Cancelled – 5345-41 (7/70)

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DATE: 4/24/70

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: SPECIFICATION FOR L-855, INDIVIDUAL LAMP, SERIES-TO-SERIES TYPE INSULATING TRANSFORMER FOR 5,000-VOLT SERIES CIRCUIT, 6.6/6.6 AMPERES, 65 WATTS

1. PURPOSE. This circular describes the subject specification and is published by the Federal Aviation Administration (FAA) for the guidance of the public.

2. REFERENCES. The following FAA specifications of the issue in effect on the date of application for qualification (see paragraph 8) apply to this circular. This circular will govern in case of conflict. Copies of the following FAA specifications may be obtained from the Department of Transportation, Distribution Unit, TAD-484.3, Washington, D.C. 20590:

   a. AC 150/5345-7, Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits.

   b. AC 150/5345-26, Specification for L-823 Plug and Receptacle Cable Connectors.

3. SCOPE. This equipment specification establishes the performance requirements for a complete rubber enclosed insulating transformer for use with 6.6-ampere series airport lighting circuits having nominal voltage rating up to 5,000 volts. The transformer is designed to be watertight and for direct burial in ground or installed in a base.

4. TYPES. Build the transformer in one size. Rate the primary at 6.6 amperes, 5,000 volts, 60 Hz, and the secondary at 6.6 amperes. Rate the transformer at 65 watts to permit the operation of a 65-watt, 6.6-ampere series lamp.

5. PERFORMANCE REQUIREMENTS.

a. Transformer Characteristics. Design the transformer to have characteristics within the limits specified in Figure I.

FIGURE I. TRANSFORMER CHARACTERISTICS

TRANSFORMER RATING	PRIMARY	PRIMARY POWER FACTOR	EFFICIENCY	SECONDARY	LOAD
Watts	Amperes	(Min.)	(Min.)	Amperes	
65	6.6	95%	80%	6.53 - 6.67	1.60 Ohms (65-Watt Lamp Plus Losses)
65	6.6	---	---	6.6 - 7.1	Short-Circuited

b. Temperature Rise. When operating a transformer at rated load or when short-circuited with rated current and frequency in the primary, do not exceed a temperature rise of 55 degrees Centigrade (131 degrees Fahrenheit) as determined by the resistance method.

c. Insulation. Insulate the transformer for operation from a 5,000-volt primary.

d. Continuous Outdoor Service. Construct the transformer for continuous outdoor service, i.e., buried directly in the ground, installed in an opened or sealed base, or submerged in water. Design the transformer for continuous outdoor service for an ambient temperature range from a minimum of -45 degrees (Fahrenheit) to a maximum of +120 degrees Fahrenheit at sea level.

e. Core and Coil. Completely insulate the windings from the core and from each other.

6. DETAIL REQUIREMENTS.

a. Housing.

(1) Completely enclose the core and coil assembly in the housing and seal the primary and secondary leads in the housing to produce a completely watertight unit. Design all exposed parts

of the transformer to withstand outdoor exposure, or direct burial in earth containing large concentrations of oil, acids, or alkalis.

(2) Use rubber, synthetic rubber, or rubber-like compound. Other synthetic compounds may be used for the housing, but they are subject to prior inspection and approval by the FAA, Airports Service, Washington, D. C. 20590.

(3) Make no portion of the housing less than 1/4-inch thick, and close all seams by permanent bond. Permanently bond the housing to the sheath of the primary and secondary leads. Keep internal air pockets or voids to a minimum, and make the housing assembly sufficiently rugged to withstand rough handling.

(4) The shape of the transformer housing may be optional, but keep the overall dimensions of the housing, excluding the leads, so that the finished product can fit easily inside a space defined as a cylinder having inside dimensions of seven inches in diameter by eight inches in height inside diameter.

(5) Mold the following information on the surface of the transformer case or attach a permanently marked nameplate to the transformer:

(a) Transformer, Series-to-Series, 6.6/6.6 Amperes, 60 Hz.

(b) Watts 65 Volts 5,000 .

(c) Manufacturer's Name and Trademark _____

(d) Manufacturer's Catalog Number _____

b. Transformer Leads.

(1) Equip each transformer with two single-conductor primary leads and one two-conductor secondary lead where mating connectors are attached to the supply cables for plugging directly into the transformer connectors described below.

(a) Equip one primary lead with a plug type connector conforming to Figure 6a of AC 150/5345-26 (Spec. L-823). Equip the other primary lead with a receptacle conforming to Figure 6b of AC 150/5345-26 (Spec. L-823). Use No. 8 AWG, 19 strand, single-conductor cable insulated for not less than 5,000 volts and conforming to AC 150/5345-7 (Spec. L-824), for the primary leads. Extend each primary lead 19 inches, $\pm$ 3 inches beyond the housing, including the connector.

(b) Equip the secondary lead with a receptacle conforming to Figure 1c of AC 150/5345-26 (Spec. L-823). Use No. 14 AWG, two-conductor, 600 volts, secondary cable conforming to Type SO cord for the secondary cable leads. Extend the secondary lead cable 42 inches beyond the housing, ± 3 inches, including the cable connector.

(2) Furnish an approved watertight cap or plug on each mating part of each plug or receptacle for protection during shipment and installation.

(3) Furnish the pigtail leads specified below when specific orders require extra pigtail leads, equipped with plug-in connectors, for field splicing to primary supply cable:

(a) A length of Specification L-824, Type B, No. 8 AWG, 5 KV cable with a mating plug, Figure 6a of Specification L-823, vulcanized at one end having an overall length of not less than 15 inches.

(b) A length of Specification L-824, Type B, No. 8 AWG, 5 KV cable with a mating receptacle, Figure 6b of Specification L-823, vulcanized at one end having an overall length of not less than 15 inches.

7. TESTING.

a. Qualification Testing. Each manufacturer is to submit sample transformers equipped with pigtail leads to an independent testing laboratory to be tested as follows:

(1) Performance Test. Test the performance of the transformer to determine conformance with the requirements specified in paragraphs 5a and 5b.

(2) Impact Test. Drop the transformer twice from a height of four feet upon a concrete surface, once so it will hit on the bottom of the case and once so it will hit on the side of the case. Conduct this test subsequent to the electrical characteristic tests for paragraph 5a. Following this test, subject the transformer to the electrical characteristic tests. Any failure or change of more than one percent in the results obtained in the electrical characteristic tests will be cause for rejection.

(3) Insulation Resistance Test. For this test, equip lead transformer with pigtail leads. Tape the joints where the connectors come together to prevent separation from handling.

(a) Subject the transformer to a continuous 20-cycle test. For each test cycle, operate the transformer for a minimum of five hours in air, at room temperature, with 6.6 amperes flowing in the primary and with the secondary open-circuited. Immediately immerse the transformer and its three connectors (with mating connectors installed) in tap water, at room temperature, and soak for not less than 12 hours.

(b) Measure the direct current insulation resistance immediately after immersion (before transformer cools off), then measure the resistance again after the soaking period. Measure the insulation resistance after the voltage shown in Figure 2 has been applied for one minute between each coil and ground, with the other coil grounded. Cause for rejection will be an insulation resistance less than the values shown in Figure 2. Any softening of the housing or any evidence of leakage or swelling of the housing will also be cause for rejection. Periodically check the zero and maximum readings of the test instrument by immersing the high voltage lead in water and by suspending it in the air.

FIGURE 2. INSULATION RESISTANCE

D.C. TESTS		MINIMUM INSULATION RESISTANCE IN MEGOHMS	
Coil	Voltage	Cold	Hot
Secondary (600V)	3,000	1,000	300
Primary (5,000V)	15,000	2,000	750

b. Production Testing. Manufacturers shall make the following tests on each transformer to determine conformance with these tests:

(1) Test each transformer for current ratio at rated frequency of current on the primary and rated load on the secondary. The secondary current of each transformer must conform to the limits specified in Figure 1.

(2) Subject each transformer to one complete cycle of the test specified in paragraph 7a(3). The transformer may be heated on a temperature known equal to or exceeding the temperature as specified in paragraph 7a(3).

c. Additional Inspection and Tests. Additional inspection and tests will be made as deemed necessary by the FAA, Airports Service, Washington, D. C. 20590, to determine compliance with this specification.

8. QUALIFICATION.

a. Furnish sample transformers to a disinterested independent testing laboratory acceptable to the FAA, Airports Service, to be tested as described in paragraph 7a, to obtain certification regarding the ability to manufacturer a transformer meeting the requirements of this specification. The manufacturer shall furnish two copies of the test report, with a letter of request for approval to the FAA, Airports Service, Washington, D.C. 20590, for review and approval consideration. The cost of testing shall be borne by the manufacturer offering the equipment for approval.

b. If the manufacturer has satisfactory laboratory facilities, the tests may be performed at the factory. These factory tests must be witnessed by a representative of the FAA, Airports Service. The manufacturer shall provide a written report of these tests.

c. In addition to the test performed by the independent testing laboratory or by the manufacturer, the manufacturer must furnish the following:

(1) Parts lists, installation instructions, and drawings to the FAA, Airports Service, Washington, D.C. 20590, for review and approval.

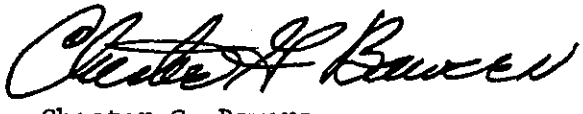
(2) A production model to the FAA, Airports Service, Washington, D.C. 20590, for physical inspection. Cost of submitting the production model shall be borne by the manufacturer.

d. Upon approval of the disinterested laboratory's or manufacturer's test reports and the additional data required in paragraph 8, which have shown satisfactory conformance to the specification requirements, the Airports Service will list the name of the manufacturer and a description of its transformer in AC 150/5345-1B, Approved Airport Lighting Equipment.

e. At any time after approval has been granted under the above conditions, a certified factory test report on the latest production model produced under this specification shall be made available by the manufacturer upon written request by the FAA, Airports Service, Washington, D.C. 20590.

f. Manufacturers shall not undertake a change of materials or manufacturing methods or revisions of catalog numbers of approved transformers without prior concurrence of the FAA, Airports Service.

9. HOW TO OBTAIN THIS CIRCULAR. Obtain additional copies of AC 150/5345-41, Specification for L-855, Individual Lamp, Series-to-Series Type Insulating Transformer for 5,000-Volt Series Circuit, 6.6/6.6 Amperes, 65 Watts, from the Department of Transportation, Distribution Unit, TAD-484.3, Washington, D.C. 20590.



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