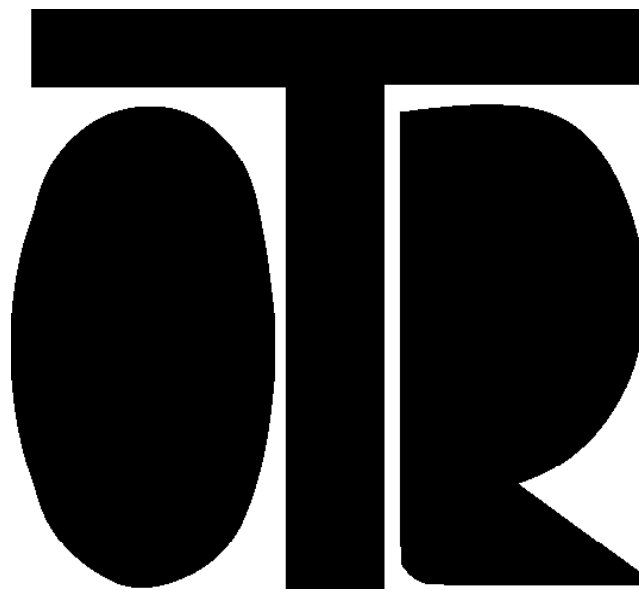




Load Cell for tunnel arch



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Load Cell for tunnel arch



WARNINGS



This instrument must be utilized only for the application it has been designed for, OTR declines all responsibility for any improper use;



During the installation phase, disconnect the instrument from measuring devices or from any device connected to the AC power supply;



Do not use instrument near potentially explosive gases;



Do not overload the cell;



Use protective gloves;

Furthermore

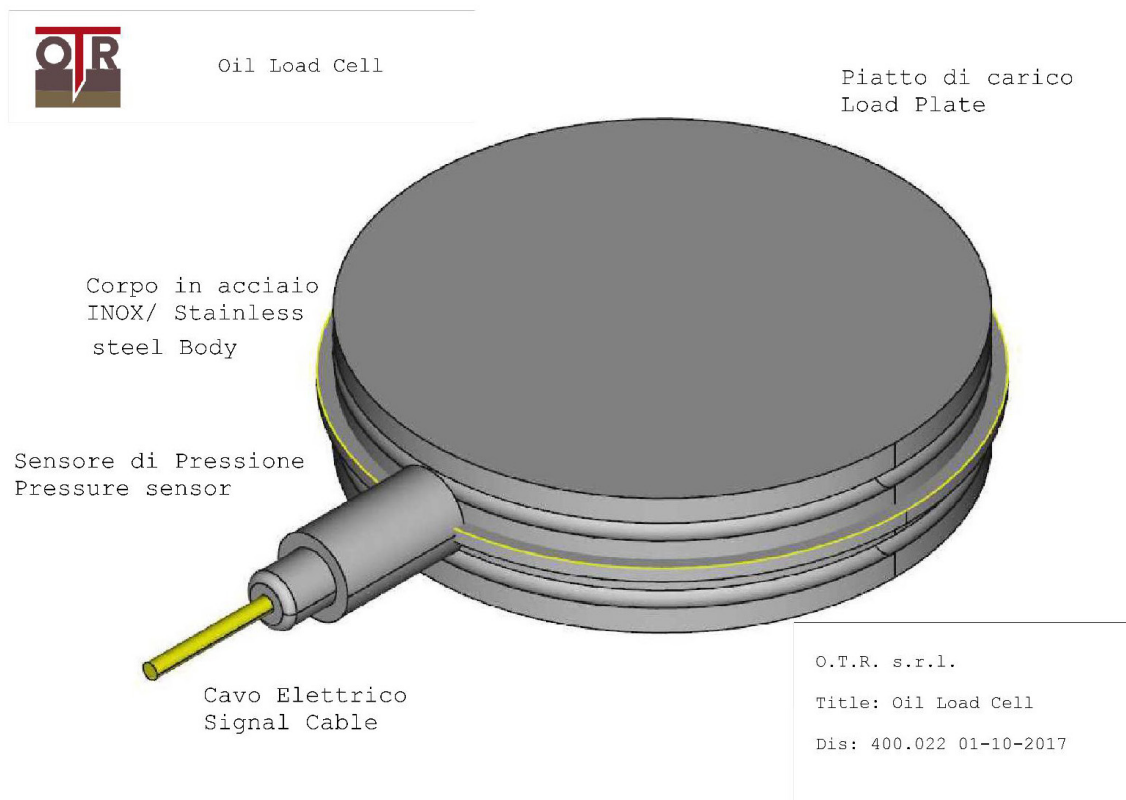
- Do not open the instrument, contact the manufacturer for checks and repairs;
- Keep out of reach of children;
- Do not connect the instrument to the readout unit with wet hands;
- Use surge arresters for installations with unprotected cables longer than 30 meters;
- Clean the instrument and its cable with alcohol or water, do not use acetone or aggressive liquids for plastics or labels;
- Do not charge the cell with not orthogonal or tangential load.

Applications

Hydraulic load cells measure load between two metallic structures or between steel and concrete. They can be installed under a tunnel arch or between two tunnels archs.



Description



Hydraulic load cell is made of two circular stainless steel plates welded together along their circumference. Space between plates first put under vacuum and then filled up with oil. Oil is desaturated to gain a good thermic resistance and a good sensitivity at low loads. Cell deformation due to applied load is transduced in a proportional variation of oil pressure. Construction technique, stainless steel and IP68 sealing make these load cells extremely reliable. Load cells can partly compensate excentric loads as well.

Load cells are made of:

- Stainless steel body. Interspace is filled up by desaturated oil
- Electric pressure transducer with 4-20 mA output signal
- Electric wire for datalogger/readout unit connection

Identification

Each load cell is labelled with:

- Serial number, related to its calibration chart;
- Model;
- Full Scale;
- Input/Output

Technical features

Material	Stainless steel
Full Scale	1000-1900-3000 KN
Output	4-20 mA
Height	40 mm
External diameter	200-300 mm



Installation

Proceed as follows, in order to install load cells on metallic tunnel arches:

- Clean up and level surface of installation site, with resistant cement if needed
- Make a base plate bigger than load cell.
- Weld containing anchors on base plate, to avoid load cells movements during installation
- Weld a weigh distribution plate under tunnel arch (2-3 cm thick), bigger than load cell
- Fix load cell on base plate, using anchors
- Fix distribution plate on load cells by means of a temporary welding, to be removed later

During installation pay attention not to damage wiring and sensor.



Readouts

Load cells can be read with dataloggers or readout units. Datalogger Geotester 2 shows mA or physical units on screen. For further information on Geotester 2.0 please refer to its manual.



Taking Measurements

Wiring between load cells and datalogger is as follows:

Output signal 4-20 mA:

Load cell red wire	= + 15 volt
Load cell black wire	= – Loop
Shield	= Earth of datalogger

Data Processing

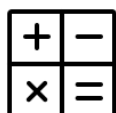
- Load measure is proportional to electrical output. Measures can be taken in mA, and can be converted to KN by means of a conversion factor.

Calculations & Formulas

For higher precision, use polynomial factors reported on each calibration chart.



E = electric output (as read on readout unit)
K = Sensitivity factor (as reported on calibration chart)



$L \text{ [KN]} = \text{measure expressed in [KN]} = E \times K$