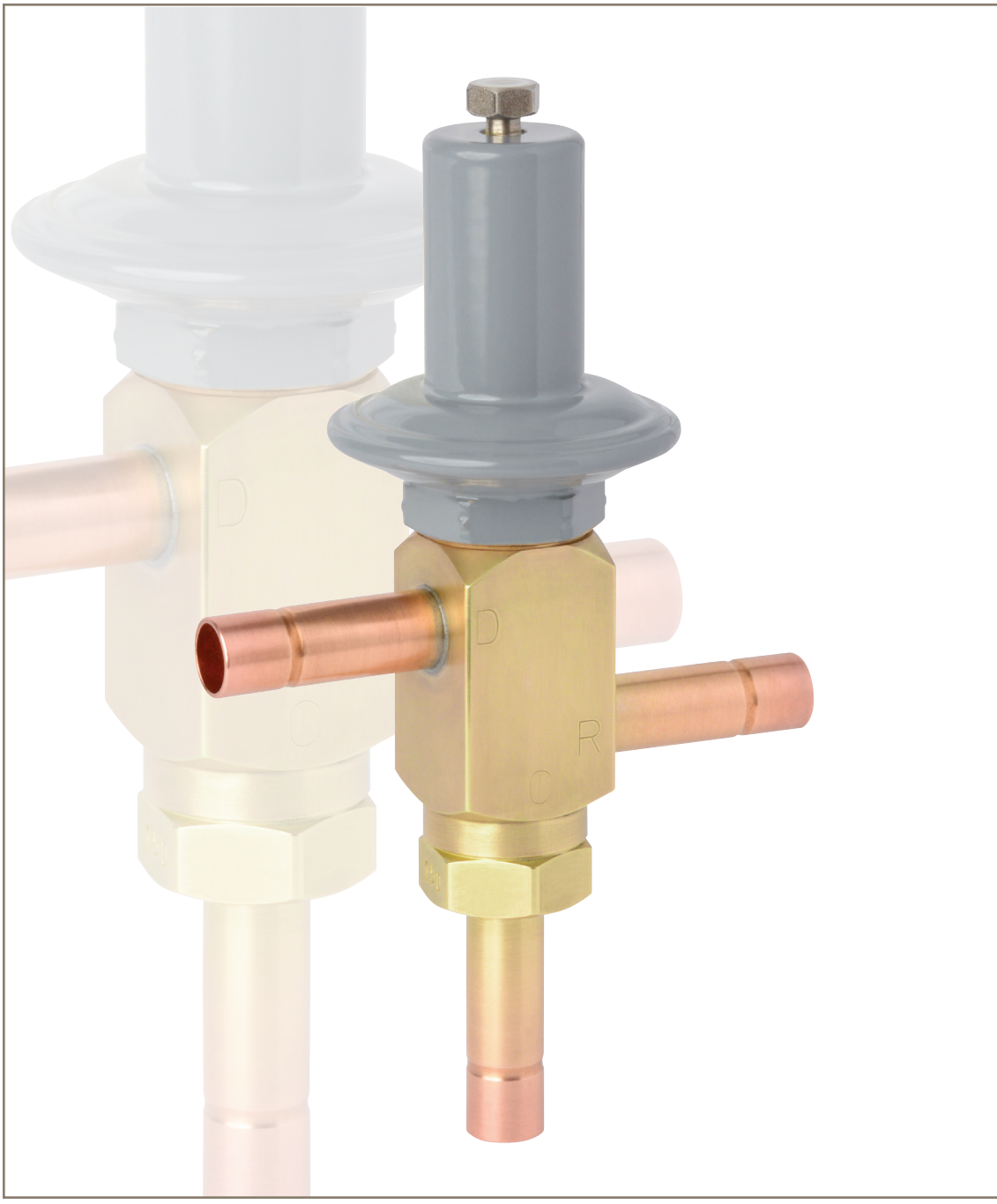
September 2021 / **BULLETIN 90-30-2**

Y1292-LAC-4
Adjustable Head Pressure Control

For AWEF Applications

SPORLAN



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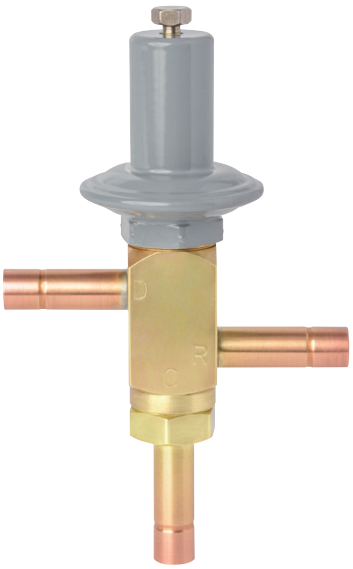

Y1292-LAC-4 Technical Specifications

- Maximum Rated Pressure: 450 PSIG
- Maximum Test Pressure: 450 PSIG
- Minimum Ambient Temperature: -40°F (-40°C)
- Maximum Ambient Temperature: 160°F (71°C)
- Minimum Fluid Temperature: -40°F (-40°C)
- Maximum Fluid Temperature: 240°F (116°C)
- See "Valve Settings and Adjustment" for adjustment range and factory setting.
- Compatible refrigerants:* All common HFO, HFC, HCFC

* *The Y1292-LAC-4 is not approved for R-410A or R-32 applications.*

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The Department of Energy has mandated minimum efficiency standards that went into effect on January 1, 2020. Annual Walk-In Energy Factor (AWEF) is a metric mandated by the Department of Energy (DOE) that indicates a unit's energy efficiency. All new applications or installations of walk-in equipment that are 3,000 ft² or less must conform to the new efficiency standard. The easiest way for Sporlan Original Equipment Manufacturer (OEM) customers to achieve conformance is by lowering the system head pressure.

Sporlan's Y1292-LAC-4 Adjustable Head Pressure Control valve is a modification of a LAC-4 that makes the valve adjustable. This valve allows the OEM to ship a unit and comply with the DOE's efficiency requirement. The contractor can set the minimum head pressure setting for the unit's ambient location. Adjustment prevents the valve's setting from dropping below the intended system design head pressure. An explanation of how the Y1292-LAC-4 works is provided in the Operation section of this bulletin.

Sporlan Bulletins 500-10-AWEF and 500-100-AWEF address sizing expansion valves for applications requiring AWEF.

Operation

Sporlan's Y1292-LAC-4, an adjustable LAC-4, is a three-way modulating valve that responds to discharge pressure. As shown in Figure 1, the discharge pressure bleeds around the pushrod to the underside of the diaphragm. The discharge pressure opposes the spring pressure from the top of the valve. When outdoor ambient falls, the condensing pressure falls. This causes the discharge pressure to fall as well. When the discharge pressure falls below the upper spring pressure, the valve modulates open to the discharge port which allows discharge gas to bypass to the condenser. Mixing the discharge gas with the liquid creates a high pressure at the condenser outlet, reducing the flow and causing liquid to back up in the condenser. Flooding the condenser reduces the area available for condensing. This reduction in effective condenser surface area results in a rise in condensing pressure. During summer conditions, the discharge pressure is high thus closing the discharge port. Hence, there is full liquid flow from the condenser to the receiver.

Table 1

Nomenclature

Y1292	–	LAC	–	4	–	150
Valve Designation		Low Ambient Control		Port Size in 1/8" Increments		Nominal Setting (PSIG)

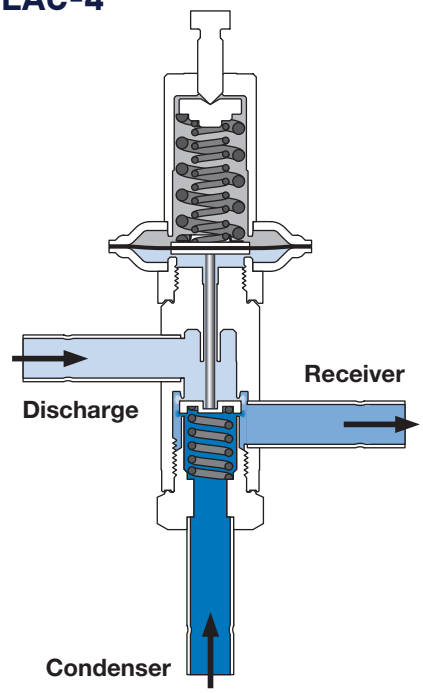
Table 2

Materials and Construction Details

Valve Type	Adjustable	Port Size (Inches)	Element Type and Material	Connections (Type)	Connections (Material)	Body Material	Sealing Material	Joint Type
Y1292-LAC-4	Yes	1/2	Diaphragm – Stainless Steel	Solder	Copper	Brass	Metal to Metal	Knife Edge (Metal to Metal)

Figure 1

Y1292-LAC-4



Valve Settings and Adjustment

The valve setting will vary with system refrigerant and discharge pressure (see Table 2). When the Y1292-LAC-4 is purchased through an OEM the valve setting may be different. This is lower than traditional head pressure controls to comply with AWEF regulations.

To adjust the Y1292-LAC-4, turn the adjustment screw on the top of the valve with a 3/8" size hex wrench. A clockwise rotation increases the valve setting while a counterclockwise rotation decreases the setting. Because of valve gradient, the valve's setting will decrease the farther the valve opens. To obtain the desired setting, a pressure gauge should be utilized at the compressor discharge service valve, so the effects of any adjustment can be observed. Small adjustments are recommended to allow the system adequate time to settle out after each adjustment.

Table 3

Valve Settings

Refrigerant	Typical Discharge Pressure	Nominal Setting	Approximate PSI / Turn
R-404A R-507	210	150 PSI	21
R-448A R-449A	180	130 PSI	15
R-407A R-407C R-407F	180	130 PSI	15

Capacity Information

The Y1292-LAC-4 is an adjustable version of the LAC-4. Internal components and stroke are the same as the LAC-4. Capacity information for the Y1292-LAC-4 is the same as the LAC-4. Due to the changing landscape of refrigerants, a capacity table is not provided in this bulletin. Bulletin 90-30 or Sporlan's online selection tool, Virtual Engineer, can be used for sizing the LAC-4 and Y1292-LAC-4. Virtual Engineer can be accessed at www.sporlan.com.

Service Instructions

There are several possible causes for system malfunction with "refrigerant side" head pressure control and these may be difficult to isolate from each other. As with any form of system troubleshooting, it is necessary to know the existing operating temperatures and pressures before system problems can be determined. Once the actual malfunction is established, it is easier to pinpoint the cause and then take suitable corrective action. Table 4 lists the most common malfunctions, the possible causes, and the remedies. Since the Y1292-LAC-4 is a hermetic valve and cannot be disassembled for inspection and/or replacement of parts, it must be replaced if it becomes inoperative.

Table 4

Troubleshooting Malfunctions

Malfunction - Low Head Pressure	
Possible Cause	**Remedy**
1. Insufficient refrigerant charge to adequately flood condenser.	Add charge.
2. Low pressure setting.	Increase setting.
3. Valve fails to open due to dirt/debris.	Turn adjustment screw all the way in and back out to free debris. If unsuccessful, replace valve.
4. Valve fails to adjust properly.	See 3 above.
Malfunction - High Head Pressure	
Possible Cause	**Remedy**
1. Dirty condenser.	Clean coil.
2. Air on condenser is blocked off.	Clear area around unit.
3. Too much refrigerant charge.	Remove charge until proper head pressure is maintained.
4. Undersized receiver.	Check receiver capacity against refrigerant required to maintain desired head pressure. See Bulletin 90-30-1 for sizing recommendations.
5. Non-condensibles (air) in system.	Purge from system.
6. High pressure setting.	Decrease setting.
7. Valve fails to close due to dirt/debris.	Turn adjustment screw all the way in and back out to free debris. If unsuccessful, replace valve.

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