HKM Messtechnik

Dual shear force transducer

DK

For tension and compression loads
Measurement ranges from 4 kN to 200 kN
Symmetrical application of force
Design pursuant to customer requirements

Container scales
Floor scales
Metering scales
Vehicle and railway scales

Designed, developed and made in Germany

The dual shear force transducers measure tensile and compressive forces. They operate on the same principles as single shear force transducers, but are easier to mount and more stable. In particular, dual shear force transducers are especially suitable for use in weighbridges.
The advantages of this design lie in the parallel load paths and insensitivity to transverse forces.

Dual shear force transducers are robust solutions designed for a variety of applications in rough weighing and industrial environments. We dimension and manufacture dual shear force transducers to meet your requirements. The transducers are usually mounted using the four screw connections. On request, we will be pleased to quote for alternative designs adapted to special force transmission requirements.
Where the measurement signal must be transmitted over a long distance, we can, optionally, equip these transducers with an integral measuring amplifier.

Technical data

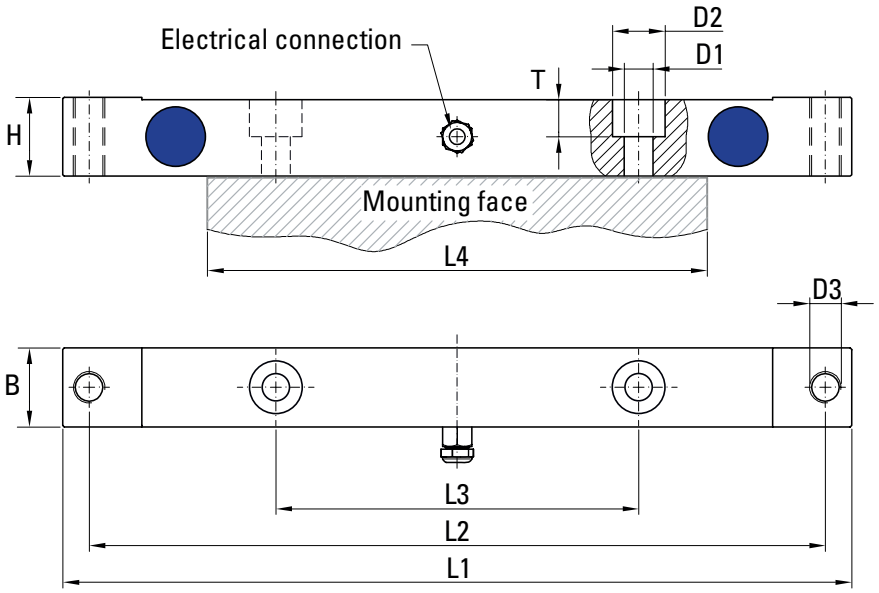
» Nominal load	4 kN to 200 kN
» Material	Aluminium or Steel
» Maximum working load*, limit load*, breaking load*	following consultation
» Accuracy	±0.25% f.s.** (under tension *or* compression)
» Reference temperature	20°C
» Nominal temperature range	-10°C to +50°C
» Working temperature range	-30°C to +80°C
» Temperature coefficient of gain	< 0.1% f.s.**/10 K
» Temperature coefficient of zero	< 0.2% f.s.**/10 K
» Nominal deflection	< 0.1 mm
» Degree of protection	IP 67

* * The sum of the dynamic and static load is decisive

** f.s. = full scale value

Dimensions

The following dimensions are defined pursuant to customer requirements

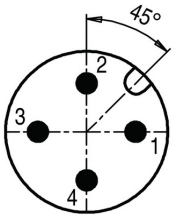


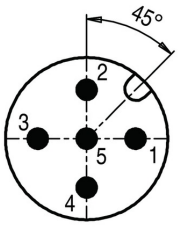
Output variants without measuring amplifiers / with integrated measuring amplifiers

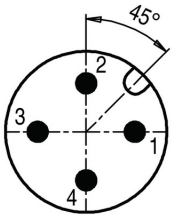
Version	Without measuring amplifier*	Measuring amplifier with current output		Measuring amplifier with voltage output			Measuring amplifier with RS 485 interface
		3-conductor	2-conductor				
Output signal Sig	≈ 2 mV/V	1…9 mA 4…20 mA 12 ± 8 mA	4…20 mA 12 ± 8 mA	0…5 V 2.5 ± 2.5 V	0…10 V 5 ± 5 V	±10 V	0...32767 digits
Supply U_b [V]	< 10	10…30	10…30	6…30	11…30	12…30	6...30
Resolution [bit]	–	11		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





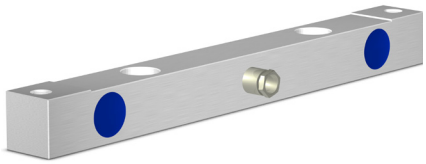


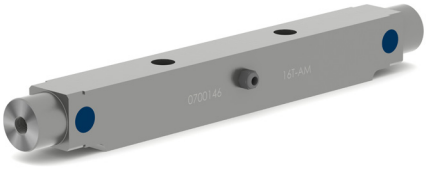
* Input bridge resistor ≈ 400 Ω | Output bridge resistor ≈ 350 Ω

Options

» Accuracy ±0.1% f.s.
» Output available with test signal on request

Design examples





Installation example