

PNEUMATICS & FITTINGS

SIEMENS/POWERS PNEUMATIC CONTROLLER 195 SERIES SINGLE AND MULTIPLE INPUT RECEIVER-CONTROLLER



DESCRIPTION

The **Siemens/Powers 195-0011 Single Input Receiver-Controller** is a pneumatic instrument which receives one pneumatic input, either direct acting (DA) or reverse acting (RA). It produces a pneumatic control signal based on the net pneumatic input and the mechanical setting of the setpoint and percent proportional band.

The **195-0003 Multiple Input Receiver-Controller** is a pneumatic instrument which 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.

FEATURES

- **Plug-in air connections make connecting, calibrating and servicing easy**
- **Internal restrictors provided for transmitter inputs**
- **Stick-on scales for setpoint dial in standard transmitter ranges in both English and metric units**
- **Large, easy-to-read scales on all adjustments**
- **Tamper-resistant cover**

NEW!

SIEMENS
POWERS™



195 Series

APPLICATION

The **195-0003 Series Receiver-Controller** is commonly used to control temperatures, humidity, and pressures of mechanical equipment in commercial buildings, such as offices, hospitals, universities and schools.

The **195-0011 Series Single Input Receiver-Controller** is a one input (direct acting or reverse acting) instrument. It is commonly used to control temperatures, humidity, and pressures of mechanical equipment in commercial buildings, such as offices, hospitals, universities, and schools.

SPECIFICATIONS		
Control Action		
195-0011 - Input 1	Direct action (DA)	
195-0011 - Input 2	Reverse action (RA)	
195-0003 - Input 1	Direct action (DA)	
195-0003 - Input 2	Reverse action (RA)	
195-0003 - Input 3	Direct reset relative to Input 2 Reverse reset relative to Input 1	
Pneumatic Inputs	3 to 15 psi (21 to 103 kPa)	
Control Output	0 psi (0 kPa) to supply pressure	
Ambient Temperature Range	40 to 120°F (4 to 49°C)	
Supply Pressure		
Operating	22 psi (152 kPa)	
Maximum Safe	30 psi (207 kPa)	
Percent Proportional Band Adjustment Range	2 to 20% for a 5 psi (34 kPa) Control pressure change	
Percent Authority Adjustment Range	20 to 200%	
Air Consumption	60 scim (17 ml/sec)	
Mounting	Surface	
Air Connections		
195-0011	Barb fittings for 1/4" (6 mm) OD plastic tubing Two plug-in connectors are provided: one for the direct acting and the reverse acting transmitter inputs and one for supply and control lines. 1/8" NPT connection provided for control pressure gauge (gauge not included).	
195-0003	Two plug-in connectors are provided: one for the three transmitter inputs and one for supply and control lines. 1/8" NPT connection provided for control pressure gauge.	
Case Material	Lexan, 20% glass filled	
Dimensions	5 11/16"H x 6 3/4"W x 3 1/2"D (14.5 x 17.2 x 8.9 cm)	
Weight	3.1 lb (1.4 Kg)	
Warranty	1 year	

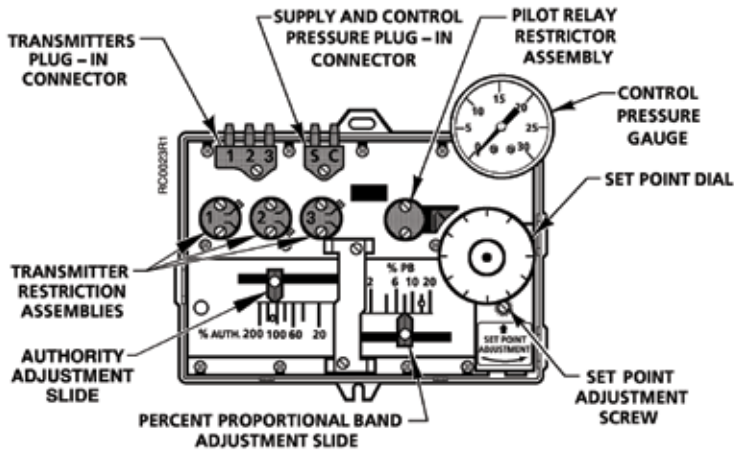


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SIEMENS/POWERS PNEUMATIC CONTROLLER

195 SERIES SINGLE AND MULTIPLE INPUT RECEIVER-CONTROLLER

INSTALLATION

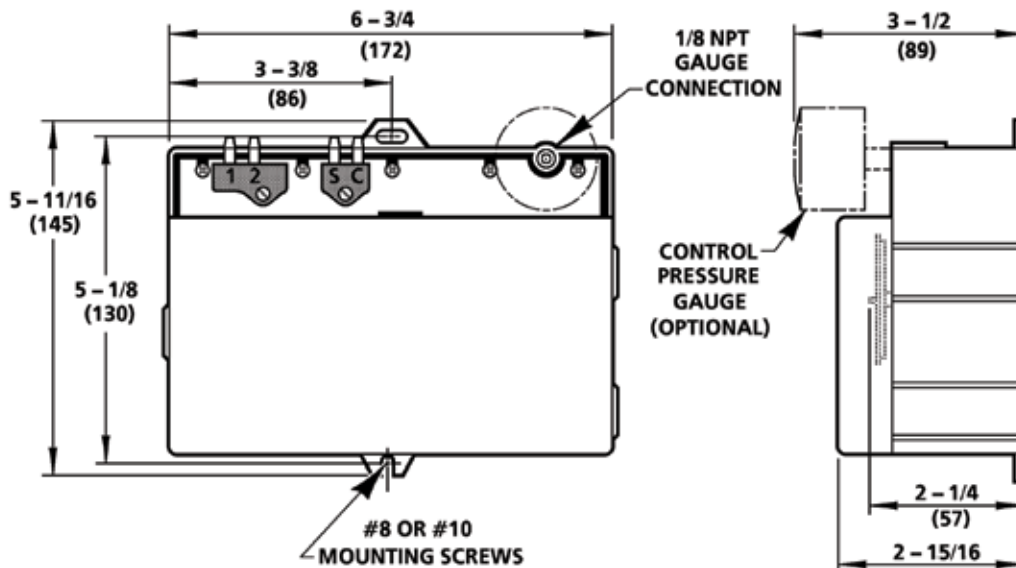


Multiple Input Receiver-Controller Connector, Restrictor, and Adjustment Locations

Scale Ranges

English	Scale Identification	Metric
-40°F to 120°F	A	-40°C to 50°C
50°F to 100°F	B	10°C to 38°C
80°F to 240°F	C	26°C to 117°C
20% to 80% rh	D	20% to 80% rh
0°F to 100°F	E	-18°C to 38°C
35°F to 135°F	F	1°C to 58°C
0 IWG to 3 IWG	G	0 Pa to 750 Pa
0 IWG to 15 IWG	H	0 kPa to 3.75 kPa
0 IWG to 0.5 IWG	J	0 Pa to 125 Pa
Blank 10 divisions	K (DA)	Blank 9 divisions
Blank 16 divisions	K (RA)	Blank 11 divisions
-0.05 IWG to 0.20 IWG	L	-12.5 Pa to 50 Pa
-0.5 IWG to 0.5 IWG	M	-125 Pa to 125 Pa
0 IWG to 10 IWG	N	0 kPa to 2.5 kPa
Blank 20 divisions	P	Blank 15 divisions
0 psi to 50 psi	R	0 kPa to 345 kPa
50°F to 150°F	S	10°C to 66°C
40°F to 240°F	T	4°C to 116°C
-40°F to 160°F	V	-40°C to 71°C

DIMENSIONS



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INSTALLATION

1. Mount the RC 195 Single Input Receiver-Controller in any position on any vertical surface using two #8 or #10 screws. The integral mounting tabs are located on the top and bottom of the case.
NOTE: Small vibrations such as those from an air handling unit will not affect the operation of the instrument.
2. Remove the cover by pulling to the right, lifting, then pulling to the left and lifting. Remove the cover for access to percent proportional band adjustment, the setpoint dial, and setpoint adjustment screw.
3. The setpoint dial comes with a 3-15 psi (21 to 103 kPa) scale. Place one of the stick-on scales (Table 1) on the dial to match the primary transmitter range. Each scale is marked DA or RA to match the required action of the receiver-controller.

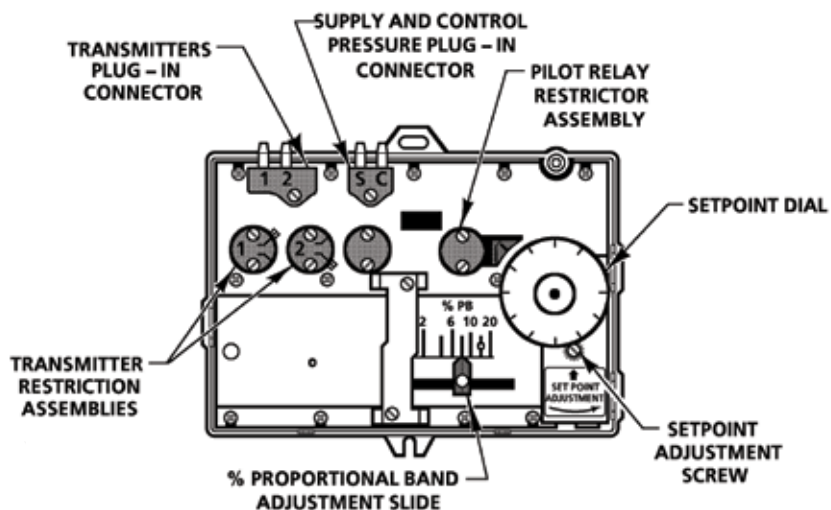


Figure 2 - Single Input Receiver-Controller Connector, Restrictor, and Adjustment Locations

4. Check all the air connections particularly those to the transmitter to eliminate leaks. Even small leaks in the pneumatic lines to the transmitters will introduce large errors.
5. Check the supply pressure. The supply pressure must be a constant 22 psi (152 kPa). If it is different or if a dual air supply is used, error will be introduced into the transmitted signal.

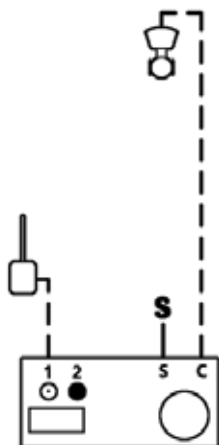


Figure 3 - Typical Direct Action (DA) Installation

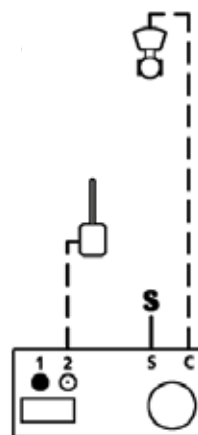


Figure 4 - Typical Reverse Action (RA) Installation



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SIEMENS/POWERS PNEUMATIC CONTROLLER

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OPERATION

The control pressure depends upon the position of the main lever which is determined by the sum of the forces acting upon it. On the left side of the pivot, two forces act against the lever: the bias spring and the #1 direct acting input pressure. On the right side of the pivot, three forces act against the lever: the control pressure acting through the percent proportional band slide, the #2 input pressure, and the setpoint spring. See Figure 1.

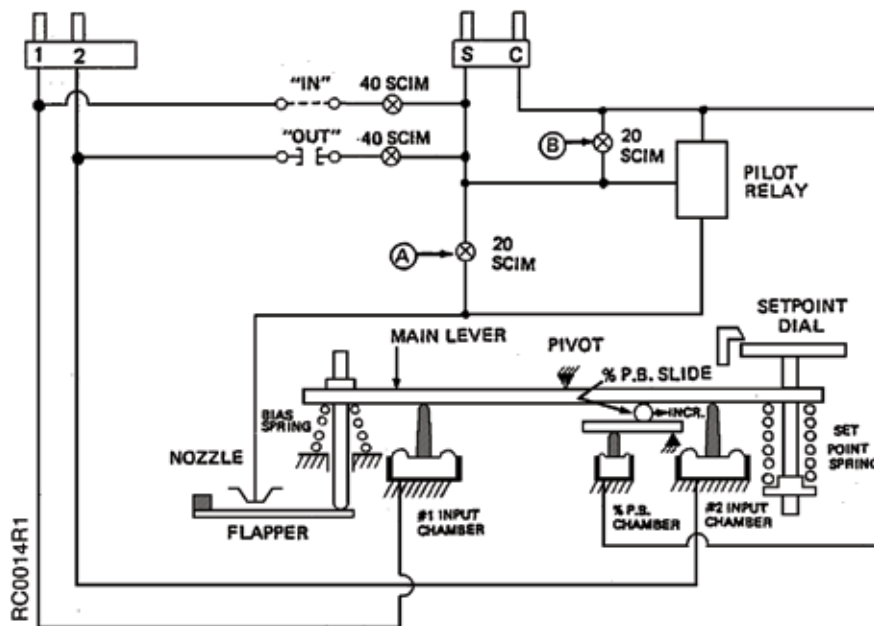


Figure 1 - Single Input Receiver-Controller Schematic

When the net forces on each side of the pivot are equal, the lever is stationary and the control pressure is constant. A change in any of the forces moves the main lever to a new equilibrium position and provides a new control pressure.

The input on the left side of the pivot is direct acting and the input on the right side of the pivot is reverse acting. An internal 40 scim (11 ml/s) restrictor is furnished for each input. Each restrictor must be switched "in" when an external restrictor is not used. When any input is not being used, its restrictor should be in the "out" position and the input connection should be open to the atmosphere. Restrictor "A" provides nozzle pressure and restrictor "B" minimizes hysteresis in the pilot relay as shown in Figure 1.

The pilot relay amplifies the nozzle pressure to provide the control pressure output. Control pressure goes to the controlled device(s) as well as the percent proportional band chamber to provide proportional feedback. For example, if the main lever is moved up on the left side of the pivot, the flapper will move toward the nozzle to increase control pressure. The increased pressure in the percent proportional band chamber will move the main lever up on the right side of the pivot moving the flapper away from the nozzle until an equilibrium and a new control pressure are reached. The amount of feedback is adjusted by moving the percent proportional band slide.



OPERATION

The control pressure depends upon the position of the main lever which is determined by the sum of the forces acting upon it. On the left side of the pivot three forces act against the lever: the bias spring, the #1 input pressure, and the #3 input pressure acting through the authority slide.

On the right side of the pivot three forces act up against the lever; the control pressure acting through the percent proportional band slide, the #2 input pressure, and the setpoint spring. See Figure 1.

When the net forces on each side of the pivot are equal, the lever is stationary and the control pressure is constant. A change in any of the forces moves the main lever to a new equilibrium position and provides a new control pressure. The inputs on the left side of the pivot (#1 and #3) are direct acting and the input on the right side of the pivot (#2) is reverse acting.

An internal 40 scim (11 ml/s) restrictor is furnished for each input. Each transmitter restrictor must be switched "in" when an external restrictor is not being used. When any input is not being used, its restrictor should be in the "out" position and the input connection should be open to the atmosphere. Restrictor "A" provides nozzle pressure and restrictor "B" minimizes hysteresis in the pilot relay. See Figure 1.

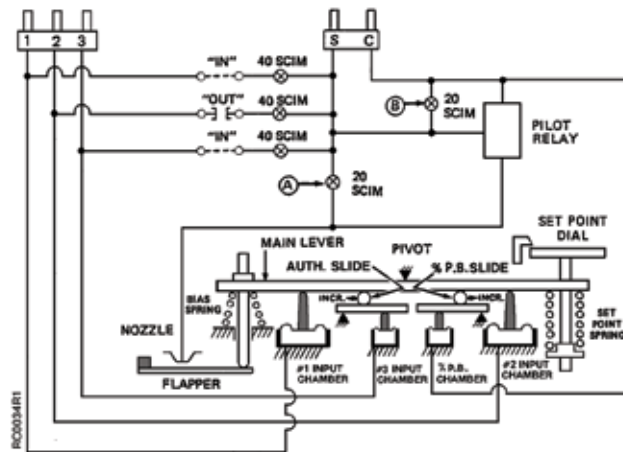


Figure 1 - Multiple Input Receiver-Controller Schematic

The pilot relay amplifies the nozzle pressure to provide the control pressure output. Control pressure goes to the controlled device(s) as well as the percent proportional band chamber to provide proportional feedback. For example, if the main lever is moved up on the left side of the pivot, the flapper will move toward the nozzle to increase control pressure. The increased pressure in the percent proportional band chamber will move the main lever up on the right side of the pivot, moving the flapper away from the nozzle until an equilibrium and a new control pressure are reached. The amount of feedback is adjusted by moving the percent proportional band slide.

Authority is defined as 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. The authority slide provides a means of adjusting this ratio.

The RC 195 Receiver-Controller can be used as a one input (DA or RA) a two input (DA or RA with reset), or a three input instrument (DA or RA with reset and control point adjust).

On reset applications, inputs 1 and 3 provide direct action with reverse reset (Figure 2), and inputs 2 and 3 provide reverse action with direct reset (Figure 3). When other combinations of action and reset are required (reverse action with reverse reset or direct action with direct reset) use the combination of inputs that provide the proper reset action and add a reversing relay in the control line of the RC 195 to change the action (Figure 4).



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ORDERING INFORMATION

MODEL
195-0003

DESCRIPTION
Multiple Input Receiver-Controller with stick-on scales

195-066
195-067
195-099
195-130
153-054
144-022

ACCESSORIES
Resistor Kit
Connector Kit
RC 195 Pressure Simulator
Scale dispensing sheet kit English and SI units DA and RA
Receiver-Controller Calibration Slide Rule
Scale Conversion Card (Form)