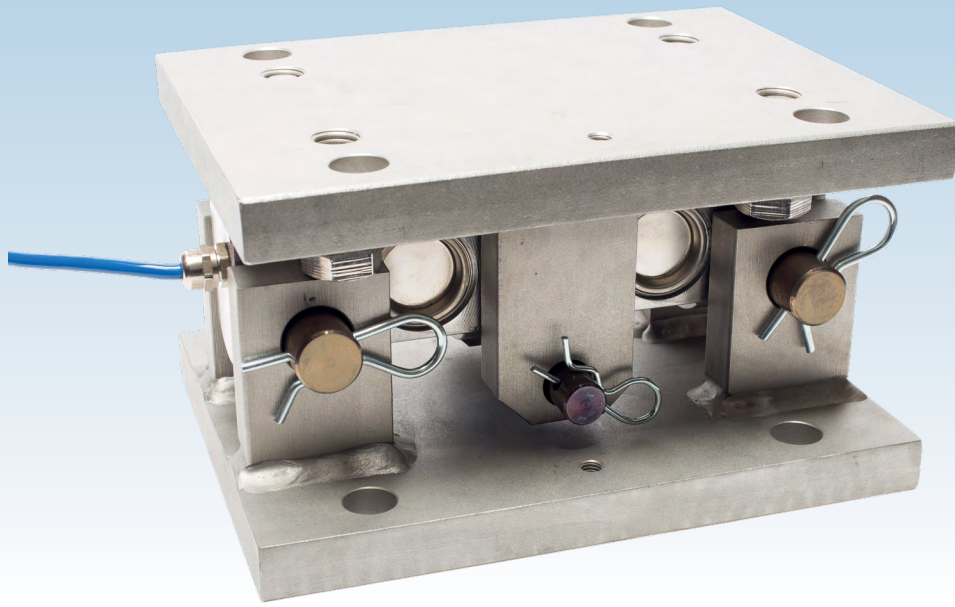


## LOAD CELL ASSEMBLY FOR SILO, TANK AND PROCESS VESSEL WEIGHING

*capacities 2t - 200t*



Vessel weighing problems solved simply and cost effectively. The VC3500 double shear beam load cell, with its robust LA3500 mounting assembly, is designed particularly for large silos and tanks and it incorporates a high resistance to lift-off. The VC3500 load cell is also available with optional ATEX or IECEx certification and can be supplied as a special version with high temperature capability (for operation up to 150°C continuously).

The LA3500 mounting assembly's mechanical characteristics have been designed and calculated according to Eurocode 3 (EN 1993) for peace of mind. Up to 75 tonnes capacity, the mounting assembly incorporates jacking bolts to simplify installation and any routine maintenance that may be desired.

A version with EN 1090 certification (and CE marking\*\*) can be quoted on special request at 30t, 50t, 75t and 100t capacities.

End use industries include cement, food, beverage, minerals, chemicals, plastics, pharmaceutical, paint, biomass, offshore and others.

- Stainless steel load cell, fully welded and hermetically sealed to IP68 and IP69K
- High integral resistance to lift-off as standard
- Resistant to off-axis loading
- Low profile design
- LA3500 mounting assembly designed according to Eurocode 3 (EN 1993)
- Durable Polyurethane cable with high resistance to chemicals, UV radiation and cuts
- 5 year warranty
- Allows for vessel expansion and contraction
- Robust LA3500 assembly is available with zinc plated, stainless steel, galvanized and other finishes
- Optional ATEX or IECEx certification is available
- Optional version with EN 1090 certification and CE marking\*\* is available on request
- Optional load cell output of 4-20mA on request



# VC3500

## installation & dimension details...

### THE CONCEPT

The VC3500 family of load cells is available in capacities from 2,000kg to 200,000kg. They are especially suitable for high capacity vessel weighing and feature a combined error specification of  $< \pm 0.03\%$ .

The critical sensor element is a fully welded double ended shear beam, manufactured from high tensile 17-4 PH stainless steel that is heat treated to give a high ultimate tensile strength. This heat treatment provides an extremely stable platform for the strain gauges, resulting in excellent accuracy and repeatability.

In common with all Thames Side load cells, the strain gauged element is temperature compensated to ensure accuracy is maintained over a wide temperature range.

Stainless steel diaphragms are welded in position to provide total environmental sealing. This method of construction, together with the fitting of a high quality cable gland, allows Thames Side to offer a 5 year warranty on the complete unit.

The mounting assembly has a durable zinc plated finish as standard, to provide a high level of protection. Galvanized alloy steel, stainless steel, or specially painted mounting assemblies are available as an option.

The bi-directional freedom of movement of the mounting assembly top plate allows for a high degree of misalignment in the silo / vessel support structure. This is particularly important in large structures where dimensional accuracy, rigidity and angular conformity cannot be guaranteed, or where large changes in ambient temperature are anticipated.

The complete VC3500 weighing assembly incorporates lift-off protection, reducing the need in many cases for additional restraints. Integrated jacking bolts on capacities up to 75t facilitate simple installation and routine maintenance. This eliminates the need for time-consuming and expensive installation work, giving a very cost effective total solution.

Due to the unique design of the VC3500, transverse and non-axial misalignment errors are minimised.

### ATEX and IECEx CERTIFICATION

The VC3500 load cell has a number of ATEX and IECEx certification options, several of which allow for use without safety barriers. This can result in significant cost savings;

Cert.	Code	Safety Parameters	Key Points
ATEX	II 1 GD Ex ia IIC T6 Ga Ex ia IIIC T70°C Da $-20^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C}$	$U_i=30\text{ V}$ , $P_i=1.3\text{ W}$ $C_i=2.4\text{ nF}$ , $L_i=8\text{ }\mu\text{H}$	Suitable for all gas (0, 1, 2) and dust (20, 21, 22) zones but requires safety barriers.
IECEx	Ex ia IIC T6 Ga Ex ia IIIC T70°C Da $-20^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C}$		
ATEX	II 3 G Ex nA T6 $-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$	$U_i=30\text{ V}$ , $P_i=1.3\text{ W}$ $C_i=2.4\text{ nF}$ , $L_i=8\text{ }\mu\text{H}$	Suitable for gas zone 2 only. No safety barriers are required; for full details refer to ATEX certificate.
ATEX	II 1 D Ex ta IIIC T80°C Da $-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$	$U_m=18\text{ V}$	Suitable for all dust zones (20, 21, 22). No safety barriers are required; for full details refer to ATEX certificate. Excitation voltage must be below 18V.

For details of the certification relating to a specific product code, please refer to the documentation included in the [“ATEX and IECEx Approved Products”](#) section of our website [www.thames-side.com](http://www.thames-side.com)

### HIGH TEMPERATURE

The VC3500 load cell is available optionally as a high temperature variant that utilises special load cell components and a 6-wire PTFE ‘Teflon’ cable (with sense wires) for continuous operation in environments up to  $150^{\circ}\text{C}$ .

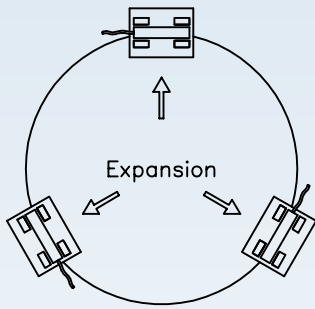
### OPTIONAL EXTRA PROTECTION FOR EXTREME ENVIRONMENTS

A special Parylene coating can be added to the load cell as an option, to provide additional protection in extreme environments where stress corrosion could occur. Examples are applications where chlorine, acids, salts or other harsh chemicals are present.

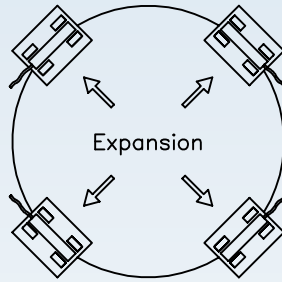
### AMPLIFIED OUTPUT

The VC3500 load cell can be supplied with an integral 4-20mA amplified output as a special option when required.

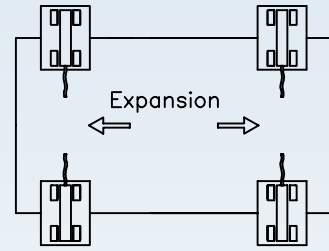




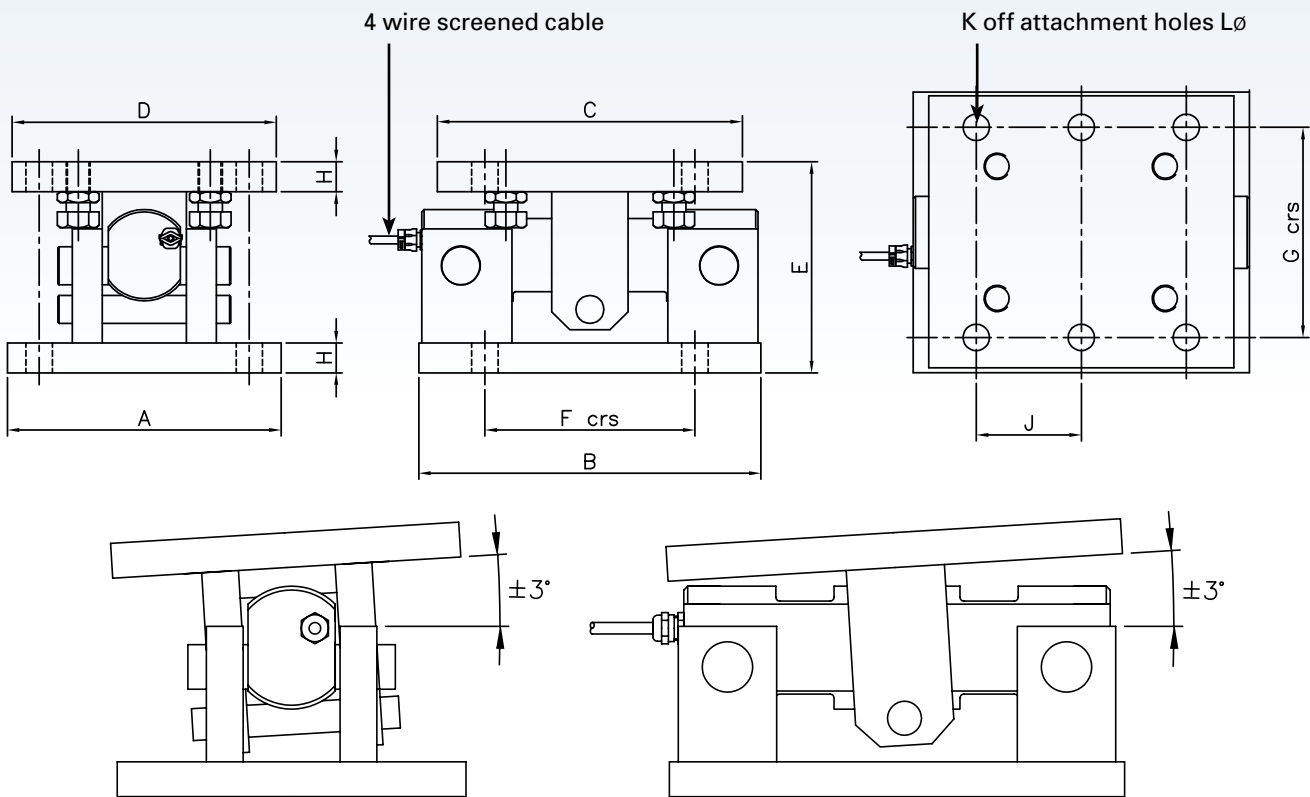
Circular Vessel, 3 Leg Supports  
VC3500 3 x Load Cell Installation



Circular Vessel, 4 Leg Supports  
VC3500 4 x Load Cell Installation



Horizontal Vessel, 4 Supports  
VC3500 4 x Load Cell Installation



Load Cell Capacity (t)	A	B	C	D	E	F crs	G crs	H	J crs	K No	L Ø	Combined weight of load cell and assembly (kg)
2	180	235	235	180	137	155	140	20	-	8	18	22.2
5												
7.5												
10												
15												
20	250	300	250	220	210	175	175	25	-	8	22	43.1
30												
50												
75	250	360	330	250	250	200	180	25	100	12	22	59.7
100	350	450	440	350	275	300	235	30	150	12	26	112.8
150	350	440	440	350	325	310	285	30	155	12	32	119.8
200												

NOTE: Jacking bolts are available except for 100t, 150t and 200t capacity versions.

A smaller body size 30t version of the VC3500 load cell is available, but is only suitable for use with the MasterMount® assembly.



# VC3500 with LA3500

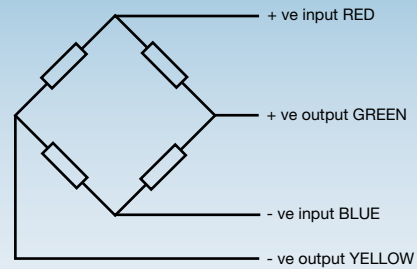
technical specification...



## VC3500 Load Cell

	Load cell specification	Units
Load Cell Capacities	2, 5, 7.5, 10, 15, 20, 30, 50, 75, 100, 150, 200	tonnes (t)
Full Load Output	2.0	mV/V $\pm$ 0.25%
Excitation - Recommended	5 - 15	V
Excitation - Maximum	18	V
Safe Service Load	150	%*
Ultimate Overload	300	%*
Combined Error	$< \pm 0.03$	%*
Repeatability	$< \pm 0.015$	%*
Output at Zero Load	$< \pm 2.0$	%*
Input Resistance	785	$\Omega \pm 20$
Output Resistance	705	$\Omega \pm 5$
Operational Temperature Range	-50 to +80	$^{\circ}\text{C}$
Compensated Temperature Range	-10 to +40	$^{\circ}\text{C}$
Temperature Coefficient on Zero	$< \pm 0.002$	%* / $^{\circ}\text{C}$
Temperature Coefficient on Span	$< \pm 0.0012$	%* / $^{\circ}\text{C}$
Environmental Protection	IP68 and IP69K	
Cable Length	20	m
Cable Material	Polyurethane	
Insulation	$> 5000$	M $\Omega$ @ 100V

\*All percentages are related to Full Rated Load



### Electrical Connections

Via 4 core, 6mm diameter, screened polyurethane cable (halogen-free).

Screen not connected electrically to load cell.

### Construction

#### Load cell VC3500

High strength stainless steel type 17-4PH

#### Mounting Assembly LA3500

- Zinc Plated Alloy Steel version (LA3500-\*\*\*\*-Z)

Upper & lower plates: alloy steel, durable zinc plated finish

Pins: corrosion resisting hardened stainless steel

Clips: plated alloy steel

- Galvanized alloy steel version (LA3500-\*\*\*\*-G)

Upper & lower plates: alloy steel, galvanized finish

Pins: corrosion resisting hardened stainless steel

Clips: plated alloy steel

- Stainless steel version (LA3500-\*\*\*\*-SS)

Upper & lower plates: stainless steel

Pins: corrosion resisting hardened stainless steel

Clips: stainless steel

## LA3500 Mounting Assembly

Loading limits for Zinc Plated and Galvanized Alloy Steel assemblies (with load cell installed)

Mounting Assembly	Load Cell Capacity (t)	Deflection at capacity (mm)	Allowable expansion across assembly (mm)	Maximum Vertical Load (kg)	Maximum End Load (kg)	Maximum Transverse Load (kg)	Maximum Lift-off (kg)
LA3500 - 20T	2	0.20	$\pm 5$	79538 <sup>Δ</sup>	10800	4000	3202
	5	0.20					
	7.5	0.25					
	10	0.25					
	15	0.30					
	20	0.40					
LA3500 - 50T	30	0.50	$\pm 9$	96873	28042	10910	18355
	50	0.50		132560			
LA3500 - 75T	75	0.80	$\pm 9$	173352	35690	8872	29572
LA3500 - 100T	100	0.80	$\pm 12$	263087	39260	11727	19885
LA3500 - 200T	150	0.90	$\pm 12$	538410 <sup>ΔΔ</sup>	87002	17285	61937
	200	0.90					

Loading limits are calculated according to Eurocode 3 (EN 1993). Limits for Stainless Steel assemblies (LA3500-\*\*\*\*-SS) are available on request.

<sup>Δ</sup>With 20t load cell installed <sup>ΔΔ</sup>With 200t load cell installed

DISTRIBUTED BY: PNEUTROL INTERNATIONAL LIMITED

sales@pneutrol.com

UK OFFICE:

5 CAULSIDE DRIVE, ANTRIM, NORTHERN IRELAND, BT41 2DU

TEL: 44 (0) 28 9448 1800, www.concretespares.co.uk

ROI OFFICE:

UNIT 6, ST ANTHONY'S BUSINESS PARK DUBLIN, D22 VW95

TEL: 353 (1) 437 3653, www.concretespares.ie

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Our policy is one of continuous product enhancement. We therefore reserve the right to incorporate technical modifications without prior notification.

