Special Purpose Regulator
Adjustable Pressure Limits - High Relief Flow
R24 - ★★★ - ★★★★

R24
Installation & Maintenance Instructions

Port
2....1/4" 6....3/4"
3....3/8 8....1"
4....1/2" A....1-1/4"

Option
0....Not applicable

Adjustment Type
0....Knob

Type
R....Relieving piston

Gauge
G....With
N....Without

Spring (Outlet Pressure Range) *
C....5 to 30 psig (0.3 to 2 bar)
F....5 to 60 psig (0.3 to 4 bar)
L....10 to 125 psig (0.7 to 8 bar)
S....10 to 250 psig (0.7 to 17 bar)

Thread Form
A....PTF
B....ISO Rc taper
G....ISO G parallel

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

TECHNICAL DATA

Fluid: Compressed air
Maximum inlet pressure: 300 psig (20 bar)
Operating temperature: 0° to +150°F (-20° to +80°C)
Air supply must be dry enough to avoid ice formation at temperatures below +35°F (+2°C).
Typical flow at 150 psig (10 bar) inlet pressure, 90 psig (6.3 bar) set pressure, and 15 psig (1 bar) droop from set:
1/2" ports: 200 scfm (94 dm^3/s)
1-1/4" ports: 700 scfm (330 dm^3/s)
Maximum bleed rate at 50 psig (3.5 bar) outlet pressure: 0.031 scfm (0.015 dm^3/s). Maximum bleed rate occurs under dead-end (no flow) conditions.
Port sizes:

Main	Gauge
1/4"	1/4"
3/8"	3/8"
1/2", 3/4", 1", 1-1/4"	1/2"

Thread type: PTF, ISO G, or ISO Rc
Materials:
Body, top cap: Zinc
Main valve, adjusting screw: Brass
Pilot valve, relief valve, bottom plug: Acetal
Elastomers: Nitrile

REPLACEMENT ITEMS

Service kit - 1/4", 3/8" 1/2" ported regulators (Items 9, 11, 12, 14, 18, 19, 22 thru 26, 28, 29, 33).....5292-52
Service kit - 3/4", 1", 1-1/4" ported regulators (Items 9, 11, 12, 14, 18, 19, 23 thru 26, 30 thru 33) 5292-53

PANEL MOUNTING DIMENSIONS

Panel mounting hole diameter: 1.26" (32 mm)
Maximum panel thickness: 0.12" (3 mm)

INSTALLATION

1. Shut off air pressure. Install regulator in air line -
   - with air flow in direction of arrow on body,
   - upstream of lubricators and cycling valves,
   - as close as possible to the device being serviced.
   - at any angle.
2. Connect piping to proper ports using pipe thread sealant on male threads only. Do not allow sealant to enter interior of regulator.
3. Install a pressure gauge or plug the gauge ports. Gauge ports can also be used as additional outlets for regulated air.
4. Install a Norgren general purpose filter upstream of the regulator.

ADJUSTMENT

1. Before applying inlet pressure to regulator, turn adjustment (4) counterclockwise until knob stops.
2. Apply inlet pressure, then turn adjustment (4) clockwise to increase and counterclockwise to decrease pressure setting.
3. 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, then bring up to the desired pressure.
4. If desired, a maximum or minimum outlet pressure adjustment limit may be set. See page 2 for instructions.

DISASSEMBLY

1. Regulator can be disassembled without removal from air line.
2. Shut off inlet pressure. Reduce pressure in inlet and outlet lines to zero.
3. Turn adjustment (4) fully counterclockwise.

WARNING

Prior to performing step 4, make certain air pressure upstream and downstream of the R24 is zero psi.

4. Use retaining ring pliers to remove the top plate (6) and retaining ring (7). Pull cap (8) and o-ring (9) from body.
5. Unscrew socket head screw (1), then remove button (2), spring (3), knob (4), tumblers (5), coupling (10), and o-ring (11).
6. Remove, as an assembled unit, the adjusting screw (12) with upper and lower piston assemblies (items 13 thru 19). Remove spring (20).
7. Unscrew the adjusting screw (12), then separate upper and lower piston assemblies (items 13 thru 19). The adjusting screw has left hand threads. Make sure o-ring (18) remains attached to the lower piston (17). If not, retrieve it from inside the upper piston (13).
8. Unscrew bottom plug (21) to gain access to the parts (22 thru 33) located in the lower portion of the body.

CLEANING

1. Clean parts with warm water and soap.
2. Rinse and dry parts. Blow out internal passages in body (34, 35) with clean, dry compressed air.
3. Inspect parts. Replace those found to be damaged.

ASSEMBLY

1. Lubricate o-rings, o-ring sealing surfaces, and the adjusting screw threads (12) with a small amount of good quality o-ring grease.
2. Assemble the lower piston (16*, 17, 18,19), the regulating spring (15), and upper piston (13, 14), then turn the adjusting screw (12) into the assembly until the tip of the screw is flush with the bottom of the lower piston (17). The adjusting screw has left hand threads. Place spring (20) in position in the body, then place the upper and lower piston assembly (items 12 thru 19) in the body.
3. Insert coupling (10) and o-ring (11) into cap (8). Place tumblers (5), knob (4), spring (3), and button (2) in position and secure with screw (1). Make sure button (2) is installed with the large end (marked **A**) up. Place o-ring (9) in position on the cap (8), then place the cap and knob assembly (items 1 thru 5, and 8 thru 11) in body, making sure coupling (10) engages the adjusting screw (12).
4. Use retaining ring pliers to install retaining ring (7), then install and top plate (6).

WARNING

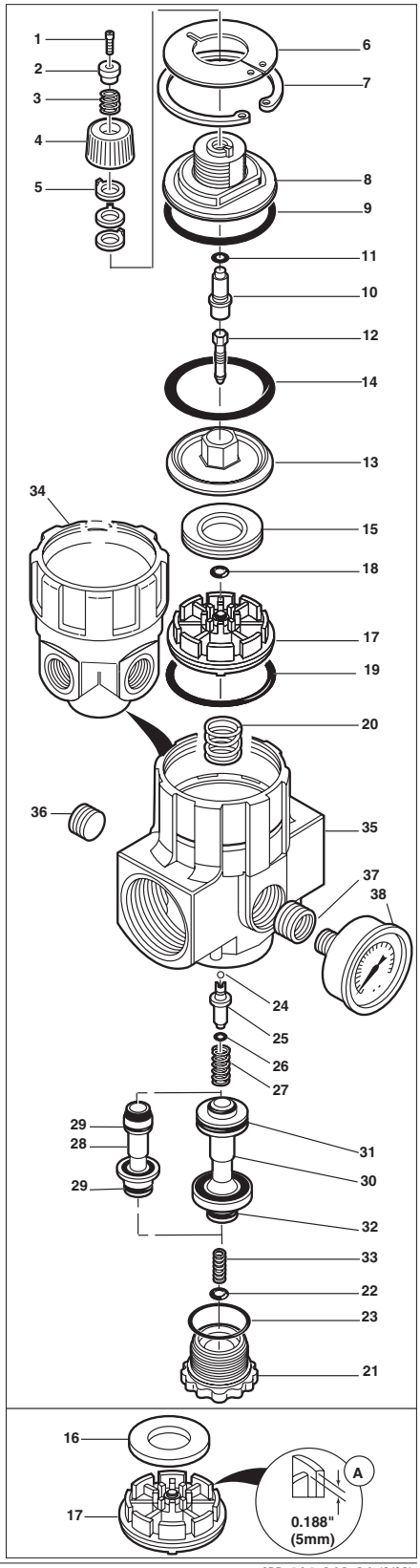
Make sure retaining ring (7) is fully seated in the groove in the body.

5. Install the lower section parts (items 21 thru 33) into body (34 or 35).
6. Torque Table

Item	Inch-Pounds (Nm)
21 (Bottom plug)	20 to 30 (2.3 to 3.4)
1 (Screw)	3 to 4 (0.3 to 0.5). Screw head must not extend more than 0.050" (1.3 mm) above top of button (2).

7. Set the R24 for normal operation as described in paragraph 1-2, page 2 before it is returned to service.

* Item 16, washer, is used only with 1/4", 3/8", and 1/2" ported R24 regulators manufactured from September, 1993 to March, 1994. The design of the piston (17) was changed in early 1994, and washer (16) was eliminated. The washer support ribs on the early pistons (Detail A of exploded view) are recessed approximately 0.188" (5mm) to accommodate washer (16). The support ribs on current pistons are recessed approximately 0.063 (2mm). Discard washer (16) when replacing the early piston with a current piston.



1-2. Regulators Shipped from Factory:

- allow pressure adjustment throughout the entire outlet pressure range as shown on the regulator label and as listed in the model number description at the top of page 1.
- have the red pressure set button (Figure 1) in the tamper resistant position, preventing the accidental setting of a pressure limit. When the button is in the tamper resistant position, the letters **TR** are visible on the button; when the button is in the adjustable position, the letter **A** is visible.

1-2. Set the R24 for Normal Operation (Fig 1).

Any time the R24 is disassembled and reassembled, the adjusting knob must be reset for normal operation (i.e., set to operate thru the entire outlet pressure range as listed in the model number description at the top of page 1).

1. Make sure the red pressure set button is in the adjustable position (end marked **A** up). If the end marked **TR** is up, reverse the position of the button by performing steps 1 and 2 in paragraph 1-5, Tamper Resistant Procedure, but reinstall the button with the end marked **A** up.
2. Install the regulator in a compressed air test line with gages installed for observing inlet and outlet pressures. Inlet pressure should not exceed 250 psig (17.2 bar).
3. Turn adjusting knob fully counterclockwise (ccw), then slowly apply inlet pressure while observing the outlet pressure gage.

If outlet pressure is indicated with the knob fully ccw:

a. Depress and hold the pressure set button, then turn adjusting knob clockwise (cw) until it stops and release button.
b. Turn adjusting knob ccw until outlet pressure reaches zero. If outlet pressure does not reach zero when knob is turned fully ccw, repeat steps (a) and (b) until it does.
c. When outlet pressure reaches zero, turn knob an additional 1/4 turn ccw. Depress pressure set button, then turn knob fully ccw and release button.
d. Turn knob slowly cw and verify that outlet pressure starts after knob is turned 1/4 turn. Fine adjustment can be made by depressing the pressure set button and turning knob cw or ccw as needed.

If outlet pressure is not indicated with the knob fully ccw:

a. Turn adjusting knob clockwise (cw) until outlet pressure is indicated.
b. If outlet pressure is not indicated when the knob is turned fully cw, depress pressure set button, then turn adjusting knob ccw until it stops and release button. Repeat steps (a) and (b) until outlet pressure is indicated when the knob is turned cw.
c. When outlet pressure starts, turn knob ccw 1/4 turn. Depress pressure set button, then turn knob fully ccw and release button.
d. Turn knob slowly cw and verify that outlet pressure starts after knob is turned 1/4 turn. Fine adjustment can be made by depressing the pressure set button and turning knob cw or ccw as needed.

After the regulator is set for normal operation, the adjusting knob may be set to limit the maximum or the minimum adjustable pressure setting of the regulator. For example, a regulator with a 10 to 125 psig outlet pressure range could be set to limit the maximum outlet pressure to 90 psig, or it could be set to limit the minimum outlet pressure to 25 psig.

1-3. How to Set Outlet Pressure Limit when the Pressure Set Button is in the Tamper Resistant Position (Fig 1).

To Set a Maximum Pressure Limit:

1. With primary pressure applied to the R24, turn adjusting knob clockwise until the desired maximum outlet pressure is reached.
2. Hold adjusting knob, then use a 5/64" hex wrench to loosen button screw 4 to 5 turns.
3. Depress and hold button screw, then turn adjusting knob clockwise until it stops. Release button screw.
4. Hold adjustment knob and tighten button screw. **Do not depress screw, as the adjustment limit will be affected.**
5. Turn adjusting knob fully counterclockwise.

To Set a Minimum Pressure Limit:

1. With primary pressure applied to the R24, turn adjusting knob clockwise until the desired minimum outlet pressure is reached.
2. Hold adjusting knob, then use a 5/64" hex wrench to loosen button screw 4 to 5 turns.
3. Depress and hold button screw, then turn the adjusting knob counterclockwise until it stops. Release button screw.
4. Hold adjustment knob and tighten screw. **Do not depress screw, as the adjustment limit will be affected.**

WARNING

When the minimum adjustment limit is set above zero, the upper limit of adjustment increases correspondingly, and could possibly approach inlet pressure.

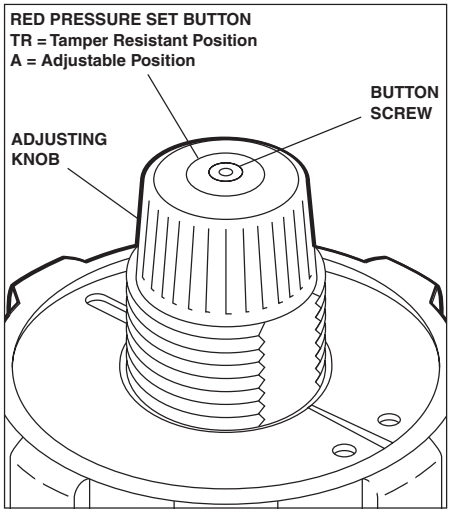


Figure 1. R24 Pressure Set Button

1-4. How to Set Outlet Pressure Limit when the Pressure Set Button is in the Adjustable Position (Fig 1).

To Set a Maximum Pressure Limit:

1. With primary pressure applied to the R24, turn adjusting knob clockwise until the desired maximum outlet pressure is reached.
2. Depress and hold button screw, then turn the adjusting knob clockwise until it stops. Release button screw.
3. Turn adjusting knob fully counterclockwise.

To Set a Minimum Pressure Limit:

1. With primary pressure applied to the R24, turn adjusting knob clockwise until the desired minimum outlet pressure is reached.
2. Depress and hold button screw, then turn the adjusting knob counterclockwise until it stops. Release button screw.

WARNING

When the minimum adjustment limit is set above zero, the upper limit of adjustment increases correspondingly, and could possibly approach inlet pressure.

1-5. Tamper Resistant Procedure (Fig 1).

Adjustment limits can be made tamper resistant by reversing the position of the red pressure set button so the end marked **TR** is up. To reverse the button:

1. Apply minimum 25 psig (1.7 bar) to the regulator. Turn adjusting knob fully clockwise, then hold adjusting knob and and remove button screw using a 5/64" hex wrench. **Do not depress screw, as the adjustment limit will be affected.** Remove button, then reinstall with the end marked **TR** up.
2. Install button screw, taking care not to push screw in when tightening. Turn adjusting knob fully counterclockwise.

1-6. Warning.

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under Technical Data.

If outlet pressure in excess of the regulator pressure setting could cause downstream equipment to rupture or malfunction, install a pressure relief device downstream of the regulator. The relief pressure and flow capacity of the relief device must satisfy system requirements.

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 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.

Before using these products with fluids other than air, for non industrial applications, or for life-support systems consult Norgren.