SIEMENS

Installation Instructions
Document No. 129-121
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RL 243 Pneumatic Relay Installation and Applications

Product Description

The RL 243 Multi-Purpose (MP), Balance Retard (BR), or Analog Relay is a pneumatic auxiliary device designed to amplify a pneumatic signal and provide a variety of control functions in a control system. An internal relief assembly prevents signal lock-up. The most common applications for each type are listed in Table 2.

Product Numbers

Table 1.

Type of Relay	Product Number
Multi-purpose	243-0009
Balance Retard	243-0010
Analog	243-0011

Required Tools

- Flat-blade screwdriver
- For MP or BR relays needing adjustment:
  - 1/16-inch (1.6 mm) hex Allen wrench
  - 0 to 30 psig pressure gauge
  - Pneumatic positioning switch

Expected Installation Time

20 minutes

Prerequisite

18 to 25 psig air supply

Retrofit

When retrofitting an installation, see Table 3 for cross-reference to sample applications.

References

Multi-Purpose Relay	RL 243-6	*155-042P25*
Balance Retard Relay	RL 243-7	*155-043P25*
Analog Relay	RL 243-8	*155-044P25*

Installation

1. Attach the mounting bracket to the bottom of the relay in either set of holes provided using two No. 6 self-threading screws.
2. Mount the bracket and relay in either horizontal or vertical position. The mounting bracket has slots designed to accommodate No. 8 or No. 10 screws. Keep the adjustment screw accessible.
3. Attach the 1/4-inch (6.4 mm) O.D. polyethylene tubing to the appropriate barbed air fittings. See *Applications.*

Adjustment

The MP and BR relays have an adjustment spring. The spring is adjusted with a 1/16-inch (1.6 mm) hex Allen wrench in the top of the relay.

Do one of the following:

- To increase spring force or setting, turn adjustment screw clockwise.
- To decrease spring adjustment force or setting, turn adjustment screw counterclockwise.
- To assure correct operation, check input and output pressures at start, midpoint, and end of range.

The analog relay does not have an adjustment spring.

Applications

Table 2 includes the application and type of relay required, as well as figures showing how the relay is connected. The MP relay is shipped from the factory with its spring adjusted for 15 psig (103 kPa) for reverse acting applications. The BR relay is factory set for balancing action.

The following designations are used in the Application examples.

R	Output signal port.
TD	Direct acting input signal port.
TR	Reverse acting input port.
S	Air supply port.
SP	Setting of the adjustable screw.
T	Direct acting input port.

Table 2. Relay Application List.

Relay Application	Type Of Relay	Figure
Reverse Acting	Multi-purpose	1
	Analog	2
Minimum Pressure	Multi-purpose	3
Minimum Pressure with Characterized Output	Multi-purpose	4
	Analog	5
Characterized Minimum Pressure	Analog	6
Minimum Pressure with Hesitation	Balance Retard	7
Adjustable Minimum Pressure	Analog	8
Highest Pressure Signal Selector		
Direct Acting	Multi-purpose	9
	Analog	10
Direct Acting with Positive Positioning Override	Analog	11
Signal Advancing	Multi-purpose	12
Adjustable Advancing	Analog	13
Summing		

Relay Application	Type Of Relay	Figure
Signal Retard	Balance Retard	14
	Analog	15
Balancing	Balance Retard	16
Hesitation	Balance Retard	17
Averaging	Analog	18
Ratio 1 in = 2 out	Analog	19
Ratio 2 in = 1 out	Analog	20
Signal Inverting	Multi-purpose	21
	Analog	22
Lowest Pressure Signal Selector	Multi-purpose	23
	Analog	24
Differential Pressure	Analog	25
Limit Control Direct Acting	Multi-purpose	26
Pressure Limiting in Dual Pressure Systems	Balance Retard	27
Limit Control Reverse Acting	Multi-purpose	28

Multi-Purpose

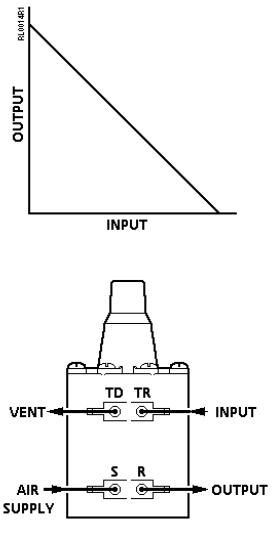


Figure 1. Multi-Purpose Reverse Acting Relay with Factory Setting.

Analog

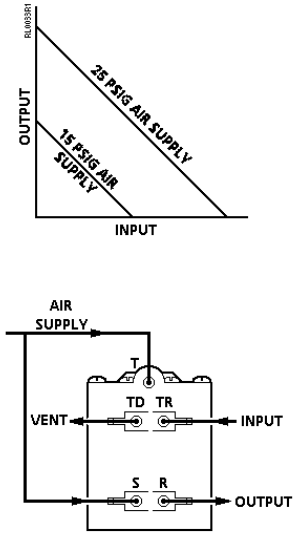


Figure 2. Analog Reverse Acting Relay.

Multi-Purpose

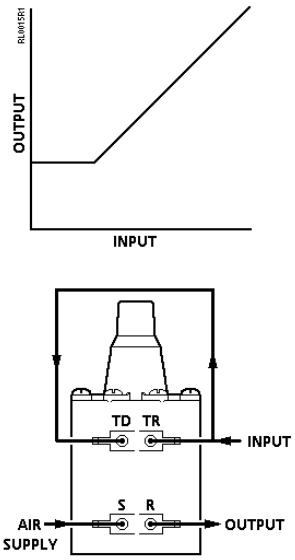


Figure 3. Multi-Purpose Minimum Pressure Relay.

Multi-Purpose

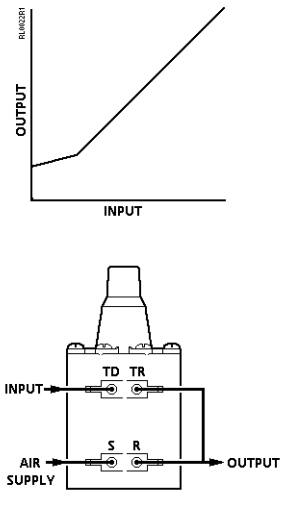


Figure 4. Multi-Purpose Minimum Pressure Characterized Output Relay.

Applications, Continued

Analog

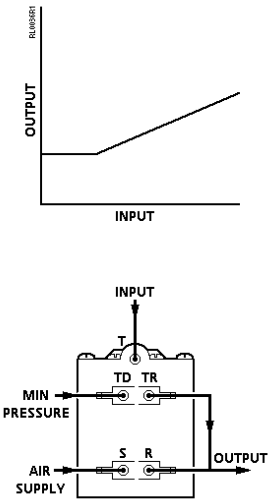


Figure 5. Analog Minimum Pressure Relay with Characterized Output.

Analog

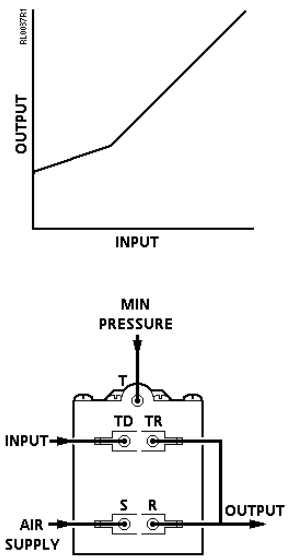


Figure 6. Analog Characterized Minimum Pressure Relay.

Balance Retard

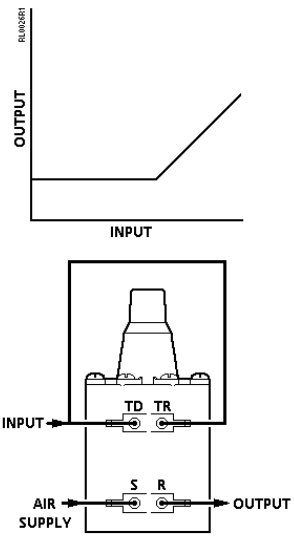


Figure 7. Balance Retard Minimum Pressure Relay with Hesitation Relay.

Analog

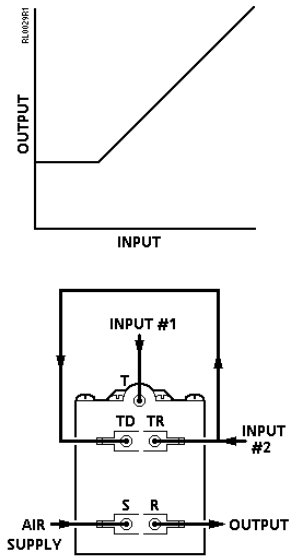


Figure 8. Analog Highest Pressure Signal Selector or Adjustable Min. Pressure.

Multi-Purpose

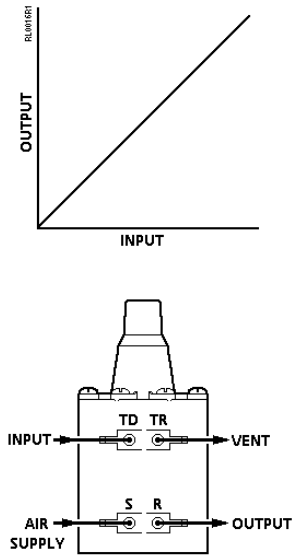


Figure 9. Multi-Purpose Direct Acting Relay.

Analog

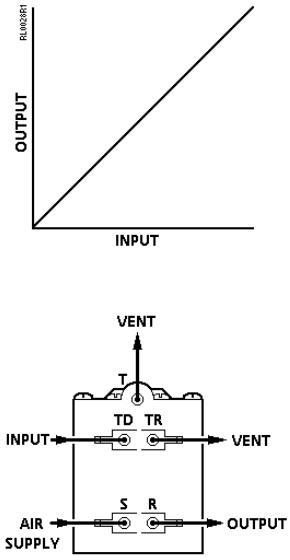


Figure 10. Analog Direct Acting Relay.

Analog

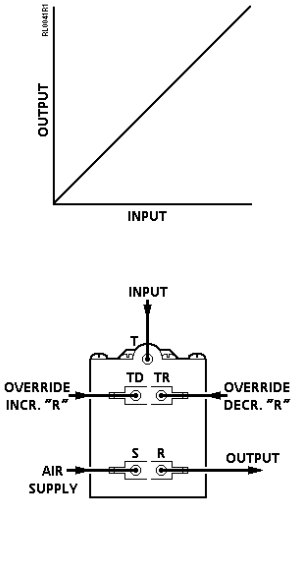


Figure 11. Analog Direct Acting Relay with Positive Positioning Override.

Multi-Purpose

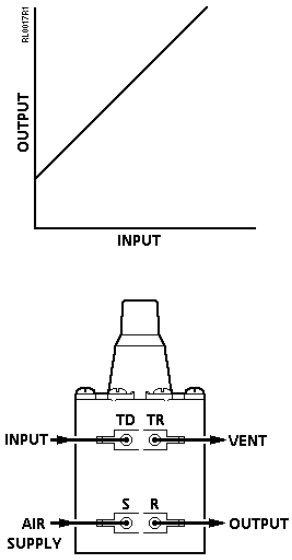


Figure 12. Multi-Purpose Signal Advancing Relay.

Applications, Continued

Analog

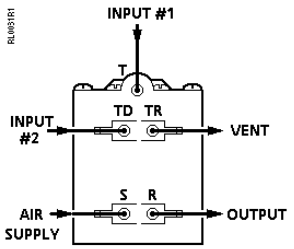


Figure 13. Analog Summing Relay or Adjustable Advancing Relay.

Balance Retard

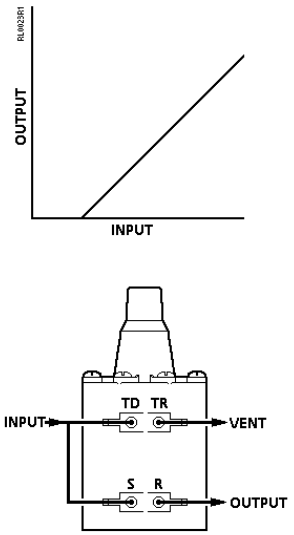


Figure 14. Balance Retard Signal Retard Relay.

Analog

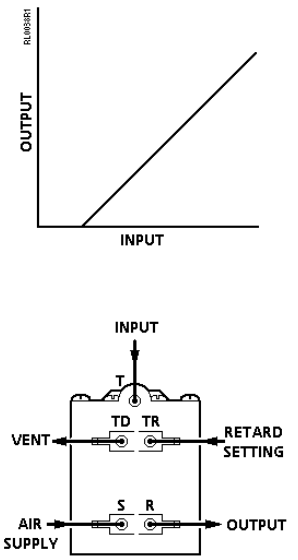


Figure 15. Analog Signal Retard Relay.

Balance Retard

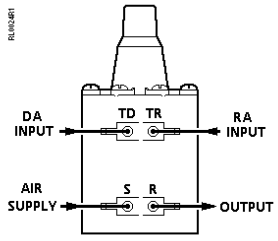


Figure 16. Balance Retard Balancing Relay with Factory Setting Shown.

Balance Retard

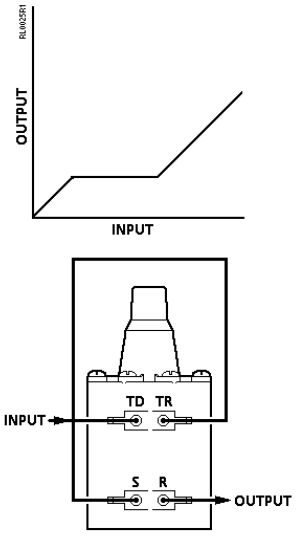


Figure 17. Balance Retard Hesitation Relay.

Analog

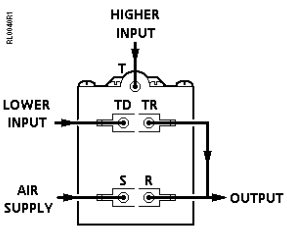


Figure 18. Analog Averaging Relay.

Analog

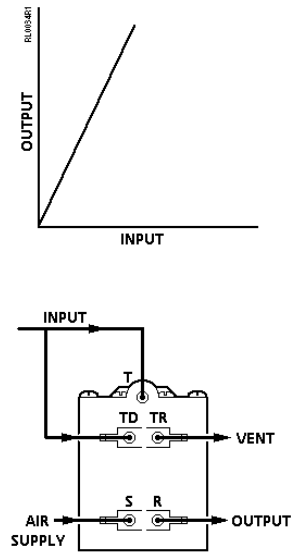


Figure 19. Analog Ratio Relay 1 in = 2 out.

Analog

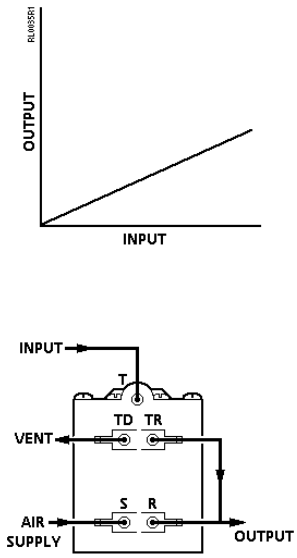


Figure 20. Analog Ratio Relay 2 in = 1 out.

Applications, Continued

Mulit-Purpose

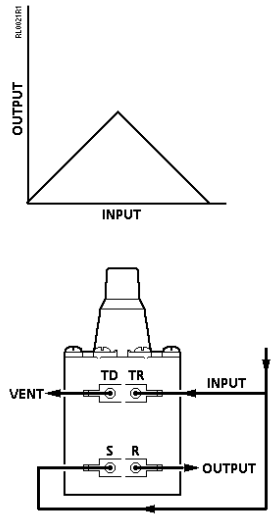


Figure 21. Multi-Purpose Signal Inverting Relay.

Analog

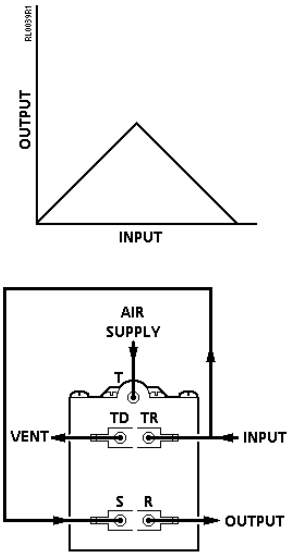


Figure 22. Analog Signal Inverting Relay.

Mulit-Purpose

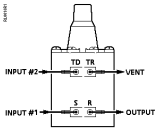


Figure 23. Multi-Purpose Lowest Pressure Signal Selector.

Analog

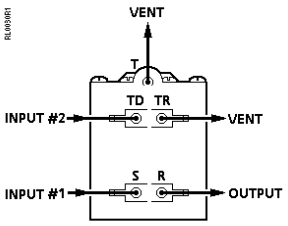


Figure 24. Analog Lowest Pressure Signal Selector.

Analog

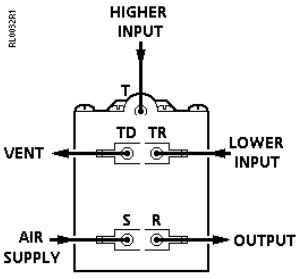


Figure 25. Analog Differential Pressure Relay.

Mulit-Purpose

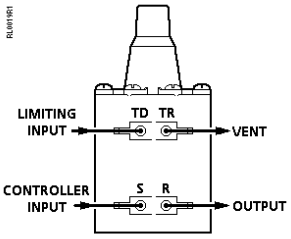


Figure 26. Multi-Purpose Limit Control Direct Acting Relay.

Balance Retard

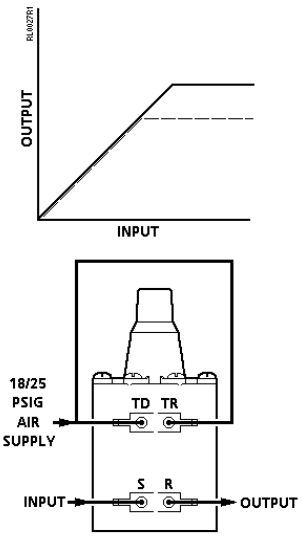


Figure 27. Balance Retard Pressure Limiting in Dual Pressure Systems.

Mulit-Purpose

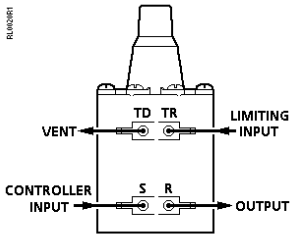
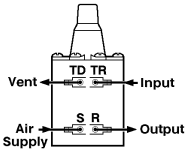
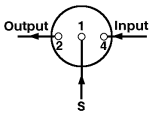
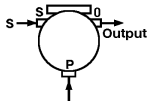
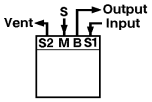
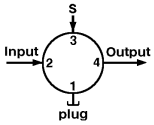
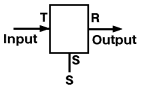
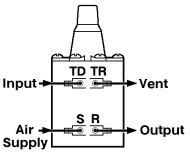
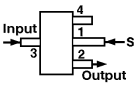
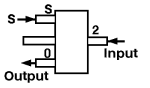
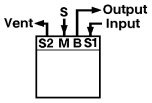
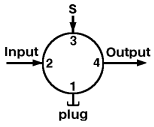
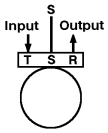
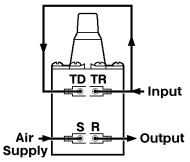
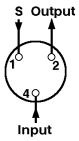
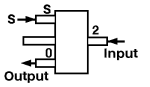
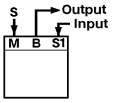
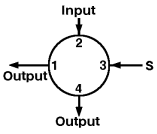
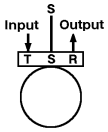
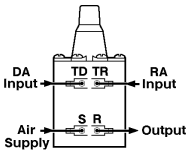
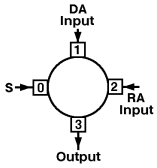
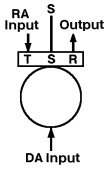
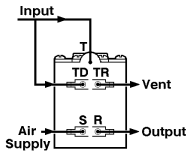
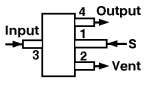
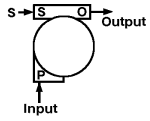
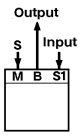
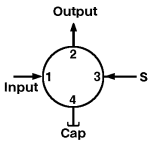
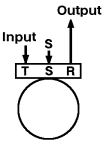


Figure 28. Multi-Purpose Limit Control Reverse Acting Relay.

Table 3. Retrofit Cross-Reference.

RELAY CROSS REFERENCE					
POWERS™ CONTROLS	HONEYWELL	JOHNSON	ROBERTSHAW	BARBER – COLMAN	DISCONTINUED LANDIS & GYR POWERS
 243 – 0009 Reverse Acting	 RP 972 A Reverse Acting	 C – 208 Reverse Acting	 R 516 Reverse Acting	 AK 50613 Reverse Acting	 TYPE 783 Reverse Acting
 243 – 0009 Direct Acting	 RP 970 A Direct Acting	 C 5230 Direct Acting	 R 532-L Direct Acting	 AK- 50603 Direct Acting	 Type 782 Direct Acting
 243 – 0009 Minimum Pressure	 SP 970 A Minimum Pressure	 C 5230 Minimum Pressure	 S 511 – 5 Minimum Pressure	 AK- 50605 Minimum Pressure	 Type 782 Minimum Pressure
 243 – 0010 Balancing Relay	NONE	 C 130 – 1 Balancing Relay	NONE	NONE	 310 – 0010 Balancing Relay
 243 – 0011 Ratio Relay 1 In = 2 Out	 RP 971 A 1007 Sequencing Relay (Setpoint + 3 psig)	 C 202 – 1 1 In = 2 Out	 R 539 1 In = 2 Out	 AK – 50703 1 In = 2 Out	 Type 782 – 0070 1 In = 2 Out

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