



*OKS Clamp-On
Buffer Ultrasonic
Flow Transducers*



Process Control Instruments

OKS Clamp-On Buffer Ultrasonic Flow Transducers

Installation Guide

916-060B

Warranty

Each instrument manufactured by GE Panametrics is warranted to be free from defects in material and workmanship. Liability under this warranty is limited to restoring the instrument to normal operation or replacing the instrument, at the sole discretion of GE Panametrics. Fuses and batteries are specifically excluded from any liability. This warranty is effective from the date of delivery to the original purchaser. If GE Panametrics determines that the equipment was defective, the warranty period is:

- one year for general electronic failures of the instrument
- one year for mechanical failures of the sensor

If GE Panametrics determines that the equipment was damaged by misuse, improper installation, the use of unauthorized replacement parts, or operating conditions outside the guidelines specified by GE Panametrics, the repairs are not covered under this warranty.

The warranties set forth herein are exclusive and are in lieu of all other warranties whether statutory, express or implied (including warranties or merchantability and fitness for a particular purpose, and warranties arising from course of dealing or usage or trade).

Return Policy

If a GE Panametrics instrument malfunctions within the warranty period, the following procedure must be completed:

1. Notify GE Panametrics, giving full details of the problem, and provide the model number and serial number of the instrument. If the nature of the problem indicates the need for factory service, GE Panametrics will issue a RETURN AUTHORIZATION NUMBER (RAN), and shipping instructions for the return of the instrument to a service center will be provided.
2. If GE Panametrics instructs you to send your instrument to a service center, it must be shipped prepaid to the authorized repair station indicated in the shipping instructions.
3. Upon receipt, GE Panametrics will evaluate the instrument to determine the cause of the malfunction.

Then, one of the following courses of action will then be taken:

- If the damage is covered under the terms of the warranty, the instrument will be repaired at no cost to the owner and returned.
- If GE Panametrics determines that the damage is not covered under the terms of the warranty, or if the warranty has expired, an estimate for the cost of the repairs at standard rates will be provided. Upon receipt of the owner's approval to proceed, the instrument will be repaired and returned.

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Overview

Installing OKS Clamp-On Buffer Ultrasonic Flow Transducers involves the following general steps:

- marking the transducer location
- fastening the clamping fixture to the pipe
- mounting the transducers onto the clamping fixture.

Installing OKS transducers requires the use of one of the following devices to hold the transducers against the pipe wall:

- Split-Collar Clamp for 5" pipes and smaller
- Pipe Riser Clamp for pipes larger than 5"

Note: *OKS transducers can also be welded directly to the pipe or clamped using the Universal Clamping Fixture (UCF). Consult GE Panametrics for these applications.*

When any of these devices are used, OKS transducers require a solid sheet couplant in order to provide reliable transmission of the signal between the transducer and the pipe surface.

Solid Sheet Couplants

GE Panametrics supplies a solid sheet couplant for OKS transducer installations. The purpose of the couplant is to provide reliable transmission of ultrasound between two adjacent solid surfaces. Generally speaking, couplants perform this task by excluding air from between the adjacent surfaces. Therefore, the OKS transducers should be pressed tightly against the pipe surface.

GE Panametrics provides a variety of solid sheet couplants for extremely high- and low-temperature applications. Standard GE Panametrics couplants are listed in Table 1 below.

Table 1: Solid Sheet Couplants

Part No.	Type	Temp. Range	Use
CPL-12	Standard	-20° to +375°C	Permanent
CPL-13	Cryogenics	-250° to +100°C	Permanent
CPL-14	Gold Only Applications	-20° to +375°C	Permanent
CPL-15	Zinc Only Applications	-20° to +375°C	Permanent
CPL-S	Special	As Required	Difficult Applications*
* Installations where gold or zinc cannot be used. Consult GE Panametrics for these applications.			

Selecting and Marking Transducer Locations

OKS transducers are typically installed using the single-traverse method (see Figure 1 below). Occasionally, multiple-traverse methods are also used. Consult the factory.

Before mounting a clamping fixture, the pipe must be marked for the proper alignment and spacing. The following tools will be required:

- level
- center punch

Caution!

A flowmeter's accuracy and performance depends on the location, spacing, and alignment of the transducers. This document provides general instructions for locating and installing OKS transducers. However, the specific spacing of transducers is unique to each installation.

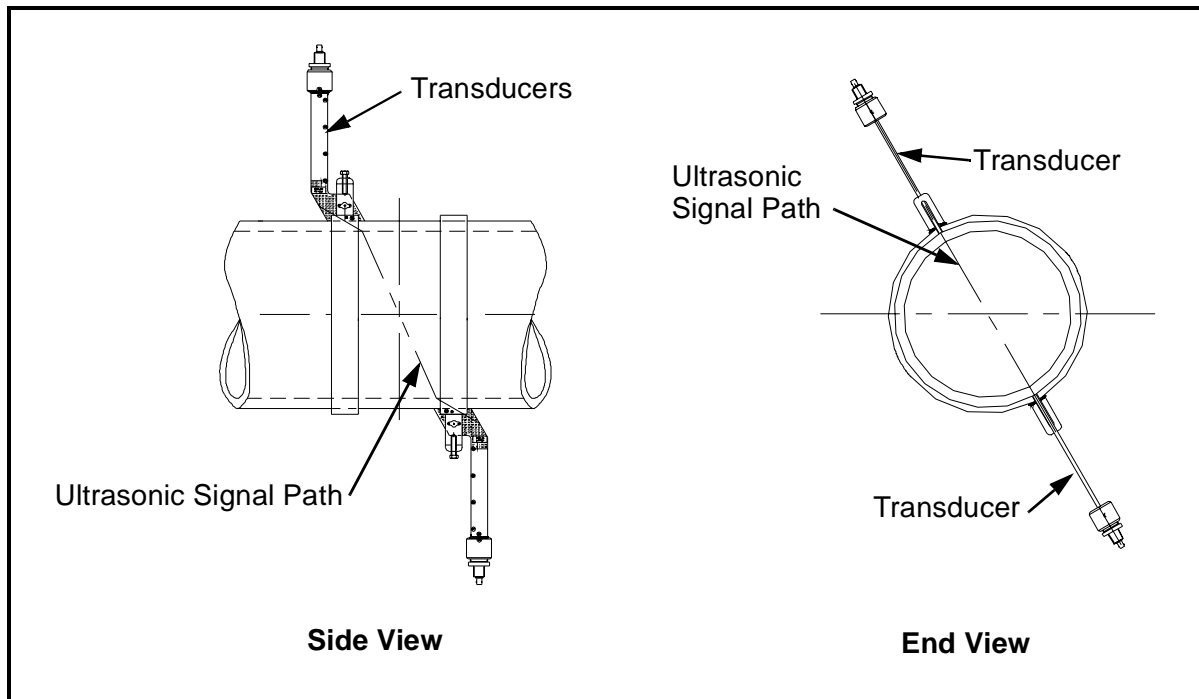
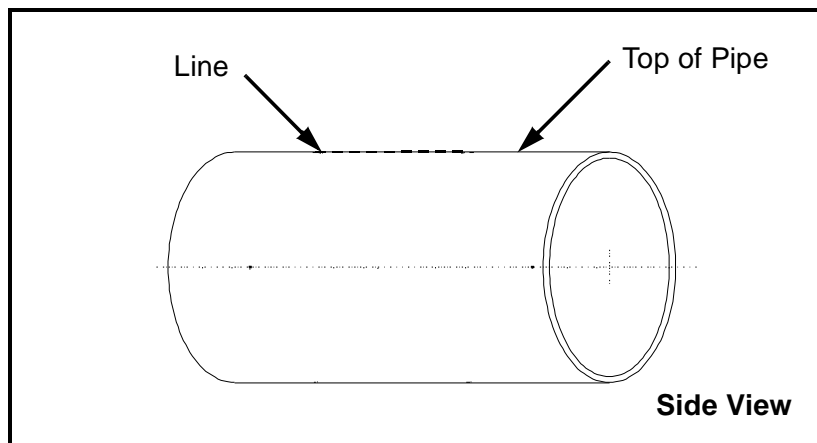


Figure 1: Single-Traverse Installation

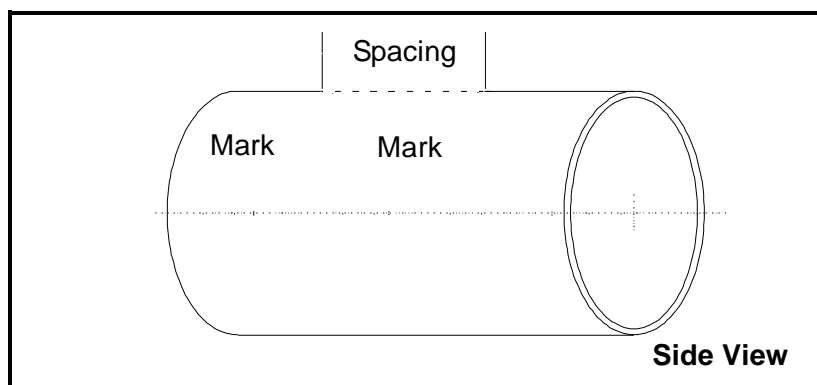
Selecting and Marking Transducer Locations (cont.)

To select and mark the transducer locations, proceed as follows:

1. Choose a location that has at least 10 pipe diameters of straight, undisturbed flow upstream and 5 pipe diameters downstream from the measurement point. Providing undisturbed flow means avoiding sources of turbulence such as flanges, elbows and tees; avoiding swirl; and avoiding disturbed flow profiles. Never install the flowmeter directly downstream of control valves, especially butterfly valves. If you cannot find an ideal location, use a downstream location of straight run in excess of 5 pipe diameters.
2. Prepare the intended installation site by removing any existing paint from the pipe and buffing the bare metal with a fine grit sand paper (or emery cloth) until it is shiny. After buffing the pipe, clean all dirt and debris away from the pipe surface.
3. Use a level to find the top of the pipe and then draw a line along the pipe's axis.

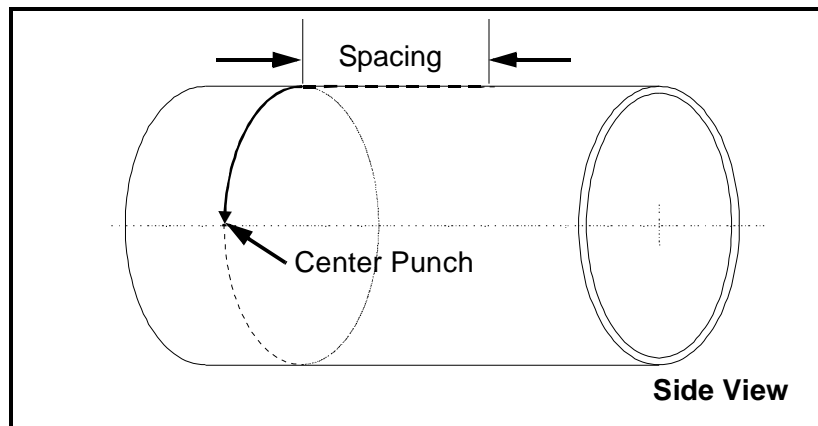


4. Make two marks on the line, separated by the transducer spacing distance S , as calculated by the meter.

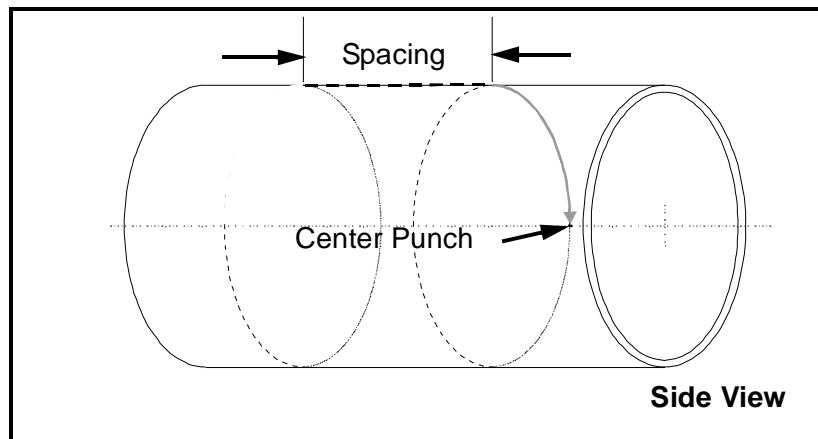


Selecting and Marking Transducer Locations (cont.)

- From one of the marks, measure around the circumference of the pipe the desired distance (30° to 90°). Use the center punch to make a mark.



- From the other mark, go a distance of 180° minus the first measurement in the opposite direction. For example, if the first measurement was 60° , the second measurement would be 120° ($180^\circ - 60^\circ = 120^\circ$). Use the center punch to make another mark.

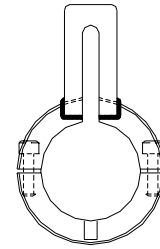


Note: When step 6 has been completed, the two center punch marks should be on opposite sides of the pipe (180° apart).

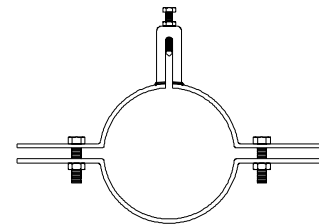
**Selecting and Marking
Transducer Locations
(cont.)**

7. Refer to one of the following sections to fasten the clamping fixture to the pipe. Use the graphics below to identify your clamp.

- Use the *Split-Collar Clamp* for pipes 5" diameter or smaller (see page 6).



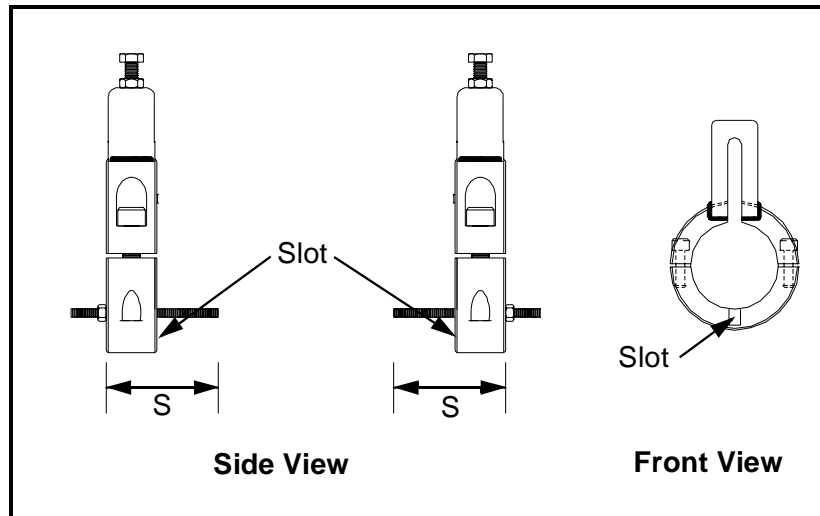
- Use the *Pipe Riser Clamp* for pipes larger than 5" diameter (see page 8).



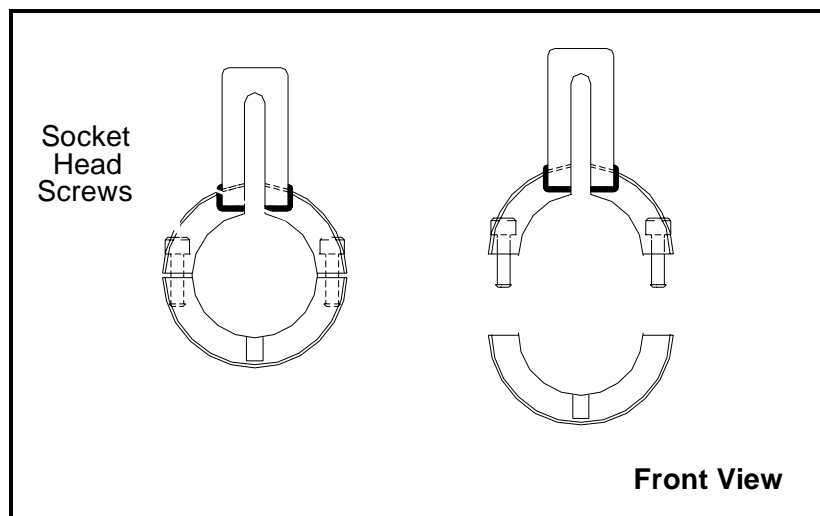
Split-Collar Clamp

Use the *Split-Collar Clamp* for pipes 5 inches in diameter or less. To fasten the clamping fixture:

1. Adjust the spacing rods on each piece of the split-collar fixture to the spacing dimension (S) as calculated by the meter. Use the drawing below to properly set the rods. When adjusting the rods, be sure to pay attention to how the clamps will be positioned on the pipe. Each clamp has a slot on the bottom. When the clamps are positioned on the pipe, the slots must face each other.

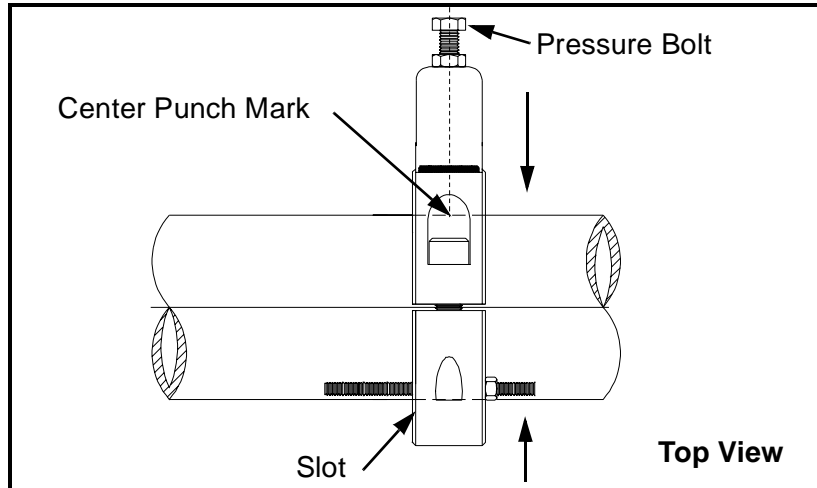


2. Using an allen wrench, separate the two pieces of the clamp so that it can be placed on the pipe. Do the same for the other clamp. Be sure not to mix the pieces of the fixtures.



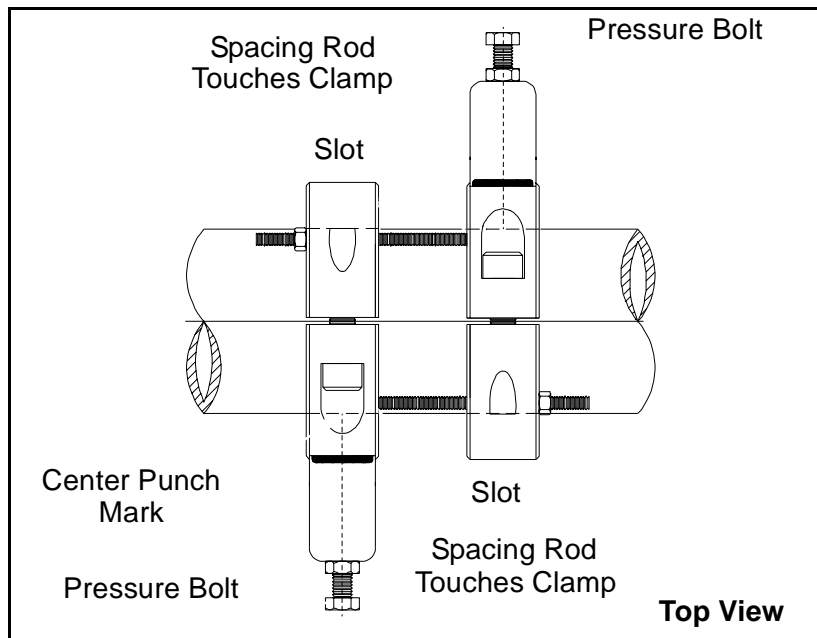
Split-Collar Clamp (cont.)

- Place one of the clamps over a center punch mark on the pipe. Align the clamp so the pressure bolt is over the center punch mark and the slot (opposite the pressure bolt) is facing the opposite clamp. Use the allen wrench to fasten the clamp to the pipe.



- Position the other clamp so that the pressure bolt is placed over the remaining center punch mark on the opposite side of the pipe and the pressure bolt is over the center of the mark.

Note: *Each clamp's spacing rods should touch the opposite clamp.*



- Verify the spacing with calipers, then proceed to *Inserting OKS Transducers* on page 10.

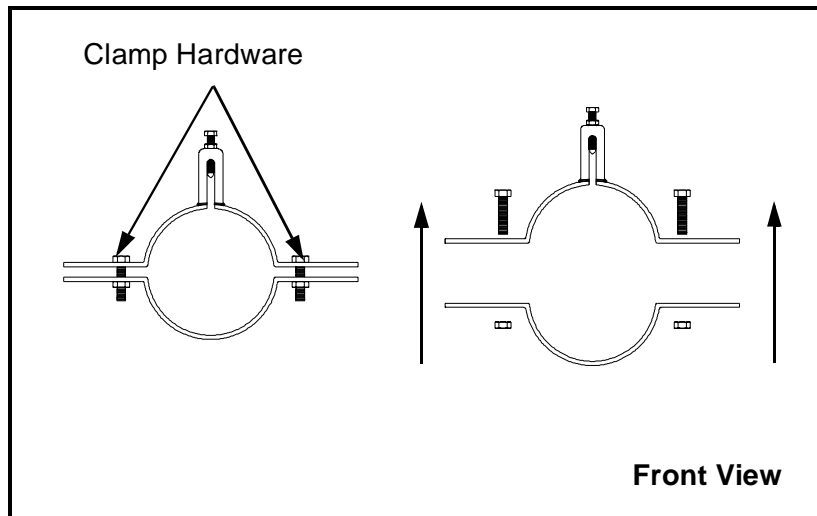
IMPORTANT: *If the spacing is incorrect, re-mark the pipe.*

Pipe Riser Clamp

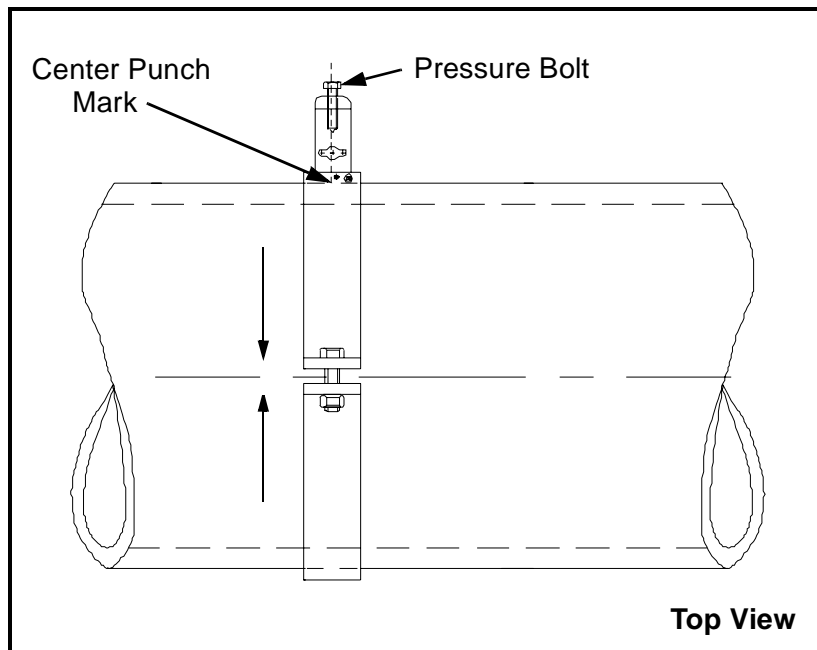
Use the *Pipe Riser Clamp* for pipes larger than 5 inches in diameter. To fasten the clamping fixture:

1. Use a wrench to separate the two pieces of the clamp so that it can be placed on the pipe. Repeat for the other clamp.

Note: *Be sure not to mix the pieces of the fixtures.*

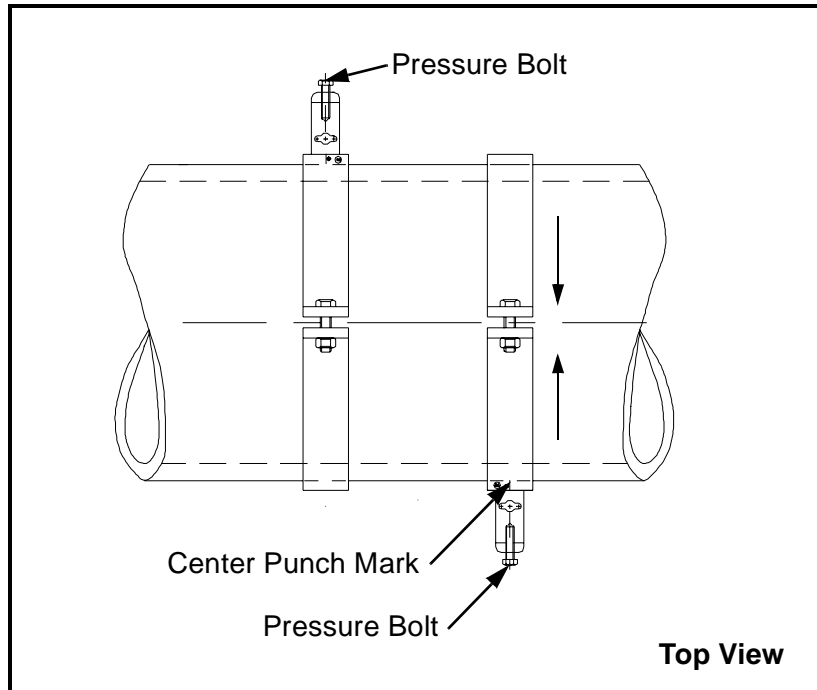


2. Position one of the clamps over a center punch mark on the pipe. Align the clamp so that the pressure bolt is over the center punch mark. Fasten the clamp to the pipe.



Pipe Riser Clamp (cont.)

3. Position the other clamp so that the pressure bolt is over the center of the remaining punch mark on the opposite side of the pipe.



4. Verify the spacing with calipers, then proceed to *Inserting OKS Transducers* on the next page.

IMPORTANT: *If the spacing is incorrect, re-mark the pipe.*

Inserting OKS Transducers

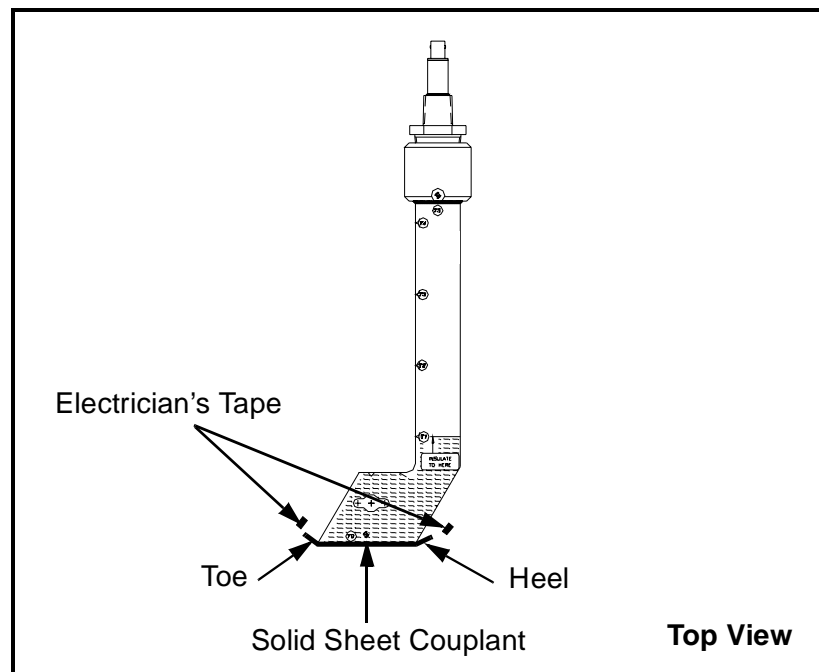
Note: *Although the illustrations in the following procedure show the clamp for pipes 5 in. or smaller, the steps for inserting the transducers are the same for both types of clamps.*

To insert the OKS transducers into the clamps you will need the following tools:

- electrician's tape
- solid sheet couplant (appropriate for the application)
- alignment tool (supplied by GE Panametrics)

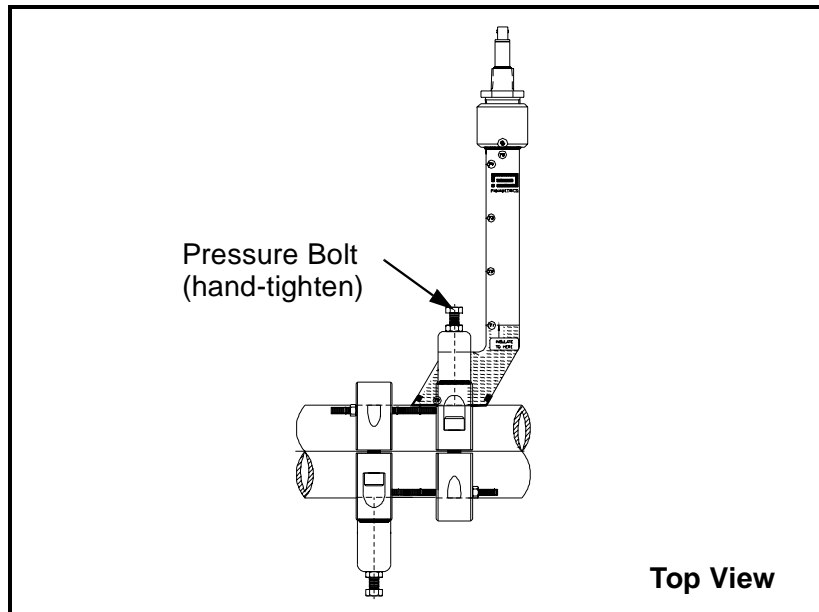
1. Before the OKS transducer can be inserted into the clamp, the solid sheet couplant must be applied. To do this, lay the solid sheet couplant over the transducer face and bend the ends over the transducer's heel and toe. Temporarily secure the couplant to the heel and toe with electrician's tape.

IMPORTANT: *Do not apply the tape to the transducer face.*

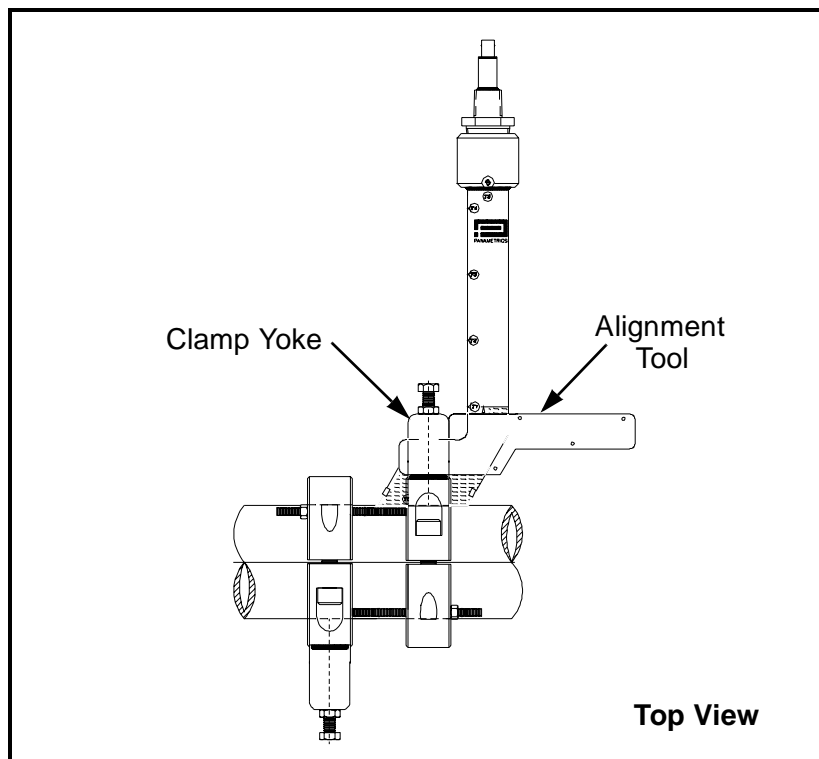


Inserting OKS Transducers (cont.)

2. Position the OKS transducer inside the clamp as shown, align the dimple in the OKS transducer with the pressure bolt, and then hand-tighten the bolt.

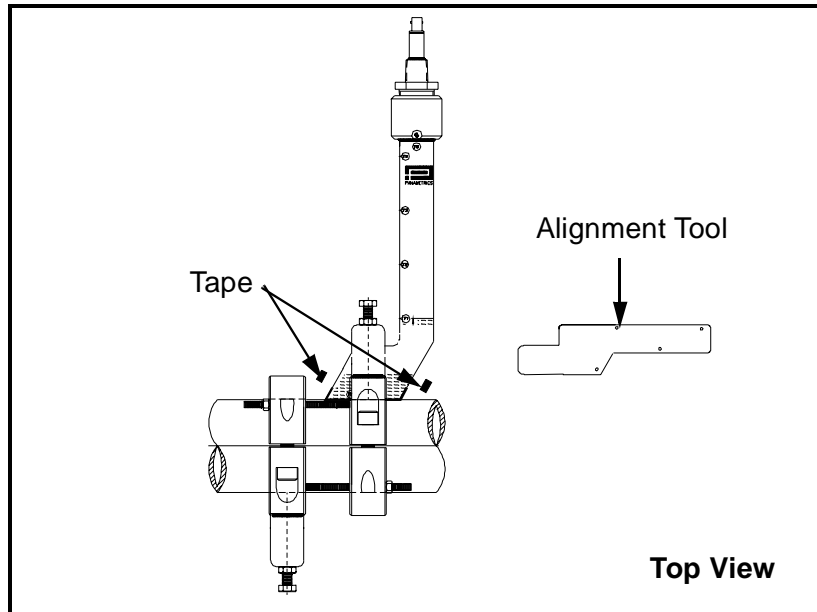


3. Slide the OKS alignment tool over the OKS transducer and into the clamp as shown. The alignment tool is slotted and the OKS transducer fits into the slot. The alignment tool centralizes the transducer within the clamp yoke.

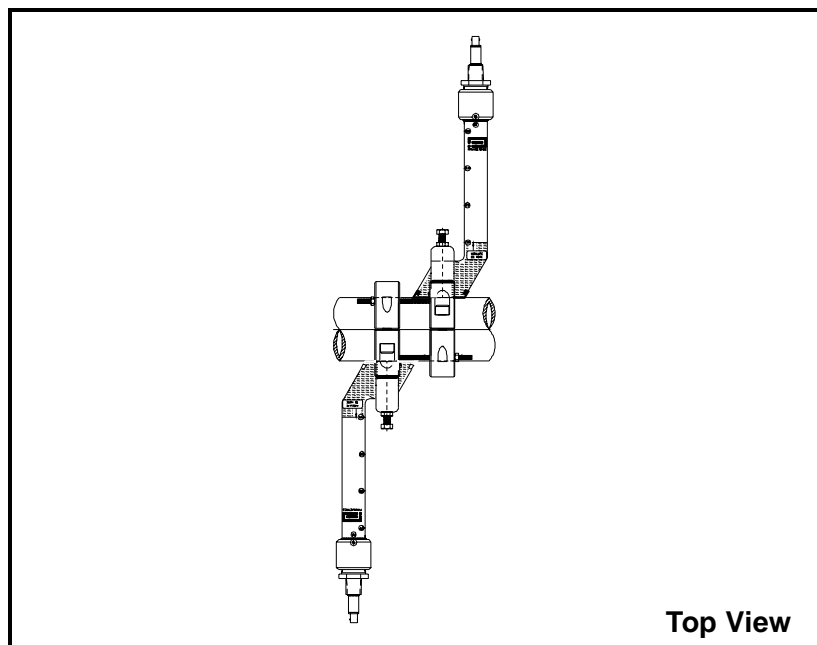


Inserting OKS Transducers (cont.)

4. While holding the alignment tool, tighten the pressure bolt to 25 ft-lb (33 N-m).
5. Remove the alignment tool and the electrician's tape



6. Repeat steps 1 through 5 for the second transducer. The completed installation will look similar to the figure below.



7. You have completed transducer installation. Connect the transducers to the meter as described in your user's manual.



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