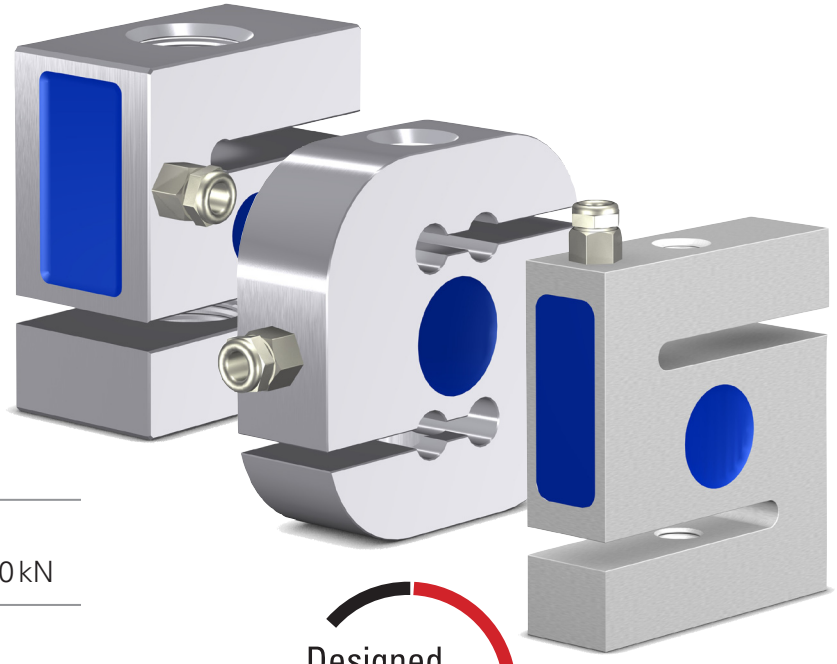
HKM Messtechnik

Shear force load cell

SW 2.X – 6.X



For tension and compression loads
Measurement ranges from 5 kN to 100 kN

Load and force measurement
Crane scales, dynamometers

Designed, developed and made in Germany

The outstanding features of shear force load cells are exceptionally compact design combined with high reliability and accuracy. Insensitivity to transverse forces is a decisive advantage of the shear force measuring principle. The many different variants of this type enable the use of shear force load cells in a wide variety of industrial applications.

The S-shaped weighing cells are symmetrical, and are readily integrated into a load path using the two tapped holes in the centre of the mounting surfaces.

Measuring amplifiers can be integrated in all shear force load cells, ensuring that a broad bandwidth of output signals are at your disposal. Transducers are supplied with a cable as a standard feature or, alternatively, can be connected with an M12x1 plug connector.

Technical data

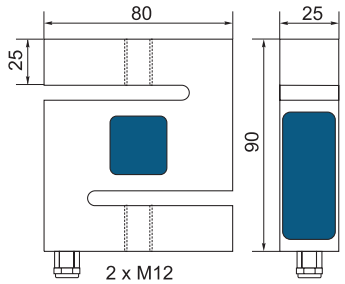
Type	SW 2.0	SW 2.1	SW 3.0	SW 3.1	SW 4.0	SW 5.0	SW 5.1	SW 6.0
Nominal load [kN]	5	10	10	20	40	50	80	100
Dimensions L x W x H [mm]	80 x 25 x 90		80 x 25 x 80		68 x 38 x 78	108 x 54 x 108		120 x 80 x 120
Mounting thread	M 12 – 25 deep		M 16 – 11/15 deep		M 24 x 2 – 19.5 deep	M 24 x 2 – 23/26 deep		M 30 x 2 – 28/31 deep
Material	Aluminium		Steel		Steel	Steel		Steel
Self-weight [kg]	0.4		0.9		1.2	3.5		6.7
Maximum working load*	1.1 x nominal load							
Limit load*	1.5 x nominal load							
Breaking load*	> 3 x nominal load				> 2 x nominal load	> 3 x nominal load		
Accuracy	±0.25% f.s.** under tension *or* compression							
Reference temperature	20°C							
Nominal temperature range	–10°C to +50°C							
Working temperature range	–30°C to +80°C							
Temperature coefficient of gain	< 0.1% f.s.**/10 K							
Temperature coefficient of zero	< 0.2% f.s.**/10 K							
Nominal deflection	< 0.2 mm							
Degree of protection	IP 67							

* The sum of the dynamic and static load is decisive
** f.s. = full scale value

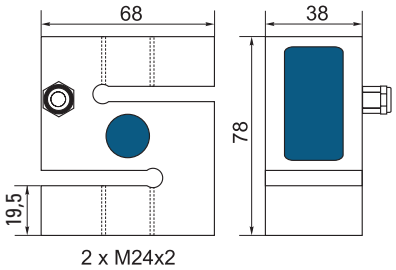
Dimensions

in mm

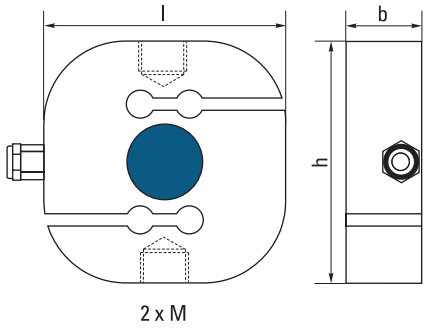
SW 2.x



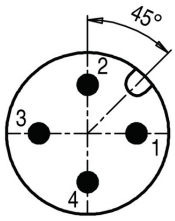
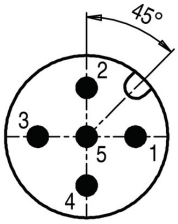
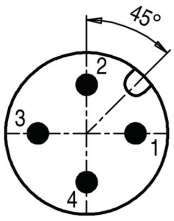
SW 4.0



SW 3.x
SW 5.x
SW 6.x



Output variants without measuring amplifiers / with integrated measuring amplifiers

Version		Without measuring amplifier*	Measuring amplifier with current output		Measuring amplifier with voltage output			Measuring amplifier with RS 485 interface
			3-conductor	2-conductor				
for sensor types	SW 2.x	●	●	●	●	●	●	●
	SW 3.x	●	●	●	●	●		
	SW 4.x	●	●	●	●	●	●	●
	SW 5.x	●	●	●	●	●	●	●
	SW 6.x	●	●	●	●	●	●	●
Output signal Sig		≈ 2 mV/V	1…9 mA 4…20 mA 12 ± 8 mA	4…20 mA 12 ± 8 mA	0…5 V 2.5 ± 2.5 V	0…10 V 5 ± 5 V	± 10 V	0...32767 digits
Supply U_b [V]		< 10	10…30	10...30	6…30	11…30	12…30	6...30
Resolution [bit]		–	11					14
Measuring rate		–	1000 (optional 30….2000) Hz					
Insulation resistance		> 1 GΩ	> 1 GΩ					
Load		–	< (U_b – 6V) / Sig_{max}	< (U_b – 8V) / Sig_{max}	> 10 000 Ω			–
Max. power consumption		40 mA	40 mA					
Electrical protection		Reverse voltage, overvoltage and short circuit protection			Reverse voltage and overvoltage protection			Reverse voltage, overvoltage and short circuit protection
Cable type (if provided)		FDCP plus, 4 x 0.25 mm², Length 5 m						
Connection variants		Cable / M 12 x 1 4-pole	Cable / M 12 x 1 5-pole	Cable / M 12 x 1 5-pole	Cable / M 12 x 1 5-pole			Cable / M 12 x 1 4-pole
	U_b	BN / 1	BN / 1	BN / 1	BN / 1			BN / 1
	$Sig_{(+)}$	GN / 4	GN / 4	BN / 1	GN / 4			
	GND	WH / 3	WH / 3	WH / 3	WH / 3			WH / 3
	Sig_-	YE / 2						
	A							YE / 4
	B							GN / 2
	Shield	BK / Housing	BK / Housing	BK / Housing	BK / Housing			BK / Housing
	not connected		2; 5	2; 4; 5	2;5			
Pole assignment								

* Input bridge resistor ≈ 400 Ω | Output bridge resistor ≈ 350 Ω

Options

» Output available with test signal on request
» Integrated measuring amplifier
  › with ratiometric voltage input
  › with 2 switching outputs
» Cable outlet in load direction for SW 4
» Accessories: spherical rod ends and eyebolts