



DEUTSCH* DT16 Series Connector System

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) DT16 Series Connector System.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 2 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 2001. The Qualification Test Report number for this testing is [501-151080](#). 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
- [408-151008](#) Instruction Guide DEUTSCH Extraction Tool DT-RT1
- [501-151080](#) Qualification Test Report for DT16 Series
- Product Drawings

X refers to A, B, C, D keys

DT16-6S-B031	6pin Plug, Blind
DT16-6S-KP01	6pin Plug
DT16-6SX-KP01	6pin Plug, Keyed
DT16-15SX-K003	15pin Plug, Keyed
DT16-18SX-EK02	18pin Plug, Keyed
DT16-18SX-K004	18pin Plug, Keyed

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 ²]	All Circuits Energized (A)
16	12 [2.5]	13
	14 [2.0]	
	16 [1.5-1.0]	
	18 [0.8-0.75]	10
	20 [0.5]	7.5

Figure 1

- Temperature: -55°C to +125°C
- Ingress Protection (IP): Not tested.
- Flammability: Not tested. Plastic components are 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.

Test Description	Requirement	Procedure
Examination of Product	Free of defects that could affect the electrical or mechanical performance of the part or degrade the long term performance of the part.	Conduct a visual examination for identification of product, torn seals, cracked plastic, etc.
ELECTRICAL		
Insulation Resistance	≥ 1000 MΩ	Check each contact to all other contacts and the shell, if shell is conductive. Test to be performed using a 500 VDC megohmmeter.
Dielectric Withstanding Voltage	Current leakage not to exceed 2.0 mA.	Check each contact to all other contacts for 1 minute minimum. Test to be performed at 1500 VAC.
MECHANICAL		
Maintenance Aging	Perform	Subject 10% of the cavities to 10 complete cycles of inserting and removing its respective contact. This process to include any secondary locks and the recommended tools. The 10 cycles shall also include any disassembly required to remove the contacts.
Contact Retention	The terminal shall remain in place.	Using same cavities from Maintenance Aging subject them to a 25 lbf direct load for 15 seconds in a direction tending to pull the terminal from the rear of the connector. The pull is to be exerted on the conductor by means of a tension-testing machine.
Durability	No evidence of damage to the contacts, contact plating, connector housing or seals which may be detrimental to reliable connector performance.	Connector shall be mated and unmated for a total of 100 complete cycles at room temperature.
Tool Abuse	Inspect cavity for torn grommet, missing contact retention fingers or any other damage that may be detrimental to reliable connector performance.	Test up to 5 cavities from each sample shall be selected. The applicable removal tool shall be inserted into the connector and an axial load of 5 lbf applied. With the force applied, the tool shall be rotated 180° and then removed, also removing the terminal. Repeat 3 times on each cavity.

Figure 2 (Cont.)

Test Description	Requirement	Procedure																
Vibration	There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test.	Connectors under test shall be fixed to the vibrating plane with the wire harness fixed to non-vibrating objects no closer than 4 inches and not farther than 12 inches from the rear of the connector. <table border="1"> <thead> <tr> <th>Parameter</th> <th>Requirement</th> </tr> </thead> <tbody> <tr> <td>Sine Sweep</td> <td>10 to 2000 Hz</td> </tr> <tr> <td>Initial Displacement</td> <td>0.07 inch [1.78 mm] DA</td> </tr> <tr> <td>Maximum Acceleration</td> <td>20 G's</td> </tr> <tr> <td>Test Duration</td> <td>12 hours</td> </tr> <tr> <td>Time Per Axis X, Y, Z</td> <td>4 hours</td> </tr> <tr> <td>Test Current first 3 hours each axis</td> <td>None</td> </tr> <tr> <td>Monitor for Discontinuity last hour each axis</td> <td>Not tested</td> </tr> </tbody> </table>	Parameter	Requirement	Sine Sweep	10 to 2000 Hz	Initial Displacement	0.07 inch [1.78 mm] DA	Maximum Acceleration	20 G's	Test Duration	12 hours	Time Per Axis X, Y, Z	4 hours	Test Current first 3 hours each axis	None	Monitor for Discontinuity last hour each axis	Not tested
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Impact	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.	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.																
ENVIRONMENTAL																		
Temperature Life	There shall be no evidence of cracking, distortion, or detrimental damage.	The wired and mated connectors shall be subject to 1000 hours at 125°C without current flowing.																
Thermal Cycle	There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test.	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.																
Salt Spray	There should be no evidence of corrosion on the connector or terminals after the connector is removed from the test and cleaned with tap water.	Connector shall be fully mated, then submerged in a fine mist of 5% by weight of salt solution for 96 hour.																
Fluid Immersion	No evidence of cracking, chipping, or other damage detrimental to the normal operation of the connector.	One sample per fluid only. The wired mated connectors shall be submerged in the fluids below at the temperatures listed. Each connector shall be submerged for 5 minutes, then removed from the fluid to air dry for 24 hours. This cycle is to be completed a total of 5 cycles. <table border="1"> <thead> <tr> <th>Fluid</th> <th>Temperature</th> </tr> </thead> <tbody> <tr> <td>Motor Oil 30 weight</td> <td>+60</td> </tr> <tr> <td>Brake Fluid (disc type 1)</td> <td>+60</td> </tr> <tr> <td>Diesel Fuel #2</td> <td>+60</td> </tr> <tr> <td>Transmission Oil 90 weight</td> <td>+60</td> </tr> </tbody> </table>	Fluid	Temperature	Motor Oil 30 weight	+60	Brake Fluid (disc type 1)	+60	Diesel Fuel #2	+60	Transmission Oil 90 weight	+60						
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Figure 2 (Cont.)

Test Description	Requirement	Procedure
Water Immersion	Insulation resistance 1000 MΩ minimum	Mated connectors shall be placed in an oven at +125 for 2 hours minimum then immediately be placed in water with a 5% slat 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.

Figure 2 (End)

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	3	4	5	6
	TEST SEQUENCE (b)					
Examination of Product	1,10	1,10	1,10	1,10	1,9	1,9
Insulation Resistance	2	2	2	2		2
Dielectric Withstanding Voltage	3	3	3	3	2	3
Maintenance Aging	4		4			
Temperature Life		4		4		4
Contact Retention	5		5			
Durability		5	6		3	
Tool Abuse				5	4	
Salt Spray		6	7			5
Fluid Immersion	6	7	8	6	5	6
Thermal Cycle	7	8				7
Vibration	8			7	6	
Impact	9			8	7	
Water Immersion		9	9	9	8	8

i **NOTE**

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

- Groups 1-6, Specimens shall consist of 6 position connectors with DEUTSCH Solid Terminal System size 16 nickel sockets with 18 AWG wire.

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

3.5 Revision History

Rev Ltr	Brief Description of Change	Date	Dwn	Apvd
A	Initial Release	31-Dec-2019	DM	DM