## 1.2 Customer Needs

Danfoss Turbocor, Inc. is developing an environmentally controlled test chamber to simulate the environments in which their compressors will be used. William Bilbow is the project sponsor and has provided the responses shown in Table 1 below.

Table : Customer Responses and Interpreted Needs

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| **Question Asked**   | **Customer Statements**   | **Interpreted Needs**   |
| 1. What problem(s) need to be solved?   | “Build upon the previous team’s design and assemble the test chamber at the Danfoss Turbocor R&D Lab Facility.”  | Adapt and tune a chamber design and build it to provide environmental control.  |
| 2. What are the expectations by the end of the project?   | “Finalize the specification and sourcing of all hardware and controls.”  | Ensure all hardware can reach the specified conditions.  |
| “Review and confirm the heat balance analysis conducted by the previous team.”  | Perform and validate the heat balance calculations done by the previous team.  |
| “Tune the environmental chamber system controls to achieve stable and specified test conditions.”  | Tune the controls to achieve stable and specified conditions quickly and accurately.  |
| “Demonstrate fundamental 6-sigma methods of problem-solving in 1+ project challenges.”  | Use fundamental 6-sigma problem-solving practices for 1 or more project challenges.  |
| “Use the numbers that the previous project group used for assumptions and target values.”  | The chamber must go from 10 to 55 degrees Celsius and from 10% to 95% relative humidity.  |
| 3. What is the volume of air that needs to be controlled?  | “The environment of the entire chamber does not need to be controlled, just the air surrounding the compressor.”   | Focus on regulating the temperature and humidity of the air surrounding the compressor.  |
| 4. What components are already in place?  | “The main test rig (base and large chamber) is already in place.”  | The design fits in and around the test rig and its surroundings.  |
| “The supports for the compressor have already been installed.”  | The design is supported by previously installed parts.  |
| 5. What are some other design considerations?  | “The compressor will be installed using a crane.”   | Accommodate space for the crane to install the compressor from above.  |
| “The compressor should be visible from all sides during the test.”  | The compressor and components are in view and the panels provide internal visibility.  |

 The team was provided with an overview of the project background, the work completed by previous teams, and a list of the project objectives. After brainstorming the questions displayed in Table 1, responses were gathered and interpreted into the true project needs over three meetings with the sponsor. The questions were presented via Microsoft Teams meetings and responses were recorded and evaluated into interpreted needs, also shown in Table 1. The primary project needs are to ensure all hardware can regulate air from 10°C to 55°C and 10% to 95% relative humidity for the Danfoss Turbocor R&D Lab Facility. The design will need to fit within the existing test rig and allow room for installation of the compressor by crane (from above).

Based on these interpreted needs, the team will continue moving forward in validating the previous design and begin formulating ways to address any issues and necessary improvements.