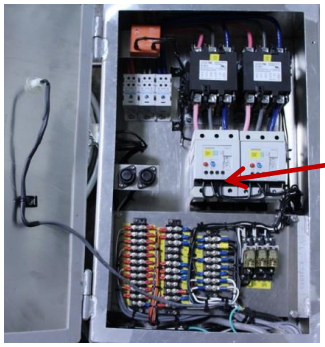
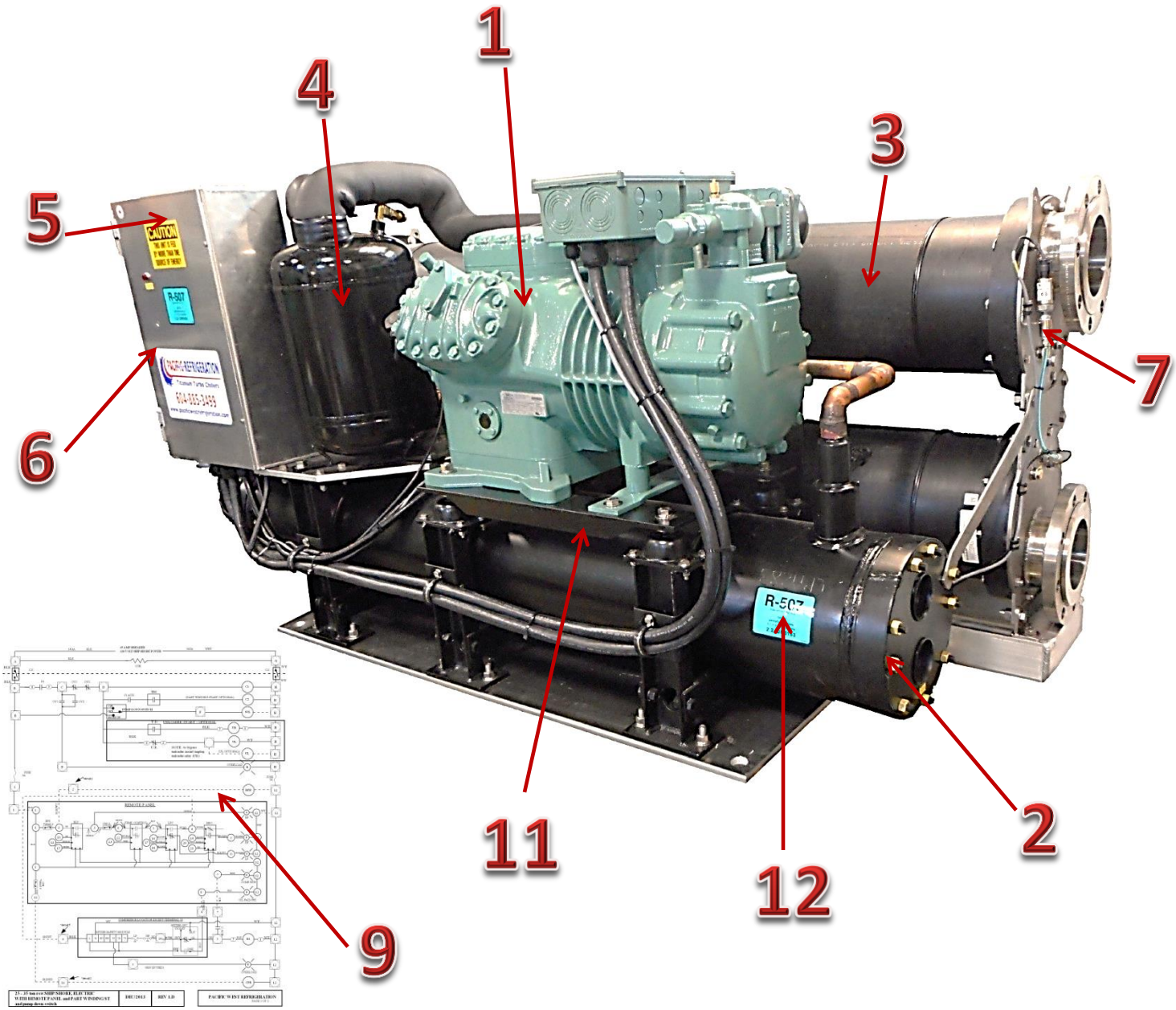
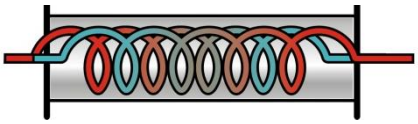
PACIFIC West REFRIGERATION
www.pacificwestrefrigeration.com
EXPERTS IN MARINE REFRIGERATION





Pacific West Refrigeration Ltd., 1647 Field Rd., Sechelt, BC, Canada, V0N-3A1
PH(604)885-3499 FX(604)885-9177 Toll Free(866)885-3499

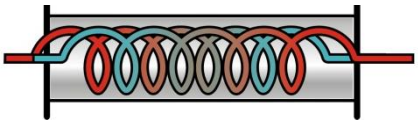
PACIFIC West REFRIGERATION
www.pacificwestrefrigeration.com
EXPERTS IN MARINE REFRIGERATION



1 BITZER COMPRESSORS. Pacific West Refrigeration has been a Bitzer OEM dealer for over 15 years and introduced the Bitzer Marine oil pan to North American fishing industry. Since then Bitzer has become one of the most popular marine compressors in North America and is now assembled in the USA.

2 STANDARD CONDENSERS. Pac West has been using Standard Refrigeration Marine Condensers for over 20 years and has been a Standard OEM customer for 12 years. Built in the USA Standard Refrigeration is the no. 1 condenser manufacture in North America. All Standard condensers are rated by H.P. in a fouled condition where most other condenser brands are rated by tons in a clean condition. Standard condensers also have a very generous pump down capacity so a second receiver is not required. Refrigerant level sight glasses are installed in each end of the condenser piping so the fisherman himself can see exactly where his refrigerant charge is at. All Pac West condensers are supported with a heavy duty zinc plate in the end cap of the condenser opposite the water end. This 4lb zinc plate usually lasts 3-5 years and the condition of the zinc plate can be detected by water drip out the end cap once the zinc plate is approx. 50% used. Standard condensers use a 1" thick heavy duty Bronze end cap on the water in end and a ½" thick bronze on the zinc end, both of which are epoxy coated, this is why Standard is the No. 1 condenser in North America and is on every Pac West system.

3 TITANIUM TURBO CHILLERS. Pac West Ref is the inventor and manufacturer of Titanium Turbo Chillers. Tired of expensive copper-nickel chillers that seem to only last 8-10 years if they are kept clean or a coiled chiller that need mega water to somewhat perform? Pac West set out to design a new marine chiller that actually chilled and lasted. Although titanium coiled chillers were nothing new to the marine industry, their ability to transfer heat from the coil was only efficient with large water volumes. Pac West Ref. designed a baffle system that drastically changed the performance and the future of marine chillers. Pac west started out with a 4" – 1Ton chiller and the 5" – 3ton chiller and from there climbed the ladder to 6", 8" and 10" chillers. With the unique tube sheets and chiller stacking capability, different water flows and tonnages were made possible. Although titanium is less conductive than copper-nickel the turbo effect of the coiled chiller and baffle system created more heat exchange than the conventional built copper-nickel chiller and the simplicity of manufacturing allows us to build the same capacity chillers in similar sizes. The HDPE barrels used as outer enclosures are the most rugged removable barrels on the market and can handle pressure surges better than any other non-metal barrel.

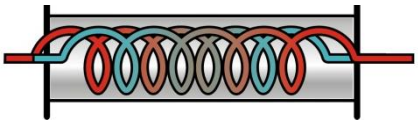


4 SUCTION ACCUMULATORS. Pac West ref. uses USA built Refrigeration Research suction accumulators. A household name in suction accumulators, Pac west designs their systems so the accumulator can hold the full charge that the chillers hold so flood back to the compressor is not possible.

5 CONTROL PANELS. Pacific West Ref. is a AYBC member and follows AYBC electrical guidelines in all electrical systems. Pac west Control panels and control systems are designed for fisherman to operate with no hassle start up and stopping. Every fisherman comments on how simple it is to operate. With its unique control system that uses a temperature and pressure control to control the temperature setting , temperatures of 30deg. F are obtainable in low salinity waters. Frozen up chillers is a thing of the past with PWR systems. The control system is also equipped with a combination pump down switch / momentary liquid solenoid energize switch that allows the operator to pump the system at the end of the day.

6 120 VOLT SHIP SHORE POWER. Pac West systems use a 120 volt control system that is separate from the main 208v / 460v 3 phase system. All systems come with a 25ft. -15A shipboard cable to tie into the boats ship / shore power supply. This power supply runs all the controls as well as the crank case heater for the compressor. On standby it draws about 1.2Amps. A couple of the benefits are the crankcase heaters are always powered even on shore power. This keeps the compressors warm and dry and ready for failsafe start up. Having the crankcase heater on is like having and light bulb on in your engine room to keep refrigeration components dry. As well as having the control system able while plugged into ship shore allows set up and testing of all components without the noise of the generator running. Especially if you are trying to trouble shoot over the phone. A 120Volt supply is safe and all remote panels and components are fused down to 5 amps.

7 BRINE/CIRCULATION PUMP PRESSURE. All Pac west systems 15ton and larger come with a brine pressure control. The control with digital display and adjustability is located in the remote panel and the transducer is located at the chiller inlet. This control not only proves that the circulation pump is running but gives the operator valuable information to the condition of the circulation system. A rise in pressure may mean the suction is blocked. If the pump gets shut off the compressor shuts down. If you want to stop the RSW system you can simply turn off the circ. pump and the chiller will shut off and restart once the pump turns back on. The pressure gauge is field adjustable for cut in and cut out. Once you have had a brine pressure switch you will never go without one again.



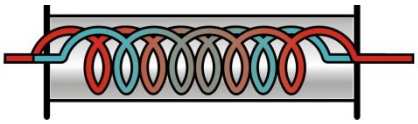
8 CONTROLS. Pac west Remote Panels use Full Gauge controls that are easily replaceable and do not require the complete gauge set to be replaced if a single control fails. These remote panels also have good clear indicators lights to indicate the system operation and simply aid the fisherman in knowing what's going on at a glance. These panels are waterproof and can be used in the engine room or wheelhouse for start-up and control. A secondary "display only" panel can be added if desired.

9 WIRING DIAGRAM. All Pac West panels have all electrical components individually wired to a terminal block. Although this adds a few extra wires to the system and a little more work manufacturing the benefits are huge for trouble shooting. Over the years this system has been improved on and perfected. The terminal strip in the remote panel matches the terminal strip in the unit panel. An engineer off shore that has a volt meter can call in for assistance to Pac West or his service man on shore and the unit can be troubleshot over the phone.
EX. Call to shore from engineer to service man.
engineer: my unit quit working .
serviceman: what lights do you have on your panel?

Engineer: circ. Pump and comp. cycle.
Serviceman: Compressor cycle. What is your suction pressure?

Engineer: 30PSI
Serviceman: The units pumped down. Can you set your meter to AC volts and take a reading from terminal F and H in the unit panel.

Engineer: it reads 120V
Serviceman: Your solenoid coil must be burnt out. On the Pac West system you have a manual stem on the solenoid you can open and get the system up and running to finish your trip and replace you solenoid when you are back at port.



10 REDUCED AMPERAGE STARTING. Pac West Ref offers two types of reduced amperage starting.
-Electronic Soft Start
-Part winding Start
Since soft starters are far less reliable and effective Pac West mainly supplies part winding start but will supply soft start if requested or if the compressor motor is 10HP or under.
-what is the difference?
Most compressors over 10HP use a dual wound motor. This is like having 2 small motors. On across the line start or soft start you connect these two winding together and run one large wire to the compressor from the starter. On part winding start you bring in one large wire from the breaker then split off to 2 smaller wires to the compressor. These 2 smaller wires are protected by 2 overloads and contactors in the unit panel. Upon energizing only the first set of windings for a .25 of a second to get the compressor turning then the second set of windings energize and brings the compressor up to speed. This kick start of the first winding cuts the starting amp draw by about half. A soft start works similar but uses electronic devices to only supply enough power to get the compressor turning then on an adjustable timer powers the compressor up the rest of the way. The advantage of part winding start is you have smaller wire and components to work with and contactors that you can get a local suppliers and repair is simple and cost effective. Soft starts are expensive, hard to get and some can be confusing to program as well they are not as reliable as part winding start. The advantage of a soft starter is they can be used on motors 10HP and smaller that are not dual wound.

11 SPREADER BARS. Pac West uses compressor spreader bars on larger compressors to evenly spread the weight onto the vibration isolator feet which gives the system a quieter smoother operation.

12 R-507. Pac West Ref was one of the first marine companies to use R-507 on chiller systems. With 35 years of experience running medium/low temp R-507 chillers in skating rink and curling rink brine systems Pac West Ref engineers brought this technology to the marine industry 20years ago and supplied its first R-507 chiller package to Alaska back in 2003.

13 RUN TESTING. Pac West Ref has one of the most complex run testing infrastructures of any marine refrigeration company and every system is time and load tested to ensure a factory tuned system to perform at its maximum capability. Customers request a copy of recorded run test and we supply.