

The HB-SP12A/D surge protection device protects load cell and weighing system installations from possible malfunctions or damage to individual strain-gauge bridges of associated electronic instrumentation etc. caused by severe overvoltages or impulse currents on signal cabling.

Weighbridges, silos and other product batching plant, weighing facilities are typically large metal structures, and are very exposed to direct lightning strikes. Protecting the structure from lightning is not in itself sufficient to prevent the secondary damage to associated electronic systems. Inside individual load cells, strain-gauge bridge insulation may break down under the abrupt shift in local structural voltage as lightning currents are dissipated to local ground, allowing surge currents to flow through the connecting cable into the various indicators and power supplies situated some distance away. The connecting cabling can be armoured, shielded and underground it will make little difference to the transient voltage across the system.

Potentially destructive surges can also be generated from a variety of other sources, including power cable faults, heavy electrical load switching, and other electrical malfunctions, while most factory and plant environments also create significant electrical noise from normal operations such as arc-welding and heavy machinery.

The HB-SP12 protect the system at the point of installation only, so a full system is likely to have at least one SP12 device installed at the weighbridge to protect the load cell(s), and another SP12 in the weighing control cabin to protect the electronics installed there. Additional protection should also be provided for any other systems interconnected with the weighing package eg. remote computer links, data-communications via telephone lines, etc.

## System connections

Load cells (LC) are sometimes used individually, though typically several load cells from part of a weighing system. Field wiring is usually brought together at a field junction box (JB), where individual conditioning resistors balance particular cells. The SP12 does not affect this system calibration, nor the accuracy claims of most system suppliers. The SP12 connects in series with the system wiring as indicated in fig 1. In those few systems where load cells are individually wired back to the indicating electronics, separate protectors are necessary per load cell.

## Grounding

No specific grounding rods are necessary around the weighbridge; the normal earthing of the structure is more than adequate. The aim is to prevent breakdown through load cells, rather than the achievement of an arbitrarily low structural earth.

Load platforms are usually metallic and continuous, with bonding cables installed across each cell mounting assembly. The SP12 should be bonded locally to the structure so that any lightning currents flow around the load cells and through the strain-gauge bridges. If the weighbridge is not crossbonded or of non-conducting (eg concrete) construction, individual SP12 protectors should be installed at each load cell.

Both 'earthed' and 'isolated' screen connections are provided, so that the normal practice of any particular load cell supplier (with respect to screens) can be maintained.

## Features

- ▲ Protects load cell, weighbridges, process weighing, and silos
- ▲ Reliable protection through high surge absorption capacity
- ▲ No affect on system accuracy
- ▲ Easy field installation in rugged weatherproof enclosure
- ▲ Repeated auto-resetting operation without maintenance
- ▲ Can be used in intrinsically safe circuits without further certification

**Hazardous area applications** are straightforward using our Group expertise in intrinsically safe installations. The SP12 is non-voltage producing, non-energy stroing simple apparatus and as such, can be used in hazardous areas with appropriate self generated system documentation.

## Specifications

HB-SP12A FOR ANALOG LOAD CELL

HB-SP12D FOR DIGITAL LOAD CELL

Nominal excitation voltage : 12 VDC

Maximum excitation voltage : 13 VDC

Leakage current : 10  $\mu$ A at 13vdc

Peak impulse current (8/20  $\mu$ gs) : 10 KA

Let-through voltage : 65 V

Ambient temperature limits : -20 to + 60°C (working)  
-30 to + 70°C (storage)

Humidity : 5 to 95% RH (non-condensing)

Protection : Dust-and water-tight enclosure

Analog Load cell : input / output : 6-wire plus screen plus earth

Digital Load cell : input / output : 4-wire plus screen plus earth

Main earth connection : M8 external stud

Weight : 1.5 kg

## Typical connection Ref.

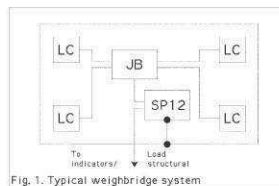


Fig. 1. Typical weighbridge system

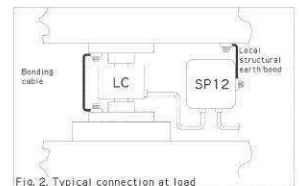


Fig. 2. Typical connection at load

## Physical Dimension

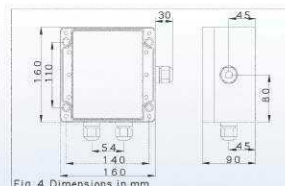


Fig. 4. Dimensions in mm

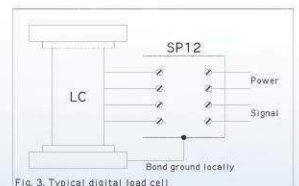


Fig. 3. Typical digital load cell



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