MODEL "50" AND "120" CHILLER BARREL
INSTALLATION AND OPERATION MANUAL

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MUELLER®
REFRIGERATION PRODUCTS

MUELLER®

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SECTION 1.0 - GENERAL INFORMATION

1.1 Description of the Equipment

- The Mueller® "50" and "120" chiller barrels are double wall heat exchangers with glass lined internal surfaces. They are designed for chilling water or similar liquids and are U.L. listed for potable water usage.

- The "50" and "120" chiller barrels chill and store in one unit. The nominal storage capacity is 50 gallons (U.S.) for the "50" and 119 gallons (U.S.) for the "120." The water tanks are tested at 300 psig and are rated for a working pressure of 150 psig.

- A "thermal-bank" effect is provided by the storage capacities of the Mueller chiller barrels. This thermal bank effect provides a ready reserve of chilled water to handle peak loads and variable flow rates. Many times the thermal-bank effect of the Mueller chiller barrel allows the use of a significantly smaller capacity condensing unit than would normally be expected for a given chilling job.

- The double-wall construction of the Mueller chiller barrel provides protection against product and/or refrigeration system contamination because of tube ruptures associated with tube/shell chillers.

- There is virtually no water pressure drop in the Mueller chiller barrels.

- The refrigeration heat exchangers are stainless steel and are rated for a maximum working pressure of 426 psig.

- Mueller chiller barrels are the low side of the system only. The high side of the system is custom-made by combining your choices of condensing unit(s), expansion valves, pumps, and other components.

- The outer jacket of the chiller is stainless steel. It is highly resistant to corrosion and will remain bright and rust-free with a minimum of care.

- Do not use abrasive cleaning materials or compounds on the outer jacket as they will scratch the surface. After using any cleaning compounds, always rinse with clear water.

- The chiller is shipped with a protective paper on it. This paper should be removed as soon as the chiller is uncrated and placed at its point of installation.

- In coastal areas where the air contains a high salt content, the bright appearance of the chiller can be maintained by rubbing it with oil or a light grease as soon as it is installed.

- The Mueller chiller barrel is particularly suited for applications requiring variable or high flows for short periods of time where the thermal-bank effect of the barrel can be utilized or places where they can be added to an existing parallel system with sufficient capacity.

- Some common applications for Mueller chiller barrels are drinking water systems, bakery dough, or other edible product-mix water, produce washing, ice machine water precoolers, plastic injection machine cooling, x-ray machines, machine tool cooling, film processing, and chilled water air conditioning systems.

1.2 Capacity

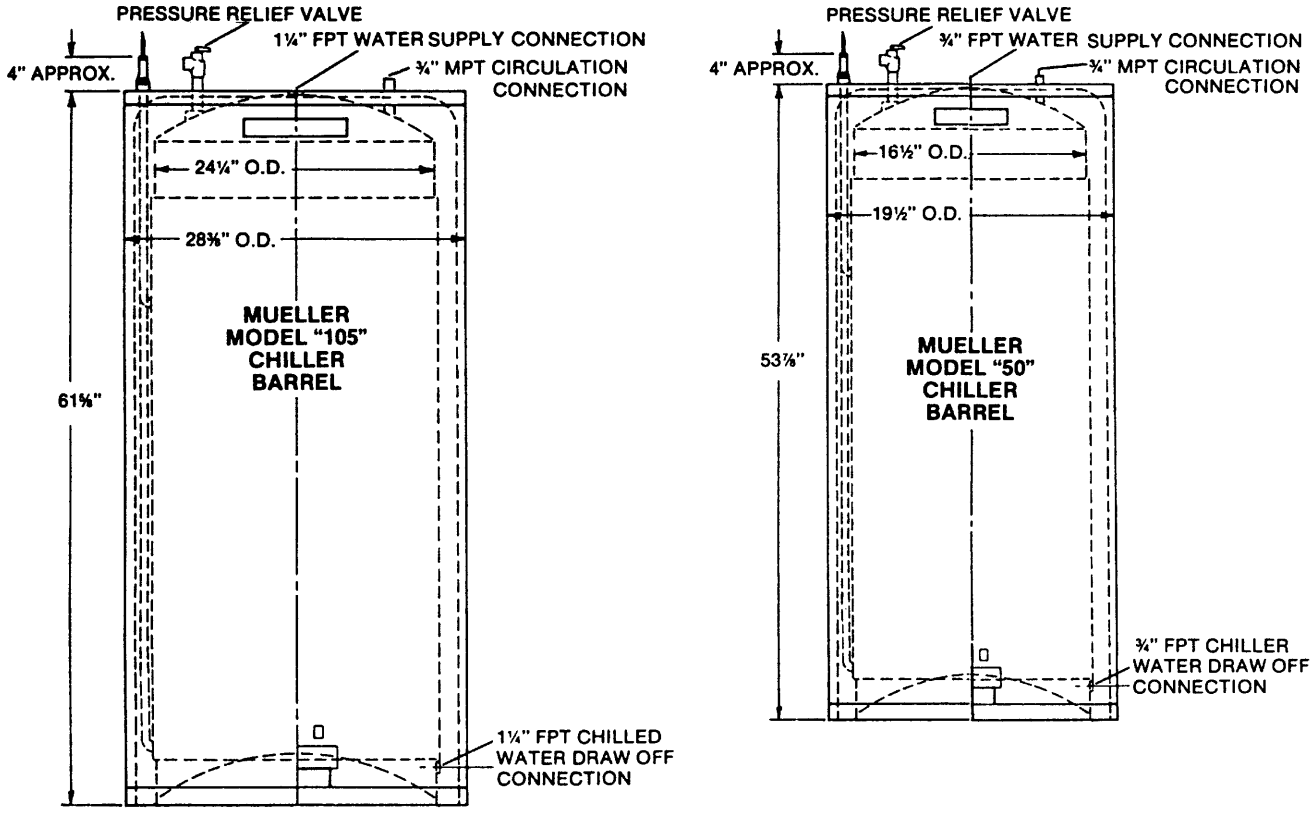
The chiller barrel is suitable for use with any commercial R22, R134A, R404A, or R507A condensing unit, either air or water cooled, within the capacity range listed in Section 1.3.

1.3 Technical Specifications

Model No.	Mueller Part No.	Water Connection Size	No. Of Refrigeration Circuits	Refrigeration Connection Size	Refrigeration Capacity @ 30°F	Dimensions (inches)	Approx. Shipping Weight (lbs)	Approx. Loaded Weight (lbs)
50	93779	3/4" FPT	1	5/8" ODM	1 ton min. 2 1/2 tons max.	Ht.: 53 7/8 Dia.: 19 1/2	270	600
120	8800220	1 1/4" FPT	2	3/4" ODM	2 tons min. 4 tons max.	Ht.: 61 5/8 Dia: 28 3/8	500	1,300

NOTE: Refrigeration capacities are not evaporator Btuh capacities. Do not confuse this with compressor nominal hp rating. Evaporator pressure regulation may be required to prevent ice formation on the evaporator surface at maximum tonnage.

Figure 1 - Chiller Barrel Dimensions



Typical performance graphs are shown in Figure 7.

1.4 Chiller Location

When selecting a location for a chiller, the ability of that location to bear the loaded weight of the chiller should be a prime consideration. The loaded weights of the chillers are listed in Section 1.3.

If installed in an unheated area, the chiller must be protected from freezing. Particular attention should be directed to protecting the water piping going to and from the chiller. If the piping will not freeze, the chiller normally will not freeze.

The chiller should be located as near to the condensing units as practical. The chiller should not be located where corrosives will be in continual direct contact with the exterior surface. Careful planning of the chiller location and plumbing can reduce installation costs, save time during installation, and reduce maintenance in the future.

See Figure 2 for chiller dimensions. Adequate space must be provided between walls and the chiller for convenient access to all piping connections.

See suggested refrigerant piping diagrams shown in Figures 4 and 5.

1.5 Leveling

Leveling legs are provided on the chiller to raise it above the floor line and level it.

The three large cap-screw legs should be screwed out enough to raise the chiller slightly before setting it in place, then adjusted as needed to level the unit. The legs provided will allow the chiller to be raised approximately 1 inch. Should more height be needed, a leg set (Mueller Part No. 8801890) is available which will raise the chiller approximately 5 1/2" above floor level.

SECTION 2.0 - INSTALLATION INSTRUCTIONS

2.1 General Information

NOTE: This product is normally sold for heat recovery, and all of the piping labels are set up for this being a heat recovery tank. In order to use this as a water chiller, the piping must be exactly opposite of how they are labeled. This means that the normal cold water inlet is now the outlet, the refrigerant in is now the refrigerant out, and so on. Please make sure that you are correctly piping this unit for water chilling purposes.

2.2 Installing Water Piping

The Mueller chiller barrel is equipped with 3/4" FPT or 1 1/4" FPT water connections. The incoming supply water (liquid) should enter the top center of the chiller barrel at the fitting marked "In." The chilled water (liquid) should be drawn off at the lower side of the chiller barrel at the fitting marked "Out." It should be piped with a recirculation line from the chilled water draw-off line to the 3/4" MPT opening on the top of the chiller barrel. A small recirculation pump (3 to 5 gpm minimum) must be installed in this line. This pump should run whenever the refrigeration unit is running. All piping should be in accordance with national and local plumbing codes. See Figure 2 for a typical water piping schematic.

2.3 Refrigeration Connections

Usual good refrigeration practices must be used while installing the chiller. These practices are common knowledge to the experienced refrigeration serviceman, and only an experienced refrigeration serviceman should undertake the refrigeration connection portion of a chiller installation.

The "50" chiller barrel has one refrigeration circuit. The "120" chiller barrel has two separate refrigeration circuits. It may be connected to two condensing units, or the two refrigeration circuits may be paralleled and connected to one condensing unit. For applicable condensing unit sizing, see Section 1.2, "Technical Specifications." For typical performance curves with given refrigeration capacities, see Figure 8.

Mueller Model "50" and "120" chiller barrels should be operated as pump-down systems.

Suction-line sizing should be in accordance with generally accepted refrigeration design standards. Two of the prime considerations should be minimum pressure drop and proper oil return.

Typical refrigeration line piping is shown in Figures 3, 4, and 5.

NOTE: Condensing units used on a Mueller chiller barrel should be equipped with a low-pressure control adjusted to shut off the compressor if the water temperature thermostat should fail and the chiller barrel begins to form ice.

Figure 2 - Water Piping Schematic

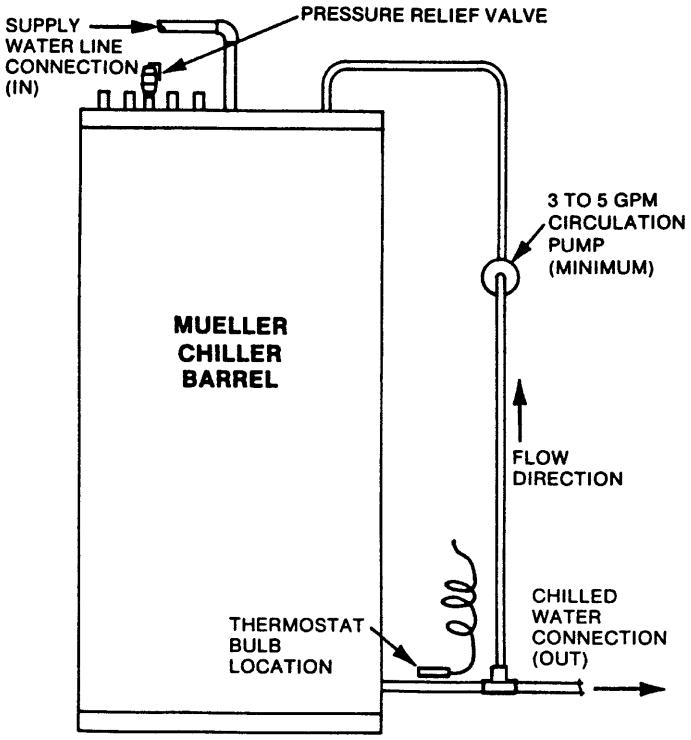


Figure 3 - Model "50" Typical Condensing Unit Piping

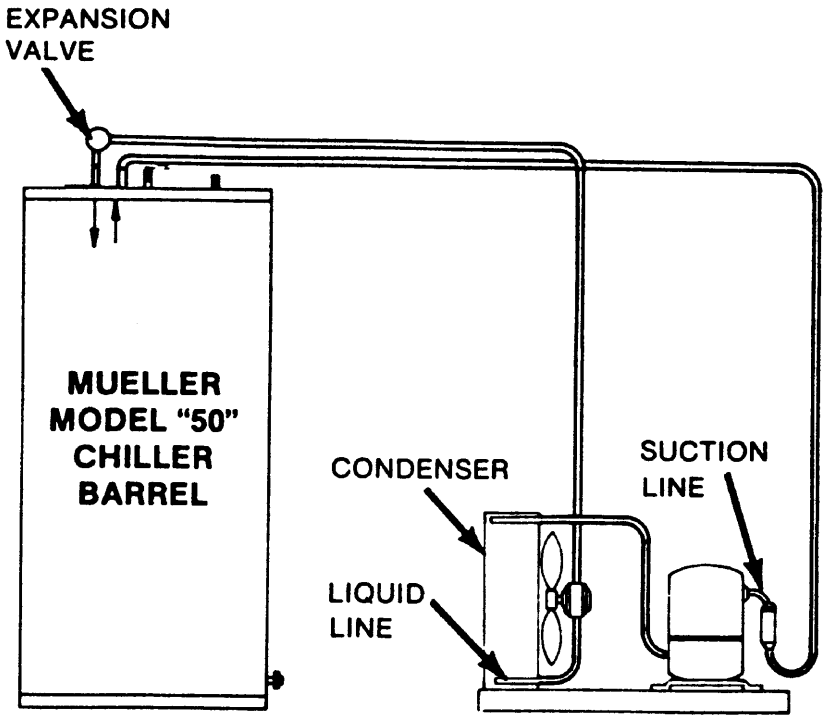


Figure 4 - Model "120" Typical Single Condensing Unit Piping

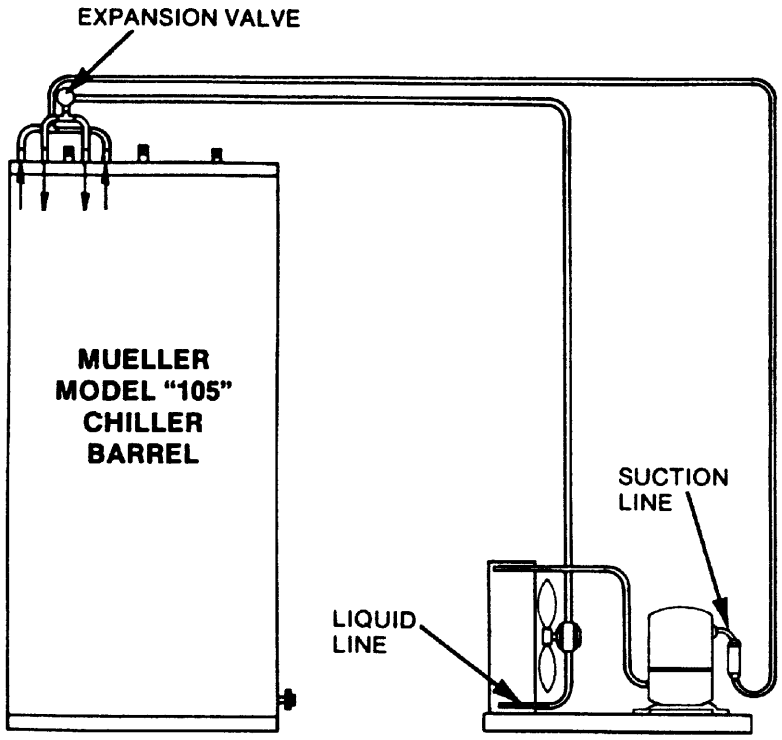
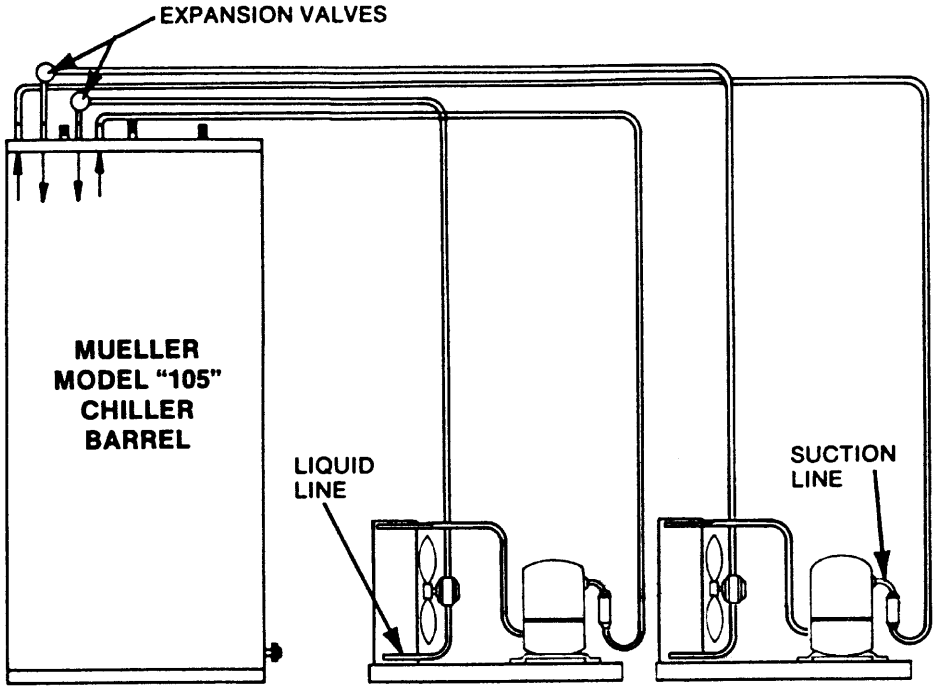


Figure 5 - Model "120" Typical Dual Condensing Unit Piping



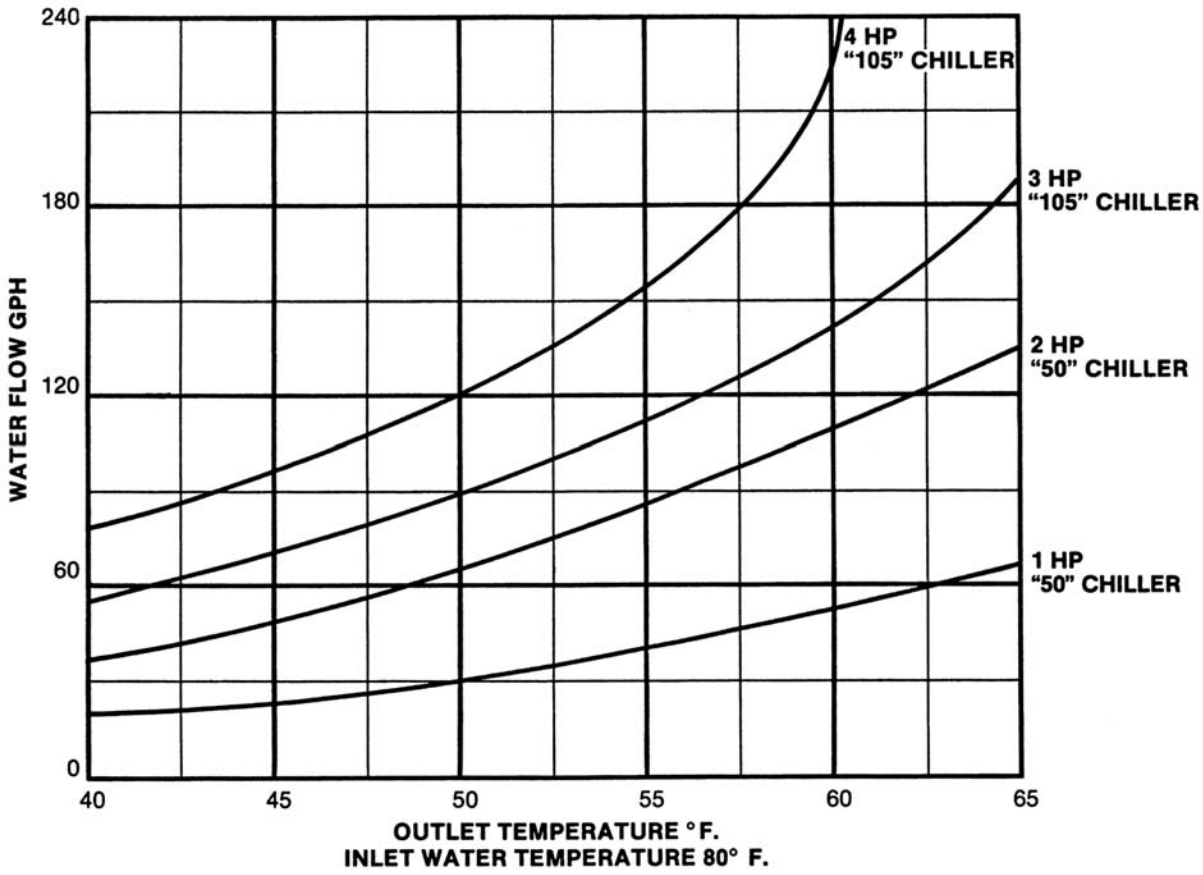
2.4 Limitations for Water Cooling Applications

- ▲ A minimum evaporator temperature of 30°F should be maintained.
- ▲ Minimum draw-off water temperature of 38°F should be maintained.
- ▲ Recirculation of the chiller liquid is required.
- ▲ Suggested thermostat mounting is shown in Figure 2.

2.5 Test Run

Turn on the water supply and fill the chiller with water. Ensure that all water and refrigeration connections are leak-free. The unit is then ready for use. Refrigerant charge should be checked after the system has achieved normal operating conditions. Be sure to check for proper operation of any and all controls, valves, etc., installed with or changed during the installation of the chiller, both in the refrigeration and water systems.

Figure 6 - Typical Performance Outlet Water Temperature vs. Water Flow Rate



Equation for Water Cooling Load Calculations:
GPM water flow x 60 minutes x 8.33 lb./gal. x water TD = BTUH

Notice: *All illustrations and diagrams contained in these instructions are schematic suggestions only. They do NOT attempt to address all of the important design considerations such as pipe sizing and configuration or the selection and placement of major system components. Every installation must follow known and accepted industry safety practices and various code or legal requirements.*

2.6 Installation Component Checklist

- ❑ Mueller Model “50” or Model “120” chiller barrel.
- ❑ Condensing unit(s):
  - ❑ Model “50” -
    (1) 12,000 Btuh through (1) 30,000 Btuh — Capacity @ 30°F Evaporation
  - ❑ Model “120” -
    (2) 12,000 Btuh
    (1) 24,000 Btuh
    (2) 18,000 Btuh
    (1) 36,000 Btuh
    (2) 24,000 Btuh
    or
    (1) 48,000 Btuh — Capacity @ 30°F Evaporation
- ❑ Thermostatic expansion valves: One or two as needed to match condensing unit(s).
- ❑ Solenoid valve: For pump-down cycle (if not included on condensing unit).
- ❑ Drier/filter (if not included on condensing unit).
- ❑ Sight glass (if not included on condensing unit).
- ❑ Temperature control: Range and differential as needed for chilling job specifications.
- ❑ Water circulating pump:
  - ❑ Mueller Part No. 8800473 - 1/25 hp, 115/60/1, 1/2" MPT
    or
  - ❑ Mueller Part No. 8801091 - 1/12 hp, 230/60/1, WHD Part No. 8801092 3/4" FPT flanges
    or
  - ❑ Other pump(s) as needed for circulation specifications.
- ❑ Refrigeration tubing and fittings as needed.
- ❑ Water piping and fittings as needed.
- ❑ Electrical wiring as needed.

NOTE: This list is for general guideline purposes only. Any particular installation may require more or less depending on the application, specifications, standard features of the condensing unit, and local code requirements.

MUELLER®

P.O. Box 828 • Springfield, Missouri 65801-0828, U.S.A.
Phone: (417) 831-3000 • 1-800-MUELLER • Fax: 1-800-436-2466
www.muel.com • E-mail: refrigeration@muel.com

International Inquiries - Fax: (417) 831-6906 • E-mail: international@muel.com

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