

## **1. GENERAL**

### **1.1 Scope**

- .1 Liquid indicators.
- .2 Strainers.
- .3 Hot Gas Regulator and hot gas piping, for last stage, piped between coil and condensing unit.
- .4 Filter-dryers.
- .5 Solenoid valves.
- .6 Expansion valves.
- .7 Refrigerant charging valves.
- .8 Flexible connections.

### **1.2 Quality Assurance**

- .1 Comply with Provincial Regulations and the current edition of CSA B52, Mechanical Refrigeration Codes.

### **1.3 Submittals**

- .1 Provide shop drawings and schedules for review. Include all product information, materials of construction capacities and performance data.

## **2. PRODUCTS**

### **2.1 Liquid Indicators**

- .1 Liquid indicators shall be double port type with copper brass body, and flared or solder ends.
- .2 Provide removable seal caps on each port to inspect refrigerant condition.

### **2.2 Strainers**

- .1 Refrigerant strainers shall be angle replaceable cartridge type with brass shell.
- .2 Cartridge material and screen size shall be suitable for refrigerant and piping materials utilised in the system.

### **2.3 Hot Gas Regulator**

- .1 Sweat end, screw adjustment, integral electric shut off valve, or a separate electric solenoid shut-off valve upstream of hot gas regulator.

### **2.4 Filter-Dryers**

- .1 Combination filter-dryers shall be angle type, with brass shell and incorporate a combined straining and drying material.
- .2 Desiccant material shall be replaceable.

### **2.5 Solenoid Valves**

- .1 Solenoid valves shall have copper or brass body with flared or screwed ends.
- .2 Coil assembly shall be replaceable.
- .3 Valves shall incorporate a manually operated stem to serve as a bypass in case of coil failure.

### **2.6 Expansion Valves**

- .1 Provide angle type or straight through expansion valves suitable for the refrigerant utilised in the system.
- .2 Valves shall have brass body, internal or external equaliser, adjustable superheat setting and be complete with capillary tube and remote sensing bulb.

### **2.7 Charging Valves**

- .1 Provide general purpose type refrigerant charging valves with brass body, flared or solder ends and with removable valve core.
- .2 Provide valve inlet with quick coupling connection for ease of charging.

### **2.8 Flexible Connectors**

- .1 Flexible connectors shall consist of close pitch corrugated bronze hose with single layer of exterior braiding to provide additional strength and prevent elongation of corrugated section.
- .2 Connectors shall be minimum 230 mm (9 inches) long and provided with bronze fittings to facilitate connection to equipment.

## **3. EXECUTION**

### **3.1 Liquid Indicators**

- .1 Provide full size liquid indicators in main liquid line leaving condenser. If a receiver is used, install in liquid line leaving receiver.

### **3.2 Strainers**

- .1 Provide full size strainer ahead of each automatic valve. Where multiple expansion valves with integral strainers are used, install single main liquid line strainer.
- .2 Provide shut-off valve at each side of strainer to facilitate maintenance.

### **3.3 Refrigerant Dryers**

- .1 Provide full flow permanent refrigerant drier in low temperature systems and systems utilising hermetic compressors.
- .2 Mount drier vertically in liquid line adjacent to receiver with three valve bypass assembly to permit isolation of drier for servicing.

### **3.4 Filter-Dryers**

- .1 Filter-dryers may be used in systems instead of separate strainers and dryers.
- .2 Install with three valve bypass assembly to permit isolation for servicing.

### **3.5 Solenoid Valves**

- .1 Provide solenoid valves in liquid line of systems operating with single pump-out or pump-down compressor control, in liquid line of single or multiple evaporator systems and in oil bleeder lines from flooded evaporators to stop flow of oil and refrigerant into the suction line when system shuts down.
- .2 Provide solenoid valves with manually operable items.

### **3.6 Expansion Valves**

- .1 Size expansion valves properly to avoid penalty of being undersized at full load and of being excessively oversized at partial load.
- .2 Properly evaluate refrigerant pressure drop through system to determine the available pressure drop across the valve.
- .3 Select valves for maximum load at design operating pressure and minimum 6°C (11°F) of superheat.
- .4 Locate remote expansion valve sensing bulb immediately after evaporator outlet and suction line.

### **3.7 Charging Valves**

- .1 Provide refrigerant charging connections in liquid line between receiver shut-off valve and expansion valve.

**3.8 Flexible Connectors**

- .1 In general install suction and hot gas piping connections to compressors with three directional changes for distance of minimum six pipe diameters before reaching point of support.
- .2 Flexible connectors shall only be utilised at or near compressors where it is not physically possible to absorb vibration within piping configuration.

**END OF SECTION**