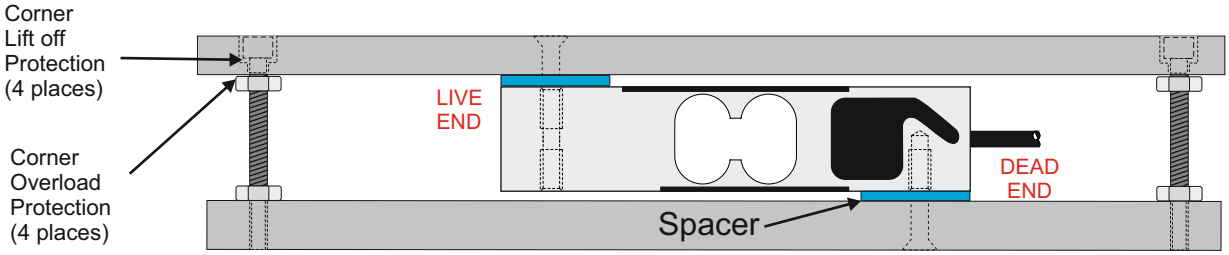
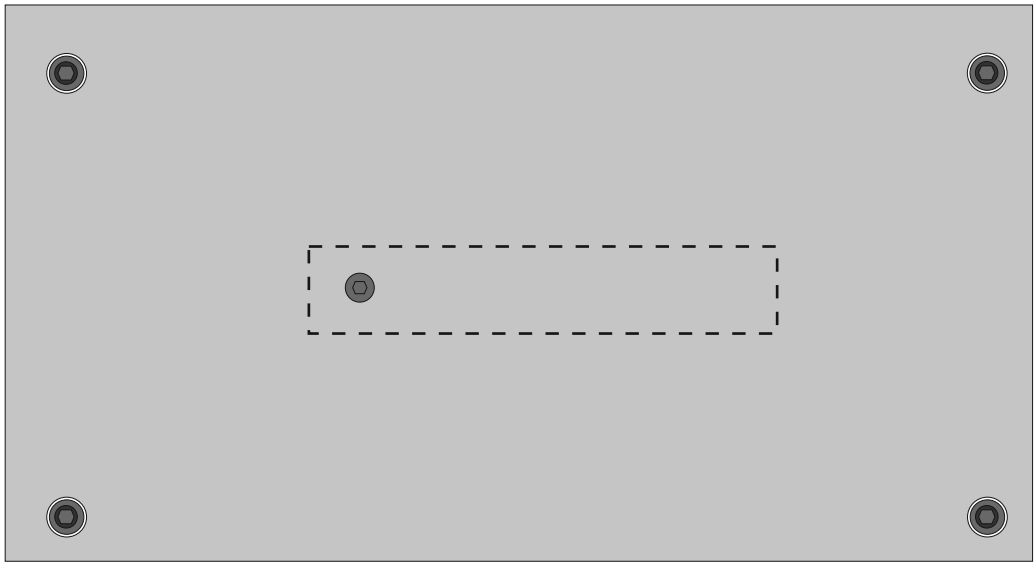
# APPLICATION NOTES MODEL PC30 LOAD CELL

## Mechanical Mounting




Side View



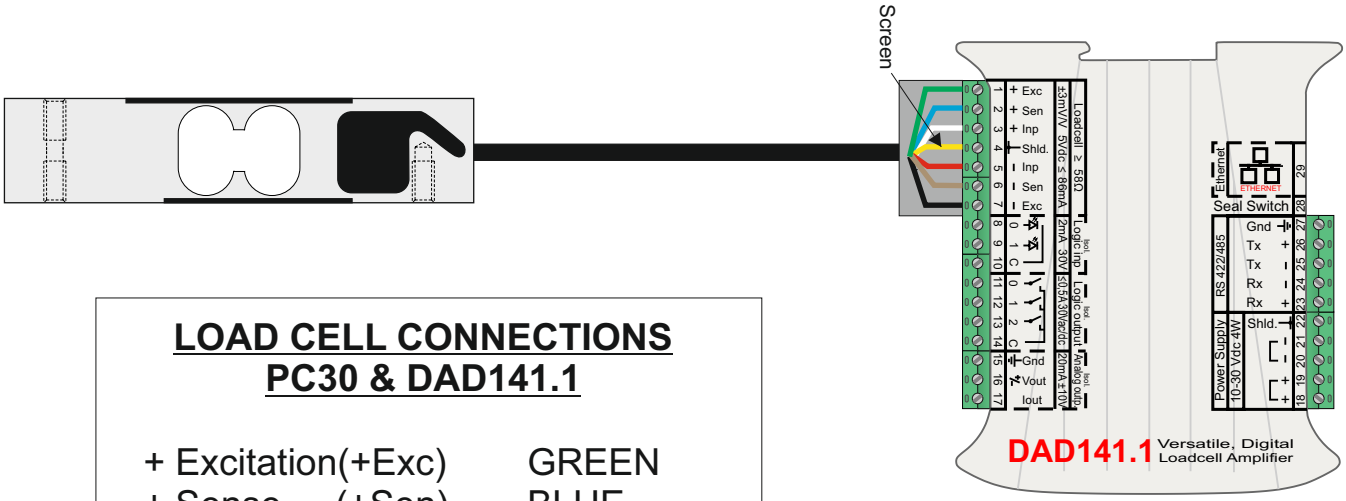
Top View

## PC30 TYPICAL OVERLOAD & LIFT OFF PROTECTION

The model PC30 load cell is designed to be used in platform applications where the load can be ‘off-centre’. A very simple scale can be constructed by mounting the load cell between two flat plates. When load is applied, the mechanical structure of the load cell actually bends or deflects. As this load cell has no built in steps on the upper and lower faces, you will need to fit spacers or create a gap top and bottom which will allow the load cell to bend freely when load is applied. Typical deflection of this type of load cell is < 0.4 mm (measured directly under the live end of the load cell) when full load is applied. Once the load moves off-centre the amount of deflection will increase due to the twisting effect caused by the off-centre load. Overload stops are recommended on the corners of the platform to limit the amount of movement. To set these stops accurately we recommend applying a load of say 25% more than you would normally want to weigh over one of the corners then wind up the overload stop until you just see the weight value on the display start to decrease. You then know that the stop is just touching. Lock the stop in place and repeat for the other 3 corners. Under-load can also be a problem. This is where the platform is picked up by the top plate and the load cell is effectively bent backwards. To overcome this you can fit corner under-load stops which limit the vertically upwards movement of the load cell. This can take the form of a bolt coming up from the base plate with the head of the bolt recessed into the top plate. A small clearance gap all round the bolt head allows the load cell to bend without the top plate fouling on the bolt head. The bolt can be screwed further into the base plate to reduce the gap between the under side of the head and the recess in the top plate.

# Electrical Wiring

## Example : PC30 with DAD 141.1 Amplifier




**LOAD CELL CONNECTIONS**
**PC30 & DAD141.1**

| | | |
|---|---|---|
| + Excitation | (+Exc) | GREEN |
| + Sense | (+Sen) | BLUE |
| + Signal | (+Inp) | WHITE |
| Shld | Shown as | YELLOW |
| - Signal | (-Inp) | RED |
| - Sense | (- Sen) | BROWN |
| -Excitation | (-Exc) | BLACK |

# Calibration

The output signal from a load cell is proportional to both the load applied and the excitation voltage. The the Output at Rated Load (or ORL for short) is set during manufacturing and is nominally 2mV/V or 3mV/V for most load cells. This means that when full load is applied the output signal will change by 2mV (or 3mV) for each volt of excitation provided by the instrumentation. So if a load cell has an ORL of 2.0010 mV/V for example and the excitation voltage from the instrumentation is 5 V, the actual change of output signal when full load is applied will be 10.005 mV (2.0010 mV x 5V). Calibration of a system involves applying known weights to the load cell and adjusting the instrumentation so that it reads the correct values. Normally this is done in two stages. Firstly setting the zero. The system should be empty - no load on the scale. Adjust the instrumentation so it reads zero. Apply a known load which is close to the system capacity and then adjust the instrumentation to read the same value. With digital instrumentation, the calibration is normally complete after these two stages. With analogue instrumentation, the process may need to be repeated a couple of times as the zero offset of the amplifier can shift if the amplifier gain is changed significantly.

# Expected Accuracy & Resolution

When mounted correctly and using good quality electronics, you should be able to achieve a resolution of 1 part in 10,000 of the load cell capacity. So for instance if you have a 20 kg load cell you should be able to increment in 2g steps (20,000g/10,000). The accuracy will depend on the grade and the load cell grade, utilisation and whether or not the application is approved for trade or not.