



Pressure Regulating Valves

6

Precise control of temperatures in evaporators
Economical method of compressor capacity control
Prevent overloading to the compressor
High and low ambient stability
Defrost differential control



ENGINEERING YOUR SUCCESS.

Discharge Bypass Valves

The Parker Sporlan Line of Discharge Bypass Valves are designed to provide an economical method of compressor capacity control in place of cylinder unloaders or to handle unloading requirements below the last step of cylinder unloading. These modulating control valves automatically bypass the required amount of discharge gas to the low side to maintain the desired minimum evaporator pressure. The valves are applicable on any refrigeration or air conditioning system that operates during periods of low load, which can result in coil icing or short cycling. These valves respond to downstream pressure changes and open when the evaporator pressure falls below the valve setting. At normal loads and evaporator conditions, the valve remains closed and the system operates in a conventional manner.



The DR line of valves consists of three basic types of valves: the adjustable models, the adjustable remote bulb models, and the non-adjustable models.

The SHGB valves are adjustable and pilot operated with a solenoid stop feature that eliminates the need for a hot gas solenoid valve.

They were developed for use on larger capacity systems.

Application

The discharge bypass valve is normally applied in a branch line off the discharge line. To allow system pump down control, a solenoid valve or hand valve must be installed upstream of the discharge DR type bypass valves. The bypassed hot gas can enter the low side at several locations; however, two of the possible locations are preferred because of superior operating performance: into the side connection of a Parker Sporlan side connection distributor or directly into the suction line. By using the side connection distributor method, the system TEV will act as a desuperheating valve to keep the compressor suction temperature below the recommended maximum temperature published by the compressor manufacturer. When the hot gas is bypassed directly into the suction line, an auxiliary desuperheating TEV may be required. See Bulletin 90-40 and 90-40-1 for complete application details.

Selection and Capacity Ratings

The capacities given in the table below are **valve** hot gas capacities and not the capacities of the system on which the valve is to be applied. To select a valve, first determine the compressor capacity at the minimum allowable evaporating temperature. Then the discharge bypass valve must supply the difference between this compressor capacity and the minimum evaporator load at which the system is to be operated. The valve pressure setting will be that pressure at which the bypass valve must start to open.

Accurate at the time of going to print.

Crankcase Pressure Regulating Valves

Crankcase Pressure Regulating Valves are designed to prevent overloading of the compressor motor by limiting the crankcase pressure to a predetermined maximum value during and after a defrost cycle or a normal shutdown period.

These valves automatically throttle the vapour flow from the evaporator until the compressor can handle the load. Parker Sporlan manufactures five adjustable direct acting models...CRO-4, CRO-6, CROT-6, CRO-10 and CROT-10... all models respond only to their outlet pressure and modulate to prevent the suction pressure at the compressor from rising above the valve setting. Since these valves are adjustable, the setting may be altered to suit the specific system requirements.

Selection and Capacity Ratings

The ratings for these valves vary depending on these items: design suction pressure after pulldown, maximum allowable suction pressure recommended by the compressor or unit manufacturer (this is the valve setting), and pressure drop across the valve. The difference between the design suction pressure and the valve setting determines how much of the valve stroke is used. Therefore, the valve setting should be kept as high as possible without exceeding the recommendation of the compressor or unit manufacturer. Once this information is available, the correct CRO can be selected from the data below.

Installation

Crankcase Pressure Regulating Valves are installed in the suction line between the evaporator and compressor, and downstream of any other controls or accessories. When installing CRO's with solder type connections, the internal parts should be protected by wrapping the valve with a wet cloth.



Head Pressure Control Valves

High and Low Ambient Stability

The design of air conditioning systems utilizing air cooled condensing units involves two main problems that must be solved if the system is to operate reliably and economically **high ambient** and **low ambient** operation. If the condensing unit is properly sized, it will operate satisfactorily during extremely high ambient temperatures. However, some units will be required to operate at ambient temperatures below their design dry bulb temperature during most of the year, the solution to low ambient operation is more complex.



Without good head pressure control during low ambient operation, the system can experience both running cycle and off-cycle problems. Since the pressure differential across the thermostatic expansion valve port affects the rate of refrigerant flow, low head pressure generally causes insufficient refrigerant to be fed to the evaporator. Failure to have sufficient head pressure will result in low suction pressure and/or iced evaporator coils.

The primary off-cycle problem is refrigerant migration to the condenser. Insufficient flow through the TEV will cause a low suction pressure. The typical method of maintaining normal head pressure in a refrigeration system during periods of low ambient temperature is to restrict liquid flow from the condenser to the receiver, and at the same time divert hot gas to the inlet of the receiver. This backs liquid refrigerant up into the condenser reducing its capacity which in turn increases the condensing pressure. At the same time the hot gas raises liquid pressure in the receiver, allowing the system to operate normally.

Parker Sporlan Head Pressure Control for systems with air cooled condensers can be accomplished using one of several valve options; the non-adjustable OROA-5, the adjustable ORI/ORD combination, or the economical LAC Series.

For all requests, consult your nearest Parker Sporlan Wholesaler or contact us on:
racecustomerservice@parker.com / www.parker.com/race