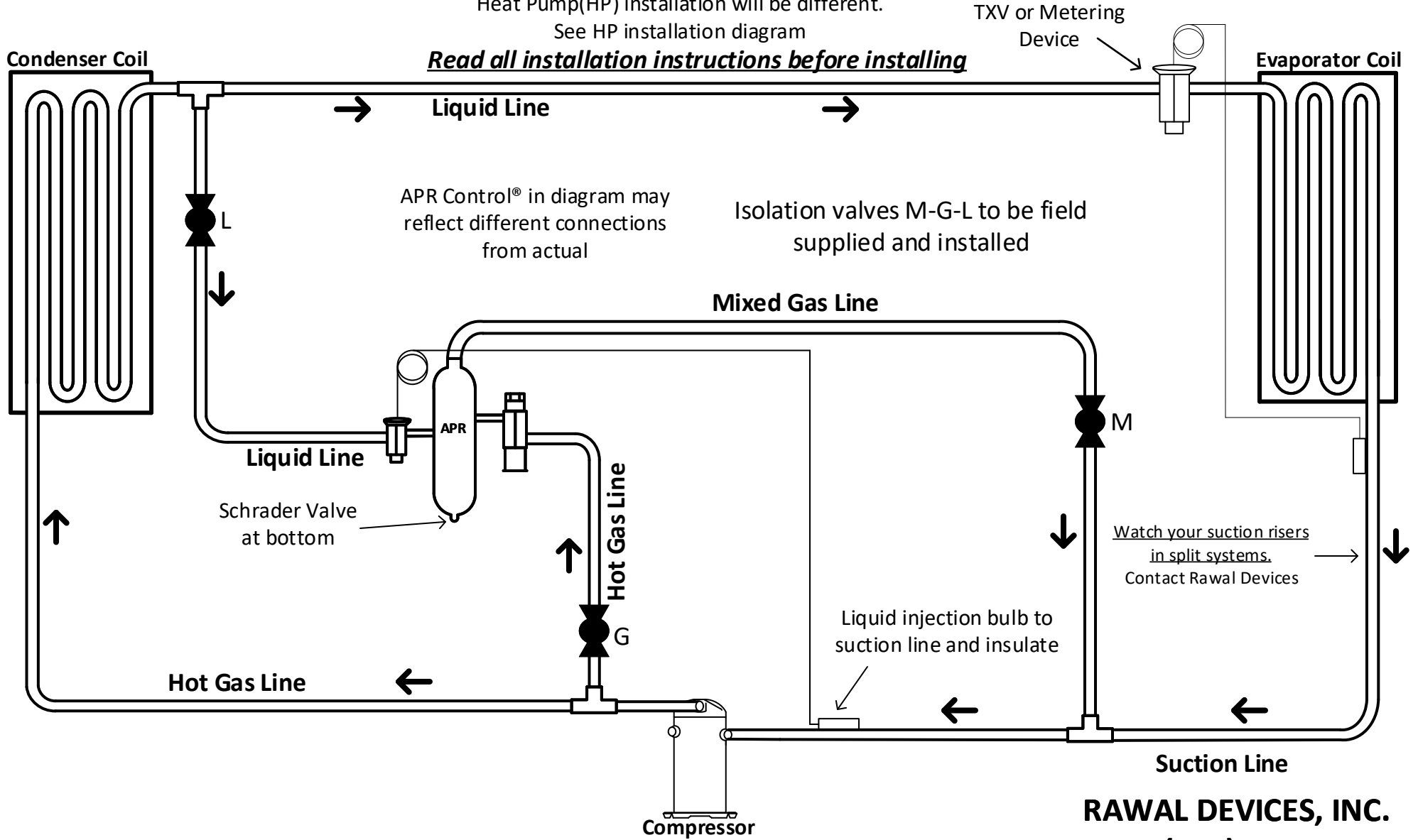


APR CONTROL[®] FOR R-22 IN SINGLE EVAPORATOR MODE

Heat Pump(HP) installation will be different.
See HP installation diagram

Read all installation instructions before installing



RAWAL DEVICES, INC.

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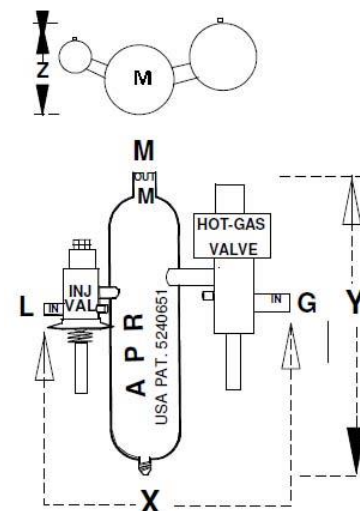
**Drawing for illustrative purposes only
Please call for assistance*



APR CONTROL - R-22 - SPEC. & DIMENSION SHEET

Unit Dimensions Connection Dimensions (OD)

Model #	Modulation Capacity	Unit Dimensions			Connection Dimensions (OD)		
		X	Y	Z	L	M	G
APR-0.7	0.7 tons	7"	8"	3.5"	3/8"	5/8"	1/2"
APR-0.9	0.9 tons	7"	8"	3.5"	↓	5/8"	1/2"
APR-1R	1.45 tons	7"	8"	3.5"		5/8"	1/2"
APR-1D	2.4 tons	8.5"	10.5"	4"		5/8"	1/2"
APR-2	5 tons	9"	10"	4"		7/8"	5/8"
APR-2.5	7 tons	12"	11"	5"		7/8"	5/8"
APR-3	10 tons	12.5"	12"	5"	7/8"	7/8"	
APR-5	19 tons	12.5"	12"	6"	7/8"	7/8"	



The APR Control Hot Gas Valve should be set to begin opening at approximately 60 PSI ~34°F

- SUPPLY BALL SHUT-OFF VALVES FOR ALL CONNECTIONS
- SUPPLY TEE FOR SUCTION LINE CONNECTION
- SUPPLY TEE FOR HOT-GAS CONNECTION
- SUPPLY TEE FOR LIQUID LINE CONNECTION

APR Control Selection:

System or Stage size is reduced by the Modulation Capacity listed above

Oil entrainment in suction line must be addressed

Please refer to Rawal Devices Fast Selection Chart or Consult with Rawal Devices Engineers

FOR APR-3 and APR-5 ONLY, SUPPLY TEE FOR EE CONNECTIONS EXTERNAL EQUILIZERS - EE - HAVE 1/4" SWEAT CONNECTION TEE EE CONNECTIONS INTO SUCTION LINE

SENSING BULB ON LIQ INJ VALVE MUST BE ATTACHED AND INSULATED TO SUCTION LINE BETWEEN TEE TO APR CONTROL DISCHARGE COMING FROM TOP OF THE CHAMBER AND COMPRESSOR

ONLY WHEN NECESSARY:

REMOVE CAPS FROM ADJUSTMENT STEMS PRIOR TO ADJUSTING

TO ADJUST VALVES WHEN FACING ADJUSTING STEM CLOCKWISE RAISES PRESSURE / TEMPERATURE. COUNTER-CLOCKWISE LOWERS PRESSURE / TEMPERATURE.

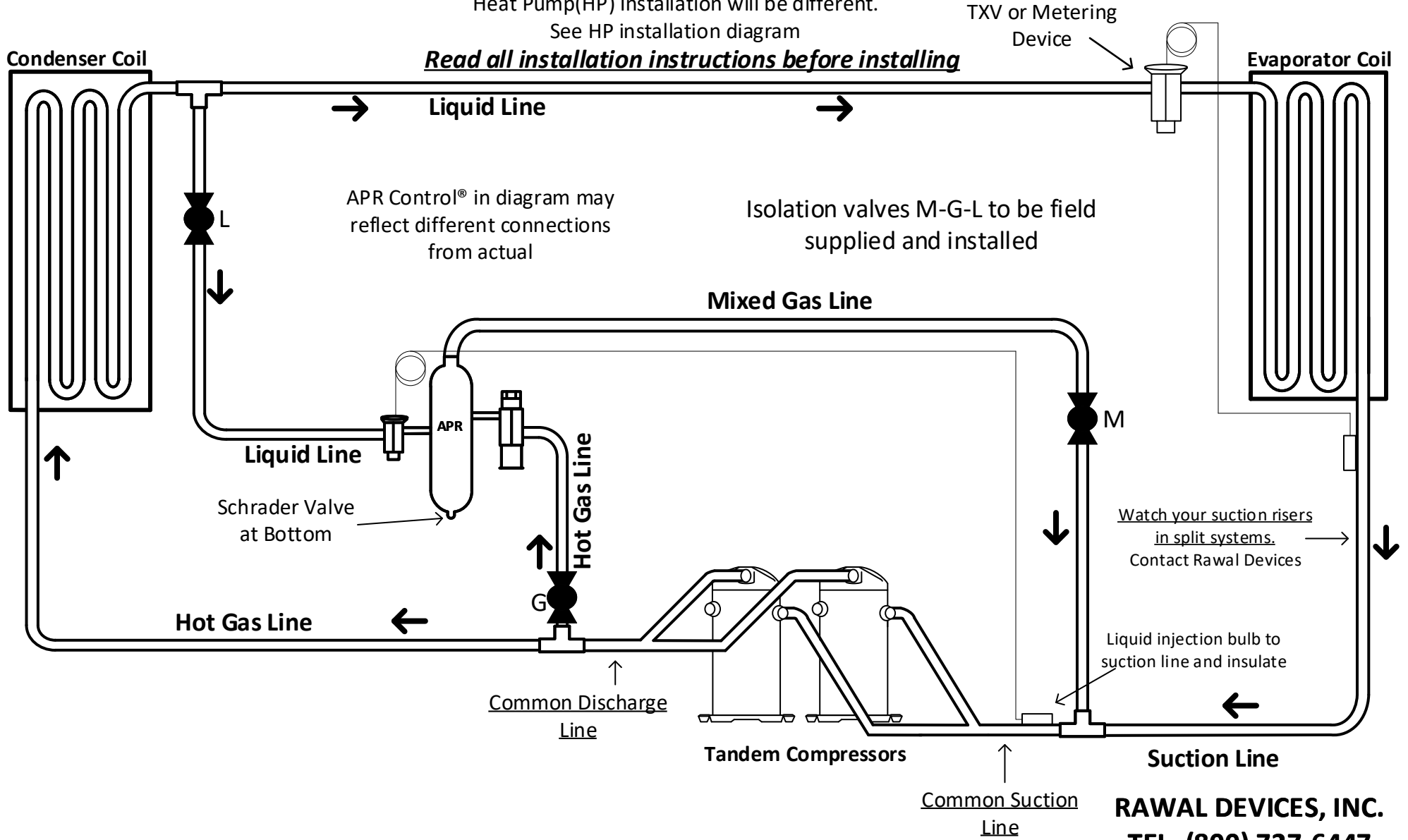
**SEE SPECIAL ADJUSTMENT PROCEDURE FOR APR-5*

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APR CONTROL® FOR R-22 IN TANDEM COMPRESSOR CONFIGURATION

Heat Pump(HP) Installation will be different.
See HP installation diagram

Read all installation instructions before installing



APR Control® in diagram may reflect different connections from actual

Isolation valves M-G-L to be field supplied and installed

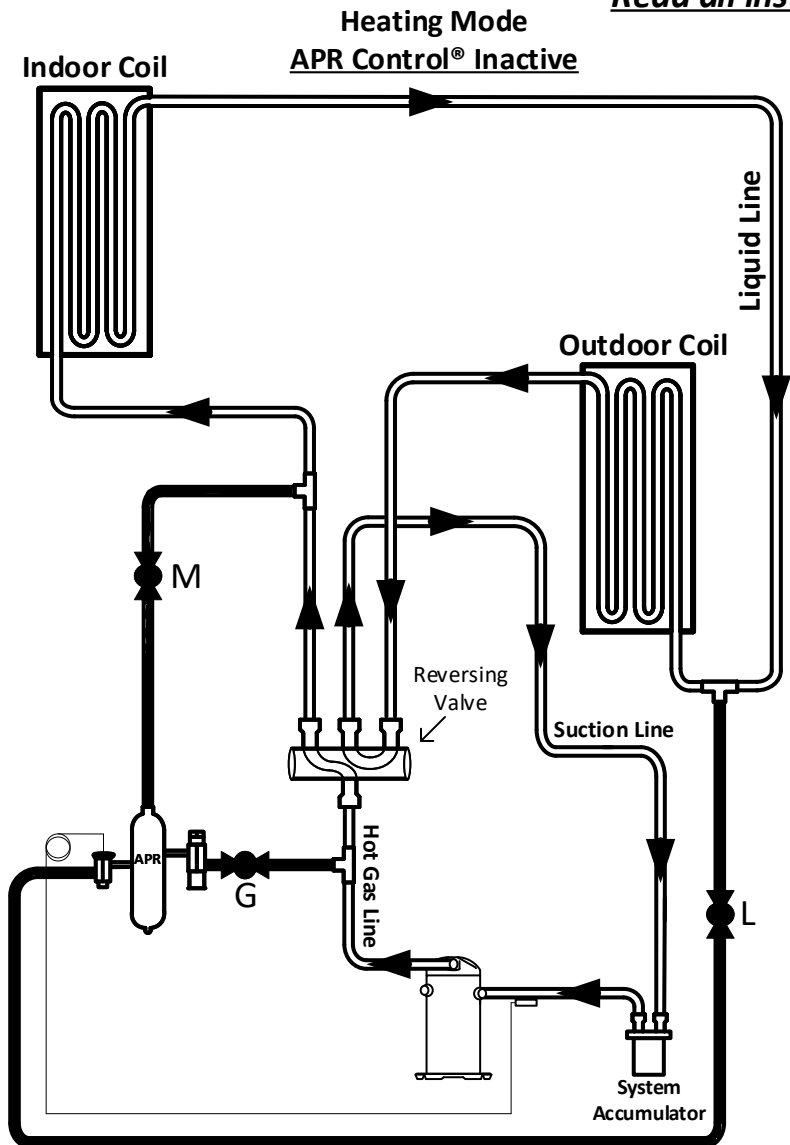
Watch your suction risers in split systems. Contact Rawal Devices

Liquid injection bulb to suction line and insulate



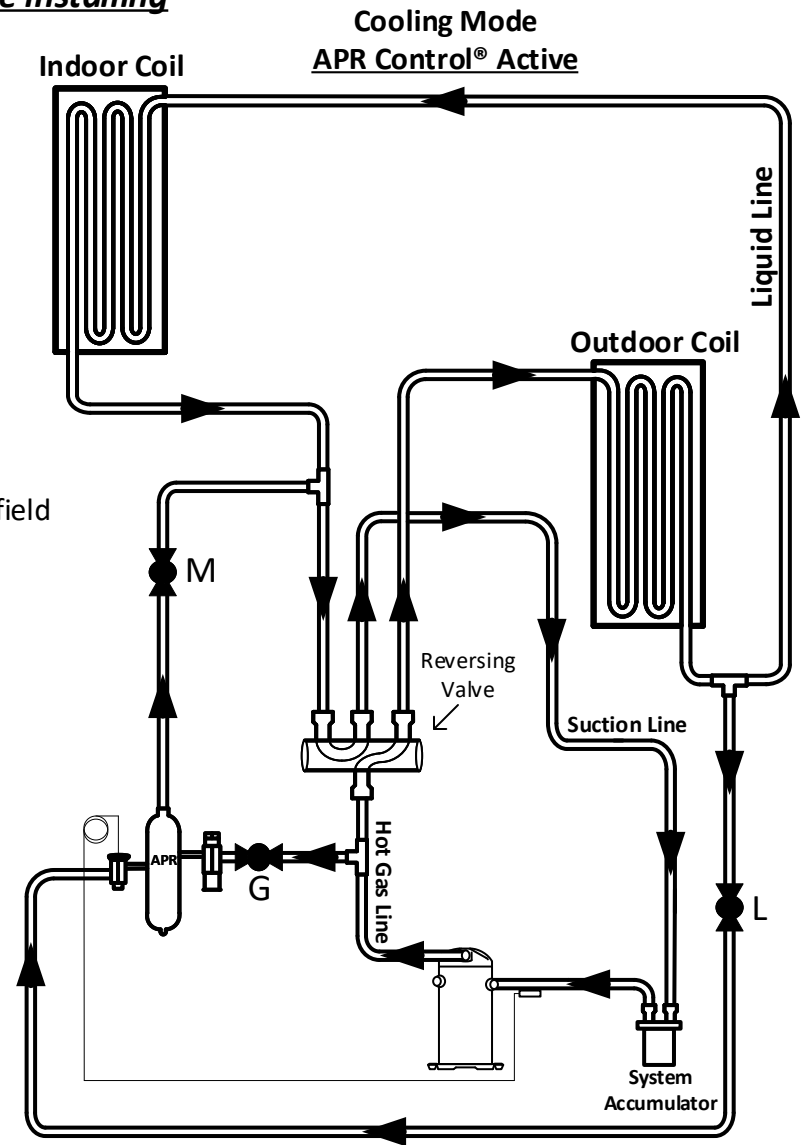
APR CONTROL® FOR R-22 IN A HEAT PUMP SYSTEM

Read all installation instructions before installing



Isolation valves M-G-L to be field supplied and installed

APR Control® active in cooling mode only



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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. Manual Shut off valves to isolate the APR Control connections to liquid, hot gas and suction lines are to be field supplied and installed. Functionally, isolation valves will assist in charging the systems and troubleshooting 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.

***Please refer to the Spec. & Dimension sheet for connection sizes for specific model APR Control.**

***Adjustment settings to all APR valves need to be confirmed in the field.**

APR Control Operation and Adjustment (R-22)

The APR Control® valve is a capacity modulation and dehumidification device that modulates the air conditioning system's refrigeration (circuit) capacity to match the varying load conditions of the space. Often utilized to minimize the challenges of oversized air conditioning systems, the APR Control is a device that operates in response to suction pressure of an active air conditioning system. As the heat load (including occupancy, ventilation and solar loads, for example) of the conditioned space drops, your suction pressure drops to the point the APR Control begins to open. A portion of hot gas gets sent through the desuperheating chamber, then back to the suction line. A liquid injection valve mixes liquid with the hot gas in the desuperheating chamber when the mixed gas temperature reaches approximately 20° Superheat returning to the compressor.

The APR Control externally unloads the compressor, keeping the evaporator coil at a constant temperature below dew point, thereby dehumidifying during the extended run time achieved. Extended run time is achieved by keeping the thermostat from being satisfied too quickly (a standard cause of short cycling).

The APR Control comes factory set at approximately 60psig and typically does not require adjustment. During part-load conditions, as the heat content of the return air (including the sensible temperature) drops, the saturated suction temperature will drop, resulting in a drop in suction pressure. As the suction pressure falls to 60psig the APR Control will begin to open and attempt to stabilize the system suction pressure at approximately 60psig.

However, if the runtime is inadequate or low load operation fails to cause suction pressure to fall low enough (the point at which the APR Control starts to open), you may need to adjust the APR Control® hot gas valve. The adjustment port can be found on the side or the bottom of the hot gas valve. Remove the cap to access the set screw. A standard hex wrench can be used to turn the screw and adjust the pressure setting. The pressure setting will adjust based on the chart listed below. The maximum pressure setting that most APR Controls can be adjusted to is approximately 85psig and the minimum is 0psig. As you adjust the APR Control, it will reduce system capacity in order to match capacity to changing load conditions beginning at the new setting.

Model #	Pressure Range (psi)	PSI Change per 360° turn	Factory Setting
APR-0.7	0-100	16 Clockwise Raises Pressure	60
Apr-0.9	0-80	3-1/2 Counterclockwise raises Pressure	60
APR-1R	0-80	9.8 Clockwise Raises Pressure	60
APR-1D	0-80	4.0 Clockwise Raises Pressure	60
APR-1.4/2	3-85	7.5 Clockwise Raises Pressure	60
APR-2.5	3-85	7.5 Clockwise Raises Pressure	60
APR-3	0-80	7.5 Clockwise Raises Pressure	60

APR Control Installation

