Technical Pull-Out

Q&A FOR YOUR CATALINA THAT'S BEEN FACTORY APPROVED

Catalina 470

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Refrigeration on S/V Southern Cross

S/V *Southern Cross* has the Seafrost DC-5000 system with two holding plates in the freezer and one holding plate in the refrigerator as a cooling system. The system is designed for significant cold holding power, but there is a cost. The DC-5000 is a direct-drive compressor system that uses a 1/2 horsepower 12 volt DC motor. The unit draws 35-40 amps of current while running. Without adequate reserve battery power or some other resource for power, such as solar or wind, the system draws too much power and will drain the batteries in no time. Insulation of the freezer and the refrigerator dictate the amount of run time of the compressor. With the addition of 1/2" of R-5 insulation on the inside of each box, I was able to get run time on the compressor down to 4 hours per day. That translates to 160 amp-hrs per day! I found this to be too long and not willing to reduce the size of the boxes with more insulation another solution was needed. It came in the form of another Seafrost system, the TradeWinds. This is a small quiet 12 volt DC system that is able to keep up with normal losses from the freezer and maintain the freezer at -3 to -5 degrees F. It removes about 250 BTU/Hr. According to the instructions, the unit should be installed fairly close to the holding plates, but where on a C470. After looking around at the existing setup and the way Catalina runs the PVC piping for the refrigeration system from the aft lazarette to the freezer, I identified a space in the aft cabin where the TV was mounted as the likely location for the compressor unit. After a conversation with Cleave Horton, Seafrost, I was sure it was a good location since the noise level was only a small fan running in the background. Judie and I had recently installed a flat screen TV on the forward bulkhead, next to the mirror and the old TV space was open for other ideas. The installation was straight forward following the instructions from Seafrost. There are two sets of copper piping coils in each holding plate in the freezer (and the refrigerator too). A 1/2" pipe for a large unit, either the DC-5000 or an engine driven unit. The second set is 3/8" pipe and made for my intended use. Piping up the holding plates and installing the expansion value was only difficult in that the space is very confined. The supply and return pipe fit into the PVC pipe without a problem. I keep the end of the pipes being installed crimped closed so I had a ridge point to get through the insulation

Expansion valve in freezer

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Pipes and power coming up through the counter top

Pipes and power going into the unit

RFD and piping behind locker

and keep the insulation out of the pipes. I had the pipes exit the PVC as shown in the picture. I had pre-bent the lines to be installed to the unit before installing the compressor so that all I had to make up were the joints to the RFD (the supply 1/4 " line) and add one splice joint on the return line. All of this work is behind the small vertical locker which is removed by the four screws on the corners of the frame. A 12 volt DC power source was supplied by a new #10 dual pair wire run from the DC panel with a 15 amp breaker. After pulling a deep vacuum and checking for leaks, the R-134 was charged and leaks were looked for again. I have to tell you that I had some and could not find them. A refrigeration expert where I work told me about the new dye laced R-134. I charged some of that and using a black light, found both leaks in minutes. With a tight system, I turned it on and the DC-5000 only runs when we add lots of food to freeze or make ice and Ice Cream is now a staple in the Freezer. It is not a task beyond anyone that has been working on their boat and is willing to get in there, follow the instructions and be creative.

Second holding plate showing large and small pipe sets

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Completed unit in aft cabin

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