

Model 141-A Field Regulator



Equimeter
INCORPORATED

141-A Field Regulator

The 141-A Field Regulator is for high pressure work such as feeding intermediate and small volume loads from gas transmission lines.

Use this field regulator on pipeline taps serving remote farm, domestic, commercial, and industrial customers. The 141 is excellent for single and double stage reduction ahead of the service regulator.

Use them also on other kinds of high pressure loads; pro-

ducer field work, high pressure burners, compressed air systems, etc. They are meant for "pounds to pounds" cuts on not only natural gas but air, LP gas, nitrogen, dry CO₂, and others as well.

The 141 design combines simplicity of operation with rugged construction. The result is "staying power" to meet the demands of high pressure, rough handling, and exposure to the elements.

Spring Ranges

Outlet Pressures	Spring Part Number	Spring Color	Diaphragm	Diaphragm Assembly
5 to 12 psi	138-02-021-00	Yellow	1/16" thick (141-10-150-01)	Standard Upper Diaphragm Plate (141-10-022-02)
10 to 50 psi	138-02-021-02	Aluminum		
50 to 150 psi	138-02-021-04	Tan	1/8" thick (141-10-150-00)	High Pressure Upper Diaphragm Plate and Loading Ring (141-10-022-03) and (141-10-002-00)
100 to 250 psi	138-02-021-11	Gray		
200 to 400 psi	138-02-021-11			
	138-02-021-11			
400 to 600 psi*	138-02-021-12†	White		

*1/8" orifice only. Use only with obsolete 140 and 3/4", 1", 1/4", 1/2", 141. † inner spring.

Maximum Inlet Pressures

1/8" H.P.	ORIFICE SIZE					
	1/8"	1/4"	3/8"	1/2"	5/8"	7/8"
MAXIMUM INLET PRESSURE psi						
1500	1000	1000	400	200	150	50

Pipe Sizes

Screwed NPT
2"

Temperature Limits

The 141-A Field Regulator may be used for flowing gas temperatures from -20°F to 150°F.

Buried Service

The 141-A Field Service Regulator is **not** recommended for buried service.

NON-RISING
ADJUSTMENT
SCREW

- With protective cap

MOLDED SOFT SEATS

- TAN POLYURETHANE (85 to 95 Durometer "A")
For pressure cuts below 300 psi and/or inlet pressures below 600 psi.
- GREEN POLYURETHANE (52 to 60 Durometer "D")
For pressure cuts above 300 psi and/or inlet pressures above 600 psi.

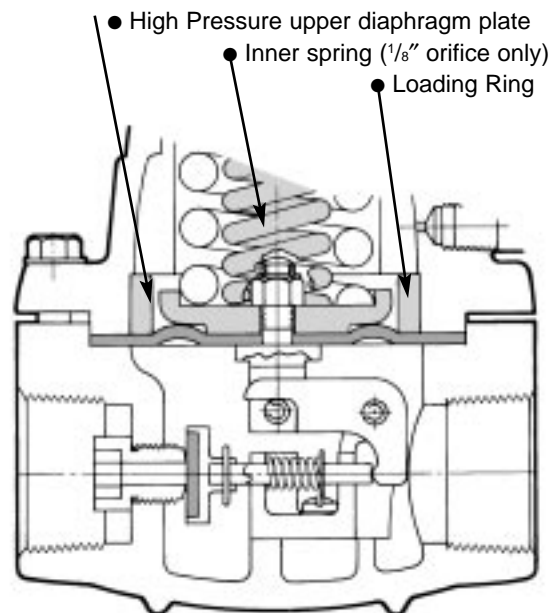
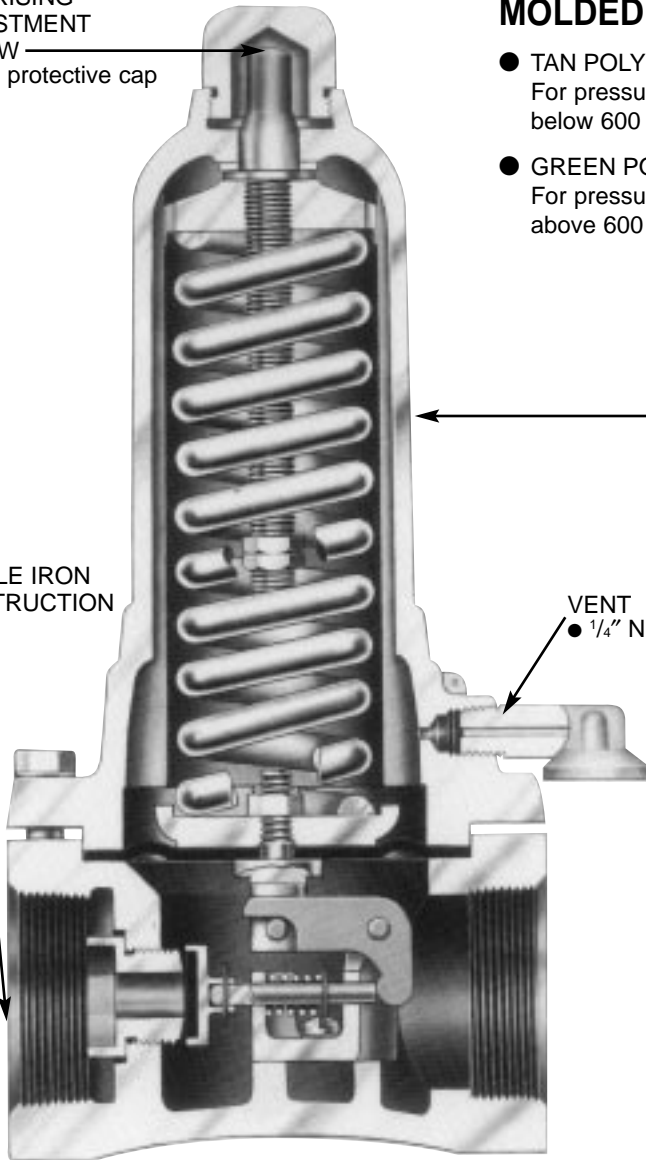
CAST IRON

DUCTILE IRON
CONSTRUCTION

VENT
● 1/4" NPT

HIGH PRESSURE DIAPHRAGM ASSEMBLY CONSTRUCTION

- High Pressure upper diaphragm plate
- Inner spring (1/8" orifice only)
- Loading Ring



141-A Capacity Tables

in scfh of natural gas

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

PRESSURES PSI		2" PIPE SIZE ORIFICES					
Inlet	Outlet	1/8"	1/4"	3/8"	1/2"	5/8"	7/8"
10	5	550	1,000	2,400	3,500	5,000	6,000
20	5	950	1,200	4,000	5,100	6,700	9,800
30	5	1,100	1,700	5,300	6,200	7,400	11,700
50	5	1,500	2,000	7,200	7,800	8,400	16,000
75	5	1,600	3,100	10,500	11,200	12,100	
100	5	2,100	4,000	14,000	16,000	21,000	
150	5	3,000	6,500	19,500	21,000	26,000	
20	10	800	1,600	3,200	5,500	7,800	11,000
30	10	1,000	1,900	5,300	6,600	8,600	15,200
50	10	1,600	2,300	7,500	8,500	9,400	21,500
75	10	1,700	3,300	11,000	12,000	12,800	
100	10	2,100	4,300	15,500	17,500	23,000	
150	10	3,000	7,000	21,000	24,500	28,000	
200	10	3,700	9,000	25,000	33,000		
30	20	900	1,600	4,000	5,500	7,500	9,700
50	20	1,400	2,000	6,000	7,800	9,000	16,500
75	20	1,700	3,400	11,000	12,500	14,000	
100	20	2,100	4,500	15,500	17,000	20,000	
150	20	3,000	8,500	21,000	23,500	27,000	
200	20	3,700	10,000	25,000	30,000		
400	20	7,500	22,000	42,000			
50	40	1,000	2,700	7,000	8,500	9,000	18,000
75	40	1,500	3,900	13,000	13,500	16,000	
100	40	2,000	6,000	15,500	17,000	20,000	
150	40	3,000	9,000	21,000	23,500	27,000	
200	40	3,700	11,000	25,000	30,000		
400	40	7,500	22,500	42,000			
60	50	1,100	3,000	7,000	9,000	8,500	
75	50	1,400	4,000	11,500	15,000	14,000	
100	50	1,900	6,500	14,000	17,000	19,000	
150	50	3,000	9,500	21,000	23,500	27,000	
200	50	3,700	11,500	25,000	30,000		
400	50	7,500	22,500	42,000			
100	75	1,350	5,500	10,000	11,500	17,000	
150	75	2,800	8,000	15,000	17,000	41,000	
200	75	3,700	9,000	24,000	24,000		
400	75	7,500	22,500	42,000			
600	75	9,500	30,000				
125	100	1,500	6,100	12,000	13,000	18,000	
150	100	2,100	7,000	18,000	20,500	32,000	
200	100	3,700	8,500	24,000	26,500		
400	100	7,500	22,500	42,000			
600	100	9,500	33,500				
200	150	2,500	10,000	21,000	25,000		
300	150	4,400	17,000	35,000			
400	150	7,500	22,500	44,000			
600	150	9,500	33,500				
800	150	13,000	44,500				

NOTES:

1. Capacities are based on 20% droop.
2. Bold type indicates maximum inlet pressure for indicated size orifice.

PRESSURES PSI		2" MODELS 141-A				
		STANDARD ORIFICES			HIGH PRESSURE* ORIFICES	
Inlet	Outlet	1/8"	1/4"	3/8"	1/8"	1/4"
250	200	3,000	11,500	23,000	2,100	7,300
300	200	4,200	16,000	32,000	3,000	10,400
400	200	6,000	22,500	44,000	5,000	14,600
600	200	9,500	33,500		9,500	33,500
800	200	13,000	44,500		11,500	44,500
1000	200				13,000	55,000
1250	200				16,500	
300	250	4,000	15,300	31,000		
400	250	5,800	21,600	44,000		
600	250	8,900	33,500			
800	250	11,500	44,500			
1000	250	13,000	55,000			
350	300				2,600	8,900
400	300				4,000	12,600
600	300				8,500	31,000
800	300				11,500	44,500
1000	300				13,000	55,000
1250	300				16,500	
1500	300				20,000	
500	400				4,300	14,500
600	400				6,000	23,000
800	400				10,000	44,500
1000	400				13,000	55,000
1250	400				16,500	
1500	400				20,000	

***HIGH PRESSURE DIAPHRAGM ASSEMBLY CONSTRUCTION:**

- a. Diaphragm Plate.....141-10-022-03
- b. Loading Ring141-10-022-00

NOTES:

1. Capacities are based on 20% droop.
2. Bold type indicates maximum inlet pressure for indicated size orifice.

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

Maximum Emergency Pressures

The maximum inlet pressure for the 141-A regulator may be subjected to under abnormal conditions without causing internal damage is as follows:

ORIFICE SIZE						
1/8"	1/4"	3/8"	7/16"	1/2"	5/8"	7/8"
PRESSURE psi						
1650*	1150*	550	450	350	300	200

*Green polyurethane soft seats only. If tan polyurethane soft seats are used, pressure is 700 psi.

The maximum pressures the outlet may be subjected to under abnormal conditions without causing internal damage are as follows:

1. Standard (set-points to 250 psi)set-point + 100 psi.
 2. High Pressure Diaphragm Assembly.....set-point + 150 psi.
- Set-point is defined as the outlet pressure a regulator is adjusted to deliver.

If any of the above pressure limits are exceeded, the regulator must be taken out of service and inspected. Damaged or otherwise unsatisfactory parts must be repaired or replaced before returning the regulator to service.

The maximum outlet pressure that can be safely contained by the diaphragm/spring case of Model 141-A regulators is 800 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 complete

lockup. The allowable outlet pressure is the lowest of the maximum pressures permitted by federal codes, state codes, Equimeter Bulletin RDS-1498, or other applicable standards.

The method of protection can be a relief valve, monitor regulator, shutoff device, or similar mechanism.

Full Open Capacity

Capacity for the full open valve position can be calculated using the following formulas and K factors:

$$1. Q = K \sqrt{P_0 (P_1 - P_0)}$$

$$2. Q = \frac{K P_1}{2}$$

Q = full open capacity of the regulator in SCFH of 0.6 specific gravity natural gas.

K = the "K" factor, the regular constant (from the table).

P₁ = absolute inlet pressure (psia).

P₀ = absolute outlet pressure (psia).

Use formula 1. when $\frac{P_1}{P_0}$ is less than 1.894.

Use formula 2. when $\frac{P_1}{P_0}$ is greater than 1.894.

ORIFICE	K
1/8"	33
1/4"	132
3/8"	292

ORIFICE	K
7/16"	400
1/2"	520
5/8"	820
7/8"	900

Remember, at the above full open capacities the droop is greater than specified in the capacity tables on page 4.

When sizing relief valve for these regulators, use the above calculated full open capacity. Do not use capacity values from tables on page 4.

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-1311 for field service instructions.**

Other Gases

141-A Field Regulators are mainly used on natural gas. However, they perform equally well on LP gas, nitrogen, dry CO₂, air, and others.

OTHER GASES	CORRECTION FACTOR
Air (Specific Gravity 1.0)	0.77
Propane (Specific Gravity 1.53)	0.63
1350 BTU Propane-Air Mix (1.20)	0.71
Nitrogen (Specific Gravity 0.97)	0.79
Dry Carbon Dioxide (Specific Gravity 1.52)	0.63
For other noncorrosive gases: CORRECTION FACTOR =	$\sqrt{\frac{0.6}{\text{Specific Gravity of the Gas}}}$

For use with gases not listed above, please contact your Equimeter representative or Industrial Distributor for recommendations.

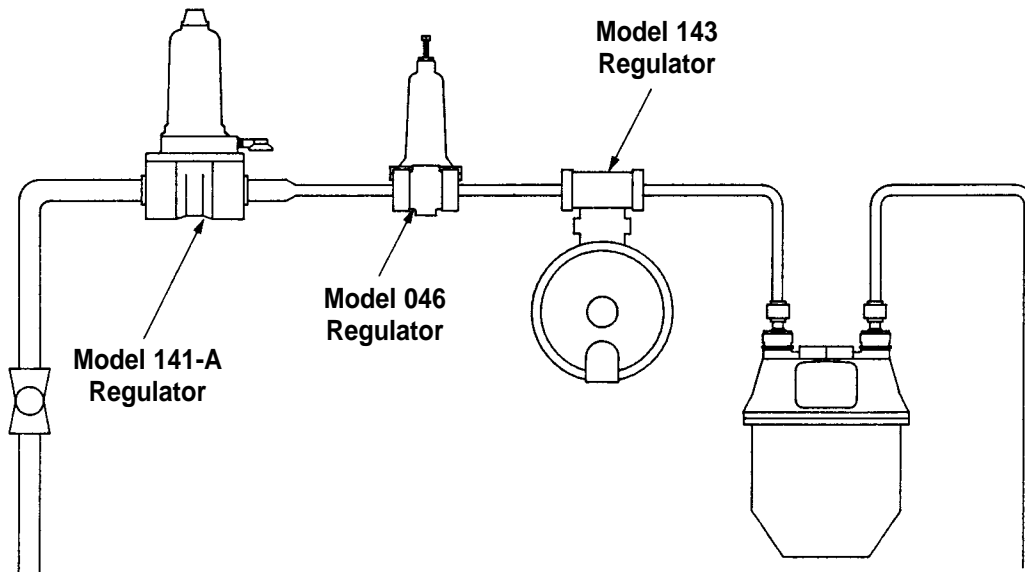
Materials of Construction

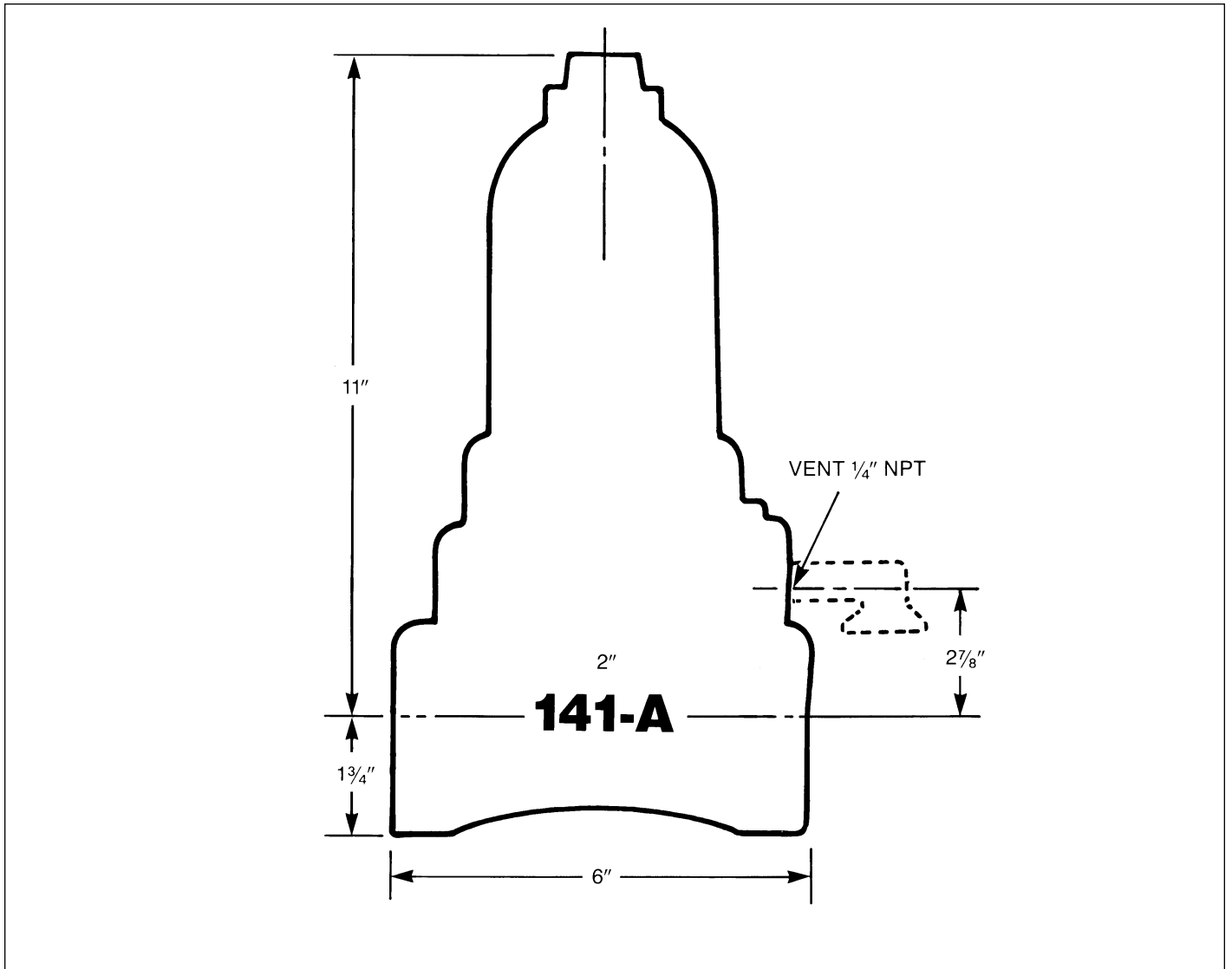
Body and Spring-Diaphragm Case	See page 2
Orifice	Brass or Stainless Steel
Valve	Aluminum with Molded Poyurethane Soft Seat, see page 3
Stem	Brass or Stainless Steel
Lever	Cadmium Plated Steel
Lever Bracket	Cadmium Plated Malleable Iron
Pins	Steel
Diaphragm Stem	Cadmium Plated Steel
Diaphragm	Buna N or Nylon Fabric
Upper Diaphragm Plate	Cadmium Plated Ductile Iron
Top Spring Button	Cadmium Plated Cast Iron
Adjustment Screw	Cadmium Plated Steel
Adjustment Cap 141A	Die Cast Aluminum

How to Order

- Specify:
- | | | |
|-------------------------------|---|---|
| 1. Pipe size and model number | 3. Inlet pressure (also maximum and minimum if available) | 5. Capacity required (scfh) |
| 2. Orifice size | 4. Outlet pressure set-point | 6. Type of gas (natural gas, propane, etc.) |
| | | 7. Spring part number |

Typical Installation





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-1311 for more detailed start-up procedures.**

CAUTION: It is the user's responsibility to assure that all regulator vents and/or vent lines exhaust to a non-hazardous location away from **any potential** sources of ignition. **Refer to Equimeter Bulletin RM-1311 for more detailed information.**

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