

CYLINDER GAS REGULATOR

NIP-253
July, 1981

WITH UNIQUE CARTRIDGE VALVE & INTEGRAL RELIEF VALVE FOR SOFT DRINK DISPENSING SYSTEMS

TYPE R81

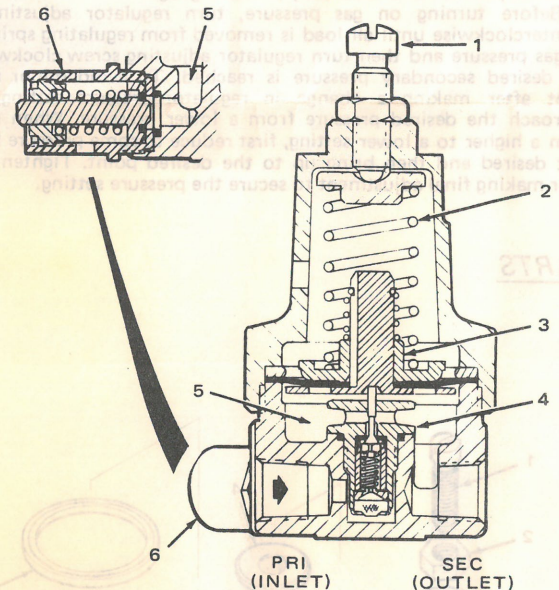
OPERATION

The working parts of the R81 regulator are the adjusting screw (1), regulating spring (2), diaphragm assembly (3), cartridge valve (4) and relief valve (6).

With the adjusting screw turned counterclockwise until no load is applied to the regulating spring, the cartridge valve is closed. When the adjusting screw is turned clockwise, a force is applied to the regulating spring which causes the diaphragm to move downward and open the cartridge valve. This allows gas to flow into the secondary (regulated) pressure chamber (5) and thence to the regulator outlet port. The increase in secondary pressure, acting against the lower side of the diaphragm, creates a force tending to move the diaphragm upward, compressing the regulating spring. This upward movement will continue until the force exerted by the pressure on the lower side of the diaphragm balances the spring force exerted on the upper side. If there is no downstream flow demand, this balance of forces will occur with the valve closed. If there is a flow demand, the balance of forces will occur with the valve open just the amount necessary to compensate for the demand, thus maintaining the desired pressure.

The R81 regulator has a relieving type diaphragm assembly which will automatically vent gas from the secondary pressure chamber (5) as the adjusting screw (1) is turned counterclockwise. This allows reductions in secondary (outlet) pressure to be made under dead-ended conditions. Since back-flow check valves must always be installed in each regulator outlet line, pressure in the lines and equipment downstream of the check valves can NOT be reduced by turning the regulator adjusting screw counterclockwise. Make adjustments in regulator pressure setting as instructed under Installation paragraph.

Relief valve (6) will, in the event of regulator malfunction, limit the outlet pressure to help protect downstream equipment from an excessive over-pressure condition. See WARNING note.



See dimensional drawings for actual location of ports and integral relief valve.

APPLICATION

These regulators are for cylinder gas applications using CARBON DIOXIDE, NITROGEN or AIR and must not be used where pressure or temperature may exceed rated operating conditions. These regulators are not intended for use in life support systems.

SPECIFICATIONS

MODEL: R81

TYPE: Relieving Diaphragm

PORTS: 1/4" PTF

RATED OPERATING CONDITIONS -

Maximum Primary (Inlet) Pressure: Up to 3000 psig (206.9 bar)

Temperature Range: -40° to 175°F (-40° to 79°C)

Secondary (Outlet) Relief Valve Setting: 130 ± 4 psig
(9.0 ± .28 bar) (Nonadjustable)

SECONDARY (REGULATED) PRESSURE RANGES:*

1 to 25 psig (.07 to 1.7 bar)

2 to 50 psig (.14 to 3.4 bar)

5 to 125 psig (.34 to 8.6 bar)

*Secondary pressure adjustment ranges are not minimum or maximum secondary pressure limits. Regulators can be adjusted to zero psig secondary pressure and, generally, to pressures in excess of those specified. The use of these regulators to control pressures outside of the specified ranges is not recommended.

Note

The integral relief valve on the R81 regulator meets the requirements of Paragraph 4.5c of NSDA Pamphlet TD02, 'Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems,' dated July, 1980.

WARNING

FOR SAFETY IN SYSTEM APPLICATIONS USING MODEL R81 REGULATORS, THE FOLLOWING PROCEDURES MUST BE FOLLOWED:

(1) PRESSURE RELIEF DEVICES OF SUFFICIENT CAPACITY MUST ALWAYS BE USED IN THE SECONDARY (OUTLET) LINES DOWNSTREAM OF EACH PRESSURE REGULATOR, WHETHER AS AN INTEGRAL PART OF THE REGULATOR, AS IS THE CASE WITH NORGREN MODEL R81 CO₂ REGULATOR, OR SEPARATELY INSTALLED ELSEWHERE IN THE OUTLET LINES. DO NOT REMOVE OR ATTEMPT TO ADJUST, PLUG, BLOCK OR OTHERWISE DEFEAT THE PURPOSE OF THE RELIEF DEVICE IN ANY MANNER. DO NOT REPLACE A RELIEF DEVICE WITH ANY BUT AN IDENTICAL MODEL. FAILURE TO PROVIDE PRESSURE RELIEF OF SUFFICIENT CAPACITY TO HOLD OUTLET PRESSURE BELOW THE LOWEST WORKING PRESSURE RATING OF ANY PIECE OF EQUIPMENT INSTALLED IN THE OUTLET LINES CAN RESULT IN EQUIPMENT DAMAGE AND/OR PERSONAL INJURY.

(2) A CHECK VALVE MUST ALWAYS BE INSTALLED AT THE REGULATOR OR AT EACH MANIFOLD OUTLET IN LIQUID DISPENSING APPLICATIONS TO PREVENT REVERSE FLOW THROUGH THE REGULATOR AND POSSIBLE INTRODUCTION OF LIQUIDS AND OTHER CONTAMINANTS INTO THE REGULATOR.

(3) THE REGULATOR MUST NOT BE USED WHERE TEMPERATURE OR PRESSURE MAY EXCEED RATED OPERATING CONDITIONS. SEE SPECIFICATIONS.

(4) THESE REGULATORS ARE NOT INTENDED FOR USE IN LIFE SUPPORT SYSTEMS.

NORGREN

LITTLETON, COLORADO

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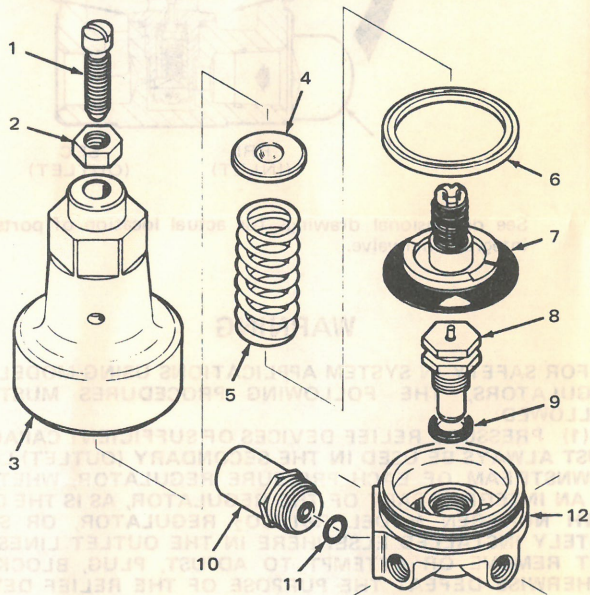
INSTALLATION

Refer to NSDA Pamphlet TD02, 'Installation & Operational Procedures for Pressurized Soft Drink Dispensing Systems.'

This regulator has two inlet ports and two outlet ports. The inlet ports are indicated by the letter 'PRI' (Primary) stamped on the body. Connect primary piping to either of the 'PRI' ports — the other inlet port can be plugged or used for a primary pressure gauge or as a manifold port to another regulator. The ports 90-degrees from the inlet ports are stamped 'SEC' (Secondary), either of which may be used as an outlet port or for a secondary pressure gauge.

Before turning on gas pressure, turn regulator adjusting screw counterclockwise until all load is removed from regulating spring. Turn on gas pressure and then turn regulator adjusting screw clockwise until the desired secondary pressure is reached. To avoid minor readjustment after making a change in regulator pressure setting, always approach the desired pressure from a lower pressure. When reducing from a higher to a lower setting, first reduce to some pressure less than that desired and then bring up to the desired point. Tighten locknut after making final adjustment to secure the pressure setting.

PARTS



1. Adjusting Screw*
2. Locknut*
3. Bonnet*
4. Springrest*
5. Regulating Spring*
1 to 25 psig 1512-04
2 to 50 psig 5187-01
5 to 125 psig 3235-01
6. Slipring 5082-89
7. Diaphragm Assembly 570-50
8. Cartridge Valve (Includes item 9) 5086-55
9. O-ring 2820-13
10. Relief Valve Cartridge (Includes item 11) 5779-55
11. O-ring 720-01
12. Body*

*Not normally replaced.

MAINTENANCE

To disassemble, shut off the inlet pressure. Bleed pressure from lines both upstream and downstream of regulator to zero. Turn the adjusting screw (1) counterclockwise until all load is removed from regulating spring (5). Unscrew and remove bonnet (3), springrest (4), regulating spring (5), slip ring (6) and diaphragm assembly (7). Unscrew and remove cartridge valve (8) using a 5/8" socket. Remove O-ring (9). Unscrew and remove relief valve (10) and O-ring (11).

Clean parts and inspect carefully. Replace any parts which are damaged.

NOTES

Relief valve (10) is not adjustable or repairable. The cartridge valve (8) is factory sealed and also is not repairable. Replace relief valve and/or valve cartridge if either or both are not sealing properly.

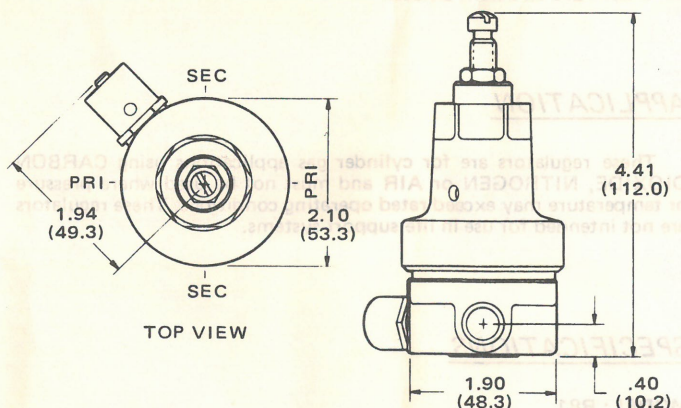
Use only the specified Norgren parts for replacement. Do not use damaged or inoperative parts or assemblies. Maintain strict cleanliness when reassembling regulator.

Apply a light, even coat of Lubriplate Aero (or equivalent) full length of adjusting screw threads and to tip of screw. Apply a light even coat of Armite Laboratories Led-Plate No. 250 (or equivalent) to bonnet threads. Apply a generous coat of Dow Corning DC 44 silicone grease (or equivalent) to O-ring (11).

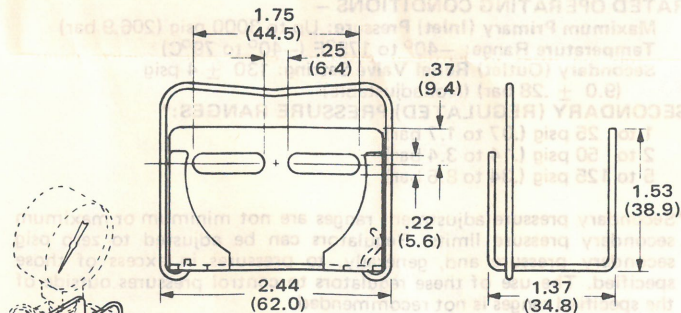
Tighten cartridge valve to 80-to-100 inch-pounds torque. Place the diaphragm, slip ring, regulating spring and springrest on body (12) and install bonnet. Tighten bonnet to 20-to-25 foot-pounds (snug using a 12-inch wrench). Tighten relief valve cartridge until fully seated in body.

DIMENSIONS

All dimensions in inches (mm).



MOUNTING BRACKET (P/N 5095-50)



C. A. NORGREN CO.
LITTLETON, COLORADO 80120 / 303-794-2611

Printed in U.S.A.

U.L. Listed Beverage Regulators

Cylinder gas pressure (CO2) regulators for Soft drink and Beer dispensing systems

Underwriters Laboratories, Inc. listed (file number SA1089)

The R81 regulator and C81 regulator configurations with integral relief valve and outlet check valves meet the requirements of paragraphs 4.5 and 4.6 of NSDA Pamphlet TD02, Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems, dated July, 1980.

The R82 regulator with integral relief valve meets the requirements of Proposed Section 9.7, Draught Beer Dispensing Equipment and Related Components (Seventh Draft dated October 17, 1980), of ANSI-ASME F2.1-1975, Food, Drug, and Beverage Equipment.

Technical data

R84

Fluid:

Carbon dioxide.

Maximum pressure:

3000 psig (207 bar)

Operating temperature:

0° to 140°F (-18° to 60°C)

Integral relief valve cracking pressure:

150 ± 5 psig (10.4 ± 0.33 bar)

R81

Fluid:

Carbon dioxide.

Maximum pressure:

3000 psig (207 bar)

Operating temperature:

0° to 140°F (-18° to 60°C)

Integral relief valve cracking pressure:

130 ± 4 psig (9.0 ± 0.28 bar)

R82

Fluid:

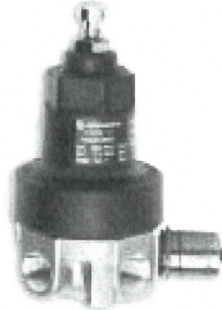
Carbon dioxide.

Maximum pressure:

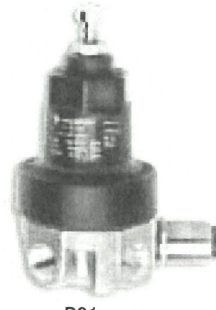
3000 psig (207 bar)

Operating temperature:

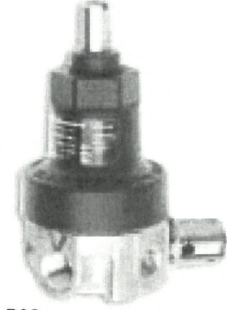
0° to 140°F (-18° to 60°C)



R84



R81



R82

Port	Model	Weight lb (kg)
1/4"	R84-200-MNLA	1.3 (0.59)
1/4"	R81-200-LNKA	1.3 (0.59)
1/4"	R82-200-ENEA	1.3 (0.59)

Alternative Models

R81-200-LN★A

Outlet Pressure Adjustment Ranges †	Substitute
1 to 25 psig (0.07 to 1.7 bar)	T
2 to 50 psig (0.14 to 3.4 bar)	E
5 to 100 psig (0.34 to 6.9 bar)	K

† Outlet pressure can be adjusted to pressures in excess of, and less than, that specified. Do not use these units to control pressures outside of the specified range.

Maximum outlet pressure adjustment limit:

Factory set at 40 to 45 psig (2.8 to 3.1 bar)

Integral relief valve cracking pressure:

60 ± 4 psig (4.1 ± 0.28 bar)

Materials

R84

Body: Brass

Bonnet: Zinc

Valve cartridge: Teflon, brass, stainless steel

Diaphragm: Acetal and nitrile

Relief valve: Brass, polycarbonate, nitrile, aluminum

Seals: Nitrile

R81

Body: Brass

Bonnet: Zinc

Valve cartridge: Teflon, brass, stainless steel

Diaphragm: Acetal and nitrile

Relief valve: Brass, polycarbonate, nitrile, aluminum

Seals: Nitrile

R82

Body: Brass

Bonnet: Zinc

Valve cartridge: Teflon, brass, stainless steel

Diaphragm: Acetal and nitrile

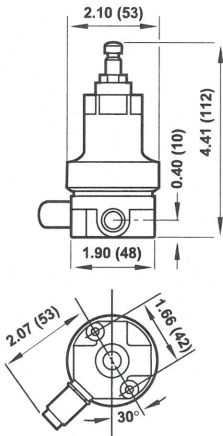
Relief valve: Brass, polycarbonate, nitrile, aluminum

Seals: Nitrile

U.L. Listed Beverage Regulators

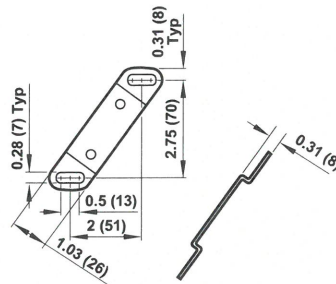
Cylinder gas pressure (CO2) regulators for Soft drink and Beer dispensing systems

R81 and R84 Regulator

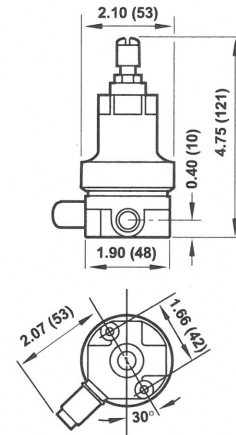


Mounting Holes (2 Places)
0.18" (4.6mm) dia. by 0.39 (10mm) deep.
Use 10-32 thread forming screws.

5095-51 Strap Type Bracket



R82 Regulator



Mounting Holes (2 Places)
0.18" (4.6 mm) dia. by 0.39" (10 mm) deep.
Use 10-32 thread forming screws.

R84 WARNING

For safety in systems using Norgren Model R84 regulators, the following procedures must be followed.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R84 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R84 regulator is preset and marked **150 PSIG RELIEF VALVE**. Replace only with the same 150 psig relief valve, part number 5779-54. The end cap on the 5779-54 relief valve is color coded red for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the **Technical data** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, beer dispensing systems, with soft drink product (syrup) containers, or industrial cylinder gas systems.

R81 WARNING

Soft drink dispensing systems must be designed, installed, and operated in accordance with the guidelines set forth in NSDA pamphlet TD02, **Installation and Operational Procedures for Pressurized Soft Drink Dispensing Systems**, dated July, 1980 or subsequent revisions.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R81 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R81 regulator is preset and marked **130 PSIG RELIEF VALVE**. Replace only with the same 130 psig relief valve, part number 5779-55. The end cap on the 5779-55 relief valve is color coded black for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the **Technical data** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, beer dispensing systems, soft drink carbonator systems, or industrial cylinder gas systems.

R82 WARNING

Beer dispensing systems must be designed, installed, and operated in accordance with the applicable guidelines such as the proposed Section 9.7, **Draught Beer Dispensing Equipment and Related Components** (Seventh Draft dated October 17, 1980), of ANSI-ASME F2.1-1975, Food, Drug and Beverage Equipment or subsequent revisions.

1. Pressure relief valves of sufficient capacity must always be used in the secondary (outlet) lines downstream of each pressure regulator, whether as an integral part of the regulator, as is the case with Norgren Model R82 Regulator, or separately installed elsewhere in the outlet lines. Do not remove or attempt to adjust, plug, block or otherwise defeat the purpose of the relief valve. Do not replace a relief valve with any but an identical model. The relief valve used on the R82 regulator is preset and marked **60 PSIG RELIEF VALVE**. Replace only with the same 60 psig relief valve, part number 5779-56. The end cap on the 5779-56 relief valve is color coded silver for visual identification. Failure to provide a pressure relief valve of sufficient capacity to hold outlet pressure below the lowest working pressure rating of any piece of equipment installed in the outlet lines can result in equipment damage and/or personal injury.
2. A back flow check valve must always be installed at the regulator or at each manifold outlet in liquid dispensing applications to prevent reverse flow through the regulator and possible introduction of liquids and other contaminants into the regulator.
3. Regulators must not be used where temperature or pressure may exceed those specified in the **Technical data** paragraph.
4. The accuracy of the indication of pressure gauges can change, both during shipment (despite care in packaging) and during the service life. If a pressure gauge is to be used in conjunction with these products and if inaccurate indications may be hazardous to personnel or property, the gauge should be calibrated before initial installation and at regular intervals during use. For gauge standards refer to ANSI B40.1.
5. These regulators are not intended for use in life support systems, soft drink carbonator systems, with soft drink product (syrup) containers, or industrial cylinder gas systems.

