

DUAL SHEAR LOAD PIN SPECIFICATION WORKSHEET



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SENTRAN specializes in non-standard, application-specific measurement solutions, particularly in the Load Pin product segment, where "standard" solutions are often not adequate to meet customer requirements.

SENTRAN Load Pins are generally a Dual Shear design, Center-Loaded and End-Supported. The Load Pins are instrumented internally utilizing unique, proprietary techniques for precise positioning of strain gauges along the Load Pin neutral axis to create a Full Wheatstone Bridge configuration. To ensure proper orientation of the Load Pin when installed, an Anti-rotation or Keeper device is typically incorporated.

LOADING INFORMATION		Please indicate total number of pins required per the following specification:
1.	What is the SYSTEM ACCURACY requirement?	_____ lbs / _____ kg
2.	What is the DEAD WEIGHT (DW) load anticipated?	_____ lbs / _____ kg
3.	What is the LIVE LOAD (LL) product weight?	_____ lbs / _____ kg
4.	What is the LOAD PIN APPLICATION?	Clevis <input type="checkbox"/> Sheave <input type="checkbox"/> Pulley <input type="checkbox"/> Shackle <input type="checkbox"/>
5.	What is the TYPE OF LOADING?	Static <input type="checkbox"/> Dynamic <input type="checkbox"/> Impact <input type="checkbox"/> Fatigue <input type="checkbox"/>
6.	What is the MAXIMUM LOAD REQUIREMENT?	_____ lbs / _____ kg
7.	What is the LOADING CONFIGURATION? (See Item #15)	Single Axis (Constant Wrap Angle) <input type="checkbox"/> Bi-Axial (Variable Wrap Angle – Two @ 90°) <input type="checkbox"/>
ENVIRONMENTAL CONSIDERATIONS		
8.	What will the Load Pin AMBIENT CONDITIONS be?	Indoor <input type="checkbox"/> Outdoor <input type="checkbox"/> Submerged* <input type="checkbox"/> Marine* <input type="checkbox"/> <small>*Provide specific details on a separate sheet.</small>
9.	What is the TEMPERATURE RANGE (Specify F or C)?	Compensated: _____° to _____° Operating: _____° to _____° Storage: _____° to _____°
10.	Is there a HAZARDOUS ENVIRONMENT classification?	<input type="checkbox"/> No <input type="checkbox"/> Yes (If "yes", Indicate Class/Division/Group below) Class I/II/III; Division 1 or 2; Group A, B, C, D, E, F & G



PERFORMANCE CONSIDERATIONS (continued)	
<p>14. Is there a preferred CABLE/CONNECTOR LOCATION?</p> <p><input type="checkbox"/> 1 (Standard - Axial Location)</p> <p><input type="checkbox"/> 2</p> <p><input type="checkbox"/> 3</p> <p><input type="checkbox"/> 4</p> <p><input type="checkbox"/> 5</p>	
LOAD PIN CONFIGURATION AND LAYOUT	
<p>15. What is the DIRECTION OF LOAD?</p> <p>1) Load angle in degrees: _____°.</p> <p>2) <u>Clevis Pins Only</u>: Indicate load direction and keeper slot location (For variable load direction, indicate range of load angle.).</p> <p>3) <u>Sheave Pins Only</u>: Indicate wrap angle and keeper slot location (For variable wrap angle, indicate range of load angle.).</p>	
<p>16. If the requirement is for a CLEVIS BOLT, specify thread size.</p>	<p>Thread Size: _____</p>
<p>17. Please specify all PIN DIMENSIONS:</p> <p>D1 – Diameter of Load Pin/Bolt: _____</p> <p>D2 – Diameter of Clevis/Sheave Eye Bore: _____</p> <p>L1 – Width of Clevis: _____</p> <p>L2 – Width of Clevis Cheeks: _____</p> <p>L3 – Width of Sheave/Clevis Eye: _____</p>	
<p>18. Is DUAL BRIDGE a requirement?</p>	<p><input type="checkbox"/> No <input type="checkbox"/> Yes (If "yes", Specify purpose of second bridge.)</p>



PERFORMANCE CONSIDERATIONS		
11.	Load Pin OUTPUT?	0.5/1.0/2.0 mV/V <input type="checkbox"/> 4-20 mA <input type="checkbox"/> 0-10 VDC <input type="checkbox"/> Other <input type="checkbox"/>
12.	What are the CABLE requirements?	Attached <input type="checkbox"/> Length _____ Ft. Other <input type="checkbox"/>
13.	Is there a CONNECTOR requirement?	On Pin <input type="checkbox"/> On Cable <input type="checkbox"/> Length _____ Ft. Mating Half <input type="checkbox"/>

INSTRUMENTATION REQUIREMENTS		
19.	Is CONTROL INSTRUMENTATION required?	Display/Keypad <input type="checkbox"/> No Display <input type="checkbox"/> Control <input type="checkbox"/> Load Only <input type="checkbox"/>
20.	Is a COMMUNICATIONS/SIGNAL INTERFACE needed?	Analog <input type="checkbox"/> Serial <input type="checkbox"/> Fieldbus <input type="checkbox"/> (Indicate type below): ProfiBus <input type="checkbox"/> DeviceNet <input type="checkbox"/> ModBus <input type="checkbox"/> Ethernet <input type="checkbox"/> Other <input type="checkbox"/>
21.	Where Is CONTROL INSTRUMENTATION located?	Control Room <input type="checkbox"/> Process Area <input type="checkbox"/> Stand Alone <input type="checkbox"/>
22.	What is the preferred MOUNTING CONFIGURATION?	Wall <input type="checkbox"/> Panel <input type="checkbox"/> Din Rail <input type="checkbox"/>
23.	Will the instrumentation be connected to an INDUSTRIAL CONTROL SYSTEM and/or LAN?	<input type="checkbox"/> PC <input type="checkbox"/> PLC <input type="checkbox"/> DCS <input type="checkbox"/> Other _____

24.	Is there an ANALOG SIGNAL OUTPUT requirement?	No <input type="checkbox"/> 4-20mA <input type="checkbox"/> 0-20mA <input type="checkbox"/> 0-10VDC <input type="checkbox"/> 0-5VDC <input type="checkbox"/> Other _____
25.	Are there SERIAL INTERFACE REQUIREMENTS requirements?	No <input type="checkbox"/> RS-485 <input type="checkbox"/> RS-422 <input type="checkbox"/> RS-232 <input type="checkbox"/> Other _____
26.	What are the POWER requirements?	115VAC <input type="checkbox"/> 230VAC <input type="checkbox"/> 50HZ <input type="checkbox"/> 60HZ <input type="checkbox"/> 12VDC <input type="checkbox"/> 24VDC <input type="checkbox"/> Other _____
27.	Is SETPOINT CONTROL a requirement?	No <input type="checkbox"/> Yes <input type="checkbox"/> How many? _____
28.	Is a REMOTE DISPLAY required?	No <input type="checkbox"/> Yes <input type="checkbox"/> LED <input type="checkbox"/> LCD <input type="checkbox"/> Scoreboard <input type="checkbox"/> Distance from control system? _____
29.	What NEMA RATING is required?	<input type="checkbox"/> 12/13 <input type="checkbox"/> 4 <input type="checkbox"/> 4X <input type="checkbox"/> Other _____
30.	Please provide any additional APPLICATION INFORMATION that is available, including drawings, sketches, photos and specifications.	



TYPICAL LOAD PIN SPECIFICATIONS

PERFORMANCE:

Rated capacities ⁽¹⁾ (lbs.):	2K to 500K+
Rated output (FSO)	0.5, 1, 2 mV/V (nominal)
Combined error	= 0.50 % FSO
Non-linearity	= 0.30 % FSO
Hysteresis	= 0.20 % FSO
Non-repeatability	= 0.10 % FSO
Side Load Rejection Ratio	= 500:1
Creep (30 minutes)	= 0.05% of load
Zero balance	= 2.0 % FSO
Zero return (30 minutes)	Better than 0.05 % FSO

⁽¹⁾ (*K* = thousand)

ELECTRICAL:

Input impedance (ohms)	380 – 800 (nominal)
Output impedance (ohms)	350 – 700 (nominal)
Insulation resistance (ohms)	>1,000 M @ 50VDC
Excitation Voltage (AC/DC)	10 V (15 V maximum)
Cable Color code:	+ Excitation (red) - Excitation (black) + Output (green) - Output (white) + Remote Sense Option (Blue) - Remote Sense Option (Brown) Shield (bare)
Cable type	4-conductor; 22 AWG; tin-copper, braided shield; polyurethane jacket
Cable termination	Finished conductors

MECHANICAL:

Material:	Alloy tool steel (LA1) Stainless Steel (LA3)
Finish:	Electroless nickel (LA1) Electro-polished (LA3)
Safe overload	Compression/Tension: 200% FSO Side load: 100% FSO
Ultimate overload	Compression/Tension: 400% FSO
Side load: 200% FSO	

ENVIRONMENTAL:

Temperature, operating	0 to +175 °F (-18 to +79°C)
Temperature, compensated	40 to +150 °F (4 to +65°C)
Temperature effects:	Zero < 0.0020% FSO/°F < 0.0036% FSO/°C Output < 0.0020% of Rdg./°F < 0.0036% Rdg./°C
Sealing	IP67, Multi-redundant; IP66/68, Hermetic (option)