

**TAC Pneumodular Ratio/Amplifying Relay  
General Instructions**

The 2378-501 Amplifying Relay is a proportioning device designed for use in pneumatic control systems where the application requires the amplification of a proportional signal from a controlling device. The 2378-501 branch line pressure output increases as a 2:1 ratio to the input signal pressure (up to main air pressure) and amplifies the volume of air available to the final control device, thereby minimizing system lag.

The unit is factory adjusted for a 10 psig branch pressure at a signal pressure of 5 psig. A bias adjustment is provided which permits the effect of the input signal pressure to be decreased up to 9 psig from the actual input pressure (see Figure-2).

**ORDERING INFORMATION**

**Table-1 Relay.**

TAC UNI-LINE Number	Replaces Model	Function
2378-501	R539	2:1 Amplifying
22-150	K502	Optional Mtg. Bracket

**Table-2 Active Connections.**

PORT	CONNECTED TO
M	Main air
B	Branch output
S1	Input Signal

**GENERAL INSTRUCTIONS**

This device is to be used on clean, dry, oil free control air only and will operate properly when mounted in any position.

The inherent reliability of this device is enhanced and prolonged through regular inspection and preventive maintenance by a qualified control expert. Should this device become inoperative, it should be replaced by a new unit.

**SPECIFICATIONS**

**Action:** Proportional output at 2:1 ratio.

**Adjustments:** Bias can be manually adjusted from +5 psig to -13 psig by means of a 5/64" hex wrench.

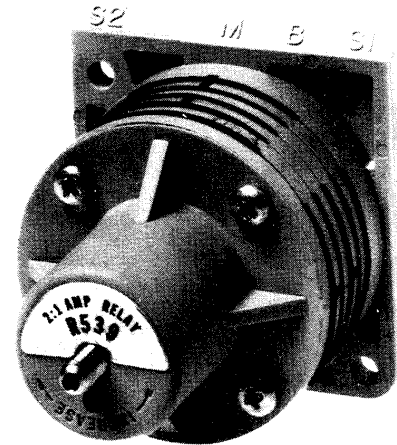
**Main Air Pressure:** 20 psig operating 30 psig maximum.

**Air Capacity:** 8 scfh.

**Air Consumption:** 1 scfh.

**Maximum Ambient Temperature:** 140 °F.

**Mounting:** Designed for use on 22-120 TAC Pneumodular



2378-501

manifold socket. These devices can also be surface mounted by using the appropriate mounting bracket (see Mounting Instructions).

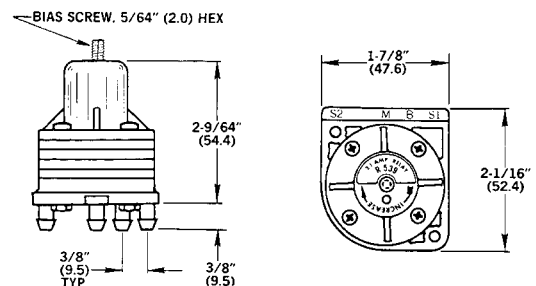
**Connections:** Barbed nipples for 1/4" OD polyethylene or 5/32" ID polyurethane tubing.

**Material:** Glass-filled nylon.

**MOUNTING INSTRUCTIONS & DIMENSIONS**

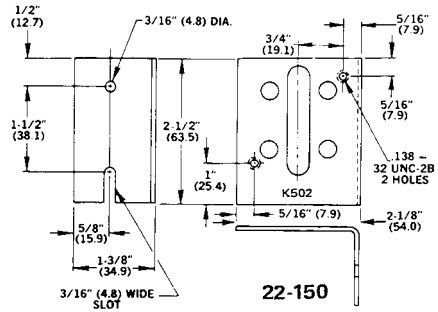
**Panel Mounting**

This device has been designed to be mounted on a TAC Pneumodular manifold socket. One socket, one gasket, and two mounting screws are required in addition to the appropriate manifold backplate. Refer to the TAC Pneumodular Parts and Accessories Data Sheet for complete ordering information.



## Field Mounting

This device may also be mounted without the backplate, socket, and gasket to replace competitive devices by using an optional 22-150 mounting bracket or by using the plastic mounting strap and adhesive base provided.



## TYPICAL APPLICATION

In the application shown, the controller operates the heating valve, outside and return air dampers, and the cooling valve in sequence. The heating valve operates directly from the controller signal and is fully opened at 2 psig and closed at 7 psig. To ensure the proper sequence, the bias of the ratio

relay is set to -7 psig (input signal plus or minus the bias times two). As the controller output rises from 9 psig (relay output 4 psig) to 13.5 psig (relay output 13 psig), the dampers and cooling valve are operated in sequence.

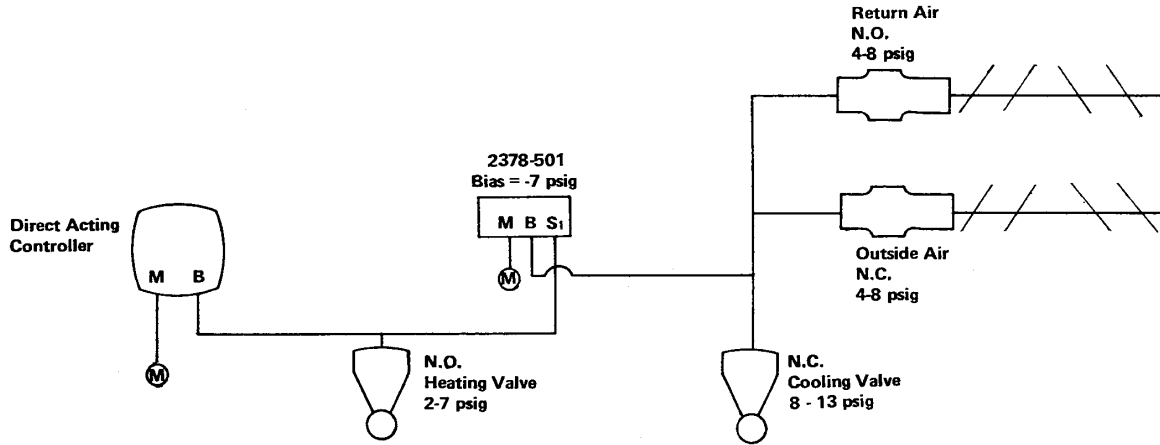


Figure-1

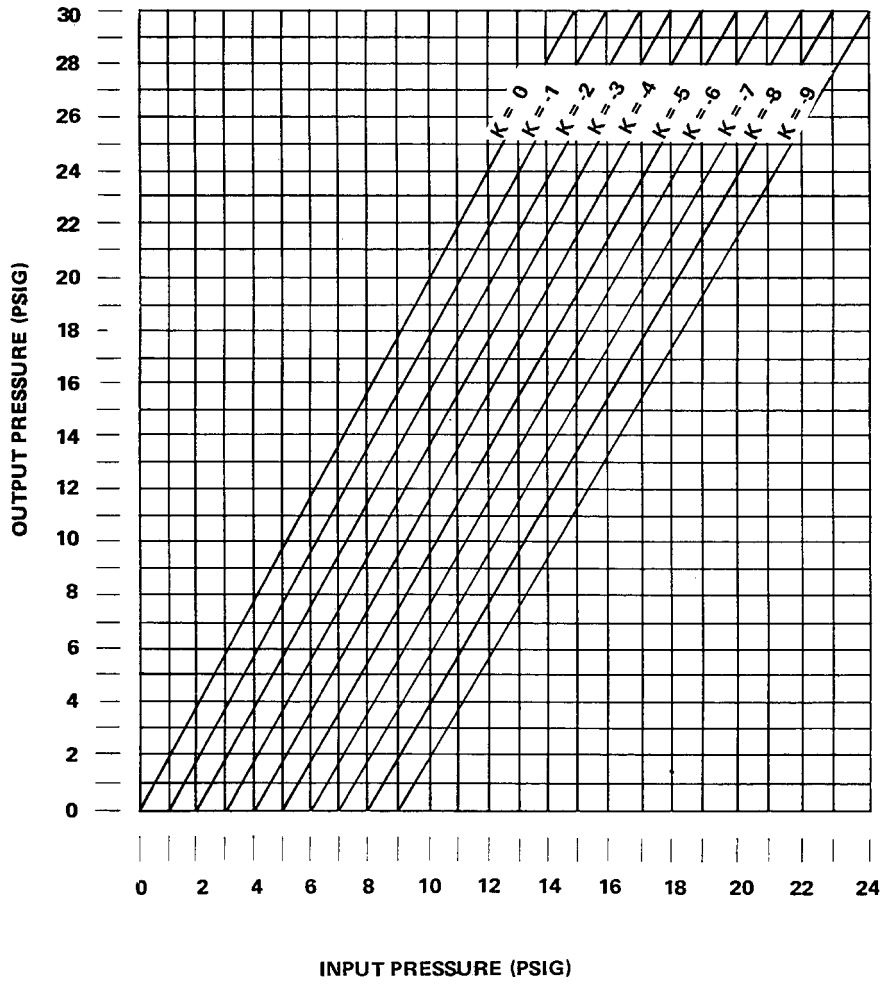


Figure-2 Input vs Output (K = Bias)

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