

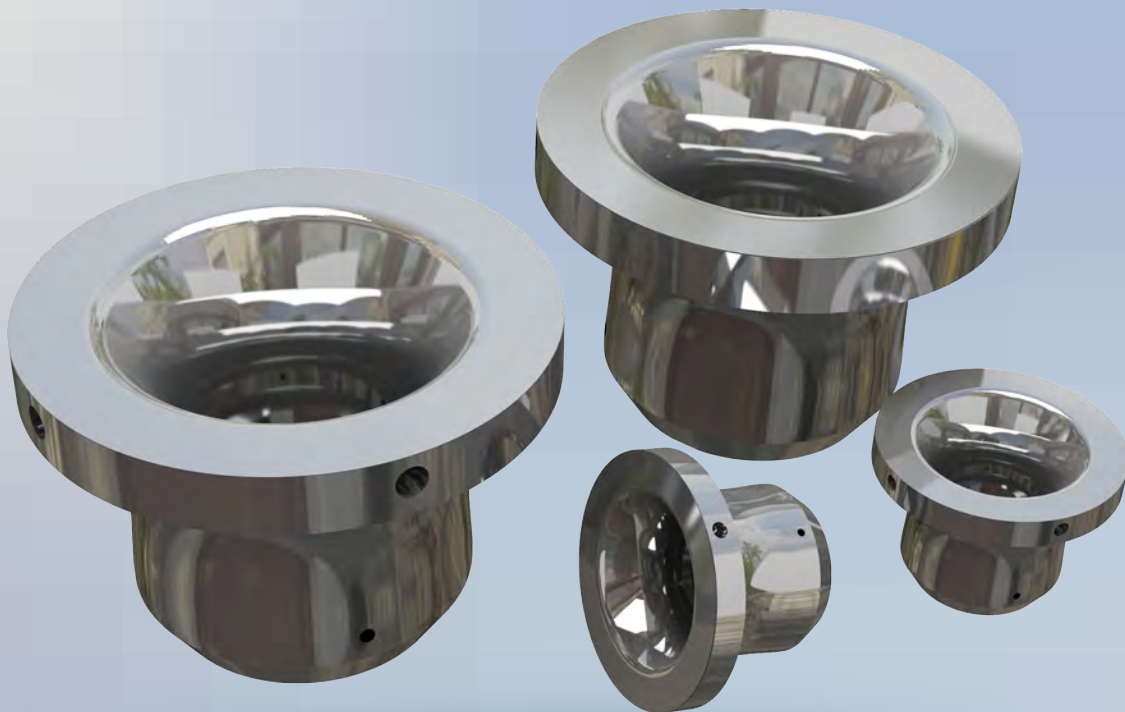


TEK-DP 1630A

Flow Nozzle

Instruction Manual

Document Number: IM-1630A



www.tek-trol.com

NOTICE

Read this manual before working with the product. For personal and system safety, and for optimum product performance, make sure you thoroughly understand the contents before installing, using, or maintaining this product.

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1 Safety Instructions

1.1 Intended Use

This installation manual is intended as a general guide for the installation of Tek-Trol Flow Nozzle Meters supported in between flanges on a natural gas or other in-line applications such as steam, water or other fluids, supplied by Tek-Trol and based on end user supplied process data sets and information related to the units supplied. ISO 5167-3:2003 specifies the geometry and method of use (installation and operating conditions) of Nozzles and Venturi nozzles.

1.2 Safety Instructions from the Manufacturer

1.2.1 Disclaimer

The manufacturer will not be held accountable for any damage that happens by using its product, including, but not limited to direct, indirect, or incidental and consequential damages.

Any product purchased from the manufacturer is warranted in accordance with the relevant product documentation and our Terms and Conditions of Sale.

The manufacturer has the right to modify the content of this document, including the disclaimer, at any time for any reason without prior notice, and will not be answerable in any way for the possible consequence of such changes.

1.2.2 Product Liability and Warranty

The operator shall bear authority for the suitability of the device for the specific application. The manufacturer accepts no liability for the consequences of misuse by the operator. Wrong installation or operation of the devices (systems) will cause the warranty to be void. The respective Terms and Conditions of Sale, which forms the basis for the sales contract shall also apply.

1.2.3 Information Concerning the Documentation

To prevent any injury to the operator or damage to the device it is essential to read the information in this document and the applicable national standard safety instructions. This operating manual contain all the information that is required in various stages, such as product identification, incoming acceptance and storage, mounting, connection, operation and commissioning, troubleshooting, maintenance, and disposal.

1.3 Safety Precautions

Safety is paramount during a meter installation. Please adhere to current relevant safety regulations regarding pipeline applications such as ASME, ISO standards or client's own safety procedures, always use appropriate personal protective equipment during an installation, and ensure a safe working environment.

For additional information not discussed in this manual, please contact the manufacturer.

Warnings and Symbols Used

The following safety symbols may be used in this manual were appropriate relative to the measurement instruments described herein.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



NOTE

Indicates that operating the hardware or software in this manner may damage it or lead to system failure.

1.4 Packaging, Transportation and Storage

1.4.1 Packing

The original package consists of

1. Tek-DP 1630A Flow Nozzle
2. Documentation



NOTE

Unpack and check the contents for damages or sign of rough handling. Report damage to the manufacturer immediately. Check the contents against the packing list provided.

1.4.2 Transportation

- Avoid impact shocks to the device and prevent it from getting wet during transportation.
- Verify local safety regulations, directives, and company procedures with respect to hoisting, rigging, and transportation of heavy equipment.
- Transport the product to the installation site using the original manufacturer's packing whenever possible.

2 Product Description

2.1 Introduction

Nozzle flow meters are commonly used to measure the flow rate of natural gas in pipelines and other gas fluids. This manual outlines the installation process for nozzle flow meters that are installed in between flanges on a natural gas pipeline or other applications as agreed in the supply documents. Flow nozzles are also used in various industries, particularly for steam flow in the power sector. Due to their long-documented history, flow nozzle designs and installation requirements are known and recognized by national and international standards organizations such as ISO 5167 part 3.

2.2 Tools and equipment required

- Pipe wrenches and ancillary equipment related to bolt and nut sizes.
- Adjustable wrenches (if required)
- Flange gaskets and bolts designed for the pressure ratings per national standards.
- Torque wrench
- Thread sealant
- Pressure gauges
- Calibration equipment
- Leak detection solution (Snoop or other applicable product – gas applications only)
- Ventilation equipment if possibility of enclosed environment – (flameproof)
- Lockout/tagout equipment per user approved and agreed safety procedure.

2.3 Nozzle flow meter overview

Please review the specifications and requirements of the nozzle flow meter before installation, confirm the unit supplied is labeled with correct serial number or tag number per the order documentation and delivery notes and is applicable for the application. This includes flow rate range, pressure and temperature rating, material compatibility, and calibration details if laboratory calibration was asked for. Please check the flow meter for any damage due to transport and contact Tek-Trol after sales service if transportation issues are found.

3 Installation Steps

3.1 Preparation

- Ensure the pipeline is depressurized and isolated from the gas source.
- Prepare the required tools and equipment.
- Identify the installation location and confirm alignment of flanges.

3.2 Flange Inspection

- Inspect the flanges for damage, corrosion, or wear make sure that correct lifting procedures are used to prevent damage to the meter such as correctly rated slings etc., according to end user/client procedures.
- Ensure the flanges are clean and free from debris during the installation.

3.3 Nozzle Flow Meter Installation

- Position the nozzle flow meter between the flanges or agreed installation method with the flow direction arrow aligned with the gas flow direction.
- Place the gaskets on both sides of the flow meter, ensuring proper alignment with flange bolt holes if the meter is installed between flanges.
- Insert and tighten the flange bolts through the bolt holes in a crisscross pattern. Tighten evenly to avoid warping the flow meter or crushing the gaskets on one side only.
- Use a torque wrench to achieve the nut and bolt manufacturer's recommended torque settings for the bolts usually standardized per bolt size, material and pressure rating.

3.4 Flange Reassembly

- Ensure the gaskets are properly seated and aligned.
- Reassemble the flange by tightening the bolts according to a crisscross pattern, ensuring even distribution of pressure.

3.5 Leak Testing

- Conduct a leak test by applying a leak detection solution around the flange joints and connection points gas applications, liquid applications fluid should be visible.
- Observe for any bubbles forming, indicating a leak on gas applications.
- If a leak is detected, shut down the process disconnect and rectify the leakage properly before proceeding, commence procedure from applicable section.

4 Calibration and commissioning

- Perform calibration according to the transmitter manufacturer's /end user guidelines. If "Tek-Trol High Performance DP Transmitters and Flow Computers" are being used, please refer to the specific installation manual for advice and set up methodology for the selected transmitter type.
- Commission the flow meter by following client/user startup procedures avoid a rapid opening of isolation valves in front and behind the flow meter run.

5 Maintenance and Troubleshooting

- Regularly inspect for leaks and damage.
- Follow the manufacturer's recommended maintenance schedule.
- If issues arise, consult the manufacturer's troubleshooting guide or seek professional assistance.

6 Final Comments

Proper installation of nozzle flow meters between flanges on natural gas pipelines or other applications is crucial for accurate flow measurement and safe operation of the meter.

Always follow the guidelines afore mentioned along with the manufacturer's instructions for tertiary equipment and industry best practices to ensure a successful installation and good performance.



NOTE

This manual provides a general overview of installation procedures. Always refer to the specific nozzle flow meter data supplied and consult with qualified professionals for accurate installation on your natural gas or other pipeline.

7 Flow Nozzle Diagrams

7.1 Flanged Type: Pipe-wall Tapping

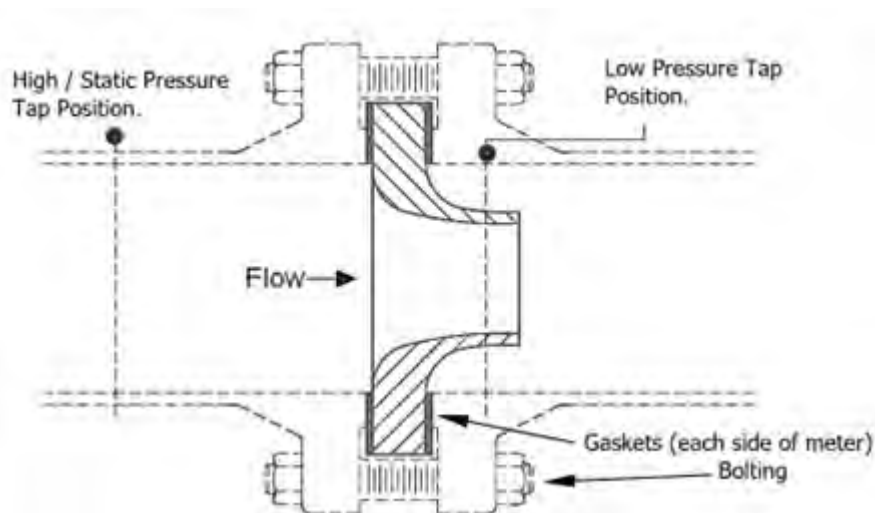


Fig 1. Flanged Flow Nozzle Type with Pipe Wall Low-Pressure Tapping

7.2 Flanged Type: Integral Low Pressure Tapping

The Tek-Trol Flanged Flow Nozzle with Integral Low-Pressure Tapping is provided with the downstream tap integral to the nozzle's mounting flange. This design provides the same ASME or ISO design flow contour but can be used in smaller pipe sizes where the low-pressure tap may interfere with a pipe weld flange, and/or flange bolting system. The low-pressure connection design is usually a 1/4" NPT (6 mm) unless specified otherwise in the supplied order documentation.

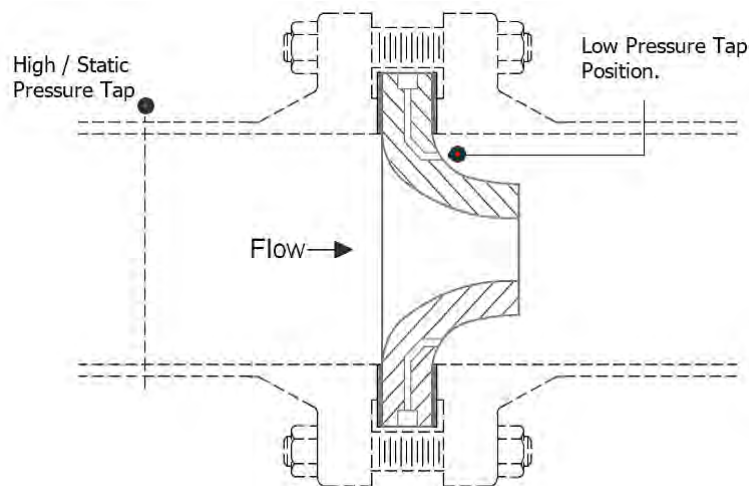


Fig 2. Flanged Flow Nozzle Type with Integral Low-Pressure Tapping's

7.3 Weld-In Nozzle Type

Tek-Trol Weld-in Flow Nozzle types can be provided as a Mounting Ring Flow Nozzle design that eliminates the need for welding dissimilar metals in the field. Basic pipe wall pressure taps are incorporated with this nozzle design and is supplied as a system with a complete flow metering section included if purchased in this configuration.



NOTE

For special applications and in particular smaller line sizes, Weld-In Type Flow Nozzles with Integral Metering Taps are available per Fig 2. This design includes a short section of upstream and downstream pipe with flanged, bevelled, or socket weld ends per the client's requirements for end user installation using approved welding procedures and standards.

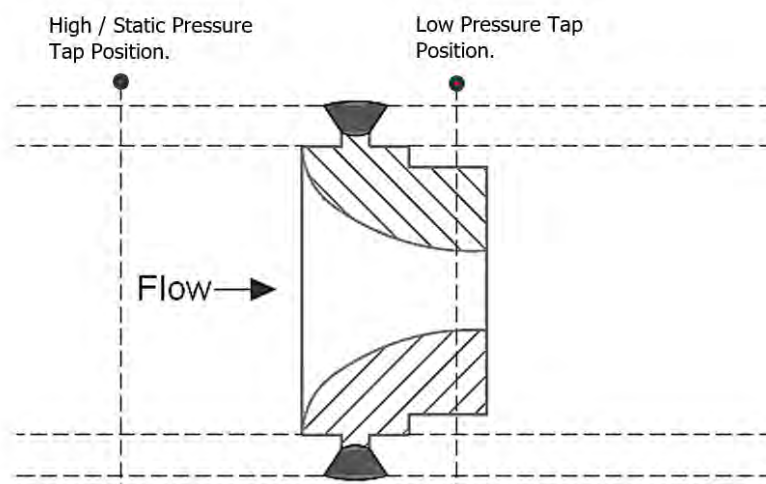


Fig 3. Weld -In Flow Nozzle Type – Pipe Wall Low Pressure Tapping.



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