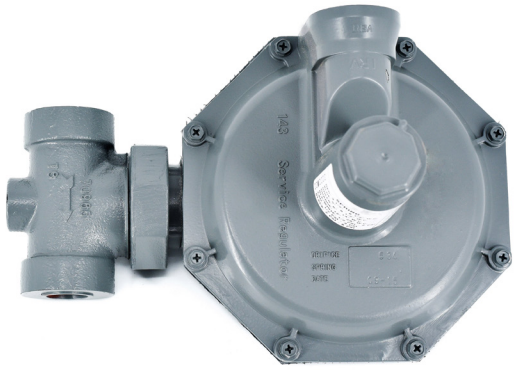
Model 143 Regulator Brochure

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.

The Model 143-80-2 regulator conforms to the ANSI B109.4 and CSA 6.18 standards. The Model 143-80-2HP regulator is approved with Measurement Canada.

Model 143 Regulator

The Model 143 models are built to perform. They feature precise pressure control, as well as outstanding performance and dependability. These gas regulators are also available with a low-pressure cut-off.

The Model 143 regulators are used for both residential and small commercial and industrial applications, such as burners, furnaces, ovens, heaters, gas engines and others.

They are available with a variety of body sizes, loading springs and orifice sizes. These compact regulators also provide the outlet pressure ranges and the capacities to fit most applications for a 6" service diaphragm regulator.

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	Acetal insert
Diaphragm Plate	Plated Steel
Diaphragm	Nylon fabric reinforced Buna-N with full 26 in² effective area
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

Basic Models

143-80 Model Numbers	Variation
143-1	Standard* Regulator
143-2	Regulator with Internal Relief Valve (IRV)
143-6	Regulator with both IRV and Low Pressure Cut-Off (LPCO)

* The term "Standard" refers to non-IRV configurations.

NOTE: For additional information on IRV and LPCO, refer to Page 3.

Orifice and Maximum Inlet Pressure

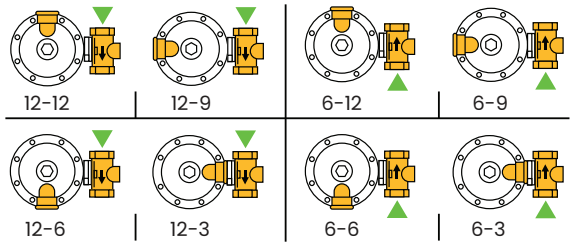
Pressure	Size	Part Number
125 psi	1/8"	143-62-023-37
125 psi	3/16"	143-62-023-40
60 psi	1/4"	143-62-023-42
40 psi	5/16"	143-62-023-43
40 psi	3/8"	143-62-023-44
20 psi	1/2"	143-62-023-45
10 psi	5/8"	143-62-023-46

Regulator Spring Chart

Normal Range	Color	Part Number
3 ½" - 6 ½" w.c.	Red	143-62-021-15
5" - 8 ½" w.c.	Blue	143-62-021-16
6" - 14" w.c.	Green	143-62-021-17
12" - 28" w.c.	Orange	143-62-021-18
½ - 2 psi	Black and White	143-62-021-22
½ - 2 psi	Cadmium*	173-62-021-02
2 - 6 psi	Black*	139-62-021-01

* For high-pressure Model 143-80-2 HP.

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	⅛"	3⁄16"	¼"	5⁄16"	⅜"	½"	⅝"
½*	–	–	–	–	340	450	510
1*	–	–	–	480	500	510	530
2*	–	–	530	560	570	580	600
3	–	420	600	620	630	650	670
5	250	560	700	720	730	770	790
7 ½	310	700	840	860	880	900	900
10	370	830	950	970	1,000	1,020	1,020
20	530	1,200	1,220	1,240	1,250	1,270	–
40	860	1,570	1,330	1,340	1,450	–	–
60	1,200	1,660	1,520	–	–	–	–
80	1,500	1,710	–	–	–	–	–
125	1,800	1,900	–	–	–	–	–

Pipe Size: ¾" × 1" and 1" × 1"

Psi	⅛"	3⁄16"	¼"	5⁄16"	⅜"	½"	⅝"
½*	–	–	–	–	350	460	520
1*	–	–	–	480	550	600	650
2*	–	–	530	700	840	880	780
3	–	420	650	870	1,000	920	810
5	250	580	890	1,120	1,160	950	970
7 ½	310	700	1,140	1,340	1,270	1,140	1,060
10	370	840	1,360	1,500	1,330	1,200	1,180
20	530	1,230	2,000	1,600	1,480	1,400	–
40	860	1,700	2,000	1,640	1,900	–	–
60	1,200	1,900	2,000	–	–	–	–
80	1,540	2,000	–	–	–	–	–
125	2,100	2,100	–	–	–	–	–

Pipe Size: ¾" × 1 ¼", 1" × 1 ¼", and 1 ¼" × 1 ¼"

Psi	⅛"	3⁄16"	¼"	5⁄16"	⅜"	½"	⅝"
½*	–	–	–	–	350	460	520
1*	–	–	–	480	550	680	760
2*	–	–	530	700	840	1,020	1,030
3	–	420	650	870	1,030	1,200	1,050
5	250	580	890	1,180	1,350	1,490	1,060
7 ½	310	700	1,140	1,340	1,270	1,140	1,060
10	370	840	1,360	1,700	1,710	1,800	1,180
20	630	1,230	1,600	1,800	1,900	1,900	–
40	860	1,800	2,200	1,900	2,000	–	–
60	1,200	2,100	2,400	–	–	–	–
80	1,550	2,200	–	–	–	–	–
125	2,250	2,400	–	–	–	–	–

* The 1/2, 1, and 2 psi inlet pressures apply only to Red and Blue springs.

NOTE: 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.

Other Gases

143 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:

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

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

⅝"	½"	⅜"	5⁄16"	¼"	3⁄16"	⅛"
820	520	292	206	132	74	33

P_i = absolute inlet pressure (psi)

P_o = absolute outlet pressure (psi)

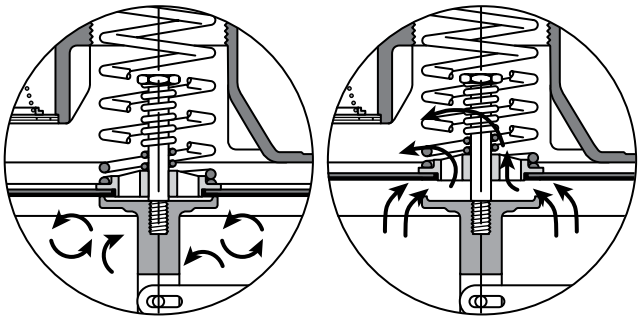
Operation of the Internal Relief Valve

The internal relief valve (IRV) is optional.

The IRV is built into the center of the diaphragm assembly as shown in the illustration and works in essentially the same way as standard relief valves.

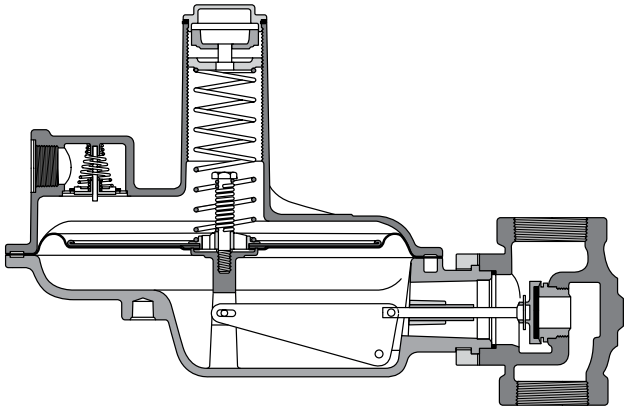
Performance is given on the curves below. The IRV will prevent the outlet pressure from exceeding the value shown by the curves upon regulator failure at the conditions specified.

The IRV is a proven design of quality construction. Within its capacity limits it adds a measure of safety protection to the outstanding and dependable performance of the 143.



IRV Closed IRV Open

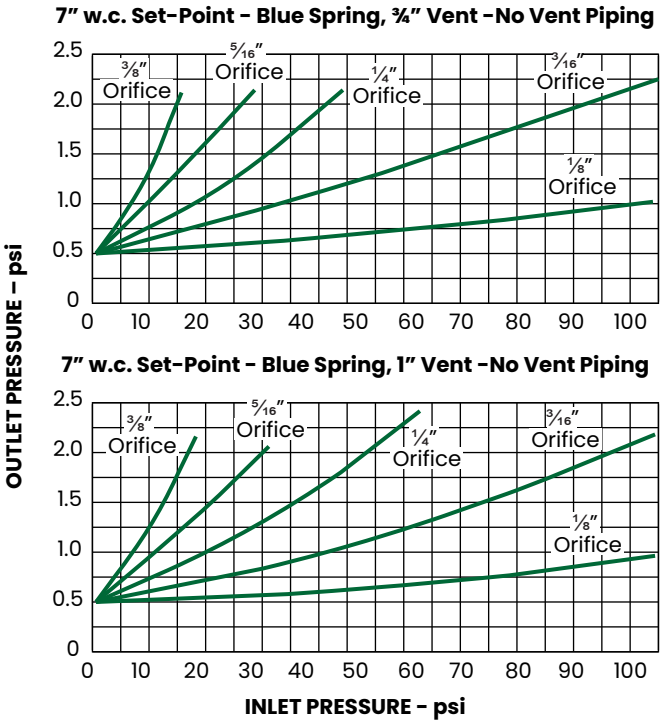
Internal Relief Valve



The 143 is available with an internal relief valve (IRV), which is a built-in safety device for providing a limited level of overpressurization protection.

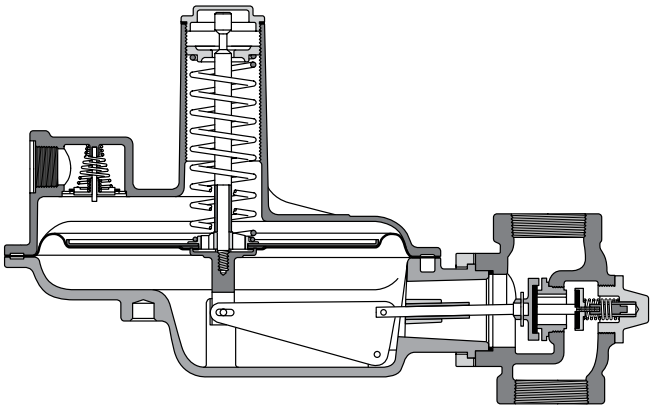
Like any relief valve, an IRV must be carefully sized. Basic Models are given in the table on Page 1.

Relief Valve Performance



NOTE: 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.

Low Pressure Cut-Off

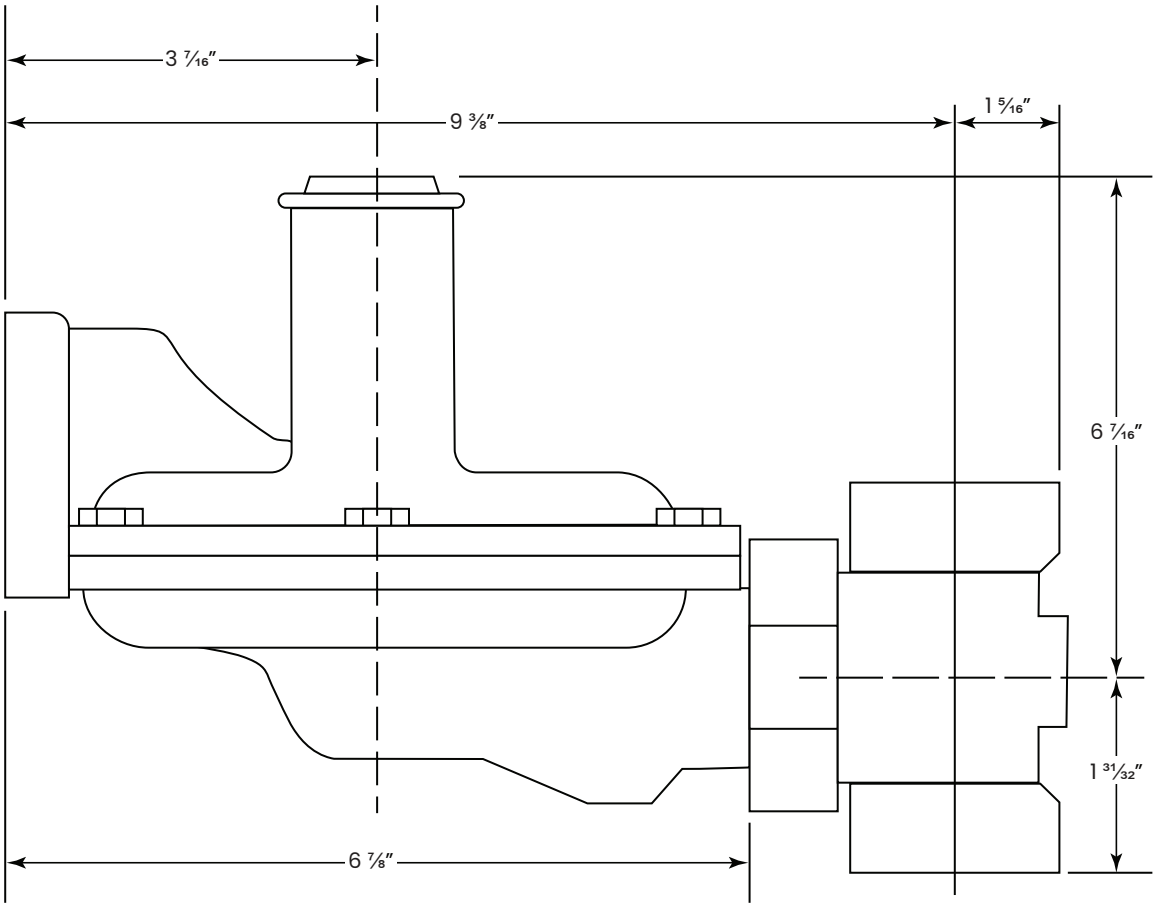


The low pressure cut-off (LPCO) is used for automatic gas shutoff when inlet pressure is too low for the required gas flow. Once closed, it must be manually reopened and reset.

Basic Models are given in the table on page 1.

NOTE: There is an LPCO version that also includes the internal relief valve.

Dimensions



Temperature Limits

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

Buried Service

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

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

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