

The 'Calibrator' Force Transfer System



A typical 'Calibrator' System consists of...	
3 or 4 †	OIML certified (3,000 division) reference load cells with adaptor plates. Load cell capacity to suit vessel size
1	Junction box for load cell cables
3 or 4 †	Compact hydraulic jacks
1	Hydraulic hand pump with manifold, hoses and self-sealing connectors
1	Model ST†† digital weight indicator with rechargeable battery pack

A 'Push-down' System will require...	
6 or 8 † per vessel	Set of fixing bosses (two per set)
3 or 4 †	Adjustable goal post assemblies (can be shared between several vessels)

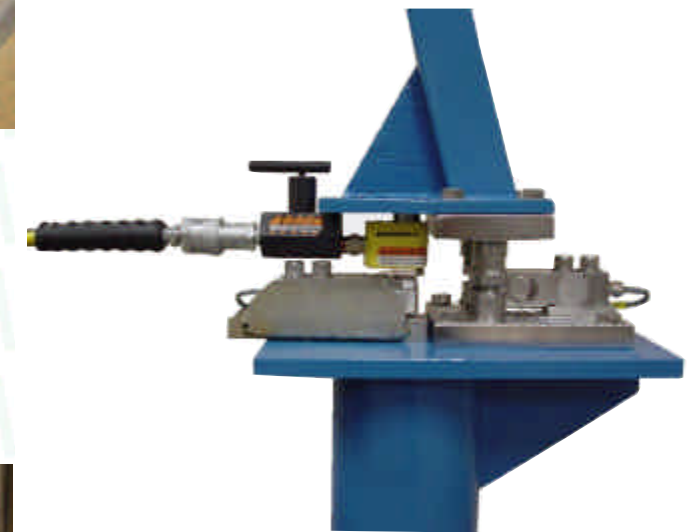
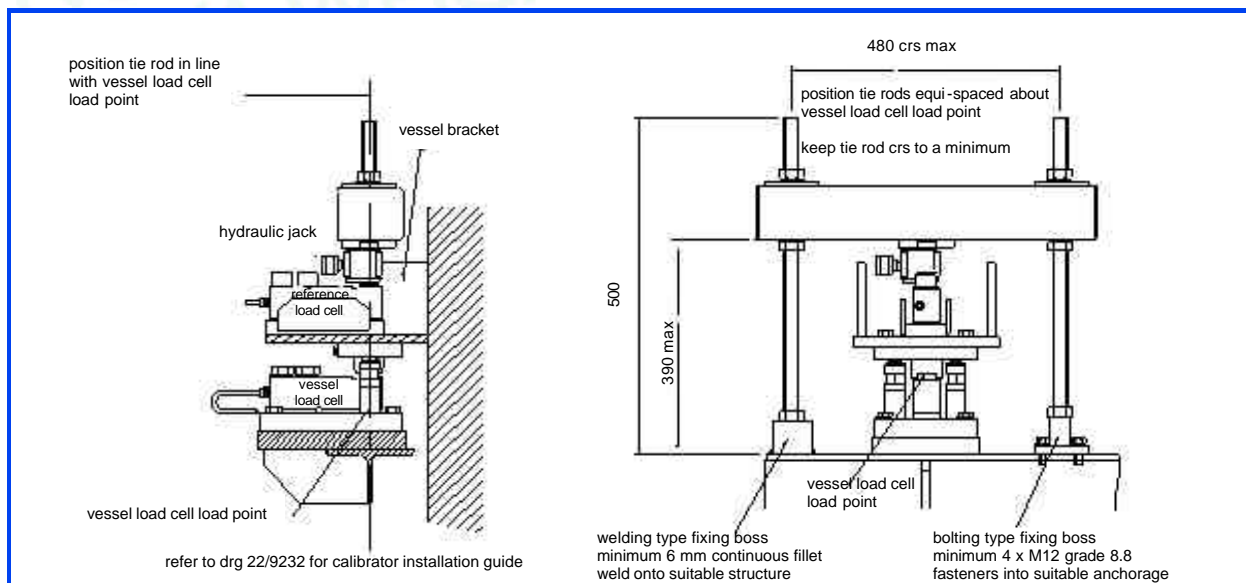
A 'Push-up' System will require...	
3 or 4 † per vessel	Modified foot plates if required

Notes ...
 † Dependent upon the number of vessel support points
 †† For hazardous areas, the ATEX certified Model ST-EX is supplied



Dimensions

typical installation arrangement for push-down calibration using a bridge construction to allow the calibration jack/reference load cell to push-down onto the vessel load cell system



NOVA WEIGH

Nova Weigh Calibrator

Precise and Traceable Calibration by Force Transfer Technique



NOVA WEIGH



INVESTOR IN PEOPLE



BS EN ISO 9001:2000 Cert No: FM 11445

Nova Weigh's policy of constant product development dictates that we may alter specifications and or the appearance of our product range without notice.

Choosing the best calibration technique for your vessel weighing system

Unless your weighing systems are calibrated then you cannot know whether they are 'fit-for-purpose' or not. If your plant is ISO 9000 accredited, then the calibration of the weighing systems is likely to form a part of a formal calibration plan with defined intervals between calibrations and constraints of the methods used and even the personnel allowed to carry out the work. But, even if the weighing is not part of an ISO9000 scheme, routine calibration is a pre-requisite of maintaining accurate and reliable weighing systems.

The problem is that what is an acceptable calibration procedure to one user is unsuitable with a different application or manufacturing environment. A good technique for a large storage silo where the weighing system is used for inventory control is probably not suitable for a reactor in a pharmaceutical plant.

Nova Weigh has long experience of dealing with all types of weighed vessel across a spread of industries. So, rather than a 'one size fits all', approach Nova Weigh will work with you to select the optimal technique for each installation.

This introduction focuses on Calibration by Force Transfer – a well-proven technique that can save valuable production time and deliver traceable, accurate and cost-effective calibrations. If you think this technique could improve your production efficiency then give us a call. We will be pleased to survey your site and let you benefit from our experience.

'A Code of Practice for the Calibration of Industrial Process Weighing Systems'

ISBN 0 904457 23 0

Nova Weigh is a Companion Company of the Institute of Measurement and Control and supports the Institute's work to maintain a Code of Practice that reflects good practice in the choice of calibration techniques and their implementation. For more information refer to the Inst. MC web site www.instm.org.uk

Standard weights

Standard Weights (sometimes called reference weights or dead weights) have the advantage that they are available certified to extremely high accuracy and are perfect for calibrating platform scales.



Using them to calibrate weigh vessels, however, normally requires some form of temporary or permanent loading frame to support the weights. A safe working procedure is essential to avoid handling accidents and, although quite widely used, the technique is time consuming except for small vessels.

Flow meter

Flow Meter Calibration is very widely used and well accepted. Of course, its use is limited to vessels where water or another liquid can be introduced into the vessel and this normally would exclude silos holding powders but also those process vessels where contamination of either the process plant - or the water used for calibration - would mean extensive cleaning or create water disposal problems.



'MilliVolt injection'

This method is applicable mainly where the weighing system is used for inventory control and the large size of the system makes other techniques impracticable.

The shortcoming of the technique is that it does not calibrate the complete measuring chain but only the weight display. So, a failed or drifting load cell will not be detected. A variation of this method uses small weights to partially calibrate the load cells over a very small part of their range with extrapolation to the full span but the technique is not likely to be acceptable as a part of an ISO 9000 accredited system.



Force transfer



This method is well proven and has now begun to gain popularity as it allows a traceable calibration to be performed quickly, non-invasively, and often without even taking the vessel out of service.

The principle is simple – small hydraulic jacks are used to apply a load to the vessel and the precise load applied is measured by 'reference' load cells. By comparing the readout of the 'reference' load cells with the system being calibrated, any errors can be determined.

But, as with all calibration techniques, only care, experience and proven working methods will give reliable and consistent results.

'Push-up' or 'Push-down' calibration?

'Push-up' calibration

The jacks and 'reference' load cells are installed beneath the vessel foot. When the jacks are actuated the effect is to reduce the load on the 'working' cells by the same amount as the load being applied by the jacks and measured by the 'reference' cells.

A big advantage of the 'push-up' arrangement is that a calibration can be performed even on a vessel containing material.

If the existing foot design does not provide space for the calibration jacks and proof cells then Nova Weigh will provide suitable adaptor plates and fit them on site.

'Push-down' calibration

This requires a structure – similar to a 'goal-post' - to be fitted over the support bracket of the vessel and against which the jack can react to apply its load. Nova Weigh's innovative approach is to offer an adjustable goalpost design that can be quickly fitted to the vessel being calibrated, and once calibration is complete can be transferred to the next vessel. Only small threaded bosses need to be added to the existing support structure and the 'goal-post' will readily adjust to different vessel foot designs and sizes.

The terms 'Push-up' and 'Push-down' simply describe whether the hydraulic jacks are placed beneath the foot-bracket (Push-up) or above the foot-bracket (Push-down).



'Push-up' calibration



'Push-down' calibration

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