Outdoor Chiller and TCU
Frequently Asked Questions
November 2019
Chillers we recommend:

**MTA:**

30 ton – 402-UL-2PL-LA
- WxDxH = 49.5in x 130in x 83.5in
- Working Weight = 3700lbs
- 460 VAC @ 82.3amps
- Reservoir 132gal

10 ton – 101-P3-UL
- WxDxH = 30in x 73.5in x 57in
- Working Weight = 1400lbs
- 230 VAC @ 52amps
- Reservoir 67gal

**Advantage:**

30 ton – OACS-30D-MZC-2P
- WxDxH = 54in x 200in x 91in
- Working Weight = 5100lbs
- 208-230VAC @ 198amps
- 460VAC @ 93amps
- 575VAC @ 73amps
- Reservoir 200gal
- Additional clearance of 4ft on all sides
10 ton – OACS-10S-MG-1P
   WxDxH = 60in x 75in x 87in
   Working Weight = 1800lbs
   208-230VAC @ 50amps
   460VAC @ 26amps
   575VAC @ 24amps
   Reservoir 68gal
   Additional clearance of 4ft on all sides

Temperature Control Unit:
   Delta T
   AB-431S
   WxDxH = 16in x 30in x 26in
   Heater Capacity 9KW
   208-230VAC @ 28amps
   460VAC @ 16amps

Advantage
   Sentra SK-1035
   WxDxH = 12.5in x 19.5in x 28.25in
   Heater Capacity 10KW
   208-230VAC @ 28amps
   460VAC @ 14amps
   575VAC @ 11.6amps
Install / Layout:

1) Please refer to diagram on page 4 to begin.
2) Proximity to TCU pipe length around 100ft or less recommended. Pipe length depends more on pressure drop than actual length. Contact the chiller manufacturer for layout verification of pipe size required if over 100ft.
3) We recommend using insulated pipe from chiller to the TCU.
4) The bypass valve goes in at the end of the loop farthest from the chiller (set at ~40psi, 50 max).
5) We recommend a venting valve at the highest point of the system on the return side to make filling easier.
6) We recommend around a 20-micron mesh strainer (with ball valves and pressure gauges to indicate pressure before and after the strainer so the operator knows when it’s dirty) placed in the return line before the chiller.
7) We recommend installing a drain at the lowest point in the loop. There is a drain on the chiller reservoir but this may not be the lowest point.
8) We use the open expansion tank except in cold environments.
9) We do not use auto-fill because it would just add water, thereby diluting the concentration of additives like propylene glycol. (MTA)
10) Advantage Chillers are open fill reservoirs. (Advantage)
11) The chillers can be installed either indoors or outdoors. If indoors it must be well ventilated. You will need to evacuate 10 ton = 150k btu/hr. The 30 ton = 450k btu/hr is not recommended for indoor use due to heat load.
12) Bulk head or passthrough routing. A/C Wire (1), Water in/out (2). We recommend using remote screen on/off addon. This uses a 18/2 communication cable less than 500m.
13) Please follow manufacture install requirements. Failure to do so will void the manufacturer warranty.
14) Factors to consider when selecting a suitable installation location:
   a. Provision for adequate ambient air supply to the condenser.
   b. Loading capacity of roof or pad. The pad must be flat and level.
   c. Distance to suitable electrical supply.
   d. Accessibility for maintenance.
   e. Applicable building codes.
   f. Adjacent buildings relative to noise levels.
   g. Do not place under trees.
   h. Do not install chillers in corrosive environments like brackish air.
   i. Avoid high winds. If necessary, install a wind screen in windy areas.

Specifying issues:

1) We recommend one 10 ton chiller per set of TCUs. Therefore, we can do a 30 ton Chiller with 3 sets of TCUs.
2) We recommend 48-50°F setpoint @ 50psi.
3) Typically, pumps are specified to be 2.4 gal/min per ton.
4) Chillers can be installed near each other the standard would be keep the clearance requirement of both chillers. Most cases will be 8 feet apart.
Electricity:

1) Please verify in the chiller manual, but as a reference look at the Apeks power requirements included in your installation manual. General information is in the specs above.

Piping:

1) 10 ton unit use 1.5in pipe.
2) 30 ton unit use 3in pipe.
3) Copper, stainless. PVC, steel are all acceptable piping materials. Each has their benefits and drawback. Corrosion inhibitor is always recommended. (Just good as a general practice.)

Fittings:

1) Water connections included with each chiller TAE evo Tech 015 – 802. The threads on the chiller are BSPT and require adapters. These HAVE to be installed with an “Aerobic Thread Sealer” like Permabond MH052 or Loctite PST 565 or 567. (MTA)
2) You must use adaptors provided for proper fit. (MTA)

Water:

1) We recommend using inhibited propylene glycol at least at a 5% by volume. A general usage of 30-40% is better. Corrosion inhibitor is always recommended when the piping composition is in question (just good as a general practice).
2) Clean tap water is recommended and the system requires inhibited propylene glycol in a concentration appropriate for the minimum temperature to which the chiller will be exposed, keeping in mind that increased concentration of propylene glycol above what is necessary to prevent freezing is going to decrease the cooling capacity of the chiller. As a standard we recommend a concentration of inhibited propylene glycol at 30 – 40% for outdoor units.
3) We do not recommend ethylene glycol. This is because if there was a leak ethylene is more toxic than propylene glycol, which can be used in food grade systems.
4) Use a glycol refractometer to check concentration level. Check levels every few months.
5) Water changing periods is based on your facility schedule. Generally flush and replace every year. If water looks dirty and filter is clogging increase the schedule of flushing and replacing.
6) Never use De-ionized water. It will damage internal components in the chiller.
7) Distilled water isn’t necessary. Clean tap water and inhibited propylene glycol is recommended.
8) Contact your local waste management for disposal recommendations.
9) Refer to the Chiller owner’s manual for concentration of inhibited propylene glycol based on environmental temperature. Basically 40% propylene will protect shut down system to -20C or -4F.
Filling Your System:
1) You will need a pump for filling the reservoir and mixing the inhibited propylene glycol.
2) Order glycol ahead of time.
3) Plan for filling your reservoir, pipe length and 30% margin.
   a. 1.5in pipe is (Reservoir + 0.0918gal/ft * pipe length) * 1.3 = min required fluid vol.
      i. 100ft 1.5in pipe with 10ton MTA chiller @40% glycol is:
         (67gal + 0.0918gal/ft * 100ft) *1.3 = 99gal Fluid
         99*0.4 = 39.6 gal glycol
         99*0.6= 59.4 gal water
   b. 3in pipe is (Reservoir + 0.3670gal/ft * pipe length) * 1.3 = min required fluid vol.

Links:
https://www.-it.com/backend/prodotti/file_upload/allegato/1904161017111_5050ftaet001qa.pdf
https://www.advantageengineering.com/centralChillers/units/OACS-10S-MG-1P.php
https://www.advantageengineering.com/centralChillers/units/OACS-30S-MG-1P.php
https://www.advantageengineering.com/temperatureControllers/units/temperatureControlUnit-skg1035.php
https://www.deltatsys.com/temperature-control-system/water-units/accent-series

Contact Apeks Supercritical:
To submit a service ticket:
https://www.apekssupercritical.com/service-request/
To purchase parts from our online store:
http://apeksonlinestore.com/
For technical support:
(740) 809-1160, option 2
Service@apekssupercritical.com