



SENTRAN

Low Profile Load Cell

PL3 Series

The PL3 Series is a miniature high performance load cell constructed of heat treated stainless steel. The PL3 is designed to accurately measure tension and compression forces in capacities ranging from 0-150 LB to 0-10,000 LB.



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APPLICATIONS

- Compression Measurements
- Laboratory Test & Measurements
- Materials Testing
- Dynamic Measurements
- Structural Analysis
- Process Control
- Automotive
- Aerospace

FEATURES

- 150 LB to 10K LB Capacities
- 0.15% Accuracy Class
- 2 mV/V Full Scale Output
- M5 or M8 Connector with 17.5 FT PUR Cable
- Miniature Compact Size
- IP67 Environmental Sealing
- Stainless Steel Construction
- Enhanced Diaphragm Design
- Universal - Tension and Compression



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

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PL3 Series Specifications

Innovative Measurement Solutions 

PERFORMANCE

Rated capacities ⁽¹⁾ (LB)	150, 250, 500, 1K, 2K, 3K, 4K, 5K, 7.5K, 10K,
Rated Output (FSO)	2 mV/V
Output Tolerance	Nominal
Combined Error Band	≤ 0.25 % FSO
Non-Linearity	≤ 0.25 % FSO
Hysteresis	≤ 0.15 % FSO
Non-Repeatability	≤ 0.05 %
Zero balance	≤ 3.0 % FSO
Creep (30 Minutes)	≤ 0.05% of Load

⁽¹⁾ ("K" = thousand)

MECHANICAL

Material	Stainless steel
Finish	Natural
Safe overload	Compression 150 % FSO
	Tension 150%
	Side Load 10% FSO
Ultimate overload	Compression 300% FSO
	Tension 150%
	Side Load: 20% FSO
Deflection	See Dimensions Page
Weight	See Dimensions Page
Recommended Bolt Torque	See Dimensions Page

ELECTRICAL

Input Impedance	375 ohms (Nominal)
Output Impedance	350 ohms (Nominal)
Insulation Resistance	>5000 Megohms @ 50VDC
Excitation Voltage	10 V AC/DC (15 V maximum)
Cable Color Code	See Wiring Diagram Below
Cable Type	150 LB to 4K LB:4-conductor, 28 AWG, TPU Jacket, M5 Axial Female Connector, Diameter: 0.130"
	5K LB to 10K LB:4-conductor, 24 AWG, PVC Jacket, M8 Axial Female Connector, Diameter: 0.217"
Cable Length	See Dimensions Table
Cable Termination	Finished Conductors

ENVIRONMENTAL

Temperature, Operating	-50 to +175 °F (-45 to +79°C)
Temperature, Compensated	14 to +104 °F (-10 to +40°C)
Temperature, Storage	-50 to +175 °F (-45 to +79°C)
Temperature Effects	Zero < 0.005% FSO/°F < 0.009% FSO/°C
Temperature Effects	Output < 0.0010% of Rdg./°F < 0.0018% Rdg./°C

PL3 Typical System Configuration

SENSING LOAD CELL(S)

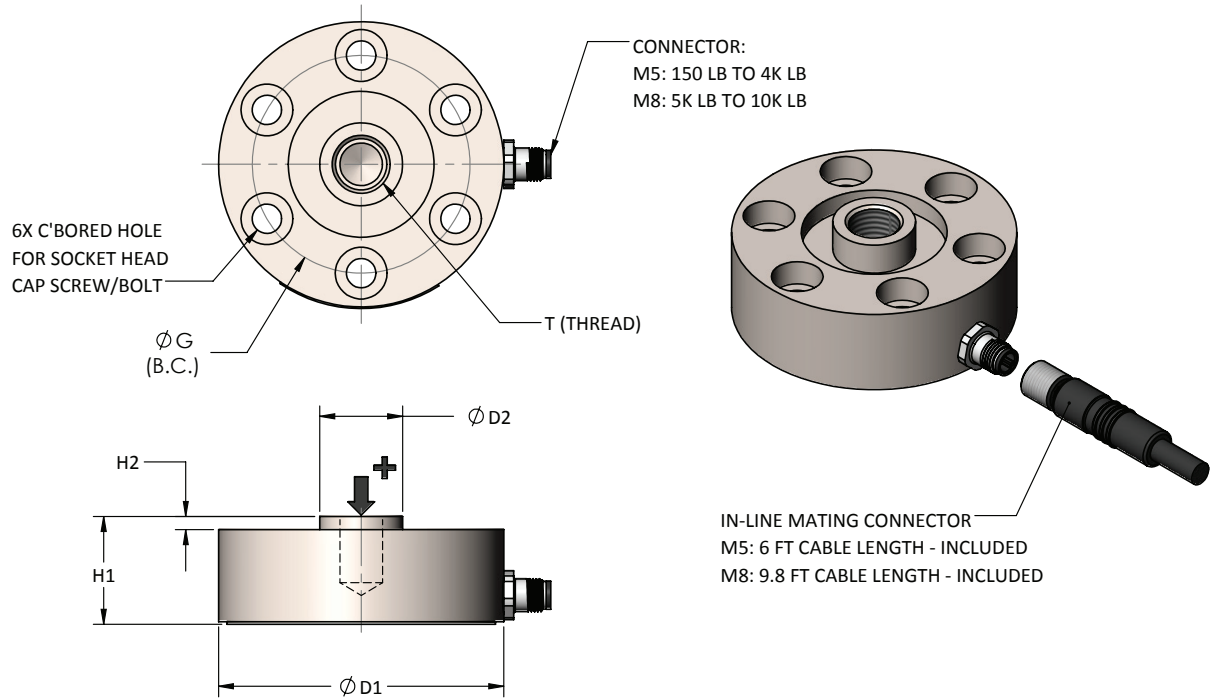


SIGNAL CONDITIONING

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

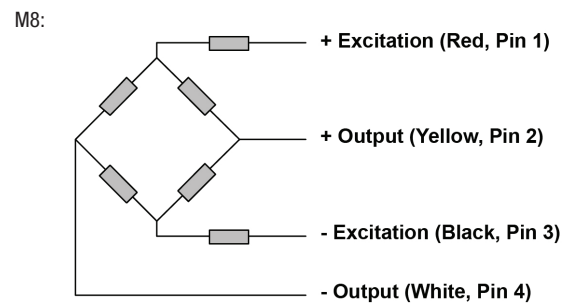
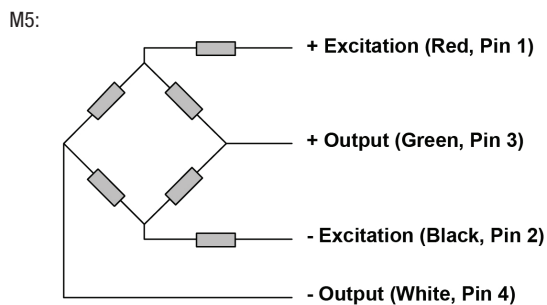
0-5 VDC
0-10VDC
±5 VDC
±10 VDC
4-20 mA
0-20 mA
RS-232
RS-422
RS-485
20 mA Serial Loop
Ethernet
Profibus DP
DeviceNet
CANOpen
ControlNet
Modbus RTU
Wireless



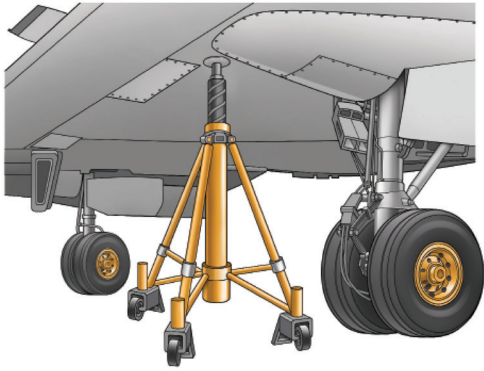
DIMENSIONS IN INCHES

Capacity (LB)	D1	D2	H1	H2	G (BC)	T(Thread)	Screw/Bolt Size	Recommended Bolt Torque	Deflect	Weight
150, 250, 500	1.72	0.50	0.65	0.08	1.312	5/16-24 UNF-2B X .33 DP	#8	25 IN-LB	0.002	0.8 LB
1K, 2K, 3K, 4K	2.35	0.85	1.00	0.12	1.800	1/2-20 UNF-2B X 0.52 DP	1/4"	90 IN-LB	0.002	1.4 LB
5K, 7.5K, 10K	3.47	1.26	1.50	0.12	2.650	3/4-16 UNF-2B X 0.77 DP	3/8"	25 FT-LB	0.002	3.0 LB

PL3 Wiring Diagram



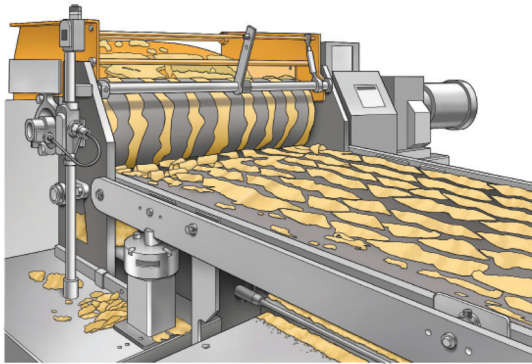
Aircraft Jack Stand



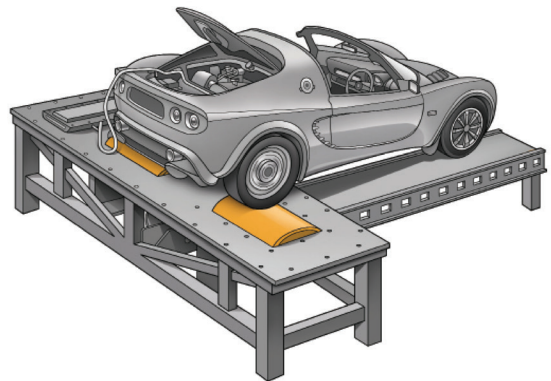
Environmental Test Load Stand



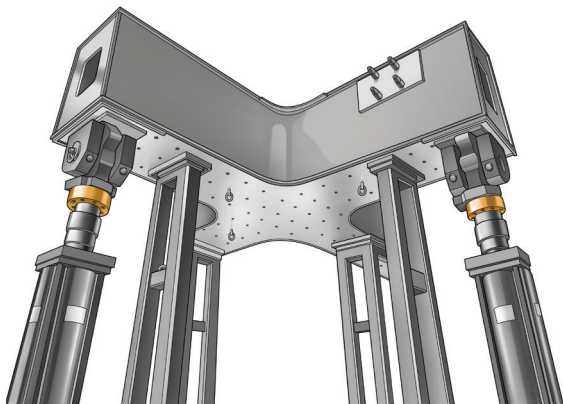
Extrusion Control



Dynamometer



Structural Test Lab



Pedal Force Measurements



- Base plates
- Load receivers
- 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 PL3 Series Compact Low Profile Load Cells are designed to be loaded in compression.
- The PL3 Series Load Cells are ideal for single or multiple load cell measurements typical of test and measurement, weighing, dynamic measurements, load testing systems and similar applications. When used in multiples, it is recommended that matched outputs be specified for optimum performance. Multiple load cell systems should include a Sentran summing/junction box to correctly multiplex the load cell excitation and measurement signals.
- The most common loading method is to apply a force axially via the integral load button. Load introduction is best accomplished using devices such as a flat plate, a loading cup or similar interface providing a hardened mating surface to point load on the load button radius. The mating surface should be a slightly softer material than the load cell to prevent brinelling of the load button surface.
- Off-axis loads and shock loading should be avoided as degraded performance and/or damage to the load cell could occur. The support for the Load Cell must be rigid with the following characteristics:
 - At least two or three times more rigid than the load cell.
 - Possess a clean, flat and parallel surface to within 0.001in. TIR.
 - A recommended surface finish of 63 micro-in.
 - A minimum hardness of Rockwell B-100.
 - The mounting side of the Load Cell must mate to the support surface.
- Mounting bolt torque values indicated on the data sheet should be used.
- 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.
- PL3 Series Compact Low Profile 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 LB rated capacity PL3 Series are designed to be used for measurements within the range of 0 to 1,000 LB. 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

WARNING!

- 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.

PERSONAL INJURY!

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

MISUSE OF DOCUMENTATION

- The information presented in this datasheet is for reference only. DO NOT USE this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

Legal Disclaimer

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