

## LOAD CELL ASSEMBLY FOR TANK AND VESSEL WEIGHING

*capacities 2t - 200t*



Vessel weighing problems solved simply and cost effectively. The VC3500 double ended shear beam load cell with integral mounting assembly is designed particularly for large silos and tanks and incorporates lift off prevention and, on most capacities, holding bolts to assist with routine maintenance. The VC3500 is also available with intrinsically safe ATEX certification and a high temperature variant. Mounting assembly mechanical characteristics are designed using the Eurocode 3 standard. End use industries include cement, minerals, chemicals, plastics, pharmaceuticals, paint, food, biomass and offshore applications .

- Stainless steel load sensor
- Optional 4 - 20mA output
- Low profile
- Integral lift off prevention
- High durability PU mud & chemical resistant cable
- Fully welded construction IP68 / IP69K
- Resistant to off-axis loading
- 5 year warranty
- Allows vessel expansion / contraction
- Optional stainless steel mounting assembly
- ATEX certification for all zones
- Mounting assembly designed using Eurocode 3

# VC3500

installation & dimension details...

## THE CONCEPT

The VC3500 family of load cells is available in capacities from 2000kg 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 released stainless steel which is heat treated to give a high ultimate tensile strength. This 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 through a wide temperature range.

Stainless steel diaphragms are TIG 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 tough, durable, paint finish as standard to provide a high level of protection. Stainless steel assemblies are available as an option.

The bi-directional freedom of movement of the top plate allows for a high degree of misalignment in the vessel support structure which 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 assembly incorporates lift off protection, reducing the need in many cases for additional restraints. Integrated holding bolts on capacities up to 75t facilitate routine maintenance. This eliminates the need for 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 CERTIFICATION

The VC3500 range has a number of ATEX certifications, several of which allow their use without safety barriers, resulting in significant savings;

Code	Safety Parameters	Key Points
II 1 GD T70°C EEx ia II C T6	$U_i=30\text{ V}$ , $P_i=1.3\text{ W}$ $C_i=2.4\text{ nF}$ , $L_i=8\text{ }\mu\text{H}$	Suitable for all dust and gas zones but require safety barriers
II 3 G Ex nA T6 ( $T_g=-20^\circ\text{C}$ to $+60^\circ\text{C}$ )	$U_i=30\text{ V}$ , $P_i=1.3\text{ W}$ $C_i=2.4\text{ nF}$ , $L_i=8\text{ }\mu\text{H}$	Suitable for Gas zone 2. No safety barriers required. Maximum applied voltage of 42V is allowed
II 1 D Ex ta III C T80°C Da IP6X $T_g=(-20^\circ\text{C} \leq T_g \leq +60^\circ\text{C})$	$U_m=18\text{ V}$	Suitable for all dust zones, 20, 21 and 22. No safety barriers required. Excitation must be below 18V

## HIGH TEMPERATURE

The VC3500 range is available in a high temperature variant which utilises special load cell components and a PTFE 'Teflon' cable for operation in environments up to  $150^\circ\text{C}$

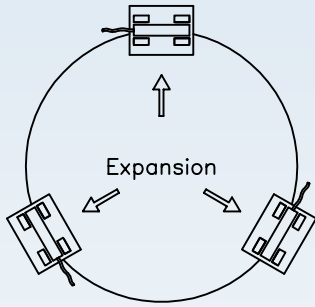
## ENVIRONMENTAL PROTECTION

A special parylene coating can be specified as an option to provide additional protection in extreme environments where stress corrosion could occur, for example where chlorine or acids are present.

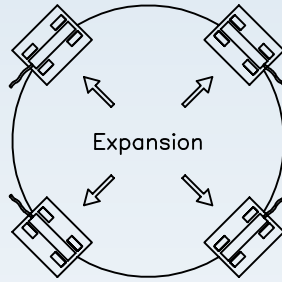
## AMPLIFIED OUTPUT

An integral 4-20mA amplified output can be specified where required.

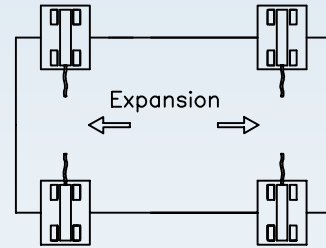




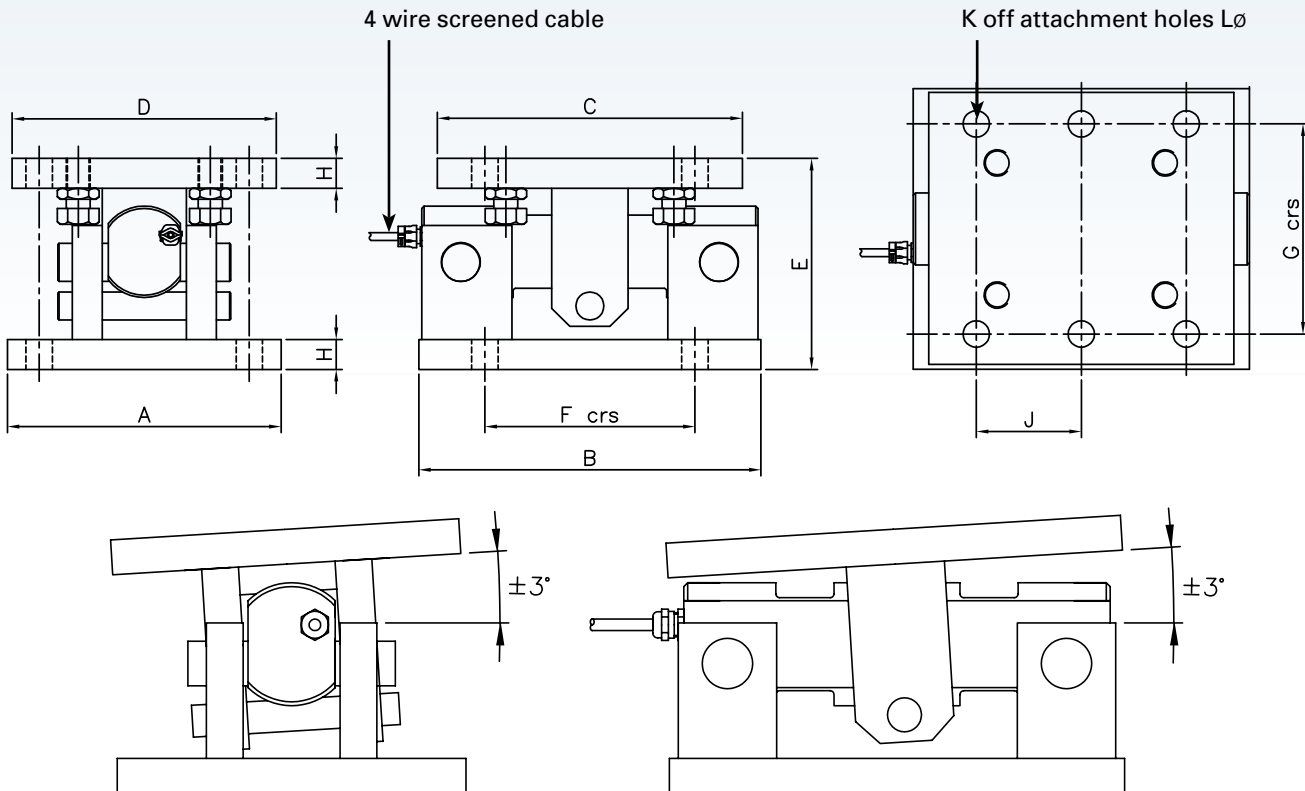
Circular Vessel, 3 Leg Supports  
VC3500 3 x Load Cell Installation



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
2	180	235	235	180	135	155	140	20	-	8	18
5											
10											
15											
20	250	285	250	220	210	175	175	25	-	8	22
30											
50											
75											
100	350	440	440	340	275	300	235	30	150	12	26
150											
200											

NOTE: No holding bolt facilities on 100t, 150t and 200t capacities.  
A smaller body size 30t version of the VC3500 load cell is available only on the MasterMount® assembly

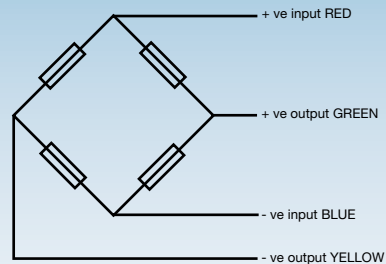
# VC3500

technical specification...

## VC3500 Load Cell

	Load cell specification	Units
Full Load Output	2.0 (+/- 0.25%)	mV/V
Excitation - Recommended	10	V
Excitation - Maximum	18	V
Safe Service Load	150	%
Combined Error	< +/- 0.03	%
Repeatability	< +/- 0.015	%
Output at Zero Load	< +/- 2.0	%
Input Resistance	785 +/- 20	$\Omega$
Output Resistance	705 +/- 5	$\Omega$
Operational Temperature Range	-50 to +80	$^{\circ}\text{C}$
Compensated Temperature Range	-10 to +40	$^{\circ}\text{C}$
Temperature Coefficient on Zero	< +/- 0.002	% / $^{\circ}\text{C}$
Temperature Coefficient on Span	< +/- 0.0012	% / $^{\circ}\text{C}$
Environmental Protection	IP68 / IP69K	
Cable Length	20	m
Cable Material	Polyurethane	
Insulation	>500 at 100Vdc	M $\Omega$

All percentages are related to Full Rated Load



### Electrical Connections

Via 4 core, 16 / 0.2mm, screened polyurethane mud resistant cable

Cable length 20m

### Construction

Sensor element

High strength stainless steel type 17-4PH

Mounting assembly

Alloy steel, durable painted finish

Stainless steel available as option

Shafts

Corrosion resisting hardened stainless steel

## LA3500 Mounting Assembly

Mounting Assembly	Load Cell Capacity (t)	Deflection (mm)	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	+/- 5	80140	10700	4000	6400
	5	0.20					
	10	0.25					
	15	0.30					
	20	0.40					
LA3500 - 50T	30	0.50	+/- 9	140000	26000	10300	37300
	50	0.50					
LA3500 - 75T	75	0.80	+/- 9	225200	35650	8650	41325
LA3500 - 100T	100	0.80	+/- 12	356000	43600	9000	39530
LA3500 - 200T	150	0.90	+/- 12	605000	86000	17285	57000
	200	0.90					



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Issue: VC3500.07.13

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

