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FORCE PLATE AND MOUNTING PLATE INSTALLATION INSTRUCTIONS

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CE

FORCE PLATE AND MOUNTING PLATE INSTALLATION INSTRUCTIONS



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During the Warranty Period, Bertec shall provide to you any new, corrected or enhanced version of the Product as created by Bertec. Such enhancement shall include all modifications to the Product which increase the speed, efficiency or ease of use of the Product, or add additional capabilities or functionality to the Product, but shall not include any substantially new or rewritten version of the Product. These updates will require Internet Access to our web site to automatically validate your License Key and provide update support.

After expiration of the Warranty Period, you may continue to receive maintenance support. The charge for such optional maintenance support shall be Bertec's regular list price for maintenance and support for the Product as published from time to time by Bertec. You will need to notify Bertec in writing if you desire to receive optional maintenance. If you fail to take optional maintenance and later elect to receive it, Bertec reserves the right to charge you their standard maintenance fees for the period of the lapse in maintenance. Bertec may elect to discontinue maintenance at any time upon notice to you, and refund of any then unearned maintenance fees.

7. Proprietary Rights Exclusion

Bertec makes no representation or warranty that the Product, or products developed using the Product, do not infringe any proprietary rights of any third parties. You shall assume sole responsibility for any such infringement.

8. Indemnification

You hereby agree to indemnify, defend and hold Bertec harmless from and against any and all claims, actions, suits, liabilities, judgments, losses, damages, attorneys' fees and other expenses of every nature and character by reason of this Agreement or use by you of products utilizing the Product.

9. Export Restrictions

You shall not export, directly or indirectly, any Product or products developed using the Product to any country for which the laws of the United States or the regulations of any U.S. agency requires an export license or other governmental approval, without first obtaining such license or approval. You shall strictly comply with all such restrictions. You agree to indemnify and hold Bertec harmless against all losses, damages, penalties, or causes of action resulting from a violation of this Section.

10. Governing Law

The validity, performance, construction and interpretation of this Agreement shall be governed by laws of the state of Ohio, United States of America, excluding its conflicts of laws rules, as applied to agreements entered into in Ohio between Ohio residents.

11. High risk activities

The software and/or hardware supplied by Bertec Corporation is not fault-tolerant and is not designed, manufactured or intended for use or resale as on-line control or equipment in hazardous environments requiring fail-safe performance in which the failure of software and/or hardware could lead directly to death, personal injury, or severe physical or environmental damage ("high risk activity"). Bertec Corporation and its suppliers specifically disclaim any express or implied warranties of fitness for high risk activities.

12. Customer's remedies

BERTEC's and its distributors' entire liability and the customer's exclusive remedy shall be, at BERTEC's option, to either repair or replace all BERTEC hardware and/or software products that do not meet BERTEC's Limited Warranty and are returned to BERTEC. Cost of delivery of the BERTEC product, to and from BERTEC, will be the responsibility of BERTEC for the first year of the warranty period. Thereafter, all costs associated with transport of the BERTEC product shall be the responsibility of the customer. This Limited Warranty is void if failure of the BERTEC hardware and/or software products has resulted from improper installation by the customer (in contravention of proper installation instructions as detailed in the user's manual included with the BERTEC product), unauthorized modifications, misuse or abuse of the BERTEC product by the customer, and/or failure by the customer to properly maintain the BERTEC product. Any replacement BERTEC product will be warranted for the remainder of the original warranty period.

Should you have any questions concerning this Agreement, please write to:

Bertec Corporation, 6171 Huntley Road, Suite J, Columbus, Ohio 43229

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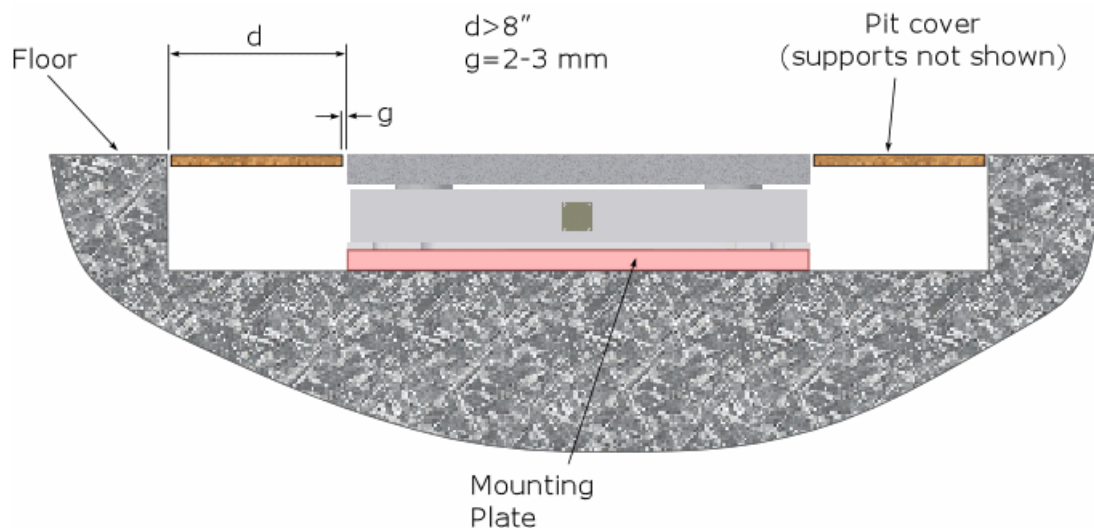
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GENERAL INSTALLATION

All Bertec force plates are pre-assembled in the factory, and are ready to be used. They can be used either mounted to the floor or without mounting. If the activity to be studied involves shear forces it is recommended that the plate is mounted in order to avoid accidental sliding of the force plate.

In all cases, the floor on which testing is to be done should be stiff enough to minimize any vibrations of the floor. Bertec force plates are sensitive devices. Therefore, they might pick up vibrations coming from the support structure. Another consideration is the flatness of the mounting surface. The surface should be flat enough to prevent rocking of the force plate. Shimming with sheets of paper is a low-tech solution, which solves the problem.

For effective use, the top surface of the force plate should be at the same level as the rest of the floor. For this purpose, a pit can be made in which the plate is mounted. Alternatively, a raised walkway can be used with the top surface of the walkway at the same level with the force plate. No matter what methodology is used, remember to leave room for the output cable and make sure that the force plate does not touch any surrounding structure as this might result in measurement errors. A gap of 2-3 mm (0.080"-0.120") between the force plate and surrounding floor will be appropriate (see Figure). The following practical considerations will be helpful during installation. If you need additional assistance, please contact Bertec Corporation.



- The pit should be deep enough to accommodate the height of both the force plate and mounting plate ($\frac{3}{4}$ inches). Leave an additional $\frac{1}{8}$ "- $\frac{1}{4}$ " space for leveling tolerances.
- The standard height of a mounting plate is $\frac{3}{4}$ " (19.05 mm).
- The size of the pit should be large enough to take future expansion plans into account, such as adding more force plates or other equipment.
- Allow about 8" (200 mm) free space around the force plate so that the output cable is not cramped, and the wrench to tighten the mounting bolts can be operated easily (see the above Figure).
- Incorporate a conduit into the construction plan so that the output cable will run under the floor. Make the conduit large enough for the cable connector to pass through. The minimum diameter for a straight conduit should be $1\frac{1}{4}$ " (45 mm). If there are bends and corners in the conduit, then the recommended diameter is 3 inches (75 mm).

INSTALLATION WITHOUT A MOUNTING PLATE

Bertec force plates may be used on any type of surface. When used on a hard, non-flat surface, shimming is required to prevent rocking of the plate (plain paper works fine for shimming small gaps up to 1/32"). When mounting to a concrete surface, Bertec recommends using threaded anchors permanently affixed to the concrete floor. The standard bolts to be used with force plates are of the size 3/8" - 16 UNC (or M8 - 1.25). For the exact locations of the anchor points for different force plate models, please refer to the anchor locations for your specific force plate. Finally, the area where the plate is going to be mounted should be clean.

Caution should be taken, however, when using unfixed force plates. Large shear forces may cause an unattached plate to move on the surface, which can be dangerous for both the subject and any by-standers. Bertec recommends avoiding use of unfixed plates in these situations.

If you are not sure about the flatness of the mounting surface, then tighten the anchoring bolts as little as possible to avoid bending the base of the force plate. Make sure that entire surface below the feet is properly shimmed.

INSTALLATION WITH A MOUNTING PLATE

Standard mounting plates are 3/4" (19 mm) thick and have the same dimensions as the force plate (for nonstandard mounting plates, please contact Bertec). The mounting plates come with pre-tapped holes that match the anchor locations on the feet of the force plate, along with leveling hardware. Typically, the mounting plate is rigidly affixed to the floor with a high strength epoxy or construction adhesive. The flatness of the floor and as result the flatness of the mounting plate is very important; therefore, floors that have gaps of 1/8" to 3/16" will receive construction adhesive whereas floors with larger gaps will receive epoxy. Once the mounting plate is adhered to the floor, then the force plate is mounted onto it via four hexagonal cap screws of size 3/8" - 16 UNC (or M8 - 1.25). The following installation hardware is provided with the mounting plate:

- High Strength Epoxy OR Construction Adhesive - to glue the mounting plate
- Trowel and Putty Knife - to spread the epoxy on the floor

- OR -

- Caulk gun – to spread the adhesive on the floor
- Water Level - to adjust the levelness of the force plate
- Hexagonal Allen Key - to adjust the set screws on the mounting plate
- Eye Bolts - to lift the mounting plate
- Hexagonal Cap Screws - to attach force plate to the mounting plate

Please read all the installation instructions included with your force plate and mounting plate.