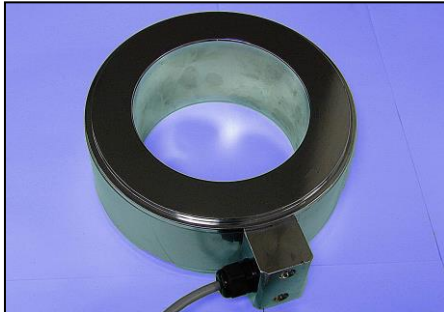


## Load Cell GT-VWM-4000 series

### GENERAL



Geotech GT-VWM 4000 series Vibrating Wire Load Cells consists of a cylinder of high strength steel with 3 vibrating wire strain sensors from a highly renowned company, mounted parallel to the longitudinal axis arranged equidistant around the circumference which measures the compression of the cylinder under load.

They are available with a centre hole to accommodate anchors, rock bolts and tendons. While solid load cells are manufactured to accommodate struts or beams monitoring.

With the multi sensor configuration it is possible to obtain accurate readings under mildly eccentric loading conditions as the sensors are read individually. The readings from the individual sensors are averaged and when used in conjunction with a calibration factor, supplied with each cell, allow the applied load to be calculated.

The Load Cells are carefully calibrated in accordance with National Taiwan University calibration procedure, which reference standard used is traceable to TAF foundation in Taiwan, based on IAF GD 3:2003 IAF Guidance on Cross Frontier Accreditation and ILAC-G21:2002 Cross Frontier Accreditation. Calibration photo in Taiwan:



Samples of the load cells are also sent to DET NORSKE VERITAS PTE LTD in Singapore for verifications. The calibration is performed with reference to ISO7500-1:2004 Part 1 standard. The result of verification is almost the same, the difference is less than 1% .

Load Cell GT-VWM - 4000 series

**VIBRATING WIRE LOAD CELLS TRANSDUCER CALIBRATION**

Model Number : GT-VWM4000-700      Date of Test : 03/12/12  
 Serial Number : LC7000036      Job Number : 120312  
 Customer : Geotech Science Pte Ltd      Testing Machine : Mr. Ye  
 Load Range : 700 Tons      Test by : Mr. Rex

Applied Load (Tons)	Readings			Change	Calculated Load(Tons)
	Gage1	Gage2	Gage3		
0	8003	7971	7965		
70	7626	7611	7597	368	72.014
140	7289	7254	7248	348	140.114
210	6920	6881	6873	372	212.911
280	6572	6540	6526	345	280.619
350	6199	6177	6175	362	351.459
420	5848	5811	5813	360	421.908
490	5493	5469	5456	351	490.595
560	5137	5104	5090	362	561.435
630	4770	4750	4737	358	631.492
700	4427	4386	4384	353	700.766

Gage Factors: 0.19569 (Tons/Digit)

Note: The above calibration uses the linear regression method. Users are advised to establish their own conditions.

Readings =  $\frac{\text{Gage1} + \text{Gage2} + \text{Gage3}}{3}$

Linearity =  $\frac{(\text{Calculated Load} - \text{Applied Load})}{\text{Max. Applied Load}} \times 100$  percent

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**DET NORSKE VERITAS PTE LTD**

Address : 10 Science Park Drive  
 DNV Technology Centre  
 Singapore 118224  
 Telephone : 6508 3750  
 Facsimile : 6774 5725  
 ROC : 158290541Z

Report no. : PPO3029-360  
 Page no. : 1 of 1  
 Date of issue : 29 Mar 2012

**RESULTS OF VERIFICATION**

Verification of the force measuring system is performed in accordance with Det Norske Veritas' calibration procedure QAD-SL-10, in reference to ISO 7500-1:2004 Part 1 standard. The reference standard used is traceable to National Metrology Centre (Singapore, Germany) or NPL (UK).

DESCRIPTION OF EQUIPMENT	LOADCELL	INDICATOR	CALIBRATOR	INDICATOR
Geotech	Geotech	Geokon	HBM	HBM
GT-VWM4000-700	GT-VWM4000-700	GR-404	C6	DK3856
LC7000036	LC7000036	273	D48899	38488
Capacity	700 tonnes	Channel B	10000 kN	
Count		0.1		0.00001 mV/V
Linearity		0.1		0.0001 mV/V
Temperature	23 deg C		20.0 deg C	
Calibration	29 Mar 2012		10 to 11-Aug-2011 & 30-Jan-2012	
Reference No.			2011050236-1 & PPO3029-68	
			GZ	

Indicated load	Repeatability				Accuracy
	(1)	(2)	(3)	(4)	
1372.9	6902.7	6887.0	6880.0	2059.0	0.33
2059.3	6492.6	6477.2	6467.4	2055.1	0.39
2745.9	6119.0	6104.0	6093.5	2109.1	0.42
3432.4	5673.7	5750.9	5740.1	3533.0	1.35
4119.9	5417.9	5405.8	5394.4	4144.5	0.43
4807.8	4730.3	4718.4	4709.0	5674.8	0.45
5494.8	4037.5	4031.0	4022.2	6810.8	0.38
6181.8					
6868.8					
7555.8					
8242.8					
8929.8					
9616.8					
10303.8					
10990.8					
11677.8					
12364.8					
13051.8					
13738.8					
14425.8					
15112.8					
15799.8					
16486.8					
17173.8					
17860.8					
18547.8					
19234.8					
19921.8					
20608.8					
21295.8					
21982.8					
22669.8					
23356.8					
24043.8					
24730.8					
25417.8					
26104.8					
26791.8					
27478.8					
28165.8					
28852.8					
29539.8					
30226.8					
30913.8					
31600.8					
32287.8					
32974.8					
33661.8					
34348.8					
35035.8					
35722.8					
36409.8					
37096.8					
37783.8					
38470.8					
39157.8					
39844.8					
40531.8					
41218.8					
41905.8					
42592.8					
43279.8					
43966.8					
44653.8					
45340.8					
46027.8					
46714.8					
47401.8					
48088.8					
48775.8					
49462.8					
50149.8					
50836.8					
51523.8					
52210.8					
52897.8					
53584.8					
54271.8					
54958.8					
55645.8					
56332.8					
57019.8					
57706.8					
58393.8					
59080.8					
59767.8					
60454.8					
61141.8					
61828.8					
62515.8					
63202.8					
63889.8					
64576.8					
65263.8					
65950.8					
66637.8					
67324.8					
68011.8					
68698.8					
69385.8					
70072.8					
70759.8					
71446.8					
72133.8					
72820.8					
73507.8					
74194.8					
74881.8					
75568.8					
76255.8					
76942.8					
77629.8					
78316.8					
79003.8					
79690.8					
80377.8					
81064.8					
81751.8					
82438.8					
83125.8					
83812.8					
84499.8					
85186.8					
85873.8					
86560.8					
87247.8					
87934.8					
88621.8					
89308.8					
89995.8					
90682.8					
91369.8					
92056.8					
92743.8					
93430.8					
94117.8					
94804.8					
95491.8					
96178.8					
96865.8					
97552.8					
98239.8					
98926.8					
99613.8					
100300.8					
100987.8					
101674.8					
102361.8					
103048.8					
103735.8					
104422.8					
105109.8					
105796.8					
106483.8					
107170.8					
107857.8					
108544.8					
109231.8					
109918.8					
110605.8					
111292.8					
111979.8					
112666.8					
113353.8					
114040.8					
114727.8					
115414.8					
116101.8					
116788.8					
117475.8					
118162.8					
118849.8					
119536.8					
120223.8					
120910.8					
121597.8					
122284.8					
122971.8					
123658.8					
124345.8					
125032.8					
125719.8					
126406.8					
127093.8					
127780.8					
128467.8					
129154.8					
129841.8					
130528.8					
131215.8					
131902.8					
132589.8					
133276.8					
133963.8					
134650.8					
135337.8					
136024.8					
136711.8					
137398.8					
138085.8					
138772.8					
139459.8					
140146.8					
140833.8					
141520.8					
142207.8					
142894.8					
143581.8					
144268.8					
144955.8					
145642.8					
146329.8					
147016.8					



## APPLICATIONS

Measurement of loads acting on

- Ground anchors
- Rock Bolts
- Tie-backs
- Struts.
- Arch Supports
- Props
- Beams

## FEATURES



- High strength steel construction
- Proven long term accuracy
- Accommodates eccentric loading
- Multiple gauge system
- Data logger compatible
- Comes with 1 meter cables



**ADVANTAGES AND LIMITATIONS**

- Vibrating wire load cells provide excellent long-term stability and can be used with long cables without adversely affecting the output frequency.
- They are waterproof and have low temperature coefficients.
- Vibrating wire load cells can be used in high radiation environments.
- Eccentric loading is accounted for by averaging the readings from all the strain sensors.
- Vibrating wire load cells are not able to measure dynamic loading and, although they are easily datalogged, the multiplicity of sensors requires a corresponding number of channels of the multiplexer.

**SPECIFICATION**

Technical Specifications	
Range	200T ~ 700T
Accuracy	0.5% Full Scale
Sensor Resolution	0.05% Full Scale.
Output	1200 ~ 2800Hz
Temperature Range	-20°C ~ 80°C.
Thermistor	3k Ohms at 25°C

Physical Specification		
Capacity	300T	500T
Diameter	130mm	165mm
Height	115mm	115mm

**ORDERING INFORMATION**

- Capacity.
- Cable length.
- Readout.
- Solid or hollow.



**TRACK RECORDS**

- Taiwan Tao Yuan international airport MRT – Contract CE01D instrument installation and real time monitoring system
- Taipei MRT Xin Zhuang line – Contract CK570J instrument installation and real time monitoring system
- Taipei Zhi Qiang tunnel – Contract CL212 instrument installation and real time monitoring system
- Taipei San Li tunnel – Contract CL314 instrument installation and real time monitoring system
- Taipei MRT CR580B- instrument installation and automatic monitoring system project
- Taipei MRT CR580A- instrument installation and automatic monitoring system project
- Taipei MRT CR570B- instrument installation and automatic monitoring system project
- Taipei MRT CL700A - instrument installation and automatic monitoring system project
- Taiwan Mrt Nei-Hu Line Contract CB420 monitoring works
- Singapore Poh Lian Construction – Supply, Installation and Monitoring for Sophia Residence construction
- Singapore Paya Lebar Army Camp – Supply, Installation and Monitoring for training school construction
- Singapore Downtown Line Stage 2 – Contract C913 Supply, Installation and Monitoring
- Singapore Contract ER337IM – Instrumentation and Monitoring for upgrading of underground link between Orchard MRT and Tangs Plaza
- Singapore Downtown Line Stage 3 – Contract 9189B3 Supply, Installation and Monitoring for contracts C931 & C932
- Singapore Downtown Line Stage 3 – Contract 9189C2 Supply, Installation and Monitoring for contracts C923 & C923A & C925
- Singapore Downtown Line Stage 3 – Contract 9189A2 Supply, Installation and Monitoring for contracts C936
- Singapore Thomson Line– Contract T2906 Supply, Installation and Monitoring works
- Malaysia Projek Mass Rapid Transit Lembah Kelang-Jajaran Sungai Buloh-Kajang – Instrumentation & Monitoring works for Maluri Station, South Crossover & South Portal.