

SENSiQ® Shear Beam Load Cell

VBB / VEB 5 ... 500 kg

- Highest accuracies (up to 6000 increments to OIML R60)
- Hermetically sealed due to laser welding (IP68)
- Approvals for potentially hazardous areas available: ATEX, IECEx, EAC, USA, Canada
- Optimized for parallel connection through perfect calibration
- 6-wire circuit
- 100 % stainless steel



Application

Load cells of the VBB type are designed to convert the mechanical input signal, the load, proportionally into the electrical output voltage.

Combined with the corresponding VEB elastomer mounts, they are very suitable for use with platform, batching, and hopper scales. Their compact design simplifies the integration in any existing construction.

The rugged design of the load cells and mounts ensures reliable operation even in severe environments.

Construction

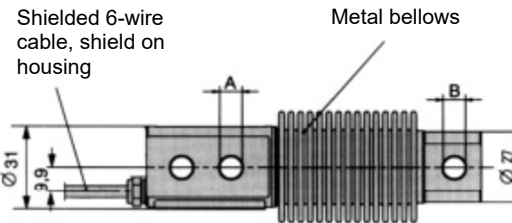
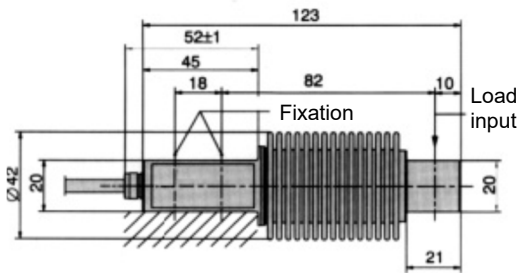
Entirely made of stainless steel and hermetically sealed by laser welding, the VBB load cells are connected by using a high-quality shielded 6-wire PVC cable.

The 6-wire circuit provides for a measuring signal which is insensitive to connecting cables of different lengths.

Functions

- High calibrating accuracy, thus, optimal prerequisites for the parallel connection of load cells
- High degree of measuring signals repeatability
- Damping of side forces through the elastomer mount
- Self-centering after side load
- Minimal effect on accuracy by side forces

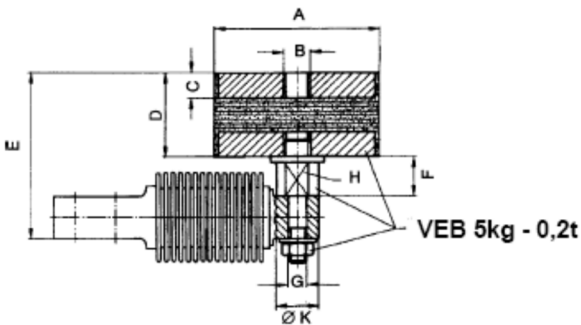
Load Cells VBB 5 kg – 0.5 t



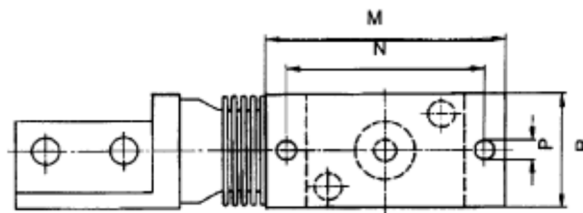
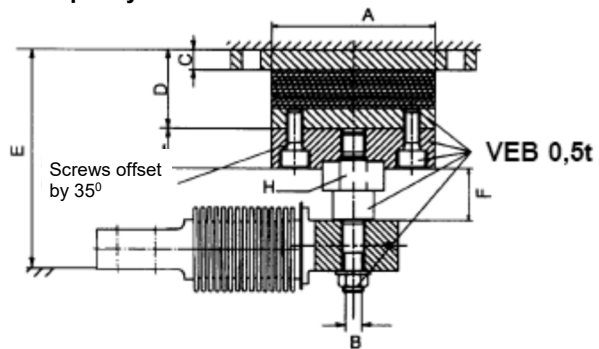
Variant	Dimensions (mm)	
	A	B
VBB 5 kg – 0.2 t	8.2	8.2
VBB 0.5 t	10.5	11.1

VEB Elastomer Mount 5 kg – 0.5 t for VBB Load Cells

Capacities 5 kg – 0.2 t



Capacity 0.5 t



Elastomer mount correct mounting position

Dimensions (in mm)

Elastomer mount	A	B	C	D	E	F	G	H	K	L	M	N	P	R	FR*	Smax**
VEB 5 kg – 0.2 t	75	M12	12	40	79 ±1.3	18.5	M8	SW 17	19	-	-	-	-	-	163	3
VEB 0.5 t	80	M10	10	39	105 ^{+2.1} _{-2.2}	26	-	SW 27	-	20	120	100	9	60	400	4.5

* Restoring force F_R in N with 1 mm lateral displacement

** maximum adm. lateral displacement S_{max} if loaded with rated capacity

Technical Data

Rated capacity	E_{max}	5 kg – 0.5 t				
Accuracy class		D1	C3*	C4**	C6***	Reference
Nominal characteristic value	C_n	2 mV/V +20 μ V/V; -2 μ V/V		2 mV/V \pm 1 μ V/V		
Combined error	F_{comb}	0.05 %	0.02 %	0.013 %	0.01 %	C_n
Zero signal return after loading (30 min)	F_{dr}	\pm 0.049 %	\pm 0.016 %	\pm 0.012 %	\pm 0.008 %	C_n
Creep error during stress (30 min)	F_{cr}	\pm 0.049 %	\pm 0.016 %	\pm 0.012 %	\pm 0.008 %	C_n
Temperature coefficient of zero signal	TK_0	\pm 0.05 %/10 K	\pm 0.0125 %/10 K	\pm 0.009 %/10 K	\pm 0.009 %/10 K	C_n B B_{Tn}
Temperature coefficient of characteristic value	TK_c	\pm 0.05 %/10 K	\pm 0.008 %/10 K	\pm 0.007 %/10 K	\pm 0.004 %/10 K	C_n B B_{Tn}
Maximum number of increments in certified applications	n_{LC}	1000	3000	4000	6000	
Min. scale interval	v_{min}	0.036 %	0.009 %	0.0066 %	0.0066 %	E_{max}
Minimum utilisation rate	B_{amin}	36 %	27 %	26 %	39 %	E_{max}
Maximum utilisation rate	B_{amax}	$B_{amax} = E_{max}$				
Input resistance	R_e	350 Ω - 480 Ω				t_r
Output resistance	R_a	356 Ω \pm 0.2 Ω	356 Ω \pm 0.12 Ω			t_r
Zero signal	S_0	\pm 1 %				C_n
Maximum supply voltage	U_{smax}	18 V				
Nominal temperature range	B_{Tn}	-10 $^{\circ}$ C ... +40 $^{\circ}$ C				
Service temperature range	B_{Tu}	-40 $^{\circ}$ C ... +70 $^{\circ}$ C				
Service temperature range Explosion-proof design		-30 $^{\circ}$ C ... +70 $^{\circ}$ C (ATEX, IECEx, EAC)- 30 $^{\circ}$ C ... +40 $^{\circ}$ C (FM-Approval Canada an USA)				
Reference temperature	t_r	23 $^{\circ}$ C				
Storage temperature range	B_{Ts}	-50 $^{\circ}$ C ... +85 $^{\circ}$ C				
Safe load limit	E_L	150 %				C_n
Breaking load	E_D	300 %				C_n
Displacement **** at rated capacity		0.25 mm	0.3 mm	0.4 mm	0.6 mm	
		5 kg	10 - 100 kg	200 kg	500 kg	
Protection class Explosion-proof design		IP68 (tightened test conditions: 1 m water gauge; 100 h) IP67				
Cable specification		3 m PVC cable, 6 wires, shielded, shield on housing				
Colour code		black: input - / blue : input + / black/yellow: shield red : output - / white : output + grey : sensor - / green : sensor +				
Corrosion protection		Stainless steel				

*: Quality C3 available for nominal loads \geq 10 kg only

** : Quality C4 available for nominal loads \geq 20 kg only

***: Quality C6 available for nominal loads \geq 50 kg only

****: Please adjust the overload stops to nominal displacement +0.05 mm (unloaded scale)

Variants Load Cells	Order No.	Ex-Variants Load Cells	Order No. 2GD	Order No. 2D/3G
VBB 5 kg D1	D 725 417.01			
VBB 10 kg D1	D 725 417.02			
VBB 10 kg C3	D 725 419.02	VBB 10 kg C3 „Ex“	D 725 419.32	D 725 419.42
VBB 20 kg D1	D 725 417.03			
VBB 20 kg C3	D 725 419.03	VBB 20 kg C3 „Ex“	D 725 419.33	D 725 419.43
VBB 50 kg D1	D 725 417.04			
VBB 50 kg C3	D 725 419.04	VBB 50 kg C3 „Ex“	D 725 419.34	D 725 419.44
VBB 0.1 t D1	D 725 409.01	VBB 0.1 t D1 „Ex“	D 725 409.61	D 725 409.41
VBB 0.1 t C3	D 725 409.04	VBB 0.1 t C3 „Ex“	D 725 409.64	D 725 409.44
VBB 0.1 t C4	D 726 370.01	VBB 0.1 t C4 „Ex“	D 726 370.31	D 726 370.41
VBB 0.2 t D1	D 725 409.02	VBB 0.2 t D1 „Ex“	D 725 409.62	D 725 409.42
VBB 0.2 t C3	D 725 409.05	VBB 0.2 t C3 „Ex“	D 725 409.65	D 725 409.45
VBB 0.2 t C4	D 726 370.02	VBB 0.2 t C4 „Ex“	D 726 370.32	D 726 370.42
VBB 0.2 t C6	D 726 370.04	VBB 0.2 t C6 „Ex“	D 726 370.34	D 726 370.44
VBB 0.5 t D1	D 725 409.03	VBB 0.5 t D1 „Ex“	D 725 409.63	D 725 409.43
VBB 0.5 t C3	D 725 409.06	VBB 0.5 t C3 „Ex“	D 725 409.66	D 725 409.46
VBB 0.5 t C4	D 726 370.03	VBB 0.5 t C4 „Ex“	D 726 370.33	D 726 370.43

Variants Elastomer Mounts	Order No.
VEB 5 kg – 0.2 t	D 725 408.01
VEB 0.5 t	D 725 408.02

Example for ordering:

Rated Capacity 0.2 t, Accuracy Class C6: Variant VBB 0.2 t C6 – Ordering Number D726 370.04

Additional versions available upon request.

Optional feature ATEX/IECEx approval

	intrinsically safe Ex version Option 2GD	Not intrinsically safe Ex version Option 2D, 3G
ATEX / IECEx	II 2G Ex ia IIC T4 Gb (zone 1) II 2D Ex ia IIIC T125°C Db, IP67 (zone 21)	II 3G Ex nA IIC T4 Gc (zone 2) II 2D Ex tb IIIC T125 °C Db, IP67 (zone 21)
FM-Approval Canada	I / 0 / Ex ia / IIC / T4; -30°C < Ta < 40°C / Ga; 20 / Ex ia / IIIC / T125°C; -30°C < Ta < 40°C / Da; IP67.	not available
FM-Approval USA	IS / I, II, III / 1 / A, B, C, D, E, F, G / T4; -30°C < Ta < 40°C, I / 0 / AEx ia / IIC / T4; -30°C < Ta < 40°C / Ga; 20 / AEx ia / IIIC / T125°C; -30°C < Ta < 40°C / Da; IP67.	not available
EAC	1Ex ia IIC T4 Gb (zone 1) Ex ia IIIC T125°C Dc X (zone 22)	2Ex nA II T4 Gc (zone 2) Ex tc IIIC T125 °C Dc X (zone 22)

Load cells marked as intrinsically safe - Ex "i" - are also operated intrinsically safely irrespective of the zone.

Warning: The verification of intrinsically safe circuit must be verified. New barriers are provided in particular for new systems. The verifications of intrinsically safe circuit are available for all load cells and barriers.

Schenck Process Europe GmbH
Pallaswiesenstr. 100
64293 Darmstadt, Germany
T: +49 61 51-15 31 0
F: +49 61 51-15 31 66
sales-eu@schenckprocess.com



<https://www.schenckprocess.com/contact>