

# Instructions for Form 3 Code Stamped Cover or Flange

## Hinge Overview

The Universal Hinge brand Bolt on Hinge\* is a custom manufactured product tailored specifically for your application. To insure proper fit and operation, the Hinge must be designed to:

- Match the Cover and Flange hole locations and
- Match Cover/Flange assembled “flange-to-flange” thickness
- Provide clearance to Cover projections such as domes and steps.
- Provide clearance to Cover and Flange welds, such as longitudinal and fillet welds.
- Provide access between the back side of the Flange and the vessel for fastener insertion and tightening

This instruction has been developed to guide you step-by-step through the measurement and data collection process. It is not difficult, but attention to detail is necessary.

Some of the design constraints are shown in Figure 1.

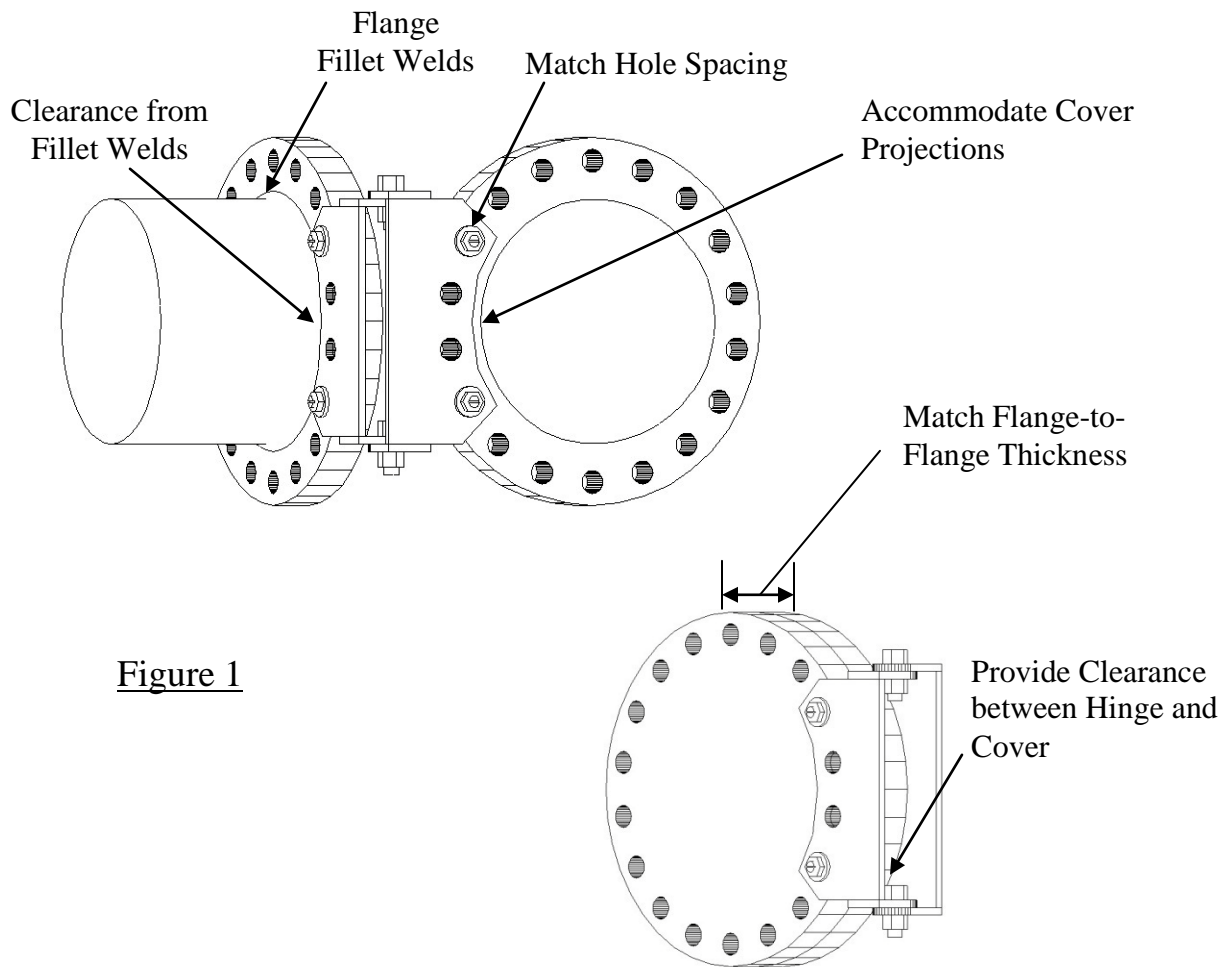


Figure 1

### Flange Overview

The geometry of a flange is governed by the equipment manufacturer. Each manufacturer may have its own unique flange designs, may utilize national standards such as the American National Standards Institute (ANSI) or may use a combination of both. Although cover and flange shapes may be circular, rectangular, half circular and half rectangular, or irregular, a Bolt-on-Hinge can be designed for most applications. It is possible that the equipment manufacturer provided detailed machining drawings of the cover and flange in the technical manual/instruction book provided with the equipment.

Covers and flanges are joined together with fasteners located near the outer edge of the cover. The cover typically has through-holes equally spaced around the circumference of the cover with the holes straddling the horizontal centerline. The flange has an identical number of holes as the cover but may have either through-holes or tapped holes. A circle drawn through the center of each hole in the cover is referred to as the Bolt Circle. The Bolt Circle diameter is identical for both the cover and flange.

If both the cover and flange have through-holes, then the cover and flanges are joined with nuts and bolts or threaded studs with a nut at the end of each stud. Since the through-holes are larger in diameter than the bolts, when assembled, the bolts are not likely located in the center of each bolt hole, therefore the hole-to-hole spacing will not be the same as the bolt to bolt spacing.

If the cover has through-holes and the flange has tapped holes, then the cover and flanges are joined with bolts or threaded studs with a single nut at one end. Although the through-holes in the cover are larger in diameter than the bolts, since the bolts are threaded into the tapped holes in the flange, the bolts will be located in the center of each hole. In this case the hole-to-hole spacing is the same as the bolt-to-bolt spacing.

### Form Submission

Use one of the following methods to submit your completed form:

- Email the form to [orders@universalhinge.com](mailto:orders@universalhinge.com)
- Fax the form to (815) 846 – 1882
- Mail the form to:

Universal Hinge Corp.  
18 Newton Road  
Westminster, MA 01473

## Instructions for Form 3 *Code Stamped Cover or Flange*

You must satisfy all of the following requirements to use this form in placing an order.

1. One of the following, but not both
  - a. National Cove stamped on flange
  - b. National Code stamped on cover

If you are unable to satisfy all of the prerequisites, then please go to <http://www.universalhinge.com/inquiries.html> to locate the correct form.

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### 3. Flange-to-Flange Thickness

If possible, clamp a small flat piece of steel (such as a flat washer) against the back side of the flange face. Place a combination square against the cover face and extend the blade of the square until it just touches the flat washer. If you couldn't clamp a piece of steel to the cover, extend the blade of the square until the end of the blade is exactly even with the back face of the flange. Tighten the locking nut and read the Flange-to-Flange thickness to the nearest 1/64<sup>th</sup> of an inch. A dial or digital caliper could be used in lieu of the combination square.



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### 5. Unstamped Flange/Cover Thickness

If possible wedge a small piece of steel into the gap between the inner face of the cover and flange. If the cover is not stamped, place a combination square against the face of the cover and extend the blade of the square until it just touches the piece of steel. If you couldn't wedge a piece of steel to the gap between the cover and flange, extend the blade until the end is even with the inside edge of that cover. Tighten the locking nut and read the Cover Thickness to the nearest 1/64<sup>th</sup> of an inch and record it in this section. If the flange is not stamped, follow the same procedure to measure the flange thickness and record that dimension in the space provided above.



**7. Cover Outside Diameter** (*Unstamped Flat Cover Only*)

If the cover is flat without any obstruction across the diameter, using a tape measure, measure the cover outside diameter across either the vertical or horizontal centerline of the cover.



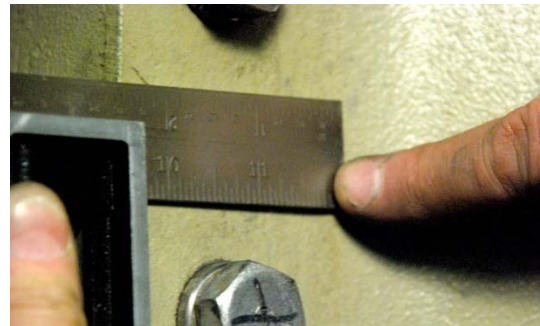
**8. Cover Outside Circumference** (*Unstamped Domed Cover Only*)

If the cover has a domed head or there is an obstruction across the diameter, using a fiberglass tape, run the tape around the perimeter of the cover and measure the circumference to the nearest 1/8<sup>th</sup> of an inch.



**9. Distance to Step** (*Unstamped Stepped/Domed Covers Only*)

Place a combination square against the side edge of the cover at the horizontal centerline. While holding the square tightly against the edge of the cover, extend the blade of the square until it just touches either the step in the cover or the beginning of the radius for the dome. Insure that the blade of the square is perpendicular to the step or dome then tighten the locking nut and read the Distance to Step to the nearest 1/32<sup>nd</sup> of an inch.



## 11. Cover to Flange Offset

### a. Hinge Side

At the horizontal centerline, the side edges of the cover and flange may not be flush, i.e. even. At the horizontal centerline, place a combination square against the side edge of the cover or flange, whichever is prouder. While holding the square tightly against the edge of the cover or flange, extend the blade of the square until it just touches the outside edge of the recessed component (cover or flange). Tighten the locking nut and read the Flange Radial Height to the nearest 1/32<sup>nd</sup> of an inch. If cover and flange are flush (no step), enter "0"



### b. Opposite Side

Repeat measurement from step 10A above for side opposite hinge.

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## 12. Flange Radial Height to Body (*Unstamped Flange Only*)

Place a combination square against the side edge of the flange at the horizontal centerline. Extend the blade of the square beyond the edge of the flange until it just touches the outer surface of the body. Make sure that the blade clears the flange-to-body fillet weld and the longitudinal weld of the body. Insuring that the blade of the square is perpendicular to the body, tighten the locking nut and read the Flange Radial Height to the nearest 1/32<sup>nd</sup> of an inch.



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## 13. Distance to Flange-to-Body Fillet Weld, Step or Weld Neck (*Unstamped Flange Only*)

As done in the previous step, place a combination square against the side edge of the flange at the horizontal centerline. This time, keep the blade of the square against the inside edge of the flange. Extend the blade of the square until it just touches the outermost surface of a fillet weld, step or the beginning radius of a weld neck. Tighten the locking nut and read the Distance to Fillet Weld to the next smaller 1/16<sup>th</sup> of an inch. This can also



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be done using a steel ruler provided that the ruler is held radially outward when taking the measurement.

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### 14. Distance to Flange-to-Longitudinal Weld *(Unstamped Flange Only)*

As done in the previous step, place a combination square against the side edge of the flange at the horizontal centerline. Extend the blade of the square beyond the edge of the flange until it just touches the outer surface of the longitudinal weld. Make sure that the blade clears the flange-to-body fillet weld. Insuring that the blade of the square is perpendicular to the body, tighten the locking nut and read the Distance to Longitudinal Weld to the nearest  $1/32^{\text{nd}}$  of an inch.



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### 15. Flange-to-Body Fillet Weld Length *(Unstamped Flange Only)*

Place a combination square against the body where the fillet weld meets the body. Keeping the edge of the square parallel to the flange face, extend the blade of the square until it just touches the flange face. Tighten the locking nut and read the Fillet Weld Length to the next larger  $1/16^{\text{th}}$  of an inch. As shown, this can also be done using a steel ruler provided that the ruler is held perpendicular to the flange face when taking the measurement.



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### 16. Axial Clearance Behind Flange Face

#### a. At 2<sup>nd</sup> Hole Above Horizontal Centerline

On the side of the cover where the hinge will be located, use a steel ruler or tape measure, measure the distance from the flange face to any obstruction behind the flange at the second bolt hole above the horizontal centerline. Measure to the nearest  $1/16^{\text{th}}$  of an inch.

#### b. At 2<sup>nd</sup> Hole Below Horizontal Centerline

Repeat the measurement from step 15A above for the second bolt hole below the horizontal centerline.



## 17. Digital Photographs

Although not required, photographs of the application will help avoid miscommunications.

*Note: Submit a photo of the back of the flange and the front of the cover. Submit the images via email to [orders@universalhinge.com](mailto:orders@universalhinge.com). Be sure to include your company name and facility in your correspondence.*

a) Front of Cover:



b) Back of Flange:

