APT-RC & WPT SERIES

- Central Chilling Modules
- Water-Cooled and Air-Cooled Models
- 5 to 180 Tons
- 20°F to 70°F
- Using Non-Ozone Depleting Refrigerants
- For Indoor Installation

APPLICATIONS

APT-RC & WPT central chilling modules can be used on a variety of process applications that require 20°F to 70°F chilled water.

C-30APT-RC model shown.

Typical remote air-cooled condenser used on APT-RC systems.
The compressor is the heart of a chiller’s refrigeration cooling system. The compressor removes the refrigerant vapor from the evaporator to a point where the desired process fluid set point can be maintained and it raises the pressure of the refrigerant vapor to a level high enough so that the available condensing medium can effectively remove the process heat.

APT-RC & WPT chilling modules are equipped with either hermetic scroll compressors or rotary screw compressors. Both compressor styles use rotary technology for smooth, efficient operation with fewer moving parts and low torque variation for better reliability compared to traditional reciprocating compressors.

Compressor suppliers are selected for the advanced performance features of their product along with their service history and after market support capabilities.

**EVAPORATORS**

The recirculated process fluid is cooled in the chiller evaporator. Liquid refrigerant boils or evaporates, absorbing heat from the process fluid as it changes into a vapor.

This critical component is carefully selected to provide optimum process fluid cooling. Each refrigerant zone is equipped with its own fully independent evaporator which is protected by a process fluid freezestat, flow switch and low pressure limit switch.

APT-RC & WPT chilling module use either brazed plate or shell & tube evaporators depending on system capacity and desired duty.

**COMPRESSORS**

Brazed plate evaporators are made of stainless steel plates brazed together with copper brazing material. This design promotes turbulent flow and high heat transfer rates in a compact, non-ferrous package. A cleanable basket strainer filter is included to protect the brazed plate evaporator from water born contamination.

Shell & tube evaporators are used on larger capacity systems. Refrigerant is circulated through copper tubes within the carbon steel shell to cool the process fluid that surrounds the tubes. Shell & tube evaporators are fully insulated and provide flexible, efficient heat transfer.

**EVAPORATORS**

Shell & tube evaporator

Water-cooled condenser

Shell & tube evaporator

Brazed plate evaporator

**COMPONENTS**

**PRESSURE GAUGES...**

High and low refrigerant pressure gauges are provided for each independent refrigeration zone. These gauges provide a diagnostic tool that can save the owner money on unneeded service calls compared to many competitive units that do not include refrigerant pressure gauges. A system water pressure gauge is also included.

**ALARMS...**

An audible and visual alarm is included and is triggered by process water temperature and process water pressure along with refrigeration system errors.

**LIMIT DEVICES...**

Limit devices provide protection against machine damage from out-of-specs operating conditions. Standard limit devices include high and low refrigerant pressure, evaporator flow, coolant freezestat and motor overload.

**REFRIGERANT COMPONENTS...**

Refrigerant components are selected for historic reliability and performance, including pressure limit switches, freezestat, expansion valve, relief valve, filter dryer and sight glass/moisture indicator.

**CONDENSERS**

APT-RC & WPT chilling module are offered with Air-Cooled or Water-Cooled condensers. The selection is influenced by the industrial environment where the chilling modules will be installed including available condensing water supply and plant ambient temperatures. The condenser is a heat exchanger where the heat absorbed by the refrigerant during the evaporating process is given off to the condensing medium. As heat is given off by the high temperature, high pressure refrigerant vapor, its temperature falls and the vapor condenses to a liquid.

APT-RC series air-cooled units use outdoor remote condensers, constructed of a heat transfer coil that has copper tubes and aluminum fins for full rated performance at 95°F ambient. The coil is housed in a sheet metal enclosure with fans that provide a vertical air discharge. Ambient operation to -20°F is standard. Air-cooled condensers are field installed by the owner. Installation includes refrigerant piping system and charging.

**CONDENSERS**

Remote air-cooled condenser

WPT series water-cooled units use tube and shell condensers with removable heads for cleaning. The condenser is equipped with a water regulator valve that maintains stable refrigerant pressures under a wide range of condensing water temperatures and pressures. Water-cooled condensers are manifolded to provide a single process connection.
The Advantage Multizone Control Instrument (MZC) has the experience of over 8 years of field service. The control instrument consists of the cabinet door mounted operator interface display and control instrument and internal cabinet mounted intelligent zone boards.

**INTELLIGENT ZONE BOARDS**
One intelligent zone board is provided for each refrigeration zone. The control instrument communicates with the zone boards to stage each refrigeration zone independently. This brings the process temperature in line with the set point quickly and accurately. In the event of a communication failure, the zone boards assume the control of their respective refrigeration zones and will continue to operate. The instrument provides control of up to 6 refrigeration zones. Although not all are used on the chiller, the extra zone control can be used for future capacity expansion where APT-RC or WPT chilling modules are installed and controlled by the chiller control.

**DISPLAY CONTROLS & LIGHTS**
Soft key controls are provided for selection of zone displays and setpoint. Two large display windows continuously show temperature for to process and setpoint. Temperatures can be shown in Fahrenheit or Celsius. From process temperatures can be displayed momentarily when selected by the operator. The display windows also display setup options. Status lights are provided for seven system components: probe, low flow, high pressure, low pressure, low oil, compressor and freeze stat. The condition is indicated by multi-colored LED’s. Solid green indicates the component is at the run condition. Flashing red indicates that an error condition exists. Solid red indicates that an error condition was once present, but is now in an acceptable run condition. Pressing the ‘select’ button changes a solid red indication into a solid green indication. The instrument provides an alarm status light on the display, as well as an audible and visual alarm beacon. A selectable refrigeration zone lead/lag mode is a standard feature of the instrument.

**WATER DISTRIBUTION SYSTEM**
APT & WPT central chilling modules require the use of an independent pumping system to distribute chilled water to the process use points and to return process water to the chilling module. Advantage offers Tough Tank® and CPTS Series pump tank stations for this purpose.

**FUTURE CAPACITY & REFRIGERANT ZONES**
APT-RC & WPT central chilling modules are offered in standard capacities with water-cooled or remote air-cooled condensers. Future capacity expansion is possible by adding additional WPT or APT-RC modules. Single, dual and triple refrigerant zone models are available. Each refrigerant zone operates independently, providing greater capacity staging, tighter temperature control and continued operation during service.

**CIRCUIT SCHEMATIC**
**STANDARD FEATURES**

- Refrigerant circuits:
  - Hermetic scroll or rotary screw compressors
  - Liquid line solenoid valve
  - Refrigerant sight glass with moisture indicator
  - Thermostatic expansion valve
  - Brazed plate or shell & tube evaporator
  - Hot gas by-pass or unloading capacity control systems
  - Water-cooled Condenser Models
  - Regulator valve
  - Single connection with manifold and isolation valves
  - Removable heads
  - R410A or R407C refrigerant
  - Air-cooled Condenser Models
  - Remote, outdoor condenser
  - Variable speed fan
  - Pressure staging

- Coolant circuit:
  - High pressure limit
  - Low pressure limit
  - Evaporator flow limit
  - Instrument control circuit fuse

- Pressure gauges:
  - Refrigerant high pressure
  - Refrigerant low pressure
  - Coolant pressure

- Coolant systems:
  - Large capacity process pump:
  - Suction service valve
  - Discharge service valve
  - Evaporator pump:
  - Suction service valve
  - Discharge service valve
  - Discharge basket strainers (brazed plate evaporators only)

**INSTALLATION SCHEMATICS**

**LIMIT DEVICES:**
- Refrigerant circuit:
  - High pressure limit
  - Low pressure limit
  - Evaporator flow limit
  - Instrument control circuit fuse

- Refrigerant circuit indicators per zone:
  - probe, low flow, high pressure, low pressure, compressor, freeze stat, capacity

- Water circuit indicators: temperature deviation, low pressure, probe, phase

- SPI communications interface

- Selectable load/lag mode

- Audible and visual alarm

**OPTIONS**

- Audible and visual alarm

**REFRIGERANT CIRCUIT:**
- Compressor CCPR valve (for temperatures above 70°F)
- Discus compressor
- Compressor hour meter
- Oversize condensers for higher efficiency and for higher operating ambient temperature

**ELECTRICAL:**
- UL listed electrical panel
- Disconnects

**INSTRUMENTATION:**
- Remote display kit
- PLC instrument with color touch screen
- Modbus RTU or TCP interface

**WARRANTIES:**
- Extended compressor warranty

**REFRIGERANT:**
- R410A refrigerant
- R407C refrigerant
- R404A refrigerant for low temperature systems

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**Model Designator**

**C-40AP&T-RC**

- Condenser Type
  - APT-RC: Remote Air-Cooled
  - WPT: Water-Cooled

**Tons of Capacity**

- Processes
- Temperature Controllers
- Central Water Coolers
- Portable Chillers

**OTHER PRODUCTS**

- Chilled & Tower Water, 450-3600 Gallons
- Air & Water-Cooled, 45-540 tons
- Fiberglass or Metal, 45-540 tons
- Triple Zone

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