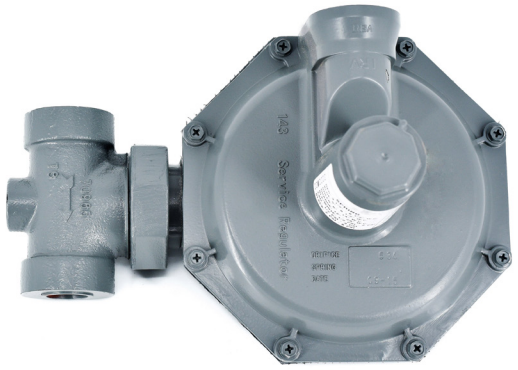
Model 143-LPCO Regulator Brochure

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.

143-LPCO

The low-pressure cut-off (LPCO) is used to automatically shut off the gas when inlet pressure is no longer large enough for the required flow. It is an optional, extra safety device that is built into the 143-80-6 as an integral part of this regulator.

During normal operation, the 143-80-6 provides its usual accurate control over the pressure of the delivered gas. However, if a line break or something else causes the regulator to open excessively as it attempts to handle the flow demand, the cutoff closes and shuts off the gas. This helps prevent a hazardous condition from developing on the service side of the regulator.

As an added protection, the LPCO does not reset itself if inlet pressure happens to return to normal. Instead, it must be manually reset, thus helping to prevent a pressure malfunction from passing unnoticed.

Technical Data

Valve Body	Cast Iron - 125 psi working pressure
Spring and Lower Case	Die-Cast Aluminum
Orifice	Aluminum
Fulcrum Pin	Stainless Steel
Valve Seat	One piece molded Buna-N
Valve Stem	Fiberglass reinforced nylon
Throat/Support/Stem	Cast Aluminum, integral to the lower case
Diaphragm Plate	Plated Steel
Diaphragm	Nylon fabric reinforced Buna-N
Vent and Valve	Polyethylene valve and seat, 1" NPT vent
Corrosion Protection	Cases dip primed chromate conversion coating, enamel topcoat
Internal Relief Valve	Set to relieve at approximately 7-10" w.c. above normal outlet pressure setting

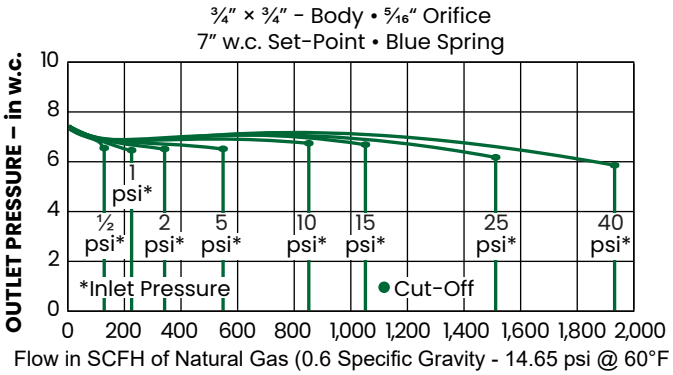
Regulator Spring Chart

Normal Range	Color	Part Number
4 ½" - 7 ½" w.c.	Red	143-62-021-15
6" - 9 ½" w.c.	Blue	143-62-021-16
7 ½" - 15" w.c.	Green	143-62-021-17
13 ½" - 29" w.c.	Orange	143-62-021-18

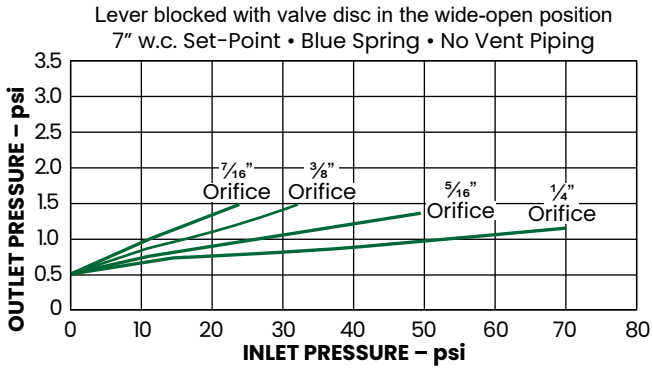
Orifice and Maximum Inlet Pressure

Pressure	Size	Part Number
60 psi	¼"	143-62-023-49
40 psi	5⁄16"	143-62-023-51
25 psi	⅜"	143-62-023-52
15 psi	7⁄16"	143-62-023-53

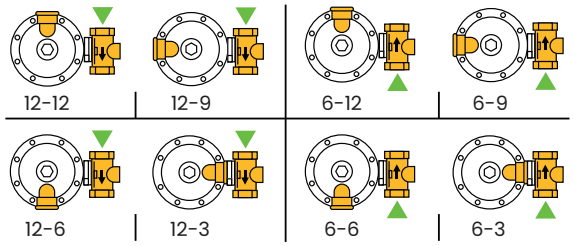
Typical Performance Curve



Typical IRV Performance Curve



Mounting Positions



For outdoor installations, it is recommended that the regulator be installed with the vent facing downward. This avoids the potential for water and other foreign material from entering and interfering with proper operation.

Capacities

SCFH Natural Gas (0.6 specific gravity - 14.65 psi @ 60°F)

Pipe Size: ¾" × ¾"

Psi	Red or Blue Spring				Green Spring			
	¼"	5/16"	⅜"	7/16"	¼"	5/16"	⅜"	7/16"
½	-	90	180	240	-	90	120	140
1	100	200	300	400	90	160	200	250
2	140	300	420	580	140	240	320	370
5	230	600	750	800	220	460	530	580
10	380	740	990	1050	370	700	720	780
15	460	950	1,050	1,140	480	800	860	920
25	640	1,100	1,100	-	660	1,000	900	-
40	870	1,300	-	-	910	1,300	-	-
60	1,160	-	-	-	1,160	-	-	-

Pipe Size: ¾" × 1" and 1" × 1"

Psi	Red or Blue Spring				Green Spring			
	¼"	5/16"	⅜"	7/16"	¼"	5/16"	⅜"	7/16"
½	-	90	210	270	-	90	120	160
1	100	210	310	430	90	160	230	260
2	140	300	420	650	140	240	350	410
5	230	610	750	1,100	220	460	730	800
10	380	760	1,120	1,300	370	700	1,090	1,220
15	460	960	1,300	1,300	480	800	1,300	1,300
25	640	1,300	1,300	-	660	1,000	1,300	-
40	870	1,300	-	-	910	1,300	-	-
60	1,160	-	-	-	1,160	-	-	-

Pipe Size: 1 ¼" × 1 ¼"

Psi	Red or Blue Spring				Green Spring			
	¼"	5/16"	⅜"	7/16"	¼"	5/16"	⅜"	7/16"
½	-	90	210	270	-	90	120	160
1	100	210	310	430	90	160	230	260
2	140	300	420	650	140	270	350	430
5	230	510	750	1,100	220	470	730	870
10	380	760	1,120	1,300	370	740	1,090	1,300
15	460	960	1,300	1,300	480	930	1,300	1,300
25	640	1,300	1,300	-	660	1,160	1,300	-
40	870	1,300	-	-	910	1,300	-	-
60	1,160	-	-	-	1,160	-	-	-

Figures highlighted in each column indicate maximum capacity for each orifice at recommended pressure within the optimum performance range. This performance data is based on normal testing at 70°F flowing temperature. Changes in performance can occur at extreme low-flowing temperatures.

Maximum Emergency Pressure

Before using any of the below data, ensure this entire section is clearly understood.

The maximum inlet pressures which the regulator body may be subjected to under abnormal conditions without causing internal damage is:

Maximum Inlet Pressure ..... + 10 psi

The maximum outlet pressure which the diaphragm may be subjected to under abnormal conditions without causing internal damage is:

Maximum Outlet Pressure ..... set-point + 3 psi

NOTE: The "set-point" is the outlet pressure the regulator is adjusted to deliver.

The maximum pressure that can be safely contained by the diaphragm case is:

Maximum Pressure ..... 10 psi

NOTE: Safely contained means no leakage and no bursting.

CAUTION

If any pressure exceeds the above values the regulator must be removed from service and inspected. Damaged or otherwise unsatisfactory parts must be repaired or replaced before returning the regulator to service.

Full Open Capacity

Use the following formula for the full open capacity of 243 regulators:

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

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

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

K = The regulator constant from the table below:

7/16"	5/16"	¼"	⅛"
400	206	132	33

P_i = absolute inlet pressure (psi)

P_o = absolute outlet pressure (psi)

Other Gases

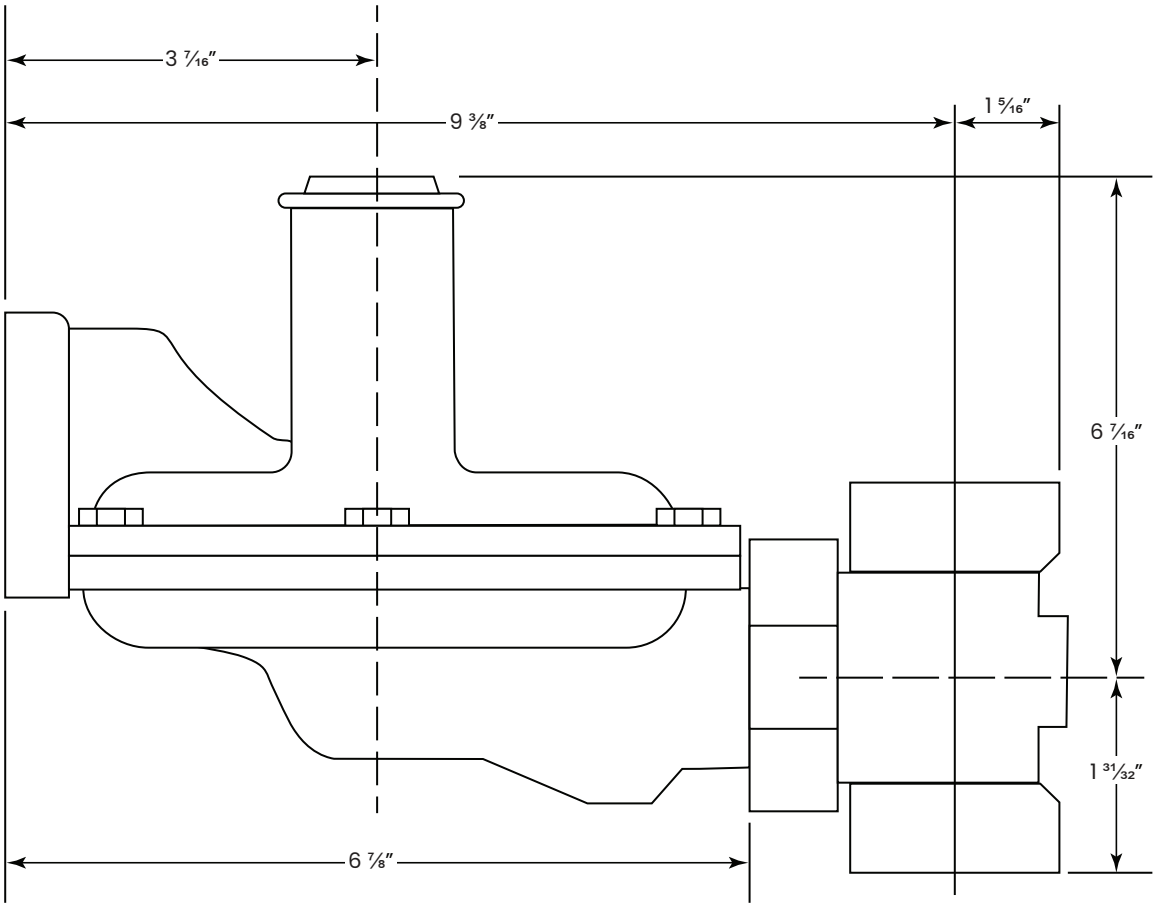
143-LPCO regulators are mainly used on natural gas. However, they perform equally as well on liquid propane gas (LPG), nitrogen gas (N_2), dry carbon dioxide (CO_2), air and others. For capacities, multiply the table values by the following correction factors:

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:

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

Dimensions



Valve Body Sizes
¾" × ¾"
¾" × 1"
¾" × 1 ¼"
1" × 1"
1" × 1 ¼"
1 ¼" × 1 ¼"

Temperature Limits

The Model 143-LPCO regulator can be used for temperatures from -20°F to +150°F.

Buried Service

The Model 143-LPCO regulator is not suitable for buried (underground) service.

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