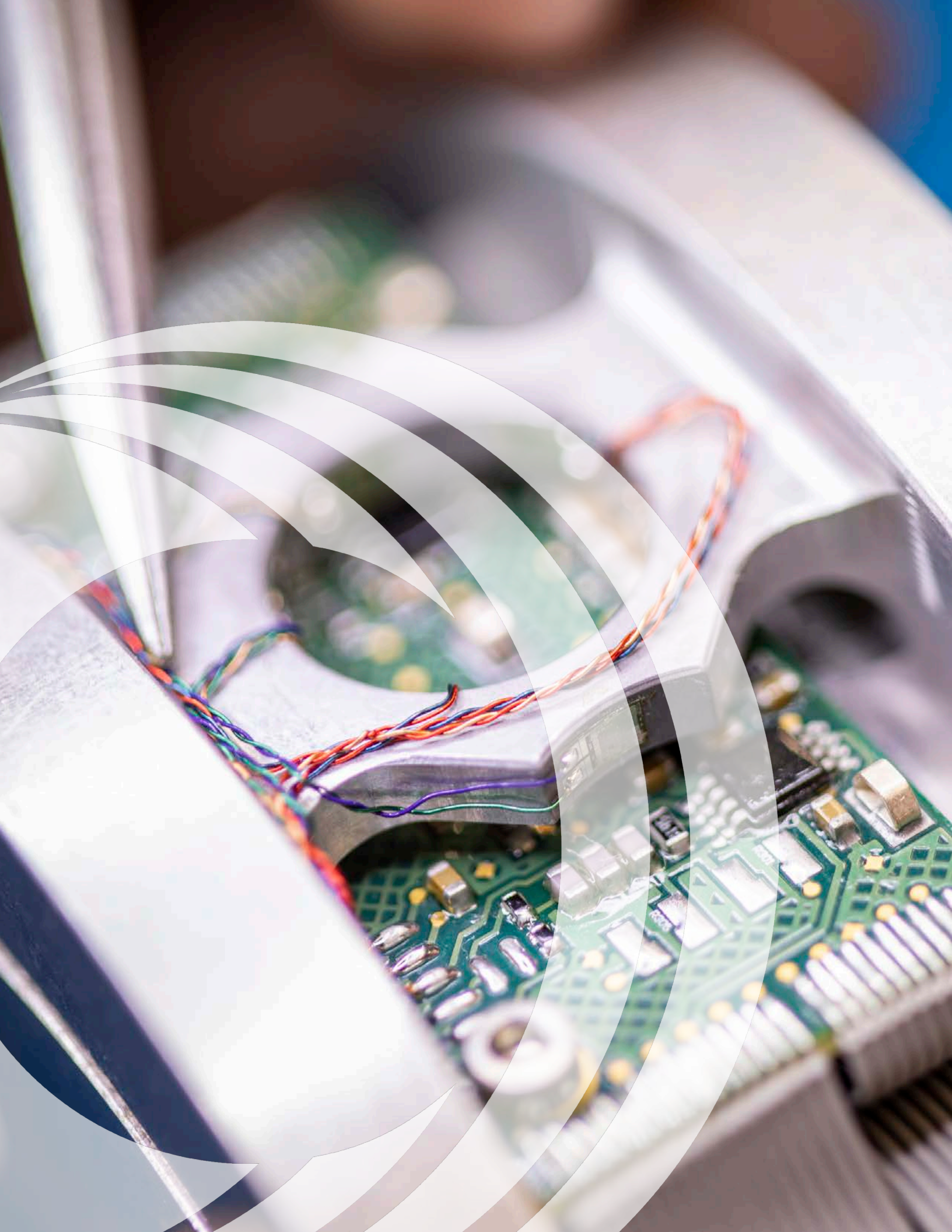
HITECSENSORS
A HUMANETICS COMPANY

MINIATURE SENSORS AND INDUSTRIAL PRODUCTS

2nd Edition



CONTENTS

ABOUT HITEC SENSORS

HITEC Sensor Developments, with locations in Massachusetts, USA, and Sri Lanka, is a global network of employees and company representatives with over 50 years of experience providing sensors, custom sensor solutions and specialized engineering services. We design and manufacturer strain gaged based force sensors, load cells, torque transducers, instruments and complete test systems, and are an innovator of custom sensor solutions specific to a customer's application. HITEC also performs component instrumentation and on-site strain gage installation services. Our products are engineered for high performance within some of the harshest environments and serve diverse industries and applications, including Medical, Aerospace, Industrial, Transportation, Energy and many others.

SRI LANKA FACILITY

Acquired by HITEC in 2018, our AS9100 qualified Sri Lanka facility enhances our global business capabilities. Over 100 highly trained technical personnel manufacture hundreds of thousands of in-flight sensors on board many types of aircraft in a wide range of applications. This team is also well equipped to support a variety of standard and custom products for the industrial market sector in both small and large volume manufacturing.

MAIN MARKETS

Automotive

Aerospace

Medical

Agriculture

Automation

Construction

Robotics

Testing

KEY INDUSTRIES

ENERGY

Energy production is a critical driver of the world's economy. HITEC is leading the way with measurement technologies used across the energy segment. HITEC has extensive experience in the oilfield, providing custom solutions for downhole drilling measurements with the survivability and accuracy that the industry demands.

AUTOMOTIVE & TRANSPORTATION

HITEC has a proud, 50-year legacy of supplying strain gauge-based sensors to a diverse customer base within the automotive and transportation industries. Our expertise includes specialized sensors for application-specific testing, general-purpose force and torque sensors for structural and performance testing, sensors used for monitoring and control of assembly processes, strain gauge bonding services for stress and strain measurements (including high temperature sensors), and OEM sensors.

MEDICAL

HITEC provides extremely sensitive strain gauge-based sensors for medical equipment, incorporating a choice of foil and semiconductor technology. Both types have wide application in the healthcare environment, from precisely measuring larger forces in equipment such as patient tables and imaging systems to the tiny forces involved in the most delicate medical procedures.

INDUSTRIAL

The industrial market is broadly categorized as applications involving automation, manufacturing, or process control. HITEC has been supporting the industrial market for a half-century with custom sensors and instrumentation services.

AEROSPACE

HITEC designs and manufactures state-of-the-art force, moment, and torque sensors for civil and military aviation as well as governmental and private spaceflight programs. Our custom solutions are optimized to meet the uniquely specialized requirements of the aerospace industry, delivering on our uncompromising standards of performance, quality and reliability.

LOAD PINS

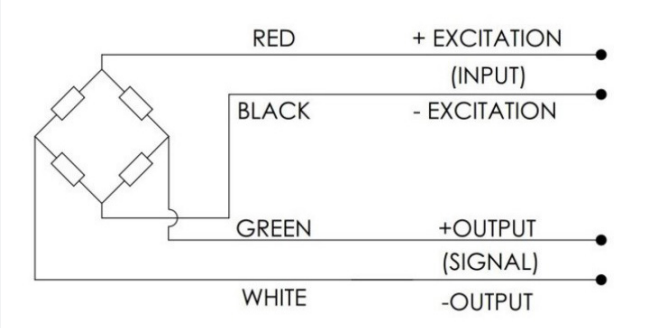
A Load Pin is a stainless steel shear pin type load cell with improved temperature performances.

Load Pins are designed to be used in hostile environments. Standard pins are offered with cable and connector versions. Many options and customized sizes are available upon request.

WIRING

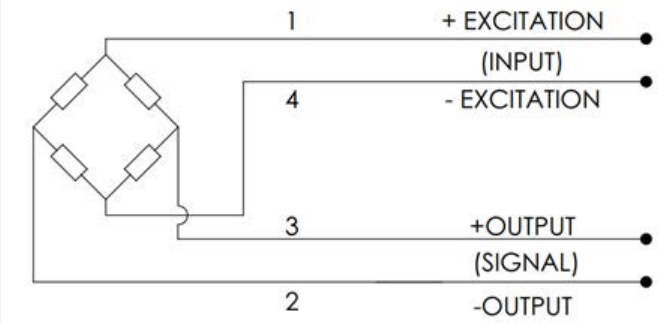
Cable Version

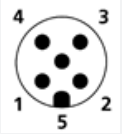
- Cable version shear pin is provided with 22 AWG cables.



Connector Version

- Connector version shear pins are provided with a LUMBERG M12 male connector, RSFM 5/0.5 M.

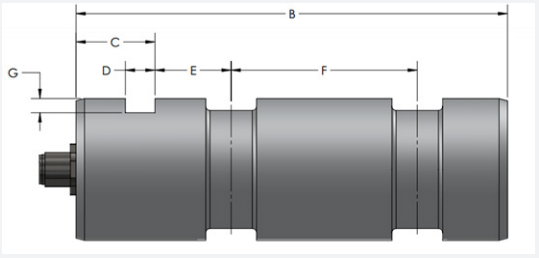


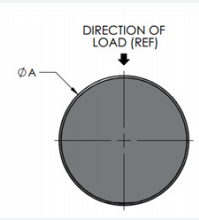


LOAD PINS

DIMENSIONS

MODEL	CAPACITY	A	B	C	D	E	F	G
ALP-1	5kN	25h6	80	16	5.2	13.5	31	3.5
ALP-2	10kN	25h6	80	16	5.2	13.5	31	3.5
ALP-3	20kN	25h6	80	16	5.2	13.5	31	3.5
ALP-4	50kN	35h6	108	23	6.3	18	47	6
ALP-5	100kN	50h6	153	28	10.5	27	66	5
ALP-6	200kN	65h6	188	28	10.5	32.5	90	10





ORDER DETAILS

To order a specific load pin required, compile and quote a unique part number from the example below.

Model		**Connector/ Cable**		**Cable length (m)**
ALPX	–	**X**	–	**X**
ALP1		A - Connector		N – N/A
ALP2		B - Cable		3
ALP3				6
ALP4				12
ALP5				20
ALP6				

Example: **ALP2-A-N**

LOAD PINS

SPECIFICATION

PARAMETER	RANGE	NOTES
Nominal Load (kN)	5, 10, 20, 50, 100, 200	
Overload (%)	150 FS	No influence on measurement
Overload Limit (%)	500 FS	
Sensitivity (mV/V)	1 ±3%	
Non-Linearity (%)	± 0.5 FS nominal	MAX 1% FS
Repeatability	± 0.1 FS nominal	MAX 0.2% FS
Total Error (%)	1 FS max.	Non-linearity and hysteresis
Zero Balance (%)	±1 FS max.	
Zero Temperature Coefficient (%)	±0.02 FS/°C	
Span Temperature Coefficient (%)	±0.02 of load/°C	
Operating Temperature (°C)	-20 to +70	Ideal operating temp range
Storage Temperature (°C)	-20 to +70	
Cable Length (m)	3 (for cable version)	Optional 6m, 12m and 20m
Connector	LUMBERG M12 male connector, RSFM 5/0.5 M (for connector version)	
Protection Class	IP67	
Mechanical Fit	G7/h6	
Excitation (V)	5, 10	

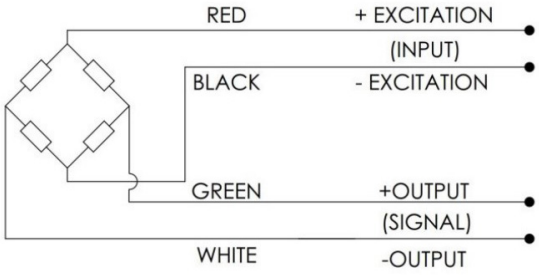
FLANGE TYPE LOAD CELL

Flange Type Load Cells are strain gauge based transducers designed for applications in tension and compression measurements.

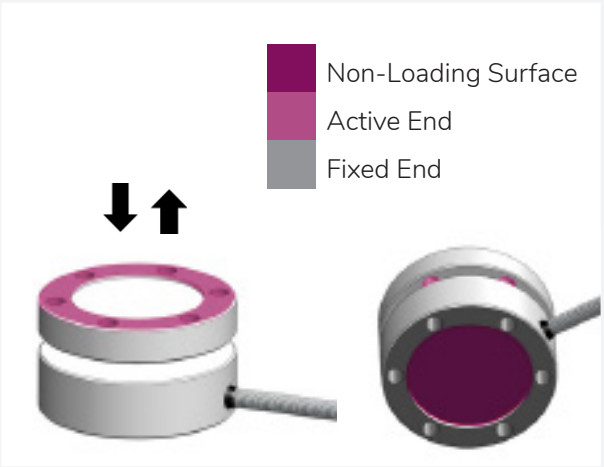
This is a low profile transducer with flanged ends on both ends. This type measures tensile and compressive loads up to 10kN with better than ±0.25% non-linearity.

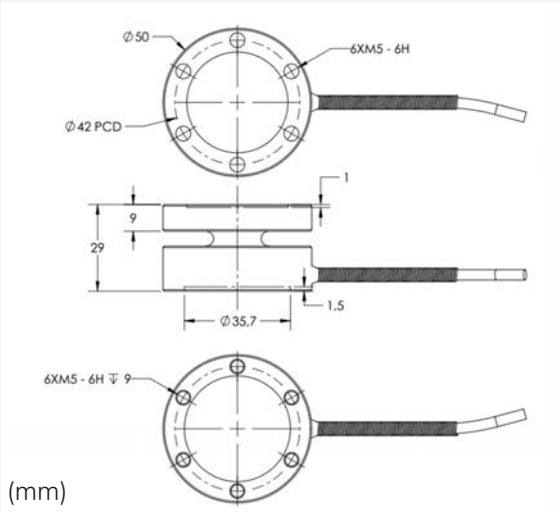
WIRING

- These force sensors are provided with 4x28 AWG wiring within a braided shielded cable (overall cable length 2m).
- 6-wire cable is available to order.
- Connector with integrated TEDS chip is available to order.



DIMENSIONS





FLANGE TYPE LOAD CELL

SPECIFICATION

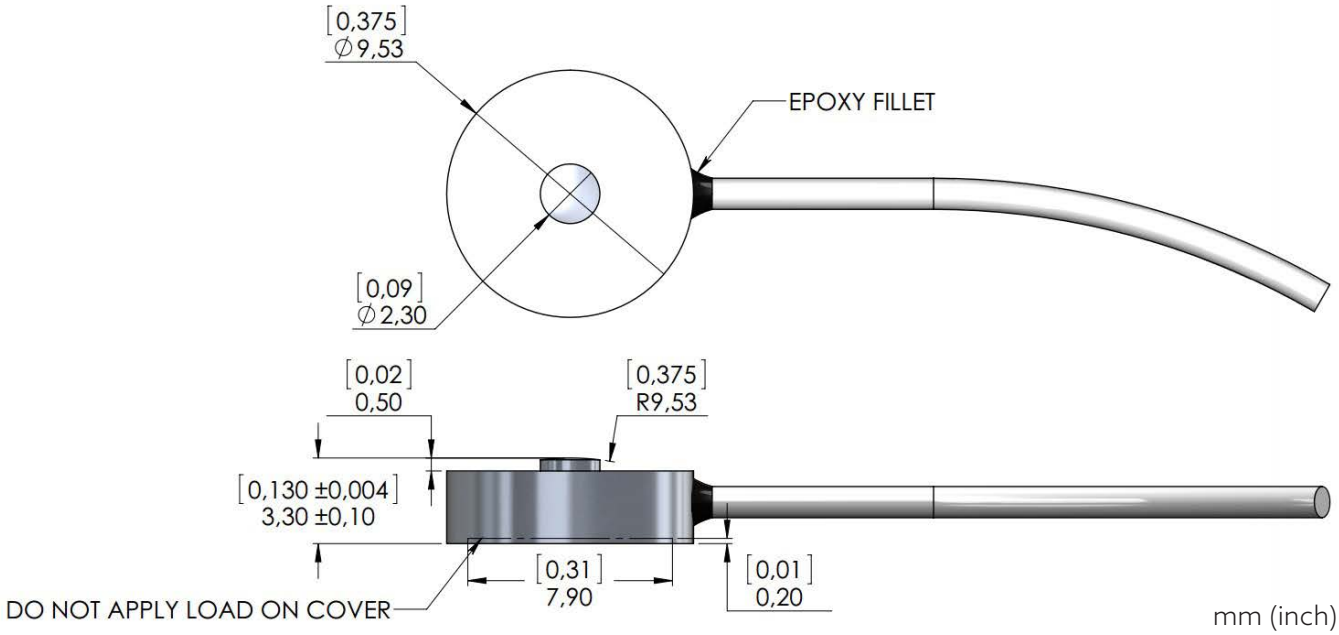
PARAMETER	RANGE	NOTES
Capacity (kN)	1, 2, 5, 10	With metric threads as standard
Rated Output (RO) (mV/V)	1 nominal	
Allowable Maximum Load (%)	150 full scale	No effect on performance
Non-Linearity (%)	± 0.25 of RO max.	
Hysteresis (%)	± 0.25 of RO max.	
Repeatability (%)	± 0.1 of RO max.	
Zero Balance (%)	± 2 of RO max.	
Zero Temperature Coefficient (%)	0.02 FS/°C	
Span Temperature Coefficient (%)	0.02 of load/°C	
Compensated Temperature (°C)	-15 to +70	Wider range available to order
Operating Temperature (°C)	-20 to +80	Wider range available to order
IP Rating	IP65	
Material	Stainless Steel	
Bridge Resistance (ohm)	700 nominal	
Excitation (V)	5-15	

LOAD BUTTON (ALBS1)

Load Button (ALBS1) is a stainless steel subminiature strain gauge based transducer with compensated temperature performance.

This type provides better than ±0.5% (full scale) non-linearity.
Also available with welded cover.

DIMENSIONS



LOAD BUTTON (ALBS1)

SPECIFICATION

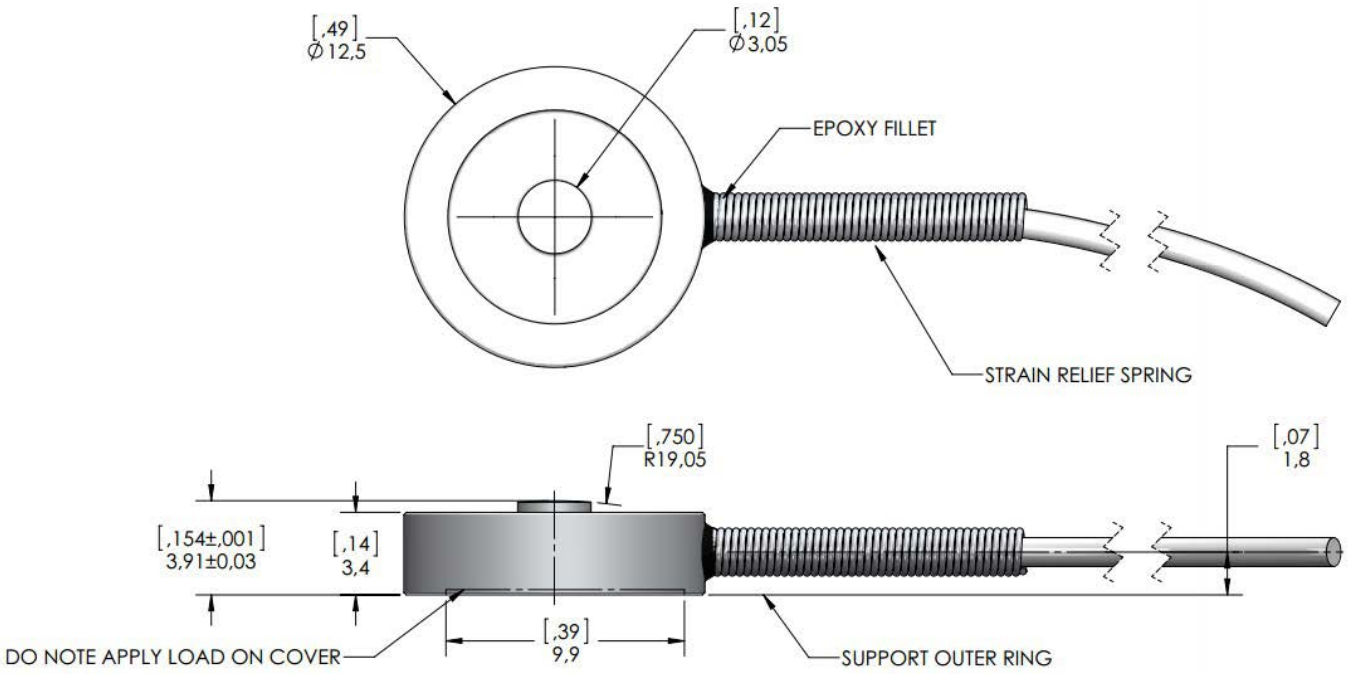
PARAMETER	RANGE
Capacity (lb)	5, 10, 25, 50
Rated Output (RO) (mV/V)	2 nominal (1 nominal for 5lb)
Safe Overload (%)	150 of RO
No Load Offset (Zero Balance) (%)	±2 of RO (±10 of RO for welded version)
Excitation (VDC or VAC)	7 max.
Input Impedance	350 Ω nominal
Non-Linearity (%)	±0.5 of RO
Hysteresis (%)	±0.5 of RO
Non-Repeatability (%)	±0.1 of RO
Creep (30 min.) (%)	±0.5 of RO
Temperature Shift Zero (%)	±0.01 of RO/°F (±0.018 of RO/°C)
Temperature Shift Span (%)	±0.02 of Load/°F (±0.036 of Load/°C)
Compensated Temperature (°F)	+5 to +160 (-15 to +71°C)
Operating Temperature (°F)	-60 to 200 (-51 to +93°C)
Weight (approx.) (lb)	0.02 (8.5g)
Material	Stainless Steel
Deflection (in)	0.0008 (0.02mm) nominal
IP Rating	IP64
Calibration Test Excitation (VDC)	5
Calibration (std.)	5 pt. compression
Connector	DB9 male or female

LOAD BUTTON (ALBS2)

Load Button (ALBS2) is a stainless steel subminiature strain gauge based transducer with compensated temperature performance.

This type of load button provides measurements up to 250lbf with better than ±0.5% (full scale) non-linearity.

DIMENSIONS



mm (inch)

LOAD BUTTON (ALBS2)

SPECIFICATION

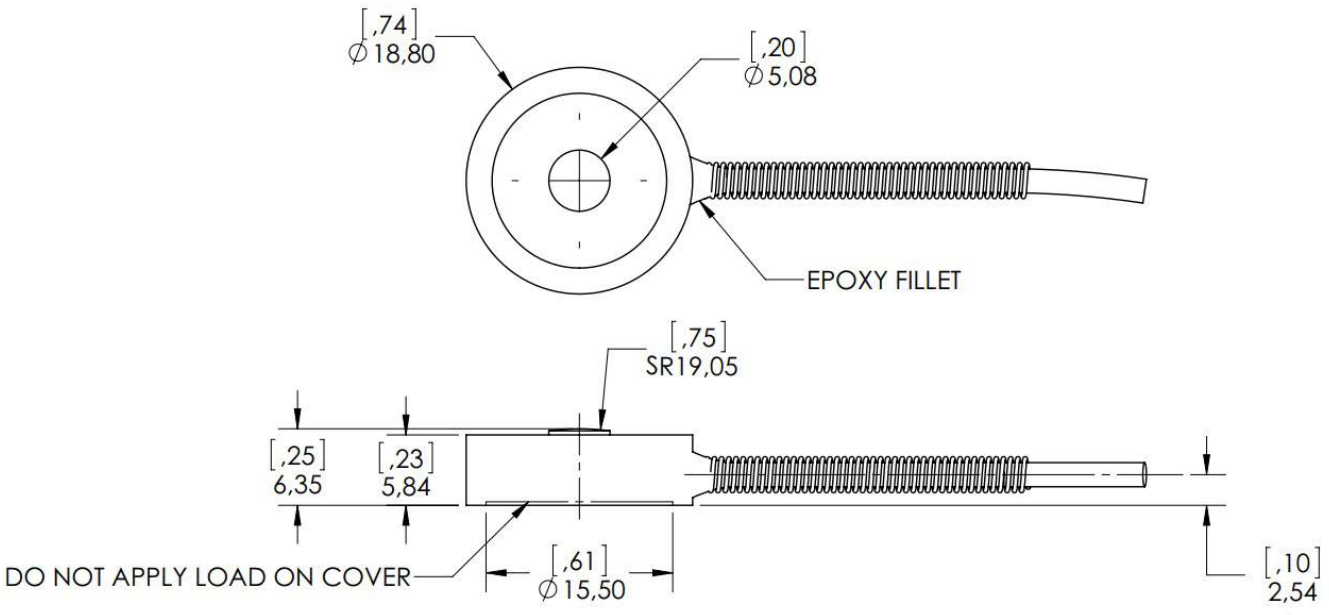
PARAMETER	RANGE
Capacity (lbf)	100, 200, 250
Rated Output (RO) (mV/V)	2 nominal
Safe Overload (%)	150 of RO
No Load Offset (Zero Balance) (%)	±2 of RO (±10 of RO for welded version)
Excitation (VDC or VAC)	7 max.
Input Impedance	350 Ω nominal
Non-Linearity (%)	±0.5 of RO
Hysteresis (%)	±0.5 of RO
Non-Repeatability (%)	±0.1 of RO
Temperature Shift Zero (%)	±0.01 of RO/°F (±0.018 of RO/°C)
Temperature Shift Span (%)	±0.02 of Load/°F (±0.036 of Load/°C)
Compensated Temperature (°F)	+60 to +160°F (+16 to +71°C)
Operating Temperature (°F)	-60 to +200°F (-51 to +93°C)
Weight (approx.) (lb)	0.03 (14.2g)
Material	Stainless Steel
Deflection (in)	0.0007 (0.018mm) nominal
IP Rating	IP64
Calibration Test Excitation (VDC)	5
Calibration (std.)	5 pt. compression
Connector	DB9 male or female

LOAD BUTTON (ALBS3)

Load Button (ALBS3) is a stainless steel subminiature strain gauge based transducer with compensated temperature performance.

This type of load button provides measurements up to 1000 lb with better than ±0.5% (full scale) non-linearity.

DIMENSIONS



mm (inch)

LOAD BUTTON (ALBS3)

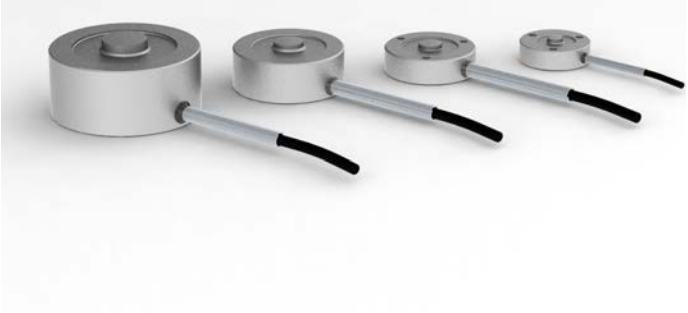
SPECIFICATION

PARAMETER	RANGE
Capacity (lbf)	100, 200, 500, 1000
Rated Output (RO) (mV/V)	2 nominal
Safe Overload (%)	150 of RO
No Load Offset (Zero Balance) (%)	±2 of RO
Excitation (VDC or VAC)	5 recommended (10 max.)
Input Impedance	350 Ω nominal
Non-Linearity (%)	±0.5 of RO
Hysteresis (%)	±0.5 of RO
Non-Repeatability (%)	±0.1 of RO
Temperature Shift Zero (%)	±0.01 of RO/°F (±0.018 of RO/°C)
Temperature Shift Span (%)	±0.02 of Load/°F (±0.036 of Load/°C)
Compensated Temperature (°F)	+60 to +160 (+16 to +71°C)
Operating Temperature (°F)	-4 to +176 (-20 to +80°C)
Material	Stainless Steel
Deflection (in)	0.001 (0.025mm) nominal
IP Rating	IP64
Calibration Test Excitation (VDC)	5
Calibration (std.)	5 pt. compression

BUTTON LOAD CELL

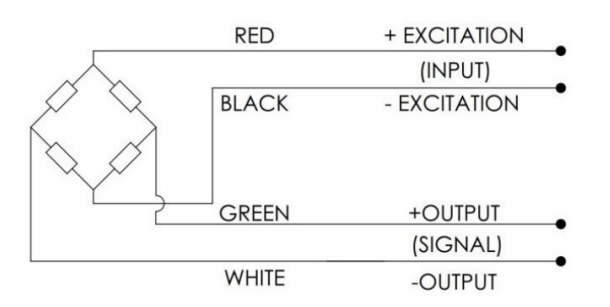
Button Load Cells are strain gauge based transducers with temperature compensation and excellent overall performance.

This type provides a range of capacities up to 200 kN or 50 klb with better than ±0.5% (full scale) non-linearity. Three tapped holes are provided on the underside for ease of mounting. Amplified and digitised versions are available upon request.

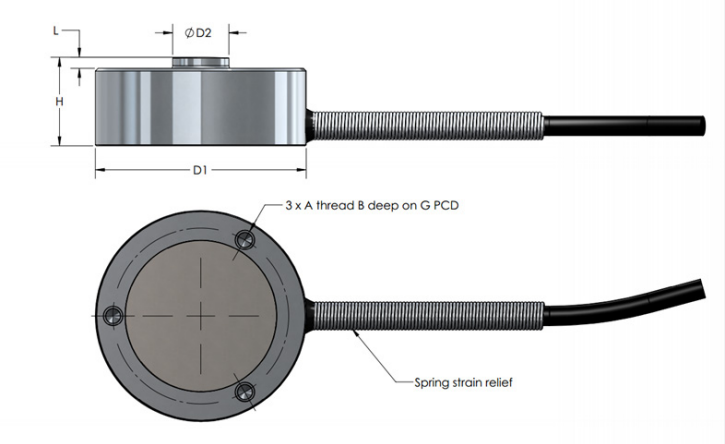


WIRING

- The load button is provided with 4x32 AWG (100N -500N & 25lb – 100lb), 4x28 AWG (1kN-200kN & 250lbf – 50klbf) wiring within a braided shielded cable (overall cable length 2m).
- Connector with integrated TEDS chip is available to order.



DIMENSIONS



Dimensions continued on next page.

CAPACITY	DEFLECTION (NOMINAL) (MM) [IN]
100N	0.02 [.001]
200N	0.04 [.002]
500N	0.03 [.001]
1kN	0.03 [.001]
2kN	0.03 [.001]
5kN	0.03 [.001]
10kN	0.03 [.001]
15kN	0.04 [.002]
20kN	0.05 [.002]
50kN	0.06 [.002]
100kN	0.08 [.003]
150kN	0.09 [.003]

BUTTON LOAD CELL

DIMENSIONS CONTINUED

RANGE	CAPACITY	D1 (MM) [IN]	D2 (MM) [IN]	H (MM) [IN]	L (MM) [IN]	A (IN)	B (MM) [IN]	G (MM) [IN]
ALBM-1M	100N							
ALBM-1M	200N	24.9 [0.98]	5,33 [0.21]	8.13 [0.32]	1,27 [0.05]	M3	5,59 [0.22]	19,05 [0.75]
ALBM-1M	500N							
ALBM-1U	25lbf							
ALBM-1U	50lbf	24.9 [0.98]	5,33 [0.21]	8.13 [0.32]	1,27 [0.05]	#4-40 UNC	5,59 [0.22]	19,05 [0.75]
ALBM-1U	100lbf							
ALBM-2M	1kN							
ALBM-2M	2kN	31,75 [1.25]	8,13 [0.32]	9,91 [0.39]	1,27 [0.05]	M4	6,35 [0.25]	25,4 [1.000]
ALBM-2M	5kN							
ALBM-2M	10kN							
ALBM-2U	250lbf							
ALBM-2U	500lbf	31,75 [1.25]	8,13 [0.32]	9,91 [0.39]	1,27 [0.05]	#6-32 UNC	6,35 [0.25]	25,4 [1.000]
ALBM-2U	1klbf							
ALBM-2U	2klbf							
ALBM-3M	15kN							
ALBM-3M	20kN	38,1 [1.50]	10,16 [0.40]	16,0 [0.63]	2,03 [0.08]	M4	6,35 [0.25]	31,75 [1.250]
ALBM-3M	50kN							
ALBM-3U	5klbf							
ALBM-3U	7.5klbf	38,1 [1.50]	10,16 [0.40]	16,0 [0.63]	2,03 [0.08]	#6-32 UNC	6,35 [0.25]	31,75 [1.250]
ALBM-3U	10klbf							
ALBM-4M	100kN	50.3 [1.98]	15.24 [0.60]	25.4 [1.00]	3.05 [0.12]	M4	6,35 [0.25]	41.3 [1.625]
ALBM-4M	150kN							
ALBM-4U	20klbf	50.3 [1.98]	15.24 [0.60]	25.4 [1.00]	3.05 [0.12]	#6-32 UNC	6,35 [0.25]	41.3 [1.625]
ALBM-4U	30klbf							
ALBM-4M	200kN	75.7 [2.98]	19.8 [0.78]	38.1 [1.50]	4.6 [0.18]	M4	6.4 [0.25]	60.5 [2.375]
ALBM-4U	50klbf	75.7 [2.98]	19.8 [0.78]	38.1 [1.50]	4.6 [0.18]	#6-32 UNC	6.4 [0.25]	60.5 [2.375]

BUTTON LOAD CELL

SPECIFICATION

PARAMETER	RANGE	NOTES
Capacity (metric) (N)	100, 200, 500, 1K, 2K, 5K, 10K, 15K, 20K, 50K, 100K, 150K, 200K	With metric threads as standard
Capacity (lb)	25, 50,100, 250, 500, 1K, 2K, 3K, 4K, 5K, 7.5K, 10K, 15K, 20K, 30K, 50K	With UNF threads as standard
Allowable Maximum Load (%)	150 full scale	No effect on performance
Non-Linearity (%)	±0.5 FS max.	
Hysteresis (%)	±0.3 FS max.	
Repeatability (%)	±0.1 FS max.	
Total Error (%)	±0.8 FS max.	Non-linearity and hysteresis
Zero Balance (%)	2 FS max.	
Zero Temperature Coefficient (%)	0.01 FS/°C	
Span Temperature Coefficient (%)	0.02 of load/°C	
Compensated Temperature (°C)	-15 to +70	Wider range available to order
Operating Temperature (°C)	-20 to +80	Wider range available to order
Output (mV/V)	2 nominal (1 for 100N and 25lbf)	Amplified and digitised versions available to order.
IP Rating	IP64 – Bonded Cover	Bonded cover is standard
Excitation (V)	5, 10	
Bridge Resistance (ohms)	350 nominal. – (100N – 500N) & (25lbf – 100lbf) 700 nominal – above 1kN & 250lbf	

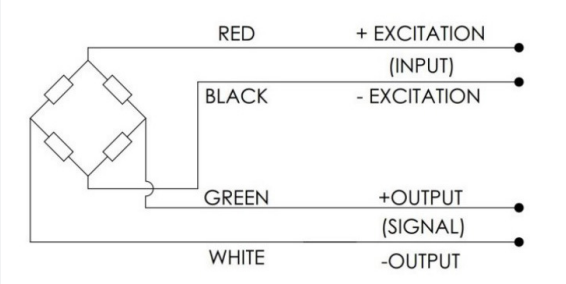
THREADED LOAD BUTTON

The model CTLB is a threaded load button for compression load measurements up to 5000kg/10000lb.

Fully welded cover (for SS load buttons), amplified and digitised versions are available on request. We can also customise this sensor for other thread sizes and cable sizes.

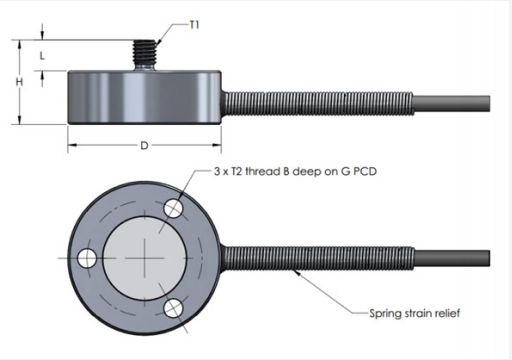
WIRING

- The sensor is provided a #32 AWG 4-conductor braided shielded cable for 1kg-1000kg & 2lb – 2000lb, 1m cable length.
- The sensor is provided with #28 AWG 4-conductor braided shielded cable for 2000kg, 5000kg, 5000lb & 10000lb, 2m cable length.
- Connector with integrated TEDS chip is available to order.



DIMENSIONS

RANGE	CAPACITY	D (MM)	H (MM)	L (MM)	T1	T2	B (MM)	G (MM)
CTLB1	1-200kg 2-500lb	20	11	4	M3	M3	7	15
CTLB2	500kg 1000kg 1000lb 2000lb	25.4	15	5	M5	M3	6	20
CTLB3	2000kg 5000kg 5000lb 10000lb	40	25	8	M12	M4	8	32



THREADED LOAD BUTTON

DIMENSIONS CONTINUED

RANGE	CAPACITY	D (MM)	H (MM)	L (MM)	T1	T2	B (MM)	G (MM)
CTLB1	1kg	20	11	4	M3	M3	7	15
	2kg	20	11	4	M3	M3	7	15
	5kg	20	11	4	M3	M3	7	15
	10kg	20	11	4	M3	M3	7	15
	20kg	20	11	4	M3	M3	7	15
	50kg	20	11	4	M3	M3	7	15
	100kg	20	11	4	M3	M3	7	15
	200kg	20	11	4	M3	M3	7	15
CTLB2	500kg	25.4	15	5	M5	M3	6	20
	1000kg	25.4	15	5	M5	M3	6	20
CTLB3	2000kg	40	25	8	M12	M4	8	32
	5000kg	40	25	8	M12	M4	8	32

RANGE	CAPACITY	D (INCH)	H (INCH)	L (INCH)	T1	T2	B (INCH)	G (INCH)
CTLB1	2lb	.787	.433	.157	8-32	4-40	.276	.591
	5lb	.787	.433	.157	8-32	4-40	.276	.591
	10lb	.787	.433	.157	8-32	4-40	.276	.591
	20lb	.787	.433	.157	8-32	4-40	.276	.591
	50lb	.787	.433	.157	8-32	4-40	.276	.591
	100lb	.787	.433	.157	8-32	4-40	.276	.591
	200lb	.787	.433	.157	8-32	4-40	.276	.591
	500lb	.787	.433	.157	8-32	4-40	.276	.591
CTLB2	1000lb	1	.591	.197	1/4-20	4-40	.226	.787
	2000lb	1	.591	.197	1/4-20	4-40	.226	.787
CTLB3	5000lb	1.575	.984	.315	1/2-20	8-32	.472	1.26
	10000lb	1.575	.984	.315	1/2-20	8-32	.472	1.26

THREADED LOAD BUTTON

SPECIFICATIONS

PARAMETER	RANGE	NOTES
Capacity (kg)	1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000	
Capacity (lb)	2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000	
Output (mV/V)	1± 20% for 1kg - 20kg and 2lb – 50lb 1.5 ± 20% for 50kg – 5000kg and 100lb – 10000lb	Amplified and digitised versions available to order
Input Impedance	350 Ω nominal (700 Ω nom. For 2000kg, 5000kg, 5000lb & 10000lb)	
Output Impedance	350 Ω nominal (700 Ω nom. For 2000kg, 5000kg, 5000lb & 10000lb)	
Allowable Maximum Load (%)	150 full scale	No effect on performances
Non-Linearity (%)	± 0.5 FS max.	
Hysteresis (%)	± 0.3 FS max.	
Repeatability (%)	± 0.1 FS max.	
Total Error (%)	± 0.8 FS max.	Non-linearity and hysteresis
Zero Balance (%)	2 FS max.	(10% FS MAX for welded versions)
Zero Temperature Coefficient (%)	0.01 FS/°C	
Span Temperature Coefficient (%)	0.02 of load/°C	
Compensated Temperature (°C)	-15 to +70	Wider range available to order
Operating Temperature (°C)	-20 to +80	Wider range available to order
Material	Al for 1kg - 20kg and 2lb – 50lb SS for 50kg – 5000kg and 100lb – 10000lb	
IP Rating	IP64	
Excitation (V)	5, 10	

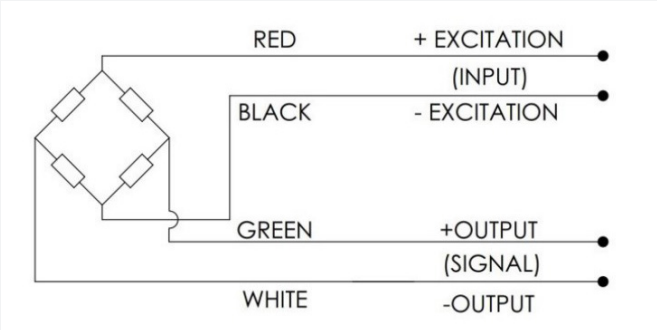
LOAD WASHER

The Load cell is a stainless steel sub miniature strain gauge based transducer with compensated temperature performance.

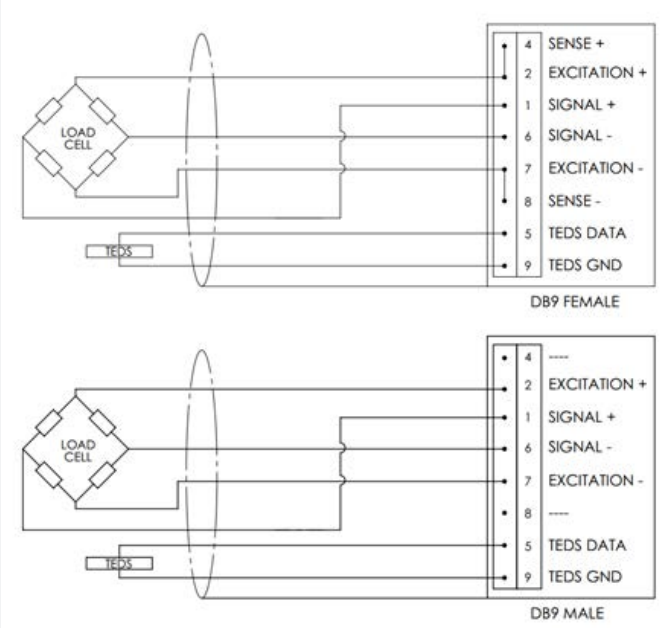
This type provides measurements up to 20000lbf with better than ±0.5% (full scale) non-linearity.

WIRING

- Model LW1 is provided with a #32 AWG 4-conductor braided shielded cable with outer jacket, 0.086" [2.2 mm] diameter. Model LW2, LW3 & LW4 are provided with a #28 AWG 4-conductor braided shielded cable with outer jacket, 0.126" [3.2 mm] diameter. There is no connection between the shield and the sensor body. For additional protection, the cable is contained within a stainless steel spring for strain relief purposes.
- Standard wire configuration as shown below.



- Standard cable lengths are 3ft, 5ft and 10ft. See Order Details section.
- These load washers are offered with DB9 Male, DB9 Female and without connector. See Order Details section.
- For connector versions, pin configuration as shown below.



LOAD WASHER

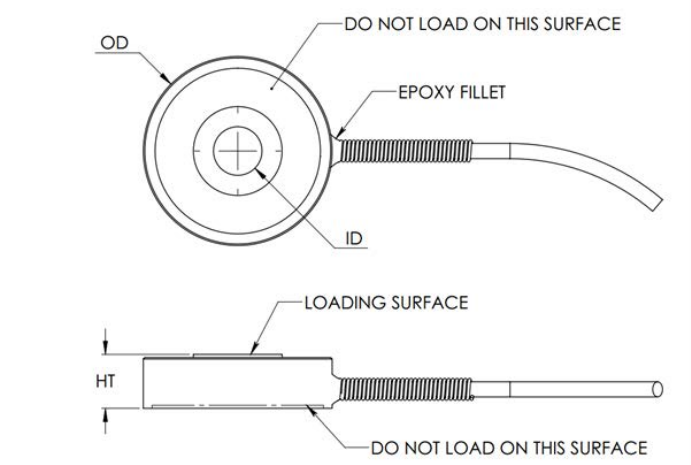
DIMENSIONS

Available upon request Common capacities

MODEL	OD	ID	SCREW SIZE	HT	CAPACITIES (LBF)													
					5	10	25	50	100	250	500	1K	2K	5K	7.5K	10K	20K	30K
ALW1	1	0.136	1/8	0.28														
	1	0.201	3/16	0.28														
	1	0.266	1/4	0.28				■	■		■	■						
	1	0.332	5/16	0.28														
	1	0.397	3/8	0.28				■	■		■	■						
ALW2	1.5	0.397	3/8	0.5														
	1.5	0.469	7/16	0.5														
	1.5	0.531	1/2	0.5										■				
	1.5	0.656	5/8	0.5										■				
ALW3	2	0.136	1/8	0.63														
	2	0.201	3/16	0.63														
	2	0.266	1/4	0.63														
	2	0.332	5/16	0.63														
	2	0.397	3/8	0.63												■		
	2	0.469	7/16	0.63														
	2	0.531	1/2	0.63														
	2	0.594	9/16	0.63														
	2	0.656	5/8	0.63												■		
ALW4	3	0.136	1/8	1														
	3	0.201	3/16	1														
	3	0.266	1/4	1														
	3	0.332	5/16	1														
	3	0.397	3/8	1														
	3	0.469	7/16	1														
	3	0.531	1/2	1														
	3	0.594	9/16	1														
	3	0.656	5/8	1														
	3	0.781	3/4	1													■	
	3	0.906	7/8	1														
	3	1.031	1	1													■	
	3	1.281	1 1/4	1													■	
	3	1.531	1 1/2	1														

LOAD WASHER

DIMENSIONS CONTINUED



ORDER DETAILS

To order a specific load washer required, compile and quote a unique part number from the example below.
Special cable lengths and pin configurations available upon request

Model		Screw Size (inch)		Capacity (lbf)		Connector type		Cable length (ft)
ALWX	**–**	**X/X**	**–**	**XXXXX**	**-**	**X**	**-**	**X**
ALW1*		1/8		5		M - DB9 Male		3
ALW2*		3/16		10		F - DB9 Female		5
ALW3*		1/4		25		N - Without connector		10
ALW4*		5/16		50				
		3/8		100				
		7/16		250				
		1/2		500				
		9/16		1000				
		5/8		2000				
		3/4		5000				
		7/8		10000				
		1		20000				
		1 ¼						
		1 ½						

* Optional

Example: **ALW2-1/4-5000-N-5**

LOAD WASHER

SPECIFICATION

PARAMETER	RANGE
Capacity (lbf)	5 – 20K
Rated Output (RO) (mV/V)	0.2 (5lbf), 0.4 (10lbf), 1 (25lbf), 2 (50-20000lbf) nominal
Safe Overload (%)	150 of RO
Zero Balance (%)	±2 of RO
Excitation (VDC or VAC)	7 max.
Bridge Resistance	700 Ω nom.
Non-Linearity (%)	±0.5 of RO
Hysteresis (%)	±0.5 of RO
Non-Repeatability (%)	±0.1 of RO
Temperature Shift Zero (%)	±0.005 of RO/°F (±0.01 of RO/°C)
Temperature Shift Span (%)	±0.005 of load/°F (±0.01 of load/°C)
Compensated Temperature (°F)	+5 to +160 (-15 to +71°C)
Operating Temperature (°F)	+5 to +176 (-15 to +80°C)
Material	Stainless Steel
IP Rating	IP64
Calibration Test Excitation (V)	5, 10
Calibration (std.)	5 pt. compression

	WEIGHT (NOM.)	DEFLECTION (NOM.)
ALW1	0.13lb [60g]	.002” [0.05mm]
ALW2	0.22lb [100g]	.002” [0.05mm]
ALW3	0.50lb [227g]	.002” [0.05mm]
ALW4	1.65lb [750g]	.002” [0.05mm]

HERMETIC LOAD WASHER

Hermetic Load Washer is a stainless steel strain gauge based load washer with compensated temperature performance.

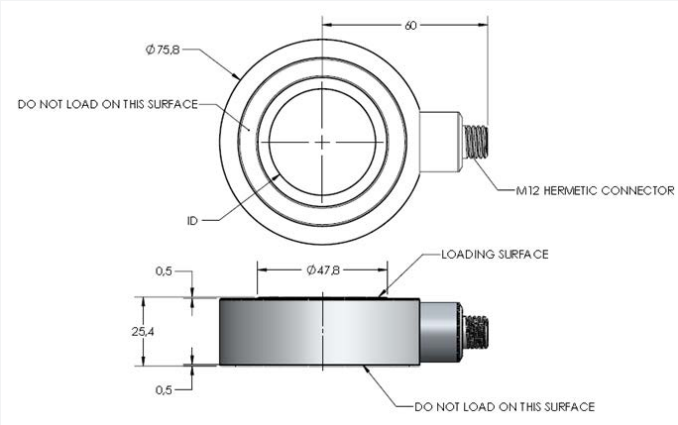
This type is fully laser welded and provides measurements up to 20,000 lbf with better than ±0.5% (full scale) non-linearity.

WIRING

NOTE: Voltage, current loop or digital output versions are also available on request.

PIN	FUNCTION
1	Excitation +
2	Excitation -
3	Signal +
4	Signal -
5	No connection
6	No connection
7	No connection
8	No connection

DIMENSIONS



MODEL	ID	SCREW SIZE
ALW4-1	3.45mm [.136"]	1/8"
	5.11mm [.201"]	3/16"
	6.76mm [.266"]	1/4"
	8.43mm [.332"]	5/16"
	10.08mm [.397"]	3/8"
	11.91mm [.469"]	7/16"
	13.49mm [.531"]	1/2"
	15.09mm [.594"]	9/16"
	16.66mm [.656"]	5/8"
	19.84mm [.781"]	3/4"
	23.01mm [.906"]	7/8"
	26.19mm [1.031"]	1"
	32.54mm [1.281"]	1 1/4"
	38.89mm [1.531"]	1 1/2"

HERMETIC LOAD WASHER

SPECIFICATION

PARAMETER	RANGE
Capacity (lbf)	1K, 2K, 5K, 7.5K, 10K, 20K
Rated Output (RO) (mV/V)	2 nominal
Safe Overload (%)	150 of RO
Zero Balance (%)	±5 of RO
Excitation (VDC or VAC) (V)	5 (recommended), 10 max.
Bridge Resistance	700 Ω nom.
Non-Linearity (%)	±0.5 of RO
Hysteresis (%)	±0.5 of RO
Non-Repeatability (%)	±0.1 of RO
Temperature Shift Zero	±0.01 of RO/°C
Temperature Shift Span	±0.01 of load/°C
Compensated Temperature (°C)	-15 to +71
Operating Temperature (°C)	-20 to +80
Material	Stainless Steel
IP Rating	IP68
Calibration Test Excitation (V)	5, 10
Calibration (std)	5 pt. compression
Weight (g)	750 nominal
Deflection (mm)	0.05 [.002”] nominal
Connector	8-pin M12 male

HERMETIC LOAD WASHER

ORDER DETAILS

To order a specific load washer required, compile and quote a unique part number from the example below.

			Screw Size (inch)		Capacity (lb)
ALW4	**–**	**1**	**–**	**X/X**	**–**	**XXXXX**
				1/8		1,000
				3/16		2,000
				1/4		5,000
				5/16		7,500
				3/8		10,000
				7/16		20,000
				1/2		
				9/16		
				5/8		
				3/4		
				7/8		
				1		
				1 ¼		
				1 ½		

Example: **ALW4-1-3/4-10,000**

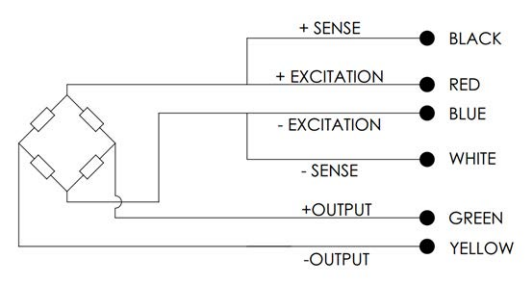
PRESS FORCE LOAD CELL

Press Force Load Cells are strain gauge based transducers for press-force monitoring.

This type offers capacities up to 100 kN and 20 klbf with compensated temperature performances. Cable is contained within a stainless steel spring for strain relief purposes for additional protection.

WIRING

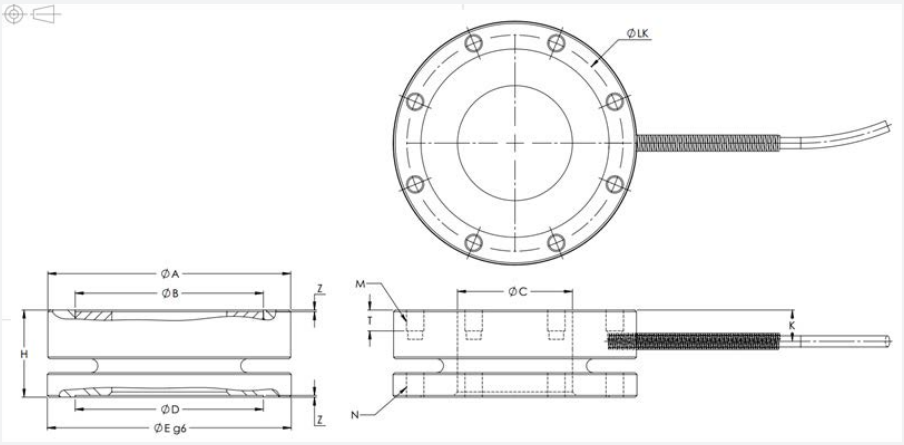
- Sensor is provided with 3m, 6x30 AWG cable (Other lengths are available on request). Voltage, current loop or digital output versions are also available on request.



CAPACITY	DEFLECTION (NOMINAL) (MM) [IN]
2kN	0.02 [.001]
5kN	0.03 [.001]
10kN	0.03 [.001]
20kN	0.05 [.002]
50kN	0.10 [.004]
100kN	0.15 [.006]

PRESS FORCE LOAD CELL

DIMENSIONS



Metric version (mm)

NOMINAL FORCE (KN)	A	B	C	D	E	H	K	Z	M	T	LK	N
2 / 5 / 10 / 20	69.7	54	33	54	70	25	9	0.5	M5-0.8, 8x45°	6	62	M5-0.8, 8x45°
50 / 100	111.5	97	70	97	112	35	13	1.1	M6-1, 8x45°	10	104	M6-1, 8x45°

Pound version (inch)

NOMINAL FORCE (KLBF)	A	B	C	D	E	H	K	Z	M	T	LK	N
0.5 / 1 / 2 / 5	2.74	2.13	1.30	2.13	2.756	0.98	0.35	0.02	#10-24, 8x45°	0.24	2.44	#10-24, 8x45°
10/ 20	4.39	3.82	2.76	3.82	4.409	1.38	0.51	0.04	#12-24, 8x45°	0.39	4.09	#12-24, 8x45°

PRESS FORCE LOAD CELL

SPECIFICATION

PARAMETER	RANGE	NOTES
Capacity (kN) Capacity (klbf)	2,5,10, 20, 50 and 100 0.5, 1, 2, 5, 10 and 20	
Safe Overload (%)	200 FS	No influence on measurement
Ultimate Load (%)	>300 FS	
Sensitivity (mV/V)	1 ± 20%	Voltage, current loop or digital output versions are available on request
Non-Linearity (%)	±0.25 FS nom.	±0.5% FS max.
Hysteresis (%)	±0.25 FS nom.	±0.5% FS max.
Repeatability (%)	±0.1 FS max.	
No Load Offset (%)	±2 RO	
Zero Temperature Coefficient (%)	0.02 RO/°C	
Sensitivity Temperature Coefficient (%)	0.02 RO/°C	
Compensated Temperature (°C)	-15 to +70	
Operating Temperature (°C)	-40 to +70	
Bridge Resistance (ohm)	700	
Excitation (V)	5, 10	
IP Rating	60	
Material	Stainless steel	

COMPACT LOW PROFILE LOAD CELL

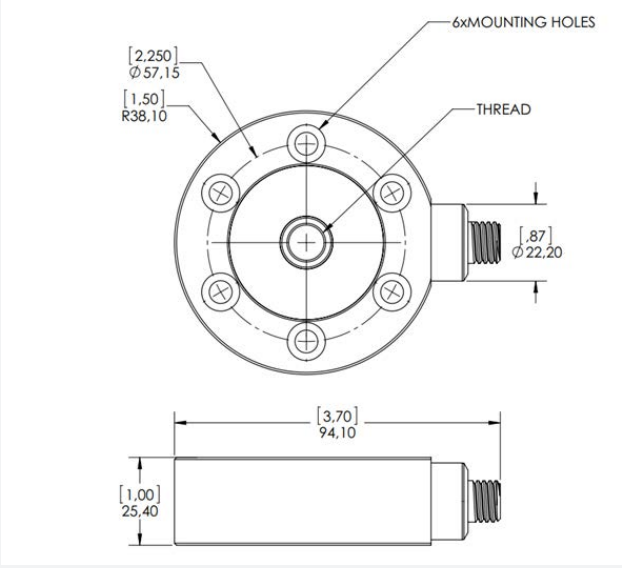
Compact Low Profile load cells are fully stainless steel, hermetically sealed load cells with a multi-beam internal structure, and fully integrated electronics to provide high level analog or digital outputs.

This type of load cell is easy to use for measuring tension or compression loads from 200N (50lb) to 5kN (1000lbf), and is capable of rejecting side forces that would otherwise affect accuracy. This type also offers the user the ability to set the gain and offset (span and zero) electronically, to provide maximum flexibility for the user application.

DIMENSIONS

CAPACITY (N)	CENTRE THREAD SIZE (THROUGH)	OUTER BOLT SIZE
200, 500	M8 x1.25	M6 Socket Head Screw
1000, 2000, 5000	M12 x1.75	M6 Socket Head Screw

CAPACITY (LBF)	CENTRE THREAD SIZE (THROUGH)	OUTER BOLT SIZE
50, 100, 200, 500, 1000	3/8-24 UNF-2B	¼” Socket Head Screw



mm (inch)

COMPACT LOW PROFILE LOAD CELL

WIRING CODES

PIN	VOLTAGE OUTPUT	CURRENT OUTPUT	CAN	RS485	MV/V
1	Supply (+)	Supply (+)	Shield	Supply (+)	Supply (+)
2	Supply (-), TEDS GND	Supply (-), TEDS GND	Supply (+)	RS485_A	Supply (-)
3	Signal (+)	Current loop (+)	Ground	Ground	Signal (+)
4	Signal (-)	Current loop (-)	CAN_H	RS485_B	Signal (-)
5	TEDS DATA/Shunt calibration (Optional)	TEDS DATA/Shunt calibration (Optional)	CAN_L	Shield	N/A
6	Calibration interface A	Calibration interface A	N/A	N/A	N/A
7	Calibration interface B	Calibration interface B	N/A	N/A	N/A
8	Calibration interface C	Calibration interface C	N/A	N/A	N/A
M12 pin layout					

Consult the user manual for further details and recommended wiring schemes.

COMPACT LOW PROFILE LOAD CELL

SPECIFICATION

PARAMETER	RANGE	NOTES
Rated Load	200, 500, 1000, 2000 & 5000N 50, 100, 200, 500 & 1000lbf	
Proof Load (%)	150 of rated load	No effect on calibration
Ultimate Load (%)	200 of rated load	No structural failure (deformation only)
Deflection (mm)	<0.05	Depends on rated load
Natural Frequency (Hz)	>1000	Depends on rated load
Output at Rated Load (RO)	1-9V or 4-20mA or CAN or RS485 or mV/V	Select when ordering
Non-Linearity (%)	<= 0.1 RO	
Hysteresis (%)	<= 0.1 RO	
Repeatability (%)	<= 0.03 RO	
Creep Over 20 Minutes (%)	<= 0.03 RO	
Output (Span) Tolerance (%)	Factory setting ±0.1 Range ±50 RO	Adjustable via electronic interface. See user manual for details
Offset (Zero Balance) (%)	Factory setting ±0.1 Range ±50 RO	Adjustable via electronic interface. See user manual for details
Output (Span) Temp. Coefficient (%)	±0.005 RO/°C	
Offset (Zero) Temp. Coefficient (%)	±0.005 RO/°C	
Compensated Temperature (°C)	-10 to +50	
Operating Temperature (°C)	-40 to +85	
Power Supply	12 to 24 VDC, <40mA	
Insulation Resistance	=>5 Gohm @ 50 VDC	ESD safe, EMC compliant with EN61326-2-3:2006, CE marked.
Connector	Analog O/P: 8-pin M12 male, hermetic Digital O/P: 5-pin M12 male, hermetic	Fully stainless steel construction, laser welded
Protection Class	IP68	
Weight (g)	750	
Bridge Resistance (ohms)	700 nominal	

COMPACT LOW PROFILE LOAD CELL

ORDER DETAILS

MODEL	CAPACITY (N)	DESCRIPTION
CLP	200	1 mV/V Output. With M12H connector (hermetic)
CLP	500	1 mV/V Output. With M12H connector (hermetic)
CLP	1,000	1 mV/V Output. With M12H connector (hermetic)
CLP	2,000	1 mV/V Output. With M12H connector (hermetic)
CLP	5,000	1 mV/V Output. With M12H connector (hermetic)
CLP	200	Amplified Output (4-20mA). With M12H connector
CLP	500	Amplified Output (4-20mA). With M12H connector
CLP	1,000	Amplified Output (4-20mA). With M12H connector
CLP	2,000	Amplified Output (4-20mA). With M12H connector
CLP	5,000	Amplified Output (4-20mA). With M12H connector
CLP	200	Amplified Output (1-9V). With M12H connector
CLP	500	Amplified Output (1-9V). With M12H connector
CLP	1,000	Amplified Output (1-9V). With M12H connector
CLP	2,000	Amplified Output (1-9V). With M12H connector
CLP	5,000	Amplified Output (1-9V). With M12H connector
CLP	200	Amplified Output (CAN/RS485). With M12H connector
CLP	500	Amplified Output (CAN/RS485). With M12H connector
CLP	1,000	Amplified Output (CAN/RS485). With M12H connector
CLP	2,000	Amplified Output (CAN/RS485). With M12H connector
CLP	5,000	Amplified Output (CAN/RS485). With M12H connector

Order details continued on next page.

COMPACT LOW PROFILE LOAD CELL

ORDER DETAILS CONTINUED

MODEL	CAPACITY (LB)	DESCRIPTION
CLP	50	1 mV/V Output. With M12H connector (hermetic)
CLP	100	1 mV/V Output. With M12H connector (hermetic)
CLP	200	1 mV/V Output. With M12H connector (hermetic)
CLP	500	1 mV/V Output. With M12H connector (hermetic)
CLP	1000	1 mV/V Output. With M12H connector (hermetic)
CLP	50	Amplified Output (4-20mA). With M12H connector.
CLP	100	Amplified Output (4-20mA). With M12H connector.
CLP	200	Amplified Output (4-20mA). With M12H connector.
CLP	500	Amplified Output (4-20mA). With M12H connector.
CLP	1000	Amplified Output (4-20mA). With M12H connector.
CLP	50	Amplified Output (1-9V). With M12H connector
CLP	100	Amplified Output (1-9V). With M12H connector
CLP	200	Amplified Output (1-9V). With M12H connector
CLP	500	Amplified Output (1-9V). With M12H connector
CLP	1000	Amplified Output (1-9V). With M12H connector
CLP	50	Amplified Output (CAN/RS485). With M12H connector
CLP	100	Amplified Output (CAN/RS485). With M12H connector
CLP	200	Amplified Output (CAN/RS485). With M12H connector
CLP	500	Amplified Output (CAN/RS485). With M12H connector
CLP	1000	Amplified Output (CAN/RS485). With M12H connector

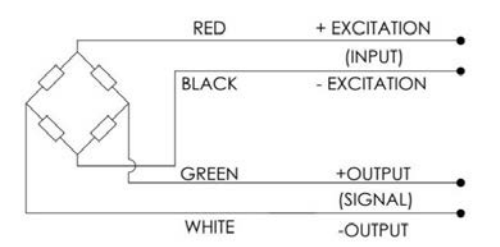
SUBMINIATURE S-BEAM LOAD CELL

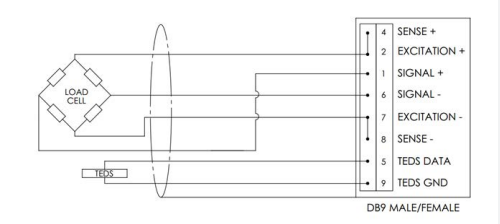
The Subminiature S-Beam Load Cell is a bi-directional strain gauge-based transducer with high performance and built-in temperature compensation.

This design provides better than ±0.1% (full scale) non-linearity and includes overload protection in both tension and compression directions. Options include IEEE1451.4 TEDS capability.

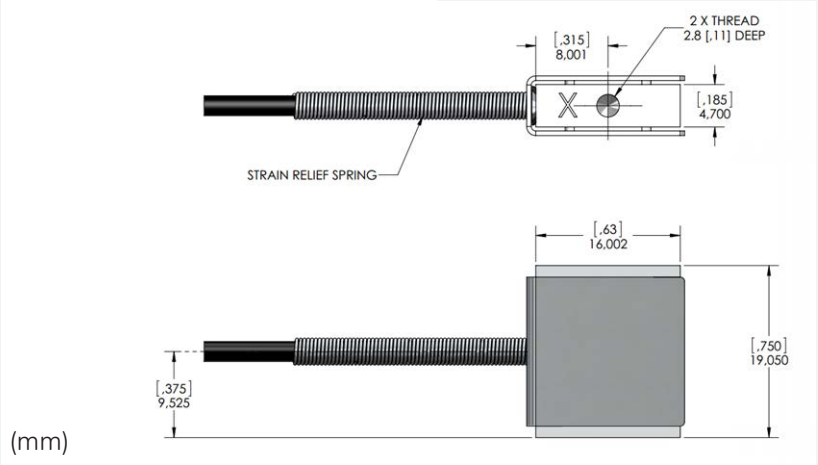
WIRING

- The sensor is provided with a #32 AWG 4-conductor braided shielded cable with an outer jacket of 0.087" [2.2 mm] diameter, 5 ft [1.5m] long, with no connection between the shield and the sensor body. For additional protection, the cable is contained within a stainless steel spring for strain relief purposes for the first 1" [25 mm].
- Connector pin configuration as shown below (for the with-connector version)





DIMENSIONS



(mm)

SUBMINIATURE S-BEAM LOAD CELL

SPECIFICATION

PARAMETER	RANGE
Rated Capacity (lbf)	1, 2, 5, 10, 25, 50, 100
Rated Output (RO) (mV/V)	2 nominal
Safe Overload (%)	1000 of R.O., 200 tension only for 50 & 100lbf
No Load Offset (Zero Balance) (%)	±3 of RO
Excitation (VDC or VAC) (V)	5, 10
Input Impedance	1000 Ω nom.
Output Impedance	1000 Ω nom.
Non-Linearity (%)	±0.1 of RO
Hysteresis (%)	±0.1 of RO
Non-Repeatability (%)	±0.1 of RO
Temperature Shift Zero (%)	±0.01 of RO/°F (±0.018 of RO/°C)
Temperature Shift Span (%)	±0.02 of load/°F (±0.036 of load/°C)
Compensated Temperature (°F)	+5 to +160 (-15 to +71°C)
Operating Temperature (°F)	-60 to +200 (-51 to +93°C)
Weight (lb)	0.02 (9g) approx.
Material	Aluminum (1lbf – 10lbf), SS (25lbf – 100lbf)
Deflection (in)	0.004 [0.1mm] nominal
IP Rating	IP40
Calibration Test Excitation (VDC)	5
Calibration (std.)	5 pt. tension & compression
Connector	Default none, optional DB9 male or female (specify at time of order)
Thread	M3x0.5 or #4-40 (specify at time of order)

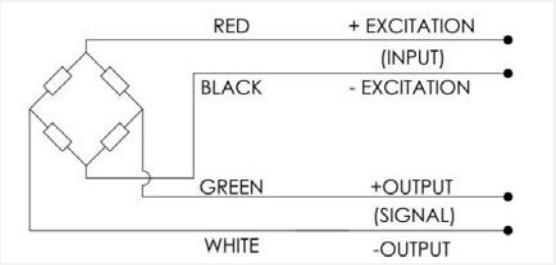
MINIATURE S-BEAM OVERLOAD PROTECTION LOAD CELL

The Miniature S-Beam Load Cell is a bi-directional Aluminium strain gauge based transducer with high performance and built-in temperature compensation.

This design provides better than ±0.05% (full scale) non-linearity and includes overload protection in both tension and compression directions.

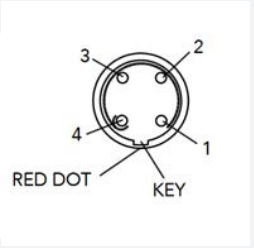
WIRING

- Cable Version
  The S-beam load cell is provided with 4x28 AWG wiring within a braided shielded cable (overall cable length 2m)

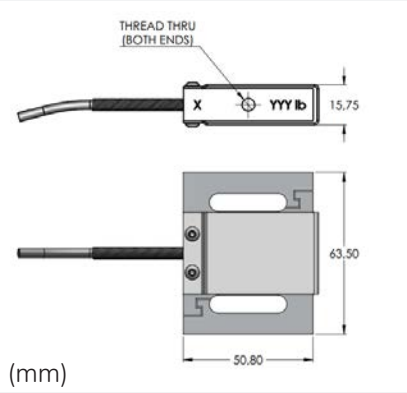


- Lemo Version
  Connector pin configuration as shown below (for the with-connector version)

PIN	WIRING CODE
1	+ EXCITATION
4	- EXCITATION
2	+ SIGNAL
3	- SIGNAL



DIMENSIONS



(mm)

MODEL	CAPACITY	THREAD
MSBLC-2M-P	25	M6 x 1
MSBLC-2U-P	25	1/4 - 28
MSBLC-2M-P	50	M6 x 1
MSBLC-2U-P	50	1/4 - 28
MSBLC-2M-P	100	M6 x 1
MSBLC-2U-P	100	1/4 - 28
MSBLC-2M-P	250	M10 x 1.5
MSBLC-2U-P	250	1/4 - 28

MINIATURE S-BEAM OVERLOAD PROTECTION LOAD CELL

SPECIFICATION

PARAMETER	RANGE
Rated Capacity (lbf)	25, 50, 100 & 250
Rated Output (RO) (mV/V)	2 nominal
Overload (%)	1000 of RO
No Load Offset (%)	±1 of RO
Excitation (VDC or VAC) (V)	5, 10
Input Impedance	1000 Ω nominal
Output Impedance	1000 Ω nominal
Non-Linearity (%)	±0.05 of RO
Hysteresis (%)	±0.05 of RO
Non-Repeatability (%)	±0.05 of RO
Temperature Shift Zero (%)	±0.005 of RO/°F (±0.009 of RO/°C)
Temperature Shift Span (%)	±0.01 of load/°F (±0.018 of load/°C)
Compensated Temperature (°F)	+5 to +160 (-15 to +71°C)
Operating Temperature (°F)	-60 to +200 (-51 to +93°C) – Lemo Version +5 to +176 (-15 to +80°C) – Cable Version
Weight (lb)	0.3 (140g) approx.
Material	Aluminum
Deflection (in)	.004 to .010 [0.1mm to 0.25mm] nominal
IP Rating	IP40
Calibration Test Excitation (V)	5 (recommended), 10 max.
Calibration (std.)	5 pt. tension

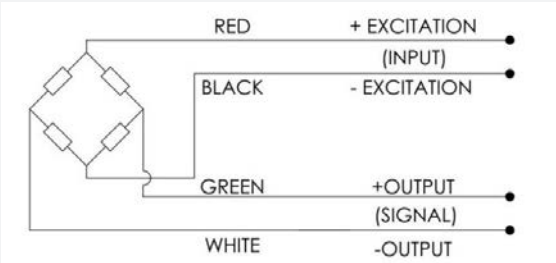
MINIATURE S-BEAM LOAD CELL

The Miniature S-Beam Load Cell is a bi-directional Aluminium strain gauge based transducer with high performance and built-in temperature compensation.

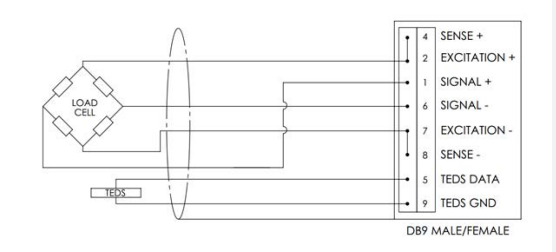
This design provides better than ±0.05% (full scale) non-linearity. Options include IEEE1451.4 TEDS capability.

WIRING

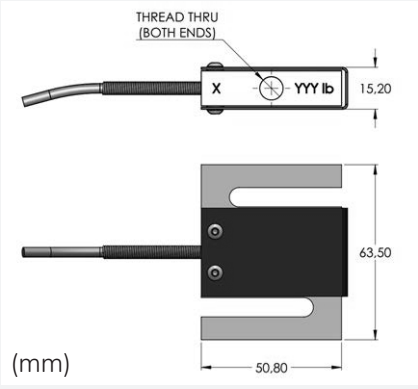
- The S-beam load cell is provided with 4x28 AWG wiring within a braided shielded cable (overall cable length 2m)



- Connector pin configuration as shown below (for the with-connector version)



DIMENSIONS



MODEL	CAPACITY	THREAD
MSBLC-2M-NP	25	M6 x 1
MSBLC-2U-NP	25	1/4 - 28
MSBLC-2M-NP	50	M6 x 1
MSBLC-2U-NP	50	1/4 - 28
MSBLC-2M-NP	100	M6 x 1
MSBLC-2U-NP	100	1/4 - 28
MSBLC-2M-NP	250	M10 x 1.5
MSBLC-2U-NP	250	1/4 - 28

MINIATURE S-BEAM LOAD CELL

SPECIFICATION

PARAMETER	RANGE
Rated Capacity (lbf)	25, 50, 100 & 250
Rated Output (RO) (mV/V)	2 nominal
Overload (%)	150 of RO
No Load Offset (%)	±1 of RO
Excitation (VDC or VAC) (V)	5, 10
Input Impedance	1000 Ω nominal
Output Impedance	1000 Ω nominal
Non-Linearity (%)	±0.05 of RO
Hysteresis (%)	±0.05 of RO
Non-Repeatability (%)	±0.05 of RO
Temperature Shift Zero (%)	±0.005 of RO/°F (±0.009 of RO/°C)
Temperature Shift Span (%)	±0.01 of load/°F (±0.018 of load/°C)
Compensated Temperature (°F)	+5 to +160 (-15 to +71°C)
Operating Temperature (°F)	-60 to +200 (-51 to +93°C) – Lemo Version +5 to +176 (-15 to +80°C) – Cable Version
Weight (lb)	0.3 (140g) approx.
Material	Aluminum
Deflection (in)	.004 to .010 [0.1mm to 0.25mm] nominal
IP Rating	IP40
Calibration Test Excitation (V)	5 (recommended), 10 max.
Calibration (std.)	5 pt. tension

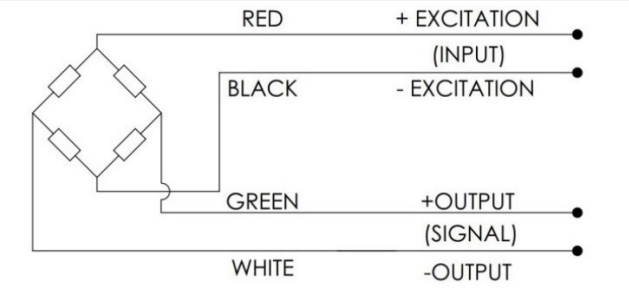
MINIATURE COLUMN LOAD CELL

Miniature Column Load Cells are designed for high capacity compression applications.

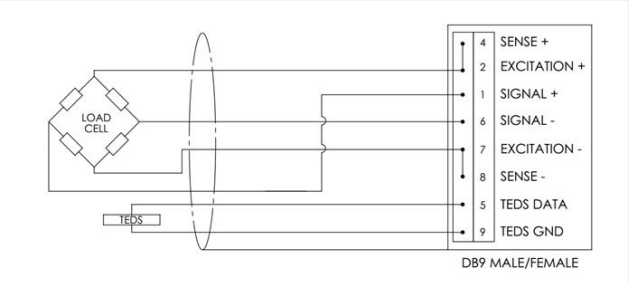
This type is offered in stainless steel with a raised surface radius to overcome off centre loading.

WIRING

- The sensor is provided with a #32 AWG 4-conductor braided shielded cable with an outer jacket of 0.087" [2.2 mm] diameter, 5 ft [1.5m] long, with no connection between the shield and the sensor body. For additional protection, the cable is contained within a stainless steel spring for strain relief purposes for the first 1" [25 mm].

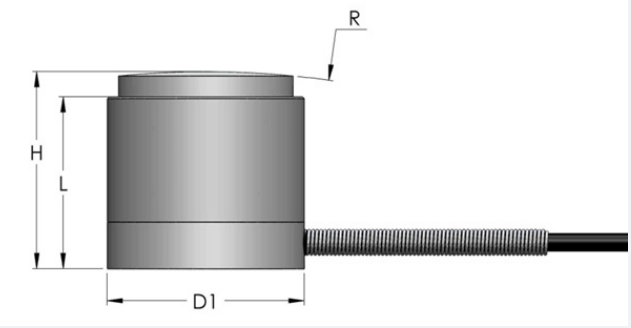


- Connector pin configuration as shown below (for the with-connector version)



DIMENSIONS

CAPACITY (LBF)	CAPACITY (KN)	D1 (MM)	H (MM)	L (MM)	R (MM)
2K, 5K	10, 25	.62 (15.9)	.65 (16.5)	.59 (15)	4 (101.6)
7.5K, 10K	50	.88 (22.4)	.88 (22.4)	.77 (19.6)	4 (101.6)
15K, 30K	100	1.25 (31.8)	1.13 (28.7)	1.06 (26.9)	5 (127)



MINIATURE COLUMN LOAD CELL

SPECIFICATION

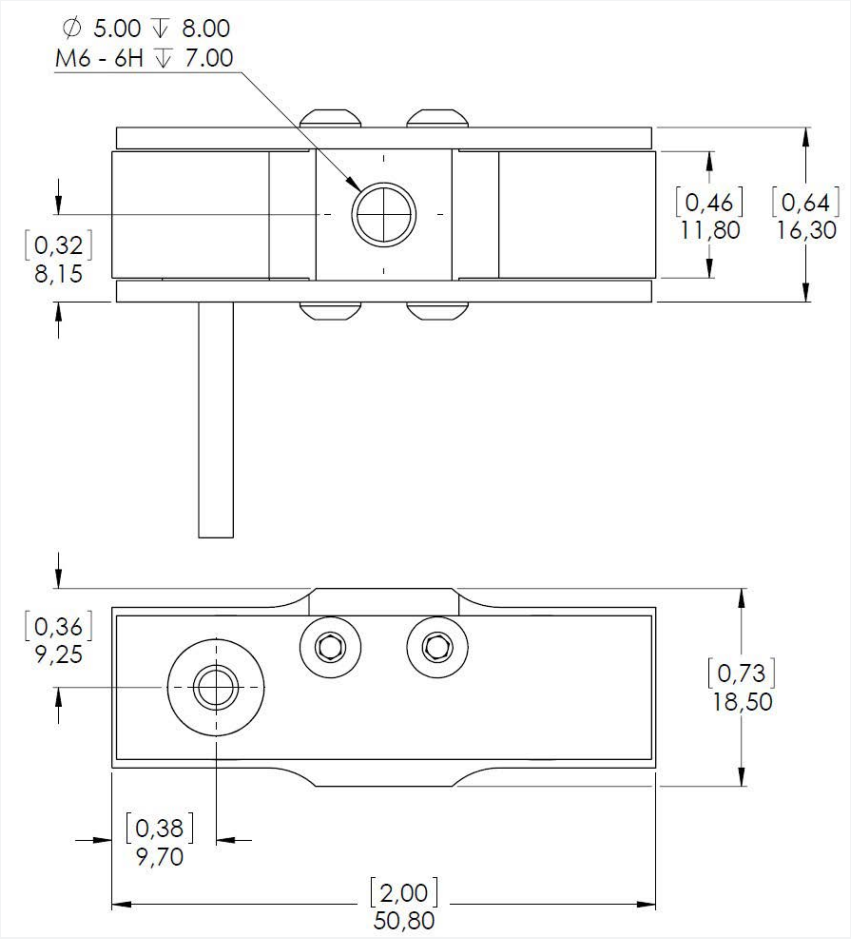
PARAMETER	RANGE	NOTES
Capacity (lbf)	2K, 5K, 7.5K, 10K, 15K, 30K	
Capacity (kN)	10, 25, 50, 100	
Sensitivity (mV/V)	2 nominal	
Safe Overload (%)	150 FS	No effect on performance
Zero Signal Error (%)	±1 FS	
Hysteresis (%)	±1-3% FS Typical	
Linearity Error (%)	±1-3% FS Typical	
Zero Temperature Coefficient (%)	0.02 FS/°C	
Span Temperature Coefficient (%)	0.02 of load/°C	
Compensated Temperature (°C)	-15 to +70	Wider range available to order
Operating Temperature (°C)	-20 to +70	Wider range available to order
Output Resistance (ohms)	350 nominal	
Input Resistance (ohms)	350 nominal	
Excitation (V)	18 max.	
IP Rating	IP64	
Material	Stainless Steel	

LOW PROFILE TENSION AND COMPRESSION LOAD CELL

The Low Profile Tension and Compression Load Cell is a bi-directional aluminium strain gauge based transducer with high performance and built-in temperature compensation.

This design provides better than ±0.1 % (full scale) non-linearity. Options include IEEE1451.4 TEDS capability.

DIAGRAM



LOW PROFILE TENSION AND COMPRESSION LOAD CELL

SPECIFICATION

PARAMETER	RANGE
Capacity (N)	100, 200, 300, 500
Rated Output (RO) (mVN)	2 nominal
Safe Overload (%)	150 of RO
No Load Offset (Zero Balance) (%)	±1 of RO
Bridge Resistance	1000 Ω nominal
Non-Linearity (%)	±0.1 of RO
Hysteresis (%)	±0.1 of RO
Non-Repeatability (%)	±0.05 of RO
Temperature Shift Zero (%)	±0.01 of RO/°F (±0.018 of RO/°C)
Temperature Shift Span (%)	±0.01 of Load/°F (±0.018 of Load/°C)
Operating Temperature (°F)	-60 to +200 (-51 to +93°C)
Weight (lb)	0.11 (51g) approx.
Material	Aluminium
Connector	Default none, optional DB9 male or female (specify at time of order)

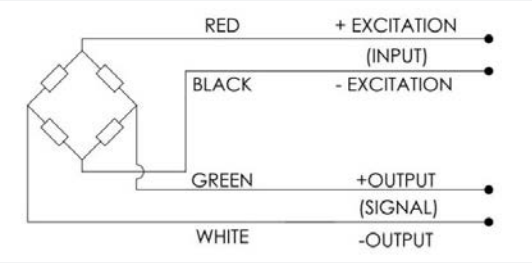
SUBMINIATURE IN LINE LOAD CELL (AILC1)

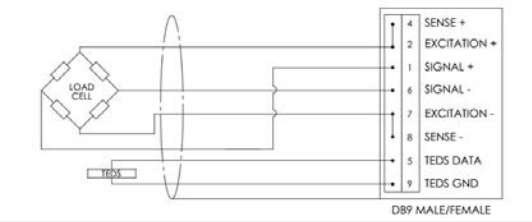
AILC1 Sub-miniature Threaded In Line Load Cells are strain gauge based transducers designed for applications in general test and measurements.

This type measures tensile and compressive loads up to 100N with better than ±0.5% non-linearity.

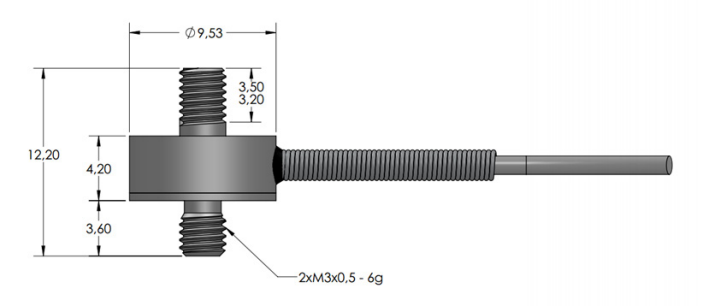
WIRING

- The load button is provided with a #36 AWG 4-conductor braided shielded cable with outer jacket, 0.065” [1.63 mm] diameter, 5 ft [1.5 m] (for standard version) long, with no connection between the shield and the sensor body. For additional protection, the cable is contained within a stainless steel spring for strain relief purposes for the first 2” [50 mm].
- Connector pin configuration as shown below (for the with-connector version)





DIMENSIONS



SUBMINIATURE IN LINE LOAD CELL (AILC1)

SPECIFICATION

PARAMETER	RANGE	NOTES
Capacity (N)	50 and 100	With metric threads as standard
Rated Output (RO) (mV/V)	2 nominal	
Allowable Maximum Load (%)	150 full scale	No effect on performance
Non-Linearity (%)	±0.5 of RO max.	
Hysteresis (%)	±0.5 of RO max.	
Repeatability (%)	±0.1 of RO max.	
Zero Balance (%)	10 of RO max.	
Zero Temperature Coefficient (%)	0.036 FS/°C	
Span Temperature Coefficient (%)	0.036 of load/°C	
Compensated Temperature (°C)	-15 to +70	Wider range available to order
Operating Temperature (°C)	-20 to +80	Wider range available to order
IP Rating	IP64	IP68 version available on request
Material	Stainless Steel	
Bridge Resistance (ohm)	350 nominal	
Excitation (V)	5, 10	

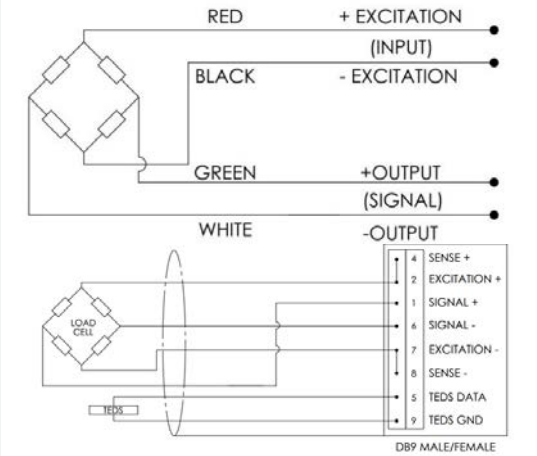
IN LINE LOAD CELL (AILC2)

Miniature threaded In Line Load Cells are strain gauge based transducers with temperature compensation and excellent overall performance.

This type measures tensile and compressive loads up to 5000N/1000lbf with better than ±0.25% non-linearity.

WIRING

- The sensor is provided with a #32 AWG 4-conductor braided shielded cable with an outer jacket of 0.087” [2.2 mm] diameter, 5 ft [1.5m] long, with no connection between the shield and the sensor body. For additional protection, the cable is contained within a stainless steel spring for strain relief purposes for the first 1” [25 mm].
- Connector pin configuration as shown below (for the with-connector version)

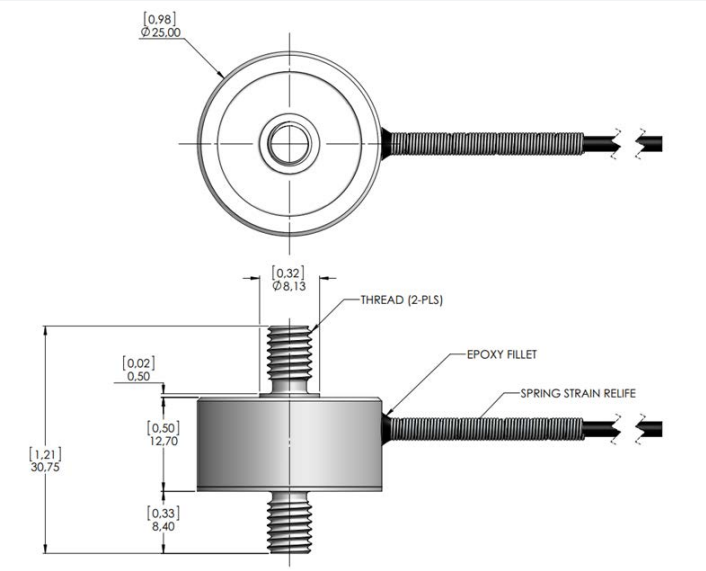


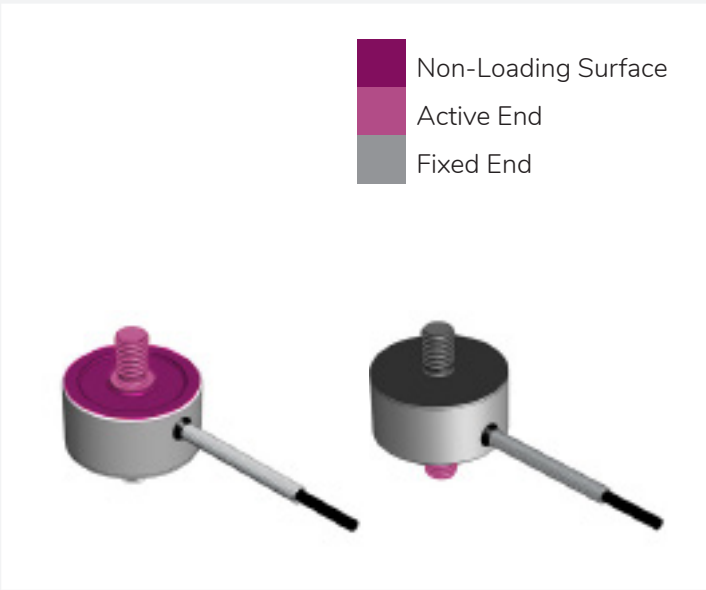
IN LINE LOAD CELL (AILC2)

DIMENSIONS

MODEL	CAPACITY	DEFLECTION NOMINAL	THREAD
AILC2	200N	0.05mm [.002"]	M6x1-6g
AILC2	500N	0.05mm [.002"]	M6x1-6g
AILC2	1000N	0.05mm [.002"]	M6x1-6g
AILC2	2000N	0.05mm [.002"]	M6x1-6g
AILC2	5000N	0.10mm [.004"]	M6x1-6g

MODEL	CAPACITY	DEFLECTION NOMINAL	THREAD
AILC2	50lbf	0.05mm [.002"]	1/4"-28 UNF 2B
AILC2	100lbf	0.05mm [.002"]	1/4"-28 UNF 2B
AILC2	250lbf	0.05mm [.002"]	1/4"-28 UNF 2B
AILC2	500lbf	0.05mm [.002"]	1/4"-28 UNF 2B
AILC2	1000lbf	0.10mm [.004"]	1/4"-28 UNF 2B





IN LINE LOAD CELL (AILC2)

SPECIFICATION

PARAMETER	RANGE	NOTES
Capacity	200N, 500N, 1000N, 2000N & 5000N 50lbf, 100lbf, 250lbf, 500lbf, 1000lbf	With metric threads as standard With unified threads as standard
Rated Output (RO) (mV/V)	2 nominal	
Allowable Maximum Load (%)	150 full scale	No effect on performance
Non-Linearity (%)	±0.25 of RO max.	
Hysteresis (%)	±0.25 of RO max.	
Repeatability (%)	±0.1 of RO max.	
Zero Balance (%)	5 of RO max.	
Zero Temperature Coefficient (%)	0.018 FS/°C	
Span Temperature Coefficient (%)	0.036 of load/°C	
Compensated Temperature (°C)	-15 to +70	Wider range available to order
Operating Temperature (°C)	-20 to +80	Wider range available to order
IP Rating	IP64	IP68 version available on request
Bridge Resistance (ohm)	700 nominal	
Excitation (V)	5, 10	

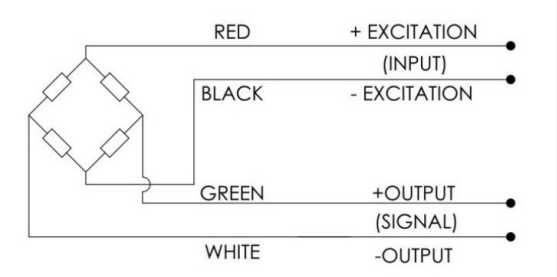
IN LINE LOAD CELL
(AILC3, AILC4 & AILC5)

Miniature threaded In Line Load Cells are strain gauge based transducers with temperature compensation and excellent overall performance.

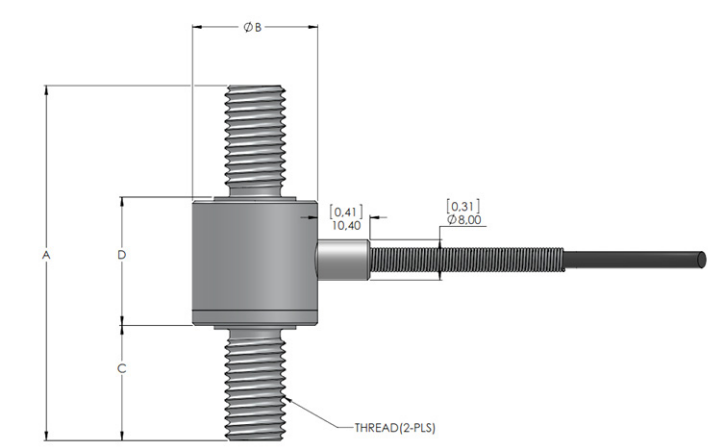
This type measures tensile and compressive loads up to 50kN and 10klbf with better than ±0.5% non-linearity.

WIRING

- The load button is provided with 4x28 AWG wiring within a braided shielded cable (overall cable length 3m).
- Connector with integrated TEDS chip is available to order.



DIMENSIONS

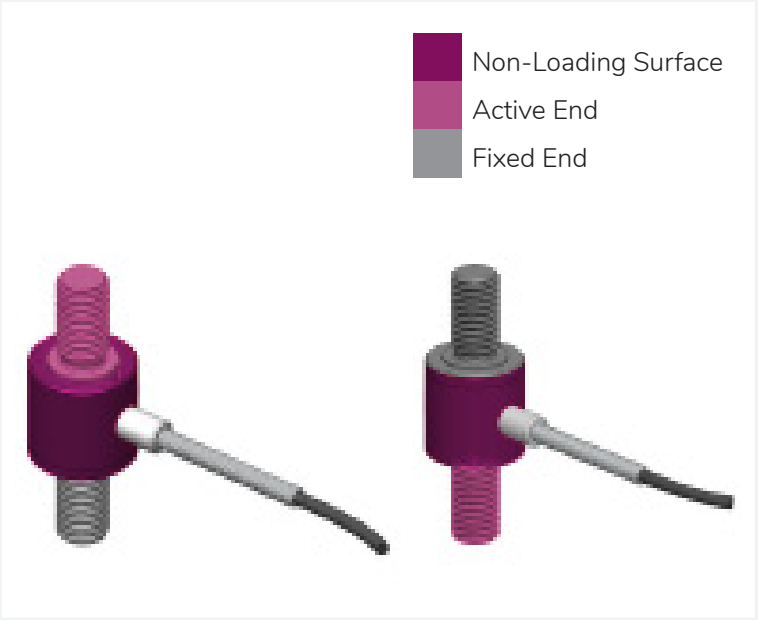


IN LINE LOAD CELL
(AILC3, AILC4 & AILC5)

DIMENSIONS CONTINUED

MODEL	CAPACITY	A	B	C	D	THREAD
AILC3	10kN	38.10mm[1.50”]	24.80mm[.98”]	10.65m[.42”]	17.55mm[.69”]	M10x1.5-6g
	3klbf	38.10mm[1.50”]	24.80mm[.98”]	10.65m[.42”]	17.55mm[.69”]	3/8”-24 UNF 2B
AILC4	20kN	70.40mm[2.77”]	24.80mm[.98”]	22.85mm[.90”]	25.45mm[1.00”]	M12x1.75-6g
	5klbf	70.40mm[2.77”]	24.80mm[.98”]	22.85mm[.90”]	25.45mm[1.00”]	1/2"-20 UNF 2B
AILC5	50kN	70.40mm[2.77”]	28.30mm[1.11”]	22.10mm[.87”]	26.20mm[1.03”]	M16X2.0-6g
	10klbf	70.40mm[2.77”]	28.30mm[1.11”]	22.10mm[.87”]	26.20mm[1.03”]	3/4”-16 UNF 2B

MODEL	CAPACITY	DEFLECTION NOMINAL
AILC3	10kN	0.04mm[.0015”]
	3klbf	0.04mm[.0015”]
AILC4	20kN	0.04mm[.0015”]
	5klbf	0.04mm[.0015”]
AILC5	50kN	0.08mm[.003”]
	10klbf	0.08mm[.003”]



IN LINE LOAD CELL
(AILC3, AILC4 & AILC5)

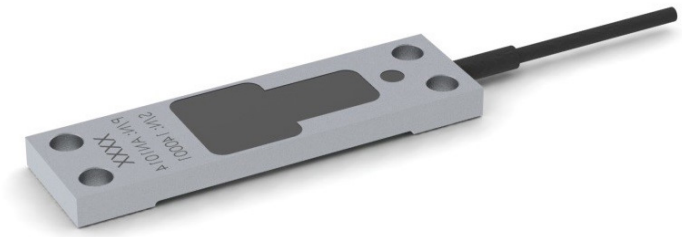
SPECIFICATION

PARAMETER	RANGE	NOTES
Capacity	10kN, 20kN & 50kN	With metric threads as standard
	3klbf, 5klbf & 10klbf	With unified threads as standard
Rated Output (RO) (mV/V)	2 nominal	
Allowable Maximum Load (%)	150 full scale	No effect on performance
Non-Linearity (%)	± 0.5 of RO max.	
Hysteresis (%)	± 0.5 of RO max.	
Repeatability (%)	± 0.1 of RO max.	
Zero Balance (%)	5 of RO max.	
Zero Temperature Coefficient (%)	0.02 FS/°C	
Span Temperature Coefficient (%)	0.02 of load/°C	
Compensated Temperature (°C)	-15 to +70	Wider range available to order
Operating Temperature (°C)	-20 to +80	Wider range available to order
IP Rating	IP64	IP68 version available on request
Bridge Resistance (ohm)	350 nominal	
Excitation (V)	5, 10	

STRAIN TRANSDUCER

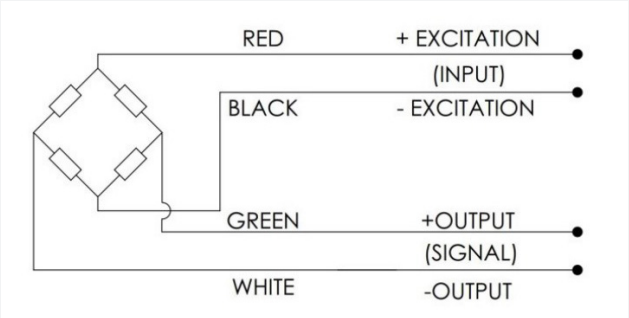
Strain Transducer is designed to measure strain in statically and dynamically loaded applications where high forces are to be measured such as roll stands, injection molding machines and cranes.

This can be directly mounted on a flat surface with four bolts. Two oppositely mounted strain transducers should be used where bending effect need to be compensated.

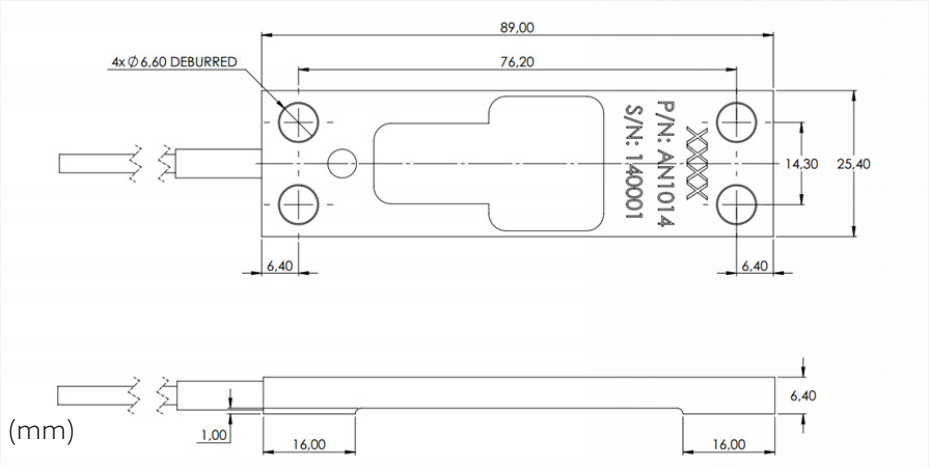


WIRING

- The strain transducer is provided with a 4 core 28 AWG cable, shield connected to housing



DIMENSIONS



STRAIN TRANSDUCER

SPECIFICATION

PARAMETER	ST500/6	ST500/12	NOTES
Measuring Range (µm/m)	0-500		
Sensitivity (mV/V)	1.5 ± 0.15		
Zero Signal Error (%)	5 FS		
Reversibility Error (%)	0.5 FS		
Linearity Error (%)	0.5 FS		
Zero Temperature Coefficient (%)	0.01 FS/°C		
Span Temperature Coefficient (%)	0.02 of load/°C		
Compensated Temperature (°C)	-15 to +70		Ideal operating temperature range
Operating Temperature (°C)	-20°C to +70		
Output Resistance (ohm)	1000 ± 10		
Input Resistance (ohm)	>1000		
Insulation Resistance (ohm)	$>5x10^{10}$		
Excitation (V)	2-15		
Maximum Operating Strain (µm/m)	750		
Breaking Strain (µm/m)	1500		
Degree of Protection	IP65		
Mounting Bolt Tightening Torque (Nm)	16		At least 8Nm
Cable Length (m)	6	12	

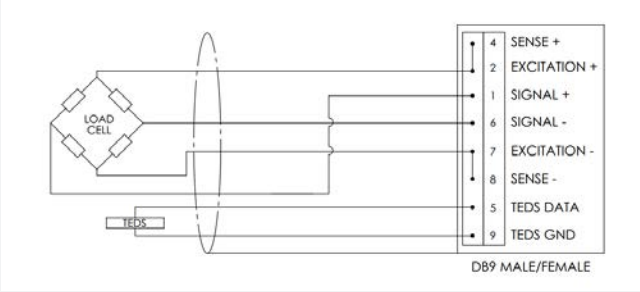
LOW CAPACITY HIGH ACCURACY (CIRCULAR TYPE LOAD CELL)

The Low Capacity High Accuracy load cell is an aluminium strain gauge based transducer designed for high accuracy, with temperature compensation and enhanced stiffness.

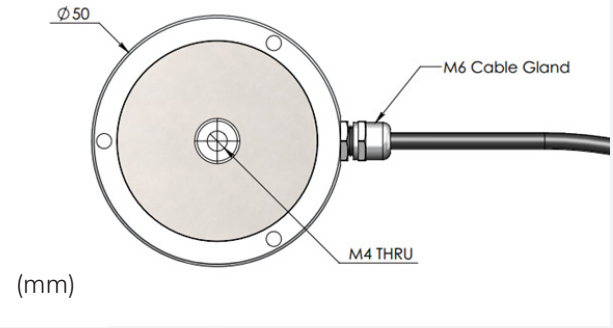
This design provides better than ±0.1% (full scale) non-linearity. The load cell is provided with a threaded central hub for loading (a load button is optional), and 3 threaded holes on the bottom surface, for ease of mounting. Options include stainless steel welded or potted construction, internal amplifier, extended temperature range and IEEE1451.4 TEDS capability.

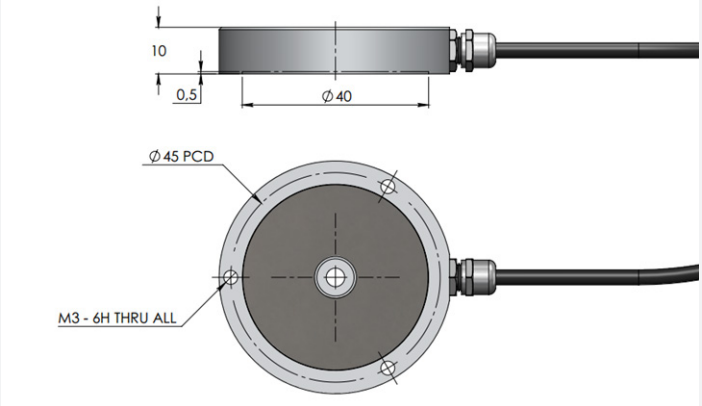
WIRING

- The load button is provided with a #28 AWG 4-conductor braided shielded cable with outer jacket, 0.12" [3 mm] diameter, 2 ft [0.6m] long, with no connection between the shield and the sensor body.
- Optional DB9 cable mounted connector pin configuration as shown below.
- M8 load cell mounted connector also available. Contact us for pinout details.



DIMENSIONS





LOW CAPACITY HIGH ACCURACY (CIRCULAR TYPE LOAD CELL)

SPECIFICATION

PARAMETER	RANGE
Rated Capacity (kg)	1, 2, 5, 10
Rated Output (RO) (mV/V)	1 nominal (0.5 – 4.5VDC from amplifier version)
Safe Overload (%)	150 of RO
No Load Offset (Zero Balance) (%)	±2 of RO
Excitation (VDC or VAC) (V)	5, 10
Input Impedance	350 Ω nominal
Output Impedance	350 Ω nominal
Non-Linearity (%)	±0.1 of RO
Hysteresis (%)	±0.1 of RO
Non-Repeatability (%)	±0.05 of RO
Creep (30 min.) (%)	<=0.1 of RO
Temperature Shift Zero (%)	±0.01 of RO/°F (±0.018 of RO/°C)
Temperature Shift Span (%)	±0.01 of load/°F (±0.018 of load/°C)
Compensated Temperature (°F)	5 to 160 (-15 to 71°C)
Operating Temperature (°C)	-20 to +80
Weight (lb)	0.09 (40g) approx.
Material	Aluminium (stainless steel optional for 2kg and above)
Deflection (in)	0.0004 (0.1mm) nominal
Natural Frequency	1kg – 1500Hz 2kg – 2400Hz 5kg – 4000Hz 10kg – 6500Hz
IP Rating	IP40
Calibration Test Excitation (VDC)	5
Calibration (std.)	5 pt. compression (tension calibration optional)
Connector	None (default) M8 Male connector mounted on the load cell (optional) DB9 cable mounted connector, male or female (optional)
Compliance	RoHS Amplified version: ESD safe, EMC compliant with EN61326-2-3:2006, CE marked.

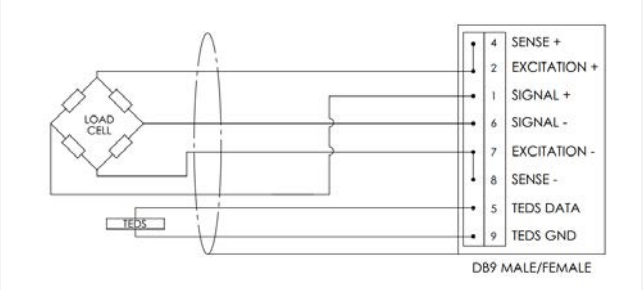
LOW CAPACITY HIGH ACCURACY (BOX TYPE LOAD CELL)

The Low Capacity High Accuracy load cell is an aluminium strain gauge based transducer designed for either tension or compression use, with enhanced stiffness and internal temperature compensation.

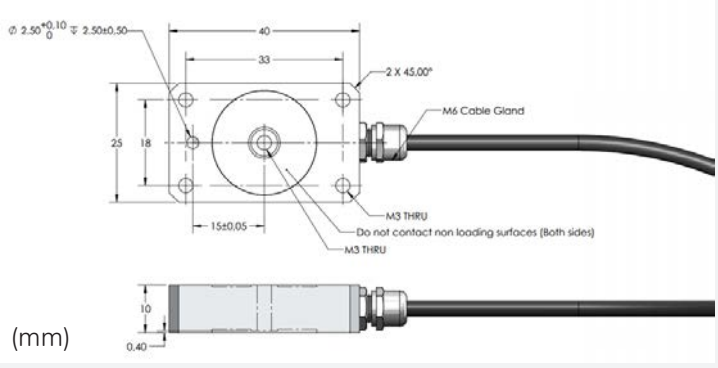
This design provides better than ±0.05% (full scale) non-linearity. The load cell is provided with a threaded central hub for loading (a load button is optional), and four threaded holes are provided for either top or bottom mounting.

WIRING

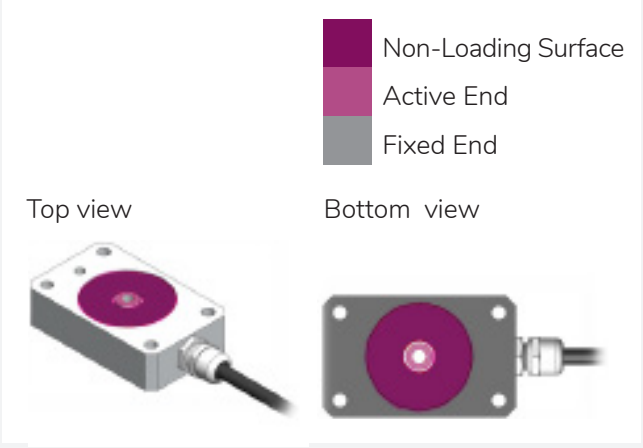
- The load cell is provided with a #28 AWG 4-conductor braided shielded cable with outer jacket, 0.12” [3 mm] diameter, 2 ft [0.6m] long, with no connection between the shield and the sensor body.
- Optional DB9 cable mounted connector pin configuration as shown below
- M8 load cell mounted connector also available. Contact factory for pinout details



DIMENSIONS



(mm)



LOW CAPACITY HIGH ACCURACY (BOX TYPE LOAD CELL)

SPECIFICATION

PARAMETER	RANGE
Rated Capacity (kg)	1
Rated Output (RO) (mV/V)	1 nominal
Safe Overload (%)	150 of RO
No Load Offset (Zero Balance) (%)	±2 of RO
Excitation (VDC or VAC) (V)	5, 10
Input Impedance	350 Ω
Output Impedance	350 Ω
Non-Linearity (%)	±0.05 of RO
Hysteresis (%)	±0.05 of RO
Non-Repeatability (%)	±0.03 of RO
Creep (30 min.) (%)	<=0.1 of RO
Temperature Shift Zero (%)	±0.01 of RO/°F (±0.018 of RO/°C)
Temperature Shift Span (%)	±0.01 of load/°F (±0.018 of load/°C)
Compensated Temperature (°F)	5 to +160 (-15 to +71°C)
Operating Temperature (°C)	-20 to +80
Weight (lb)	0.09 (40g) approx.
Material	Aluminium (stainless steel covers)
Deflection (in)	0.0004 [0.1mm] nominal
Natural Frequency (Hz)	2800
IP Rating	IP40
Calibration Test Excitation (VDC)	5
Calibration (std.)	5 pt. compression (tension calibration optional)
Connector	None (default) M8 Male connector mounted on the load cell (optional) DB9 cable mounted connector, male or female (optional)
Compliance	RoHS

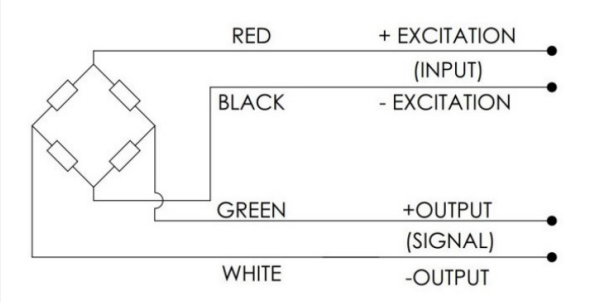
CLAMPING FORCE LOAD CELL

Clamping Force Load Cells are strain gauge based transducers with temperature compensation and excellent overall performance.

This type measures compressive loads up to 160kN with better than ±2% non-linearity. This low height and robust design is ideal for determining bolt preload.

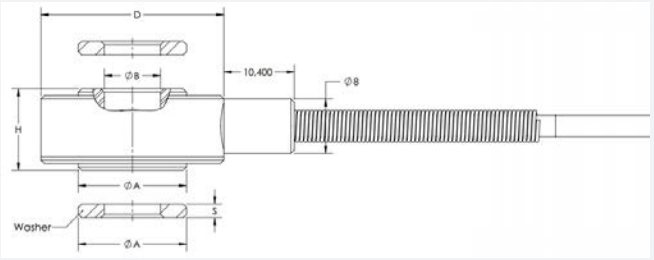
WIRING

- The load button is provided with 4x28 AWG wiring within a braided shielded cable (overall cable length 3m).
- Connector with integrated TEDS chip is available to order.



DIMENSIONS

MODEL	CAPACITY	A	B	D	H	S	THREAD
CFCL1	15kN	12	6.3	24	12	3	M6
CFCL1	30kN	16	8.3	27	12	3	M8
CFCL1	60kN	22	10.3	33	12	3	M10
CFCL1	80kN	26	12.3	37	15	4	M12
CFCL1	120kN	33	16.3	44	15	4	M16
CFCL1	160kN	39	20.3	50	15	5	M20



CLAMPING FORCE LOAD CELL

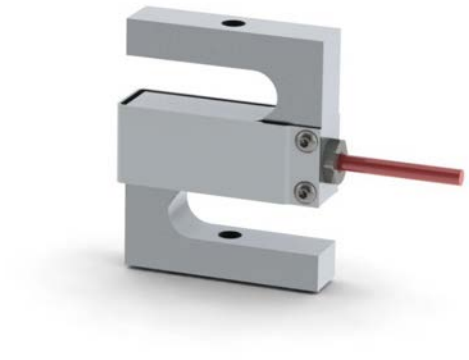
SPECIFICATION

PARAMETER	RANGE	NOTES
Capacity (FS) (kN)	15, 30, 60, 80, 120 & 160	
Rated Output (RO) (mV/V)	1 nominal	
Allowable Maximum Load (%)	150 full scale	No effect on performance
Non-Linearity (%)	±2-3 of FS	Typical
Repeatability (%)	±0.3 of RO	
Zero Balance (%)	5 of RO max.	
Zero Temperature Coefficient (%)	± 0.03 RO/°C	
Span Temperature Coefficient (%)	± 0.03 load/°C	
Compensated Temperature (°C)	-15 to +70	Wider range available to order
Operating Temperature (°C)	-20 to +80	Wider range available to order
IP Rating	IP65	
Bridge Resistance (ohm)	350	
Excitation (V)	5VDC recommended, 10VDC Max	

HIGH TEMPERATURE MINIATURE S-BEAM LOAD CELL

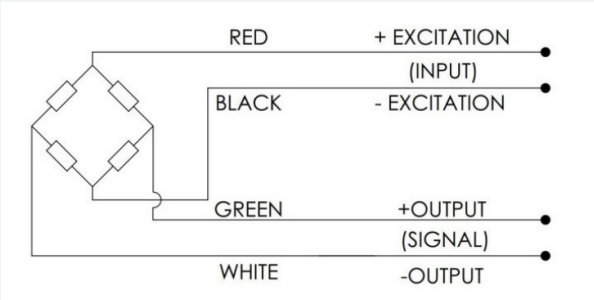
The HTSB Load Cell is a bi-directional Aluminum strain gauge based transducer with high performance, specially designed for high temperature applications.

This design provides better than ±0.05% (full scale) non-linearity.



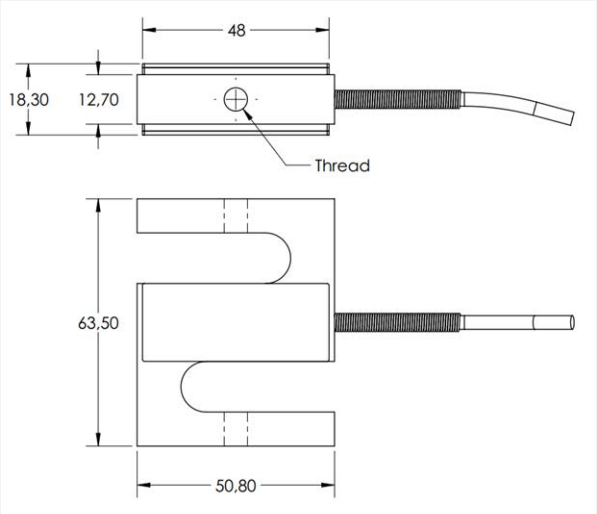
WIRING

- The HTSB load cell is provided with 4x22 AWG wiring within a braided shielded cable (overall cable length 15ft)



DIMENSIONS

MODEL	CAPACITY	THREAD
HTSB-M	50lbf	M6 x 1
HTSB-U	50lbf	1/4 - 28
HTSB-M	100lbf	M6 x 1
HTSB-U	100lbf	1/4 - 28
HTSB-M	150lbf	M6 x 1
HTSB-U	150lbf	1/4 - 28
HTSB-M	250lbf	M6 x 1
HTSB-U	250lbf	1/4 - 28



HIGH TEMPERATURE MINIATURE
S-BEAM LOAD CELL

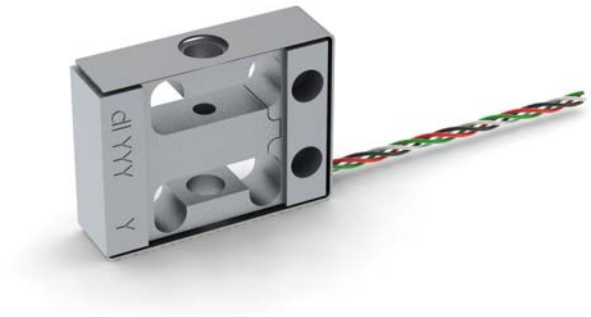
SPECIFICATION

PARAMETER	RANGE
Rated Capacity (lbf)	50, 100, 150 & 250
Rated Output (RO) (mV/V)	3 nominal
Safe Overload (%)	150 of RO
No Load Offset (Zero Balance) (%)	±1 of RO
Excitation (VDC or VAC) (V)	5, 10
Input Impedance	350 Ω nominal
Output Impedance	350 Ω nominal
Non-Linearity (%)	±0.05 of RO
Hysteresis (%)	±0.03 of RO
Non-Repeatability (%)	±0.02 of RO
Temperature Shift Zero (%)	±0.005 of RO/°F (±0.009 of RO/°C)
Temperature Shift Span (%)	±0.005 of load/°F (±0.009 of load/°C)
Compensated Temperature (°F)	0 to +300 (-20 to +150°C)
Operating Temperature (°F)	-65 to +320 (-50 to +160°C)
Material	Aluminum
Calibration (std)	Tension

SIDE MOUNT LOAD CELL

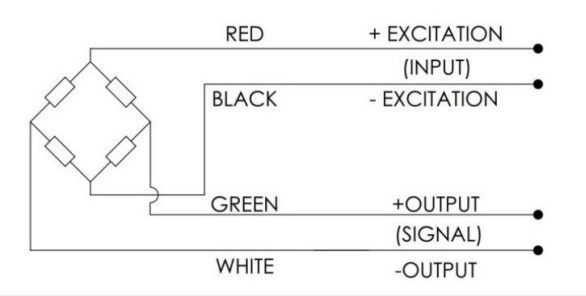
The Side Mount Load Cell is a bi-directional strain gauge based transducer with high performance and built-in temperature compensation.

This design provides better than ±0.02% (full scale) non-linearity.

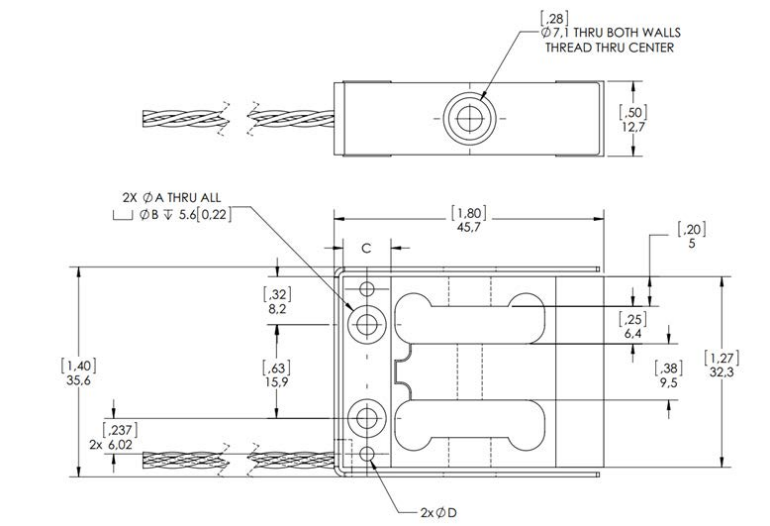


WIRING

- The OLP Beam LC is provided with 28 AWG wiring, overall cable length 6in (152.4mm)



DIMENSIONS



Dimensions continued on next page.

SIDE MOUNT LOAD CELL

DIMENSIONS CONTINUED

MODEL	CAPACITY	THREAD	A	B	C	D	SAFE OVERLOAD
ABLC-M	9.8N	M5 x 0.8 – 6H	3.4 [.13]	6.5 [.26]	8.13 [.32]	-	1112N
ABLC-U	2.2lb	#10-32 UNF-2B	3.6 [.14]	6.4 [.25]	8.13 [.32]	-	250lb
ABLC-M	22.2N	M5 x 0.8	3.4 [.13]	6.5 [.26]	8.13 [.32]	-	1112N
ABLC-U	5lb	#10-32 UNF-2B	3.6 [.14]	6.4 [.25]	8.13 [.32]	-	250lb
ABLC-M	44.5N	M5 x 0.8	3.4 [.13]	6.5 [.26]	8.13 [.32]	-	1112N
ABLC-U	10lb	#10-32 UNF-2B	3.6 [.14]	6.4 [.25]	8.13 [.32]	-	250lb
ABLC-M	111N	M5 x 0.8	3.4 [.13]	6.5 [.26]	8.13 [.32]	-	1112N
ABLC-U	25lb	#10-32 UNF-2B	3.6 [.14]	6.4 [.25]	8.13 [.32]	-	250lb
ABLC-M	222N	M5 x 0.8	3.4 [.13]	6.5 [.26]	8.13 [.32]	-	1112N
ABLC-U	50lb	#10-32 UNF-2B	3.6 [.14]	6.4 [.25]	8.13 [.32]	-	250lb
ABLC-M	1445N	M5 x 0.8	3.4 [.13]	6.5 [.26]	8.13 [.32]	-	1112N
ABLC-U	100lb	#10-32 UNF-2B	3.6 [.14]	6.4 [.25]	8.13 [.32]	-	250lb
ABLC-M	890N	M5 x 0.8	3.4 [.13]	6.5 [.26]	8.13 [.32]	2.38 [.094]	1780N*
ABLC-U	200lb	#10-32 UNF-2B	3.6 [.14]	6.4 [.25]	8.13 [.32]	2.38 [.094]	400lb*
ABLC-M	2224N	M6 x 1	4.5 [.18]	8 [.31]	10.16 [.4]	2.38 [.094]	4450N*
ABLC-U	500lb	¼ - 28 UNF – 2B	5.3[.21]	8.6 [.34]	10.16 [.4]	2.38 [.094]	1000lb*

*With additional pins

SIDE MOUNT LOAD CELL

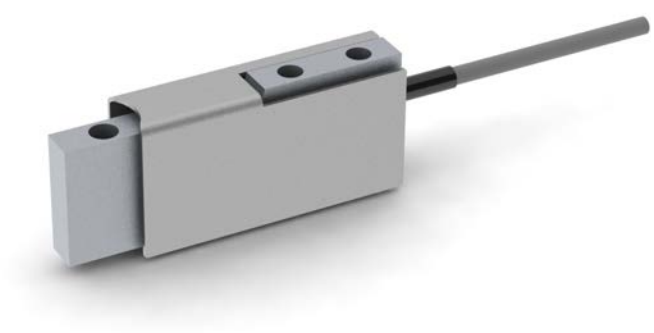
SPECIFICATION

PARAMETER	RANGE
Rated Capacity (lbf)	2.2 - 500 [9.8N-2224N]
Rated Output (RO) (mV/V)	2 nominal
No Load Offset (Zero Balance) (%)	±3 of RO
Excitation (VDC or VAC) (V)	5, 10
Input Impedance	1000 Ω nom.
Output Impedance	1000 Ω nom.
Non-Linearity (%)	±0.02 of R. (2.2-100lbf) ±0.06 of RO (200-500lbf)
Hysteresis (%)	±0.02 of RO (2.2-100lbf) ±0.06 of RO (200-500lbf)
Non-Repeatability (%)	±0.02 of RO
Temperature Shift Zero (%)	±0.005 of RO/°F (±0.009 of RO/°C)
Temperature Shift Span (%)	±0.005 of load/°F (±0.009 of load/°C)
Compensated Temperature (°F)	+5 to +160 (-15 to +71°C)
Operating Temperature (°F)	-60 to +200 (-51 to +93°C)
Material	Aluminum (2.2-100lbf), SS (200lbf-500lbf)
Calibration Test Excitation (V)	5 (recommended), 10 max.
Calibration (std.)	2 pt. tension

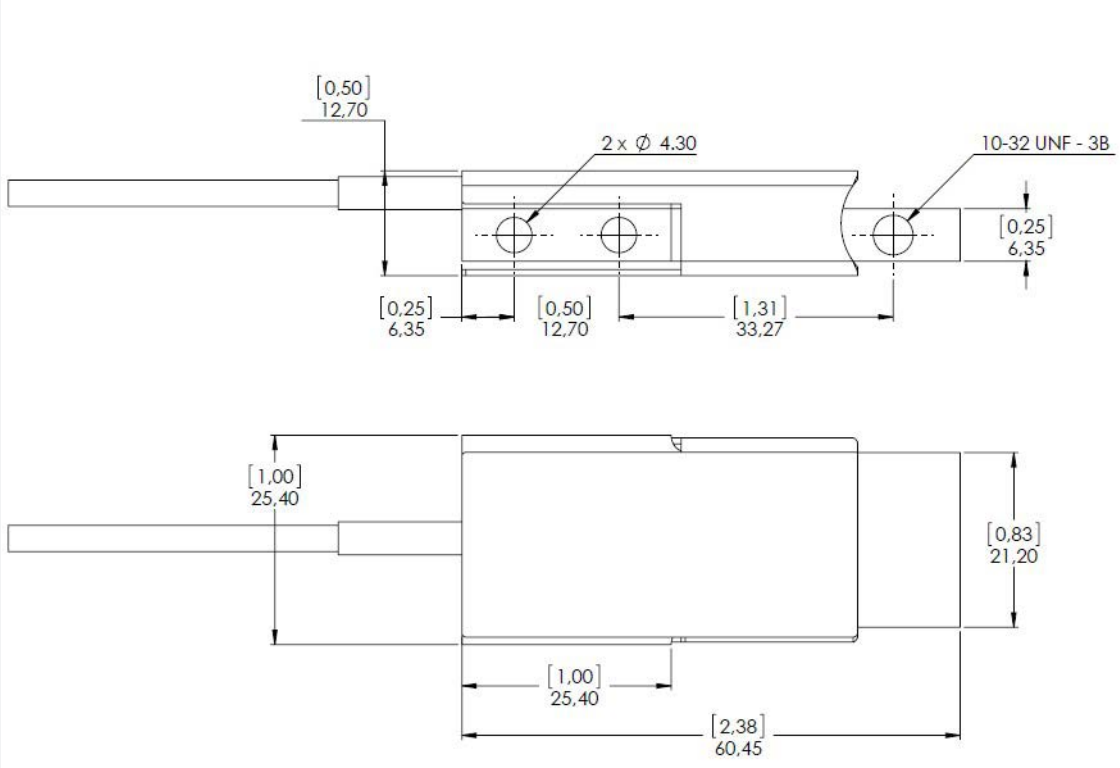
MINIATURE BEAM LOAD CELL

Miniature Beam Load Cell is a bi-directional strain gauge based transducer with high performance and built-in temperature compensation.

This load cell design provides better than ±0.03% (full scale) non-linearity.



DIAGRAM



mm (inch)

MINIATURE BEAM LOAD CELL

SPECIFICATION

PARAMETER	RANGE
Rated Capacity (FS) (lb)	5-250 (22.2N-1110N)
Safe Overload (FS) (%)	150
Rated Output (RO) (mV/V)	3 nominal
No Load Offset (Zero Balance) (%)	±1 of RO
Excitation (VDC or VAC) (V)	5 recommended (15 max.)
Input Impedance	1000 Ω nominal
Output Impedance	1000 Ω nominal
Non-Linearity (%)	±0.03 of RO
Hysteresis (%)	±0.02 of RO
Non-Repeatability (%)	±0.01 of RO
Temperature Shift Zero (%)	±0.005 of RO/°F (±0.009 of RO/°C)
Temperature Shift Span (%)	±0.005 of Load/°F (±0.009 of Load/°C)
Compensated Temperature (°F)	+5 to +160 (-15 to +71°C)
Operating Temperature (°F)	-60 to +200 (-51 to +93°C)
Calibration (std.)	2 pt. tension

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