SENTRAN

Low Profile Load Cell

# PK3 Series

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## APPLICATIONS

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

## FEATURES

- 100 LB to 100K LB Capacities
- 0.15% Accuracy Class
- mV/V Full Scale Output
- M5 or M8 Connector with Mate/Cable
- Miniature Compact Size
- IP67 Environmental Sealing
- Stainless Steel Construction
- Enhanced Diaphragm Design
- Compression Only

ISO 9001:2015 CERTIFIED · IP 67 · RoHS COMPLIANT · CE

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

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# PK3 Series Specifications

*Innovative Measurement Solutions*

| PERFORMANCE | |
|---|---|
| Rated capacities [1] (LB) | 100, 250, 500, 1K, 2K, 3K, 4K, 5K, 7.5K, 10K, 15K, 20K, 30K, 50K, 75K, 100K |
| Rated Output (FSO) | 2 mV/V |
| Output Tolerance | Nominal |
| Combined Error Band | ≤ 0.15 % FSO |
| Non-Linearity | ≤ 0.15 % FSO |
| Hysteresis | ≤ 0.15 % FSO |
| Non-Repeatability | ≤ 0.05 % |
| Zero balance | ≤ 3.0 % FSO |
| Creep (20 Minutes) | ≤ 0.05% of Load |

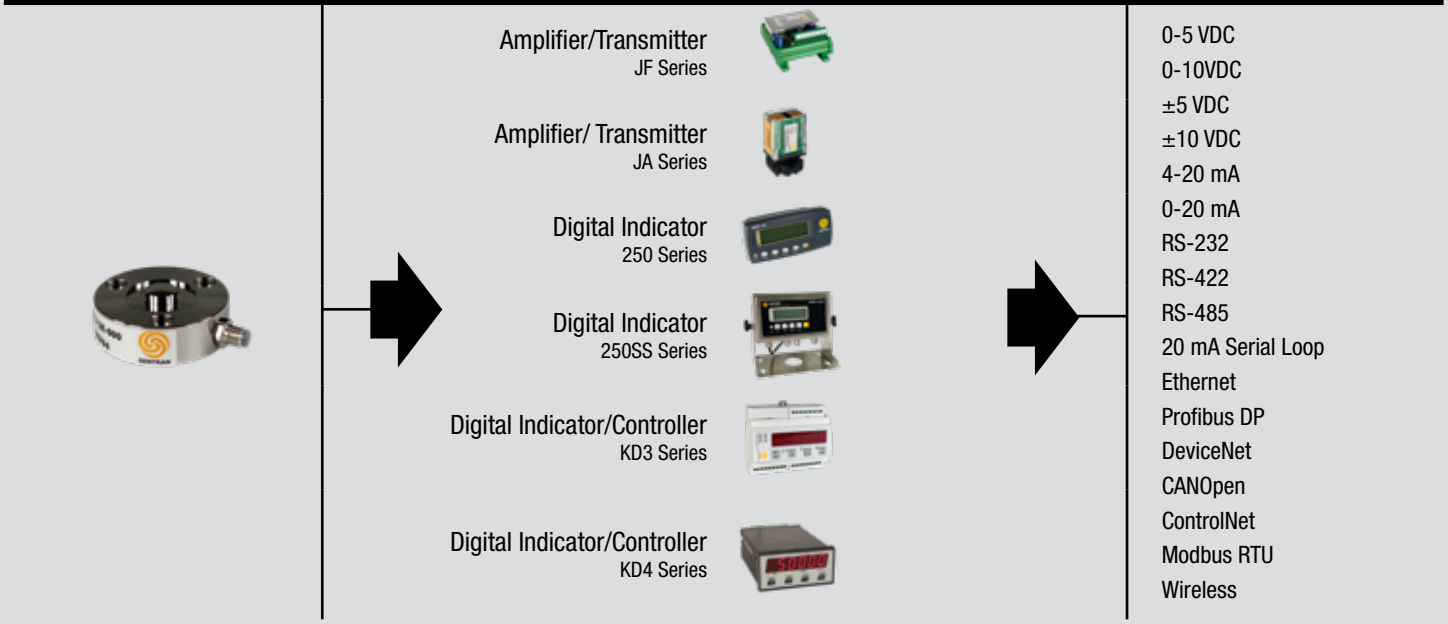
*[1] ("K" = thousand)*

| MECHANICAL | |
|---|---|
| Material | Stainless steel |
| Finish | Natural |
| Safe overload | Compression 150 % FSO<br>Side Load 10% FSO |
| Ultimate overload | Compression 300% FSO<br>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 | 100 LB to 30K LB:4-conductor, 28 AWG, TPU Jacket, M5 Axial Female Connector, Diameter: 0.130"<br>50K LB to 100K LB:4-conductor, 24 AWG, PVC Jacket, M8 Axial Female Connector, Diameter: 0.217" |
| Cable Length | See Dimensions Table |
| Cable Termination | Finished Conductors |

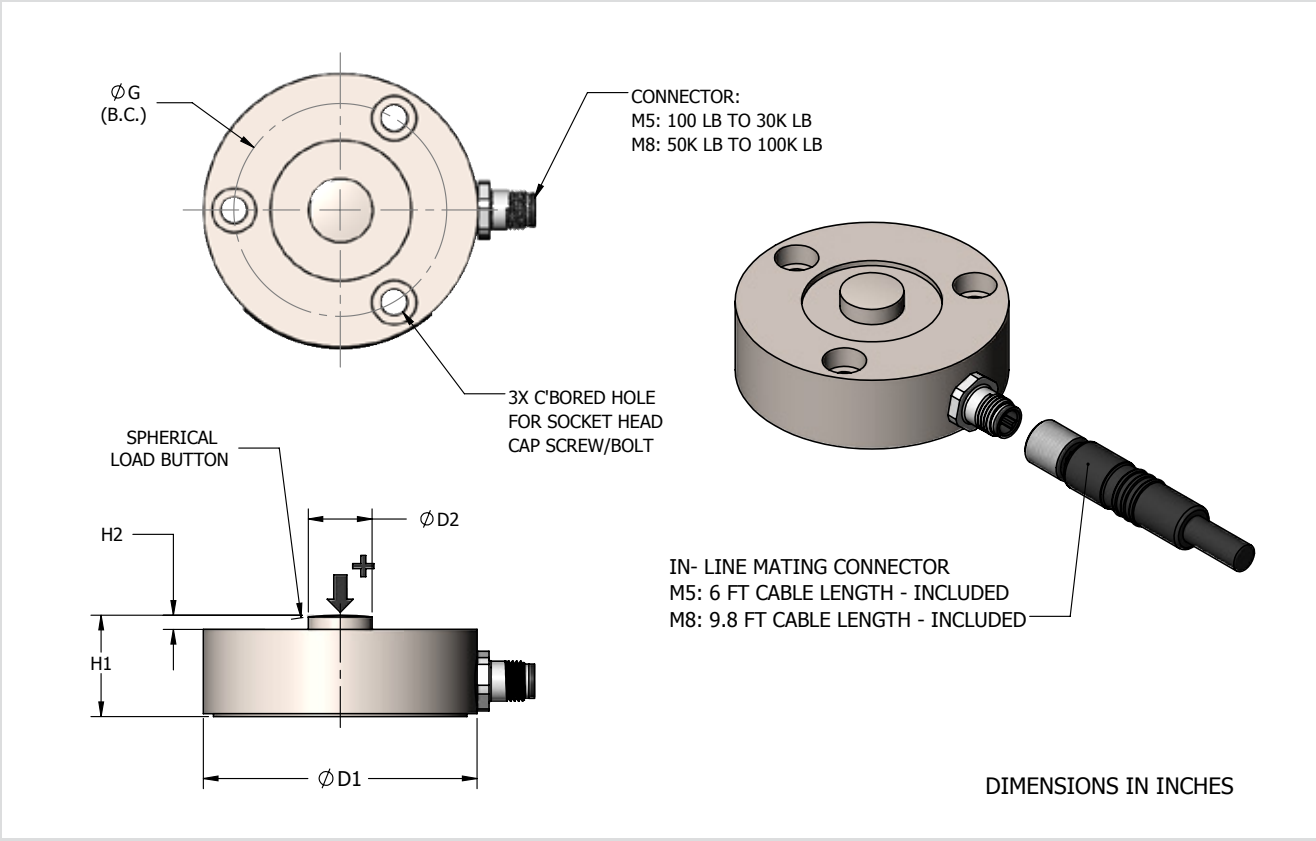
| ENVIRONMENTAL | |
|---|---|
| Temperature, Operating | -50 to +175 °F (-45 to +79°C) |
| Temperature, Compensated | 14 to +104 °F (-10 to +40°C) |
| Temperature, Storage | -50 to +175 °F (-45 to +79°C) |
| Temperature Effects | Zero < 0.005% FSO/°F<br>< 0.009% FSO/°C |
| Temperature Effects | Output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

# PK3 Typical System Configuration



# PK3 Dimensions

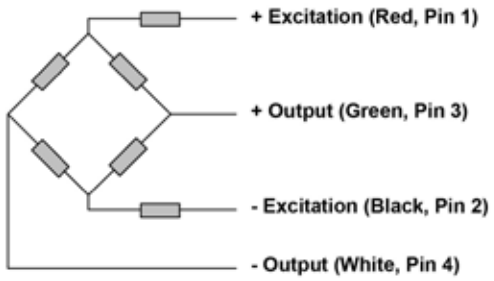




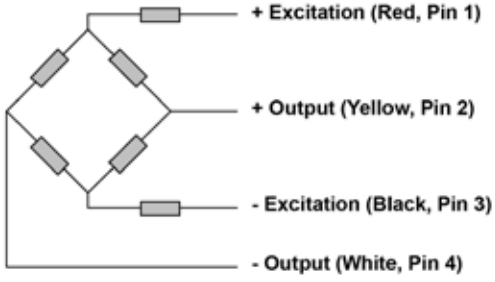

| Capacity (LB) | D1 | D2 | H1 | H2 | G | Screw/Bolt Size | Recommended Bolt Torque | Deflect | Weight |
|---|---|---|---|---|---|---|---|---|---|
| 100, 250, 500, 1K, 2K | 1.35 | 0.32 | 0.50 | 0.07 | 1.050 | #4 | 8 IN-LB | 0.001 | 0.5 LB |
| 3K, 4K, 5K, 7.5K, 10K | 1.72 | 0.40 | 0.65 | 0.08 | 1.313 | #6 | 15 IN-LB | 0.001 | 0.5 LB |
| 15K, 20K, 30K | 2.35 | 0.60 | 1.00 | 0.12 | 1.875 | #8 | 27 IN-LB | 0.002 | 1.0 LB |
| 50K, 75K, 100K | 3.97 | 1.50 | 1.63 | 0.18 | 3.125 | 5/16 | 17 FT-LB | 0.003 | 4.5 LB |

# PK3 Wiring Diagram

M5:




M8:



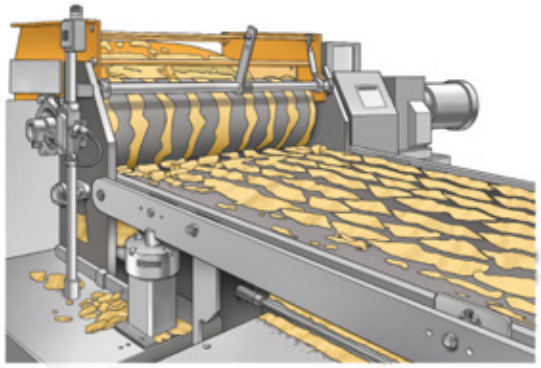
# Application Examples



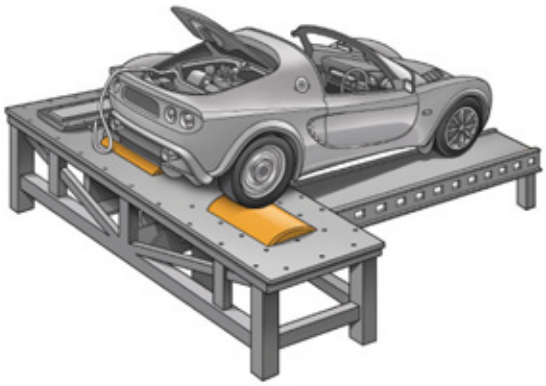
## Aircraft Jack Stand

## Environmental Test Load Stand

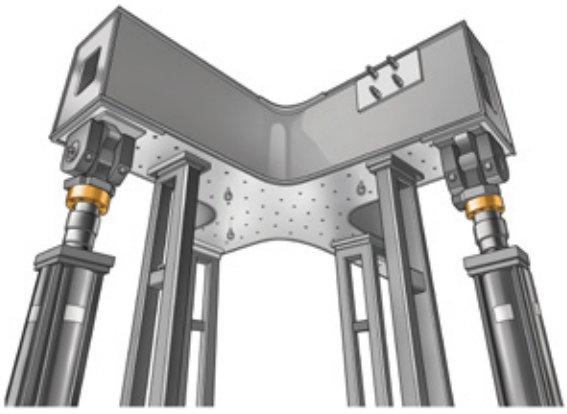
## Extrusion Control



## Dynamometer



## Structural Test Lab



## Pedal Force Measurements

## Available Options

- 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 PK3 Series Compact Low Profile Load Cells are designed to be loaded in compression.
- The PK3 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.
- PK3 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 PK3 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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