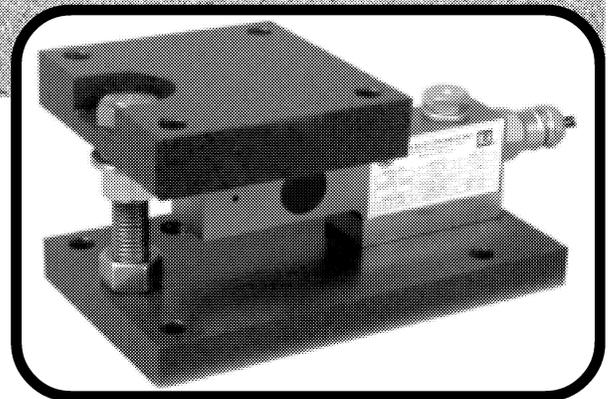
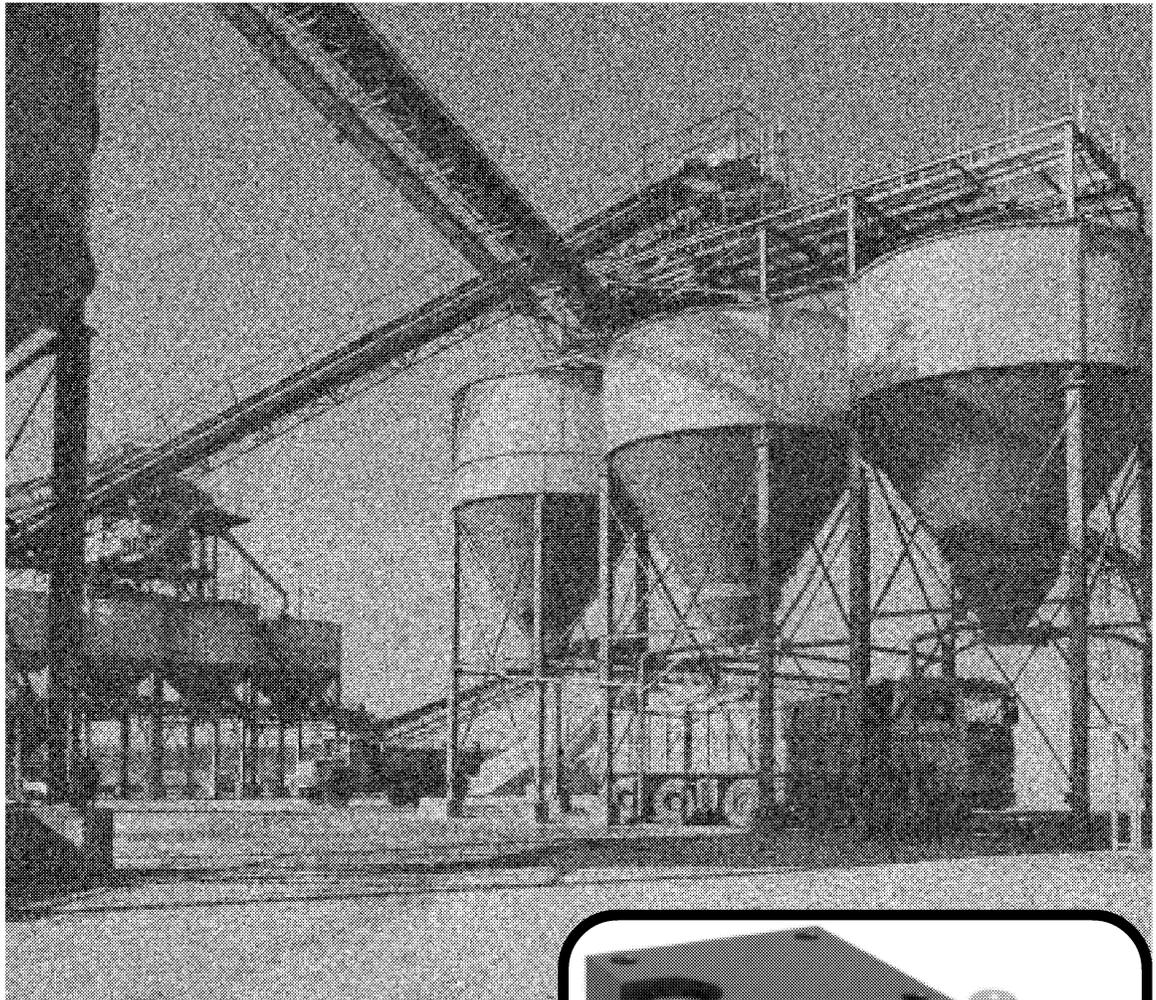


BLH NOBEL

A VPG Brand



EconoMount™ Weigh Module Installation Instructions

NOTICE

BLH Nobel makes no representation or warranties of any kind whatsoever with respects to the contents hereof and specifically disclaims any implied warranties or merchantability or fitness for any particular purpose. BLH Nobel shall not be held liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this publication or its contents.

BLH Nobel reserves the right to revise this manual at any time and to make changes in the contents hereof without obligation to notify any person of such revision or changes.

Table of Contents

SECTION I General Information	Page 1-1
1.1 INTRODUCTION	Page 1-1
1.2 DESCRIPTION	Page 1-1
1.2.1 Fixed Mounting Modules	Page 1-1
1.2.2 Semi-Floating Modules	Page 1-1
1.2.3 Full-Floating Modules	Page 1-1
1.3 EconoMount Accessories	Page 1-1
1.3.1 Simulated (Dummy) Weigh Modules	Page 1-1
1.3.2 Thermal Insulation Pads	Page 1-2
1.4 ECONOMOUNT SPECIFICATIONS	Page 1-2
1.5 OUTLINE DIMENSIONS	Page 1-2
1.6 WARRANTY POLICY	Page 1-2
1.7 FIELD ENGINEERING	Page 1-2
SECTION II Installation	Page 2-1
2.1 GENERAL	Page 2-1
2.1.1 Single Point Installations	Page 2-1
2.1.2 Multi-Point Installations	Page 2-2
2.2 SITE PREPARATION	Page 2-2
2.2.1 Module orientation - three point support	Page 2-2
2.2.2 Module orientation - four point support	Page 2-2
2.2.3 Mounting Base Considerations	Page 2-2
2.2.4 Vessel Leg/Gusset Preparations	Page 2-3
2.3 STEP-BY-STEP MOUNTING PROCEDURES	Page 2-3
2.3.1 Module Placement	Page 2-3
2.3.2 Vessel Placement	Page 2-3
2.3.3 Retainer Bolt Adjustments	Page 2-3
2.3.4 Electrical Connections	Page 2-3
2.3.5 Shimming For Load Distribution	Page 2-3
SECTION III Operation	Page 3-1
3.1 TEMPERATURE CONSIDERATIONS	Page 3-1
3.2 LOAD CONSIDERATIONS	Page 3-1
SECTION IV Maintenance	Page 4-1
4.1 CALIBRATION	Page 4-1
4.2 MAINTENANCE/TROUBLESHOOTING	Page 4-1

SECTION I General Information

1.1 INTRODUCTION

This manual provides general information, installation, operating, and service information for Vishay BLH EconoMount Weigh Modules (Figure 1-1).

1.2 DESCRIPTION

EconoMount Weigh Modules are designed for general industrial applications which require converting an existing structure (bin, tank, or hopper) into a scale. Based upon proven strain gage technology, EconoMount modules provide highly reliable, non-intrusive force or weight measurement.

A complete EconoMount system uses three types of module mounting hardware; fixed, semi-floating, and full-floating. The full combination results in a 'check-less' (no stay rods required) weigh system that accommodates moderate amounts of thermal expansion and contraction. All three mounting hardware types use the same load beams, base plates, and assembly bolts. All types conform to the same outline dimensions and performance specifications.

1.2.1 Fixed Mounting Modules

The fixed type mounting module design restricts movement in both horizontal directions while allowing a moderate degree of mounting plate angular movement to accommodate construction variances. This module type is installed on only one vessel support to provide a fixed system 'anchor'.

1.2.2 Semi-Floating Modules

The semi-floating module design restricts lateral horizontal movement, but allows radial horizontal movement as a guide for thermal expansion and contraction. This design also allows a moderate degree of mounting plate angular movement to accommodate

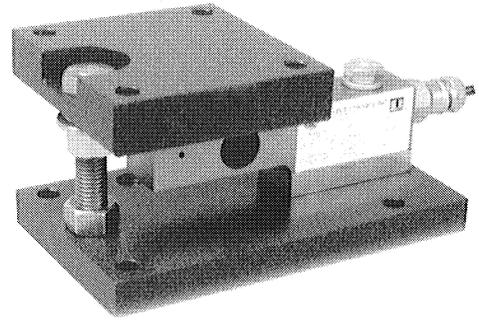


Figure 1-1. The EconoMount Weigh Module

construction variances. Use only one semi-floating module per system.

1.2.3 Full-Floating Modules

The full-floating module allows movement in both horizontal directions and angular movement of the mounting plate. At least one full-floating module is needed in each system to accommodate thermal expansion and contraction in all directions.

1.3 EconoMount Accessories

To expedite installation and ensure satisfactory operation, Vishay BLH offers two EconoMount Accessories.

1.3.1 Simulated (Dummy) Weigh Modules

Simulated weigh modules (Figure 1-2) are steel weldments with the same dimensions as the corresponding EconoMount Weigh Module for use in place of the EconoMount module during installation. Using simulated weigh modules during installation eliminates the risk of damage to actual EconoMount modules due to stray welding currents and/or mechanical impact during vessel placement.

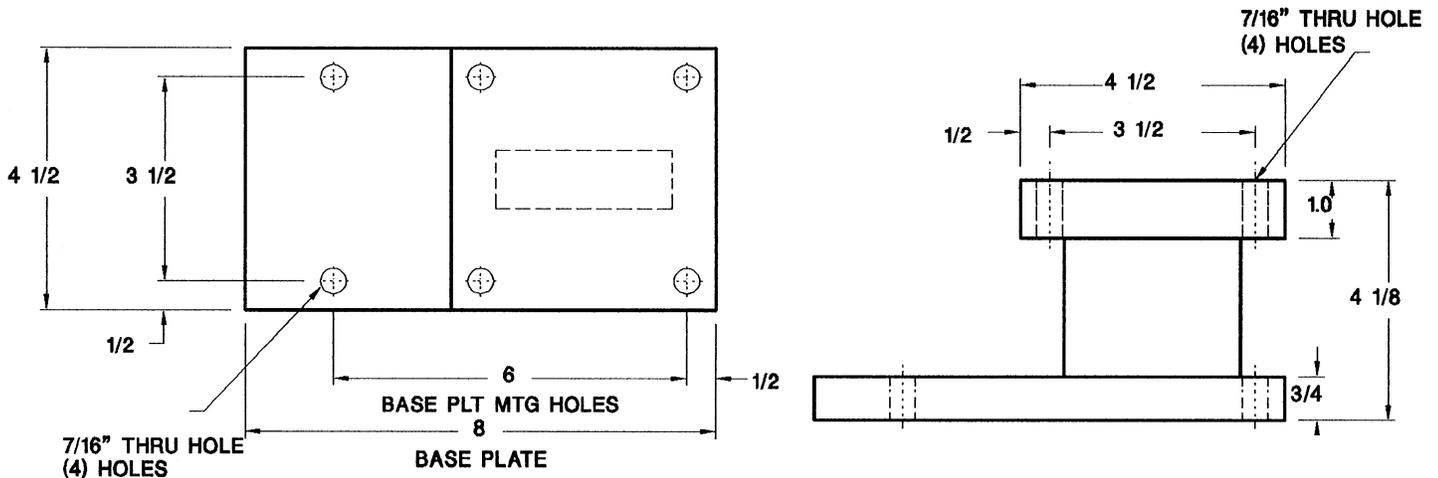


Figure 1-2. Simulated (Dummy) Weigh Modules

Simulated weigh modules also serve as permanent support points for single point measurement systems. Even if the system design requires only one 'live' weigh module, all other legs/gussets must still be supported uniformly for correct operation.

1.3.2 Thermal Insulation Pads

Thermal insulation pads reduce heat conduction from a heated vessel into the modules allowing beam temperatures to remain close to ambient. This ensures reliable system performance and maintains the accuracy of summed module readings. The pads are made from rigid glass-cloth laminate with extremely low thermal conductivity. Use of thermal pad kits is recommended when temperatures at the vessel supports exceed 130 degrees Fahrenheit.

1.4 ECONOMOUNT SPECIFICATIONS

Performance

Capacities	500, 1250, 2500, & 5000 lb
Rated Output (RO)	2.0 mV/V (0.25%)
Repeatability	0.01% RO
Creep (20 min)	0.03% RO
Combined Error	0.05% RO (Beam Only) 0.10% RO Module Assembly

Electrical

Bridge Imbalance	1.0% RO
Maximum Excitation	15V ac-dc
Input Resistance	1106 ohms (10)
Output Resistance	1000 ohms (2)
Connection	15.5 foot cable

Materials

Load Beam	17-4PH Stainless Steel
-----------	------------------------

Load Beam Sealing

500 - 5000 lb	NEMA 4 and IP67
---------------	-----------------

Load Ratings

Safe Load	150%
Ultimate Load	300%

Temperature

Temperature Effects:	
Zero Balance - %RO	0.0015%RO/°F
Output - %Reading	0.0008%RO/°F
Compensated Range	14 - 104°F
Safe Range	-58 - 194°F

Beam Deflection

500 lb Module	0.0075 in.
1250 lb Module	0.0075 in.
2500 lb Module	0.0110 in.
5000 lb Module	0.0170 in.
10000 lb Module	0.0170 in.

1.5 OUTLINE DIMENSIONS

The EconoMount outline dimension drawing is provided on the following page.

1.6 WARRANTY POLICY

Vishay BLH warrants the products covered hereby to be free from defects in material and workmanship. Vishay BLH's liability under this guarantee shall be limited to repairing or furnishing parts to replace, f.o.b. point of manufacture, any parts which, within one (1) year from date of shipment of said product(s) from the plant, fail because of defective workmanship or material performed or furnished by Vishay BLH. As a condition hereof, such defects must be brought to Vishay BLH's attention for verification when first discovered, and the material or parts alleged to be defective shall be returned if requested. Vishay BLH shall not be liable for transportation or installation charges, for expenses of Buyer for repairs or replacements or for any damages from delay or loss of use for other indirect or consequential damages of any kind. Vishay BLH may use improved designs of the parts to be replaced. This guarantee shall not apply to any material which shall have been repaired or altered outside of Vishay BLH's plant in any way, so as in Vishay BLH's judgment, to affect its strength, performance, or reliability, or to any defect due in any part to misuse, negligence, accident or any cause other than normal and reasonable use, nor shall it apply beyond their normal span of life to any materials whose normal span of life is shorter than the applicable period stated herein. In consideration of the foregoing guarantees, all implied warranties are waived by the Buyer, Vishay BLH does not guarantee quality of material or parts specified or furnished by Buyer, or by other parties designated by buyer, if not manufactured by Vishay BLH. If any modifications or repairs are made to this equipment without prior factory approval, the above warranty can become null and void.

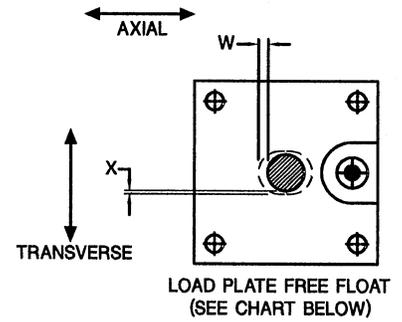
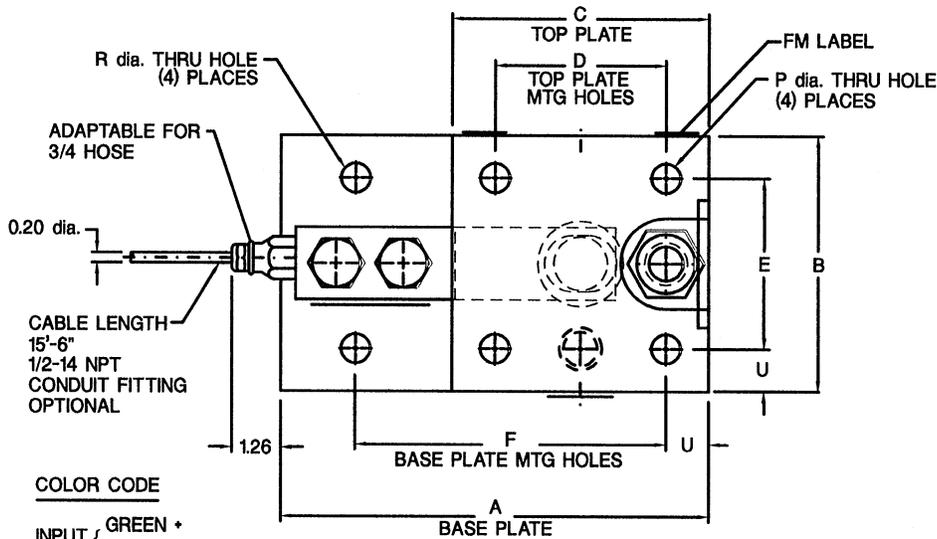
1.7 FIELD ENGINEERING

Improper EconoMount installation or operation may result in module, vessel, or factory damage. Please follow instructions carefully. Vishay BLH will not accept any liability for faulty installation and/or misuse of this product. Authorized Vishay BLH Field Service Engineers are available around the world to install EconoMount modules and/or train factory personnel to do so. The Field Service Department is the most important tool to assure the best performance from your application. Field Service phone numbers are listed below.

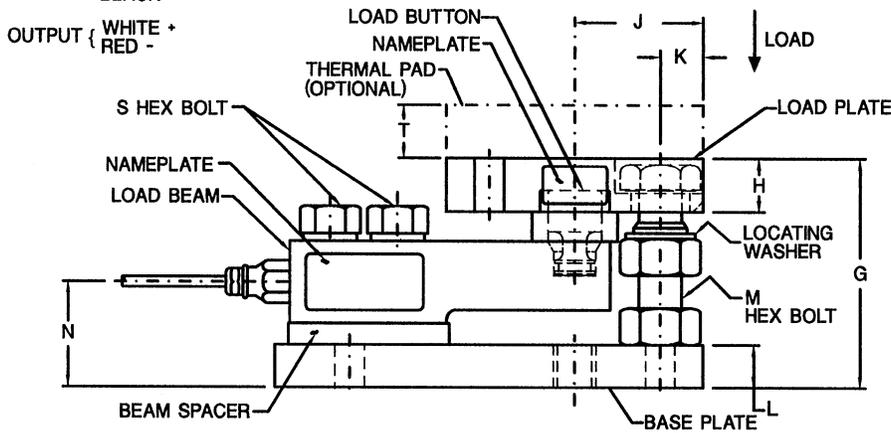
**Call (Factory Field Service)
(781) 821-2000**

Midwest - (815) 879-8818

Canada - (416) 251-2554



LOAD PLATE FREE FLOAT			
CAPACITY (lbs)		W AXIAL	X TRANSVERSE
500 _T 5,000 _R 5,000 _U	FIXED	+/- 0	+/- 0
	SEMI	+/- 1/8	+/- 1/32
	FULL	+/- 1/8	+/- 1/8
10,000	FIXED	+/- 0	+/- 0
	SEMI	+/- 3/16	+/- 3/16
	FULL	+/- 3/16	+/- 3/16



COMPONENT	MATERIAL	
	LOAD CELL	
	PAINTED	STAINLESS STEEL
BEAM SPACER	304 STAINLESS STL	304 STAINLESS STL
LOCATING WASHER	304 STAINLESS STL	304 STAINLESS STL
LOAD BUTTON	17-4 PH STAINLESS STL	17-4 PH STAINLESS STL
LOAD BEAM	17-4 PH STAINLESS STL	17-4 PH STAINLESS STL
LOAD PLATE	PAINTED 1018 STEEL	CL 304 STAINLESS STL
BASE PLATE	1018 STEEL	304 STAINLESS STL
HEX BOLTS (M)	ZINC PLATE	18-8 STAINLESS STL
HEX BOLTS (S)	ZINC PLATE SAE GRADE 5	410 STAINLESS STL ASTM A193 GRADE B6

*Dummy module HWD dimensions are identical to beam based modules. All dimensions shown in inches

CAPACITY (lbs)	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	WEIGHT APPROX
500-5000	8	4 1/2	4 1/2	3 1/2	3 1/2	6	4 1/8	10	2 1/4	5/8	3/4	5/8-11	2	7/16	7/16	1/2-20	10	1/2	16 lb
10,000	10	6	6	4	4	7.25	5 3/8	1 1/4	3.0	1.0	1.0	1-8	2 1/2	1 1/16	1 1/16	3/4-10	10	10	RES

SECTION II Installation

Tips, techniques, and procedures for installing total weigh systems are presented in the Electronic Weigh Systems Handbook (HB 002-1). TM021 deals only with EconoMount Weigh Modules.

IMPORTANT NOTE: Vishay BLH strongly recommends that the user read this section completely prior to starting installation as each successive step depends upon satisfactory completion of all prior procedures.

2.1 GENERAL

This publication provides mechanical and electrical installation instructions for EconoMount Weigh Modules. Procedures are relatively simple since modules need only to be bolted to a fixed mounting base, attached to the weigh vessel, and connected electrically. As shown in Figure 2-1, each module consists of a top plate, load beam, base plate, and a retainer bolt. Four bolts (customer supplied) secure the base plate to a prepared mounting base, and four bolts (customer supplied) attach the top plate to the vessel gusset/leg/etc. Customer supplied bolts should be grade 8.8 or stronger.

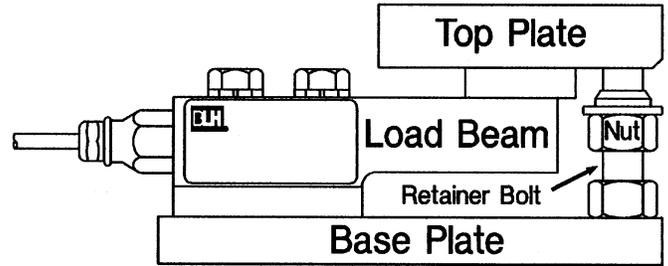


Figure 2-1. EconoMount Weigh Module Composition

2.1.1 Single Point Installations

Simple level or low resolution weigh systems can be designed and implemented using only one 'live' weigh module (Figure 2-2). However, any system must be supported at a minimum of three locations (three points determine the mounting plane). If a system design incorporates two or more simulated modules, be sure to select the proper capacity for the one live module. A single point installation typically requires a full-floating module to allow for some thermal expansion/contraction.

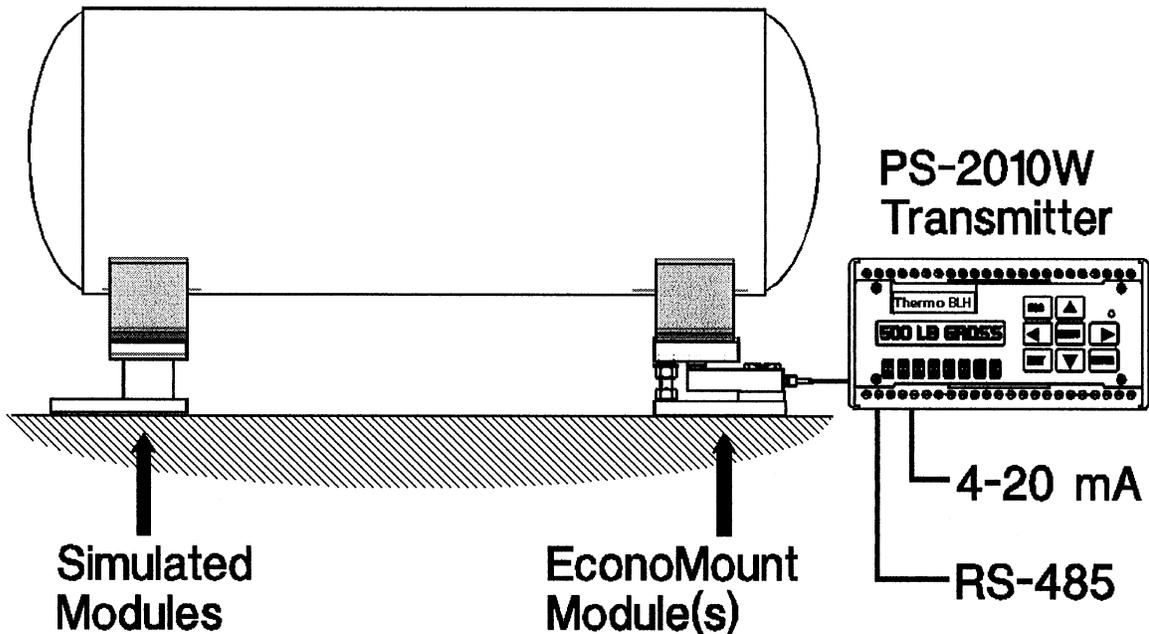


Figure 2-2. Level Weighing System with Dummy Modules

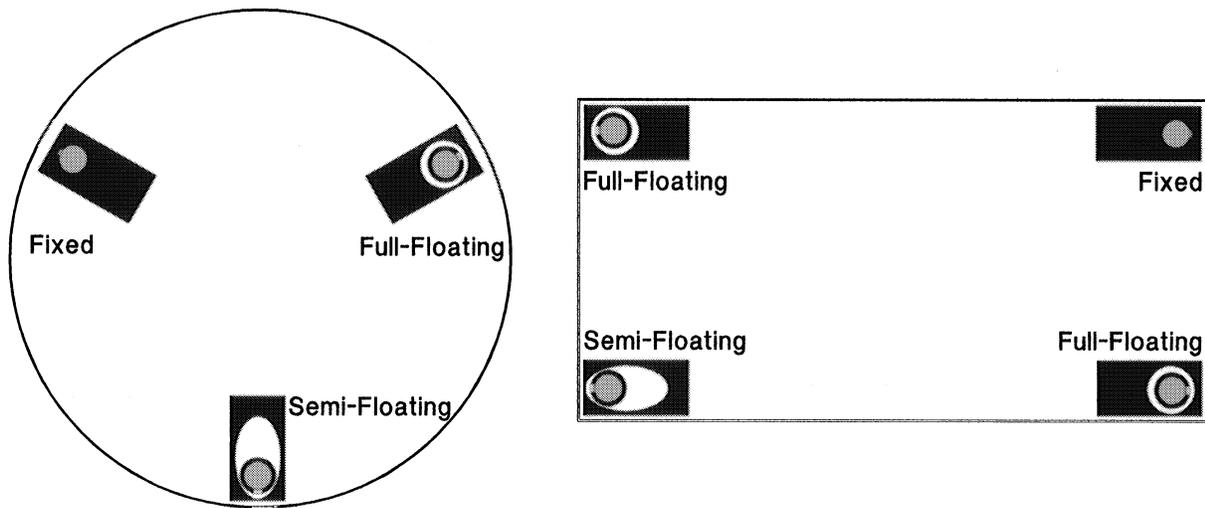


Figure 2-3. 3 and 4 Point Support Mounting Configurations

2.1.2 Multi-Point Installations

To obtain maximum system accuracy, all vessel support locations should be mounted to live weigh modules. Output signals from all modules are then electrically summed together to provide the total system gross weight. When using live modules at all supports, Vishay BLH recommends using a combination of mounting hardware types for optimal system performance. Figure 2-3 shows typical three and four point installation configurations and the recommended mixture of mounting hardware types.

2.2 SITE PREPARATION

2.2.1 Module Orientation - Three Point Support

Upright cylindrical vessels are well suited for a three point support system. Orientation of the weigh modules can be either tangent to the perimeter, or radially towards or away from the center. Both the fixed and full floating modules can be mounted tangentially or radially without changes. However, the semi-floating module is designed to accommodate thermal expansion in only one direction and must be oriented with that expansion capability in line with the primary axis of vessel expansion. From the factory that module is assembled with the axis of movement parallel to the main axis of the beam transducer and should therefore be oriented radially.

In situations that require a tangential type mounting arrangement, the EconoMount base plate is equipped with an alternate assembly hole that makes it possible to disassemble and re-orient the plate to accommodate expansion transverse to the beam (reference outline drawing, page 1-3).

2.2.2 Module Orientation - Four Point Support

A four point support arrangement is well suited for horizontal tanks and rectangular hoppers. The Orientation of the fixed and full-floating modules can be parallel to any side or can be radially facing to or away from the center. Mounting of the semi-floating

module should be oriented so that its axis of expansion accommodation is parallel with the main axis of the vessel or hopper. From the factory that module is designed to accommodate expansion in a direction parallel to the main axis of the beam transducer. The EconoMount base plate is equipped with an alternate assembly hole that makes it possible to disassemble and re-orient the plate to accommodate expansion transverse to the beam (see page 1-3 outline drawing).

2.2.3 Mounting Base Considerations

The module base plate must be uniformly supported and level. On a structural steel support using through bolts, or a concrete pad using studs, the bolt spacing must be accurate to within 0.05 inches of the bolt pattern specified in the outline drawing. Grade 8.8 (or stronger) studs or bolts must be used.

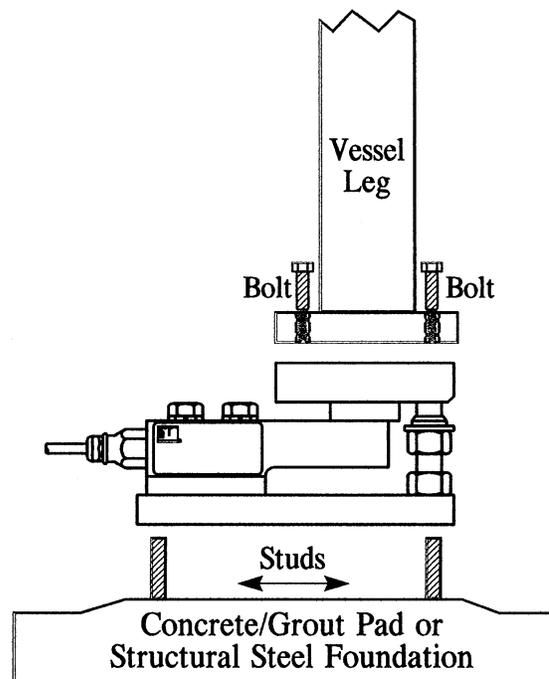


Figure 2-4. Installation Arrangements

2.2.4 Vessel Leg/Gusset Preparations

Pre-drill holes in the leg or gusset of the vessel to match the top plate bolt pattern (see outline drawing). Allow for normal bolt clearance and adjustment. Use grade 8.8 (or stronger) bolts sized long enough to allow four full threads of engagement.

2.3 STEP-BY-STEP MOUNTING PROCEDURES

After the site and vessel supports are fully prepared, installation begins. Figure 2-4 shows the typical mounting configuration for an EconoMount Weigh Module.

2.3.1 Module Placement

Lift the vessel and place the EconoMount Weigh Modules on the prepared mounting surfaces. Be sure that the mounting surface for each module is uniformly supported and level. Secure the base plate of each module to its mounting surface by tightening bolts to the manufacturer's recommended torque specification.

2.3.2 Vessel Placement

Lower the vessel onto the module top plates. Avoid dropping the vessel or applying an impact load to the weigh modules. Attach the top plate of each module to the vessel leg/gusset by tightening bolts to the manufacturer's recommended torque specification.

2.3.3 Retainer Bolt Adjustments

Modules are factory shipped with the retainer bolt nuts in a rigid position. This keeps the top plate from wobbling during vessel installation. After the vessel is attached, tension on the retainer bolt nut must be backed off to ensure proper weighing. Loosen the nut until the sleeve breaks contact with the top plate. Back the nut down the full length of the bolt so that it is completely out of the way of the top plate.

2.3.4 Electrical Connections

The EconoMount wiring color code is presented in the outline dimension drawing. Each conductor has tinned leads for easy connection to a Vishay BLH summing junction box or transmitter. Connect each signal wire to its appropriate J-Box location. Excess cable can be coiled up inside the junction box or transmitter enclosure. Cutting the cable can affect the transducer signal and is therefore not recommended. To achieve extra protection from electrical damage, Vishay BLH recommends a ground strap between the vessel and earth ground.

2.3.5 Shimming For Load Distribution

With empty vessel weight resting on the EconoMount modules and excitation voltage applied, measure the output of each module with a DVM (digital volt meter). Each module must indicate some output representing partial weight of the empty vessel. Reading would normally be from 1-10 mV dc. No module should indicate less than 10 % of the empty vessel weight; ideally the share should be identical.

Any module with output less than 10 % of the vessel weight should be shimmed between the top plate and vessel leg/gusset. Repeat shimming process until all modules have outputs within 20-30% of each other.

Once shimming is complete, the system is ready for calibration and live operation.

SECTION III Operation

3.1 TEMPERATURE CONSIDERATIONS

EconoMount modules perform best when operated within their compensated temperature range of +14 to +104 degrees fahrenheit. Maximum operating temperature range without damage is -58 to +194 degrees fahrenheit.

When ambient temperatures at the module exceed the compensated temperature range, special precautions must be taken to ensure that actual module temperature is held within specified limits. These precautions are necessary whether or not the module is being operated. Thermal pads can be used to reduce conductive heating. (Ref. para. 1.3.2)

3.2 LOAD CONSIDERATIONS

EconoMount Weigh Modules can be periodically loaded up to 150% of rated capacity without adverse effects.

CAUTION

A static overload in excess of the Overload Rating may permanently affect the accuracy and performance of the module. Peak vibratory loading should be limited to 100% of rated capacity to preclude premature fatigue failure of the module. Shock loads should be avoided or otherwise attenuated by means of resilient pads or mounts. Weigh systems designed without regard to significant shock loads may lose calibration or even damage the module beyond repair.

SECTION IV Maintenance

4.1 CALIBRATION

EconoMount modules are carefully checked and calibrated at Vishay BLH before shipment. The accuracy of the instruments and standards used for calibration are traceable to the National Bureau of Standards. A data and calibration sheet is furnished with each module supplied by Vishay BLH. The data included on this sheet can be used as a reference where independent calibration checks are performed.

Calibration can be accurately checked by applying the rated load to the module and then comparing the output with the original data on the calibration certificate. Calibration should be checked whenever the beam is thought to have been overloaded beyond its safe overload rating (150%). Note that the module performance cannot be changed through external adjustments and any module displaying calibration error should be returned to Vishay BLH for service.

System calibration instructions are included in the digital indicator/transmitter operator's manual.

4.2 MAINTENANCE/TROUBLESHOOTING

When it is necessary to determine if a module circuit is operative, the vessel does not have to be lifted off the module in question. Simply read across the output leads (red & white) with a digital voltmeter with power applied to the module. The readings should be somewhat similar, normally in the 5-30 mV range. Any radical departure from these figures are usually indicative of a failure.

To determine the cause of incorrect operation of the measuring system, perform the following inspections:

- a. Check instrument power and fuses.
- b. Check that connections to the instrument are correct and tight.
- c. Check instrument performance independently following recommended procedure.
- d. Check continuity of interconnecting leads.
- e. Check junction box connections (where used).
- f. Check for proper excitation voltage.
- g. Check output of each module for comparable output levels.
- h. Insulation resistance checks: EconoMount modules must be disconnected for leakage test (measured values should exceed 5000 m-ohms).
 - 1) Ground to a lead of the interconnecting cable.
 - 2) Module case to a lead of the cable.
 - 3) Module case to the shield of the cable.
- j. Input/Output resistance check. Disconnect the module cable leads from the instrument or junction box. Measure the resistance between the input leads and between the output leads. Resistance should be as specified. **OHMMETER USED SHOULD NOT APPLY MORE THAN 20 VOLTS TO THE BEAM BRIDGE.**

Resistance readings other than those listed in the specifications indicate a failure within the unit. DO NOT attempt to repair; faulty modules require factory service. Contact the local sales office or Vishay BLH directly for RETURN AUTHORIZATION. Upon examination of the module at the factory, a full report on the condition with a quotation on repair cost and delivery will be submitted to the customer.

BLH NOBEL

A **VPG** Brand

blhnobel.com