

# Force Magnitude Load Pin

## LM-LP

**Proven technology developed by and exclusive to DLM; the Force Magnitude technology has been tried and tested in multiple applications and can be applied to various designs of shear pin load cell.**

Making use of DLM's intelligent Sirius amplifier mounted internally within a dual bridge load pin, the Force Magnitude technology enables the client to have a load pin which can read load in any direction across a 110 degree range.

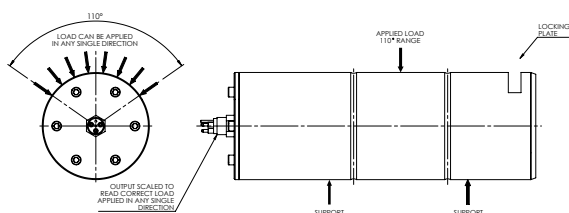
Typical load pins are required to be fitted so that the load is applied in one plane on the pin and will not produce accurate load readings if load is applied outside this plane. However, with Force Magnitude technology the load can be applied and accurately read in various locations around the pins central axis, eliminating the need for a load direction and preventing constraints to clients mounting arrangements.



### Features:

- Ability to measure magnitude of load in varying directions around the load pin
- Wide application area of 110°
- Optional signal outputs of a single 4-20mA or RS485
- DLM proprietary design

### Dimensional Data



### Applications:

- Subsea vehicles
- Stinger load monitoring
- Moorings
- Applications where the load direction changes

For a given load applied in any single direction within the load application region, the Force Magnitude Shear Pin Load Cell will output a consistent calibrated 4-20mA output where 4mA=0t and 20mA = WLL, or R485 MODBUS output. This removes the need to have a load direction on the Shear Pin Load Cell and allows for use in application with a varying load direction.

## Specification

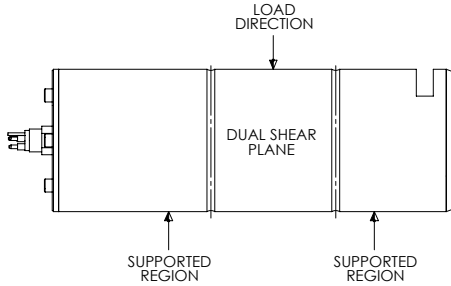
<b>Pin Material:</b>	17-4PH H1150 + 1150 stainless steel
<b>Bridge Resistance:</b>	350Ω - 1000Ω
<b>Accuracy:</b>	<1% FS across combined angles
<b>Load ratings:</b>	50t - 2000t
<b>Operating Temperature:</b>	-40 to +60 °C
<b>Internal Amplifier:</b>	Sirius 4-20mA 3 wire amplifier or RS485 MODBUS enabled with Force Magnitude Technology. See Sirius datasheet for further information
<b>Input Voltage:</b>	12-30VDC for internal amplifier
<b>Degree of protection:</b>	<ul style="list-style-type: none"> <li>• Subsea variant available with face and barrel O-Ring sealed end caps for subsea rated protection</li> <li>• IP67 available with O-Ring sealed end caps and gland cable connection</li> </ul>
<b>Connection options (client specific):</b>	46.5MBORA connector / Impulse MCBH-3-MP-SS / IP67 cable gland and cable / customer specified connector
<b>Certification:</b>	Supplied with calibration, proof load and test certificates to BS EN ISO 7500-1:2018 and material certification to 3.1 or 3.2 upon request
<b>Output Type:</b>	4-20mA scaled to WLL / RS485 MODBUS / RS485 ASCII

Note: Force Magnitude load pin can only work with certain size load pins. Contact DLM to discuss feasibility of load pin design.

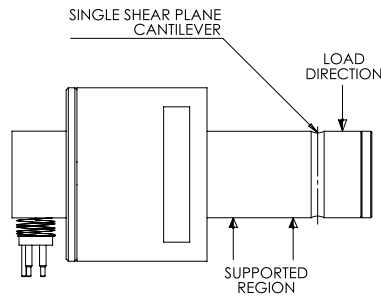
# Custom Load Pin Design Options

## Custom Load Pin design options

### 1. Dual shear plane type

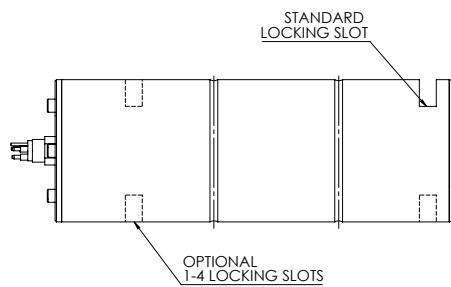


### 2. Single shear plane cantilever pin

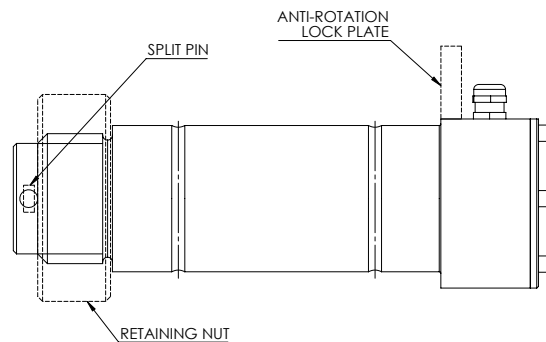


## Locking options

### 1. Lock plate (1 to 4 locking slots)

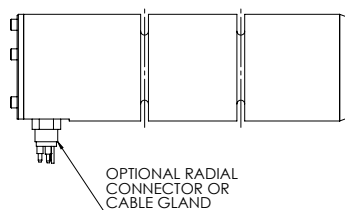


### 2. Anti-Rotation – thread and nut split pin

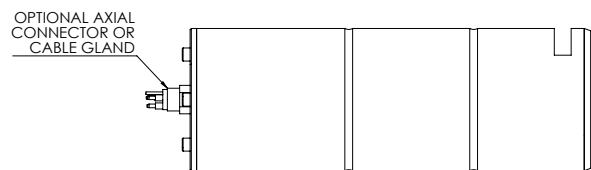


## Cable entry options

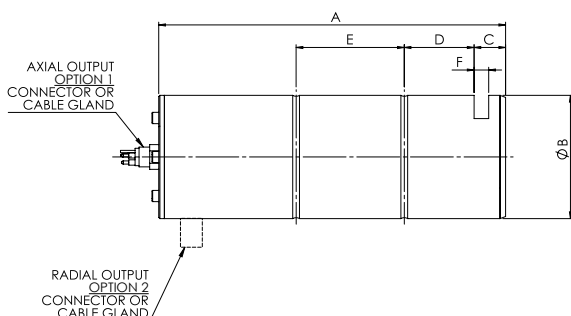
### 1. Radial – connector or cable gland



### 2. Axial – connector or cable gland



## Dimensional Data



## Features:

- Stainless steel construction
- FEA verified designs
- Down hole gauged for high protection
- IP67/IP68 ratings and robust construction
- Removable end caps for easy serviceability and excellent sealing