

INSTALLATION & SERVICE INSTRUCTIONS



CRANKCASE PRESSURE REGULATING VALVES

CRO-4, CRO-6, CROT-6, CRO-10, & CROT-10

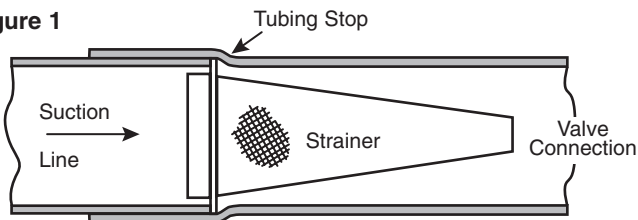
INSTALLATION INSTRUCTIONS

To insure best performance, CRO's must be applied and selected correctly. This is covered thoroughly in Bulletin 90-10. However, proper installation procedures are equally important. All of the information in the Application section of 90-10 should be reviewed before installing CRO valves.

VALVE LOCATION – CRO's are normally installed downstream of any other suction line controls or accessories. However, on some applications it may be advisable, or necessary for special purposes, to locate other system components, e.g., an accumulator, downstream of the CRO. This is satisfactory as long as the CRO valve is intended to function as a crankcase pressure regulating valve only.

CRO's may be installed in any position – whichever best suits the application and permits easy adjustment and accessibility. However, consideration should be given to locating these valves so that they don't act as an oil trap or that solder cannot run into the internal parts during brazing in the suction line. Since the CRO(T)-6 and CRO(T)-10 are hermetic, there is no way to disassemble them and clean out any solder that gets trapped in the internal parts.

Figure 1



STRAINER – Catch-All Filter-Drier – See•All Moisture and Liquid Indicator – Just as with any refrigerant flow control device, the need for an inlet strainer is a function of system cleanliness and proper installation procedures. To install the strainer, the tubing is inserted in the valve connection until the tubing and the strainer flange ring are up against the tubing stop, thus locking the strainer in place, see Figure 1. Moisture and particles too small for the inlet strainer are harmful to the system and must be removed. Therefore, it is recommended that a **Catch-All Filter-Drier** be installed according to the application recommendations in Bulletin 40-10.

Further system protection is easily and inexpensively provided with installation of a **See•All Moisture and Liquid Indicator** on every system. Complete information is given in Bulletin 70-10.

STRAINER PART NUMBERS

Valve Type	Connection Size Inches	Strainer Part Number
CRO-4	3/8 ODF	825-003
	1/2 ODF	825-004
CRO(T)-6	5/8 ODF	825-005
	7/8 ODF	825-007
	1-1/8 ODF	825-009
CRO(T)-10	7/8 ODF	825-007
	1-1/8 ODF	825-009
	1-3/8 ODF	825-011
Strainers not available for SAE connections.		

BRAZING PROCEDURES – When installing CRO's with solder connections, the internal parts must be protected by wrapping the valve with a **wet** cloth to keep the body temperature below 250°F. The tip of the torch should be large enough to avoid prolonged heating of the connections. Overheating can also be minimized by directing the flame away from the valve body.

Any of the commonly used solders may be used with these copper connections. The key points to remember are: avoid overheating the valve and avoid running solder into the internal parts of the valve.

ACCESS VALVE ON CROT MODELS – When the CROT model is used, care must be taken with the access valve core to protect the synthetic seating material. The valve core is shipped in an envelope attached to the access valve. If the access valve connection is to be used as a reusable pressure tap, to check the inlet pressure (evaporator), the CROT must be brazed in **before** the core is installed. If the access valve connection is to be used as a permanent pressure tap, for a pressure actuated defrost control or any other purpose, the core and access valve cap may be discarded.

TEST and OPERATING PRESSURES – Inert dry gases such as nitrogen, CO₂ or helium are often used for leak detection. Excessive leak testing or operating pressures may damage these valves or reduce the life of the diaphragm or bellows.

CAUTION: Inert gases must be added to the system carefully through a pressure regulator. Unregulated gas pressure can seriously damage the system and endanger human life. Never use oxygen or explosive gases.

The table below lists the maximum pressure values that each valve can **withstand without damage**. It also lists the Underwriter's Laboratories maximum rated pressure values.

Valve Type	Maximum Test Pressure - psig	Maximum Rated Pressure - psig
CRO-4	450	500
CRO(T)-6	300	400
CRO(T)-10	200	400

VALVE SETTING and ADJUSTMENT – The table below lists the standard adjustment ranges available for each valve type and the associated standard setting.

The valves are adjustable and the average psi change per turn is also listed for reference.

Valve Type	Adjustment Ranges - psig	Standard Factory Setting - psig	Average psi Change Per Turn
CRO-4	0/20	15	3.3
	0/50	30	6
	0/75	50	10
CRO(T)-6	0/60	30	6
	30/110	70	12
CRO(T)-10	0/60	30	2.5
	30/110	70	5

CRO's should be adjusted at start-up when the pressure in the evaporator is above the desired setting. The final valve setting should be below the maximum suction pressure recommended by the compressor or unit manufacturer.

Since the primary job of the CRO is to protect the compressor motor against overloading due to high suction pressure, it is important to arrive at the correct pressure setting to offer this protection. The best way to see if the motor is overloaded is to check the current draw at start-up or after a defrost cycle. If an overloaded condition is evident, a suction gauge should be put on the compressor because the CRO setting may be too high and may have to be adjusted. If the compressor is overloaded and the CRO valve is to be reset to offer the necessary protection, the following instructions are suggested.

- Step 1.** Shut the unit off long enough for the system pressure to equalize.
- Step 2.** Start the unit and observe the suction pressure. This is the pressure at which the valve is controlling.
- Step 3.** Turn the adjusting nut counterclockwise the correct number of turns to set the valve approximately 10 psi below the desired setting.

Step 4. Repeat Steps 1 and 2.

Step 5. Adjust the valve in a clockwise direction to the desired setting.

Step 6. Repeat Steps 1 and 2 and readjust if required.

The CRO-4 has a 3/8" adjustment screw on top of the adjustment housing. The CRO(T)-6 and CRO(T)-10 have a valve cap and a hex adjustment in the adjustment housing. Remove the cap and use a 1/4" hex wrench for the CRO(T)-6 and a 5/16" hex wrench for the CRO(T)-10. A clockwise rotation increases the setting while a counterclockwise rotation decreases the setting

When CRO's are installed in parallel, each should be adjusted the same amount. If one valve has been adjusted more than the other, best performance will occur if both are adjusted all the way in before resetting them an equal amount.

SERVICE INSTRUCTIONS

The CRO-4 can be disassembled for inspection and cleaning, however, the CRO(T)-6 and CRO(T)-10 are hermetic and cannot be disassembled for cleaning. Replacement is usually necessary if they become inoperative. If a CRO **fails to open, close properly, or won't adjust**, it is probably due to solder or other foreign materials lodged in the port. It is sometimes possible to dislodge these materials by turning the adjustment nut all the way in with the system running.

If the CRO(T)-6 or CRO(T)-10 develop a refrigerant leak around the spring housing, it probably has been overheated during installation or the bellows failed due to severe compressor pulsations. In either case, if the valve fails in the open position, the valve must be replaced.

