

DATA SHEET

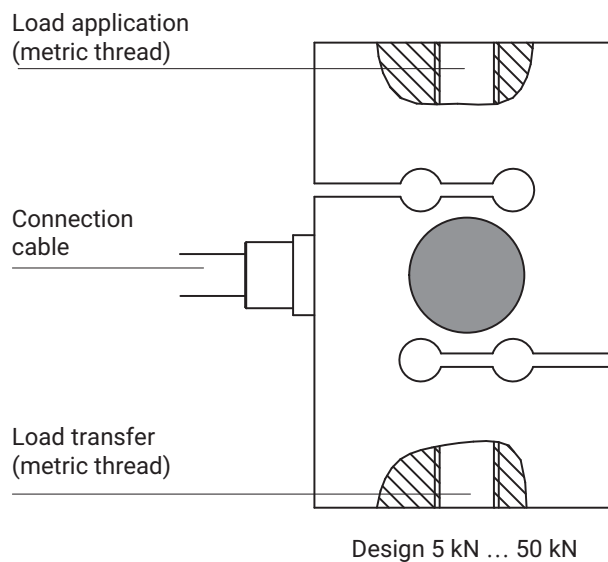
S9M Force Transducer

SPECIAL FEATURES

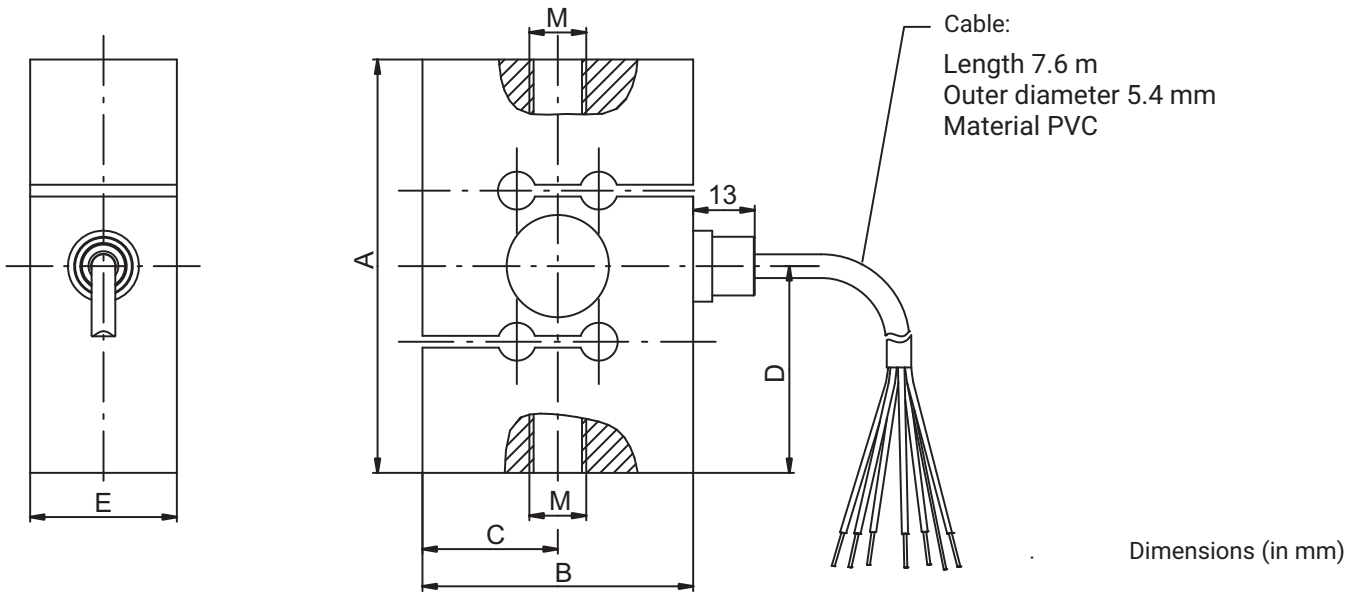
- Tensile/compressive force transducer
- Accuracy class 0.02
- Hermetically encapsulated (IP68)
- Rust-resistant materials
- Available in different cable lengths and with connector mounted on request
- TEDS on request



PRINCIPLE OF THE S9M FORCE TRANSDUCER



DIMENSIONS



Type	A	B	C	D	E	M
S9M/500 N	62	50.8	25.4	31	24	M8
S9M/1 kN	62	50.8	25.4	31	24	M8
S9M/2 kN	87.3	57.2	28.6	43.7	24	M12
S9M/5 kN	87.3	57.2	28.6	43.7	31	M12
S9M/10 kN	87.3	57.2	28.6	43.7	31	M12
S9M/20 kN	100	69.8	34.9	50	31	M24x2
S9M/50 kN	100	76.2	38.1	50	36.5	M24x2

SPECIFICATIONS

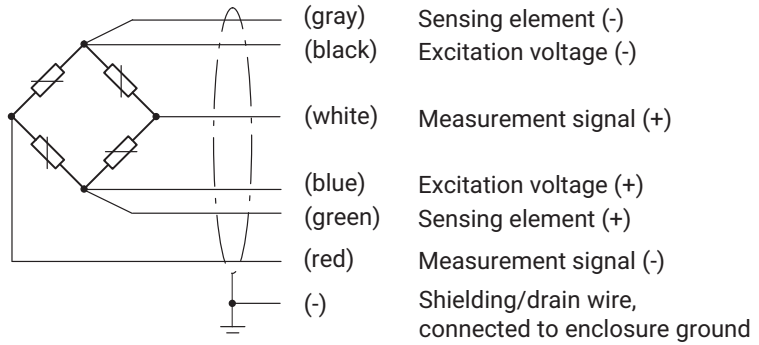
Type			S9M							
Nominal (rated) force	F_{nom}	kN	0.5	1	2	5	10	20	50	
Accuracy										
Accuracy class			0.02							
Relative reproducibility and repeatability errors without rotation	b_{rg}	%	0.02							
Rel. reversibility error	v		0.02							
Non-linearity	d_{lin}		0.02							
Relative creep	d_{crf+E}		0.02							
Temperature effect on sensitivity	TC_S	%/10K	0.02							
Temperature effect on zero signal	TC_0		0.02							
Electrical characteristics										
Nominal (rated) sensitivity	C_{nom}	mV/V	2							
Relative zero signal error	$d_{s,0}$	%	5							
Sensitivity error	d_c		0.25							
Tensile/compressive sensitivity variation	d_{zd}		0.1							
Input resistance	R_i	Ω	389 ±15							
Output resistance	R_o		350 ±1.5							
Insulation resistance	R_{is}	Giga Ω	>2							
Operating range of the excitation voltage	$B_{u,gt}$	V	0.5...12							
Reference excitation voltage	U_{ref}		5							
Connection			6-wire circuit							
Temperature										
Reference temperature	T_{ref}	°C	+23							
Nominal temperature range	$B_{t,nom}$		-10...+70							
Operating temperature range	$B_{t,g}$		-30...+85							
Storage temperature range	$B_{t,S}$		-30...+85							
Characteristic mechanical quantities										
Maximum operating force	F_G	% of F_{nom}	150							
Force limit	F_L		150							
Breaking force	F_B		200		300			200		
Limit torque	$M_{G,max}$	Nm	25		50		90		150	
Bending moment limit	$M_{b,max}$	Nm	16	13	65.8	465	468	600	118	
Static lateral limit force	F_q	% of F_{nom}	10							
Nominal (rated) displacement	s_{nom}	mm	0.35	0.4	0.35	0.1	0.2	0.2	0.4	
Fundamental frequency	f_G	kHz	0.6	0.9	1	1.7	2.1	2.3	2.5	
Relative permissible oscillatory stress	F_{rb}	% of F_{nom}	100							70
General information										
Degree of protection per EN 60529			IP68 (test condition 1 m water column / 100 hours)							
Spring element material			Stainless steel in accordance with EN 10088-1							
Measuring point protection			Hermetically welded enclosure							

PIN ASSIGNMENT OF PLUG AND CABLE CONNECTION

Nominal (rated) force:	F_{nom}	kN	0.5	1	2	5	10	20	50
Cable	6-wire cable, PVC insulation								
Cable length	m		7.6 m (standard), also available: 1.5 m; 3 m and 6 m						

Cable assignment (6-wire configuration)

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



VERSIONS AND ORDERING NUMBERS

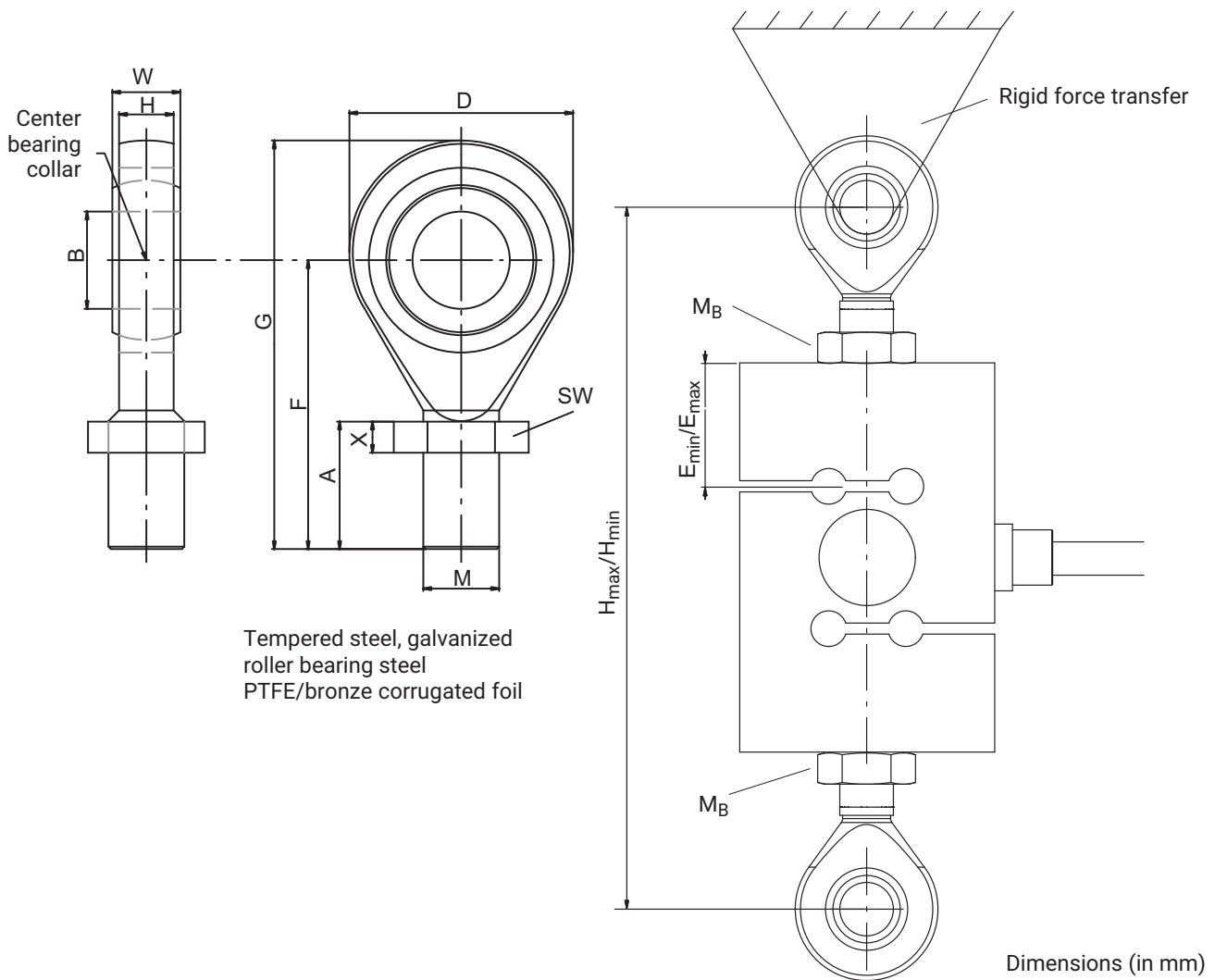
Code	Measuring range	Stock item ordering number	The ordering numbers shown in gray are preferred types. They can be delivered rapidly.
500N	500 N	1-S9M/500N-1	All preferred types with 7.6 m cable, open ends and without TEDS. The ordering number for the preferred types is 1-S9M/xxxN-1 The ordering number for customer-specific designs is K-S9M-Mont
001K	1 kN	1-S9M/1kN-1	
002K	2 kN	1-S9M/2kN-1	
005K	5 kN	1-S9M/5kN-1	
010K	10 kN	1-S9M/10kN-1	
020K	20 kN	1-S9M/20kN-1	
050K	50 kN	1-S9M/50kN-1	

Cable length	Plug	Transducer identification
01M5 1.5m	Y Free ends	S Without TEDS
03M0 3m	F D-Sub (for Scout 55, many MGC+s, etc.)	T With TEDS
06M0 6m	Q Sub-HD (for many Quantum modules)	
07M6 7.6 m	N ME3106PEMV	
	P CON P1016 (for industrial amplifiers of the Somat XR series)	

K-S9M-MONT	010K	03M0	Q	T
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The example above shows an S9M with 10kN capacity, 3 m cable, a fitted plug for the Quantum system, and TEDS. TEDS is only possible when a plug is fitted. TEDS and open ends cannot be combined.

Force application parts for tensile loading

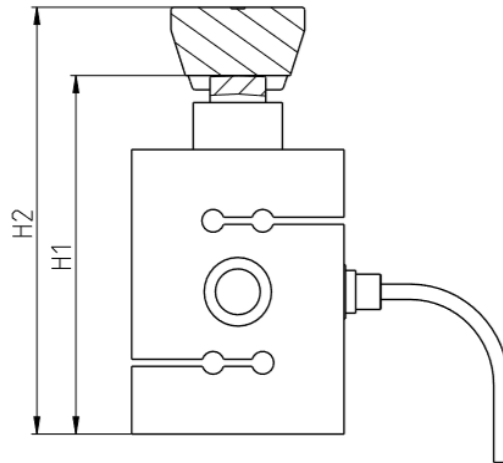


Nominal (rated) force:	Knuckle eye	Weight (kg)	A	∅B H7	D	F	G	H	M	W	X	SW
0.5 kN ... 1 kN	1-U1R/200KG/ZGW	0.05	16.5	8	24	32	44	9	M8	12	6.5	13
2 kN ... 10 kN	1-U2A/1T/ZGUW	0.1	33	12	32	54	70	12	M12	16	7	19
20 kN ... 50 kN	1-U2A/5T/ZGUW	0.4	57	25	60	94	124	22	M24x2	31	10	36

Nominal (rated) force:	Knuckle eye	H _{min}	H _{max}	E _{min}	E _{max}	M _B (N·m)
0.5 kN	1-U1R/200KG/ZGW	110	118	4	8	15
1 kN	1-U1R/200KG/ZGW	110	118	4	8	15
2 kN	1-U2A/1T/ZGUW	156	174	11	20	50
5 kN	1-U2A/1T/ZGUW	158	174	11	19	50
10 kN	1-U2A/1T/ZGUW	158	174	11	19	50
20 kN	1-U2A/5T/ZGUW	231	263	13	29	200
50 kN	1-U2A/5T/ZGUW	241	265	12	24	500

FORCE APPLICATION PARTS FOR COMPRESSIVE LOADING

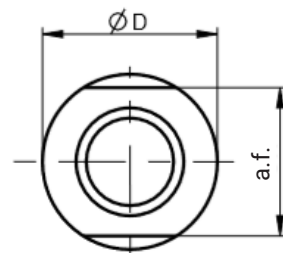
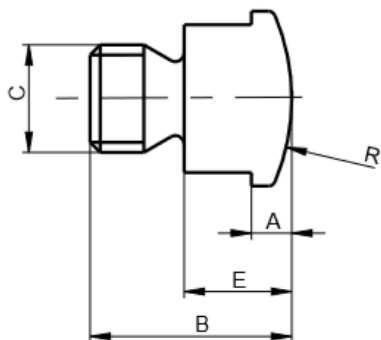
Load button and thrust piece



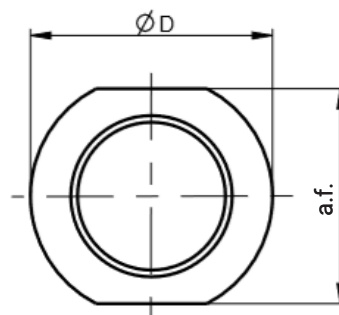
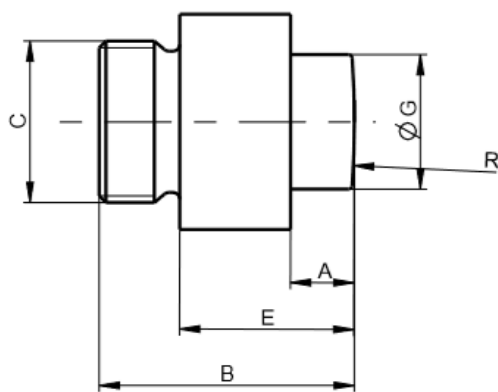
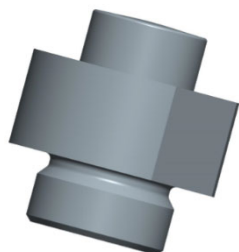
Measuring range [kN]	Measuring body [mm]	H1 [mm]	H2 [mm]	Tightening torque of load button
0.5	62	70	89	25
1	62	70	89	25
2	87.3	96.3	120.3	60
5	87.3	93.3	120.3	60
10	87.3	96.3	120.3	60
20	100	126	150	100
50	100	126	150	100

LOAD BUTTON

for S9M/50 N ... 10 kN



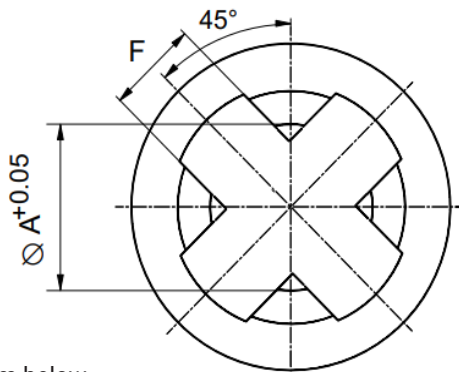
for S9M/20 kN ... 50 kN



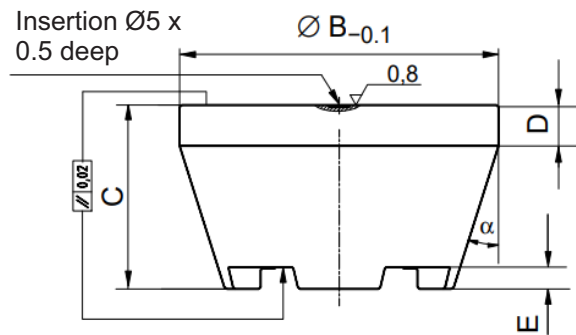
Type	Load button Ordering number	A [mm]	B [mm]	C [mm]	$\varnothing D \begin{smallmatrix} -0.05 \\ -0.10 \end{smallmatrix}$ [mm]	E [mm]	$\varnothing G$ [mm]	a.f.	R [mm]
S9M/500N-1kN	1-U1R/200kg/ZL	3	15	M8	13	8	-	11	16
S9M/2kN-10kN	3-9202.0140	3	20	M12	20	9	-	17	40
S9M/20kN-50kN	1-ZLM24F	9.5	38	M24	36	26	20	32	140

THRUST PIECE

Always use together with the load button for compressive loads



View from below



Dimensions (in mm; 1 mm = 0.03937 inches)

Type	Thrust piece Ordering number	Weight (kg)	$\varnothing A$	$\varnothing B$	C	D	E	F	α
S9M/500N-1kN	1-EDO3/1kN	approx. 0.2	13.2	37	22	6	3	8	18°
S9M/2kN-10kN	1-EDO4/50kN	0.34	20.2	48	29	8	5	12	18°
S9M/20kN-50kN	1-EDO4/50kN	0.34	20.2	48	29	8	5	12	18°

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