

PS1 Single High and Low Pressure & PS2 Dual Pressure Refrigeration Controls

THE FLEXIBLE CONTROL

- Emerson Type PS1 Single and PS2 Dual Pressure Controls are designed for cycling, cutout and alarm applications on the high and low pressure sides of refrigeration systems.
- Standard pressure ranges and construction are ideally suited to conventional fluorocarbon and new alternative refrigerants (**not Ammonia**).
- High rated single pole double throw (SPDT) switch action on all PS series controls provides either open or close on pressure rise (pressure drop) operation to provide maximum application flexibility. The other switch contact can be used for an alarm or signal function if desired.
- A convertible reset feature on selected dual pressure controls allows the user to select either Automatic or Manual Reset Cutout on the high pressure side.
- PS2 Dual Pressure Controls incorporate 2 independent SPDT switches with factory installed jumper for conventional operation with high and/or low pressure cutout alarm or signal, if desired. Removal of the jumper on dual pressure controls provides totally independent high and low pressure SPDT switch operation.
- The parts package includes a lockplate and knob which allows the user to lock both the range and differential screws or the range or differential screw with a knob on the unlocked screw.

Details of the Emerson "Flexible" Control options are in the installation Instructions.

SAFETY INSTRUCTIONS

1. Read all Instructions thoroughly. Failure to comply can result in control failure, system damage or personal injury.
2. Do not use with ammonia or on hazardous or corrosive fluids.
3. Do not install in Hazardous Locations.
4. Disconnect electrical power before installation. Do not reapply power until control installation is complete, wiring connections secured and cover is installed.
5. Before making pressure control connections, depressurize system and make certain lines are at atmospheric pressure.

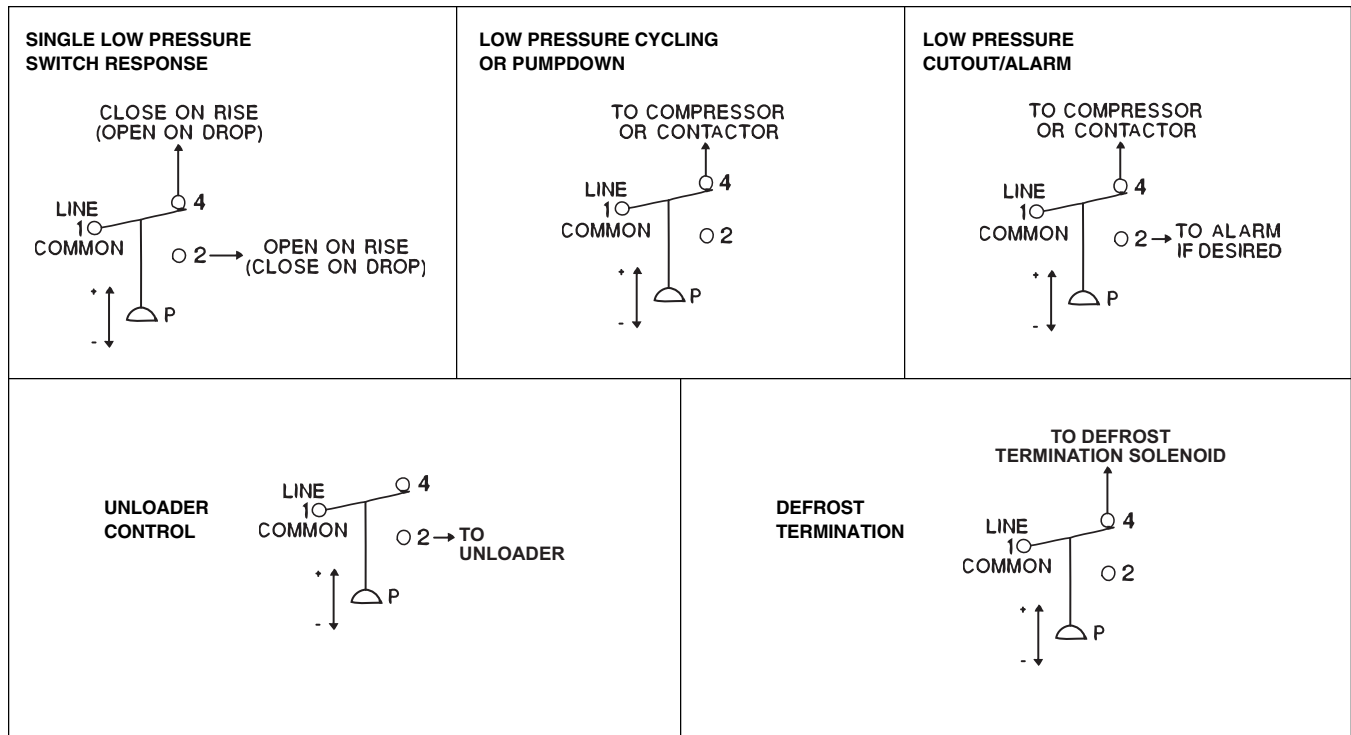
SPECIFICATIONS – SWITCH RATINGS

Maximum Load	120VAC	240VAC
Full Load Amps	24 FLA	24 FLA
Locked Rotor Amps	144 LRA	144 LRA
Horsepower	2 HP	3 HP
Pilot Duty	720VA	720VA
NonInductive	24 amps	24 amps

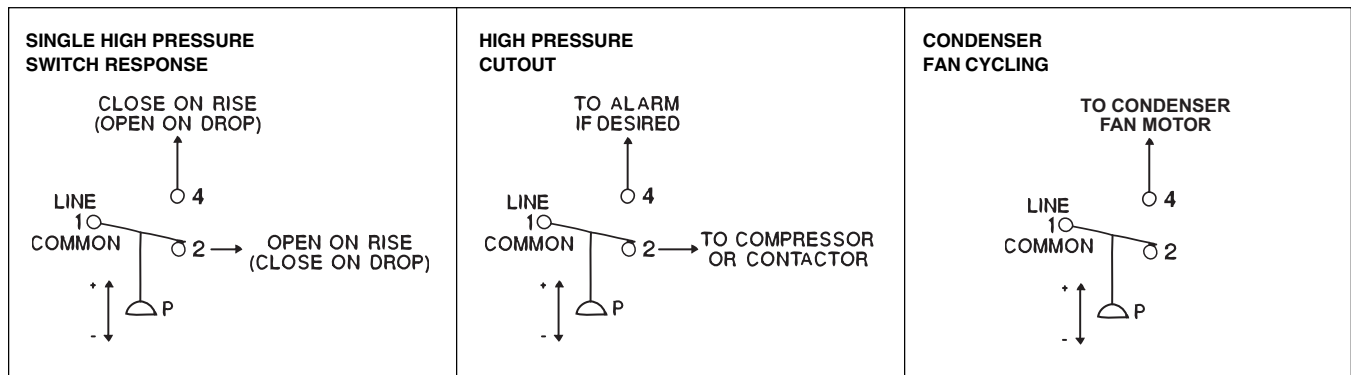
INSTALLATION INSTRUCTIONS—GENERAL

1. **Cover Removal**—Loosen cover screw and lift cover up.
2. **Mounting**—Mount the control in a protected area with the included angle mounting bracket and screws, or on a flat surface from the front.
CAUTION: If other screws are used, use 8-32 screws that do **not** penetrate into the control more than 1/8".
3. **Pressure Connections/Capillary /Pressure Lines:** Proper installation of capillary and pressure lines will insure a trouble-free installation.
 - If the control is mounted on the compressor, all lines must be secured to the compressor so they do not vibrate independently from the compressor.
 - If the control is mounted remote from the compressor an open coiled vibration loop, 2 to 3 coils, 2 to 3" diameter should be provided between the rigid compressor base and the moving compressor. The lines coming from the coil should be secured to the base and compressor so the coil takes all the vibration. Avoid any "violin string" runs of pressure connection lines.
 - Sharp bends or kinks **must** be avoided in the capillary or pressure lines. Do not allow the lines to rub and abrade against any moving surface. Avoid any excessive handling or reforming of the copper lines to minimize work hardening of the copper.
 - A generous loop (3 to 4") should be provided in the capillary below the control.
Pressure connections should be self-draining. High and low pressure connections to refrigeration lines should be **on the top or now lower than** the side of the line to minimize refrigerant oil from entering the line, which slows the control's ability to respond to pressure changes. Pressure connections to the compressor body should be slanted to allow the connection to self-drain to the compressor body.
4. **WARNING: Before making any electrical connections, check with a voltmeter as there could be more than one power source.**
5. **Electrical Connections** – Make certain the load to be connected is within the electrical rating of the control.
 - All wiring should conform to National Electrical Code and local regulations. Use **14AWG or larger copper conductors ONLY**.**See Switch Connection Diagrams later in this installation instructions sheet.**
 - The terminals are of a clamp design. Loosen the terminal screw with a Phillips head or small screwdriver, insert approximately 3/8" stripped wire and tighten.

PS1 SINGLE LOW PRESSURE CONTROL SWITCH CONNECTIONS



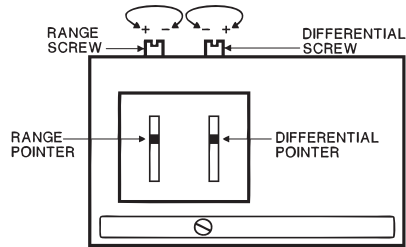
PS1 SINGLE HIGH PRESSURE CONTROL SWITCH CONNECTIONS



NOTE: In above diagrams, **P = Pressure**

SETTINGS & ADJUSTMENTS

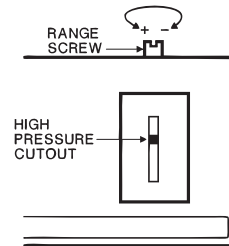
Adjustable Range & Differential Controls



Procedure

- 1) Adjust the Range Screw/Pointer to the desired "High Event" setting.
 - 2) Adjust the Differential screw to the desired differential.
Low Event = High Event – Differential
- ◇ Adjustment of the Range Screw changes both high and low events.
 - ◇ Adjustment of the Differential Screw changes the "Low Event" only.

Adjustable Range Fixed Differential Controls or High Side Dual Pressure



Controls may have external adjustments (shown), or internal adjustments. If the control has internal adjustments, the cover must be removed to access the adjustment screws.

Procedure

- 1) Adjust the Range Screw to the desired "High Event" setting.
Low Event = High Event – Fixed Differential
- ◇ Adjustment of the Range Screw changes both the high and low events.

Do not set the Low Event below the lowest allowable event
Low Event – High Event = Differential

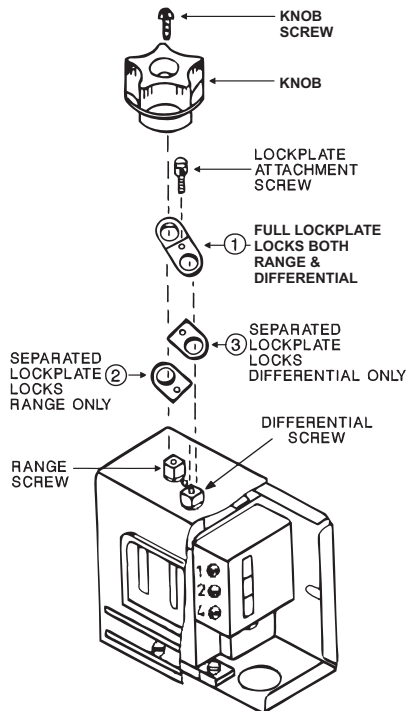
Lowest Allowable Events

Low Pressure Control = 27" Hg
 High Pressure Control = 50 PSIG

CONTROL SETTING & CHECKOUT

- **Low Pressure Controls** – With an accurate pressure gauge attached to the suction service valve, slowly close the liquid line valve to allow the system to pump down. Observe the control's Low Event Switching Pressure – slowly open the liquid line to allow suction pressure to rise. Observe the control's High Event Switching Pressure – adjust the control range and differential set points as required to achieve the desired settings.
- **High Pressure Controls** – With a high pressure gauge attached to a high pressure service port, restrict the air flow thru an air-cooled condenser, or reduce the water flow thru a water-cooled condenser to cause discharge pressure to rise. Observe the control's High Event Switch Point and adjust as necessary. Restore normal cooling and observe the control's Low Event Switch Point, adjusting as required.

Before leaving a new control installation, it is best to observe a minimum of 3 cycles to assure proper operation.



NOTE: If only one screw is locked, knob can be applied to unlocked screw.

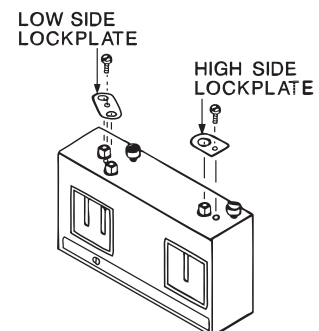
NOTE: The Range Screw(s) and Lockplate attachment screw are cross-drilled to allow the use of a wire seal.

LOCKPLATE AND KNOB

The lockplate can be used to lock:

1. Both Range and Differential Screws. Neither setting can be adjusted. To use lockplate options 2 or 3, break one end off the lockplate along the creaseline (see exploded view diagram at left).
2. Range Screw Only. Range screw is locked so that high event is fixed – adjusting the differential screw allows low event only to be changed.
3. Differential Screw Only. Differential is locked so that differential is fixed – adjusting range screw moves both high and low event up or down together.

Lockplate Installation on Dual Pressure Control



**SPECIFICATIONS –
TEMPERATURE & PRESSURE RANGES**

Temperature Range -20°F to +140°F

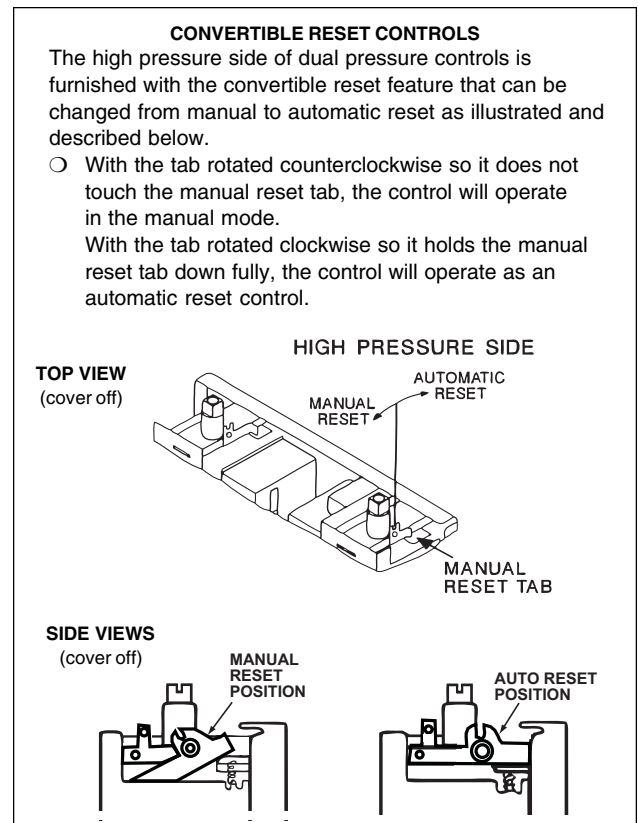
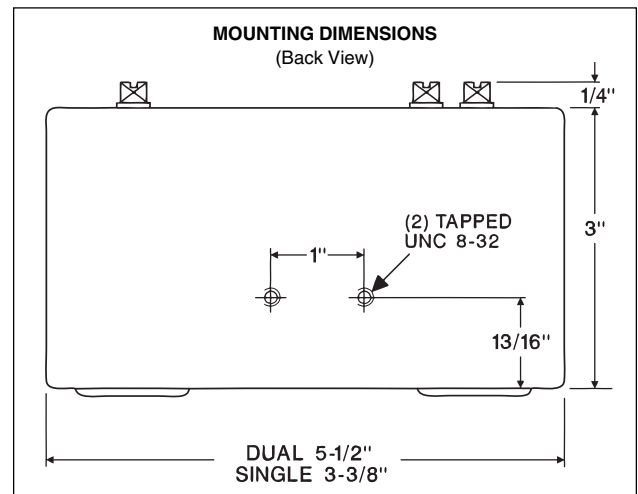
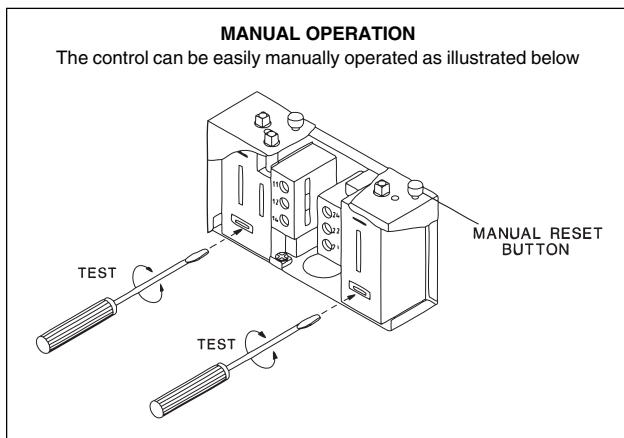
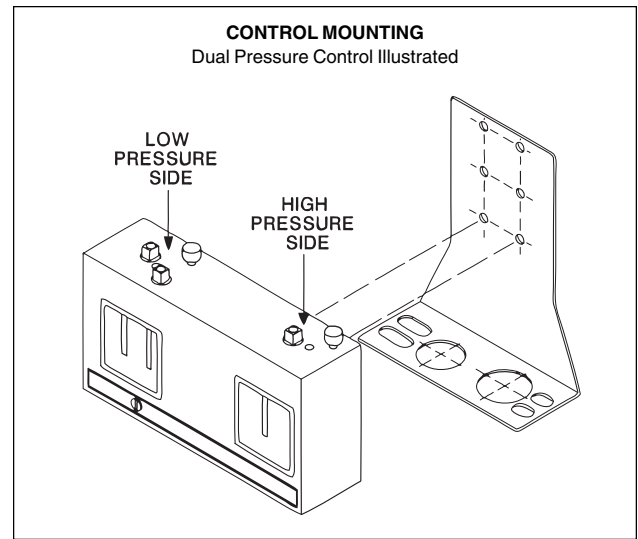
Pressure Range – see control label on box.

Maximum Pressure – During installation and service, the control's power element should not be exposed to pressure exceeding those listed in the table below.

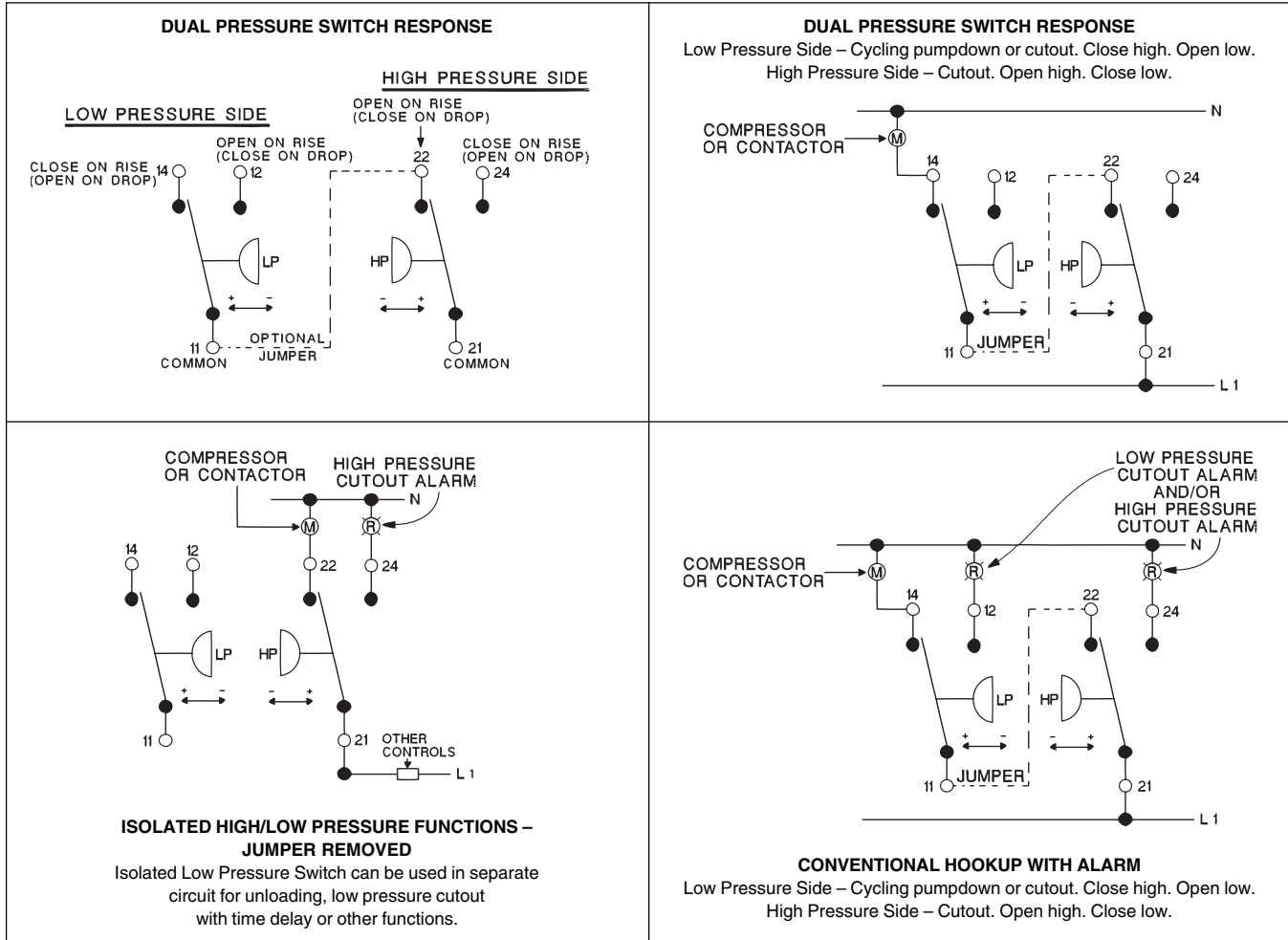
Control Range	Maximum Allowable Pressure
24" to 42 PSIG	230 PSIG
15" to 100 PSIG	360 PSIG
90 to 450 PSIG	500 PSIG

SPECIFICATIONS – ENCLOSURE

NEMA CLASS I – Mount the control body in an area protected from the weather, water or excessive moisture, dirt, dust and corrosive or explosive atmospheres.



PS2 DUAL PRESSURE CONTROL SWITCH CONNECTIONS



NOTE: In above diagrams, P = Pressure; LP = Low Side Pressure; HP = High Side Pressure

