

## ROOTS® Rotary Displacement Gas Meters



*ROOTS® G Series Meter*



*ROOTS® G Series Meter with LF Pulser*

### Principal Features:

- Full range of meter sizes from G16 through G1000
- High Pressure meter sizes from G16 through G100
- Permanent Metrological repeatability
- Accuracy independent of gas specific gravity, line pressure, or fluctuating flow
- Flange Classes ANSI #150 FF 2" to 8" or PN 16 FF in pipe sizes DN40 to DN200
- Temperature range: -40°C to +70°C
- Permanently lubricated, maintenance free gear reduction Accessory Units
  - Euro Counter: 355° rotatable index with LF Pulser, Optional HF pulser available upon request
  - Series 3 – numerous types available
- MID Certified

Since 1920, the time-proven ROOTS® Meter has been recognized for providing accurate gas measurement from the well head to the burner. ROOTS® Meters & Instruments offers a complete line of G-Rated rotary meter sizes to measure a wide range of gas volumes for commercial and industrial custody transfer and in-plant measurement, as well as for the transmission and production market segments.

ROOTS® Meters are suitable for handling most types of clean and dry common fuel gases as well as specialty gases such as methane, nitrogen, air, argon, carbon monoxide, carbon dioxide, helium, and other dry gases. ROOTS® Meters are not suitable for measurement of hydrogen or oxygen. Our optional Special Service Meters (SSM) incorporate stainless steel components inside the gas measurement chamber for added corrosion resistance against saturates or for specialty applications such as biogas. Meters for measurement of acetylene are available upon request. ROOTS® Meters have been the preferred meter for most Vapor Recovery applications since 1975.

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

ROOTS® Meters are recognized for highly accurate measurement from Qmin to Qmax. The meter's rangeability, the 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, not just laboratory testing. Our meters are designed to provide accurate gas measurement over widely fluctuating flow, pressure, and temperature conditions.

Unlike other meter types, measurement accuracy is not affected by changes in specific gravity, pressure, or fluctuating flow. ROOTS® Meters may be used from a few ounces up to full capacity 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® 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.

### **Meters for Commercial & Industrial Applications**

ROOTS® Meter sizes G16 through G1000 offer a complete line of rotary meters for an ideal measurement solution over a wide array of varying loads and pressures. Meter sizes G16 – G1000 meet PED requirements and have PTB approval 7.131/96.10. For Versatility and Lower Installation Cost, meter sizes G16 – G65 have 50 mm flanged connections with 172mm flange-to-flange dimensions. This unique and cost-effective feature not only enables you to design one common meter set for four meter sizes, it also allows a quick and easy meter exchange without the need to re-pipe the meter set.

### **ROOTS® Euro Counter (ECTR) Accessory Unit**

The ECTR gear reduction unit incorporates engineered polymer with added Teflon for extreme resistance to wear. The permanently lubricated, oil free design eliminates maintenance and assures a long life expectancy as composite gear material offers lower friction and no corrosion issues as compared to sintered metal gears.

The durable, one piece molded Lexan® cover features a larger viewing window for the odometer. The ECTR non-Compensated index can be rotated 355° for easy-to-read positioning in most meter installations. Dual low frequency (LF) pulse outputs are standard, generating an electronic signal proportional to a specific volume of gas. An optional High Frequency (HF) pulse output is available upon special request.

### **Pulse Generator**

Low Frequency pulse devices that generate an electronic signal, proportional to a specific volume of gas, may be fitted to enable operation of compatible volume converters, data loggers or other electronic devices. The ECTR Lexan® cover has two ports that are external to the index for superior sealing to accept a LF Pulser. A High Frequency connector is an available option to enable indication of measured rate of flow. The Pulser that inserts into the port has a female Binder connector.

## G-Rating Technical Data

Technical Data	UNITS	G16	G25	G40	G65	G100	G160-3"	G160-4"	G250	G400-4"	G400	G650	G1000
Base Rating (Qmax.)	m <sup>3</sup> /h	25,0	40,0	65,0	100,0	160,0	250,0	250,0	400,0	650,0	650,0	1000,0	1600,0
Qt	m <sup>3</sup> /h	0,9	0,7	0,8	1,1	1,2	3,6	3,6	3,9	3,8	16,3	11,7	30,2
Qmin for ± 2% error	m <sup>3</sup> /h	0,5	0,4	0,45	0,6	0,7	1,7	1,7	2,0	2,3	10	9,6	14,5
Qmax/Qmin		50	73	144	163	243	145	145	198	278	60	104	110
Qmax/Qt		28	37	78	89	135	70	70	103	169	40	85	53
Rangeability @±1% error		1:28	1:37	1:78	1:89	1:135	1:70	1:70	1:103	1:169	1:40	1:85	1:53
Rangeability @±2% error		1:50	1:73	1:144	1:163	1:243	1:145	1:145	1:198	1:278	1:60	1:104	1:110
Max Operating Pressure (MAOP)*	bar	12	12	12	12	12	12	12	12	12	12	12	12
Start Rate	m <sup>3</sup> /h	0,0790	0,0549	0,0538	0,0595	0,0340	0,1510	0,1510	0,0917	0,2926	0,6513	0,7646	1,1327
Stop Rate	m <sup>3</sup> /h	0,0575	0,0445	0,0311	0,0510	0,0227	0,0960	0,0960	0,0535	0,1628	0,5097	0,5663	0,8212
Avg. Differential, 100% Flow	mbar	1,6	1,7	2,2	3,2	3,7	2,8	2,8	3,9	5,2	3,1	4,7	5,5
Drive Rate	m <sup>3</sup> /rev	0,1	0,1	0,1	0,1	1,0	1,0	1,0	1,0	1,0	1,0	1,0	10,0
Flange DM PN 16	mm	***50	***50	***50	50	80	80	100	100	100	150	150	200
Bolt Size**	mm	M16	M16	M16	M16	M16	M16	M16	M16	M16	M20	M20	M20
Flange ANSI #150	inch	2	2	2	2	3	3	4	4	4	6	6	8
Bolt Size**	inch	5/8-11	5/8-11	5/8-11	5/8-11	5/8-11	5/8-11	5/8-11	5/8-11	5/8-11	3/4-10	3/4-10	3/4-10
Net Weight	kg	8	11	12	13	16	29	31	39	47	92	111	129

\* 16 bar option available on sizes G40-G250.

\*\* Bolt Length varies by application.

\*\*\* Available in 1-1/2" (DN 40) NPT nipples connection upon request.

### Installation

ROOTS® Meters do not require straight lengths of pipe before or after the meter. Due to its lightweight construction, the meter needs only to be supported by the connecting pipe and does not require any direct means of support.

- Standard ECTR meters can be mounted in a vertical (top) or horizontal (side) inlet configuration.
- Installation of a cone type filter (factory option) is commonly used at the inlet in all applications to protect the meter from ingress of possible foreign matter (.25um). When installed for bottom inlet, it is recommended that another cone filter is installed on the meter's outlet to prevent foreign matter falling down into the meter.

### Maintenance

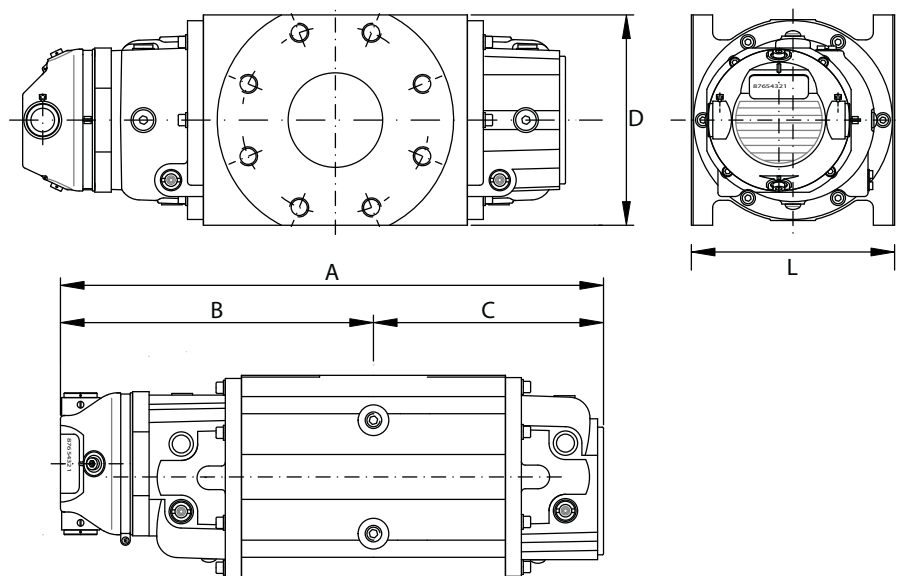
Low maintenance - ROOTS® Meters are simple in construction, but sophisticated in design. The splash lubrication system in the oil reservoirs provides continuous lubrication and cleanses contaminants from the bearings. Oil levels can be easily viewed through sight gauges in each sump. The frequency of oil change is dependent upon cleanliness of the gas and the pipeline. Change oil when dirty, or when the oil level rises from entrapped condensation

### Field Testing

A differential test is a quick, easy, and inexpensive method of comparing the performance of the meter with its original performance while in service, and a means of substantiating that the original accuracy remains unchanged. An increase up to 50% in the differential as compared to the original recorded value or baseline will have an insignificant effect on meter accuracy, making this an ideal preventive maintenance tool.

### Performance

The Rangeability of all ROOTS® Meters meets or exceeds OIML Qmin Qmax for ≥ 1:50



Meter Size	G16	G25	G40	G65	G100	G160	G160	G250	G400	G400	G650	G1000
DN	50	50	50	50	80	80	100	100	100	150	150	200
L (mm)	172	172	172	172	172	241	241	241	241	406	458	533
A (mm)	315	352	356	386	460	502	502	620	690	684	822	927
B (mm)	196	215	212	227	264	292	292	343	381	375	444	497
C (mm)	119	137	144	159	196	210	210	277	309	309	378	430
D (mm)	153	153	177	177	177	226	226	226	241	458	458	458
Mass (kg)	8	9,5	12	13	15,9	29,5	29,5	39	46	94	116	129

### Dresser Roots Meters & Instruments Houston, Texas USA Laboratory

Our 10 CF, 20 CF, and 50 CF bell provers and 1200 CF piston prover are traceable to the US National Institute of Standards & Technology (NIST). Our prover laboratory is Certified and Accredited by NMI, making it one of the best metrology laboratories in the world. All meters are supplied with a Test Data Sheet for accuracy and differential at atmospheric pressure at specific flow rates.

### Dresser Roots Meters & Instruments Suzhou, China Laboratory

Dresser Machinery (Suzhou) assembles G16 – G160 ROOTS® Meters from complete parts kits machined in Houston, Texas, following DRMI Houston ISO 9001 and DMS ISO 9001 documented procedures.

### Design and Metrology Approvals

Approved for custody transfer applications, ROOTS® Meters are designed and in accordance with all relevant and international published and accepted standards such as: AGA/ANSI B109.3, EN12480, OIML R6 and R32, NMI approval for E187, PED (91/23/EC) Lloyd's Certificate #0038/PED/20050010/A, and MID EC-type examination certificate #T10035 (2004/22/EC) Module B + D. Our Dresser Machinery (Suzhou) meter assembly facility has EC-type approval for MID Module B.

### Roots Meters & Instruments Dresser, Inc.

16240 Port Northwest Drive  
Houston, Texas 77041-2645 USA  
Inside US Ph: 800.521.1114      Fax: 800.335.5224  
Outside US Ph: 832.590.2303      Fax: 832.590.2494



[www.dresser.com](http://www.dresser.com)