

# Model 243 Service Regulators

Construction and Design Features

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## 243 Service Regulators

These large capacity service regulators are designed and built for commercial, industrial, and gas distribution work. They are right at home in such places as factories and foundries, district regulator stations, commercial laundries and laundromats, motels, hotels and apartments, bakeries, restaurants, schools, churches, and hospitals.

The versatile 243 is used for all kinds of gas fueled equipment such as boilers, burners, furnaces, ovens, heaters, kilns, engines, air conditioners, etc.

Remarkable field versatility results from the union connection between the fully interchangeable bodies and diaphragm-case assemblies. They are easy to install, adjust, inspect, and service in all kinds of piping arrangements.

While used primarily for natural gas services, Model 243 regulators perform equally well on LPG vapor, air, dry CO<sub>2</sub>, nitrogen, and other inert gas applications. Contact your representative for special construction which may be available for certain corrosive gases.

## Basic Models

| 243-12<br>Model Numbers | Variation                                  | 243-8<br>Model Numbers |
|-------------------------|--|------------------------|
| 243-12-1                | Standard* Regulator                        | 243-8-1                |
| 243-12-2                | Regulator with Internal Relief Valve (IRV) | 243-8-2                |
| 243-12-4                | Regulator with Low Pressure Cut-Off (LPCO) | 243-8-4                |
| 243-12-6                | Regulator with both IRV and LPCO           | 243-8-6                |
|                         | High Pressure Regulator                    | 243-8HP                |
|                         | Pressure Loaded Regulator                  | 243-8PL                |

For additional information on IRV refer to page 4. For LPCO refer to page 5.

\*The term "standard" refers to non-IRV configurations.

## Outlet Pressure Ranges and Springs

| Spring Color | Outlet Pressure Range |                 | Spring Part Number |
|--------------|-----------------------|-----------------|--------------------|
|              | 243-12                | 243-8           |                    |
| Red-Black    | —                     | 3½" to 6½" w.c. | 143-82-021-00      |
| Blue-Black   | —                     | 5" to 8½" w.c.  | 143-82-021-01      |
| Green-Black  | —                     | 6" to 14" w.c.  | 143-82-021-02      |
| Red          | 3½" to 6½" w.c.       | —               | 143-16-021-03      |
| Blue         | 5" to 8½" w.c.        | —               | 143-16-021-04      |
| Green        | 6" to 14" w.c.        | 12" to 28" w.c. | 143-16-021-05      |
| Orange-Black | 10" to 18" w.c.       | —               | 143-16-021-11      |
| Orange       | 12" to 28" w.c.       | 1 to 2 psi      | 143-16-021-06      |
| Black        | 1 to 2 psi            | 2 to 4½ psi     | 143-16-021-07      |
| Cadmium      | 1½ to 3 psi           | 3 to 5 psi§     | 143-16-021-08      |
| Cadmium      | 1½ to 3 psi           | 3 to 6½ psi*    | 143-16-021-08      |
| Cadmium      | —                     | 6 to 10 psi*    | 143-16-021-08      |
| White †      | —                     | —               | 143-16-021-13      |

† White is nested inside Cadmium \*Model 243-8HP only §Model 243-8-2 (IRV) only

## Pipe Sizes

| Model                 | Pipe Size       |
|-----------------------|-----------------|
| 243-12-1 and 243-12-2 | 1¼", ½" and 2"  |
| 243-8-1 and 243-8-2   | 1¼", 1½" and 2" |
| 243-8HP               | 1¼", 1½" and 2" |

## Temperature Limits

The Model 243 regulator may be used for flowing gas temperatures from -20°F to 150°F.

## Buried Service

The Model 243 regulator is **not** recommended for buried service.

### Maximum Inlet Pressure, psig

| Regulator Model and Size | 1¼" | *1¼" | 1"  | *1" | ¾"  | ¾"  | ½"  | ⅜"  | ¼"  | .207" |
|--------------------------|-----|------|-----|-----|-----|-----|-----|-----|-----|-------|
|                          | 30° | 10°  | 30° | 10° | 30° | 10° | 10° | 10° | 10° | 10°   |
| 1¼", 243-12              | 15  | 25   | 25  | 40  | -   | 60  | 100 | 125 | 125 | -     |
| 1½", 243-12              | 15  | 25   | 25  | 40  | -   | 60  | 100 | 125 | 125 | -     |
| 2", 243-12               | 15  | 25   | 25  | 40  | 40  | 60  | 100 | 125 | 125 | -     |
| 1¼", 243-8               | -   | -    | -   | -   | -   | 40  | 80  | 100 | 125 | 125   |
| 1½", 243-8               | -   | -    | 25  | -   | -   | 40  | 80  | 100 | 125 | 125   |
| 2", 243-8                | -   | -    | 25  | -   | 40  | 40  | 80  | 100 | 125 | -     |
| 1¼", 243-8HP             | -   | -    | -   | -   | -   | 40  | 80  | 100 | 125 | -     |
| 1½", 243-8HP             | -   | -    | 25  | -   | -   | 40  | 80  | 100 | 125 | -     |
| 2", 243-8HP              | -   | -    | 25  | -   | -   | 40  | 80  | 100 | 125 | -     |

\*External Control Regulator Only.

### Fixed Factor Billing

Regulator accuracy is essential to measurement accuracy. Because the 243 is so precise, it is ideal for pressure factor measurement, pressure compensated metering, fixed factor Billing, etc.

The table below gives the pressure accuracies obtainable with 243-12 and 243-8 regulators at the capacities in the tables on pages 6 to 22.

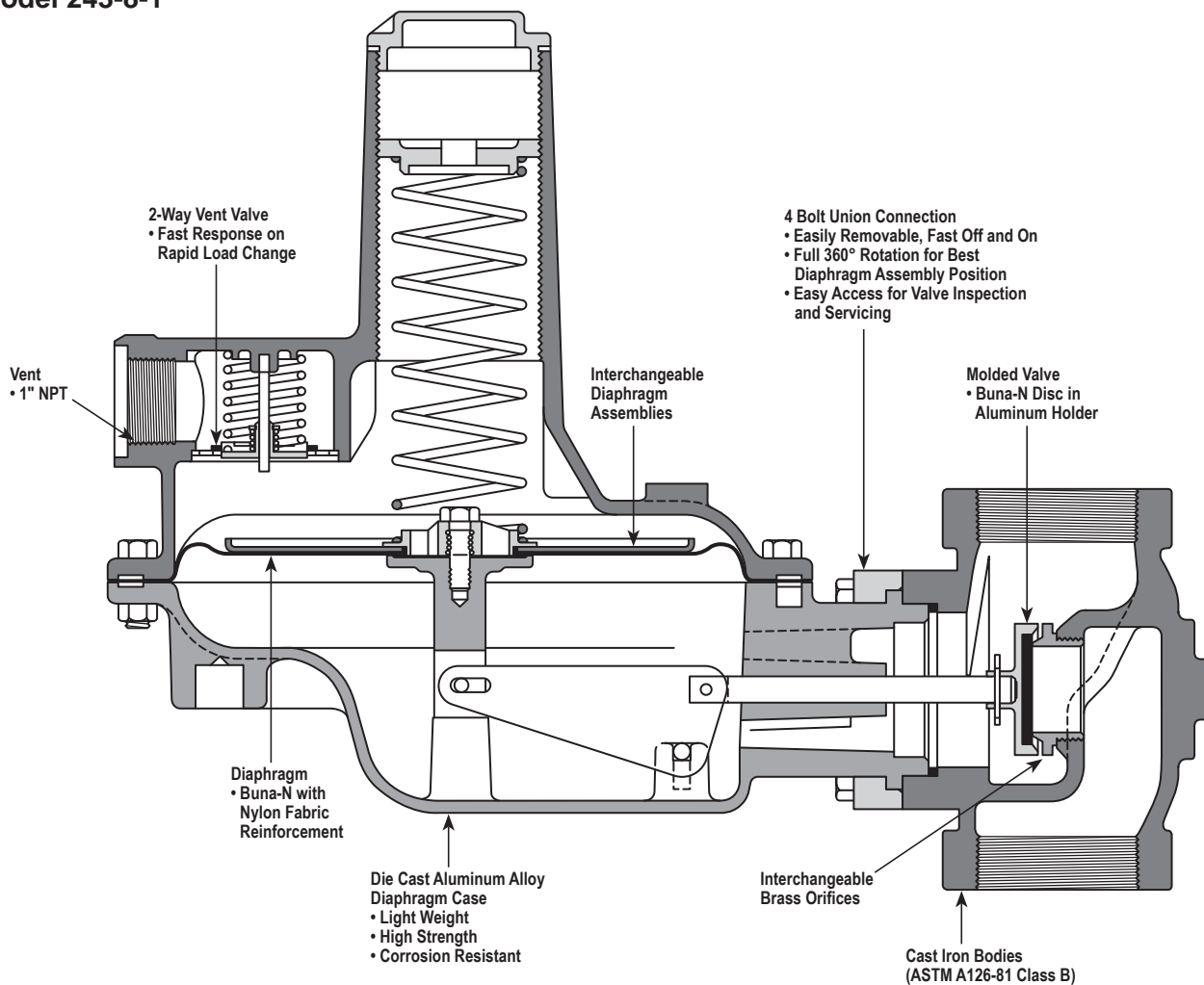
The 243 will hold outlet pressure within the indicated percentage limits from set flow (250 scfh) to the flows given in the capacity tables. Percentages are all based on absolute pressure using 14.4 psia as atmospheric.

As an example, referring to page 9, a 1½" Model 243-12- 2 with 1" orifice, 30° valve, 15 psig inlet, and 11" w.c. setpoint (green spring) at 2" w.c. droop has a gas capacity of 9800 scfh. Per the table below, this regulator at these conditions will hold outlet pressure at 11" w.c. ± ½% (2" w.c.) from 250 to 9800 scfh (based on absolute pressure).

For higher outlet pressures, greater capacities, increased accuracies, and excessive inlet pressure variations, use the 243-RPC pilot operated regulator (see page 5).

| Setpoint | Droop   | Accuracy      |
|----------|---------|---------------|
| 6" w.c.  | 1" w.c. | + ½% and -½%  |
| 7" w.c.  | 1" w.c. | + ½% and -½%  |
| 11" w.c. | 2" w.c. | + ½% and -½%  |
| 18" w.c. | 3" w.c. | + 1% and -1%  |
| 1psi     | 0.3 psi | + 1% and -2%  |
| 1psi     | 0.2 psi | + 1% and -1½% |
| 2psi     | 0.6 psi | + 1% and -4%  |
| 3psi     | 0.3 psi | + 1% and -2%  |
| 3psi     | 0.6 psi | + 1% and -3½% |

### Model 243-8-1



CDF1306-005

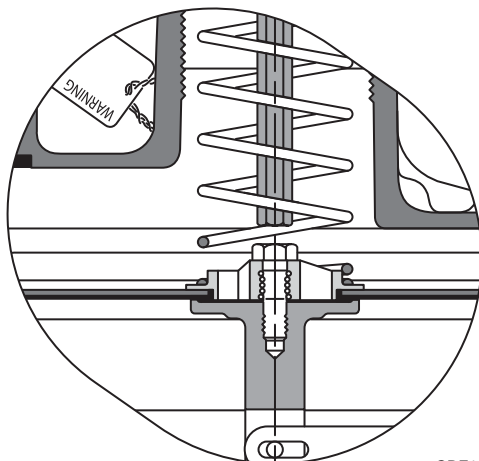
**Pipe Sizes**

2", 1½", 1¼" NPT Screwed\*

2" Flanged ANSI 125

\*Can also be furnished with British Standard Threads (BST)

### Model 243-12-1 Travel Stop



CDF1306-010

A travel stop is located in the 243-12-1 and the 243-12-4 to provide overpressurization protection.



**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-1306 for more detailed start-up procedures.

### Operation of the Internal Relief Valve

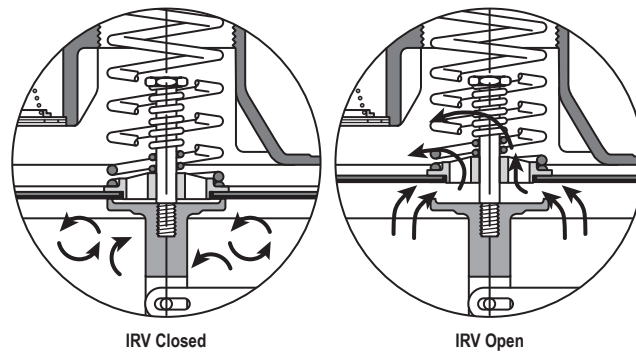
The internal relief valve (IRV) is optional (refer to Basic Models Table, page 1).

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.

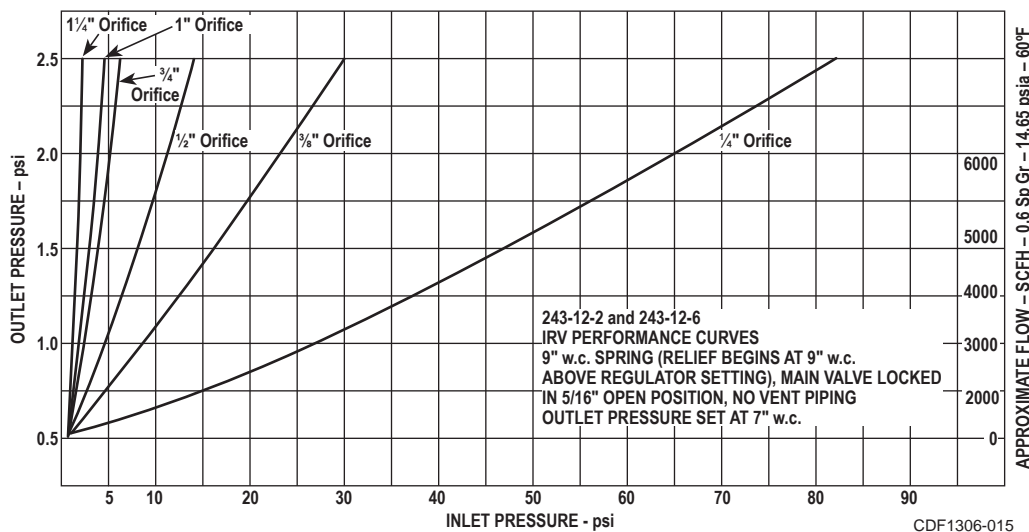
It opens when outlet pressure exceeds the setpoint by approximately 9" w.c. thereby allowing excess gas to escape through the vent to atmosphere. An optional spring is available on the 243-8-2 for relieving at approximately 20" w.c. above setpoint. A cross-section of a complete 243 with IRV is shown on page 5.

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.

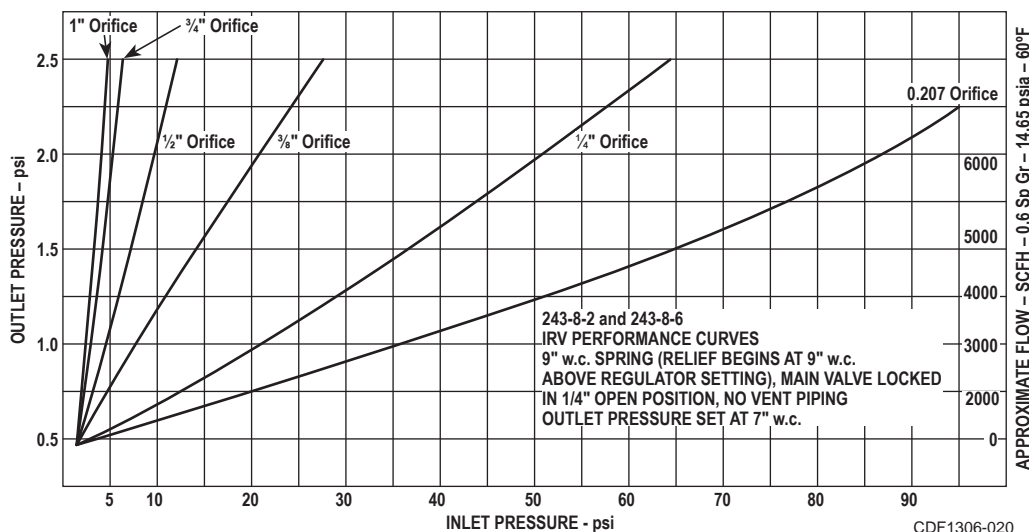
The IRV is a proven design of quality construction. Within its capacity limits it adds a measure of safety protection to the outstanding and dependable performance of the 243.



CDF1306-025



CDF1306-015



CDF1306-020

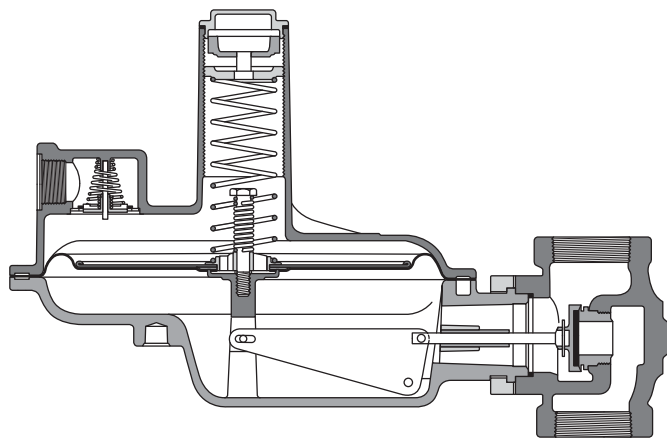


### CAUTION

Note that an IRV, like any other relief valve, must be sized carefully. If the curves indicate that outlet pressure can exceed the maximum safe limit it is essential to provide an additional relief valve carefully sized to handle the difference.

## 243 Variations

### Internal Relief Valve



CDF1306-030

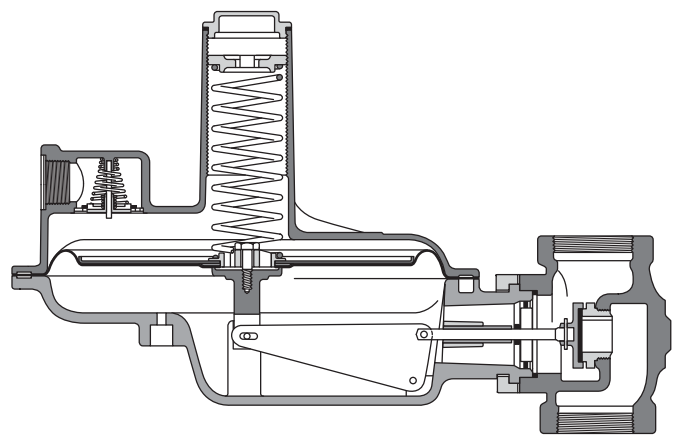
The 243 is available with an internal relief valve (IRV), which is a built-in safety device for providing a limited level of overpressurization protection.

Like any relief valve, an IRV must be carefully sized.

A more complete description plus performance data is given on page 4. For Basic Models, refer to the table on page 1.

Internal relief valves are not available in the high pressure Model 243-8HP.

### Monitoring and External Control Line



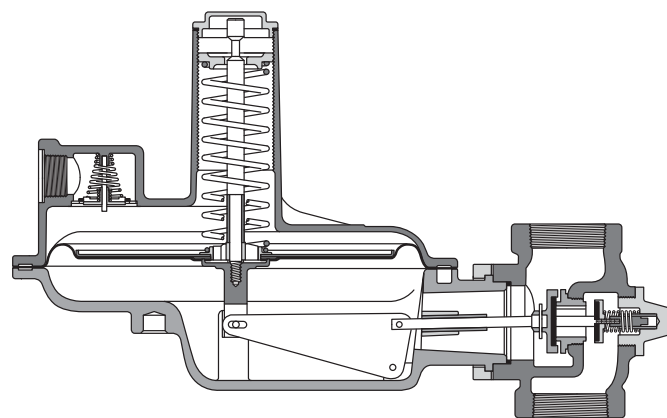
CDF1306-045

This 243 is used for the first regulator (upstream regulator) in a monitor set or for other applications requiring an external downstream control line.

A throat block with an o-ring stem seal isolates the lower diaphragm chamber which has a 1/2" FNPT connection for the external control line.

Use of this regulator for monitoring is shown on page 23. Capacities with the external control line are provided on pages 13 and 14.

### Low Pressure Cut-Off



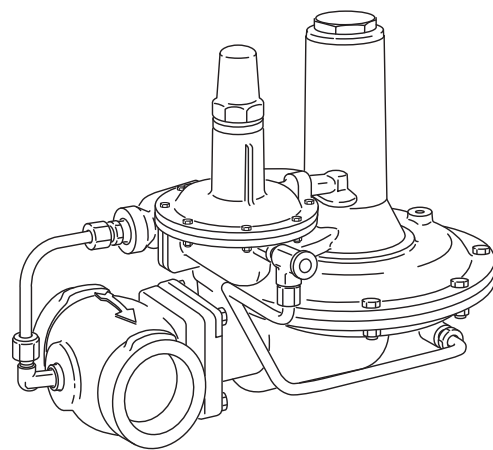
CDF1306-035

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 at the bottom on page 1. Note: There is an LPCO version that also includes the internal relief valve.

Outlet pressures range from 4" w.c. to 30" w.c. and available orifices are 1/2", 3/4" and 1".

### Pilot Operated Regulator



CDF1306-050

The 243-RPC is a genuine pilot operated regulator.

Like its bigger brothers, it not only provides remarkably precise pressure regulation but it maintains that high level of accuracy even for wide variations in inlet pressure.

The 243-RPC can be used for any outlet pressure from 3 1/2" w.c. to 35 psig with capacity ranging as high as 75,000 scfh.

### Model 243 Capacity Tables

**2" Models 243-12-1 and 243-12-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F)

| Outlet Pressure and Spring   | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |       |      |
|--|--------------------|------------------------------|-------|-------|-------|-------|-------|------|
|  |                    | 1¼"                          | 1"    | ¾"    | ¾"    | ½"    | ⅜"    | ¼"   |
|  |                    | 30°                          | 30°   | 30°   | 10°   | 10°   | 10°   | 10°  |
| Setpoint 6" w.c.<br>1" w.c. Droop<br>Red Spring<br>3½" to 6½" w.c.<br><b>143-16-021-03</b>   | 12                 | 2400                         | 2200  | 1500  | 1250  | 800   | 500   |      |
|  | 1                  | 4000                         | 3600  | 2700  | 2100  | 1300  | 850   | 400  |
|  | 2                  | 6400                         | 6000  | 4500  | 3800  | 2200  | 1400  | 600  |
|  | 5                  | 11000                        | 11000 | 8200  | 6500  | 3800  | 2300  | 1000 |
|  | 10                 | 13000                        | 15000 | 12500 | 9000  | 5700  | 3300  | 1500 |
|  | 15                 | 14000                        | 15000 | 15000 | 10300 | 7100  | 4000  | 1750 |
|  | 25                 |                              | 15000 | 20000 | 11500 | 9500  | 5300  | 2400 |
|  | 40                 |                              |       | 20000 | 13000 | 13000 | 7500  | 3300 |
|  | 60                 |                              |       |       | 15000 | 13000 | 10000 | 4500 |
|  | 80                 |                              |       |       |       | 13000 | 12000 | 5700 |
|  | 100                |                              |       |       |       | 13000 | 12000 | 7000 |
|  | 125                |                              |       |       |       |       | 12000 | 8000 |
| Setpoint 7" w.c.<br>1" w.c. Droop<br>Blue Spring<br>5" to 8½" w.c.<br><b>143-16-021-04</b>   | 12                 | 2000                         | 1800  | 1400  | 1100  | 700   | 500   |      |
|  | 1                  | 3400                         | 3000  | 2200  | 2000  | 1200  | 750   | 400  |
|  | 2                  | 6000                         | 5600  | 4000  | 3200  | 2000  | 1250  | 600  |
|  | 5                  | 11000                        | 11000 | 8000  | 6000  | 3700  | 2100  | 1000 |
|  | 10                 | 12500                        | 14000 | 12000 | 8400  | 5600  | 3300  | 1400 |
|  | 15                 | 14000                        | 15000 | 15000 | 10000 | 7100  | 4000  | 1750 |
|  | 25                 |                              | 15000 | 20000 | 11500 | 9500  | 5300  | 2400 |
|  | 40                 |                              |       | 20000 | 13500 | 12000 | 7500  | 3200 |
|  | 60                 |                              |       |       | 15000 | 13000 | 10000 | 4400 |
|  | 80                 |                              |       |       |       | 13000 | 12000 | 5600 |
|  | 100                |                              |       |       |       | 13000 | 12000 | 7000 |
|  | 125                |                              |       |       |       |       | 12000 | 8000 |
| Setpoint 11" w.c.<br>2" w.c. Droop<br>Green Spring<br>6" to 14" w.c.<br><b>143-16-021-05</b> | 1                  | 3400                         | 3000  | 2100  | 1950  | 1150  | 750   | 400  |
|  | 2                  | 5600                         | 4700  | 3700  | 3400  | 2000  | 1200  | 600  |
|  | 5                  | 10500                        | 9000  | 7800  | 6900  | 3500  | 2100  | 1000 |
|  | 10                 | 13000                        | 13000 | 12000 | 9200  | 5500  | 3200  | 1600 |
|  | 15                 | 14000                        | 14000 | 15000 | 10500 | 7000  | 4000  | 1800 |
|  | 25                 |                              | 15000 | 20000 | 12000 | 9500  | 5300  | 2400 |
|  | 40                 |                              |       | 20000 | 14500 | 12500 | 7500  | 3200 |
|  | 60                 |                              |       |       | 15500 | 13000 | 10000 | 4400 |
|  | 80                 |                              |       |       |       | 14000 | 12000 | 5600 |
|  | 100                |                              |       |       |       | 14000 | 12000 | 7000 |
|  | 125                |                              |       |       |       |       | 12000 | 8000 |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the optimum performance range.

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

### Model 243 Capacity Tables

**2" Models 243-12-1 and 243-12-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring   | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |       |       |
|--|--------------------|------------------------------|-------|-------|-------|-------|-------|-------|
|  |                    | 1¼"                          | 1"    | ¾"    | ¾"    | ½"    | ⅜"    | ¼"    |
|  |                    | 30°                          | 30°   | 30°   | 10°   | 10°   | 10°   | 10°   |
| Setpoint 18" w.c.<br>3" w.c. Droop<br>Orange Spring<br>12" to 28" w.c.<br><b>143-16-021-06</b> | 1                  | 2500                         | 2000  | 1400  | 1200  | 950   | 650   |       |
|  | 2                  | 4200                         | 3400  | 2700  | 2400  | 1500  | 1000  | 500   |
|  | 5                  | 8000                         | 7100  | 5600  | 4700  | 2800  | 1800  | 950   |
|  | 10                 | 12000                        | 12000 | 10500 | 7500  | 4800  | 2900  | 1400  |
|  | 15                 | 13500                        | 14500 | 15000 | 9500  | 6500  | 3900  | 1700  |
|  | 25                 |                              | 16500 | 20000 | 11500 | 9200  | 5300  | 2300  |
|  | 40                 |                              |       | 20000 | 13500 | 12000 | 7500  | 3200  |
|  | 60                 |                              |       |       | 15000 | 13000 | 10000 | 4400  |
|  | 80                 |                              |       |       |       | 14000 | 12000 | 5600  |
|  | 100                |                              |       |       |       |       | 14000 | 12000 |
| 125  |                    |                              |       |       |       |       | 12000 | 8000  |
| Setpoint 1 psi<br>0.31 psi Droop<br>Orange Spring<br>12" to 28" w.c.<br><b>143-16-021-06</b>   | 2                  | 6500                         | 5000  | 4000  | 4000  | 2000  | 1300  | 500   |
|  | 5                  | 8000                         | 7500  | 6000  | 6000  | 4000  | 2200  | 1000  |
|  | 10                 | 9000                         | 8500  | 8000  | 8000  | 5500  | 3000  | 1400  |
|  | 15                 | 12000                        | 11000 | 10000 | 10000 | 7000  | 4000  | 1800  |
|  | 25                 |                              | 13500 | 12500 | 11500 | 9500  | 5500  | 2400  |
|  | 40                 |                              |       | 14000 | 13000 | 11000 | 7400  | 3300  |
|  | 60                 |                              |       |       | 15000 | 13500 | 10000 | 4500  |
|  | 80                 |                              |       |       |       | 15000 | 13000 | 6000  |
|  | 100                |                              |       |       |       | 16000 | 14000 | 7000  |
|  | 125                |                              |       |       |       |       | 14000 | 8500  |
| Setpoint 1 psi<br>0.2 psi Droop<br>Black Spring<br>1 to 2 psi<br><b>143-16-021-07</b>          | 2                  | 3350                         | 3000  | 2000  | 1900  | 1200  | 1000  | 500   |
|  | 5                  | 6600                         | 5900  | 4200  | 3900  | 2400  | 1600  | 1000  |
|  | 10                 | 11000                        | 10000 | 7600  | 6500  | 4100  | 2800  | 1450  |
|  | 15                 | 13000                        | 12000 | 9300  | 8300  | 5600  | 3800  | 1700  |
|  | 25                 |                              | 15000 | 16500 | 11000 | 8500  | 5300  | 2400  |
|  | 40                 |                              |       | 20000 | 14000 | 12500 | 7500  | 3400  |
|  | 60                 |                              |       |       | 15500 | 13000 | 10000 | 4400  |
|  | 80                 |                              |       |       |       | 14000 | 12000 | 5600  |
|  | 100                |                              |       |       |       | 14000 | 12000 | 7000  |
|  | 125                |                              |       |       |       |       | 12000 | 8000  |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance* range.

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

### Model 243 Capacity Tables

**2" Models 243-12-1 and 243-12-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring  | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |       |       |      |
|---|--------------------|------------------------------|-------|-------|-------|-------|-------|-------|------|
|   |                    | 1¼"                          | 1"    | ¾"    | ¾"    | ½"    | ⅜"    | ¼"    |      |
|   |                    | 30°                          | 30°   | 30°   | 10°   | 10°   | 10°   | 10°   |      |
| Setpoint 2 psi<br>0.6 psi Droop<br>Cadmium Spring<br>1½ to 3 psi<br><b>143-16-021-08</b>  | 5                  | 8200                         | 7400  | 5200  | 4800  | 2900  | 1900  | 900   |      |
|   | 10                 | 12500                        | 11300 | 8700  | 7800  | 4800  | 3000  | 1400  |      |
|   | 15                 | 15500                        | 14500 | 11500 | 10000 | 6500  | 3800  | 1700  |      |
|   | 25                 |                              | 18000 | 16500 | 13500 | 9000  | 5300  | 2400  |      |
|   | 40                 |                              |       | 20000 | 16500 | 12500 | 7600  | 3400  |      |
|   | 60                 |                              |       |       | 16500 | 15500 | 10000 | 4600  |      |
|   | 80                 |                              |       |       |       | 16000 | 12000 | 5600  |      |
|   | 100                |                              |       |       |       |       | 16000 | 12000 | 7000 |
|   | 125                |                              |       |       |       |       |       | 12000 | 8000 |
| Setpoint 3 psi<br>0.35 psi Droop<br>Cadmium Spring<br>1½ to 3 psi<br><b>143-16-021-08</b> | 5                  | 3500                         | 3000  | 2000  | 1800  | 1400  | 1100  | 750   |      |
|   | 10                 | 8000                         | 7000  | 5500  | 5000  | 3000  | 2000  | 1100  |      |
|   | 15                 | 10500                        | 10000 | 8000  | 7000  | 4000  | 3000  | 1600  |      |
|   | 25                 |                              | 11500 | 9800  | 9000  | 5600  | 4500  | 2000  |      |
|   | 40                 |                              |       | 21500 | 20000 | 10500 | 7500  | 3500  |      |
|   | 60                 |                              |       |       | 21000 | 14500 | 10500 | 4500  |      |
|   | 80                 |                              |       |       |       | 18000 | 13500 | 6000  |      |
|   | 100                |                              |       |       |       |       | 20500 | 16400 | 7500 |
|   | 125                |                              |       |       |       |       |       | 19000 | 9000 |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance* range.

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



### Model 243 Capacity Tables

**1½" Models 243-12-1 and 243-12-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F)

| Outlet Pressure and Spring   | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |       |       |      |
|--|--------------------|------------------------------|-------|-------|-------|-------|-------|-------|------|
|  |                    | 1¼"                          | 1"    | ¾"    | ½"    | ⅜"    | ¼"    |       |      |
|  |                    | 30°                          | 30°   | 10°   | 10°   | 10°   | 10°   |       |      |
| Setpoint 6" w.c.<br>1" w.c. Droop<br>Red Spring<br>3½" to 6½" w.c.<br><b>143-16-021-03</b>   | 12                 | 2000                         | 1600  | 1300  | 700   | 500   |       |       |      |
|  | 1                  | 2800                         | 2500  | 2100  | 1200  | 800   | 400   |       |      |
|  | 2                  | 4000                         | 3500  | 3200  | 2100  | 1300  | 600   |       |      |
|  | 5                  | 6100                         | 5600  | 4800  | 3700  | 2200  | 1000  |       |      |
|  | 10                 | 8200                         | 7700  | 6500  | 5600  | 3100  | 1400  |       |      |
|  | 15                 | 9300                         | 9300  | 7400  | 6800  | 3900  | 1750  |       |      |
|  | 25                 |                              | 11000 | 9100  | 8100  | 5100  | 2400  |       |      |
|  | 40                 |                              |       | 10500 | 9800  | 7100  | 3200  |       |      |
|  | 60                 |                              |       |       | 12000 | 11000 | 9300  | 4400  |      |
|  | 80                 |                              |       |       |       | 12000 | 10500 | 5600  |      |
|  | 100                |                              |       |       |       |       | 11000 | 7000  |      |
|  | 125                |                              |       |       |       |       |       | 11000 | 8000 |
| Setpoint 7" w.c.<br>1" w.c. Droop<br>Blue Spring<br>5" to 8½" w.c.<br><b>143-16-021-04</b>   | 12                 | 1800                         | 1550  | 1100  | 600   | 500   |       |       |      |
|  | 1                  | 2600                         | 2300  | 1850  | 1100  | 750   | 400   |       |      |
|  | 2                  | 3800                         | 3300  | 2600  | 1900  | 1250  | 600   |       |      |
|  | 5                  | 5700                         | 5100  | 4200  | 3300  | 2100  | 1000  |       |      |
|  | 10                 | 8200                         | 7600  | 6000  | 5400  | 3100  | 1400  |       |      |
|  | 15                 | 9300                         | 9100  | 7000  | 6600  | 3900  | 1750  |       |      |
|  | 25                 |                              | 11000 | 8400  | 7800  | 5100  | 2400  |       |      |
|  | 40                 |                              |       | 10000 | 9500  | 7100  | 3200  |       |      |
|  | 60                 |                              |       |       | 10500 | 10500 | 9300  | 4400  |      |
|  | 80                 |                              |       |       |       | 11500 | 10500 | 5600  |      |
|  | 100                |                              |       |       |       |       | 12000 | 11000 | 7000 |
|  | 125                |                              |       |       |       |       |       | 11000 | 8000 |
| Setpoint 11" w.c.<br>2" w.c. Droop<br>Green Spring<br>6" to 14" w.c.<br><b>143-16-021-05</b> | 1                  | 2700                         | 2300  | 1900  | 1100  | 750   | 400   |       |      |
|  | 2                  | 4000                         | 3500  | 2700  | 1900  | 1200  | 600   |       |      |
|  | 5                  | 6000                         | 5600  | 4500  | 3500  | 2100  | 1000  |       |      |
|  | 10                 | 8800                         | 8200  | 6500  | 5500  | 2900  | 1400  |       |      |
|  | 15                 | 10000                        | 9800  | 7700  | 6800  | 3800  | 1750  |       |      |
|  | 25                 |                              | 11500 | 9700  | 8100  | 5100  | 2400  |       |      |
|  | 40                 |                              |       | 11500 | 9700  | 7100  | 3200  |       |      |
|  | 60                 |                              |       |       | 12500 | 11500 | 9300  | 4400  |      |
|  | 80                 |                              |       |       |       | 12000 | 10500 | 5600  |      |
|  | 100                |                              |       |       |       |       | 12500 | 11000 | 7000 |
|  | 125                |                              |       |       |       |       |       | 11000 | 8000 |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the optimum performance range.

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

### Model 243 Capacity Tables

**1½" Models 243-12-1 and 243-12-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring   | Inlet Pressure psi  | Orifice Size and Valve Angle |       |       |       |       |      |
|--|---|------------------------------|-------|-------|-------|-------|------|
|  |   | 1¼"                          | 1"    | ¾"    | ½"    | ⅜"    | ¼"   |
|  |   | 30°                          | 30°   | 10°   | 10°   | 10°   | 10°  |
| Setpoint 18" w.c.<br>3" w.c. Droop<br>Orange Spring<br>12" to 28" w.c.<br><b>143-16-021-06</b> | 1   | 1800                         | 1300  | 1100  | 800   | 500   |      |
|  | 2   | 3000                         | 2800  | 2200  | 1500  | 1000  | 500  |
|  | 5   | 5600                         | 5200  | 4200  | 2600  | 1800  | 950  |
|  | 10  | 8600                         | 7700  | 6000  | 4300  | 2900  | 1400 |
|  | 15  | 10000                        | 9300  | 7400  | 5800  | 3800  | 1750 |
|  | 25  |                              | 11500 | 9100  | 7800  | 5100  | 2400 |
|  | 40  |                              |       | 11000 | 9500  | 7100  | 3200 |
|  | 60  |                              |       | 12500 | 11000 | 9300  | 4400 |
|  | 80  |                              |       |       | 12500 | 10500 | 5600 |
|  | 100   |                              |       |       | 13000 | 11000 | 7000 |
|  | 125   |                              |       |       |       | 11000 | 8000 |
| Setpoint 1 psi<br>0.31 psi Droop<br>Orange Spring<br>12" to 28" w.c.<br><b>143-16-021-06</b>   | 2   | 6500                         | 5000  | 4000  | 2000  | 1300  | 500  |
|  | 5   | 8000                         | 7500  | 6000  | 4000  | 2200  | 1000 |
|  | 10  | 9000                         | 8500  | 8000  | 5500  | 3000  | 1400 |
|  | 15  | 12000                        | 11500 | 10000 | 7000  | 4000  | 1800 |
|  | 25  |                              | 13500 | 11500 | 9500  | 5500  | 2400 |
|  | 40  |                              |       | 13000 | 11000 | 7400  | 3300 |
|  | 60  |                              |       | 15000 | 13500 | 10000 | 4500 |
|  | 80  |                              |       |       | 15000 | 13000 | 6000 |
|  | 100   |                              |       |       | 16000 | 14000 | 7000 |
|  | 125   |                              |       |       |       | 14000 | 8500 |
|  | Setpoint 1 psi<br>0.2 psi Droop<br>Black Spring<br>1 to 2 psi<br><b>143-16-021-07</b> | 2                            | 2800  | 2450  | 1500  | 1200  | 850  |
| 5  |   | 5500                         | 5100  | 3700  | 2400  | 1600  | 950  |
| 10   |   | 8000                         | 7500  | 5700  | 4000  | 2700  | 1400 |
| 15   |   | 10000                        | 9100  | 7100  | 5300  | 3700  | 1750 |
| 25   |   |                              | 11000 | 9300  | 7300  | 5100  | 2400 |
| 40   |   |                              |       | 11000 | 9300  | 7100  | 3200 |
| 60   |   |                              |       | 12500 | 11000 | 9300  | 4600 |
| 80   |   |                              |       |       | 12500 | 10500 | 5600 |
| 100  |   |                              |       |       | 13000 | 11000 | 7000 |
| 125  |   |                              |       |       |       | 11000 | 8000 |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance* range.

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

### Model 243 Capacity Tables

**1½" Models 243-12-1 and 243-12-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring  | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |      |
|---|--------------------|------------------------------|-------|-------|-------|-------|------|
|   |                    | 1¼"                          | 1"    | ¾"    | ½"    | ⅜"    | ¼"   |
|   |                    | 30°                          | 30°   | 10°   | 10°   | 10°   | 10°  |
| Setpoint 3 psi<br>0.35 psi Droop<br>Cadmium Spring<br>1½ to 3 psi<br><b>143-16-021-08</b> | 5                  | 3500                         | 3000  | 2000  | 1400  | 1100  | 500  |
|   | 10                 | 7000                         | 6000  | 5000  | 2500  | 2000  | 1000 |
|   | 15                 | 9000                         | 8000  | 7000  | 3500  | 2500  | 1500 |
|   | 25                 |                              | 10000 | 8000  | 4800  | 4500  | 1900 |
|   | 40                 |                              |       | 11500 | 6500  | 6000  | 3500 |
|   | 60                 |                              |       | 14000 | 8000  | 7500  | 4500 |
|   | 80                 |                              |       |       | 9000  | 8000  | 6000 |
|   | 100                |                              |       |       | 12000 | 11000 | 7000 |
|   | 125                |                              |       |       |       | 12000 | 8500 |
| Setpoint 2 psi<br>0.6 psi Droop<br>Cadmium Spring<br>1½ to 3 psi<br><b>143-16-021-08</b>  | 5                  | 6000                         | 5300  | 4100  | 2700  | 1700  | 900  |
|   | 10                 | 10000                        | 9300  | 7100  | 4700  | 2900  | 1400 |
|   | 15                 | 13000                        | 12000 | 8800  | 6200  | 3800  | 1700 |
|   | 25                 |                              | 14500 | 11000 | 8600  | 5200  | 2400 |
|   | 40                 |                              |       | 13500 | 11000 | 7100  | 3200 |
|   | 60                 |                              |       | 15000 | 13500 | 10000 | 4600 |
|   | 80                 |                              |       |       | 15000 | 12000 | 5600 |
|   | 100                |                              |       |       | 16000 | 12000 | 7000 |
|   | 125                |                              |       |       |       | 12000 | 8000 |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance* range.

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

### Model 243 Capacity Tables

#### 1¼", 1½" and 2" Model 243-12-1 with External Control Line in SCFH of Natural Gas

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

| Outlet Pressure and Spring   | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |      |
|--|--------------------|------------------------------|-------|-------|-------|-------|------|
|  |                    | 1¼"                          | 1"    | ¾"    | ½"    | ⅜"    | ¼"   |
|  |                    | 10°                          | 10°   | 10°   | 10°   | 10°   | 10°  |
| Setpoint 6" w.c.<br>1" w.c. Droop<br>Red Spring<br>3½" to 6½" w.c.<br><b>143-16-021-03</b>   | 12                 | 2200                         | 1900  | 1600  | 800   | 500   |      |
|  | 1                  | 3600                         | 3200  | 2300  | 1300  | 850   | 400  |
|  | 2                  | 5600                         | 4700  | 3500  | 2000  | 1400  | 600  |
|  | 5                  | 10500                        | 8200  | 5700  | 3500  | 2200  | 1000 |
|  | 10                 | 15000                        | 12000 | 8900  | 5200  | 3000  | 1500 |
|  | 15                 | 19000                        | 16000 | 12000 | 6700  | 4000  | 1750 |
|  | 25                 | 22000                        | 20000 | 16000 | 9000  | 5200  | 2400 |
|  | 40                 |                              | 24000 | 21000 | 12000 | 7500  | 3200 |
|  | 60                 |                              |       | 27000 | 15500 | 10000 | 4400 |
|  | 80                 |                              |       |       | 17000 | 12000 | 5700 |
|  | 100                |                              |       |       | 19000 | 13500 | 7000 |
|  | 125                |                              |       |       |       | 15000 | 8000 |
| Setpoint 7" w.c.<br>1" w.c. Droop<br>Blue Spring<br>5" to 8½" w.c.<br><b>143-16-021-04</b>   | 12                 | 2000                         | 1700  | 1500  | 700   | 450   |      |
|  | 1                  | 3100                         | 2600  | 2000  | 1100  | 750   | 400  |
|  | 2                  | 5000                         | 3800  | 3000  | 1700  | 1200  | 600  |
|  | 5                  | 7800                         | 6500  | 5000  | 3100  | 2000  | 1000 |
|  | 10                 | 13000                        | 10000 | 7000  | 4800  | 2900  | 1500 |
|  | 15                 | 15000                        | 14000 | 9400  | 6400  | 4000  | 1750 |
|  | 25                 | 20000                        | 17000 | 13500 | 8500  | 5200  | 2400 |
|  | 40                 |                              | 21000 | 17000 | 11500 | 7500  | 3200 |
|  | 60                 |                              |       | 19000 | 15000 | 10000 | 4400 |
|  | 80                 |                              |       |       | 17000 | 12000 | 5700 |
|  | 100                |                              |       |       | 19000 | 13500 | 7000 |
|  | 125                |                              |       |       |       | 15000 | 8000 |
| Setpoint 11" w.c.<br>2" w.c. Droop<br>Green Spring<br>6" to 14" w.c.<br><b>143-16-021-05</b> | 1                  | 3200                         | 2500  | 1900  | 1100  | 700   | 350  |
|  | 2                  | 5200                         | 4200  | 3200  | 1800  | 1300  | 550  |
|  | 5                  | 8500                         | 7200  | 5200  | 3200  | 2000  | 1000 |
|  | 10                 | 13500                        | 11000 | 8000  | 5000  | 3000  | 1500 |
|  | 15                 | 16000                        | 14000 | 11000 | 6500  | 4000  | 1750 |
|  | 25                 | 20000                        | 17000 | 14000 | 9000  | 5200  | 2400 |
|  | 40                 |                              | 24000 | 21000 | 12000 | 7000  | 3200 |
|  | 60                 |                              |       | 25000 | 15000 | 9800  | 4400 |
|  | 80                 |                              |       |       | 17000 | 12000 | 5700 |
|  | 100                |                              |       |       | 19000 | 13500 | 7000 |
|  | 125                |                              |       |       |       | 15000 | 8000 |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the optimum performance range.

\* 2" Body Only.

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

### Model 243 Capacity Tables

#### 1 1/4", 1 1/2" and 2" Model 243-12-1 with External Control Line in SCFH of Natural Gas

(0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring  | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |      |
|---|--------------------|------------------------------|-------|-------|-------|-------|------|
|   |                    | 1 1/4"                       | 1"    | 3/4"  | 1/2"  | 3/8"  | 1/4" |
|   |                    | 10°                          | 10°   | 10°   | 10°   | 10°   | 10°  |
| Setpoint 18" w.c.<br>3" w.c. Droop<br>Orange Spring<br>12" to 28" w.c.<br>143-16-021-06 | 1                  | 2400                         | 2000  | 1200  | 900   | 600   | 300  |
|   | 2                  | 4200                         | 3200  | 2000  | 1500  | 1000  | 500  |
|   | 5                  | 6500                         | 5500  | 4100  | 2700  | 1600  | 950  |
|   | 10                 | 11000                        | 8000  | 6200  | 4200  | 2800  | 1500 |
|   | 15                 | 14500                        | 11000 | 8000  | 5800  | 3800  | 1750 |
|   | 25                 | 18000                        | 15000 | 11500 | 8000  | 5000  | 2400 |
|   | 40                 |                              | 21000 | 15000 | 11000 | 7000  | 3200 |
|   | 60                 |                              |       | 20000 | 15000 | 9800  | 4400 |
|   | 80                 |                              |       |       | 17000 | 12000 | 5700 |
|   | 100                |                              |       |       | 19000 | 13500 | 7000 |
|   | 125                |                              |       |       |       | 15000 | 8000 |
| Setpoint 1 psi<br>0.2 psi Droop<br>Black Spring<br>1 to 2 psi<br>143-16-021-07          | 2                  | 3500                         | 2900  | 1700  | 1300  | 850   | 500  |
|   | 5                  | 7000                         | 5400  | 4000  | 2600  | 1600  | 950  |
|   | 10                 | 10500                        | 8500  | 5800  | 4000  | 2800  | 1500 |
|   | 15                 | 14500                        | 10500 | 7600  | 5400  | 3800  | 1750 |
|   | 25                 | 18000                        | 14500 | 10500 | 7500  | 5000  | 2400 |
|   | 40                 |                              | 20000 | 15000 | 10500 | 7000  | 3200 |
|   | 60                 |                              |       | 20000 | 15000 | 9800  | 4400 |
|   | 80                 |                              |       |       | 17000 | 12000 | 5700 |
|   | 100                |                              |       |       | 19000 | 13500 | 7000 |
|   | 125                |                              |       |       |       | 15000 | 8000 |
| Setpoint 2 psi<br>0.6 psi Droop<br>Cadmium Spring<br>1 1/2 to 3 psi<br>143-16-021-08    | 5                  | 8600                         | 6800  | 5300  | 2700  | 1900  | 850  |
|   | 10                 | 13000                        | 10500 | 7500  | 4500  | 2900  | 1400 |
|   | 15                 | 17500                        | 13500 | 10500 | 6000  | 3800  | 1750 |
|   | 25                 | 25000                        | 20000 | 14000 | 8500  | 5000  | 2400 |
|   | 40                 |                              | 25000 | 20000 | 12000 | 7000  | 3200 |
|   | 60                 |                              |       | 25000 | 15000 | 10000 | 4400 |
|   | 80                 |                              |       |       | 17000 | 12000 | 5700 |
|   | 100                |                              |       |       | 19000 | 13500 | 7000 |
| 125   |                    |                              |       |       | 15000 | 8000  |      |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the optimum performance range.

\* 2" Body Only.

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

### Model 243 Capacity Tables

**1½" and 2" Model 243-8-1 and 243-8-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F)

| Outlet Pressure and Spring   | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |      |        |
|--|--------------------|------------------------------|-------|-------|-------|------|--------|
|  |                    | 1"                           | ¾"    | ½"    | ⅜"    | ¼"   | 0.207" |
|  |                    | 30°                          | 10°   | 10°   | 10°   | 10°  | 10°    |
| Setpoint 6" w.c.<br>1" w.c. Droop<br>Red-Black Spring<br>3½" to 6½" w.c.<br><b>143-82-021-00</b>   | 12                 | 1100                         | 900   | 700   | 500   |      |        |
|  | 1                  | 1950                         | 1600  | 1050  | 750   | 350  |        |
|  | 2                  | 3200                         | 2400  | 1550  | 1000  | 550  | 350    |
|  | 5                  | 5200                         | 3900  | 2700  | 1900  | 950  | 550    |
|  | 10                 | 7400                         | 5800  | 4500  | 3000  | 1350 | 900    |
|  | 15                 | 9100                         | 7100  | 5800  | 3800  | 1700 | 1150   |
|  | 25                 | 12500                        | 8700  | 7200  | 5100  | 2400 | 1500   |
|  | 40                 |                              | 10500 | 9200  | 7100  | 3200 | 2100   |
|  | 60                 |                              |       | 11000 | 9300  | 4400 | 2900   |
|  | 80                 |                              |       | 11500 | 10500 | 5600 | 3700   |
|  | 100                |                              |       |       | 11000 | 7000 | 4500   |
|  | 125                |                              |       |       |       | 8000 | 5600   |
| Setpoint 7" w.c.<br>1" w.c. Droop<br>Blue-Black Spring<br>5" to 8½" w.c.<br><b>143-82-021-01</b>   | 12                 | 1000                         | 750   | 650   | 400   |      |        |
|  | 1                  | 1600                         | 1150  | 900   | 650   | 300  |        |
|  | 2                  | 2700                         | 1800  | 1350  | 950   | 450  | 350    |
|  | 5                  | 4800                         | 3500  | 2350  | 1600  | 770  | 500    |
|  | 10                 | 7000                         | 5400  | 3900  | 2500  | 1250 | 900    |
|  | 15                 | 9100                         | 7000  | 5000  | 3500  | 1700 | 1150   |
|  | 25                 | 12500                        | 8700  | 6600  | 5100  | 2400 | 1500   |
|  | 40                 |                              | 10500 | 9000  | 7100  | 3200 | 2100   |
|  | 60                 |                              |       | 11000 | 9300  | 4400 | 2900   |
|  | 80                 |                              |       | 11500 | 10500 | 5600 | 3700   |
|  | 100                |                              |       |       | 11000 | 7000 | 4500   |
|  | 125                |                              |       |       |       | 8000 | 5600   |
| Setpoint 11" w.c.<br>2" w.c. Droop<br>Green-Black Spring<br>6" to 14" w.c.<br><b>143-82-021-02</b> | 1                  | 1650                         | 1150  | 1000  | 650   | 300  |        |
|  | 2                  | 2700                         | 2000  | 1400  | 1000  | 450  | 350    |
|  | 5                  | 4800                         | 3800  | 2600  | 1750  | 900  | 600    |
|  | 10                 | 7000                         | 5400  | 4200  | 2800  | 1300 | 900    |
|  | 15                 | 9000                         | 7400  | 5500  | 3600  | 1700 | 1100   |
|  | 25                 | 11000                        | 8800  | 7500  | 5100  | 2400 | 1500   |
|  | 40                 |                              | 11000 | 9600  | 7100  | 3200 | 2100   |
|  | 60                 |                              |       | 11000 | 9300  | 4400 | 2900   |
|  | 80                 |                              |       | 11500 | 10500 | 5600 | 3700   |
|  | 100                |                              |       |       | 11000 | 7000 | 4500   |
|  | 125                |                              |       |       |       | 8000 | 5600   |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the optimum performance range.

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

### Model 243 Capacity Tables

**1½" Models 243-8-1 and 243-8-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F)

| Outlet Pressure and Spring  | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |      |        |
|---|--------------------|------------------------------|-------|-------|-------|------|--------|
|   |                    | 1"                           | ¾"    | ½"    | ¾"    | ¼"   | 0.207" |
|   |                    | 30°                          | 10°   | 10°   | 10°   | 10°  | 10°    |
| Setpoint 18" w.c.<br>3" w.c. Droop<br>Green Spring<br>12" to 28" w.c.<br><b>143-16-021-05</b> | 1                  | 1500                         | 1100  | 800   | 550   |      |        |
|   | 2                  | 2100                         | 1700  | 1300  | 900   | 450  | 350    |
|   | 5                  | 4500                         | 3400  | 2000  | 1350  | 850  | 600    |
|   | 10                 | 6600                         | 5700  | 3500  | 2400  | 1300 | 850    |
|   | 15                 | 8800                         | 7100  | 5000  | 3400  | 1700 | 1050   |
|   | 25                 | 11500                        | 9100  | 7100  | 5100  | 2400 | 1500   |
|   | 40                 |                              | 11000 | 9300  | 7100  | 3200 | 2100   |
|   | 60                 |                              |       | 11000 | 9400  | 4400 | 2900   |
|   | 80                 |                              |       | 12000 | 10500 | 5600 | 3700   |
|   | 100                |                              |       |       | 11000 | 7000 | 4500   |
| 125   |                    |                              |       |       | 8000  | 5600 |        |
| Setpoint 1 psi<br>0.31 psi Droop<br>Green Spring<br>12" to 28" w.c.<br><b>143-16-021-05</b>   | 2                  | 4000                         | 3500  | 1800  | 1200  | 500  |        |
|   | 5                  | 6000                         | 5000  | 3500  | 2200  | 1000 |        |
|   | 10                 | 7500                         | 7000  | 5000  | 3000  | 1500 |        |
|   | 15                 | 9000                         | 8000  | 6500  | 4000  | 1850 |        |
|   | 25                 | 12000                        | 10000 | 8000  | 5000  | 2000 |        |
|   | 40                 |                              | 12500 | 9500  | 7000  | 3000 |        |
|   | 60                 |                              |       | 11500 | 9500  | 4500 |        |
|   | 80                 |                              |       | 12500 | 11500 | 6000 |        |
|   | 100                |                              |       |       | 12500 | 7000 |        |
|   | 125                |                              |       |       |       | 8000 |        |
| Setpoint 1 psi<br>0.2 psi Droop<br>Orange Spring<br>1 to 2 psi<br><b>143-16-021-06</b>        | 2                  | 2100                         | 1650  | 1200  | 850   | 450  |        |
|   | 5                  | 4000                         | 3200  | 2100  | 1300  | 850  | 550    |
|   | 10                 | 6500                         | 5200  | 3100  | 2200  | 1300 | 800    |
|   | 15                 | 8400                         | 6500  | 4400  | 3000  | 1700 | 1000   |
|   | 25                 | 11000                        | 8600  | 6500  | 4400  | 2400 | 1500   |
|   | 40                 |                              | 11000 | 8600  | 6700  | 3200 | 2100   |
|   | 60                 |                              |       | 10500 | 9000  | 4400 | 2900   |
|   | 80                 |                              |       | 11500 | 10500 | 5600 | 3700   |
|   | 100                |                              |       |       | 11000 | 7000 | 4500   |
|   | 125                |                              |       |       |       | 8000 | 5600   |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance* range.

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

### Model 243 Capacity Tables

**1½" Models 243-8-1 and 243-8-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring  | Inlet Pressure psi   | Orifice Size and Valve Angle |       |       |       |      |        |
|---|--|------------------------------|-------|-------|-------|------|--------|
|   |  | 1"                           | ¾"    | ½"    | ⅜"    | ¼"   | 0.207" |
|   |  | 30°                          | 10°   | 10°   | 10°   | 10°  | 10°    |
| Setpoint 3 psi<br>0.35 psi Droop<br>Black Spring<br>2 to 4¼ psi<br><b>143-16-021-07</b> | 5  | 3000                         | 1800  | 1200  | 1100  | 900  |        |
|   | 10   | 4000                         | 2500  | 1800  | 1500  | 1000 |        |
|   | 15   | 5200                         | 4000  | 2850  | 2000  | 1400 |        |
|   | 25   | 7000                         | 5200  | 3600  | 3100  | 1800 |        |
|   | 40   |                              | 9000  | 5000  | 4200  | 2200 |        |
|   | 60   |                              |       | 8300  | 6500  | 3000 |        |
|   | 80   |                              |       | 10000 | 8500  | 5000 |        |
|   | 100  |                              |       |       | 9000  | 6000 |        |
|   | 125  |                              |       |       |       | 8000 |        |
|   | Setpoint 3 psi<br>0.6 psi Droop<br>Black Spring<br>2 to 4¼ psi<br><b>143-16-021-07</b> | 5                            | 4400  | 3400  | 2400  | 1600 | 800    |
| 10  |  | 7100                         | 5900  | 3600  | 2400  | 1300 | 750    |
| 15  |  | 9600                         | 7500  | 4800  | 3400  | 1700 | 1000   |
| 25  |  | 12500                        | 10500 | 6500  | 5000  | 2400 | 1500   |
| 40  |  |                              | 13000 | 9600  | 7000  | 3200 | 2100   |
| 60  |  |                              |       | 12500 | 9300  | 4400 | 2900   |
| 80  |  |                              |       | 13500 | 11000 | 5600 | 3700   |
| 100   |  |                              |       |       | 12000 | 7000 | 4500   |
| 125   |  |                              |       |       |       | 8000 | 5600   |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance* range.

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



### Model 243 Capacity Tables

#### 1¼" Models 243-8-1, 243-8-2, 243-12-1 and 243-12-2 in SCFH of Natural Gas

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

| Outlet Pressure and Spring<br>243-12  | Outlet Pressure and Spring<br>243-8   | Inlet Pressure<br>psi | Orifice Size and Valve Angle |      |      |      |        |
|---|---|-----------------------|------------------------------|------|------|------|--------|
|   |   |                       | ¾"                           | ½"   | ⅜"   | ¼"   | 0.207" |
|   |   |                       | 10°                          | 10°  | 10°  | 10°  | 10°    |
| Setpoint 6" w.c.<br>1" w.c. Droop<br>Red Spring<br>3½" to 6" w.c.<br>143-16-021-03    | Setpoint 6" w.c.<br>1" w.c. Droop<br>Red-Black Spring<br>3½" to 6½" w.c.<br>143-82-021-00   | 1/2                   | 900                          | 700  | 500  |      |        |
|   |   | 1                     | 1600                         | 1050 | 750  | 350  |        |
|   |   | 2                     | 2250                         | 1500 | 1000 | 550  | 350    |
|   |   | 5                     | 2500                         | 2200 | 1900 | 950  | 550    |
|   |   | 10                    | 3100                         | 2900 | 2650 | 1350 | 900    |
|   |   | 15                    | 3550                         | 3600 | 2700 | 1700 | 1050   |
|   |   | 25                    | 4200                         | 3800 | 3300 | 2400 | 1500   |
|   |   | 40                    | 4200                         | 4100 | 3800 | 3200 | 2100   |
|   |   | 60                    |                              | 4800 | 4400 | 4400 | 2900   |
|   |   | 80                    |                              | 5600 | 5600 | 5600 | 3700   |
|   |   | 100                   |                              |      | 6000 | 6000 | 4500   |
| 125   |   |                       |                              | 6000 | 5600 |      |        |
| Setpoint 7" w.c.<br>1" w.c. Droop<br>Blue Spring<br>5" to 8½" w.c.<br>143-16-021-04   | Setpoint 7" w.c.<br>1" w.c. Droop<br>Blue-Black Spring<br>5" to 8½" w.c.<br>143-82-021-01   | 1/2                   | 750                          | 650  | 400  |      |        |
|   |   | 1                     | 1150                         | 900  | 650  | 300  |        |
|   |   | 2                     | 1700                         | 1300 | 950  | 450  | 350    |
|   |   | 5                     | 2300                         | 1900 | 1600 | 770  | 500    |
|   |   | 10                    | 2900                         | 2600 | 2200 | 1250 | 900    |
|   |   | 15                    | 3500                         | 3100 | 2500 | 1700 | 1050   |
|   |   | 25                    | 4200                         | 3600 | 3300 | 2400 | 1500   |
|   |   | 40                    | 4800                         | 4000 | 3800 | 3200 | 2100   |
|   |   | 60                    |                              | 4600 | 4400 | 4400 | 2900   |
|   |   | 80                    |                              | 5600 | 5600 | 5600 | 3700   |
|   |   | 100                   |                              |      | 6000 | 6000 | 4500   |
| 125   |   |                       |                              | 6000 | 5600 |      |        |
| Setpoint 11" w.c.<br>2" w.c. Droop<br>Green Spring<br>6" to 14" w.c.<br>143-16-021-05 | Setpoint 11" w.c.<br>2" w.c. Droop<br>Green-Black Spring<br>6" to 14" w.c.<br>143-82-021-02 | 1                     | 1150                         | 1000 | 650  | 300  |        |
|   |   | 2                     | 1850                         | 1350 | 1000 | 450  | 350    |
|   |   | 5                     | 2500                         | 2200 | 1750 | 800  | 550    |
|   |   | 10                    | 2900                         | 2700 | 2450 | 1300 | 900    |
|   |   | 15                    | 3700                         | 3950 | 2600 | 1700 | 1100   |
|   |   | 25                    | 4250                         | 4000 | 3300 | 2400 | 1500   |
|   |   | 40                    | 5300                         | 4200 | 3800 | 3200 | 2100   |
|   |   | 60                    |                              | 4850 | 4400 | 4400 | 2900   |
|   |   | 80                    |                              | 5850 | 5600 | 5600 | 3700   |
|   |   | 100                   |                              |      | 6000 | 7000 | 4500   |
|   |   | 125                   |                              |      |      | 8000 | 5600   |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the optimum performance range.

**NOTE:** 1" x 30° and 1¼" x 30° orifice and valve angle are available on the 1¼" 243-12-1 and 243-12-2 models.

**NOTE:** The performance data is based on normal testing at 70°F flowing temperature.

Changes in performance can occur at extreme low flowing temperatures.

### Model 243 Capacity Tables

#### 1¼" Models 243-8-1, 243-8-2, 243-12-1 and 243-12-2 in SCFH of Natural Gas

(0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring<br>243-12  | Outlet Pressure and Spring<br>243-8  | Inlet Pressure<br>psi | Orifice Size and Valve Angle |      |      |      |        |
|---|--|-----------------------|------------------------------|------|------|------|--------|
|   |  |                       | ¾"                           | ½"   | ⅜"   | ¼"   | 0.207" |
|   |  |                       | 10°                          | 10°  | 10°  | 10°  | 10°    |
| Setpoint 18" w.c.<br>3" w.c. Droop<br>Orange Spring<br>12" to 28" w.c.<br>143-16-021-06 | Setpoint 18" w.c.<br>3" w.c. Droop<br>Green Spring<br>12" to 28" w.c.<br>143-16-021-05 | 1                     | 1100                         | 800  | 500  |      |        |
|   |  | 2                     | 1900                         | 1250 | 900  | 450  | 350    |
|   |  | 5                     | 2250                         | 1700 | 1350 | 750  | 550    |
|   |  | 10                    | 2950                         | 2250 | 2100 | 1300 | 850    |
|   |  | 15                    | 3450                         | 3600 | 2450 | 1700 | 1050   |
|   |  | 25                    | 4400                         | 3750 | 3300 | 2400 | 1500   |
|   |  | 40                    | 5300                         | 4100 | 3800 | 3200 | 2100   |
|   |  | 60                    |                              | 4800 | 4400 | 4400 | 2900   |
|   |  | 80                    |                              | 4850 | 5600 | 5600 | 3700   |
|   |  | 100                   |                              |      | 6000 | 7000 | 4500   |
|   |  | 125                   |                              |      |      | 8000 | 5600   |
| Setpoint 1 psi<br>0.31 psi Droop<br>Orange Spring<br>12" to 28" w.c.<br>143-16-021-06   | Setpoint 1 psi<br>0.31 psi Droop<br>Green Spring<br>12" to 28" w.c.<br>143-16-021-05   | 2                     | 3000                         | 1800 | 1200 | 500  |        |
|   |  | 5                     | 4000                         | 3000 | 2000 | 1000 |        |
|   |  | 10                    | 5000                         | 4000 | 3000 | 1500 |        |
|   |  | 15                    | 6000                         | 5100 | 3900 | 1900 |        |
|   |  | 25                    | 7500                         | 6400 | 4500 | 2200 |        |
|   |  | 40                    | 8000                         | 7400 | 6100 | 2600 |        |
|   |  | 60                    |                              | 8000 | 7350 | 4000 |        |
|   |  | 80                    |                              | 8500 | 8000 | 5100 |        |
|   |  | 100                   |                              |      | 8500 | 6500 |        |
|   |  | 125                   |                              |      |      | 7000 |        |
| Setpoint 1 psi<br>0.2 psi Droop<br>Black Spring<br>1 to 2 psi<br>143-16-021-07          | Setpoint 1 psi<br>0.2 psi Droop<br>Orange Spring<br>1 to 2 psi<br>143-16-021-06        | 2                     | 1850                         | 1150 | 850  | 450  |        |
|   |  | 5                     | 2100                         | 1700 | 1350 | 750  | 500    |
|   |  | 10                    | 2700                         | 2000 | 1950 | 1300 | 800    |
|   |  | 15                    | 3150                         | 3100 | 2050 | 1700 | 1000   |
|   |  | 25                    | 4150                         | 3250 | 2850 | 2400 | 1500   |
|   |  | 40                    | 5300                         | 3800 | 3600 | 3200 | 2100   |
|   |  | 60                    |                              | 4600 | 4250 | 4400 | 2900   |
|   |  | 80                    |                              | 4650 | 5600 | 5600 | 3700   |
|   |  | 100                   |                              |      | 6000 | 7000 | 4500   |
|   |  | 125                   |                              |      |      | 8000 | 5600   |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance range*.

**NOTE:** 1" x 30° and 1¼" x 30° orifice and valve angle are available on the 1¼" 243-12-1 and 243-12-2 models.

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

### Model 243 Capacity Tables

#### 1 1/4" Models 243-8-1, 243-8-2, 243-12-1 and 243-12-2 in SCFH of Natural Gas

(0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring<br>243-12   | Outlet Pressure and Spring<br>243-8  | Inlet Pressure<br>psi | Orifice Size and Valve Angle |      |      |      |        |
|--|--|-----------------------|------------------------------|------|------|------|--------|
|  |  |                       | 3/4"                         | 1/2" | 3/8" | 1/4" | 0.207" |
|  |  |                       | 10°                          | 10°  | 10°  | 10°  | 10°    |
| Setpoint 3 psi<br>0.35 psi Droop<br>Cadmium Spring<br>1 1/2 to 3 psi<br><b>143-16-021-08</b> | Setpoint 3 psi<br>0.35 psi Droop<br>Black Spring<br>2 to 4 1/4 psi<br><b>143-16-021-07</b> | 5                     | 1200                         | 1000 | 800  | 500  |        |
|  |  | 10                    | 2000                         | 1800 | 1400 | 1000 |        |
|  |  | 15                    | 3300                         | 2800 | 1800 | 1400 |        |
|  |  | 25                    | 4700                         | 3300 | 2300 | 1650 |        |
|  |  | 40                    | 6300                         | 4900 | 2800 | 2000 |        |
|  |  | 60                    |                              | 5800 | 5000 | 2800 |        |
|  |  | 80                    |                              | 6500 | 6400 | 4600 |        |
|  |  | 100                   |                              |      | 6500 | 4750 |        |
|  |  | 125                   |                              |      |      | 5000 |        |
| Setpoint 3 psi<br>0.6 psi Droop<br>Cadmium Spring<br>1 1/2 to 3 psi<br><b>143-16-021-08</b>  | Setpoint 3 psi<br>0.6 psi Droop<br>Black Spring<br>2 to 4 1/4 psi<br><b>143-16-021-07</b>  | 5                     | 2200                         | 1950 | 1650 | 700  |        |
|  |  | 10                    | 3600                         | 2300 | 2150 | 1300 | 750    |
|  |  | 15                    | 3800                         | 3400 | 2350 | 1700 | 1000   |
|  |  | 25                    | 5000                         | 3900 | 3250 | 2400 | 1500   |
|  |  | 40                    | 6300                         | 4300 | 3700 | 3200 | 2100   |
|  |  | 60                    |                              | 5500 | 4400 | 4400 | 2900   |
|  |  | 80                    |                              | 5500 | 5850 | 5600 | 3700   |
|  |  | 100                   |                              |      | 6550 | 7000 | 4500   |
|  |  | 125                   |                              |      |      | 8000 | 5600   |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance* range.

**NOTE:** 1" x 30° and 1 1/4" x 30° orifice and valve angle are available on the 1 1/4" 243-12-1 and 243-12-2 models.

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

### Model 243 Capacity Tables

**2" Models 243-8-1 and 243-8-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F)

| Outlet Pressure and Spring  | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |      |
|---|--------------------|------------------------------|-------|-------|-------|-------|------|
|   |                    | 1"                           | 3/4"  | 3/4"  | 1/2"  | 3/8"  | 1/4" |
|   |                    | 30°                          | 30°   | 10°   | 10°   | 10°   | 10°  |
| Setpoint 18" w.c.<br>3" w.c. Droop<br>Green Spring<br>12" to 28" w.c.<br><b>143-16-021-05</b> | 1                  | 1500                         | 1200  | 1100  | 800   | 600   |      |
|   | 2                  | 2400                         | 1800  | 1700  | 1250  | 950   | 500  |
|   | 5                  | 5500                         | 3700  | 3500  | 2300  | 1400  | 900  |
|   | 10                 | 9400                         | 8400  | 6000  | 3700  | 2400  | 1400 |
|   | 15                 | 12000                        | 12000 | 8100  | 5600  | 3800  | 1700 |
|   | 25                 | 14500                        | 17500 | 10000 | 8200  | 5600  | 2400 |
|   | 40                 |                              | 20000 | 12000 | 11500 | 7400  | 3400 |
|   | 60                 |                              |       |       | 13500 | 10000 | 4600 |
|   | 80                 |                              |       |       | 14000 | 11000 | 5600 |
|   | 100                |                              |       |       |       | 12000 | 7000 |
| 125   |                    |                              |       |       |       | 8000  |      |
| Setpoint 1 psi<br>0.31 psi Droop<br>Green Spring<br>12" to 28" w.c.<br><b>143-16-021-05</b>   | 2                  | 5000                         | 4000  | 4000  | 3000  | 1000  | 500  |
|   | 5                  | 8000                         | 7000  | 7000  | 4000  | 1900  | 1000 |
|   | 10                 | 14000                        | 12800 | 10000 | 5500  | 3000  | 1500 |
|   | 15                 | 16500                        | 14000 | 13900 | 7750  | 4500  | 1800 |
|   | 25                 | 17700                        | 16900 | 15000 | 9000  | 5500  | 2500 |
|   | 40                 |                              | 18000 | 16500 | 11500 | 7400  | 3200 |
|   | 60                 |                              |       |       | 15000 | 10000 | 4600 |
|   | 80                 |                              |       |       | 17000 | 13800 | 6100 |
|   | 100                |                              |       |       |       | 14000 | 7000 |
|   | 125                |                              |       |       |       |       | 9000 |
| Setpoint 1 psi<br>0.2 psi Droop<br>Orange Spring<br>1 to 2 psi<br><b>143-16-021-06</b>        | 2                  | 2400                         | 1800  | 1700  | 1200  | 850   | 450  |
|   | 5                  | 4000                         | 3400  | 3300  | 2200  | 1300  | 900  |
|   | 10                 | 7000                         | 6000  | 5400  | 3500  | 2200  | 1400 |
|   | 15                 | 11000                        | 9000  | 7000  | 4600  | 3100  | 1700 |
|   | 25                 | 14500                        | 15000 | 10000 | 7400  | 4800  | 2400 |
|   | 40                 |                              | 17500 | 12000 | 10500 | 7000  | 3400 |
|   | 60                 |                              |       |       | 12500 | 9500  | 4600 |
|   | 80                 |                              |       |       | 13500 | 10500 | 5600 |
|   | 100                |                              |       |       |       | 11000 | 7000 |
|   | 125                |                              |       |       |       |       | 8000 |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance range*.

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

### Model 243 Capacity Tables

**2" Models 243-8-1 and 243-8-2 in SCFH of Natural Gas** (0.6 Specific Gravity – 14.65 psia – 60°F) (Continued)

| Outlet Pressure and Spring   | Inlet Pressure psi | Orifice Size and Valve Angle |       |       |       |       |      |
|--|--------------------|------------------------------|-------|-------|-------|-------|------|
|  |                    | 1"                           | 3/4"  | 3/4"  | 1/2"  | 3/8"  | 1/4" |
|  |                    | 30°                          | 30°   | 10°   | 10°   | 10°   | 10°  |
| Setpoint 3 psi<br>0.35 psi Droop<br>Black Spring<br>2 to 4 1/4 psi<br><b>143-16-021-07</b> | 5                  | 2000                         | 1600  | 1600  | 1400  | 1000  | 500  |
|  | 10                 | 4000                         | 3000  | 3000  | 2000  | 1400  | 1000 |
|  | 15                 | 5800                         | 4200  | 4000  | 2600  | 1800  | 1500 |
|  | 25                 | 7500                         | 5200  | 5000  | 3900  | 2750  | 2300 |
|  | 40                 |                              | 9100  | 9000  | 6500  | 5800  | 3100 |
|  | 60                 |                              |       |       | 10000 | 7500  | 4600 |
|  | 80                 |                              |       |       | 14000 | 10000 | 6000 |
|  | 100                |                              |       |       |       | 12000 | 7000 |
|  | 125                |                              |       |       |       |       | 9000 |
| Setpoint 3 psi<br>0.6 psi Droop<br>Black Spring<br>2 to 4 1/4 psi<br><b>143-16-021-07</b>  | 5                  | 4400                         | 3400  | 3300  | 2400  | 1600  | 800  |
|  | 10                 | 7600                         | 6000  | 5800  | 3600  | 2400  | 1300 |
|  | 15                 | 11000                        | 9000  | 7500  | 4800  | 3500  | 1700 |
|  | 25                 | 15000                        | 15000 | 10500 | 8000  | 5100  | 2400 |
|  | 40                 |                              | 17500 | 13000 | 11000 | 7000  | 3400 |
|  | 60                 |                              |       |       | 14000 | 9600  | 4600 |
|  | 80                 |                              |       |       | 15000 | 11000 | 5600 |
|  | 100                |                              |       |       |       | 12000 | 7000 |
|  | 125                |                              |       |       |       |       | 8000 |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the *optimum performance* range.

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

### Model 243 Capacity Tables

#### Model 243-8HP in SCFH of Natural Gas (0.6 Specific Gravity – 14.65 psia – 60°F)

| Outlet Pressure   | Inlet Pressure<br>psi | 1¼" Model 243-8HP            |           |           |           | 1½" Model 243-8HP            |           |           |           |           | 2" Model 243-8HP             |           |           |           |           |
|---|-----------------------|------------------------------|-----------|-----------|-----------|------------------------------|-----------|-----------|-----------|-----------|------------------------------|-----------|-----------|-----------|-----------|
|   |                       | Orifice Size and Valve Angle |           |           |           | Orifice Size and Valve Angle |           |           |           |           | Orifice Size and Valve Angle |           |           |           |           |
|   |                       | ¾"<br>10°                    | ½"<br>10° | ⅜"<br>10° | ¼"<br>10° | 1"<br>30°                    | ¾"<br>10° | ½"<br>10° | ⅜"<br>10° | ¼"<br>10° | 1"<br>30°                    | ¾"<br>10° | ½"<br>10° | ⅜"<br>10° | ¼"<br>10° |
| Setpoint<br>5 psi<br>1 psi Droop<br>Cadmium<br>Spring<br>3 to 6½ psi<br>143-16-021-08             | 10                    | 3300                         | 2050      | 2000      | 1300      | 6000                         | 5500      | 3200      | 2300      | 1300      | 6000                         | 5500      | 3200      | 2400      | 1300      |
|   | 15                    | 3400                         | 3100      | 2200      | 1700      | 8600                         | 6500      | 4400      | 3200      | 1700      | 8600                         | 6000      | 4400      | 3200      | 1700      |
|   | 25                    | 4400                         | 3650      | 3050      | 2400      | 12000                        | 9300      | 6100      | 4800      | 2400      | 13000                        | 8200      | 6100      | 4800      | 2400      |
|   | 40                    | 5800                         | 3800      | 3200      | 3200      | 12000                        | 8500      | 6100      | 3200      |           | 12000                        | 8700      | 6100      | 3400      |           |
|   | 60                    |                              | 4400      | 4100      | 4400      |                              | 10000     | 8700      | 4400      |           |                              | 10000     | 8700      | 4600      |           |
|   | 80                    |                              | 4500      | 5300      | 5600      |                              | 11000     | 10000     | 5600      |           |                              | 11500     | 10000     | 5600      |           |
|   | 100                   |                              |           | 6000      | 7000      |                              |           | 11000     | 7000      |           |                              |           | 11000     | 7000      |           |
|   | 125                   |                              |           |           | 8000      |                              |           |           | 8000      |           |                              |           |           |           | 8000      |
| Setpoint<br>7 psi<br>1 psi Droop<br>Cadmium-<br>White<br>Springs<br>6 to 10 psi<br>143-16-021-03  | 10                    | 2300                         | 2000      | 1800      | 1000      | 2500                         | 2300      | 2000      | 1600      | 1000      | 2700                         | 2500      | 2100      | 1600      | 1000      |
|   | 15                    | 3000                         | 2800      | 2200      | 1400      | 5000                         | 4000      | 2500      | 2200      | 1500      | 5900                         | 4300      | 2800      | 2400      | 1500      |
|   | 25                    | 5400                         | 4100      | 3300      | 2000      | 8500                         | 6500      | 4300      | 3500      | 2000      | 8600                         | 6600      | 4600      | 3600      | 2000      |
|   | 40                    | 7600                         | 5600      | 4800      | 2800      | 9500                         | 9500      | 6500      | 5000      | 3000      | 10000                        | 7200      | 5600      | 3000      |           |
|   | 60                    |                              | 7500      | 6200      | 3800      |                              | 9000      | 6500      | 4000      |           |                              | 9700      | 7000      | 4500      |           |
|   | 80                    |                              | 8800      | 7200      | 5200      |                              | 11000     | 8500      | 5000      |           |                              | 12000     | 9000      | 5500      |           |
|   | 100                   |                              |           | 8600      | 5800      |                              |           | 10500     | 5500      |           |                              |           | 11500     | 7000      |           |
|   | 125                   |                              |           |           | 7000      |                              |           |           | 5500      |           |                              |           |           |           | 5500      |
| Setpoint<br>7 psi<br>2 psi Droop<br>Cadmium-<br>White<br>Springs<br>6 to 10 psi<br>143-16-021-03  | 10                    | 5400                         | 3500      | 2500      | 1400      | 8000                         | 5500      | 3500      | 2500      | 1300      | 8600                         | 6000      | 4300      | 2700      | 1400      |
|   | 15                    | 7400                         | 5000      | 3500      | 1800      | 10500                        | 8000      | 5000      | 3500      | 1700      | 12700                        | 8900      | 5700      | 3800      | 1800      |
|   | 25                    | 10000                        | 7600      | 5500      | 2500      | 15000                        | 12000     | 8000      | 5000      | 2300      | 18600                        | 13500     | 8600      | 5700      | 2400      |
|   | 40                    | 12500                        | 10000     | 7500      | 3500      | 16000                        | 11500     | 7500      | 3300      |           | 19000                        | 12500     | 8000      | 3500      |           |
|   | 60                    |                              | 12500     | 9500      | 4800      |                              | 15000     | 9500      | 4500      |           |                              | 17000     | 10000     | 4800      |           |
|   | 80                    |                              | 14000     | 11500     | 6100      |                              | 17500     | 12500     | 5500      |           |                              | 20000     | 13500     | 6200      |           |
|   | 100                   |                              |           | 13500     | 7200      |                              |           | 15500     | 7000      |           |                              |           | 16500     | 7300      |           |
|   | 125                   |                              |           |           | 8800      |                              |           |           | 7000      |           |                              |           |           |           | 8100      |
| Setpoint<br>10 psi<br>1 psi Droop<br>Cadmium-<br>White<br>Springs<br>6 to 10 psi<br>143-16-021-03 | 15                    | 2500                         | 2200      | 1800      | 1200      | 3500                         | 3000      | 2000      | 1300      | 1000      | 3600                         | 3000      | 2000      | 1800      | 1000      |
|   | 25                    | 4800                         | 3500      | 2800      | 1900      | 6500                         | 5000      | 3500      | 2500      | 1900      | 6800                         | 5700      | 4000      | 3000      | 1900      |
|   | 40                    | 7200                         | 5000      | 4000      | 2500      | 8000                         | 5500      | 4300      | 2500      |           | 8600                         | 5700      | 4600      | 2800      |           |
|   | 60                    |                              | 6700      | 5700      | 3500      | 10500                        | 7500      | 6000      | 3500      |           |                              | 8600      | 6400      | 4300      |           |
|   | 80                    |                              | 7800      | 6600      | 4600      |                              | 9000      | 7500      | 4500      |           |                              | 10500     | 8400      | 5200      |           |
|   | 100                   |                              |           | 7800      | 5400      |                              |           | 9500      | 6000      |           |                              |           | 10700     | 6500      |           |
|   | 125                   |                              |           |           | 6500      |                              |           |           | 7000      |           |                              |           |           |           | 8000      |
| Setpoint<br>10 psi<br>2 psi Droop<br>Cadmium-<br>White<br>Springs<br>6 to 10 psi<br>143-16-021-03 | 15                    | 6000                         | 4000      | 2800      | 1700      | 8500                         | 6500      | 4000      | 2500      | 1500      | 9000                         | 6600      | 4800      | 3000      | 1500      |
|   | 25                    | 9000                         | 6500      | 5000      | 2500      | 12000                        | 10500     | 7000      | 4500      | 2300      | 15500                        | 11000     | 7400      | 5000      | 2400      |
|   | 40                    | 12000                        | 9000      | 7000      | 3500      | 15000                        | 10000     | 7500      | 3000      |           | 16500                        | 11000     | 7700      | 3200      |           |
|   | 60                    |                              | 12000     | 9400      | 4700      |                              | 14000     | 10000     | 4500      |           |                              | 15000     | 10700     | 4800      |           |
|   | 80                    |                              | 13000     | 11000     | 6000      |                              | 17000     | 12000     | 5500      |           |                              | 18500     | 13000     | 6000      |           |
|   | 100                   |                              |           | 13000     | 7000      |                              |           | 15000     | 7000      |           |                              |           | 16000     | 7300      |           |
|   | 125                   |                              |           |           | 8800      |                              |           |           | 9000      |           |                              |           |           |           | 9000      |

The last capacity figure in each group indicates the maximum allowable inlet pressure (except for emergency conditions). The stepped line indicates the recommended maximum capacity and inlet pressure for each orifice for operation within the optimum performance range.

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

### Maximum Emergency Pressures

**NOTE:** The use of an internal or external relief valve is recommended for installations subjected to no flow for extended periods of time, such as pilotless ignition systems. A travel stop stem is located in the 243-12-1 and 243-12-4 to provide over-pressurization protection to internal components during overpressurization.

The maximum pressure the regulator inlet may be subjected to under abnormal conditions without causing damage to the regulator is the maximum allowable inlet pressure (from the capacity tables, pages 6 through 22) plus 50 psi.

The maximum pressure the diaphragm may be subjected to without causing damage to the internal parts of the regulator is:

- 243-12-1 ..... Setpoint + 3 psi
- 243-12-2, 243-8-1 and 243-8-2 ..... Setpoint + 5 psi
- 243-8HP ..... Setpoint + 5 psi

Setpoint is defined as the outlet pressure that a regulator is adjusted to deliver.

If any of the pressure limits are exceeded, the regulator must be taken out of service and inspected. All damaged or otherwise unsatisfactory parts must be repaired or replaced.

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

- 243-12-1 and 243-12-2..... 15 psi
- 243-8-1 and 243-8-2..... 15 psi
- 243-8HP ..... 25 psi

"Safely contained" means no leakage as well as no bursting.

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

### Overpressurization Protection

Protect the downstream piping system and the regulator's low pressure chambers against overpressurization due to possible regulator malfunction or failure to achieve positive lockup. The allowable outlet pressure is the lowest of the maximum pressures permitted by federal codes, state codes, Bulletin RDS-1498 or other applicable standards. The method of protection can be a relief valve, monitor regulator, shut-off device or similar mechanism.

### Monitoring

A monitor set consists of two regulators in series as shown in the figure. The monitor is the standby. It takes control if a failure in the operating regulator causes outlet pressure to exceed normal.

Either regulator may be used as the monitor. In both cases, the upstream regulator must have a blocked throat and external control line as shown for the 243 on page 5. Also, the control line for the upstream regulator connects into the outlet piping all the way downstream, which means downstream of the downstream regulator.

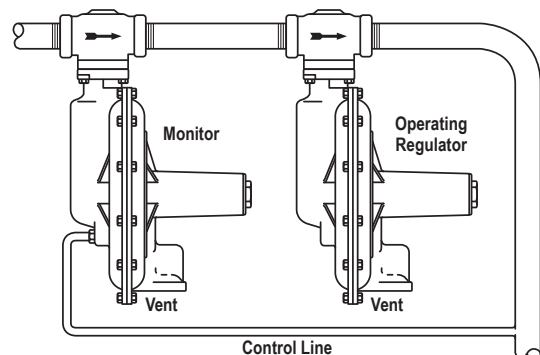
The illustration shows a typical 243 monitor set. While the downstream regulator is shown as operating and the upstream regulator is shown as the monitor, the two can be reversed. There are reasons for doing it either way depending on the user's practice. Stop and bypass valves (which are not shown) likewise would depend on the user's preference and practice.

Either way, the operating regulator is adjusted for the normal outlet pressure. The monitor is adjusted somewhat higher so it is normally full open. If a failure in the operating regulator causes excessive increase in outlet pressure, the monitor will go into operation to hold outlet pressure at its setpoint.

Monitoring is an effective and dependable method of providing overpressure protection. A significant advantage is that it provides the protection without wasting gas to atmosphere. Refer to Bulletin RDS-1306-2 (package monitor sets 243-DOT) for more information.

When a 243 is used to monitor another 243 with an identical orifice size, the total maximum capacity through both can be figured at 70% of the rated capacity for one regulator. This applies with the monitor located upstream or downstream.

243 MONITOR SET



CDF1306-055

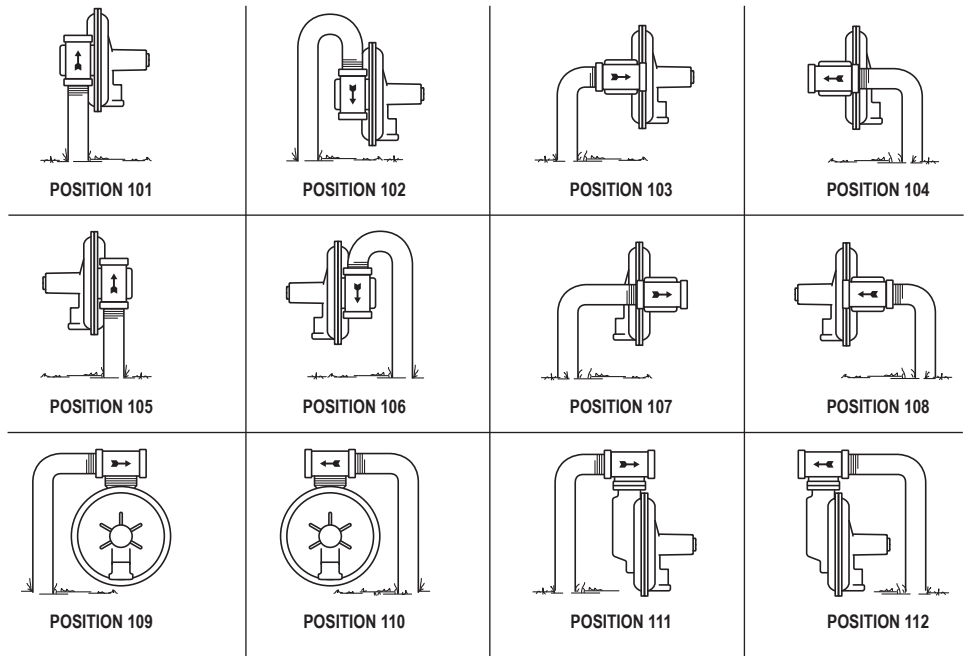
**Periodic Inspection:** Regulators are pressure control devices with numerous moving parts subject to wear that is dependent upon particular operating conditions. To assure continuous satisfactory operation, a periodic inspection schedule must be adhered to with the frequency of inspection determined by the severity of service and applicable laws and regulations. **See Bulletin RM-1306 field service instructions.**

### Mounting Positions

The 243 Service Regulator can be provided in any of the positions shown. Specify by position number when ordering.

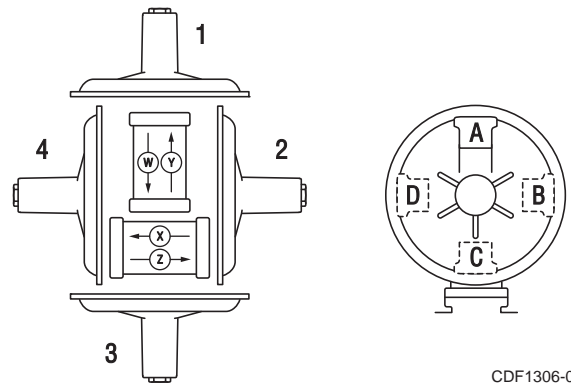
**CAUTION**  
The diaphragm case vent must be positioned to protect against flooding, drain water, ice formation, traffic, tampering, etc. The vent must be protected against nest-building animals, bees, insects, etc. to prevent vent blockage and minimize the chances of foreign materials from collecting in the vent side.

**CAUTION**  
It is the user's responsibility to assure that all service regulator vents and/or vent lines exhaust to a non-hazardous location away from any potential sources of ignition. Refer to Bulletin RM-1306 for more detailed information.



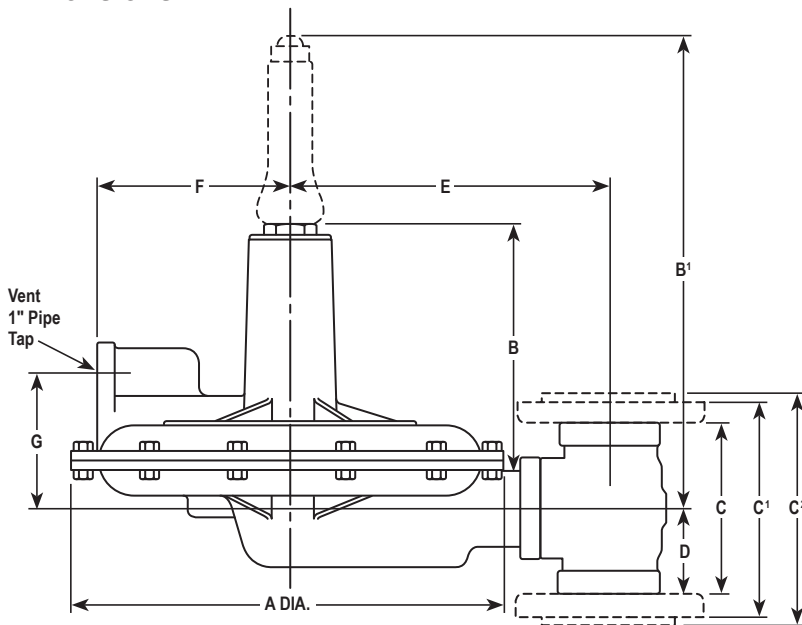
CDF1306-060

**NOTE:** If desired position is not shown use diagrams at right as guides to specify vent, diaphragm case, and body arrangement. Example: Position 105 would be D-4-Y.



CDF1306-065

### Dimensions



CDF1306-070

| Model              | 243-12                             | 243-8                             | 243-8HP                           |
|--------------------|------------------------------------|-----------------------------------|-----------------------------------|
| A                  | 14"                                | 10 <sup>3</sup> / <sub>16</sub> " | 10 <sup>3</sup> / <sub>16</sub> " |
| **B                | 9 <sup>3</sup> / <sub>4</sub> "    | 9 <sup>3</sup> / <sub>4</sub> "   | -                                 |
| B'                 | -                                  | -                                 | 12 <sup>3</sup> / <sub>4</sub> "  |
| C                  | 5 <sup>3</sup> / <sub>4</sub> "    | 5 <sup>3</sup> / <sub>4</sub> "   | 5 <sup>3</sup> / <sub>4</sub> "   |
| ***C <sup>1</sup>  | 7 <sup>1</sup> / <sub>2</sub> "    | 7 <sup>1</sup> / <sub>2</sub> "   | 7 <sup>1</sup> / <sub>2</sub> "   |
| ****C <sup>2</sup> | 7 <sup>7</sup> / <sub>8</sub> "    | 7 <sup>7</sup> / <sub>8</sub> "   | 7 <sup>7</sup> / <sub>8</sub> "   |
| D                  | 2 <sup>7</sup> / <sub>8</sub> "    | 2 <sup>7</sup> / <sub>8</sub> "   | 2 <sup>7</sup> / <sub>8</sub> "   |
| E                  | 10 <sup>13</sup> / <sub>32</sub> " | 8 <sup>19</sup> / <sub>32</sub> " | 8 <sup>19</sup> / <sub>32</sub> " |
| F                  | 6 <sup>1</sup> / <sub>32</sub> "   | 4 <sup>27</sup> / <sub>32</sub> " | 4 <sup>27</sup> / <sub>32</sub> " |
| G                  | 4 <sup>1</sup> / <sub>32</sub> "   | 4 <sup>5</sup> / <sub>32</sub> "  | 4 <sup>5</sup> / <sub>32</sub> "  |
| Shipping Weight*   | 27 lbs.                            | 25 lbs.                           | 29 lbs.                           |

\* Add 9 lbs. for flanges on 2" body  
 \*\* 10" for 243-12-1 and 243-12-4, which include travel stop  
 \*\*\* ANSI flanges  
 \*\*\*\* ND-10 flanges



### Materials of Construction

- Body ..... Cast Iron
- Diaphragm Case ..... Die Cast Aluminum Alloy
- Diaphragm ..... Buna-N with Nylon Fabric Insert
- Diaphragm Pans ..... Zinc Plated Steel
- Diaphragm Coupling ..... Zinc Die Casting
- Orifice ..... Brass
- Valve ..... Buna-N Soft Seat in Aluminum Holder
- Stem ..... Brass
- Lever ..... Zinc Plated Steel
- O-Rings and Tetra Seals ..... Buna-N
- Adjustment Spring Button & Seal Cap, Std. .... Zinc Die Casting
- Adjustment Screw, 243-8HP ..... Zinc Plated Steel
- Cover, 243-8HP ..... Cast Iron
- Seal Cap, 243-8HP ..... Cast Iron

### Full Open Capacity

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

1.  $Q = K\sqrt{P_o(P_i - P_o)}$  ..... (for  $\frac{P_i}{P_o}$  less than 1.894)
2.  $Q = \frac{KP_i}{2}$  ..... (for  $\frac{P_i}{P_o}$  greater than 1.894)

Q = maximum capacity of the regulator (in SCGH of 0.6 specific gravity natural gas).  
 K = the “K” factor, the regulator constant (see below)  
 P<sub>i</sub> = **absolute** inlet pressure (psia)  
 P<sub>o</sub> = **absolute** outlet pressure (psia)

| Orifice size: | .207" | ¼"  | ⅜"  | ½"  | ¾"   | 1"   | 1¼"  |
|---------------|-------|-----|-----|-----|------|------|------|
| K             | 90    | 132 | 292 | 520 | 1100 | 1800 | 2480 |

When sizing relief valves for use with 243 regulators, use *full open capacity*. Do not use capacity from capacity tables pages 6 through 22.

### Other Gases

243 regulators are mainly used on natural gas. However, they perform equally as well on LP gas, nitrogen, dry CO<sub>2</sub>, air and others. For capacities, multiply the table values on pages 6 thru 22 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:

$$\text{CORRECTION FACTOR} = \sqrt{\frac{0.60}{\text{Specific gravity of the gas}}}$$

While used primarily on natural gas services, Model 243 regulators perform equally as well on LPG vapor, air, CO<sub>2</sub>, nitrogen and other inert gas applications. Please contact your Sensus representative for special construction which may be available for certain corrosive gases.

### How to Order

Specify:

1. Pipe size and model number (page 1)
2. Screwed or flanged connections
3. Mounting position
4. Orifice size and valve angle
5. Inlet pressure (also maximum and minimum if available)
6. Outlet pressure setting
7. Capacity required (scfh)
8. Type of gas (natural gas, propane, etc.)
9. Spring part number

### Other Sensus Gas Pressure Regulators

Sensus produces a broad product line of gas pressure regulators which are widely used throughout the natural gas industry. These regulators are also suitable for non-corrosive industrial gas applications such as propane, butane, air, nitrogen, dry CO<sub>2</sub>, etc. For additional information on a particular model, please request the indicated bulletin from the local Sensus sales office, or visit our website at [www.sensus.com](http://www.sensus.com)

### Multi-Purpose Service Regulators

Model 043-C  
 ½", ¾", 1", 1¼" pipe sizes  
 Inlet pressures ..... to 125 psi  
 Outlet pressures ..... 5" w.c. to 5 psi  
 Capacity to 3500 SCFH  
 Available with 90° angle or straight-through body.  
 Standard with internal relief valve.

Model 143-80  
 ¾", 1", 1¼" pipe sizes  
 Inlet pressures ..... to 125 psi  
 Outlet pressures ..... 3½" w.c. to 6 psi  
 Capacity to 2000 SCFH  
 Optional internal relief valve and low pressure cut-off.

### Industrial Field Regulators

For intermediate to high pressure applications. Ideal on pipeline taps servicing plants and buildings. Appropriate for double stage reduction ahead of service regulators and for high pressure burners and compressed air systems.

Model 046  
 ¾", 1" and 1¼" pipe sizes  
 Inlet pressures ..... to 1000 psi  
 Outlet pressures ..... 3 to 200 psi  
 Capacity to 40,000 SCFH  
 Optional monitor and internal relief valve.

### Pilot Loaded Regulators

For intermediate and high pressure applications requiring precise pressure reduction with minimal droop. Ideal for standard and high capacity flows on burners, driers, dehydrators and compressor lines. Appropriate for fixed factor billing.

Model 243-RPC  
 1¼", 1½" and 2" pipe sizes  
 Inlet pressures ..... to 150 psi  
 Outlet pressures ..... 3½" w.c. to 35 psi  
 Capacity to 76,000 SCFH

Sensus also produces industrial and combustion regulators; high pressure, high capacity regulators, and safety relief valves. Detailed information is available on request.





# Model 243 Service Regulators

Construction and Design Features



## Authorized Distributor:

All products purchased and services performed are subject to Sensus' terms of sale, available at either <http://na.sensus.com/TC/TermsConditions.pdf> or 1-800-METER-IT. Sensus reserves the right to modify these terms and conditions in its own discretion without notice to the customer.

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