



Number: CTSO-C2d

Date of approval: Jun 4, 2019

Approved by: Xu Chaoqun

China Civil Aviation Technical Standard Order

This China Civil Aviation Technical Standard Order (CTSO) is issued according to Part 37 of the China Civil Aviation Regulations (CCAR-37). Each CTSO is a criterion which the concerned aeronautical materials, parts or appliances used on civil aircraft must comply with when it is presented for airworthiness certification.

Airspeed Instruments

1. Purpose.

This China Civil Aviation Technical Standard Order (CTSO) is applied to manufacturers who apply for technical standard specification project approval (CTSOA) for airspeed instruments. This CTSO specifies the minimum performance criteria that must be met for the airspeed instruments to be approved and identified using the applicable CTSO marking

2. Applicability.

This CTSO applies to application submitted after its effective date. For equipment approved by CTSO, major design changes shall be reapplied for CTSOA in accordance with section 21.353 of CCAR-21R4.

3. Requirements

Airspeed instruments manufactured on or after the effective date of

this CTSO and intended to be identified with this CTSO mark shall meet the SAE AS 8019A (March 30, 1981) , as well as the supplements and amendments made in accordance with this CTSO.

a. The environmental identification shall be in accordance with the test conditions in RTCA/DO-160E “environmental conditions and test procedures for airborne equipment” and the standard environmental conditions and test procedures applicable to the equipment shall be proved that the performance of the equipment meets the requirements.

Note: In general, RTCA/DO-160D (including Change 1 and Change 2) or earlier versions are no longer applicable. If this version is used, it shall be certified in accordance with the deviation requirements in section 3.c of this CTSO.

b. Software identification

If software is contained in the equipment, the software shall be developed in accordance with RTCA/DO-178B “Software Considerations in Airborne Systems and Equipment Certification” (1992.12.1)”. The design assurance level of the software should be at least consistent with the failure status category.

c. Deviation

If an alternative or equivalent compliance method is used to meet the minimum performance standards set forth in this CTSO, the applicant must indicate that the equipment maintains an equivalent level of safety.

Applicants should apply for deviation in accordance with section 21.368 (1) of CCAR-21-R4.

4. Marking.

In addition to all the information specified in section 21.423 (b) of CCAR-21-R4, permanent and clear markings shall be provided for the main components. Including the following information:

a. Each individual component (antenna, receiver, transmitter, etc.) manufactured in accordance with this CTSO must be permanently and clearly marked, including at least the manufacturer's name and the CTSO standard number;

b. If software and/or onboard electronic hardware are contained in this part, the part number should include hardware and software identification, or a separate part number for hardware and software. In any way, it must be able to indicate the status of the change;

c. Software validation and verification level;

d. Type A, B or C (refer to SAE AS8019);

e. Rated input power (voltage and frequency) for type B and C instruments.

5. Applicant data information.

The applicant must submit technical documentation to the person responsible for reviewing the project to support design and production

approval. The submission includes a declaration of compliance to section 21.353 (1) in CCAR-21R4 and one copy each of the following technical data:

- a. Operation instructions;
- b. Equipment limitation;
- c. Installer and limitation;
- d. Installation schematic;
- e. Installation wiring diagram;
- f. Process specification;
- g. List of replaceable parts of the equipment (specify the part number);
- h. Environmental identification form specified in RTCA/DO-160E;
- i. Manufacturer's CTSO qualification test report;
- j. Nameplate drawings;
- k. If software is contained in the equipment, the documentation as specified in RTCA/DO-178B should be provided, including all materials that supporting the applicable objectives in RTCA/DO-178B Annex A, "Process Levels and Outputs at Software Levels".

6. Manufacturer data requirements.

Besides the data given directly to the authorities, the following technical data shall be prepared for review by the authorities:

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- a. A list of definition for drawings and processes for equipment design (including revisions);
 - b. A functional qualification specification used to identify each piece of equipment for compliance with the requirements of this CTSO;
 - c. Equipment calibration procedures;
 - d. Continuing airworthiness documentation (submitted within 12 months of the issuance of CTSOA);
 - e. Schematic diagram;
 - f. Wiring diagrams;
 - g. The appropriate documentation as defined in RTCA/DO-178A, or equivalent, necessary to support the verification and validation of the computer software to Level A, Level B, Level C, Level D and Level E. If the software needs to be verified for multiple levels, the highest level documentation needs to be submitted for review.
 - h. An environmental identification form described in RTCA Document DO-160E.

7. Data provided with equipment.

If one or more pieces of equipment manufactured in accordance with this CTSO are to be submitted to an institution (such as an operator or repair station), a copy of the information in sections 5.a to 5.k of this CTSO shall be provided with the equipment, together with the

information necessary for the proper installation, approval, use and continued airworthiness of the equipment.

8. Availability of Referenced Documents.

a. SAE documents can be ordered from the following address:

Society of Automotive Engineers, Inc.

400 Commonwealth Drive, WARRENDALE, PA 15096-001, USA

Copies can also be ordered through the website www.sae.org.

b. RTCA documents can be ordered from the following address:

Radio Technical Commission for Aeronautics, Inc.

1150 18th Street NW, Suite 910, Washington D.C. 20036

Copies can also be ordered through the website www.rtca.org.