Model 121 Regulator Brochure

UTILITY SOLUTIONS GROUP

Introduction

Who We Are

Utility Solutions Group is a manufacturer of natural gas regulators and relief valves based in Columbus, OH. All products are made in the USA and compliant with the requirements of the Build America, Buy America Act. Utility Solutions Group's Quality Management System is certified to ISO 9001 by Smithers Quality Assessments.

For Commercial, Industrial Combustion, and Distribution Applications

The Model 121 offers a new dimension in spring regulator capability. These offerings allow for increased dependability, simplicity, and economy.

New technology paired with contemporary design provides greater capacity, higher inlet pressure, more accurate performance, faster responses, and space-saving economy; in most cases, a smaller regulator will do the job.

Model 121 Regulators may be used for commercial and industrial applications, such as: burners, boilers, furnaces, air heaters, kilns, and gas engines.

These offer the versatility to be utilized as both large capacity supply regulators on commercial and industrial service lines, or as a small district regulator.

They offer excellent performance as either a primary control or for monitoring — use it for either or both.

Model 121 Regulators can be used with natural gas, propane, LPG, air nitrogen, etc. Special materials are available for certain corrosive gases.

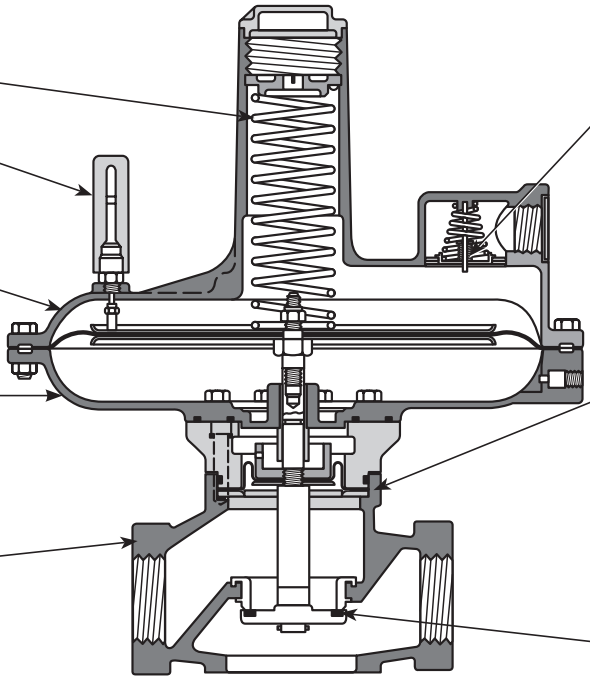
The **Model 121** is ready to get to work for you. Simply contact your Utility Solutions Group Representative or Authorized Industrial Distributor.

Pressure Ranges and Springs

Size	Outlet Pressure Range	Spring Color	Spring Part Number	Maximum Inlet Pressure	Nominal Diaphragm Size
¾", 1", and 1 ¼" ** Model 121-8	1 ½" to 3 ½" w.c.	Blue-Black Black-Red	143-82-021-01 (Main spring) 121-10-021-50 (Counterspring)	60 psi	8"
	1 ½" to 12" w.c.	Green-Black Black-Red	143-82-021-02 (Main spring) 121-10-021-50 (Counterspring)		
	3 ½" to 6 ½" w.c.	Red-Black	143-82-021-00		
	5" to 8 ½" w.c.	Blue-Black	143-82-021-01		
	6" to 14" w.c.	Green-Black	143-82-021-02		
	12" to 28" w.c.	Green (2" O.D.)	143-16-021-05		
	1 to 2 psi	Orange (2" O.D.)	143-16-021-06		
	2 to 4 ¼ psi	Black	143-16-021-07		
¾", 1", and 1 ¼" ** Model 121-8HP	3 to 6 ½ psi	Cadmium*	143-16-021-08	60 psi	8"
	6 to 10 psi	Cadmium* White	143-16-021-08 (Outer) 143-16-021-13 (Inner)		
1 ½", 2", and 2 ½" Model 121-12	1 ½" to 3 ½" w.c.	Red —	143-16-021-03 (Main spring) 120-10-021-10 (Counterspring)	60 psi	12"
	1 ½" to 12" w.c.	Maroon —	121-42-021-00 (Main spring) 120-10-021-10 (Counterspring)		
	3 ½" to 6 ½" w.c.	Red (2" O.D.)	143-16-021-03		
	5" to 8 ½" w.c.	Blue (2" O.D.)	143-16-021-04		
	6" to 14" w.c.	Green (2" O.D.)	143-16-021-05		
	12" to 28" w.c.	Orange (2" O.D.)	143-16-021-06		
	1 to 2 psi	Black	143-16-021-07		
	1 ½ to 3 psi	Cadmium	143-16-021-08		
1 ½", 2", and 2 ½" Model 121-8	3 to 6 ½ psi	Cadmium*	143-16-021-08	60 psi	8"
	6 to 10 psi	Cadmium* White	143-16-021-08 (Outer) 143-16-021-13 (Inner)		
3" Model 121-16	3 ½" to 6 ½" w.c.	Red (3" O.D.)	121-62-021-50	40	16"
	5" to 8 ½" w.c.	Blue (3" O.D.)	121-62-021-51		
	6" to 14" w.c.	Green (3" O.D.)	121-62-021-52		
	14" to 28" w.c.	Orange (3" O.D.)	121-62-021-53		
	½ to 1 ¼ psi	Yellow	121-62-021-56		
3" Model 121-12	1 to 2 psi	Black	143-16-021-07	40	12"
	1 ½ to 3 psi	Cadmium	143-16-021-08		

* Require High-Pressure Spring Adjustment. ** ¾" × ¾" not available.

1 ½", 2", and 2 ½" Model 121-12 Regulator



COLOR CODED SPRINGS

OPTIONAL TRAVEL INDICATOR

DIE CAST ALUMINUM ALLOY DIAPHRAGM CASE
- High-Strength
- Lightweight
- Corrosion-Resistant

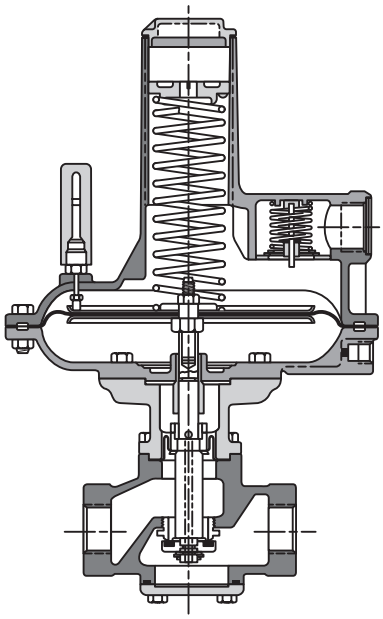
CAST IRON BODY
(ASTM A126-71 Class B)

DOUBLE-ACTING VENT DAMPER
- Ensures fast response plus stable operation

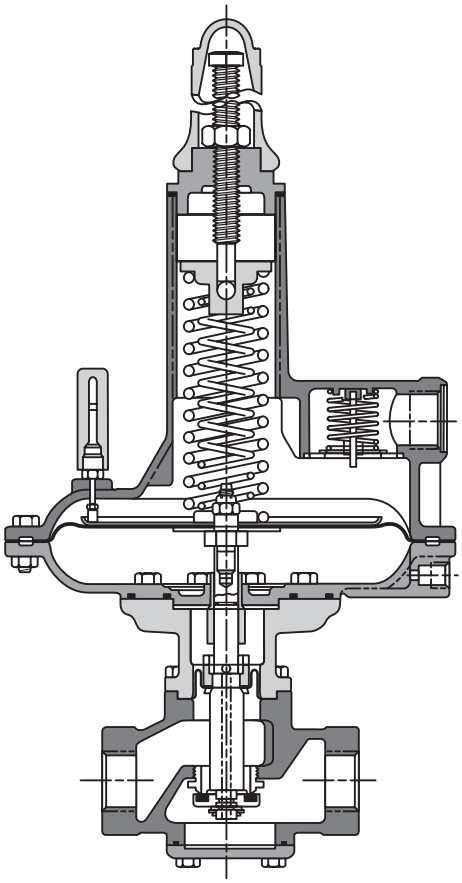
VALVE IS BALANCED BY A ROLL-TYPE DIAPHRAGM
- Eliminates valve adjustments
- Maintains accurate regulation to high-inlet pressures

V-PORT VALVE OPTION
- Increases turndown for regulation at lower flows

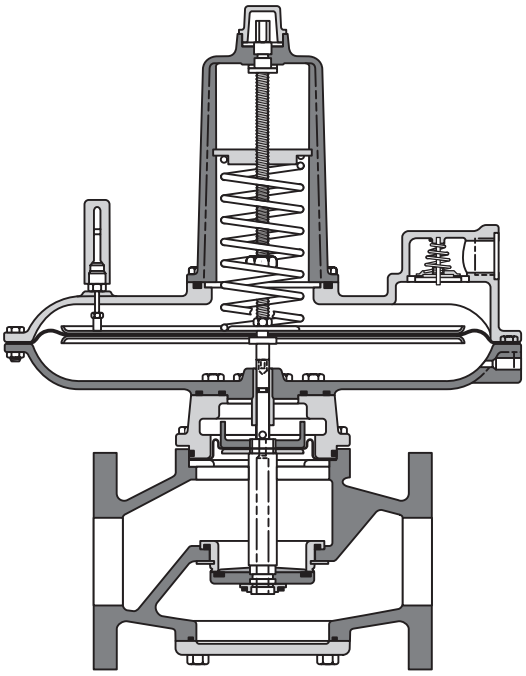
REMOVABLE ORIFICE
- Precision knife-edge plus molded soft seats ensure positive tight shutoff



¾", 1", AND 1 ¼"
MODEL 121-8



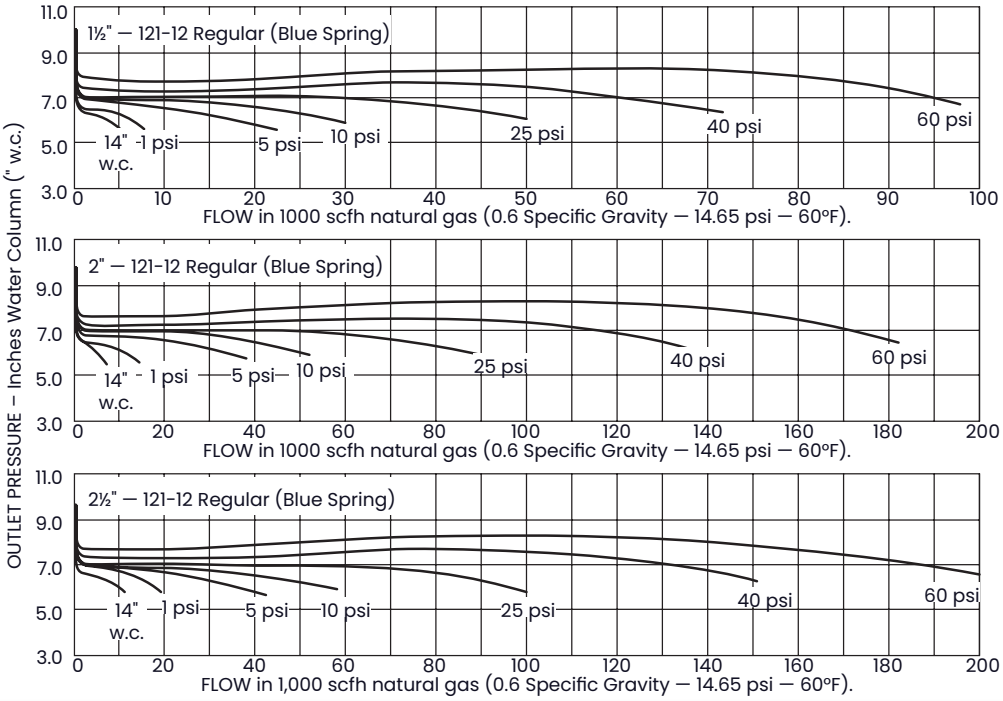
HIGH-PRESSURE SPRING ADJUSTMENT FOR 3 PSI TO 10 PSI OUTLET PRESSURE
MODEL 121-8HP



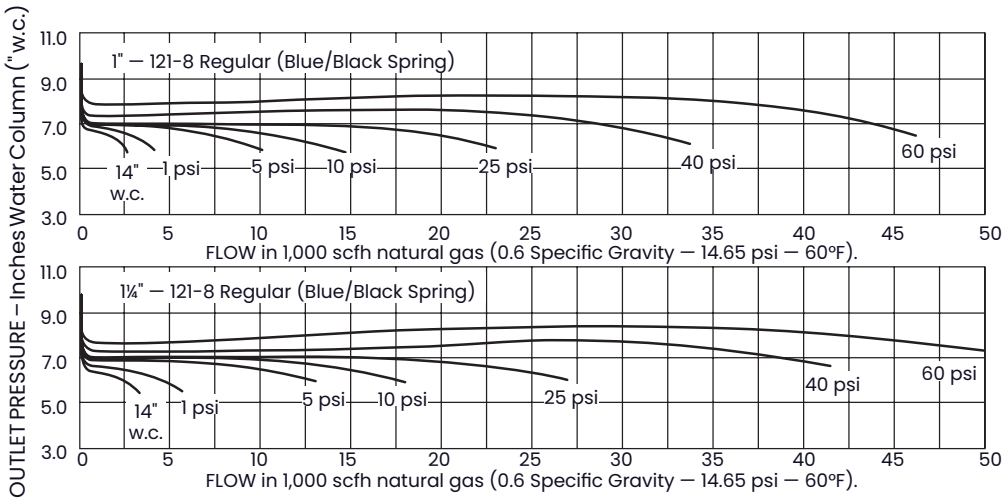
3"
MODEL 121-16

Typical Performance Curves

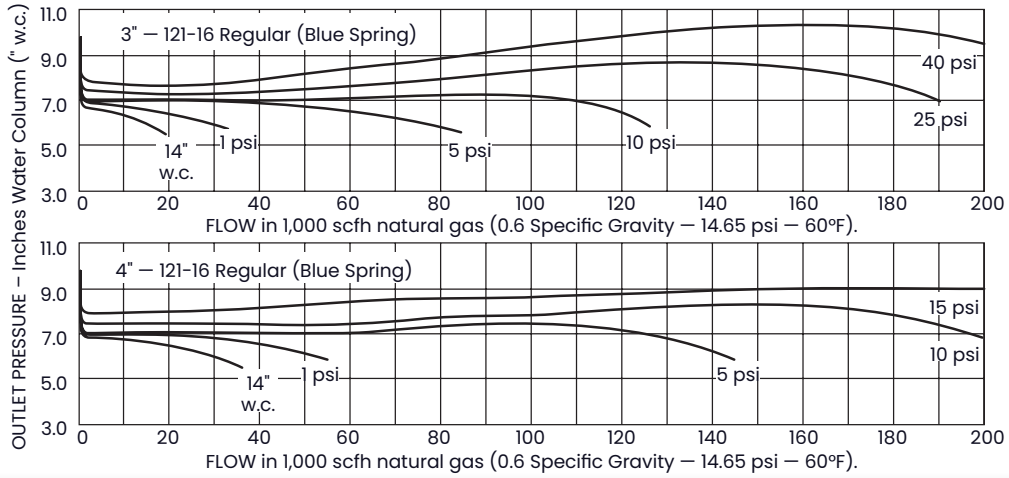
Model 121-12



Model 121-8



Model 121-16



1 ½", 2", and 2 ½" Model 121-12 Capacity in SCHF of Natural Gas

(0.6 Specific Gravity – 14.65 psi – 60°F)

An outstanding feature of the 121 is its large capacity. It has so much that at higher inlet pressures it is necessary to increase the size of the outlet piping.

Pipe size increases are indicated by the asterisks in the capacity tables below, as well as on pages 4, 5, 6, and 7. The following note explains how to read this data from the tables:

NOTE: Capacity figures immediately above the heavy horizontal lines are the maximum capacity for the outlet pipe size shown. Increasing the inlet pressures will not increase the capacity without also increasing the outlet pipe size as indicated.

For example: a 1 ½" Model 121-12 at 5" w.c. set-point has the following maximum capacities:

1. With 1 ½" size outlet piping..... 14,600 SCFH at 3 psi to 60 psi inlet pressure.
2. With 2" size outlet piping..... 37,000 SCFH at 15 psi to 60 psi inlet pressure.
3. With 3" size outlet piping..... 95,000 SCFH at 60 psi inlet pressure.

Designated increase in outlet pipe size must be made immediately downstream of the regulator outlet.

This **NOTE** applies to the asterisks in all capacity tables on pages 4, 5, 6, and 7.

NOTE: Capacities with V-port valves are approximately 80% of the published data.

Outlet Pressure

Pipe Size	Inlet Pressure	Set-Point 5" w.c. Red Spring 1" w.c. Droop	Set-Point 7" w.c. Blue Spring 1" w.c. Droop	Set-Point 11" w.c. Green Spring 2" w.c. Droop	Set-Point 18" w.c. Orange Spring 2" w.c. Droop	Set-Point 28" w.c. Orange Spring 3" w.c. Droop	Set-Point 2 psi Black Spring ¼ psi. Droop	Set-Point 3 psi Cadmium ½ psi. Droop	Regulator Size and Model
1 ½" *	8" w.c.	4,000	3,000	—	—	—	—	—	1 ½" Model 121-12
	14" w.c.	4,900	4,500	3,700	—	—	—	—	
	1 psi	7,400	7,000	6,500	6,000	—	—	—	
	2 psi	11,500	11,000	10,300	9,500	10,000	—	—	
	3 psi	14,600	14,500	13,750	12,500	13,000	10,000	—	
2" *	5 psi	19,500	19,400	18,500	17,300	18,000	16,400	14,000	
	10 psi	30,000	30,000	28,000	27,000	27,500	25,100	25,500	
	15 psi	37,000	37,000	36,200	35,000	35,700	34,000	31,500	
3" *	25 psi	50,000	50,000	49,000	47,400	48,000	46,000	45,500	
	40 psi	68,000	68,000	67,100	66,000	66,600	64,200	63,500	
	50 psi	80,000	80,000	79,000	77,700	78,000	74,900	76,000	
	60 psi	95,000	95,000	93,500	90,000	92,000	87,000	86,500	
2" *	8" w.c.	5,000	4,000	—	—	—	—	—	2" Model 121-12
	14" w.c.	8,900	8,000	6,600	—	—	—	—	
	1 psi	13,000	12,500	12,000	11,000	—	—	—	
	2 psi	20,500	20,000	19,400	17,500	18,000	—	—	
	3 psi	26,300	26,000	25,000	23,400	23,800	19,000	—	
	5 psi	35,000	35,000	34,500	33,500	34,000	30,000	27,500	
3" *	10 psi	52,000	52,000	51,000	49,600	50,000	49,000	46,500	
	15 psi	68,000	68,000	67,500	65,500	66,000	64,700	61,500	
	25 psi	90,000	90,000	89,000	88,000	88,500	84,500	87,000	
4" *	40 psi	125,000	125,000	124,000	120,000	121,500	118,000	116,500	
	50 psi	150,000	150,000	148,000	145,000	146,500	143,300	139,500	
	60 psi	175,000	175,000	174,000	171,200	172,000	170,000	165,500	
2 ½" *	8" w.c.	5,500	4,500	—	—	—	—	—	2 ½" Model 121-12
	14" w.c.	9,700	9,000	7,300	—	—	—	—	
	1 psi	14,400	14,000	13,000	12,000	—	—	—	
	2 psi	22,200	22,000	21,000	19,100	20,000	—	—	
	3 psi	29,100	29,000	27,900	26,000	27,100	21,500	—	
	5 psi	39,500	39,500	38,700	37,000	37,600	33,500	27,500	
3" *	10 psi	58,000	58,000	57,000	54,800	55,500	53,000	52,000	
	15 psi	75,500	75,500	74,000	71,900	72,300	70,100	66,500	
	25 psi	100,000	100,000	99,000	97,100	98,000	94,000	94,000	
4" *	40 psi	140,000	140,000	138,000	133,500	135,000	130,000	129,500	
	50 psi	166,000	166,000	164,000	156,000	158,000	155,000	153,500	
	60 psi	195,000	195,000	193,000	189,700	191,000	188,000	179,000	

* See NOTE in upper part of page 4.

NOTE: The above performance data is based on normal testing at 70°F flowing temperature. Changes in performance can occur at extreme low-flowing temperatures.

1 ½", 2", and 2 ½" Models 121-8 and 121-8HP Capacity in SCHF of Natural Gas

(0.6 Specific Gravity – 14.65 psi – 60°F)

Regulator Size and Model	Outlet Pressure		Pipe Size	Inlet Pressure	Outlet Pressure		Regulator Size and Model
	Set-Point 3 psi	Set-Point 2 psi			Set-Point 5 psi	Set-Point 10 psi	
	Black Spring ½ psi Droop	Orange Spring ¼ psi Droop			Cadmium Spring ½ psi Droop	Cadmium & White Spring 1 psi Droop	
1 ½" Model 121-8	—	8,500	1 ½" *	3 psi	—	—	1 ½" Model 121-8HP†
	11,000	13,000		5 psi	—	—	
	20,000	21,000		10 psi	16,500	—	
	26,000	27,000		15 psi	24,500	22,000	
	35,100	36,000		25 psi	33,000	30,000	
	47,000	50,000		40 psi	44,500	42,700	
	63,500	66,000	2" *	50 psi	62,000	60,500	
	70,000	71,500		60 psi	68,000	66,500	
2" Model 121-8	—	15,000	2" *	3 psi	—	—	2" Model 121-8HP†
	20,000	24,000		5 psi	—	—	
	37,000	39,000		10 psi	30,000	—	
	48,000	50,000		15 psi	45,000	40,000	
	64,000	65,000		25 psi	60,000	55,000	
	85,000	90,000		40 psi	80,000	76,000	
	116,000	120,000	3" *	50 psi	114,000	110,000	
	127,000	130,000		60 psi	123,000	121,000	
2 ½" Model 121-8	—	16,700	2 ½" *	3 psi	—	—	2 ½" Model 121-HP†
	22,000	26,700		5 psi	—	—	
	41,000	43,500		10 psi	33,500	—	
	53,500	55,000		15 psi	50,000	44,500	
	71,000	72,000		25 psi	66,500	61,000	
	94,500	100,000		40 psi	89,000	85,000	
	129,000	133,000	3" *	50 psi	127,000	122,000	
	140,000	144,000		60 psi	135,000	130,000	

* See NOTE in upper part of page 4.

† These Regulators use the High-Pressure Spring Adjustment.

NOTE: Capacities with V-port valves are approximately 80% of the published data.

NOTE: The above performance data is based on normal testing at 70°F flowing temperature. Changes in performance can occur at extreme low-flowing temperatures.

¾", 1" and 1¼" Models 121-8 and 121-8HP
Capacity in SCHF of Natural Gas

(0.6 Specific Gravity – 14.65 psi – 60°F)

Pipe Size	Inlet Pressure	Outlet Pressure							Regulator Size and Model
		Set-Point 5" w.c.	Set-Point 7" w.c.	Set-Point 11" w.c.	Set-Point 18" w.c.	Set-Point 28" w.c.	Set-Point 2 psi	Set-Point 2 psi	
		Red/Black 1" w.c. Droop	Blue/Black Spring 1" w.c. Droop	Green/Black Spring 2" w.c. Droop	Green Spring 2" w.c. Droop	Green Spring 3" w.c. Droop	Orange Spring ¼ psi Droop	Black Spring ½ psi. Droop ½ psi droop	
1" *	8" w.c.	1,500	1,000	—	—	—	—	—	¾" x 1" 1" x 1" Model 121-8
	14" w.c.	2,500	2,300	2,000	—	—	—	—	
	1 psi	4,200	4,000	3,600	2,500	—	—	—	
	2 psi	6,100	6,000	5,500	5,000	5,200	—	—	
	3 psi	7,700	7,500	7,400	7,200	7,300	6,000	—	
2" *	5 psi	11,200	10,000	9,900	9,700	9,800	9,000	7,500	
	10 psi	14,500	14,000	13,700	13,000	13,500	12,200	11,500	
	15 psi	17,300	17,000	16,500	15,800	16,000	15,000	14,300	
	25 psi	23,200	23,000	22,700	22,000	22,500	21,400	20,000	
	40 psi	32,000	32,000	31,200	30,000	31,000	30,100	29,500	
3" *	50 psi	38,000	38,000	37,700	37,000	38,000	35,500	34,500	
	60 psi	44,000	44,000	43,300	42,500	43,000	42,000	40,000	
1 ¼" *	8" w.c.	2,000	1,500	—	—	—	—	—	¾" x 1 ¼" 1" x 1 ¼" 1 ¼" x 1 ¼" Model 121-8
	14" w.c.	3,500	3,000	2,200	—	—	—	—	
	1 psi	5,500	5,000	4,500	4,000	—	—	—	
	2 psi	7,800	7,500	7,000	6,000	6,200	—	—	
	3 psi	9,700	9,500	9,000	8,000	8,400	7,200	—	
	5 psi	12,700	12,500	11,200	10,400	10,800	9,700	8,300	
2" *	10 psi	18,000	17,850	17,000	16,000	16,300	15,400	15,000	
	15 psi	22,500	22,000	21,700	20,500	21,000	18,900	18,000	
	25 psi	27,100	27,000	26,200	25,400	25,900	24,900	24,000	
3" *	40 psi	41,000	41,000	40,000	39,000	39,600	38,400	38,000	
	50 psi	48,000	48,000	45,000	43,600	44,000	42,000	40,800	
	60 psi	56,000	56,000	55,000	53,000	53,800	52,100	51,600	

Regulator Size and Model	Outlet Pressure		Pipe Size	Inlet Pressure	Pipe Size	Outlet Pressure		Regulator Size and Model
	Set-Point 10 psi	Set-Point 5 psi				Set-Point 5 psi	Set-Point 10 psi	
	Cadmium & White Spring 1 psi Droop	Cadmium Spring ½ psi Droop				Cadmium Spring ½ psi Droop	Cadmium & White Spring 1 psi Droop	
¾" x 1" 1" x 1" Model 121-8HP†	—	11,000	1" *	10 psi	1 ¼" *	14,200	—	¾" x 1 ¼" 1" x 1 ¼" 1 ¼" x 1 ¼" Model 121-8HP†
	10,000	14,000		15 psi		17,300	14,000	
	17,000	19,200		25 psi		23,100	20,000	
	24,000	28,000		40 psi		37,200	34,000	
	30,000	34,000		50 psi	2" *	39,800	37,000	
	35,000	38,500	2" *	60 psi		50,000	45,000	

* See NOTE in upper part of page 4.

† These Regulators use the High-Pressure Spring Adjustment.

NOTE: Capacities with V-port valves are approximately 80% of the published data.

NOTE: The above performance data is based on normal testing at 70°F flowing temperature. Changes in performance can occur at extreme low-flowing temperatures.

3" Models 121-16 and 121-12
Capacity in SCHF of Natural Gas

(0.6 Specific Gravity – 14.65 psi – 60°F)

Pipe Size	Inlet Pressure	Set-Point 5" w.c. Red Spring 1" w.c. Droop	Set-Point 7" w.c. Blue Spring 1" w.c. Droop	Set-Point 11" w.c. Green Spring 2" w.c. Droop	Set-Point 18" w.c. Orange Spring 2" w.c. Droop	Set-Point 28" w.c. Orange Spring 3" w.c. Droop	Regulator Size and Model
3" *	8" w.c.	10,000	9,700	—	—	—	3" Model 121-16
	14" w.c.	19,500	19,000	18,000	—	—	
	1 psi	31,000	30,800	29,000	27,000	—	
	2 psi	47,000	46,000	46,000	34,000	35,000	
	3 psi	60,000	59,000	58,000	53,000	55,000	
	5 psi	80,000	80,000	78,000	74,000	75,000	
4" *	10 psi	12,500	125,000	120,000	120,000	125,000	
	15 psi	14,500	145,000	145,000	138,500	140,000	
6" *	25 psi	190,000	190,000	190,000	185,000	190,000	
	40 psi	260,000	260,000	260,000	260,000	260,000	

See **NOTE** in upper part of page 4.

Regulator Size and Model	Outlet Pressure Set-Point 3 psi Cadmium Spring ½ psi Droop	Set-Point 2 psi Black Spring ¼ psi Droop	Set-Point 1 psi Black Spring ¼ psi Droop	Inlet Pressure
3" Model 121-12	—	—	35,000	2 psi
	—	40,000	53,000	3 psi
	55,000	65,000	74,000	5 psi
	90,000	100,000	110,000	10 psi
	125,000	135,000	139,000	15 psi
	175,000	183,000	185,000	25 psi
	200,000	20,000	100,000†	40 psi

† 100,000 is the capacity at a boost of 3" w.c. instead of the 5" w.c. droop indicated.

NOTE: The above performance data is based on normal testing at 70°F flowing temperature. Changes in performance can occur at extreme low-flowing temperatures.

NOTE: Capacities with V-port valves are approximately 80% of the published data.

Maximum Emergency Pressures

NOTE: Before using any of the following data, make sure this entire section is clearly understood.

Maximum pressures the regulator inlet may be subjected to under abnormal conditions, without causing damage to the regulator are:

¾" through 2 ½" Pipe Sizes ..... 70 psi
3" Pipe Size ..... 50 psi

i

Maximum pressures the regulator outlet may be subjected to, without causing damage to the internal parts of the regulator are:

121-8 ..... Set-point + 5 psi
121-8HP ..... Set-point + 10 psi
121-12 ..... Set-point + 5 psi
121-16 ..... Set-point + 2 psi

NOTE: Set-point is defined as the outlet pressure a regulator is adjusted to deliver. If any of the above pressure limits are exceeded, the regulator must be taken out of service and inspected. Damaged parts must be repaired or replaced.

Maximum pressures that can be safely contained by the diaphragm case are:

121-8 ..... 25 psi
121-8HP ..... 25 psi
121-12 ..... 20 psi
121-16 ..... 10 psi

NOTE: "Safely contained" is defined as; no leakage, as well as no bursting.

Over-Pressurization Protection

Protects the downstream piping system, as well asthe regulator's low-pressure chambers against over-pressurization. This generally occurs due to potential regulator malfunction, or failure to achieve complete lockup. The allowable outlet pressure is defined as the lowest of the maximum pressures permitted by federal and state codes, Utility Solutions Group document USG-IG-038, or other applicable standards. Method of protection may be a relief valve, monitor regulator, shutoff device, or similar mechanism.

Full Open Capacity

Capacity of the Model 121 in the full open position can be calculated using the following formulas and K factors:

$Q = K\sqrt{P0\ (P1 - P0)}$ ..... (for P_i/P_o less than 1.894)

$Q = \frac{K\ P_1}{2}$ ..... (for P_i/P_o less than 1.894)

Q = Full open capacity in SCFH of 0.6 specific gravity natural gas

P_i = absolute inlet pressure (psi)

P_o = absolute outlet pressure (psi)

1" Pipe Size (outlet) ..... K=1,400
1 ½" Pipe Size ..... K=2,750
2" Pipe Size ..... K=4750
2 ½" Pipe Size ..... K=5250
1 ¼" Pipe Size (outlet) ..... K=1,750
3" Pipe Size ..... K=11,000

When used at the above full-open capacities, the droop is significantly greater than specified in the capacity tables on pages 4, 5, 6, and 7.

To check the 121 regulator for adequate relief capacity, use the above calculated full-open capacities. Do not use 121 capacity values from the tables on pages 4, 5, 6, and 7.

Pipe Sizes

Threaded NPT		Flanged ANSI 125 lb. FF.
¾" × 1"	1 ½" × 1 ½"	2" × 2"
¾" × 1 ¼"	1 ½" × 2"	3" × 3"
1" × 1 ¼"	2 ½" × 2 ½"	
1 ¼" × 1 ¼"	3" × 3"	

Other Gases

Model 121 Regulators are most widely used with natural gas. However, they perform equally well with LP gas, nitrogen, dry CO2, and air.

For other gas capacities, multiply the table values on page 4, 5, 6, and 7 by the applicable correction factors:

Pipe Sizes

Type of Gas	Correction Factor
Air (Specific Gravity 1.0)	0.77
Propane (Specific Gravity 1.53)	0.63
1350 BTU Propane-Air Mix (Specific Gravity 1.20)	0.71
Nitrogen (Specific Gravity 0.97)	0.79
Dry Carbon Dioxide (Specific Gravity 1.52)	0.63

For other non-corrosive gases, use the following formula:

$$\text{Correction factor} = \sqrt{\frac{0.60}{\text{Specific gravity of the gas}}}$$

When used with gases not listed above, please contact your Utility Solutions Group representative or Industrial Distributor for recommendations.

CAUTION

Turn gas on slowly. If an outlet stop valve is used, it should be opened first. Do not overload the diaphragm with a sudden surge of inlet pressure. Monitor the outlet pressure during start-up to prevent an outlet pressure overload. REFER TO RM-1328 FOR MORE DETAILED START-UP PROCEDURES.

Materials of Construction

Component	Materials Used
Body and Adapter	Cast Iron
Diaphragm Case (8" and 12" Diaphragm)	Die Cast Aluminum Alloy
Diaphragm Case (16" Diaphragm)	Permanent Mold Aluminum Alloy
Main Seal and Diaphragms	Buna-N with Nylon
Piston for Seal Diaphragm (¾" thru 2 ½" Model 121)	Powdered Iron-Zinc Plated
Piston for Seal Diaphragm (3" and 4" Model 121)	Aluminum Alloy
Stem, Stud, Pans, and Plates for 8", 12", and 16" Diaphragms	Stainless Steel
Stem bushing	Stainless Steel
Orifice (¾" thru 1 ¼" Model 121)	Brass
Orifice (1 ½" thru 3" Model 121)	Cast Iron
Retaining Ring (1 ½" thru 3" Model 121)	Plated Steel
Valve	Plated Steel with Molded Buna-N Soft Seat
Valve Holder	Stainless Steel
Retaining Ring and Wave Washer	Stainless Steel
O-Rings and Tetraseals	Buna-N
Adjustment Spring Ferrule	Zinc Die Casting
Bottom Spring Button	Powdered Iron-Plated
Adjustment Screw (16" Diaphragm) and H.P. Adjustment Spring Ferrule	Plated Steel
Adjustment Ferrule Screw (16" Diaphragm) and H.P. Adjustment Spring Ferrule	Cast Iron
Seal Cap (8" and 12" Diaphragm)	Zinc Die Casting
Seal Cap (16" Diaphragm)	Die Cast Aluminum Alloy
Bottom Spring Button	Powdered Iron-Plated

Body Taps

Inlet and outlet taps are available on either side of the body. Tap size is ¼-inch NPT. Refer to "dimensions" on page 10.

NOTE: Desired taps must be specified when ordering.

Metrication

Use the following for Metric Conversions:

std. meters^3/hr. x 35.31 = std. ft.^{3}/hr. (SCFH) std. ft.^{3}/hr. (SCFH) x 0.0283 = std. meters^3/hr.
kilograms/centimeter^2(kg/cm^2) x 14.22 = psi psi x 0.0703 = kilograms/centimeters^2(kg/cm^2)
kilopascals (kPa) x 0.145 = psi psi x 6.90 = kilopascals (kPa)
bars x 14.50 = psi psi x 0.69 = bars
millimeters water (mm H_2O) x .0394 = in. w.c. in. w.c. x 25.4 = millimeters water (mm H_2O)
millimeters mercury (mm Hg) x 0.535 = in w.c. in. w.c. x 1.868 = millimeters mercury (mm Hg)

How to Order

Specify:

1. Model number.
2. Pipe size (on 2" and 3", specify whether screwed or flanged).
3. Inlet pressure.
4. Outlet pressure.
5. Capacity required — SCFH.
6. Kind of gas (natural gas, propane, air, etc.)

Buried Service

Model 121 Field Regulators are not suitable for buried (underground) service.

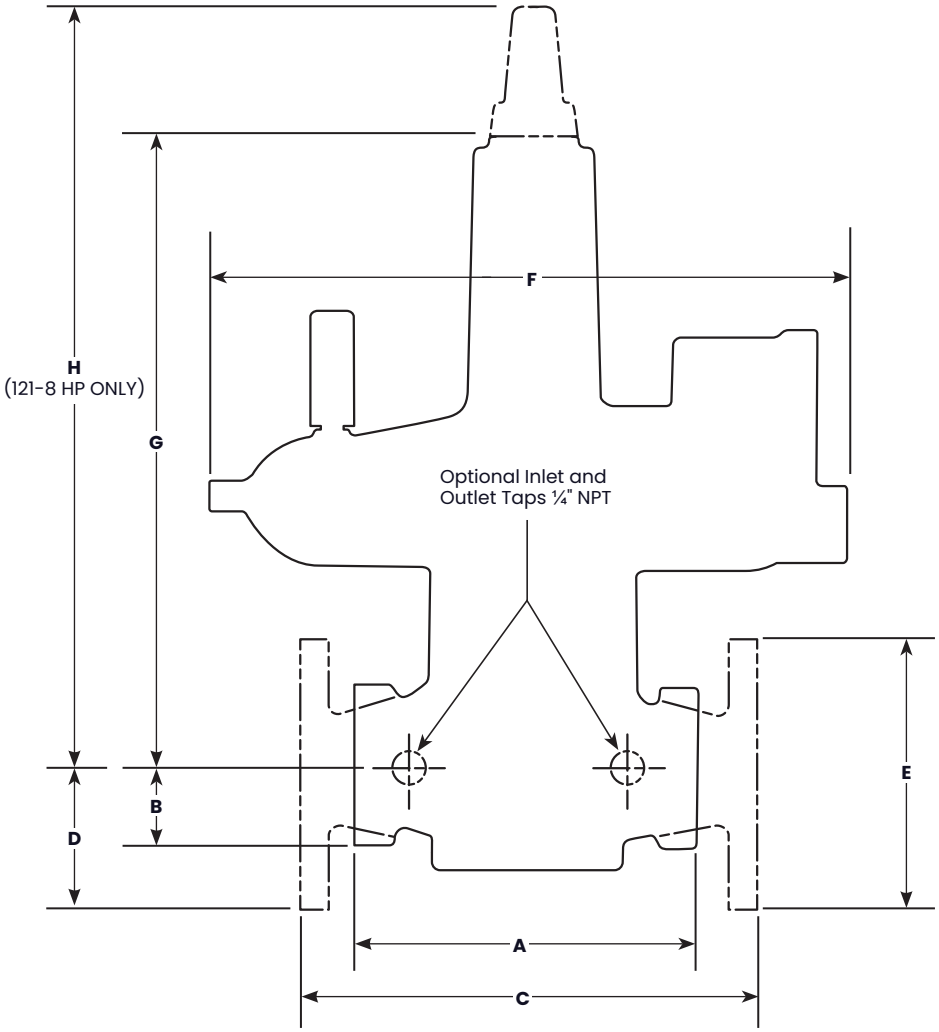
Temperature Limits

Model 121 regulators can be used for temperatures from -20°F to 150°F.

CAUTION

It is the user's responsibility to ensure all regulator vents and/or vent lines exhaust to a non-hazardous location away from ANY POTENTIAL sources of ignition.

Dimensions



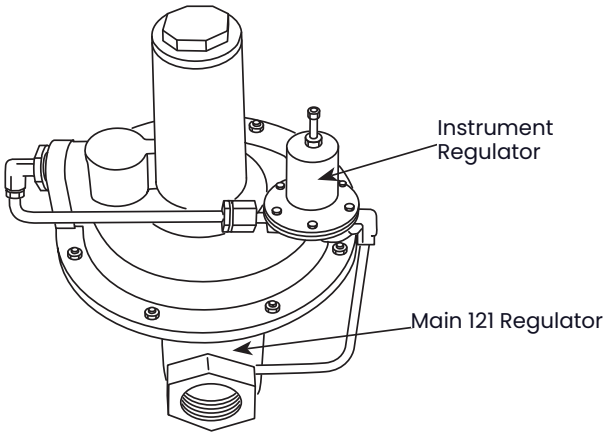
Pipe Size	Model Number	Threaded NPT		Flanged ANSI 125 lb. FF			F (Dia.)	G	High-Pressure Spring Adjustment
		A	B	C	D	E			H
¾"-1"-1 ¼"	121-8 & -8 HP	5 ¾"	1 ⅞"	—	—	—	10 3/16"	13 9/16"	19 ⅛"
1 ½"	121-8 & -8 HP	7 ½"	2 ⅜"	—	—	—	10 3/16"	13 11/16"	19 ¼"
1 ½"	121-12	7 ½"	2 ⅜"	—	—	—	14"	14 ⅛"	—
2"	121-8 & -8 HP	7 ½"	2 ⅜"	10"	3"	6"	10 3/16"	13 11/16"	19 ¼"
2"	121-12	7 ½"	2 ⅜"	10"	3"	6"	14"	14 ⅛"	—
2 ½"	121-8 & 121-8 HP	8 ¼"	2 ⅜"	—	—	—	10 3/16"	13 11/16"	19 ¼"
2 ½"	121-12	8 ¼"	2 ⅜"	—	—	—	14"	14 ⅛"	—
3"	121-12	11 ¾"	3 9/16"	11 ¾"	3 ¾"	7 ½"	14"	15 ½"	—
3"	121-16	11 ¾"	3 9/16"	11 ¾"	3 ¾"	7 ½"	18"	19"	—

Pilot Operated and Pressure Loaded

Three options are available for 1 ½", 2", and 2 ½" Model 121 regulators. These product variations increase versatility, address a wide range of applications, and enhance performance.

121 Pressure Loaded (121-8PL)

- Constant loading pressure on diaphragm
- +/- 5.0% absolute outlet pressure accuracy
- 1 to 35 psi outlet pressure range
- Bleeds to line

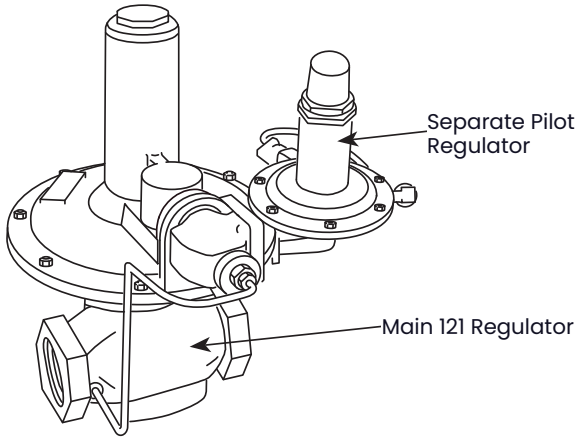


Model 121-8PL

121 Pilot Operated (121-RPC)

- Precision regulation of pressure to a set-point
- +/- 0.5% absolute outlet pressure accuracy
- 3 ½" w.c. to 35 psi outlet pressure range

Outlet Pressure Range	Pilot Spring	
	Spring Color	Spring Part Number
3 ½" to 6 ½" w.c.	Red	143-08-021-00
5" to 8 ½" w.c.	Blue	143-08-021-01
6" to 14" w.c.	Green	143-08-021-02
12" to 28" w.c.	Orange	143-08-021-03
1 psi to 2 psi	Black	143-08-021-06
1 psi to 5 psi	White	138-18-021-01
3 ½" w.c. to 5 psi	Aluminum	138-18-021-05
3 psi to 15 psi	Gray	138-18-021-04
10 psi to 35 psi	Brown	138-18-021-03



Model 121-RPC

Capacity Tables – 1 ½" Models 121-RPC and 121-8PL in SCHF of Natural Gas

(0.6 Specific Gravity – 14.65 psi – 60°F)

Model		Outlet Pressure	Inlet Pressure														
			2	3	5	7	10	15	20	25	30	35	40	45	50	55	60
121-RPC		0.13	13,043	16,152	21,035	24,981	29,940	36,750	43,000	49,250	55,500	61,750	68,000	74,250	80,500	86,750	93,000
		0.25	12,650	15,862	20,851	24,858	29,877	36,750	43,000	49,250	55,500	61,750	68,000	74,250	80,500	86,750	93,000
		0.51	11,800	15,244	20,462	24,597	29,741	36,750	43,000	49,250	55,500	61,750	68,000	74,250	80,500	86,750	93,000
	121-8PL	1.00	9,811	13,874	19,621	24,031	29,432	36,750	43,000	49,250	55,500	61,750	68,000	74,250	80,500	86,750	93,000
		2.00		10,124	17,536	22,638	28,636	36,503	43,000	49,250	55,500	61,750	68,000	74,250	80,500	86,750	93,000
		3.00			14,748	20,857	27,591	36,125	43,000	49,250	55,500	61,750	68,000	74,250	80,500	86,750	93,000
		5.00				15,572	24,622	34,821	42,647	49,250	55,500	61,750	68,000	74,250	80,500	86,750	93,000
		7.00					20,031	32,711	41,698	49,066	55,500	61,750	68,000	74,250	80,500	86,750	93,000
		10.00						27,613	39,051	47,828	55,227	61,750	68,000	74,250	80,500	86,750	93,000
		15.00							30,311	42,866	52,500	60,622	67,777	74,250	80,500	86,750	93,000
		20.00								32,787	46,368	56,789	65,574	73,314	80,312	86,750	93,000
		25.00									35,089	49,624	60,776	70,178	78,462	85,951	92,837
		30.00										37,249	52,678	64,517	74,498	83,292	91,241
		35.00											39,291	55,565	68,053	78,581	87,856

Capacity Tables – 2" Models 121-RPC and 121-8PL in SCHF of Natural Gas

(0.6 Specific Gravity – 14.65 psi – 60°F)

Model		Outlet Pressure	Inlet Pressure														
			2	3	5	7	10	15	20	25	30	35	40	45	50	55	60
121-RPC		0.13	23,477	29,074	37,863	44,966	53,893	66,150	77,400	88,650	99,900	111,150	122,400	133,650	144,900	156,150	167,400
		0.25	22,770	28,551	37,531	44,744	53,779	66,150	77,400	88,650	99,900	111,150	122,400	133,650	144,900	156,150	167,400
		0.51	21,240	27,440	36,832	44,275	53,533	66,150	77,400	88,650	99,900	111,150	122,400	133,650	144,900	156,150	167,400
	121-8PL	1.00	17,659	24,974	35,319	43,256	52,978	66,150	77,400	88,650	99,900	111,150	122,400	133,650	144,900	156,150	167,400
		2.00		18,224	31,564	40,749	51,544	65,706	77,400	88,650	99,900	111,150	122,400	133,650	144,900	156,150	167,400
		3.00			26,546	37,542	49,663	65,025	77,400	88,650	99,900	111,150	122,400	133,650	144,900	156,150	167,400
		5.00				28,030	44,320	62,678	76,779	88,650	99,900	111,150	122,400	133,650	144,900	156,150	167,400
		7.00					36,056	58,880	75,096	88,333	99,408	111,150	122,400	133,650	144,900	156,150	167,400
		10.00						49,704	70,396	86,145	99,408	111,150	122,400	133,650	144,900	156,150	167,400
		15.00							54,897	77,349	94,500	109,119	121,999	133,650	144,900	156,150	167,400
		20.00								59,517	83,463	102,220	118,034	131,966	144,561	156,150	167,400
		25.00									63,161	89,322	109,397	126,321	141,231	154,711	167,400
		30.00										67,048	94,821	116,131	134,097	149,925	164,235
		35.00											70,723	100,017	122,496	141,446	158,142

Capacity Tables – 2 ½" Models 121-RPC and 121-8PL in SCHF of Natural Gas

(0.6 Specific Gravity – 14.65 psi – 60°F)

Model		Outlet Pressure	Inlet Pressure														
			2	3	5	7	10	15	20	25	30	35	40	45	50	55	60
121-RPC		0.13	26,085	32,305	42,070	49,962	59,881	73,500	86,000	98,500	111,000	123,500	136,000	148,500	161,000	173,500	186,000
		0.25	25,299	31,724	41,702	49,716	59,755	73,500	86,000	98,500	111,000	123,500	136,000	148,500	161,000	173,500	186,000
		0.51	23,599	30,489	40,925	49,195	59,481	73,500	86,000	98,500	111,000	123,500	136,000	148,500	161,000	173,500	186,000
	121-8PL	1.00	19,621	27,749	39,243	48,062	58,864	73,500	86,000	98,500	111,000	123,500	136,000	148,500	161,000	173,500	186,000
		2.00		20,248	35,071	45,277	57,271	73,007	86,000	98,500	111,000	123,500	136,000	148,500	161,000	173,500	186,000
		3.00			29,496	41,713	55,182	72,250	86,000	98,500	111,000	123,500	136,000	148,500	161,000	173,500	186,000
		5.00				31,145	49,244	69,642	85,294	98,500	111,000	123,500	136,000	148,500	161,000	173,500	186,000
		7.00					40,062	65,422	83,397	98,133	111,000	123,500	136,000	148,500	161,000	173,500	186,000
		10.00						55,227	78,102	95,656	110,454	123,500	136,000	148,500	161,000	173,500	186,000
		15.00							60,622	85,732	105,000	121,244	135,554	148,500	161,000	173,500	186,000
		20.00								65,574	92,736	113,578	131,149	146,629	160,624	173,500	186,000
		25.00									70,178	99,247	121,552	140,357	156,924	171,901	185,674
		30.00										74,498	105,357	129,035	148,997	166,583	182,483
		35.00											78,581	111,131	136,107	157,162	175,713

NOTE: Capacities for 1 ½", 2", and 2 ½" Model 121-8 and 121-8PL Regulators with V-port valves are approximately 80% of the published data.

UTILITY SOLUTIONS GROUP

https://my-usg.com/

USG Headquarters
1050 Dearborn Dr.
Suite 200
Columbus, OH 43085

support@my-usg.com
614-704-5650
888-456-6060 (International)