Scotsman®

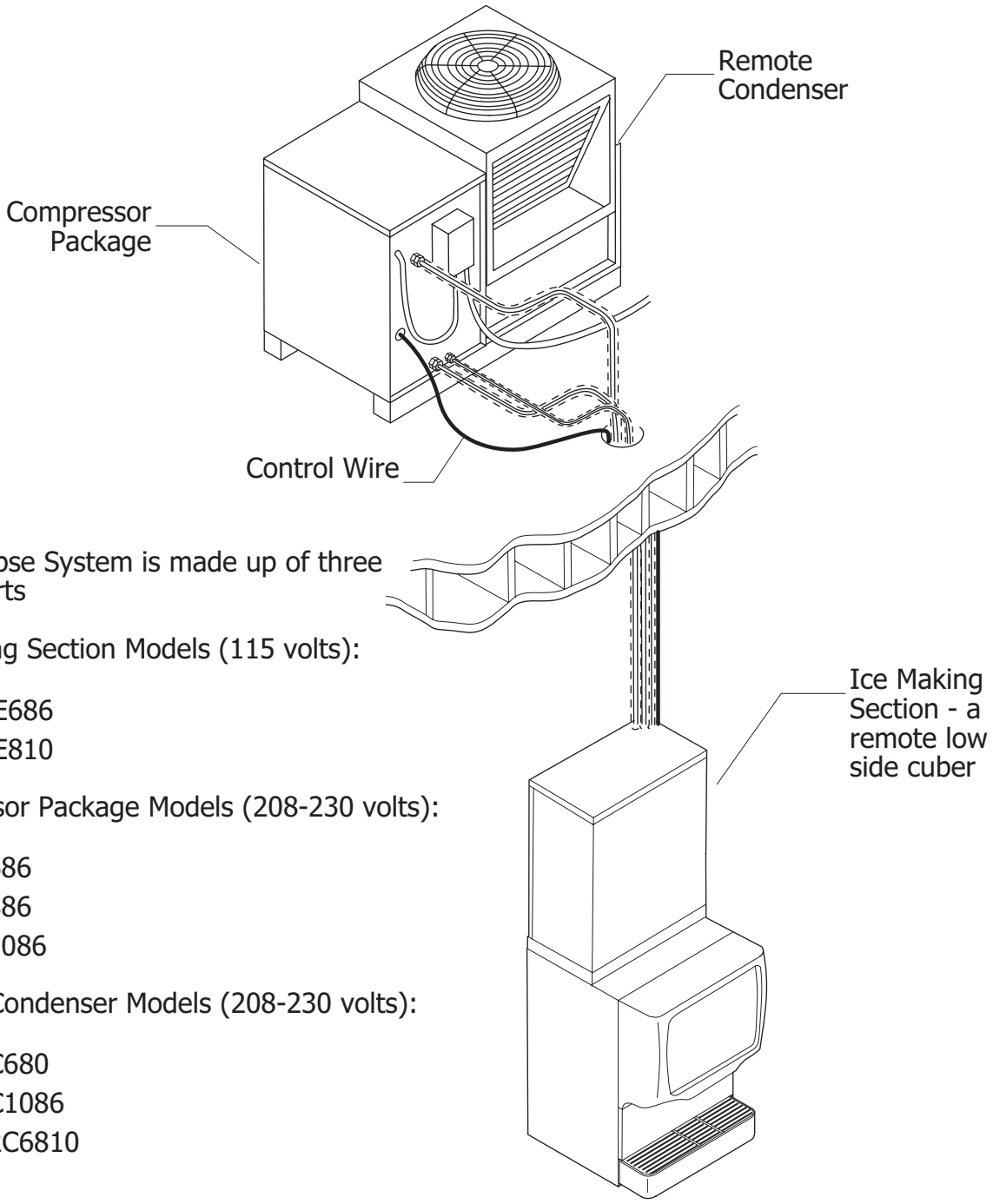
# Technical Review:
# Eclipse 600, 800 and 1000 Systems

Eclipse™

# Eclipse System

Scotsman's Eclipse System offers users a new choice in remote cubers. In the past, when a user needed to put an ice machine in a location that was heat and noise sensitive, the choice was to use either a water cooled unit or one that was remote air cooled. Each has advantages and disadvantages. Although they consume water, water cooled machines are very quiet, don't give off much heat and are easy to install. Remote air cooled units are just as cool and quiet as a water cooled machine because they move the heat and noise generated by the air cooled condenser to a location where that isn't so objectionable.

Eclipse is a new type of remote air cooled machine, one that goes beyond remote air cooled: the compressor has been moved out of the ice making section to be next to the condenser - taking the noise it generates and the space it occupies with it.




Each Eclipse System is made up of three major parts

Ice Making Section Models (115 volts):

- CME686
- CME810

Compressor Package Models (208-230 volts):

- CP686
- CP886
- CP1086

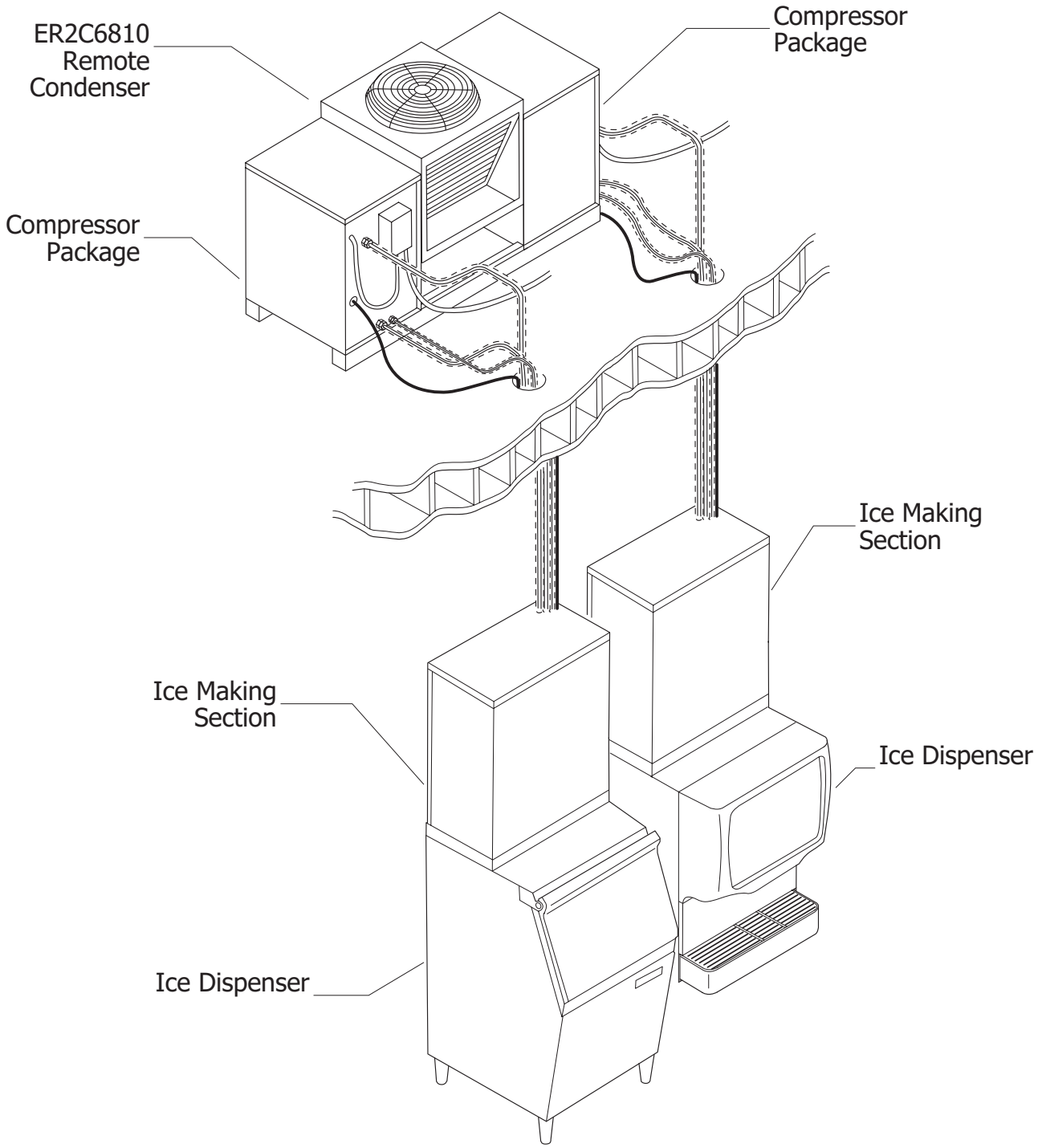
Remote Condenser Models (208-230 volts):

- ERC680
- ERC1086
- ER2C6810

# Eclipse System

A flexible design allows the Eclipse system to be used in a variety of situations. One application involves the use of a two-circuit remote condenser, the ER2C6810. Two ice making sections and two compressor packages can be mounted to a single two-circuit condenser. The condenser fan is wired to be on at all times, eliminating the need for a fan motor relay and power leg phasing of the relay.

Ice making sections can be placed on dispensers and bins. An adapter will be needed for each application.



# Eclipse System

The Eclipse refrigeration system consists of three main parts: ice making section, compressor package and condenser.

- The ice making section contains three evaporators, each with its own TXV, check valves, and a vapor inlet valve. The control system is also located there as are the pump, inlet water solenoid valve and purge valve.
- The compressor package contains most of the refrigeration components, including the compressor, crankcase pressure regulating valve, receiver, accumulator, headmaster, condenser bypass valve and liquid inlet valve.
- The condenser is made up of the fan motor and coils.

A control wire connects the controller in the ice making section to the contactor and solenoid valves in the compressor package.

There are three refrigerant lines between the ice making section and the compressor package: Liquid, Vapor and Suction.

**Refrigeration System Operation**, refer to the schematic on the next page.

During Freeze,

- The compressor is operating
- The vapor inlet and condenser by pass valves are closed.
- The normally open liquid line inlet valve is open.
- The headmaster is open between condenser inlet and liquid outlet.

Under low ambient/low pressure conditions, the headmaster valve closes the liquid outlet of the condenser and opens a bypass route to direct refrigerant gas to the receiver inlet until discharge pressure builds back up to the headmaster's set point.

From the receiver liquid outlet, liquid refrigerant flows into the liquid line and into the ice making section.

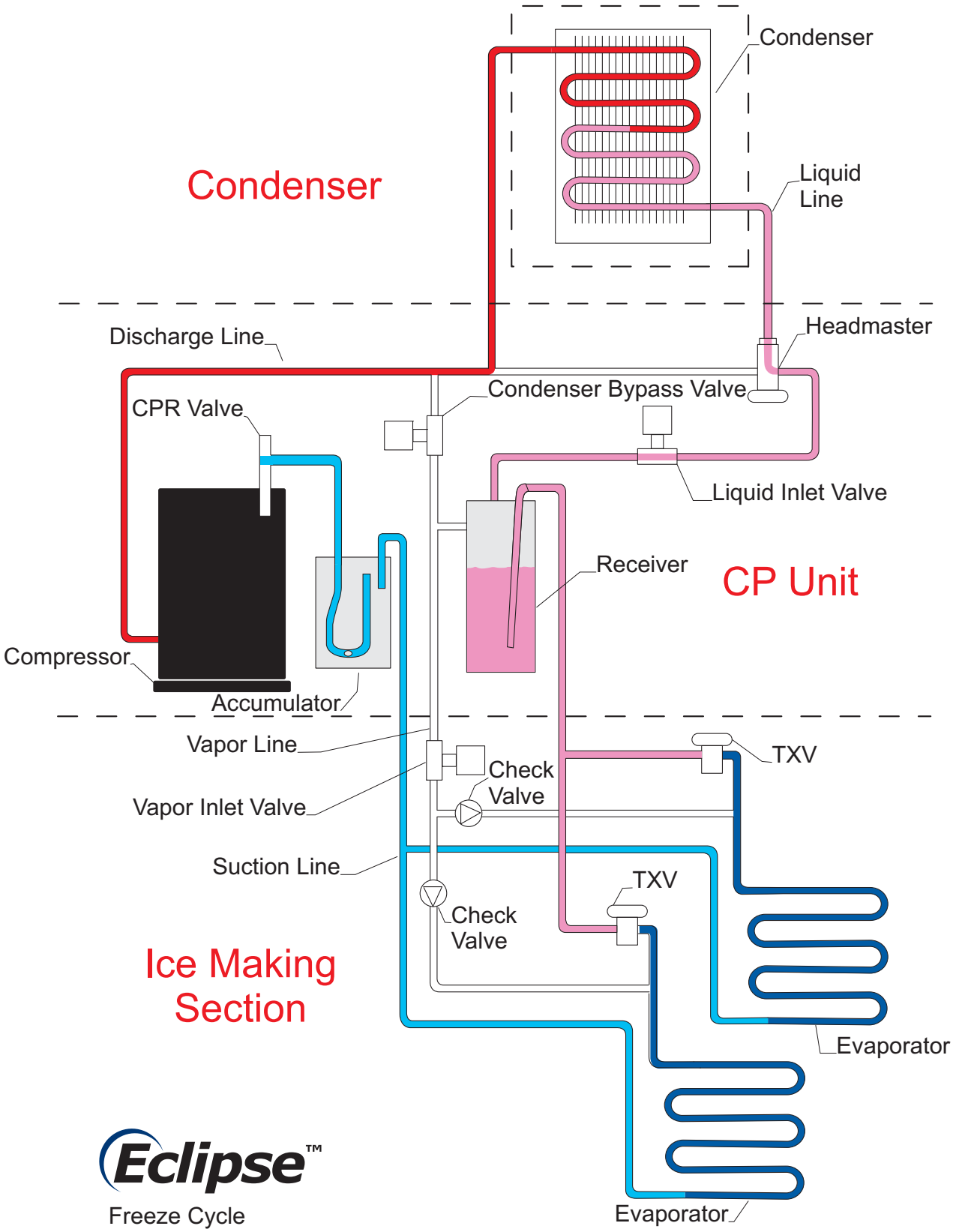
At the ice making section, the refrigerant flows into the three expansion valves.

Each evaporator has a check valve in its vapor inlet to prevent evaporating refrigerant from flowing into the wrong evaporator.

After the evaporators,  low-pressure refrigerant gas flows into the suction line, which carries it back to the condensing unit, where it enters the accumulator. In the accumulator most of any liquid carried with the suction gas is separated and only vapor flows out of the accumulator through the CPR valve and to the compressor where the cycle continues.

Suction pressure during freeze will be the same at the compressor or at the evaporators. During harvest, the CPR valve limits the suction pressure to a pre-set maximum, evaporator pressure will be higher.

# Freeze Cycle Schematic

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Freeze Cycle

# Eclipse System

**Refrigeration System Operation**, refer to the schematic on the next page.

During Harvest,

- The compressor is operating
- The vapor inlet and condenser by pass valves are open.
- The normally open liquid line inlet valve is closed.

Discharge gas, combined with some vapor from the receiver's outlet, flows through the vapor line to vapor inlet valve and into the evaporators. The gas-vapor combination, when entering the relatively cold evaporators, condenses, transferring latent heat to the evaporators, which warms them. Ice releases and falls into the bin.

Low-pressure refrigerant flows out of the evaporators and into the suction line. The suction line brings the refrigerant, now consisting of a vapor-liquid combination, to the accumulator. From the accumulator the vapor-liquid combination (now mostly vapor) goes to the Crankcase Pressure Regulator valve which limits the amount of dome pressure in the compressor, where the cycle continues.

**Unique Characteristics of the Eclipse System**

Ice Making Section

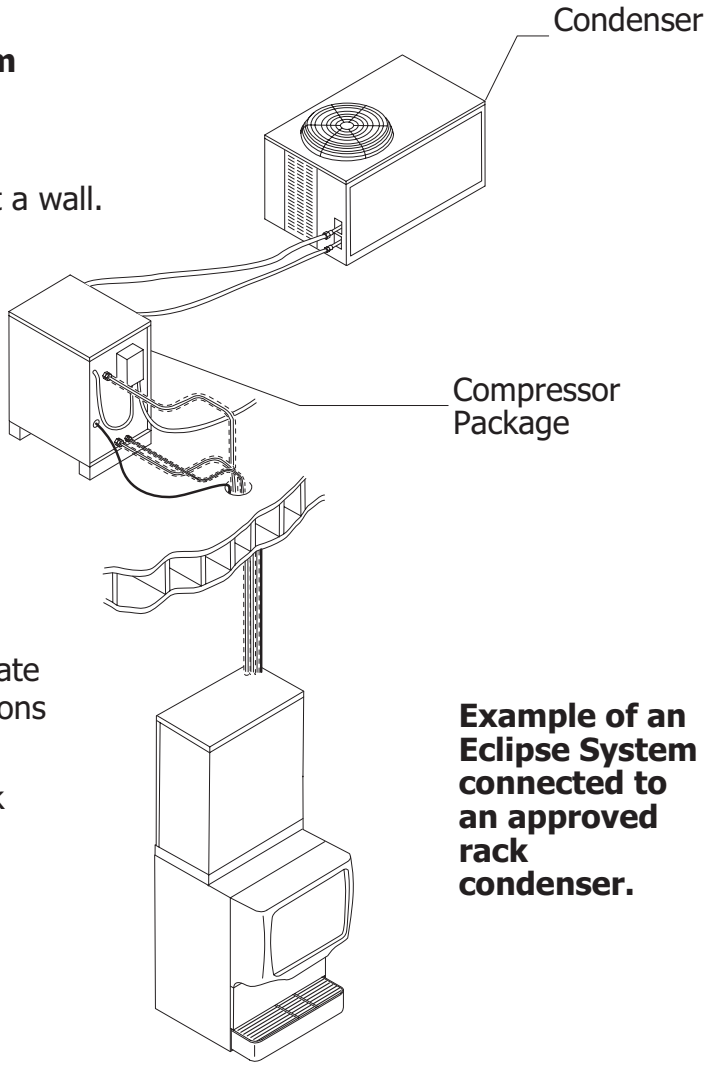
- Cabinet may be placed with its back against a wall.
- Drain tubing can be routed out the back, or out the left side or out the right side
- Refrigerant lines can be routed out the top or the back
- Water line can be routed out the top or out the back
- Mounting straps can be attached on the sides or back

Compressor Package

- Liquid and Discharge fittings on the back mate to ERC680, ERC1086 or ER2C6810 connections
- Contains the system's headmaster
- Can be connected to approved coil of a rack condenser system with special line set

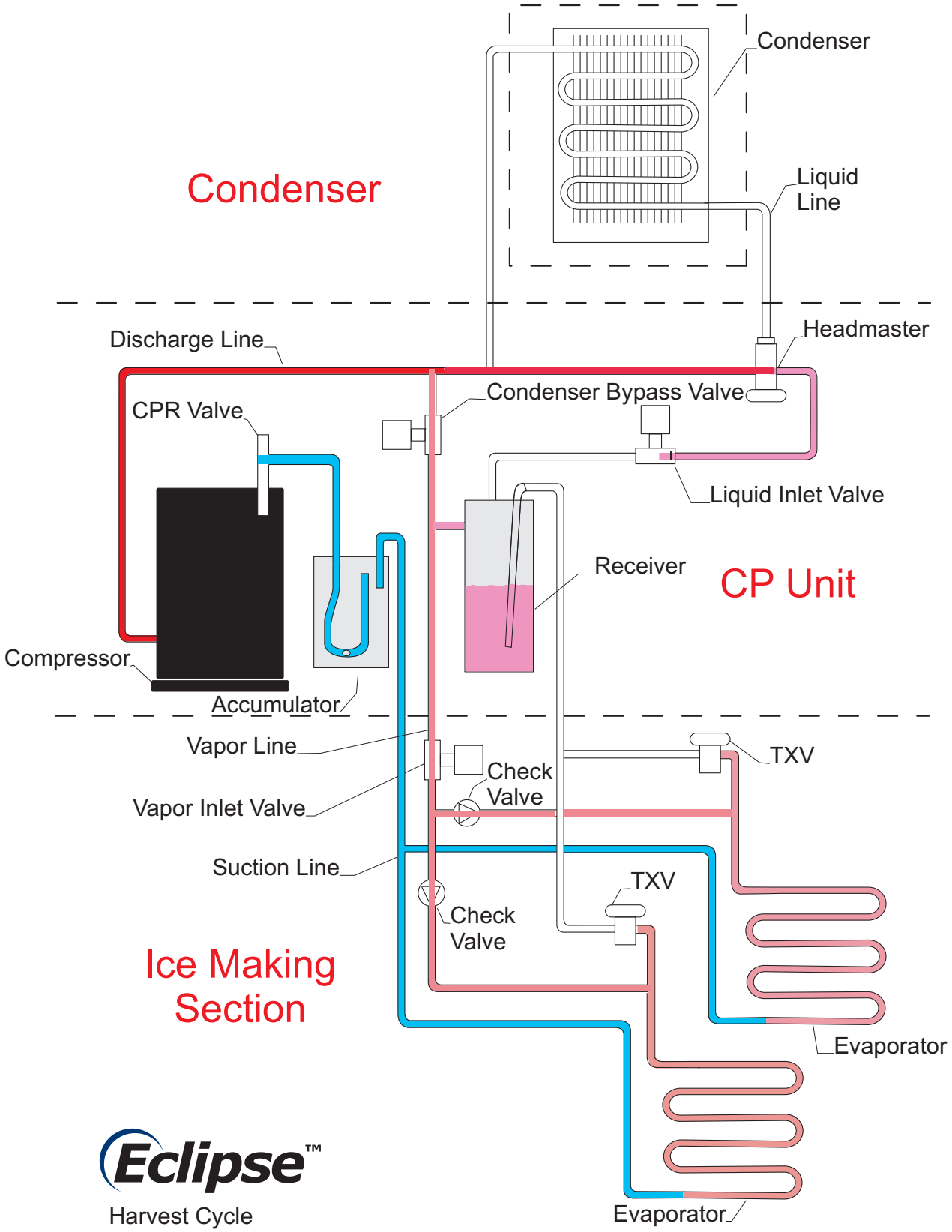
Remote Condenser

- Special for the Eclipse System
- Swivel nut connections
- No headmaster




**Example of an Eclipse System connected to an approved rack condenser.**

# Harvest Cycle Schematic

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Harvest Cycle

# Ice Level Control

The 600, 800 and 1000 lb Eclipse systems use a unique method of controlling how much ice is in the bin or dispenser. The ice sensors are located in two pods that project below the ice making section's base. The ice machine makes ice until the area between the sensors is blocked by the top of the ice pile, then the system will shut off. It will automatically restart when the ice level drops.