HIGH ACCURACY

measurement instruments

PRODUCT DATASHEET

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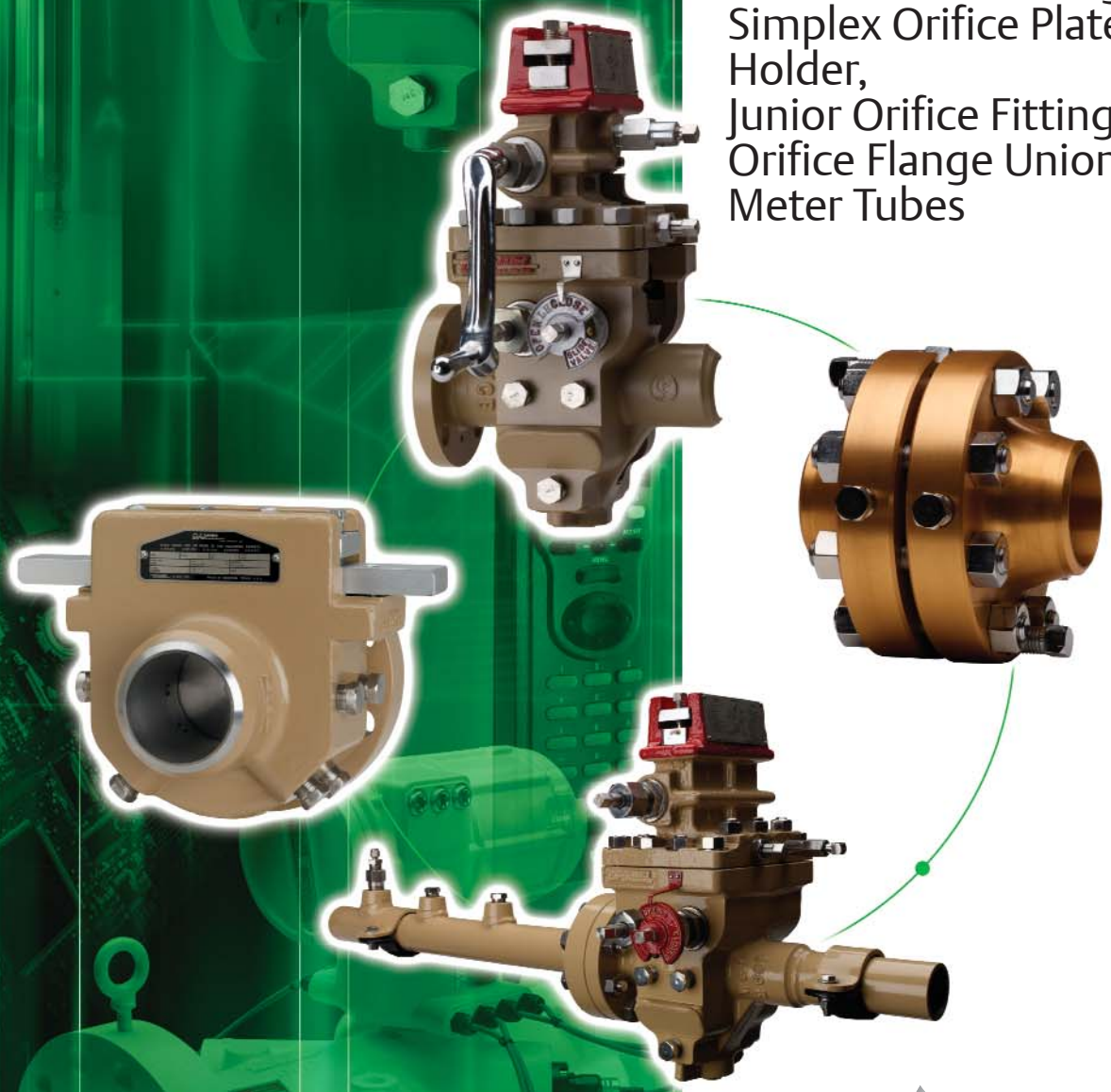
DANIEL®

Daniel Orifice Fittings Brochure

Senior Orifice Fitting,
Simplex Orifice Plate Holder,
Junior Orifice Fitting,
Orifice Flange Union,
Meter Tubes



EMERSON™
Process Management

Is unaccounted hydrocarbon draining your bottom line?

When the stakes are high, any amount of unaccounted hydrocarbon drains the bottom line. That's why companies like yours count on proven measurement technology and industry expertise from Daniel to improve service, reduce cost and add value.

Daniel® Overview

For more than 70 years Daniel has been at the forefront of measurement technology development for the Oil and Gas Industry. Daniel has become a leading figure in the development of the standards that govern orifice measurement around the world. With offices around the globe, Daniel is capable of offering the level of quality and service required by our most demanding clients. Daniel engineers its products to produce the most precise measurement solutions in the industry. Daniel relies on precision manufacturing to ensure that specifications are met or exceeded to offer the best quality product in the marketplace.

All fittings meet or exceed the recommendations of ANSI/API 14.3, A.G.A. #3, A.S.M.E, and numerous other professional organizations. Please read and follow all manufacturer's product warnings and instructions.

Daniel® Orifice Fittings

Orifice Fittings operate by means of differential pressure technology. They contain an orifice plate that restricts the flow of product through the pipeline. As fluid approaches the orifice plate pressure increases slightly and drops suddenly as the orifice is passed. Established procedures and calculations allow the flow rate to be inferred from the differential in pressure.

Daniel® Senior® Orifice Fitting

The Daniel Senior Orifice Fitting is a dual-chamber device that reigns as the most widely used means of measurement for natural gas. Designed to allow operation by one person, this differential technology meter saves time and money in many ways. The Senior Orifice Fitting permits plate-changing under flowing conditions, which translates into no operation shutdown. By maintaining flow during plate changes, the fitting also avoids the burden of bypass piping. In addition, the Senior Orifice Fitting is field-repairable. That means no downtime and other costs associated with shipping to a repair site. This fitting also offers special trims and an optional soft seat.

Since its original development, the Senior Orifice Fitting product line has grown enormously to serve customers with applications for pipeline sizes from 2 inches to 48 inches, and pressure ratings up to 10,000 pounds per square inch. In addition, the use of corrosion resistant and other special materials makes this product suitable for sour gas service and other special applications. Daniel's most popular Senior Orifice Fitting, the "Flangnek®," has a weldneck inlet and a flanged outlet. Daniel fittings meet or exceed API Chapter 14, Section 3, Part 2 (14.3/AGA 3) requirements.

Features and benefits:

- **High reliable, time proven technology**
- **Fast and simple method of changing orifice plates under pressure without interrupting the flow**
- **Multiple sizes and pressure ratings**
- **Special trims**
- **Field-repairable**
- **Optional soft seat**

Daniel® Simplex® Orifice Plate Holders

Daniel® Simplex® Orifice Plate Holders
Daniel Simplex Orifice Plate Holders are single-chamber fittings that house and accurately position an orifice plate for differential pressure measurement.

These fittings allow the removal or insertion of the orifice plate quickly and economically. The single chamber design allows for inspection and replacement of orifice plates without removing the Simplex meter from the flow line. Since Simplex fittings use one piece bodies, there is no spillage in liquid service, no rusted stud bolts, no nuts to remove, no flanges to spread apart and no line strain. The Simplex is designed and manufactured in strict accordance with all applicable ANSI, ASTM, API 14.3 and ISO 5167 specifications.

Features and benefits:

- **Operation of the Simplex Orifice Plate Holder is simple because of its few parts The plate carrier ring is permanently attached to the sealing bar so that the bar, ring, plate and seal unit can all be removed at the same time. The only other parts are the gasket clamping bar and pipe plugs for taps and drain**
- **Under normal conditions Daniel Simplex Orifice Plate Holders require minimal or no maintenance at all**
- **This Simplex Orifice Plate Holder is designed in 3 - 4 inch line sizes for high pressure measurement in applications such as production wells, injection systems and recycling operations. Heavy-duty construction throughout enables the fitting to handle pressures up to 10,000 P.S.I.**
- **The Daniel Simplex Orifice Plate Holder uses universal size orifice plates and removable sealing units**
- **Standard sealing unit for the Simplex Orifice Plate Holder is the "DSC" Nitrile Dual Seal. Additional seal material available upon request. The type of sealing unit used will depend on the application for which they are being used**
- **Body styles include flangnek, welding neck, socket welding and threaded**
- **Simplex Orifice Plate Holders are made of cast carbon or alloy steels, and types 304 and 316 stainless steel. Internal parts are trimmed in a variety of metals to suit most operating conditions**
- **A specially designed top closure seals off the fitting**

Daniel® Junior Orifice Fitting

Safety, simplicity and ease of operation make Daniel Junior Orifice Fitting a popular choice for reliable measurement at large volume meter stations.

The Junior Orifice Fitting is a single-chamber fitting, engineered and manufactured to make orifice plate changing quick and easy at installations where line movement from flange spreading is undesirable.

Features and benefits

- **Rack-and-pinion configuration ensures fast plate changing**
- **Saves time by avoiding flange spreading**
- **Junior Orifice Fittings installed on liquid lines prevent product spillage during plate changing**
- **All parts can be replaced on location without removing the fitting from the line**
- **Special positioning of set screws impinges on the plate carrier on all four edges, fixing and centering its position**
- **The top set screw is in the sealing bar so that the fitting cannot be sealed off unless the carrier is fully seated and centered**
- **Versatility of line sizes from 10 to 42 inches**

All fittings meet or exceed the recommendations of ANSI/API 14.3, A.G.A. #3, A.S.M.E, and numerous other professional organizations.

Daniel® Orifice Flange Union

Daniel® Orifice Flange Union

Daniel offers a comprehensive line of Orifice Flange Unions manufactured to ensure the highest possible accuracy in measurement, backed by the reliability and experience only Daniel can provide. Daniel Orifice Flange Unions provide economic differential measurement with little or no maintenance. The Orifice Flange Union serves as an economical, simple device for securely holding an orifice plate in a line.

Features and benefits:

- **Advanced machining equipment enables Daniel to meet the mos stringent tolerances and recommendations for flanges as specified in ANSI B16.36: Steel Orifice Flanges, and ANSI/API 2530 (AGA #3): Orifice Metering Of Natural Gas**
- **Careful attention is paid to the tap location, bolt and flange facings and bore smoothness**
- **Daniel Orifice Flanges are made of forged steel in accordance with ASTM A-105. Other materials are available by request**
- **Orifice Plates are centered within stringent tolerances becoming the first plates that met the latest AGA standards**
- **Bore tolerances meet or exceed the latest recommendations of the American Gas Association**
- **Pressure tap hole location is closely controlled. Tap hole centers are 15/16 inch from bearing faces of flanges. This places the centerline one inch from the face of the orifice plate when 1/16 inch gasket thickness is included. For three inch and smaller flanges, the tap hole location tolerance is ± 1/64 inch. For four inch and larger flanges, the location tolerance is ± 1/32 inch**
- **Pressure tap holes edge on the flange bore surface are carefully inspected to be free from burrs. All roughness is eliminated**
- **Standard flange tap connections are 1/2 inch N.P.T. Other sizes and styles are available upon request**
- **Daniel Raised Face Orifice Flanges are made to conform to the standard raised face dimensions in accordance with the ANSI B16.5 Flange Piping Code for all pressure ranges**
- **Two 1/16 inch thick precision die-cut gaskets are furnished with all Raised Face Orifice Flanges. Ring type joint facing available upon request. It is important to note that when the specified gasket thickness is other than 1/16 inch, flange pressure tap location will change.**

Daniel® Meter Tubes

Daniel Meter Tubes are accurate and dependable instruments that adhere to the highest quality standards. They are an integral piece of a Daniel Orifice Meter.

Quality Fabrication

Close quality control guarantees highly accurate fabrication of Meter Tubes for Orifice Meters. Special jigs and fixtures are used to assure precise alignment of tube and fitting so there are no steps or offsets. All welds are ground and micrometer readings are made.

Testing

Radiography and hydrostatic testing is available for Daniel Orifice Meters to ensure measurement accuracy. Micrometer and internal surface roughness readings are recorded and supplied with each meter tube.

Paint and Coating

A special quick-drying paint is applied as standard on Meter Tubes. Sand-blasting and corrosion-resistant coatings are also available.

Daniel® Engineered Systems

Daniel Measurement and Control is the industry leader in designing, constructing and commissioning of complex oil and gas metering systems to exacting standards.

This global organization offers decades of petroleum fiscal flow measurement application experience. Customers rely confidently on Daniel's Systems Group international fabrication facilities, customized engineering and its successes in field-testing and support. From the simplest single-stream skid to complex on-site installations, Daniel Systems delivers both natural gas and liquid petroleum turnkey applications. Daniel Systems designs, constructs and commissions the metering project, blending up-to-the-minute technology with decades of understanding what customers need and expect.

Components of a Daniel Systems installation typically include meters, valves, provers, flow-control instruments, instrumentation and read-out equipment and process management components. Computer software and hardware are integrated with the measurement system. Standard calculation methods include AGA3 (now API-MPMS-14.3), ISO 5167, AGA5/7/8, AGA9 and the API Manual for Petroleum Measurement Standards.

Daniel DMSS-2000 Supervisory Control Systems utilize a sophisticated Graphical User Interface, database server, and a dedicated PLC for the metering skid/MOV interface. Redundancy is often used for custody transfer systems and/or when system integrity is essential.

A dedicated Project Manager and Project Team are assigned to each measurement system project. This team is responsible for overall system design and project construction from start to finish. A separate internal QA/QC group reviews all design details, inside and outside fabrication, assembly and system testing.

Whether it is a pipeline, offshore production facility or a loading facility for ocean-going tankers, the Daniel Systems group is a proven, single-source solution for customers throughout the world.

Daniel® Measurement Services, Inc.

Daniel® Measurement Services, Inc. takes pride in being there with the right solution for customers with gas and liquid fiscal flow measurement applications.

Around the clock, and around the world, Daniel Measurement Services has experienced, highly qualified people prepared to assist customers with:

Startup and commissioning
Preventative maintenance
Product repair/upgrades
Project management and integration
Meter tube inspection and recertification
Educational services
Remote diagnostics
Warranty Plus!

The Solution can be a warranty-enhancement program, or a remote dial-up check of installed equipment that keeps desired performance a fingertip away.

Daniel Measurement Services also offers a series of educational courses essential to customer success. Courses can be at the factory or the customer's location, and are taught by an accredited engineer, technician or other trainer. Courses include product instruction on proper operation of Daniel gas chromatographs, ultrasonic meters, presets and other instruments for fiscal flow measurement applications.

Daniel Measurement Services' educational courses and the commitment to being the world's leading provider of value-added measurement services, affirms that the Daniel support of customers has never been stronger.

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Our offering:

	Pressure Measurement		Level Measurement
	Temperature Measurement		Flow Measurement
	Marine Measurement & Analytical		Gas Analysis
	Liquid Analysis		Flame and Gas Detection
	Tank Gauging		Wireless Infrastructure
	Acoustic & Discrete	HIGH ACCURACY measurement instruments	

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