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DATA SHEET

S2M
Force Transducer

SPECIAL FEATURES

- Tensile/compressive force transducer
- Accuracy class 0.02
- Nominal (rated) forces: 10 N … 1000 N
- High protection class (IP67)
- High lateral force stability
- Six-wire circuit
- Cable suitable for drag chains, resistant to most oils and operating materials

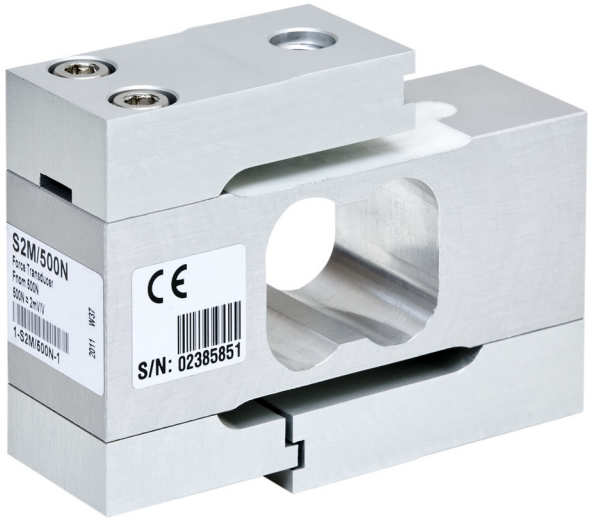
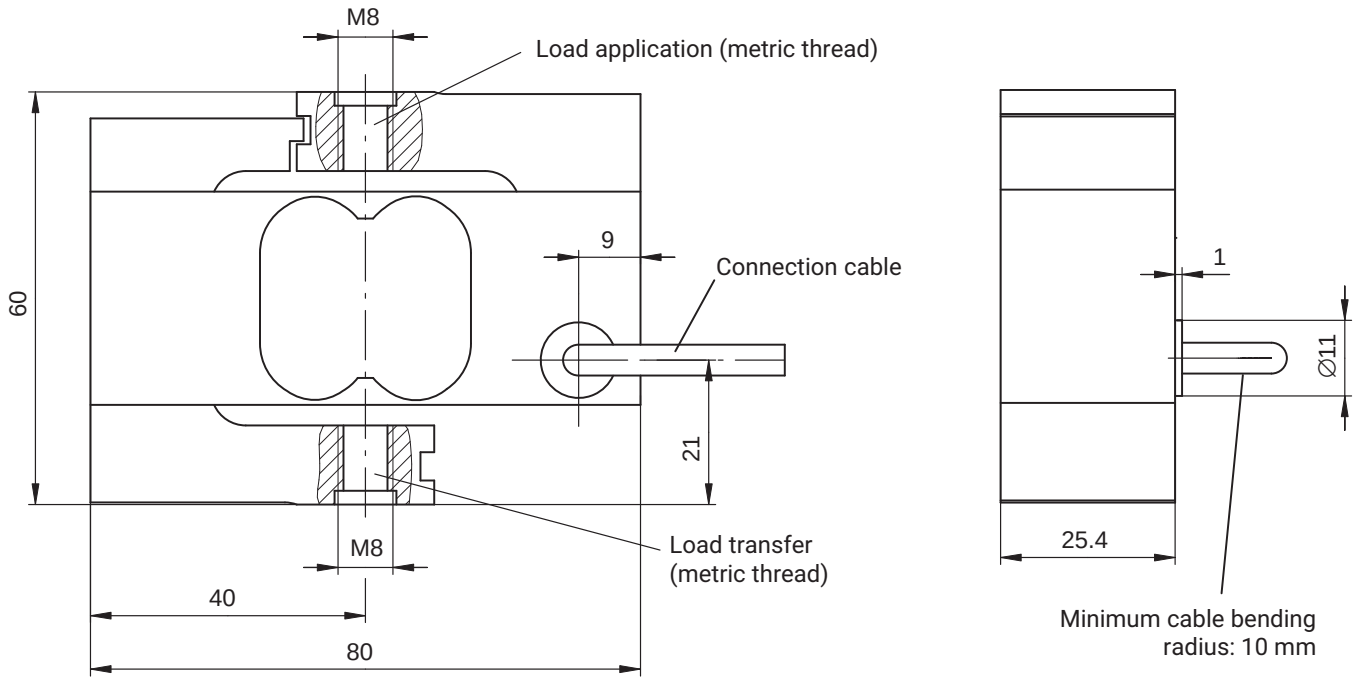


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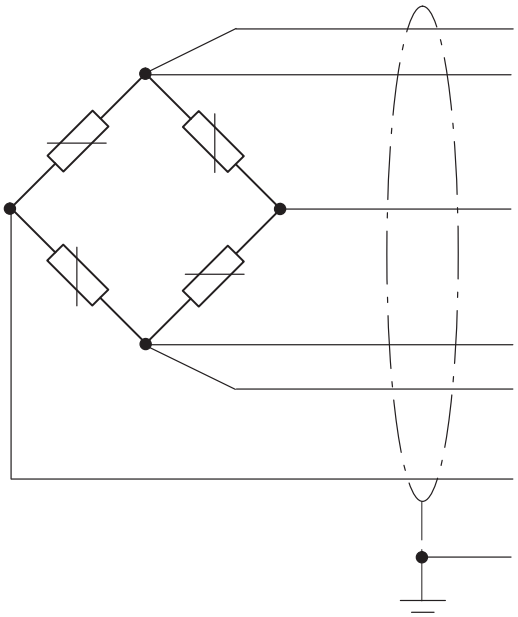
DIMENSIONS AND PRINCIPLE OF THE S2M FORCE TRANSDUCER

Dimensions in mm (1 mm = 0.03937 inches)



CABLE ASSIGNMENT (SIX-WIRE CONFIGURATION)

With this cable assignment, the output voltage at the measuring amplifier is positive in the pressure direction when the transducer is loaded.



(gray)	Sensing element (-)
(black)	Excitation voltage (-)
(white)	Measurement signal (+)
(blue)	Excitation voltage (+)
(green)	Sensing element (+)
(red)	Measurement signal (-)
(-)	Shielding/drain wire, connected to enclosure ground

SPECIFICATIONS (DATA PER VDI/VDE/DKD 2638 STANDARDS)

Type			S2M						
Nominal (rated) force	F_{nom}	N	10	20	50	100	200	500	1000
Accuracy									
Accuracy class			0.02						
Relative reproducibility and repeatability errors without rotation	b_{rg}	%	0.02						
Relative reversibility error	v		0.02						
Non-linearity	d_{lin}		0.02						
Relative creep over 30 min.	$d_{cr,\ F+E}$		0.02						
Effect of the bending moment at 10% F_{nom} * 10 mm	d_{Mb}		0.02						
Effect of lateral forces (lateral force = 10% F_{nom})	d_Q		0.02						
Effect of temperature on sensitivity	TK_C	% / 10 K	0.02						
Effect of temperature on zero signal	TK_0		0.02						
Electrical characteristic values									
Nominal (rated) sensitivity	C_{nom}	mV/V	2						
Relative zero signal error	$d_{S,\ 0}$	%	5						
Relative sensitivity error	d_c		0.25						
Rel. tensile/compression sensitivity variation	d_{ZD}		0.1						
Input resistance	R_i	Ω	> 345						
Output resistance	R_o		350 ± 50						
Insulation resistance	R_{is}	GΩ	> 2						
Operating range of the excitation voltage	$B_{U,\ G}$	V	0.5 … 12						
Reference excitation voltage	U_{ref}		5						
Connection			Six-wire circuit						
Temperature									
Nominal (rated) temperature range	$B_{T,\ nom}$	°C	-10 … +45						
Operating temperature range	$B_{T,\ G}$		-10 … +70						
Storage temperature range	$B_{T,\ S}$		-10 … +85						
Mechanical characteristic quantities									
Max. operating force	F_G	%	150						
Limit force	F_L		1000						
Breaking force	F_B		1000						
Limit torque	M_L	Nm	4	8	25	28			
Limit bending moment	$M_{b\ perm}$		6	25	34	50	71	95	125
Static lateral limit force	F_Q	% of F_{nom}	100						
Nominal (rated) displacement	s_{nom}	mm	0.27	0.21	0.18	0.15	0.14	0.16	0.21
Fundamental resonance frequency	f_G	Hz	113	187	321	426	545	649	665
Relative permissible oscillatory stress	F_{rb}	% of F_{nom}	140						
General data									
Degree of protection per EN 60529			IP 67						
Measuring body material			Aluminum						
Potting material			Silicone						
Cable			Six-wire circuit, PUR insulation, drag chain compliant						
Cable length		m	6						
Mass (with cable)	m	kg	0.5						

VERSIONS AND ORDERING NUMBERS

Nominal (rated) force	Ordering number
10 N	1-S2M/10N-1
20 N	1-S2M/20N-1
50 N	1-S2M/50N-1
100 N	1-S2M/100N-1
200 N	1-S2M/200N-1
500 N	1-S2M/500N-1
1000 N	1-S2M/1000N-1

The ordering numbers shown in gray are preferred types. They can be delivered rapidly.
All preferred types with 6 m cable, open ends and without TEDS.
The ordering number for the preferred types is 1-S2M…
The ordering number for customer-specific designs is K-S2M-MONT…
The ordering number example **K-S2M-MONT-010N-03M0-M-T** shown below is a: S2M, with a nominal (rated) force of 10 N, 3 m cable, with M12 plug and TEDS.

Nominal (rated) force	Cable length	Electrical output	Transducer identification
10 N **010N**	1,5 m **01M5**	Free ends **Y**	Without TEDS **S**
20 N **020N**	3 m **03M0**	D-sub-HD15, 15-pin **F**	With TEDS **T**
50 N **050N**	6 m **06M0**	HD-Sub plug, 15-pin **Q**	
100 N **100N**		ME3106PEMV plug **N**	
200 N **200N**		ODU plug, 14-pin **P**	
500 N **500N**		M12 plug, 8-pin **M**	
1000 N **001K**			

Ordering example

K-S2M-MONT-	010N-	03M0-	M-	T

Cable length	The S2M is equipped with a cable 6 m long in the standard version. You can also order the force transducer with cable lengths of 1.5 m or 3 m.
Electrical output	We can mount one of the following plugs on the S2M, if requested: Y = free ends, no plug assembly F = D-sub-HD15, for connecting to MGC+ (e.g. AP01), Scout Q = HD-sub-HD15, for connecting to many HBK amplifiers of the Quantum series (MX410, Mx440, MX840) N = MS plug, for connecting to HBK measuring amplifiers, such as MGC+ (AP03), DMP or DK38 P = ODU plug, 14-pin, degree of protection IP68, for connecting to all HBK measuring amplifiers of the SomatXR series that are suitable for measuring full bridge circuits M = M12 plug, 8-pin, suitable for measuring amplifiers digiBOX and DSE
Transducer identification	Integration of TEDS (Transducer Electronic Data Sheet) chip as per IEEE1451.4. If the relevant amplifier electronics are provided, the measurement chain will parameterize itself. TEDS is only possible when a plug is fitted, open ends and TEDS cannot be combined.

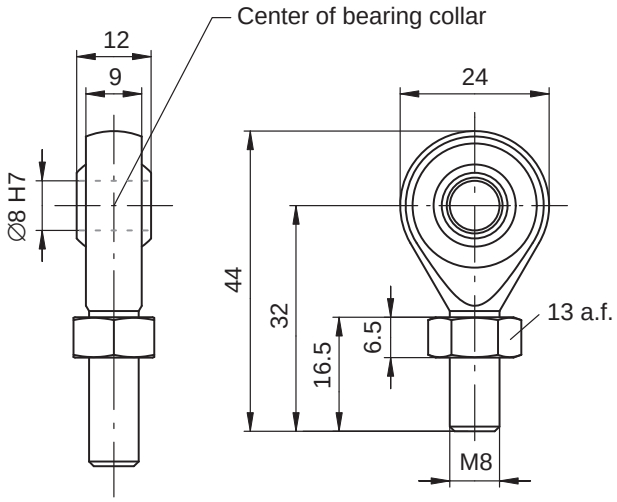
ACCESSORIES

Accessories not included in the scope of supply.

Accessories	Ordering number
Knuckle eye ZGW	1-UR/200KG/ZGW
Load button ZL	1-U1R-200KG/ZL
Thrust piece EDO3	1-EDO3/1KN
Ground cable (400 mm long)	1-EEK4
Ground cable (600 mm long)	1-EEK6
Ground cable (800 mm long)	1-EEK8

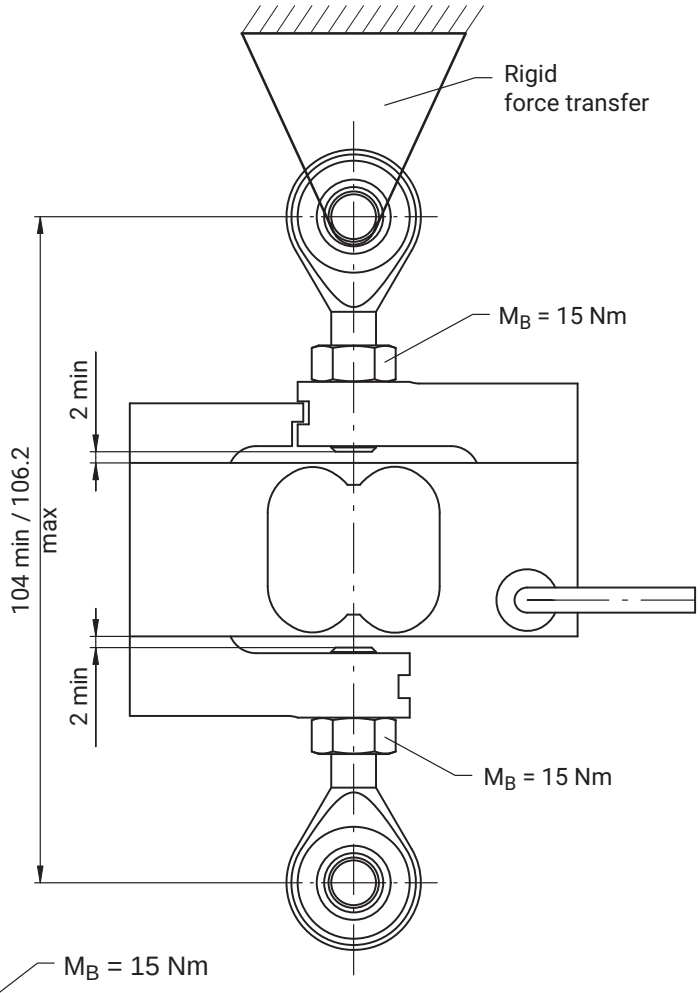
Force application parts for tensile loading

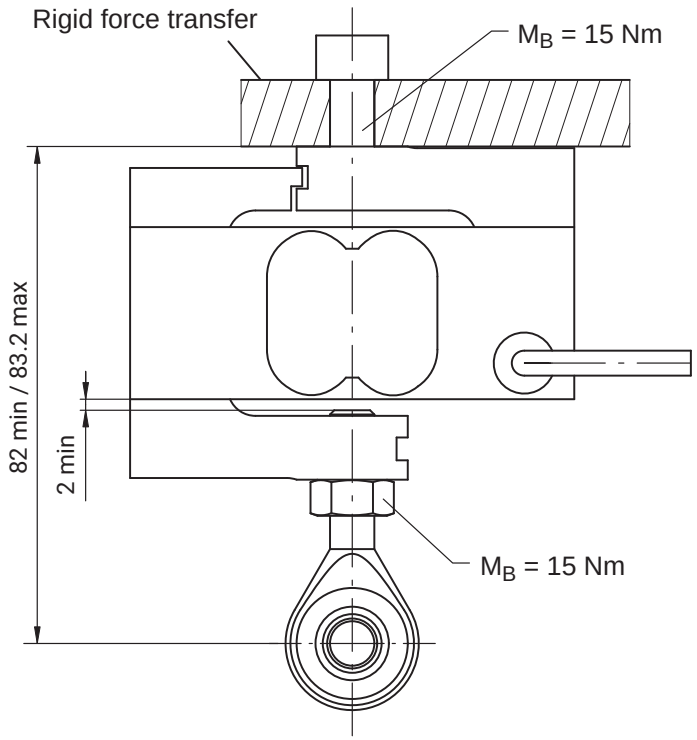
Dimensions in mm (1 mm = 0.03937 inches)



ZGW knuckle eye
Order no. 1−U1R/200KG/ZGW

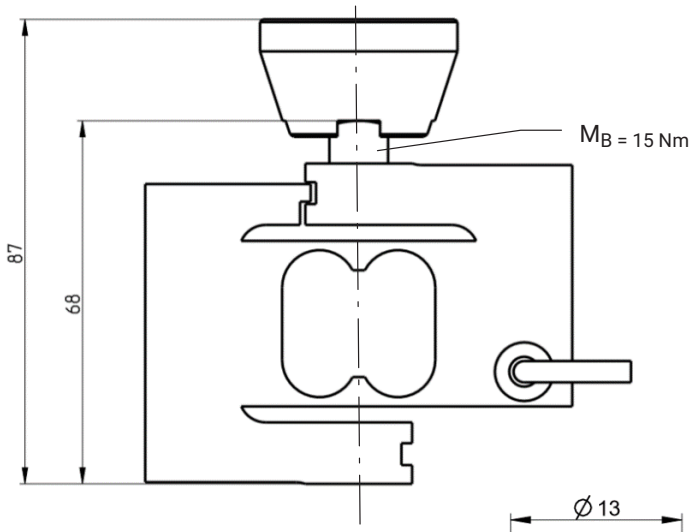
Material: Tempered steel, galvanized
roller bearing steel
PTFE/bronze corrugated foil



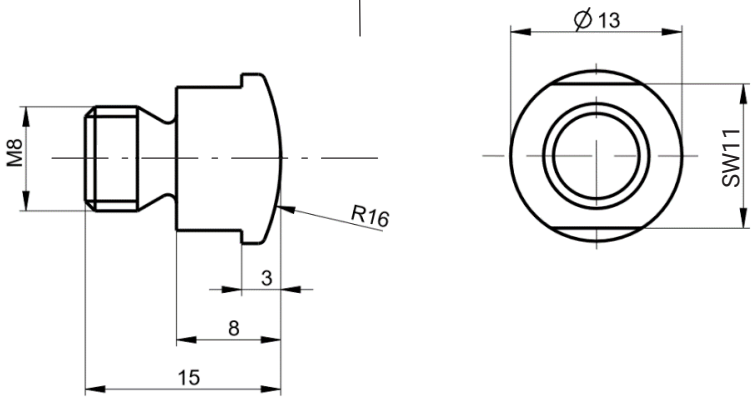


Force application parts for compressive loading

Dimensions in mm
(1 mm = 0.03937 inches)



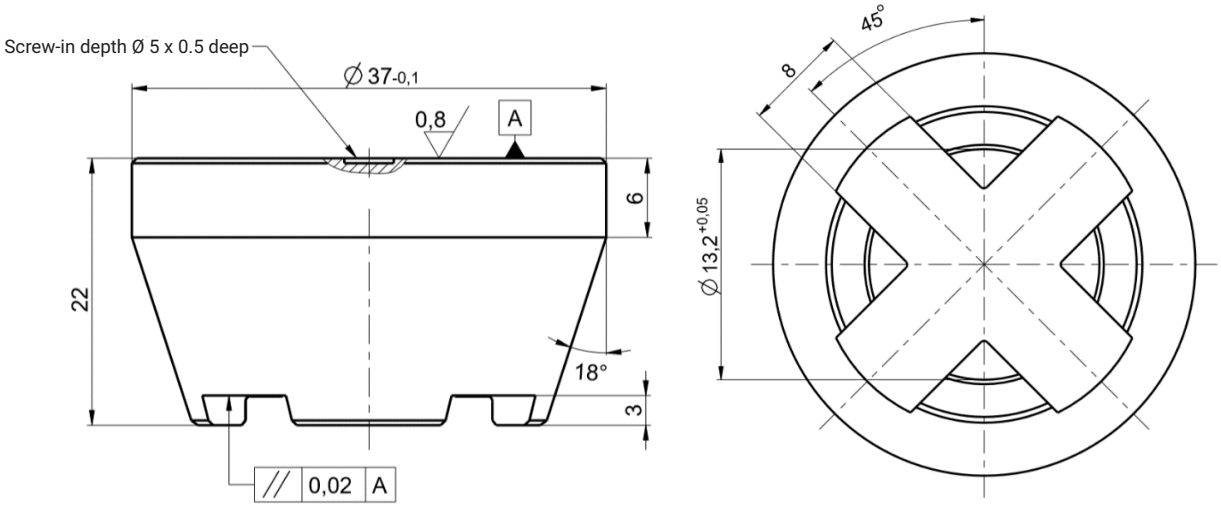
Load button
Order no.: 1-U1R-200kg/ZL
Material: stainless steel



Side view

View from below

Thrust piece EDO3
Order no.: 1-EDO3/1kN
Material: quenched and tempered steel
For use with a load button



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