



SENTRAN

Shear Beam Load Cell

XA1-C Series

The XA1-C Series is a high performance strain gage load cell constructed of alloy tool steel. This robust, rectangular shear beam is designed to accurately measure compression loads in capacity ranges from 0-250 LB to 0-20,000 LB.



The XA1-C Series is a high performance shear beam load cell constructed of nickel plated alloy steel. The XA1-C is designed to accurately measure tension and compression forces for applications ranging from 0-250 LB to 0-20,000 LB. The XA1-C features a robust shear beam design that readily tolerates moments induced by angular, eccentric, or off-center loading, with minimal sensitivity to these extraneous loads. The XA1-C load cell is Harsh Environment Sealed (IP67-Limited Immersion) by virtue of proprietary multi-redundant barriers uniquely integrated to protect all internal components. The load cell output signals are calibrated to a close tolerance to facilitate in situ interchangeability and multiple load cell summing applications. The integral premium instrumentation grade cable features a durable PVC jacket over a tinned-copper braided shield for superior mechanical protection and to minimize the unwanted electrical effects of RFI and EMI. Versatile companion weighing modules, MB Series and MF Series, are available for convenient weighing of tanks, bins, hoppers, conveyors, and similar applications. The attributes of the XA1-C Series make it an ideal choice for Industrial, reactor, mixer and blender weighing, material handling, and weighing situations where a versatile high performance load cell solution is required.



APPLICATIONS

- Compression Measurements
- Process Control Weighing
- Tank, Bin and Hopper Weighing
- Reactor, Mixer and Blender Weighing
- Conveyor Weighing
- OEM/VAR Solutions

FEATURES

- 250 LB to 20K LB Capacities
- 0.03% Accuracy Class
- 3 mV/V Full Scale Output
- 20 FT PVC Cable
- FM Approved, Intrinsically Safe
- IP67 Environmental Sealing
- Nickel Plated Alloy Steel Construction
- Shear Beam Design
- Universal - Tension and Compression

For more information call **1-888-545-8988**

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XA1-C Series Specifications

Innovative Measurement Solutions



PERFORMANCE

Rated Capacities ⁽¹⁾ (LB)	250, 500, 1K, 1.5K, 2K, 2.5K, 4K, 5Kse, 5K, 10K, 15K, 20K
Rated Output (FSO)	3 mV/V
Output Tolerance	± .25 % R.O.
Combined Error Band	≤ 0.03 % FSO
Non-Linearity	≤ 0.03 % FSO*
Hysteresis	≤ 0.03 % FSO*
Non-Repeatability	≤ 0.02 % FSO
Side Load Rejection Ratio	500:1
Zero Balance	± 1.0 % FSO
Creep (30 Minutes)	0.03 % of Load

⁽¹⁾ ("K"=Thousand)

*250/500 LB: <0.05% FSO

MECHANICAL

Load Cell Material	Alloy Tool Steel
Load Cell Finish	Electroless Nickel Plated
Safe Overload	Compression 150% FSO
	Tension 150% FSO
	Side Load 100% FSO
Ultimate Overload	Compression 300% FSO
	Tension 300% FSO
	Side Load: 200% FSO
Deflection	See Dimensions Page
Weight	See Dimensions Page
Mounting Bolt Torque	See Dimensions Page
Sealing	IP67, Multi-redundant; Limited Immersion Tolerance

ELECTRICAL

Input Impedance	350 ± 7 ohms
Output Impedance	350 ± 3 ohms
Insulation Resistance	>5000 Megohms
Excitation Voltage	10 V AC/DC (15 V maximum)
Cable Color Code	+ Excitation (red)
	- Excitation (black)
	+ Signal (green)
	- Signal (white)
	Shield (natural)
Cable Type	4-conductor, 24 AWG, PVC Jacket, Tinned Copper Braid, Diameter: 0.200"
Cable Length	See Dimensions Table
Cable Termination	Finished Conductors
Cable Seal	Compression Gland Fitting

ENVIRONMENTAL

Temperature, Operating	-20 to +160 °F (-29 to +71°C)
Temperature, Compensated	14 to +122 °F (-10 to +50°C)
Temperature, Storage	-58 to +185 °F (-50 to +85°C)
Temperature Effects	Zero < 0.0015% FSO/°F
	< 0.0026% FSO/°C
Temperature Effects	Output < 0.0008% of Rdg./°F
	< 0.0014% Rdg./°C
Sealing	IP67, Multi-redundant; Limited Immersion Tolerance
FM Approval	Per Sentran: FM Certificate of Conformity: FM24US00012X and FM24CA0005X

FM approved versions carry a "-FM" suffix to the part number. Every Sentran unit of an FM APPROVED product will bear an FM compliant label indicating the application level (e.g., Class 1, Division 1, Groups) corresponding to the type of protection required.

XA1-C Typical System Configuration

SENSING LOAD CELL(S)

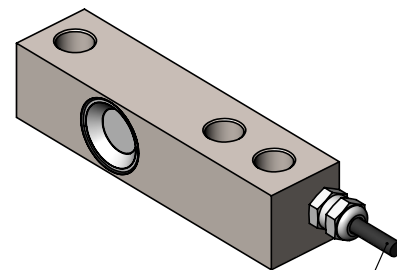
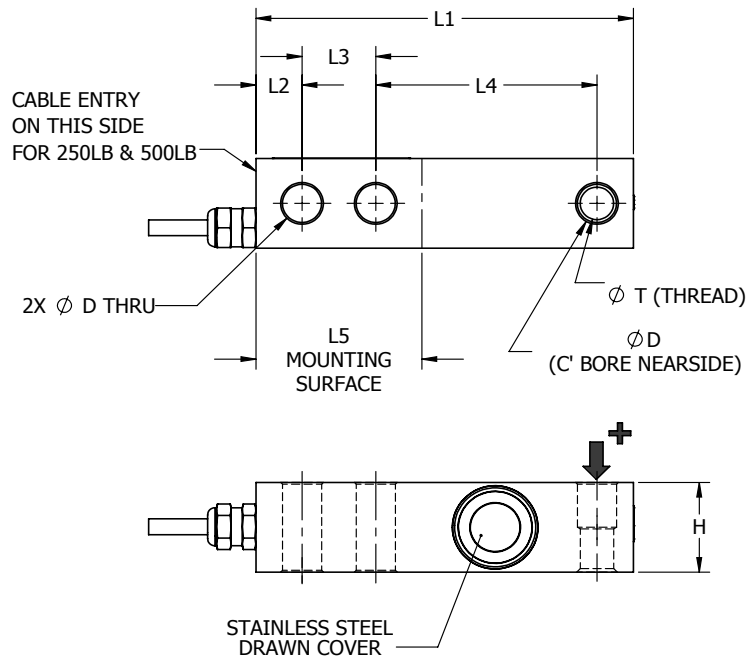


SIGNAL CONDITIONING

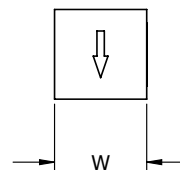
Amplifier/Transmitter JF Series	
Amplifier/ Transmitter JA Series	
Digital Indicator 250 Series	
Digital Indicator 250SS Series	
Digital Indicator/Controller KD3 Series	
Digital Indicator/Controller KD4 Series	

OUTPUT OPTIONS

0-5 VDC
0-10VDC
±5 VDC
±10 VDC
4-20 mA
0-20 mA
RS-232
RS-422
RS-485
20 mA Serial Loop
Ethernet
Profibus DP
DeviceNet
CANOpen
ControlNet
Modbus RTU
Wireless



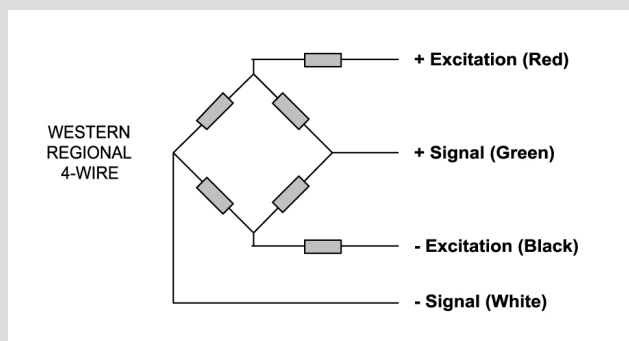
STANDARD CABLE:
0.200" NOM DIA
SHIELDED CABLE, FREE ENDS
20 FT STANDARD



DIMENSIONS IN INCHES

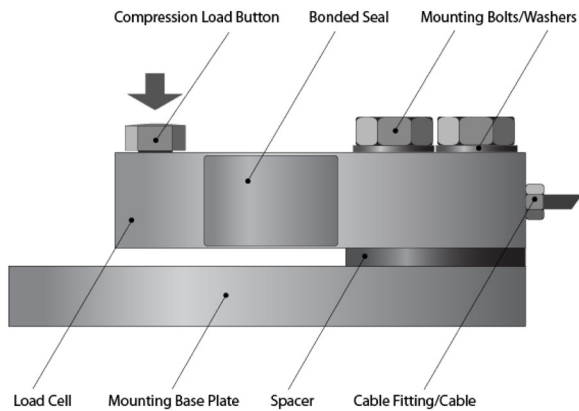
Capacity (LB)	D	H	L1	L2	L3	L4	L5	W	T (THREAD)	RECOMMENDED BOLT TORQUE	DEFLECT	WEIGHT
250, 500, 1K, 1.5K, 2K, 2.5K, 4K, 5KSE	0.530	1.25	5.12	0.62	1.00	3.00	2.25	1.25	1/2-20 UNF X 0.63 DP	75 FT-LB	0.013-0.018	2.5 LB
5K, 10K	0.780	1.50	6.75	0.75	1.50	3.75	3.00	1.50	3/4-16 UNF X 0.75 DP	100 FT-LB	0.016-0.020	4.0 LB
15K, 20K	1.030	2.00	8.88	1.00	2.00	4.88	4.00	2.00	1-14 UNS X 1.00 DP	250 FT-LB	0.022-0.026	8.0 LB

XA1-C Wiring Diagram

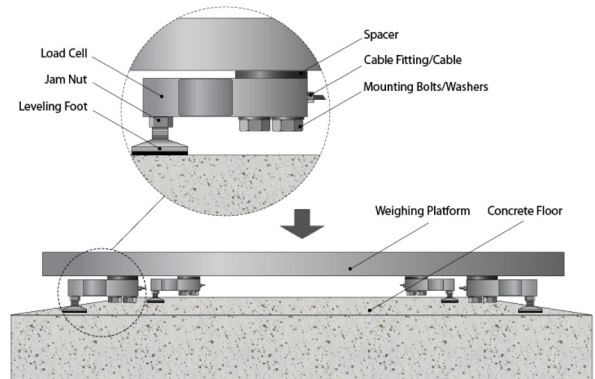




Compression Mount Components



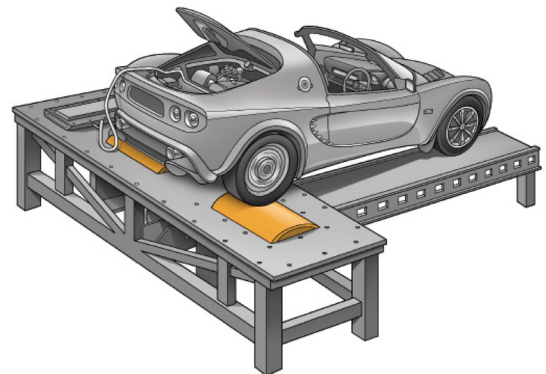
Platform Mount Components



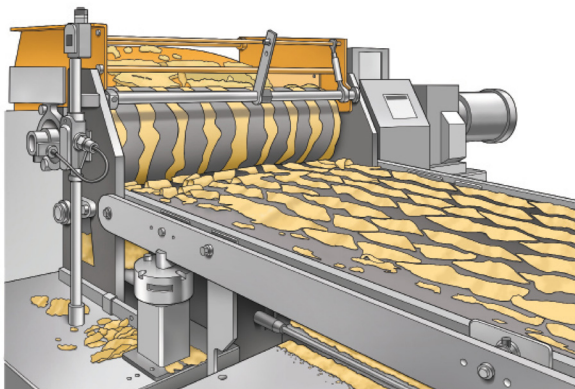
Therapy/Training Treadmill



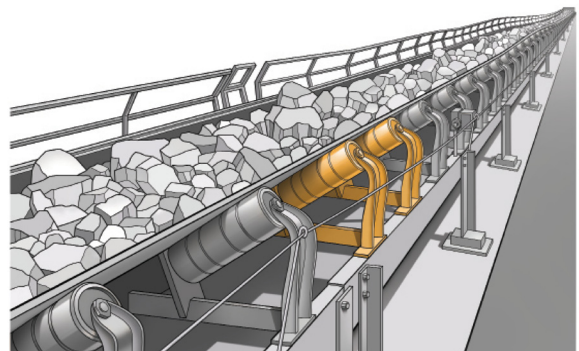
Dynamometer



Extrusion/Die-Cutting Control



Volume and Rate Control





- MB & MF Series Weigh Modules
- Companion Loading Hardware
 - Eyebolts
 - Rod End Bearings
 - Load Buttons
- High Temperature Operation (to 400°F)
- In-Line Analog or Serial Transmitters
- Display/Control Instrumentation
- Junction/Summing Boxes
- Wireless Operation
- MS Connectors
- Shunt Calibration
- Use and Installation Guide
- Custom and OEM Solutions

Application Recommendations / Suggestions

- The X Series Load Cells are designed to be loaded in compression. The most common loading method is via a load button, articulating foot, a weigh module assembly, or similar loading scenarios designed to push on the load cell. The X Series is also compatible with tension measurements through the use of eyebolts, rod end bearings or similar components to pull down on the load cell. Sentran offers optional loading hardware such as load buttons, rod end bearings, eyebolts, MB & MF Weigh Modules and related components that contribute to ease of installation, ease of use and optimum performance.
- The X Series Load Cells are ideal solutions for multiple load cell weighing applications typical of platform scales, belt and roller conveyor scales, process weighing, storage tanks, bins and hoppers.
- In multiple load cell applications involving four or more supports, use care to ensure that the load on each load cell support varies by no more than 20% over the complete loading range. Balancing of the load can be accomplished by using shims, or similar mechanical components to achieve satisfactory load distribution.
- X Series Shear Beams output signals are calibrated to a close output tolerance to facilitate in situ interchangeability and multiple load cell summing applications. However, the use of a Sentran load cell signal trimming summing junction box is recommended for achieving optimum performance and minimum sensitivity to changes in load distribution in multiple load cell applications.
- X Series Shear Beam Load Cells are available in many capacity ranges. These load cells are designed to be used over the complete range of “no load” (0) up to the rated capacity. For example, 1,000 lbs. rated capacity X Series Shear Beams are designed to be used for measurements within the range of 0 to 1,000 lbs. These load cells can be safely loaded to 150% of rated capacity without affecting the load cell performance within the capacity range.
- The reason for the variety of capacities is to allow the user to select the most ideal capacity for a given application. The most ideal capacity is one in which at least 80% of the capacity range is utilized at some point in the measurement process, without exceeding the rated capacity. This allows the load cell to deliver the highest signal to load ratio, and therefore the highest resolution and most stable measurement. There are other factors to consider, such as excitation voltage, but correct “sizing” of the load cell is the first step. Both the dead load and the live load need to be considered in determining the gross load and the load cell capacity.
- Contact Sentran’s expert Applications Specialists for additional professional guidance.

Commercial Information & Precautions

- Do not exceed specified Maximum Load Limits.
- The Safe Load Limit is the point to which normal loading will not cause the load cell to experience an excessive zero shift or a degradation in performance.
- Use reasonable care when applying load to any load cell. Load limits can be exceeded due to shock loading (i.e. dropping a load onto a load cell), off axis loading, side loading and similar loading conditions that are beyond design capabilities.
- The structural integrity of all load bearing components in any load cell system should be designed with safety redundant load paths. (Overload stops, overhead load arrestors, etc.)
- The surfaces to which the load cell(s) is attached and/or is reacting against must be of sufficient structural integrity to carry loads up to and exceeding the ultimate ratings of the load cell(s) being used, while also taking into account any companion hardware being used in conjunction with the load cell.
- To ensure optimum performance, all measuring system cabling should be run through dedicated conduit when available. Avoid proximity to electrical noise sources and use of "dirty" power sources.
- The load cell cable shield should be connected to a dedicated instrument ground point only.
- Force measurement and weighing applications have numerous application-specific considerations to be addressed both mechanically and electrically. Therefore, installation of all system components are the responsibility of the user and should always be approved by a qualified, professional engineer. Any information provided by Sentran, LLC is intended only as informational and does not constitute a formal recommendation for the use of any product for any application.
- Sentran offers application/installation/use guides on request for most standard products. Please contact your Sentran representative for assistance, or visit our technical library resource at www.sentranllc.com.

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