

# OPERATIONS MANUAL

## MECHANICAL TRANSPORT REFRIGERATION CERTIFICATION PROGRAM

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**AHRI TR 1110 OM – DECEMBER 2019**

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## **PREFACE**

The following manual outlines the procedures and policies of the Performance Certification Program for Mechanical Transport Refrigeration (TR) operated by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI). This manual is to be used in conjunction with the AHRI General Operations Manual for AHRI Certification Programs. Where the AHRI General Operations Manual and this product-specific manual differ, this product-specific operations manual shall prevail.

The revision of this manual supersedes all previous revisions. The current edition of this manual, as well as the AHRI General Operations Manual, can be accessed through the AHRI website, [www.ahrinet.org](http://www.ahrinet.org).

The TR Certification Program by AHRI provides for independent verification of the Mechanical Transport Refrigeration manufacturers' stated equipment performance. Safety criteria are not within the scope of this program.

Participation in the program is voluntary. Any manufacturer, regardless of AHRI membership, may obtain approval of Program Ratings and use of the AHRI TR Certification Mark hereinafter referred to as the "Mark". The Mark is the Participant's public representation that the ratings of randomly selected samples have been verified by an independent laboratory in accordance with test procedures prescribed by this operations manual. A Certification Agreement is executed between the manufacturer and AHRI specifying the conditions under which such Ratings and the Mark may be used. No manufacturer has the right to use Program Ratings or to state that their products have been tested in conformance with the procedures outlined in this Rating Procedure unless and until they have received written authority from AHRI to use the Mark as applied to the specific approved Program Ratings.

This Operations Manual has been prepared to assure that administration of the program is carried out in a uniform manner. It is an amplification of the Certification Agreement signed by licensees and AHRI. General information, procedural details, and copies of forms are included in this Operations Manual. Provisions of the Operations Manual may be amended as provided in the Certification Agreement.

This certification program complies with requirements of the ISO/IEC Standard 17065:2012, *General Requirements for Bodies Operating Product Certification Systems*.

### Note:

This manual supersedes Mechanical Transport Refrigeration Units Operations Manual, January 2018.

**CERTIFICATION OPERATIONS MANUAL FOR**  
**MECHANICAL TRANSPORT REFRIGERATION**

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## 1. Program Overview

1.1 Applicable Rating Standard. It is mandatory for program Participants to comply with the provisions of the latest edition of AHRI Standard 1110 (I-P), *Mechanical Transport Refrigeration Units* (Standard). A copy of the Standard is available for download from the AHRI website, [www.ahrinet.org](http://www.ahrinet.org).

1.2 Product Definitions.

1.2.1 Mechanical Transport Refrigeration Unit. A combination of one (1) or more of the following factory-made assemblies:

- A compressor, drive, and condenser combination;
- A single Forced-Circulation Air-Cooler;
- All necessary refrigerant lines and electrical wiring; and
- Means whereby the unit can be suitably mounted and installed on a vehicle which it is intended to serve.

Where such equipment is used in more than one (1) assembly, the individual assemblies are designed to be used together, and the requirements of rating outlined in the Standard are based on the use of matched assemblies.

1.2.2 Speed-Governed Transport Refrigeration Unit. A Mechanical Transport Refrigeration Unit whose drive is designed to operate at a governed (constant), although possibly multiple, speed.

1.2.3 Forced-Circulation Air-Cooler. A factory-made assembly including means for forcing air circulation, and components where heat is transferred from air to refrigerant. The purpose of this unit is to transfer heat from a refrigerated space, through the medium of air, to the refrigerant.

1.3 Program Scope. This program applies to Production Models of Mechanical Transport Refrigeration Units, as defined in Section 1.2.

1.3.1 Program Scope Exclusions. The Mechanical Transport Refrigeration Program shall not apply to:

- Individual assemblies, such as condensing units or air-coolers, for separate use;
- Complete system that is field assembled and charged with refrigerant at the point of installation;
- Transport air-conditioners (automotive, bus or rail);
- Sea-going containers; and
- Refrigerated tankers.

1.4 Intended Market. The Intended Market for this certification program includes all products defined in Section 1.3 that are sold for use in the U.S. (including U.S Territories) and Canada.

1.5 Basic Model Groups (BMGs). A Participant's listing shall be grouped by BMG. A BMG is a regular range of sizes of a similar type, design and construction, and having a common designation as catalogued. At a minimum, Mechanical Transport Refrigeration units shall be grouped into BMGs as follows:

- Self-contained trailer refrigeration units; and
- Self-contained truck refrigeration units.

## 2. Qualification Process

2.1 Original Equipment Manufacturer (OEM) Applicants. With the additions noted below, the OEM qualification process shall proceed according to the AHRI General Operations Manual, Section 4.

STEP 2.1.1 Certification Application Package. In addition to the Application for AHRI Certification, Annual Sales Volume Form, product-specific ratings and data, noted in the AHRI General Operations Manual, Section 4, STEP 4.1, Applicants shall submit the following documentation to AHRI:

- One test report for each BMG;
- If the Applicant chooses to conduct witness testing at its AHRI Approved Test Stand within a Facility (Facility), all required forms per Section 3.3.1 of this manual for Witness Testing Facility Approval shall also be submitted;

Electronic forms shall be obtained from AHRI (available on [www.ahrinet.org](http://www.ahrinet.org) under the Product-Specific Certification Program).

STEP 2.1.2 Processing Application Package.

STEP 2.1.2.1 Performance Certification Agreement for Original Equipment Manufacturer (OEM Agreement). No further action required beyond that listed in Section 4, STEP 4.2 of the AHRI General Operations Manual.

STEP 2.1.2.2 Participation and Licensing Fee Invoice. Payment of the Participation and Licensing Fee is due within 30 calendar days of the invoice issue date. Testing shall not be conducted until the invoice is paid in full. No further action required beyond that listed in Section 4, STEP 4.2 of the AHRI General Operations Manual.

STEP 2.1.3 Selection and Acquisition of Test Samples.

STEP 2.1.3.1 Number of Qualification Tests. 20% of an Applicant's BMGs shall be tested with a minimum of two (2) models. Fractional numbers shall be rounded up to the next whole number.

STEP 2.1.3.2 Acquisition of Qualification Test Samples/Selection Criteria. Within 90 calendar days of a request from AHRI, the Applicant shall have samples available for selection. Samples shall be acquired in accordance with Section 3 of this manual.

STEP 2.1.3.3 Facility Approval and Sample Selection. If the Applicant has not yet applied to conduct witness testing at its facility, the Independent Third-Party Laboratory contracted by AHRI (Laboratory) shall contact the Applicant to schedule a preliminary witness test facility inspection. Upon final approval of the Applicant's witness test facility and the approval of the Applicant's computerized rating method(s) and/or paper catalogs, the Laboratory shall contact the Applicant to schedule initial qualification testing. Section 3 further explains the requirements and procedures for applying and conducting witness testing.

Qualification testing may be scheduled simultaneously with facility inspection; however, should the facility fail inspection the testing shall be delayed until the facility is brought into compliance.

If the Applicant has not applied to conduct witness testing at its facility, the qualification process shall continue with the approval of the Applicant's Selection Rating Software and/or paper catalogs. Upon approval by AHRI, the Laboratory shall contact the Applicant to schedule initial qualification testing.

STEP 2.1.4 Qualification Testing. AHRI shall supply the Laboratory with the Published Ratings. The Laboratory shall conduct the testing of the samples in accordance with the Standard, against the Published Ratings.

STEP 2.1.4.1 Successful Completion of All Qualification Tests. If all qualification tests pass proceed to STEP 2.1.5.

STEP 2.1.4.2 First Sample Qualification Test Failure. Refer to Section 4, STEP 4.4.2 of the AHRI General Operations Manual for details regarding the first sample qualification failure options:

STEP 2.1.4.3 Second Sample Qualification Test Failure. Refer to Section 4, STEP 4.4.3 of the AHRI General Operations Manual for details regarding the second sample qualification failure options.

STEP 2.1.5 Welcome to the Program. No further action required beyond that listed in Section 4, STEP 4.5 of the AHRI General Operations Manual.

2.2 Private Brand Marketer (PBM) Applicants. With the additions noted below, the PBM qualification process shall proceed according to the AHRI General Operations Manual, Section 5.

PBM Applicants are not required to undergo qualification testing. PBM product certification is contingent upon the certification of the associated OEM product.

STEP 2.2.1 Certification Application Package. No further action required beyond that listed in Section 5, STEP 5.1 of the AHRI General Operations Manual.

STEP 2.2.2 Processing Application Package.

STEP 2.2.2.1 Performance Certification Agreement for Private Brand Marketer (PBM Agreement). No further action required beyond that listed in Section 5, STEP 5.2.1 of the AHRI General Operations Manual.

STEP 2.2.2.2 OEM Agreement on Behalf of the PBM Applicant. No further action required beyond that listed in Section 5, STEP 5.2.2 of the AHRI General Operations Manual.

STEP 2.2.2.3 Licensing Fee Invoice. Payment of the Licensing Fee is due within 30 calendar days of the invoice issue date.

STEP 2.2.3 Welcome to the Program. No further action required beyond that listed in Section 5, STEP 5.3 of the AHRI General Operations Manual.

### 3. Equipment Selection and Testing

3.1 Annual Testing Requirement. 20% of a Participant's BMGs shall be tested with a minimum of two (2) models. Fractional numbers shall be rounded up to the next whole number.

3.2 Location of Tests. Testing shall be performed at the Facility and the sample shall be installed in the test facility in accordance with the Participant's published installation instructions in printed or electronic format.

The Facility shall be approved by AHRI prior to any test being conducted. Testing shall continue to be conducted at the Participant's Facility, contingent upon it remaining AHRI-approved, or until the Participant notifies AHRI, in writing, of its desire to change facilities. All tests shall be witnessed by the Laboratory's Representative (Representative).

3.3 Witness Testing Procedures and Operations. This Certification Program allows witness testing; where Participant personnel, witnessed by the Representative, conducts testing at a Facility. Witness testing requirements are covered in the AHRI General Operations Manual, Section 9 and as specified below.

3.3.1 Application for Witness Testing. A Participant shall submit all of the following to AHRI:

- Form TR-WT1, Application for Witness Testing;
- Form TR-WT2, Personnel Experience Questionnaire;
- Form TR-WT3, Witness Testing Laboratory Inspection form;
- A complete list of all instruments and equipment being used to perform certification testing in accordance with applicable rating standard and a copy of each calibration report showing date of last calibration;
- A schematic drawing of the area of the test facility in which AHRI certification testing will be performed; and
- Photographs of the test facility in which AHRI certification testing will take place, which shall include sufficient views to show the location and connection of each instrument.

Electronic copies of these forms are available from AHRI.

3.3.1.1 Acknowledgement of Request. AHRI shall acknowledge receipt of the Participant's application to conduct witness testing. AHRI shall review the material and shall inform the Participant if additional information and/or changes are required for the Facility to meet the Standard.

3.3.2 Inspection of Witness Test Facility. Following preliminary facility approval based on submitted data, the Representative shall inspect the Facility to verify compliance to the data submitted and to the certification program. Testing may be scheduled simultaneously with facility inspection; however, should the facility fail inspection, the testing shall be delayed until the facility is brought into compliance. The Representative shall complete applicable portions of Form TR-WT3.

3.3.2.1 Non-Compliant Inspection Results. If the results of the inspection indicate that a Facility is non-compliant with the certification program all discrepancies shall be resolved and resubmitted to AHRI, before approval can be granted to proceed with certified rating tests.

3.3.2.2 Final Approval of Witness Test Facility. Upon acceptable results of the inspection, AHRI shall notify the Facility of final acceptance and approval to proceed with certified ratings tests. AHRI shall provide the Participant with a certificate of approval that shall be displayed in the Facility.

3.3.3 Scheduled Witness Test Facility Re-approval. The Facility shall remain approved for no more than two (2) years. At this time, re-approval shall be required, including submittal of the documents outlined in Section 3.3.1 and inspection outlined in Section 3.3.2. Upon re-approval by AHRI, the Facility shall receive a new certificate of approval to be displayed in the Facility.

3.3.4 Unscheduled Facility Re-approval. Any changes that may affect a Facility's ability to function per the certification program requirements, shall be required to be re-approved by the Laboratory personnel prior to conducting any witness testing. At this time, re-approval shall be required, including submittal of the documents outlined in Section 3.3.1 and inspection outlined in Section 3.3.2.

3.3.5 Witness Test Operations at a Facility.

3.3.5.1 Advance Set-Up of Sample in the AHRI-Approved Test Facility. A Participant may set up the test sample in the Facility prior to the arrival of the Representative. Prior to test commencement, the Representative shall verify that the sample is the model selected by AHRI for testing and that the sample has been set up in the Facility in accordance with the Participant's installation instructions and referenced method of test.

3.3.5.2 Duty Assignments of Representative. Sample testing, data acquisition, and generation of test data shall be performed by the Participant personnel and assisted and witnessed by the Representative. Participant or Facility personnel shall be on-hand to assist the Representative as requested and are permitted to be present but are not permitted to



tamper or adjust samples during tests, unless specifically approved by the Representative responsible for the test.

Verification of instrument application (in accordance with the procedures defined in the Standard) and verification of calibrations shall be performed by the Representative.

3.3.5.3 Use of Laboratory Instrumentation. The Representative shall use primary test instruments belonging to the Facility, in accordance with certification program requirements. The Laboratory shall provide secondary instrumentation to verify measured data. If the measurement(s) indicate that the Facility instrumentation accuracy may not be in accordance with the certification program requirements, the Representative shall consult AHRI and the issue shall be resolved prior to conducting the test.

3.3.5.4 Sample Start-Up and Operation. Start-up and operation of the sample shall be in accordance with the Participant's published installation and operation instructions in printed or electronic format.

3.4 Selection of Test Samples. AHRI shall make a Scheduled Production Model Selection based on data contained in the Directory. AHRI's test selections shall be sent out no later than July 1<sup>st</sup> to ensure that first sample testing is completed within the calendar year. Refer to Section 9 of the AHRI General Operations Manual.

3.5 Method of Acquiring Test Samples. Selected samples shall be accompanied by the Participant's published installation instructions in printed or electronic format or be available for Witness Testing at the Facility.

3.6 Sample Acquisition Timeframe. Upon notification of selections by AHRI, the Participant shall have 90 calendar days to deliver the samples to the Facility and conduct witness testing at the Facility. Extended transit times shall be approved by AHRI prior to selection. Prior to test, AHRI shall supply the Laboratory with the Published Ratings.

Upon notification of selections by AHRI, the Participant shall work with AHRI to determine mutually agreed upon test date which may require the Participant to accelerate product production.

3.7 Certified Data. In accordance with the Standard, the following certified ratings are verified by test

- High Temperature Cooling Capacity, Btu/h;
- Low Temperature Cooling Capacity, Btu/h;
- Electric Standby High Temperature Cooling Capacity, Btu/h; and
- Electric Standby Low Temperature Cooling Capacity, Btu/h.

3.8 Test Failures.

3.8.1 Options Following 1<sup>st</sup> Sample Failure. When the Participant is notified of a first sample certified rating failure, the Participant has seven (7) calendar days to select one of the following options:

- Re-rate all models within the failed sample's BMG proportionate to the failed test's results;
- Test second sample of the same model (sample shall be available within the timeframe and procedure allotted in Section 3.5 following notification of decision to AHRI via Manufacturer's Decision Form [MDF]); or
- Obsolete the model, which also obsoletes all models within the corresponding BMG.

3.8.2 Options Following 2<sup>nd</sup> Sample Failure. When the Participant is notified of a second-sample certified rating failure, the Participant has seven (7) calendar days to select one of the following options:

- Re-rate all models within the failed sample's BMG proportionate to the failed test's results; or
- Obsolete the model, which also obsoletes all models within the corresponding BMG.

#### 4. Challenge Tests

Refer to Section 10 of the AHRI General Operations Manual.

#### 5. AHRI Directory of Certified Product Performance

All certified products shall be listed in the Directory, [www.ahridirectory.org](http://www.ahridirectory.org). Certification shall not be implied nor claimed for any product not listed in the Directory. Except as noted below, the Participant shall follow the steps outlined in Section 11 of the AHRI General Operations Manual.

5.1 Publication of Ratings in Certified Directory. The following information pertaining to each model certified shall be published in the Directory:

- AHRI Certified Reference Number;
- Name of Manufacturer;
- Trade Name;
- Model Status;
- Model Number(s) or Designation(s);
- Type:
  - SP: single-package, all-electric. For SP models, the compressor speed is fixed during testing to the speed as listed in the directory. The compressor speed is therefore not measured during testing.
  - SP-D: single-package, diesel-engine driven
  - SP-E: single-package, electric-motor driven
  - SP-G: single-package, gasoline or gas-engine driven;
- Refrigerant Type;
- Standard Ratings;
  - High Temperature Refrigeration Capacity;
  - High Temperature Compressor Speed;
  - Low Temperature Refrigeration Capacity;
  - Low Temperature Compressor Speed;
- Electric Standby Ratings( If applicable);
  - High Temperature Refrigeration Capacity;
  - High Temperature Compressor Speed;
  - Low Temperature Refrigeration Capacity and
  - Low Temperature Compressor Speed.

5.1.1 Updating the Directory. AHRI shall ask the Participants to update their product data twice a year. AHRI shall publish the updated directory data by January and July of the program year.

5.2 Data Forms. Each Participant shall list its products by BMG. OEM and PBM Participants shall submit/edit product data via the Directory.

#### 6. Assessment and Payment of Certification Fees

Refer to Section 12 of the AHRI General Operations Manual.

#### 7. Issuance of Violations and/or Termination

Refer to Section 14 of the AHRI General Operations Manual.

#### 8. Program Hierarchy, Complaints, and the Appeals Process

Refer to Section 15 of the AHRI General Operations Manual.

**9. Proper Use of the AHRI Certification Mark and Claims to Certification**

Refer to Section 8 of the AHRI General Operations Manual.