



H3A TIC-LOQ metal Hood and Housing series

Table of contents

- 1. SCOPE2
 - 1.1. Content2
 - 1.2. Qualification2
- 2. APPLICABLE DOCUMENTS2
 - 2.1. TE Connectivity Documents2
 - 2.2. Other Documents2
- 3. REQUIREMENTS3
 - 3.1. Design and Construction3
 - 3.2. Materials3
 - 3.3. Rated3
 - 3.4. Performance and Test Description3
 - 3.5. Test Requirements and Procedures Summary3
 - 3.6. Test Sequence5
- 4. QUALITY ASSURANCE PROVISIONS6
 - 4.1. Qualification Testing6
 - 4.2. Requalification Testing6
 - 4.3. Acceptance6
 - 4.4. Quality Conformance Inspection6



1. SCOPE

1.1. Content

This specification covers the performance, tests and quality standards for TIC-LOQ housings and hoods for heavy duty connector series **H3A size 1**. The housings are for the insertion and protection of contact inserts of various series and sizes.

1.2. Qualification

When tests are performed, the following specified specifications and standards shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the case of a conflict between the requirements of this specification and the product drawing or of conflicts between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. TE Connectivity Documents

- A. Customer drawing and name
H3A TIC-LOQ metal Hood and Housing series

2.2. Other Documents

- EN 61984: Connectors - Safety requirements and tests
- EN 60068: Environmental testing
- EN 60512: Connectors for electronic equipment - Test and measurements
- EN 60529: Degrees of Protection Provided by Enclosures (IP Code)
- EN 60664-1: Insulation coordination for equipment within low-voltage systems (Part 1)
- EN 61373: Railway application - Rolling stock equipment - Shock and vibration test
- ISO 6988: Metallic and other non-organic coatings - Sulfur dioxide test with general condensation of moisture
- ISO 8092/2: Road Vehicles-Connections for on-board electrical wiring harnesses



3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Rated

- Operation Temperature -40°C ~+125°C
- Degree of Protection IP65

3.4. Performance and Test Description

Product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Paragraph 3.5. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EN 61984.

3.5. Test Requirements and Procedures Summary

| General | | | |
|---------|------------------------------------|---------------------------------------|---|
| No. | Test Items | Requirements | Condition according to |
| 3.5.1 | Visual and dimensional examination | Meets requirements of product drawing | Visual and dimensional examination IEC 60512-1-1/-2, Test 1a and 1b |

| Mechanical | | | |
|------------|-----------------------------------|---|---|
| 3.5.2 | Mechanical strength impact | No damage likely to impair function | Dropping height: - 750mm for specimens of mass ≤ 250g - 500mm for specimens of mass >250g Dropping cycles:8 positions in 45° step, one cycles per position IEC 60512-7-2 Test 7b |
| 3.5.3 | Mechanical Operation (Durability) | 1) 100 operation cycles 2) No damage likely to impair normal use | Shall operate to open /close the locking system by means of A) a device simulating normal use B) manual open/close 200 Max. cycle per hour |



Product Specification

108-137605
Apr 07th, 2022 Rev. A

| | | | |
|-------|-------------------|---|--|
| 3.5.4 | Vibration, Random | No damage likely to impair function No discontinuities greater than $t > 1\mu s$ | Frequency: 5~150Hz Per EN 61373, Category 1, Class B (IEC60068-2-6 Test Fc) |
| 3.5.5 | Shock | No damage likely to impair function No discontinuities greater than $t > 1\mu s$ | Acceleration: 50m/s ² Duration: 30ms Total 18 shocks (three positive and three negative in each of the three orthogonal axes) Per EN 61373 |

Environmental

| | | | |
|-------|-----------------|---|--|
| 3.5.6 | Cold | No damage likely to impair function | Subject mated specimen to -40°C Duration time: 16h, Test Ab Per IEC 60512-11-10 Test 11j (IEC 60068-2-1) |
| 3.5.7 | Dry Heat | No damage likely to impair function | Subject mated specimen to +125°C Duration time: 168h Test Bb Per IEC 60512-11-9 Test 11i (IEC 60068-2-2) |
| 3.5.8 | Salt Spray Test | No damage likely to impair function Follow ISO 4628: -No blistering (Degree: 0) -No rusting (Degree: 0) -No cracking (Degree: 0) -No flaking (Degree: 0) | Follow: ASTM B117-11 Test Condition: 1). Mated connector 2). Salt spray: (5±1) % NaCl (m/m) concentration solution 3). Temperature (35±1) °C 4). Precipitation rate of salt spray (1.0-2.0) ml (/ 80cm*h) 5). PH value: 6.5-7.2 6). Duration: 72H |

Protection

| | | | |
|--------|---------------------------|----------------------------|---|
| 3.5.9 | Degree of protection IP6X | IP 6X, No ingress of dust | Test IP 6X according to IEC 60529 |
| 3.5.10 | Degree of protection IPX5 | IP X5, No ingress of water | Test IP X5 (water jetting) according to IEC 60529 7.3.6.3 & 7.3.7 of EN61984 |



Number of Specimen as below table 1:

| Table 1 - Number of Specimen | | |
|------------------------------|----------------------------------|--------------------|
| Test | Description | Numbers |
| Group A | Mechanical Strength Test | 1 pair connector |
| Group B | Operating Cyclic Life Test | 3 pairs connectors |
| Group C | Degree of protection Test, Mated | 3 pairs connectors |
| Group D | Degree of protection Test, Mated | 3 pairs connectors |
| Group E | Vibration and Shock Test, Mated | 3 pairs connectors |
| Group F | Salt Spray Test | 3 pairs connectors |

Note: For connector family of the same design and comparable size, test may be made only on that member of the family which represents the worse case for that test.

3.6. Test Sequence

| Test or Examination | Test Group | | | | | |
|------------------------------------|------------------------------------|-----|-----|-----|-----|-----|
| | A | B | C | D | E | F |
| | Test Sequence ¹⁾ | | | | | |
| Visual and dimensional examination | 1,3 | 1,3 | 1,6 | 1,6 | 1,4 | 1,3 |
| Mechanical strength impact | 2 | | | | | |
| Mechanical Operation (Durability) | | 2 | | | | |
| Vibration, Random | | | | | 2 | |
| Shock | | | | | 3 | |
| Cold | | | 3 | 3 | | |
| Dry Heat | | | 4 | 4 | | |
| Salt Spray Test | | | | | | 2 |
| Degree of protection IP6X | | | 2,5 | | | |
| Degree of protection IPX5 | | | | 2,5 | | |

Notes:

- 1) Numbers indicate the sequence in which the tests are performed.



4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

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

B. Test Sequence

The samples shall be prepared in accordance with product drawings. They shall be selected at random from current production.

4.2. Requalification Testing

If changes significantly affecting form, fit or functions are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of paragraph 3.5. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before re-submittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification. Bulk wire resistance shall be subtracted from resistance readings.