

# Rosemount™ 1595 Conditioning Orifice Plate





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# 1 Introduction

## 1.1 Using this manual

This product manual provides installation, configuration, calibration, troubleshooting, and maintenance instructions for the Rosemount 1595 Conditioning Orifice Plate.

[Introduction](#)

[Installation](#)

[Reference Data](#)

[Product certifications](#)

## 1.2 Receiving and inspection

Flow meters are available in different models and with different options, so it is important to inspect and verify that the appropriate model was delivered before installation.

Upon receipt of the shipment, check the packing list against the material received and the purchase order. All items are tagged with a model number, serial number, and customer tag number. Report any damage to the carrier.

## 1.3 Returning the product

To expedite the return process, call the Rosemount National Response Center toll-free at 800-654-7768. This center, available 24 hours a day, will assist you with any needed information or materials.

The center will ask for the following information:

- Product model
- Serial numbers
- The last process material to which the product was exposed

The center will provide:

- A Return Material Authorization (RMA) number
- Instructions and procedures that are necessary to return goods that were exposed to hazardous substances

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### Note

If a hazardous substance is identified, a Material Safety Data Sheet (MSDS), required by law to be available to people exposed to specific hazardous substances, must be included with the returned materials.

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## 2 Installation

### 2.2 Location and orientation

The 1595 conditioning orifice plate electronics must be installed in the proper orientation relative to the pipe and the fluid measured.

#### 2.2.1 Horizontal pipe installation

##### Operating temperature limits

- For line sizes 2 in. (50 mm) to 24 in. (600mm)** Temperature Range: -320 to 1200 °F (-196 to 649 °C)
- -320 to 800 °F (-196 to 427 °C) and differential pressure up to 800 inH<sub>2</sub>O.
  - 800 to 1200 °F (427 to 649 °C) and differential pressure up to 400 inH<sub>2</sub>O.

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##### Note

The maximum allowable differential pressure is dependent on the selected options and operating conditions. Refer to the calculation sheet for the actual limit.

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##### Pressure tap orientation

Position the 1595 Conditioning Orifice Plate to satisfy the following conditions:

- Pressure taps are centered between any 2 (of 4) orifice bore holes
- Pressure taps should be located at 90° to the plane of the last elbow

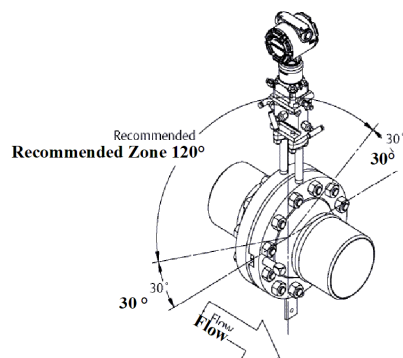
The following figures show paddle-style conditioning orifice plate, but orientation pertains to both paddle and universal plate styles.

##### Gas in horizontal pipes

Mount the electronics above the pipe to ensure that condensate does not collect on the transmitter sensing diaphragms. Orient the unit within the 120° recommended zone as shown in [Figure 2-1](#).

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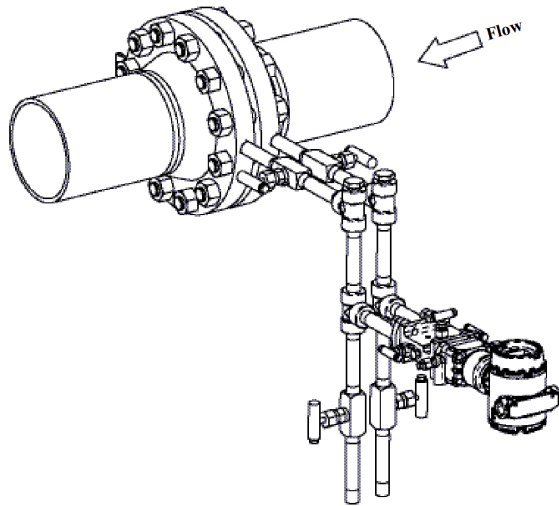
**Figure 2-1: Gas in Horizontal Pipes**



### Liquid or steam in horizontal pipes

The electronics should be mounted below the pipe to ensure that gases do not collect on the transmitter sensing diaphragms.

Figure 2-2: Liquid and Steam in Horizontal Pipes

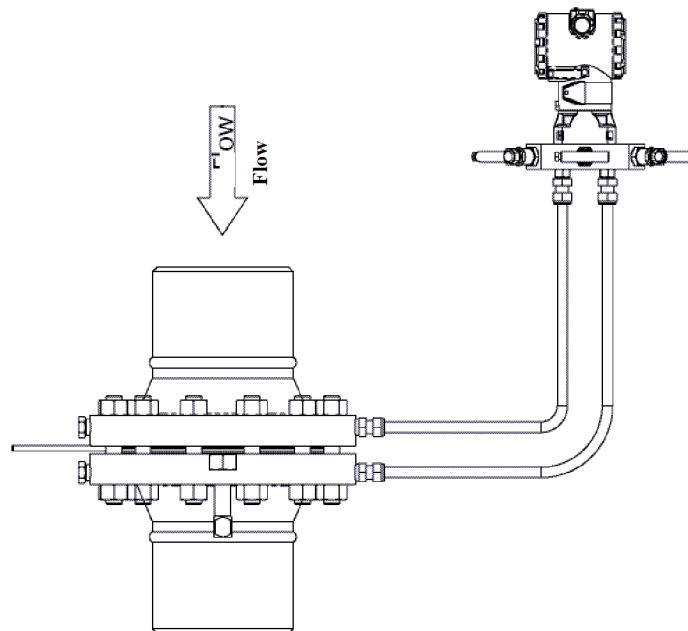


## 2.2.2 Vertical pipe installation

### Gas in vertical pipes

Mount the electronics above the pipe with the instrument lines sloping down.

Figure 2-3: Gas in Vertical Pipes

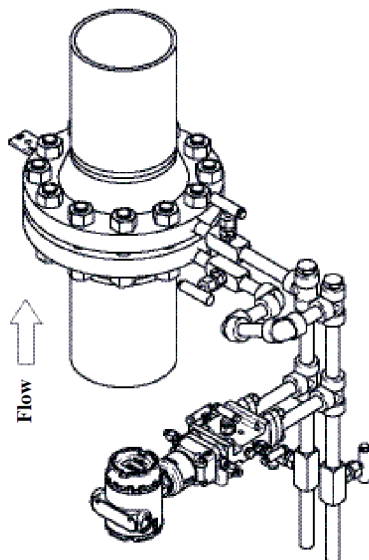




### Liquid or steam in vertical pipes

Mount the transmitter below the pipe with the instrument lines sloping up.

Figure 2-4: Liquid and Steam in Vertical Pipes



## 2.2.3

### Rosemount 1595 straight pipe requirements

Use the appropriate lengths of straight pipe upstream and downstream of the 1595 to minimize the effects of moderate flow disturbances in the pipe.

Table 2-1: 1595 Straight Pipe Requirements <sup>(1)</sup>

	Beta	0.20	0.40	0.50	0.65
Upstream (inlet) side of primary	Single 90° bend or tee	2	2	2	2
	Two or more 90 ° bends in the same plane	2	2	2	2
	Two or more 90° bends in different plane	2	2	2	2
	Up to 10° of swirl <sup>(2)</sup>	2	2	2	2
	Reducer (1 line size) <sup>(2)</sup>	2	2	2	2
	Butterfly valve (75% to 100% open) <sup>(2)</sup>	2	2	5	5
Downstream (outlet) side of primary		2	2	2	2

(1) Consult an Emerson representative if the type of disturbance is not listed.

(2) Not applicable in line sizes greater than 24 in. (600 mm).

### Centering requirements

The 1595 should be installed so that it is centered in the pipes as recommended by International Organization for Standardization (ISO)-5167.

**Note**

The Rosemount 1595 can be used with Rosemount 1496 Orifice Flange Unions. For product offering see document number 00813-0100-4792.

## 2.3 Installation

### 2.3.1 Rosemount 1496 types

- 1496 WN
- 1496 SO
- 1496 RJ
- 1496DN
- 1496TH

#### Weld the orifice flanges to the pipe

**Prerequisites**

Determine the proper orientation

**Procedure**

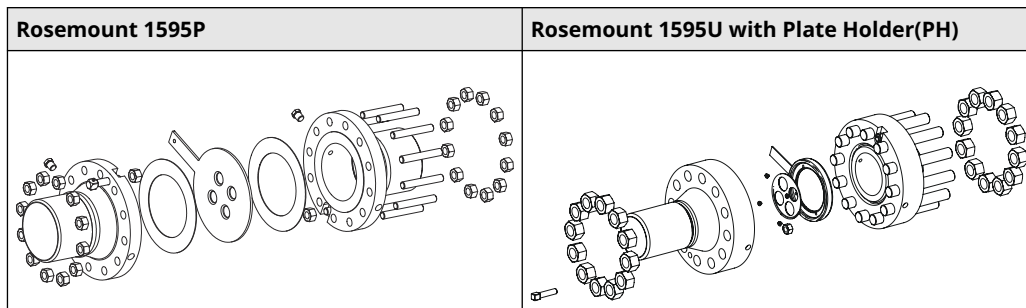
1. Depressurize the line using site-specific requirements.
2. Prepare the pipe ends.
  - For flanged models, ensure the pipe mounting flange is the same size or rating.
  - For threaded models, ensure the pipe union or coupling is the same size pipe thread as the meter section.
3. Ensure the pipe mounting flange is the correct size and rating.
4. Ensure the flange taps are aligned and level.
5. Weld the orifice flange to the pipe.

**⚠ WARNING**

To avoid serious burns, allow the orifice flanges to cool before continuing.

### 2.3.2 Rosemount 1595 types

**Rosemount 1595 types**



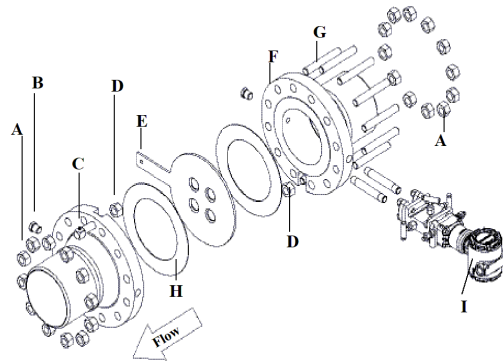
## Install the Rosemount 1595 Conditioning Orifice Plate (paddle or universal plate style)

### Prerequisites

Determine location and orientation.

For line sizes > 24 in. (600 mm), refer to [Figure 2-7](#) and instructions using alignment tool.

**Figure 2-5: Rosemount 1595P Installation**



- A. Nuts
- B. Plug
- C. Jackscrew
- D. Jackscrew nut
- E. Rosemount 1595 <sup>(1)</sup>
- F. Pipe Section
- G. Stud
- H. Gasket
- I. Transmitter

<sup>(1)</sup> The installation drawings applies when using the Rosemount 2051C, Rosemount 3051C, Rosemount 3051S and Rosemount 3051SMV. See the following documents for quick installation instruction of the transmitters.

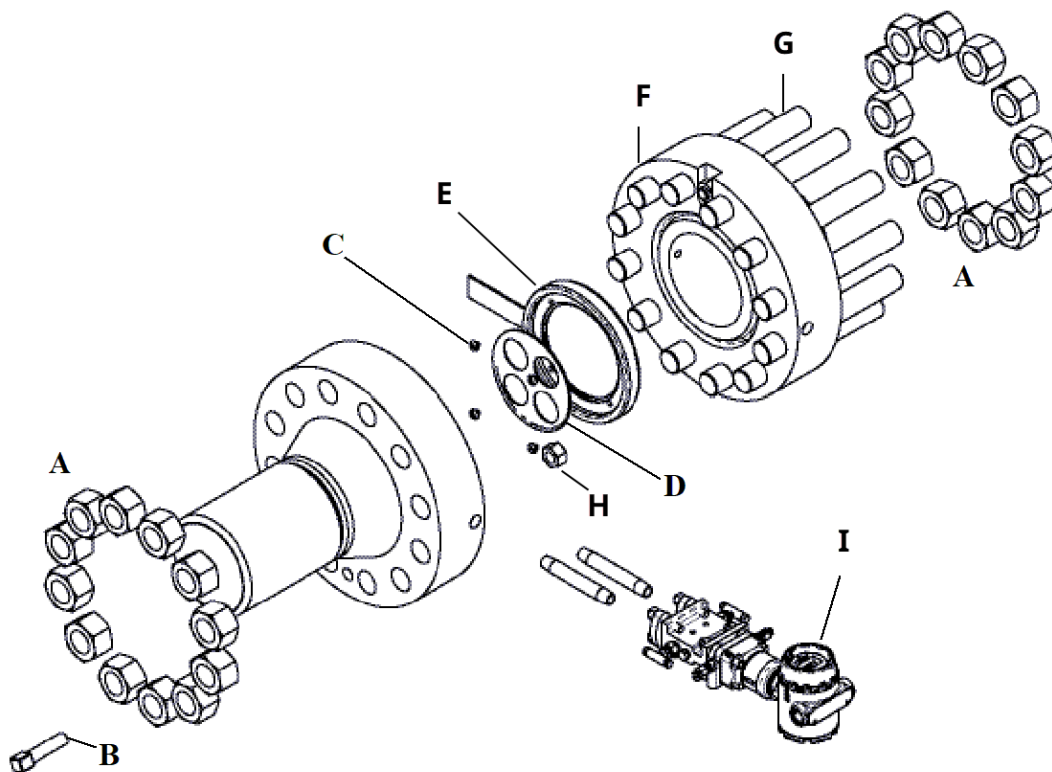
Rosemount 2051C: document number 00825-0100-4101

Rosemount 3051C: document number 00825-0100-4001

Rosemount 3051S: document number 00825-0100-4801

Rosemount 3051SMV: document number 00825-0100-4803

Figure 2-6: Rosemount 1595U with Plate Holder (PH) Installation



- A. Nuts
- B. Jackscrew
- C. Set screws
- D. Rosemount 1595 (2)
- E. Plate holder
- F. Pipe Section
- G. Stud
- H. Jackscrew nut
- I. Transmitter

**Note**

For 1595U Universal Conditioning Orifice Plate style, refer to manufacturer's orifice fitting installation manual for installation details.

(2) The installation drawings applies when using the Rosemount 2051C, Rosemount 3051C, Rosemount 3051S and Rosemount 3051SMV. See the following documents for quick installation instruction of the transmitters.  
Rosemount 2051C: document number 00825-0100-4101  
Rosemount 2051C: document number 00825-0100-4101  
Rosemount 3051C: document number 00825-0100-4001  
Rosemount 3051S: document number 00825-0100-4801  
Rosemount 3051SMV: document number 00825-0100-4803

### Procedure

1. Depressurize the line using site-specific requirements.
2. Loosen all studs and nuts.
3. Remove the studs in one-half of the flange union.
4. Spread flange union by turning jackscrews clockwise.
  - Install the new plate and new gaskets.

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#### Note

The supplied spiral wound gaskets are default for CL600 (PN100) and higher flange ratings. For RTJ flanges, a plate holder with oval ring cross-section is normally supplied.

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- Remove the existing plate for replacement or inspection.

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#### Note

It is recommended that new gaskets be installed each time the orifice flange union is separated. Standard 1/16 in. thick fiber gaskets are recommended for use with the 1595. Using other gaskets could potentially affect the measurement.

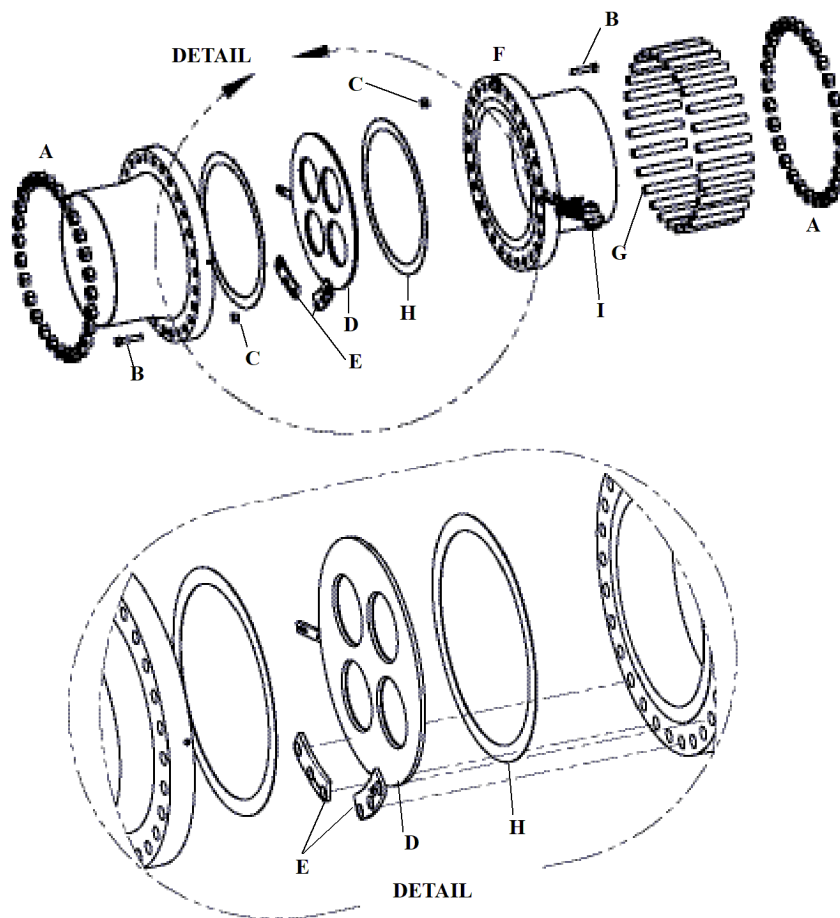
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5. Center the plate in the pipe I.D.
6. Release the flange union by turning the jackscrews counter-clockwise.
7. Replace the studs.
8. Tighten studs in a star pattern.

### Install the Rosemount 1595 Conditioning Orifice Plate (paddle or universal plate style) using the alignment tool.

When an alignment tool is provided, install the alignment tool on the flange studs.

Figure 2-7: Rosemount 1595P (sizes > 24 in. (600 mm)) installation



- A. Nuts
- B. Jackscrew
- C. Jackscrew nut
- D. Rosemount 1595<sup>(3)</sup>
- E. Alignment tool
- F. Orifice flange union
- G. Flange studs
- H. Flange gasket
- I. Transmitter

<sup>(3)</sup> The installation drawings applies when using the Rosemount 2051C, Rosemount 3051C, Rosemount 3051S and Rosemount 3051SMV. See the following documents for quick installation instruction of the transmitters.

Rosemount 2051C: document number 00825-0100-4101

Rosemount 3051C: document number 00825-0100-4001

Rosemount 3051S: document number 00825-0100-4801

Rosemount 3051SMV: document number 00825-0100-4803

**Note**

To ensure the best possible flow measurement accuracy, Emerson will provide an Official DP Calculation Sheet when the WD calibrated option for 1595 is ordered. The official DP calculation sheet uses the calibration factor which is unique to that device and is also stamped on the orifice plate. The Official DP Calculation Sheet displays the expected full scale flow value and the calculated full scale DP value and is corrected for the unique calibration factor which is also displayed on the sheet. This full scale DP value should be used to range a DP transmitter for the referenced application. Or, the calibration factor should be used as a correction factor when configuring a flow computer for the Rosemount 1595 Conditioning Orifice Plate.

**Procedure**

Install the alignment tool on the flange studs.

Option	Description
Horizontal installation	Use the horizontal lift hole (stamped HLH on paddle): <ol style="list-style-type: none"> <li>a. Lift the conditioning orifice plate from a horizontal position</li> <li>b. Guide it into location between the flanges</li> </ol> to lift the conditioning orifice plate from a horizontal position and guide it into location between the flanges.
Vertical installation	<ol style="list-style-type: none"> <li>a. Use the horizontal lift hole (HLH) to lift the conditioning orifice plate from the horizontal to a vertical position.</li> <li>b. Use the vertical lift hole (stamped VLH on paddle) to lift the conditioning orifice plate vertically.</li> <li>c. Guide it into location between the flanges</li> </ol>





# A Reference data

## A.1 Specifications, ordering information, and dimensional drawings

For specifications, ordering information, and dimensional drawings, refer to the *Rosemount DP Flow Meters and Primary Elements Product Data Sheet*.



## B Product certifications

### Approved manufacturing locations

Emerson — Chanhassen, Minnesota USA

### B.1 European Directive information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at [www.rosemount.com](http://www.rosemount.com). A hard copy may be obtained by contacting our local sales office.

#### European Pressure Equipment Directive (PED) (2014/68/EU)

Rosemount 1595 Conditioning Orifice Plate — Sound Engineering Practice (SEP)

Pressure Transmitter — See appropriate Pressure Transmitter QIG

For more information: [Emerson.com/global](https://emerson.com/global)

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