

## RC 195 Receiver-Controller

### Product Description

The POWERS RC 195 Receiver-Controller is a pneumatic instrument that receives one, two or three pneumatic inputs. It produces a pneumatic control signal based on the net pneumatic input and the mechanical settings, such as setpoint, percent proportional band and authority.

### Product Numbers

Table 1.

Product Number	Control (Output) Pressure Gauge	Stick-On Scale Dispenser For Setpoint Dial
195-0001	None	English/Standard International Units
195-0003	0 to 30 psig/ 0 to 200 kPa	English/Standard International Units

### Troubleshooting

Before troubleshooting the operation of the RC 195 Receiver-Controller, ensure that:

1. The supply pressure at the unit is 22 psi (152 kPa).
2. All transmitter inputs being used are between 3 to 15 psi (21 to 103 kPa).
3. Only one restrictor supplies each transmitter.
4. The transmitter calibration is correct.

### Accessories

Restriction Repair Kit, includes Four restriction plates and gaskets	195-066
Connector Kit, includes Two connectors, one 2-barb and One 3-barb (for 1/4 O.D. plastic tubing)	195-067
RC 195 Input Pressure Simulator Two gauge/switch assemblies	195-099
Terminal Strip (for ten 1/4 O.D. plastic tubes)	195-082
Scale Conversion Card (Single)	125-1661
Scale Conversion Card (Pkg. of 25)	144-022
Setpoint Dial Sheets (See <i>POWERS CONTROL® RC195 Multiple Input Receiver-Controller Technical Instructions</i> 155-036P25 or the <i>Powers Controls Catalog</i> for scale ranges.)	195-130
Receiver Gauges a variety of 1-1/2 inch (38mm), 2-1/2 inch (64mm) and 3-1/2 inch (89mm) diameter receiver gauges are available to monitor transmitter input signals. Request GA 142-2 Receiver Gauges (155-023P25) from your nearest Siemens Industry, Inc. office.	
RC Calibration Slide Rule	153-054

Table 1. Troubleshooting Checklist.

Complaint	Check	Probable Cause	Corrective Action	
Control pressure stays at approximately zero	Rotate setpoint adjustment screw counterclockwise	Pressure increases	Transmitter sensing medium which is above (R.A.) or below (D.A.) the proportional band RC 195 out of calibration	None Recalibrate
		Pressure remains unchanged	Plugged Pilot Relay Restrictors Receiver-Controller is defective	Replace Pilot Relay Restrictors Replace Receiver-Controller
Control pressure stays at approximately supply pressure	Rotate setpoint adjustment screw clockwise	Pressure decreases	Transmitter sensing medium which is above (D.A.) or below (R.A.) the proportional band RC 195 out of calibration	None Recalibrate
		Pressure remains unchanged	Receiver-Controller is defective	Replace Receiver-Controller

## Installation

### General

1. The RC 195 Receiver-Controller may be mounted in any position on any vertical surface. Two integral mounting tabs accept a No. 8 or No. 10 screw. Small vibrations, such as those from an air handling unit, will not affect the operation of the instrument.
2. Generally, 1/4-inch (6.4 mm) O.D. plastic tubing should be used for all the connections to the plug-in air connectors. Larger size tubing will reduce the pressure drops, but they will increase time delays. Conversely, smaller tubing will reduce time delays, but will increase pressure drops.
3. The RC 195 requires a clean, dry, oil free supply of compressed air. It is recommended that an AF 908 In-Line Air Filter be located in the supply line to the RC 195. A maximum of two RC 195 Receiver-Controllers can be supplied by a single AF 908 In-line Air Filter.
4. Whenever possible, the RC 195 equipment should be used with a constant air supply. The RC 195 Receiver-Controller and transmitter are calibrated at the factory with a 22 psig air supply. If a constant air supply is not available, use a remote restrictor and separate air supply to transmitters.

Changing the supply pressure to the RC 195 Receiver-Controller system from 22 psig to either 18 or 25 psig can shift the control point by as much as 2% of scale.

Once the instrument is secured and proper tubing connections are made, the cover can be removed for access to internal restrictors, percent authority adjustment, percent proportional band adjustment, the setpoint dial and the setpoint dial adjustment.

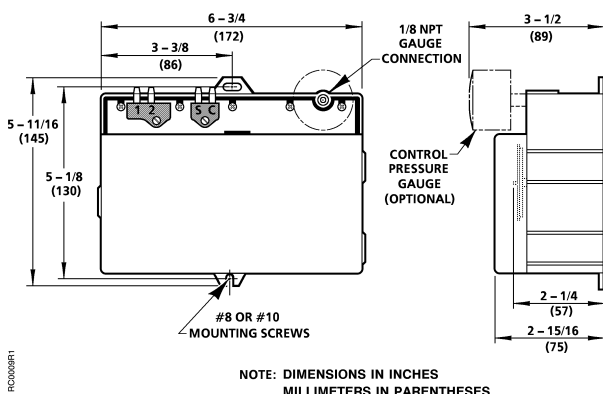


Figure 1. Dimensions.

### Cover removal

The cover furnished with the RC 195 is self-locking to the instrument body. To remove the cover, pull cover to the right and lift then pull cover to the left and lift. To put the cover back on, put it in place and press down until it latches.

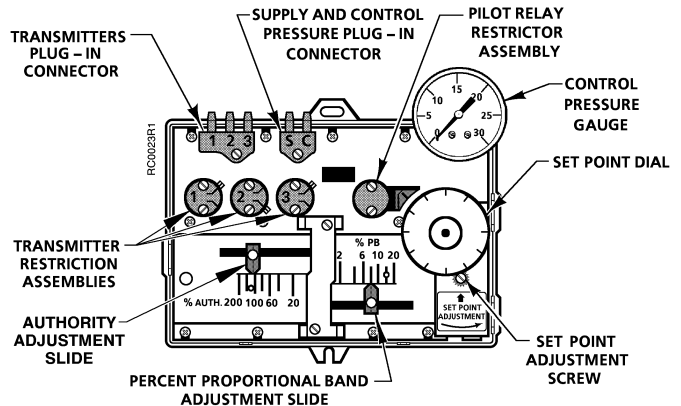


Figure 2.

### Restrictors

1. Restrictors are factory installed in all inputs of the Receiver-Controller. Restrictors are in the "OUT" position as shipped from the factory.

**NOTE:** When an internal restrictor is required, the restrictor must be moved to the "IN" position.

Use the following procedure when dialing to a new restrictor position:

- a. Loosen both screws two full turns.
  - b. Move the restrictor lever back and forth, between the full travel limits, a minimum of two times or until there is no sensation of "drag" against the lever. This will allow the gasket to return to its proper position.
  - c. Retighten both screws with the restrictor lever fully in position against its stop. Do not over-tighten the screws. Screws should be tight enough to provide a good seal without warping the restrictor assembly.
  - d. See *Accessories* for Replacement Restrictor Kit part number.
2. When an input is not being used, the restrictor should be in the "OUT" position and the input connection should be open to atmosphere.

## Installation, Continued

Figure 3 gives the maximum recommended distances for using the internal restrictor, external restrictor and remote gauges. If the maximum distances are exceeded, there will be excessive pressure drops and time delays which will produce faulty indication and unsatisfactory operation.

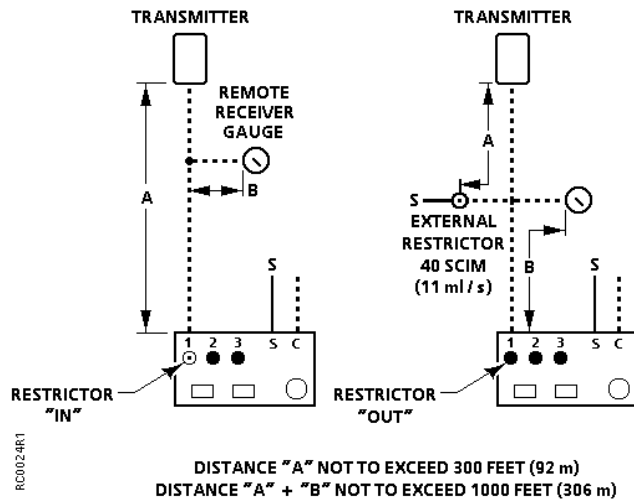


Figure 3.

## Proportional band (sensitivity)

The proportional band setting is adjustable from 2 to 20% of the primary input scale based on a control pressure change of 5 psi. The proportional band setting selected depends on the characteristics of the system under control; this setting is normally a value which will result in satisfactory control without short cycling (too low percent PB) or hunting (too high percent PB).

## Authority adjustment

The authority slide provides a means of adjusting the ratio of the change of the #1 (or #2) input pressure to the change of the #3 input pressure for the same control pressure change. Input connections #1 and #2 have fixed authorities with respect to each other equal to 100%. Input connection #3 has an adjustable authority with respect to inputs #1 and #2 which, by means of authority slide, may be varied from 20 to 200%. The authority adjustment is required only when input #3 is used.

## Setpoint adjustment

The output pressure at setpoint can be adjusted by simply rotating the setpoint adjustment screw until the desired pressure is reached. The setpoint dial has a 3 to 15 psi (21 to 103 kPa) scale. One of the stick-on scales provided with the unit may be placed on the dial to match the #1 or #2 input transmitter range. Each scale is marked D.A. (Direct Acting) or R.A. (Reverse Acting) to match the required action of the receiver-controller.

To determine the authority setting, the proportional band setting, and setpoint setting, see the *control diagram* (or the setting on the instrument being replaced). *Technical Instructions RC 195-1* gives detailed information on how to calculate the percent proportional band setting, the percent authority setting, and setpoint conditions.

## Calibration

### Receiver-Controller Simulator

A tool designed to simplify the calibration and set-up of the RC 195 receiver-controller is available. The RC 195 simulator (Product Number 195-099) can simulate two transmitters (one-pipe) and indicate their corresponding simulated pressures.

### Procedure

1. Set the proportional band pointer to value shown on the control diagram.
2. Set the authority pointer to value shown on the control diagram.

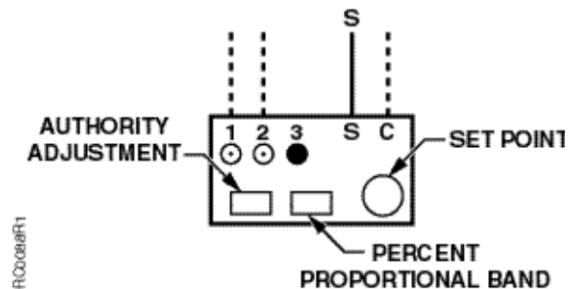


Figure 4. RC-1 Control Diagram.

3. Connect 22 psi supply air to port "S".
4. Connect pressure gauge to port "C".

## Installation, Continued

5. Apply setpoint pressures to inputs and, with a screwdriver, turn the setpoint adjustment screw until control pressure reaches 8 psi (55 kPa) or midpoint pressure between spring range of actuator.
6. Calibrate the setpoint dial by pulling it up, turning it to agree with the transmitter input and then releasing it.
7. Turn the setpoint adjustment screw until the dial agrees with control diagram.
8. For two input applications, setpoint conditions are equal to the midpoints of the reset schedule.

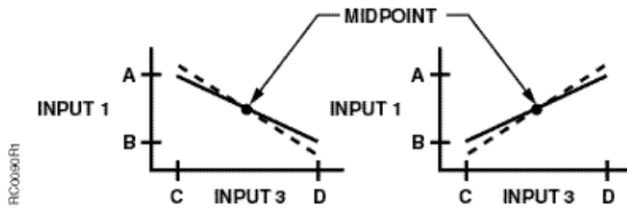


Figure 5.

9. For manual control point adjustment (CPA), connect gradual switch to input 1 or 2, set switch to 9 psi (62 kPa), and then calibrate controller as in Steps 5 through 8 above. Calibrating in this manner will allow equal increase or decrease in control point when the bleed type positioning switch is used.
10. Once the sensor-controller system is completely installed and sensor(s) have been calibrated, some tuning of the control loop may be required. If output continuously cycles, increase percent proportional band. If hunting (large offset) is present, decrease percent proportional band.

**NOTE:** Whenever the proportional band or authority settings are changed, the setpoint dial must be recalibrated.

The installation is now complete.

## References

- RC 195-1  
Operation and adjustment information  
155-036P25
- GA 142-2  
Receiver Gauges  
155-023P25
- RC 195-3  
RC 195 Simulators  
155-103P25

## Receiver-Controller Cross Reference

RECEIVER-CONTROLLER CROSS REFERENCE			
DIRECT ACTION - SINGLE INPUT	REVERSE ACTION - SINGLE INPUT	DIRECT ACTION - RESERVE RESET DUAL INPUT (ONE RESETTING)	DIRECT ACTION - RESERVE RESET THREE INPUT (TWO RESETTING)
<b>POWERS CONTROLS</b>			
<p>RC - 195</p>	<p>RC - 195</p>	<p>RC - 195</p>	<p>RC - 195</p>
<b>HONEYWELL</b>			
<p>RP - 908A (D.A. MODEL)</p>	<p>RP - 908A (R.A. MODEL)</p>	<p>RP - 908B</p>	<p>RP - 908B</p>
<b>JOHNSON</b>			
<p>T-9001 &amp; T-9005</p>	<p>T-9001</p>	<p>T-9002 &amp; T-9006</p>	<p>T-9002 &amp; T-9006</p>
<b>ROBERTSHAW</b>			
<p>P341</p>	<p>P341</p>	<p>P341</p>	<p>P341</p>
<b>BARBER-COLMAN</b>			
<p>RKS - 5001</p>	<p>RKS - 5001</p>	<p>RKS - 3002</p>	<p>RKS - 4002</p>
<b>DISCONTINUED LANDIS AND GYR POWERS</b>			
<p>RC - 185</p>	<p>RC - 185</p>	<p>RC - 185</p>	<p>RC - 185</p>

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