Data Sheet

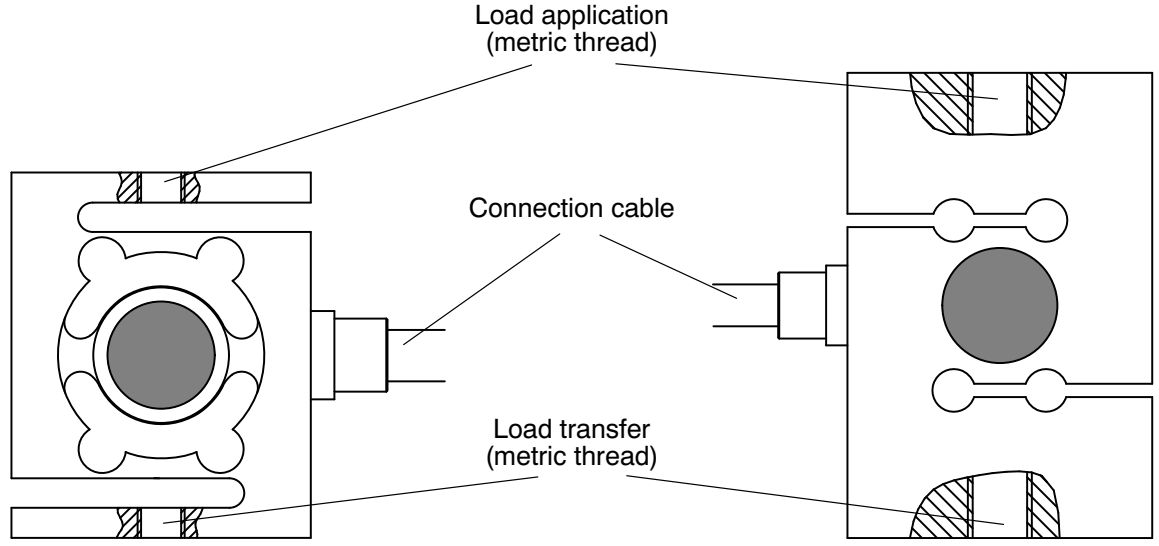
S9M

Force transducer

Special features

- **Tensile/compressive force transducer**
- **Nominal (rated) forces: 500 N ... 50 kN**
- **Hermetically encapsulated (IP68)**
- **Rust–resistant materials**
- **Accuracy class 0.02**
- **Six–wire circuit**
- **High lateral force stability**

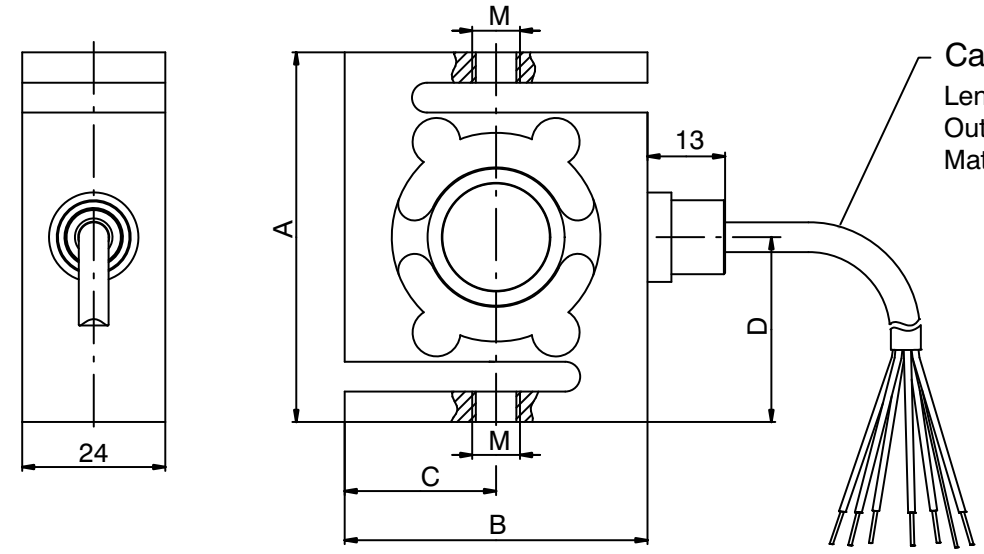
S9M force transducer principle



Design 500 N … 2 kN

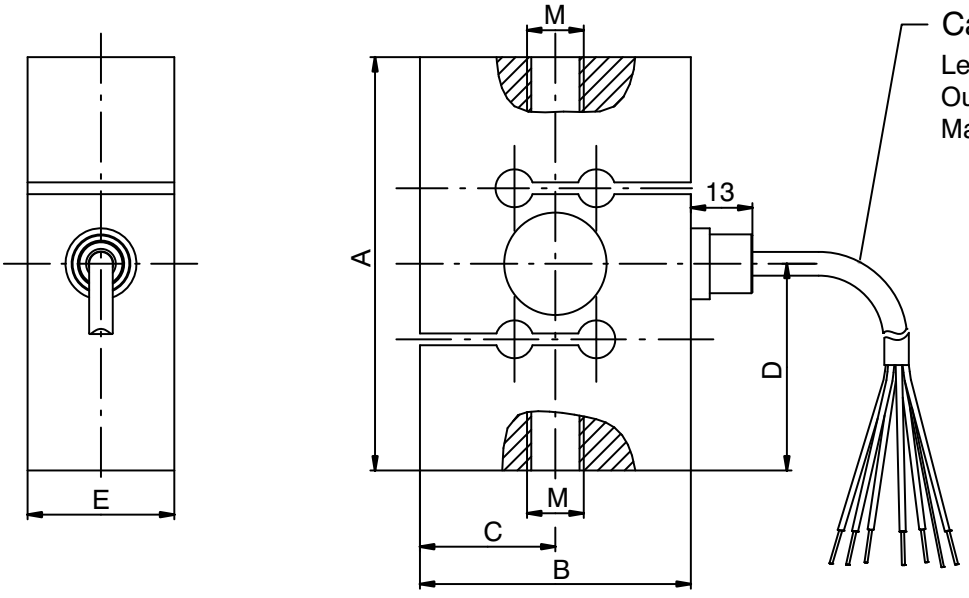
Design 5 kN … 50 kN

Dimensions (in mm; 1 mm = 0.03937 inches)



Type	A	B	C	D	M
S9M/500 N	62	50.8	25.4	31	M8
S9M/1 kN	62	50.8	25.4	31	M8
S9M/2 kN	87.3	57.2	28.6	43.7	M12

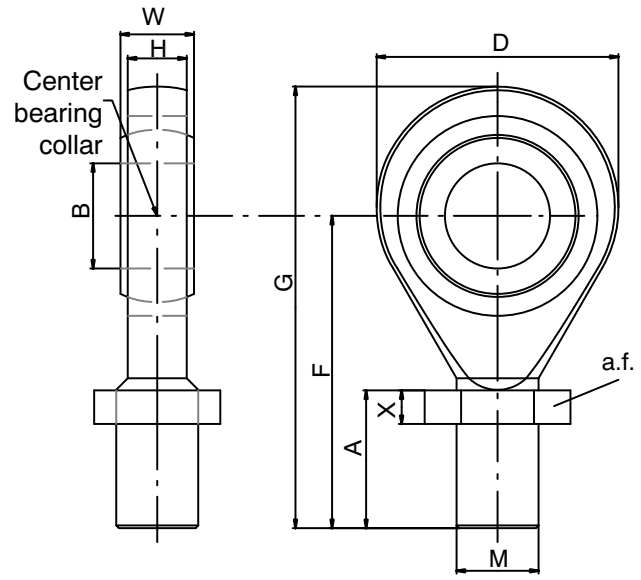
Dimensions (in mm; 1 mm = 0.03937 inches)



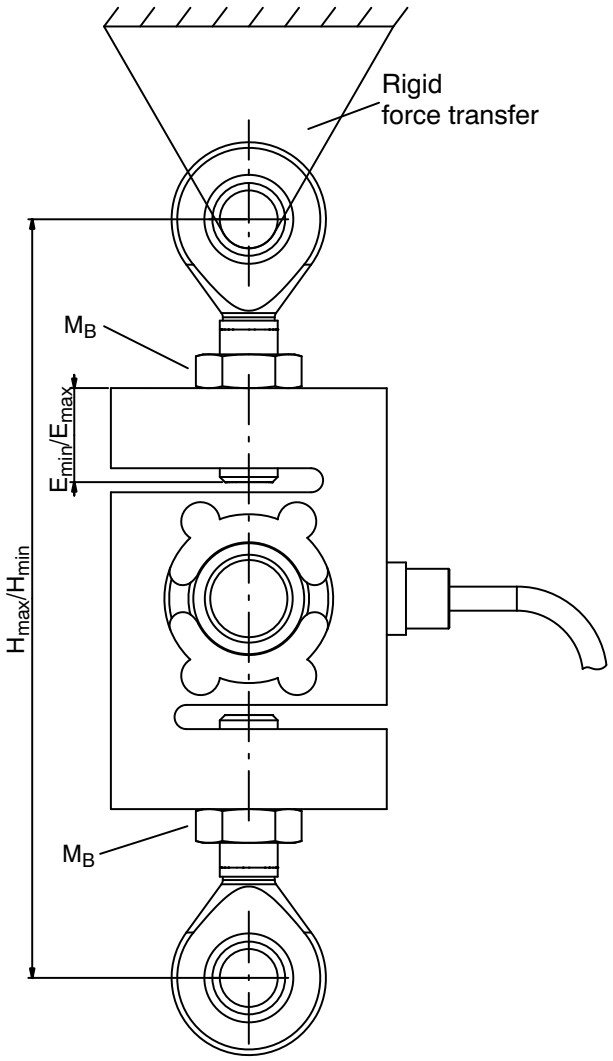
Type	A	B	C	D	E	M
S9M/5 kN	87.3	57.2	28.6	43.7	31	M12
S9M/10 kN	87.3	57.2	28.6	43.7	31	M12
S9M/20 kN	100	69.8	34.9	50	31	M24x2
S9M/50 kN	100	76.2	38.1	50	36.5	M24x2

Mounting accessories (to be ordered separately):

Dimensions (in mm; 1 mm = 0.03937 inches)



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



Nominal (rated) force	Knuckle eye	Weight (kg)	A	∅B H7	D	F	G	H	M	W	X	a.f.
0.5 kN … 1 kN	1-U1R/200KG/ZGW	0.05	15	8	24	32	44	9	M8	12	6.5	13
2 kN … 10 kN	1-U2A/1T/ZGUW	0.1	33.5	12	32	54.5	70.5	12	M12	16	7	19
20 kN … 50 kN	1-U2A/5T/ZGUW	0.4	57.5	25	60	94.5	124.5	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

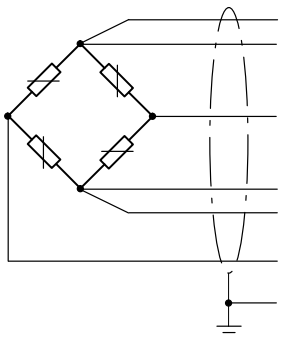
Specifications (data per VDI/VDE 2638 standards)

Type		**S9M**						
Accuracy class		0.02						
Nominal (rated) force (F_{nom})	kN	0.5	1	2	5	10	20	50
Nominal (rated) sensitivity (C_{nom})	mV/V	2						
Relative sensitivity error (tensile/compressive (d_c)	%	< ±0.25						
Relative sensitivity variation tensile/compressive (d_{zd})	%	< ±0.1						
Relative zero signal compensation ($d_{s.o}$)	%	< 5						
Relative reversibility error 0.2 F_{nom} … F_{nom} (u)	%	0.02						
Linearity error (d_{lin})	%	0.02						
Temperature coefficient of sensitivity (TK_C) **Temperature coefficient of zero signal (TK_0)**	% / 10 K	0.02 0.02						
Relative creep over 30 min. (d_{crf+E})	%	± 0.02						
Effect of lateral forces (lateral force 10% F_{nom})[1] (d_Q)	%	± 1						
Input resistance (Re) (nominal) **Output resistance (R_a)**	Ω	389 ± 15 350 ± 1.5						
Insulation resistance (R_{iso})	GΩ/100 V	> 2						
Reference excitation voltage (U_{ref}) **Nominal supply voltage range ($B_{U, GT}$)**	V	5 0.5 ... 12						
Nominal ambient temperature range ($B_{T, nom}$) **Operating temperature range ($B_{t,G}$)** **Storage temperature range ($B_{t,S}$)** **Reference temperature (t_{ref})**	°C	−10 ... +70 −30 ... +85 −30 ... +85 22						
Maximal operating force (F_G)	%	150						
Limit force (F_L)	%	150						
Breaking force (F_B)	%	200			300			200
Limit torque (M_D)	Nm	25		50	90		150	
Static lateral limit force[1] (F_Q)	%	10						
Nominal (rated) displacement at nominal (rated) force (s_{nom}), ± 0.05 mm	mm	0.35	0.4	0.35	0.1	0.2	0.2	0.4
Fundamental resonance frequency (f_G)	kHz	0.6	0.9	1	1.7	2.1	2.3	2.5
Relative perm. vibrational stress (F_{rb})	%	100						70
Weight	kg	0.7		1	1.4		1.7	2.2
Degree of protection per EN 60 529 (IEC 529)		IP 68 (test conditions 1 m water column / 100 h)						
Cable length, six-wire circuitry		Standard 7.6 m						
Material: Measuring body **Screwed cable gland** **Cable sheath**		Stainless Steel [2] Stainless steel / Neoprene PVC						

[1] Relative to a point of contact on the force application surface.
[2] Per EN 10088-1.

Cable assignment (6-wire circuitry)

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



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

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