OIL EDUCTOR CIRCUIT

An oil eductor circuit is provided to properly manage the amount of oil in the refrigerant charge. A small amount of oil is normal in the refrigerant charge and will be found in the evaporator. If not properly managed the oil will accumulate and have adverse consequences regarding chiller performance.

The oil eductor circuit consists of three refrigerant and oil filter driers, two "jet pump" eductors and the interconnecting piping. Refer to Figures 21 and 22.

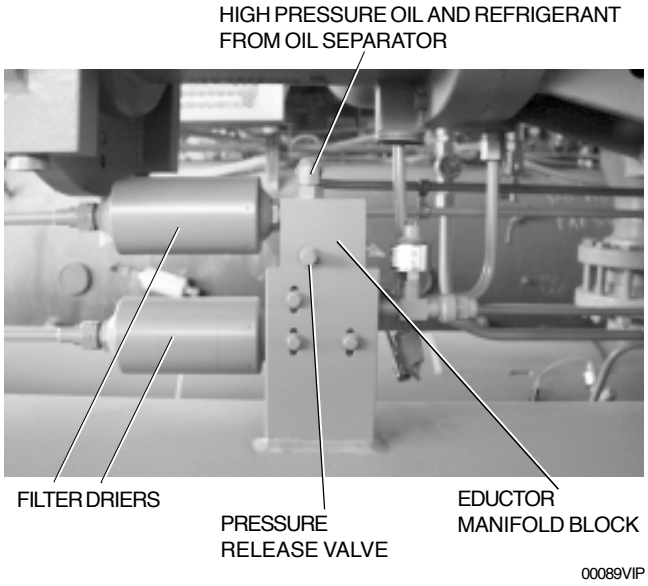

FIG. 21 – FILTER DRIERS AND OIL EDUCTOR

The eductors operate using the "jet pump" principle. Discharge pressure gas and oil flows through a filter dryer located at the bottom of the oil separator. YS Chillers are supplied with a variable orifice arrangement. The reduced pressure (pumping action) is created by the velocity of the discharge pressure gas and oil flowing through the orifice and nozzle. This creates a reduced pressure area that allows the oil-rich refrigerant and oil to flow from the evaporator into the compressor.

Oil-rich refrigerant flows into the eductor block through the filter drier from the evaporator. The oil rich refrigerant mixes with the discharge pressure gas and flows into the compressor suction line.

A second eductor flows oil, which may have collected in the evaporator trough through the second filter drier located on the eductor block. This oil mixes with the discharge gas in the eductor block and flows to the compressor at port SC-5.

The filter driers should be changed annually or when excessive amount of oil is indicated in the refrigerant charge.

LIQUID REFRIGERANT CIRCUIT

Liquid refrigerant flows from the condenser into the evaporator by differential pressure. Sub-cooled liquid refrigerant flows out of the condenser into the liquid line. A metering orifice is installed in the liquid line to control the rate liquid refrigerant flows into the evaporator. The orifice is selected based upon the operating conditions of the chiller. Refer to Figure 23.

YS Chillers are supplied with a variable orifice arrangement. In parallel with the metering orifice is a solenoid valve and hand-throttling valve. The solenoid is energized open by the DIFFERENTIAL PRESSURE set point that is field programmable from the panel. The differential pressure between condensing pressure and evaporating pressure is compared to the set point value. When the differential pressure is at or less than the setpoint, the solenoid valve is energized open. The solenoid valve is de-energized closed when the differential pressure is equal to or greater than the setpoint plus 10 PSIG. A hand-throttling valve is provided to adjust the refrigerant flow rate through the solenoid valve to match the system operating conditions.

Dual Service Chillers – Ice duty and comfort cooling air conditioning applications will require the solenoid valve to be energized open in the air conditioning mode of operation since this represents the low differential pressure mode of operation.

The differential pressure setpoint is field programmable within the ranges specified in Table 5 for different refrigerants and EPROM version S.01F.17 and later. See YORK Service Bulletin 160.47-M2 (SB18) for programming instructions.

TABLE 5 – VARIABLE ORIFICE PRESSURE DIFFERENTIAL SETPOINTS

REFRIGERANT	DIFFERENTIAL PRESSURE RANGE
R-22	25 - 150 PSID
R-134A	15 - 110 PSID

A liquid line hand-isolation valve is located between the condenser and the metering orifice plate. This valve, in combination with the hand isolation valve between the