Hydraulic Load Cells

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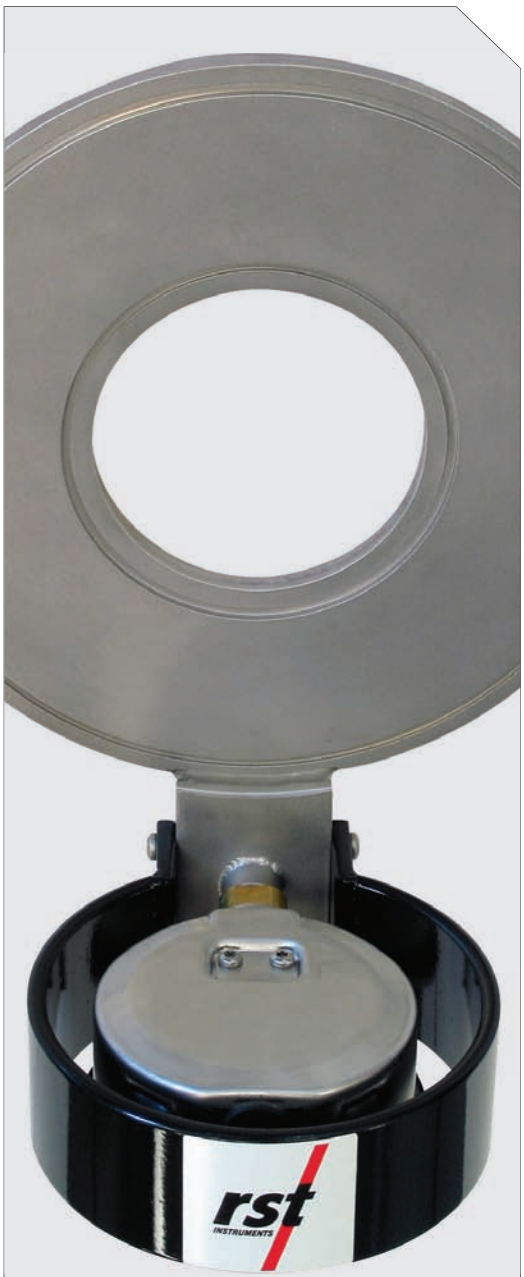


Hydraulic Load Cells are constructed from stainless steel. The load is distributed equally over the loading area of the cell by a thick, machined steel distribution plate. The load, when applied to the cell, causes a pressure increase in the hydraulic fluid, and this change in pressure may be measured via a Bourdon Tube Gauge or a variety of electrical transducers.

Two designs are available. An annular cell, and a solid cell for the measurement of compressive force. Both designs are available with the following readout methods:

1. A Bourdon Tube Gauge. This is the most simple method, but if directly connected requires access or visibility. The gauge can be mounted a short distance away and connected to the cell by a flexible hose.
2. Various types of electrical transducers, allowing for remote readout and data acquisition,

Technical Data

Annular cells are available to suit all load ranges for both cable bolts and continuously threaded rock bolts. Please contact RST for more information.

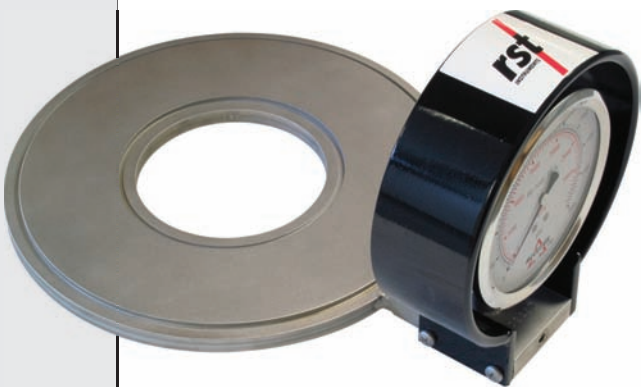
Custom cells, either solid or annular, can be fabricated to suit any specialized application or ranges.

A very stiff distribution plate is required in order to insure that the load is applied equally over the pad of the cell. The outside diameter of this plate is equal to the loading area of the cell with an identical inside diameter.

Bearing plates may not be required if adequate provision has been incorporated into the installation design. If required, the bearing plate is greater in diameter than the cell. Both bearing and distribution plates are machined from mild steel and zinc plated for corrosion protection.

Hydraulic Load Cells are sensitive to temperature changes, and are not recommend for use in applications where temperature fluctuations may occur.

For highest accuracy and temperature compensation, RST recommends either strain gauge or vibrating wire type cells.



Applications

Rock anchors.

Soil anchors.

Concrete and post-tensioning.

Measurement of compressive loads between structural members.

Features

Simple and reliable hydraulic operation.

Automated data acquisition systems compatible.

Low profile.

Remote readout capability.

Optional

Distribution plates.

Bearing plates.

Data acquisition systems.

Digital readout instruments.

Optional, fully enclosed, lockable housing to protect the data gauge.

Ordering Info

All Hydraulic Load Cells may be ordered using simple notation. For example, part # HLC-100-1 indicates the following:

HLC: Hydraulic Load Cell

100: max. capacity required (Kips)

1: hole sizes in inches

Please specify O.D. and height when ordering.

Con-Tech Systems Ltd.
Western Division: (604) 946-5571
Eastern Division: (613) 342-0041
Email: con-tech@contechsystems.com
Website: www.contechsystems.com

Strain Gauge Load Cells

Strain Gauge Load Cells incorporate from 8 to 16 high output electrical resistance strain gauges in a full bridge configuration that are bonded to a high strength steel or stainless steel spool. This arrangement compensates for both temperature effects and off center loading. Strain Gauge Load Cells are available in virtually any size, in both annular and solid styles. Gauge waterproofing utilizes the latest application techniques and protective materials. The rugged design includes heavy duty protective cover, sealed construction, and low deflection under load.

Mounting surfaces should be flat and parallel for optimum performance. RST recommends the use of top & bottom loading platens for best performance with annular load cells.

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Applications

Measure load/strain in various applications.

Features

- Compatible with any conventional strain indicator instrument.
- Optional readout instrument in engineering units (model IR-2840).
- High resistance strain gauges to minimize cable effects.
- High sensitivity.
- Long term reliability.
- Heat treated and stress relieved load element.
- Available with either a plug connector, or with cable attached to load cells per client specified length.
- Accommodates off center loading.
- Custom manufactured to fit project requirements.
- Matched calibration for readout in engineering units.
- Temperature compensated.

Strain Gauge Load Cells

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Standard Dimensions

	CAPACITY		I.D.		O.D.		HEIGHT	
MODEL	KIPS	KN	INCHES	MM	INCHES	MM	INCHES	MM
SGA-50-1	50	233	1.0	25	4.0	102	3.0	76
SGA-100-1	100	445	1.0	25	4.0	102	3.0	76
SGA-136-1.4	136	605	1.4	36	4.5	114	3.5	89
SGA-200-1.75	200	890	1.75	44	5.0	127	5.0	127
SGA-255-2.0	255	1135	2.0	51	5.5	140	5.25	133
SGA-300-2.0	300	1334	2.0	51	5.5	140	5.25	133
SGA-300-3.0	300	1334	3.0	76	6.0	152	6.25	159
SGA-400-2.5	400	1779	2.5	63	6.0	152	6.25	159
SGA-400-3.5	400	1779	3.5	89	7.0	178	7.25	184
SGA-600-3.0	600	2669	3.0	76	7.0	178	7.5	190
SGA-600-4.0	600	2669	4.0	102	7.75	197	8.5	216
SGA-1665-LC	1665	7406	N/A	N/A	8.5	216	11.8	300

NOTE: These dimensions are typical only and may be modified to suit project requirements.
The model number is determined as follows: eg. SGA - 200 - 1.5
SGA – Strain Gauge Annular Cell
200 – Maximum capacity in Kips
1.5 – Hole size in inches

Specifications

ITEM	DESCRIPTION
Capacity	22.5 kN to 10675 kN (5,000 lbs to 2,400,000 lbs).
Hole Size	16 mm to 356 mm (5/8 in. to 14 in.), as required.
Material	High strength steel or stainless elements.
Temperature Compensation	-40°F to +107°F (-40°C to +40°C)
Overrange	100% FS
Sensitivity	±2.0 mV/V

Accessories

- Digital strain indicator.
- Cable.
- Load and bearing plates.
- Terminal stations.
- Centralizer bushings if required.

Optional Equipment

- Armored cable.
- Metal military, or plastic connectors (connectors not recommended in waterproof applications).

Ordering Info

- Application.
- Annular or solid cell.
- Maximum capacity and smallest increment required.
- Environmental data.
- Size limitations.
- Cable connection and length.
- Loading Platens.
- Options.

RST Instruments Ltd. reserves the right to change specifications without notice.

Con-Tech Systems Ltd.
Western Division: (604) 946-5571
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Vibrating Wire Load Cells

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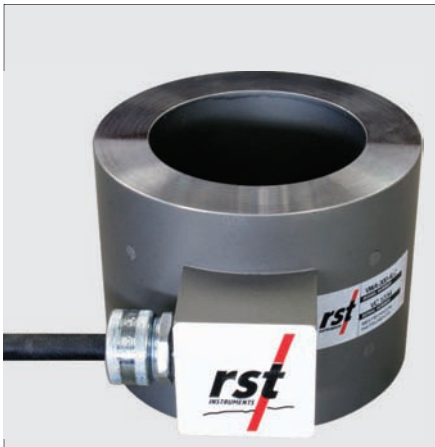
Applications

Measurement of loads in tie-backs, struts, ground anchors and rock bolts.

Measure loads during the testing of piles.

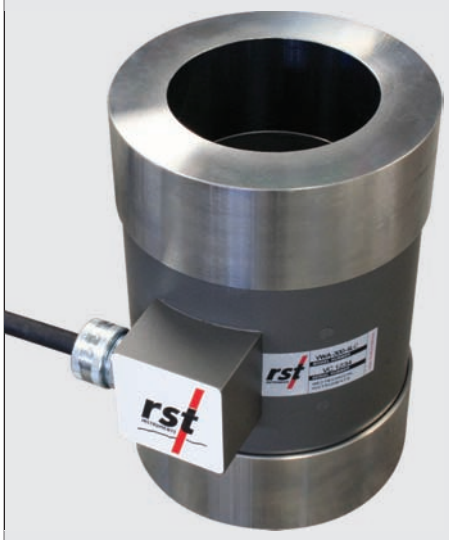
Features

Manufactured from high tensile, heat treated, stress relieved steel, with precision bearing surfaces.



Annular Load Cell

Solid Load Cell



Annular load cell shown with top and bottom platens.

Vibrating Wire Load cells are available in both solid and annular styles to monitor compressive loads. Load elements are manufactured from high tensile, heat treated, stress relieved steel, with precision bearing surfaces. Machined overall, high tensile matching load platens are recommended to provide a smooth parallel bearing surface and spread the load.

Solid style cells incorporate 3 Vibrating Wire strain sensing elements mounted parallel to the longitudinal axis of the cell. Optional spherical platens are available to enhance alignment to the load axis.

Annular cells incorporate 3 to 6 vibrating wire strain sensors, mounted parallel to the longitudinal axis, equidistant around the circumference.

With the multi sensor configuration, it is possible to obtain accurate readings under mildly eccentric loading conditions, as the sensors are read individually. In multi strand anchors, it is possible to tension the strands uniformly by monitoring the load in each sensor as appropriate.

Submerged service designs are available on special order. The electrical cable to the readout may be either hard wired to the cell or connect via a metal Mil-spec type bayonet connector.

Sensors are read with the pluck and read technique, permitting compatibility with various brands of readouts and loggers. Gauges employing the auto-resonant reading technique are available on special order.

Vibrating Wire Load Cells

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Dimensions: Solid Load Cells

	CAPACITY		O.D.		HEIGHT		PLATEN THICKNESS***	
MODEL	KIPS	KN	INCHES	MM	INCHES	MM	INCHES	MM
VWS-100	100	445	2.375	60.3	4.0	101.6	1.0	25.4
VWS-200	200	890	3.25	82.6	4.0	101.6	1.0	25.4
VWS-300	300	1335	4.0	101.6	4.0	101.6	1.5	38.1
VWS-400	400	1780	4.625	117.5	4.0	101.6	1.5	38.1
VWS-500	500	2225	5.125	130.2	4.0	101.6	2.5	63.5
VWS-600	600	2670	5.625	142.9	4.0	101.6	2.5	63.5
VWS-800	800	3560	6.5	165.1	4.0	101.6	3.0	76.2
VWS-1000	1000	4450	7.25	184.1	4.0	101.6	4.0	101.6

The model number is determined as follows: eg. VWS - 300: VWS – Vibrating Wire Solid Load Cell, 300 – Maximum capacity in Kips

Dimensions: Annular Load Cells

	CAPACITY		I.D.		O.D.		HEIGHT		PLATEN THICKNESS***	
MODEL	KIPS	KN	IN.	MM	IN.	MM	IN.	MM	IN.	MM
VWA-50-1	50	223	1.0	25.4	2.0	50.8	4.0	101.6	1.0	25.4
VWA-100-1	100	445	1.0	25.4	2.5	63.5	4.0	101.6	1.0	25.4
VWA-136-1.4	136	605	1.4	35.6	3.0	76.2	4.0	101.6	1.0	25.4
VWA-200-1.75	200	890	1.75	44.5	3.75	95.3	4.0	101.6	1.0	25.4
VWA-255-2.0	255	1135	2.0	50.8	4.125	104.8	4.0	101.6	1.5	38.1
VWA-300-2.0	300	1335	2.0	50.8	4.5	114.3	4.0	101.6	1.5	38.1
VWA-300-3.0	300	1335	3.0	76.2	5.0	127.0	4.0	101.6	1.5	38.1
VWA-400-2.5	400	1780	2.5	63.5	5.25	133.4	4.0	101.6	1.5	38.1
VWA-400-3.5	400	1780	3.5	88.9	5.75	146.1	4.0	101.6	2.0	50.8
VWA-600-3.0	600	2670	3.0	76.2	6.375	161.9	4.0	101.6	2.5	63.5
VWA-600-4.0	600	2670	4.0	101.6	6.875	174.6	4.0	101.6	2.5	63.5
VWA-800-5.0	800	3560	5.0	127.0	8.25	209.6	4.0	101.6	3.0	76.2
VWA-800-6.5	800	3560	6.5	165.1	9.25	235.0	4.0	101.6	4.0	101.6
VWA-1000-5.0	1000	4450	5.0	127.0	8.75	222.2	4.0	101.6	4.0	101.6
VWA-1000-8.0	1000	4450	8.0	203.2	10.75	273.1	4.0	101.6	4.0	101.6

NOTES: These specifications are typical only—custom sizes and capacities are available to suit individual project requirements. All loadcell design stress is 25 ksi. The model number is determined as follows: eg. VWA - 200 - 1.5; VWA – Vibrating Wire Annular; 200 – Maximum capacity in Kips; 1.5 – Hole size in inches
*** Platen thickness is for each of the two platens (top and bottom).

VW Load Cells Specs

ITEM	DESCRIPTION
Capacity	225 kN to 10675 kN (50,000 to 2,400,000 lbs)
Overrange Capacity	150% full scale
Sensitivity	0.01% full scale
Accuracy	0.5% full scale
Temperature Range	-40°C to +75°C
Material	High tensile, stress relieved steel
Hole Size	As requested

Optional Equipment

- VW2106 Vibrating Wire Readout.
- Dataloggers.
- Load platens.
- Terminal stations.
- Electrical cable.
- Centralizer bushings, if required.

Ordering Info

- Application.
- Annular or solid cell.
- Environmental data.
- Cable type, connection method to cell, and length.
- Spherical platens.
- Maximum load.
- Size limitations.
- Connector for VW2106 Vibrating Wire Readout.