Laboratory HVAC Testing Research for 2013-14 (HVAC5): An Introduction and Data Dictionary

California Public Utilities Commission

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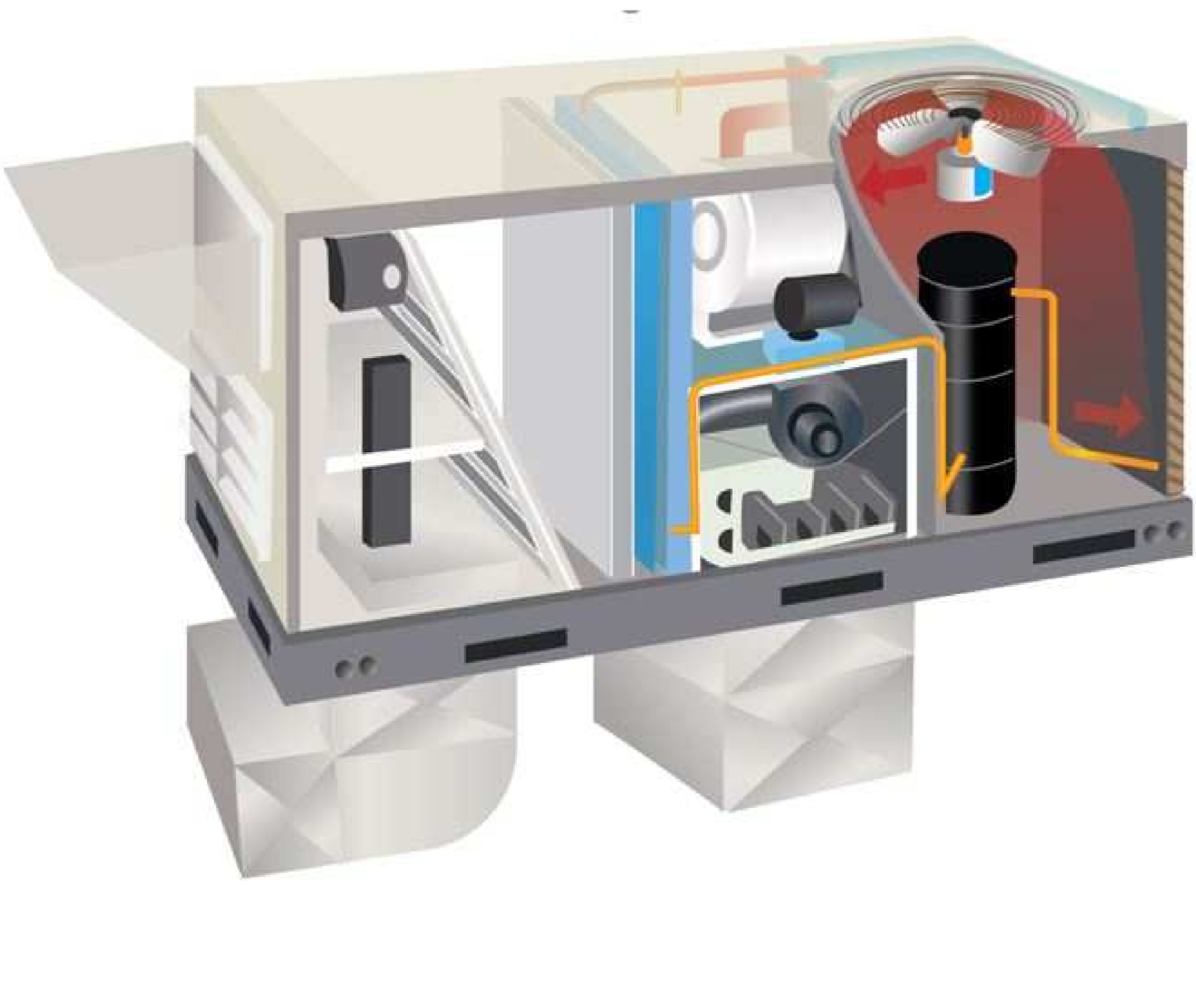

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Laboratory HVAC Testing Research for 2013-2014

Energy Division staff commissioned this study (HVAC5) in 2013-14. The objective was to obtain insight into HVAC performance using a controlled laboratory environment. Intrinsically, laboratory testing provides impact data and insights into HVAC system response to service actions that are not possible in a field study. HVAC laboratory testing is an ongoing activity spanning multiple program cycles.

The Introduction to this report is authored by DNV GL and references the laboratory report by Robert Mowris and Associates (RMA) with more detailed findings. The Introduction capacity and efficiency values have been converted from system to equipment format that can be used as inputs into building simulations models such as those used by the investor-owned utility (IOU) workpapers and the Database for Energy Efficiency Resources (DEER). However, the lab results provide useful underlying measurement data which are being made available to the public with publication of this report. The DNV GL team used the lab data to produce adjusted findings that can be used in building simulations and to inform program savings estimates for program impacts using appropriate engineering best practices. These estimates are contained in the test data file (APPENDIX D). Please see section 2.1 of this report for more details.

The detailed laboratory report prepared by RMA is being provided to the public exactly as submitted by the authors, and has not been edited by DNV GL or Energy Division.

Sincerely,

Peter Biermayer P.E.

1 INTRODUCTION

This document provides an introduction to a detailed report of the results of laboratory testing of heating, ventilation, and air conditioning (HVAC) equipment for the California Public Utilities Commission (CPUC). It identifies why the work was completed, objectives, and study approach. It also provides some of the major findings from the laboratory testing.

Per the Laboratory HVAC Testing Research Plan, the purpose of these tests is to establish the energy impacts of faults that HVAC maintenance programs address. The test results are also meant to:

- Improve the accuracy of the California Database for Energy Efficiency Resources (DEER) updates
- Examine fault detection diagnostic (FDD) reliability
- Examine instrumentation accuracy
- Probe unexpected findings

This report assumes that the reader has a basic level of HVAC knowledge. APPENDIX B provides HVAC fundamentals and a discussion of the refrigeration cycle.

1.1 Background

Air conditioning is a key contributor to peak electric demand across California. Many existing air conditioners operate less efficiently due to performance deficiencies or faults. Unfortunately, direct measurement of efficiency in the field presents physical constraints and unknown and uncontrollable factors that result in higher measurement uncertainty than laboratory testing. Past CPUC HVAC evaluations have shown that the field test measurement uncertainty may exceed the magnitude of the efficiency and capacity changes resulting from correcting the fault.[1] Reliable efficiency measurements require controllable, accurate, and repeatable laboratory testing that is generally performed only for new equipment at standardized test conditions. The CPUC has initiated laboratory testing of HVAC equipment at off-design or in situ (existing installed system) conditions to support Quality Maintenance (QM) and commercial HVAC tune-up energy efficiency programs administered by investor-owned utilities (IOUs) in California.

This document provides an introduction to a more detailed report on the results of ongoing laboratory tests investigating the impact of HVAC maintenance faults on efficiency as well as additional discoveries beyond the initial objectives. This is the second in what will be a series of documents that report on the results of these laboratory tests.[2] This report period covers laboratory test data from the 2010-12 and 2013-14 funding cycles. The CPUC is conducting this testing for the following reasons:

- **To capitalize on the potential energy savings of HVAC energy efficiency programs.** The potential electric energy and peak demand savings from commercial HVAC equipment is significant.[3] Improving the accuracy and reliability of savings estimates in the HVAC programs will have a greater effect on the accuracy and reliability of the portfolio as a whole.

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[1] DNV GL, *Evaluation, Measurement, and Verification of the California Public Utilities Commission HVAC High Impact Measures and Specialized Commercial Contract Group Programs.* CPUC, 2010.

[2] DNV GL, *HVAC Impact Evaluation FINAL Report WO32*. CPUC, 2015. http://www.calmac.org/publications/FINAL_HVAC_Impact_Evaluation_WO32_Report_28Jan2015_Volume1_Report.pdf. An interim memo was produced for the IOUs and WHPA August 2013.

[3] California Public Utilities Commission. *California Energy Efficiency Strategic Plan: January 2011 Update*. http://www.energy.ca.gov/ab758/documents/CAEnergyEfficiencyStrategicPlan_Jan2011.pdf

- **To improve accuracy of program savings estimates.** The installation and realization rates from the 2006-08 and 2010-12 impact evaluations showed that recent ex ante (before evaluation) HVAC energy savings estimates were unreliable. Laboratory testing increases accuracy of these important savings estimates by replicating actual installations, testing installation and maintenance faults under controlled conditions, and updating DEER[4] inputs. Laboratory testing also helps focus evaluation field measurements on the most significant variables.
  - The CPUC DEER team has already used the results of the laboratory tests to support savings estimates from fault evaluations.
- **To improve energy efficiency program delivery.** Laboratory results can improve FDD and allow HVAC technicians to more clearly identify the cause or causes of operational issues. Current issues that can be addressed by laboratory testing include a general lack of knowledge, unproven diagnostic methods, inaccurate tool use, and unreliable measurement predictors.
- **To satisfy energy efficiency program requirements.** The CPUC requires that some measures receive ex-post evaluation to best determine the actual energy and demand impacts. A primary objective of the laboratory testing is to inform the ex-post evaluation effort by developing estimates of common HVAC faults that are difficult to measure in the field. Incorporating laboratory measurements in the ex post evaluations will improve the confidence in program-level estimates.
  - The impact evaluation of the 2013-14 QM programs[5] has already used the laboratory data to support energy savings estimates associated with condenser coil blockage, among other things.
- **To maximize the energy savings of HVAC energy efficiency programs.** Lab testing has suggested additional measures and savings opportunities for inclusion in HVAC installation and maintenance programs, and will guide the development of best practices for these programs. Improved practices have significant potential to increase electric energy and peak demand savings for these programs.

Laboratory testing enables the most effective determination of the impact of faults on capacity and system efficiency, which drive energy use and affect occupant comfort. It allows control and consistency of all test conditions and can isolate faults and eliminate system effects. It uses more accurate instrumentation with optimal sensor placement to measure unit performance under known faults generated at precise levels. In the field, under weather and occupant-control conditions, faults are diagnosed but often impossible to directly observe. Consequently, instrumentation must sacrifice sensitivity and accuracy for reliability, cost per sample point, and non-destructive installation. Detailed laboratory testing is essential to understanding the findings from fieldwork, especially in quantifying smaller efficiency improvements where the change in system efficiency is less than the field measurement uncertainty.

Scalable conclusions can be reached based on the tests conducted in this study, allowing wide application of the findings to non-tested systems because the fundamental operational characteristics of HVAC units are not expected to differ widely between manufacturers of units with similar designs.

This report provides results of two types of tests conducted primarily in the 2013-14 funding cycle:

1. Testing to determine the capacity and efficiency of units under typical in situ and fault conditions

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[4] California Energy Commission (CEC) and CPUC sponsored database designed to provide well-documented estimates of energy and peak demand savings values, measure costs, and effective useful life (EUL) all with one data source.

[5] DNV GL, *Impact Evaluation of 2013-14 HVAC3 Commercial Quality Maintenance Programs*. CPUC, 2016.

2. Testing to determine the ability of equipment and current procedures to diagnose maintenance faults.

In all cases, the testing focuses on unitary systems subject to American National Standards Institute /Air-Conditioning, Heating, and Refrigeration Institute (ANSI/AHRI) Standards 210/240 or 340/360, depending upon system size.

1.2 Objectives

The laboratory team includes staff from DNV GL (primary evaluators), Robert Mowris and Associates (RMA), and Intertek (an independent AHRI certified testing laboratory). The team worked closely with HVAC maintenance and installation program implementers, IOU representatives, and industry groups (e.g., the Western HVAC Performance Alliance or WHPA) to identify the objectives for this project. Some of the key objectives of the testing activities include:

- Reducing uncertainty and establishing confidence in ex ante and ex post savings estimates
- Developing comprehensive, reliable knowledge-based information serving the needs of multiple stakeholders
- Conducting enhanced and ongoing collaboration between laboratory testing, program evaluation, and implementation teams to evaluate the success of HVAC programs
- Developing standardized laboratory test protocols with a common data repository for test results and reporting of HVAC system operational metrics under non-AHRI standard conditions
- Developing tests to characterize the performance or effectiveness of:
    - Systems that include emerging HVAC technologies such as digital economizers
    - Systems that suffer from commonly occurring faults
    - FDD protocols

1.3 Approach

The laboratory regimen was established by the CPUC, in part based on a desire to understand the efficiency of an HVAC system across its entire lifetime. Prior to this project, the only reliably known equipment efficiency was that determined during equipment design, when manufacturers are required to measure the rated efficiency under standardized conditions (AHRI-specified conditions). However, it is a well-known fact that the efficiency of the equipment as it is installed and operated is likely not equal to the rated efficiency. The DNV GL team devised the HVAC Lab testing strategy to address the unknowns. The goal of the strategy is to test each unit under the following regimen:

- **Out-of-the-Box (OOTB):** This test measures the condition of the unit as it is received from the manufacturer, or straight "out-of-the-box." It is equivalent to the unit condition entering the installation phase. Typically, the conditions for this test (Table 1) differ from AHRI-specified conditions in that:
    - Static pressure settings are typical of in situ conditions (more detail later)
    - The unit is left as shipped with no additional sealing
    - The supply fan speed is left as shipped
- **Refrigerant Weigh-in:** After the initial OOTB test, the refrigerant is recovered and weighed to determine whether it matches the factory nameplate specification.
- **AHRI:** Units are tested under AHRI test specifications to confirm that they meet AHRI requirements within the allowable tolerances. Modifications to meet AHRI conditions generally include reduction in supply fan speed to meet AHRI flow and external static pressure requirements, insulation under the unit,

and cabinet air leakage sealing. The specifications for a 7.5-ton and 3-ton rated-capacity unitary commercial air conditioner are listed in Table 1.

- **In-situ:** A number of tests are conducted under in-situ conditions; that is, conditions that were found to be typical during CPUC HVAC evaluation field studies sampled from past IOU program populations. These tests are conducted across a range of operating conditions to give us a better sense of how those conditions affect efficiency. The following are in-situ tests performed:
  - *Economizer testing:* California requires economizers to be installed on all commercial air conditioners above a certain size; however, economizers are not part of the AHRI test specification and therefore the effect of the economizer is not included in the AHRI rated efficiency.
  - *Damper position:* These tests are conducted to determine the effect of changing damper positions on outdoor air ventilation rates and unit capacity and efficiency.
  - *Part-load operation:* These tests are conducted to determine performance at conditions less extreme than the design state, which is called part-load operation. Smaller units (less than 65,000 Btu/hr) must use cycling tests to determine rated efficiency (SEER), while larger units use a test at a single set of conditions (AHRI energy efficiency rating "A" or "B" test) or use the average of four sets of conditions (integrated energy efficiency ratio or IEER) to determine rated efficiency. The part-load operation test replicates the cycling test on larger units, which is assumed to be more representative of typical operation.
  - *Fault testing:* These tests are conducted to determine the effect of faults such as low refrigerant charge, non-condensable impurities in the refrigerant, and refrigerant system restrictions on unit capacity and energy efficiency and gain information that may help diagnose the faults in the field.
- **Diagnostic Equipment Testing:** Tests were also conducted with diagnostic equipment to assess the accuracy of field instrumentation and issues with typical field measurement protocols.

Table 1. AHRI, OOTB, and in-situ test specifications

Specified Condition	AHRI	OOTB	In Situ
External Static Pressure	7.5-ton: Maximum 0.25 in H_2O (inches of water column) 3-ton: Maximum 0.15 in H_2O	0.3 to 1.2 in H_2O	0.3–1.2 in H_2O
Airflow	Maximum 450 standard cubic feet per minute (SCFM)/ton[6]	400 SCFM/ton	Varies from 250 to 680 SCFM/ton
Indoor Dry-Bulb (DB)	80°F	80°F	75°F
Indoor Wet-Bulb (WB)	A & B Tests: 67°F C & D Tests: 57°F	A & B Tests: 67°F C & D Tests: 57°F	62°F
Outdoor Dry-Bulb (DB)	A Tests: 95°F B, C, & D Tests: 82°F	A Tests: 95°F B, C, & D Tests: 82°F	Varies from 55°F to 115°F
Outdoor Wet-Bulb (WB)	A Tests: 75°F* B, C, & D Tests: 65°F*	1 test: 76°F 13 tests: 70°F 2 tests: 65°F 4 tests: 58°F	Varies from 51°F to 80°F
Cabinet Sealing	Yes	No	Varies
Refrigerant Charge	Factory	As delivered (OOTB)	Varies
Economizer	No	No	Varies

NOTE: A, B, C, and D tests are defined by ANSI /AHRI Standards 210/240 or 340/360.
SCFM is the volumetric flow rate of a gas corrected to standardized conditions of temperature and pressure, eliminating the effect of density and resulting in a comparable flow rate that corrects for mass.
* The specified test condition only applies if the unit rejects condensate to the outdoor coil.

The primary difference between the AHRI test conditions and the OOTB and in situ test conditions is the external static pressure. External static pressure represents the resistance that the blower fan needs to overcome to push the air through the duct system to the space it conditions. The AHRI tests are conducted using a static pressure that does not represent typical installed conditions. The OOTB tests and in situ tests are conducted at a static pressure consistent with what has been measured and observed in field studies.

1.1 Tested equipment

The tests reported in this document were conducted on 7.5-ton and 3-ton commercial packaged units. These units were unused (new) and purchased from a variety of sources. The air conditioner manufacturer, unit size, model, economizer manufacturer, and diagnostic manufacturer were chosen to reflect the largest portion of the population of units served by commercial CPUC HVAC programs, which are shown in Table 2.

6 SCFM is the volumetric flow rate of a gas corrected to standardized conditions of temperature and pressure, eliminating the effect of density and resulting in a comparable flow rate that corrects for mass.

Table 2. Chosen equipment and percent of typical QM Program represented

Equipment Characteristic	Percent Represented	Defined Population
Manufacturer	75%	Systems that received QM services in typical program[7]
Model	14%	Systems that received QM services in typical program
Non-TXV* models	25%	Total units in tons of cooling that received QM services
TXV* models	22.9%	Total units in tons of cooling that received QM services
Economizer Manufacturer	90%	Economizers installed on systems that received QM services
Diagnostic Tool Manufacturer	80%	Tools used by technicians performing services in QM programs

* TXV is thermostatic expansion valve.[9]

DNV GL believes that generalized and scalable conclusions can be reached based on the tests conducted on these units, allowing wide application of the findings to other non-tested equipment because the fundamental operational characteristics do not differ widely between manufacturers.[8] The possible exception may be non-TXV[9] systems with single fixed-geometry expansion devices rather than the multiple parallel fixed-geometry expansion devices tested in this effort.

1.2 Completed tests

Table 3 provides an overview of the rooftop unit (RTU) test results provided in the report. The test names in Table 3 provide a general description of the test performed; however, the individual tests performed on each unit may have been conducted under different in-situ conditions, which are specified in the laboratory report. In other words, a refrigerant charge fault test on RTU 1 may not be directly comparable to a refrigerant charge fault test on RTU 3 because the test for RTU 1 may have used different test conditions, such as different damper positions and airflow rates.

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[7] Program implementer data in 2010-12 were used to determine quantity of units receiving QM program incentives by manufacturer (see EEGA 2267 RCA Data_SDGE3161.xls).

[8] While the data itself can be considered scalable, the interpretation of the data represents the opinion of RMA. The results indicate trends in energy use specific to the test conditions. Extrapolating these results to installed units will need to consider behavioral factors such as set point temperatures, operating schedules, and actual weather conditions.

[9] A TXV unit uses a valve to adjust the flow of refrigerant entering the evaporator based upon a temperature sensor that measures the degree of superheat exiting the evaporator. A non-TXV unit is one that uses fixed-geometry expansion devices to control the flow of refrigerant to the evaporator.

Table 3. Overview of RTU tests conducted

Test Category	RTU 3 7.5-ton Non-TXV	RTU 2 7.5-ton TXV	RTU1 7.5-ton TXV	RTU 5 3-ton Non-TXV	RTU 4 3-ton TXV
OOTB	X	X	X	X	X
Part-load Cycling Tests	X	X		X	X
AHRI Verification	X	X	X	X	X
Manufacturer Charge Diagnostics	X	X	X	X	X
Outdoor Air Fraction at Varying Damper Positions	X	X		X	X
Effect of Damper Position on Efficiency and Capacity	X	X		X	X
Effect of Inoperable, 100% Open Economizer on Efficiency and Capacity	X				
Airflow Impacts	X	X			
Refrigerant Charge Faults	X	X		X	X
Non-condensable Faults	X	X			
Condenser Blockage Faults	X	X		X	
Evaporator Blockage Faults	X	X		X	
Refrigerant Restriction Faults	X	X			
Multiple Faults	X	X		X	

Table 4 provides an overview of the diagnostic instrument test results provided in the report.

Table 4. Overview of diagnostic tests conducted

Test Name
Refrigerant Hose Measurement Test
Refrigerant Tube Measurement Instrument Test
Pressure Measurement Instrument Test
Airflow Measurement Instrument Tests

1.4 Report structure

The detailed report follows a structure similar to this introduction, with a section on the study background, objectives, and testing methods. The results are presented and organized by unit, with individual sections for each test performed on that unit. A separate section presents the results of the diagnostic testing. The conclusions and recommendations are presented at the end of the report.

Each individual test section indicates the purpose of the test, the general test conditions, the test results, and a description of the trends. As an example, consider the non-condensable fault tests conducted on the 7.5-ton non-TXV unit, RTU3. The section begins with the purpose of the tests: to evaluate the impact of non-condensables on the efficiency of the unit. It describes the test conditions: economizer installed, dampers closed, economizer perimeter unsealed, and airflow of 360 SCFM/ton.[10] It also describes the varying test conditions: outdoor conditions of 82°F, 95°F, and 115°F, and indoor conditions of 75°F DB and 62°F WB temperatures. It also indicates how the non-condensables were "introduced" by adding 0.4 oz of nitrogen to the refrigerant system. The write-up goes on to discuss the quantitative tests results for each of the six tests conducted to study the effects of non-condensables, and provides a table and figure of the results. The other test sections follow a very similar structure.

While the findings from each group of tests are included in the individual test sections, they are also summarized in the conclusions section of the report. These findings represent the specific interpretations of the testing contractor, Robert Mowris Associates. The actual changes in energy use of an installed unit may vary once site-specific influences of behavior and weather conditions are considered. The DNV GL team has produced adjusted findings that can be used in building simulations, contained in the test data file (APPENDIX D). See APPENDIX A for additional details.

[10] Standard cubic feet per minute (SCFM) is the volumetric flow rate of a gas corrected to standardized conditions of temperature and pressure, eliminating the effect of density and resulting in a comparable flow rate that corrects for mass.

2 FINDINGS

This section summarizes the main findings from the laboratory testing.

This section does not present detailed quantitative findings; rather, it indicates general trends seen in the test results and how they appear to affect performance and efficiency. The same quantitative effects may not represent the actual changes in energy use of an installed unit once site-specific influences of behavior and weather conditions are considered. The DNV GL team has produced adjusted findings that can be used in building simulations, contained in the test data file (APPENDIX D). APPENDIX A provides additional details.

2.1 How to use the results

The detailed laboratory report presents quantitative capacity and efficiency measurements under changing conditions, such as varying refrigerant charge, introduced faults, and changing outdoor temperature. However, these quantitative results cannot be used directly in building simulation programs, engineering calculations, or to estimate energy efficiency savings because of the way they account for the air conditioner load resulting from outdoor air. While the CPUC does not use the reported capacity and efficiency to directly calculate energy savings in an impact evaluation, the raw lab results (the underlying data) were used in the impact evaluation to update efficiency versus charge curves and inform coil cleaning impacts, among other results. For example, Figure 4 shows a figure from the report of the impact evaluation of the 2013-14 QM programs[11] with the relative change in efficiency against the relative increase in discharge pressure for units with condenser coil blockage.

The difference between the laboratory report's measured capacity and efficiency and the capacity and efficiency values used in CPUC energy savings simulations or engineering calculations has to do with how the outdoor air load is treated. APPENDIX A discusses the difference in greater detail. The Intertek laboratory is designed for AHRI testing, which does not use outside air, and thus does not account for outdoor air in the load on the cooling coil. When outside air is introduced to the unit, as in the fault tests conducted for the detailed report, the efficiency and capacity values are dependent on the mixed temperature of the return air and the outdoor air together. Physically separating the two flows to measure flow rates (and determine capacity requirements) individually would be wildly inconsistent with how units are operated; leaving them together makes it impossible to directly measure the two coil loads (return air and outside air) separately.

The HVAC lab team has worked with the CPUC DEER team to develop a methodology for translating the laboratory data into values that can be used in simulations, outlined in APPENDIX A. The DNV GL team has produced adjusted findings that can be used in building simulations, contained in the test data file (APPENDIX D).

2.2 Important findings – general testing

- The impact of economizers on system efficiency is significant and unexpected due to higher than anticipated economizer leakage. For units tested with economizers, average closed damper outdoor airflow was 18% of total system airflow. This may exceed ASHRAE 62.1 minimum outdoor air ventilation requirements for common commercial buildings.
- Excess ventilation loads (over code-required minimums) can have a significant negative impact on cooling efficiency.

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[11] DNV GL, *Impact Evaluation of 2013-14 HVAC3 Commercial Quality Maintenance Programs*. CPUC, 2016.

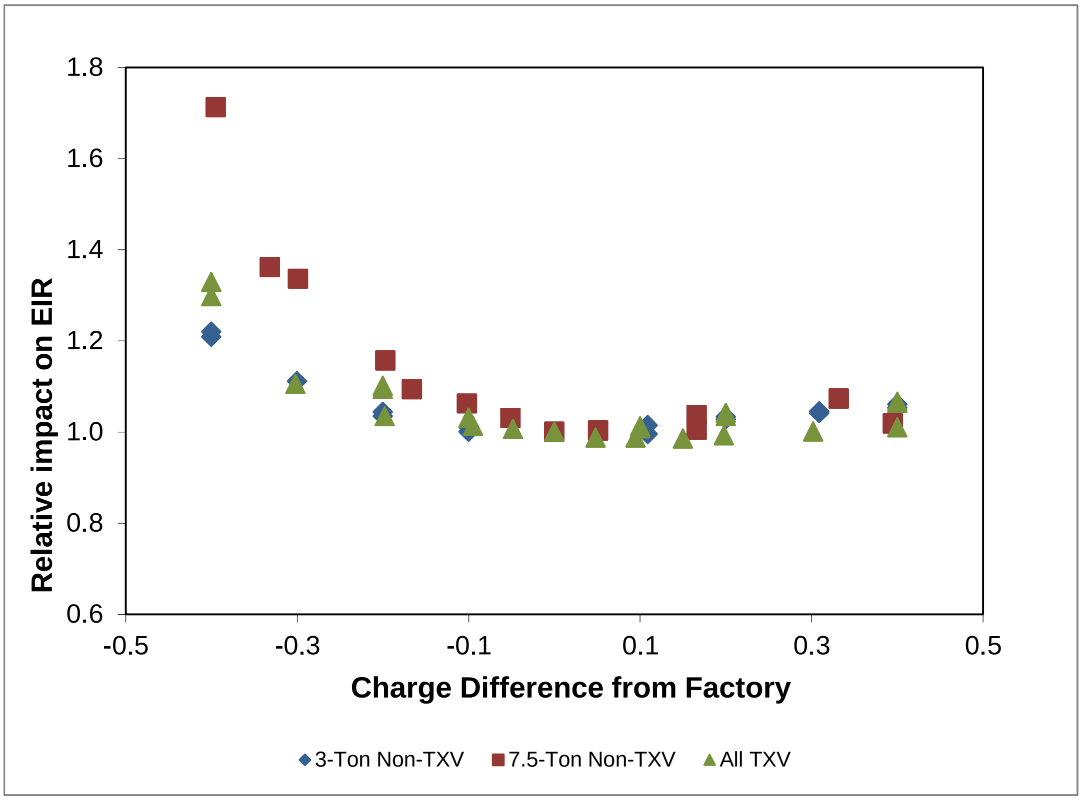
- For economizers that were 100% open, the average outdoor airflow is 68% of total system airflow instead of 100%, limiting the amount of free cooling supplied.
- Economizer outdoor airflow varies as a function of damper position and return static pressure. Such data are not typically provided by manufacturers, so technicians do not have a reliable method to establish optimal damper position without making direct measurements of outdoor airflow.
- If operating properly, an economizer with changeover set points at 70ºF or lower can increase cooling capacity and save energy.
- The units as delivered from the manufacturer (out-of-the-box, or OOTB) did not consistently perform at the rated efficiency. OOTB units produced higher supply airflow than allowed by applicable AHRI standards for four of the five units tested. Single-compressor units tested within the published AHRI efficiency and capacity values, but the dual-compressor units had efficiency below the rated values. The as-shipped refrigerant charge levels were less than the listed factory charge for three of the five units tested.
- Each unit required modifications to meet the established AHRI test conditions and achieve the published efficiency and capacity ratings. These modifications included operating fans at lower speeds (by adjusting the motor sheave or installing a larger diameter pulley) to reduce airflow rates and reduce external static pressure. More than one of the units needed to have refrigerant added beyond the factory charge in order to meet the published efficiency. Laboratory staff also had to seal all unit cabinets with tape to insure minimal leakage.
- Optimal efficiency at external static pressures representing field conditions was achieved at airflow rates lower than the nominal 400 cfm/ton. The fan power required to increase the airflow rate at higher static pressures overshadowed the efficiency gains due to improved heat transfer at the coils.

2.3 Important findings – fault testing

- The diagnosis and adjustment of refrigerant charge is difficult to achieve in the field since both total unit airflow and the presence of outdoor air intake affect the reliability of fault diagnosis and detection. Most fault detection diagnostic protocols are based on entering evaporator coil (or mixed air) conditions, which are nearly impossible to measure in the field with standard contractor maintenance equipment.
- The accuracy of refrigerant charge diagnostic tests varied greatly. Manufacturer specific protocols correctly diagnosed incorrect refrigerant charge from 25% to 97% of the time (depending on unit) with an average correct diagnosis rate of 48%. The CEC testing protocols, also known as the superheat and subcooling protocols, were accurate predictors of refrigerant charge faults from 23% to 51% of the time with an average correct diagnosis rate of 31%.
- Undercharge conditions had a much greater (negative) impact on capacity and efficiency than overcharge conditions for both TXV and non-TXV[9] units as illustrated in Figure 1, which shows the relative effect of undercharging and overcharging on one measure of system efficiency, the electric input ratio (EIR)[12]. The larger the relative EIR, the greater the negative impact.

[12] EIR is the reciprocal of the coefficient of performance (COP).

Figure 1. Refrigerant charge impact on unit efficiency (95ºF OAT)



- The optimal refrigerant charge for a unit may slightly exceed the factory charge at high outdoor air temperatures with excess outdoor airflow. This is illustrated in Figure 1, which shows curves that "bottom out" at a point slightly greater than 0% charge difference for a test conducted at 95ºF outdoor temperature.
- Refrigerant line restrictions lower suction pressure and evaporator saturation temperature and increase superheat. These are similar to the symptoms for refrigerant undercharge, which may result in a misdiagnosis.
- For the 7.5-ton non-TXV unit, the refrigerant charge diagnostic protocols misdiagnosed non-condensables as undercharge.
- Cooling capacity and efficiency impacts due to evaporator coil blockage are correlated to changes in evaporator airflow, shown in Figure 2 and Figure 3. This suggests that the impacts of evaporator coil blockages can be estimated in the field using airflow measurements.

Figure 2. Impact of evaporator coil blockage on total and sensible gross cooling capacity

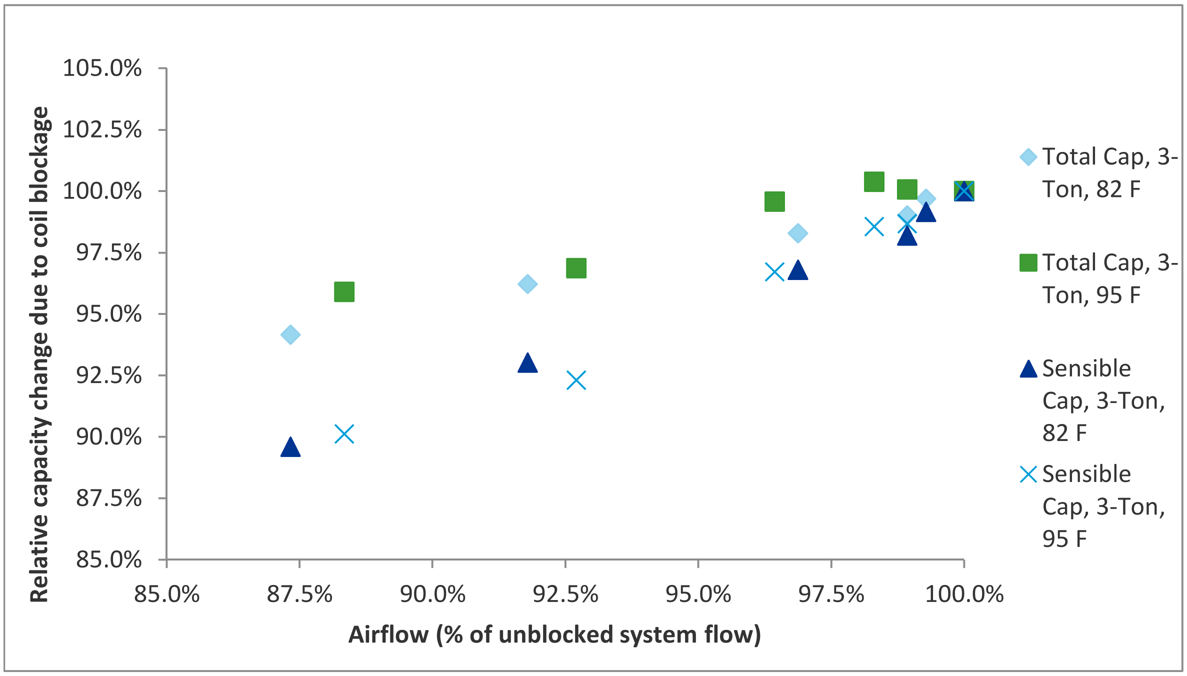
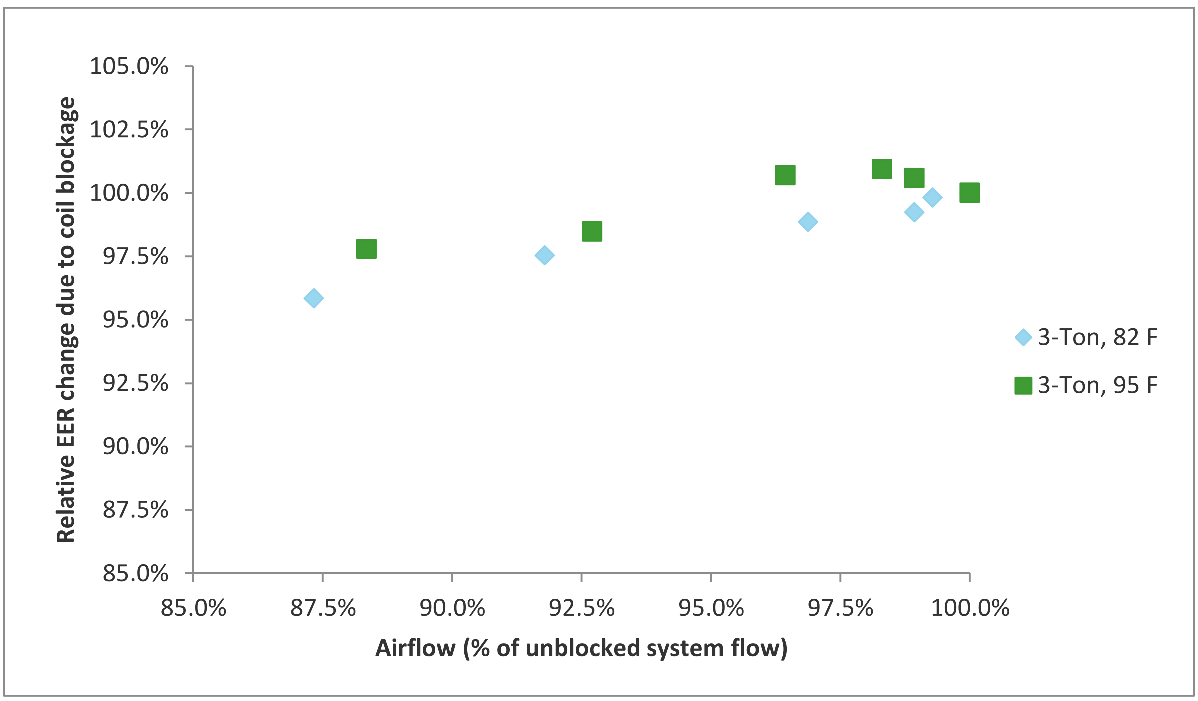


Figure 3. Impact of evaporator coil blockage on relative efficiency



- Evaporator coil blockage reduces both airflow and evaporator heat transfer surface area, which makes it difficult to use one diagnostic test, called the temperature split method, to diagnose the blockage. The temperature split method is designed to diagnose low airflow under clean coil conditions, and is confounded by the combination of reduced airflow and reduced heat transfer surface common to evaporator coil blockage faults.

- A condenser coil blockage has a greater negative effect on system efficiency than an evaporator coil blockage.
- An evaporator blockage lowers sensible efficiency and capacity (which influences room temperature and thermostat operation) more than total efficiency. Sensible capacity determines unit run time and energy consumption.
- Cooling capacity and efficiency impacts due to a condenser coil blockage are highly correlated to changes in condenser discharge pressure, shown in Figure 4 and Figure 5. This suggests that condenser coil blockages can be estimated in the field using condenser discharge pressure measurements.

Figure 4. Sample figure from HVAC3 commercial QM program evaluation

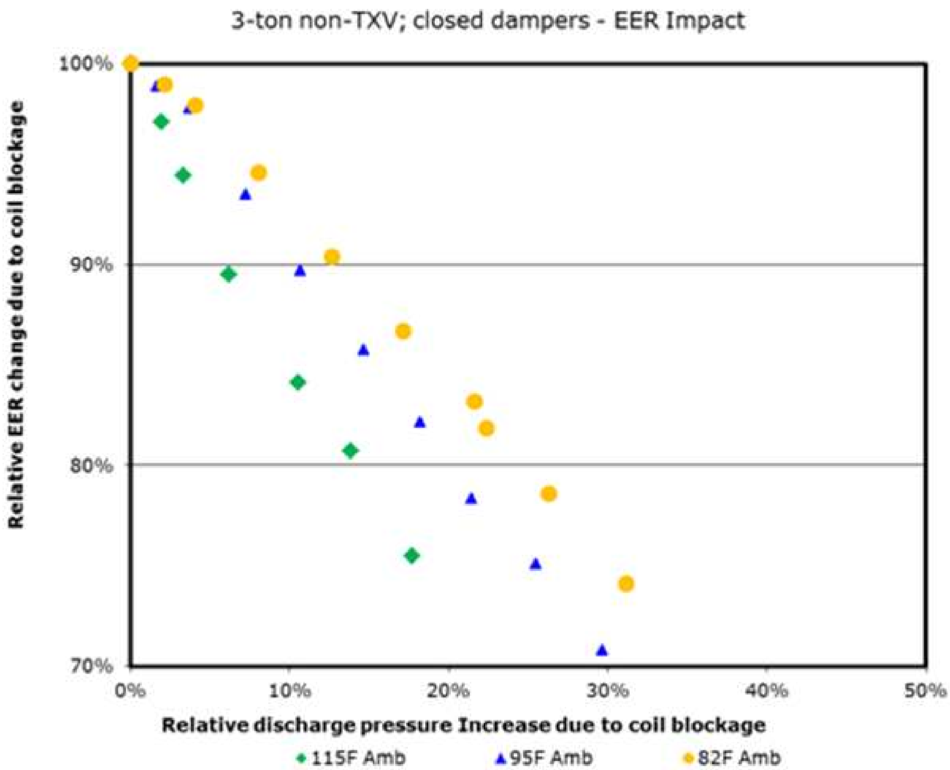
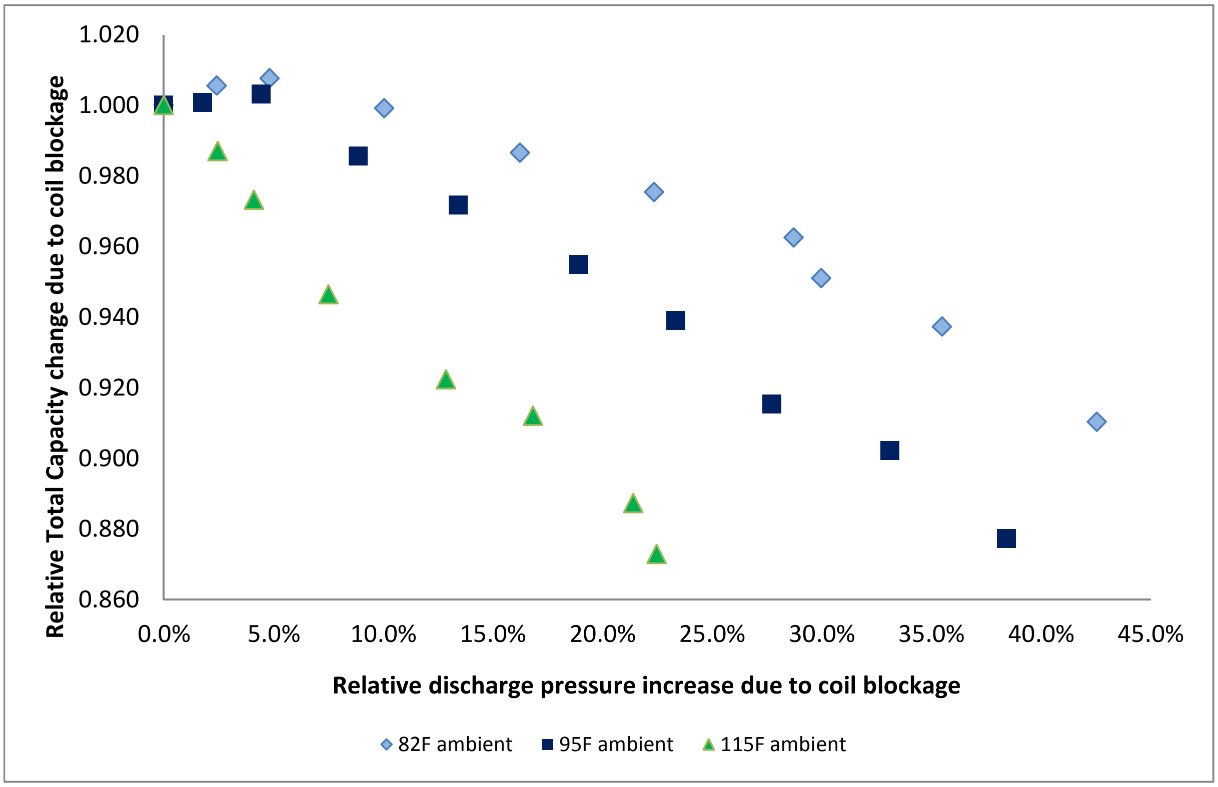


Figure 5. Relative total capacity impact due to condenser coil blockage



- Multiple fault tests showed that the sum of the impacts of the individual faults accurately predicted the effect of the combined multiple faults. One exception is the combination of condenser blockage and refrigerant restrictions, where the combined impact is less than the sum of the individual faults.
- Troubleshooting multiple faults through a logical progression will reduce or eliminate false alarms, misdetection, and misdiagnosis. Cleaning coils, changing filters, and checking airflow are important first steps before attempting additional FDD on the unit.

2.4 Important findings – diagnostic instrument testing

- The CEC testing protocol often failed to correctly diagnose refrigerant charge faults. On average, manufacturer-specific protocols do better than generic protocols, but are not as accurate as the weigh-in method.
- Both generic and manufacturer-specific refrigerant charge testing protocols give "false alarm" readings at some conditions.
- One unit (RTU2) was tested for the effects of attaching and detaching refrigerant hoses. Total power, sensible EER, sensible capacity, and total EER all decreased as the number of attachments increased. Total EER showed the greatest decrease, with more than a 10% loss of efficiency at 60 attachment cycles. This may be due to the introduction of non-condensables or may be due to refrigerant loss. Further study is necessary to determine the exact cause of the change in efficiency.
- It can take 5 to 10 minutes for the refrigerant-tube temperature measurement instrument sensors to read the correct temperature due to the starting temperature of the measurement sensor, even when the unit is already in steady-state operation.

- Type-K scissor clamp refrigerant-tube measurement devices were the most accurate measurement of refrigerant temperature. The least accurate were Type-K insulated bead probes and thermistors, which recorded a 10 ºF temperature error at 95ºF ambient conditions. Such errors can result in misdiagnosed or undiagnosed faults.
- Refrigerant-tube test measurements were most accurate at the 10:00 and 2:00 position of the tube and least accurate at the 6:00 position, where liquid refrigerant is most likely to collect if present.
- Preliminary tests show that the average difference between laboratory and digital pressure measurement instruments was 0.57% +/- 0.24%. The average difference between laboratory and analog pressure measurements instruments was 1.76% +/- 0.57%. Only best-case conditions have been tested; further tests at high-temperatures are planned to simulate instruments that sit in a closed vehicle on a hot day.

3 DETERMINING FUTURE TESTING

The HVAC Laboratory Testing team recommends continued testing activities in future HVAC roadmaps. The data collected to date has already allowed for the following improvements:

- The laboratory test activities described in this introduction have been a resource for understanding the impacts of refrigerant system faults on unit performance, and the ability of FDD protocols to correctly identify faults.
- The test activities contributed to the impact evaluation of the refrigerant charge and coil cleaning components of the commercial maintenance programs and the refrigerant charge adjustment updates to the 2018 DEER.
- The fan power and economizer airflow data from the test activities have been used to improve the specification of building prototypes used across all DEER measures.
- Information on the efficacy of FDD protocols has informed the development of evaluation field test protocols.

In addition, the release of the test results will provide the HVAC research community with a rich dataset for further investigations of the impact of HVAC system faults on unit performance and the development of new FDD and field test protocols.

DNV GL recommends further discussion among the HVAC community to inform the development of the next test plan to direct laboratory research. The discussion should include many interested stakeholders, including the CPUC, CPUC advisors, ex ante team, IOUs, implementers, Western HVAC Performance Alliance (WHPA), evaluators, and interested academics. The laboratory team has established the following methodology for facilitating that discussion:

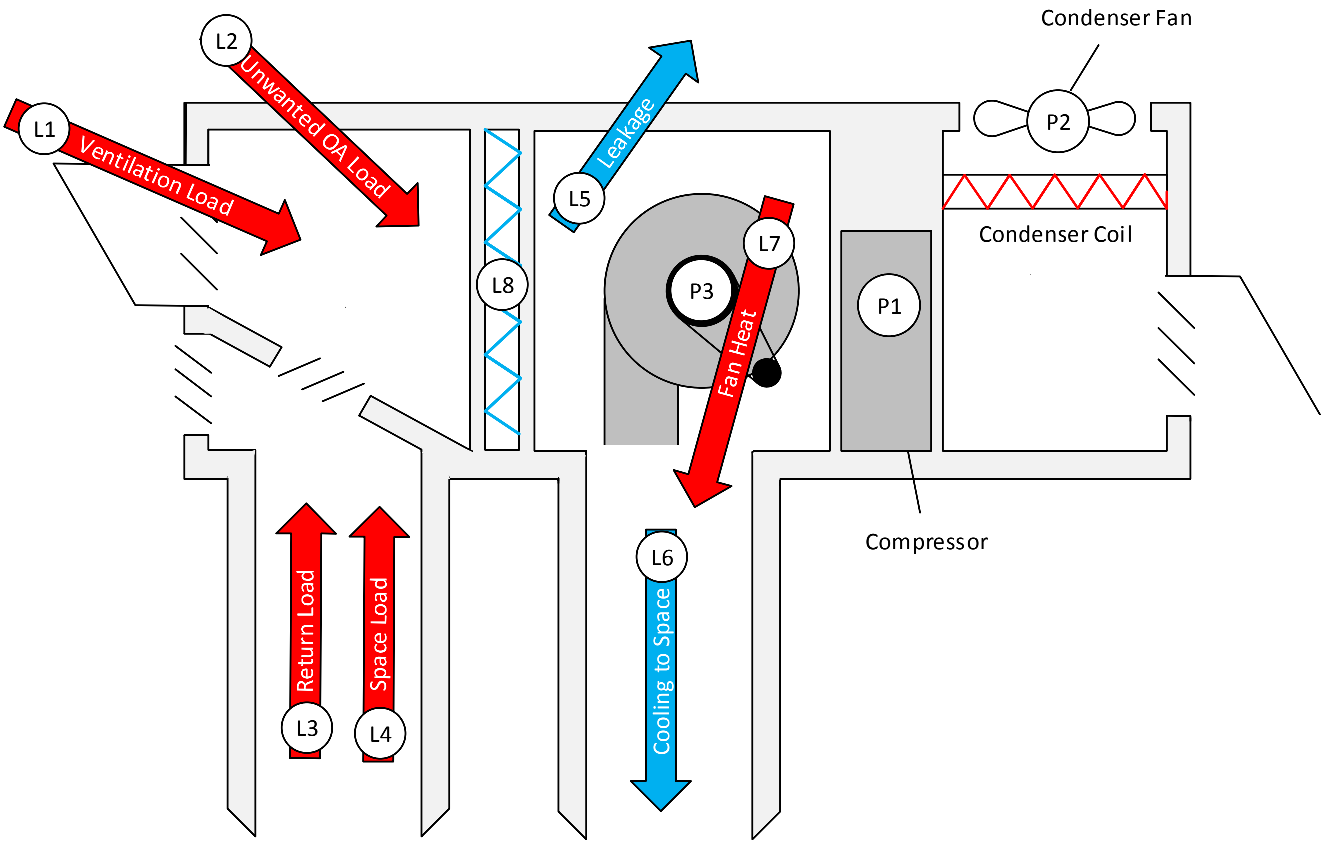
- Collect data from other report reviews: the commercial maintenance programs evaluation report contained a recommendation to collect additional coil cleaning laboratory data for systems under a variety of HVAC system fault conditions and combination of conditions, such as low airflow, dirty condenser coil, and low refrigerant charge.
- Assemble comments received in the course of distributing and reviewing the overall laboratory test report and compilation of the laboratory test data from the individual test reports.
- In the course of presenting the results of testing to the stakeholders, including the IOUs and WHPA, initiate specific conversations requesting feedback on the direction of future testing.
- Reach out to interested academics known to conduct or interpret similar types of HVAC testing and solicit suggestions.
- Identify facilities for conducting testing, determine pricing, and develop cost data to assist with budgeting and prioritization of future laboratory testing activities.

APPENDIX A. ADJUSTING FINDINGS FOR SIMULATION

The detailed laboratory report presents quantitative capacity and efficiency measurements under a series of test conditions, such as varying refrigerant charge, introduced faults, and changing outdoor temperature. However, these quantitative results cannot be used directly in methods relying on equipment (versus system) efficiency such as building simulation programs and certain engineering calculations because of the way they account for the air conditioner load resulting from outdoor air. The DNV GL team has produced adjusted findings that *can* be used in building simulations, contained in the test data file (APPENDIX D).

Figure 6 shows a schematic of the loads on the cooling coil and the power inputs into the air conditioner. The loads on the cooling coil are marked with "L" and the power inputs are marked with "P." The loads on the warm air-side include the space load (L4), the return load (L3, such as leakage in the return plenum), the ventilation load (L1), and the load from unwanted outside air[13] (L2). The loads on the cool air-side include cabinet leakage (L5), the cooling delivered to the space (L6), and heat added from the fan (L7). L8 represents the total load on the cooling coil. The power inputs are at the condenser fan (P2), the compressor (P1), and the supply fan motor (P3).

Figure 6. Schematic of air conditioner loads and power inputs



[13] This represents leakage into the unit above the desired ventilation load.

The reason the laboratory results cannot be used directly in energy calculations or building simulations is due to where the airflows are measured, how their temperatures are measured, and whether the coil load is "net" or "gross."

- **Where the airflows are measured.** The laboratory is designed to test units to AHRI specifications, which allow the cabinet to be sealed and do not include outside air. As a result, the ventilation load (L1), unwanted outside air load (L2), and leakage (L2 and L5) loads are not typically part of the AHRI measurement. The laboratory measures the air into the coil and out of the coil, but because it does not usually need to account for outdoor air, the measurements are of the return air duct and the supply air duct. It does not account for the outside air in the coil measurement.
- **How the airflow temperatures are measured.** The laboratory data, which measure the temperature in a matrix across the duct, show that a direct, single-point measurement of airflow temperature is not a good representation of the actual conditions seen by the coil. The airflow is generally stratified and the temperature unevenly distributed. As a result, it's more accurate to estimate mixed air conditions from the two streams that make it, which are the outdoor air and the return air.
- **Net versus gross capacity.** The gross coil capacity is the total load on the coil (L8), while the net capacity is the load delivered to the space (L6). The difference is somewhat in the cabinet leakage, but most importantly in the heat added by the supply fan. The net capacity is what is measured in the laboratory. The gross capacity is what is required for building simulations.

There are three steps to adjusting the capacity to account for outdoor air and the supply fan load.

1. Determine the amount of outdoor air that enters the unit at different economizer damper positions using direct measurement, and correct it for the temperature and pressure at which the fault test was conducted.
2. Determine the fan heat added to the supply air.
3. Calculate the mixed air conditions and revised supply air condition and determine the corrected capacity (and efficiency).

Determine the OA at different economizer damper positions and correct for fault test conditions

The Intertek tests included a number of direct measurements of outdoor airflow rates at varying damper positions at 55ºF outdoor air conditions (economizer tests). However, the fault tests were generally conducted at 82ºF, 95ºF, and 115ºF outdoor air conditions. In addition, there were slight differences between the return plenum pressures in the economizer tests and the fault tests. The temperature and pressure differences produce different air densities, affecting the velocity of air through the outside air dampers. Therefore, the outdoor air measured through a given damper opening at 55ºF must be corrected to determine the outdoor air through the same damper opening at 82ºF, 95ºF, or 115ºF. The correction equation is shown in Equation 1.

$$cfm_2 = cfm_1 \sqrt{\frac{\Delta P_2\, \gamma_2}{\Delta P_1\, \gamma_1}}$$ **Equation 1**

where:

cfm	=	the outside airflow in cubic feet per minute
ΔP	=	the measured plenum-to-ambient static pressure drop in inches of water
γ	=	the specific volume of the air in cubic feet per pound

1 = references the economizer test condition
2 = references the fault test condition

Calculating the fault test outdoor air using the economizer test outdoor airflow rate was possible for all but one group of tests conducted on the 7.5-ton non-TXV unit with the economizer open 1 Finger, because no outdoor flow rate economizer test was conducted at this damper setting. For this set of tests, a refrigerant/air-side gross capacity balance was determined and the outdoor airflow calculated for the 82ºF, 95ºF, and 115ºF fault test outdoor air conditions.

Using the variable names from the data file, Equation 1 can be represented as shown in Equation 2.

$$OA\ Flow\ corrected = OA\ comp\sqrt{\frac{(Unit\ Inlet\ Static_{mean} * OA\ spec\ vol)}{(Delta\ P\ Comp * Spec\ Vol\ Comp)}}$$ **Equation 2**

Determine the fan heat added to the supply air

The Intertek laboratory measurements included the power and power factor of the supply fan. The total power used by the fan (fan power) can be divided into two components: the flow power, used to move the air, and the fan heat. The flow power is a function of the total airflow and the total static pressure, calculated using Equation 3.

$$Flow\ Power = \frac{(746)(Total\ Air\ Flow)(Unit\ Total\ Static)}{6350}$$ **Equation 3**

where:

Flow Power = the flow power of the fan in watts
Total Airflow = the supply airflow in standard cubic feet per minute
Unit Total Static = the external static pressure on the fan in inches of water

To calculate the fan heat, one must know the mass airflow of the supply air, which can be calculated using Equation 4.

$$Mass\ Air\ Flow = \frac{Total\ Air\ Flow}{\gamma}$$ **Equation 4**

where:

Mass Airflow = the mass flow rate of the supply air in pound-mass of dry air per minute
Total Airflow = the measured volumetric flow of the return air in cubic feet per minute
γ = the specific volume of the air in cubic feet per pound

The fan heat can be calculated using Equation 5.

$$Fan\ Heat = \frac{3.413(Fan\ Power - Flow\ Power)}{0.240\ Mass\ Air\ Flow}$$ **Equation 5**

where:

Fan Heat = the temperature increase in the supply air stream caused by the fan in ºF
Fan Power = the total power of the fan in W

Using the variable names from the data file, Equation 3, Equation 4, and Equation 5 can be represented as shown in Equation 6, Equation 7, and Equation 8 respectively.

$$Flow\ Power = \frac{(746)(Tot\ Air\ Flow\ SCFM_{mean})(Unit\ Total\ Static_{mean})}{6350}$$ **Equation 6**

$$SA\ Mass\ Flow = \frac{Total\ Air\ Flow\ SCFM_{mean}}{Coil\ Out\ Spec\ Vol}$$ **Equation 7**

$$Fan\ Heat\ DT = \frac{3.413\big(ID\ Blower\ W_{Avg} - Flow\ Power\big)}{0.240\ SA\ Mass\ Flow}$$ **Equation 8**

Calculate the mixed air conditions, corrected capacity, and simulation efficiency

The mixed air conditions represent the properties "seen" by the cooling coil, which is a mix of the outdoor air and return air. To determine the corrected gross coil capacity, one must know the enthalpy of the mixed air entering the coil, which is a measure of the "heat energy" present in the air. One must also know the enthalpy leaving the coil. The enthalpy provided by the coil (the gross capacity) can be calculated as the difference between the entering enthalpy (mixed air enthalpy) and leaving enthalpy (leaving enthalpy).

To determine the mixed air enthalpy, one must know the portion of the mixed air that comes from the outdoor air and the portion that comes from the return air. The portion that comes from the return air can be calculated using Equation 9.

$$\dot{m}_{ra} = Mass\ Air\ Flow - \dot{m}_{oa}$$ **Equation 9**

where:

$\dot{m}$ = the mass flow rate in pounds-mass of dry air per hour
ra = refers to the portion of the mixed air from return air
oa = refers to the portion of the mixed air from outdoor air

The enthalpy of the mixed air stream can be calculated using Equation 10.

$$h_{ma} = \frac{\dot{m}_{ra}\, h_{ra} + \dot{m}_{oa}\, h_{oa}}{Mass\ Air\ Flow}$$ **Equation 10**

where:

h = the enthalpy in Btu per pound-mass of dry air
ma = refers to the mixed air

The coil leaving enthalpy can be determined from an understanding of the characteristics of the air leaving the coil, which are the characteristics of the supply air corrected for the heat added by the supply fan. The coil leaving enthalpy can be identified from standard HVAC tables if one knows the coil leaving humidity ratio and DB temperature. The humidity ratio of the air leaving cooling coil (L5 in Figure 6) is the same as the humidity ratio of the air supplied to the space (L6 in Figure 6)~~The leaving humidity ratio is the same as the supply air humidity ratio~~. The leaving DB temperature can be found using Equation 11.

$$DB_{leave} = DB_{sa} - Fan\ Heat$$ **Equation 11**

where:

DB = the dry bulb temperature in degrees Fahrenheit
leave = refers to the coil leaving conditions

The gross cooling capacity can be calculated using Equation 12.

$$Gross\ Cooling\ Capacity = Mass\ Air\ Flow\ (h_{ma} - h_{leave})$$ **Equation 12**

The energy input ratio (EIR), typically used by building simulations as a measure of air conditioner efficiency, is a function of the input power divided by the gross cooling capacity in equivalent units, or Equation 13.

$$EIR = \frac{(P1 + P2)}{Gross\ Cooling\ CapW}$$ **Equation 13**

where:

EIR	=	the energy input ratio
P1	=	the compressor power in watts
P2	=	the condenser fan power in watts
P3	=	the supply fan power in watts
Gross Cooling CapW	=	the gross cooling capacity converted to watts

Using the variable names from the data file, Equation 9, Equation 10, Equation 11, Equation 12, and Equation 13 can be represented as shown in Equation 14, Equation 15, Equation 16, Equation 17, and Equation 18 respectively.

$$RA\ Mass\ Flow\ Rate = SA\ Mass\ Flow - OA\ Mass\ Flow\ Corrected$$ **Equation 14**

$$MA\ Enthalpy = \frac{RA\ Mass\ Flow\ Rate * RA\ Enthalpy + OA\ Mass\ Flow\ Corrected\ OA\ Enthalpy}{SA\ Mass\ Flow}$$ **Equation 15**

$$Coil\ Leaving\ DB = ID\ Outlet\ Dry\ Air_{mean} - Fan\ Heat\ DT$$ **Equation 16**

$$Gross\ Cooling\ Capacity = Mass\ Air\ Flow\ (h_{ma} - h_{leave})$$ **Equation 17**

$$EIR = \frac{(Comp\ Unit\ Power)}{Gross\ Cooling\ Capacity}$$ **Equation 18**

APPENDIX B. HVAC BASICS

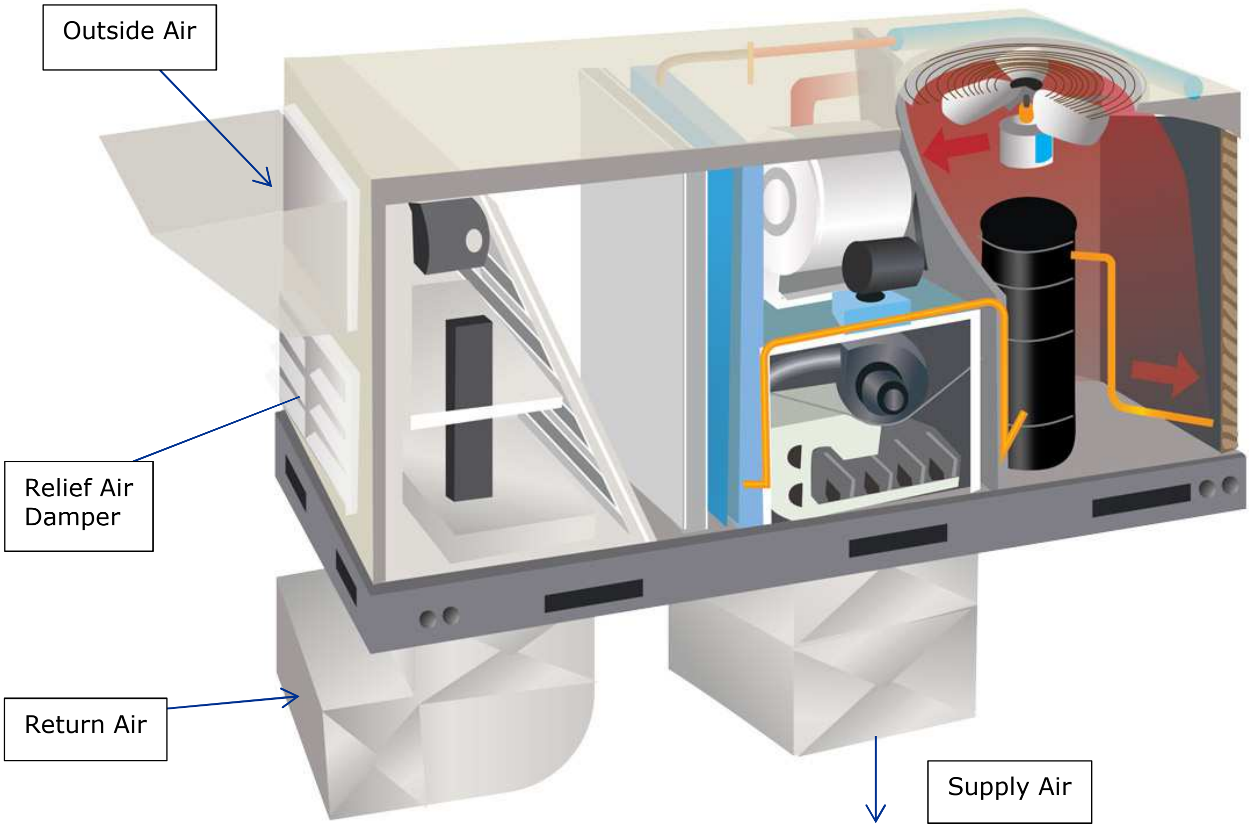
This appendix provides a basic understanding of an air conditioner system and the terminology used to characterize how it operates. Understanding the functions of the main components and how they interact is critical to understanding the laboratory test results.

Figure 7 shows how a typical packaged commercial air conditioner is installed on a small office space. The “cut-away” air conditioner on the left of the roof is shown in greater detail in Figure 8; the other three air conditioners more closely approximate what a unit looks like when installed. The packaged units are connected to duct systems which distribute the air to the office locations.

Figure 7. Installed packaged commercial air conditioner

Figure 8 shows a cut-away view of the packaged air conditioner on the left of the roof in Figure 7. Outside air enters the unit through the vent on the left, while return air enters from the curved duct under the unit. The warm air (from the outside and the return) is sent through an air filter and pulled through the cooling coil (shown in blue). A supply fan delivers the cooled air to the building through the straight duct under the unit. The final portion of the air conditioner contains the compressor, which is the portion of the refrigeration cycle that removes and rejects the heat from the air conditioner. The fan at the top right of the unit helps keep the compressor cool.

Figure 8. Cut-away packaged air conditioner



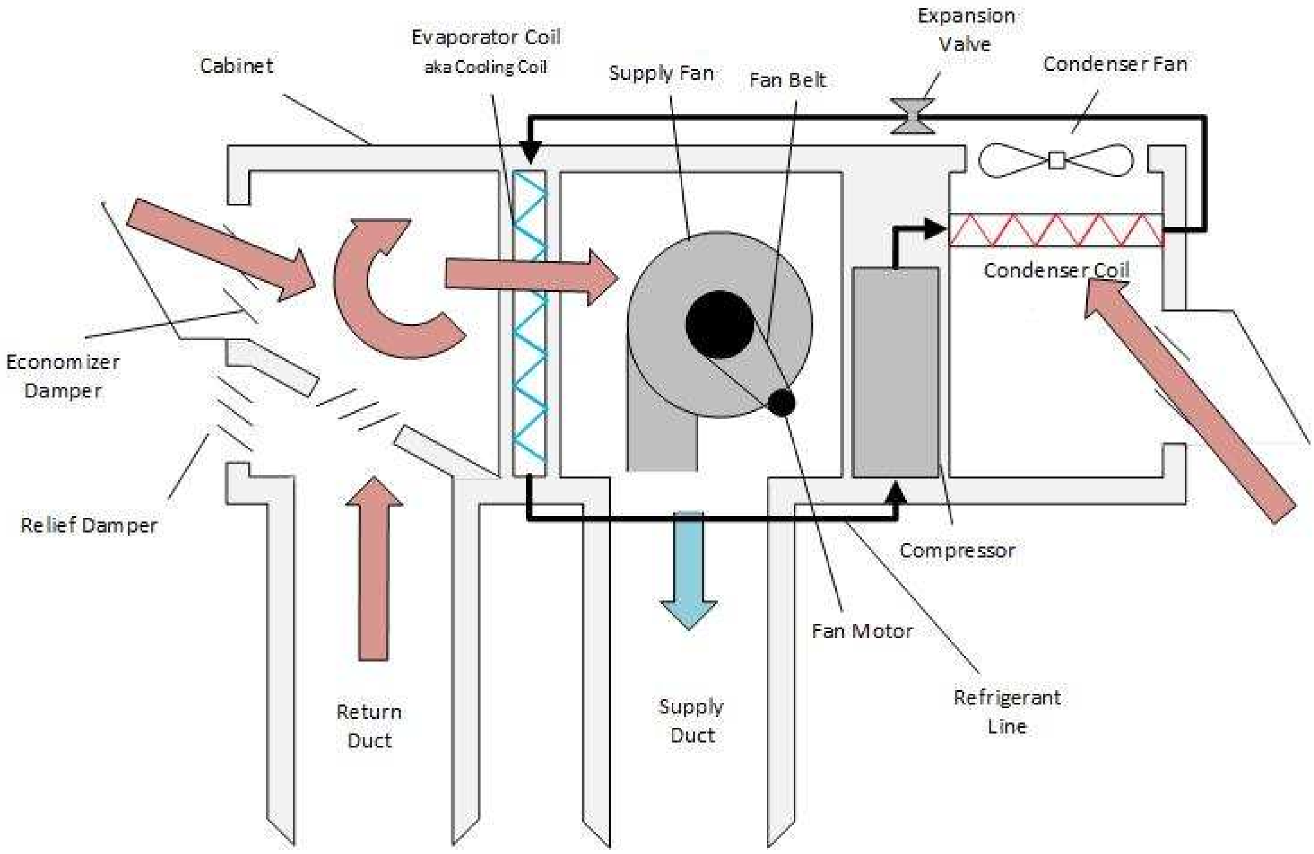
The basic schematic

The primary purpose of an air conditioner is to balance building heat loads[14] to maintain a constant internal air temperature. A secondary purpose is to introduce and condition outside ventilation air added to the building to displace carbon dioxide produced by the occupants. To offset these loads, air conditioners produce cold air that mixes with the warmer internal air until the desired space temperature is accomplished. As the rate of heat load on the building increases, more and more cool air is needed to offset the load. If the air is not delivered at the intended temperature or in the intended volume, occupancy comfort will be affected. Figure 9 shows a basic packaged air conditioner schematic.[15]

[14] When the sun shines, it radiates heat on the building exterior and through windows. When the temperature outside of the building is warmer than the indoor temperature, conduction through the building's shell adds heat. In addition, buildings are full of things that give off heat, such as people, computers, plants, and lights.

[15] A packaged system is one where all of the air conditioner components are in one unit, which is typical for small and medium-sized commercial buildings.

Figure 9. Basic air conditioner schematic



In an HVAC system, heat is transferred from air to a refrigerant. A fan pulls the air from inside the building through the evaporator coil, sometimes called the cooling coil, which reduces the temperature of the air. The cooled air is supplied to the building. The refrigerant in the cooling coil evaporates and this chemical phase change pulls heat out of the air to provide the cooling effect. The air conditioner has another fan and coil to push (reject) heat to the outside air and a compressor that raises the pressure of the evaporated refrigerant and moves the refrigerant between the coils like a pump.

The goal of air conditioner efficiency is minimum electrical power draw for a given amount of cooling energy delivered at specific weather and occupant conditions, or loads. The basic air conditioner has three main power-consuming parts: the evaporator fan, the condenser fan, and the compressor. Larger units have multiple compressors and/or condenser fans. As mentioned above, the evaporator fan moves air across the evaporator coil, which lowers the temperature of the air and delivers cooling to the space. The condenser fan moves air across the condenser coil, which rejects heat to the outside air. The compressor compresses the refrigerant from a low-pressure gas to a high-pressure gas. More details on the refrigeration cycle are provided later in this appendix.

The compressor does the hardest work and requires the most electrical power of the components, more than the evaporator and condenser fans combined. For a given cooling load, the hotter it is outside, the harder the compressor has to work. The primary reason is that the compressor needs to push the refrigerant to a higher pressure in order to reject the heat through the condenser. Additionally, cooling loads are generally highest on the hottest days and thus air conditioning power consumption peaks on hot days.

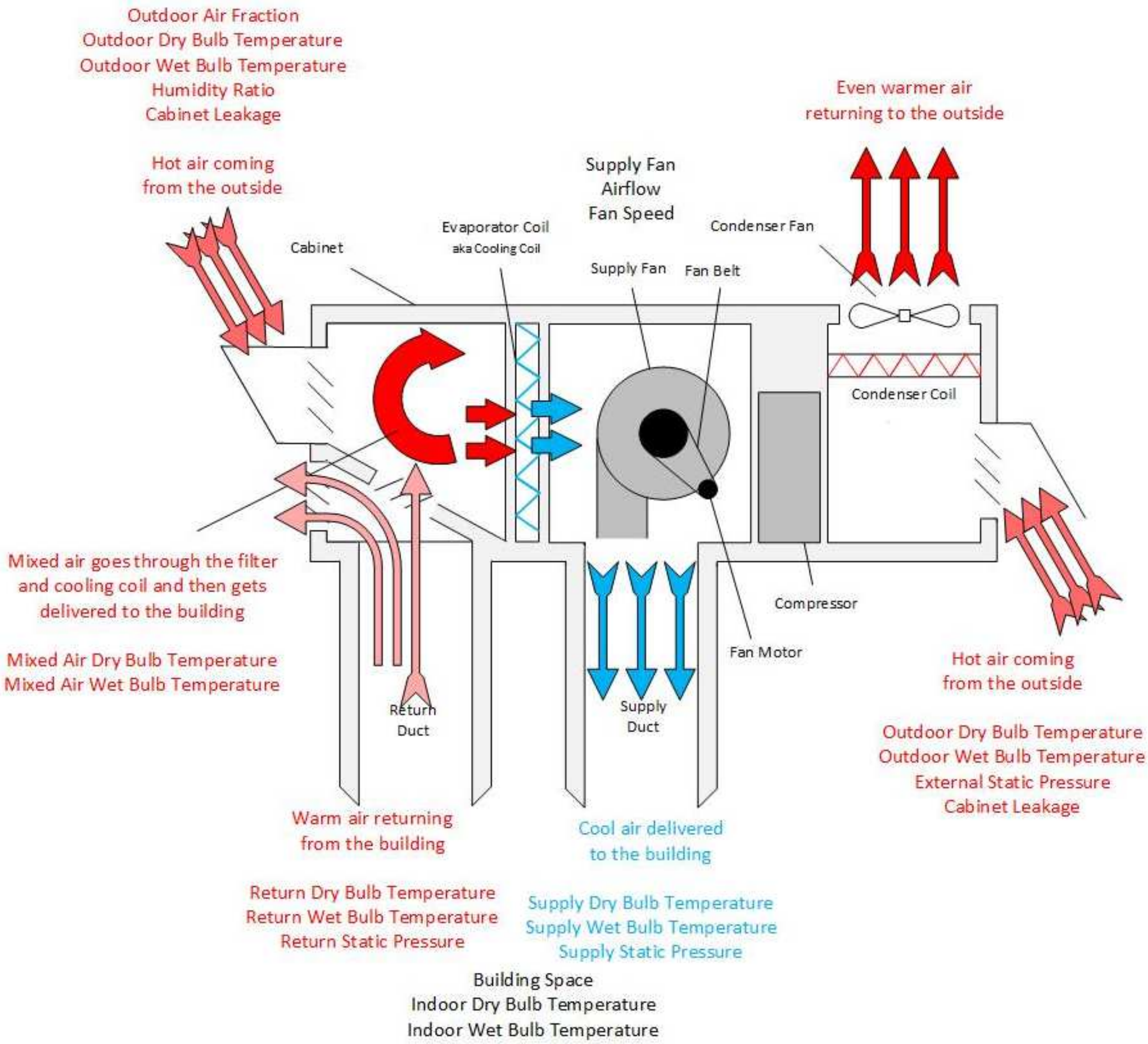
The air component

Figure 10 shows the air-side portion of the air conditioner system on a day where the outdoor temperature is warmer than the desired indoor air temperature. ~~Warm return air from the building is mixed with hot outdoor ventilation air and~~ A combination of warm return air and from the building and hot outdoor ventilation air are pulled into the cabinet, and while thermal stratification at the coil entrance is not well understood, this mixed air is then drawn across a cooling coil within the unit. ~~air conditioner cabinet.~~ As the air passes the coil, heat is transferred from the air to the refrigerant, reducing the air temperature and removing humidity. The cool air is driven into the building ductwork using a supply fan connected to a fan motor by a fan belt. In AHRI standard efficiency tests[16] ventilation air is not added to the return air, as the AHRI tests are designed to test the efficiency of the unit by itself and limit the variables controlled in the laboratory rating tests.

Separated from the building air, but crucial to the refrigeration system, is the air that moves past the condenser coil. The outdoor air accepts heat rejected from the condenser coil and dissipates it to the environment, allowing the refrigerant to “reset” and accept heat at the evaporator (cooling) coil once again. The refrigerant system is described in greater detail in the next section.

[16] The Air Conditioning and Heating Institute (AHRI) sets the national standard test procedures and conditions for reference in minimum standards for new units including federal appliance code and California energy code.

Figure 10. The air component



There are a number of air-side data points that help HVAC engineers characterize the operation of the system. They are:

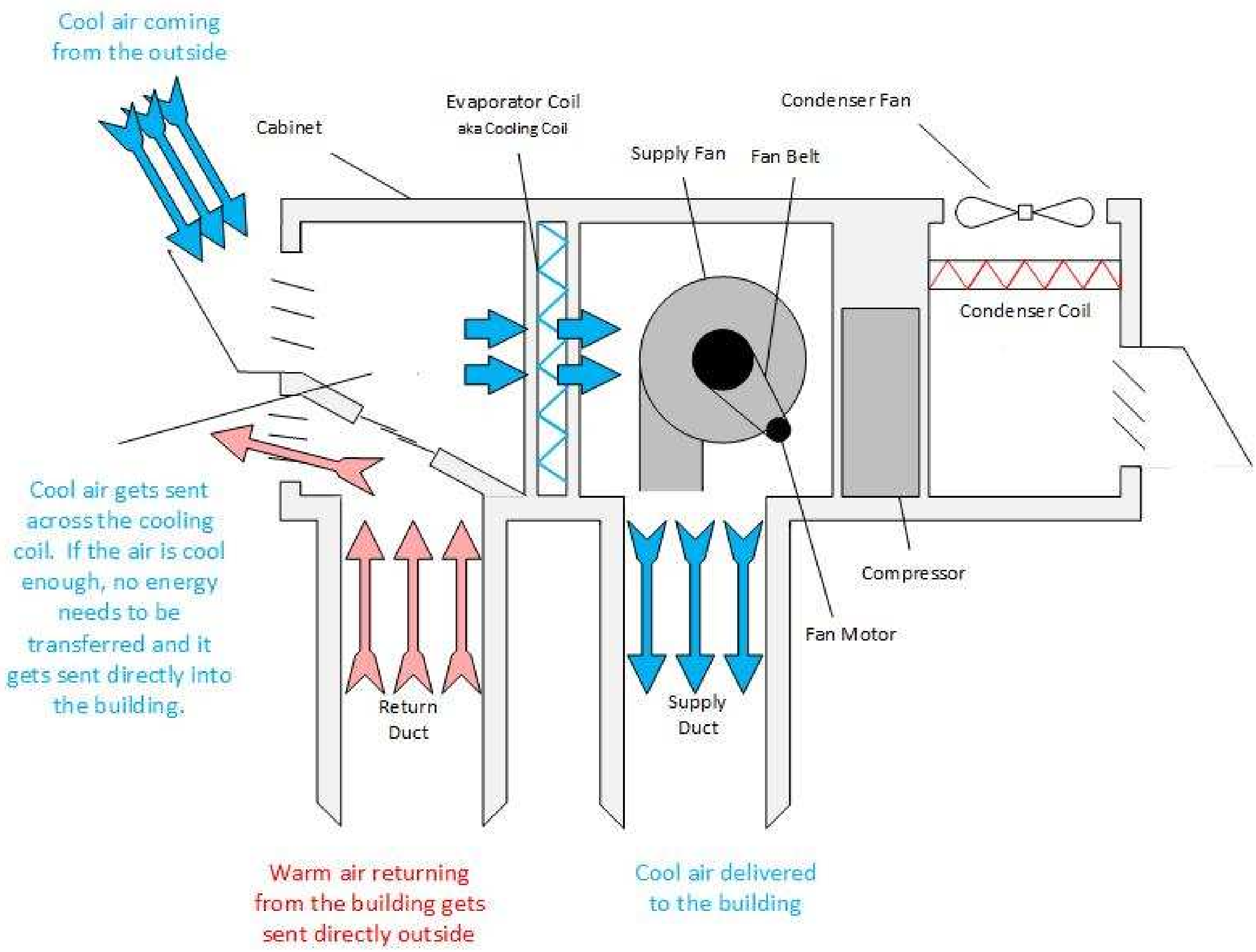
- **Supply Dry Bulb Temperature:** The supply dry bulb temperature is the desired temperature of the air leaving the air conditioner and entering the building supply ductwork.
- **Supply Wet Bulb Temperature:** The supply wet bulb temperature is the corresponding wet temperature of the air leaving the air conditioner and entering the building supply ductwork.
- **Indoor dry-bulb (DB) Temperature:** The indoor DB temperature is the air temperature of the inside space. This temperature is usually assumed to be equal to the thermostat set point temperature.
- **Indoor wet-bulb (WB) Temperature:** The indoor WB temperature is a measure of the amount of humidity in the air. The closer the WB temperature is to the DB temperature, the greater the humidity.
- **Total External Static Pressure:** External static pressure is a measure of the amount of resistance that must be overcome to deliver the air through the ducts. The total external static pressure is the total

amount of resistance "seen" by the ~~fan, less the resistance of internal components,~~ RTU and is equal to the difference between the supply static pressure and the return static pressure. For any given fan and fan motor, the total external static pressure and system flowrate determine the amount of energy the fan needs to add to overcome the resistance of the entire duct system. In this report, static pressure is reported in inches of water column, or in H_2O.

- **Supply Static Pressure:** This is the static pressure measured at the supply duct connection to the air conditioner.
- **Return Static Pressure:** This is the static pressure measured at the return duct connection to the air conditioner. Note that return static pressure is generally a negative number relative to the fan because the fan is "pulling" air (creating a vacuum) from the return duct.
- **Fan Speed:** The fan speed is measured in rotations per minute and is related to the amount of airflow produced by the fan.
- **Airflow:** The airflow is the amount of air delivered from the air conditioner to the building ductwork, usually measured in cubic feet per minute, and sometimes referred to as cfm. Airflow can also be measured in "SCFM," or standard cubic feet per minute, which is the amount of air delivered corrected to "standardized" temperature and pressure conditions.
- **Outdoor Air Fraction:** The outdoor air fraction is the portion of the air supplied to the evaporator that comes from the outdoors and is a measure of the amount of ventilation provided to the building. The minimum ventilation is specified by ASHRAE Standard 62.1.
- **Cabinet Leakage:** Cabinet leakage can occur when the cabinet seams are not taped and made airtight, allowing outside air to leak into the system before the fan or cool air to leak out of the system downstream of the fan before being delivered to the building.
- **Return DB Temperature:** This is the dry bulb temperature of the air returning from the building, which is generally a few degrees warmer than the space set point temperature or indoor DB temperature due to heat gains in the return duct system.
- **Return WB Temperature:** This is the wet bulb temperature of the air returning from the building, which is generally a few degrees warmer than the indoor WB temperature due to heat and moisture gains into the return duct system.
- **Outdoor Air Temperature:** Sometimes referred to as outdoor DB temperature, this is the temperature of the outdoor air.
- **Outdoor WB Temperature:** This is a measure of the amount of humidity in the outdoor air, and it affects the amount of dehumidification that must be provided by the cooling coil associated with the ventilation air.
- **Humidity Ratio:** The humidity ratio is the ratio between the mass of water vapor in the air to the mass of dry air. It is represented by the WB temperature. The closer the WB temperature is to the DB temperature, the higher the humidity ratio.
- **Latent Heat:** In an air conditioning system, latent heat refers to the heat transfer required at the evaporator to condense the water droplets from the air, reducing the humidity.
- **Sensible Heat:** Sensible heat is the heat transfer at the evaporator related to the change in air temperature, not the change in humidity.
- **Mixed Air DB Temperature:** This is the dry-bulb temperature of air entering the cooling coil, which is a mixture of the return air and the outdoor ventilation air.
- **Mixed Air WB Temperature:** This is the wet-bulb temperature of air entering the cooling coil, which is a mixture of the return air and the outdoor ventilation air.

One of the typical energy efficiency measures associated with commercial buildings is the use of an economizer. Figure 11 shows the air-side system in economizer mode when the air temperature is equal to the supply temperature. In this situation, the return air is exhausted and not allowed to mix with the outside air, which means the supply air is 100% outdoor air. In cases where the outdoor air is exactly equal to the supply temperature and below the humidity requirements, no additional cooling is needed.

Figure 11. The air component with an economizer



There are air-side data points specific to economizer systems that help HVAC engineers characterize the operation of the system. They are:

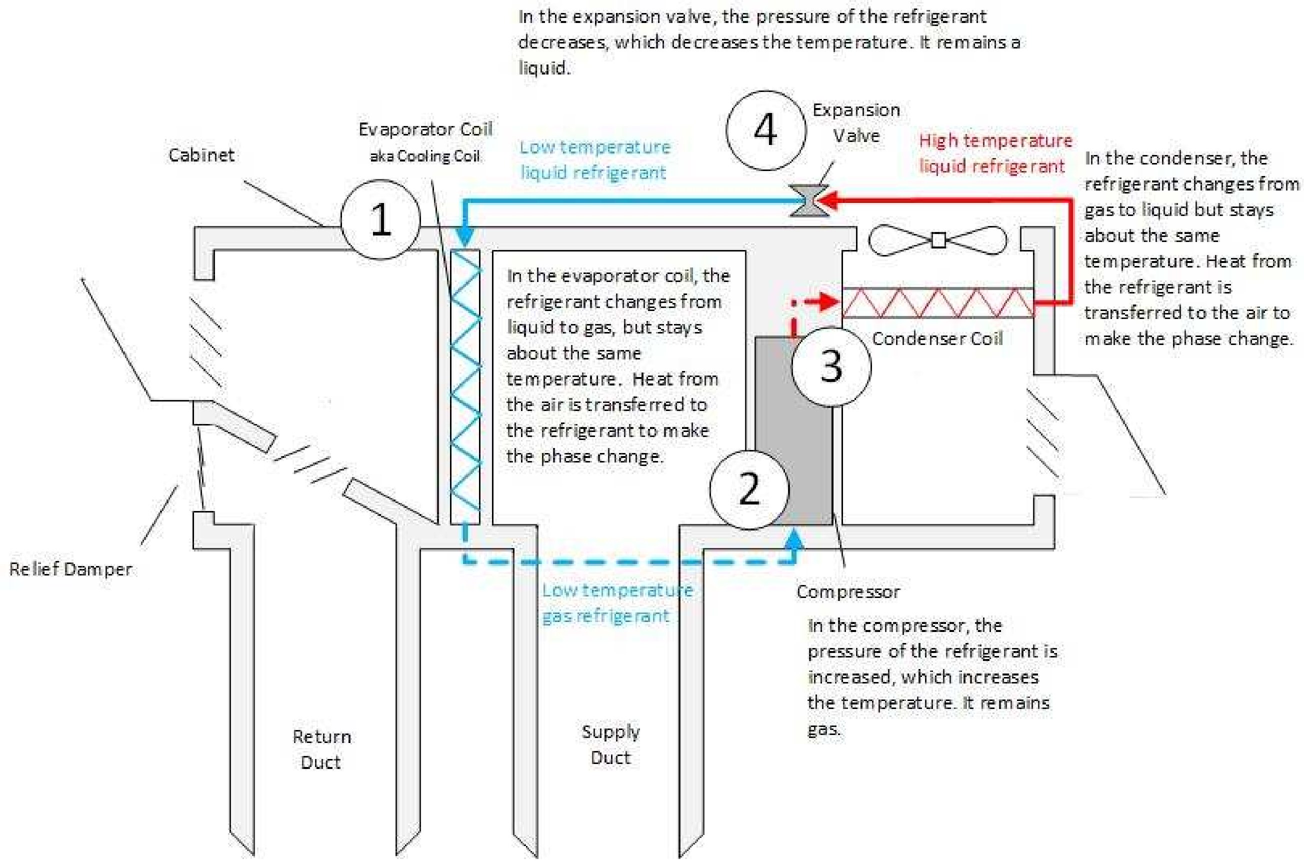
- **Relief Damper:** The relief damper allows return air to leave the building when the economizer is in use, maintaining the building air balance.
- **Minimum Damper Position:** This is the damper position that allows the smallest amount of outside air (to meet minimum ventilation requirements) into the building. It is the setting when the system is in operation but the economizer is not activated. Technicians typically establish the minimum position by setting the distance between the damper blades as the width of 1, 2, or 3 of their fingers. The laboratory team replicated this practice using wooden dowels of varying diameters, shown in Figure 12.

Figure 12. Damper positions established using 1, 2, and 3-finger dowels

The refrigerant component

Figure 13 shows the refrigerant-side portion of the air conditioner system. Refrigeration cycles are complex and involve complex phase change thermodynamics; however, this section explains the basic concepts. Phase change refers to the change a substance undergoes when it changes from gas to liquid or liquid to solid. If the substance is held at a constant pressure, then the phase change process includes a significant amount of heat transfer at approximately the same temperature. For example, when water changes to steam, the actual phase change process happens at 212°F. Immediately prior to phase change, the substance is liquid water at 212°F. Immediately after phase change, the substance is steam at 212°F. During the process of changing from water to steam, a large amount of energy is added to the system without changing the substance's temperature. At the most basic level, this thermodynamic principle is what makes refrigeration cycles possible.

Figure 13. The Refrigerant Component



The refrigeration cycle consists of four components: two heat exchangers (the condenser coil and the evaporator coil), a compressor, and an expansion valve. Refrigerant moves through the system in a closed loop. Starting at the evaporator coil (Point 1), low-temperature liquid refrigerant enters the coil and removes heat from the air while it changes phases to a gas (evaporates), maintaining a relatively constant temperature. The low-temperature gas enters a compressor (Point 2), where the pressure is increased but the phase remains constant, which also increases the temperature. The high-temperature and pressure gas enters the condenser coil (Point 3), where it transfers heat to the air and changes phases to a high-pressure liquid (condenses), at a relatively constant temperature. The high-pressure liquid refrigerant is allowed to expand in the expansion valve (Point 4), reducing the pressure, which lowers the temperature. The low temperature and pressure liquid enters the evaporator coil (Point 1) and the cycle repeats.

Refrigerants are chosen by their phase change properties, namely the amount of energy they absorb or reject when they change phases and the temperatures and pressures at which the phase change happens. Refrigerants that require too much or too little pressure would require systems that would be too difficult to construct. Refrigerants that do not change phases at temperatures found in our atmosphere cannot be used. Refrigerants that do not absorb or reject much heat at phase change are too inefficient. Refrigerants are also chosen based on their sustainability, and new refrigerants are being produced (and required by regulation) that are less destructive to the environment. Many refrigerants are referred to by an “R” and a number and/or letter, such as R-22 or R-410a.

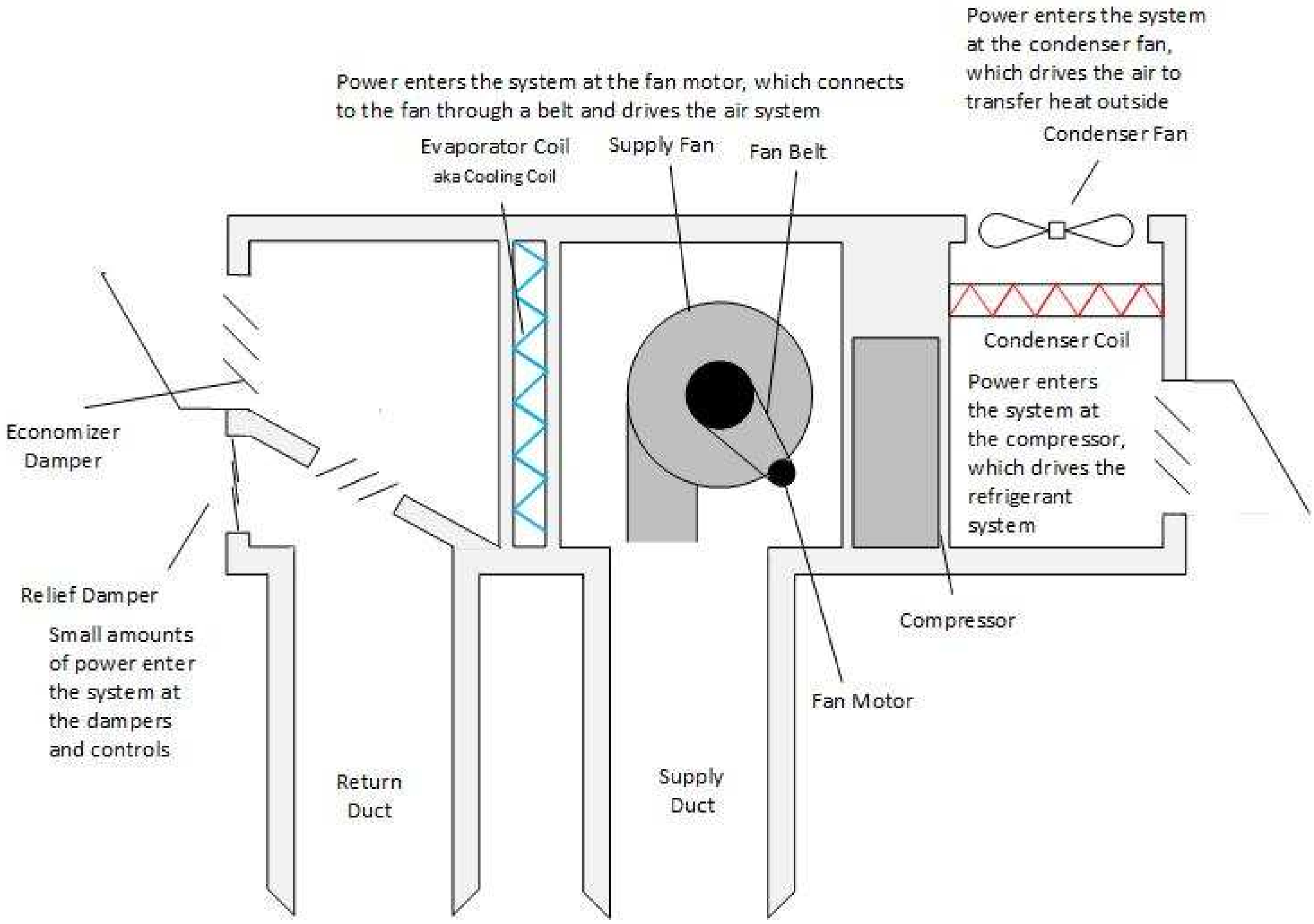
There are a number of refrigerant-side data points that help HVAC engineers characterize the operation of the system. They are:

- **Refrigerant Charge:** The refrigerant charge is a measure of the mass of refrigerant in the system. Too little refrigerant will reduce the cooling capacity and efficiency of the system.
- **Suction Temperature:** The suction temperature is the temperature of the refrigerant immediately before it enters (gets sucked into) the compressor at Point 2. It is approximately equal to the temperature of the refrigerant leaving the evaporator.
- **Suction Pressure:** The suction pressure is the pressure of the refrigerant immediately before it enters (gets sucked into) the compressor at Point 2. It is approximately equal to the pressure of the refrigerant leaving the evaporator coil.
- **Discharge Temperature:** The discharge temperature is the temperature of the refrigerant immediately after it leaves (gets discharged from) the compressor at Point 3. It is approximately equal to the temperature of the refrigerant entering the condenser coil.
- **Discharge Pressure:** The discharge pressure is the pressure of the refrigerant immediately after it leaves (gets discharged from) the compressor at Point 3. It is approximately equal to the pressure of the refrigerant entering the condenser coil.
- **Superheat:** Superheat measures the difference between the temperature at which the refrigerant evaporates and the suction temperature. If the refrigerant is not completely evaporated, it will affect the compressor operation. To ensure 100% evaporation, evaporators are designed to "superheat" the refrigerant, or increase the temperature past the phase change point by a few degrees. Too much superheat leads to a loss of efficiency.
- **Subcooling:** Subcooling measures the difference between the temperature at which the refrigerant condenses and the temperature entering the expansion valve at Point 4. Condensers are generally designed to reject enough heat to completely convert the refrigerant to a liquid, and further cool it below the condensing temperature. Too much subcooling leads to a loss of efficiency.

The electrical and mechanical components

Electricity drives the air conditioner at three points. On the air side, a motor connects to the supply fan through a fan belt. The fan pulls the mixed return and outdoor air through the cooling coil and pushes the supply air through the duct system. An additional fan is used to reject heat from the condenser coil to the atmosphere. Supplemental fans may be used at different points of the system depending on the design. On the refrigerant side, the compressor is used to increase the pressure (and therefore temperature) of the refrigerant and push it through the cycle.

Figure 14. The electrical and mechanical components



There are a number of mechanical/electrical data points that help HVAC engineers characterize the operation of the system. They are:

- **Fan Horsepower:** This is the size of the motor, measured in horsepower (hp), which drives the supply fan.
- **Fan Belt:** The fan belt transfers the rotational output of the motor to the supply fan through the fan pulley.
- **Fan Pulley:** The fan pulley uses the fan belt to transfer the rotational output of the motor to the fan.
- **Motor Sheave:** The sheave is a pulley with an adjustable operating diameter that is set by turning a screw. The sheave setting is typically referenced by the number of turns (typically between 0 and 5 or 6) on the sheave needed to achieve that setting.

Interactions between the air and refrigerant components

To maintain the proper internal air temperature (and occupant comfort), an air conditioner needs to produce the right volume of supply air at the correct temperature. To achieve that, it’s important to balance the air and refrigerant systems to ensure the proper amount of heat transfer. Improper balance can result in improper heat transfer, resulting in supply air that is too cold or too hot. Manufacturers design air conditioners to maintain the correct internal temperature.

- **Too cold:** The supply air temperature can be too cold if too much heat is removed from the air. This can happen when:
  - The refrigerant is too cold
  - The airflow is too slow
  - The mixed air temperature is very low
- **Too hot:** The supply air temperature can be too hot if too little heat is removed from the air. This can happen when:
  - The refrigerant is too hot
  - The airflow is too fast
  - There is too little heat transfer surface between the air and the refrigerant
  - The mixed air temperature is very high

The amount of cooling energy delivered to the building occupants depends on the coil exiting air temperature and airflow. Essentially each component of the system reacts to changes in other components to some degree, resulting in a specific cooling output. Under ideal conditions the cooling output can be calculated with reasonable accuracy. "Rated" conditions are achieved at specific predetermined conditions for airflow, outdoor and entering temperature, and external static pressure.

As components and the system begin operating outside of design specifications, the cooling output and energy input become less predictable. Expanded performance tables in the engineering manuals provide capacity and efficiency under a variety of off-design conditions, assuming correct installation and no faults. Laboratory testing is most useful for indicating the impact of faults on system performance, and the ability of FDD systems to correctly diagnose faults.

Maintenance faults and how they affect performance

The focus of this study is the effect of real world operating conditions on air conditioner performance. There are a number of real world conditions, equipment malfunctions, and deferred maintenance issues that can affect system performance, called "faults" in this study. When faults lower the cooling energy delivered to a building without substantially dropping the input power, they cause the system to run less efficiently and cause it to run longer to eventually achieve the desired building temperature. This means that the compressor and fans run longer, consuming more energy. Faults can also cause the compressor and fans to work harder, increasing their power consumption and dropping the cooling output. The issues and their effects on an air conditioner's efficiency are complex.

Leaks in the air or refrigerant cycles will directly affect the amount of cooling delivered. Air leaks can be hard to identify, but for many operating conditions will make the system run longer. Refrigerant leaks are easy to identify and generally result in failure of the unit, but issues arise because past leak fixes leave the refrigerant charge higher or lower than required. Leakage related faults include:

- **Cabinet leakage:** Cabinet leakage can occur when the cabinet seams are not tight due to missing screws or gaps in the joints between components, allowing outside air to leak into the system if the leak is located before the fan or cool air to leak out of the system if the leak is located after the fan.

- **Damper leakage:** Outdoor air damper leakage causes excessive ventilation air during system operation. Relief damper leakage can cause pressure imbalances in the building and potentially increase cabinet or outdoor air damper leakage. Leakage in either damper can result in unwanted infiltration when the system is not operating. Leaks can occur at the damper blades or in gaps between the damper assembly and the unit.
- **Incorrect refrigerant charge:** Incorrect refrigerant charge occurs when there is too much or too little refrigerant in the system to remove and reject heat. Low charge will lower the capacity and efficiency of the air conditioner; high charge can lower efficiency depending on the type of expansion valve.

Restrictions to the airflow across the coils and to the refrigerant flow directly affect cooling performance. Increased resistance to airflow or refrigerant flow increases the power needed to maintain the same flow. If the coils are blocked it can increase the refrigerant pressures, increasing compressor power and decreasing the cooling produced. This is a double hit as the unit will run longer at a lower efficiency. Other mechanical issues with the fan systems can also affect airflow across the coils. Restriction and airflow related faults include:

- **Poor evaporator fan belt connections:** Poor belt connections result in slippage and prevent the motor rotation from being fully translated to the fan blades, causing the fan motors to work harder to achieve the desired airflow or deliver less air at the same power draw.
- **Coil blockages:** Dirt, ice, or other debris on the evaporator or condenser coils restrict airflow and prevent proper heat transfer, resulting in reduced capacity and efficiency.
- **Refrigerant restrictions:** Restrictions in the expansion valve or filter/dryer due to impurities such as water vapor turned to ice, sludge from degraded refrigerant oil, or particulate matter introduced during service activities can increase the compressor discharge pressure and decrease the evaporator pressure and temperature decreasing efficiency and causing ice formation on the evaporator coil. Restrictions cause the compressor to work harder and reduce the cooling output. Very high pressures will trip a safety mechanism and turn off the compressor to avoid damaging it.
- **Non-condensable gasses in refrigerant cycle:** Impurities in the refrigerant introduced during charge tests or repair accumulate in the condenser and restrict refrigerant flow and heat transfer. Non-condensables can increase the compressor discharge pressure and cause the compressor to work harder and reduce the cooling output. Very high pressures will trip a safety mechanism and turn off the compressor to avoid damaging it.

APPENDIX C. LIST OF TESTS CONDUCTED

The following list presents some of the conditions under which the tests were conducted. These conditions were determined by disaggregating the comment fields included in the test files. The following assumptions were made:

- Assume compressor on unless stated otherwise.
- Assume cabinet and ductwork unsealed unless stated otherwise.
- Fields with missing or "." data indicate that the information was not specified for that test.

Table 5. List of tests conducted with some test conditions

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
5	C-55-1ER-DM	30N0001	1 Finger	Off / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-55-2ER-DM	30N0002	2 Finger	Off / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-55-3ER-DM	30N0003	3 Finger	Off / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-55-CE-DM	30N0004	closed	Off / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-55-OER-DM	30N0005	Fully open	Off / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-MF-75629575-1E3J	30N0006	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-MF-75629575-2E3J	30N0007	2 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-MF-75629575-3E3J	30N0008	3 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-MF-75629575-E3J	30N0009	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-MF-75629575-NE3J	30N0010	None	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-MF-75629575-OE3J	30N0011	Fully open	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-22A-ONE	30N0012		on / N/A	5.5 turns	unsealed	unsealed			horizontal	0%	0%
5	C-ONE-5TA-OB	30N0013	None	on / N/A	5.5 turns	unsealed	unsealed	760		horizontal	0%	0%
5	C-22A	30N0014	None	on / N/A	5.5 turns	sealed	unsealed	760		horizontal	0%	0%
5	C-22B	30N0015	None	on / N/A	5.5 turns	sealed	unsealed	760		horizontal	0%	0%
5	C-95-3+10-C	30N0016	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
5	C-95-3+40-C	30N0017	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-10-C	30N0018	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-40-C	30N0019	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-FC-C	30N0020	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-55-T1ER-DM	30N0021	1 Finger	Off / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-55-T2ER-DM	30N0022	2 Finger	Off / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-55-T3ER-DM	30N0023	3 Finger	Off / N/A		unsealed	unsealed			horizontal	0%	0%
5	C-55-TCE-DM	30N0024	closed	Off / N/A		unsealed	unsealed			horizontal	0%	0%
5	C-55-TOER-DM	30N0025	Fully open	Off / N/A		unsealed	unsealed			horizontal	0%	0%
5	C-75629575-T1E3	30N0026	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-75629575-T2E3-1	30N0027	2 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-75629575-T3E3	30N0028	3 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-75629575-TE3	30N0029	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-75629575-TOE3	30N0030	Fully open	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-ONE-OB	30N0031		on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-ONE	30N0032	None	on / N/A	3 turns	unsealed	unsealed	945		horizontal	0%	0%
5	C-22C-D#2	30N0033	None	on / N/A		sealed	unsealed	760		horizontal	0%	0%
5	C-22C-D#3	30N0034	None	on / N/A		sealed	unsealed	760		horizontal	0%	0%
5	C-22C-D#4	30N0035	None	on / N/A		sealed	unsealed	760		horizontal	0%	0%
5	C-22C-D#5	30N0036	None	on / N/A		sealed	unsealed	760		horizontal	0%	0%
5	C-22C-D#6	30N0037	None	on / N/A		sealed	unsealed	760		horizontal	0%	0%
5	C-22C-D#7	30N0038	None	on / N/A		sealed	unsealed	760		horizontal	0%	0%
5	C-95-3+10-1	30N0039	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3+20-1	30N0040	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3+20-C	30N0041	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3+30-1	30N0042	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
5	C-95-3+30-C	30N0043	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3+40-1	30N0044	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-10-1	30N0045	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-20-1	30N0046	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-20-C	30N0047	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-30-1	30N0048	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-30-C	30N0049	closed	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-40-1	30N0050	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-95-3-FC-1	30N0051	1 Finger	on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-55-CE	30N0052		on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-EB10-55-CE	30N0053	closed	Off / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	10%
5	C-EB20-55-CE	30N0054	closed	Off / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	20%
5	C-EB35-55-CE	30N0055	closed	Off / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	35%
5	C-EB5-55-CE	30N0056	closed	Off / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	5%
5	C-EB50-55-CE	30N0057	closed	Off / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	50%
5	C-R100-EB0-CB0-95CE	30N0058	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	0%
5	C-R100-EB20-CB30-95CE	30N0059	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	30%	20%
5	C-R120-EB0-CB0-95CE	30N0060	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	0%
5	C-R120-EB0-CB30-95CE	30N0061	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	30%	0%
5	C-R120-EB20-CB0-95CE	30N0062	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	20%
5	C-R120-EB20-CB30-95CE	30N0063	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	30%	20%
5	C-R80-EB0-CB0-95CE	30N0064	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	0%
5	C-R80-EB0-CB30-95CE	30N0065	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	30%
5	C-R80-EB20-CB0-95CE	30N0066	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	20%
5	C-R80-EB20-CB30-95CE	30N0067	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	30%	20%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
5	C-55-NE	30N0069		on / N/A	3 turns	sealed	unsealed			horizontal	0%	0%
5	C-55-NES	30N0070	None	on / N/A	3 turns	sealed	unsealed		4.75	horizontal	0%	0%
5	C-CB0-115-CE	30N0076	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	0%
5	C-CB10-115-CE	30N0077		on / N/A		unsealed	unsealed			horizontal	10%	0%
5	C-CB20-115-CE	30N0078	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	20%	0%
5	C-CB30-115-CE	30N0079	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	30%	0%
5	C-CB40-115-CE	30N0080	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	40%	0%
5	C-CB5-115-CE	30N0081	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	5%	0%
5	C-CB50-115-CE	30N0082	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	50%	0%
5	C-CB60-115-CE	30N0083	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	60%	0%
5	C-CB0-82-CE	30N0086	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	0%
5	C-CB10-82-CE	30N0087	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	10%	0%
5	C-CB20-82-CE	30N0088	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	20%	0%
5	C-CB30-82-CE	30N0089	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	30%	0%
5	C-CB40-82-CE	30N0090	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	40%	0%
5	C-CB5-82-CE	30N0091	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	5%	0%
5	C-CB50-82-CE	30N0092	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	50%	0%
5	C-CB60-82-CE	30N0093	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	60%	0%
5	C-CB70-82-CE	30N0094	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	70%	0%
5	C-CB80-82-CE	30N0095	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	80%	0%
5	C-CB0-95-CE	30N0096	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	0%
5	C-CB10-95-CE	30N0097	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	10%	0%
5	C-CB20-95-CE	30N0098	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	20%	0%
5	C-CB30-95-CE	30N0099	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	30%	0%
5	C-CB40-95-CE	30N0100	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	40%	0%
5	C-CB5-95-CE	30N0101	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	5%	0%
5	C-CB50-95-CE	30N0102	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	50%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
5	C-CB60-95-CE	30N0103	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	60%	0%
5	C-CB70-95-CE	30N0104	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	70%	0%
5	C-CB80-95-CE	30N0105	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	80%	0%
5	C-EB0-115-CE	30N0106		on / N/A	3 turns	unsealed	unsealed			horizontal	0%	0%
5	C-EB10-115-CE	30N0107	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	10%
5	C-EB20-115-CE	30N0108	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	20%
5	C-EB35-115-CE	30N0109	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	35%
5	C-EB5-115-CE	30N0110		on / N/A	3 turns	unsealed	unsealed			horizontal	0%	5%
5	C-EB50-115-CE	30N0111	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	50%
5	C-EB0-82-CE	30N0112	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	0%
5	C-EB10-82-CE	30N0113	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	10%
5	C-EB20-82-CE	30N0114	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	20%
5	C-EB35-82-CE	30N0115	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	35%
5	C-EB5-82-CE	30N0116	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	5%
5	C-EB50-82-CE	30N0117	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	50%
5	C-EB0-95-CE	30N0118	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	0%
5	C-EB10-95-CE	30N0119	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	10%
5	C-EB20-95-CE	30N0120	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	20%
5	C-EB35-95-CE	30N0121	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	35%
5	C-EB5-95-CE	30N0122	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	5%
5	C-EB50-95-CE	30N0123	closed	on / N/A	3 turns	unsealed	unsealed		4.75	horizontal	0%	50%
4	L-75629575-E3	30T0001	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-22A	30T0002	none	on / N/A	5 turns	sealed	unsealed	664			0%	0%
4	L-75629575-NE3-SS	30T0003	none	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-ONE-5T	30T0004	none	on / N/A	5 turns	unsealed	unsealed	663			0%	0%
4	L-ONE-SS	30T0005	none	on / N/A	2.5 turns	unsealed	unsealed				0%	0%
4	L-95-3+10-C	30T0006	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
4	L-95-3+40-C	30T0007	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3-10-C	30T0008	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3-40-C	30T0009	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-55-1ER-DM	30T0010	1 Finger	off / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-55-2ER-DM	30T0011	2 Finger	off / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-55-3ER-DM	30T0012	3 Finger	off / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-55-CE-DM	30T0013	closed	off / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-55-OER-DM	30T0014	open	off / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-75629575-1E3	30T0015	1 Finger	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-75629575-2E3	30T0016	2 Finger	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-75629575-3E3	30T0017	3 Finger	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-75629575-OE3	30T0018	open	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-75629575-T1E3	30T0019	1 Finger	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-75629575-T2E3-1	30T0020	2 Finger	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-75629575-T3E3	30T0021	3 Finger	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-75629575-TE3	30T0022	closed	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-75629575-TOE3	30T0023	open	on / N/A	3 turns	sealed	unsealed				0%	0%
4	L-22B	30T0024	none	on / N/A	5 turns	sealed	unsealed	664			0%	0%
4	L-22C-L22D Cyclic #2	30T0025		on / N/A		unsealed	unsealed				0%	0%
4	L-22C-L22D Cyclic #3	30T0026		on / N/A		unsealed	unsealed				0%	0%
4	L-22C-L22D Cyclic #4	30T0027		on / N/A		unsealed	unsealed				0%	0%
4	L-55-T1ER-DM	30T0028	1 Finger	off / N/A	3 turns	sealed	unsealed				0%	0%
4	L-55-T2ER-DM	30T0029	2 Finger	off / N/A	3 turns	sealed	unsealed				0%	0%
4	L-55-T3ER-DM	30T0030	3 Finger	off / N/A	3 turns	sealed	unsealed				0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
4	L-55-TCE-DM	30T0031	closed	off / N/A	3 turns	sealed	unsealed				0%	0%
4	L-55-TOER-DM	30T0032	open	off / N/A	3 turns	sealed	unsealed				0%	0%
4	L-95-3+10-1	30T0033	1 Finger	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3+20-1	30T0034	1 Finger	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3+20-C	30T0035	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3+30-1	30T0036	1 Finger	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3+30-C	30T0037	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3+40-1	30T0038	1 Finger	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3-20-1	30T0039	1 Finger	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3-20-C	30T0040	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3-30-1	30T0041	1 Finger	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3-30-C	30T0042	closed	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3-40-1	30T0043	1 Finger	on / N/A	3 turns	unsealed	unsealed				0%	0%
4	L-95-3-10-1	30T0044	1 Finger	on / on		unsealed	unsealed					
3	3-52115CF	75N0001	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-5282CF	75N0002	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-5295CF	75N0003	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-295	75N0004	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Run 2-21A no optimized charge	75N0005		on / on		sealed	unsealed		10	.	0%	0%
3	Run 3-21A AHRI Out of the Box	75N0006		on / on	3 turns	sealed	sealed		10	.	0%	0%
3	3-21A AHRI Verification H	75N0007		on / on	6 turns	sealed	sealed		10	horizontal	0%	0%
3	5-295 recalc	75N0008	closed	on / on		unsealed	unsealed			.	0%	0%
3	7-3A	75N0009	closed	on / on		unsealed	unsealed			.	0%	0%
3	7-5A	75N0010	closed	on / on		unsealed	unsealed			.	0%	0%
3	Run 3-20N95	75N0011		on / on	4.5 turns	sealed	unsealed		7	horizontal	0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
3	3-42115CF	75N0012	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-4282CF	75N0013	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-4295CF	75N0014	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-62115CF	75N0015	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-6282CF	75N0016	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-6295CF	75N0017	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	1-OEH	75N0018	open	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Mar-15	75N0019	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-21151	75N0020	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-21152	75N0021	2 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-21153	75N0022	3 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-2115OD	75N0023	open	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Mar-51	75N0024	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Mar-52	75N0025	2 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Mar-53	75N0026	3 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-295OD	75N0027	open	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-521151CF	75N0028	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-52821CF	75N0029	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-52951CF	75N0030	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-CB30-95-CE	75N0031	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	30%	0%
3	C8-55-CE3	75N0033	closed	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Run 1-1A Out of the Box Baseline	75N0034		on / off		unsealed	unsealed		7		0%	0%
3	Run 1-1B Out of the Box Baseline	75N0035		on / off		unsealed	unsealed		7		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
3	Run 1-1C-D Out of the Box Baseline Cycle #1	75N0040		on / on		unsealed	unsealed			.	0%	0%
3	Run 1-1C-D Out of the Box Baseline Cycle #2	75N0041		on / on		unsealed	unsealed			.	0%	0%
3	Run 1-1C-D Out of the Box Baseline Cycle #3	75N0042		on / on		unsealed	unsealed			.	0%	0%
3	Run 1-1C-D Out of the Box Baseline Cycle #4 (to be used with 3)	75N0043		on / on		unsealed	unsealed			.	0%	0%
3	Run 1-2A Out of the Box Baseline	75N0044		on / on		unsealed	unsealed		7	.	0%	0%
3	Run 1-2B Out of the Box Baseline	75N0045		on / on		unsealed	unsealed		7	.	0%	0%
3	3-2000-115	75N0046	none	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-2000-82	75N0047	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-2000-95	75N0048	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-2500-115	75N0049	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-2500-82	75N0050	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-2500-95 Rerun	75N0051	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-3000-115	75N0052	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-3000-82	75N0053	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-3000-95 Rerun	75N0054	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-NC-2500-115	75N0055		on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-NC-2500-82	75N0056		on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-NC-2500-95	75N0057		on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
3	IEER Calculation 7.5 ton	75N0058		on / on		unsealed	unsealed			.	.	.
3	IPLV Calculation 7.5 ton	75N0059		on / on		unsealed	unsealed			.	.	.
3	1-CEH	75N0060	closed	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Run 3-20N115	75N0061	none	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-282	75N0062	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Mar-21	75N0063	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Mar-22	75N0064	2 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	Mar-23	75N0065	3 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-282OD	75N0066	open	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	1-1CH Retest	75N0067	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	1-1EH	75N0068	open	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	1-2CH Retest	75N0069	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	2-1CH	75N0070	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	2-1EH	75N0071	open	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	2-2CH Retest	75N0072	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	2-OEH	75N0073	open	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-1CH Retest	75N0074	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-1EH	75N0075	open	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-2CH Retest	75N0076	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-OEH	75N0077	open	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	4-1CH Retest	75N0078	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	4-1EH	75N0079	open	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	4-2CH Retest	75N0080		on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	4-OEH 2nd	75N0081	open	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-421151CF	75N0082	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
3	3-42821CF	75N0083	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-42951CF	75N0084	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-621151CF	75N0085	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-62821CF	75N0086	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	3-62951CF	75N0087	1 finger	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	5-2115 recalc	75N0088		on / on		unsealed	unsealed			.	0%	0%
3	5-21151 recalc	75N0089	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	5-282 recalc	75N0090		on / on		unsealed	unsealed			.	0%	0%
3	5-2821 recalc	75N0091	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	5-2951 recalc	75N0092	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	7-3B	75N0093	closed	on / on		unsealed	unsealed			.	0%	0%
3	7-3F	75N0094	closed	on / on		unsealed	unsealed			.	0%	0%
3	7-4A	75N0095	closed	on / on		unsealed	unsealed			.	0%	0%
3	7-4B	75N0096	closed	on / on		unsealed	unsealed			.	0%	0%
3	7-4F	75N0097	closed	on / on		unsealed	unsealed			.	0%	0%
3	7-5B	75N0098	closed	on / on		unsealed	unsealed			.	0%	0%
3	7-5F	75N0099	closed	on / on		unsealed	unsealed			.	0%	0%
3	8-3A	75N0100	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	8-3B	75N0101	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	8-3F	75N0102	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	8-4A	75N0103	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	8-4B	75N0104	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	8-4F	75N0105	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	8-5A	75N0106	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	8-5B	75N0107	closed	on / on		unsealed	unsealed			.	0%	0%
3	8-5F	75N0108	1 finger	on / on		unsealed	unsealed			.	0%	0%
3	C8-CB10-115-CE	75N0111	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	10%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
3	C8-CB20-115-CE	75N0112	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	20%	0%
3	C8-CB30-115-CE	75N0113	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	30%	0%
3	C8-CB40-115-CE	75N0114	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	40%	0%
3	C8-CB5-115-CE	75N0115	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	5%	0%
3	C8-CB50-115-CE	75N0116	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	50%	0%
3	C8-CB10-82-CE	75N0119	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	10%	0%
3	C8-CB20-82-CE	75N0120	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	20%	0%
3	C8-CB30-82-CE	75N0121	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	30%	0%
3	C8-CB40-82-CE	75N0122	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	40%	0%
3	C8-CB5-82-CE	75N0123	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	5%	0%
3	C8-CB50-82-CE	75N0124	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	50%	0%
3	C8-CB60-82-CE	75N0125	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	60%	0%
3	C8-CB70-82-CE	75N0126	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	70%	0%
3	C8-CB80-82-CE	75N0127	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	80%	0%
3	C8-CB10-95-CE	75N0131	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	10%	0%
3	C8-CB20-95-CE	75N0132	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	20%	0%
3	C8-CB40-95-CE	75N0133	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	40%	0%
3	C8-CB5-95-CE	75N0134	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	5%	0%
3	C8-CB50-95-CE	75N0135	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	50%	0%
3	C8-CB60-95-CE	75N0136	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	60%	0%
3	C8-CB70-95-CE	75N0137	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	70%	0%
3	C8-CB80-95-CE	75N0138	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	80%	0%
3	C8-55-1FE3	75N0140	1 finger	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-55-2FE3	75N0141	2 finger	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-55-3FE3	75N0142	3 finger	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-55-NE-CAB	75N0143	none	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
3	C8-55-OE3	75N0145		off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-55-T1FE3	75N0146	1 finger	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-55-T2FE3	75N0147	2 finger	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-55-T3FE3	75N0148	3 finger	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-55-TCE3	75N0149	closed	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-55-TOE3	75N0150	open	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-95-NE	75N0155	none	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-1FE	75N0156	1 finger	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-2FE	75N0157	2 finger	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-3FE	75N0158	3 finger	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-CE	75N0159	closed	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-NE-CAB	75N0160	none	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-95-NE-DUCT	75N0161	none	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-95-OE	75N0162	open	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-T1FE	75N0163	1 finger	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-T2FE	75N0164	2 finger	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-T2FE_calc	75N0165	2 finger	on / on		unsealed	unsealed	870	7	.	0%	0%
3	C8-95-T3FE	75N0166	3 finger	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-T3FE_calc	75N0167	3 finger	on / on		unsealed	unsealed	870	7	.	0%	0%
3	C8-95-TCE	75N0168	closed	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-95-TOE	75N0169	open	on / on	4.5 turns	unsealed	sealed	870	7	horizontal	0%	0%
3	C8-R100-95-CE-1	75N0170		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R100-95-CE	75N0171		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R100-E20C30-95CE	75N0172	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	30%	0%
3	C8-R105-95-CE	75N0173		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R110-110C2-95-CE	75N0174		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
3	C8-R120-95-CE	75N0175		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R120-E0C30-95CE	75N0176	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	30%	0%
3	C8-R120-E20C0-95CE	75N0177	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-R120-E20C30-95CE	75N0178	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	30%	0%
3	C8-R130-95-CE	75N0179		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R140-95-CE	75N0180		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R60-95-CE	75N0181		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R70-95-CE	75N0182		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R80-95-CE	75N0183		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R80-E0C30-95CE	75N0184	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	30%	0%
3	C8-R80-E20C0-95CE	75N0185	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	20%
3	C8-R80-E20C30-95CE	75N0186	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	30%	20%
3	C8-R90-95-CE	75N0187	closed	on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-R95-95-CE	75N0188		on / on	4.5 turns	unsealed	sealed	865	7	horizontal	0%	0%
3	C8-EB0-115-CE	75N0189	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-EB10-115-CE	75N0190	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	10%
3	C8-EB20-115-CE	75N0191		on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	20%
3	C8-EB35-115-CE	75N0192	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	35%
3	C8-EB5-115-CE	75N0193	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	5%
3	C8-EB50-115-CE	75N0194	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	50%
3	C8-EB10-55-CE	75N0195	closed	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	10%
3	C8-EB20-55-CE	75N0196	closed	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	20%
3	C8-EB35-55-CE	75N0197	closed	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	35%
3	C8-EB5-55-CE-2	75N0198	closed	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	5%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
3	C8-EB50-55-CE	75N0200	closed	off / off	4.5 turns	unsealed	sealed		7	horizontal	0%	50%
3	C8-EB0-82-CE	75N0201	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-EB10-82-CE	75N0202	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	10%
3	C8-EB20-82-CE	75N0203	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	20%
3	C8-EB35-82-CE	75N0204	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	35%
3	C8-EB5-82-CE	75N0205	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	5%
3	C8-EB50-82-CE	75N0206	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	50%
3	C8-EB0-95-CE	75N0207	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	0%
3	C8-EB10-95-CE	75N0208	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	10%
3	C8-EB20-95-CE	75N0209	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	20%
3	C8-EB35-95-CE	75N0210	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	35%
3	C8-EB5-95-CE	75N0211	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	5%
3	C8-EB50-95-CE	75N0212	closed	on / on	4.5 turns	unsealed	sealed		7	horizontal	0%	50%
2	T2-TRN-100A-55-NE	75T0001	none	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-MF17-115C1-115C2-90A-95-CCE	75T0002	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		30%	0%
2	T2-MF19-85C1-85C2-90A-95-CCE	75T0003	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		30%	0%
2	T2-TRN-100A-55-NE-SC	75T0004	none	off / off	3 turns	sealed	unsealed	950	5.75		0%	0%
2	3T-75629575-NE3-Retest	75T0005	none	on / on	3 turns	unsealed	sealed		5.375		0%	0%
2	T2-MF1-100C1-100C2-90A-95-CCE	75T0006	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		30%	0%
2	T2-MF35-115C1-115C2-90A-95-CE	75T0007	closed	on / on	4.5 turns	unsealed	unsealed	848	5.75		0%	0%
2	T2-MF37-85C1-85C2-90A-95-CE	75T0008	closed	on / on	4.5 turns	unsealed	unsealed	848	5.75		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-MFB2-100C1-100C2-90A-95-CE	75T0009	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-MFR10-85C1-85C2-90A-95-CC2F	75T0010	open	on / on	4.5 turns	unsealed	unsealed	865	5.75		30%	0%
2	T2-MFR12-115C1-115C2-90A-95-CC2F	75T0011	open	on / on	4.5 turns	unsealed	unsealed	865	5.75		30%	0%
2	T2-MFR8-100C1-100C2-90A-95-CC2F	75T0012	open	on / on	4.5 turns	unsealed	unsealed	865	5.75		30%	0%
2	T2-TRN-100A-55-1E-DM	75T0013	10% open	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-1F-DM	75T0014	1 finger	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-2E-DM	75T0015	20% open	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-2F-DM	75T0016	2 finger	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-3E-DM	75T0017	30% open	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-3F-DM	75T0018	3 finger	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-CE-DM-2	75T0019	closed	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-OE-DM	75T0020	open	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-95-1ER-DM	75T0021	10% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-1FER-DM	75T0022	1 finger	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-2ER-DM	75T0023	20% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-2FER-DM	75T0024	2 finger	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-3ER-DM	75T0025	30% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-3FER-DM	75T0026	3 finger	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-CE-DM	75T0027	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-OER-DM	75T0028	open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-CBASE-3000-95-CE	75T0029	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-MF0-100C1-100C2-100A-95-CCE	75T0030	closed	on / on	3 turns	unsealed	unsealed	939	5.75		30%	0%
2	T2-MF11-85C1-85C2-110A-95-CCE	75T0031	closed	on / on	1 turn	unsealed	unsealed	1060	5.75		30%	0%
2	T2-MF13-115C1-115C2-100A-95-CCE	75T0032	closed	on / on	3 turns	unsealed	unsealed	939	5.75		30%	0%
2	T2-MF15-85C1-85C2-100A-95-CCE	75T0033	closed	on / on	3 turns	unsealed	unsealed	939	5.75		30%	0%
2	T2-MF2-100C1-100C2-63A-95-CCE	75T0034	closed	on / on	3 turns	unsealed	unsealed	650	9.25		30%	0%
2	T2-MF21-115C1-115C2-63A-95-CE	75T0035	closed	on / on	3 turns	unsealed	unsealed	650	9.25		0%	0%
2	T2-MF24-85C1-85C2-63A-95-CE	75T0036	closed	on / on	3 turns	unsealed	unsealed	650	9.25		0%	0%
2	T2-MF26-115C1-115C2-110A-95-CE	75T0037	closed	on / on	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-MF29-85C1-85C2-110A-95-CE	75T0038	closed	on / on	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-MF31-115C1-115C2-100A-95-CE	75T0039	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-MF33-85C1-85C2-100A-95-CE	75T0040	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-MF38-100C1-100C2-63A-95-CE	75T0041	closed	on / on	3 turns	unsealed	unsealed	640	9.25		0%	0%
2	T2-MF39-100C1-100C2-110A-95-CE	75T0042	closed	on / on	1 turn	unsealed	unsealed	1056	5.75		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-MF4-85C1-85C2-63A-95-CCE	75T0043	closed	on / on	3 turns	unsealed	unsealed	650	9.25		30%	0%
2	T2-MF6-115C1-115C2-63A-95-CCE	75T0044	closed	on / on	3 turns	unsealed	unsealed	650	9.25		30%	0%
2	T2-MF7-100C1-100C2-110A-95-CCE	75T0045	closed	on / on	1 turn	unsealed	unsealed	1060	5.75		30%	0%
2	T2-MF8-115C1-115C2-110A-95-CCE	75T0046	closed	on / on	1 turn	unsealed	unsealed	1060	5.75		30%	0%
2	T2-MFB1-100C1-100C2-100A-95-CE	75T0047	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	3T-22A-Retest-OB	75T0048	none	on / on	6 turns	sealed	sealed		5.375		0%	0%
2	3T-22A-Retest	75T0049	none	on / on	6 turns	sealed	sealed		5.375		0%	0%
1	T2-22A-ONE-6T-US	75T0050	none	on / on	6 turns	unsealed	unsealed				0%	0%
2	T2-55-1ER-DMM	75T0051	1 finger	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-55-2ER-DMM	75T0052	2 finger	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-55-CE-DMM	75T0053	closed	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-55-OER-DMM	75T0054	open	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-55-T1ER-DMM	75T0055	1 finger	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-55-TCE-DMM	75T0056	closed	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-63A-55-1E-DM-2	75T0057	10% open	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-1F-DM-2	75T0058	1 finger	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-2E-DM-2	75T0059	20% open	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-2F-DM-2	75T0060	2 finger	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-3E-DM-2	75T0061	30% open	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-TRN-63A-55-3F-DM-2	75T0062	3 finger	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-CE-DM-2	75T0063	closed	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-NE-DM-SC	75T0064	none	off / off	5.5 turns	sealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-NE-DM	75T0065	none	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-OE-DM-2	75T0066	open	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-RD-DM	75T0067	none	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-T1E-DM	75T0068	10% open	off / off	3 turns	unsealed	unsealed	650	9.25		0%	0%
2	T2-TRN-63A-55-T2E-DM-2	75T0069	20% open	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-T3E-DM-2	75T0070	30% open	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-63A-55-TCE-DM-2	75T0071	closed	off / off	5.5 turns	unsealed	unsealed	620	7.25		0%	0%
2	T2-TRN-75A-55-1E-DM	75T0072	10% open	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-1F-DM-2	75T0073	1 finger	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-2E-DM-2	75T0074	20% open	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-2F-DM-2	75T0075	2 finger	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-3E-DM-2	75T0076	30% open	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-3F-DM-2	75T0077	3 finger	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-CE-DM-2	75T0078	closed	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-NE-DM-SC	75T0079	none	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-NE-DM	75T0080	none	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-OE-DM-2	75T0081	open	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-75A-55-RD-DM	75T0082	none	off / off	3 turns	unsealed	unsealed	725	7.25		0%	0%
2	T2-TRN-88A-55-1ER-DM	75T0083	10% open	off / off	3.5 turns	unsealed	unsealed	864	6.25		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-TRN-88A-55-1F-DM-2	75T0084	1 finger	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-2E-DM-2	75T0085	20% open	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-2F-DM-2	75T0086	2 finger	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-3E-DM-2	75T0087	30% open	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-3F-DM-2	75T0088	3 finger	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-CE-DM-2	75T0089	closed	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-NE-DM-SC	75T0090	none	off / off	4.5 turns	unsealed	unsealed	864	5.75		0%	0%
2	T2-TRN-88A-55-NE-DM	75T0091	none	off / off	4.5 turns	unsealed	unsealed	864	5.75		0%	0%
2	T2-TRN-88A-55-OE-DM-2	75T0092	open	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-RD-DM	75T0093	none	off / off	4.5 turns	unsealed	unsealed	864	5.75		0%	0%
2	T2-TRN-88A-55-T1ER-DM	75T0094	10% open	off / off	3.5 turns	unsealed	unsealed	864	6.25		0%	0%
2	T2-TRN-88A-55-T2E-DM-2	75T0095	20% open	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-T3E-DM-2	75T0096	30% open	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-88A-55-TCE-DM-2	75T0097	closed	off / off	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-TRN-100A-55-RD	75T0098	none	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-T1E-DM	75T0099	10% open	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-T2E-DM	75T0100	20% open	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-T3E-DM	75T0101	30% open	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-100A-55-TCE-DM	75T0102	closed	off / off	3 turns	unsealed	unsealed	950	5.75		0%	0%
2	T2-TRN-55-T1FER-DM	75T0103	1 finger	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-55-T2FER-DM	75T0104	2 finger	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-55-T3FER-DM	75T0105	3 finger	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-TRN-110A-55-1E-DM	75T0106	10% open	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-1F-DM-2	75T0107	1 finger	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-2E-DM	75T0108	20% open	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-2F-DM-2	75T0109	2 finger	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-3E-DM	75T0110	30% open	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-3F-DM-2	75T0111	3 finger	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-NE-DM-2	75T0112	none	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-NE-DM-SC	75T0113	none	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-OE-DM-2	75T0114	open	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-RD-DM	75T0115	none	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-T1E-DM	75T0116	10% open	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-T2E-DM	75T0117	20% open	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-T3E-DM	75T0118	30% open	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-TRN-110A-55-TCE-DM	75T0119	closed	off / off	1 turn	unsealed	unsealed	1060	5.75		0%	0%
2	T2-CAN-55-1ER-DM	75T0120	10% open	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-55-2ER-DM	75T0121	20% open	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-55-3ER-DM	75T0122	30% open	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-55-CE-DM	75T0123	closed	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-55-OER-DM	75T0124	open	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-55-T1ER-DM	75T0125	10% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-55-T2ER-DM	75T0126	20% open	on / on	3 turns	unsealed	unsealed		5.75		0%	0%
2	T2-CAN-55-T3ER-DM	75T0127	30% open	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-CAN-55-TCE-DM	75T0128	closed	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-55-TOER-DM	75T0129	open	off / off	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-T1ER-DM	75T0130	10% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-T1FER-DM	75T0131	1 finger	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-T2ER-DM	75T0132	20% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-T2FER-DM	75T0133	2 finger	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-T3ER-DM	75T0134	30% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-T3FER-DM	75T0135	3 finger	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-TCE-DM	75T0136	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-TRN-95-TOER-DM	75T0137	open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-95-1ER-DM	75T0138	10% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-95-2ER-DM	75T0139	20% open	on / on	3 turns	unsealed	unsealed		5.75		0%	0%
2	T2-CAN-95-3ER-DM	75T0140	30% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-95-CE-DM	75T0141	closed	on / on	3 turns	unsealed	unsealed		5.75		0%	0%
2	T2-CAN-95-OER-DM	75T0142	open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-95-T1ER-DM	75T0143	10% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-95-T2ER-DM	75T0144	20% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-95-T3ER-DM	75T0145	30% open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-95-TCE-DM	75T0146	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-CAN-95-TOER-DM	75T0147	open	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-HS-1875-95-CF-C	75T0148	closed	on / on	4.5 turns	unsealed	unsealed		8		0%	0%
2	T2-HS-2250-95-CF	75T0149	closed	on / on	3 turns	unsealed	unsealed	859	7		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-HS-2384-95-CF	75T0150	closed	on / on	4 turns	unsealed	unsealed	1002	6.25		0%	0%
2	T2-HS-2625-95-CF	75T0151	closed	on / on	2 turns	unsealed	unsealed	1002	6.25		0%	0%
2	T2-HS-3000-95-CF-C	75T0152	closed	on / on	1.5 turns	unsealed	unsealed		5.75		0%	0%
2	T2-HS-3200-95-CF-C	75T0153	closed	on / on	1.5 turns	unsealed	unsealed		5.25		0%	0%
2	T2-1875-95-CF-C	75T0154	closed	on / on	3 turns	unsealed	unsealed	640	9.25		0%	0%
2	T2-2250-95-CF	75T0155	closed	on / on	3 turns	unsealed	unsealed	859	7		0%	0%
2	T2-2625-95-CF	75T0156		on / on		unsealed	unsealed				0%	0%
2	T2-3000-95-CF	75T0157	closed	on / on	3 turns	unsealed	unsealed		5.75		0%	0%
2	T2-3240-95-CF	75T0158	closed	on / on	1 turn	unsealed	unsealed		5.75		0%	0%
2	3T-22AA-0	75T0159	none	on / on	6 turns	sealed	unsealed		5.75		0%	0%
2	3T-22B	75T0160	none	on / on	6 turns	unsealed	unsealed		5.75		0%	0%
2	3T-22C Cyclic #2	75T0161	none	on / on		unsealed	unsealed				0%	0%
2	3T-22C Cyclic #3	75T0162		on / on		unsealed	unsealed				0%	0%
2	3T-22C Cyclic #4	75T0163		on / on		unsealed	unsealed				0%	0%
2	3T-ONE	75T0164	none	on / on	3 turns	unsealed	sealed		5.5		0%	0%
1	T2-ONE-3HP	75T0165	open	on / on	3 turns	unsealed	unsealed				0%	0%
1	T2-ONE	75T0166	none	on / on	3 turns	unsealed	unsealed				0%	0%
2	T2-R-3000-115-CE	75T0167	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-R-3000-75-CE	75T0168	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-R-3000-95-CE	75T0169	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-RBASE-3000-115-CE	75T0170	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-RBASE-3000-75-CE	75T0171	closed	on / on	3 turns	unsealed	unsealed	939	5.75		0%	0%
2	T2-MFB3-100C1-100C2-90A-95-CE-3	75T0172	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-NC1-CK1-100C1-100C2-90A-CE	75T0173	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-NC2-CK1-CK2-100C1-100C2-90A-CE	75T0174	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-NC3-CK1-100C1-100C2-90A-CE	75T0175	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-NC4-CK1-CK2-100C1-100C2-90A-CE	75T0176	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	IEER Calculation 7.5 ton RTU2 6 turns	75T0177		on / on		unsealed	unsealed				.	.
2	IEER Calculation 7.5 ton Trane RTU1 6 turns	75T0178		on / on		unsealed	unsealed				.	.
2	IPLV Calculation 7.5 ton Trane RTU1 6 turns	75T0179		on / on		unsealed	unsealed				.	.
2	Retest IPLV Calculation 7.5 ton Trane RTU2 6 turns	75T0180		on / on		unsealed	unsealed				.	.
2	3T-75629575-E3-Retest	75T0181	closed	on / on	3 turns	unsealed	sealed		5.375		0%	0%
2	3T-75629575-E6-Retest	75T0182	closed	on / on	6 turns	unsealed	sealed		5.375		0%	0%
2	3T-75629575-E6	75T0183	closed	on / on	6 turns	unsealed	sealed		5.375		0%	0%
2	T2-RC10-130C1-130C2-90A-95-CE	75T0186	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RC11-140C1-140C2-90A-95-CE	75T0187	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RC2-95C1-95C2-90A-95-CE	75T0188	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-RC3-90C1-90C2-90A-95-CE	75T0189	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RC4-80C1-80C2-90A-95-CE	75T0190	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RC5-70C1-70C2-90A-95-CE	75T0191	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RC6-60C1-60C2-90A-95-CE	75T0192	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RC7-105C1-105C2-90A-95-CE	75T0193	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RC8-110C1-110C2-90A-95-CE	75T0194	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RC9-120C1-120C2-90A-95-CE	75T0195	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-RCB1-100C1-100C2-90A-95-CE-5	75T0196	closed	on / on	4.5 turns	unsealed	unsealed	865	5.75		0%	0%
2	T2-MF45-100C1-100C2-90A-CB05-CCE	75T0197	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		5%	0%
2	T2-MF46-100C1-100C2-90A-CB10-CCE	75T0198	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		10%	0%
2	T2-MF47-100C1-100C2-90A-CB20-CCE	75T0199	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		20%	0%
2	T2-MF48-100C1-100C2-90A-CB30-CCE	75T0200	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		30%	0%
2	T2-MF49-100C1-100C2-90A-CB40-CCE	75T0201	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		40%	0%
2	T2-MF50-100C1-100C2-90A-CB50-CCE	75T0202	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		50%	0%

RTU	Test	Test ID	Economizer Opening	Compressor 1/2 On or Off	Motor Sheave Setting	Cabinet Sealing	Ductwork Sealing	Fan Speed (RPM)	Pulley Diameter (in)	Air Discharge Configuration	Condenser Blockage	Evaporator Blockage
2	T2-MF51-100C1-100C2-90A-CB60-CCE	75T0203	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		60%	0%
2	T2-MF52-100C1-100C2-90A-CB70-CCE	75T0204	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		70%	0%
2	T2-MF53-100C1-100C2-90A-CB80-CCE	75T0205	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		80%	0%
2	T2-MFB3-100C1-100C2-90A-95-CE-2	75T0206	closed	on / on	4.5 turns	unsealed	unsealed	866	5.75		0%	0%
2	T2-E-3000-95-CE-B30%	75T0207	closed	on / on	3 turns	unsealed	unsealed	939	5.75		.	30%
2	T2-E-3000-95-CE-B50%	75T0208	closed	on / on	3 turns	unsealed	unsealed	939	5.75		.	50%
2	T2-TRN-75A-55-TCE-DM-2	75T0209	closed	on / on		unsealed	unsealed					
2	T2-TRN-75A-55-T1E-DM	75T0210	10% open	on / on		unsealed	unsealed					
2	T2-TRN-75A-55-T2E-DM-2	75T0211	20% open	on / on		unsealed	unsealed					
2	T2-TRN-75A-55-T3E-DM-2	75T0212	30% open	on / on		unsealed	unsealed					
2	T2-TRN-110A-55-CE-DM-2	75T0213	closed	on / on		unsealed	unsealed					

APPENDIX D. TEST DATA

This section provides an overview of the test data and how it was collected, assembled, and reported. Please reference the HVAC Laboratory Data Dictionary (APPENDIX E) for more detail.

The original data were taken as a time series of measurements over the course of steady-state operation. The Intertek data collection system calculated an average point estimate for each relevant test variable which was used as the value for that test.

The data were delivered in individual Excel files; one for each test. The Excel file had different sheets for different information, such as a sheet containing the time series of data, a sheet summarizing the compressor power data, and a sheet summarizing the temperature data.

DNV GL assembled the data into a flat file by selecting the summary/average information from the sheets in the individual test workbooks and putting them into a dataset with one record per test. We established the test conditions based on the comments included with each test workbook and the data in the individual variable readings.

The flat file represents the best collection of the test conditions and test results based on the information available in the individual test reports. A few gaps in the data resulted when the test reports omitted information related to test conditions.

APPENDIX E. DATA DICTIONARY AND DETAILS

Introduction

This appendix describes the process for creating a "flat file" of test data gathered during the CPUC HVAC Laboratory Test study. DNV GL assembled a flat file of HVAC laboratory data from the individual test file results produced during data collection at the Intertek test facility. This document introduces the individual test files, provides an overview of the flat file development process, and contains a data dictionary describing the final flat file.

The document is presented in four primary sections. Individual Test Files introduces the individual test files that were the "output" from the testing process. Flat File Assembly describes how the individual test files were assembled into a single flat file with one record per test. Data Dictionary contains the data dictionary, and Additional Flat File Documentation provides additional, more detailed documentation related to assembling the flat file.

Individual Test Files

The data was collected during multiple testing periods at Intertek. Each test produced a single Excel workbook with data at two levels: a time-series of detailed data and summary data made up of the average of the time series data. The summary data was stored in multiple sheets within the Excel workbook. The summary data is what was most often used for analysis and reporting, and the summary data is what was assembled into the flat file.

There were many challenges in assembling the individual test files into a single flat file. They include:

- The data was collected in multiple "sessions" of testing which lasted as long as two weeks, with months passing between sessions. Each session had its own naming convention for identifying individual tests and the summary data variables.
- Not all tests collected or summarized the same data. Some tests were conducted without the compressor running, for example, and don't contain compressor data.
- Although the variable names are generally descriptive, it's not always possible to clearly identify the data that was collected and where in the cycle from which it was collected.

Despite those differences, there were also many similarities to the test files. This section will describe a typical individual file and how it might be interpreted. For our example, we reference the test named C8-EB5-82-CE.xls.

The typical file includes time series data as the last tab (or two) in the Excel file. The time-series data was summarized to provide average "steady-state" results for the test. The summary data is included in the rest of the tabs, typically named:

- Summary
- Comments
- Detail1
- Power
- Compressor1
- Compressor2
- Indoor TC

- Outdoor TC

This particular test also has a tab named Condensate HB, which is not a typical component and appears to have been added after the data was collected.

Each sheet contains some high-level test characterization. The Summary sheet includes the greatest characterization, which includes the type of equipment tested, the temperature conditions, the refrigerant charge, the technician's name, etc. Subsequent sheets contain a subset of the high-level data.

The Summary and Comments sheets contain a field (or two) for comments, entered by the laboratory technician. The comments include information on the test conditions, such as whether the cabinet or duct work was sealed, or changes in the motor pulley or motor sheave that would affect the fan speed. The Comments sheet includes only the comment and the high-level test data, while the Summary sheet also contains numeric data, discussed later.

The rest of the sheets contain summary information from the time series data. In the Detail1, Power, Compressor1, Compressor2, Indoor TC, and Outdoor TC sheets, the data is presented in rows, with each variable representing one row. Figure 15 shows an example of the data from the Detail1 sheet.

Figure 15. Example data from Detail1 sheet

	1	2	3	4	5	6	7 Avg	Stdev
Indoor Data								
In Dry Bulb	75.075	75.006	74.995				75.039	0.01
In Wet Bulb	61.971	62.011	62.041				62.003	0.018
Out Dry Bulb	57.494	57.494	57.494				57.502	0.012
Out Wet Bulb	53.803	53.828	53.852				53.831	0.013
OD Dry Bulb	82.012	81.972	81.992				81.991	0.011
OD Wet Bulb	67.965	68.031	68.004				68.001	0.023
Inlet Grid	74.57	74.55	74.54				74.62	0.07
Outlet Grid	57.15	57.15	57.29				57.18	0.08
Nozzle Temp	61.35	61.34	61.32				61.36	0.03
Unit Static	1.134	1.132	1.137				1.135	0.002
B4Nozzle	0.163	0.169	0.155				0.161	0.005
Nozzle Delta	0.8773	0.8738	0.8667				0.8728	0.0028
Air flow CFM	2510.1	2504.9	2494.8				2503.6	4
Air flow SCFM	2455.1	2450.1	2440				2448.5	4
Net Sensible	49096	48816	48598				48856	88
Net Latent Enthalpy	11680	11982	12040				11831	98
Air Side Only EER	7.998	8.018	7.947				7.991	0.023

As the figure shows, the sheet contains three measurements for each variable with a subsequent "average" value and the standard deviation of the values over the course of the test. Although all of the test files were set up to accommodate seven measurements per variable, most tests reported three, with a few reporting 4 measurements.

The data was divided among the sheets in a very logical manner. The Power sheet reports on the amps, volts, and wattages of the different system components. The Compressor1 and Compressor2 sheets report on the refrigerant temperature and pressure for each circuit at different points in the cycle. The Outdoor TC sheet reports on temperature measurements for the air-side portion of the system.

The final sheet, the Summary sheet, contains the average data and standard deviation for some of the measurements from the other sheets. For example, this test shows the inlet and outlet dry and wet bulb temperature for the air, the air flow and static pressure, the power draws, and the sensible capacity and efficiency, among other variables. Most of the data in the laboratory reports comes directly from the Summary sheet.

As mentioned above, there is a lot of data variation between the different test files, but most follow the same general structure described in this section.

Flat File Assembly

Overview

The objective of the flat file assembly was to create a single file with the results of all of the tests in one, easy-to-analyze dataset. To accomplish this, DNV GL was required to take data from each individual Excel file and assemble it into a single file with one record (or row of data) per test. We established 3 levels of data characterization when developing the flat file:

- Level 1: A complete list of the test files. Which of the Excel files from the testing process should be included in the flat file?
- Level 2: A complete list of the sheets (or tabs) within each Level 1 test file.
- Level 3: A complete characterization of the summary data and other information in each sheet, including the type of data and its location.

Once the data was characterized at these three levels, we were able to establish the structure of the flat file and populate the structure with the data. Each step involved some level of quality control to ensure that the information we assembled was correct. The final step in the assembly process involved cleaning the flat file and conducting quality control to ensure the data contained in it was accurate.

The following sections describe in detail the process of characterizing the data and populating the structure.

Level 1 Data Characterization – List of Files

DNV GL had three sources of information for developing a complete list of the tests conducted during the HVAC Laboratory project: A directory of individual data files, a laboratory test plan,[17] and a report written by Robert Mowris and Associates which discusses the results of the tests. To determine the final list of data files, we compared the three sources to:

- Confirm that the files in the directory had a corresponding test in the report.
- Confirm that the tests in the report had a corresponding file in the directory.
- Identify files in the test plan that were not intended to be part of the analysis.

Detailed Process

Table 6 summarizes the file dispositions at 3 review levels, called Level 1a, Level 1b, and Level 1c. The tasks used to conduct the characterization included:

[17] HVAC_5_Lab_Test_Plan_20150615_v7.42x.xls

1) **Initial List:** Develop a list of all of the files (there were 778) in the folder structure.[18]
2) **List Level 1a:** Eliminate files that are known to be outside of the analysis: 197 were eliminated.
   a) These include files with JPG or DB file extensions, tests with "SPWCT"[19] in the name, and tests with "calc" or "calculation" in the name.
   b) Confirm that all files correspond to a test in the report. 27 files were removed from the analysis list. (See Table 6 for a list of the files that were removed and why.)
3) **List Level 1b:** Identify duplicate files (e.g. files located in more than one sub-folder) and reduce the list to unique files.
   a) Removed 15 files similar to the "baseline" files from Level 1a.
      i) Removed 11 files classified as "Baseline" in the test plan. These files were used to establish the test conditions but were not used in the analysis.
      ii) Removed 3 files that are not in the test plan and not in the report. DNV GL assumed these were similar to the "Baseline" files.
      iii) Removed another that was treated as a "Baseline" but also included in the test plan.
   b) Removed 2 files that were used in a manner similar to the "SPWCT" files but not named that way (companion files).
   c) Removed 4 duplicate files with slightly different file names from the duplicate.
   d) Removed 4 unusable or non-test files.
      i) Removed 3 files from tests that were begun but not completed because the unit could not sustain the extreme test conditions. Removed 1 test that was completed but incorrectly measured.
      ii) Removed 1 file that was a calculation file, not a test file.
4) **List Level 1c:** Confirm that all tests in the report correspond to a file. DNV GL was able to match all tests to a file in the structure.

The remaining list of tests characterizes Level 1, or the complete list of tests that were analyzed for the HVAC 5 Laboratory project. A DNV GL identification number (ID) was assigned to each test. The IDs were assigned so the 3-ton units have a "30" series ID and the 7.5-ton units have a "75" series ID. The TXV units have a "T" in the ID and the non-TXV units have an "N."[20] The entire Level 1 list is located after the data dictionary, later in this document. Table 7 summarizes the tests by RTU.

[18] The folder structure includes all files and folders under Q:\PROJECT\CPUC HAVC Lab\Untouched Test Data.

[19] SPWCT stands for static pressure with code tester. This references a "setup" test that used the code tester fan to establish the correct static pressure. The outcome of the test was used to establish the correct conditions for the actual measurement test.

[20] The final list includes some non-sequential IDs because 8 files were removed during the data processing portion of the project, after the ID numbers were already assigned. The 8 files are accounted for in Table 6.

Table 6. Level 1 file disposition summary

List Level	Notes	Adjustment	Cumulative Count
Initial List	All files in directory		778
List Level 1a	Remove picture files	- 27	
	Remove companion files	- 162	
	Remove calculation-only files	-8	581
List Level 1b	Remove baseline tests	- 15	
	Remove companion files	- 2	
	Remove duplicate files	- 4	
	Removed unusable test files	- 4	
	Remove non-test file	- 1	555
List Level 1c	No change	0	555

Table 7. Level 1 file summary by RTU

RTU	# of Tests in Level 1	Actual # of Test Files
1: 7.5-ton TXV	3	3
2: 7.5-ton TXV	208	204
3: 7.5-ton non-TXV	193	189
4: 3-ton TXV	44	44
5: 3-ton non-TXV	115	115
Total	563	555

Quality Control

DNV GL ensured the quality and accuracy of the Level 1 characterization through the following:

- Multiple sources: by comparing the tests located in three sources (the file structure, the test plan, and the report), we were able to identify tests that may have been overlooked when assembling any one of the sources.
- Multiple processes: DNV GL employed a combination of automatic and manual comparisons to identify duplicates and inconsistencies between the two tests.
    - The automatic processes reduced comparison time, limiting the fatigue that can occur in a long manual process.

- The outcome of the automatic process was reviewed and confirmed manually to ensure there were no systematic errors.
- The manual process addressed the special cases that were flagged during the automatic process.

- Independent final deliverable: The final list was produced manually and automatically and the two outcomes compared to identify any discrepancies, which were resolved.

Level 2 Data Characterization – List of Sheets

The Level 2 list contains a complete list of worksheets found in the workbook for each test file. To determine the list for each Level 1 file, DNV GL:

- Used a pre-existing macro to list the sheets in each test file
- Limited the tests to those contained in the Level 1 list
- Manually combined the macro-produced files into one workbook with a list of the sheets for each test.

Detailed Process

DNV GL used a pre-existing Excel macro, modified for this application, which imports the name of all of the sheets contained in all of the workbooks within a given file structure. It outputs a summary Excel spreadsheet with a single row per test file and the sheet names in columns. Table 8 shows an example of the output for 4 test files.

The macro produced a row for every file in the structure, including those that were eliminated when producing the Level 1 list. DNV GL limited the macro output to only the files included in Level 1 by merging the Level 1 list with the macro-produced list and discarding all non-Level 1 files.

The macro was run in subfolders of the larger file structure. The list of files from each subfolder had to be combined with other subfolders to produce a list of all sheet names for each Level 1 test, which satisfies the Level 2 characterization. The complete Level 2 characterization is in a later section.

Table 8. Sample Level 2 macro output

Test Name	Sheet 1 Name	Sheet 2 Name	Sheet 3 Name	Sheet 4 Name	Sheet 5 Name	Sheet 6 Name	Sheet 7 Name	Sheet 8 Name	Sheet 9 Name
C-EB20-115-CE.xlsx	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-76	G100958166-100-76 (2)
C-95-NE.xlsx	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-20	G100958166-100-20 (2)
C-MF-75629575-2E3J.xlsx	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-361	G100958166-100-361 (2)
IPLV Calculation 7.5 ton.xls	Sheet4	Sheet1	Sheet2	Sheet3					

Quality Control

DNV GL ensured the quality and accuracy of the Level 2 characterization through the following:

- We confirmed that the Level 2 characterization has the same files as the Level 1 list.
- DNV GL looked at the number of sheets per test (see Table 9). We used the experience gained from manually looking at individual test files to determine whether the distribution output from our file was reasonable. It was.
- DNV GL implemented a manual process for the Level 3 characterization that involved a review of every file. The manual review confirmed the automatic results produced by the macro.

Table 9. Number of sheets per file by RTU

RTU	Number of Test Files						
	1 Sheet	4 Sheets	8 Sheets	9 Sheets	10 Sheets	11 Sheets	Total # Files
1	0	0	0	0	3	0	3
2	2	5	13	0	188	0	208
3	1	5	4	6	83	94	193
4	0	3	11	30	0	0	44
5	0	6	10	99	0	0	115
Total	3	19	38	135	274	94	563

Level 3 Data Characterization – List of Variables

The Level 3 list contains the distribution of data across all files and tabs. In other words, the Level 3 list includes the specific cells that contain the data for each variable. To determine the Level 3 list for each Level 2 sheet, DNV GL:

- Manually identified cell ranges in each tab that corresponded to logical blocks of information
- Selected ranges across all tests and RTUs[21]
- Created a single summary range file[22]
- Automatically populated missing logic blocks (for tests that did not have a particular block) with 'N/A' rather than leaving it empty

[21] Located here "Q:\PROJECT\CPUC HVAC Lab\Test Data\Documentation\Level3_Documentation_v5.xlsx"

[22] Located here "E:\CPUC 1314 HVAC Lab Testing - 20470028\data\summary_range_driver.xlsx"

Detailed Process

At its heart, the basis for the Level 3 characterization was a manual process that identified the range of cells that contain logical (and repeating) blocks of data. For example, most data files (but not all) had a grouping of test data in the test's Summary tab located in cells A1:F12. DNV GL manually opened each test file and confirmed the cell range for each defined logic block. Small adjustments were made to accommodate anomalies in individual data files where necessary. Table 10 shows an example mapping for one test.

Table 10. Example mapping of logical informational block

Name of Logical Block	Cell Range
Summary Tab Test Information Range	A1:F12
Summary Tab Comment Range 1	A13:B15
Summary Tab Comment Range 2	A45:F45
Summary Tab Summ Stats Range	A17:F44
Detail1 Tab Information Range	A8:J28
Power Tab Information Range	A9:J53
Compressor 1	N/A
Compressor 1 Discharge Information Range	A10:J13
Compressor 1 Condenser Outlet	A16:J19
Compressor 1 OD Liquid Information Range	N/A
Compressor 1 Evaporator Inlet Information Range	A22:J25
Compressor 1 Evaporator Outlet Information Range	A28:J31
Compressor 1 Compressor Suction Information Range	A34:J43
Compressor 2	N/A
Compressor 2 Discharge Information Range	A10:J13
Condenser Outlet	A16:J19
Compressor 2 Evaporator Inlet Information Range	A22:J25
Compressor 2 Evaporator Outlet Information Range	A28:J31
Compressor 2 Compressor Suction Information Range	A34:J43
Indoor TC Tab Information Range	A10:J42
Outdoor TC Tab Information Range	A8:J55

Once the ranges were identified for each test file, they were assembled into a single file that identified all of the similar ranges for each test. In other words, each record contained a single test and identified which cells had data for the first logic block, which cells had data for the second logic block, etc. If a particular test did not contain data for a given logic block (if the compressor was turned off, for example), the assembly code populated that range with "N/A" to identify data that was intentionally missing, not data that was overlooked. The completed Level 3 characterization is in a later section.

Final Flat File

Once the data was characterized on all three levels (which files contain the data we want; which sheets contain the data we want; which cells contain the data we want), DNV GL was able to pull the data into a single dataset and clean the file. To create the flat file, DNV GL:

- Used the Level 3 ranges to import data from all tests into a single dataset
- Reviewed the data to identify anomalies in naming conventions or units
- Remove artificial distinctions and combine like data with like data
- Eliminate fields with no populated cells.

Detailed Process

DNV GL started assembling the flat file by pulling in the data from each file, sheet, and cell range. The variables were named according to the information in the Excel files. For example, Figure 16 shows an example of the compressor sheet data for a test. The Compressor 1 logic block of data is contained in cells A3:J7. There are many variables within the group, including Compressor 1 flow rate measurement 1, compressor 1 flow rate measurement 2, compressor 1 flow rate average, and compressor 1 flow rate standard deviation. Each cell was named and the corresponding data brought in for each test.

Figure 16. Example of data in Excel

	1	2	3	4	5	6	7	Avg	Stdev
Compressor 1									
Flow rate lbs/hr	590.58	589.14	590.04					589.74	1
Enthalpy Evap In	39.74	39.78	39.77					39.75	0.02
Enthalpy Evap Out	113.93	113.93	113.91					113.92	0.01
Meas ref only cap	81011	80953	80933					80923	83
Gross ref meas cap	43816	43683	43749					43746	75
Compressor Disch									
Discharge PSIG	258.79	258.96	258.87					258.93	0.25
Discharge temp	202.11	202.19	202.09					202.08	0.08
Sat Compr disch	119.62	119.67	119.65					119.66	0.07
SH Compr disch	82.49	82.52	82.45					82.42	0.06
Evaporator Inlet									
Liq ID PSIG	248.31	248.49	248.55					248.46	0.22
Liq ID temp	100.82	100.96	100.92					100.85	0.06
Sat Liq ID	116.59	116.65	116.66					116.64	0.07
SC Liq ID	15.77	15.69	15.74					15.78	0.05
Compressor Suction									
Suction PSIG	73.18	73.12	73.16					73.19	0.05
Suction temp	73.19	73.16	73.11					73.17	0.03
Sat Suction	43	42.96	42.99					43.01	0.03
SH Suction	30.19	30.19	30.11					30.16	0.04
Liquid Bef Filter temp	99.52	99.6	99.57					99.52	0.06
Liquid After Filter temp	100.64	100.82	100.81					100.7	0.07

Once all the data was in, DNV GL examined it to identify any data anomalies or errors in naming convention. Continuing with the example in Figure 16, a different test file may have had a Compressor sheet with the Compressor Disch block titled Compressor Disg instead. The values in the two blocks contain the same type of data, but the variables have different names. Where possible, DNV GL combined the data under a single variable name to make comparisons and overall trends easier to analyze. In this way, we were able to combine like data with other like data.

As a final assembly step, DNV GL eliminated variables that contained no data. Again, using Figure 16, DNV GL looked across all files (not just the sample test) and found that none contained data for the variable compressor 1 flow rate measurement 7, for example. That variable was eliminated from the dataset to reduce the overall size of the file.

Quality Control on Flat File

DNV GL completed the following quality control checks on the assembled flat file:

- Automated checks: Much of the data in the flat file is composed of varying degrees of summary. For example, the data on the Summary sheet in the Excel file is an average of multiple readings in previous sheets. To check that the data was brought in correctly, we calculated an average from the more detailed measurements and compared it to the summary information. If detailed readings were missing, the average would be incorrect.
- Frequencies: DNV GL automated a check to determine the frequency of the data in the different variables. Variables with no populated data were not brought in correctly. Variables that had less than complete population were checked to ensure the data was correct.
- Engineering confirmation: DNV GL had an experienced engineer review the data to identify outliers and confirm that the values were consistent with the types of tests that were performed.
- Manual spot checks: DNV GL opened and manually compared the values from some individual Excel files with the data contained in the flat file.
- Tab-level summary checks: DNV GL did a manual check to compare the count and sum of the variables in each tab of every test, at the tab level. For example, if the Power tab for a given test had 47 values that summed to 100,000, then we compared that sum and count to all of the Power tab variables in the flat file.

Data Dictionary

Variable	Description	Units
average_time	Vacuum test duration	minutes
customer	RMA unit specifics	N/A
date	Test Date	N/A
dnv_gl_id	Unique ID for each test file	N/A
Conditions	a combined field for the indoor and outdoor dry and wet bulb temperatures	degrees F
conditions_indoor_dry_bulb	The indoor dry bulb temperature	degrees F
conditions_indoor_wet_bulb	The indoor wet bulb temperature	degrees F
conditions_outdoor_dry_bulb	The outdoor dry bulb temperature	degrees F
conditions_outdoor_wet_bulb	The outdoor wet bulb temperature	degrees F
engineer	Engineer in Charge	N/A
id_unit_type	Indoor Unit Motor Type	N/A
od_unit_model	RTU Model Number	N/A
od_unit_serial	RTU Serial Number	N/A
psy_room	Capacity of Psychometric Testing Room	N/A
refrig_charge_ck_1	parsed from Refrigerant_charge variable; charge on circuit 1	pounds
refrig_charge_ck_2	parsed from Refrigerant_charge variable; charge on circuit 2. If only one circuit, then blank	pounds
refrig_charge_factory_ck_1	Factory listed Charge	pounds
refrig_charge_factory_ck_2	Factory listed Charge	pounds
refrigerant_charge	amount of refrigerant measured in unit	pounds
refrigerant_type	Refrigerant Used in Units	N/A
rtu	RTU Number Used in Report	N/A
tech	Tech Responsible for administering test	N/A
test_standard	HVAC Performance Rating Standard	N/A
test_type	RMA given name for the test	N/A
time	Time test conducted	N/A
tu_id_tag	Test unit ID	N/A
unit_capacity	Nominal Gross Cooling Capacity	Tons
volt_min_max_phs	min/max voltage/phase	N/A
workbook	Test File Name	N/A
ID_Inlet_Dry_Air_x	indoor inlet dry bulb temp ('_mean' = average value; '_std' = standard deviation)	degrees F
ID_Inlet_Wet_Air_x	indoor inlet wet bulb temp ('_mean' = average value; '_std' = standard deviation)	degrees F
ID_Outlet_Dry_Air_x	indoor outlet dry bulb temp ('_mean' = average value; '_std' = standard deviation)	degrees F
ID_Outlet_Wet_Air_x	indoor outlet wet bulb temp ('_mean' = average value; '_std' = standard deviation)	degrees F
OD_Inlet_Dry_Air_x	outdoor inlet dry bulb temp ('_mean' = average value; '_std' = standard deviation)	degrees F
OD_Inlet_Wet_Air_x	outdoor inlet wet bulb temp ('_mean' = average value; '_std' = standard deviation)	degrees F
Tot_Air_Flow_CFM_x	outdoor outlet dry bulb temp ('_mean' = average value; '_std' = standard deviation)	Cubic Feet per Minute
Tot_Air_Flow_SCFM_x	outdoor outlet wet bulb temp ('_mean' = average value; '_std' = standard deviation)	Standard Cubic Feet per Minute

Variable	Description	Units
Unit_Total_Static_x	unit total static pressure ('_mean' = average value; '_std' = standard deviation)	inches of water
Unit_Inlet_Static_x	unit inlet static pressure ('_mean' = average value; '_std' = standard deviation)	inches of water
B4_Nozzle_Static_x	static pressure before nozzle ('_mean' = average value; '_std' = standard deviation)	inches of water
Nozzle_Delta_x	differential pressure before/after nozzle ('_mean' = average value; '_std' = standard deviation)	inches of water
Barometric_Pressure_x	barometric pressure ('_mean' = average value; '_std' = standard deviation)	millimeters of mercury
Total_Volts_x	total volts ('_mean' = average value; '_std' = standard deviation)	Volts
Total_Amps_x	total amps ('_mean' = average value; '_std' = standard deviation)	Amps
Total_Power_x	total power ('_mean' = average value; '_std' = standard deviation)	Watts
Total_Power_Individual_avg	the sum of the average blower watts and the average controls watts	Watts
Net_Sensible_Capacity_x	net sensible capacity ('_mean' = average value; '_std' = standard deviation)	British thermal units per hour
Sensible_ViaGrids_x	sensible capacity via air grids ('_mean' = average value; '_std' = standard deviation)	British thermal units per hour
Air_Side_Only_Cap_x	air side only capacity ('_mean' = average value; '_std' = standard deviation)	British thermal units per hour
Air_Side_Only_EER_x	air side only Energy Efficiency Ratio ('_mean' = average value; '_std' = standard deviation)	British thermal units per hour per watt
ID_Blower_Motor_mean	blower motor speed	rotations per minute
ID_Blower_PF_avg	blower motor power factor	dimensionless
Meas_Refr_Only_Cap_x	Measured Refrigerant Only Capacity ('_mean' = average value; '_std' = standard deviation)	British thermal units per hour
Enthalpy_evap_In_1_x	refrigerant enthalpy at Evaporator Inlet - Circuit 1 ('_mean' = average value; '_std' = standard deviation)	British thermal units per pound
Enthalpy_evap_out_1_x	refrigerant enthalpy at Evaporator Outlet - Circuit 1 ('_mean' = average value; '_std' = standard deviation)	British thermal units per pound
Total_meas_heat_bal_mean	Total measured heat balance - average value	%
ID_Blower_Power_mean	Blower motor power - average value	watts
Air_Side_Only_EERs_mean	air side only sensible Energy Efficiency Ratio - average value	British thermal units per hour per watt
Average_air_side_EER_mean	air side only Energy Efficiency Ratio - average value	British thermal units per hour per watt
Cycle_number	Cycle Number	N/A
Fan_on_time_min	Number of minutes blower fan was on	minutes
OD_Outdoor_Dry_Air_mean	Outdoor mean dry-bulb temperature - average value	degrees F
OD_Outdoor_Wet_Air_mean	Outdoor mean wet-bulb temperature - average value	degrees F
Cycle_total_time	Total cycle time	minutes
C_test_SCFM_mean	Mean SCFM of C Test - average value	Standard Cubic Feet per Minute
OD_On_Watt_hours	Condenser watt-hr when on	Watt-hour
OD_Off_Watt_hours	Condenser watt-hr when off	Watt-hour

Variable	Description	Units
Integrated_EER_mean	Mean Integrated EER - average value	British thermal units per hour per watt
Off_Watt_hours	Watt-hour when unit is off	Watt-hour
EER_from_B_sensible_only_mean	Average EER - sensible heat only - B test - average value	British thermal units per hour per watt
ID_Off_Watt_hours	Evap fan watt-hr when off	Watt-hour
ID_On_Watt_hours	Evap fan watt-hr when on	Watt-hour
Cyclic_Watt_hours	Watt-hour when unit is cycling	Watt-hour
SEER_mean	Mean SEER - average value	British thermal units per hour per watt
Steady_Watt_hours	Watt-hour when unit is in steady state	Watt-hour
ID_Calc_Power_From_CFM_mean	Calculated evaporator fan average power based on delivered cfm	Watts
Code_Tester_Spd_mean	Speed of code-tester fan - average value	%
comments1	A field in which the technician made notes explaining some details about the test	N/A
comments2	A field in which the technician made notes explaining some details about the test	N/A
In_Dry_Bulb_x	indoor inlet dry bulb temp (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
In_Wet_Bulb_x	indoor inlet wet bulb temp (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
OD_Dry_Bulb_x	outdoor inlet dry bulb temp (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
OD_Wet_Bulb_x	outdoor inlet wet bulb temp (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inlet_Grid_x	Indoor grid temperature (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Outlet_Grid_x	Outdoor grid temperature (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Nozzle_Temp_x	Air temperature at nozzle (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
B4Nozzle_x	static pressure before nozzle (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	inches of water

Variable	Description	Units
Nozzle_Delta_x	differential pressure before/after nozzle (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	inches of water
Net_Latent_Enthalpy_x	net latent enthalpy (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per pound
Net_sensible_x	net sensible capacity (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per hour
Air_Side_Only_EER_x	air side only Energy Efficiency Ratio (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per hour per watt
Ref_Only_Cap_x	Measured Refrigerant Only Capacity (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per hour
Meas_Refr_Only_EER_x	Measured refrigerant only energy efficiency ratio (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per hour per watt
Total_meas_heat_bal_x	Total measure heat balance (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	%
Tu_Total_V1_x	Test unit Voltage Line 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
Tu_Total_V2_x	Test unit Voltage Line 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
Tu_Total_V3_x	Test unit Voltage Line 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
Tu_Total_A1_x	Test unit Current Line 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
Tu_Total_A2_x	Test unit Current Line 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps

Variable	Description	Units
Tu_Total_A3_x	Test unit Current Line 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
Tu_Total_W1_x	Test unit Power Line 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Watts
Tu_Total_W2_x	Test unit Power Line 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Watts
Tu_Total_W3_x	Test unit Power Line 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Watts
ID_Blower_V1_x	Indoor blower Voltage Line 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
ID_Blower_V2_x	Indoor blower Voltage Line 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
ID_Blower_V3_x	Indoor blower Voltage Line 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
ID_Blower_A1_x	Indoor blower current Line 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
ID_Blower_A2_x	Indoor blower current Line 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
ID_Blower_A3_x	Indoor blower current Line 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
ID_Blower_W_x	Indoor blower power (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Watts
Comp_1_V1_x	Compressor 1 Voltage Line 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts

Variable	Description	Units
Comp_1_V2_x	Compressor 1 Voltage Line 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
Comp_1_V3_x	Compressor 1 Voltage Line 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
Comp_1_A1_x	Compressor 1 current Line 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
Comp_1_A2_x	Compressor 1 current Line 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
Comp_1_A3_x	Compressor 1 current Line 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
Comp_1_W_x	Compressor 1 blower power (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Watts
OD_Fan_Volts_x	Outdoor fan voltage (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts
OD_Fan_Amps_x	Outdoor fan current (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
OD_Fan_Watts_x	Outdoor fan power (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Watts
Control_Watts_x	Control system power (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Watts
Total_Power_x	Total equipment power (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Watts
Control_Volts_x	Control system Voltage (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Volts

Variable	Description	Units
Control_Amps_x	Control system current (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Amps
Comp_2_V1_avg	Compressor 2 - Voltage in Leg 1	Volts
Comp_2_V2_avg	Compressor 2 - Voltage in Leg 2	Volts
Comp_2_V3_avg	Compressor 2 - Voltage in Leg 3	Volts
Comp_2_A1_avg	Compressor 2 - Current in Leg 1	Amps
Comp_2_A2_avg	Compressor 2 - Current in Leg 2	Amps
Comp_2_A3_avg	Compressor 2 - Current in Leg 3	Amps
Comp_2_W_avg	Compressor 2 Power	Watts
Comp_2_PF_avg	Compressor 2 Power Factor	dimensionless
Comp_1_PF_avg	Compressor 1 Power Factor	dimensionless
Code_Tester_L1_V_avg	Code-tester fan Voltage Line 1	Volts
Code_Tester_L2_V_avg	Code-tester fan Voltage Line 2	Volts
Code_Tester_L3_V_avg	Code-tester fan Voltage Line 3	Volts
Code_Tester_L1_A_avg	Code-tester fan Current Line 1	Amps
Code_Tester_L2_A_avg	Code-tester fan Current Line 2	Amps
Code_Tester_L3_A_avg	Code-tester fan Current Line 3	Amps
Code_Tester_Watts_avg	Code-tester fan power	Watts
Code_Speed_avg	Code-tester fan speed	%
Code_Tester_PF_avg	Code-tester fan power factor	dimensionless
Code_Hz_avg	Code-tester fan power frequency	Hertz
Liq_ID_PSIG_x	Average liquid refrigerant pressure at evaporator inlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_ID_PSIG_x_c2	Average liquid refrigerant pressure at evaporator inlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_ID_temp_x	Average liquid refrigerant temperature at evaporator inlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_ID_temp_x_c2	Average liquid refrigerant temperature at evaporator inlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SC_Liq_ID_x	Degree of super cooling at evaporator inlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
SC_Liq_ID_x_c2	Degree of super cooling at evaporator inlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Gas_ID_PSIG_x	Average gas pressure at evaporator outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Gas_ID_PSIG_x_c2	Average gas pressure at evaporator outlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Gas_ID_temp_x	Average gas temperature at evaporator outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Gas_ID_x	Saturated gas refrigerant temperature at evaporator outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_ID_Gas_x	Saturated gas refrigerant temperature at evaporator outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Gas_ID_x_c2	Saturated gas refrigerant temperature at evaporator outlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SH_Gas_ID_x	Degree of super heat at evaporator outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Gas_SH_ID_x	Degree of super heat at evaporator outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SH_ID_Gas_x	Degree of super heat at evaporator outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SH_Gas_ID_x_c2	Degree of super heat at evaporator outlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Suction_x	Saturated suction temperature at compressor inlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Sat_Suction_x_c2	Saturated suction temperature at compressor inlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SH_Suction_x	Degree of super heat at compressor inlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SH_Suction_x_c2	Degree of super heat at compressor inlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Suction_PSIG_x	Suction pressure at compressor inlet (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Suction_PSIG_x_c2	Suction pressure at compressor inlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Suction_temp_x	Suction temperature at compressor inlet (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Suction_temp_x_ck2	Suction temperature at compressor inlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Bef_Filter_temp_ck1_x	Liquid refrigerant temperature before filter (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_OD_BR_PSIG_x	Average liquid pressure before throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_OD_BR_PSIG_x_c2	Average liquid pressure before throttle, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_OD_BR_temp_x	Average liquid temperature before throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_OD_BR_temp_x_c2	Average liquid temperature before throttle, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
liq_aft_dryer_b4_restr_ck1_x	Average liquid temperature after the drier but before the throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
liq_aft_dryer_b4_restr_ck2_x	Average liquid temperature after the drier but before the throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_OD_BR_x	Saturated liquid refrigerant temperature before throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_OD_BR_x_c2	Saturated liquid refrigerant temperature before throttle, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SC_Liq_OD_BR_x	Degree of super cooling before throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SC_Liq_OD_BR_x_c2	Degree of super cooling before throttle, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_OD_AR_PSIG_x	Average liquid pressure after throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_OD_AR_PSIG_x_c2	Average liquid pressure after throttle, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_After_Restriction__PSIG_x	Average liquid pressure after throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Sat_Liq_OD_AR_x	Saturated liquid refrigerant temperature after throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_OD_AR_x_c2	Saturated liquid refrigerant temperature after throttle, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
SC_Liq_OD_AR_x	Degree of super cooling after throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SC_Liq_OD_AR_x_c2	Degree of super cooling after throttle, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Cond_Outlet_Liq_ID_temp_x_c2	Liquid refrigerant temperature after condenser in circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	Degrees F
Cond_Outlet_Sat_Liq_ID_x	Saturated liquid refrigerant temperature after condenser (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Cond_Outlet_Sat_Liq_ID_x_c2	Saturated liquid refrigerant temperature after condenser in circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_OD_x	Saturated liquid refrigerant temperature after condenser, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_OD_x_c2	Saturated liquid refrigerant temperature after condenser, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_ID_x	Saturated liquid refrigerant temperature after condenser, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_ID_x_c2	Saturated liquid refrigerant temperature after condenser, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SC_Liq_OD_x	Degree of super cooling after condenser, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SC_Liq_OD_x_c2	Degree of super cooling after condenser, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Flow_rate_lbs_hr_x_	Refrigerant flow rate, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per hour
Flow_rate_lbs_hr_x_c2	Refrigerant flow rate, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per hour
Enthalpy_Evap_In_x	Enthalpy at inlet of evaporator, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per pound
Enthalpy_Evap_In_x_c2	Enthalpy at inlet of evaporator, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per pound
Enthalpy_Evap_Out_x	Enthalpy at outlet of evaporator, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per pound
Enthalpy_Evap_Out_x_c2	Enthalpy at outlet of evaporator in circuit 2 (_avg = average of the steady-states time series data; _std = standard deviation of the steady-state time series data)	British thermal units per pound
Gross_ref_meas_cap_x	Gross measured capacity, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per hour
Gross_ref_meas_cap_x_c2	Gross measured capacity, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per hour
Discharge_PSIG_x	Compressor dischrage pressure, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Discharge_PSIG_x_c2	Compressor dischrage pressure, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Discharge_temp_x	Compressor dischrage temperaure, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Discharge_temp_x_c2	Compressor dischrage temperaure, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Sat_Compr_disch_x	Saturated temperature at compressor discharge, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Compr_disch_x_c2	Saturated temperature at compressor discharge, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SH_Compr_disch_x	Degree of super heat at compressor discharge, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SH_Compr_disch_x_c2	Degree of super heat at compressor discharge, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_OD_PSIG_x	Liquid refrigerant pressure at condenser outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_OD_PSIG_x_c2	Liquid refrigerant pressure at condenser outlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_OD_temp_x	Liquid refrigerant temperature at condenser outlet, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_OD_temp_CK2_x	Liquid refrigerant temperature at condenser outlet, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Meas_ref_only_cap_x_c2	Refrigerant measured capacity, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	British thermal units per hour
Liq_Bef_Drier_PSIG_x	Liquid refrigerant pressure before filter (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	pounds per square inch
Liq_Bef_Drier_temp_x	Liquid refrigerant temperature before filter (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_Bef_Drier_x	Saturated liquid refrigerant temperature before filter (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
SC_Liq_Bef_Drier_x	Degree of super cooling before filter (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Compressor_Top_x	Temperature at the top of the compressor (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Compressor_Middle_x	Temperature at the middle of the compressor (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_1_After_Restriction_x	Average liquid temperature after throttle, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_2_After_Restriction_x	Average liquid temperature after throttle, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Sat_Liq_After_Restriction_x	Saturated liquid refrigerant temperature after throttle (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
SC_Liq_After_Restriction_x	Degree of super cooling after throttle (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_Inlet_A1_temp_x	Economizer Outside air temperature A1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_Inlet_A2_temp_x	Economizer Outside air temperature A2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_Inlet_B1_temp_x	Economizer Outside air temperature B1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_Inlet_B2_temp_x	Economizer Outside air temperature B2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_Inlet_C1_temp_x	Economizer Outside air temperature C1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Economizer_Inlet_C2_temp_x	Economizer Outside air temperature C2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_1_x	Economizer Outside air temperature 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_2_x	Economizer Outside air temperature 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_3_x	Economizer Outside air temperature 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_4_x	Economizer Outside air temperature 4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_5_x	Economizer Outside air temperature 5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_6_x	Economizer Outside air temperature 6 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_grid_x	Economizer Outside air temperature (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Gas_ID_ck1_x	Average indoor gas temperature, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Gas_ID_ck2_x	Average indoor gas temperature, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Gas_id_backup_ck1_x	Average indoor gas temperature, backup circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Gas_id_backup_ck2_x	Average indoor gas temperature, backup circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Inside_Supply_Duct_1_x	Inside supply duct temp -1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_2_x	Inside supply duct temp -2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_3_x	Inside supply duct temp -3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_4_x	Inside supply duct temp -4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_5_x	Inside supply duct temp -5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_6_x	Inside supply duct temp -6 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_7_x	Inside supply duct temp -7 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_8_x	Inside supply duct temp -8 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Aft_Restric_Temp_Ck1_x	Liquid refrigerant temperature after restriction Ckt 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Aft_Restric_Temp_CK2_x	Liquid refrigerant temperature after restriction Ckt 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Aft_filter_temp_ck1_x	Liquid refrigerant temperature after filter, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Aft_filter_temp_ck2_x	Liquid refrigerant temperature after filter, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Liq_Bef_Filter_Temp_Ck2_x	Liquid refrigerant temperature before filter Ckt 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_10_x	Inside return air temperature 10 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_11_x	Inside return air temperature 11 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_12_x	Inside return air temperature 12 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_13_x	Inside return air temperature 13 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_14_x	Inside return air temperature 14 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_15_x	Inside return air temperature 15 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_1_x	Inside return air temperature 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_2_x	Inside return air temperature 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_3_x	Inside return air temperature 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_4_x	Inside return air temperature 4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_5_x	Inside return air temperature 5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Inside_Return_Duct_6_x	Inside return air temperature 6 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_7_x	Inside return air temperature 7 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_8_x	Inside return air temperature 8 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Return_Duct_9_x	Inside return air temperature 9 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_1_x	Inside supply duct temp -1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_2_x	Inside supply duct temp -2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_3_x	Inside supply duct temp -3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_4_x	Inside supply duct temp -4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_5_x	Inside supply duct temp -5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Inside_Supply_Duct_6_x	Inside supply duct temp -6 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
OD_Inlet_Grid_1_x	Outdoor air temperaure -Grid 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
OD_Inlet_Grid_2_x	Outdoor air temperaure -Grid 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
OD_Inlet_Grid_3_x	Outdoor air temperaure -Grid 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_A1_x	Return air coil face temperature A1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_A2_x	Return air coil face temperature A2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_A3_x	Return air coil face temperature A3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_A4_x	Return air coil face temperature A4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_A5_x	Return air coil face temperature A5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_B1_x	Return air coil face temperature B1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_B2_x	Return air coil face temperature B2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_B3_x	Return air coil face temperature B3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_B4_x	Return air coil face temperature B4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_B5_x	Return air coil face temperature B5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_C1_x	Return air coil face temperature C1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Return_Coil_Face_C2_x	Return air coil face temperature C2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_C3_x	Return air coil face temperature C3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_C4_x	Return air coil face temperature C4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_C5_x	Return air coil face temperature C5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_D1_x	Return air coil face temperature D1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_D2_x	Return air coil face temperature D2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_D3_x	Return air coil face temperature D3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_D4_x	Return air coil face temperature D4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_D5_x	Return air coil face temperature D5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_E1_x	Return air coil face temperature E1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_E2_x	Return air coil face temperature E2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_E3_x	Return air coil face temperature E3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Return_Coil_Face_E4_x	Return air coil face temperature E4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_1_x	Return air coil face temperature 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_2_x	Return air coil face temperature 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_3_x	Return air coil face temperature 3 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_4_x	Return air coil face temperature 4 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_5_x	Return air coil face temperature 5 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_6_x	Return air coil face temperature 6 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_7_x	Return air coil face temperature 7 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_8_x	Return air coil face temperature 8 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_9_x	Return air coil face temperature 9 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_10_x	Return air coil face temperature 10 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_11_x	Return air coil face temperature 11 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Return_Coil_Face_12_x	Return air coil face temperature 12 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_13_x	Return air coil face temperature 13 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_14_x	Return air coil face temperature 14 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_15_x	Return air coil face temperature 15 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Return_Coil_Face_16_x	Return air coil face temperature 16 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Aft_FD_CK1_x	Average temperature after fan discharge - CK-1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Aft_FD_CK2_x	Average temperature after fan discharge - CK-2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Bef_FD_CK1_x	Average temperature before fan discharge - CK-1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Bef_FD_CK2_x	Average temperature before fan discharge - CK-2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Upstream_CK1_x	Average upstream temperature, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Downstream_CK1_x	Average downstream temperature, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Downstream_CK2_x	Average downstream temperature, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Liq_Upstream_CK2_x	Average upstream temperature, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Discharge_backup_ck1_x	Discharge temprature - Back up circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Discharge_backup_ck2_x	Discharge temprature - Back up circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_od_backup_2_ck1_x	Average liquid refrigerant temperature, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_od_backup_2_ck2_x	Average liquid refrigerant temperature, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_ID_Backup_CK1_x	Indoor liquid refrigerant temperature - Back up, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_id_backup_ck2_x	Indoor liquid refrigerant temperature – Backup, circuit 2 (_avg = average of the steady-states time series data; _std = standard deviation of the steady-state time series data)	degree F
Liq_ID_Temp_CK1_x	Indoor liquid refrigerant temperature - CK 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_ID_Temp_CK2_x	Indoor liquid refrigerant temperature - CK 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
CK1_Liq_ID_Temp_x	Indoor liquid refrigerant temperature - CK 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_OD_BR_1_x	Outdoor liquid refrigerant temperature - Back up CK 1 (_avg = average of the steady-states time series data; _std = standard deviation of the steady-state time series data)	degree F
Liq_OD_BR_2_x	Outdoor liquid refrigerant temprature - Back up CK 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F

Variable	Description	Units
Liq_OD_Backup_CK1_x	Outdoor liquid refrigerant temperature - Back up, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_OD_Backup_CK2_x	Outdoor liquid refrigerant temperature - Back up, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_OD_Temp_CK1 _x	Outdoor liquid refrigerant temperature, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
OD_Inlet_Grid_Econo_x	Average outside air economizer temperature (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Suction_CK1_x	Suction refrigerant temperature, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Suction_CK2_x	Suction refrigerant temperature, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Suction_Backup_CK1_x	Suction refrigerant temperature - Back up CK 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Suction_Backup_CK2_x	Suction refrigerant temperature - Back up CK 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_After_FlowM_Ck1_x	Liquid temperature after flow meter, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_After_FlowM_Ck2_x	Liquid temperature after flow meter, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Bef_FlowM_Ck1_x	Liquid temperature before flow meter, circuit 1 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Liq_Bef_FlowM_Ck2_x	Liquid temperature before flow meter, circuit 2 (_avg = average of the steady-state time series data; _std = standard deviation of the steady-state time series data)	degrees F
Economizer_opening	The degree to which the economizer damper is open to allow air through the economizer	N/A
Compressor_1_on_off	Whether or not compressor 1 is running	N/A

Variable	Description	Units
Compressor_2_on_off	Whether or not compressor 2 is running	N/A
Motor_sheave_setting	The setting of the motor sheave, which helps to control the fan speed	N/A
Cabinet_sealing	Whether or not the air conditioner cabinet is sealed with tape to prevent air leakage and infiltration	N/A
Ductwork_Sealing	Whether or not the air conditioner ductwork is sealed with tape to prevent air leakage and infiltration	N/A
Fan_Speed	The speed at which the fan is operated	rotations per minute
Pulley_Diameter	The fan pulley diameter, which affects the speed of the fan	inches
Air_Discharge_Configuration	Whether the air conditioner is configured to produce a horizontal or vertical air discharge	N/A
condenser_blockage	The degree to which the condenser airflow is blocked	%
evaporator_blockage	The degree to which the evaporator airflow is blocked	%
C_Net_mean	unknown	unknown
C_test_Hum_ratio	cycling test humidity ratio	pound-mass of water per pound-mass of dry air
C_test_Spec_heat	cycling test specific heat	British thermal units per pound per degree F
C_test_Spec_vol_mix	cycling test specific volume	cubic feet per pound
CD_mean	cycle degradation coefficient	dimensionless
CLF_mean	unknown	unknown
D_Net_mean	unknown	unknown
Delta_T_mean	unknown	unknown
ID_SS_Watt_hours	unknown	watt-hour
Nozzle_Area_mean	nozzle area	unknown
OD_SS_Watt_hours	unknown	watt-hour
Qcyc_mean	unknown	unknown
Qss_mean	steady-state capacity	British thermal units per hour
Watt_hour_ratio	unknown	%
Liquid_bef_filter_temp_avg_x_c2	Liquid refrigerant temperature before filter in circuit 2 (_avg = average of the steady-states time series data; _std = standard deviation of the steady-state time series data)	degree F
Comparison	The comparison economizer test used to adjust the measured capacity and efficiency to the appliance calculation and efficiency	No units
OA_Comp_Ratio	The outside air flow ratio of the comparison test	percent
OA_Comp	The outdoor air flow based on the comparison test	Cubic feet per minute of outdoor air
Spec_Vol_Comp	The specific volume of the air from the comparison test	Cubic feet per pound mass of dry air
Delta_P_Comp	The return plenum pressure from the comparison test	Inches of water
Fan_Heat_DT	The temperature increase in the supply air stream caused by the fan	Degree F
SA_Mass_Flow	The mass flow rate of supply air	Pound-mass of dry air per minute
Flow_Power	The flow power of the fan	Watts
OA_Flow_Corrected	Corrected outdoor air flow for different damper settings	Cubic feet per minute

Variable	Description	Units
OA_Mass_Flow_Corrected	Corrected outdoor air mass flow for different damper settings	Pound-mass of dry air per minute
RA_Mass_Flow_rate	The mass flow rate of return air	Pound-mass of dry air per minute
MA_Hum_Ratio	The humidity ratio of the mixed air stream	Pound-mass of water per pound-mass of dry air
MA_Enthalpy	The enthalpy of the mixed air stream	Btu per pound-mass of dry air
Coil_Leaving_DB	The coil leaving dry bulb temperature	Degree F
OA_Spec_V	The specific volume of outdoor air	Cubic feet per pound
Coil_Out_Spec_Vol	The specific volume at outlet of coil	Cubic feet per pound
OA_Hum_Ratio	The humidity ratio of outdoor air	Pound-mass of water per pound-mass of dry air
OA_Enthalpy	The enthalpy of outdoor air	Btu per pound-mass of dry air
RA_Hum_Ratio	The humidity ratio of return air	Pound-mass of water per pound-mass of dry air
RA_Enthalpy	The enthalpy of return air	Btu per pound-mass of dry air
Coil_Out_Hum_Ratio	The humidity ratio of coil outlet	Pound-mass of water per pound-mass of dry air
SA_Enthalpy	The enthalpy of the supply air	Btu per pound-mass of dry air
MA_Dry_Bulb	The mixed air stream dry bulb temperature	Degree F
MA_Web_Bulb	The mixed air stream wet bulb temperature	Degree F
Coil_Leaving_Enthalpy	The coil leaving enthalpy	Btu per pound-mass of dry air
Gross_Cooling_Capacity	Total load on the unit	Watts
Gross_Sensible_Capacity	Total load on the unit that is only associated with temperature change, not humidity change.	Watts
Comp_Unit_Power	The compressor power, measured as the difference in the total power and the indoor blower power	Watts
EIR	The energy input ratio	Btuh input per rated Btuh output capacity
Net_Cooling_Capacity	The total cooling capacity delivered to the space	Watts
Net_Sensible_Capacity	The total cooling capacity delivered to the space, only involving temperature change, not humidity change	Watts
EER	The energy efficiency ratio	British thermal units per hour per watt
Coil_Bypass_Factor	Coil bypass factor, or the percentage of air that passes through the coil unchanged. This is a measure of coil efficiency.	percent
dh	Enthalpy difference between the coil leaving air and the mixed air	Btu per pound-mass of dry air
dT	Dry bulb temperature difference between the coil leaving air and the mixed air	Degree F
Ts	Saturation temperature calculated from a regression, as a function of the mixed air dry bulb temperature, mixed air enthalpy, dt, and dh	Degree F
Gross_Coil_Capacity	Total load on the coil	Watts
Space_Load	Space load, or the heat added to the air in the space, measured as the enthalpy difference between the supply and return air	Btu per pound-mass of dry air
Fan_Heat	The temperature increase in the supply air stream caused by the fan	Degree F
OA_Load	Outdoor air load, or the heat added to the air from the outside, measured as the enthalpy difference between the outdoor and return air	Btu per pound-mass of dry air
Total_Load	The total heat load addressed by the RTU, measured as the	Btu per pound-mass of dry air

Variable	Description	Units
	sum of the space load and outdoor air load	
Calibration	A comparison to ensure the total load and gross coil capacity are equal	percent

Additional Flat File Documentation

Level 1 File Disposition Details

Table 11. Level 1b list: detailed list of removed files

File Name	Note
Run 1-1C&D Out of the Box Baseline Cycle #1.xls	Duplicate of a file with the same name but "&" in place of "-"
Run 1-1C&D Out of the Box Baseline Cycle #2.xls	Duplicate of a file with the same name but "&" in place of "-"
Run 1-1C&D Out of the Box Baseline Cycle #3.xls	Duplicate of a file with the same name but "&" in place of "-"
Run 1-1C&D Out of the Box Baseline Cycle #4(to be used with 3).xls	Duplicate of a file with the same name but "&" in place of "-"
C8-95-NE-0.xlsx	Test plan classifies this as "Baseline"
C8-95-NE-1.xlsx	Test plan classifies this as "Baseline"
C8-95-NE-2.xlsx	Test plan classifies this as "Baseline"
C8-CB0-115-CE.xlsx	Test plan classifies this as "Baseline"
C8-CB0-82-CE.xlsx	Test plan classifies this as "Baseline"
C8-CB0-95-CE.xlsx	Test plan classifies this as "Baseline"
C8-CB0X-115-CE.xlsx	Test plan classifies this as "Baseline"
C8-CB0X-82-CE.xlsx	Test plan classifies this as "Baseline"
C8-CB0X-95-CE.xlsx	Test plan classifies this as "Baseline"
C-95-NE.xlsx	Test plan classifies this as "Baseline"
C-95-NES.xlsx	Test plan classifies this as "Baseline"
C8-CB0-95-CE-2.xlsx	Not in test plan; not in report. Treat as "Baseline"
C8-CB80-95-CE_calc.xlsx	Not in test plan; not in report. Treat as "Baseline"
C-95-NE-1.xlsx	Not in test plan; not in report. Treat as "Baseline"

C-95-NE-2.xlsx	Not in test plan; not in report. Treat as "Baseline"
C-55-1FE.xlsx	Treat as "Baseline
C8-55-NE-DUCT.xlsx	Based on test plan, appear to be similar to "SPWCT" files
C-EB5-55-CE-0.xlsx	Based on test plan, appear to be similar to "SPWCT" files
C-CB70-115-CE.xlsx	Test was started but not completed
C-CB80-115-CE.xlsx	Test was started but not completed
Trend C8-CB60-115-CE.xlsx	Test was started but not completed
C8-EB5-55-CE.xlsx	Test results were incorrectly measured
Econo_0_55F_Unsealed-Sealed_400_cfmt.xls	Analysis file, not test file
IEER Calculation 7.5 ton	Calculation spreadsheet only
IPLV Calculation 7.5 ton	Calculation spreadsheet only
C8-95-T2FE_calc	Calculation spreadsheet only
C8-95-T3FE_calc	Calculation spreadsheet only
IEER Calculation 7.5 ton RTU2 6 turns	Calculation spreadsheet only
IEER Calculation 7.5 ton Trane RTU1 6 turns	Calculation spreadsheet only
IPLV Calculation 7.5 ton Trane RTU1 6 turns	Calculation spreadsheet only
Retest IPLV Calculation 7.5 ton Trane RTU2 6 turns	Calculation spreadsheet only

Level 1 List

DNVGL ID	RTU	File Name	Test Name
30N0001	5	C-55-1ER-DM.xlsx	C-55-1ER-DM
30N0002	5	C-55-2ER-DM.xlsx	C-55-2ER-DM
30N0003	5	C-55-3ER-DM.xlsx	C-55-3ER-DM
30N0004	5	C-55-CE-DM.xlsx	C-55-CE-DM
30N0005	5	C-55-OER-DM.xlsx	C-55-OER-DM
30N0006	5	C-MF-75629575-1E3J.xlsx	C-MF-75629575-1E3J
30N0007	5	C-MF-75629575-2E3J.xlsx	C-MF-75629575-2E3J
30N0008	5	C-MF-75629575-3E3J.xlsx	C-MF-75629575-3E3J
30N0009	5	C-MF-75629575-E3J.xlsx	C-MF-75629575-E3J
30N0010	5	C-MF-75629575-NE3J.xlsx	C-MF-75629575-NE3J
30N0011	5	C-MF-75629575-OE3J.xlsx	C-MF-75629575-OE3J

30N0012	5	C-22A-ONE.xlsx	C-22A-ONE
30N0013	5	C-ONE-5TA-OB.xlsx	C-ONE-5TA-OB
30N0014	5	C-22A.xlsx	C-22A
30N0015	5	C-22B.xlsx	C-22B
30N0016	5	C-95-3+10-C.xlsx	C-95-3+10-C
30N0017	5	C-95-3+40-C.xlsx	C-95-3+40-C
30N0018	5	C-95-3-10-C.xlsx	C-95-3-10-C
30N0019	5	C-95-3-40-C.xlsx	C-95-3-40-C
30N0020	5	C-95-3-FC-C.xlsx	C-95-3-FC-C
30N0021	5	C-55-T1ER-DM.xlsx	C-55-T1ER-DM
30N0022	5	C-55-T2ER-DM.xlsx	C-55-T2ER-DM
30N0023	5	C-55-T3ER-DM.xlsx	C-55-T3ER-DM
30N0024	5	C-55-TCE-DM.xlsx	C-55-TCE-DM
30N0025	5	C-55-TOER-DM.xlsx	C-55-TOER-DM
30N0026	5	C-75629575-T1E3.xlsx	C-75629575-T1E3
30N0027	5	C-75629575-T2E3-1.xlsx	C-75629575-T2E3-1
30N0028	5	C-75629575-T3E3.xlsx	C-75629575-T3E3
30N0029	5	C-75629575-TE3.xlsx	C-75629575-TE3
30N0030	5	C-75629575-TOE3.xlsx	C-75629575-TOE3
30N0031	5	C-ONE-OB.xlsx	C-ONE-OB
30N0032	5	C-ONE.xlsx	C-ONE
30N0033	5	C-22C-D#2.xlsx	C-22C-D#2
30N0034	5	C-22C-D#3.xlsx	C-22C-D#3
30N0035	5	C-22C-D#4.xlsx	C-22C-D#4
30N0036	5	C-22C-D#5.xlsx	C-22C-D#5
30N0037	5	C-22C-D#6.xlsx	C-22C-D#6
30N0038	5	C-22C-D#7.xlsx	C-22C-D#7
30N0039	5	C-95-3+10-1.xlsx	C-95-3+10-1
30N0040	5	C-95-3+20-1.xlsx	C-95-3+20-1
30N0041	5	C-95-3+20-C.xlsx	C-95-3+20-C
30N0042	5	C-95-3+30-1.xlsx	C-95-3+30-1
30N0043	5	C-95-3+30-C.xlsx	C-95-3+30-C
30N0044	5	C-95-3+40-1.xlsx	C-95-3+40-1
30N0045	5	C-95-3-10-1.xlsx	C-95-3-10-1
30N0046	5	C-95-3-20-1.xlsx	C-95-3-20-1
30N0047	5	C-95-3-20-C.xlsx	C-95-3-20-C
30N0048	5	C-95-3-30-1.xlsx	C-95-3-30-1
30N0049	5	C-95-3-30-C.xlsx	C-95-3-30-C
30N0050	5	C-95-3-40-1.xlsx	C-95-3-40-1
30N0051	5	C-95-3-FC-1.xlsx	C-95-3-FC-1
30N0052	5	C-55-CE.xlsx	C-55-CE

30N0053	5	C-EB10-55-CE.xlsx	C-EB10-55-CE
30N0054	5	C-EB20-55-CE.xlsx	C-EB20-55-CE
30N0055	5	C-EB35-55-CE.xlsx	C-EB35-55-CE
30N0056	5	C-EB5-55-CE.xlsx	C-EB5-55-CE
30N0057	5	C-EB50-55-CE.xlsx	C-EB50-55-CE
30N0058	5	C-R100-EB0-CB0-95CE.xlsx	C-R100-EB0-CB0-95CE
30N0059	5	C-R100-EB20-CB30-95CE.xlsx	C-R100-EB20-CB30-95CE
30N0060	5	C-R120-EB0-CB0-95CE.xlsx	C-R120-EB0-CB0-95CE
30N0061	5	C-R120-EB0-CB30-95CE.xlsx	C-R120-EB0-CB30-95CE
30N0062	5	C-R120-EB20-CB0-95CE.xlsx	C-R120-EB20-CB0-95CE
30N0063	5	C-R120-EB20-CB30-95CE.xlsx	C-R120-EB20-CB30-95CE
30N0064	5	C-R80-EB0-CB0-95CE.xlsx	C-R80-EB0-CB0-95CE
30N0065	5	C-R80-EB0-CB30-95CE.xlsx	C-R80-EB0-CB30-95CE
30N0066	5	C-R80-EB20-CB0-95CE.xlsx	C-R80-EB20-CB0-95CE
30N0067	5	C-R80-EB20-CB30-95CE.xlsx	C-R80-EB20-CB30-95CE
30N0069	5	C-55-NE.xlsx	C-55-NE
30N0076	5	C-CB0-115-CE.xlsx	C-CB0-115-CE
30N0077	5	C-CB10-115-CE.xlsx	C-CB10-115-CE
30N0078	5	C-CB20-115-CE.xlsx	C-CB20-115-CE
30N0079	5	C-CB30-115-CE.xlsx	C-CB30-115-CE
30N0080	5	C-CB40-115-CE.xlsx	C-CB40-115-CE
30N0081	5	C-CB5-115-CE.xlsx	C-CB5-115-CE
30N0082	5	C-CB50-115-CE.xlsx	C-CB50-115-CE
30N0083	5	C-CB60-115-CE.xlsx	C-CB60-115-CE
30N0086	5	C-CB0-82-CE.xlsx	C-CB0-82-CE
30N0087	5	C-CB10-82-CE.xlsx	C-CB10-82-CE
30N0088	5	C-CB20-82-CE.xlsx	C-CB20-82-CE
30N0089	5	C-CB30-82-CE.xlsx	C-CB30-82-CE
30N0090	5	C-CB40-82-CE.xlsx	C-CB40-82-CE
30N0091	5	C-CB5-82-CE.xlsx	C-CB5-82-CE
30N0092	5	C-CB50-82-CE.xlsx	C-CB50-82-CE
30N0093	5	C-CB60-82-CE.xlsx	C-CB60-82-CE
30N0094	5	C-CB70-82-CE.xlsx	C-CB70-82-CE
30N0095	5	C-CB80-82-CE.xlsx	C-CB80-82-CE
30N0096	5	C-CB0-95-CE.xlsx	C-CB0-95-CE
30N0097	5	C-CB10-95-CE.xlsx	C-CB10-95-CE
30N0098	5	C-CB20-95-CE.xlsx	C-CB20-95-CE
30N0099	5	C-CB30-95-CE.xlsx	C-CB30-95-CE
30N0100	5	C-CB40-95-CE.xlsx	C-CB40-95-CE
30N0101	5	C-CB5-95-CE.xlsx	C-CB5-95-CE
30N0102	5	C-CB50-95-CE.xlsx	C-CB50-95-CE

30N0103	5	C-CB60-95-CE.xlsx	C-CB60-95-CE
30N0104	5	C-CB70-95-CE.xlsx	C-CB70-95-CE
30N0105	5	C-CB80-95-CE.xlsx	C-CB80-95-CE
30N0106	5	C-EB0-115-CE.xlsx	C-EB0-115-CE
30N0107	5	C-EB10-115-CE.xlsx	C-EB10-115-CE
30N0108	5	C-EB20-115-CE.xlsx	C-EB20-115-CE
30N0109	5	C-EB35-115-CE.xlsx	C-EB35-115-CE
30N0110	5	C-EB5-115-CE.xlsx	C-EB5-115-CE
30N0111	5	C-EB50-115-CE.xlsx	C-EB50-115-CE
30N0112	5	C-EB0-82-CE.xlsx	C-EB0-82-CE
30N0113	5	C-EB10-82-CE.xlsx	C-EB10-82-CE
30N0114	5	C-EB20-82-CE.xlsx	C-EB20-82-CE
30N0115	5	C-EB35-82-CE.xlsx	C-EB35-82-CE
30N0116	5	C-EB5-82-CE.xlsx	C-EB5-82-CE
30N0117	5	C-EB50-82-CE.xlsx	C-EB50-82-CE
30N0118	5	C-EB0-95-CE.xlsx	C-EB0-95-CE
30N0119	5	C-EB10-95-CE.xlsx	C-EB10-95-CE
30N0120	5	C-EB20-95-CE.xlsx	C-EB20-95-CE
30N0121	5	C-EB35-95-CE.xlsx	C-EB35-95-CE
30N0122	5	C-EB5-95-CE.xlsx	C-EB5-95-CE
30N0123	5	C-EB50-95-CE.xlsx	C-EB50-95-CE
30T0001	4	L-75629575-E3.xlsx	L-75629575-E3
30T0002	4	L-22A.xlsx	L-22A
30T0003	4	L-75629575-NE3-SS.xlsx	L-75629575-NE3-SS
30T0004	4	L-ONE-5T.xlsx	L-ONE-5T
30T0005	4	L-ONE-SS.xlsx	L-ONE-SS
30T0006	4	L-95-3+10-C.xlsx	L-95-3+10-C
30T0007	4	L-95-3+40-C.xlsx	L-95-3+40-C
30T0008	4	L-95-3-10-C.xlsx	L-95-3-10-C
30T0009	4	L-95-3-40-C.xlsx	L-95-3-40-C
30T0010	4	L-55-1ER-DM.xlsx	L-55-1ER-DM
30T0011	4	L-55-2ER-DM.xlsx	L-55-2ER-DM
30T0012	4	L-55-3ER-DM.xlsx	L-55-3ER-DM
30T0013	4	L-55-CE-DM.xlsx	L-55-CE-DM
30T0014	4	L-55-OER-DM.xlsx	L-55-OER-DM
30T0015	4	L-75629575-1E3.xlsx	L-75629575-1E3
30T0016	4	L-75629575-2E3.xlsx	L-75629575-2E3
30T0017	4	L-75629575-3E3.xlsx	L-75629575-3E3
30T0018	4	L-75629575-OE3.xlsx	L-75629575-OE3
30T0019	4	L-75629575-T1E3.xlsx	L-75629575-T1E3
30T0020	4	L-75629575-T2E3-1.xlsx	L-75629575-T2E3-1

30T0021	4	L-75629575-T3E3.xlsx	L-75629575-T3E3
30T0022	4	L-75629575-TE3.xlsx	L-75629575-TE3
30T0023	4	L-75629575-TOE3.xlsx	L-75629575-TOE3
30T0024	4	L-22B.xlsx	L-22B
30T0025	4	L-22C-L22D Cyclic #2.xlsx	L-22C-L22D Cyclic #2
30T0026	4	L-22C-L22D Cyclic #3.xlsx	L-22C-L22D Cyclic #3
30T0027	4	L-22C-L22D Cyclic #4.xlsx	L-22C-L22D Cyclic #4
30T0028	4	L-55-T1ER-DM.xlsx	L-55-T1ER-DM
30T0029	4	L-55-T2ER-DM.xlsx	L-55-T2ER-DM
30T0030	4	L-55-T3ER-DM.xlsx	L-55-T3ER-DM
30T0031	4	L-55-TCE-DM.xlsx	L-55-TCE-DM
30T0032	4	L-55-TOER-DM.xlsx	L-55-TOER-DM
30T0033	4	L-95-3+10-1.xlsx	L-95-3+10-1
30T0034	4	L-95-3+20-1.xlsx	L-95-3+20-1
30T0035	4	L-95-3+20-C.xlsx	L-95-3+20-C
30T0036	4	L-95-3+30-1.xlsx	L-95-3+30-1
30T0037	4	L-95-3+30-C.xlsx	L-95-3+30-C
30T0038	4	L-95-3+40-1.xlsx	L-95-3+40-1
30T0039	4	L-95-3-20-1.xlsx	L-95-3-20-1
30T0040	4	L-95-3-20-C.xlsx	L-95-3-20-C
30T0041	4	L-95-3-30-1.xlsx	L-95-3-30-1
30T0042	4	L-95-3-30-C.xlsx	L-95-3-30-C
30T0043	4	L-95-3-40-1.xlsx	L-95-3-40-1
75N0001	3	3-52115CF.xlsx	3-52115CF
75N0002	3	3-5282CF.xlsx	3-5282CF
75N0003	3	3-5295CF.xlsx	3-5295CF
75N0004	3	3-295.xlsx	3-295
75N0005	3	Run 2-21A no optimized charge.xls	Run 2-21A no optimized charge
75N0006	3	Run 3-21A AHRI Out of the Box.xlsx	Run 3-21A AHRI Out of the Box
75N0007	3	3-21A AHRI Verification H.xlsx	3-21A AHRI Verification H
75N0008	3	5-295 recalc.xls	5-295 recalc
75N0009	3	7-3A.xls	7-3A
75N0010	3	7-5A.xls	7-5A
75N0011	3	Run 3-20N95.xlsx	Run 3-20N95
75N0012	3	3-42115CF.xlsx	3-42115CF
75N0013	3	3-4282CF.xlsx	3-4282CF
75N0014	3	3-4295CF.xlsx	3-4295CF
75N0015	3	3-62115CF.xlsx	3-62115CF
75N0016	3	3-6282CF.xlsx	3-6282CF
75N0017	3	3-6295CF.xlsx	3-6295CF
75N0018	3	1-OEH.xlsx	1-OEH (comp off)

75N0019	3	3-2115.xlsx	3-2115
75N0020	3	3-21151.xlsx	3-21151
75N0021	3	3-21152.xlsx	3-21152
75N0022	3	3-21153.xlsx	3-21153
75N0023	3	3-2115OD.xlsx	3-2115OD
75N0024	3	3-2951.xlsx	3-2951
75N0025	3	3-2952.xlsx	3-2952
75N0026	3	3-2953.xlsx	3-2953
75N0027	3	3-295OD.xlsx	3-295OD
75N0028	3	3-521151CF.xlsx	3-521151CF
75N0029	3	3-52821CF.xlsx	3-52821CF
75N0030	3	3-52951CF.xlsx	3-52951CF
75N0031	3	C8-CB30-95-CE.xlsx	C8-CB30-95-CE
75N0033	3	C8-55-CE3.xlsx	C8-55-CE3
75N0034	3	Run 1-1A Out of the Box Baseline.xls	1-1A Out of the Box Baseline
75N0035	3	Run 1-1B Out of the Box Baseline.xls	1-1B Out of the Box Baseline
75N0040	3	Run 1-1C-D Out of the Box Baseline Cycle #1.xls	Run 1-1C & D Out of the Box Baseline Cycle #1
75N0041	3	Run 1-1C-D Out of the Box Baseline Cycle #2.xls	Run 1-1C & D Out of the Box Baseline Cycle #2
75N0042	3	Run 1-1C-D Out of the Box Baseline Cycle #3.xls	Run 1-1C & D Out of the Box Baseline Cycle #3
75N0043	3	Run 1-1C-D Out of the Box Baseline Cycle #4 (to be used with 3).xls	Run 1-1C & D Out of the Box Baseline Cycle #4
75N0044	3	Run 1-2A Out of the Box Baseline.xls	1-2A Out of the Box Baseline
75N0045	3	Run 1-2B Out of the Box Baseline.xls	1-2B Out of the Box Baseline
75N0046	3	3-2000-115.xlsx	3-2000-115
75N0047	3	3-2000-82.xlsx	3-2000-82
75N0048	3	3-2000-95.xlsx	3-2000-95
75N0049	3	3-2500-115.xlsx	3-2500-115
75N0050	3	3-2500-82.xlsx	3-2500-82
75N0051	3	3-2500-95 Rerun.xlsx	3-2500-95
75N0052	3	3-3000-115.xlsx	3-3000-115
75N0053	3	3-3000-82.xlsx	3-3000-82
75N0054	3	3-3000-95 Rerun.xlsx	3-3000-95
75N0055	3	3-NC-2500-115.xlsx	3-NC-2500-115
75N0056	3	3-NC-2500-82.xlsx	3-NC-2500-82
75N0057	3	3-NC-2500-95.xlsx	3-NC-2500-95
75N0060	3	1-CEH.xlsx	1-CEH (comp off)
75N0061	3	Run 3-20N115.xlsx	3-20N115
75N0062	3	3-282.xlsx	3-282
75N0063	3	3-2821.xlsx	3-2821
75N0064	3	3-2822.xlsx	3-2822

75N0065	3	3-2823.xlsx	3-2823
75N0066	3	3-282OD.xlsx	3-282OD
75N0067	3	1-1CH Retest.xlsx	1-1CH Retest
75N0068	3	1-1EH.xlsx	1-1EH
75N0069	3	1-2CH Retest.xlsx	1-2CH Retest
75N0070	3	2-1CH.xlsx	2-1CH *and* 2-1CH Retest
75N0071	3	2-1EH.xlsx	2-1EH
75N0072	3	2-2CH Retest.xlsx	2-2CH Retest
75N0073	3	2-OEH.xlsx	2-OEH
75N0074	3	3-1CH Retest.xlsx	3-1CH Retest
75N0075	3	3-1EH.xlsx	3-1EH
75N0076	3	3-2CH Retest.xlsx	3-2CH Retest
75N0077	3	3-OEH.xlsx	3-OEH
75N0078	3	4-1CH Retest.xlsx	4-1CH Retest
75N0079	3	4-1EH.xlsx	4-1EH
75N0080	3	4-2CH Retest.xlsx	4-2CH Retest
75N0081	3	4-OEH 2nd.xlsx	4-OEH 2nd
75N0082	3	3-421151CF.xlsx	3-421151CF
75N0083	3	3-42821CF.xlsx	3-42821CF
75N0084	3	3-42951CF.xlsx	3-42951CF
75N0085	3	3-621151CF.xlsx	3-621151CF
75N0086	3	3-62821CF.xlsx	3-62821CF
75N0087	3	3-62951CF.xlsx	3-62951CF
75N0088	3	5-2115 recalc.xls	5-2115 recalc
75N0089	3	5-21151 recalc.xls	5-21151 recalc
75N0090	3	5-282 recalc.xls	5-282 recalc
75N0091	3	5-2821 recalc.xls	5-2821 recalc
75N0092	3	5-2951 recalc.xls	5-2951 recalc
75N0093	3	7-3B.xls	7-3B
75N0094	3	7-3F.xls	7-3F
75N0095	3	7-4A.xls	7-4A
75N0096	3	7-4B.xls	7-4B
75N0097	3	7-4F.xls	7-4F
75N0098	3	7-5B.xls	7-5B
75N0099	3	7-5F.xls	7-5F
75N0100	3	8-3A.xls	8-3A
75N0101	3	8-3B.xls	8-3B
75N0102	3	8-3F.xls	8-3F
75N0103	3	8-4A.xls	8-4A
75N0104	3	8-4B.xls	8-4B
75N0105	3	8-4F.xls	8-4F

75N0106	3	8-5A.xls	8-5A
75N0107	3	8-5B.xls	8-5B
75N0108	3	8-5F.xls	8-5F
75N0111	3	C8-CB10-115-CE.xlsx	C8-CB10-115-CE
75N0112	3	C8-CB20-115-CE.xlsx	C8-CB20-115-CE
75N0113	3	C8-CB30-115-CE.xlsx	C8-CB30-115-CE
75N0114	3	C8-CB40-115-CE.xlsx	C8-CB40-115-CE
75N0115	3	C8-CB5-115-CE.xlsx	C8-CB5-115-CE
75N0116	3	C8-CB50-115-CE.xlsx	C8-CB50-115-CE
75N0119	3	C8-CB10-82-CE.xlsx	C8-CB10-82-CE
75N0120	3	C8-CB20-82-CE.xlsx	C8-CB20-82-CE
75N0121	3	C8-CB30-82-CE.xlsx	C8-CB30-82-CE
75N0122	3	C8-CB40-82-CE.xlsx	C8-CB40-82-CE
75N0123	3	C8-CB5-82-CE.xlsx	C8-CB5-82-CE
75N0124	3	C8-CB50-82-CE.xlsx	C8-CB50-82-CE
75N0125	3	C8-CB60-82-CE.xlsx	C8-CB60-82-CE
75N0126	3	C8-CB70-82-CE.xlsx	C8-CB70-82-CE
75N0127	3	C8-CB80-82-CE.xlsx	C8-CB80-82-CE
75N0131	3	C8-CB10-95-CE.xlsx	C8-CB10-95-CE
75N0132	3	C8-CB20-95-CE.xlsx	C8-CB20-95-CE
75N0133	3	C8-CB40-95-CE.xlsx	C8-CB40-95-CE
75N0134	3	C8-CB5-95-CE.xlsx	C8-CB5-95-CE
75N0135	3	C8-CB50-95-CE.xlsx	C8-CB50-95-CE
75N0136	3	C8-CB60-95-CE.xlsx	C8-CB60-95-CE
75N0137	3	C8-CB70-95-CE.xlsx	C8-CB70-95-CE
75N0138	3	C8-CB80-95-CE.xlsx	C8-CB80-95-CE
75N0140	3	C8-55-1FE3 .xlsx	C8-55-1FE3
75N0141	3	C8-55-2FE3.xlsx	C8-55-2FE3
75N0142	3	C8-55-3FE3 .xlsx	C8-55-3FE3
75N0143	3	C8-55-NE-CAB.xlsx	C8-55-NE-CAB
75N0145	3	C8-55-OE3.xlsx	C8-55-OE3
75N0146	3	C8-55-T1FE3 .xlsx	C8-55-T1FE3
75N0147	3	C8-55-T2FE3.xlsx	C8-55-T2FE3
75N0148	3	C8-55-T3FE3 .xlsx	C8-55-T3FE3
75N0149	3	C8-55-TCE3 .xlsx	C8-55-TCE3
75N0150	3	C8-55-TOE3 .xlsx	C8-55-TOE3
75N0155	3	C8-95-NE.xlsx	C8-95-NE
75N0156	3	C8-95-1FE.xlsx	C8-95-1FE *and* C8-95-1FE3
75N0157	3	C8-95-2FE.xlsx	C8-95-2FE *and* C8-95-2FE3
75N0158	3	C8-95-3FE.xlsx	C8-95-3FE *and* C8-95-3FE3
75N0159	3	C8-95-CE.xlsx	C8-95-CE *and* C8-95-CE3

75N0160	3	C8-95-NE-CAB .xlsx	C8-95-NE-CAB
75N0161	3	C8-95-NE-DUCT .xlsx	C8-95-NE-DUCT
75N0162	3	C8-95-OE.xlsx	C8-95-OE *and* C8-95-OE3
75N0163	3	C8-95-T1FE.xlsx	C8-95-T1FE
75N0164	3	C8-95-T2FE.xlsx	C8-95-T2FE
75N0166	3	C8-95-T3FE.xlsx	C8-95-T3FE
75N0168	3	C8-95-TCE.xlsx	C8-95-TCE
75N0169	3	C8-95-TOE.xlsx	C8-95-TOE
75N0170	3	C8-R100-95-CE-1.xlsx	C8-R100-95-CE-1
75N0171	3	C8-R100-95-CE.xlsx	C8-R100-95-CE
75N0172	3	C8-R100-E20C30-95CE.xlsx	C8-R100-E20C30-95CE
75N0173	3	C8-R105-95-CE.xlsx	C8-R105-95-CE
75N0174	3	C8-R110-110C2-95-CE.xlsx	C8-R110-110C2-95-CE
75N0175	3	C8-R120-95-CE.xlsx	C8-R120-95-CE
75N0176	3	C8-R120-E0C30-95CE.xlsx	C8-R120-E0C30-95CE
75N0177	3	C8-R120-E20C0-95CE.xlsx	C8-R120-E20C0-95CE
75N0178	3	C8-R120-E20C30-95CE.xlsx	C8-R120-E20C30-95CE
75N0179	3	C8-R130-95-CE.xlsx	C8-R130-95-CE
75N0180	3	C8-R140-95-CE.xlsx	C8-R140-95-CE
75N0181	3	C8-R60-95-CE.xlsx	C8-R60-95-CE
75N0182	3	C8-R70-95-CE.xlsx	C8-R70-95-CE
75N0183	3	C8-R80-95-CE.xlsx	C8-R80-95-CE
75N0184	3	C8-R80-E0C30-95CE.xlsx	C8-R80-E0C30-95CE
75N0185	3	C8-R80-E20C0-95CE.xlsx	C8-R80-E20C0-95CE
75N0186	3	C8-R80-E20C30-95CE.xlsx	C8-R80-E20C30-95CE
75N0187	3	C8-R90-95-CE.xlsx	C8-R90-95-CE
75N0188	3	C8-R95-95-CE.xlsx	C8-R95-95-CE
75N0189	3	C8-EB0-115-CE.xlsx	C8-EB0-115-CE
75N0190	3	C8-EB10-115-CE.xlsx	C8-EB10-115-CE
75N0191	3	C8-EB20-115-CE.xlsx	C8-EB20-115-CE
75N0192	3	C8-EB35-115-CE.xlsx	C8-EB35-115-CE
75N0193	3	C8-EB5-115-CE.xlsx	C8-EB5-115-CE
75N0194	3	C8-EB50-115-CE.xlsx	C8-EB50-115-CE
75N0195	3	C8-EB10-55-CE.xlsx	C8-EB10-55-CE
75N0196	3	C8-EB20-55-CE.xlsx	C8-EB20-55-CE
75N0197	3	C8-EB35-55-CE.xlsx	C8-EB35-55-CE
75N0199	3	C8-EB5-55-CE.xlsx	C8-EB5-55-CE
75N0200	3	C8-EB50-55-CE.xlsx	C8-EB50-55-CE
75N0201	3	C8-EB0-82-CE.xlsx	C8-EB0-82-CE
75N0202	3	C8-EB10-82-CE.xlsx	C8-EB10-82-CE
75N0203	3	C8-EB20-82-CE.xlsx	C8-EB20-82-CE

75N0204	3	C8-EB35-82-CE.xlsx	C8-EB35-82-CE
75N0205	3	C8-EB5-82-CE.xlsx	C8-EB5-82-CE
75N0206	3	C8-EB50-82-CE.xlsx	C8-EB50-82-CE
75N0207	3	C8-EB0-95-CE.xlsx	C8-EB0-95-CE
75N0208	3	C8-EB10-95-CE.xlsx	C8-EB10-95-CE
75N0209	3	C8-EB20-95-CE.xlsx	C8-EB20-95-CE
75N0210	3	C8-EB35-95-CE.xlsx	C8-EB35-95-CE
75N0211	3	C8-EB5-95-CE.xlsx	C8-EB5-95-CE
75N0212	3	C8-EB50-95-CE.xlsx	C8-EB50-95-CE
75T0001	1&2	T2-TRN-100A-55-NE.xlsx	T2-TRN-100A-55-NE
75T0002	1&2	T2-MF17-115C1-115C2-90A-95-CCE.xlsx	T2-MF17-115C1-115C2-90A-95-CCE
75T0003	1&2	T2-MF19-85C1-85C2-90A-95-CCE.xlsx	T2-MF19-85C1-85C2-90A-95-CCE
75T0004	1&2	T2-TRN-100A-55-NE-SC.xlsx	T2-TRN-100A-55-NE-SC
75T0005	1&2	3T-75629575-NE3-Retest.xlsx	3T-75629575-NE3-Retest *and* 3T-75629575-NE3
75T0006	1&2	T2-MF1-100C1-100C2-90A-95-CCE.xlsx	T2-MF1-100C1-100C2-90A-95-CCE
75T0007	1&2	T2-MF35-115C1-115C2-90A-95-CE.xlsx	T2-MF35-115C1-115C2-90A-95-CE
75T0008	1&2	T2-MF37-85C1-85C2-90A-95-CE.xlsx	T2-MF37-85C1-85C2-90A-95-CE
75T0009	1&2	T2-MFB2-100C1-100C2-90A-95-CE.xlsx	T2-MFB2-100C1-100C2-90A-95-CE
75T0010	1&2	T2-MFR10-85C1-85C2-90A-95-CC2F.xlsx	T2-MFR10-85C1-85C2-90A-95-CC2F
75T0011	1&2	T2-MFR12-115C1-115C2-90A-95-CC2F.xlsx	T2-MFR12-115C1-115C2-90A-95-CC2F
75T0012	1&2	T2-MFR8-100C1-100C2-90A-95-CC2F.xlsx	T2-MFR8-100C1-100C2-90A-95-CC2F
75T0013	1&2	T2-TRN-100A-55-1E-DM.xlsx	T2-TRN-100A-55-1E-DM
75T0014	1&2	T2-TRN-100A-55-1F-DM.xlsx	T2-TRN-100A-55-1F-DM
75T0015	1&2	T2-TRN-100A-55-2E-DM.xlsx	T2-TRN-100A-55-2E-DM
75T0016	1&2	T2-TRN-100A-55-2F-DM.xlsx	T2-TRN-100A-55-2F-DM
75T0017	1&2	T2-TRN-100A-55-3E-DM.xlsx	T2-TRN-100A-55-3E-DM
75T0018	1&2	T2-TRN-100A-55-3F-DM.xlsx	T2-TRN-100A-55-3F-DM
75T0019	1&2	T2-TRN-100A-55-CE-DM-2.xlsx	T2-TRN-100A-55-CE-DM-2
75T0020	1&2	T2-TRN-100A-55-OE-DM.xlsx	T2-TRN-100A-55-OE-DM
75T0021	1&2	T2-TRN-95-1ER-DM.xlsx	T2-TRN-95-1ER-DM
75T0022	1&2	T2-TRN-95-1FER-DM.xlsx	T2-TRN-95-1FER-DM
75T0023	1&2	T2-TRN-95-2ER-DM.xlsx	T2-TRN-95-2ER-DM
75T0024	1&2	T2-TRN-95-2FER-DM.xlsx	T2-TRN-95-2FER-DM
75T0025	1&2	T2-TRN-95-3ER-DM.xlsx	T2-TRN-95-3ER-DM
75T0026	1&2	T2-TRN-95-3FER-DM.xlsx	T2-TRN-95-3FER-DM
75T0027	1&2	T2-TRN-95-CE-DM.xlsx	T2-TRN-95-CE-DM
75T0028	1&2	T2-TRN-95-OER-DM.xlsx	T2-TRN-95-OER-DM

75T0029	1&2	T2-CBASE-3000-95-CE.xlsx	T2-CBASE-3000-95-CE
75T0030	1&2	T2-MF0-100C1-100C2-100A-95-CCE.xlsx	T2-MF0-100C1-100C2-100A-95-CCE
75T0031	1&2	T2-MF11-85C1-85C2-110A-95-CCE.xlsx	T2-MF11-85C1-85C2-110A-95-CCE
75T0032	1&2	T2-MF13-115C1-115C2-100A-95-CCE.xlsx	T2-MF13-115C1-115C2-100A-95-CCE
75T0033	1&2	T2-MF15-85C1-85C2-100A-95-CCE.xlsx	T2-MF15-85C1-85C2-100A-95-CCE
75T0034	1&2	T2-MF2-100C1-100C2-63A-95-CCE.xlsx	T2-MF2-100C1-100C2-63A-95-CCE
75T0035	1&2	T2-MF21-115C1-115C2-63A-95-CE.xlsx	T2-MF21-115C1-115C2-63A-95-CE
75T0036	1&2	T2-MF24-85C1-85C2-63A-95-CE.xlsx	T2-MF24-85C1-85C2-63A-95-CE
75T0037	1&2	T2-MF26-115C1-115C2-110A-95-CE.xlsx	T2-MF26-115C1-115C2-110A-95-CE
75T0038	1&2	T2-MF29-85C1-85C2-110A-95-CE.xlsx	T2-MF29-85C1-85C2-110A-95-CE
75T0039	1&2	T2-MF31-115C1-115C2-100A-95-CE.xlsx	T2-MF31-115C1-115C2-100A-95-CE
75T0040	1&2	T2-MF33-85C1-85C2-100A-95-CE.xlsx	T2-MF33-85C1-85C2-100A-95-CE
75T0041	1&2	T2-MF38-100C1-100C2-63A-95-CE.xlsx	T2-MF38-100C1-100C2-63A-95-CE
75T0042	1&2	T2-MF39-100C1-100C2-110A-95-CE.xlsx	T2-MF39-100C1-100C2-110A-95-CE
75T0043	1&2	T2-MF4-85C1-85C2-63A-95-CCE.xlsx	T2-MF4-85C1-85C2-63A-95-CCE
75T0044	1&2	T2-MF6-115C1-115C2-63A-95-CCE.xlsx	T2-MF6-115C1-115C2-63A-95-CCE
75T0045	1&2	T2-MF7-100C1-100C2-110A-95-CCE.xlsx	T2-MF7-100C1-100C2-110A-95-CCE
75T0046	1&2	T2-MF8-115C1-115C2-110A-95-CCE.xlsx	T2-MF8-115C1-115C2-110A-95-CCE
75T0047	1&2	T2-MFB1-100C1-100C2-100A-95-CE.xlsx	T2-MFB1-100C1-100C2-100A-95-CE
75T0048	1&2	3T-22A-Retest-OB.xlsx	3T-22A-Retest-OB (RTU2) *and* 3T-22A-Retest-OB (RTU2) C1 undercharge
75T0049	1&2	3T-22A-Retest.xlsx	3T-22A-Retest (RTU2)
75T0050	1&2	T2-22A-ONE-6T-US.xlsx	T2-22A-ONE-6T-US (RTU1)
75T0051	1&2	T2-55-1ER-DMM.xlsx	T2-55-1ER-DMM
75T0052	1&2	T2-55-2ER-DMM.xlsx	T2-55-2ER-DMM
75T0053	1&2	T2-55-CE-DMM.xlsx	T2-55-CE-DMM
75T0054	1&2	T2-55-OER-DMM.xlsx	T2-55-OER-DMM
75T0055	1&2	T2-55-T1ER-DMM.xlsx	T2-55-T1ER-DMM
75T0056	1&2	T2-55-TCE-DMM.xlsx	T2-55-TCE-DMM
75T0057	1&2	T2-TRN-63A-55-1E-DM-2.xlsx	T2-TRN-63A-55-1E-DM-2
75T0058	1&2	T2-TRN-63A-55-1F-DM-2.xlsx	T2-TRN-63A-55-1F-DM-2
75T0059	1&2	T2-TRN-63A-55-2E-DM-2.xlsx	T2-TRN-63A-55-2E-DM-2
75T0060	1&2	T2-TRN-63A-55-2F-DM-2.xlsx	T2-TRN-63A-55-2F-DM-2
75T0061	1&2	T2-TRN-63A-55-3E-DM-2.xlsx	T2-TRN-63A-55-3E-DM-2

75T0062	1&2	T2-TRN-63A-55-3F-DM-2.xlsx	T2-TRN-63A-55-3F-DM-2
75T0063	1&2	T2-TRN-63A-55-CE-DM-2.xlsx	T2-TRN-63A-55-CE-DM-2
75T0064	1&2	T2-TRN-63A-55-NE-DM-SC.xlsx	T2-TRN-63A-55-NE-DM-SC
75T0065	1&2	T2-TRN-63A-55-NE-DM.xlsx	T2-TRN-63A-55-NE-DM
75T0066	1&2	T2-TRN-63A-55-OE-DM-2.xlsx	T2-TRN-63A-55-OE-DM-2
75T0067	1&2	T2-TRN-63A-55-RD-DM.xlsx	T2-TRN-63A-55-RD-DM
75T0068	1&2	T2-TRN-63A-55-T1E-DM.xlsx	T2-TRN-63A-55-T1E-DM
75T0069	1&2	T2-TRN-63A-55-T2E-DM-2.xlsx	T2-TRN-63A-55-T2E-DM-2
75T0070	1&2	T2-TRN-63A-55-T3E-DM-2.xlsx	T2-TRN-63A-55-T3E-DM-2
75T0071	1&2	T2-TRN-63A-55-TCE-DM-2.xlsx	T2-TRN-63A-55-TCE-DM-2
75T0072	1&2	T2-TRN-75A-55-1E-DM.xlsx	T2-TRN-75A-55-1E-DM
75T0073	1&2	T2-TRN-75A-55-1F-DM-2.xlsx	T2-TRN-75A-55-1F-DM-2
75T0074	1&2	T2-TRN-75A-55-2E-DM-2.xlsx	T2-TRN-75A-55-2E-DM-2
75T0075	1&2	T2-TRN-75A-55-2F-DM-2.xlsx	T2-TRN-75A-55-2F-DM-2
75T0076	1&2	T2-TRN-75A-55-3E-DM-2.xlsx	T2-TRN-75A-55-3E-DM-2
75T0077	1&2	T2-TRN-75A-55-3F-DM-2.xlsx	T2-TRN-75A-55-3F-DM-2
75T0078	1&2	T2-TRN-75A-55-CE-DM-2.xlsx	T2-TRN-75A-55-CE-DM-2
75T0079	1&2	T2-TRN-75A-55-NE-DM-SC.xlsx	T2-TRN-75A-55-NE-DM-SC
75T0080	1&2	T2-TRN-75A-55-NE-DM.xlsx	T2-TRN-75A-55-NE-DM
75T0081	1&2	T2-TRN-75A-55-OE-DM-2.xlsx	T2-TRN-75A-55-OE-DM-2
75T0082	1&2	T2-TRN-75A-55-RD-DM.xlsx	T2-TRN-75A-55-RD-DM
75T0083	1&2	T2-TRN-88A-55-1ER-DM.xlsx	T2-TRN-88A-55-1ER-DM
75T0084	1&2	T2-TRN-88A-55-1F-DM-2.xlsx	T2-TRN-88A-55-1F-DM-2
75T0085	1&2	T2-TRN-88A-55-2E-DM-2.xlsx	T2-TRN-88A-55-2E-DM-2
75T0086	1&2	T2-TRN-88A-55-2F-DM-2.xlsx	T2-TRN-88A-55-2F-DM-2
75T0087	1&2	T2-TRN-88A-55-3E-DM-2.xlsx	T2-TRN-88A-55-3E-DM-2
75T0088	1&2	T2-TRN-88A-55-3F-DM-2.xlsx	T2-TRN-88A-55-3F-DM-2
75T0089	1&2	T2-TRN-88A-55-CE-DM-2.xlsx	T2-TRN-88A-55-CE-DM-2
75T0090	1&2	T2-TRN-88A-55-NE-DM-SC.xlsx	T2-TRN-88A-55-NE-DM-SC
75T0091	1&2	T2-TRN-88A-55-NE-DM.xlsx	T2-TRN-88A-55-NE-DM
75T0092	1&2	T2-TRN-88A-55-OE-DM-2.xlsx	T2-TRN-88A-55-OE-DM-2
75T0093	1&2	T2-TRN-88A-55-RD-DM.xlsx	T2-TRN-88A-55-RD-DM
75T0094	1&2	T2-TRN-88A-55-T1ER-DM.xlsx	T2-TRN-88A-55-T1ER-DM
75T0095	1&2	T2-TRN-88A-55-T2E-DM-2.xlsx	T2-TRN-88A-55-T2E-DM-2
75T0096	1&2	T2-TRN-88A-55-T3E-DM-2.xlsx	T2-TRN-88A-55-T3E-DM-2
75T0097	1&2	T2-TRN-88A-55-TCE-DM-2.xlsx	T2-TRN-88A-55-TCE-DM
75T0098	1&2	T2-TRN-100A-55-RD.xlsx	T2-TRN-100A-55-RD
75T0099	1&2	T2-TRN-100A-55-T1E-DM.xlsx	T2-TRN-100A-55-T1E-DM
75T0100	1&2	T2-TRN-100A-55-T2E-DM.xlsx	T2-TRN-100A-55-T2E-DM
75T0101	1&2	T2-TRN-100A-55-T3E-DM.xlsx	T2-TRN-100A-55-T3E-DM
75T0102	1&2	T2-TRN-100A-55-TCE-DM.xlsx	T2-TRN-100A-55-TCE-DM

75T0103	1&2	T2-TRN-55-T1FER-DM.xlsx	T2-TRN-55-T1FER-DM
75T0104	1&2	T2-TRN-55-T2FER-DM.xlsx	T2-TRN-55-T2FER-DM
75T0105	1&2	T2-TRN-55-T3FER-DM.xlsx	T2-TRN-55-T3FER-DM
75T0106	1&2	T2-TRN-110A-55-1E-DM.xlsx	T2-TRN-110A-55-1E-DM
75T0107	1&2	T2-TRN-110A-55-1F-DM-2.xlsx	T2-TRN-110A-55-1F-DM-2
75T0108	1&2	T2-TRN-110A-55-2E-DM.xlsx	T2-TRN-110A-55-2E-DM
75T0109	1&2	T2-TRN-110A-55-2F-DM-2.xlsx	T2-TRN-110A-55-2F-DM-2
75T0110	1&2	T2-TRN-110A-55-3E-DM.xlsx	T2-TRN-110A-55-3E-DM
75T0111	1&2	T2-TRN-110A-55-3F-DM-2.xlsx	T2-TRN-110A-55-3F-DM-2
75T0112	1&2	T2-TRN-110A-55-NE-DM-2.xlsx	T2-TRN-110A-55-NE-DM-2
75T0113	1&2	T2-TRN-110A-55-NE-DM-SC.xlsx	T2-TRN-110A-55-NE-DM-SC
75T0114	1&2	T2-TRN-110A-55-OE-DM-2.xlsx	T2-TRN-110A-55-OE-DM-2
75T0115	1&2	T2-TRN-110A-55-RD-DM.xlsx	T2-TRN-110A-55-RD-DM
75T0116	1&2	T2-TRN-110A-55-T1E-DM.xlsx	T2-TRN-110A-55-T1E-DM
75T0117	1&2	T2-TRN-110A-55-T2E-DM.xlsx	T2-TRN-110A-55-T2E-DM
75T0118	1&2	T2-TRN-110A-55-T3E-DM.xlsx	T2-TRN-110A-55-T3E-DM
75T0119	1&2	T2-TRN-110A-55-TCE-DM.xlsx	T2-TRN-110A-55-TCE-DM
75T0120	1&2	T2-CAN-55-1ER-DM.xlsx	T2-CAN-55-1ER-DM
75T0121	1&2	T2-CAN-55-2ER-DM.xlsx	T2-CAN-55-2ER-DM
75T0122	1&2	T2-CAN-55-3ER-DM.xlsx	T2-CAN-55-3ER-DM
75T0123	1&2	T2-CAN-55-CE-DM.xlsx	T2-CAN-55-CE-DM
75T0124	1&2	T2-CAN-55-OER-DM.xlsx	T2-CAN-55-OER-DM
75T0125	1&2	T2-CAN-55-T1ER-DM.xlsx	T2-CAN-55-T1ER-DM
75T0126	1&2	T2-CAN-55-T2ER-DM.xlsx	T2-CAN-55-T2ER-DM
75T0127	1&2	T2-CAN-55-T3ER-DM.xlsx	T2-CAN-55-T3ER-DM
75T0128	1&2	T2-CAN-55-TCE-DM.xlsx	T2-CAN-55-TCE-DM
75T0129	1&2	T2-CAN-55-TOER-DM.xlsx	T2-CAN-55-TOER-DM
75T0130	1&2	T2-TRN-95-T1ER-DM.xlsx	T2-TRN-95-T1ER-DM
75T0131	1&2	T2-TRN-95-T1FER-DM.xlsx	T2-TRN-95-T1FER-DM
75T0132	1&2	T2-TRN-95-T2ER-DM.xlsx	T2-TRN-95-T2ER-DM
75T0133	1&2	T2-TRN-95-T2FER-DM.xlsx	T2-TRN-95-T2FER-DM
75T0134	1&2	T2-TRN-95-T3ER-DM.xlsx	T2-TRN-95-T3ER-DM
75T0135	1&2	T2-TRN-95-T3FER-DM.xlsx	T2-TRN-95-T3FER-DM
75T0136	1&2	T2-TRN-95-TCE-DM.xlsx	T2-TRN-95-TCE-DM
75T0137	1&2	T2-TRN-95-TOER-DM.xlsx	T2-TRN-95-TOER-DM
75T0138	1&2	T2-CAN-95-1ER-DM.xlsx	T2-CAN-95-1ER-DM
75T0139	1&2	T2-CAN-95-2ER-DM.xlsx	T2-CAN-95-2ER-DM
75T0140	1&2	T2-CAN-95-3ER-DM.xlsx	T2-CAN-95-3ER-DM
75T0141	1&2	T2-CAN-95-CE-DM.xlsx	T2-CAN-95-CE-DM
75T0142	1&2	T2-CAN-95-OER-DM.xlsx	T2-CAN-95-OER-DM
75T0143	1&2	T2-CAN-95-T1ER-DM.xlsx	T2-CAN-95-T1ER-DM

75T0144	1&2	T2-CAN-95-T2ER-DM.xlsx	T2-CAN-95-T2ER-DM
75T0145	1&2	T2-CAN-95-T3ER-DM.xlsx	T2-CAN-95-T3ER-DM
75T0146	1&2	T2-CAN-95-TCE-DM.xlsx	T2-CAN-95-TCE-DM
75T0147	1&2	T2-CAN-95-TOER-DM.xlsx	T2-CAN-95-TOER-DM
75T0148	1&2	T2-HS-1875-95-CF-C.xlsx	T2-HS-1875-95-CF-C
75T0149	1&2	T2-HS-2250-95-CF.xlsx	T2-HS-2250-95-CF
75T0150	1&2	T2-HS-2384-95-CF.xlsx	T2-HS-2384-95-CF
75T0151	1&2	T2-HS-2625-95-CF.xlsx	T2-HS-2625-95-CF
75T0152	1&2	T2-HS-3000-95-CF-C.xlsx	T2-HS-3000-95-CF-C
75T0153	1&2	T2-HS-3200-95-CF-C.xlsx	T2-HS-3200-95-CF-C
75T0154	1&2	T2-1875-95-CF-C.xlsx	T2-1875-95-CF-C
75T0155	1&2	T2-2250-95-CF.xlsx	T2-2250-95-CF
75T0156	1&2	T2-2625-95-CF.xlsx	T2-2625-95-CF
75T0157	1&2	T2-3000-95-CF.xlsx	T2-3000-95-CF
75T0158	1&2	T2-3240-95-CF.xlsx	T2-3240-95-CF
75T0159	1&2	3T-22AA-0.xlsx	3T-22AA-0
75T0160	1&2	3T-22B.xlsx	3T-22B
75T0161	1&2	3T-22C Cyclic #2.xlsx	3T-22C Cyclic #2
75T0162	1&2	3T-22C Cyclic #3.xlsx	3T-22C Cyclic #3
75T0163	1&2	3T-22C Cyclic #4.xlsx	3T-22C Cyclic #4
75T0164	1&2	3T-ONE.xlsx	3T-ONE
75T0165	1&2	T2-ONE-3HP.xlsx	T2-ONE-3HP
75T0166	1&2	T2-ONE.xlsx	T2-ONE
75T0167	1&2	T2-R-3000-115-CE.xlsx	T2-R-3000-115-CE
75T0168	1&2	T2-R-3000-75-CE.xlsx	T2-R-3000-75-CE
75T0169	1&2	T2-R-3000-95-CE.xlsx	T2-R-3000-95-CE
75T0170	1&2	T2-RBASE-3000-115-CE.xlsx	T2-RBASE-3000-115-CE
75T0171	1&2	T2-RBASE-3000-75-CE.xlsx	T2-RBASE-3000-75-CE
75T0172	1&2	T2-MFB3-100C1-100C2-90A-95-CE-3.xlsx	T2-MFB3-100C1-100C2-90A-95-CE-3
75T0173	1&2	T2-NC1-CK1-100C1-100C2-90A-CE.xlsx	T2-NC1-CK1-100C1-100C2-90A-CE
75T0174	1&2	T2-NC2-CK1-CK2-100C1-100C2-90A-CE.xlsx	T2-NC2-CK1-CK2-100C1-100C2-90A-CE
75T0175	1&2	T2-NC3-CK1-100C1-100C2-90A-CE.xlsx	T2-NC3-CK1-100C1-100C2-90A-CE
75T0176	1&2	T2-NC4-CK1-CK2-100C1-100C2-90A-CE.xlsx	T2-NC4-CK1-CK2-100C1-100C2-90A-CE
75T0181	1&2	3T-75629575-E3-Retest.xlsx	3T-75629575-E3-Retest
75T0182	1&2	3T-75629575-E6-Retest.xlsx	3T-75629575-E6-Retest
75T0183	1&2	3T-75629575-E6.xlsx	3T-75629575-E6
75T0186	1&2	T2-RC10-130C1-130C2-90A-95-CE.xlsx	T2-RC10-130C1-130C2-90A-95-CE
75T0187	1&2	T2-RC11-140C1-140C2-90A-95-	T2-RC11-140C1-140C2-90A-95-CE

		CE.xlsx	
75T0188	1&2	T2-RC2-95C1-95C2-90A-95-CE.xlsx	T2-RC2-95C1-95C2-90A-95-CE
75T0189	1&2	T2-RC3-90C1-90C2-90A-95-CE.xlsx	T2-RC3-90C1-90C2-90A-95-CE
75T0190	1&2	T2-RC4-80C1-80C2-90A-95-CE.xlsx	T2-RC4-80C1-80C2-90A-95-CE
75T0191	1&2	T2-RC5-70C1-70C2-90A-95-CE.xlsx	T2-RC5-70C1-70C2-90A-95-CE
75T0192	1&2	T2-RC6-60C1-60C2-90A-95-CE.xlsx	T2-RC6-60C1-60C2-90A-95-CE
75T0193	1&2	T2-RC7-105C1-105C2-90A-95-CE.xlsx	T2-RC7-105C1-105C2-90A-95-CE
75T0194	1&2	T2-RC8-110C1-110C2-90A-95-CE.xlsx	T2-RC8-110C1-110C2-90A-95-CE
75T0195	1&2	T2-RC9-120C1-120C2-90A-95-CE.xlsx	T2-RC9-120C1-120C2-90A-95-CE
75T0196	1&2	T2-RCB1-100C1-100C2-90A-95-CE-5.xlsx	T2-RCB1-100C1-100C2-90A-95-CE-5
75T0197	1&2	T2-MF45-100C1-100C2-90A-CB05-CCE.xlsx	T2-MF45-100C1-100C2-90A-CB05-CCE
75T0198	1&2	T2-MF46-100C1-100C2-90A-CB10-CCE.xlsx	T2-MF46-100C1-100C2-90A-CB10-CCE
75T0199	1&2	T2-MF47-100C1-100C2-90A-CB20-CCE.xlsx	T2-MF47-100C1-100C2-90A-CB20-CCE
75T0200	1&2	T2-MF48-100C1-100C2-90A-CB30-CCE.xlsx	T2-MF48-100C1-100C2-90A-CB30-CCE
75T0201	1&2	T2-MF49-100C1-100C2-90A-CB40-CCE.xlsx	T2-MF49-100C1-100C2-90A-CB40-CCE
75T0202	1&2	T2-MF50-100C1-100C2-90A-CB50-CCE.xlsx	T2-MF50-100C1-100C2-90A-CB50-CCE
75T0203	1&2	T2-MF51-100C1-100C2-90A-CB60-CCE.xlsx	T2-MF51-100C1-100C2-90A-CB60-CCE
75T0204	1&2	T2-MF52-100C1-100C2-90A-CB70-CCE.xlsx	T2-MF52-100C1-100C2-90A-CB70-CCE
75T0205	1&2	T2-MF53-100C1-100C2-90A-CB80-CCE.xlsx	T2-MF53-100C1-100C2-90A-CB80-CCE
75T0206	1&2	T2-MFB3-100C1-100C2-90A-95-CE-2.xlsx	T2-MFB3-100C1-100C2-90A-95-CE-2
75T0207	1&2	T2-E-3000-95-CE-B30%.xlsx	T2-E-3000-95-CE-B30%
75T0208	1&2	T2-E-3000-95-CE-B50%.xlsx	T2-E-3000-95-CE-B50%
75T0209	1&2	T2-TRN-75A-55-TCE-DM-2.xlsx	T2-TRN-75A-55-TCE-DM-2
75T0210	1&2	T2-TRN-75A-55-T1E-DM.xlsx	T2-TRN-75A-55-T1E-DM
75T0211	1&2	T2-TRN-75A-55-T2E-DM-2.xlsx	T2-TRN-75A-55-T2E-DM-2
75T0212	1&2	T2-TRN-75A-55-T3E-DM-2.xlsx	T2-TRN-75A-55-T3E-DM-2
75T0213	1&2	T2-TRN-110A-55-CE-DM-2.xlsx	T2-TRN-110A-55-CE-DM-2
30T0044	4	L-95-3-10-1.xlsx	L-95-3-10-1
30N0070	5	C-55-NES.xlsx	C-55-NES

Level 2 Characterization

DNV GL ID	Tab1	Tab2	Tab3	Tab4	Tab5	Tab6	Tab7	Tab8	Tab9	Tab10	Tab 11	Tab 12
75T0159	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-190	G100958166-100-190 (2)		
75T0160	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-38	G100958166-100-38 (2)		
75T0161	Summary	Comments	G100958166-100-42	G100958166-100-42 (2)								
75T0162	Summary	Comments	G100958166-100-43	G100958166-100-43 (2)								
75T0163	Summary	Comments	G100958166-100-44	G100958166-100-44 (2)								
75T0164	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-5	G100958166-100-5 (2)		
75T0165	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G101372923-100-25	G101372923-100-25 (2)		
75T0166	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G101372923-100-51	G101372923-100-51 (2)		
75T0048	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-7	G100958166-100-7 (2)		
75T0049	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-9	G100958166-100-9 (2)		
75T0177	2Circuits-1Comp Each-Fixed Fan											
75T0178	2Circuits-1Comp Each-Fixed Fan											
75T0179	Sheet4	Sheet1	Sheet2	Sheet3								
75T0180	Sheet4	Sheet1	Sheet2	Sheet3								
75T0050	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G101372923-100-93	G101372923-100-93 (2)		
75T0181	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-23	G100958166-100-23 (2)		
75T0182	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-17	G100958166-100-17 (2)		
75T0183	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-36	G100958166-100-36 (2)		
75T0005	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-25	G100958166-100-25 (2)		
75T0051	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-178	G100958166-100-178 (2)				
75T0052	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-174	G100958166-100-174 (2)		
75T0053	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-186	G100958166-100-186 (2)		
75T0054	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-170	G100958166-100-170 (2)		
75T0120	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-226	G100958166-100-226 (2)				
75T0121	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-223	G100958166-100-223 (2)				

75T0122	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-220	G100958166-100-220 (2)				
75T0123	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-229	G100958166-100-229 (2)				
75T0020	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-523	G100958166-100-523 (2)		
75T0021	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-368	G100958166-100-368 (2)		
75T0022	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-385	G100958166-100-385 (2)		
75T0023	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-374	G100958166-100-374 (2)		
75T0014	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-540	G100958166-100-540 (2)		
75T0099	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-528	G100958166-100-528 (2)		
75T0094	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-290	G100958166-100-290 (2)		
75T0106	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-324	G100958166-100-324 (2)		
75T0061	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-636	G100958166-100-636 (2)		
75T0063	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-628	G100958166-100-628 (2)		
75T0107	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-507	G100958166-100-507 (2)		
75T0087	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-571	G100958166-100-571 (2)		
75T0089	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-552	G100958166-100-552 (2)		
75T0100	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-530	G100958166-100-530 (2)		
75T0125	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-234	G100958166-100-234 (2)				
75T0083	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-296	G100958166-100-296 (2)		
75T0097	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-555	G100958166-100-555 (2)		
75T0096	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-567	G100958166-100-567 (2)		
75T0114	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-515	G100958166-100-515 (2)		
75T0057	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-630	G100958166-100-630 (2)		
75T0116	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-314	G100958166-100-314 (2)		
75T0129	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-248	G100958166-100-248 (2)				
75T0118	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-318	G100958166-100-318 (2)		
75T0119	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-312	G100958166-100-312 (2)		
75T0072	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-352	G100958166-100-352 (2)		
75T0085	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-577	G100958166-100-577 (2)		
75T0092	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-589	G100958166-100-589 (2)		
75T0115	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-440	G100958166-100-440 (2)		

75T0077	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-605	G100958166-100-605 (2)		
75T0075	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-602	G100958166-100-602 (2)		
75T0071	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-647	G100958166-100-647 (2)		
75T0066	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-645	G100958166-100-645 (2)		
75T0126	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-240	G100958166-100-240 (2)				
75T0060	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-641	G100958166-100-641 (2)		
75T0113	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-400	G100958166-100-400 (2)		
75T0088	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-587	G100958166-100-587 (2)		
75T0103	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-403	G100958166-100-403 (2)		
75T0079	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-412	G100958166-100-412 (2)		
75T0062	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-643	G100958166-100-643 (2)		
75T0070	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-653	G100958166-100-653 (2)		
75T0110	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-320	G100958166-100-320 (2)		
75T0082	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-449	G100958166-100-449 (2)		
75T0018	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-547	G100958166-100-547 (2)		
75T0026	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-380	G100958166-100-380 (2)		
75T0004	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-405	G100958166-100-405 (2)		
75T0108	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-322	G100958166-100-322 (2)		
75T0080	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-427	G100958166-100-427 (2)		
75T0019	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-519	G100958166-100-519 (2)		
75T0068	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-264	G100958166-100-264 (2)		
75T0065	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-423	G100958166-100-423 (2)		
75T0028	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-357	G100958166-100-357 (2)		
75T0112	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-435	G100958166-100-435 (2)		
75T0102	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-526	G100958166-100-526 (2)		
75T0098	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-443	G100958166-100-443 (2)		
75T0117	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-316	G100958166-100-316 (2)		
75T0101	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-532	G100958166-100-532 (2)		
75T0067	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-453	G100958166-100-453 (2)		
75T0016	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-543	G100958166-100-543 (2)		

75T0076	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-597	G100958166-100-597 (2)		
75T0024	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-383	G100958166-100-383 (2)		
75T0027	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-377	G100958166-100-377 (2)		
75T0124	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-200	G100958166-100-200 (2)				
75T0059	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-633	G100958166-100-633 (2)		
75T0078	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-591	G100958166-100-591 (2)		
75T0069	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-651	G100958166-100-651 (2)		
75T0090	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-409	G100958166-100-409 (2)		
75T0105	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-399	G100958166-100-399 (2)		
75T0111	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-510	G100958166-100-510 (2)		
75T0001	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-431	G100958166-100-431 (2)		
75T0091	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-433	G100958166-100-433 (2)		
75T0058	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-638	G100958166-100-638 (2)		
75T0084	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-582	G100958166-100-582 (2)		
75T0056	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-184	G100958166-100-184 (2)				
75T0025	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-359	G100958166-100-359 (2)		
75T0128	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-232	G100958166-100-232 (2)				
75T0093	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-446	G100958166-100-446 (2)		
75T0104	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-401	G100958166-100-401 (2)		
75T0017	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-534	G100958166-100-534 (2)		
75T0086	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-585	G100958166-100-585 (2)		
75T0095	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-563	G100958166-100-563 (2)		
75T0015	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-536	G100958166-100-536 (2)		
75T0081	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-608	G100958166-100-608 (2)		
75T0064	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-418	G100958166-100-418 (2)		
75T0074	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-595	G100958166-100-595 (2)		
75T0127	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-244	G100958166-100-244 (2)				
75T0013	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-538	G100958166-100-538 (2)		
75T0055	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-180	G100958166-100-180 (2)				
75T0109	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-505	G100958166-100-505 (2)		

75T0073	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-599	G100958166-100-599 (2)		
75T0138	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-276	G100958166-100-276 (2)		
75T0139	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-274	G100958166-100-274 (2)		
75T0140	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-279	G100958166-100-279 (2)		
75T0141	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-270	G100958166-100-270 (2)		
75T0131	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-395	G100958166-100-395 (2)		
75T0144	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-259	G100958166-100-259 (2)		
75T0133	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-391	G100958166-100-391 (2)		
75T0132	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-345	G100958166-100-345 (2)		
75T0147	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-252	G100958166-100-252 (2)		
75T0143	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-263	G100958166-100-263 (2)		
75T0142	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-281	G100958166-100-281 (2)		
75T0136	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-351	G100958166-100-351 (2)		
75T0135	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-388	G100958166-100-388 (2)		
75T0130	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-348	G100958166-100-348 (2)		
75T0146	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-267	G100958166-100-267 (2)		
75T0137	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-337	G100958166-100-337 (2)		
75T0145	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-256	G100958166-100-256 (2)		
75T0134	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-341	G100958166-100-341 (2)		
75T0154	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-134	G100958166-100-134 (2)		
75T0155	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-127	G100958166-100-127 (2)		
75T0156	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-138	G100958166-100-138 (2)		
75T0157	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-92	G100958166-100-92 (2)		
75T0158	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-95	G100958166-100-95 (2)		
75T0148	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-122	G100958166-100-122 (2)		
75T0149	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-127	G100958166-100-127 (2)		
75T0150	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-125	G100958166-100-125 (2)		
75T0151	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-129	G100958166-100-129 (2)		
75T0152	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-113	G100958166-100-113 (2)		
75T0153	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-117	G100958166-100-117 (2)		

75T0186	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-826	G100958166-100-826 (2)		
75T0187	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-829	G100958166-100-829 (2)		
75T0188	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-792	G100958166-100-792 (2)		
75T0189	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-796	G100958166-100-796 (2)		
75T0190	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-800	G100958166-100-800 (2)		
75T0191	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-804	G100958166-100-804 (2)		
75T0192	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-808	G100958166-100-808 (2)		
75T0193	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-814	G100958166-100-814 (2)		
75T0194	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-818	G100958166-100-818 (2)		
75T0195	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-821	G100958166-100-821 (2)		
75T0196	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-788	G100958166-100-788 (2)		
75T0197	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-666	G100958166-100-666 (2)		
75T0198	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-670	G100958166-100-670 (2)		
75T0199	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-679	G100958166-100-679 (2)		
75T0200	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-682	G100958166-100-682 (2)		
75T0202	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-692	G100958166-100-692 (2)		
75T0203	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-696	G100958166-100-696 (2)		
75T0204	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-700	G100958166-100-700 (2)		
75T0205	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-704	G100958166-100-704 (2)		
75T0206	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-661	G100958166-100-661 (2)		
75T0201	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-687	G100958166-100-687 (2)		
75T0029	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-465	G100958166-100-465 (2)		
75T0207	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-475	G100958166-100-475 (2)		
75T0208	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-473	G100958166-100-473 (2)		
75T0167	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-480	G100958166-100-480 (2)		
75T0168	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-482	G100958166-100-482 (2)		
75T0169	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-477	G100958166-100-477 (2)		
75T0170	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-485	G100958166-100-485 (2)		
75T0171	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-483	G100958166-100-483 (2)		
75T0172	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-724	G100958166-100-724 (2)		

75T0173	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-728	G100958166-100-728 (2)		
75T0174	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-732	G100958166-100-732 (2)		
75T0175	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-738	G100958166-100-738 (2)		
75T0176	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-742	G100958166-100-742 (2)		
75T0030	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-62	G100958166-100-62 (2)		
75T0006	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-77	G100958166-100-77 (2)		
75T0002	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-81	G100958166-100-81 (2)		
75T0003	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-88	G100958166-100-88 (2)		
75T0031	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-113	G100958166-100-113 (2)		
75T0034	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-98	G100958166-100-98 (2)		
75T0035	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-21	G100958166-100-21 (2)		
75T0036	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-25	G100958166-100-25 (2)		
75T0037	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-31	G100958166-100-31 (2)		
75T0007	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-48	G100958166-100-48 (2)		
75T0008	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-52	G100958166-100-52 (2)		
75T0039	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-42	G100958166-100-42 (2)		
75T0040	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-44	G100958166-100-44 (2)		
75T0043	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-102	G100958166-100-102 (2)		
75T0044	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-105	G100958166-100-105 (2)		
75T0045	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-108	G100958166-100-108 (2)		
75T0046	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-110	G100958166-100-110 (2)		
75T0009	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-18	G100958166-100-18 (2)		
75T0047	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-14	G100958166-100-14 (2)		
75T0011	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-169	G100958166-100-169 (2)		
75T0012	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-153	G100958166-100-153 (2)		
75T0010	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-160	G100958166-100-160 (2)		
75T0033	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-69	G100958166-100-69 (2)		
75T0041	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-56	G100958166-100-56 (2)		
75T0032	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-65	G100958166-100-65 (2)		
75T0042	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-58	G100958166-100-58 (2)		

75T0038	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-36	G100958166-100-36 (2)		
75N0140	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-66	G100958166-100-66 (2)	
75N0141	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-68	G100958166-100-68 (2)	
75N0142	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-72	G100958166-100-72 (2)	
75N0145	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-75	G100958166-100-75 (2)	
75N0143	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-78	G100958166-100-78 (2)	
75N0033	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-63	G100958166-100-63 (2)	
75N0149	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-59	G100958166-100-59 (2)	
75N0148	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-53	G100958166-100-53 (2)	
75N0146	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-57	G100958166-100-57 (2)	
75N0147	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-55	G100958166-100-55 (2)	
75N0150	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-51	G100958166-100-51 (2)	
75N0155	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-10	G100958166-100-10 (2)	
75N0167	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-98	G100958166-100-98 (2)	
75N0166	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-98	G100958166-100-98 (2)	
75N0160	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-88	G100958166-100-88 (2)	
75N0169	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-102	G100958166-100-102 (2)	
75N0161	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-84	G100958166-100-84 (2)	
75N0163	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-93	G100958166-100-93 (2)	
75N0162	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-105	G100958166-100-105 (2)	
75N0164	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-96	G100958166-100-96 (2)	
75N0159	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-122	G100958166-100-122 (2)	
75N0168	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-90	G100958166-100-90 (2)	
75N0158	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-108	G100958166-100-108 (2)	
75N0165	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-96	G100958166-100-96 (2)	
75N0156	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-117	G100958166-100-117 (2)	
75N0157	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-111	G100958166-100-111 (2)	
75N0170	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-243	G100958166-100-243 (2)	
75N0171	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-195	G100958166-100-195 (2)	
75N0174	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-225	G100958166-100-225 (2)	

75N0175	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-227	G100958166-100-227 (2)
75N0176	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-233	G100958166-100-233 (2)
75N0179	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-237	G100958166-100-237 (2)
75N0180	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-241	G100958166-100-241 (2)
75N0181	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-218	G100958166-100-218 (2)
75N0182	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-215	G100958166-100-215 (2)
75N0183	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-205	G100958166-100-205 (2)
75N0184	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-213	G100958166-100-213 (2)
75N0187	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-203	G100958166-100-203 (2)
75N0188	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-201	G100958166-100-201 (2)
75N0173	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-221	G100958166-100-221 (2)
75N0178	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-231	G100958166-100-231 (2)
75N0186	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-210	G100958166-100-210 (2)
75N0177	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-229	G100958166-100-229 (2)
75N0172	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-199	G100958166-100-199 (2)
75N0185	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-207	G100958166-100-207 (2)
75N0031	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-177	G100958166-100-177 (2)
75N0201	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-302	G100958166-100-302 (2)
75N0207	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-124	G100958166-100-124 (2)
75N0195	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-155	G100958166-100-155 (2)
75N0202	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-306	G100958166-100-306 (2)
75N0196	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-152	G100958166-100-152 (2)
75N0203	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-308	G100958166-100-308 (2)
75N0197	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-150	G100958166-100-150 (2)
75N0204	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-310	G100958166-100-310 (2)
75N0199	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-157	G100958166-100-157 (2)
75N0198	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-191	G100958166-100-191 (2)
75N0210	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-142	G100958166-100-142 (2)
75N0189	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-325	G100958166-100-325 (2)
75N0194	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-315	G100958166-100-315 (2)

75N0205	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-304	G100958166-100-304 (2)
75N0212	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-145	G100958166-100-145 (2)
75N0211	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-130	G100958166-100-130 (2)
75N0192	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-317	G100958166-100-317 (2)
75N0208	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-135	G100958166-100-135 (2)
75N0200	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-148	G100958166-100-148 (2)
75N0190	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-321	G100958166-100-321 (2)
75N0209	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-138	G100958166-100-138 (2)
75N0191	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-319	G100958166-100-319 (2)
75N0206	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-312	G100958166-100-312 (2)
75N0193	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-323	G100958166-100-323 (2)
75N0119	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-275	G100958166-100-275 (2)
75N0131	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-173	G100958166-100-173 (2)
75N0111	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-253	G100958166-100-253 (2)
75N0120	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-277	G100958166-100-277 (2)
75N0132	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-175	G100958166-100-175 (2)
75N0112	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-255	G100958166-100-255 (2)
75N0121	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-279	G100958166-100-279 (2)
75N0113	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-257	G100958166-100-257 (2)
75N0122	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-283	G100958166-100-283 (2)
75N0133	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-179	G100958166-100-179 (2)
75N0114	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-260	G100958166-100-260 (2)
75N0123	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-273	G100958166-100-273 (2)
75N0124	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-286	G100958166-100-286 (2)
75N0125	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-290	G100958166-100-290 (2)
75N0136	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-183	G100958166-100-183 (2)
75N0126	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-294	G100958166-100-294 (2)
75N0137	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-185	G100958166-100-185 (2)
75N0127	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-298	G100958166-100-298 (2)
75N0138	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-187	G100958166-100-187 (2)

75N0115	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-251	G100958166-100-251 (2)	
75N0116	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-263	G100958166-100-263 (2)	
75N0135	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-181	G100958166-100-181 (2)	
75N0134	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-171	G100958166-100-171 (2)	
75N0213	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	Condensate HB	G100958166-100-264	G100958166-100-264 (2)	
75N0034	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-66	G100958166-100-66 (2)			
75N0035	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-68	G100958166-100-68 (2)			
75N0040	Summary	Comments	G100958166-100-71	G100958166-100-71 (2)								
75N0041	Summary	Comments	G100958166-100-72	G100958166-100-72 (2)								
75N0042	Summary	Comments	G100958166-100-73	G100958166-100-73 (2)								
75N0043	Summary	Comments	G100958166-100-74	G100958166-100-74 (2)								
75N0044	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-55	G100958166-100-55 (2)		
75N0045	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-57	G100958166-100-57 (2)		
75N0005	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-38	G100958166-100-38 (2)		
75N0006	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-19	G100958166-100-19 (2)		
75N0007	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-87	G100958166-100-87 (2)		
75N0058	2Circuits-1Comp Each-Fixed Fan											
75N0059	Sheet4	Sheet1	Sheet2	Sheet3								
75N0004	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-144	G100958166-100-144 (2)		
75N0008	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-422	G100958166-100-422 (2)		
75N0009	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-550	G100958166-100-550 (2)		
75N0010	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-525	G100958166-100-525 (2)		
75N0060	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-239	G100958166-100-239 (2)				
75N0018	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-241	G100958166-100-241 (2)				
75N0019	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-163	G100958166-100-163 (2)		
75N0020	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-166	G100958166-100-166 (2)		
75N0021	Summary	Comments	Detail1	Compressor 1	Power	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-168	G100958166-100-168 (2)		
75N0022	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-170	G100958166-100-170 (2)		
75N0024	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-142	G100958166-100-142 (2)		
75N0025	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-140	G100958166-100-140 (2)		

75N0026	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-138	G100958166-100-138 (2)		
75N0027	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-136	G100958166-100-136 (2)		
75N0023	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-172	G100958166-100-172 (2)		
75N0061	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-114	G100958166-100-114 (2)		
75N0011	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-110	G100958166-100-110 (2)		
75N0063	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-148	G100958166-100-148 (2)		
75N0064	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-161	G100958166-100-161 (2)		
75N0065	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-159	G100958166-100-159 (2)		
75N0066	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-158	G100958166-100-158 (2)		
75N0062	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-146	G100958166-100-146 (2)		
75N0067	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-277	G100958166-100-277 (2)			
75N0068	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-243	G100958166-100-243 (2)			
75N0069	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-282	G100958166-100-282 (2)		
75N0070	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-199	G100958166-100-199 (2)		
75N0071	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-193	G100958166-100-193 (2)		
75N0072	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-262	G100958166-100-262 (2)		
75N0073	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-195	G100958166-100-195 (2)		
75N0074	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-270	G100958166-100-270 (2)			
75N0075	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-209	G100958166-100-209 (2)			
75N0076	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-268	G100958166-100-268 (2)		
75N0077	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-211	G100958166-100-211 (2)				
75N0078	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-274	G100958166-100-274 (2)		
75N0079	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-225	G100958166-100-225 (2)		
75N0080	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-272	G100958166-100-272 (2)		
75N0081	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-229	G100958166-100-229 (2)				
75N0082	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-462	G100958166-100-462 (2)		
75N0012	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-460	G100958166-100-460 (2)		
75N0083	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-456	G100958166-100-456 (2)		
75N0013	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-458	G100958166-100-458 (2)		
75N0084	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-441	G100958166-100-441 (2)		

75N0014	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-439	G100958166-100-439 (2)		
75N0028	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-464	G100958166-100-464 (2)		
75N0001	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-466	G100958166-100-466 (2)		
75N0029	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-454	G100958166-100-454 (2)		
75N0002	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-452	G100958166-100-452 (2)		
75N0030	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-443	G100958166-100-443 (2)		
75N0003	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-435	G100958166-100-435 (2)		
75N0085	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-470	G100958166-100-470 (2)		
75N0015	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-468	G100958166-100-468 (2)		
75N0086	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-447	G100958166-100-447 (2)		
75N0016	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-450	G100958166-100-450 (2)		
75N0087	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-445	G100958166-100-445 (2)		
75N0017	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-437	G100958166-100-437 (2)		
75N0088	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-442	G100958166-100-442 (2)		
75N0089	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-444	G100958166-100-444 (2)		
75N0090	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-440	G100958166-100-440 (2)		
75N0091	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-438	G100958166-100-438 (2)		
75N0092	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-424	G100958166-100-424 (2)		
75N0093	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-559	G100958166-100-559 (2)		
75N0094	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-544	G100958166-100-544 (2)		
75N0095	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-511	G100958166-100-511 (2)		
75N0096	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-509	G100958166-100-509 (2)		
75N0097	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-517	G100958166-100-517 (2)		
75N0098	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-527	G100958166-100-527 (2)		
75N0099	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-519	G100958166-100-519 (2)		
75N0100	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-548	G100958166-100-548 (2)		
75N0101	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-561	G100958166-100-561 (2)		
75N0102	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-546	G100958166-100-546 (2)		
75N0103	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-513	G100958166-100-513 (2)		
75N0104	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-507	G100958166-100-507 (2)		

75N0105	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-515	G100958166-100-515 (2)		
75N0106	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-523	G100958166-100-523 (2)		
75N0107	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	K TC	Condensate HB	G100958166-100-529	G100958166-100-529 (2)
75N0108	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-521	G100958166-100-521 (2)		
75N0046	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-529	G100958166-100-529 (2)		
75N0047	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-541	G100958166-100-541 (2)		
75N0048	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-524	G100958166-100-524 (2)		
75N0049	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-528	G100958166-100-528 (2)		
75N0050	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-539	G100958166-100-539 (2)		
75N0051	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-522	G100958166-100-522 (2)		
75N0052	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-526	G100958166-100-526 (2)		
75N0053	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-537	G100958166-100-537 (2)		
75N0054	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-520	G100958166-100-520 (2)		
75N0055	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-593	G100958166-100-593 (2)		
75N0056	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-585	G100958166-100-585 (2)		
75N0057	Summary	Comments	Detail1	Power	Compressor 1	Compressor 2	Indoor TC	Outdoor TC	G100958166-100-583	G100958166-100-583 (2)		
30T0002	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-11	G100958166-100-11 (2)			
30T0024	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-13	G100958166-100-13 (2)			
30T0025	Summary	Comments	G100958166-100-17	G100958166-100-17 (2)								
30T0026	Summary	Comments	G100958166-100-18	G100958166-100-18 (2)								
30T0027	Summary	Comments	G100958166-100-19	G100958166-100-19 (2)								
30T0010	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-108	G100958166-100-108 (2)				
30T0011	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-112	G100958166-100-112 (2)				
30T0012	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-123	G100958166-100-123 (2)				
30T0013	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-96	G100958166-100-96 (2)				
30T0014	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-127	G100958166-100-127 (2)				
30T0028	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-104	G100958166-100-104 (2)				
30T0029	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-115	G100958166-100-115 (2)				
30T0030	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-119	G100958166-100-119 (2)				
30T0031	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-100	G100958166-100-100 (2)				

30T0032	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-131	G100958166-100-131 (2)				
30T0015	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-61	G100958166-100-61 (2)			
30T0016	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-66	G100958166-100-66 (2)			
30T0017	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-80	G100958166-100-80 (2)			
30T0001	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-48	G100958166-100-48 (2)			
30T0003	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-44	G100958166-100-44 (2)			
30T0018	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-84	G100958166-100-84 (2)			
30T0019	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-57	G100958166-100-57 (2)			
30T0020	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-70	G100958166-100-70 (2)			
30T0021	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-76	G100958166-100-76 (2)			
30T0022	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-53	G100958166-100-53 (2)			
30T0023	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-88	G100958166-100-88 (2)			
30T0033	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-151	G100958166-100-151 (2)			
30T0006	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-149	G100958166-100-149 (2)			
30T0034	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-153	G100958166-100-153 (2)			
30T0035	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-155	G100958166-100-155 (2)			
30T0036	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-159	G100958166-100-159 (2)			
30T0037	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-157	G100958166-100-157 (2)			
30T0038	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-161	G100958166-100-161 (2)			
30T0007	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-163	G100958166-100-163 (2)			
30T0008	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-147	G100958166-100-147 (2)			
30T0039	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-143	G100958166-100-143 (2)			
30T0040	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-141	G100958166-100-141 (2)			
30T0041	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-137	G100958166-100-137 (2)			
30T0042	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-139	G100958166-100-139 (2)			
30T0043	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-135	G100958166-100-135 (2)			
30T0009	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-133	G100958166-100-133 (2)			
30T0004	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-9	G100958166-100-9 (2)			
30T0005	Summary	Comments	Detail1	Power	Compressor 1	Outdoor TC	G100958166-100-3	G100958166-100-3 (2)				
30N0001	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-425	G100958166-100-425 (2)				

30N0002	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-431	G100958166-100-431 (2)				
30N0003	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-449	G100958166-100-449 (2)				
30N0004	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-406	G100958166-100-406 (2)				
30N0005	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-453	G100958166-100-453 (2)				
30N0006	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-357	G100958166-100-357 (2)			
30N0007	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-361	G100958166-100-361 (2)			
30N0008	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-374	G100958166-100-374 (2)			
30N0009	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-344	G100958166-100-344 (2)			
30N0010	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-339	G100958166-100-339 (2)			
30N0011	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-379	G100958166-100-379 (2)			
30N0012	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-13	G100958166-100-13 (2)			
30N0013	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-17	G100958166-100-17 (2)			
30N0014	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-19	G100958166-100-19 (2)			
30N0015	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-21	G100958166-100-21 (2)			
30N0016	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-578	G100958166-100-578 (2)			
30N0017	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-567	G100958166-100-567 (2)			
30N0018	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-583	G100958166-100-583 (2)			
30N0019	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-599	G100958166-100-599 (2)			
30N0020	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-557	G100958166-100-557 (2)			
30N0021	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-421	G100958166-100-421 (2)				
30N0022	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-438	G100958166-100-438 (2)				
30N0023	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-445	G100958166-100-445 (2)				
30N0024	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-412	G100958166-100-412 (2)				
30N0025	Summary	Comments	Detail1	Power	Indoor TC	Outdoor TC	G100958166-100-457	G100958166-100-457 (2)				
30N0026	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-353	G100958166-100-353 (2)			
30N0027	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-365	G100958166-100-365 (2)			
30N0028	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-369	G100958166-100-369 (2)			
30N0029	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-349	G100958166-100-349 (2)			
30N0030	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-385	G100958166-100-385 (2)			
30N0031	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-15	G100958166-100-15 (2)			

30N0032	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-4	G100958166-100-4 (2)			
30N0033	Summary	Comments	G100958166-100-25	G100958166-100-25 (2)								
30N0034	Summary	Comments	G100958166-100-26	G100958166-100-26 (2)								
30N0035	Summary	Comments	G100958166-100-27	G100958166-100-27 (2)								
30N0036	Summary	Comments	G100958166-100-28	G100958166-100-28 (2)								
30N0037	Summary	Comments	G100958166-100-29	G100958166-100-29 (2)								
30N0038	Summary	Comments	G100958166-100-30	G100958166-100-30 (2)								
30N0039	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-580	G100958166-100-580 (2)			
30N0040	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-574	G100958166-100-574 (2)			
30N0041	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-576	G100958166-100-576 (2)			
30N0042	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-572	G100958166-100-572 (2)			
30N0043	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-569	G100958166-100-569 (2)			
30N0044	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-563	G100958166-100-563 (2)			
30N0045	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-581	G100958166-100-581 (2)			
30N0046	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-588	G100958166-100-588 (2)			
30N0047	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-585	G100958166-100-585 (2)			
30N0048	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-590	G100958166-100-590 (2)			
30N0049	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-597	G100958166-100-597 (2)			
30N0050	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-603	G100958166-100-603 (2)			
30N0051	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-561	G100958166-100-561 (2)			
30N0052	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-34	G100958166-100-34 (2)			
30N0053	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-109	G100958166-100-109 (2)			
30N0054	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-111	G100958166-100-111 (2)			
30N0055	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-113	G100958166-100-113 (2)			
30N0056	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-117	G100958166-100-117 (2)			
30N0057	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-115	G100958166-100-115 (2)			
30N0058	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-209	G100958166-100-209 (2)			
30N0059	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-212	G100958166-100-212 (2)			
30N0060	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-226	G100958166-100-226 (2)			
30N0061	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-228	G100958166-100-228 (2)			

30N0062	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-233	G100958166-100-233 (2)		
30N0063	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-230	G100958166-100-230 (2)		
30N0064	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-224	G100958166-100-224 (2)		
30N0065	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-219	G100958166-100-219 (2)		
30N0066	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-222	G100958166-100-222 (2)		
30N0067	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-216	G100958166-100-216 (2)		
30N0068	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-36	G100958166-100-36 (2)		
30N0069	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-28	G100958166-100-28 (2)		
30N0070	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-26	G100958166-100-26 (2)		
30N0076	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-177	G100958166-100-177 (2)		
30N0077	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-173	G100958166-100-173 (2)		
30N0078	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-171	G100958166-100-171 (2)		
30N0079	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-169	G100958166-100-169 (2)		
30N0080	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-166	G100958166-100-166 (2)		
30N0081	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-175	G100958166-100-175 (2)		
30N0082	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-162	G100958166-100-162 (2)		
30N0083	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-159	G100958166-100-159 (2)		
30N0086	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-206	G100958166-100-206 (2)		
30N0087	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-201	G100958166-100-201 (2)		
30N0088	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-198	G100958166-100-198 (2)		
30N0089	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-195	G100958166-100-195 (2)		
30N0090	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-192	G100958166-100-192 (2)		
30N0091	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-203	G100958166-100-203 (2)		
30N0092	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-189	G100958166-100-189 (2)		
30N0093	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-186	G100958166-100-186 (2)		
30N0094	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-184	G100958166-100-184 (2)		
30N0095	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-181	G100958166-100-181 (2)		
30N0096	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-121	G100958166-100-121 (2)		
30N0097	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-138	G100958166-100-138 (2)		
30N0098	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-143	G100958166-100-143 (2)		

30N0099	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-145	G100958166-100-145 (2)		
30N0100	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-133	G100958166-100-133 (2)		
30N0101	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-125	G100958166-100-125 (2)		
30N0102	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-147	G100958166-100-147 (2)		
30N0103	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-149	G100958166-100-149 (2)		
30N0104	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-151	G100958166-100-151 (2)		
30N0105	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-129	G100958166-100-129 (2)		
30N0106	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-66	G100958166-100-66 (2)		
30N0107	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-73	G100958166-100-73 (2)		
30N0108	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-76	G100958166-100-76 (2)		
30N0109	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-78	G100958166-100-78 (2)		
30N0110	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-69	G100958166-100-69 (2)		
30N0111	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-84	G100958166-100-84 (2)		
30N0112	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-88	G100958166-100-88 (2)		
30N0113	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-94	G100958166-100-94 (2)		
30N0114	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-96	G100958166-100-96 (2)		
30N0115	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-100	G100958166-100-100 (2)		
30N0116	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-90	G100958166-100-90 (2)		
30N0117	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-104	G100958166-100-104 (2)		
30N0118	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-40	G100958166-100-40 (2)		
30N0119	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-51	G100958166-100-51 (2)		
30N0120	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-53	G100958166-100-53 (2)		
30N0121	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-57	G100958166-100-57 (2)		
30N0122	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-46	G100958166-100-46 (2)		
30N0123	Summary	Comments	Detail1	Power	Compressor 1	Indoor TC	Outdoor TC	G100958166-100-63	G100958166-100-63 (2)		

Level 3 Characterization

The Level 3 characterization is presented in individual tables by RTU.

RTU 2

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0001	T2-TRN-100A-55-NE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0002	T2-MF17-115C1-115C2-90A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0003	T2-MF19-85C1-85C2-90A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0004	T2-TRN-100A-55-NE-SC	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0005	3T-75629575-NE3-Retest	A1:F12	A13:B14	A44:F44	A16:F43	A8:J28	A9:J53	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	A10:J19	A8:J52
75T0006	T2-MF1-100C1-100C2-90A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0007	T2-MF35-115C1-115C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0008	T2-MF37-85C1-85C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0009	T2-MFB2-100C1-100C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0010	T2-MFR10-85C1-85C2-90A-95-CC2F	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J55
75T0011	T2-MFR12-115C1-115C2-90A-95-CC2F	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0012	T2-MFR8-100C1-100C2-90A-95-CC2F	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0013	T2-TRN-100A-55-1E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0014	T2-TRN-100A-55-1F-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0015	T2-TRN-100A-55-2E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0016	T2-TRN-100A-55-2F-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0017	T2-TRN-100A-55-3E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0018	T2-TRN-100A-55-3F-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0019	T2-TRN-100A-55-CE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0020	T2-TRN-100A-55-OE-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0021	T2-TRN-95-1ER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0022	T2-TRN-95-1FER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0023	T2-TRN-95-2ER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0024	T2-TRN-95-2FER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0025	T2-TRN-95-3ER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J56
75T0026	T2-TRN-95-3FER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0027	T2-TRN-95-CE-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0028	T2-TRN-95-OER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J56
75T0029	T2-CBASE-3000-95-CE	A1:F12	A13:B14	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:54
75T0030	T2-MF0-100C1-100C2-100A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0031	T2-MF11-85C1-85C2-110A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0032	T2-MF13-115C1-115C2-100A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0033	T2-MF15-85C1-85C2-100A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0034	T2-MF2-100C1-100C2-63A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0035	T2-MF21-115C1-115C2-63A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0036	T2-MF24-85C1-85C2-63A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0037	T2-MF26-115C1-115C2-110A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0038	T2-MF29-85C1-85C2-110A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J55
75T0039	T2-MF31-115C1-115C2-100A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0040	T2-MF33-85C1-85C2-100A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0041	T2-MF38-100C1-100C2-63A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0042	T2-MF39-100C1-100C2-110A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0043	T2-MF4-85C1-85C2-63A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0044	T2-MF6-115C1-115C2-63A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0045	T2-MF7-100C1-100C2-110A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0046	T2-MF8-115C1-115C2-110A-95-CCE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0047	T2-MFB1-100C1-100C2-100A-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0048	3T-22A-Retest-OB	A1:F12	A13:B13	A44:F44	A16:F42	A8:J28	A9:J53	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	A10:J19	A8:J52
75T0049	3T-22A-Retest	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A9:J53	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	A10:J13	A8:J45
75T0050	T2-22A-ONE-6T-US	A1:F12	A13:B13	A43:F43	A15:F41	A8:J28	A9:J53	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	A10:J20	A8:J45
75T0051	T2-55-1ER-DMM	A1:F12	A13:B15	A39:F39	A17:F37	A8:J31	A9:J53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J37	A8:J55
75T0052	T2-55-2ER-DMM	A1:F12	A13:B15	A38:F38	A17:F37	A8:A23	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A9:J36	A8:J56
75T0053	T2-55-CE-DMM	A1:F12	A13:B15	A38:F38	A17:F36	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A10:J35	A8:J56
75T0054	T2-55-OER-DMM	A1:F12	A13:B15	A55:F55	A17:F54	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A9:J36	A8:J56
75T0055	T2-55-T1ER-DMM	A1:F12	A13:B15	A38:F38	A17:F37	A8:J23	A9:J53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:J34	A8:J57
75T0056	T2-55-TCE-DMM	A1:F12	A13:B15	A38:F38	A17:F37	A8:J31	A9:J53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:J34	A8:J57
75T0057	T2-TRN-63A-55-1E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0058	T2-TRN-63A-55-1F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0059	T2-TRN-63A-55-2E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0060	T2-TRN-63A-55-2F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0061	T2-TRN-63A-55-3E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0062	T2-TRN-63A-55-3F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J54

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0063	T2-TRN-63A-55-CE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0064	T2-TRN-63A-55-NE-DM-SC	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0065	T2-TRN-63A-55-NE-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0066	T2-TRN-63A-55-OE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J54
75T0067	T2-TRN-63A-55-RD-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0068	T2-TRN-63A-55-T1E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0069	T2-TRN-63A-55-T2E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0070	T2-TRN-63A-55-T3E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0071	T2-TRN-63A-55-TCE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J54
75T0072	T2-TRN-75A-55-1E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0073	T2-TRN-75A-55-1F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0074	T2-TRN-75A-55-2E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0075	T2-TRN-75A-55-2F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0076	T2-TRN-75A-55-3E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0077	T2-TRN-75A-55-3F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0078	T2-TRN-75A-55-CE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0079	T2-TRN-75A-55-NE-DM-SC	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0080	T2-TRN-75A-55-NE-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0081	T2-TRN-75A-55-OE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0082	T2-TRN-75A-55-RD-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0083	T2-TRN-88A-55-1ER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0084	T2-TRN-88A-55-1F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J54
75T0085	T2-TRN-88A-55-2E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0086	T2-TRN-88A-55-2F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J55
75T0087	T2-TRN-88A-55-3E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0088	T2-TRN-88A-55-3F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0089	T2-TRN-88A-55-CE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0090	T2-TRN-88A-55-NE-DM-SC	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0091	T2-TRN-88A-55-NE-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J55
75T0092	T2-TRN-88A-55-OE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0093	T2-TRN-88A-55-RD-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0094	T2-TRN-88A-55-T1ER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0095	T2-TRN-88A-55-T2E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0096	T2-TRN-88A-55-T3E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0097	T2-TRN-88A-55-TCE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0098	T2-TRN-100A-55-RD	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0099	T2-TRN-100A-55-T1E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0100	T2-TRN-100A-55-T2E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0101	T2-TRN-100A-55-T3E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0102	T2-TRN-100A-55-TCE-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J54
75T0103	T2-TRN-55-T1FER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J54
75T0104	T2-TRN-55-T2FER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J54
75T0105	T2-TRN-55-T3FER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J54
75T0106	T2-TRN-110A-55-1E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0107	T2-TRN-110A-55-1F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0108	T2-TRN-110A-55-2E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0109	T2-TRN-110A-55-2F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0110	T2-TRN-110A-55-3E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0111	T2-TRN-110A-55-3F-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0112	T2-TRN-110A-55-NE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0113	T2-TRN-110A-55-NE-DM-SC	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0114	T2-TRN-110A-55-OE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J54
75T0115	T2-TRN-110A-55-RD-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0116	T2-TRN-110A-55-T1E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0117	T2-TRN-110A-55-T2E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0118	T2-TRN-110A-55-T3E-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0119	T2-TRN-110A-55-TCE-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0120	T2-CAN-55-1ER-DM	A1:F12	A13:B14	A45:F45	A17:F44	A8:J28	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:J39	A8:J57
75T0121	T2-CAN-55-2ER-DM	A1:F12	A13:B14	A45:F45	A17:F44	A8:J28	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:J40	A8:J57
75T0122	T2-CAN-55-3ER-DM	A1:F12	A13:B15	A38:F38	A17:F37	A8:J28	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:J40	A8:J57
75T0123	T2-CAN-55-CE-DM	A1:F12	A13:B14	A38:F38	A17:F37	A8:J20	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:39	A8:J57
75T0124	T2-CAN-55-OER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J41	A8:J55
75T0125	T2-CAN-55-T1ER-DM	A1:F12	A13:B14	A38:F38	A17:F37	A8:J20	A9:J53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:J39	A8:J57
75T0126	T2-CAN-55-T2ER-DM	A1:F12	A13:B13	A38:F38	A17:F37	A8:J20	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:39	A8:J57
75T0127	T2-CAN-55-T3ER-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J41	A8:J53
75T0128	T2-CAN-55-TCE-DM	A1:F12	A13:B15	A38:F38	A17:F37	A8:J22	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A9:J34	A8:J57
75T0129	T2-CAN-55-TOER-DM	A1:F12	A13:B14	A45:F45	A17:F44	A8:J28	A9:J31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J41	A8:J54
75T0130	T2-TRN-95-T1ER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0131	T2-TRN-95-T1FER-DM	A1:F12	A13:B14	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J55
75T0132	T2-TRN-95-T2ER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0133	T2-TRN-95-T2FER-DM	A1:F12	A13:B14	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0134	T2-TRN-95-T3ER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0135	T2-TRN-95-T3FER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0136	T2-TRN-95-TCE-DM	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0137	T2-TRN-95-TOER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0138	T2-CAN-95-1ER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A9:J39	A8:J53
75T0139	T2-CAN-95-2ER-DM	A1:F12	A13:B13	A43:F43	A15:F41	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A9:J39	A9:J57
75T0140	T2-CAN-95-3ER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J40	A9:J57
75T0141	T2-CAN-95-CE-DM	A1:F12	A13:B13	A43:F43	A15:F41	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A9:J39	A8:J57
75T0142	T2-CAN-95-OER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A9:J57
75T0143	T2-CAN-95-T1ER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J53
75T0144	T2-CAN-95-T2ER-DM	A1:F12	A13:B14	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J40	A8:J53
75T0145	T2-CAN-95-T3ER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J53
75T0146	T2-CAN-95-TCE-DM	A1:F12	A13:B14	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J53
75T0147	T2-CAN-95-TOER-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J53
75T0148	T2-HS-1875-95-CF-C	A1:F12	A13:B13	A53:F53	A15:F51	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A10:J37	A8:J55
75T0149	T2-HS-2250-95-CF	A1:F12	A13:B15	A55:F55	A17:F53	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A10:J38	A8:J55
75T0150	T2-HS-2384-95-CF	A1:F12	A13:B15	A55:F55	A17:F53	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A10:J36	A8:J55
75T0151	T2-HS-2625-95-CF	A1:F12	A13:B15	A55:F55	A17:F53	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A9:J37	A8:J55
75T0152	T2-HS-3000-95-CF-C	A1:F12	A13:B14	A55:F55	A17:F53	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J56
75T0153	T2-HS-3200-95-CF-C	A1:F12	A13:B14	A55:F55	A17:F53	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0154	T2-1875-95-CF-C	A1:F12	A13:B14	A55:F55	A17:F53	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A9:J36	A8:J55
75T0155	T2-2250-95-CF	A1:F12	A13:B15	A55:F55	A17:F53	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A10:J38	A8:J56
75T0156	T2-2625-95-CF	A1:F12	A13:B15	A53:F53	A15:F51	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A9:J36	A8:J55
75T0157	T2-3000-95-CF	A1:F12	A13:B13	A53:F53	A15:F51	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A10:J38	A8:J55
75T0158	T2-3240-95-CF	A1:F12	A13:B13	A53:F53	A15:F51	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A10:J38	A8:J55
75T0159	3T-22AA-0	A1:F12	A13:B14	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J55
75T0160	3T-22B	A1:F12	A13:B13	A53:F53	A15:F51	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A9:J34	A8:J54
75T0161	3T-22C Cyclic #2	A1:F11	A12:B12	N/A	A14:F47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75T0162	3T-22C Cyclic #3	A1:F11	N/A	N/A	A13:F47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0163	3T-22C Cyclic #4	A1:F11	N/A	N/A	A13:F47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75T0164	3T-ONE	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A9:J47	N/A	A10:J13	N/A	A16:J16	N/A	A19:J27	N/A	A10:J13	N/A	A16:J16	N/A	A19:J26	A10:J21	A8:J39
75T0165	T2-ONE-3HP	A1:F12	A13:B13	A43:F43	A15:F41	A8:J28	A9:J53	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	A10:J13	A8:J45
75T0166	T2-ONE	A1:F12	A13:B13	A43:F43	A15:F41	A8:J28	A9:J53	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	A10:J20	A8:J52
75T0167	T2-R-3000-115-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0168	T2-R-3000-75-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0169	T2-R-3000-95-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0170	T2-RBASE-3000-115-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J56
75T0171	T2-RBASE-3000-75-CE	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J57
75T0172	T2-MFB3-100C1-100C2-90A-95-CE-3	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0173	T2-NC1-CK1-100C1-100C2-90A-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0174	T2-NC2-CK1-CK2-100C1-100C2-90A-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0175	T2-NC3-CK1-100C1-100C2-90A-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0176	T2-NC4-CK1-CK2-100C1-100C2-90A-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J55
75T0177	IEER Calculation 7.5 ton RTU2 6 turns	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75T0178	IEER Calculation 7.5 ton Trane RTU1 6 turns	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75T0179	IPLV Calculation 7.5 ton Trane RTU1 6 turns	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75T0180	Retest IPLV Calculation 7.5 ton Trane RTU2 6 turns	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75T0181	3T-75629575-E3-Retest	A1:F12	A13:B14	A44:F44	A16:F43	A8:J28	A9:J53	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	A10:J19	A8:J52

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0182	3T-75629575-E6-Retest	A1:F12	A13:B14	A44:F44	A16:F42	A8:J28	A9:J53	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	N/A	A10:J13	N/A	A16:J16	A19:J19	A22:J29	A10:J20	A8:J52
75T0183	3T-75629575-E6	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A9:J47	N/A	A10:J13	N/A	A16:J16	N/A	A19:J27	N/A	A10:J13	N/A	A16:J16	N/A	A19:J26	A10:J14	A8:J53
75T0186	T2-RC10-130C1-130C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0187	T2-RC11-140C1-140C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0188	T2-RC2-95C1-95C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0189	T2-RC3-90C1-90C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0190	T2-RC4-80C1-80C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0191	T2-RC5-70C1-70C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0192	T2-RC6-60C1-60C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0193	T2-RC7-105C1-105C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J57
75T0194	T2-RC8-110C1-110C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J57
75T0195	T2-RC9-120C1-120C2-90A-95-CE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0196	T2-RCB1-100C1-100C2-90A-95-CE-5	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0197	T2-MF45-100C1-100C2-90A-CB05-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0198	T2-MF46-100C1-100C2-90A-CB10-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0199	T2-MF47-100C1-100C2-90A-CB20-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J41	A8:J56
75T0200	T2-MF48-100C1-100C2-90A-CB30-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0201	T2-MF49-100C1-100C2-90A-CB40-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Condenser Outlet	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Compressor 2	Compressor 2 Discharge Information Range	Condenser Outlet	Compressor 2 Evaporator Inlet Information Range	Compressor 2 Evaporator Outlet Information Range	Compressor 2 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75T0202	T2-MF50-100C1-100C2-90A-CB50-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0203	T2-MF51-100C1-100C2-90A-CB60-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0204	T2-MF52-100C1-100C2-90A-CB70-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0205	T2-MF53-100C1-100C2-90A-CB80-CCE	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0206	T2-MFB3-100C1-100C2-90A-95-CE-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0207	T2-E-3000-95-CE-B30%	A1:F12	A13:B15	A45:F45	A17:F43	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A9:J36	A8:J55
75T0208	T2-E-3000-95-CE-B50%	A1:F12	A13:B15	A45:F45	A17:F43	A8:J31	A9:J53	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J46	A10:J38	A8:J56
75T0209	T2-TRN-75A-55-TCE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0210	T2-TRN-75A-55-T1E-DM	A1:F12	A13:B15	A45:F45	A17:F43	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0211	T2-TRN-75A-55-T2E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56
75T0212	T2-TRN-75A-55-T3E-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J43	A8:J57
75T0213	T2-TRN-110A-55-CE-DM-2	A1:F12	A13:B15	A45:F45	A17:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	N/A	A10:J13	A16:J19	A22:J25	A28:J31	A34:J43	A10:J42	A8:J56

RTU 3

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0001	3-52115CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0002	3-5282CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0003	3-5295CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0004	3-295	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J38
75N0005	Run 2-21A no optimized charge	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J14	A8:J38

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0006	Run 3-21A AHRI Out of the Box	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J38
75N0007	3-21A AHRI Verification H	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J38
75N0008	5-295 recalc	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0009	7-3A	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0010	7-5A	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0011	Run 3-20N95	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0012	3-42115CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0013	3-4282CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0014	3-4295CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0015	3-62115CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0016	3-6282CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0017	3-6295CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0018	1-OEH	A1:F12	A13:B13	A43:F43	A15:B41	A8:J31	A9:J47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J16	A8:J52
75N0019	3-2115	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0020	3-21151	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0021	3-21152	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0022	3-21153	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0023	3-2115OD	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0024	3-2951	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0025	3-2952	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0026	3-2953	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0027	3-295OD	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0028	3-521151CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0029	3-52821CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0030	3-52951CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0031	C8-CB30-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0033	C8-55-CE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0034	Run 1-1A Out of the Box Baseline	A1:F12	A13:B13	A49:F49	A15:B46	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J14	A8:J38
75N0035	Run 1-1B Out of the Box Baseline	A1:F12	A13:B13	A49:F49	A15:B46	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J14	A8:J38
75N0040	Run 1-1C-D Out of the Box Baseline Cycle #1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75N0041	Run 1-1C-D Out of the Box Baseline Cycle #2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75N0042	Run 1-1C-D Out of the Box Baseline Cycle #3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75N0043	Run 1-1C-D Out of the Box Baseline Cycle #4 (to be used with 3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75N0044	Run 1-2A Out of the Box Baseline	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J14	A8:J38
75N0045	Run 1-2B Out of the Box Baseline	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J14	A8:J38
75N0046	3-2000-115	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0047	3-2000-82	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A37:J39	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0048	3-2000-95	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0049	3-2500-115	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0050	3-2500-82	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0051	3-2500-95 Rerun	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0052	3-3000-115	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0053	3-3000-82	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0054	3-3000-95 Rerun	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0055	3-NC-2500-115	A1:F12	A13:B13	A53:F53	A15:B51	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0056	3-NC-2500-82	A1:F12	A13:B13	A53:F53	A15:B51	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0057	3-NC-2500-95	A1:F12	A13:B13	A53:F53	A15:B51	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	A38:J41	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	A37:J40	A10:J21	A8:J47
75N0058	IEER Calculation 7.5 ton	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75N0059	IPLV Calculation 7.5 ton	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75N0060	1-CEH	A1:F12	A13:B13	A43:F43	A15:B41	A8:J31	A9:J47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J16	A8:J52
75N0061	Run 3-20N115	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J44
75N0062	3-282	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0063	3-2821	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0064	3-2822	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0065	3-2823	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0066	3-282OD	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0067	1-1CH Retest	A1:F12	A13:B13	A49:F49	A15:B46	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J16	A8:J52
75N0068	1-1EH	A1:F12	A13:B13	A49:F49	A15:B46	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J16	A8:J52
75N0069	1-2CH Retest	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0070	2-1CH	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0071	2-1EH	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0072	2-2CH Retest	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0073	2-OEH	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0074	3-1CH Retest	A1:F12	A13:B13	A49:F49	A15:B46	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J16	A8:J52
75N0075	3-1EH	A1:F12	A13:B13	A49:F49	A15:B46	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J16	A8:J52
75N0076	3-2CH Retest	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0077	3-OEH	A1:F12	A13:B13	A43:F43	A15:B40	A8:J31	A9:J47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J16	A8:J52
75N0078	4-1CH Retest	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0079	4-1EH	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0080	4-2CH Retest	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0081	4-OEH 2nd	A1:F12	A13:B13	A43:F43	A15:B40	A8:J31	A9:J47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J16	A8:J52
75N0082	3-421151CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0083	3-42821CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0084	3-42951CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0085	3-621151CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0086	3-62821CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0087	3-62951CF	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J16	A8:J52
75N0088	5-2115 recalc	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0089	5-21151 recalc	A1:F12	A13:B13	A52:F52	A15:B51	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0090	5-282 recalc	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0091	5-2821 recalc	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0092	5-2951 recalc	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0093	7-3B	A1:F12	A13:B13	A52:F52	A15:B51	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0094	7-3F	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0095	7-4A	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0096	7-4B	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0097	7-4F	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0098	7-5B	A1:F12	A13:B13	A52:F52	A15:B51	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0099	7-5F	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0100	8-3A	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0101	8-3B	A1:F12	A13:B13	A52:F52	A15:B51	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0102	8-3F	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0103	8-4A	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0104	8-4B	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0105	8-4F	A1:F12	A13:B13	A52:F52	A15:B49	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J18	A8:J52
75N0106	8-5A	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0107	8-5B	A1:F12	A13:B13	A52:F52	A15:B51	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J27	A8:J52
75N0108	8-5F	A1:F12	A13:B13	A52:F52	A15:B50	A8:J31	A9:J47	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J35	N/A	A8:J12	A15:J18	N/A	N/A	A21:A24	A27:J34	N/A	A10:J20	A8:J52
75N0111	C8-CB10-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0112	C8-CB20-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0113	C8-CB30-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0114	C8-CB40-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0115	C8-CB5-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0116	C8-CB50-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0119	C8-CB10-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0120	C8-CB20-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0121	C8-CB30-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0122	C8-CB40-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0123	C8-CB5-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0124	C8-CB50-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0125	C8-CB60-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0126	C8-CB70-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0127	C8-CB80-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0131	C8-CB10-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0132	C8-CB20-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0133	C8-CB40-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0134	C8-CB5-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0135	C8-CB50-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0136	C8-CB60-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0137	C8-CB70-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0138	C8-CB80-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0140	C8-55-1FE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0141	C8-55-2FE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0142	C8-55-3FE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0143	C8-55-NE-CAB	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0145	C8-55-OE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0146	C8-55-T1FE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0147	C8-55-T2FE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0148	C8-55-T3FE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0149	C8-55-TCE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0150	C8-55-TOE3	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0155	C8-95-NE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0156	C8-95-1FE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0157	C8-95-2FE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0158	C8-95-3FE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0159	C8-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0160	C8-95-NE-CAB	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0161	C8-95-NE-DUCT	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0162	C8-95-OE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0163	C8-95-T1FE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0164	C8-95-T2FE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0165	C8-95-T2FE_calc	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75N0166	C8-95-T3FE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0167	C8-95-T3FE_calc	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0168	C8-95-TCE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0169	C8-95-TOE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0170	C8-R100-95-CE-1	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0171	C8-R100-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0172	C8-R100-E20C30-95CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0173	C8-R105-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0174	C8-R110-110C2-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0175	C8-R120-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0176	C8-R120-E0C30-95CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0177	C8-R120-E20C0-95CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0178	C8-R120-E20C30-95CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0179	C8-R130-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0180	C8-R140-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0181	C8-R60-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0182	C8-R70-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0183	C8-R80-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0184	C8-R80-E0C30-95CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0185	C8-R80-E20C0-95CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0186	C8-R80-E20C30-95CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0187	C8-R90-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0188	C8-R95-95-CE	A1:F12	A13:B15	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0189	C8-EB0-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46

Test ID	Test Name	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Compressor 1 Liq OD Bef Restric	Compressor 1 Liq OD Aft Restric	Compressor 1 Evaporator Inlet	Compressor 1 Compressor Suction	Compressor 1 Evaporator Outlet	Compressor 2	Compressor 2 Discharge Information Range	Compressor 2 Liq OD Bef Restric	Compressor 2 Liq OD Aft Restric	Compressor 2 Evaporator Inlet	Compressor 2 Compressor Suction	Compressor 2 Evaporator Outlet	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
75N0190	C8-EB10-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0191	C8-EB20-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0192	C8-EB35-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0193	C8-EB5-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0194	C8-EB50-115-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0195	C8-EB10-55-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0196	C8-EB20-55-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0197	C8-EB35-55-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0198	C8-EB5-55-CE-2	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0200	C8-EB50-55-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0201	C8-EB0-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0202	C8-EB10-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0203	C8-EB20-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0204	C8-EB35-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0205	C8-EB5-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0206	C8-EB50-82-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0207	C8-EB0-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0208	C8-EB10-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0209	C8-EB20-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0210	C8-EB35-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0211	C8-EB5-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46
75N0212	C8-EB50-95-CE	A1:F12	A13:B16	A46:F46	A18:F44	A8:J28	A9:J53	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	N/A	A10:J13	A16:J19	A22:A25	N/A	A28:J31	N/A	A9:J24	A9:J46

RTU 4

DNV GL ID	Workbook	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1 Discharge Information Range	Compressor 1 OD Liquid Information Range	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
30T0001	L-75629575-E3	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J12	A8:J52
30T0002	L-22A	A1:F12	A13:B13	A44:F44	A14:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J12	A8:J52
30T0003	L-75629575-NE3-SS	A1:F12	A13:B14	A45:F45	A15:F44	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J17	A8:J52
30T0004	L-ONE-5T	A1:F12	A13:B13	A44:F44	A14:F42	A8:J28	A9:J55	A10:J13	A16:J16	A19:J19	A22:J22	A25:J28	A10:J10	A8:J45
30T0005	L-ONE-SS	A1:F12	A13:B13	A44:F44	A14:F42	A8:J28	A10:J56	A10:J13	A16:J16	A19:J19	A22:J22	A25:J28	N/A	A8:J52
30T0006	L-95-3+10-C	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52
30T0007	L-95-3+40-C	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	N/A	A24:J27	A9:J9	A8:J52
30T0008	L-95-3-10-C	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52
30T0009	L-95-3-40-C	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J11	A8:J52
30T0010	L-55-1ER-DM	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J41	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0011	L-55-2ER-DM	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J41	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0012	L-55-3ER-DM	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J41	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0013	L-55-CE-DM	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J41	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0014	L-55-OER-DM	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J41	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0015	L-75629575-1E3	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J12	A8:J52
30T0016	L-75629575-2E3	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J12	A8:J52
30T0017	L-75629575-3E3	A1:F12	A13:B14	A46:F46	A16:F44	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A9:J9	A8:J52
30T0018	L-75629575-OE3	A1:F12	A13:B14	A46:F46	A16:F44	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A9:J9	A8:J52
30T0019	L-75629575-T1E3	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J12	A8:J52
30T0020	L-75629575-T2E3-1	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J12	A8:J52
30T0021	L-75629575-T3E3	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A9:J9	A8:J52
30T0022	L-75629575-TE3	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J12	A8:J52
30T0023	L-75629575-TOE3	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A9:J9	A8:J52
30T0024	L-22B	A1:F12	A13:B13	A44:F44	A14:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A10:J12	A8:J52
30T0025	L-22C-L22D Cyclic #2	A1:F11	N/A	N/A	A13:F48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

DNV GL ID	Workbook	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1 Discharge Information Range	Compressor 1 OD Liquid Information Range	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
30T0026	L-22C-L22D Cyclic #3	A1:F11	N/A	N/A	A13:F48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30T0027	L-22C-L22D Cyclic #4	A1:F11	N/A	N/A	A13:F48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30T0028	L-55-T1ER-DM	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J42	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0029	L-55-T2ER-DM	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J41	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0030	L-55-T3ER-DM	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J41	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0031	L-55-TCE-DM	A1:F12	A13:B15	A46:F46	A16:F44	A8:J28	A9:J41	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30T0032	L-55-TOER-DM	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A10:J30	N/A	N/A	N/A	N/A	N/A	A10:J11	A8:J52
30T0033	L-95-3+10-1	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52
30T0034	L-95-3+20-1	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A9:J9	A8:J52
30T0035	L-95-3+20-C	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A9:J9	A8:J52
30T0036	L-95-3+30-1	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	N/A	A24:J27	A9:J9	A8:J52
30T0037	L-95-3+30-C	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	A24:J24	A27:J30	A9:J9	A8:J52
30T0038	L-95-3+40-1	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A21:J21	N/A	A24:J27	A9:J9	A8:J52
30T0039	L-95-3-20-1	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52
30T0040	L-95-3-20-C	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52
30T0041	L-95-3-30-1	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52
30T0042	L-95-3-30-C	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52
30T0043	L-95-3-40-1	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52
30T0044	L-95-3-10-1	A1:F12	A13:B14	A45:F45	A15:F43	A8:J28	A9:J55	A10:J13	A16:J19	A22:J22	A25:J25	A28:J31	A10:J11	A8:J52

RTU 5

DNV GL ID	Workbook	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Before Filter Drier	Compressor 1 OD Liquid Information Range	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
30N0001	C-55-1ER-DM	A1:F12	A13:B13	A51:F51	A15:F49	A8:J28	A10:J40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30N0002	C-55-2ER-DM	A1:F12	A13:B14	A46:F46	A16:F44	A8:J28	A10:J26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A11:J11	A8:J52
30N0003	C-55-3ER-DM	A1:F12	A13:B14	A46:F46	A16:F44	A8:J28	A10:J26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A11:J11	A8:J52
30N0004	C-55-CE-DM	A1:F12	A13:B14	A46:F46	A16:F44	A8:J28	A11:J27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J19	A8:J52
30N0005	C-55-OER-DM	A1:F12	A13:B14	A46:F46	A16:F44	A8:J28	A9:J24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A11:J11	A8:J52
30N0006	C-MF-75629575-1E3J	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J19	A8:J52
30N0007	C-MF-75629575-2E3J	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J19	A8:J52
30N0008	C-MF-75629575-3E3J	A1:F12	A13:B13	A51:F51	A15:F49	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A9:J16	A8:J52
30N0009	C-MF-75629575-E3J	A1:F12	A13:B15	A53:F53	A17:F51	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J52
30N0010	C-MF-75629575-NE3J	A1:F12	A13:B15	A53:F53	A16:F51	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J45
30N0011	C-MF-75629575-OE3J	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A9:J16	A8:J52
30N0012	C-22A-ONE	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A10:J29	N/A	A10:J13	N/A	N/A	A16:J16	A19:J19	A22:J29	A10:J11	A8:J45
30N0013	C-ONE-5TA-OB	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A10:J29	N/A	A10:J13	N/A	N/A	A16:J16	A19:J19	A22:J29	A10:J11	A8:J45
30N0014	C-22A	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A10:J29	N/A	A10:J13	N/A	N/A	A16:J16	A19:J19	A22:J29	A10:J11	A8:J45
30N0015	C-22B	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A10:J29	N/A	A10:J13	N/A	N/A	A16:J16	A19:J19	A22:J29	A10:J11	A8:J45
30N0016	C-95-3+10-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51
30N0017	C-95-3+40-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A9:J9	A8:J52
30N0018	C-95-3-10-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51
30N0019	C-95-3-40-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J10	A8:J52
30N0020	C-95-3-FC-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J52
30N0021	C-55-T1ER-DM	A1:F12	A13:B15	A53:F53	A16:F51	A8:J28	A10:J40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J17	A8:J52
30N0022	C-55-T2ER-DM	A1:F12	A13:B15	A47:F47	A17:F45	A8:J28	A10:J26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A11:J11	A8:J52

DNV GL ID	Workbook	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Before Filter Drier	Compressor 1 OD Liquid Information Range	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
30N0023	C-55-T3ER-DM	A1:F12	A13:B15	A47:F47	A17:F45	A8:J28	A10:J26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A11:J11	A8:J52
30N0024	C-55-TCE-DM	A1:F12	A13:B14	A46:F46	A16:F44	A8:J28	A9:J24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A10:J19	A8:J52
30N0025	C-55-TOER-DM	A1:F12	A13:B15	A47:F47	A17:F45	A8:J28	A10:J25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A11:J11	A8:J52
30N0026	C-75629575-T1E3	A1:F12	A13:B15	A53:F53	A17:F51	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J52
30N0027	C-75629575-T2E3-1	A1:F12	A13:B14	A52:F52	A16:F51	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J19	A8:J52
30N0028	C-75629575-T3E3	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J19	A8:J52
30N0029	C-75629575-TE3	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J10	A8:J52
30N0030	C-75629575-TOE3	A1:F12	A13:B15	A53:F53	A17:F51	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J17	A8:J52
30N0031	C-ONE-OB	A1:F12	A13:F13	A44:F44	A15:F42	A8:J28	A10:J29	N/A	A10:J13	N/A	N/A	A16:J16	A19:J19	A22:J29	A10:J11	A8:J45
30N0032	C-ONE	A1:F12	A13:B14	A45:F45	A16:F43	A8:J28	A10:J29	N/A	A10:J13	N/A	N/A	A16:J16	A19:J19	A22:J29	A10:J11	A8:J45
30N0033	C-22C-D#2	A1:F11	A12:B12	N/A	A14:F49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30N0034	C-22C-D#3	A1:F11	A12:B12	N/A	A14:F49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30N0035	C-22C-D#4	A1:F11	A12:B12	N/A	A14:F49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30N0036	C-22C-D#5	A1:F11	A12:B12	N/A	A14:F49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30N0037	C-22C-D#6	A1:F11	A12:B12	N/A	A14:F49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30N0038	C-22C-D#7	A1:F11	A12:B12	N/A	A14:F49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30N0039	C-95-3+10-1	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51
30N0040	C-95-3+20-1	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51
30N0041	C-95-3+20-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51
30N0042	C-95-3+30-1	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A9:J9	A8:J51
30N0043	C-95-3+30-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A9:J9	A8:J52
30N0044	C-95-3+40-1	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J10	A8:J52
30N0045	C-95-3-10-1	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51

DNV GL ID	Workbook	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Before Filter Drier	Compressor 1 OD Liquid Information Range	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
30N0046	C-95-3-20-1	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51
30N0047	C-95-3-20-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51
30N0048	C-95-3-30-1	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A11:J11	A8:J51
30N0049	C-95-3-30-C	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A10:J10	A8:J52
30N0050	C-95-3-40-1	A1:F12	A13:B14	A52:F52	A16:F50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30N0051	C-95-3-FC-1	A1:F12	A13:B14	A52:F52	A16:F50	A8:J28	A10:J40	A8:J12	A15:J18	A21:J24	A27:J30	A33:J36	A39:J42	A45:J50	A9:J9	A8:J52
30N0052	C-55-CE	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J54
30N0053	C-EB10-55-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0054	C-EB20-55-CE	A1:F12	A13:B15	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0055	C-EB35-55-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0056	C-EB5-55-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0057	C-EB50-55-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J51
30N0058	C-R100-EB0-CB0-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0059	C-R100-EB20-CB30-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0060	C-R120-EB0-CB0-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0061	C-R120-EB0-CB30-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0062	C-R120-EB20-CB0-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0063	C-R120-EB20-CB30-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0064	C-R80-EB0-CB0-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0065	C-R80-EB0-CB30-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0066	C-R80-EB20-CB0-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0067	C-R80-EB20-CB30-95CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0069	C-55-NE	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J54
30N0070	C-55-NES	A1:F12	A13:B13	A44:F44	A15:F43	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J54

DNV GL ID	Workbook	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Before Filter Drier	Compressor 1 OD Liquid Information Range	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
30N0076	C-CB0-115-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0077	C-CB10-115-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0078	C-CB20-115-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J20	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0079	C-CB30-115-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0080	C-CB40-115-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0081	C-CB5-115-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0082	C-CB50-115-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0083	C-CB60-115-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0086	C-CB0-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0087	C-CB10-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J20	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0088	C-CB20-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0089	C-CB30-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0090	C-CB40-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0091	C-CB5-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0092	C-CB50-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0093	C-CB60-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0094	C-CB70-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0095	C-CB80-82-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0096	C-CB0-95-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0097	C-CB10-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0098	C-CB20-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J12	A8:J45
30N0099	C-CB30-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0100	C-CB40-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0101	C-CB5-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0102	C-CB50-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45

DNV GL ID	Workbook	Summary Tab Test Information Range	Summary Tab Comment Range 1	Summary Tab Comment Range 2	Summary Tab Summ Stats Range	Detail1 Tab Information Range	Power Tab Information Range	Compressor 1	Compressor 1 Discharge Information Range	Before Filter Drier	Compressor 1 OD Liquid Information Range	Compressor 1 Evaporator Inlet Information Range	Compressor 1 Evaporator Outlet Information Range	Compressor 1 Compressor Suction Information Range	Indoor TC Tab Information Range	Outdoor TC Tab Information Range
30N0103	C-CB60-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0104	C-CB70-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0105	C-CB80-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0106	C-EB0-115-CE	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J54
30N0107	C-EB10-115-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A8:J45
30N0108	C-EB20-115-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0109	C-EB35-115-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0110	C-EB5-115-CE	A1:F12	A13:B13	A44:F44	A15:F42	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J54
30N0111	C-EB50-115-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0112	C-EB0-82-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0113	C-EB10-82-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0114	C-EB20-82-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0115	C-EB35-82-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J12	A8:J45
30N0116	C-EB5-82-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0117	C-EB50-82-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J12	A8:J45
30N0118	C-EB0-95-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0119	C-EB10-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0120	C-EB20-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0121	C-EB35-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45
30N0122	C-EB5-95-CE	A1:F12	A13:B16	A47:F47	A18:F45	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A9:J11	A9:J46
30N0123	C-EB50-95-CE	A1:F12	A13:B15	A46:F46	A17:F44	A8:J28	A10:J31	N/A	A10:J13	N/A	A16:J19	A22:J25	A28:J31	A34:J37	A10:J16	A8:J45

ABOUT DNV GL

Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping our customers make the world safer, smarter, and greener.

Draft HVAC5 Report Public Comments and DNV GL Responses

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0	IOU	This contradicts the draft cover letter that was reviewed by the IOUs. In that draft, the letter stated, "Nonetheless, the capacity and efficiency values from the laboratory findings should not be used directly to calculate energy savings or considered as inputs into building simulations models."	The purpose of the letter is to inform people that the direct results (unadjusted lab data) from the longer technical report should not be used in energy savings or building simulation models; only the adjusted values calculated from the methodology outlined in the Introduction should be used. The section has been clarified.
1	IOU	Will field measurement provide sufficient precision to provide reliable ex-post energy savings.	This study was commissioned as lab testing. Conclusions about field tests are out of scope
4	IOU	Are these representative of the conditions found for the population of RTUs in the various service territories?	Changed to: "A number of tests are conducted under in-situ conditions, that is, conditions that were found to be typical during CPUC HVAC evaluation field studies sampled from past IOU program populations." There is no large "non participant" sample available with all the detailed field measurements.
10	IOU	SCE - How did this testing account for pressure effects/balancing of the closed-air-loop test chambers themselves? Any chance for relief air to recirculate back into the outside air damper?	The recirculation and entrainment issues shown by Yuill and Hjortland are certainly relevant to the economizer testing performed. RMA and the lab technicians performed several iterative tests to control relief and return dampers and reach stable conditions. While outside of scope, studying the time series lab data for tests with suspected entrainment may be the best option to further research this issue.

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10	IOU	SCE - What was the threshold for what is considered a fault and what isn't? Triggering metrics need to be established to frame any diagnostics analysis, such as 10% penalty to cooling capacity or efficiency.	The threshold depends on the test that was used. For example, the manufacturer refrigerant charge suction temperature tolerances for the 7.5-ton non-TXV RTU 3 are +/- 5F, per section 4.1.3 of the RMA report. The pass/fail thresholds associated with each FDD protocol were used to determine if the unit passed the test. Note, the data in Appendix D can be used by researchers to investigate FDD strategies and set up their own thresholds based on specific capacity and/or efficiency deviations.
10	IOU	SCE - Be specific about what procedures are being referenced. Is it the T-24 reference appendices' RA3.2 Field Verification and Diagnostic Testing of Refrigerant Charge for Air Conditioners and Heat Pumps? The scope of this is only for residential systems. Also, the standard charge verification procedures that leverage the superheat/subcooling tables are supposed to be applied after airflow has been verified. For ex. you can't fairly subject data from a multiple charge/airflow fault to it without fixing the airflow first.	These are defined in footnote 72 of the RMA report, which is designed for a more technical audience. The Introduction is designed for a non-technical policy-making audience. California Energy Commission (CEC). 2008. Reference Appendices for the 2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings. CEC-400-2008-004-CMF. Appendix RA3 - Residential Field Verification and Diagnostic Test Protocols. RA3.2 Procedures for Determining Refrigerant Charge for Split System Space Cooling Systems Without a Charge Indicator Display. Effective January 1 2010. http://www.energy.ca.gov/2008publications/CEC-400-2008-004/CEC-400-2008-004-CMF.PDF The CEC method referenced in the report is the protocol described in RA 3.2. This method is also used by contractors to diagnose charge faults for small

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			commercial packaged systems. Most of the time the charge is checked without correcting the airflow.
11	IOU	SCE - Metrics for establishing optimal charge? How do you quantify “bottoming out”?	"Optimal charge" = maximum measured/observed efficiency. "Bottom out" - the data points in Figure 2 suggest curves that have a larger (worse) EIR at undercharge and a larger EIR at overcharge. The optimal charge (best) is at the bottom of the curve.
11	IOU	SDG&E - As described in the RMA report, "blockage" was achieved by placing a corrugated sheet of plastic of different sizes over the coil to reduce the air flow across the coil. While this reduces the heat transfer in the air stream, it doesn't account for the reduction due to fouling of the coils. Coil cleaning not only increases the heat transfer due to obstructed air flow, but also removes the fouling on the surface of the coils that tend to "insulate" the surfaces, preventing maximum heat transfer.	Secondary research indicates the reduction in coil conductance due to a "fouling factor" is << than the impact of the reduced air flow. We can dig up the reference to this research if needed
13	IOU	SDG&E - As described in the RMA report, "blockage" was achieved by placing a corrugated sheet of plastic of different sizes over the coil to reduce the air flow across the coil. While this reduces the heat transfer in the air stream, it doesn't account for the reduction due to fouling of the coils. Coil cleaning not only increases the heat transfer due to obstructed air flow, but also removes the fouling on the surface of the coils that tend to "insulate" the surfaces, preventing maximum heat transfer.	Thank you for your comment.

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15	IOU	SCE - If the pipe you are measuring contains pure vapor or pure liquid, what drives a more/less optimal position? For example, the liquid line should have all subcooled liquid, and the suction line should have all superheated vapor.	The most likely driver is that the conditions are turbulent, not uniform, and the results suggest a gravity effect, thus the bottom is least representative and upper parts are more representative of the overall flow. When diagnosing faults, there may be mixed fluid situations. Externally, the potential drivers of more/less optimal position are the sensors themselves, how effectively they contact the line, the quality of the insulation, and whether the lines have non-circular skew.
16	IOU	SCE - How does this compare to/influence best practices/standards of QM implementers?	Evaluation measurements have the benefit of more time and resources available for instrumentation while the implementation has the issue of cost-effectiveness driving what can be done and collected in the field. It is difficult to recommend testing that would be more expensive than what the measures will save in energy and demand.
A-1	IOU	SCE - OD section configuration is not intuitive? Usually the fan draws air across the condenser, which wraps around the outdoor section, with two or three exposed faces, and the air is brought through the empty inner space and rejected through the top of the unit. I've never seen an RTU with the OD section configuration that is shown. Why are return load and space load different? The ID fan section chamber is usually pretty close to the OD section. Might be significant conduction/leakage of hot air that has already been brought through a condenser face.	This schematic matches the 2D Figure 8, which is intended as an "Air Conditioning 101" for a non-technical audience. The 3D cutaway in Figure 8 shows the OD section configuration the way you describe it; this 2D version simplifies the schematic and makes the discussion easier to follow for a non-technical audience without affecting the information we are trying to convey. The space load refers to the calculated heat gains - equipment, people, solar gain - while the return load accounts for things like

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			unintended leakage in the return plenum.
A-2	IOU	SCE - For small equipment covered under AHRI 210/240, federal test procedure specifically states you cannot do this.	Units are tested without economizers, so sealing the OA isn't a problem. Cabinet sealing may not be allowed, but in our case was necessary to get rid of the leaks into the unit. Intertek personnel stated sealing units was common practice.We conducted both standard AHRI testing (non-sealed) and non-standard testing (sealed) on all test units. When we study the fault tests, the cabinets were sealed to exclude the impact from leaking OA and study the performance of the unit under all kinds of fault conditions, such as blockage, under or over change, and dirty coils. The results will be used to correct unit performance. As expected, the addition of outside air into the unit created problems with determining appliance cooling capacities. The standard AHRI air-side capacity measurements no longer represented appliance (cooling coil) values. Instead, they equaled the net system capacity, that of the cooling coil less that associated with cooling load of the outside air entering the unit. This load was significant.

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A-2	IOU	SCE - What about conduction through the metal cabinet? Especially from the outdoor section air (already drawn through the condenser), which is right next to the indoor fan section.	Insulation reduces conduction losses. The condenser fan would likely draw cool air out of the indoor section rather than push hot air into a section that has a positive pressure. The indoor fan sections are thermally insulated from the compressor and outdoor air sections. We would primarily be concerned with air leakage into the indoor fan section since there is a good thermal barrier in all units. This may be a small factor since the early testing would likely have led to sealing the surfaces between sections when we looked to eliminate all leakage in the sealed tests.
B-4	IOU	SCE - Not much space in the RTU to allow mixing. It's possible the different airstreams are brought through different sections of the evaporator.	Revised as suggested: "A combination of warm return air and from the building and hot outdoor ventilation air are pulled into the cabinet, and while thermal stratification at the coil entrance is not well understood, this mixed air is then drawn across a cooling coil within the unit"
B-4	IOU	SCE – Unless you have dry coil conditions.	See the response to the previous comment.
B-6	IOU	SCE - So it's the total resistance seen by the RTU, caused by the return, supply duct system. The total seen by the fan, has to overcome both the duct system and the RTU internal resistance.	Revised the sentence for readability: "The total external static pressure is the total amount of resistance "seen" by the RTU and is equal to the difference between the supply static pressure and the return static pressure."

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B-6	IOU	SCE - It's "negative" because it's on the "negative side" of the fan, not because of the duct system. The fan creates a vacuum that draws in relatively higher atmospheric pressure air. The more duct restriction you have to overcome, the more "negative" pressure you need.	The definition has been changed to, "This is the static pressure measured at the return duct connection to the air conditioner. Note that return static pressure is generally a negative number relative to the fan because the fan is "pulling" air (creating a vacuum) from the return duct."
2	RMA	Page 2 discusses installation and realization rates from 2006-08 and 2010-12 impact evaluation findings There is no relationship between the laboratory test report and previous load impact studies thatwere not based on laboratory test data or reliable field measurements. Citing past load impact studies provides no useful information regarding the laboratory report or proper evaluation of current or future HVAC maintenance programs. Recommendation: Remove irrelevant discussions of previous impact evaluation findings from the HVAC5 Report.	Section 1 is intended only to provide the reader with background information. Part of the reason that funding exists for lab studies is the gaps in findings of previous load impact studies.
7	RMA	Table 4 on Page 7 provides an overview of diagnostic tests conducted. Airflow diagnostic tests were conducted on the 7.5-ton non-TXV RTU3 of pitot-tube array airflow measurements from 1 manufacturer (AC1) (see Table 118, page 196 of the RMA report). Recommendation: Revise table 4 to add "Airflow Measurement Instrument Tests."	Revision made as proposed.

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9	RMA	Section 2 This section contains misleading or incorrect information regarding the laboratory tests. Section 2.1 discusses "how to use the results" and adjust raw laboratory test data for use in simulation models. The discussion and examples provided in Section 2.1 is incorrect and misleading. The figures and text do not differentiate sensible efficiency and capacity from total efficiency and capacity. An example is provided in Figure 4 from the impact evaluation of the 2013-14 QM programs.1 This figure mistakenly reports "the relative change in efficiency against the relative increase in discharge pressure for units with condenser coil blockage." RMA provided previous comments to the CPUC to explain that this figure should show sensible efficiency versus discharge pressure increase due to condenser coil blockage (see RMA report Figure 41, page 153).2 The final HVAC3 report also did not revise Figure 11 (same as Figure 4) to indicate sensible efficiency on y-axis.	The figures are illustrative.

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9	RMA	Section 2.2 through 2.4 repeat virtually all key findings provided in the RMA laboratory report without reference to the source with the exception of misleading and incorrect information provided in Section 2.4. “On average, manufacturer-specific protocols do better than generic protocols, but are not as accurate as the weigh-in method.” The “weigh-in method” is not discussed in the RMA laboratory report since this is not a diagnostic method. The “weigh-in” method was only recommended for EM&V studies where master HVAC technicians properly recover refrigerant to a reclaim tank, weigh all recovered refrigerant in the reclaim tank, hoses, and recovery machine, evacuate the system to 500 microns Hg held at or below 1000 microns for at least 20 minutes, and weigh in the factory charge using new virgin refrigerant. No other recovery procedure was approved for use under the HVAC03 study. The HVAC03 study did not adhere to US EPA 608 requirements and did not perform proper weigh-out, evacuation or weigh-in procedures and the HVAC5 report indicates the “weigh-in” method is an accurate diagnostic method. All laboratory tests had the charge accurately weighed into each unit to verify the percent charge amount for each test. The RMA report provides tables of refrigerant charge test results where the overcharge tests provide improved sensible efficiency and capacity and improved superheat values compared to factory charge tests. Many of the overcharge tests were identified as notfaultedbased on “sensible cooling capacity performance” criteria discussed in section 2.2.1 of the RMA report. “Green highlighting indicates	The RMA laboratory report is cited in the CPUC letter. The Introduction does not suggest the weigh-in method should be used for diagnostics, it is simply comparing the accuracy of manufacturer-specific protocols to the more accurate weigh-in method.

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		capacity is greater than 105% of ACCA Manual N including ventilation loads and no less than 10% of non-faulted capacity. Yellow highlighting is used to indicate sensible capacity is between 100 and 105% of ACCA Manual N including ventilation loads and no less than 10% of non-faulted capacity. Red highlighting indicates sensible capacity is less than the ACCA Manual N including ventilation loads or less than 10% of non-faulted capacity."Overcharged tests identified as faulted based on red highlighting were often due to excess outdoor airflow at 115F Outdoor Air Temperature (OAT) and lower capacity would be expected at 115F OAT (Manual N doesn't apply to these tests). The RMA laboratory report should not be viewed as promoting one diagnostic method over the other. In fact, the RMA laboratory report provided the following key finding (see Abstract page iii) omitted from the HVAC Introduction and Data Dictionary Report. "The CEC temperature split protocol average accuracy was 90 +/- 2% based on 736 tests of faults causing low airflow or low capacity. The tested protocols were less reliable with combined faults of low airflow and evaporator coil blockage indicating the importance of checking and correcting dirty filters or coil blockage before checking refrigerant charge and airflow. For comparison, studies of medical diagnostics indicate general accuracy of 31% with 55% accuracy for easier cases and 5.8% for more difficult cases. Laboratory tests indicate manufacturer troubleshooting procedures would be effective if used in a systematic manner to diagnose faults such as: overventilation, low cooling/heating	

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		capacity, blocked condenser/evaporator, refrigerant restrictions, non-condensables, and refrigerant charge faults. Troubleshooting procedures and protocols are less effective at diagnosing low airflow from undercharge, and RC protocols alone cannot diagnose other faults they were not designed to diagnose.The RMA laboratory report found that refrigerant charge (RC) protocols are generally as accurate as medical diagnostics and the CEC temperature split (TS) protocol is much better. Evidence of this may be found in Table 31 for the 7.5-ton non-TXV (page 70), Table 65 for the 7/5-ton TXV (page 117), Table 82 3-ton non-TXV (page 148), and Table 99 for the 3-ton TXV (page 174) where 20 to 40% overcharge provided similar sensible cooling efficiencies for all units tested. Virtually all of the overcharge tests pass the CEC temperature split (TS) method which indicates whether or not a system has proper airflow and cooling capacity. The factory charge is not always the most efficient amount of refrigerant charge for an air conditioning system which should be charged based on superheat and subcooling with no other faults present. Viewing Fault Detection Diagnostics (FDD) only from the perspective of the refrigerant system can lead to hooking up refrigerant hoses to measure superheat or subcooling before performing less intrusive FDD such as checking economizers, relays, capacitors, contactors, and inspecting and cleaning condenser/evaporator coils, replacing air filters, and checking temperature split which provides a more reliable indication of whether or not the system has low capacity or low airflow. Improper attachment and detachment of refrigerant pressure hoses can cause contamination of the refrigerant system and loss of charge. Laboratory tests of	

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		attachment and detachment of refrigerant hoses without EPA low-loss fittings found 0.4 to 0.5% loss of factory charge and 0.2% reduced cooling capacity and sensible efficiency per attachment/detachment. Some fixed orifice units don't have proper superheat until they are overcharged by 20 to 40%, and the sensible capacity and efficiency often improves compared to factory charge. Many TXV units don't have liquid pressure valves so condenser saturation temperature cannot be accurately measured and subcooling cannot be accurately determined. Therefore, the laboratory report recommends performing less intrusive visual inspections of condenser/evaporator coils, filters, TXV sensing bulbs, filter driers, relays, capacitors, and contactors and accurate measurements of temperature split to correctly diagnose and repair 90% of maintenance faults.Recommendation: Revise or remove Section 2 since it provides recommendations from the RMA laboratory report without proper citations, omits key findings, and provides misleading or incorrect information.	

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16	RMA	Section 3 Determining Future Testing. This section provides the following recommendation. “The HVAC Laboratory Testing team recommends continued testing activities in future HVAC roadmaps. The data collected to date has already allowed for the following improvements: • The laboratory test activities described in this introduction have been a resource for understanding the impacts of refrigerant system faults on unit performance, and the ability of FDD protocols to correctly identify faults. • The test activities contributed to the impact evaluation of the refrigerant charge and coil cleaning components of the commercial maintenance programs and the refrigerant charge adjustment updates to the 2018 DEER. • The fan power and economizer airflow data from the test activities have been used to improve the specification of building prototypes used across all DEER measures. • Information on the efficacy of FDD protocols has informed the development of evaluation field test protocols. In addition, the release of the test results will provide the HVAC research community with a rich dataset for further investigations of the impact of HVAC system faults on unit performance and the development of new FDD and field test protocols.” This recommendation is incorrect. The laboratory test activities have not helped the CPUC improve impact evaluations. The laboratory test data has been misunderstood, misapplied or incorrectly reported by the CPUC contractor. Recommendation: Revise or remove Section 3 since the laboratory test activities have not	We are confident that the lab results have not been misrepresented and that the findings have been applied appropriately. The findings were used in the previous impact evaluation cycle.

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		helped the CPUC improve impact evaluations and have been misunderstood, misapplied or incorrectly reported by the CPUC contractor	

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A-1	RMA	Appendix A. Adjusting Findings for Simulations provides an incorrect interpretation of equations in the RMA laboratory report and incorrect adjustments for simulations Appendix A (Adjusting Findings for Simulations) provides equations to adjust “findings that can be used in building simulations, contained in the test data file (Appendix D).” Appendix A mistakenly reproduces equations from the RMA laboratory report used to calculate the mixed air temperature and economizer outdoor air fraction (OAF) and uses these equations to calculate incorrect EIR values. See RMA report equations 1 through 11 (page 48 through 9).The description of Equation 11 on page A-4 provides the following information. “The coil leaving enthalpy can be identified from standard HVAC tables if one knows the coil leaving humidity ratio and DB temperature. The leaving humidity ratio is the same as the supply (SIC should be entering) air humidity ratio. The leaving DB temperature can be found using Equation 11.”The leaving humidity ratio is only the same as entering air humidity if the compressor is not operating and the supply air is not being dehumidified. When the compressor is operating, the humidity ratio will be approximately 50 to 80% greater than the entering air humidity ratio and Equations 11 through 13 will not produce correct results for the EIR. The correct method to model economizer outdoor airflow is described in the DOE-2 Supplement.3 The System Input Function Example on page 1.27 describes how to model a drybulb economizer that sets the outside air fraction to minimum if the outside air temperature exceeds the return air temperature. For this example, the minimum outdoor airflow would be set to the baseline for an economizer with unintended outdoor airflow based	We replaced the sentence:"The leaving humidity ratio is the same as the supply air humidity ratio."with:"The humidity ratio of the air leaving cooling coil (L5 in Figure 6) is the same as the humidity ratio of the air supplied to the space (L6 in Figure 6)" This section is built on work done by the CPUC Ex Ante team, not equations in the RMA report.

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		on laboratory test data and the “measure” minimumoutdoor airflow would be set an optimal value based on laboratory test data. There is no need to adjust the EIR. The electric input ratio (EIR) for other faults can be adjust using regression equations describedin the RMA laboratory report for the following faults: condenser coil blockage, refrigerant charge faults, restrictions, or non-condensables.Recommendation: Revise or remove Appendix A from the report since it provides incorrect information about how to use the laboratory data to adjust simulation EIR values when simulation models already contain input instructions and routines to properly model economizer outdoor airflow.	

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A-1	RMA	Figure 5 (page A-1) also provides a "Schematic of air conditioner loads and power inputs." This figure shows the economizer hood attached upside down to the unit so rain and snow can enter as indicated by the red arrow labeled L1. Red arrow labeled L2 as "unwanted OA load" shows air entering the unit from the top which doesn't happen since the top of the return plenum is solid sheet metal with no cabinet gaps. Blue arrow labeled L5 shows "Leakage" leaving the supply fan where negative pressure would cause air to enter not leave the unit. The condenser coil on the right side of the figure shows the condenser coil in a horizontal position with louvered dampers and a hood on the right side below the condenser coil (condenser coils are positioned vertically and do not have louvered dampers.	This schematic is intended as an "Air Conditioning 101" for a non-technical audience. It is not drawn to scale and the location and size of certain elements may be exaggerated in order to best display the flows and labels.
B-1	RMA	Appendix B. HVAC Basics. Figure 8 shows the economizer hood upside down. Figures 9-11 and Figures 13-14 show the economizer hood upside down so rain or snow can enter. The figures also show a hood and dampers on the condenser with the condenser coil installed horizontally instead of vertically.	This schematic is intended as an "Air Conditioning 101" for a non-technical audience. It is not drawn to scale and the location and size of certain elements may be exaggerated in order to best display the flows and labels.
B-11	RMA	Interactions between air and refrigerant components on Page B-11 and B-12 are too simplified and the reasons given for "too cold" or "too hot" faults are incorrect or misleading. Maintenance fault definitions on pages B-12 and B-13 are incorrect or incomplete. Restriction or airflow fault definitions on B-13 are incorrect or incomplete.	Intended to be simplified for a non-technical audience.

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B-9	RMA	Figure 13 (page B-9) provides notes with incorrect information regarding how an air conditioning refrigeration system works. Figure 13 provides the following information in note 1 (left side of Figure 13)."In the evaporator coil, the refrigerant changes from liquid to gas, but stays about the same temperature. Heat from the air is transferred to the refrigerant to make the phase change." Instead Note 1 should provide the following information. “Inside the evaporator coil, the refrigerant changes from a mixture of vapor and liquid to saturated vapor at constant temperature and pressure as heat is added to the refrigerant, and as more heat is added the refrigerant changes to superheated vapor at a higher temperature and constant pressure referred to as the evaporator saturation pressure measured at the suction line valve. Heat from the air is transferred to the refrigerant making the air colder and superheating the refrigerant to ensure vapor enters the compressor.” With proper refrigerant charge, typical superheat values can range from 5 to 30F depending on evaporator entering air and outdoor air temperatures. Severe overcharging can cause superheat to be near zero and severe undercharging can cause superheat to be above 30F. Overcharging causes liquid refrigerant to enter the compressor which can cause compressor damage. Undercharging causes the evaporator saturation temperature to fall below freezing which can cause condensate to freeze and form ice on the coil which can reduce or entirely block airflow causing continuous compressor operation. Figure 13 provides the following information in note 2 (bottom of Figure 13)."In the	This schematic is intended as an "Air Conditioning 101" for a non-technical audience. It's purpose is to clearly and concisely communicate the basics of HVAC. While the wording suggested in the comment is more precise, we belive that it would detract from this purpose.

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		compressor, the pressure of the refrigerant is increased. It remains a gas." Note 2 should provide the following information. “Refrigerant entering the compressor is typically superheated refrigerant (but can be partially liquid if overcharged), and the compressor will increase both the pressure and temperature of the refrigerant.” The RMA laboratory report provides the following information from test T2-RCB1-100C1-100C2-90A-95-CE-5.xlsx. The Trane 7.5-ton 2-compressor test at 100% charge, 95F OAT, and closed economizer found the following test measurements. Compressor 1 entering (suction) conditions were 73.5 psig and 55.1 F and compressor 1 outlet conditions were 248.5 psig and 174.6F temperature. Compressor 2 entering (suction) conditions were 76.8 psig and 56.2 F and leaving conditions were 250.2 psig and 171.9 F.Figure 13 provides the following information in note 3 (right side of Figure 13). "In the condenser, the refrigerant changes from gas to liquid but stays about the same temperature." Note 3 should provide the following information. “In the condenser, the refrigerant cools from superheated vapor to saturated vapor where both temperature and pressure decrease. The refrigerant vapor further condenses intosaturated liquid at constant pressure referred to as the condenser saturation pressure measured at the liquid line valve (if available), and then the saturated liquid is further sub-cooled to a lower subcooling temperature below the saturated temperature at relatively constant pressure.” Typical subcooling ranges from 5 to 13F depending on refrigerant charge and indoor/outdoor conditions. Severe undercharging can cause low subcooling less than 3F and severe overcharging can cause high subcooling greater than 15F. Laboratory test measurements	

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		show how using only subcooling for FDD can cause, misdetections, misdiagnoses and false alarms. The RMA laboratory report provides the following information from test T2-RCB1-100C1-100C2-90A-95-CE-5.xlsx. The Trane 7.5-ton 2-compresor unit test at 100% charge, 95F OAT,and closed economizer dampers found the following test measurements. Compressor 1 condenser entering conditions were 248.5 psig and 174.6 F and outlet conditions were 220.9 psig and 107.2F. Compressor 2 condenser entering conditions were 250.2 psig and 171.9 F and leaving conditions were 232 psig and 101.4F. Figure 13 provides the following information in note 4 (top of Figure 13).“In the expansion valve, the pressure of the refrigerant decreases which decreases temperature, it remains a liquid." Note 4 should provide the following information. “The expansion device (either fixed-orifice, non-TXV, or thermostatic expansion valve, TXV) located at the entrance to the evaporator causes the liquid refrigerant to expand adiabatically to a lower pressure and temperature mixture of vapor and liquid.”Recommendation: Revise or remove Appendix B from the report due errors and misleading information.	
C-1	RMA	Appendix C has a significant amount of missing or incorrect information about the laboratory tests and is unnecessary. Recommendation: Revise or remove Appendix C which has a significant amount of missing or incorrect information about the laboratory tests and should be removed.	Appendix C is abstracted from the flat file attachment. Suggest deleting the air discharge configuration, since virtually all of the tests were in the horizontal configuration. It might be possible to go back and fill in some of the missing fan speed and pully diameter values based on the test description and adjacent test specifications.

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D-1	RMA	Appendix D has a significant amount of unnecessary data that has no value indicating a lack of understanding regarding how to use the HVAC laboratory test data. Recommendation: Revise or remove unnecessary data from Appendix D which has no value indicating a lack of understanding regarding how to use the HVAC laboratory test data.	Appendix D is seen as the an extremely important deliverable from this work. The data are transcribed directly from Intertek tests, and the methodology used to derive the calculated values is documented in the report.
E-1	RMA	Appendix E has a significant amount of unnecessary information and meaningless fields of data about the location of information in the Intertek spreadsheets. Recommendation: Revise or remove Appendix E which has a significant amount of unnecessary information and meaningless fields of data about the location of information in the test spreadsheets.	Appendix E documents the process used to develop Appendix D. As stated above, Appendix D is seen as an important deliverable from this work. The level of detail is appropriate for an Appendix.

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N/A	RMA	American Evaluation Association (AEA) Guidelines These comments show the HVAC5 Introduction and Data Dictionary report does not meet the requirements of the American Evaluation Association (AEA) guidelines regarding data-based systematic inquiry, competence, integrity, respect, and responsibility for general and public welfare. The California Evaluation Protocols recommend adherence to the following American Evaluation Association Guiding Principles. A) Systematic Inquiry: Evaluators conduct systematic, data-based inquiries about whatever is being evaluated. To ensure accuracy and credibility of the evaluative information they produce, evaluators should adhere to the highest technical standards appropriate to the methods they use. Evaluators should explore with the client the shortcomings and strengths both of the various evaluation questions and the various approaches that might be used for answering those questions. Evaluators should communicate their methods and approaches accurately and in sufficient detail to allow others to understand, interpret and critique their work. They should make clear the limitations of an evaluation and its results. Evaluators should discuss in a contextually appropriate way those values, assumptions, theories, methods, results, and analyses significantly affecting the interpretation of the evaluative findings. These statements apply to all aspects of the evaluation, from its initial conceptualization to the eventual use of findings. B. Competence: Evaluators provide competent performance to	This study was commissioned as lab testing. It was not intended as an evaluation and was not written to AEA guidelines.

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		stakeholders. Evaluators should possess (or ensure that the evaluation team possesses) the education, abilities, skills and experience appropriate to undertake the tasks proposed in the evaluation. Evaluators should practice within the limits of their professional training and competence, and should decline to conduct evaluations that fall substantially outside those limits. When declining the commission or request is not feasible or appropriate, evaluators should make clear any significant limitations on the evaluation that might result. Evaluators should make every effort to gain the competence directly or through the assistance of others who possess the required expertise. C. Integrity/Honesty: Evaluators ensure the honesty and integrity of the entire evaluation process. If evaluators determine certain procedures are likely to produce misleading evaluative conclusions, they have the responsibility to communicate their concerns and the reasons for them. If discussions with the client do not resolve these concerns, the evaluator should decline to conduct the evaluation. If declining the assignment is unfeasible or inappropriate, the evaluator should consult colleagues or relevant stakeholders about other proper ways to proceed. (Options might include discussions at a higher level, a dissenting cover letter or appendix, or refusal to sign the final document.) D. Respect for People: Evaluators respect the security, dignity, and self-worth of the respondents, program participants, clients, and other stakeholders with whom they interact. Evaluators should abide by current professional ethics, standards, and regulations regarding risks, harms, and burdens that might befall those participating in the evaluation. Knowing that evaluations may	

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		negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its results in a way that clearly respects the stakeholders' dignity and self-worth. E. Responsibilities for General and Public Welfare: Evaluators articulate and take into account the diversity of interests and values that may be related to the general and public welfare. Freedom of information is essential in a democracy. Evaluators should allow all relevant stakeholders access to evaluative information in forms that respect people and honor promises of confidentiality. Evaluators should actively disseminate information to stakeholders as resources allow. Communications that are tailored to a given stakeholder should include all results that may bear on interests of that stakeholder and refer to any other tailored communications to other stakeholders. In all cases, evaluators should strive to present results clearly and simply so that clients and other stakeholders can easily understand the evaluation process and results. Conclusion: CPUC-funded laboratory studies should adhere to the AEA guidelines for data-based systematic inquiry, competence, integrity, respect, and responsibility for all stakeholders. Future laboratory tests of HVAC systems should adhere to the CPUC California Evaluation Framework and AEA guidelines. RMA appreciates the opportunity to provide these comments and respectfully requests that the CPUC consider these comments to revise the HVAC5 Introduction and Data Dictionary report.	

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A-3	NCI	Appendix A fan heat equations:Most packaged units place the motor in the airstream. In this configuration ALL of the power input to the fan motor will ultimately dissipate as heat into the system components and building. Building simulation programs don't separately simulate the fan temperature rise and the heat dissipation into the system and building components, so you need to calculate the total fan heat. Recommend ASHRAE fundamentals 2013 P. 18.33: qf(Btu/h)=2545(Btu/h per hp)*Pmotorinput(hp). Since you have motor power in W you could use q(Btu/h)=3.412(Btu/h per watt)*Pmotorinput(watts).	It is agreed that the motor is placed in the airstream and all power heat will FINALLY be dissipated as heat into the system. However, most portion of the flow power will dissipate in air duct, at dampers or at the discharge. In the heat balance analysis, the boundary is at the discharge duct of the DX unit box. Supply air temperature and humidity were measured at the discharge of the unit. At this location, most of flow power has not been converted into heat. Therefore, it is reasonable to exclude flow power from fan DT calculation. This treatment makes all calculations consistent. In building simulation programs, for example eQUEST, fan heat rise (SUPPLY-DELTA-T) is defaulted to SUPPLY-KW/FLOW * 3090. The fan heat rise and duct temperature rise (DUCT-DT) are added to coil leaving temperature to calculate zone supply temperature. The boundary is at the discharge of the air duct to zone. Therefore, there is no contradiction here. The formula we used is: Fan heat DT = (Blower power in W-Flow power in W)*3.412/supply air mass flow in lb/0.24The formula assumes all the fan input power is turned into heat before the air leaves the unit. The amount of flow power to heat conversion along the distribution system is assumed to be zero. This is consistent with the methodology used in eQUEST. This is a reasonable assumption, since the heat due to fan and fan motor inefficiency >> flow power. We used the same equation as suggested by

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			the reviewer.