

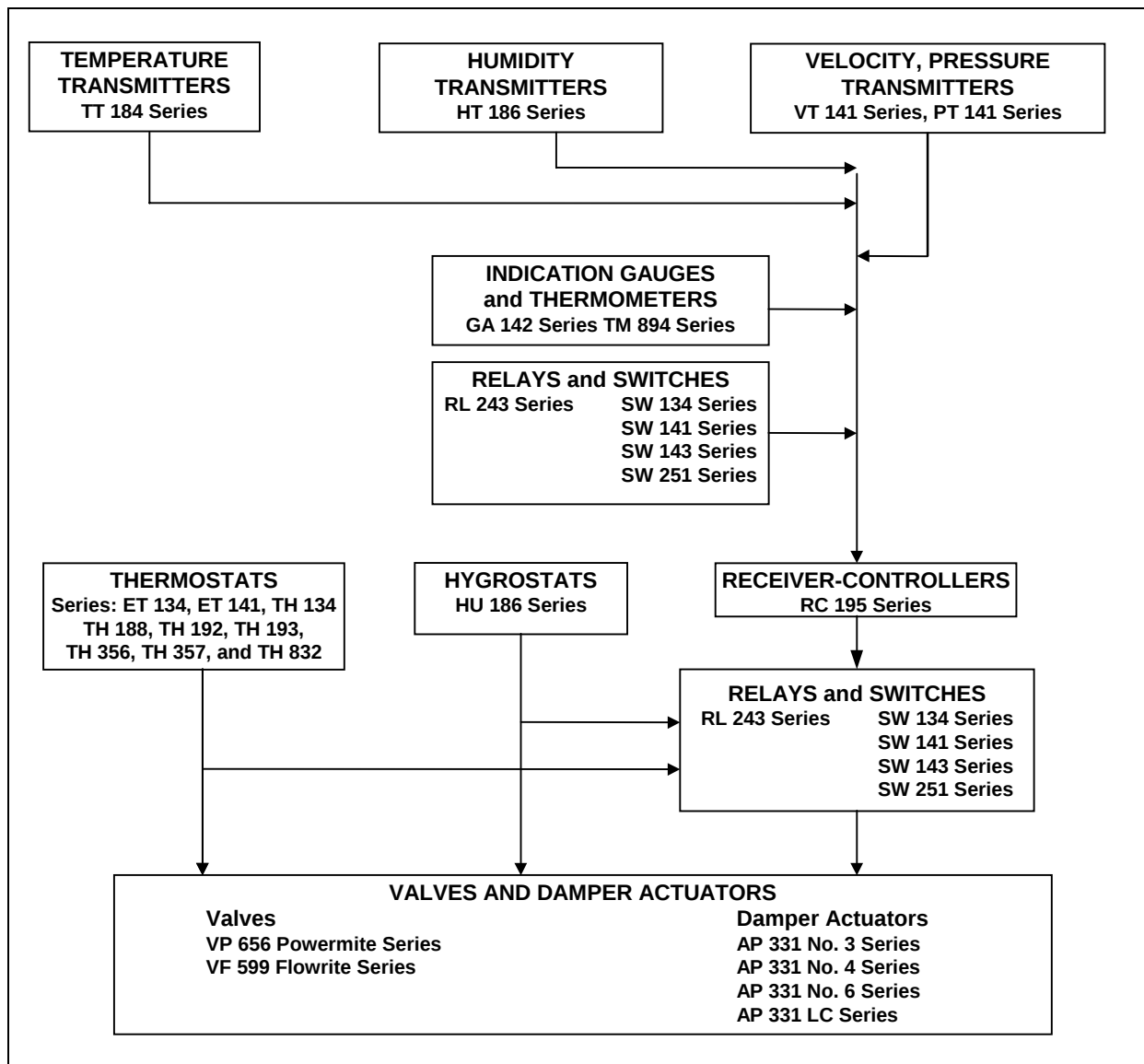
Table of Contents

Item No.	Description	Tech. Ref.	Document No. (Pkg of 25)	Item No.	Description	Tech. Ref.	Document No. (Pkg of 25)
THERMOSTATS AND HYGROSTATS				VALVES			
Pneumatic				Electronic			
PC1-1	TH 192 S Powerstar® Single Temperature	TH192-1	155-065	PC3-13	Powermite AP 599 Series 2" Pneumatic Actuator	VF599-4	155-198P25
PC1-2	TH 192 HC Powerstar Dual Heating/Cooling	TH192-2	155-066	PC3-14	Powermite 599 MZ Series SSB81U Electric Valve Actuator	VF599-13	155-195P25
PC1-3	TH 192 DN Powerstar Dual Day/Night/(Vent)	TH192-3	155-067	PC3-15	Powermite 599 MZ Series SSB61U Electric Valve Actuator	VF599-10	155-192P25
PC1-4	TH 193 HC Powerstar Dual Free Energy Band	TH193-4	155-068	PC3-16	Powermite 599 MT Series SQS 82 Electric Actuator	EA599-9	155191P25
PC1-5	TH 193 HC Powerstar Dual Hesitation			PC3-17	Powermite 599 MT series SQS 65 Electric Valve Actuator	VF599-8	155-190P25
	Free Energy Band	TH193-5	155-069	Flowrite™			
PC1-6	TH 832 D-Style	TH832-1	155-072	PC3-18	Flowrite VF 599 Series Two-Way	VF599-3	155-184P25
		TH832-2	155-073	PC3-19	Flowrite VF 599 Series Three-Way	VF599-4	155-185P25
PC1-7	HU 186 Room and Duct Hygrostats	HU186-1	155-027	PC3-20	Flowrite VF 599 Series Two-Way	VF599-1	155-159P25
PC1-8	TH 356 Limitem – Rigid Bulb	TH356-1	155-070	PC3-21	Flowrite VF 599 Series Three-Way	VF599-2	155-160P25
PC1-9	TH 357 Limitem – Remote Bulb	TH357-1	155-071	PC3-22	Flowrite AP 599 Series 4-Inch	AP599-4	155-183P25
PC1-10	TH 188 Unit Mounted	TH188-2	155-064	PC3-23	Flowrite AP 599 Series 8-Inch	AP599-1	155-161P25
PC1-11	TH 134 High/Low Temperature Detection	TH134-1	155-063	PC3-24	Flowrite AP 599 Series 12-Inch	AP599-2	155-162P25
Electric				PC3-25	Flowrite EA 599 Series SQX Proportional	EA599-6	155-182P25
PC1-12	ET 141 Line Voltage Remote Bulb	ET141-2	155-019	PC3-26	Flowrite EA 599 Series SQX 3-Position	EA599-7	155-186P25
PC1-13	ET 134 Line Voltage Wall	ET134-55	155-017	PC3-27	Flowrite EA 599 Series SKD Proportional	EA599-4	155-180P25
PC1-14	ET 141 Low Voltage Wall	ET141-11	155-167	PC3-28	Flowrite EA 599 Series SKD 3-Position	EA599-5	155-181P25
PC1-14	ET 141 Two-Stage Low Voltage	ET141-8	155-139	PC3-29	Flowrite EA 599 Series SKB/C Proportional	EA599-1	155-163P25
PC1-14	ET 141 Programmable Low Voltage	ET141-9	155-140	PC3-30	Flowrite EA 599 Series SKB/C 3-Position	EA599-2	155-171P25
PC1-15	ET 141 Surface Mounted	ET141-1	155-018	PC3-31	Flowrite EA 599 Series Electro-Mechanical	EA599-3	155-172P25
PC1-16	ET 556 Fan Coil Thermostats	ET556-1	155-309P25				
PC1-17	ET 141 Low Temperature Detection	ET134-20	155-115	DAMPER ACTUATORS			
PC1-17	ET 134 Low Temperature Detection Cut-out and Alarm	ET134-22	155-016	Pneumatic			
PC1-18	ET 141 High Temperature Limit	ET141-5	155-021	PC4-1	AP 331 No. 3 Damper Actuator	AP331-1	155-146
RECEIVER-CONTROLLERS				PC4-2	AP 331 No. 4 Damper Actuator	AP331-2	155-032
Pneumatic				PC4-3	AP 331 No. 6 Damper Actuator	AP331-3	155-029
PC2-1	RC 195 Single Input Receiver-Controller	RC195-4	155-119	PC4-4	AP 331 No. 6 Damper Actuators – Tandem Mounting	AP331-12	155-277
PC2-2	RC 195 Multiple Input Receiver-Controller	RC195-1	155-036	PC4-5	AP 331 Large Capacity Damper Actuator	AP331-4	155-030
			155-250	Electronic			
			155-251	PC4-6	EA 349 Damper Actuator	EA349-1	155-123
TRANSMITTERS				PC4-7	Open Air™ EA GDE Damper Actuator Non-Spring Return Modulating	EAGDE-1	155-187P25
Pneumatic				PC4-8	Open Air EA-GDE Damper Actuator Non-Spring Return 3-Position	EAGDE-2	155-188P25
PC2-3	TT 184 Temperature – Room and Duct	TT184-1	155-077	PC4-9	EA 349 Damper Actuator Spring Return 3-Position	EA349-2	155-178P25
PC2-4	HT 186 Humidity – Room and Duct	HT186-1	155-026	PC4-10	EA-349 Damper Actuator Spring Return Modulating	EA349-3	155-179P25
PC2-5	VT 141 Air Velocity	VT141-1	155-093	PC4-11	Open Air EA-GBB Damper Actuator Non-Spring Return Modulating	EAGBB-1	155-176P25
PC2-6	PT 141 Low Differential Pressure	PT141-1	155-035	PC4-12	Open Air EA-GBB Damper Actuator Non-Spring Return 3-Position	EAGBB-2	155-177P25
PC2-7	PT 378 Differential Pressure Transmitter	PT378-1	155-125		Open Air EA-GIB Damper Actuator Non-Spring Return 3-Position	EAGIB-2	155-177P25
PC2-8	PR 269 Static Pressure and Liquid Level	PR269-2	155-033	PC4-13	Open Air EA-GIB Damper Actuator Non-Spring Return Modulating	EAGIB-1	155-176P25
PC2-9	EC 184 Enthalpy Transmitter-Comparator	EC184-1	155-012	PC4-14	Open Air EA-GCA Damper Actuator Spring Return 2-Position	EAGCA-2	155-174P25
SERIES 200 CONTROLLERS AND TRANSMITTERS				PC4-15	Open Air EA-GCA Damper Actuator Spring Return 3-Position	EAGCA-3	155-175P25
Pneumatic				PC4-16	EA 388 Electric Actuator	EA388-1	155-136
PC2-10	TC 163 Temperature Controller	TC163-1 (Supp. 1)	155-096	SWITCHES			
		TC163-2	155-097	Pneumatic			
		TC163-3	155-098	PC5-1	SW 768 Selector Switch	SW786-2	155-118
PC2-11	TC 163 Receiver-Controller	TC163-4	155-100	PC5-2	SW 141 Positioning Switch	SW141-4	155-117
		TC163-5	155-101	PC5-3	SW 151 Positioning Switch	SW151-1	155-055
PC2-12	TT 163 Temperature Transmitter	TT163-1	155-104	PC5-4	SW 786 Selector Switch	SW786-1	155-062
		TC163-3	155-099	PC5-5	SW 269 Static Pressure Switch	SW269-1	155-061
PC2-13	PR 163 Pressure Controller	PR163-1	155-095	Electronic			
VALVES				PC5-6	SW 256 Step Controller	SW256-3	155-060
Pneumatic				PC5-7	SW 134 Pressure Electric Switch–Adjust. Diff.	SW134-3	155-050
PC3-1	VP 656 NO 2-Way N.O. Powermite	VP656-1	155-084		SW 134 Pressure Electric Switch–Fixed Diff.	SW134-6	155-051
PC3-2	VP 656 NC 2-Way Flared Powermite	VP656-2	155-085	PC5-8	SW 251 Pressure Electric Switch	SW251-1	155-057
PC3-3	VP 656 WM 3-Way Powermite–Flared Body	VP656-3	155-086	PC5-9	SW 141 Low Differential Pressure Switch	SW141-1	155-052
PC3-4	VP 658 S Sequence Powertop	VP658-4	155-092	PC5-10	VE 265 Electro-Pneumatic Valve	VE265-2	155-078
PC3-5	VP 658 SC Sequence Changeover Powertop	VP658-4	155-092	PC5-11	SW 141 Enthalpy Control Switch	SW141-3	155-054
Electronic							
PC3-6	VE MTE 2-Way N.O. Zone Valve	VEMTE-1	155-168				
PC3-6	VE MVE 2-Way N.C. Zone Valve	VEMVE-1	155-165				
PC3-7	VE MXE 3-Way Zone Valve	VEMXE-1	155-166				
PC3-8	VE 339 Retrofit Actuators	VE339-3	155-122				
PC3-9	599 MZ Zone Control 2-Way N.O. N.C. Valve Powermite	VF 599-7	155-198P25				
PC3-10	599 MZ WM Terminal Unit 3-Way Screwed Mixing Valve Powermite	VF 599-8	155-199P25				
PC3-11	599 MT Terminal Unit 2-Way N.O. N.C. Valve Powermite	VF 599-5	155-196P25				
PC3-12	599 WM Terminal Unit 3-way Screwed Mixing Valve Powermite	VF 599-6	155-197P25				

Table of Contents

Item No.	Description	Tech. Ref.	Document No. (Pkg of 25)	Item No.	Description	Tech. Ref.	Document No. (Pkg of 25)
RELAYS				AUXILIARY EQUIPMENT			
Pneumatic				Pneumatic			
PC5-12	RL 243 MP Industrial Duty Multi-Purpose Relay	RL243-6	155-042	PC6-1	RV Pressure Reducing Valves	RV201-1	155-049
PC5-13	RL 243 MP Commercial Duty Multi-Purpose Relay	RL243-14	155-105	PC6-2	AF 908 Air Line Filter	RV201-2	155-137
RELAYS				PC6-3	AF 908 Air In Line Filter	AF908-4	155-005
Pneumatic				PC6-4	GA 142 Analog Receiver Gauges	AF908-3	155-004
PC5-14	RL 243 BR Industrial Duty Balance-Retard Relay	RL243-7	155-043	PC6-5	GA 142 Analog Pressure Gauges	GA142-2	155-023
PC5-15	RL 243 BR Commercial Duty Balance-Retard Relay	RL243-15	155-106	PC6-6	Restrictors	GA142-4	155-025
PC5-16	RL 243 A Industrial Duty Analog Relay	RL243-8	155-044	PC6-7	RL 380 Check Valve	TB167	155-213
PC5-17	RL 243 A Commercial Duty Analog Relay	RL243-16	155-107	PC6-8	CP 567 Control Cabinets	RL380-3	155-048
PC5-18	RL 243 SW Switching Relay	RL243-4	155-040	PC6-9	TM 894 Multi-Angle Thermometer	CP567-7	155-272
PC5-19	RL 147 Positioning Relay	RL147-2	155-038	PC6-10	TM 894 Bimetal Thermometer	TB196	155-223
PC5-20	RL 243 Reverse Acting Relay	RL243-17	155-124	PC6-11	TM 894 Remote Bulb Dial Thermometer	TB197	155-224
PC5-21	RL 243 Signal Selector Relay	RL243-13	155-047	PC6-12	Pneutrol Needle Valve	TM894-2	155-075
PC5-22	AO-P Transducer	-	149-277			TM894-1	155-074
PC5-23	RL 243 H Highest Pressure Signal Selector	RL243H	155-045			TM894-4	155-076
		RL243-11	-			M-230	-
PC5-24	RL 243 LH Signal Selector	RL243LH	155-046				
		RL243-12	-				

Powers Controls Pneumatic System Flowchart



Specification Data For Powers Controls

Thermostats

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC1-1	TH 192 S Powerstar Single Temperature Thermostat Gradual acting. One-pipe requires external 20 scim (5.4 mml/sec) restrictor. Two-pipe offers high air capacity relay. Used to control valve or damper actuators in heating or cooling applications. Fahrenheit or Celsius scales.	Control Action Operating Range Operating Pressure Adj Sensitivity Cover Thermometer Set point indicator Set point Adj.	Direct or Reverse 45 to 85°F (7 to 30°C) 30 psig (207 kPa) max 1 to 4 psi per °F 12 to 50 kPa per °C Plastic (Metal option) Horizontal Concealed or exposed Concealed or exposed Concealed or key/finger exposed	 TH 192 S Powerstar Single Temperature Thermostat Document Number 155-065 TH 192-1
PC1-2	TH 192 HC Powerstar dual Heat/Cool Temperature Thermostat Gradual acting. Two-pipe offers high air capacity relay. Energy conserving thermostat has two separate set point dials that can be set between 45 to 85°F (7 to 30°C). Used to control valve or damper actuators for all season control of heating and cooling systems. Fahrenheit or Celsius scales. Also available TH 194 HC, factory calibrated for Honeywell (13/18 psig) or Johnson (15/20 psig) to pressure system.	Control Action Operating Range Operating Pressure Adj Sensitivity Cover Thermometer Set point indicator Set point Adj.	Direct, Reverse Direct/Reverse Reverse/Direct 45 to 85°F (7 to 30°C) C (18 psig O, H (25 psig) 30 psig (207 kPa) max 1 to 4 psi per °F 12 to 50 kPa per °C Plastic (Metal option) Horizontal Concealed or exposed Concealed or exposed Concealed or key/finger exposed	 TH 192 HC Powerstar Dual Heat/Cool Thermostat Document Number 155-066 TH 192-2
PC1-3	TH 192 DN Powerstar dual Day/Night Temperature Thermostat Gradual acting. Two-pipe offers high air capacity relay. Energy conserving thermostat has two separate set point dials that can be set between 45 to 85°F (7 to 30°C). Used to control valve or damper actuators heating or cooling applications and to reduce building energy needs during "unoccupied" hours. Manual override switch provides occupant comfort during "off-hour" times. TH 192 DNA model provides 3rd pipe logic for fresh air control during "off-hours" period. Fahrenheit or Celsius scales. Also available TH 194 DN and TH 194 DNV, factory calibrated for Honeywell (13/18 psig) or Johnson (15/20 psig) to pressure system.	Control Action Operating Range Operating Pressure Adj Sensitivity Cover Thermometer Set point indicator Set point Adj.	Direct, Reverse Direct/Reverse Reverse/Direct 45 to 85°F (7 to 30°C) D (18 psig O, N (25 psig) 30 psig (207 kPa) max. 1 to 4 psi per °F 12 to 50 kPa per °C Plastic (Metal option) Horizontal Concealed or exposed Concealed or exposed Concealed or key/finger exposed	 TH 192 DN Powerstar Day/Night Thermostat Document Number 155-067 TH 192-3
PC1-4	TH 192 HC Powerstar Free Energy Band Heat/Cool Temperature Thermostat Gradual acting, dual control outputs. One-pipe requires external 20 scim (5.4 mml/sec) restrictor. Two-pipe offers high air capacity relay. Used to control valve or damper actuators for all season control of heating/cooling systems. Provides free building energy when both heating and cooling are required on the same day. Energy is added to the space only when the temperature exceeds these set points. Fahrenheit or Celsius scales.	Control Action Operating Range Operating Pressure Adj Sensitivity Cover Thermometer Set point indicator Set point Adj.	Direct, Reverse Direct/Reverse Reverse/Direct 45 to 85°F (7 to 30°C) 30 psig (207 kPa) max. 1 to 4 psi per °F 12 to 50 kPa per °C Plastic (Metal option) Horizontal Concealed or exposed Concealed or exposed Concealed or key/finger exposed	 TH 192 HC Powerstar Free Energy Band Thermostat Document Number 155-068 TH 193-4

Thermostats

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC1-5	TH 193 HC Powerstar Hesitation Free Energy Band Heat/Cool Temperature Thermostat Gradual acting, two separate set point dials and single control output (hesitates or holds control pressure between free energy band set points). Two-pipe high air capacity relay. Controls valve/damper actuators for all-season control of heating/cooling systems. Provides free building energy when both heating and cooling are required on the same day. Energy is added to the space only when the temperature exceeds these set points. Fahrenheit or Celsius scales	Control Action Operating Range Operating Pressure Adj. Sensitivity Cover Thermometer Set point indicator Set point Adj.	Direct 45 to 85°F (7 to 30°C) 30 psig (207 kPa) max 1 to 4 psi per °F 12 to 50 kPa per °C Plastic (Metal option) Horizontal Concealed or exposed Concealed or exposed Concealed or key/finger exposed  TH 193 HC Powerstar Hes. Free Energy Band Heat/Cool	Document Number 155-069 TH 193-5
PC1-6	TH 832 D Room Thermostats are gradual direct acting instruments for heating and air conditioning control applications. They feature a double air valve assembly which prevents continuous air waste. Also available as a Day-Night model for two temperature applications.	Control Action Operating Range Operating Pressure Sensitivity (Fixed) Set point Adj.	Direct 60–85°F (15.5–29.4°C) 30 psi (206.7 kPa) max. 2.25 psi per °F (27.9 kPa per °C) Concealed, exposed key  TH 832 D Thermostat	Document Numbers: 155-072 and 155-073 TH 832-1 TH 832-2
PC1-7	HU 186 Room Hygrostat and HU 186 Duct Hygrostat are gradual acting humidity controllers that are temperature compensated to minimize temperature effects.	Control Action Operating Range Adj. Sensitivity Available Models Dry Bulb Temperature	Direct, Reverse 20 to 90% R.H. 1/4 to 4 psi per % R.H. (1.7–28 kPa per % R.H.) Room and Duct 135°F (57.2°C) max  HU 186 Room Hygrostat	Document Number: 155-027 HU 186-1
PC1-8	TH 356 Limitem Thermostats gradual, direct acting; TH 356 R gradual, reverse acting, are pneumatic instruments for controlling air or water temperatures. Double air valve assembly prevents constant waste of air.	Control Action Operating Range Operating Pressure Sensing Element Adj. Sensitivity	Direct, Reverse 30–180°F (-1.1–8.°C) 100–250°F (38–121°C) 0–100°F (-18–38°C) 30 psi (207 kPa) max. Rigid Bimetallic Bulb 0.25–2 psi per °F (3.1–24.8 kPa per °C)  TH 356 Limitem	Document Number: 155-070 TH 356-1
PC1-9	TH 357 Remote Bulb Thermostat gradual, direct acting, is used for air temperature control. Double air valve assembly prevents constant waste of air.	Control Action Operating Range Operating Pressure Adj. Sensitivity Sensing Element	Direct 35–145°F (1.6–62.7°C) 120–230°F (48.8–110°C) 20–100°F (-6.7–37.8°C) 30 psi (206.7 kPa) max. 0.3–3.5 psi per °F (3.7–43.4 kPa per °C) 8 ft. (2.44 m) Av. 15 ft. (4.57 m) Av. Short Bulb  TH 357 Remote Bulb Limitem	Document Number: 155-071 TH 357-1

Thermostats

Electric Thermostats

Item No.	Description	Specifications		Illustration	Document no(s). (Pkg of 25)
PC1-10	TH 188 Unit Mounted Thermostats are remote bulb, gradual acting instruments for use in fan coil or induction units. Direct acting, reverse acting or heating-cooling models are available and all instruments are case-compensated.	Control Action Operating Range Operating Pressure	Direct, Reverse 60–85°F (15.5–29.4°C) Heating: 25 psi (172.2 kPa) Cooling: 18 psi (124.0 kPa)	 TH 188 Unit Mounted Thermostat	Document Number: 155-064 TH 188-2
		Sensitivity Sensing Element	Variable Short Bulb		
PC1-11	TH 134 Pneumatic High and Low Temperature Detection Thermostats are one-pipe remote bulb instruments which bleed air from a pneumatic line when temperature at the sensing element passes the set point of the instrument. These models have manual reset.	Range Differential Max. Pressure	15–55°F (-9.4–13°C) Low Model 100–170°F (38–77°C) High Model 5°F (3°C) Low Model 10°F (6°C) High Model 22 psi (152 kPa)	 TH 134 High-Low Temperature Detection Thermostat	Document Number: 155-063 TH 134-1
PC1-12	ET 141 Line Voltage Remote Bulb Thermostats are used for two position temperature control when remote or immersion sensing is required	Action Range Differential Elec. Rating	SPDT 20–120°F (-6.7–49°C) 100–240°F (38–115.5°C) 6–45°F (3.3–25°C) Adj. AC FLA: 7.4 @ 120V, 3.7A @ 240V Non-Ind: 25A @ 120V, 20A @ 240V	 ET 141 Remote Bulb Thermostat	Document Number: 155-019 ET 141-2
PC1-13	ET 134 Line Voltage Room Thermostats are two position temperature regulating instruments used for close control of heating and/or cooling systems. A model is available with "Auto-Off-Fan" switch.	Control Action Action Range Differential Elec. Rating Set point Adj.	Heating or Cooling Heating and Cooling SPST, SPDT 40–90°F (4–32°C) 1.8–3.5°F (1–2°C) AC FLA, 6.0–16.0A @ 120 Vac, 3.0–8.0 @ 240 Vac NI, UP to 22A @ 120 Vac Concealed or Exposed Knob	 ET 134 Line Voltage Thermostat	Document Number: 155-017 ET 134-55

Electric Thermostats

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)	
PC1-14	ET 141 Low Voltage Thermostats provide a wide range of single zone controls for heating and air conditioning equipment. The thermostats are designed for heating and/or cooling applications which control single or multi-stage heat and cooling systems including heat pumps	Control Action Action Operating Temp. Range Differential Elec. Rating	Heating or Cooling SPDT 50–90°F (10–32°C) Heat 1°F (0.5°C) Cool 1.5 °F (0.8 °C) 30 Vac max.	 ET 141 Low Voltage Thermostat	Document Number: 155-167 ET 141-11
		Control Action Action Operating Temp. Range Differential Elec. Rating	Seven Day Programmable Multi-stage Low Voltage Thermostat Heat mode makes on temperature fall Cool Mode makes on temperature rise 40–90°F (4.44–32.2°C) Stage 1: on 1°F (0.5°C) from set point, off at set point Stage 2: on 2 °F(1.1°C) from set point, off 0.5 °F (0.3 °C) from set point. Stage 3: on 3 °F (1.7°C) off 1°F (0.5°C) from set point 1.2 Amps @ 30 Volts DC max.	 ET 141 3 Stage Programmable Low Voltage Thermostat	Document Number: 155-140 ET 141-9
PC1-15	ET 141 Surface Mounted Electric Thermostats are designed for mounting on pipes. These units can be used for high limit, low limit, or changeover control.	Action Range Differential Elec. Rating	SPDT 50–150°F (10–65.5°C) 10°F (5.5°C) AC FLA: 7.4A @ 120V, 3.7A @ 240V	 ET 141 Surface Mounted Electric Thermostat	Document Number: 155-018 ET 141-1
PC1-16	ET556 Fan Coil Thermostats are microprocessor controlled, self-configuring thermostats designed for a variety of two-pipe or four-pipe fan coil applications. Models include IAQ damper control, freeze and condensate overflow protection. The ET556 Series thermostats were issued a patent for the design allowing high and low voltage control capacity and varied functional capabilities.	Action Range Operating Voltages Elec. Rating Differential Valve control Action	SPDT 50 - 85 F (10 – 29.4 C) 18 – 31 Vac 120, 208, 277 Vac 3 Va max. 0.9° F (0.5 C) N.O. or N.C.	 ET 556-1	Document Number: 155-309p25 ET 556-1

Electric Thermostats Receiver-Controllers

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)	
PC1-17	ET 134 Electric Low Temperature Detection Thermostats are remote bulb instruments with a Single Pole Double Throw (SPDT) switch that closes and opens a circuit in both directions. The thermostats are especially suited for prevention of freeze-up of hydronic heating coils, cooling coils, liquid heating pipes and similar applications. The Low Temperature Detection Thermostat is available with automatic reset.	Switch Action Range Reset Action Elec. Rating	SPDT 35-45°F (2-7°C) Manual AC FLA: 16A @ 120V 9.2 @ 208	 ET 134 Low Temperature Detection Thermostat	Document Number: 155-115 ET 134-20
	ET 134 Electric Low Temperature Detection Cut-out and Alarm Thermostats are remote bulb instruments that open an electric circuit when temperature at the sensing element falls below the setting of the instrument. This two circuit model can perform both low temperature detection and alarm functions.	Range Reset Action Elec. Rating	15-55°F (-9.4-12.8°C) Manual AC FLA: 16A @ 120V Non-Ind: 16A @ 120V	 ET 134 Low Temperature Detection Cut-out and Alarm Thermostat	Document Number: 155-016 ET 134-22
PC1-18	ET 141 High Temperature Electric Limit Control "locks out" on a temperature increase to the control set point. Manual reset is required to reclose the electrical contacts.	Action Elec. Range Range	SPST, open on rise AC FLA: 10A @ 120V, 6A @ 240V 24-215°F (-3.9-102°C)	 ET 141 High Temperature Limit Control	Document Number: 155-021 ET 141-5
PC2-1	RC 195 Single Input Receiver-Controller is a pneumatic instrument that receives one pneumatic input. It produces a pneumatic control signal based on the pneumatic input and mechanical settings, such as set point and proportional band.	Control Action Pneumatic Inputs Operating Ambient Temp. Range Supply Pressure Max. % Proportional Band Adjust. Range	Input #1 - Direct Action Input #2 - Reverse 3-15 psi (21-103 kPa) 40-120°F (4-49°C) 30 psi (207 kPa) 2-20% for a 5 psi (34 kPa) control pressure change	 RC 195 Single Input Receiver-Controller	Document Number: 155-119 RC 195-4

Receiver-Controllers

Transmitters

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC2-2	RC 195 Multiple Input 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 set point, percent proportional band and authority. Factory installed control pressure gauge included.	Control Action Input #1 - Direct Action Input #2 - Reverse Input #3 - Direct reset relative to Input #2; Reverse reset relative to Input #1 Pneumatic Inputs 3–15 psi (21–103 kPa) Operating Ambient Temp. Range 40–120°F (4–49°C) Supply Pressure Max. 30 psi (207 kPa) % Proportional Band 2–20% for a 5 psi (34 kPa) control pressure change % Authority Adjust. Range 20–200%	 RC 195 Multiple Input Receiver-Controller	Document Numbers: 155-036 RC 195-1 Applications 155-250 and 155-251
PC2-3	TT 184 Temperature Transmitter senses temperature and transmits a proportional pneumatic signal to a remotely located receiver gauge or receiver-controller. Available types: Remote bulb, remote averaging, rigid bulb, and room. All models are one-pipe.	Operating Range Remote Bulb -40–120°F (-40–48.9°C) -10–65°F (-23.3–18.3°C) 0–100°F (-17.8–37.8°C) 30°–190°F (1.1–88°C) 50–100°F (10–37.8°C) 80–240°F (27–115.5°C) Remote Averaging Bulb 0–100°F (-17.8–37.8°C) 35–135°F (1.7–57.2°C) Rigid Bulb 35–135°F (1.7–57.2°C) 50–100°F (10–37.8°C) 80–240°F (27–115.5°C) 0–100°F (-17.8–37.8°C) Room 50–100°F (10–37.8°C) Avg., Short bulb with and without armored capillary, rigid bulb	 TT 184 Temperature Transmitter	Document Number: 155-077 TT 184-1
PC2-4	HT 186 Room and Duct Humidity Transmitters sense the space humidity and transmit a proportional air pressure signal. All models are one-pipe.	Operating Range 20–80% R.H. Available Models Room and Duct Dry Bulb Temp. Cover 135°F (57.2°C) max. Plastic (metal option)	 HT 186 Room Humidity Transmitter	Document Number: 155-026 HT 186-1
PC2-5	VT 141 Air Velocity Transmitter converts velocity pressure from an air measuring station into a 3 to 15 psig (21 to 103 kPa) air pressure signal that is proportional to air velocity in ft./min. (meters/sec).	Control Action Direct Input Signals 0–2000 FPM (0–10.2 m/sec) 0–3000 FPM (0–15.2 m/sec) 0–4000 FPM (0–20.3 m/sec) 0–5500 FPM (0–27.9 m/sec) Output Pressure 3–15 psig (21–103 kPa)	 VT 141 Air Velocity Transmitter	Document Number: 155-093 VT 141-1

Transmitters

Item No.	Description	Specifications		Illustration	Document no(s). (Pkg of 25)
PC2-6	PT 141 Low Differential Pressure Transmitter converts a pressure input to a 3 to 15 psig (21 to 103 kPa) proportional air pressure signal. Transmitter location can be as far away as 500 ft. (152 m) from the controller. Pressure input can be positive, negative or differential.	Control Action Input Pressure	Direct -0.05/+0.2" W.G. (-12.5/+50 Pa) -0.5/+0.5" W.G. (-125/+125 Pa) 0/3" W.G. (0/747 Pa) 0/10" W.G. (0/2.4 kPa) 3-15 psig (21-103 kPa)	 PT 141 Static Pressure Transmitter	Document Number: 155-035 PT 141-1
PC2-7	PT 378 Differential Pressure Transmitter is a pneumatic fixed-span output signal to a controlling device proportional to the input pressures sensed from air, water or steam.	Control Action Operating Range Max. Pressure (static) Input Differential Range Air Capacity:	Direct, proportional 3-15 psig (21-103 kPa) 300 psig (2068 kPa) 0-50 psig (586 kPa) 30 SCIM (8 ml/s)	 PR 378 Differential Pressure Transmitter	Document Number: 155-125 PT 378-1
PC2-8	PR 269 Static Pressure and Liquid Level Regulator is used to measure static pressure and control a damper or similar device to maintain constant air pressure in an air handling system. Also used for velocity static, or differential pressure control.	Control Action Low Range Model Sensitivity Press. Diff. Range Med. Range Model Sensitivity Press. Diff. Range	Direct 2.25 psi per .01 in. W.G. (11.2 kPa per 1 Pa) 0.5-1 in. W.G. (12.4-249 Pa) 1.00 psi per .01 in. W.G. (5 kPa per 1 Pa) 0.05-3 in. W.G. (12.4-747 Pa)	 PR 269 Static Pressure Regulator	Document Number: 155-033 PR 269-2
PC2-9	EC 184 Pneumatic Enthalpy Transmitter-Comparator System consists of two direct acting, one-pipe transmitters that sense enthalpy, i.e., total heat, and an enthalpy comparator. The transmitters are located in the outdoor air and return air. The enthalpy comparator is a logic element that compares the enthalpy signals sensed by the two transmitters. The comparator selects the lowest enthalpy air source (mixing vs. recirculation with minimum outdoor air) as the input to the mechanical cooling equipment to minimize energy consumption.	TRANSMITTER Enthalpy Range Operating Ambient Temp. Range Humidity Range Action Supply Pressure Output Signal	16-40 BTU/lb (37-93 kJ/kg) -20-125°F (-29-52°C) 10-98% R.H. Direct Acting 22±4 psi (152 kPa ± 28 kPa) Pneumatic signal through a 40 SCIM (11 ml/s) restrictor 3-15 psi (21-103 kPa)	 EC 184 Enthalpy Transmitter	Document Number: 155-012 EC 184-1
		COMPARATOR Operating Ambient Temp. Range Supply Pressure Max. Input Signal Output Signal Output-Input Relationship	-20-125°F (-29-52°C) 30 psi (207 kPa) Any pneumatic transmitter signal up to 30 psi (207 kPa) 2±1 psi (14±7 kPa) to approx. "M" pressure. Output is 2±1 psi (14±7 kPa) when Input #1 is less than or equal to Input #2. Output is approx. "M" pressure when Input #1 is 1.5 psi (10 kPa) greater than Input #2.	 EC 184 Enthalpy Comparator	Document Number: 155-012 EC 184-1

Series 200 Controllers

Item No.	Description	Specifications		Illustration	Document no(s). (Pkg of 25)
PC2-10	Series 200 Temperature Controller is designed for heating and air conditioning applications. Can also be supplied with automatic reset. A submaster model is available to remotely readjust set point.	Operating Range	-25–135°F (-31.7–57.2°C) 25–250°F (-3.9–121.1°C) 150–375°F (65.6–190.5°C)	 Series 200 Temperature Controller	Document Numbers: 155-096 155-097 and 155-098 TC 163-1, TC 163-1 Supl. and TC 163-2
		Control Action	Direct, Reverse		
		Thermal Sys. Material Bulb	Copper, 316L St. Steel 15 ft. (4.6 m) Avg. 1" x 6" (25.4 x 152.4 mm) 1" x 9" (25.4 x 228.6 mm) 3/4" x 12" (19 x 304.8 mm)		
		Air Connection	1/8" NPT		
PC2-11	Series 200 Receiver-Controller operates in conjunction with a remotely located pneumatic transmitter to maintain a selected temperature at the transmitter location. Can also be supplied with automatic reset. A master transmitter and a submaster model are available to remotely readjust set point.	Operating Range	-25–135°F (-31.7–57.2°C) 50–100°F (10–37.8°C)	 Series 200 Receiver-Controller	Document Numbers: 155-100 and 155-101 TC 163-4, C 163-5
		Movement	3–15 psi (20.7–103.3 kPa)		
		Control Action	Direct, Reverse		
		% Prop. Band	0–35%, 0–100%		
		Air Connection	1/8" NPT		
PC2-12	Series 200 Transmitter converts a temperature measurement into a 3 to 15 psi air pressure signal. It can be used as a sensor or master instrument to automatically readjust set point of the submaster.	Operating Range	-25–135°F (-31.7–57.2°C) 25–250°F (-3.9–121.1°C) -10–65°F (-23.3–18.3°C)	 Series 200 Temperature Transmitter	Document Number: 155-104 TT 163-1
		Control Action	Direct		
		Thermal Sys. Material	Copper		
		Capillary Length	15 ft. (4.6 m)		
		Air Connection	1/8" NPT		
		Bulb	15 ft. (4.6 m) Avg. 1" x 6" (25.4 x 152.4 mm)		Document Number: 155-099 TC 163-3
PC2-13	Series 200 Pressure Controller controls liquid, gas or vapor pressure in a variety of industrial and heating processes. Furnished with bronze sensing elements of the flat spiral type.	Operating Range	30" (HG) Vacuum to 60 psig (101.3 kPa Vacuum to 413 kPa) 0–100 psig (0–689 kPa) 0–200 psig (0–1378 kPa) 0–350 psig (0–2411 kPa)	 Series 200 Pressure Controller	Document Number: 155-095 PR 163-1
		Control Action	Reverse, Direct		
		Air Connection	1/8" NPT		

Valves - Pneumatic

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-1	VP 656 NO Powermite 2-Way Normally Open Valves are designed to control flow of water or steam. They are used on radiators and reheat coils.	Body Types Valve Sizes Body Rating C_v Rating Nom. Spring Range Max. Modulating Pressure Diff. Max. Fluid Temp.	Globe Flared Flared: 1/2" ANSI Class 250 0.9, 2.1 3–8 psig, 5–10 psig (21–55 kPa, 35–69 kPa) 20 psi (138 kPa) 250°F (121°C)	 VP 656 Powermite 2-Way Document Number: 155-311P25 VP 656-1
PC3-2	VP 656 NC Powermite 2-Way Flared Valves are designed to control flow of water or steam. They are used on fan coil units and cooling coils	Body Type Valve Size Body Rating C_v Rating Nom. Spring Range Max. Modulating Pressure Diff. Max. Fluid Temp.	Globe Flared 1/2" ANSI Class 250 2.1 10–15 psig (69–103 kPa) 20 psi (138 kPa) 250°F (121°C)	 VP 656 NC Powermite 2-Way Document Number: 155- 311P25 VP 656-2
PC3-3	VP 656 WM Powermite 3-Way Flared Valves are designed to control flow of water. They are used on heating or cooling coils on terminal units. Upper seat is normally closed. Also used as an air pilot valve.	Body Type Valve Size Body Rating C_v Rating Nom. Spring Range Max. Modulating Pressure Diff. Max. Fluid Temp.	3-way Flared 1/2" ANSI Class 250 1.5, 2.5 3–8 psi, 5–10 psi (21–55 kPa, 35–69 kPa) 25 psi (170 kPa) 250°F (121°C)	 VP 656 WM Powermite 3-Way Flared Document Number: 155-086 VP 656-3
PC3-4	VP 658 S Powertop Sequence Valves control flow of hot and cold water (without mixing), to single coil unit conditioners in either three or four pipe systems.	Body Type Valve Sizes Body Rating C_v Rating Max. Modulating Pressure Diff. Max. Fluid Temp.	3-Way Flared 1/2" ANSI Class 250 1.5, 2.5 25 psi (170 kPa) 250°F (121°C)	 VP 658 S Powertop Sequence Document Number: 155-092 VP 658-4

Valves - Pneumatic

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-5	VP 658 SC Powertop Changeover Valves divert flow of hot and cold water (without mixing), from single coil unit conditioners in either three or four pipe systems. Used in conjunction with Powertop VP 658 S Sequence Valves.	Body Type Valve Sizes Body Rating C_v Rating Max. Modulating Pressure Diff. Max. Fluid Temp.	3-Way Flared 1/2" ANSI Class 250 2.5 10 psi (69 kPa) 250°F (121°C)	 VP 658 SC Powertop Changeover Document Number: 155-092 VP 658-4
PC3-6	MTE, MVE Electronic 2-way Spring Return Zone Valves are designed for the control of baseboard perimeter radiation units and terminal units including fan coil units. They receive a two position signal to control the flow of water and glycol solutions. Three control voltages are available as well as two thread options on end connections.	Body Types Valve Sizes Body Rating Action C_v Rating K_{vs} Rating Flow Characteristic Max. Fluid Temp. Operating Voltage Operating Frequency End Connections	1/2" through 1" (15 – 25 mm) 300 psi (2068 kPa) Normally Open Normally Closed 2.9 through 7.4 2.5 through 6.3 Two position quick opening 200°F (93°C) 24 Vac ±20% 120 Vac ±20% 230 Vac ±20% 50-60 Hz NPT connection British Standard Pipe (BSP) connection	 Two-way Zone Valve Document Number: 155-168 VE MTE-1 Document Number: 155-165 VE MVE-1
PC3-7	MXE Electronic 3-way Zone Valves are designed for the control of baseboard perimeter radiation units and terminal units including fan coil units. It receives a two position signal to control the flow of water and glycol solutions. Three control voltages are available as well as two thread options on end connections.	Body Types Valve Sizes Body Rating Action C_v Rating K_{vs} Rating Flow Characteristic Max. Fluid Temp. Operating Voltage Operating Frequency End Connections	1/2" through 1" (15 – 25 mm) 300 psi (2068 kPa) Diverting 2.9 through 7.4 2.5 through 6.3 Quick opening 200°F (93°C) 24 Vac ±20% 120 Vac ±20% 230 Vac ±20% 50-60 Hz NPT connection British Standard Pipe (BSP) connection	 Three-way Zone Valve Document Number: 155-166 VE MXE-1

Valves and Valve Actuators - Electronic

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-8	VE 339 Retrofit Actuators are designed to modulate selected Siemens Building Technologies, Honeywell, and Johnson Controls valve assemblies. The electronic actuator receives a 24 Vac floating control signal from a Terminal Equipment Controller to control the valve stroke. These actuators are not compatible with TCU, and should only be used with microprocessor based floating outputs capable of programmable run times.	Operating Voltage 24 Vac, 50–60 Hz Power Consumption 2.5 VA 5.7 VA Control Signal 24 Vac Floating Stroke Time (3/4") 32s @ 60 Hz 38s @ 50 Hz	 Siemens VE 339 Retrofit Valve Actuator  Honeywell Retrofit Actuator  Johnson Controls Retrofit Actuator	Document Number: 155-122 VE 339-3

Powermite VF 599 Series Valves

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-9	Powermite 599 MZ Series Zone Control 2-Way Normally Open, Normally Closed Valves are designed to control flow of water or steam. They are used on radiators, fan coil units, unit conditioners and reheat coils. These valves require an actuator that delivers a minimum of 45 pounds force (200N). Use electric SSB actuator only.	Body Types Globe Screwed, Globe Union Male, Angle Union Valve Sizes Globe Screwed, Globe Union Male: 1/2", 3/4", 1" Angle: 1/2" Flow Characteristics: Linear Body Rating ANSI Class 250 C_v Rating 0.4, 0.63, 1.0, 1.6, 2.5, 4.0, 6.3, 10 Max. Modulating Pressure Diff. Liquid 25 psi (173 kPa) Steam 15 psi (103 kPa) Max. Fluid Temp. 250°F (121°C)	 VF 599 Powermite 2-Way	Document Number: 155-198P25 VF 599-7
PC3-10	Powermite 599 MZ Series WM Terminal Unit 3-Way Screwed Mixing Valves are designed to control flow of water or steam. They are used on radiators, fan coil units, unit conditioners and reheat coils. These valves require an actuator that delivers a minimum of 67 pounds force (200N). Use SSB actuator only.	Body Type 3-Way Screwed Valve Size 1/2", 3/4", 1" Body Rating ANSI Class 250 C_v Rating 0.4, 0.63, 1.0, 1.6, 2.5, 4.0, 6.3, 10 Max. Modulating Pressure Diff. 25 psi (170 kPa) Max. Fluid Temp. 250°F (121°C)	 VF 599 WM Powermite 3-Way Screwed	Document Number: 155-199P25 VF 599-8
PC3-11	Powermite 599 MT Series Terminal Unit 2-Way Normally Open, Normally Closed Valves are designed to control flow of water or steam. They are used on radiators, fan coil units, unit conditioners and reheat coils. These valves require an actuator that delivers a minimum of 67 pounds force (300N). Use 2" pneumatic, SQS65, SQS65.5, SQS82 actuators only.	Body Types Globe Screwed, Globe Union Male, Angle Union Valve Sizes Globe Screwed, Globe Union Male: 1/2", 3/4", 1" Angle: 1/2" Flow Characteristics: Linear Body Rating ANSI Class 250 C_v Rating 0.4, 0.63, 1.0, 1.6, 2.5, 4.0, 6.3, 10 Nom. Spring Range Normally Open 3 – 8 psi (21 – 55 kPa) Normally Closed 10 – 15 psi (69 – 103 kPa) Max. Modulating Pressure Diff. Liquid Bronze 25 psi (173 kPa) St STL 50 psi (345 kPa) Steam 15 psi (103 kPa) Max. Fluid Temp. 250°F (121°C)	 VF 599 Powermite 2-Way	Document Number: 155-196P25 VF 599-5
PC3-12	Powermite 599 MT Series WM Terminal Unit 3-Way Screwed Mixing Valves are designed to control flow of water or steam. They are used on radiators, fan coil units, unit conditioners and reheat coils. These valves require an actuator that delivers a minimum of 67 pounds force (300N). Use 2" pneumatic, SQS65, SQS65.5, SQS82 actuators only.	Body Type 3-Way Screwed Valve Size 1/2", 3/4", 1" Body Rating ANSI Class 250 C_v Rating 0.4, 0.63, 1.0, 1.6, 2.5, 4.0, 6.3, 10 Max. Modulating Pressure Diff. Brass 25 psi (170 kPa) St Steel 50 psi (345 kPa) Max. Fluid Temp. 250°F (121°C)	 VF 599 WM Powermite 3-Way Screwed	Document Number: 155-197P25 VF 599-6

Powermite VF 599 Series Valves

Item No.	Description	Specifications		Illustration	Document no(s). (Pkg of 25)
PC3-12	Powermite 599 MT Series WM Terminal Unit 3-Way Screwed Mixing Valves are designed to control flow of water or steam. They are used on radiators, fan coil units, unit conditioners and reheat coils. These valves require an actuator that delivers a minimum of 67 pounds force (300N). Use 2" pneumatic, SQS65, SQS65.5, SQS82 actuators only.	Body Type Valve Size Body Rating C_v Rating Max. Modulating Pressure Diff. Max. Fluid Temp.	3-Way Screwed 1/2", 3/4", 1" ANSI Class 250 0.4, 0.63, 1.0, 1.6, 2.5, 4.0, 6.3, 10 Brass 25 psi (170 kPa) St Steel 50 psi (345 kPa) 250°F (121°C)	 VF 599 WM Powermite 3-Way Screwed	Document Number: 155-198P25 VF 599-4
PC3-14	Powermite 599 MZ Series SSB81U Electric Valve Actuator requires a 24Vac supply floating control signal to provide three-position control. Actuator is fail in place, designed to work with the Powermite 599 MZ series zone control valves with 7/32" (5.5 mm) stroke. They can be used in liquid or steam service applications. Not to be used with Powermite MT series valves.	Operating voltage Frequency Power consumption Control Signal Run time Nominal Force Agency Approvals UL CUL Ambient temperature Operation Transport and storage Ambient humidity Media temperature	24 Vac ±20% 50/60 Hz 6 VA 3-position (floating) @ 60 Hz @ 50 Hz 150 sec. 180 sec. 45 lb (200N) UL873 CSA C22.2 No. 24-93 34 to 122°F (1 to 50°C) -13 to 158°F (-30 to 65°) 0 to 90% RH 34 to 230°F (1 to 110°C)	 Powermite 599 MZ Series SSB Actuator	Document Number. 155-195P25 VF 599-13
PC3-15	Powermite 599 MZ Series SSB61U Electric Valve Actuator requires a 24 Vac supply and receives a 0 to 10 Vdc control signal to proportionally control a valve. Actuator is fail in place, designed to work with the Powermite 599 MZ series zone control valves with 7/32" (5.5 mm) stroke. They can be used in liquid or steam service applications. The SSB actuator is not to be used with Powermite MT series valves.	Operating voltage Frequency Power consumption Control input (Y) Voltage Current Control output (U) Voltage Current Run time Nominal Force Agency Approvals UL CUL Ambient temperature Operation Transport and storage Ambient humidity Media temperature	24 Vac ±20%, 24 Vdc ±20% 50/60 Hz 6 VA 0 to 10 Vdc 0.1 mA max. 0 to 10 Vdc 0.5 mA max. 150 seconds 45 lb (200N) UL873 CSA C22.2 No. 24-93 34 to 122°F (1 to 50°C) -13 to 158°F (-30 to 65°) 0 to 90% RH 34 to 230°F (1 to 110°C)	 Powermite 599 MZ Series SSB Actuator	Document Number. 155-192P25 VF 599-10

Powermite VF 599 Series Valves

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-16	Powermite 599 MT Series SQS 82 Electric Actuator requires a 24Vac supply floating control signal to provide three-position control. Actuator is fail-in-place, designed to work with the Powermite 599 MT series zone control valves with 7/32" (5.5 mm) stroke. They can be used in liquid or steam service applications. Not to be used with Powermite MZ series valves.	Operating voltage 60 Hz 24 Vac -5 to +5% 50 Hz 24 Vac -20 to +10% Frequency 50/60 Hz Power consumption 1.5 VA Control Signal 3-position (floating) Run time @ 60 Hz 125 sec. @ 50 Hz 150 sec. Nominal Force 90 lb (400N) Agency Approvals UL UL873 CUL CSA C22.2 No. 24-93 Ambient temperature Operation 34 to 122°F (1 to 50°C) Transport and storage -13 to 149°F (-25 to 65°C) Ambient humidity 0 to 90% RH Media temperature 34 to 230°F (1 to 110°C)	 Powermite 599 MT Series SQS 82 Series Electric Valve Actuator	Document Number: 155-191P25 EA 599-9
PC3-17	Powermite 599 MT Series SQS 65 Electric Valve Actuator requires a 24 Vac supply and receives a 0 to 10 Vdc or a 0 to 1000 Ohm control signal to proportionally control a valve. Available in fail-in-place or fail-safe models, they are designed to work with Powermite 599 Series terminal unit valves with 7/32" (5.5 mm) stroke. They can be used in liquid or steam applications. The SQS actuators are not to be used with MZ series zone valves.	Operating voltage 24 Vac ±20%, 24 Vdc ±20% Frequency 50/60 Hz Power consumption 18 VA Control input (Y) Voltage 0 to 10 Vdc Current 0.1 mA max. Control input (R) Voltage 0 to 10 Vdc Current 0.1 mA max. Control output (U) Voltage 0 to 10 Vdc Current 0.5 mA max. Control output (U) Current 4 to 20 mA Max impedance 250 ohms Run time 35 seconds Nominal Force 150 lb (700N) Agency Approvals UL UL873 CUL CSA C22.2 No. 24-93 Ambient temperature Operation 5 to 122°F (-15 to 50°C) Transport and storage -13 to 149°F (-25 to 65°) Ambient humidity 0 to 90% RH Media temperature 41 to 248°F (5 to 120°C)	 Powermite 599 MT Series SQS 65 Series Electric Valve Actuator	Document Number: 155-190P25 VF 599-8

Flowrite VF 599 Series Valves

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-18	VF 599 Flowrite Two-Way Valves are designed to work with either pneumatic or electronic actuators with a 3/4 inch (20mm) stroke. They are available in ANSI Class 250 for normally closed normally open. These Flowrite valves are generally recommended for water, steam, and glycol solutions to 50%.	Body Types Valve Sizes Body Rating C_v Rating Max. Modulating Pressure Difference Bronze Liquid Steam Stainless Steel Liquid Steam Max. Fluid Temp.	Globe style control valve with four connection options 1/2" to 2" (15 to 50mm) ANSI class 250 (Refer to Table 7 in technical instruction.) 1, 1.6, 2.5, 4, 6.3, 10, 16, 25, 40 25psi (173 kPa) 15 psi (103 kPa) 50psi (345 kPa) 50psi (345 kPa) 337°F (170°C)	 VF 599 Flowrite 2-Way Document Number: 155-184P25 VF 599-3
PC3-19	VF 599 Flowrite Three-Way Valves are designed to work with either pneumatic or electronic actuators with a 3/4 inch (20mm) stroke. A typical application for the Flowrite three-way valve is the mixing of two different temperatures of water supplies.	Body Types with two connection options Valve Sizes Body Rating C_v Rating Max. Modulating Pressure Diff. Max. Fluid Temp.	Globe style control valve 1/2" to 2" (15 to 50mm) ANSI class 250 (Refer to Table 4 in technical instruction.) 1, 1.6, 2.5, 4, 6.3, 10, 16, 25, 40 Bronze: 25psi (173 kPa) Stainless Steel: 50 psi (345 kPa) 250°F (120°C)	 VF 599 Flowrite 3-Way Document Number: 155-185P25 VF 599-4
PC3-20	VF 599 Flowrite Series Two-Way Valves are designed to work with either pneumatic or electronic actuators. They are available in both ANSI Class 125 and 250 for normally closed or normally open action.	Body Style Seat Style Valve Sizes Max. Modulating Pressure Diff. Liquid Steam Medium Temp. Range Normal Duty Packing Steam Packing	Flanged Single Seat 2-1/2" to 6" Bronze 25 psi (173 kPa) Stl. Steel 50 psi (345 kPa) 50 psi (345 kPa) 20 to 250°F (-7 to 120°C) 337°F (170°C) maximum	 Flowrite VF 599 2-Way Document Number: 155-159P25 VF 599-1
PC3-21	VF 599 Flowrite Series Three-Way Valves are designed to work with either pneumatic or electronic actuators. They are available in both ANSI Class 125 and 250.	Body Style Valve Sizes Max. Modulating Pressure Diff. Medium Temp. Range	3-Way Flanged 2-1/2" to 6" Bronze 25 psi (173 kPa) Stl. Steel 50 psi (345 kPa) 20 to 250°F (-7 to 120°C)	 Flowrite VF 599 3-way Document Number: 155-160P25 VF 599-2

Flowrite AP 599 Series Pneumatic Valve Actuators

Item No.	Description	Specifications		Illustration	Document no(s). (Pkg of 25)
PC3-22	AP 599 Flowrite Pneumatic Valve Actuators are designed for use with Flowrite VP 599 series valves with 3/4 inch (20mm) stroke in liquid and steam service applications. These actuator are available with three spring ranges.	Effective Diaphragm Area Diaphragm Material Nominal Stroke Nom. Spring Range Max. Diaphragm Pressure Air Connection Ambient Operating and Storage Temp.	11 in² (71cm²) Silicone rubber 3/4 inch (20 mm) 3–8 psig, 5–10 psig, 10 to 15 psi (21–55 kPa, 35–69 kPa, 69 to 103 kPa) 35 psi (241 kPa) 1/8 inch NPT 0 to 180°F (-18 to 85°C)	 AP 599 Flowrite 4 inch	Document Number: 155-183P25 AP 599-4

Flowrite AP 599 Series Pneumatic Valve Actuators

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-23	AP 599 Flowrite Series 8-Inch Pneumatic Valve Actuators are designed for use with the Flowrite VF 599 Series valves with a 3/4-inch (20 mm) stroke. These actuators are available with two diaphragm options.	Effective Diaphragm Area 28 in² (180 cm²) Diaphragm Material Buna-N Norm. Duty Service 25 to 300°F (–4 to 149°C) High Temp. Service Silicone Rubber 200 to 366°F (93 to 186°C) Nominal Spring Range Fixed Span Normal Duty Ser. 5 psi (34 kPa) High Temp. Ser. 10 psi (68 kPa) Adj. Start Point 3 to 10 psi (21 to 69 kPa) Factory Setting 3 to 8 psig (21 to 55 kPa) Nominal Stroke 3/4-inch (20 mm) Max. Diaphragm Pres. 35 psi (241 kPa) Air Connection 1/4-inch NPT Ambient Oper. and Storage Temp. 35 to 180°F (2 to 85°C) Mounting Location NEMA 1 (interior only)	 Flowrite AP 599 8-Inch Valve Actuator	Document Number: 155-161 AP 599-1
PC3-24	AP 599 Flowrite Series 12-Inch Pneumatic Valve Actuators are designed for use with the Flowrite VF 599 series valves. These actuators are available with two stem strokes.	Effective Diaphragm Area 90 in² (580 cm²) Diaphragm Material Buna-N 25 to 366°F (–4°C to 186°C) Nominal Spring Range Fixed span 5 psi (34 kPa) Adj. Start Point 3 to 10 psi (21 to 69 kPa) Factory Setting 3-8 psig (21 to 55 kPa) Nominal stroke 3/4-inch (20 mm) 1-1/2 inch (40 mm) Max. Dia. Pressure 35 psi (241 kPa) Air Connection 1/4-inch NPT Ambient Oper. and StorageTemp. 35 to 180°F (2 to 85°C) Mounting Location NEMA 1 (interior only)	 Flowrite AP 599 12-Inch Pneumatic Valve Actuator	Document Number: 155-162P25 AP 599-2

Flowrite EA 599 Series Electronic Valve Actuators

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-25	EA 599 Flowrite Proportional Control SQX Electronic Valve Actuators require a 24 Vac supply and receive a 0 to 10 Vdc or 4 to 20 mA control signal to proportionally control a valve. These actuators are designed to work with Flowrite VF 599 series and Landis & Staefa standard valves with a 3/4 inch (20 mm) stroke in liquid service and steam service applications. They are particularly recommended for installations requiring quick response and good rangeability.	Operating voltage Frequency 60 Hz 24 Vac +20 -15% Frequency 50 HZ 24 Vac + -20 % Power consumption Fail-in-place 3 VA Fail-safe 7 VA Control input (Y) Voltage 0 to 10 Vdc Current 0.1 mA max. Control input (R) Voltage 0 to 10 Vdc Current 0.1 mA max. Control output (U) Voltage 0 to 10 Vdc Current 0.5 mA max. Control output (U) Current 4 to 20 mA Max impedance 250 ohms Run time @ 60 HZ 30 seconds @ 50 HZ 35 seconds Fail-safe 8 seconds Nominal Force 90 lb (700N) Nominal Stroke 7/32" (5.5mm) Agency Approvals UL UL873 CUL CSA C22.2 No. 24-93 Ambient temperature Operation 5 to 122°F (-15 to 55°C) Transport and storage -22 to 149°F (-30 to 65°) Ambient humidity 0 to 90% RH Media temperature to 285°F (140°C)	 EA 599 Flowrite Proportional Control	Document Number: 155-182P25 EA 599-6
PC3-26	EA 599 Flowrite 3-position Control SQX Electronic Valve Actuators require a 24 Vac supply and receive a 3-position control signal to proportionally control a valve. These actuators are designed to work with Flowrite VF 599 series and Landis & Staefa standard valves with a 3/4 inch (20 mm) stroke in liquid service and steam service applications. They are particularly recommended for installations requiring quick response and good rangeability.	Operating voltage 24 Vac ±20% Frequency 50/60 Hz Power consumption 6.5 VA Control Signal 3-position (floating) Run time SQX82.00U @ 60 Hz 120 sec. @ 50 Hz 150 sec. SQX82.03U 30 sec. 35 sec. Nominal Force 150 lb (700N) Agency Approvals UL UL873 CUL CSA C22.2 No. 24-93 Ambient temperature Operation 5 to 131°F (-15 to 55°C) Transport and storage -22 to 149°F (-30 to 65°) Ambient humidity 0 to 90% RH Media temperature to 285°F (140°C)	 EA 599 Flowrite 3-position Control	Document Number: 155-186P25 EA 599-7

Flowrite EA 599 Series Electronic Valve Actuators

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-27	EA 599 Flowrite Proportional Control Series SKD Electronic Valve Actuators require a 24 Vac supply and receive a 0 to 10 Vdc or 4 to 20 mA control signal to proportionally control a valve. These actuators are designed to work with Flowrite VF 599 series and Landis and Staefa standard valves with a 3/4-inch (20 mm) stroke in liquid service and steam service applications.	Operating voltage 24 Vac $\pm 20\%$ Frequency 50/60 Hz Power consumption 18 VA Control input (Y) Voltage 0 to 10 Vdc Current 0.1 mA max. Control input (R) Resistance 0 to 1000 ohms Voltage 0 to 1.6 V Control input (R) Current 4 to 20 mA Max. impedance 250 ohms Control output (U) Voltage 0 to 10 Vdc Current 0.5 mA max. Control output (U) Current 4 to 20 mA Max. impedance 250 ohms Run time with control operation (full stroke) Power stroke 0 to 100% 30 seconds Return stroke 100 to 0% 15 seconds Nominal Force NC and 3-way upper 0%, 225 lb. (1000 N) NO and 3-way by-pass 100%, 258 lb. (1150 N) Agency Approval UL UL873 CUL CSA C22.2 No. 24-93 Ambient temperature 5 to 130°F (-15 to 55°C) Media temperature 14 to 300°F (-10 to 150°C)	 Flowrite EA 599 Series SKD Electronic Valve Actuator	Document Number: 155-180P25 EA 599-4
PC3-28	EA 599 Flowrite 3-position Control Series SKD Electronic Valve Actuators require a 24 Vac supply to provide three-position control. These actuators are designed to work with Flowrite VF 599 series and Landis and Staefa standard valves with a 3/4-inch (20 mm) stroke in liquid service and steam service applications.	Operating voltage 24 Vac $\pm 20\%$, Frequency 50/60 Hz Power consumption SKD82.50U 10 VA SKD82.51U 15 VA Control Signal 3-position (floating) Run time with control operation (full stroke) SKD82.50U SKD82.51U Power stroke, 0 to 100% 120 seconds Return stroke, 100 to 0% 120 seconds Fail safe 8 seconds Nominal Force NC and 3-way upper 0%, 225 lb. (1000 N) NO and 3-way by-pass 100%, 258 lb. (1150 N) Agency Approval UL UL873 CUL CSA C22.2 No. 24-93 Ambient temperature 5 to 130 °F (-15 to 55°C) Media temperature 14 to 300 °F (-10 to 150°C)	 Flowrite EA 599 Series SKD Electronic Valve Actuator	Document Number: 155-181P25 EA 599-5

Flowrite EA 599 Series Electronic Valve Actuators

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC3-29	EA 599 Flowrite Proportional Control Series SKB/C Electronic Valve Actuators require a 24 Vac supply and receive a 0 to 10 Vdc or 4 to 20 mA control signal to proportionally control either a 20 mm or 40 mm stroke valve. These actuators are designed to work with Flowrite VF 599 series valves and Landis & Staefa standard valves with 20 and 40 mm stroke.	Nominal stroke SKB62U 3/4 inch (20 mm) SKC62U 1-1/2 inch (40 mm) Operating voltage 24 Vac $\pm$20% Frequency 50/60 Hz Power consumption SKB62U 18 VA SKC62U 28 VA Control input (Y) Voltage 0 to 10 Vdc Current 0.1 mA max. Control input (R) Resistance 0 to 1000 ohms Voltage 0 to 1.6 V Control input (R) Current 4 to 20 mA Maximum Impedance 250 ohms Control output (U) Voltage 0 to 10 Vdc Current 0.5 mA max. Control output (U) Current 4 to 20 mA Maximum Impedance 250 ohms Run Time with Control Operation (Full Stroke) Opening 2 minutes Closing with spring SKB62U 15 seconds SKC62U 20 seconds Conduit opening 1/2" NPSM Nominal Force NC and 3-Way Upper 0%, 610 lb. (2684 N) NO and 3-Way By-Pass 100% 1000 lb. (4400 N) Agency Approval UL UL873 CUL CSA C22.2 No. 24-93 Ambient Temperature 5 to 130 °F (-15°C to 55°C) Media Temperature 14 to 300 °F (-10 to 150°C)	 Flowrite EA 599 Series SKB/C Electronic Valve Actuator	Document Number: 155-163 EA 599-1

Flowrite EA 599 Series Electronic Valve Actuators

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)																																																		
PC3-30	EA 599 Flowrite 3-position Control Series SKB/C Electronic Valve Actuators with 3-position (floating) control require a 24 Vac supply. These actuators are designed to work with Flowrite VF 599 Series valves and Landis & Gyr standard valves with 20 and 40 mm stroke.	<table><tr><td>Operating voltage</td><td>24 Vac ±20%</td></tr><tr><td>Frequency</td><td>50/60 Hz</td></tr><tr><td>Power consumption</td><td></td></tr><tr><td> SKB82.50U</td><td>10 VA</td></tr><tr><td> SKB82.51U</td><td>15 VA</td></tr><tr><td> SKC82.60U</td><td>19 VA</td></tr><tr><td> SKC82.61U</td><td>20 VA</td></tr><tr><td>Control Signal</td><td>3-position (floating)</td></tr><tr><td>Run Time With Control Operation (Full Stroke)</td><td></td></tr><tr><td> SKB82.50U</td><td></td></tr><tr><td> SKC82.60U</td><td></td></tr><tr><td> Opening</td><td>2 minutes</td></tr><tr><td> Closing</td><td>2 minutes</td></tr><tr><td>Spring Return Time</td><td></td></tr><tr><td> SKB82.51U Closing</td><td>10 seconds</td></tr><tr><td> SKB82.61U Closing</td><td>18 seconds</td></tr><tr><td>Conduit opening</td><td>1/2" NPSM</td></tr><tr><td>Nominal Force</td><td></td></tr><tr><td> NC and 3-Way Upper</td><td>0%, 610 lb (2684 N)</td></tr><tr><td> NO and 3-way By-Pass</td><td>100%, 1000 lb (4400 N)</td></tr><tr><td>Agency Approval</td><td></td></tr><tr><td> UL</td><td>UL873</td></tr><tr><td> CUL</td><td>CSA C22.2 No. 24-93</td></tr><tr><td>Ambient Temperature</td><td>5 to 130 °F (-15°C to 55°C)</td></tr><tr><td>Media Temperature</td><td>14 to 300 °F (-10 to 150°C)</td></tr></table>	Operating voltage	24 Vac ±20%	Frequency	50/60 Hz	Power consumption		SKB82.50U	10 VA	SKB82.51U	15 VA	SKC82.60U	19 VA	SKC82.61U	20 VA	Control Signal	3-position (floating)	Run Time With Control Operation (Full Stroke)		SKB82.50U		SKC82.60U		Opening	2 minutes	Closing	2 minutes	Spring Return Time		SKB82.51U Closing	10 seconds	SKB82.61U Closing	18 seconds	Conduit opening	1/2" NPSM	Nominal Force		NC and 3-Way Upper	0%, 610 lb (2684 N)	NO and 3-way By-Pass	100%, 1000 lb (4400 N)	Agency Approval		UL	UL873	CUL	CSA C22.2 No. 24-93	Ambient Temperature	5 to 130 °F (-15°C to 55°C)	Media Temperature	14 to 300 °F (-10 to 150°C)	 Flowrite EA 599 Series SKB/C Electronic Valve Actuator	Document Number: 155-171 EA 599-2
Operating voltage	24 Vac ±20%																																																					
Frequency	50/60 Hz																																																					
Power consumption																																																						
SKB82.50U	10 VA																																																					
SKB82.51U	15 VA																																																					
SKC82.60U	19 VA																																																					
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Control Signal	3-position (floating)																																																					
Run Time With Control Operation (Full Stroke)																																																						
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CUL	CSA C22.2 No. 24-93																																																					
Ambient Temperature	5 to 130 °F (-15°C to 55°C)																																																					
Media Temperature	14 to 300 °F (-10 to 150°C)																																																					
PC3-31	EA 599 Series Flowrite Electro-Mechanical Valve Actuators are designed for use with Flowrite VF 599 series valves of 2-1/2 through 4-inch line size. These actuators are adapted to the valve bodies by a linkage that not only fastens the valve body and actuator together, but also transforms the angular movement of the actuator output shaft to the straight-line motion required to position the valve plug in the valve body.	<table><tr><td>Operating Voltage</td><td>24 Vac ±10%, 50/60 Hz, 20 VA</td></tr><tr><td>Running Time (Full Stroke)</td><td></td></tr><tr><td> Spring Return</td><td></td></tr><tr><td> 60 Hz</td><td>60 sec</td></tr><tr><td> 50 Hz</td><td>75 sec</td></tr><tr><td> Non Spring Return</td><td></td></tr><tr><td> 60 Hz</td><td>120 sec</td></tr><tr><td> 50 Hz</td><td>144 sec</td></tr><tr><td>Input Signal (as shipped)</td><td>0 to 10 Vdc</td></tr><tr><td> Adjustable Start V</td><td>0 to 10 Vdc</td></tr><tr><td> Adjustable Span ΔV</td><td>3 to 16 Vdc</td></tr><tr><td>Input Impedance</td><td>100 K ohm</td></tr><tr><td>Position Resolution</td><td>70</td></tr><tr><td>Enclosure</td><td>Die Cast Magnesium</td></tr><tr><td>Ambient Temperature</td><td></td></tr><tr><td> Working</td><td>0 to 120°F (-18 to 49°C)</td></tr><tr><td> Storage</td><td>-40 to 150°F (-40 to 66°C)</td></tr><tr><td>Conduit Opening (4)</td><td>7/8 inch (≈22 m)</td></tr></table>	Operating Voltage	24 Vac ±10%, 50/60 Hz, 20 VA	Running Time (Full Stroke)		Spring Return		60 Hz	60 sec	50 Hz	75 sec	Non Spring Return		60 Hz	120 sec	50 Hz	144 sec	Input Signal (as shipped)	0 to 10 Vdc	Adjustable Start V	0 to 10 Vdc	Adjustable Span ΔV	3 to 16 Vdc	Input Impedance	100 K ohm	Position Resolution	70	Enclosure	Die Cast Magnesium	Ambient Temperature		Working	0 to 120°F (-18 to 49°C)	Storage	-40 to 150°F (-40 to 66°C)	Conduit Opening (4)	7/8 inch (≈22 m)	 Flowrite EA 599 Series Electro-Mechanical Valve Actuator	Document Number: 155-172 EA 599-3														
Operating Voltage	24 Vac ±10%, 50/60 Hz, 20 VA																																																					
Running Time (Full Stroke)																																																						
Spring Return																																																						
60 Hz	60 sec																																																					
50 Hz	75 sec																																																					
Non Spring Return																																																						
60 Hz	120 sec																																																					
50 Hz	144 sec																																																					
Input Signal (as shipped)	0 to 10 Vdc																																																					
Adjustable Start V	0 to 10 Vdc																																																					
Adjustable Span ΔV	3 to 16 Vdc																																																					
Input Impedance	100 K ohm																																																					
Position Resolution	70																																																					
Enclosure	Die Cast Magnesium																																																					
Ambient Temperature																																																						
Working	0 to 120°F (-18 to 49°C)																																																					
Storage	-40 to 150°F (-40 to 66°C)																																																					
Conduit Opening (4)	7/8 inch (≈22 m)																																																					

Damper Actuators - Pneumatic

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC4-1	AP 331 No. 3 Actuators are used to position dampers and sequence with other control devices. Available with a number of mounting kits, their compact size facilitates use in mixing boxes, unit ventilators, fan coil units and other terminal units. UL 555/555S component recognition on some models.	Supply Air Spring Ranges Type Mounting Nominal Stroke Effective Diaphragm Area	30 psig (207 kPa) max. 3–7psi (20–50 kPa) 5–10 psig (35–70 kPa): 8–13 psig (55–90 kPa) Fixed bracket, pivot or extended shaft 2-3/8" (60 mm) 8 sq. in. (52 cm ²)	 AP 331 No. 3 Actuator Document Number: 155-146 AP 331-1
PC4-2	AP 331 No. 4 Actuators are used to position and sequence dampers. Available for extended shaft, frame mounting and special terminal unit application. Also available with factory-mounted positioning relay for heavy-duty applications. Hesitation type used to provide minimum ventilation damper position on unit ventilator and similar applications. UL 555/555S component recognition on some models.	Supply Air Spring Ranges Type Mounting Nominal Stroke Effective Diaphragm Area	30 psig (207 kPa) max. 3–7 psig (20–50 kPa) 3–13 psig (20–90 kPa) 5–10 psig (35–70 kPa) 9–14 psi (60–100 kPa) Bracket, pivot or universal kit 4" (102 mm) 11 sq. in. (71 cm ²)	 AP 331 No. 4 Actuator Document Number: 155-032 AP 331-2
PC4-3	AP 331 No. 6 Actuators are used to position and sequence dampers. Available for extended shaft, frame mounting or remote mounting applications. Also available with factory-mounted positioning relay for heavy-duty applications. Hesitation type used to provide minimum ventilation damper position on unit ventilator and similar applications. UL 555/555S component recognition on some models.	Supply Air Spring Ranges Type Mounting Nominal Stroke Effective Diaphragm Area	30 psig (207 kPa) max. 3–13 psig (20–90 kPa) 3–8 psig (20–55 kPa) 8–13 psig (55–90 kPa) Bracket, pivot or universal kit 4" (102 mm) 17.9 sq. in. (115 cm ²)	 AP 331 No. 6 Actuator Document Number: 155-029 AP 331-3
PC4-4	AP 331 No. 6 Damper Actuators – Tandem Mounting are used for positioning inlet vanes on fans or large dampers that use a jackshaft.	Supply Air Spring Range Nominal Stroke Effective Diaphragm Area	30 psig (207 kPa) max. 3–10 psig (21–69 kPa) adjustable 4" (102 mm) 35.8 sq. in. (230 cm ²)	 AP 331 No. 6 Actuators – Tandem Mounting Document Number: 155-277 PA 331-12
PC4-5	AP 331 LC Actuators are double acting cylinder types that can develop high thrust to actuate large damper assemblies, vane axial dampers and similar heavy duty loads. All are provided with precise positioning and amplifying relays to ensure rapid response and accurate positioning.	Spring Range Operating Span Type Mounting Nominal Stroke Effective Piston Area	3–10 psig (20–70 kPa) 3–13 psig (20–89 kPa) Pivot 7" (178 mm) 18 sq. in. (116 cm ²)	 AP 331 LC Document Number: 155-030 AP 331-4

Damper Actuators - Electric

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)	
PC4-6	EA 349 Electronic Damper Actuator is designed for use in terminal units of constant or variable air volume (VAV) systems, unit conditioners, and heat pump HVAC installations for the operation of return air, mixed air, exhaust, and face and bypass dampers. The actuator receives a 24 VAC floating control signal to stroke 90° rotation.	Torque Mounting Power Supply Power Consumption Control Signal Running Time(90°) @ 60 Hz @ 50 Hz	35 lb-in (4.0 Nm) Extended Shaft Direct Coupled 24 Vac, 50-60 Hz 2.2 VA 24 Vac Floating (3-Position) 90 seconds 108 seconds	 EA 349 Electronic Damper Actuator	Document Number: 155-123 EA 349-1
PC4-7	EA-GDE Open Air Non-spring Return Rotary Modulating Control Electric Damper Actuators are used in constant or air variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 44 in-lb (5 Nm) torque.	Operating Voltage (G-G0) Frequency Power Consumption Input Signal (Y-G0) Voltage-Input Input Resistance Position Output Signal (U-G0) Voltage-Output Max. Output Current Equipment Rating Torque Run Time for 90° Opening or Closing	AC 24 V ±20% 50/60 Hz 3 VA DC 0 to 10 V 100K Ohms DC 0 to 10 V DC 1 mA Class 2 44 lb-in (5 Nm) 50Hz/150 seconds 60Hz/ 125 seconds	 EA GDE-1 Non-spring Return Modulating Control Electric Damper Actuator	Document Number: 155-187P25 EA GDE-1
PC4-8	EA-GDE Open Air Non-spring Return Rotary 3-Position Electric Damper Actuators are used in constant or air variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 44 in-lb (5 Nm) torque.	Operating Voltage (G-G0) Frequency Power Consumption Equipment Rating Torque Run Time for 90° Opening or Closing	AC 24 V ±20% 50/60 Hz 2 VA Class 2 44 lb-in (5 Nm) 50Hz/150 seconds 60Hz/ 125 seconds	 EA GDE-2 Non-spring Return 3-Position Electric Damper Actuator	Document Number: 155-188P25 EA GDE-2

Damper Actuators - Electric

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC4-9	EA-349 Spring Return Rotary 3-Position Control Electric Damper Actuators are used in constant or air variable air volume installations for unit ventilators, control dampers, ventilation flaps, and louvers requiring up to 50 in-lb (6 Nm) torque. It is designed for applications that require the damper to return to a fail-safe position when there is a power failure.	Operating Voltage 24 Vac $\pm 20\%$ Frequency 50/60 Hz Power Consumption 12 VA max. at 24 Vac Control Signal 3-position floating Equipment Rating Class 2 Running Stall Torque Maximum 130 lb-in (15 Nm) Spring Return Stall Torque Minimum 50 lb-in (6 Nm) Nominal Angular Rotation $95^\circ \pm 2^\circ$ Run Time With Control Operation Full Stroke Power Stroke, 0 to 100% @ 60 Hz 88 ± 2 seconds @ 50 Hz 106 ± 2 seconds Spring Return Stroke, 100 to 0% @ 72°F No Load 10 seconds @ 72°F Rated Load 30 seconds	 EA 349 Spring Return 3-Position Electric Damper Actuator	Document Number: 155-178P25 EA 349-2
PC4-10	EA-349 Spring Return Rotary Modulating Control Electric Damper Actuators are used in constant or air variable air volume installations for unit ventilators, control dampers, ventilation flaps, and louvers requiring up to 50 in-lb (6 Nm) torque. It is designed for applications that require the damper to return to a fail-safe position when there is a power failure.	Operating Voltage 24 Vac $\pm 20\%$ Frequency 50/60 Hz Power Consumption 12 VA max. at 24 Vac Control Signal Input Signal Position Output Signal Voltage 2 to 10 Vdc Current 1 mA Equipment Rating Class 2 Running Stall Torque Maximum 130 lb-in (15 Nm) Spring Return Stall Torque Minimum 50 lb-in (6 Nm) Nominal Angular Rotation $95^\circ \pm 2^\circ$ Run Time With Control Operation (90% Stroke) Power Stroke, 0 to 100% @ 60 Hz 88 ± 2 seconds @ 50 Hz 106 ± 2 seconds	 EA 349 Spring Return Modulating Control Electric Damper Actuator	Document Number: 155-179P25 EA 349-3
PC4-11	EA-GBB Open Air Non-spring Return Rotary Modulating Control Electric Damper Actuators are used in constant or air variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 177 in-lb (20 Nm) torque.	Operating Voltage (G-G0) AC 24 V $+20\%, -15\%$ Frequency 50/60 Hz Power Consumption 4 VA Input Signal (Y-G0) Voltage-Input DC 0 to 10 V Input Resistance 100K Ohms Current-Input DC 4 to 20 mA Input Resistance 500 Ohms Position Output Signal (U-G0) Voltage-Output DC 0 to 10 V Max. Output Current DC 1 mA Equipment Rating Class 2 Torque 177 lb-in (20 Nm) Run Time for 90° Opening or Closing 150 seconds	 EA GBB-1 Non-spring Return Modulating Control Electric Damper Actuator	Document Number: 155-176P25 EA GBB-1

Damper Actuators - Electric

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC4-12	EA-GBB Open Air Non-spring Return Rotary 3-Position Electric Damper Actuators are used in constant or air variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 177 in-lb (20 Nm) torque.	Operating Voltage (G-G0) AC 24 V $\pm 15\%$ Frequency 50/60 Hz Power Consumption 4 VA Equipment Rating Class 2 Torque 177 lb-in (20 Nm) Run Time for 90° Opening or Closing 120 seconds	 EA GBB-2 Non-spring Return Modulating Control Electric Damper Actuator	Document Number: 155-177P25 EA GBB-2
	EA-GIB Open Air Non-spring Return Rotary 3-Position Electric Damper Actuators are used in constant or air variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 310 in-lb (35 Nm) torque.	Operating Voltage (G-G0) AC 24 V $\pm 15\%$ Frequency 50/60 Hz Power Consumption 6 VA Equipment Rating Class 2 Torque 310 lb-in (35 Nm) Run Time for 90° Opening or Closing 150 seconds	 EA GIB-2 Non-spring Return Modulating Control Electric Damper Actuator	Document Number: 155-177P25 EA GIB-2
PC4-13	EA-GIB Open Air Non-spring Return Rotary Modulating Control Electric Damper Actuators are used in constant or air variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 310 in-lb (35 Nm) torque.	Operating Voltage (G-G0) AC 24 V $+20\%$ Frequency 50/60 Hz Power Consumption 6 VA Input Signal (Y-G0) Voltage-Input DC 0 to 10 V Input Resistance 100K Ohms Current-Input DC 4 to 20 mA Input Resistance 500 Ohms Position Output Signal (U-G0) Voltage-Output DC 0 to 10 V Max. Output Current DC 1 mA Equipment Rating Class 2 Torque 310 lb-in (35Nm) Run Time for 90° Opening or Closing 150 seconds	 EA GIB-1 Non-spring Return Modulating Control Electric Damper Actuator	Document Number: 155-176P25 EA GIB-1

Damper Actuators - Electric

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC4-14	EA-GCA Open Air Spring Return Rotary 2-Position Control Electric Damper Actuators are used in the control of dampers requiring up to 142 lb-in (16 Nm) torque. It is designed for applications that require the damper to return to a fail-safe position when there is a power failure.	Operating Voltage GCA12x.xx AC 24 V +20%, -15% GCA22x.xx AC 115 V $\pm$ 15% Frequency 50/60 Hz Power Consumption GCA12x.xx AC 24V Running 8 VA Holding 3 VA Equipment rating Class 2 GCA22x.xx AC 115V Running 9 VA Holding 9 VA Running Torque 142 lb-in (16 Nm) Run Time for 90° Operating With Motor 90 seconds Closing (on power loss) with Spring Return 15 seconds typical (30 seconds max.) Nominal Angle of Rotation 90°	 EA GCA-2 Spring Return 2-Position Control Electric Damper Actuator	Document Number: 155-174P25 EA GCA-2
PC4-15	EA-GCA Open Air Spring Return Rotary 3-Position Control Electric Damper Actuators are used in constant or air variable air volume installations for the control of return air, mixed air, exhaust, and face and bypass dampers requiring up to 142 in-lb (16 Nm) torque. It is designed for applications that require the damper to return to a fail-safe position when there is a power failure.	Operating Voltage AC 24 V +20%, -15% Frequency 50/60 Hz Power Consumption Running 8 VA Holding 5 VA Equipment Rating Class 2 Running Torque 142 lb-in (16 Nm) Run Time for 90° Operating With Motor 90 seconds Closing (on power loss) With Spring Return 15 seconds typical (30 seconds max.) Nominal Angle of Rotation 90°	 EA GCA-3 Spring Return 3-Position Control Electric Damper Actuator	Document Number: 155-175P25 EA GCA-3
PC4-16	EA 338 Electronic Actuators are designed to operate dampers in HVAC installations. Modulating or two-position control models are available. These modular style motors are suitable for floor or frame mount. These actuators are compatible with field panel outputs.	Nominal Angular Rotation 80° to 160° Adjustable Torque (Rotary) 60 lb-in (6.7 Nm) 75 lb-in (8.5 Nm) 150 lb-in (17 Nm) 300 lb-in (34 Nm) Control Signal 0–10 Vdc (Adjustable 0 to 26 Vdc) or 2-position Mounting (Rotary) Modular motor (floor or frame mount) Operating Voltage 24 Vac $\pm$ 10% Power Consumption 20 VA Running Time 60, 75, and 150 in-lb @ 60 Hz 60 seconds @ 50 Hz 75 seconds 300 in-lb @ 60 Hz 120 $\pm$ 2 seconds @ 50 Hz 144 seconds	 EA 338 Electronic Damper Actuator	Document Number: 155-136 EA 338-1

Switches

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC5-1	SW 786 Selector Switches are designed to deliver or stop the flow of compressed air to selected controllers, valves or dampers. The common port may be connected to two or three ports depending on the switch model. These selector switches may be mounted on a wall, duct or control panel up to 1/4 inch (6 mm) thick.	Capacity Maximum Air Pressure Air Connection	@ 1 psi (7 kPa) 250 SCIM (68 ml/s) with 3/32 OD fitting 480 SCIM (130 ml/s) with 1/4 OD fitting 125 psi (858 kPa) 10-32 Female thread Barb Fittings for 3/32 & 1/4-in O.D. tube supplied  SW 786 Selector Switch	Document Number: 155-118 SW 786-2
PC5-2	SW 141 Positioning Switch is used to deliver any manually selected pressure over a range of 0 to 30 psi (0 to 207 kPa). The adjustment knob can be left free to rotate or held in position by snapping the locking ring into position. The switch may be mounted on a wall, duct or control panel up to 1/4 inch (6 mm) thick.	Output Capacity Max. Air Pressure Air Connection	0 to 30 psi (0 to 206 kPa) (@ 1 psi (7 kPa) differential): 3/32 OD fitting 500 scim (140 ml/s) 1/4 OD fitting 650 scim (180 ml/s) 400 psi (2745 kPa) 1/8" NPT female  SW 141 Positioning Switch	Document Number: 155-117 SW 141-4
PC5-3	SW 151 Positioning Switches gradually increase or decrease air pressure to pneumatically operated equipment. Standard type delivers a manually selected pressure over a 15 psi span. Bleed type changes outlet pressure 3 psi only.	Output (Standard) (Bleed) Capacity Max. Air Pressure Color (Knob and Dial Plate) Air Connection	Span for 300° Knob Rotation 0–15 psi (0–103 kPa) 7.5–10.5 psi (51.7–72.3 kPa) 625 SCIM (170.6 cm³/s) 30 psi (207 kPa) Gray with white letters 1/16" NPT  SW 151 Positioning Switch	Document Number: 155-055 SW 151-1
PC5-4	SW 786 Selector Switches manually direct an input air supply to one or more selected output air lines. A large capacity selector switch with double the capacity of the standard selector switch is also available. Special discs can be obtained for additional applications.	Capacity (Standard) (Large Capacity) Max. Air Pressure Color (Knob and Dial Plate) Air Connection	1400 SCIM (382. cm³/s) 2500 SCIM (683 cm³/s) 30 psi (207 kPa) Gray with white letters 1/16" NPT (Std.) 1/8" NPT (LC)  SW 786 Selector Switch	Document Number: 155-062 SW 786-1
PC5-5	SW 269 Static Pressure Switches provide a 3-way switching function. The switch will compare two static levels (high & Low inputs) and switch when the high port is 0.25" W. G. (62.2 kPa) higher than the lower port.	Switching Threshold (Diff. H to L) Input Pressure (Diff. H to L) Capacity Switching	0.25" W.G.(62.2 kPa) 10" W.G. (2490 Pa) max. 150 SCIM (40.9 cm³/s) @ 1 PSI (6.9 kPa) PD  SW 269 Static Pressure Switch	Document Number: 155-061 SW 269-1

Damper Actuators - Electric

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC5-6	SW 256 Step Controller is a pressure electric device that converts a proportional pneumatic input signal into a series of ten electric on-off contact closures. Normally open switch contacts are used to provide fail-safe operation.	Actuator: Normal Air Signal Pressure 0–15 psig (0–103 kPa) Spring Range 8–13 psig (55–90 kPa) Switches: Rating 20A @ 120, 240 & 480 Vac 1 HP @ 125V, 2 HP @ 240V Action SPDT Air Connections 1/8" NPT female	 SW 256 Step Controller	Document Number: 155-060 SW 256-3
PC5-7	SW 134 Pressure Electric Switches are pressure actuated, mechanical contact type switches used to open or close electrical circuits from pressure signals in pneumatic control systems. Typical applications include the control of air compressors, fans, pilot lights, etc. The enclosure is NEMA class 1, cold drawn steel, gray enamel finish. Pressure connection 1/8 NPTF. Conduit openings are standard 1/2" knockouts. (Switch for two-stage sequencing applications not shown.)	Operating Range 3–20 psi (21–138 kPa) Control Action N.O., DPST: N.C. DPST Rating AC FLA: 12A @ 120V, 208, & 240V Non-Ind: 12A to 277V Pressure Differential 105-20 psi (10.3-137.8 kPa) Adj.	 SW 134 Pressure Electric Switch	Document Number: 155-050 SW 134-3
		Operating Range 3–20 psi (21–138 kPa) Control Action SPDT Rating AC FLA: 16A @ 120V, 8A @ 240V Non-Ind: 16A @ 120V to 277V (SPDT), 24A @ 120V to 277V (SPST) Pressure Differential 2.0 psi (13.8 kPa) Fixed	 SW 134 Pressure Electric Switch	Document Number: 155-051 SW 134-6
PC5-8	SW 251 Pressure Electric Switches actuate electrical circuits from pneumatic control signals. All models have 1/4" barb fittings for pneumatic connection. Models include single stage, two-stage and dual input for use on Day-Night control.	Set point Range 2–30 psi (14–207 kPa) Maximum Pressure 30 psi (206.7 kPa) Ambient Temp. Range 40–120°F (4.4–48.9°C) Control Action SPDT, SPST Elec. Rating AC FLA: 3, 6A @ 120V Non-Ind: 5, 8, 19, 22A @ 120V	 SW 134 Pressure Electric Switch	Document Number: 155-057 SW 251-1
PC5-9	SW 141 Air Flow Switches sense static differential pressure and are used to control, alarm or interlock on a change in differential air pressure. Models include auto and manual reset.	Set point Range 1.0 to 12.0" W.G (7 Pa to 3000 Pa) 0.05 to 1.0" W.G (12 Pa to 250 Pa) Action SPST, SPDT Differential Progressive; Increasing from 0.03±.015" W.G. (7±4 Pa) at min. set point to approx. 1.2" W.G. (300 Pa) at max. set point or 0.02" W.C. (10 Pa) at min. set point to 0.1" W.C. (25 Pa) at max. set point Measured Media Air Ambient Temp. -40–180°F (-40–82.2°C)	 SW 141 Air Flow Switch	Document Number: 155-052 SW 141-1

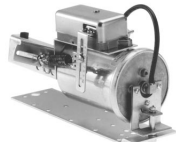
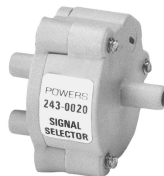
Relays

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC5-10	EP 265 Electro-Pneumatic Valves are electrically operated, 3-way type pneumatic valves, designed to handle air flow only. It is frequently wired to load side of a motor starter to be energized when the motor is started and de-energized when the motor is stopped.	Power Supply @ 60 Hertz A.C. Max. Press. Rating Capacity Switch Action	24V, 120V, 208V 240V, 277V, 480V 30 psi (206.7 kPa) 600 SCIM (164 cm ³ /s) (with 20 psig inlet pressure, ΔP=1psi) 3-Way	 EP 265 Electro-Pneumatic Valve Document Number: 155-078 EP 265-2
PC5-11	SW 141 Electric Enthalpy Control Switches are designed to sense the BTU heat content of ventilation air. Provided with a SPST snap acting electric switch, this control automatically initiates corrective damper control or alarm circuitry whenever the sensed air condition either rises above or falls below desired settings.	Elec. Rating Elec. Connection Switching Action Differential	2.5A max. @ 24 Vac Metal enclosure with 1/2" conduit opening SPDT Approx. 8% R.H. and 2°F	 SW 141 Electric Enthalpy Switch Document Number: 155-054 SW 141-3
PC5-12	RL 243 MP Industrial Duty Multi-Purpose Relays are pneumatic auxiliary devices designed to amplify, reverse, advance or pass a minimum control signal to a controlled device. They have adjustable settings.	Supply Adjustment Range Action Mounting Air Connection	25 psi (172 kPa) normal 30 psi (207 kPa) max. Spring 0–25 psi (0–172 kPa) Gradual Flush or Exposed Surface 1/8" NPT	 RL 243 MP Industrial Duty Multi-Purpose Relay Document Number: 155-042 RL 243-6
PC5-13	RL 243 MP Commercial Duty Multi-Purpose Relays are pneumatic auxiliary devices designed to amplify, reverse, advance or pass a minimum control signal to a controlled device. They have adjustable settings.	Supply Adjustment Range Action Mounting Air Connection	25 psi (172 kPa) normal 30 psi (207 kPa) max. Spring 0–25 psi (0–172 kPa) Gradual Flush or Exposed Surface Barb (for 1/4" O.D. Poly)	 RL 243 MP Commercial Duty Multi-Purpose Relay Document Number: 155-105 RL 243-14
PC5-14	RL 243 BR Industrial Duty Balance-Retard Relays perform as balancing relays or as retard action and other special functions such as hesitation and pressure limiting.	Supply Air Adjustment Action Mounting Air Connection	30 psi (207 kPa) max. Spring: Adv.: 0–15 psi (0–103 kPa) Retard: 0–10 (0–70 kPa) Gradual Flush or exposed 1/8" NPT	 RL 243 BR Industrial Duty Balance-Retard Relay Document Number: 155-043 RL 243-7

Relays

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC5-15	RL 243 BR Commercial Duty Balance-Retard Relays perform as balancing relays or as retard action and other special functions such as hesitation and pressure limiting.	Supply Air Adjustment Action Mounting Air Connection	30 psi (207 kPa) max. Spring: Adv.: 0–15 psi (0–103 kPa) Retard: 0–10 (0–70 kPa) Gradual Flush or exposed Barb (for 1/4" O.D. Poly)	 RL 243 BR Commercial Duty Balance-Retard Relay Document Number: 155-106 RL 243-15
PC5-16	RL 243 A Industrial Duty Analog Relays are pneumatic relays with the following applications: direct acting amplifying (1/1 ratio); higher pressure amplifying, minimum pressure; lower transfer; summing; direct acting amplifying (1/2 ratio or 2/1 ratio); minimum pressure (2/1 ratio) or with characterized pressure output; signal retard (remote adjustment of retard); signal inverting; averaging high and low signals — and direct acting amplifying (1/1 ratio) optional override.	Supply Air Adjustments Action Mounting Air Connection	30 psi (207 kPa) max. None required Gradual Flush or exposed surface 1/8" NPT	 RL 243 A Industrial Duty Analog Relay Document Number: 155-044 RL 243-8
PC5-17	RL 243 A Commercial Duty Analog Relays are pneumatic relays with the following applications: direct acting amplifying (1/1 ratio); higher pressure amplifying, minimum pressure; lower transfer; summing; direct acting amplifying (1/2 ratio or 2/1 ratio); minimum pressure (2/1 ratio) or with characterized pressure output; signal retard (remote adjustment of retard); signal inverting; averaging high and low signals — and direct acting amplifying (1/1 ratio) optional override.	Supply Air Adjustments Action Mounting Air Connection	30 psi (207 kPa) max. None required Gradual Flush or exposed surface Barb (for 1/4" O.D. Poly)	 RL 243 A Commercial Duty Analog Relay Document Number: 155-107 RL 243-16
PC5-18	RL 243 SW Switching Relays are compact 3-way valves that can be used to perform a variety of switching and diverting functions. Switching action connects a common port to either of two ports.	Supply Air Adj. Changeover Range Std. Changeover Settings Changeover Diff. Air Connection	30 psi (207 kPa) max. 0–25 psi (0–172 kPa) 9 psi (62 kPa); 22 psi (152 kPa) 1.5 psi (10 kPa) nominal 1/8" NPT	 RL 243 SW Switching Relay Document Number: 155-040 RL 243-4

Relays

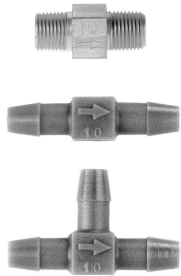
Item No.	Description	Specifications	Illustration	Document no(s). (Pkg. of 25)
PC5-19	RL 147 Positioning Relays mount directly on actuated device to provide positive positioning. Use full available pressure or actuator spring force to maintain any position and are adjustable for start point and operating span.	Pilot Pressure 30 psi (207 kPa) max Supply Air (to positioner) 0–25 psi (0–172 kPa) Mounts On 60 psi (413 kPa) max. Nos. 3, 4, and 6 Actuators 30 psi (207 kPa) max. Flowrite Valve with 8" Top 35 psi (241 kPa) max. Flowrite Valve with 12" Top 35 psi (241 kPa) max. Adj. Range Start point: 3–10 psi (20–70 kPa) Operating span: 3–12 psi (20–85 kPa) Air Connection 1/8" NPT	 RL 147 Positioning Relay (Shown mounted on a No. 6 Damper Actuator.)	Document Number: 155-038 RL 147-2
PC5-20	RL 243 Reverse Acting Relays provide a proportional output signal that varies inversely with the input signal. A spring adjustment is provided to allow setting a desired reverse acting schedule required by a particular application.	Action Reverse Supply Pressure 30 psig (207 kPa) max. Range Adjustment 10 to 30 psi (69 to 207 kPa) Air Capacity 230 scim (63 ml/s) Air Consumption 29 scim (8 ml/s) Air Connection Barbed nipple for 1/4" O. D. tube Mounting Mounting bracket provided	 RL 243 Reverse Acting Relay	Document Number: 155-124 RL 243-17
PC5-21	RL 243 Signal Selector Relays are designed to select the highest and/or lowest pressure from a multiple number of input signals. Provided with integral barbs for direct connection to plastic tubing.	Action Direct Supply Pressure 30 psig (207 kPa) max. Input/Output 1:1 fixed No. of Inputs 2 inputs, highest out 2 inputs, lowest out 6 inputs, lowest/highest out 1 in/1 out direct amplifying	 RL 243 Signal Selector Relay	Document Number: 155-047 RL 243-13
PC5-22	AO-P Transducers convert an electronic signal into a linear pneumatic signal for the accurate positioning of valve and damper actuators. The transducer is available in two different mounting styles: remote mount with its own integral enclosure and conduit connection; or panel mount for mounting in control cabinet applications.	Supply Voltage 19 to 26 Vac (24 Vac Typical) Input 0 to 10 Vdc/20 K ohm Signal/Impedance Output Signal 0 to 20 psig (0 to 138 kPa) 500 SCIM (135 ml/s) minimum @ 5 psi (34.5 kPa) Drop (20 psi input, 15 psi output) Output Capacity Air Consumption for compressor sizing 8 SCIM (2.2 ml/s)	 AO-P Transducer	Document Number: 149-277
PC5-23	RL 243 H Highest Pressure Signal Selectors are dual input, single output logic devices for use in pneumatic control systems. The small size of this device allows it to be supported in-line from the plastic signal tubing or bracked mounted. A bracket and mounting screws are supplied with each signal selector.	Action Direct Max. Pressure 30 psig (207 kPa) Connections 1/4" (6 mm) OD plastic tubing Air Capacity @ ΔP = 2 psi 130 scim (35 ml/sec)	 RL 243 H Highest Pressure Signal Selector	Document Number: 155-045 RL 243 H RL 243-11

Relays

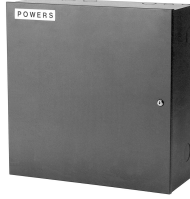
Auxiliary Equipment

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC5-24	RL 243 LH Lowest and Highest Signal Selectors are six-input, dual output logic devices for use in pneumatic control systems. The small size of this device allows it to be supported in-line from the plastic signal tubing or bracket mounted. A bracket and mounting screws are supplied with each signal selector. An air supply of 20 psig is required.	Action Direct Air Supply Pressure Normal Operating 20 psig (138 kPa) Maximum 30 psig (207 kPa) Connections ¼" (6 mm) OD plastic tubing Air Consumption 44 scim (12 ml/sec) Air Capacity @ ΔP = 2 psi Highest 5 scim (1.4 ml/sec) Lowest 10 scim (2.7 ml/sec)	 RL 243 LH Lowest and Highest Signal Selector	Document Number: 155-046 RL 243 LH RL 243-12
PC6-1	RV 201 Pressure Reducing Valves control air supply pressure for pneumatic control systems. Available as a single pressure or dual pressure model.	Mounting Wall or Pipe Supported Inlet Pressure 150 psig (1033 kPa) max. Outlet Pressure Single: 2–35 psig (13.7–241.1 kPa) Air Capacity 10 SCFM (4.72 dm³/s)	 RV 201 Pressure Reducing Valve	Document Number: 155-049 RV 201-1
		Mounting Wall Inlet Pressure 250 psig (1734 kPa) max. Outlet Pressure 3–50 psig (21–345 kPa) Air Capacity 10 SCFM (4.72 dm³/s)	RV 201 Pressure Reducing Valve	Document Number: 155-137 RV 201-2
PC6-2	AF 908 Air Line Filter removes particulate matter, oil and water from compressed air sources in pneumatic control systems.	Pressure 150 psig (1033 kPa) max. Capacity 10 SCFM (4.72 dm³/s) Removal Rating (Microns) 0.08 Particles 0.01 Oil and Water	 AF 908 Air Line Filter	Document Number: 155-005 AF 908-4
PC6-3	AF 908 In Line Filter cartridge is designed to remove solids and petroleum based oils from compressed air. A unique visible filtration element changes color as oil is absorbed indicating when filter element should be replaced.	Pressure 30 psi max. (206 kPa) Capacity 500 SCFM @ 25 psi supply 1.37 cu. m/hr. with 172.4 kPa supply Filtration Efficiency 99.9% for particles 0.5 micron and larger	 AF 908 Air In Line Filter	Document Number: 155-004 AF 908-3

Auxiliary Equipment

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC6-4	GA 142 Analog Receiver Gauges are used wherever visual indication of a specific value of a variable is required. English and metric units available.	Inlet Pressure Operating Range 3-15 psig -40/120°F -25/135°F -10/65°F -35/125°F 30/190°F 50/100°F 80/240°F 20/80% R.H. 3/15 psig 0/100°F 160/320°F -0.05/0.2" W.G. -0.5/0.5" W.G. 0/3" W.G. (0/747 Pa) 0/10" W.G. (0/2.4 kPa) 20/40°C 26/120°C 0/210 kPa 0/2.5 kPa 0/5500 FPM 16-40 BTU/lb 1-1/2", 2-1/2", 3-1/2" Size Mounting Connection Panel 1/4" Barb (1-1/2" has pipe connection)	 GA 142 Analog Receiver Gauge	Document Number: 155-023 GA 142-2
PC6-5	GA 142 Analog Pressure Gauges are used whenever a specific value in pressure is required. English or metric units available.	Input Pressure 0-30 psig 0-100 psig 0-160 psig 0-200 kPa 1-1/2", 2-1/2", 3" Panel, Pipe 1/4" Barb, 1/8" NPT Sizes Mounting Connection	 GA 142 Analog Pressure Gauge	Document Number: 155-025 GA 142-4
PC6-6	Restrictors with integral barb for 1/4" O.D. plastic tube or 1/8" NPT connections are available for pneumatic circuits in a wide range of sizes. Provided in both straight through and tee configurations.	Restrictors with Integral Barb Connection Capacity Style Connection Capacity	Red: 10 SCIM (2.7 ml/s) Yellow: 20 SCIM (5.5 ml/s) Green: 40 SCIM (11 ml/s) Straight through or tee: In Line Restrictor 1/8" NPT 1/4" O.D. plastic tube or 1/8" NPT 10, 20, 40, 80, 320 SCIM (2.7, 5.5, 11, 22, 87 ml/s)  Restrictors	Document Numbers: 155-213 TB 167
PC6-7	RL 380 Check Valves are positive acting devices that allow air flow in one direction only. Used primarily in signal selection networks to obtain highest and/or lowest pressure output, or as a fail-safe device to ensure pressure equalization.	Capacity Max. Air Pressure Temp. Range Air Connection.	30 SCIM at 1 psi PD (8.19 cm³/s at 6.9 kPa PD) 450 SCIM at 8 psi PD (122.8 cm³/s at 55.1 kPa PD) 30 psi (207 kPa) -20-300°F (-28.9-148.9°C) Integral Barb for 1/4" O.D. tubing  RL 380 Check Valve	Document Numbers: 155-048 RL 380-3

Auxiliary Equipment

Item No.	Description	Specifications	Illustration	Document no(s). (Pkg of 25)
PC6-8	CP 567 Control Cabinets are designed to conveniently group control system components. Control components can be mounted on the door or mounted within the enclosure using the perforated sub-panel. All cabinets are NEMA 1 style and U.L. listed.	Cabinet Size: Large 36-1/2" x 24-3/8" x 9-3/8" (927 mm x 619 mm x 238 mm) Medium 24-3/8" x 24-3/8" x 9-3/8" (619 mm x 619 mm x 238 mm) Small 19-1/2" x 16-3/8" x 5-3/4" (495 mm x 416 mm x 146 mm) Mounting Wall: all sizes Floor: large cabinet only <i>Light fixture available for all sizes.</i>	 CP 567 Control Cabinet	Document Numbers: 155-272 155-223 155-224 CP 567-7 TB 196 TB 197
PC6-9	TM 894 Multi-Angle Thermometers are used for measuring liquid temperatures in heating, ventilating, air conditioning or processing installations. They contain universal mounting features for applications involving unusual or difficult stem angle installation.	Ranges -40–100°F 30–180°F 30–300°F Stem Length 3-1/2", 6" (8.9, 15.2 cm) Connection Jam nut type Material Aluminum Accessories Well; flange or standard union hub	 TM 894 Multi-Angle Thermometer	Document Number: 155-075 TM 894-2
PC6-10	TM 894 Bimetal Thermometers are used to measure air temperature in ducts. They feature an extra large 4-1/2" (11.4 cm) dial and large numbers for easy reading when mounted in hard-to-get-to air ducts.	Range -30–210°F (-34.4–98.9°C) Dial Scale 2 degree graduations, accuracy within 2% of scale range Color Case & bezel: gray finish Material Aluminum Mounting Swivel flange	 TM 894 Bimetal Thermometer	Document Number: 155-074 TM 894-1

Auxiliary Equipment

Item No.	Description	Specifications		Illustration	Document no(s). (Pkg of 25)
PC6-11	TM 894 Remote Bulb Dial Thermometers are used for liquid or air immersion applications. Bulb styles are vapor-filled, plain bulb, and liquid-filled averaging bulb.	Bulb	Averaging bulb: 1/8" x 180" (3 mm x 460 cm) Plain bulb: 7/16" x 6" (11 mm x 15.2 cm)		Document Number: 155-076 TM 894-4
		Bulb Ranges	-40–110°F 20–220°F 0–180°F		
		Capillary Length	10 ft. (3.0 m) or 40 ft. (12.2 m)		
		Mounting	Surface or flush		
		Accessories	Wells; brass or stainless steel (Plain bulb only)		
PC6-12	Pneutrol Needle Valve is designed to restrict the flow of compressed air. It can be used for restricted feed or restricted waste. The needle valve is provided with a locking nut to prevent change in setting.	Body Max. Flow Connections	Brass hex SAE-72 (2000 psi) 2.0 CFM @ 10 psi drop 3.2 CFM @ 25 psi drop 1/8 NPT (dry seal)		Order from Technical Communications M-230
				Pneu-trol Needle Valve	

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Howard Industries.....	909 784-8800
Riverside	
RSD / Total Control	909-684-8110
Riverside	
RSD / Total Control	909-684-8110

Wholesalers

California, continued

S. El Monte	
Burke Engineering.....	626 579-6763
Sacramento	
Control Technology Specialists	916 922-9367
Sacramento	
Controlco Automation Distributors.....	916 927-5599
Sacramento	
RSD / Total Control	916-927-1824
San Bernardino	
Allied Refrigeration, Inc.	909 884-1885
San Carlos	
ControlTech	650 593-2111
San Diego	
Burke Engineering.....	619 874-8499
San Diego	
George T. Hall Company.....	619 297-4671
San Diego	
RSD / Total Control	619-239-4127
San Diego	
RSD / Total Control	619-565-7191
San Francisco	
Controlco Automation Distributors.....	415 647-9445
San Jose	
Acucon, Inc.	408 998-1550
San Jose	
Allied Refrigeration, Inc.	408 286-7674
San Jose	
Burke Engineering.....	408 275-6880
San Jose	
RSD / Total Control	408-297-9453
San Leandro	
RSD / Total Control	510-562-8440
Santa Ana	
Allied Refrigeration, Inc.	714 547-0021
Santa Ana	
Burke Engineering.....	714 547-9715
Santa Ana	
RSD / Total Control	714-480-1177
Santa Rosa	
RSD / Total Control	707-588-8283
So. San Francisco	
RSD / Total Control	415-737-7912
Taft	
Controlco Automation Distributors.....	805 763-5183
Van Nuys	
Allied Refrigeration, Inc.	818 782-0726
Van Nuys	
Burke Engineering.....	818 781-6017
Van Nuys	
Howard Industries	818 782-3600
Van Nuys	
RSD / Total Control	818-902-9800
Ventura	
Controlco Automation Distributors.....	805 642-8523
Ventura	
George T. Hall Company.....	805 656-5155
Visalia	
RSD / Total Control	209-636-2101

Colorado

Colorado Springs	
Burke Engineering.....	719 471-9990
Colorado Springs	
Control Logic	719-632-4562
Colorado Springs	
Sid Harvey.....	719 442-6446
Colorado Springs	
Trane Parts Center	719 473-7400
Denver	
Burke Engineering.....	303 777-9232
Denver	
Sid Harvey.....	303 623-1236
Denver	
Trane Parts Center	303 228-3310
Englewood	
Mechanical Solutions, Inc.....	303-789-1700
Fort Collins	
Sid Harvey.....	970 221-1929
Grand Junction	
Sid Harvey.....	970 256-0700

Connecticut

Lakewood	
CW Industries.....	303-233-8653
Hartford	
Bell Simons Companies	860 525-6675
Hartford	
F. W. Webb Co.....	860 522-9322
Stratford	
Tower Equipment Company, Inc.	203 375-4420

Florida

Jacksonville	
C.C. Dickson Company	904 354-0600
Oakland Park	
Design Controls.....	954 566-1440
Orange Park	
C.C. Dickson Company	904 272-4402
Orlando	
Stromquist & Company.....	407-299-7070
St. Augustine	
C.C. Dickson Company	904 825-0041

Georgia

Atlanta	
C.C. Dickson Company	404 659-2240
Augusta	
C.C. Dickson Company	706 724-0234
Daulton	
Stromquist & Company.....	404 278-2551
Doraville	
C.C. Dickson Company	770-449-1421
Smyrna	
Stromquist & Company.....	404 794-3440

Iowa

Des Moines	
Hosier Refrigeration.....	515 288-7211
Mason City	
Gustave A. Larson Company	515 423-1808

Wholesalers

Indiana

Boise	
RSD / Total Control	208-378-9940
Pocatello	
RSD / Total Control	208-232-6406

Illinois

Arlington Heights	
G & O Thermal Supply Company	847 439-5242
Bridgeview	
G & O Thermal Supply Company	708-430-6900
Broadview	
South Side Control Supply	708 343-5970
Buffalo Grove	
Gustave A. Larson Company	847-279-0800
Chicago	
G & O Thermal Supply Company	773 763-1300
Chicago	
G & O Thermal Supply Company	312 563-1300
Chicago	
South Side Control Supply	312 226-4900
Chicago	
South Side Control Supply	773 488-4400
Chicago	
South Side Control Supply	773 283-1300
Crestwood	
South Side Control Supply	708 385-5252
Decatur	
South Side Control Supply	217 428-6601
Des Plaines	
South Side Control Supply	847 952-0013
Downers Grove	
Neuco	800-323-7394
Glen Ellyn	
South Side Control Supply	630 858-0888
Highland Park	
G & O Thermal Supply Company	847 831-2400
Lake Villa	
M & M Controls, Inc.	847 356-0566
Lansing	
South Side Control Supply	708 895-5110
Morton Grove	
South Side Control Supply	847 966-2940
Peoria	
South Side Control Supply	309 637-3775
Rockford	
Gustave A. Larson Company	815-398-4922

Kansas

Lenexa	
Thermal Components	913-928-8115
Lexington	
S.W.H. Supply Company	502-261-9287
Louisville	
S.W.H. Supply Company	502-589-9287

Louisiana

Harahan(New Orleans)	
Universal Supply & Equipment, Inc.	504 734-5001

Massachusetts

Auburn	
F. W. Webb Co.	508-757-9322
Boston	
F. W. Webb Co.	617 227-2240
Braintree	
Control Consultants, Inc.	781 356-7006

Massachusetts, continued

Brockton	
F. W. Webb Co.	508-580-8310
Fitchburg	
F. W. Webb Co.	978-345-4121
Hyannis	
F. W. Webb Co.	506-775-3890
Lowell	
F. W. Webb Co.	978 937-9322
Northampton	
F. W. Webb Co.	413 586-8100
Salem	
F. W. Webb Co.	978-744-6550
Springfield	
Bell Pump Service Co.	413 781-4500
Springfield	
Webb Air	413-781-1700
Woburn	
Webb Air	781 933-1804
Worcester	
Bell Simons Companies	508 756-5771
Annapolis	
Aireco Supply, Inc.	410 280-2350
Baltimore	
Aireco Supply, Inc.	410 783-9220
Baltimore	
Aireco Supply, Inc.	410 931-4807
Baltimore	
Aireco Supply, Inc.	410 646-1310
Beltsville	
Aireco Supply, Inc.	301 595-5666
Easton	
Aireco Supply, Inc.	410 819-5833
Frederick	
Aireco Supply, Inc.	301 663-0505
Gaithersburg	
Aireco Supply, Inc.	301 948-5000
Hyattsville	
Aireco Supply, Inc.	301 779-8770

Maryland

Millersville	
Aireco Supply, Inc.	410 969-5544
Owings Mills	
Aireco Supply, Inc.	410 363-6230
Rockville	
Aireco Supply, Inc.	301 881-7020
Savage	
Aireco Supply, Inc.	301 953-8800
Silver Spring	
Aireco Supply, Inc.	301 585-9100
Temple Hills	
Aireco Supply, Inc.	301 423-1400

Wholesalers

Maryland, continued

Timonium	
Aireco Supply, Inc.	410 252-2185
Timonium	
M & M Controls, Inc.	410-252-1221
Upper Marlboro	
Aireco Supply, Inc.	301 967-6966
White Plains	
Aireco Supply, Inc.	301 932-8700

Maine

Bangor	
F. W. Webb Co.	207-947-6905
Portland	
Control Consultants, Inc.	800 435-1355
Portland	
Webb Air	207 780-1492

Michigan

Grand Rapids	
Cochrane Supply & Engineering	616 365-3210
Jackson	
Tommark Company	517 782-0557
Lansing	
Tommark Company	517 487-3900
Livonia	
Cochrane Supply & Engineering	248-466-9899
Madison Heights	
Cochrane Supply & Engineering	810-588-9260

Minnesota

Bloomington	
Gustave A. Larson Company	612 881-8077
Duluth	
Gustave A. Larson Company	218 628-2293
Minneapolis	
Minvalco, Inc.	612 920-0131
Plymouth	
Gustave A. Larson Company	612 546-7175
Rochester	
Gustave A. Larson Company	507 281-0272
Roseville	
Minvalco, Inc.	651-636-8778
Sauk Rapids	
Minvalco, Inc.	320 654-1500
St. Paul	
Gustave A. Larson Company	612 645-6640

Montana

Arnold	
Crescent Parts & Equip. Co, Inc.	314 296-2778
Ballwin	
Crescent Parts & Equip. Co, Inc.	314 256-2653
Poplar Bluff	
Crescent Parts & Equip. Co, Inc.	314 785-9680
Springfield	
Thermal Components	417-882-0963
St. Louis	
Control Consultants & Supply Co.	314 647-6680

Montana, continued

St. Louis	
Crescent Parts & Equip. Co, Inc.	314 647-5511
St. Louis	
Crescent Parts & Equip. Co, Inc.	314 647-5511
St. Louis	
Crescent Parts & Equipment Co., Inc. ..	314 427-6622

Mississippi

Gulfport	
Climate Supply of Gulfport	228-864-7343
Jackson	
Climate Supply of Jackson	601 355-7413
Meridian	
Climate Supply of Meridian	601-483-5387
Tupelo	
Climate Supply of Tupelo	601-842-0024

North Carolina

Burlington	
ACR Supply Company	336-227-5000
Carrboro	
ACR Supply Company	919 929-2099
Chapel Hill	
C.C. Dickson Company	919 942-0177
Charlotte	
C.C. Dickson Company	704 372-2604
Charlotte	
C.C. Dickson Company	704 372-2600
Charlotte	
C.C. Dickson Company	704 334-7341
Durham	
ACR Supply Company	919 286-2228
Greensboro	
ACR Supply Company	336-854-5800
Raleigh	
C.C. Dickson Company	919 832-2066

North Dakota

Fargo	
Gustave A. Larson Company	701-241-4400

New Hampshire

Dover	
F. W. Webb Co.	603 749-3100
Lebanon	
F. W. Webb Co.	603-448-1980
Nashua	
F. W. Webb Co.	603-883-3355

New Jersey

N. Arlington	
Charles F. Connolly Dist.	201 998-8080
Wanamassa	
Industrial Controls Distributors, Inc.	732-918-9000

New Mexico

Albuquerque	
Burke Engineering	505 883-7501
Albuquerque	
Western Controls Company, Inc.	800 366-4571

Wholesalers

Nevada

Las Vegas	
Allied Refrigeration, Inc.	702 737-0090
Las Vegas	
Burke Engineering	702 369-5446
Las Vegas	
RSD / Total Control	702-597-1040
Las Vegas	
RSD / Total Control	702-385-4876
Reno	
RSD / Total Control	702-329-1067

New York

Albany	
F. W. Webb Co.	518 472-9322
Huntington	
Twinco Supply	516 547-1100
New York	
Industrial Controls Distributors, Inc.	212-947-3100
Queensbury	
F. W. Webb Co.	518 792-1316
Rochester	
Ward Supply Company, Inc.	716 244-8840
Syracuse	
F. W. Webb Co.	315 476-9322
Syracuse	
Oil Burner Supply Company, Inc.	315 475-6315
Syracuse	
Ward Supply Company, Inc.	315 424-9000
Yonkers	
Martin Walshin	914 478-4300

Ohio

Akron	
G.D. Supply	330-535-4499
Brooklyn Heights	
G.D. Supply	216-661-9922
Cincinnati	
Mason Supply Company	513 853-3257
Cleveland	
Cleveland Hermetic & Supply, Inc.	216 961-6250
Cleveland	
Cleveland Hermetic & Supply, Inc.	216-961-6520
Cleveland	
Cleveland Hermetic & Supply, Inc.	216-961-6515
Columbus	
Columbus Temperature Control	614 294-6216
Columbus	
G.D. Supply	614-258-1111
Columbus	
Mason Supply Company	614 253-8607

Oklahoma

Oklahoma City	
Federal Corporation	800 289-3331
Tulsa	
Federal Corporation	918-249-1918
Tulsa	
Tulsa Controls	918-459-9839

Oregon

Eugene	
RSD / Total Control	541-342-3331
Medford	
RSD / Total Control	541-734-4304
Portland	
Burke Engineering	503 239-9409
Portland	
Industrial Control Company	503 233-5501
Portland	
Johnstone Supply, Inc.	503 256-3668
Portland	
RSD / Total Control	503 234-4334
Salem	
RSD / Total Control	503-399-0919

Pennsylvania

Allentown	
Energy Equipment & Control, Inc.	610 437-9715
Clifton Heights	
Capp, Inc.	610-394-1142
Havertown	
National Energy Control Corp.	610 449-9800
Lester	
Industrial Controls Distributors, Inc.	610 521-7400
Oaks	
Control Products USA	610 666-1300
Pittsburgh	
Edward C. Smyers Company	412 471-3222
Plymouth Meeting	
C. S. Fuller	610-941-9225

Rhode Island

Providence	
Automatic Heating Equipment Inc.	401 521-8877
Warwick	
Webb Air	401 463-8339

South Carolina

Charleston	
C.C. Dickson Company	803 571-4510
Columbia	
C.C. Dickson Company	803 765-0290
Greenville	
Control Consultants & Supply Co.	864-233-3366
Greenville	
C.C. Dickson Company	864-244-5931
Spartanburg	
C.C. Dickson Company	864-585-9314

South Dakota

Sioux Falls	
Gustave A. Larson Company	605-336-0550

Tennessee

Knoxville	
C.C. Dickson Company	423-525-0233
Memphis	
C.C. Dickson Company	901 363-8100
Nashville	
C.C. Dickson Company	615 242-2997
Nashville	
Ener-tech	615 242-2997

Wholesalers

Texas

Austin	Austin Controls, Inc.	512-339-8555
Dallas	Temperature Control - Dallas	972-241-7086
Dallas	Temperature Control Systems	214-343-1444
Ft. Worth	Climate Controls.....	817-222-0200
Houston	Complete Controls	713-464-7002
Odessa	Western Controls Company, Inc.	800 634-7374

Utah

Ogden	RSD / Total Control	801-621-5960
Orem	RSD / Total Control	801-224-0797
Salt Lake City	Applied Automation, Inc.	801 486-8791
Salt Lake City	Burke Engineering.....	801 463-1300
Salt Lake City	RSD / Total Control	801 485-5000

Virginia

Alexandria	Aireco Supply, Inc.	703 941-0660
Arlington	Aireco Supply, Inc.	703 684-7800
Ashland	Aireco Supply, Inc.	804 752-2612
Chantilly	Aireco Supply, Inc.	703 378-0300
Charlottesville	Aireco Supply, Inc.	804-973-1610
Chesapeake	C.C. Dickson Company	757-436-2811
Fredericksburg	Aireco Supply, Inc.	540 891-8919
Harrisonburg	Aireco Supply, Inc.	540 434-5888
Lynchburg	Aireco Supply, Inc.	804 845-0400
Manassas	Aireco Supply, Inc.	703-631-8610
Newport News	Aireco Supply, Inc.	757 244-2665
Norfolk	Aireco Supply, Inc.	757 858-2468
Richmond	Aireco Supply, Inc.	804 358-3051
Richmond	Aireco Supply, Inc.	804 745-0641
Tysons Corner	Aireco Supply, Inc.	703 556-0280
Woodbridge	Aireco Supply, Inc.	703 494-1600

Vermont

Barre	F. W. Webb Co.	802-479-3373
Rutland	F. W. Webb Co.	802-775-1922
Williston	F. W. Webb Co.	802-527-0531

Washington

Bellingham	RSD / Total Control	360-671-7407
Seattle	Burke Engineering.....	206 292-918
Seattle	Mortemp, Inc.	206 767-0140
Seattle	RSD / Total Control	206-623-8005
Spokane	Blacks Industrial Inc.....	509 535-1503
Spokane	Mortemp, Inc.	509 747-1130
Spokane	RSD / Total Control	509-838-0593
Tacoma	RSD / Total Control	206-922-2422
Woodinville	Mortemp, Inc.	206 482-0800

West Virginia

Charleston	Mason Supply Company	304-344-3681
Huntington	Mason Supply Company	304 522-8935
Wheeling	Mason Supply Company	304 232-8940

Wisconsin

Appleton	Gustave A. Larson Company	414 739-4451
Eau Claire	Gustave A. Larson Company	715 834-5096
Green Bay	Gustave A. Larson Company	414 499-0866
LaCrosse	Gustave A. Larson Company	608 785-7050
Madison	Gustave A. Larson Company	608 221-3303
Menomonee Falls	Gustave A. Larson Company	414-255-9900
Milwaukee	Gustave A. Larson Company	414 273-1838
New Berlin	Gustave A. Larson Company	414-782-2301
Pewaukee	Gustave A. Larson Company	414 542-0200
Wausau	Gustave A. Larson Company	715 355-5414

Wyoming

Cheyenne	Sid Harvey.....	307 635-4281
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Wholesalers

Canada

Alberta

Calgary	
AMRE Supply Co. Ltd.	403-243-6662
Calgary	
Sinclair Supply Ltd.....	403-571-6340
Edmonton	
AMRE Supply Co. Ltd.	403 463 9977 x109
Edmonton	
AMRE Supply Co. Ltd.	403-426-2673
Edmonton	
Premier Industrial Ltd.	403 451 1065
Edmonton	
Sinclair Supply Ltd.....	403 452-3110
Red Deer	
Sinclair Supply Ltd.....	403-346-3848

British Columbia

Burnaby	
Meyers Controls	604-299-2641
Burnaby	
Refrigerative Supply	604-435-7151
Prince George	
International Comfort Systems Corp ...	250 563 2404

British Columbia

Vancouver	
AMRE Supply Co. Ltd.	604-689-3377
Vancouver	
Pacific Controls	604-879-6711

Manitoba

Winnipeg	
Recon Heating Supplies Ltd.....	204-774-8388
Winnipeg	
Refrigerative Supply	204-775-5887

Ontario

Concord	
Concord Temp. Controls Inc.	905 660-7572
Downsview	
Yorkland Controls Ltd.....	416 661-3306
Etobicoke	
B & B Trade Distribution Centre	416 244-7700
Hamilton	
B & B Trade Distribution Centre	905-523-4466
London	
B & B Trade Distribution Centre	519-659-1555
London	
B & B Trade Distribution Centre	519-679-1770
Ottawa	
Wiles Legault & Associates Ltd.	613 747-1867
Windsor, Ontario	
B & B Trade Distribution Centre	519-969-4400
Windsor, Ontario	
Wholesale Service.....	519 945-3478

Quebec

Laval	
Pro Kontrol.....	450-973-7765
Montreal	
Binette, Eugene Reg'd.....	514 274-2583
Quebec City	
Binette, Eugene Reg'd.....	418 687-4770
Trois-rivieres	
Binette, Eugene Reg'd.....	819 373-3777
Ville Vanier	
Pro Kontrol.....	418 682-2421
Vimont	
Binette, Eugene Reg'd.....	450-668-0088

Saskatchewan

Regina	
Sinclair Supply Ltd.....	306-569-0627
Saskatoon	
Davies Electric.....	306-933-4222

Notes

Notes