

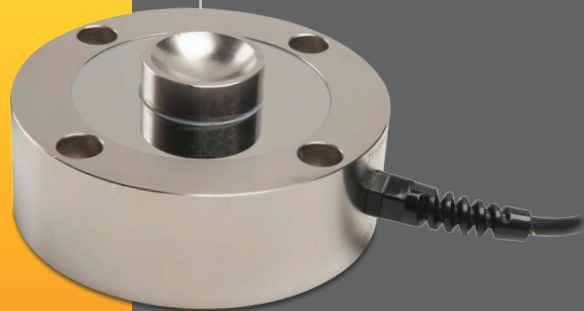


**SENTRAN**

## Low Profile Load Cell

# PD Series

**The PD Series is a high performance, low profile, strain gage load cell constructed of heat-treated alloy tool steel. The PD Series is designed to accurately measure compression loads ranging from 0-5000 lbs. to 0-100,000 lbs.**



The PD Series is a high performance, low profile, bonded foil strain gage load cell constructed of heat-treated alloy tool steel construction. The PD is designed to accurately measure compression forces in capacities ranging from 0-5,000 lbs. to 0-100,000 lbs. The shear web sensing design produces excellent performance, a very low profile, and reduced sensitivity to eccentric and side loading effects. The high output and low deflection of the PD Series combine to yield a high dynamic response and superior output resolution for applications in structural analysis, materials testing and process control. This load cell is Harsh Environment Sealed (IP67-Limited Immersion) by virtue of proprietary, multi-redundant barriers uniquely integrated to protect all internal components, including sealed stainless steel covers to protect the strain gage area. The attached cable is a durable polyurethane-jacketed cable with a tinned-copper braided shield for mechanical protection and to minimize the effects of RFI and EMI. Optional cable assemblies are available with mating connectors, including durable polyurethane or Teflon® jacketed cables. The attributes of the PD make it ideal for measurements in the laboratory, structures testing, materials testing, process control and for general force measurements where a compact, low profile precision tension and compression load cell solution is needed.



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

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### APPLICATIONS

- Platform Scales
- Hopper and Vessel Weighing
- Motor Truck Scales
- Compression Measurements
- Laboratory Test & Measurement
- Aerospace - Jack Stands

### FEATURES

- 5,000 to 100,000 lbs. Capacities
- Compact Low Profile Design
- High Output - Low Deflection
- 0.1 Accuracy Class
- High Frequency Response
- IP67 Environmental Sealing
- FM Approved
- Alloy Tool Steel Construction
- Two Year Warranty

# PD Series Specifications

Innovative Measurement Solutions



## PERFORMANCE

Rated Capacities <sup>(1)</sup> (lbs.)	5K, 10K, 25K, 50K, 100K
Rated Output (FSO)	4 mV/V
Output Tolerance	± 0.25 % R.O.
Combined Error Band	≤ 0.05 % FSO
Non-Linearity	≤ 0.05 % FSO
Hysteresis	≤ 0.05 % FSO
Non-Repeatability	≤ 0.02 % of load
Zero balance	± 1.0 % FSO
Creep (20 Minutes)	0.03% of Load

<sup>(1)</sup> ("K" = thousand)

## MECHANICAL

Material	Alloy Tool Steel
Finish	Electroless Nickel Plated
Safe overload	Compression 150 % FSO Side Load 150% FSO
Ultimate overload	Compression 300% FSO Side Load: 200% FSO
Deflection	See Dimensions Page
Weight	See Dimensions Page
Mounting Bolt Torque	<a href="#">Torque Table</a>

## ELECTRICAL

Input Impedance	385 ±5 ohms (nominal)
Output Impedance	350 ±3 ohms (nominal)
Insulation Resistance	>5000 Megohms @ 50VDC
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, 22 AWG, Polyurethane Jacket, Tinned Copper Braid, Diameter: 0.220"
Cable Length	See Dimensions Table
Cable Termination	Finished Conductors
Cable Seal	Compression Fitting/Strain Relief

## ENVIRONMENTAL

Temperature, Operating	-4 to +140 °F (-20 to +60°C)
Temperature, Compensated	14 to +104 °F (-10 to +40°C)
Temperature, Storage	-40 to +170 °F (-40 to +77°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	
Intrinsically Safe:	Class I, II, III; Div.1 Groups A-G
Non-Incendive:	Class 1; Div.2 Groups A-D

# PD Typical System Configuration

## SENSING LOAD CELL(S)



## SIGNAL CONDITIONING

Analog Transmitters



Serial Transmitters



Digital Indication



Process Control



Batch Control

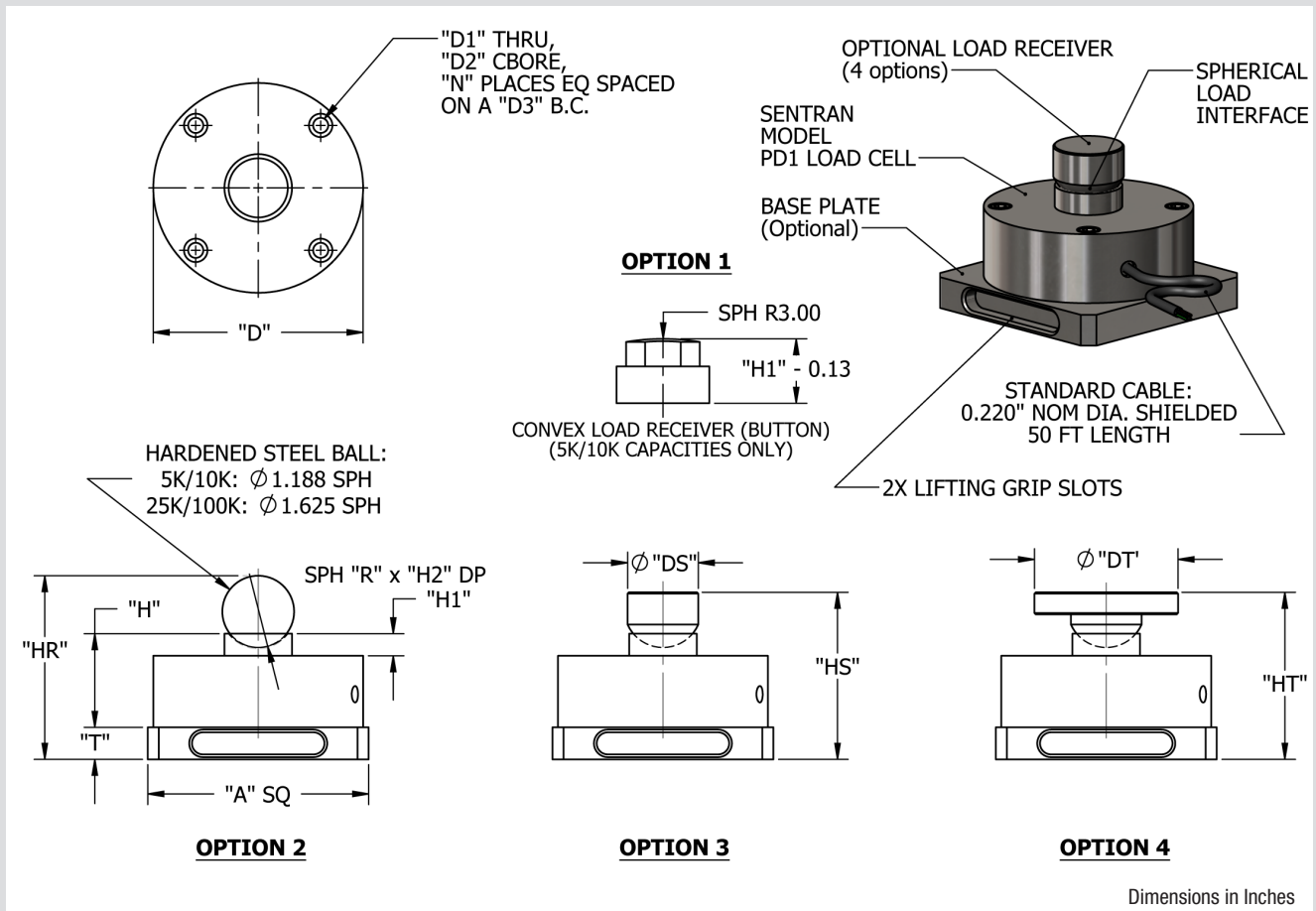


Data Acquisition



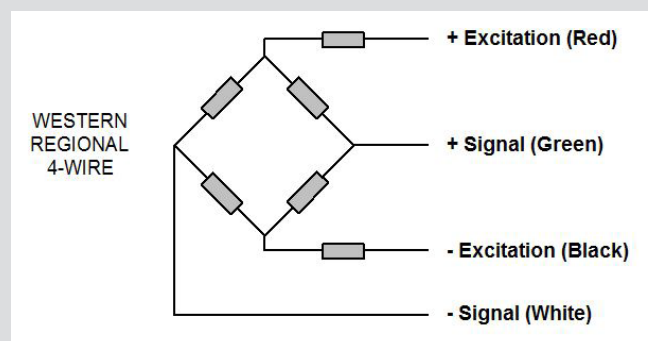
## OUTPUT OPTIONS

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



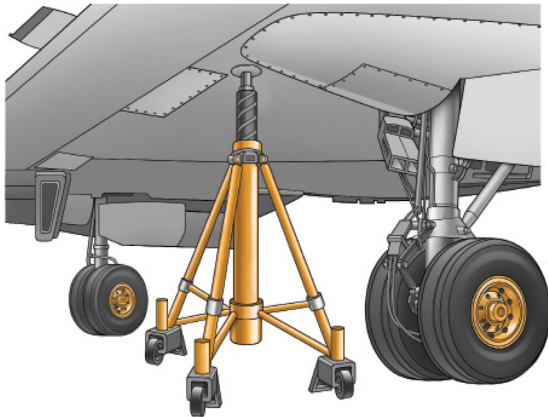
Capacity (LB)	D	H	H1	H2	R	D1	D2	D3	N	A	DS	DT	HR	HS	HT	T	Deflect	Weight
DIMENSIONS (INCHES)																		
5K, 10K	4.12	1.37	0.12	0.25	0.625	0.28	.41 X 28 DP	3.50	8	4.50	1.00	2.75	3.41	2.81	3.25	0.60	0.010"	4.0 LBS
25K, 50K	4.75	2.12	0.50	0.31	0.875	0.34	.51 X .38 DP	4.00	4	5.00	1.60	3.25	4.17	3.29	3.79	0.72	0.010"	7.5 LBS
100K	5.43	2.25	0.25	0.31	0.875	0.41	.63 X .40 DP	4.60	8	6.00	1.60	4.25	4.55	3.67	4.42	0.97	0.010"	11.0 LBS

## PD Wiring Diagram

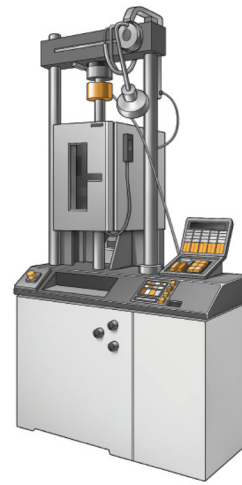




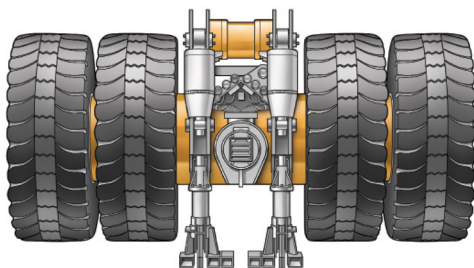
Aircraft Jack Stand



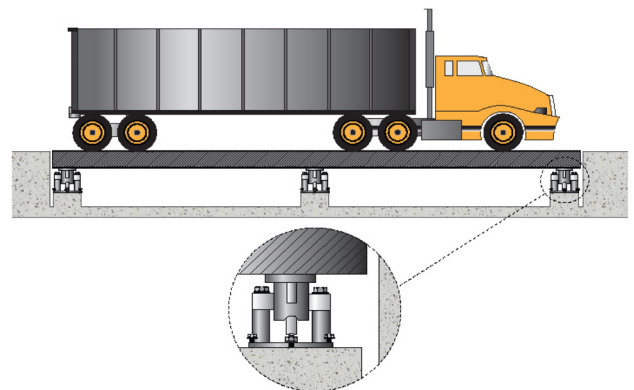
Environmental Test Load Stand



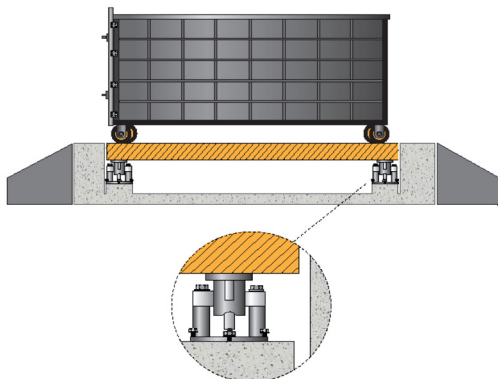
Mining Truck Jack Stand



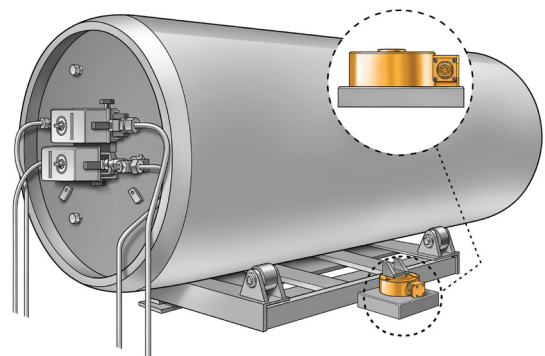
Truck Scale



Container Scale



Tank Weighing Dispersion Control





- 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 PD Series Low Profile Load Cells are designed to be loaded in compression.
- The PD 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 loading cup. Load introduction is best accomplished via one of the optional load receivers shown on this data sheet.
- 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. Mounting bolt torque values are not critical and have no effect on the load cell calibration, since they bear virtually no load. In some applications, such as checking the forces generated in hydraulic presses, mounting bolts may be omitted altogether.
- 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.
- PD Series 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 lbs. rated capacity PD Series 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

### 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](http://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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