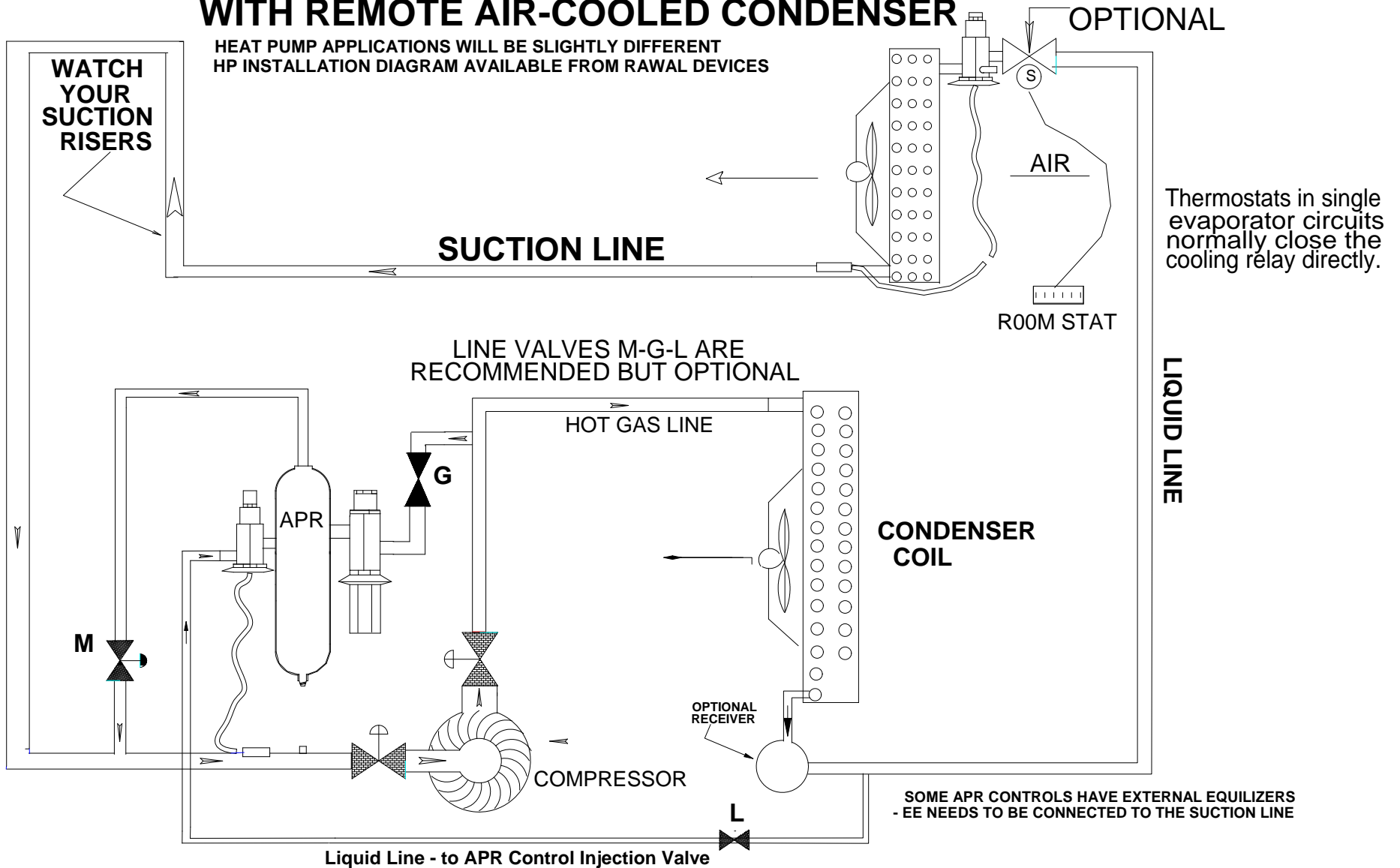


APR IN SINGLE EVAPORATOR MODE

WITH REMOTE AIR-COOLED CONDENSER

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APR Control Installation Instructions R-22

If possible pump down system and lock existing refrigerant in the receiver or condenser. If you cannot secure existing system charge, use proper refrigerant recovery methods to save and store the refrigerant charge. Before installing the APR Control ensure your system is clean. If not or in doubt, a new filter / strainer must be used to protect the APR Control, isolating and removing the system contaminants. Particles of dirt can settle on the valve seat of the hot gas bypass valve and prevent it from closing, leading to possible compressor overheating and system damage.

After you install the APR Control, use standard evacuation procedures and follow the directions listed below. All connections between the system and the APR Control are made in the condensing section. The APR Control may be mounted outside the condensing unit housing if space or access are a problem. The APR Control should be mounted vertically, with discharge from the desuperheating chamber UP or an orientation so discharge is above Schrader valve at bottom. The APR Control must be supported independently to the structure of the unit. Using line valves to isolate the APR Control connections to liquid, hot gas and suction are strongly recommended. Functionally, isolation valves will assist in charging the systems and trouble shooting should difficulty with set-up arise.

Connections to the refrigeration circuit can be on horizontal or vertical pipes, but the discharge from the APR Control desuperheating chamber to the suction line must be into the top of the suction line to prevent oil from draining into the APR chamber.

All soldering connections to the APR Control should be made with type 400 6% silver (205° C) solder – consistent with Staybright #6 or #8. DO NOT hard solder or silver solder APR Control connections. (Exceptions can be made where vibration or pulsation is present or Government specification calls for hard solder or braising.)

Always use plenty of wet rags or heat absorbing paste on the valves and aim your flame away from valve bodies to prevent possible damage.

- 1) Tee in a line shut off valve (G) at the compressor hot gas discharge line (size to APR hot gas valve inlet) where strainer is supplied, install it in the 5/8" or 7/8" OD APR hot gas inlet only.
- 2) Tee in a line shut off valve (M) at the compressor suction line (size to APR mixed gas discharge outlet at top of desuperheating chamber) where strainer is supplied, either 5/8" or 7/8" OD.
- 3) Tee in a line shut off valve (L) at the liquid line near the condenser coil (or receiver outlet), size to APR injection valve inlet 3/8" OD.
- 4) Mount APR Control securely in the condensing unit.
- 5) Connect hot gas from the line valve (G) to the hot gas inlet on APR Control.
- 6) Connect suction from the line valve (M) to the mixed gas outlet on APR Control.
- 7) Connect liquid from the line valve (L) to the liquid injection valve (txv) inlet on APR Control.
- 8) If there is an external equalizer on the APR Control hot gas valve, lines should be connected to the suction line between the mixed gas discharge connection from the APR Control and compressor inlet.
- 9) The Injection valve (txv) bulb must be mounted to the suction line between the compressor and mixed gas discharge connection from the APR Control and insulated.
- 10) Leak test system and evacuate. Before charging system close all APR Control line valves, do not leave the APR Control open when charging the system. No additional charge is required for the APR Control to operate. For R-22 Systems – the Hot Gas Bypass valve of the APR Control is factory set to open at 60 psig (32.5° F). See adjustment sheet if you require further instructions. It is not necessary to adjust the TXV on the APR Control. It is set to open at about 60°F (15-17°F superheat) to protect the compressor from overheating.



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Adjusting the APR Control / R-22

(R-22 pressures are shown for all refrigerants except 410A. Use their corresponding pressures)

With your system operating normally and your gauges attached, gradually decrease the system load on the evaporator coil by reducing the return air quantity until the suction approaches 60 psig. Reducing the air quantity over the evaporator coil is equivalent to reducing the load on the system and will cause the suction pressure to fall.

When the suction pressure reaches 60 psig, adjust the hot gas valve (HGBV) of the APR Control to open at that suction pressure. When the control is set, return your system to normal by returning the load (in the form of return air to the evaporator) to its normal operating quantity. The APR Control is now adjusted properly and will open at 60 psig, modulating the system capacity continuously to match the changing load.

The APR Control will continue bypassing enough hot-gas discharge from the compressor to keep the system capacity in balance with the system load, and the system energy draw consistent with the system capacity. You have now achieved "system load compliance mode." The system now has the ability to self-adjust its capacity to continuously equal the changing system load and vary its energy input to match the change.

LATENT/SENSIBLE COIL ADJUSTMENT – EXTENDED SYSTEM RUNTIME

The normal approximately 70% to 30% ratio, of sensible to latent heat removal of an evaporator coil can be altered with the APR Control. The APR Control can help keep the system from quickly satisfying the thermostat, reducing cycling.

To enhance the dehumidifying ability of the evaporator, the pressure setting of the APR Control's HGBV can be increased from 60 psig to 66 psig, or higher. By noting suction line pressure when the circuit cycles off, and attempting to set the pressure at which the APR Control HGBP valve opens should keep the APR Control ahead of the thermostatic response – allowing for increased runtime. (If it is necessary to increase the suction pressure higher than 66 psig for proper performance, please consult with Rawal Devices, Inc. Engineers about your application).