



**Products and Services**



# The ROOTS® Meter Advantage

For almost a century, ROOTS® meters have been used for billing of commercial and industrial gas loads. Accuracy, dependability, and low maintenance are of key importance in custody transfer measurement applications. The time-proven ROOTS® meter is the preferred rotary positive displacement gas meter in distribution, transmission and production segments for accurate measurement of gas from the well to the burner.

To meet the evolving needs of our customers, our product line has expanded to include a large variety of control and measurement equipment. Dresser Meters & Instruments is much more than just a meter supplier. We offer a wide range of products and services.

## **Proven Accuracy**

- Volumetric accuracy is permanent and non-adjustable
- Measuring characteristics established by the precision machined contours of non-wearing fixed and rotating parts
- Durable components ensure a long life expectancy under normal operating conditions
- Increased rangeability due to closer tolerances improve performance regardless of pressure and flow

## **Meters For Commercial & Industrial Applications**

- Line Mount Meters
- Foot Mount Meter
- High Pressure Meters

## **Magnetically Coupled Accessory Units**

- Large variety of readout and output options
- Non-pressurized and interchangeable modular design simplifies conversion between accessory types
- Permanently lubricated Series 3 Accessories combine a long life expectancy with a reduction in maintenance
- Commonality of Series 3 Accessory components reduces inventory requirements

## **Full Line of Electronic Instrumentation**

- Pressure (P), Temperature (T), and PTZ Correctors with Differential Pressure Monitoring options
- Solid State Pulsers to interface with Automated Meter Reading (AMR) devices and for remote readings
- High Frequency outputs to interface with flow capacities
- Loggers with options for one or two pressures and a temperature probe

## **Customer Service**

Our unsurpassed customer service is provided through the combined efforts of our Customer Service, Technical Support, and Product Services Departments. Each department takes pride in their ability to deliver courteous and professional care to all customers in a timely manner. As described below, the departments are structured to efficiently support all customer service requirements:

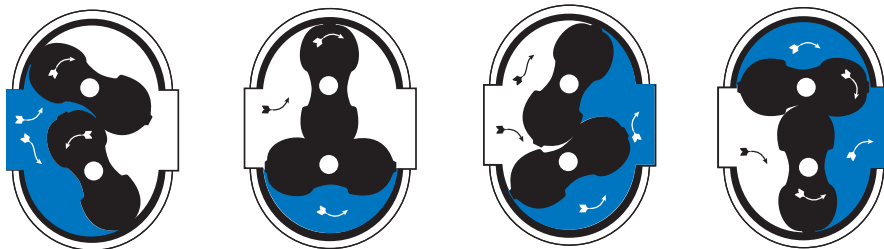
- Customer Service representatives for inquiries and order placement
- Technical Services staff for product application assistance and training
- Product Services Department for remanufacturing and testing services

# The ROOTS® Meter Operating Principle

The ROOTS® meter is designed to measure the volume of gases and gas mixtures with a high degree of accuracy. The industry accepted rotary type positive displacement operating principle ensures permanent, non-adjustable accuracy by using precision machined two-lobe impellers encased within a rigid measuring chamber.

Unlike other meter types, measurement accuracy is not affected by changes in gas specific gravity, pressure, or fluctuating flow. ROOTS® meters may be used from a few ounces to full capacity up of the meter's maximum pressure rating with highly accurate measurement over a wide operating range. This equates to a lower total cost.

The condition of a ROOTS® rotary meter can be verified by performing a differential pressure test while the meter is still in service. This simple and cost-effective preventive maintenance procedure contributes to a significant reduction in the whole life cost of the meter.



Precision machined for exceptional accuracy

As shown in the picture, two contra-rotating impellers of two-lobe or “figure 8” design are encased within a rigid measuring chamber, with inlet and outlet connections on opposite sides. Precision machined timing gears keep the impellers in correct relative position. Optimal operating clearances between the impellers, cylinder and headplates provide a continuous, non-contacting seal.

## ROOTS® Meter Product Line

A complete line of rotary meter sizes are available to measure a wide range of gas volumes for the majority of commercial and industrial applications in custody transfer applications. Refer to the Meter Sizing Chart in this brochure to determine the correct meter size for cost effectiveness and accurate measurement.

ROOTS® meters are suitable for handling most types of clean, common gases at either constant or varying flow rates and pressure. They are ideal for applications throughout the meter's operating range, from a few ounces to full maximum allowable operating pressure.

Our meters are widely recognized for their highly accurate measurement capabilities at both the low and high end of their rated capacity. The meter's rangeability (ability to measure gas over a wide flow range within a specified accuracy) provides the best over-all measurement accuracy on a “day-after-day” basis.



# ROOTS® Series B3 Line Mount Meters



8C/11C/15C



2M/3M/5M



7M/11M/16M

## Right Size the Meter to the Application

Series B3 meters are designed to provide accurate gas measurement over widely fluctuating flow, pressure, and temperature conditions. For further versatility, the five smallest meter sizes (8C through 3M) have 2" (50 mm) flanged connections, and a 6-3/4" (171 mm) flange-to-flange dimension.

If application requirements change, this unique, cost-effective feature allows a quick and easy meter exchange without the need to re-pipe the meter set. Other key features include:

- Capacity ratings from 800 CFH to 56,000 CFH (22,6 m<sup>3</sup>/h to 1,585 m<sup>3</sup>/h)
- Maximum operating pressure rating of 175 PSIG (12 Bar)
- Models 8C through 5M are available with a 200 PSIG (13,8 Bar) rating upon request
- Models 8C through 2M are available with a 1-1/2" nipped connections upon request
- Operating temperature range from -40°F to +140°F (-40°C to +60°C)

For operating requirements beyond those listed, please contact your Dresser Meters & Instruments representative.



23M/38M/56M



## 23M232 Meter with 4" Flanged Connection

Our 23M232 includes four inch flanged connections and a 232 PSIG (16 bar) maximum working pressure. This design complements our standard six inch 23M175. With a maximum capacity of 385 MSCFH (10,895 Nm<sup>3</sup> per hour) the 23M is an ideal measurement solution for a wide array of applications.

# ROOTS® Series 3 Accessory Units

## Designed for low maintenance and a long service life

- Interchangeability among Series B meter bodies of the same size
- Permanently lubricated for long life and virtually maintenance-free operation
- Modular design allows a quick-change to a different version at a lower overall cost
- Durable, weather resistant cover with improved sealing capability
- Versatile and configurable odometer masking
- Universal Instrument Drive (ID) assembly – one size fits all 8C-56M Series B Meters
- Quick and easy field installation of the low cost Solid State Pulser
- Available with factory pre-installed magnets for quick installation of the Solid State Pulser or Model 5 Prover Field Counter Pulser Module

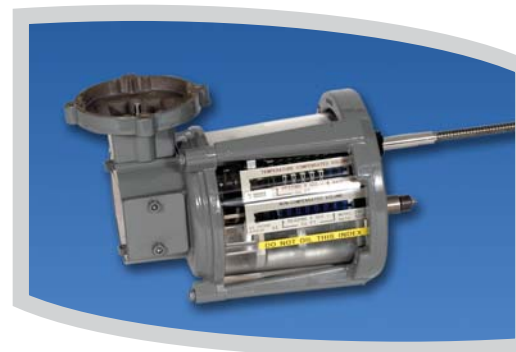
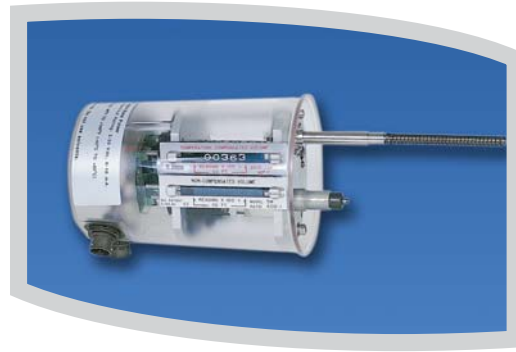
## Counter (CTR)

An 8 digit non-compensated index registers displaced volume in Actual Cubic Feet (ACF) or in Actual Cubic Meters (m<sup>3</sup>).



## Solid State Pulser (ICPW/ITPW)

The ROOTS® solid state pulser mounts directly to a CTR/TC Unit, generating low frequency pulses representing volumetric information for remote reading. Mechanical switches have been eliminated for maximum reliability. No battery or maintenance is required.



## Temperature Compensated (TC)

Temperature compensation, available in meter sizes 8C-16M, is accomplished by a mechanical computer with a spiral bi-metallic thermocouple (probe) located in a sealed temperature well at the meter inlet. Series 3 TC Units provide corrected gas volume readings to a 60°F (15°C) base temperature for readout in Standard Cubic Feet (SCF) or Normal meters cubed (Nm<sup>3</sup>) between flowing temperatures of -20°F and +120°F (-29°C and +49°C).

## Counter or Temperature Compensated with Instrument Drive (CD/TD)

The Universal Instrument Drive (ID) Assembly adapts to the CTR and TC Accessory for installation of a corrector, chart recorder, or other externally mounted, mechanically driven device. The ID Assembly is mechanically linked to the CTR/TC mechanical gear reduction unit. One revolution of the instrument drive dog represents a specific displaced volume measured by the meter.

# ROOTS® Series 3A Accessory Units for LMMA Meters

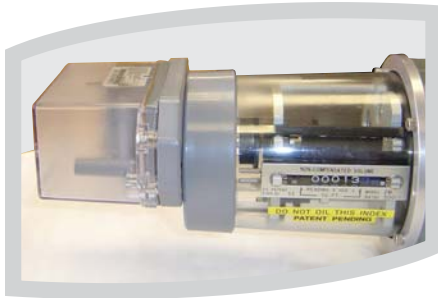
Dresser's new S3A Accessory unit - that mounts to your LMMA meter - features the same high quality and long-term reliability of the oil-free S3 Accessory unit.



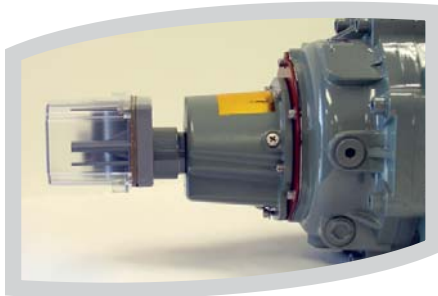
## Benefits are:

- **No Index maintenance.** Oil is not required for the polymer bushings and pre-lubricated, shielded ball bearings making the index environmentally friendly and easier to install and maintain.
- **Configurable Masking Options.** The S3A's versatile odometer masking design uses opaque or semi-transparent covers, offering configurable, trouble-free masking with no moving parts, hinges, flappers or magnets.
- **Easy-to-change ID Rotation.** Simply remove two bolts and invert the gear module so the pinion gear is driven at the bottom rather than the top of the horizontal bevel gear.
- **Conversion Kit Inventory Reduction.** The S3A uses the same #399 conversion kits as the B3 meters. Now you can stock the same Instrument Drive, Pulser or AMR Adapter #399 Kits for both Series Meters – LMMA and Series B3.
- **Proving Procedure Simplification.** With the S3A, you can prove your LMMA meters the same way you prove your B3 meters – off the odometer test wheel.
- **Lower Price.** The S3A Accessory Units are less expensive than LMMA series units – especially in the Instrument Drive and Pulser versions.  
The no-maintenance, less expensive and easier-to-read S3A Accessory Unit extends the life expectancy of your LMMA meter (LMMA meter line was obsoleted in 1998) providing many additional years of reliable service.

# ROOTS® AMR Adapters



Series B3 AMR Adapter for CTR and TC



Series A (LMMA) CTR AMR Adapter



Series A (LMMA) TC AMR Adapter



Dresser's AMR Adapter is available for mounting residential AMR devices of various manufacturers' directly onto a ROOTS® Series B3 or A1 (LMMA) meter. Adapters are available to mount either the American or Sensus footprint Itron 40G and 40GB ERTS, as well as the American footprint Itron 100G ERT and Itron 2.4 GZ Open Way devices. In addition to these Itron kits, Dresser also has adapter kits available to mount residential AMR devices manufactured by Cellnet, Sensus, TRACE, and Badger, directly to the ROOTS® meter.

The design utilizes a Series 3 Lexan® cover on Series B Counter and TC meters, and for LMMA meters that have S3A units installed. There are also options for the older LMMA (Series A) accessory units – both TC and Counter versions. The Lexan® covers have an opening designed to engage the AMR device in a direct drive link to the gear reduction assembly of the meter's accessory unit. The proven ID seal system between the adapter and the Series 3 cover provides a barrier against moisture intrusion into the oil free cover. The AMR Adapter is fastened to the Series 3 or Series A cover from the inside, providing a tamper proof design.

The direct drive AMR adapter offers a low cost, easy to install option for meters fitted with mechanical Counter and TC accessory units.

In addition, to the AMR adapter kits, Dresser also offers a remote AMR device mounting kit, for use in conjunction with the ROOTS® Micro Corrector, Model IMC/W2. This simple to install kit, allows the AMR device to be installed on the back of the corrector, which eliminates the need for long lengths of cabling between the corrector's pulse output connector and the AMR device. This mounting kit can be assembled to the IMC/W2 meter at the factory or at the customer location.



# ROOTS® Expanded Meter Line

## B3-VRM Vapor Recovery Meter

Rated for a maximum capacity of 3000 actual cubic feet per hour, the B3-VRM meters are specifically designed and tested for vapor recovery applications and conform to the California Air Resources Board specifications TP-201.1, TP-201.1A, TP-201.2, and P-201.5, as applicable. The extremely low pressure drop associated with the ROOTS® positive displacement meter makes this meter ideal for the accurate measurement in low pressure recovery systems. Odometers on the vapor recovery meters are marked at 0.02 cubic foot increments, which allows accurately estimated readings in increments of 0.01 cubic feet. All B3-VRM meters are supplied with a 7 point certified accuracy curve for reference.



## Series Z Compact Meters

Ideal for small commercial loads at pressures up to 15 PSIG (1 Bar), the aesthetically pleasing 5C15 (500 ACFH) and 8C15 (800 ACFH) meters are easy to install and conceal. Series Z meters provide excellent measurement accuracy starting at “pilot loads” and continuing throughout the range of the meter. To match the meter configuration to the application, the user selects the following parameters when ordering:

- Dial Imperial Wheel Index
- Sealed Index Cover
- Standard (Atmospheric) or 2 PSIG Compensated Index
- Top or Bottom Inlet
- Sprague 4 (male), 45 Light (male), or 1–1/2 inch NPT (female) Connections
- Optional Inlet Strainer/Screen



## Series B4 Rotary Gas Meter

The Series B4 meters have a permanently lubricated, maintenance free uncorrected counter unit which can be rotated 355°. One low frequency (LF) and one high frequency (HF) pulse output are standard, a second low frequency (LF) pulse output is available upon request.



## Series A (LM-MA) Meters

The 8C175 compact meter, like the Series Z, is also ideal for small commercial applications, but with a higher pressure rating. This meter is rated for a 175 PSIG (12 Bar) working pressure. Also available as a Vapor Recovery Meter that is C.A.R.B. approved and available with a High Frequency transmitter (PX).



## Series A1 Foot Mount Meter

The 102M125 Foot Mount meter is used for the measurement of high volume industrial gas loads for capacities up to 965.3 MSCFH at 125 PSIG (27,334 Nm³/h at 8,6 Bar).

# ROOTS® High Pressure Meters



Series B3-HPC



Series B3-HPC with Integral Micro Corrector

## Series B3-HPC (High Pressure Cartridge) Meters

This meter line features a common cast-steel housing for the 1M (1000 ACFH) and 3M (3000 ACFH) sizes as well as the 5M 1480 (5000 ACFH) and 7M 1480 (7000 ACFH) sizes of aluminum cartridges. Recently, the new 11M1480 meter was added, further expanding the HPC meter line. The meters are available with either an ANSI Class 300# flange for the 740 PSIG Meter lines or an ANSI Class 600# flange for the 1480 PSIG Meter lines. For 1M and 3M only.

The 5M(5000 ACFH), 7M (7,000 ACFH), and 11M (1100 ACFH) meters are designed for higher capacity applications with a maximum allowable operating pressure of 1480 PSIG. The housing is cast steel to meet the demands of the higher flow rates and pressures.

The cartridges are field replaceable and are interchangeable between housings regardless of the pressure rating on the housing. As an option, a self-resetting full flow internal bypass is available on new meters and on replacement cartridges for the 1M through 7M sizes. Since this meter utilizes the Series 3 Accessory Units, a full line of mechanical index options is available.

The latest addition to the list of high pressure meter accessory unit options, is the Integral Micro Corrector, Model IMC/W2. See page 12 for further details on the corrector.



Removable B3-HPC Cartridge



## Series B3-HP (High Pressure) Meters

For lower pressure loads, the 1M300 (1000 ACFH) and 3M300 (3000 ACFH) are viable alternatives for pressures up to 300 PSIG. Based on the B3 meter line, the B3-HP meters offer extremely low start and stop rates and a compact design with a 6-3/4" flange-to-flange dimension and a much lower weight than traditional high pressure meters. This is achieved by using aluminum for all major meter components. The Series B3-HP meters mate with ANSI Class 300# FF flanges and are easily installed by one person without the need for a lift or hoist.

# ROOTS® Optional Electronic Products



## Solid State Transmitter (XMTR)

- High frequency pulse output
- 100 pulses per input shaft revolution
- Solid State circuitry provides a long life expectancy
- Mounts on any standard Instrument Drive
- 10 to 15 VDC



## ROOTS® ICEX

- Provides a non-compensated, high frequency pulse output
- Mounts on all Series B meter bodies and Series A meters fitted with the S3A Accessory unit
- Available factory installed or as a field installable conversion kit
- Ensures maximum reliability by using Solid State components to eliminate mechanical switches
- Minimizes maintenance
- Available in three connections styles: MS-style circular connector, 1/2 inch liquid tight type conduit fitting, or cable gland with 4-ft. cable.



Cable Gland Connector



Conduit Connector



Circular Connector





# ROOTS® Electronic Instrumentation

The ROOTS® Micro Corrector line of products, offers both the latest technology in electronic volume correction and the best value that is available in the gas market today.



ID Mount Version



IMC/W2



IMC/W2 ptz-dp

## ROOTS® Micro Corrector

The Micro Corrector is available in two models – the Instrument Drive/Wall mount version, and the IMC/W2 which can be mounted integrally to the meter. The IMC/W2 is available for mounting on the Series A and Series B ROOTS® meter line, as well as Romet meters. Both the IMC/W2 and the MC2 are available in PTZ+Log, P+Log, and T+Log versions.

### Both models feature:

- Intuitive User Terminal software
- 3 separate logged data reports, which can be imported into commercially available software platforms such as MS Excel™
- 3 user programmable pulse outputs included at no additional charge: corrected volume, uncorrected volume, and fault/alarm condition
- Extremely reliable and accurate volume correction with unprecedented nominal five year battery life – data and configuration stored in E2PROM
- Newly designed instrument drive assembly senses meter rotation, eliminating the need to physically change the rotational direction

## IMC/W2 ptz-dp

The Differential Pressure (DP) Micro Corrector now offers an integrated solution, which monitors rotary meter health by constantly measuring the differential pressure drop across the meter. The DP Micro adds diagnostic features to the proven capabilities of the Integral Micro Corrector.

The DP Micro retains the last valid average differential pressure measurement on the LCD of the corrector along with the date when this occurred. It also displays the average line pressure, average line temperature and meter flow rate for that same date. The differential pressure test information required to be in compliance with state PUC requirements is available with the push of a button! This is a significant cost savings as the number of return trips to the meter set is greatly reduced, and is environmentally friendly as it eliminates the need for venting gas during periods of low consumption.

Developed from the proven IMC/W platform, the ROOTS® Micro Corrector continues to provide industry-leading volume correction through a simple-to-use interface. Features such as improved low flow accuracy, greatly enhanced data logging capability, and significantly reduced accuracy test times combine to offer a complete solution with major customer benefits.



# ROOTS® Communication Devices

## Model GSM/GPRS Micro Modem

The Dresser Micro Modem, Model GSM/GPRS embeds a wireless quad band GPRS modem. Opto-isolators provide an intrinsically safe unit specifically designed to work with the Dresser range of Micro Series products including volume correctors & data loggers. The Dresser GSM/GPRS Modem is designed to work directly with the MCNet SQL Database software, and allows for simple mechanical and electrical installation.



GSM/GPRS Micro Modem



Telephone Line Micro Modem

## Telephone Line Micro Modem Model 108

The telephone line model of the Dresser Micro Modem takes enough required power from the telephone line to handle one data download per day.

## Dresser Micro Power

The Dresser Micro Power is designed specifically for use with the Dresser Micro Series range of products when an intrinsically safe low power supply is required in the hazardous area. This includes the MC2 and Micro Logger 2 products. The Micro Power eliminates the need for battery changes in applications where the unit is being interrogated frequently.



Micro Power

## Dresser Micro Logger

Dresser Micro Logger 2 is an extension of the successful Micro Series product line. It utilizes the same user friendly Micro Corrector User Terminal Software and communication cables and, is designed to be installed on any part of the distribution or transmission system requiring accurate, safe, and reliable data logging and network status monitoring. The Micro Logger is available with single or dual pressure transducers and a temperature probe.



Micro Logger 2

## Chatterbox-e Isolation Unit

The Chatterbox-e provides safety isolation between equipment generating pulses in the hazardous area and non intrinsically safe equipment located in the safe area. Chatterbox-e operates from a self contained power supply and is suitable for installation in remote and environments without the need for an external power supply.



Chatterbox-e Isolation Unit

# ROOTS® Communication Devices

## Micro Series Corrector User Terminal Software

The Micro Series Corrector User Terminal software allows you to configure, calibrate, log data, download data and monitor alarms via the unique Live Data Screen feature. The data logs can be downloaded serially using a laptop or remotely using the Telephone Line Micro Modem Model 108.



Micro Series Corrector User Terminal Software

## Dresser Automatic Meter Reading & Automatic Data Acquisition Software – MCNet SQL

Dresser MCNet SQL receives data log emails from the MC2, IMC/W2 or ML2. This process is fully automatic; 1, 2 or 3 emails are generated from site each day, via the GPRS network, and are forwarded to two email addresses (To: & Cc:). No limit to the number of sites that can use this system. An internet connection is all that is required.



MCNet SQL Software

## Micro Generator

The Micro Generator uses cutting edge technology to convert the rotation of the meter impellers into electrical energy, while simultaneously providing volume pulses to the Micro Corrector.

- Reduces Battery Replacement Costs
- Increases Life of Main Battery
- Easy to Install
- Converts Rotation of Meter Impellers into Electrical Power
- Available for both Series B and Series A (LMMA) meters



Micro Generator

## SmartProve™

The Dresser SmartProve™ Interface is a user friendly approach to testing the ROOTS® Micro Corrector, Models IMC/W2, and MC2, when using the ROOTS® Model 5 Transfer Prover. The specially designed cable and software allow for a combined accuracy test of the corrector and the meter. The SmartProve package consists of a Model 5 Prover software upgrade CD, the SmartProve Interface Cable, and instructions for use.



SmartProve

# Model 5 ROOTS® Provers

Model 5 Transfer Provers feature an integrated computer controlled system for verification and testing of rotary, diaphragm, and turbine gas meters. After the field meter is connected to the Prover and the test sequence is selected, the remainder of the operation is “hands-off.” Test sequencing is automatically controlled by the software settings and the test results are displayed on the computer screen.

For ease of testing and recording, the Model 5 Prover system will:

- Store unlimited predetermined field meter test configurations
- Perform and display all calculations at the end of each test and allow for saving to disk
- Provide user-friendly menu prompts
- Allow easy access to extensive Help Files

The primary components for all Model 5 Prover systems include highly accurate ROOTS® master meters as measurement standards, easy-to-use Windows®-based software, and a blower system to provide a stable air flow through the system.



2M/10M

## 10M or 2M/10M Prover

- 10M or 2M/10M master meters  
Capacities:
  - 2M: 35 to 2,300 ACFH (1 to 65.1 m<sup>3</sup>/h)
  - 10M: 100 to 10,000 ACFH (2.83 to 283 m<sup>3</sup>/h)
- Suitable for both field and shop use
- Easily transported in a van or truck



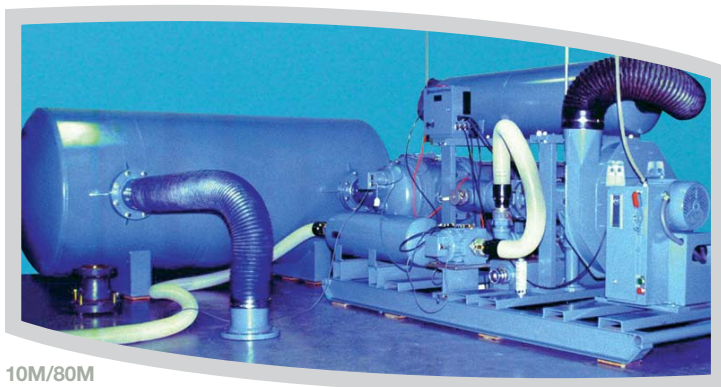
5M/20M

## 5M/20M Prover

The cart-mounted prover gives you the increased capability to prove rotary, turbine and diaphragm meters up to 20,000 acfh, while occupying minimal floor space.

- Capacities:
- 5M: 35 to 5,650 ACFH (.41 to .60 m<sup>3</sup>/h)
  - 20M: 160 to 20,000 ACFH (4.5 to 566 m<sup>3</sup>/h)

# ROOTS® Provers & Accessories



10M/80M

## 10M/80M Proving System

- 10M and 80M master meters  
Capacities:
  - 10M: 100 to 10,000 ACFH  
(2.83 to 283 m<sup>3</sup>/h)
  - 80M: 1,600 to 80,000 ACFH  
(45,3 to 2265,3 m<sup>3</sup>/h)
- Skid Mounted Shop System
- Ideal for testing large capacity rotary and turbine type gas meters



Software

## Windows®-based Software

Easy-to-use software with icons and menus typical of Windows-based programs allow you to increase your productivity and work more intuitively with the computer. The new software is designed for all Model 5 Prover Systems and is compatible with Windows® 95, 98, 2000, ME, XP, NT 4.0 and VISTA.



USB Converter Cable

## USB to Serial Port Converter Cable

This converter will allow users with existing Windows® - based Model 5 Software and computers without a serial port to connect to their Model 5 Provers. The Converter Kit consists of a converter cable and Model 5 Upgrade CD. Minimum System requirements are a computer with 500MHz processor, 128MB RAM, 400MB hard disk space, Windows® 98, XP professional, an open USB port, and the Windows® - based Model 5 Software.



RS\_PB

## RS Optical Scanner

The optional RS Optical Scanner is used to facilitate meter testing using an automatic testing sequence. This eliminates the potential for human error associated with a manual test. The Scanner can be used on dial indexes and odometers with black and white graduated marks.



Acoustic Filter

## Acoustic Filter

When testing turbine-type gas meters with a transfer prover, an Acoustic Filter should be installed between the Field Meter (meter under test) and the ROOTS® master meter. The Acoustic Filter reduces or eliminates the resonance phenomena induced by pulsation from the master meter at most flow rates. An Acoustic Filter is ideal for shop use with a 2M/10M Model 5 ROOTS® prover.



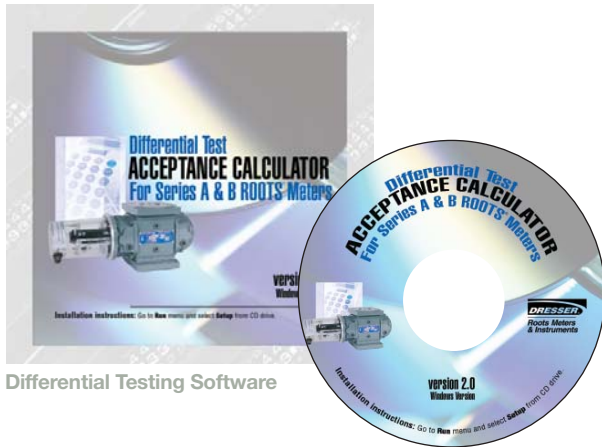
# ROOTS® Test Equipment



Smart Manometer

## Smart Manometer

The Smart Manometer is a pressure measuring instrument with an accuracy of  $\pm 0.025\%$  of full scale at a truly low cost. As a replacement for glass manometers, this microprocessor based system, manufactured by Meriam Instrument, is suitable for the measurement of differential pressures across a rotary meter.



Differential Testing Software

## Differential Testing Acceptance Calculator Software

The new DTA Calculator lets you quickly verify the operational condition of your ROOTS® Meter. Print or Save data for future comparisons. Just "clock" your meter, take your differential pressure reading, plug in your value, and the software does the rest.



# ROOTS® Meter Sets & Piping Specialty Accessories

A full line of meter set components are available for a one-stop-shopping approach to meter set design and installation. Reduce your installation cost with a professionally designed and tested ROOTS® meter set.



Pre-Fabricated Sets

## Pre Fabricated Meter Sets

Dresser offers both Standard and Customer Specified designs. These modular meter sets are packaged for economical shipping and storage. Benefits include design standardization, reduced inventories, and lower overhead costs.



UltraSeal® Valve

## Ultraseal® Gas Meter Valves

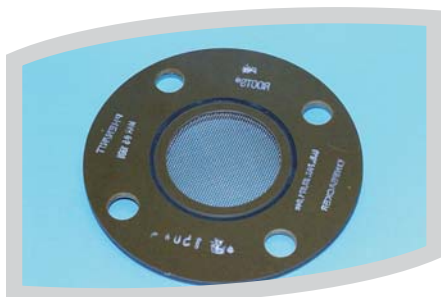
Ultraseal® valves are permanently lubricated and bi-directional. They meet NPFA standards and continue to maintain a bubble-tight seal after qualification testing to over 10,000 cycles. Torque values remain low even at subzero temperatures. Locking plates are also available.



Pipeline Strainer

## Pipeline Strainers

These strainers are designed to protect meters and other precision devices from the damaging effects of entrained system debris. A low pressure drop is achieved through a large element area and venturi port design. The debris bowl is tapped for cleaning.

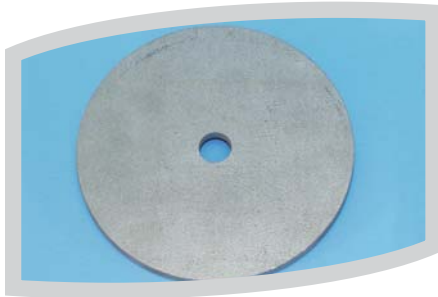


Gasket Strainer

## Gasket Strainers

Using a 20 mesh stainless steel screen, the Gasket Strainer helps protect against potential damage to precision pipeline measurement and regulation equipment caused by occasional introduction of weld slag, plastic pipe shavings, or other debris.

# ROOTS® Accessories



Restricting Orifice Plates

## Restricting Flow Orifice Plates

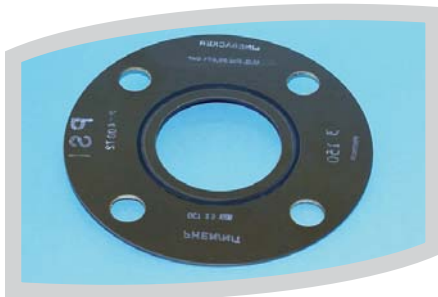
Sized orifice plates provide low cost protection against meter overspeed. The plates are designed to choke gas flow at 100% for meters rated over 300 psig. Plates are installed 2 to 4 pipe diameters downstream for maximum effectiveness.



Companion Flange Accessories

## Companion Flange Assemblies

These kits include all the equipment necessary for mounting a meter in a pipeline. The kit consists of flanges, coated flange bolts, and gaskets.



Flanged Gaskets

## Flange Gaskets

LineBacker™ gaskets, with their unique sealing element, use the lowest possible clamp and compressive load to eliminate flange leaks.



Bolts

## Coated Flange Bolts

These bolts have a lubricious, polymer-based coating to help prevent galling of the threads in the meter body.



Pete's Plug II®

## Differential Test Plugs

Allows user to take pressure and temperature readings quickly while eliminating the cost of leaving gauges or temperature indicators in line. Pete's Plug II® test plug is still the only pressure and temperature test plug with two self-closing valves and is rated to a maximum pressure of 500 psig at 200°F.

# ROOTS® Accessories



Meter Oil

## ROOTS® Meter Oil

Approved for use in all ROOTS® meters. The oil is packaged in quantities from 4 ounces to 55 gallons.

# ROOTS® Services



## Product Repair Service

Our Product Services Department offers repair, remanufacturing, testing and calibration service for all ROOTS® meters, provers, and instrumentation. At Dresser Meters & Instruments, our focus is on customer satisfaction. Let the experts handle your ROOTS® products repair and calibration needs.

The overall cost effectiveness of factory service is enhanced by:

- Standardized and competitive service levels
- Specialization in contract services
- Inspection for warranty and upgrades
- Line Mount Meters returned freight prepaid to the first point of delivery within the United States



# Imperial Sizing Charts

Line Mounted														
Model	8C175*	11C175*	15C175*	2M175*	3M175*	5M175*	7M175	11M175	16M175	23M175	23M232	38M175	56M175	102M125
*Also available in 200 PSIG Rating														
Rating	800	1100	1500	2000	3000	5000	7000	11000	16000	23000	23000	38000	56000	102000
PSIG	Corrected Capacity at Metering Pressure – in MSCFH													
1	0.84	1.15	1.57	2.09	3.1	5.2	7.3	11.5	16.7	24.0	24.0	39.7	58.5	106.6
3	0.95	1.30	1.77	2.36	3.5	5.9	8.3	13.0	18.9	27.2	27.2	44.9	66.2	120.5
5	1.05	1.45	1.98	2.63	4.0	6.6	9.2	14.5	21.1	30.3	30.3	50.0	73.8	134.3
10	1.33	1.82	2.48	3.31	5.0	8.3	11.6	18.2	26.5	38.1	38.1	62.9	92.8	168.9
15	1.60	2.20	2.99	3.99	6.0	10.0	14.0	22.0	31.9	45.9	45.9	75.8	111.8	203.6
20	1.87	2.57	3.50	4.67	7.0	11.7	16.3	25.7	37.4	53.7	53.7	88.7	130.8	238.2
25	2.14	2.94	4.01	5.35	8.0	13.4	18.7	29.4	42.8	61.5	61.5	101.6	149.8	272.9
30	2.41	3.32	4.52	6.03	9.0	15.1	21.1	33.2	48.2	69.3	69.3	114.5	168.8	307.4
40	2.95	4.06	5.54	7.39	11.1	18.5	25.9	40.6	59.1	84.9	84.9	140.3	206.8	376.7
50	3.50	4.81	6.56	8.74	13.1	21.9	30.6	48.1	70.0	100.6	100.6	166.1	244.8	445.9
60	4.04	5.56	7.58	10.10	15.2	25.3	35.4	55.6	80.8	116.2	116.2	191.9	282.9	515.2
70	4.58	6.30	8.59	11.46	17.2	28.6	40.1	63.0	91.7	131.8	131.8	217.7	320.9	584.5
80	5.13	7.05	9.61	12.82	19.2	32.0	44.9	70.5	102.5	147.4	147.4	243.5	358.9	653.7
90	5.67	7.80	10.63	14.18	21.3	35.4	49.6	78.0	113.4	163.0	163.0	269.3	396.9	723.0
100	6.21	8.54	11.65	15.53	23.3	38.8	54.4	85.4	124.3	178.6	178.6	295.1	434.9	792.1
110	6.76	9.29	12.67	16.89	25.3	42.2	59.1	92.9	135.1	194.2	194.2	320.9	472.9	861.4
120	7.30	10.04	13.69	18.25	27.4	45.6	63.9	100.4	146.0	209.9	209.9	346.7	511.0	930.6
125	7.57	10.41	14.2	18.93	28.4	47.3	66.2	104.1	151.4	217.7	217.7	359.6	530.0	965.3
135	8.11	11.16	15.21	20.29	30.4	50.7	71.0	111.6	162.3	233.3	233.3	385.4	568.0	
150	8.93	12.28	16.74	22.32	33.5	55.8	78.1	122.8	178.6	256.7	256.7	424.1	625.0	
175	10.29	14.14	19.29	25.72	38.6	64.3	90.0	141.4	205.7	295.7	295.7	488.6	720.1	
200	11.64	16.01	21.83	29.11	43.7	72.8						334.8		
232												384.7		

175 PSIG Standard MAOP on sizes 8C175-56M175  
 \* 200 PSIG MAOP Rating Optional. Contact Factory.

High Pressure Meters									
Model	1M300	1M740	1M1480	3M300	3M740	3M1480	5M1480	7M1480	11M480
Rating	1000	1000	1000	3000	3000	3000	5000	7000	11000
PSIG	Corrected Capacity at Metering Pressure - MSCFH								
125	9.5	9.5	9.5	28.4	28.4	28.4	47.3	66.2	104.1
150	11.2	11.2	11.2	33.5	33.5	33.5	55.8	78.1	122.8
175	12.9	12.9	12.9	38.6	38.6	38.6	64.3	90.0	141.4
200	14.6	14.6	14.6	43.7	43.7	43.7	72.8	102	160.1
250	18.0	18.0	18.0	53.9	53.9	53.9	89.8	126	197.4
300	21.3	21.3	21.3	64.0	64.0	64.0	107	149	234.8
350		24.7	24.7		74.2	74.2	124	173	272.1
500		34.9	34.9		105	105	175	244	384.1
600		41.7	41.7		125	125	209	292	458.8
740		51.2	51.2		154	154	256	359	563.4
800			55.3			166	276	387	608.2
900			62.1			186	310	435	682.9
1200			82.4			247	412	577	906.9
1480			102			305	508	711	1116.0

## SIZING INSTRUCTIONS

To select the proper meter size, use the Minimum Operating Pressure and the Maximum Instantaneous Hourly Flow Rate. Do not exceed meter's maximum allowable operating pressure.

To prevent oversizing of a meter, sizing should be based upon the total connected load giving consideration to the load diversity. When using this method to size a meter, a selected diversity factor times the total connected load will be used as the Maximum Instantaneous Flow Rate for sizing purposes.

A diversity factor of 0,85 is commonly used for a single application where two or more major appliances are in use (i.e, boilers, furnaces, space heaters, etc.).

As the number of appliances considered when determining a connected load increases, the diversity factor will typically decrease. For applications such as multiple ranges and water heaters, some examples of commonly used diversity factors are:

Qty	Factor	Qty	Factor*
0-5	1	6	0.9
7	0.85	8	0.83

\*The diversity factors listed above are estimates. For proper sizing, consult your company or industry standards for determining accepted values.

**NOTE:** All capacities listed are Standard Cubic Feet per Hour (SCFH) and based upon Average Atmospheric Pressure (14.4 PSIA), Base Pressure (14.73 PSIA), and Base Temperature (60°F). Tables do not take into account Supercompressibility. Please refer to RM-135 for further information on the Application of Temperature and/or Pressure Correction Factors in Gas Measurement.

Energy Value	
Gas	BTU/Cu. Ft.
Acetylene	1498
Butane	3200
Ethane	1758
Ethylene	1606
Methane	997
Natural	965/1055
Propane	2550

# Metric Sizing Charts

Line Mounted - Metric																
Model			8C175*	11C175*	15C175*	2M175*	3M175*	5M175*	7M175	11M175	16M175	23M232	23M175	38M175	56M175	102M125
*Also available in 200 PSIG Rating																
Rating			22,7	31,2	42,5	56,6	85	141,6	198,2	311,5	453,1	651,3	651,3	1076	1585,7	2888,3
PSIG	kPa	Bar	Corrected Capacity at Metering Pressure – in Nm <sup>3</sup> /H													
1	6,9	0,1	23,7	32,6	44,4	59,2	88,8	148,0	207,2	325,7	473,7	680,9	680,9	1125,0	1657,9	3019,7
3	20,7	0,2	26,8	36,8	50,2	66,9	100,3	167,2	234,1	368,0	535,2	769,3	769,3	1271,1	1873,2	3411,9
5	34,5	0,3	29,8	41,0	55,9	74,6	111,9	186,5	261,1	410,2	596,7	857,8	857,8	1417,2	2088,5	3804,0
10	68,9	0,7	37,5	51,6	70,4	93,8	140,7	234,5	328,3	516,0	750,5	1078,9	1078,9	1782,4	2626,8	4784,5
15	103,4	1,0	45,2	62,2	84,8	113,0	169,6	282,6	395,6	621,7	904,3	1299,9	1299,9	2147,7	3165,0	5764,9
20	137,9	1,4	52,9	72,7	99,2	132,3	198,4	330,6	462,9	727,4	1058,1	1521,0	1521,0	2513,0	3703,3	6745,3
30	206,8	2,1	68,3	93,9	128,0	170,7	256,1	426,8	597,5	938,9	1365,7	1963,2	1963,2	3243,5	4779,8	8706,1
40	275,8	2,8	83,6	115,0	156,8	209,1	313,7	522,9	732,1	1150,4	1673,3	2405,3	2405,3	3974,0	5856,4	10667,0
50	344,7	3,4	99,0	136,2	185,7	247,6	371,4	619,0	866,6	1361,8	1980,8	2847,5	2847,5	4704,5	6932,9	12627,8
60	413,7	4,1	114,4	157,3	214,5	286,0	429,1	715,1	1001,2	1573,3	2288,4	3289,6	3289,6	5435,0	8009,4	14588,7
70	482,6	4,8	129,8	178,5	243,3	324,5	486,7	811,2	1135,8	1784,8	2596,0	3731,8	3731,8	6165,5	9086,0	16549,5
80	551,6	5,5	145,2	199,6	272,2	362,9	544,4	907,3	1270,3	1996,2	2903,6	4173,9	4173,9	6896,0	10162,5	18510,3
90	620,5	6,2	160,5	220,8	301,0	401,4	602,1	1003,5	1404,9	2207,7	3211,2	4616,1	4616,1	7626,5	11239,1	20471,2
100	689,5	6,9	175,9	241,9	329,8	439,8	659,8	1099,6	1539,5	2419,2	3518,8	5058,2	5058,2	8357,0	12315,6	22432,0
125	861,8	8,6	214,4	294,8	401,9	535,9	803,9	1339,9	1875,9	2947,8	4287,7	6163,6	6163,6	10183,3	15006,9	27334,1
150	1034,2	10,3	252,8	347,7	474,0	632,0	948,1	1580,2	2212,3	3476,5	5056,7	7269,0	7269,0	12009,6	17698,3	
175	1206,6	12,1	291,2	400,5	546,1	728,2	1092,3	1820,5	2548,7	4005,2	5825,6	8374,4	8374,4	13835,8	20389,6	
200	1379,0	13,8	329,7	453,4	618,2	824,3	1236,5	2060,7				9479,7				
232	1599,6	16,0														10894,6

175 PSIG Standard MAOP on sizes 8C175-56M175.

\* 200 PSIG MAOP Rating Optional. Contact Factory.

High Pressure Meters - Metric											
Model			1M300	1M740	1M1480	3M300	3M740	3M1480	5M1480	7M1480	11M1480
Rating			28,3	28,3	28,3	85,0	85,0	85,0	141,6	198,2	311,5
PSIG	kPa	Bar	Corrected Capacity at Metering Pressure - in Nm <sup>3</sup> /H								
125	861,8	8,6	268,0	268,0	268,0	803,9	803,9	803,9	1339,9	1875,9	2943,2
150	1034,2	10,3	316,1	316,1	316,1	948,1	948,1	948,1	1580,2	2212,3	3471,0
175	1206,6	12,1	364,1	364,1	364,1	1092,3	1092,3	1092,3	1820,5	2548,7	3998,9
200	1379,0	13,8	412,2	412,2	412,2	1236,5	1236,5	1236,5	2060,7	2885,2	4526,7
250	1723,7	17,2	508,3	508,3	508,3	1524,8	1524,8	1524,8	2541,3	3558,0	5582,4
300	2068,4	20,7	604,5	604,5	604,5	1813,2	1813,2	1813,2	3021,9	4230,8	6638,1
350	2413,2	24,1		700,6	700,6		2101,5	2101,5	3502,5	4903,7	7693,7
400	2757,9	27,6		796,7	796,7		2389,9	2389,9	3983,1	5576,5	8749,4
500	3447,4	34,5		989,0	989,0		2966,6	2966,6	4944,2	6922,2	10860,7
600	4136,9	41,4		1181,2	1181,2		3543,3	3543,3	5905,4	8267,9	12972,1
700	4826,3	48,3		1373,5	1373,5		4120,0	4120,0	6866,6	9613,6	15083,4
740	5102,1	51,0		1450,4	1450,4		4350,7	4350,7	7251,0	10151,9	15928,0
800	5515,8	55,2			1565,8			4696,8	7827,7	10959,3	17194,8
900	6205,3	62,1			1758,0			5273,5	8788,9	12305,0	19306,1
1000	6894,8	68,9			1950,3			5850,2	9750,1	13650,7	21417,4
1200	8273,7	82,7			2334,8			7003,6	11672,4	16342,0	25640,1
1300	8963,0	90,0			2527,1			7580,3	12635,4	17686,0	27751,5
1480	10204,2	102,0			2873,1			8618,4	14363,7	20110,0	31551,9

# ROOTS® G-Rating Sizing Charts

Line Mounted														
Model			G16	G25	G40	G65	G100	G160 3"	G160 4"	G250	G400 4"	G400 6"	G650	G1000
Base Rating (m³/h)			25	40	65	100	160	250	250	400	650	650	1000	1600
Meter Oper. Press.			Corrected Capacity at Metering Pressure in Nm³/h											
PSIG	kPa	Bar												
3	21	0,2	29,5	47,3	76,8	118,1	189,0	295,3	295,3	472,5	767,8	767,8	1181,3	1890,0
5	34	0,3	32,9	52,7	85,6	131,7	210,7	329,3	329,3	526,8	856,1	856,1	1317,0	2107,3
10	69	0,7	41,4	66,3	107,7	165,6	265,0	414,1	414,1	662,6	1076,7	1076,7	1656,5	2650,4
15	103	1,0	49,9	79,8	129,7	199,6	319,3	499,0	499,0	798,4	1297,4	1297,4	1995,9	3193,5
20	138	1,4	58,4	93,4	151,8	233,5	373,7	583,8	583,8	934,1	1518,0	1518,0	2335,4	3736,6
30	207	2,1	75,4	120,6	195,9	301,4	482,3	753,6	753,6	1205,7	1959,3	1959,3	3014,3	4822,8
40	276	2,8	92,3	147,7	240,1	369,3	590,9	923,3	923,3	1477,3	2400,5	2400,5	3693,1	5909,0
50	345	3,4	109,3	174,9	284,2	437,2	699,5	1093,0	1093,0	1748,8	2841,8	2841,8	4372,0	6995,2
60	414	4,1	126,3	202,0	328,3	505,1	808,1	1262,7	1262,7	2020,4	3283,1	3283,1	5050,9	8081,5
70	483	4,8	143,2	229,2	372,4	573,0	916,8	1432,5	1432,5	2291,9	3724,4	3724,4	5729,8	9167,7
80	552	5,5	160,2	256,3	416,6	640,9	1025,4	1602,2	1602,2	2563,5	4165,6	4165,6	6408,7	10253,9
90	621	6,2	177,2	283,5	460,7	708,8	1134,0	1771,9	1771,9	2835,0	4606,9	4606,9	7087,6	11340,1
100	689	6,9	194,2	310,7	504,8	776,6	1242,6	1941,6	1941,6	3106,6	5048,2	5048,2	7766,5	12426,3
125	862	8,6	236,6	378,5	615,1	946,4	1514,2	2365,9	2365,9	3785,5	6151,4	6151,4	9463,7	15141,9
150	1034	10,3	279,0	446,4	725,5	1116,1	1785,7	2790,2	2790,2	4464,4	7254,6	7254,6	11160,9	17857,4
175	1207	12,1	321,5	514,3	835,8	1285,8	2057,3	3214,5	3214,5	5143,2	8357,8	8357,8	12858,1	20573,0
200	1379	13,8			946,1*	1455,5*	2328,9*	3638,8*	3638,8*	5822,1*	9461,0*			
232	1600	16,0			1087,3*	1672,8*	2676,4*	4181,9*	4181,9*	6691,1*	10873,0*			

12 bar MAOP Standard \*16 bar MAOP optional on sizes G40-G400 4". Contact Factory.

ROOTS® High Pressure Meters															
Model			G16-300	G25-300	G40-300	G65-300	G16-740	G25-740	G40-740	G65-740	G16-1480	G25-1480	G40-1480	G65-1480	G100-1480
Base Rating (m³/h)			25	40	65	100	25	40	65	100	25	40	65	100	160
Meter Oper. Press.			Corrected Capacity at Meter Pressure -in Nm³/H												
PSIG	kPa	Bar													
125	862	9	236,6	378,5	615,1	946,4	236,6	378,5	615,1	946,4	236,6	378,5	615,1	946,4	1514,2
150	1034	10	279,0	446,4	725,5	1116,1	279,0	446,4	725,5	1116,1	279,0	446,4	725,5	1116,1	1785,7
175	1207	12	321,5	514,3	835,8	1285,8	321,5	514,3	835,8	1285,8	321,5	514,3	835,8	1285,8	2057,3
200	1379	14	363,9	582,2	946,1	1455,5	363,9	583,2	946,1	1455,5	363,9	582,2	946,1	1455,5	2328,9
250	1724	17	448,7	718,0	1166,7	1795,0	448,7	718,0	1166,7	1795,0	448,7	718,0	1166,7	1795,0	2872,0
300	2068	21	533,6	853,8	1387,4	2134,4	533,6	853,8	1387,4	2134,4	533,6	853,8	1387,4	2134,4	3415,1
350	2413	24					618,5	989,5	1608,0	2473,9	618,5	989,5	1608,0	2473,9	3958,2
400	2758	28					703,3	1125,3	1828,6	2813,3	703,3	1125,3	1828,6	2813,3	4501,3
500	3447	34					873,0	1396,9	2269,9	3492,2	873,0	1396,9	2269,9	3492,2	5587,5
600	4137	41					1042,8	1668,4	2711,2	4171,1	1042,8	1668,4	2711,2	4171,1	6673,7
700	4826	48					1212,5	1940,0	3152,5	4850,0	1212,5	1940,0	3152,5	4850,0	7759,9
740	5102	51					1280,4	2048,6	3329,0	5121,5	1280,4	2048,6	3329,0	5121,5	8194,4
800	5516	55									1382,2	2211,5	3593,8	5528,9	8846,2
900	6205	62									1551,9	2483,1	4035,0	6207,7	9932,4
1000	6895	69									1721,7	2754,7	4476,3	6886,6	11018,6
1200	8274	83									2061,1	3297,8	5358,9	8244,4	13191,0
1300	8963	90									2230,8	3569,3	5800,1	8923,3	14277,3
1480	10204	102									2536,3	4058,1	6594,4	10145,3	16232,5

# Imperial and Metric Technical Data

Technical Data	Units	8C175*	11C175*	15C175*	2M175*	3M175*	5M175*	7M175	8.8M175	11M175	16M175	23M175	23M232
<b>Base Rating (Q Max.)</b>	acfh m <sup>3</sup> /h	800 22.6	1100 31.0	1500 42.5	2000 56.6	3000 85.0	5000 141.5	7000 200.0	N/A 250.0	11000 310.0	16000 450.0	23000 650.0	23000 650.0
<b>Max. Operating Pressure (MAOP)*</b>	psig kPa	175 1200	175 1200	175 1200	175 1200	175 1200	175 1200	175 1200	175 1200	175 1200	175 1200	175 1200	232 1600
<b>Rangeability +/- 1%</b>	ratio	26:01:00	31:01:00	40:01:00	68:01:00	76:01:00	120:01:00	67:01:00	70:01:00	124:01:00	116:01:00	40:01:00	169:01:00
<b>Start Rate</b>	cfh m <sup>3</sup> /h	2.8 0.0790	2.3 0.0651	1.9 0.0549	1.01 0.0538	2.1 0.0595	1.2 0.0340	5.3 0.1509	N/A 0.1510	3.9 0.1099	3.2 0.0917	23 0.6513	10.33 0.2926
<b>Stop Rate</b>	cfh m <sup>3</sup> /h	2 0.0575	1.7 0.0493	1.6 0.0445	0.82 0.0311	1.8 0.0510	0.8 0.0227	3.4 0.096	N/A 0.0960	3.2 0.0915	1.9 0.0535	18 0.5097	5.75 0.1628
<b>Avg. Differential, 100% Flow</b>	in. w.c. mbar	0.5 1.1	0.6 1.5	0.8 1.9	0.7 1.6	1.1 2.6	1.1 2.6	1.6 4.0	N/A 2.8	1.6 4.0	2.1 5.2	1.3 3.1	2.08 5.18
<b>Drive Rate CTR, CD</b>	cf/rev m <sup>3</sup> /rev	10 0.1	10 0.1	10 0.1	10 0.1	10 0.1	10 0.1	10 0.1	N/A 1	10 0.1	10 0.1	10 0.1	100 1
<b>Drive Rate TC, TD</b>	cf/rev m <sup>3</sup> /rev	100 1	100 1	100 1	100 1	100 1	100 1	100 1	N/A 10	100 10	1000 10	N/A N/A	N/A N/A
<b>Nominal Pipe Size</b>	in. mm	2 50	2 50	2 50	2 50	2 50	3 80	3 80	N/A 80 or 100	4 100	4 100	6 150	4 100
<b>Flange-to-Flange</b>	in. mm	6/3/04 172	6/3/04 172	6/3/04 172	6/3/04 172	6/3/04 172	6/3/04 172	9/1/02 241	N/A 241	9/1/02 241	9/1/02 241	16 406.4	9/1/02 241
<b>Flange Connection</b>	ANSI	150#FF	150#FF	150#FF	150#FF	150#FF	150#FF	150#FF	150#FF	150#FF	150#FF	150#FF	150#FF
<b>Net Weight - CTR Version</b>	lbs. kg	18 8.2	22 10.0	24 10.9	26 11.8	29 13.2	35 15.9	52 23.6	N/A 29.0 or 31.0	60 27.2	85 38.6	202 91.6	100 45.4

Technical Data	Units	38M175	56M175	102M125	1M300	1M740	1M1480	3M300	3M740	3M1480	5M1480	7M1480	11M1480
<b>Base Rating (Q Max.)</b>	acfh m <sup>3</sup> /h	38000 1050.0	56000 1575.0	102000 2875.0	1000 28.3	1000 65.0	1000 65.0	3000 85.0	3000 85.0	3000 85.0	5000 141.5	7000 200.0	11000 310
<b>Max. Operating Pressure (MAOP)*</b>	psig kPa	175 1200	175 1200	125 860	300 2065	740 5100	1480 10200	300 2065	740 5100	1480 10200	1480 10200	1480 10200	1480 10204
<b>Rangeability +/- 1%</b>	ratio	90:1	53:1	38:1	30:1	18:1	18:1	50:1	77:1	77:1	28:1	60:1	55:1
<b>Start Rate</b>	cfh m <sup>3</sup> /h	27 0.7646	40 11.327	120 33.980	1.9 0.0538	2.5 0.0708	2.5 0.0708	2.1 0.0595	3 0.0850	3 0.0850	7.6 0.133	5.8 0.1642	12.83 0.363
<b>Stop Rate</b>	cfh m <sup>3</sup> /h	20 0.5663	29 0.0283	110 31.149	1.1 0.0311	2 0.0566	2 0.0566	1.8 0.0510	2.5 0.0708	2.5 0.0708	4.6 0.057	4.6 0.1303	4.65 0.132
<b>Avg. Differential, 100% Flow</b>	in. w.c. mbar	1.9 4.7	2.2 5.5	2 5.0	0.2 0.5	0.4 1.0	0.3 0.7	1 2.5	1.3 3.2	1.35 3.4	0.9 2.24	2 4.26	1.04 0.029
<b>Drive Rate CTR, CD</b>	cf/rev m <sup>3</sup> /rev	100 1	100 1	100 1	10 0.1	10 0.1	10 0.1	10 0.1	10 0.1	10 0.1	10 0.1	10 0.1	10 N/A
<b>Drive Rate TC, TD</b>	cf/rev m <sup>3</sup> /rev	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
<b>Nominal Pipe Size</b>	in. mm	6 150	8 200	10 250	1-1/2 40	2 50	2 50	2 50	2 50	2 50	3 80	3 80	4 100
<b>Flange-to-Flange</b>	in. mm	18 457.2	21 533.4	28 711.2	6/3/04 172	10/3/04 273	10/3/04 273	6/3/04 172	10/3/04 273	10/3/04 273	14-3/4 374.65	14-3/4 374.65	14-3/4 374.65
<b>Flange Connection</b>	ANSI	150#FF	150#FF	125#FF	300#FF	300#FF	600#FF	300#FF	300#FF	600#FF	600#FF	600#FF	600#FF
<b>Net Weight - CTR Version</b>	lbs. kg	244 110.7	284 128.8	2390 1084.1	26.5 12.0	107 48.5	107 48.5	29 13.2	107 48.5	107 48.5	215 97.52	220 99.79	277 125.65

\* Available with 200 PSIG Rating.



# G-Rating Technical Data

Technical Data	Units	G16	G25	G40	G65	G100	G160-3"	G160-4"	G250
<b>Base Rating (qMax.)</b>	m <sup>3</sup> /h	25,0	40,0	65,0	100,0	160,0	250,0	250,0	400,0
<b>Max Operating Pressure (MAOP)*</b>	bar	12	12	12	12	12	12	12	12
<b>Rangeability +/- 1%</b>	ratio	28:1	37:1	78:1	89:1	135:1	70:1	70:1	103:1
<b>Start Rate</b>	m <sup>3</sup> /h	0,0790	0,0549	0,0538	0,0595	0,0340	0,1510	0,1510	0,0917
<b>Stop Rate</b>	m <sup>3</sup> /h	0,0575	0,0445	0,0311	0,0510	0,0227	0,0960	0,0960	0,0535
<b>Avg. Differential, 100% Flow</b>	mbar	1,6	1,9	2,2	3,2	3,7	2,8	2,8	3,9
<b>Drive Rate CTR, CD</b>	m <sup>3</sup> /rev	0,1	0,1	0,1	0,1	1,0	1,0	1,0	1,0
<b>Nominal Pipe Size</b>	mm	50	50	50	50	80	80	100	100
<b>Flange-to-Flange</b>	mm	172	172	172	172	172	241	241	241
<b>Flange Connection</b>	ANSI	150# FF	150# FF	150# FF	150# FF	150# FF	150# FF	150# FF	150# FF
<b>Net Weight - CTR Version</b>	kg	8	11	12	13	16	29	31	39

\* 16 bar optional on sizes G40-G160 upon request.

Technical Data	Units	G400	G650	G1000
<b>Base Rating (qMax.)</b>	m <sup>3</sup> /h	650,0	1000,0	1600,0
<b>Max Operating Pressure (MAOP)</b>	bar	12	12	12
<b>Rangeability +/- 1%</b>	ratio	40:1	85:1	53:1
<b>Start Rate</b>	m <sup>3</sup> /h	0,6513	0,7646	1,1327
<b>Stop Rate</b>	m <sup>3</sup> /h	0,5097	0,5663	0,8212
<b>Avg. Differential, 100% Flow</b>	mbar	3,1	4,7	5,5
<b>Drive Rate CTR, CD</b>	m <sup>3</sup> /rev	1,0	1,0	10,0
<b>Nominal Pipe Size</b>	mm	150	150	200
<b>Flange-to-Flange</b>	mm	406,4	457,2	533,4
<b>Flange Connection</b>	ANSI	150# FF	150# FF	150# FF
<b>Net Weight - CTR Version</b>	kg	92	111	129

ISO9001





## About Dresser® Products

Dresser brand products are highly engineered, technically superior and are designed to help global customers meet and exceed requirements for mission critical energy applications.

## About Dresser, Inc.

Dresser, Inc. is a leader in providing highly engineered infrastructure products for the global energy industry. The company has leading positions in a broad portfolio of products, including valves, actuators, meters, switches, regulators, piping products, natural gas-fueled engines, retail fuel dispensers and associated retail point-of-sale systems, and air and gas handling equipment. Leading brand names within the Dresser portfolio include Dresser Wayne® retail fueling systems, Waukesha® natural gas-fired engines, Masoneilan® control valves, Consolidated® pressure relief valves, and Roots® blowers. It has manufacturing and customer service facilities located strategically worldwide and a sales presence in more than 100 countries.

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