assignment M12x1 (4-pole) /

Open cable end of tectsis standard connecting cable (STL 288, black)

Pin	4...20 mA (2-wire)	0...10 VDC (3-wire)	Connection identifier
	electr. connection	electr. connection	
1	UB+/S+	UB+	brown
2	-	-	white
3	OV/S-	OV/S-	blue
4	-	S+	black
shielding	thread M12x1	thread M12x1	shield

Subject to change without notice