



## DEUTSCH\* EEC-5X650 Electronic Enclosure System

### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) EEC-5X650 Electronic Enclosure System.

#### 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Test Requirements and Procedures Summary sections shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Successful qualification testing on the subject product line was completed in 2011. The Qualification Test Report number for this testing is [501-151062](#). These documents are on file at and available from Product Engineering, Industrial Commercial Transportation (ICT).

### 2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

#### 2.1. TE Connectivity (TE) Documents

- [109-1](#) General Requirements for Testing
- [114-151000](#) Application Specification for DEUTSCH Size 16 S&F Pin & Socket
- [114-151001](#) Application Specification for DEUTSCH Size 16 S&F Pin & Socket
- [114-151004](#) Application Specification for DEUTSCH Size 4-20 Solid Pin & Socket
- [408-151008](#) Instruction Guide DEUTSCH Extraction Tool DT-RT1
- [501-151062](#) Qualification Test Report for EEC-5X650
- Product Drawings

X refers to A, B, C, D keys

|                                   |   |
|-----------------------------------|---|
| <a href="#">DT13-12PA-R015</a>    | 12pin Receptacle, 90° Header, EEC Box, Sn |
| <a href="#">DT13-24PAB-R015</a>   | 24pin Receptacle, 90° Header, EEC Box, Sn |
| <a href="#">DT13-36PABC-R015</a>  | 36pin Receptacle, 90° Header, EEC Box, Sn |
| <a href="#">DT13-48PABCD-R015</a> | 48pin Receptacle, 90° Header, EEC Box, Sn |
| <a href="#">EEC-5X650A</a>        | Electronic Enclosure with Vent Hole       |
| <a href="#">EEC-5X650B</a>        | Electronic Enclosure without Vent Hole    |

#### 2.2. Industry Documents

- DIN 72551-6: Road Vehicles—Low-Tension Cables—Part 6: Single-Core, Unscreened with Thin Insulation Wall; Dimensions, Materials, Marking
- ISO 6722: Road Vehicles—60 V and 600 V Single-Core Cables—Dimensions, Test Methods, and Requirements
- SAE J1128: Low Voltage Primary Cable

### 3. REQUIREMENTS

#### 3.1. Design and Construction

Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

#### 3.2. Ratings

- Voltage: 250 VAC/VDC
- Current (Amp): See Figure 1

| Contact Size | Wire Size AWG [mm <sup>2</sup> ] | All Circuits Energized (A) |
|--------------|----------------------------------|----------------------------|
| 16           | 14 [2.00]                        | 13                         |
|              | 16 [1.50-1.00]                   |                            |
|              | 18 [0.80-0.75]                   | 10                         |
|              | 20 [0.50]                        | 7.5                        |

Figure 1

- Temperature: -55°C to +125°C
- Ingress Protection (Header): Not Tested.
- Ingress Protection (Enclosure): Not Tested.
- Flammability (Header): Not Tested. Parts are made with UL94 V-0 rated material.
- Flammability (Enclosure): Not Applicable. Part is made with UL94 V-0 rated material.

### 3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

#### **VISUAL**

##### 3.3.1. Examination of Product

- A. Procedure: Not Applicable
- B. Method: Visually inspected for use of materials, proper construction, correct part number and insert markings and over-all quality of workmanship. Poor molding fabrication, loose materials, damaged or improperly manufactured contacts, galling of metal parts, nicks and burrs of metal parts, torn seals or cracked plastic were considered adequate basis for rejection.
- C. Requirement: The connectors shall be correctly constructed, marked and shall show good quality and workmanship.

#### **ELECTRICAL**

##### 3.3.2. Insulation Resistance

- A. Procedure: MIL-STD-1344, Method 3003.1
- B. Method: Using a 500 VDC megohmmeter check each contact to all other contacts and the shell electrically connected together.
- C. Requirement: 1000 M $\Omega$  minimum

#### **MECHANICAL**

##### 3.3.3. Durability

- A. Procedure: Not Applicable
- B. Method: Connector shall be mated and unmated for a total of 100 complete cycles at room temperature.
- C. Requirement: No evidence of damage to the contacts, contact plating, connector housing or seals which may be detrimental to reliable connector performance.

##### 3.3.4. Impact

- A. Procedure: Not Applicable
- B. Method: Wired mated connector shall be dropped from a height of 4 feet on a cement floor. This action is to be completed a total of 5 times.
- C. Requirement: There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test. Small chips and dents that do not adversely affect the connector shall be disregarded.

#### **ENVIRONMENTAL**

##### 3.3.5. Temperature Life

- A. Procedure: MIL-STD-202, Method 108, Test Condition D
- B. Method: The wired and mated connectors shall be subject to 1000 hours at 125°C without current flowing.
- C. Requirement: There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test.

##### 3.3.6. Thermal Cycle

- A. Procedure: Not Applicable
- B. Method: Cycle mated connectors from -55°C to +125°C at a rate of 3°C per minute. Connectors to remain at each temperature extreme for 1 hour minimum. Mated connectors are to be cycled a total of 20 complete cycles.
- C. Requirement: There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test.

3.3.7. Water Immersion

- A. Procedure: Not Applicable
- B. Method: Mated connectors shall be placed in an oven at +125 for 2 hours minimum then immediately be placed in water with a 5% salt by weight content and 0.1 g/L wetting solution to a depth of 3 feet for 4 hours minimum. The free ends of the mated connectors must remain out of the water to prevent wicking of the water through the open wires. Water temperature to be +23°C.
- C. Requirement: Insulation resistance 1000 MΩ minimum

3.3.8. Pressure Leak

- A. Procedure: Not Applicable
- B. Method: The mated connector test samples shall be placed inside a sealed pressure chamber with a vent tube attached and the other end exiting the chamber and immersed in 21°C±5°C water. Apply a 1.4 psi dry compressed air source to the pressure chamber. Allow the pressure to stabilize for one minute before observing any bubbles.
- C. Requirement: Observe the water vessel for 5 minutes. No bubbles allowed.

**i** NOTE

a) All cavities wired with the minimum approved wire gauge per SAE J1128 suitable for the terminal size and with enough length to accommodate testing. Wire insulation shall be minimum diameter per SAE J1128 and shall be verified to be within the connector wire sealing range. Crimp characteristics (i.e. height, width, etc.) shall be checked prior to testing.

All unsealed cavities shall be secured with sealing plugs. To prevent capillary action on the sealed connector, all free wire ends and test points (i.e. millivolt test connection) shall be sealed with alcohol-based RTV silicone or equivalent and covered with heat shrink tubing.

b) Specimens shall be prepared in accordance with applicable production drawings and shall be selected at random from current production.

3.4. Product Qualification and Requalification Test Sequence

| TEST OR EXAMINATION    | TEST GROUP (a)    |       |
|------------------------|-------------------|-------|
|                        | 1                 | 2     |
|                        | TEST SEQUENCE (b) |       |
| Examination of Product | 1,7               | 1,8   |
| Insulation Resistance  | 3,6               |       |
| Durability             |                   | 5     |
| Impact                 |                   | 6     |
| Temperature Life       |                   |       |
| Thermal Cycle          | 4                 | 3     |
| Water Immersion        | 2,5               |       |
| Pressure Leak Test     |                   | 2,4,7 |

**i** NOTE

(a) Specimens shall be prepared in accordance with applicable Application Specification and shall be selected at random from current production.

- Groups 1 & 2, Specimens shall consist of 48 position connector and EEC box with DEUTSCH Solid Terminal System size 16 gold sockets with 16 AWG wire.

(b) Numbers indicate sequence in which tests are performed.

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#### 4. REVISION HISTORY

| Rev Ltr | Brief Description of Change | Date        | Dwn | Apvd |
|---------|-----------------------------|-------------|-----|------|
| A       | Initial Release             | 05-Jun-2020 | DM  | DM   |
|         |                             |             |     |      |