Residential Meters



About Sensus Metering Systems

Quality is a philosophy--an attitude at Sensus Metering Systems. We take pride in our craftsmanship; and through a team effort we construct top quality for our customers.

Active Engineering and Research and Development Groups utilize state-of-the-art computer aided engineering and diagnostic equipment to design and produce gas metering products to meet the uncompromising demands of today's gas industry. This special balance of philosophy, attitude, dedicated workers and modern equipment assures that quality and performance have been skillfully designed into every product.

In our advanced proving room, every Sensus gas metering product is inspected and proved to be accurate. Sensus products are built with our reputation at stake; a reputation founded on years of experience, earned by the pride and skills of hundreds of dedicated professionals and backed by sophisticated Quality Assurance instrumentation used at critical points throughout the manufacturing process.

How to Order

When submitting orders or inquiries, please specify the following:

- 1. Size and type of meter (model number, standard or temperature compensated, etc.)
- 2. Kind of gas to be metered
- 3. Rate of flow to be metered maximum SCFH
- 4. Maximum operating and test pressure
- 5. Ferrule size
- 6. Swivel specifications
- 7. Type of index
- 8. Special requirements (sealing, paint, accuracy spec., etc.)

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Single Joint Residential Gas Meters

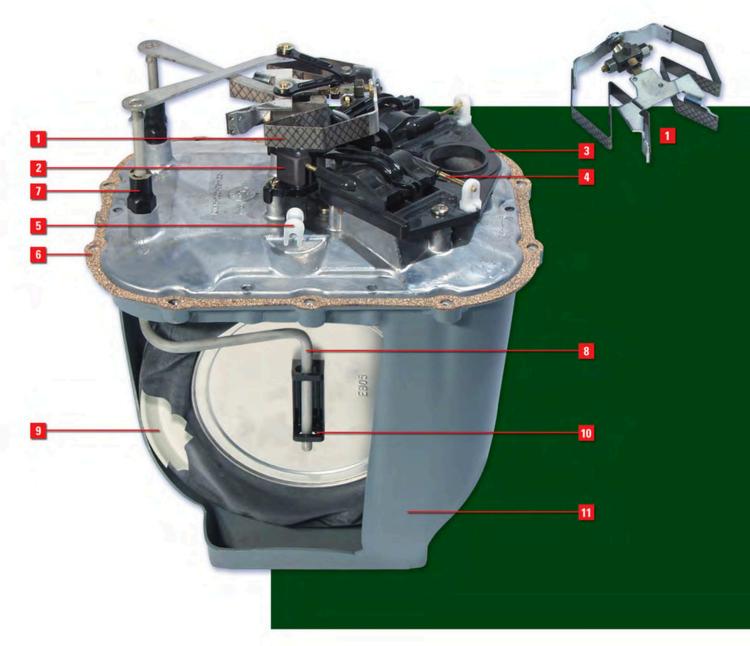


All capacities are maximum, based on 0.6 specific gravity gas measured at 4 oz. base pressure and 60°F at 1/2" w.c. differential pressure – in accordance with B109.1 specifications. Recommended meter operating temperature range:

-30°F to +150°F. See temperature compensation description page 7.

Design Features

- 1.Temperature Compensation Element
- a design with increased strength to minimize deflection from valve drag, the TCelement is more rugged and linear in movement, thus, more accurate in compensation.
- 2.Crank Bracket –a simplified multipurpose design incorporating internal valve guides and index shaft support. Fine tolerance, attained through precision molding, provides accurate positioning of the crank support. Low friction polymer eliminates the need for lubrication.
- 3. Valve Seat close tolerances achieved through molded phenolic construction minimize seat wear while providing a much smoother operation with a significantly lower differential. Incorporates easily installed external valve guides.



- 7.Synthetic Rubber Glands in the cover stuffing box and in the valve plate to seal the flag rods assure positive pressure sealing at these critical points. The gland design produces pressure integrity with a minimum amount of drag.
- 8.One Piece Flag Rod closely controlled dimensions improve parallelism of all vertical segments. Greater distance between bearing points has been designed to provide lateral stability. Easy to position and install.
- 9.Molded Port & Pan with Integral Diaphragm Stabilizers one piece construction of glass fiber reinforced material, increases strength and eliminates a potential leak point. Integral stabilizers provide positive positioning of the diaphragm assembly.

- 4.Valve Cover and Links precision parts of engineered plastic materials reduce friction and are inert to chemicals and condensates commonly found in gas lines. Simple snap-on design with common left and right link reduces your parts inventory. This design reduces the job of valve replacement.
- 5.Index Drive Shaft molded "dog" locks to brass index shaft eliminating "slop" often encountered in proving.
 - 6.Gaskets are made of tough, resilient cork and neoprene composition and the linear amount of gasket is an absolute minimum due to "single-joint" design. This significantly reduces the chance of leakage.



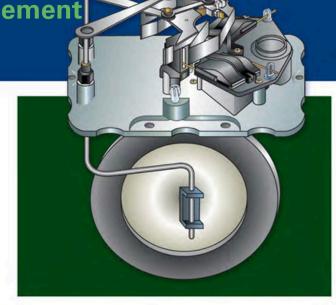
Module Replacement Program

Because of the "single joint" design of the Sensus residential meter, easy replacement of all internal working parts is possible. A new measuring module can be installed simply by removing and replacing sev- eral screws.

Listed below are the modules available for our current line of residential meters. They are available in standard or temperature compensated construction and can be inserted into existing bodies and covers and calibrated in your shop.

This program is important in your long-range planing. It means that the Sensus meters you purchase today can be updated to new condition years from now at about two-thirds of the cost of new meters.

Consider updating your meter population at a fraction of the cost of new meters. For your immediate planning, many of the modules listed below fit into older meters – those currently in your system that need attention now.



Base Module Part Numbers									
Meter Model	Non-Temperature Compensated	Temperature Compensated							
S-275, R-275, R-315	001-63-502-06	001-63-502-07							
MR-5, MR-8 MR-9	001-63-502-19	001-63-502-20							
#415	001-41-502-70	001-41-502-71							
MR-12	001-41-502-72	001-41-502-73							

The Meter Replacements

Sensus offers a complete line of residential meter replacements for the 5 Lt. and 10 Lt. tin meters, without any need for special connections or modifications to the meter set.



Temperature Compensation

All Sensus residential gas meters can be equipped with a bi-metallic element that will automatically correct for changes in gas temperature and convert line volumes to the common base temperature of 60°F.

The fundamental difference in a temperaturecompensated meter is the tangent. It features twin bi-metallic elements as the active or compensating members. The tangent is mounted in such a way that temperature variations, causing expansion or contraction of the bi-metallic element, alter the volume of gas displaced per revolution of the meter. This automatically causes the meter to speed up or slow down as required and does not affect valve timing.

The Sensus TC element ensures stable meter operation and accurate correction for gas temperature variations.

A temperature compensated meter can be outwardly identified by a difference in the manufacturer's badge



color along with a "TC" notation on both the badge and the meter index. Standard meters have blue badges. TC metes have red manufacturer's badges.

The typical temperature compensation performance

i

within an accuracy band of ±2% over a flowing gas temperature range of -20°F to 120°F.

Test Meters

Sensus Test Meters are applicable where minute quantities of gas must be measured with a high degree of accuracy. They are used in factories, showrooms, laboratories, and various testing departments. Some utilities use them to demonstrate to customers the amount of gas consumed by ranges, furnaces, clothes dryers, and other gas appliances.

One of the more popular uses of the test meter has been in the area of pollution control. The Environmental Protection Agency has set standards of performance for limiting gaseous and particulate emissions from factories. Federal, state and local pollution control authorities have discovered a need for dependable precision instruments to sample and evaluate pollutants. Sensus Test Meters are being used extensively in stack sampling and pollution monitoring devices.

Operation

All Sensus Test Meters are equipped with a special

 Test Meter Models Available

 Capacity- SCFH of 0.6

 Model
 specific gravity gas @ w.c. diff.

 S-275
 250

 R-275
 275

 R-315
 315

 #415
 415

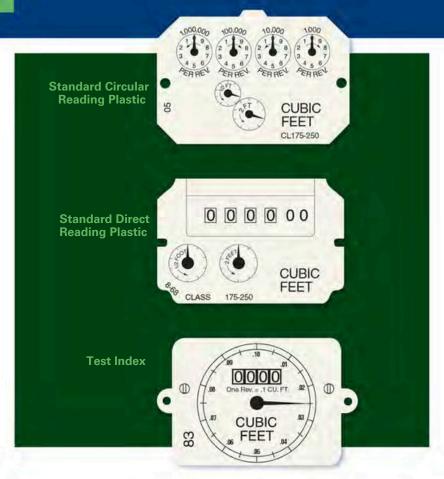
Note:

Capacity rating based on connections as per ANSI B-109.1.

test index. This test index has a sweep hand which can be compared to the sweep hand on a stopwatch.

Minute amounts of flow are precisely measured on the finely graduated sweep hand circle. Timing of the sweep hand accurately determines small flow rates.

Residential Gas Meter Indexes



	S-275,	R-275, R-315 /M	R8		#415/ MR12		
	Index	Numbe	er of Teeth	Index	Numbe	r of Teeth	
Туре	Assembly with Drive Gear Part Number	Index Drive Gear	Stuffing Box Gear	Assembly with Drive Gear Part Number	Index Drive Gear	Stuffing Box Gear	Dial
Plastic Circular Reading	001-63-538-05 001-63-538-10 001-63-538-11 001-63-538-15	11	11	001-41-538-05 001-41-538-10 001-41-538-11 001-41-538-15 001-41-538-25	18	18	4 Circle
Plastic Direct Reading	001-63-538-62 001-63-538-63 001-63-538-68 001-63-538-69 001-63-538-66 001-63-538-64	11 11 11 11 12 11 16	11 11 11 11 24 11	001-41-538-25 001-41-538-62 001-41-538-68 001-41-538-69 001-41-538-66 001-41-538-64	18 18 18 18 12 18 16	18 18 18 18 24 18	5 Whee 5 Whee 4 Whee 4 Whee 4 Whee 6 Wheel
High Resoluti on Index	001-63-537-97	12	24	001-63-537-97	12	24	4 Wheel
Test Indexes	001-63-537-83 001-63-538-93	16 12	20 30	001-41-537-83 001-41-538-93	13 22	20 10	4 Wheel

Rockseal "Tamper Obvious" Devices

Rockseal Index Box

The UV Stabilized Clear Polycarbonate Rockseal index box has molded recesses at the upper left and lower right corners into which molded plastic plugs are inserted to cover index box mounting screw heads.

Rockseal Index Box Kit

1 index box 2 Rockseal plugs 4 screws 001-63-656-50 with drains 001-63-656-51 without drains

Front View:

Part Number 001-63-006-05 with drains 001-63-006-06 without drains Sensus Clear Polycarbonate Index Box



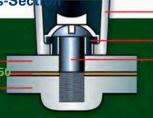
Rockseal plug 001-63-056-05 packaged either 100 or 1000 pieces per package

Rockseal Handhole Plate Device Cross-Sed

Handhole Plate 001-60-004-00

Handhole Plate Gasket 001-63-160-5

Meter Cover Casting



Rockseal Plug 001-63-056-05 Handhole Plate Seal Cup 001-63-057-02

Handhole Plate Seal Spacer 001-63-053-01 Handhole Plate Mounting Screw (#10-24 x 11/16") 950532

Rockseal Plug Kit

Plug, seal cup, seal spacer and mounting screw. Part number 001-63-656-00 Components packaged individually in lots of 100 pieces per package

Index	Assemblie	es				
				S-275, R-275/MF R-315	R8, #415/MR12	
Legend	First Reading Circle	Proving Hand	Description	Index A with D Part I	Туре	
Cubic Feet	1000	2' 1/2' 2' 2' 2'-1/2' 2'-1/2'	Standard-C.C.W Standard-C.C.W. T.C. – C.C.W. T.C. – C.C.W. 415 on Dial	001-63-538-05 001-63-583-10 001-63-538-11 001-63-538-15	001-41-538-05 001-41-538-10 001-41-538-11 001-41-538-15 001-41-538-25	Plastic Circular Reading
Cubic Feet Cubic Feet	10 10 Cubic Feet	2'-1/2' 2' 1/2' 100	Standard-C.C.W T.C. – C.C.W. 2'-1/2'	001-63-538-62 001-63-538-63 Standard-C.C.W.	001-41-538-25 001-41-538-62 001-63-538-68	001-41-538-6
Plastic Cubic Feet Cubic Feet Cubic Feet	100 100 100	2'-1/2' 1' 2'	T.C. – C.C.W. Standard Standard	001-63-538-69 001-63-538-66 001-63-538-70	001-41-538-69 001-41-538-66 001-41-538-70	Direct Reading
Cubic Meters	0.1m³	0.05m³	Fully Metric	001-63-538-64	001-41-538-64	
Cubic Feet	1	1'	High Resolution	001-63-537-97	001-63-537-97	High Resolution
Cubic Feet Cubic Meters	.1 .01m³	.1 .01m³	Test Fully Metric Meter Test	001-63-537-83 001-63-538-93	001-41-537-83 001-41-538-93	Index Test Indexes

Rockseal "Tamper Obvious" Devices

Liquefied Petroleum Gas Metering (LPG) The Sensus S-275 was designed especially for the LPG industry. The S-275 has been tested and proven for all services, and can particularly measure LP gases from bottle sets, bulk storage and distribution systems to the house.

Manufactured under the same exacting Quality Control requirements as Sensus' residential gas meters, the S-275 contains the same joint design and utilizes the same corrosion resistant materials that exhibit high lubricity for low differential operation. The major difference is the connections. The S-275 is available with 3/4" FPT connections. The "S" denotes side-connection.

Industrial Gas Measurement

Industry today is placing a tremendous amount of emphasis on fuel conservation and fuel allocation within its facilities. Plant accountants are making efforts to keep increasingly accurate records of fuel gas consumption as well as consumption of various Gas



(All Sensus residential meters described in this brochure can be used to measure liquefied petroleum gases.)

special process gases within their facilities. Sensus' complete line of single joint diaphragm meters provides industry with the specialized metering equipment they need to do the job and to do it accurately. Listed below are some of the special type service gases used by industry that Sensus meters are capable of handling. See your local Sensus representative or distributor for further information regarding in-plant metering and special gas services.

Air	A ₂ Argon	CO ₂ Carbon Dioxide*	C ₂ H ₆ Ethane [†]	H₂ <i>Hydrogen</i> [†]	CH ₄ Methane	Ne Neon	C ₃ H ₈ Propane
	C ₄ H ₁₀ Butane	CO Carbon Monoxide*	He ₂ Helium	Kr ₂ Krypton	N ₂ Nitrogen	C ₅ H ₁₂ Pentane	Xe ₂ Xenon

*Gas must be 100% dry.

Because of the low density of these gases, meters for this service may not be used in excess of 50% of their pressure rating

Metric Meters For bell provers calibrated with metric scales, meters must be equipped with a metric output (50 liters). It is also necessary that the meters have some number of full revolutions of the tangent assembly for that given metric output. Listed are current meter modules along with their metric counter parts with metric outputs.

For further information about Sensus metric meters, consult your local Sensus representative.

Cubic Foot Models	Metric Model	Capacity m3/hr.
S-275	MR-5	7
R-275	MR-8	8
R-315	MR-9	9
#415	MR-12	12

Std. Meters3/Hr. x 35.31 = Std. Ft.3/Hr. (SCFH)
Std. Ft.3/Hr.(SCFH) x 0.0283 = Std. Meters3/Hr.
Kilograms/centimeter2(Kg/cm2) x 14.22 = psi
psi x 0.0703 = Kilograms/centimeter2 (Kg/cm2)
Kilo Pascals (Kpa) x 0.145 = psi
psi x 6.90 = Kilo Pascals (Kpa)

Bars x 14.50 = psi psi x .0689 = Bars millimeters water (mm H2O) x 0.039 = in. w.c. in. w.c. x 25.4 = millimeters water (mm H2O) millimeters mercury (mm Hg) x 1.868 = in. w.c. in. w.c. x 0.535 = millimeters mercury (mm Hg)



Meter Connections Sensus offers a complete line of meter connections for meter installations. Listed below are some of the more common swivel nut and swivel washer sizes available. Common swivels in standard and insulated varieties can be found of page 12. Black iron or galvanized connections are available. For sizes other than those listed, contact your local Sensus representative.

		Swivel	Nuts
Ferrule Size	Swivel Washers Part Number	Galvanized Part Number	Black Iron Part Number
1-1/4"	001-61-153-02	001-61-165-07	001-41-165-07
10 Lt. 20 Lt. 30 Lt. 45 Lt. 1A Spg. 2 Spg. 3 Spg.	003-51-131-04 001-61-154-02 001-61-155-03 001-62-156-02 001-61-153-02 001-62-156-03 011-14-131-01	003-51-130-00 001-61-166-00 001-61-167-07 001-62-168-00 001-61-165-16 001-41-130-00 001-64-167-02	003-51-230-00 001-41-166-00 001-41-167-07 001-41-168-00 001-41-165-16 001-41-230-00 001-64-168-02

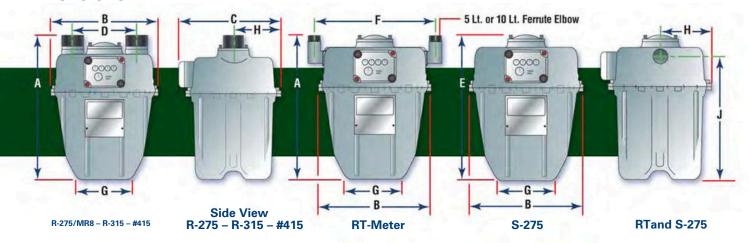


Sı	wivels								
Meter Ferrule Size	Straight or Offset	Galvanized Part Number	Black Iron Part Number	Pipe Size	Amount of Offset	Height	Insulting Yes/No*	Galvanized Swivel Set Part Number	Black Iron Swivel Set Part Number
1-1/4	s	001-61-165-08	001-41-165-08	1"		2-7/32"	No	001-61-365-08	001-41-365-08
	0	001-61-165-27		1/2"	2-3/4"	3-5/16"	No	001-61-365-27	
	s	001-61-165-58		1"		2-7/32"	Yes	001-61-365-58	
	0	001-61-165-26	001-41-165-26	3/4"	1"	2-11/16"	No	001-61-365-26	001-41-365-26
	s	001-61-165-02		3/4"		2-3/8"	No	001-61-365-02	
	s	001-61-165-52		3/4"		2-3/8"	Yes	001-61-365-52	
	0	001-61-165-55		3/4"	2-11/16"	2-15/16"	Yes	001-61-365-55	
	0	001-61-165-05		3/4"	2-11/16"	2-15/16"	No	001-61-365-05	
10 Lt.	S	003-51-134-00		3/4"		2-5/16"	No	003-51-334-00	
	s	003-51-134-50		3/4"		2-5/16"	Yes	003-51-334-50	222 54 422 54
	0		003-51-236-50	3/4"	1"	3-1/4"	Yes		003-51-436-50
20 Lt.	s	001-61-165-11	001-41-165-11	1"		2-3/4"	No	001-61-365-11	001-41-365-1
	s	001-61-166-15		3/4"		2-3/8"	No	001-61-366-15	
	0	001-62-168-11		3/4"	3-3/16"	3-13/16"	No	001-62-368-11	
	0	001-61-166-13		1/2"	2-11/16"	3-7/16"	No	001-61-366-13	
	s	001-61-165-61	001-41-165-61	1"		2-3/4"	Yes	001-61-365-61	001-41-365-61
	s	001-61-166-65		3/4"		2-3/8"	Yes	001-61-366-65	001-41-565-61
	s	001-61-165-61	001-41-165-61	1"		2-3/4"	Yes	001-61-565-61	001-41-303-01
	s	001-61-166-15		3/4"		2-3/8"	No	001-61-566-15	
	0	001-61-166-63		1/2"	2-11/16"	3-7/16"	Yes	001-61-366-63	
	s	001-61-165-61		1"		2-3/4"	Yes	001-61-665-61	
30 Lt.	s	001-61-167-02	001-41-167-02	1-1/4"		2-7/8"	No	001-61-367-02	001-41-367-0
	s	001-61-167-52	001-41-167-52	1-1/4"		2-7/8"	Yes	001-61-367-52	001-42-367-5
	s	001-61-165-62	001-41-165-62 001-41-165-12	1"		2-27/32"	Yes	001-61-365-62	00-141-365-6
	s	001-61-165-12	001-41-165-62	1"		2-27/32"	No	001-61-365-12	001-41-365-1
	s	001-61-165-62	001-41-167-52	1"		2-27/32"	Yes	001-61-565-62	001-41-565-6
	s	001-61-167-52		1-1/4"		2-7/8"	Yes	001-61-467-52	001-41-567-5
45 Lt.	s	001-62-168-02	001-41-168-02	1-1/4"		3-7/8"	No	001-62-368-02	001-41-368-0
	s	001-62-168-52	001-41-168-52	1-1/4"		3-7/8"	Yes	001-62-368-52	001-41-368-5
	s	001-62-168-04	001-41-168-04	1-1/2"		3"	No	001-62-368-04	001-41-368-0
	s	001-61-168-54	001-41-168-54	1-1/2"		3"	Yes	001-62-368-54	001-41-368-5
	s	001-62-168-52		1-1/4"		3-7/8"	Yes	001-62-468-52	
	s	001-62-168-54		1-1/4"		3"	Yes	001-62-468-54	
#2 Spg.	s	001-62-168-21	001-41-168-21	1-1/4"		3-1/8"	No	001-62-368-21	001-41-368-2
#3 Spg.	s	001-14-134-04		1-1/2"		3-1/16"	No	011-14-334-04	

 $^{{\}it *The minimum insulation break down voltage for insulating swivels (Assembled Joint) is 2500 \ volts.}$

Residential Meters

Dimensions



Meter Model	A*	В	C	D	Е	F	G	Н	J
S-275		10-1/8"	8-1/2"		13-1/4"		5-1/4"	3-15/16"	11-1/16"
R-275*	13-23/64"	10-1/8"	8-1/2"	6"			5-1/4"	3-15/16"	
R-315*	13-23/64"	10-1/8"	8-1/2"	7'			5-1/4"	3-15/16"	
#415*	14-37/64"	11-1/8"	9-3/8"	7" or 8-1/4"			6"	3-15/16"	
RT-230	13-5/8"	10-1/8"	8-1/2"			11-1/4"	5-1/4"	3-15/16"	11-1/16"
RT-275	13-5/8"	10-1/8"	8-1/2"			11-1/4"	5-1/4"	3-15/16"	11-1/16"

^{*}The"A" dimension assumes 20Lt. connections. This may vary slightly for other connections.

Specifications

Meter Model	Natural Gas	Butane	Propane	Air	Max W.P. PSI	Approxi. Shipping Wt. Lbs.	No. of Rev. per Ft3	Stuffing Box Shaft Ft 3/Rev	
R-275	275	150	175	215	5-10	14	8	2	10, 20, 30 Lt., 1-1/4", 1A Spg, #2 Spg.
R-315	315	170	200	245	5-10	14	8	2	20, 30, 45 Lt. 1-1/4", 1A Spg, #2 Spg.
#415	415	225	260	320	10-25	21	6.5	2	20, 30, 45 Lt, 1-1/4", 1A Spg, #2 Spg, #3 Spg.
S-275	250	150	175	195	5-10	14	8	2	3/4" NPT
RT-230	210				5	14	8	2	5 Lt.
RT-275	250				5	14	8	2	10 Lt.

Authorized Distributor



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Selección del medidor







Specific Gravity	0.6		MR-8						MR-12		
		Capacity		/laximum		/laximum	Capacity	Capacity I	/laximum	Capacity I	
		Nm3h	Nm3h	Dial Rate	Nm3h	Dial Rate	Nm3h	Nm3h	Dial Rate	Nm3h 2" wc diff*	Dial Rate
	Capacity Pressure	½"wcdiff 0.6SG	1"wcdiff* 0.6SG	(am3h) @ 1" wc	2"wcdiff* 0.6SG	(am3h) @ 2" wc	½"wcdiff 0.6SG	1"wcdiff* 0.6SG	(am3h) @ 1" wc	0.6 SG	(am3h) @ 2" wc
Line Pressure	Multiplier	Gas	Gas	diff	Gas	diff	Gas	Gas	diff	Gas	diff
7" wc (.25 psig)	1.000	8	12	12	17	17	12	18	18	25	25
8" wc	1.001	8	12	12	17	17	12	18	18	26	25
9" wc	1.002 1.004	8	12	12	17	17	12	18	18	26	25
10" wc	1.005	8	12	12	17	17	12	18	17	26	25
11" wc	1.006 1.007	8	12	12	17	17	12	18	17	26	25
12" wc 13" wc	1.008	8 8	12 12	12 12	17 17	17 17	12 12	18 18	17	26	25
14" wc (.5 psig)	1.010 1.011	8	12	12	17	17	12	18	17	26	25
15" wc (.5 psig)	1.012	8	12	12	17	17	12	18	17	26	25
16" wc	1.013 1.014	8	12	11	17	17	12	18	17	26 26	25 25
17" wc	1.016	8	12	11	17	17	12	18	17 17	26 26	25 25
18" wc	1.017	8	12	11	17	17	12	18	17	26	25 25
19" wc	1.018 1.019	8	12	11	17	17	12	18	17	26	25 25
20" wc	1.020 1.022	8	12	11	17	17	12	18	17	26	25
21" wc (.75 psig)	1.022	8	12	11	17	17	12	18	17	26	25
22" wc	1.024	8	12	11	17	17	12	18	17	26	25
23" wc 24" wc	1.025 1.033	8 8	12 12	11 11	17 17	17 17	12 12	18 18	17	26	25
25" wc	1.042	8	12	11	17	17	12	18	17	26	25
26" wc	1.050 1.058	8	12	11	17	17	12	18	17	26	25
27" wc	1.066	8	12	11	17	17	12	18	17	26	25
28" wc (1 psig)	1.074 1.082	8	12	11	17	17	12	18	17	26	25
1.25 psig	1.089	8	12	11	18	16	12	18	17	26	25
1.5 psig	1.097 1.105	8	12	11	18	16	12	18	17	26	25
1.75 psig	1.112	8	12	11	18	16	12	18	17	27	24
2 psig	1.120 1.128	8	12	11	18	16	12	19	17 17	27 27	24 24
2.25 psig	1.126	8	12	11	18	16	13	19	16	27	24
2.5 psig	1.143	8	12	11	18	16	13	19	16	27	24
2.75 psig	1.150 1.179	8 8	13 13	11 11	18 19	16 16	13 13	19 19	16	28	24
3 psig 3.25 psig	1.208	9	13	11	19	15	13	19	16	28	23
3.5 psig	1.235 1.263	9	13	11	19	15	13	19	16	28	23
3.75 psig	1.289	9	13	10	19	15	13	20	16	28	23
4 psig	1.315 1.341	9	13	10	19	15	13	20	16	28	23
4.25 psig	1.366	9	13	10	19	15	13	20	16	29	23
4.5 psig	1.390 1.415	9	13	10	19	15	13	20	16	29	23
4.75 psig	1.530	9	13	10	19	15	13	20	15	29	22
5 psig	1.637	9	13	10	20	15	14	20	15	29	22
6 psig		9	14	10	20	14	14	21	15 15	29	22
7 psig		9	14	10	21	14	14	21	15 15	30 31	22 21
8 psig		10	14	9	21	14	15	22	15	31	21
9 psig		10	15 45	9	21	13	15	22	14	32	20
10 psig		10	15	9	22	13	15 15	23	14	33	20
11 psig							15 16	23 24	13	34	19
12 psig 13 psig							16	24 24	13	34	19
14 psig							16	24	13	35	19
15 psig							17	25	13	35	18
20 psig							18	27	12	36	18
25 psig							19	29	11	39	17
									11	42	16