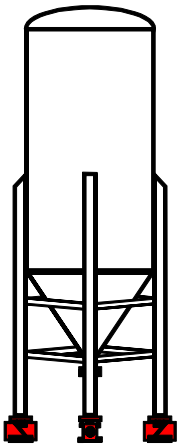
BLH®

Precision Force and Weight Measurement Technologies

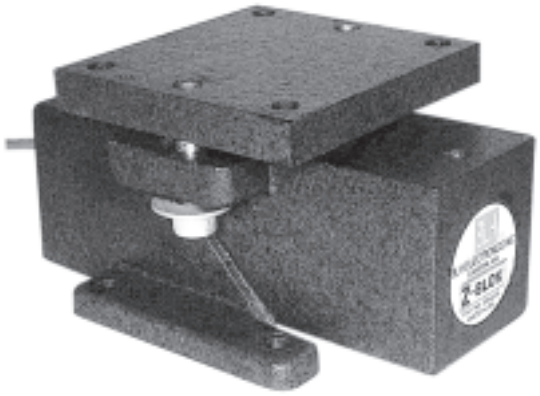
Z-BLOK Weigh Module

Applications:

Inventory Silos
Storage Tanks
Process Vessels



- **Capacities from 500 to 100,000 Pounds**
- **'Checkless' Design - No Stay or Check Rods Required**
- **Low Profile and Integral Expansion Assembly Simplifies Installation**
- **Designed to Meet ANSI and UBC Wind Load and Seismic Requirements**
- **Double Cantilever Design Improves System Performance and Accuracy**
- **FM and CSA Approved**



Product Description

Z-BLOK Weigh Modules are specifically designed to meet the requirements of inventory and process weighing applications. Checkless design (no stay or check rods), low profile, and uniform bolt spacing simplify installation on new or existing vessels. The integral expansion assembly, double cantilever design, and temperature compensated full bridge transducer, minimize temperature effects allowing accurate measurement indoors or out, in virtually any environment.

The ANSI qualified design provides an efficient balance between performance as a transducer and strength as a structural member when earthquakes or wind resistance is a structural design requirement. Sideloads of up to 100% full scale capacity, caused by mixer torque, vibration, or other extraneous forces, virtually have no effect on weight measurement.

An integral cable conduit fitting, epoxy sealed strain gages, and a stainless steel transducer ensure long life in wet or washdown locations. High overload capacity, ductile iron mounting hardware, and high strength assembly bolts enable the Z-BLOK to survive where others fail.

BLH Electronics, Inc.
An ISO 9001 Registered Company

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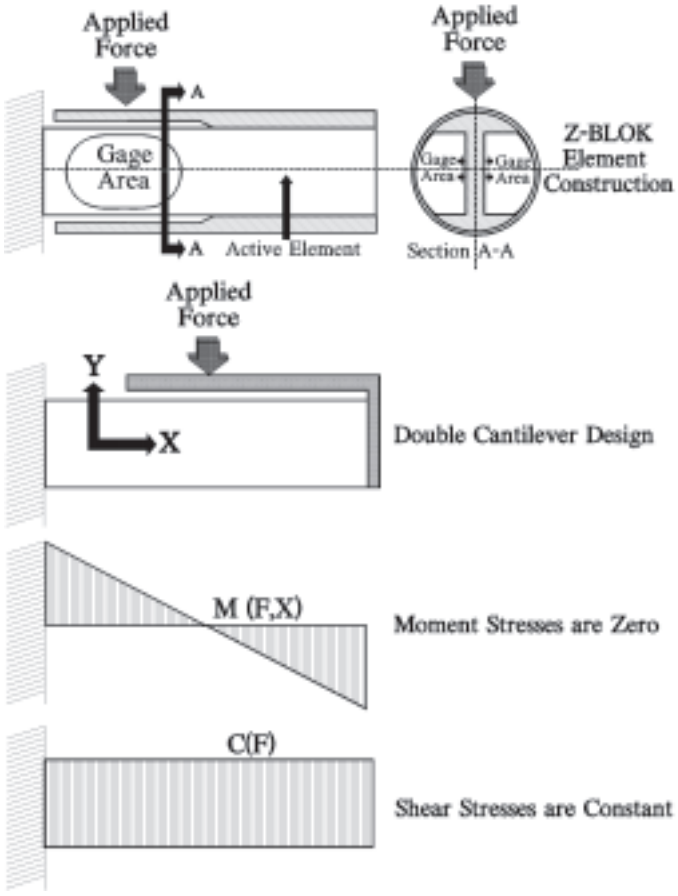
The Double Cantilever Advantage

Double cantilever shear beams measure the shear component of force without errors caused by changing point or moment stresses.

The Z-BLOK Weigh Module incorporates an outer sleeve that can be thought of as a second cantilever, rigidly attached to the free end of the first cantilever. Thus the term double cantilever. With this design, rather than applying force at the free end of the beam, the point of load application is brought back to a point directly over the gaged area. The result is that bending moment is close to zero across the gaged area. Because a shear beam is designed to measure shear, not bending, any reduction in bending moment stress is desirable. The second cantilever also is effective at isolating load application point stresses from the active element.

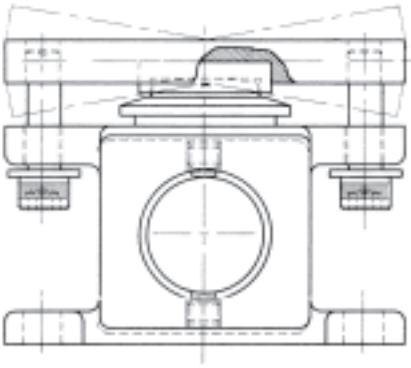
Reducing the force due to bending moment in a cantilever beam has a side benefit - a reduction in the beam's strength requirements. By reducing the bending moment induced at the weakest part of the shear beam (section A-A), a double cantilever shear beam can be operated at a stress level well below that of a single cantilever shear beam. The result is a more conservative structural design with high overload capacity and fatigue resistance. Double cantilever shear beams approach the ideal in load cell design; they measure the desired force while ignoring any extraneous forces that may be present.



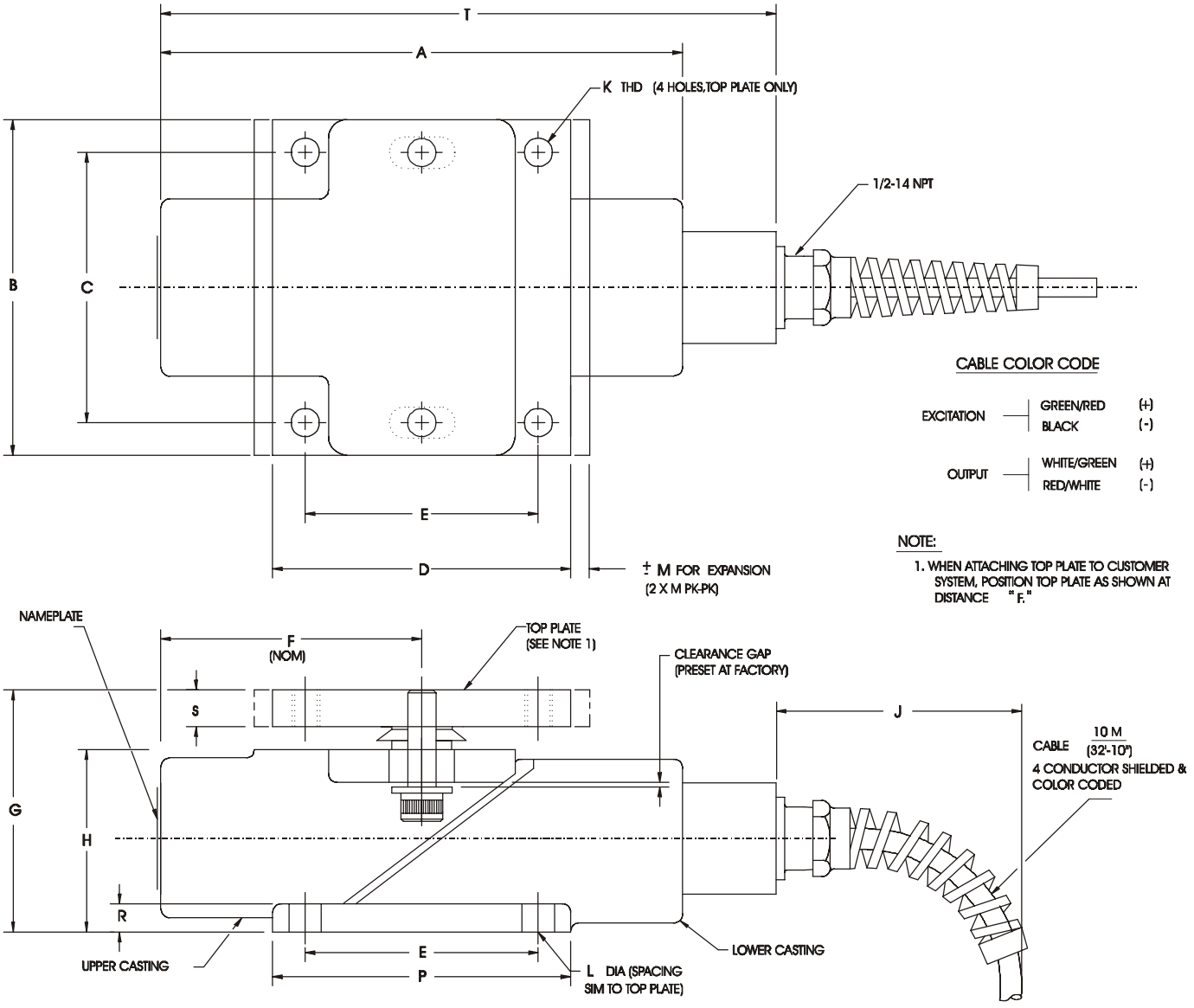
The Integral Expansion/Retainer Plate Advantage

Z-BLOK's unique design incorporates an integral expansion/retainer plate assembly with retainer bolts. This mounting arrangement provides simple checkless installation while allowing for minor mounting surface irregularities and vessel/structure expansion and contraction. The spherical load button and socket eliminates torsional stresses on the load element caused by non-level or out of plum mounting surfaces.

End load stresses, caused by vessel/structure expansion and contraction or process vibration, are negated by the teflon impregnated slide plate. The expansion/retainer plate assembly is attached to the module at the factory and requires no adjustments. The high strength bolts that connect the module and expansion/retainer plate assembly provide resistance to uplift forces and complete the checkless design.



Outline Dimensions



Dimensions shown in mm/(in.)

PART NO.	CAPACITY (lb)	A	B	C	D	E	F	G	H	J	K	L	M	P	R	S	T
468528-4	Reserved																
468529-4	Reserved																
468530-4	500	152.4 (6.0)	98.4 (3.875)	76.2 (3.0)	88.9 (3.50)	65.0 (2.56)	76.2 (3.0)	68.3 (2.69)	50.5 (1.99)	76.2 (3)	1/4-20	8.13 (.32)	2.2 (.09)	89 (3.5)	7.9 (.31)	9.1 (.36)	190.5 (7.50)
462795-4	1,000																
462796-4	2,000	177.8 (7.0)	114.3 (4.50)	91.95 (3.62)	101.6 (4.0)	79.2 (3.12)	88.9 (3.50)	88.1 (3.47)	63.2 (2.49)		3/8-16	10.9 (.43)	4.0 (.16)	101.6 (4.0)	9.7 (.38)	12.4 (.49)	209.6 (8.25)
462797-4	5,000																
462798-4	10,000	228.6 (9.0)	139.7 (5.50)	112.3 (4.42)	127.0 (5.0)	99.6 (3.92)	114.3 (4.50)	115.6 (4.55)	85.3 (3.36)		1/2-13	10.9 (.43)	4.5 (.18)	127 (5.0)	14.2 (.56)	18.5 (.73)	___
462799-4	20,000	254.0 (10.0)	(162.0) (6.38)	128.5 (5.06)	139.7 (5.50)	106.2 (4.18)	127.0 (5.0)	137.0 (5.39)	99.6 (3.92)		5/8-11	12.7 (.50)	4.8 (.19)	139.7 (5.5)	19.1 (.75)	21.8 (.86)	___
462800-4	50,000	305.1 (12.01)	190.5 (7.50)	152.4 (6.0)	177.8 (7.0)	127.0 (5.0)	152.4 (6.0)	177.3 (6.98)	126.5 (4.98)		3/4-10	17.5 (.69)	6.3 (.25)	165.1 (6.5)	25.4 (1.0)	24.9 (.98)	___
462801-4	100,000	400.1 (15.75)	254.0 (10.0)	206.2 (8.12)	203.2 (8.0)	155.4 (6.12)	(200.2) (7.88)	257.6 (10.14)	179.1 (7.05)		1-8	23.9 (.94)	6.3 (.25)	203.2 (8.0)	38.1 (1.5)	37.3 (1.47)	___

Product Specifications and Accessories

Performance

Capacity	500 lb - 100,000 lb (8 ranges)
Input Resistance	350 ohms + /. 3 ohms
Output Resistance	350 ohms + /.3 ohms
Rated Output	2.0 mVN + /-0.1 % mV/V
Zero Balance	5% R.O. (Rated Output)
Combined Error (best fit)	0.10% R.O. (0.25% -100,000 lb)
Creep (20 minutes)	0.03% R.O.
Repeatability	0.01 % R.O.
Recommended Excitation	10 or 15 Vdc
Environmental Class	NEMA 4/IP65
Moisture Protection	IEC Recomm. 68-2-4 Test D, 100 Cycles

Temperature Effects

Temperature Range	-40 to 102°C (-40 to 220°F)
Compensated Range	-1 to 54°C (30 to 130°F)
Zero Balance	0.0017% R.O. per °F
Output	0.0020% Reading per °F

Loadind Specifications

Safe Load	150% Rated Capacity
Ultimate Load	300% Rated Capacity
Safe Sideload	100% Rated Capacity

Material

Beam	15-5PH Stainless Steel
Brackets	Ductile Iron with Enamel Paint

Deflection Under Load and Unit Weight

CAPACITY	DEFLECTION	WEIGHT
500 lb	0.012 in.	10 lb
1000 lb	0.012 in.	10 lb
2000 lb	0.013 in.	15 lb
5000 lb	0.027 in.	15 lb
10,000 lb	0.023 in.	35 lb
20,0001b	0.047 in.	50 lb
50,000 lb	0.066 in.	75 lb
100,000 lb	0.094 in.	200 lb

Termination

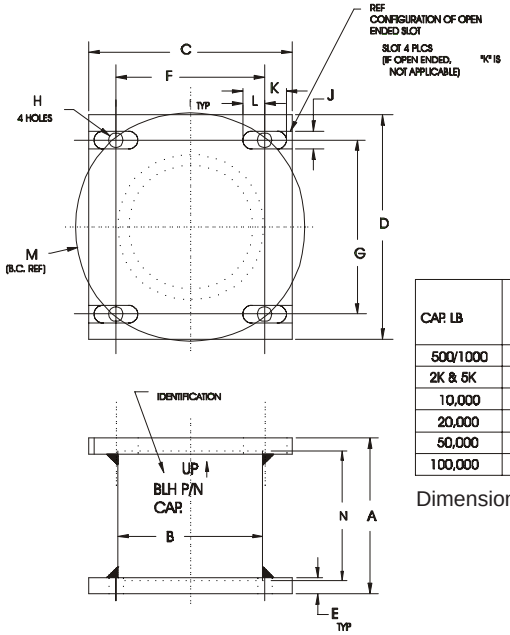
All Capacities	10 m (32', 10') cable with conduit fitting

FM and CSA Approval

Approved Intrinsically Safe for Class I, II, and III, Div 1, Groups A-G When Installed in Accordance with BLH Drawing # 449255-3.

NOTES: Many performance specifications are proven on a statistical sample basis.

BLH is continually seeking to improve product quality and performance. Specifications may change accordingly.



Simulated Weigh Modules

CAP. LB	A	B	C	D	E	F	G	H	J	K	L	M BC REF	N N=TOTAL COLUMN LENGTH
500/1000	2.69	2 1/2	3 1/2	3 7/8	.28	2.560	3.000	5/16	5/16	3/4	3/8	3.944	2.33
2K & 5K	3.47	3 1/4	4	4 1/2	.41	3.120	3.620	7/16	7/16	//	7/16	4.779	2.86
10,000	4.55	3 1/2	5	5 1/2	.59	3.920	4.420	7/16	9/16	//	1/2	5.908	3.56
20,000	5.39	4	5 1/2	6 3/8	.72	4.180	5.060	1/2	11/16	//	9/16	6.563	4.15
50,000	6.98	4 3/4	7	7 1/2	.97	5.000	6.000	11/16	13/16	1 1/4	5/8	7.810	5.24
100,000	10.14	6	8	10	1.44	6.120	8.120	15/16	1 1/16	//	3/4	10.168	7.46

Dimensions shown in inches

Thermal Insulation Pads

In applications where heat conduction is a concern, BLH can provide thermal pads to isolate the ZBLOK modules from the hot vessel. The one inch thick, phenolic glass pads install directly between the Z-BLOK expansion/ retainer plate and the vessel gusset/mounting bracket for thermal insulation.

Thermal Insulation Pad Part Numbers

Part #	Capacity lb		Part #	Capacity lb
464393	500/1000		464396	20,000
464394	2000/5000		464397	50,000
464395	10,000		464398	100,000

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