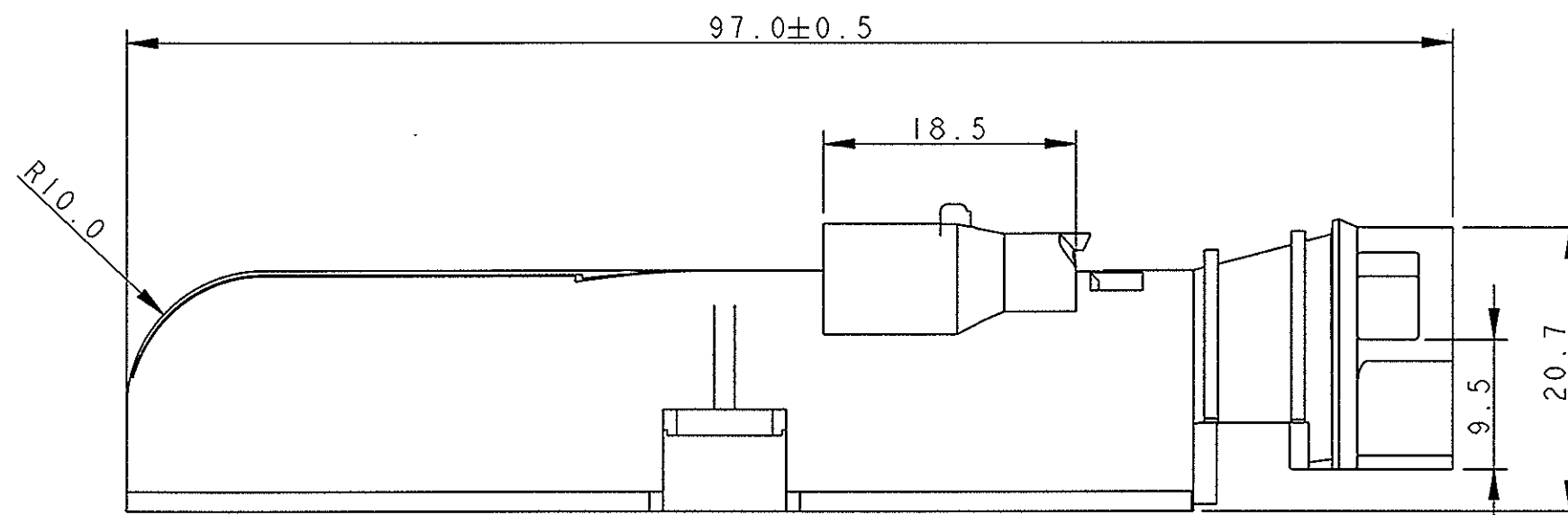
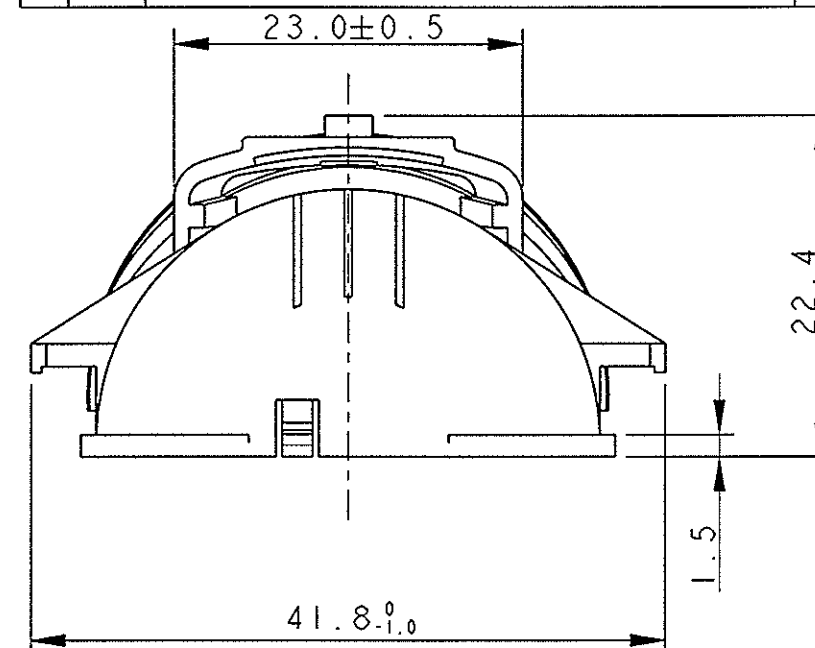
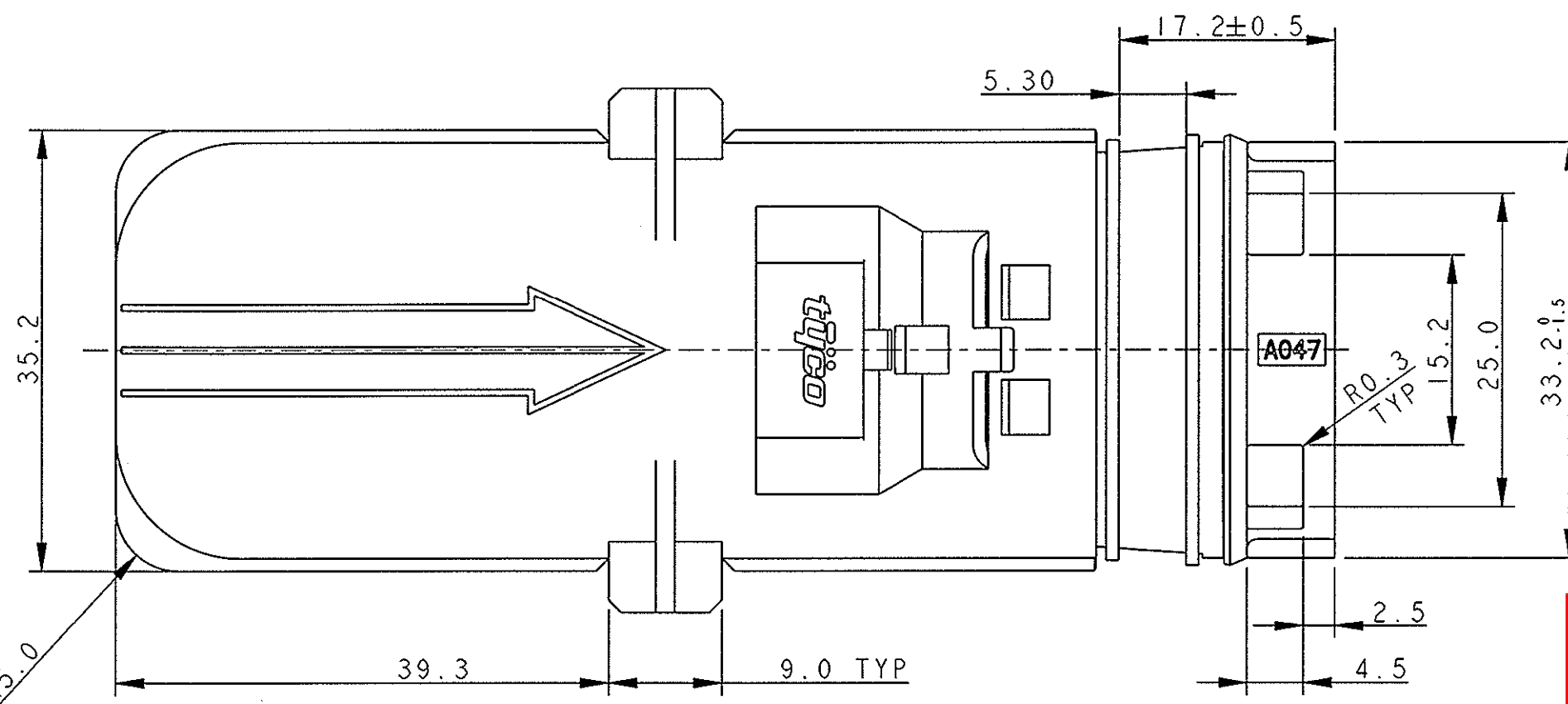
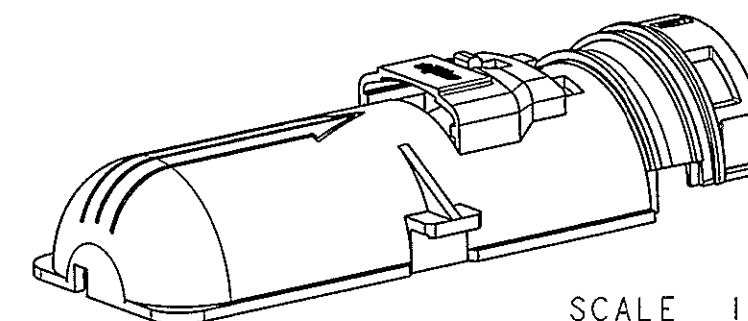


| P  | LTR | DESCRIPTION                                | DATE      | DWN  | APVD |
|----|-----|--------------------------------------------|-----------|------|------|
| A  |     | FIRST ISSUE (PRIMA EMISSIONE) ET00-0112-03 | 18JUL2003 | M.P. | O.C. |
| B1 |     | ADDED TIE SLOT (WAS 03-51169) ET00-0159-03 | 10SEP2003 | M.P. | O.C. |
| B2 |     | RELEASED FOR PRODUCTION (ET00-0059-04)     | 29APR2004 | M.P. | O.C. |



SCALE 1:1

勝特力電材超市-龍山店 886-3-5773766  
勝特力電材超市-光復店 886-3-5729570  
勝特力電子(上海) 86-21-34970699  
勝特力電子(深圳) 86-755-83298787  
<http://www.100y.com.tw>

284722-1 AS SHOWN

## NOTES

- 1) COVER IS SUITABLE TO BE ASSEMBLED WITH TYCO CONNECTOR  
P/N 3-1355136-3 AND TYCO C.P.A.  
(IL COPERCHIO SI ASSEMBLA CON IL CONNETTORE TYCO  
P/N 3-1355136-3 E IL C.P.A. DI TYCO)

2) MATERIAL : PA6.6 GF BLACK COLOUR  
(MATERIALE : PA 6.6 FV COLORE NERO)

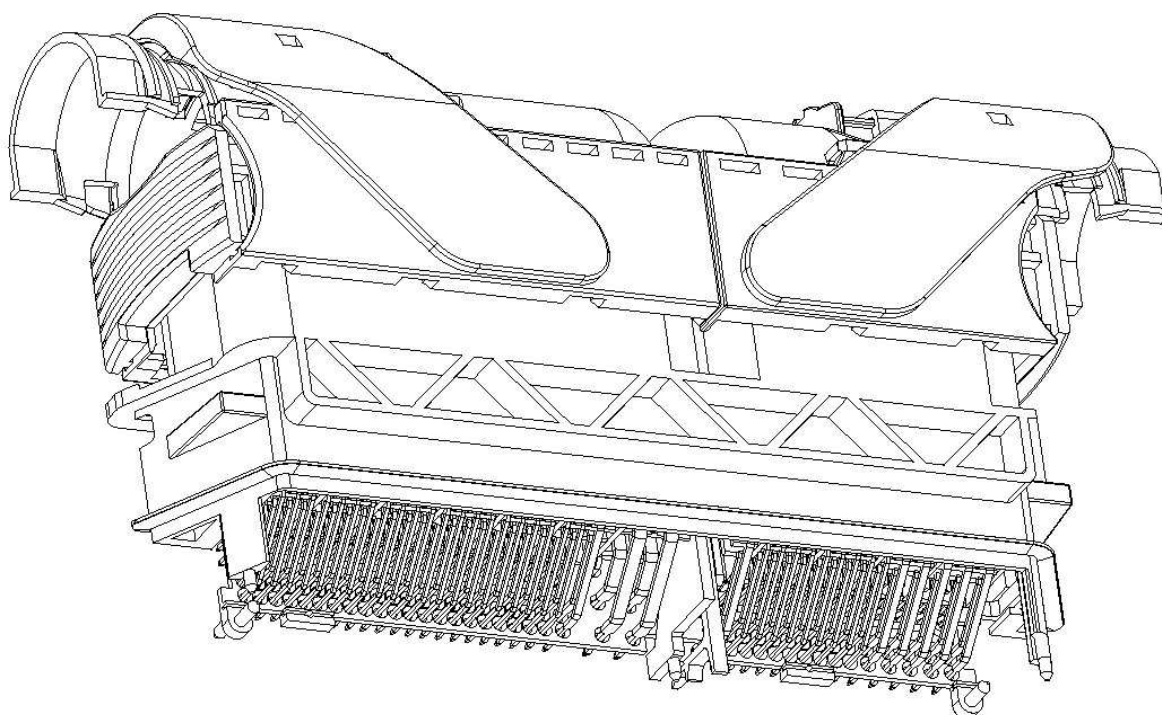
THIS DRAWING IS A CONTROLLED DOCUMENT FOR TYCO ELECTRONICS CORPORATION  
IT IS SUBJECT TO CHANGE AND THE CONTROLLING ENGINEERING ORGANIZATION  
SHOULD BE CONTACTED FOR THE LATEST REVISION.

| DIMENSIONS: | TOLERANCES UNLESS OTHERWISE SPECIFIED: |
|-------------|----------------------------------------|
| mm          |                                        |
|             | 0 PLC ±0.3                             |
|             | 1 PLC ±0.3                             |
|             | 2 PLC ±0.3                             |
|             | 3 PLC ±0.3                             |
|             | 4 PLC ±0.3                             |
|             | ANGLES ±1°                             |
| MATERIAL    | FINISH                                 |
| 2           | 2                                      |

|                  |                |           |
|------------------|----------------|-----------|
| DWN              | M. POLI        | 25JUN2003 |
| CHK              | O. CANUTO      | 25JUN2003 |
| APVD             | A. GENTA       | 25JUN2003 |
| PRODUCT SPEC     | 108-20235      |           |
| APPLICATION SPEC | I.S. 411-20067 |           |
| WEIGHT           | -              |           |
| CUSTOMER DRAWING |                |           |

|                                                                                            |           |                                                                      |               |
|--------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------|---------------|
| tyco Electronics                                                                           |           | tyco Electronics AMP Italia<br>C.so Fratelli Cervi, 15 Collegno (To) |               |
| NAME<br>COVER FOR 94 POS. RECEPTACLE HOUSING<br>Coperchio per connettore femmina<br>94 vie |           |                                                                      |               |
| SIZE                                                                                       | CAGE CODE | DRAWING NO                                                           | RESTRICTED TO |
| A3                                                                                         | 00779     | C-284722                                                             | -             |
| SCALE 2:1                                                                                  |           | SHEET 1 OF 1                                                         | REV B2        |

# 154 POSITIONS HEADER AND RECEPTACLE CONNECTORS FOR ENGINE MANAGEMENT



Product Code : M107

G.P.L. : N02

P. 023279

|            |                              |      |            |      |            |
|------------|------------------------------|------|------------|------|------------|
| <b>A5</b>  | Revised                      | M.P. | 16/05/2016 | M.G. | 16/05/2016 |
| <b>A4</b>  | Revised                      | M.G. | 22/10/2013 | M.G. | 22/10/2013 |
| <b>A3</b>  | Updated 9.10 (Page 10)       | M.P. | 10/09/2009 | M.G. | 10/09/2009 |
| <b>A2</b>  | Updated P/N's table (Page 4) | M.P. | 23/06/2006 | O.C. | 23/06/2006 |
| <b>A1</b>  | Active ET00-0122-04          | M.P. | 11/06/2004 | O.C. | 11/06/2004 |
| <b>A</b>   | First issue ET0090-02        | D.B. | 08/05/2002 | A.G. | 08/05/2002 |
| rev letter | rev. record                  | DR   | Date       | CHK  | Date       |
| DR.        |                              | DATE | APVD       |      | DATE       |

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**Page 1 of 12**

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**LOC I**

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## 0.1 CONTENTS

This specification covers the requirements for product performance, test methods and quality assurance provision for the 154 positions header and receptacle connector system for engine management, composed by the parts listed in the following table:

| Description                                             | Part number                                                                                                                                             |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 154 positions Header                                    | 284617-1                                                                                                                                                |
| Socket housing, 60w                                     | 284742-1                                                                                                                                                |
| Socket housing, 94w                                     | 284743-1                                                                                                                                                |
| MQS Clean Body contact, WSR 0.35-0.5 mm <sup>2</sup>    | 968220-1                                                                                                                                                |
| MQS Clean Body contact, WSR 0.75 mm <sup>2</sup>        | 968221-1                                                                                                                                                |
| 1.5 mm Clean Body contact, WSR 0.5 mm <sup>2</sup>      | 1452158-1                                                                                                                                               |
| 1.5 mm Clean Body contact, WSR 0.75-1.5 mm <sup>2</sup> | 1241608-1                                                                                                                                               |
| AMP MCP2.8K, SWS, WSR 0.5-1 mm <sup>2</sup>             | 1241394-1                                                                                                                                               |
| AMP MCP2.8K, SWS, WSR > 1-2.5 mm <sup>2</sup>           | 1241396-1                                                                                                                                               |
| Single wire seal for AMP MCP2.8K                        | 963292-1, 963293-1, 963294-1<br>(For the assignment of the individual seals to the various wire cross-sections, see the drawing of the individual seal) |

## 0.2 APPLICABLE DOCUMENTS

Product drawings have to be considered part of this specification. In case of conflicts between specification and referenced documents, this specification shall take precedence.

## 0.3 TE CONNECTIVITY SPECIFICATIONS

- A. 109-1 Test Specification, General Requirements for Test Methods
- B. 108-18030 Product Specification, Micro-Quadlock-System
- C. 108-18717/108-18513-0 Product Specification, AMP MCP 2.8

## 0.4 STANDARD AND SPECIFICATIONS

- A. Low Voltage Stranded Cables for Automobiles according to FIAT normation table Nr. 91107/05 and 91107/17.
- B. FIAT General Specification for Connectors 9.91320/02 Ed. 7.

## 0.5 DESIGN AND CONSTRUCTION

Product shall comply with design, construction and physical dimensions specified in the applicable product drawing.

## 0.6 RATINGS

- A. TEMPERATURE RATING:** -40°C TO +125 °C (including the temperature increasing due to working current flow).
- B: MAXIMUM OPERATING VOLTAGE:** 24 V dc. For application at higher voltage please contact TE Connectivity
- C. MQS Clean Body CURRENT RATING:**
- 7,5 A max. with 0.75 mm<sup>2</sup> wire
  - 6,0 A max. with 0.50 mm<sup>2</sup> wire
  - 3,5 A max. with 0.35 mm<sup>2</sup> wire
- D. 1.5 mm MQS Clean Body CURRENT RATING:**
- 14,0 A max. with 1.50 mm<sup>2</sup> wire
  - 11,0 A max. with 1.00 mm<sup>2</sup> wire
  - 9,0 A max. with 0.75 mm<sup>2</sup> wire
  - 6,0 A max. with 0.50 mm<sup>2</sup> wire
- E. AMP MCP2.8K CURRENT RATING:**
- 20,0 A max. with 2.50 mm<sup>2</sup> wire
  - 14,0 A max. with 1.50 mm<sup>2</sup> wire
  - 11,0 A max. with 1.00 mm<sup>2</sup> wire
  - 6,0 A max. with 0.50 mm<sup>2</sup> wire
- Current rating per wire section a.m. are according to Fiat spec. 91107/05, 91107/17

## 0.7 QUALITY ASSURANCE PROVISION

### A. SAMPLES PREPARATION

The test samples to be used for the test shall be prepared by random selection from the current production and the contact shall be crimped in accordance with the Application Specifications: 114-18021, 114-18286, 114-18387/114-18148.  
No sample shall be reused, unless otherwise specified.

### B. TEST CONDITION:

All the test shall be performed under any combination of the following test condition, unless otherwise specified:

- Room temperature: 23±5°C
- Relative humidity: 45÷70%
- Atmospheric pressure: 860÷1060 mbar

## 0.8 TEST REQUIREMENTS AND PROCEDURES

| #                       | Test                                           | Procedures                                                                                                                                                                                                                                                                                               | Requirements                                                                                                                                                                                                                   |
|-------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PRODUCT EXAMINATION     |                                                |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                |
| 1.1                     | Visual aspect                                  | Visual Inspection                                                                                                                                                                                                                                                                                        | Compliance with relevant drawings                                                                                                                                                                                              |
| 1.2                     | Dimensions and tolerances                      |                                                                                                                                                                                                                                                                                                          | Following relevant drawings                                                                                                                                                                                                    |
| 1.3                     | Marking                                        | Visual Inspection                                                                                                                                                                                                                                                                                        | Supplier's indications must be clear and legible                                                                                                                                                                               |
| 1.4                     | Materials and coverings                        |                                                                                                                                                                                                                                                                                                          | Following relevant drawings                                                                                                                                                                                                    |
| ELECTRICAL REQUIREMENTS |                                                |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                |
| 2.1                     | Insulation resistance                          | Applied voltage 500 V dc between one contact and the others short circuited.                                                                                                                                                                                                                             | ≥10MΩ                                                                                                                                                                                                                          |
| 2.2                     | Dielectric strength                            | >1000V ac for 1 minute<br>Test between adjacent circuits of mated connectors                                                                                                                                                                                                                             | Neither creeping discharge nor flash over shall occur                                                                                                                                                                          |
| 2.3                     | Voltage Drop                                   | Between a point of the wire at 1 cm from the connector edge and a point very close to the header edge, at the nominal current for each wire size. (Termination resistance is obtained after subtraction of the resistance of wire used for termination)                                                  | On new contacts and after ten in/out                                                                                                                                                                                           |
|                         |                                                |                                                                                                                                                                                                                                                                                                          | Class of terminal types                                                                                                                                                                                                        |
|                         |                                                |                                                                                                                                                                                                                                                                                                          | 0.631.52.8                                                                                                                                                                                                                     |
| 2.4                     | Contact Resistance                             | On terminal without housing mated. Placed the measure points in the transition zones                                                                                                                                                                                                                     | ≤5mV/A≤4mV/A≤4mV/A                                                                                                                                                                                                             |
|                         |                                                |                                                                                                                                                                                                                                                                                                          | Class of terminal types                                                                                                                                                                                                        |
|                         |                                                |                                                                                                                                                                                                                                                                                                          | 0.631.52.8                                                                                                                                                                                                                     |
| 2.5                     | High temperature resistance with current load. | On 6 adjacent ways contemporary. 5 temperature cycles composed of:<br>- 5 hours in oven at 80 ±2°C without air ventilation, with rated current according to wire size. (see point 0.6)<br>- 2 hours in freezing cell at −30°C, without current. (thermocouple placed on transition zone of each contact) | ≤4mΩ≤3mΩ≤3mΩ                                                                                                                                                                                                                   |
|                         |                                                |                                                                                                                                                                                                                                                                                                          | Class of terminal types                                                                                                                                                                                                        |
|                         |                                                |                                                                                                                                                                                                                                                                                                          | 0.631.52.8                                                                                                                                                                                                                     |
| 2.6                     | Current overload                               | On one pair of mated contacts without housing:<br>Test current 1.5 time nominal current (See par. 0.6)<br>– Duration 500 cycles composed of:<br>45 min current ON<br>15 min current OFF<br>(Thermocouple placed between contact body and wire barrel)                                                    | • Over temperature in transit area: ≤45°C (at the end of the first test cycle)<br>• Voltage drop within the original limit specified<br>• No damage<br>• Over temperature in transit area: ≤50°C (at the end of 5 test cycles) |
|                         |                                                |                                                                                                                                                                                                                                                                                                          | Class of terminal types                                                                                                                                                                                                        |
|                         |                                                |                                                                                                                                                                                                                                                                                                          | 0.631.52.8                                                                                                                                                                                                                     |

| #                                            | Test                                                      | Procedures                                                                                                                                                                                                                                                                       | Requirements                                                                                                                                                                                                         |      |       |       |       |
|----------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-------|-------|
| MECHANICAL REQUIREMENTS FOR HEADER           |                                                           |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                      |      |       |       |       |
| 3.1                                          | Pin and tab retention force in header                     | Apply an axial force on pin and tab in order to remove them from the header.<br>Operation speed: 25 mm/min                                                                                                                                                                       | Class of terminal types                                                                                                                                                                                              |      |       |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | 0.63                                                                                                                                                                                                                 | 1.5  | 2.8   |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | ≥25N                                                                                                                                                                                                                 | ≥40N | ≥50N  |       |       |
| MECHANICAL REQUIREMENTS FOR FEMALE TERMINALS |                                                           |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                      |      |       |       |       |
| 4.1                                          | Single contact mating and un-mating force                 | Operation speed: 50 mm/min (with relevant counterpart pin and tabs)                                                                                                                                                                                                              | Class of terminal types                                                                                                                                                                                              |      |       |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | 0.63                                                                                                                                                                                                                 | 1.5  | 2.8   |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | On. 1 <sup>st</sup> mating and un-mating                                                                                                                                                                             |      |       |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | ≤5N                                                                                                                                                                                                                  | ≤5N  | ≤15N  |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | On 10 <sup>th</sup> un-mating                                                                                                                                                                                        |      |       |       |       |
| ≥2N                                          | ≥2.5N                                                     | ≥4N                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                      |      |       |       |       |
| 4.2                                          | Contact insertion force into housing (crimp contacts)     | Insert contacts into the cavities with operating speed of 25 mm/min. The housing has to be mounted on a self aligning platform.                                                                                                                                                  | Class of terminal types                                                                                                                                                                                              |      |       |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | 0.63                                                                                                                                                                                                                 | 1.5  | 2.8   |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | ≤15N                                                                                                                                                                                                                 | ≤20N | ≤25N  |       |       |
| 4.3                                          | Pull-out force of contacts from housing. (crimp contacts) | Pulling wires axially with an operating speed of 50 mm/min                                                                                                                                                                                                                       | Class of terminal types                                                                                                                                                                                              |      |       |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | 0.63                                                                                                                                                                                                                 | 1.5  | 2.8   |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | With primary lock only                                                                                                                                                                                               |      |       |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | ≥30N                                                                                                                                                                                                                 | ≥45N | ≥60N  |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | with primary and secondary lock                                                                                                                                                                                      |      |       |       |       |
| ≥60N                                         | ≥100N                                                     | ≥100N                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                      |      |       |       |       |
| 4.4                                          | Crimp tensile                                             | Apply a pulling force to the terminal correctly crimped on wire for 1 minute.<br><br>Operating speed: 25÷50 mm/min                                                                                                                                                               | Class of wire sizes [mm <sup>2</sup> ]                                                                                                                                                                               |      |       |       |       |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | 0.5                                                                                                                                                                                                                  | 0.75 | 1.0   | 1.5   | 2.5   |
|                                              |                                                           |                                                                                                                                                                                                                                                                                  | ≥70N                                                                                                                                                                                                                 | ≥90N | ≥115N | ≥155N | ≥235N |
| MECHANICAL REQUIREMENTS FOR CONNECTORS       |                                                           |                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                      |      |       |       |       |
| 5.1                                          | Connector mating and un-mating force                      | With correspondent header counterpart all assembled moving the lever with an operating speed of 50 mm/min                                                                                                                                                                        | <ul style="list-style-type: none"><li>≤ 70 N at 1st mating / un-mating for connectors equipped with force reduction device (lever, slide, etc.).</li><li>Max. 50% decay is admitted after thermal cycles.</li></ul>  |      |       |       |       |
| 5.2                                          | Front seal retention force                                | Pull front gasket with proper fixture at speed of 25 to 100 mm/min                                                                                                                                                                                                               | > 15 N                                                                                                                                                                                                               |      |       |       |       |
| 5.3                                          | Connector retention force                                 | With relevant Header counterpart assembled, apply a pulling force axially to the female connector mating direction, with an operating speed of 60±10 mm/min                                                                                                                      | > 120 N                                                                                                                                                                                                              |      |       |       |       |
| 5.4                                          | Mechanical retention of the connector                     | Connector fully loaded mated with the corresponding header counterpart (wire bundle fixed to the shell by a tie)<br>Operating speed: 100 mm/min<br><br>Apply an axial pull-off load of 120 N to the cables bundle in all directions of the semi-sphere over the wire exit plane. | <ul style="list-style-type: none"><li>No uncoupling of connector, not even partial</li><li>No extraction, detachment from connection, opening of electric contact</li><li>No damage on the coupling system</li></ul> |      |       |       |       |
| 5.5                                          | Polarization effectiveness                                | Assembled connectors must withstand without mating the counterpart with the incorrect polarization                                                                                                                                                                               | <ul style="list-style-type: none"><li>No coupling of connector or closing of electrical contact for a force &lt; 100 N</li></ul>                                                                                     |      |       |       |       |

| #                                            | Test                                                                             | Procedures                                                                                                                                                                                                                | Requirements                                                                                                    |         |         |
|----------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------|---------|
| MECHANICAL REQUIREMENTS FOR SECONDARY LOCK   |                                                                                  |                                                                                                                                                                                                                           |                                                                                                                 |         |         |
| 6.1<br>6.1.1                                 | Closing force of secondary lock with all terminals correctly inserted            | Apply increasing load parallel to the operating direction and measure force to actuate.                                                                                                                                   | Class of terminal types                                                                                         |         |         |
|                                              |                                                                                  |                                                                                                                                                                                                                           | 0.63                                                                                                            | 1.5     | 2.8     |
|                                              |                                                                                  |                                                                                                                                                                                                                           | ≤ 30N                                                                                                           | ≤ 40N   | ≤ 40N   |
| 6.1<br>6.1.2                                 | Closing force of secondary lock with one or more contacts not correctly inserted | Apply increasing load parallel to the operating direction and measure force to actuate.                                                                                                                                   | Class of terminal types                                                                                         |         |         |
|                                              |                                                                                  |                                                                                                                                                                                                                           | 0.63                                                                                                            | 1.5     | 2.8     |
|                                              |                                                                                  |                                                                                                                                                                                                                           | ≥ 80 N                                                                                                          | ≥ 120 N | ≥ 120 N |
| 6.2                                          | Connector mating force with secondary lock not completely closed                 | Apply increasing load parallel to the operating direction and measure force to actuate.                                                                                                                                   | ≥ 100 N                                                                                                         |         |         |
| MECHANICAL REQUIREMENTS FOR SLIDES AND LEVER |                                                                                  |                                                                                                                                                                                                                           |                                                                                                                 |         |         |
| 7.1                                          | SLIDE retention force in pre-assembled position                                  | Pull slide axially to its operating direction with increasing force                                                                                                                                                       | ≥ 50 N                                                                                                          |         |         |
| 7.2                                          | LEVER resistance to transversal load                                             | Apply 100 N transversal load to the lever positioned open and at the middle of its operating angular displacement. Apply 60 N transversal load to the lever in all other positions of its operating angular displacement. | • No lever stepping and/or damages; permanent deformations are allowed if they do no affect the lever operation |         |         |
| 7.3                                          | LEVER locking resistance force (without C.P.A. device)                           | Apply a load to the lever with connection completely closed (without C.P.A. device) in order to open it                                                                                                                   | ≥ 70 N                                                                                                          |         |         |
| MECHANICAL REQUIREMENTS FOR C.P.A DEVICE     |                                                                                  |                                                                                                                                                                                                                           |                                                                                                                 |         |         |
| 8.1<br>8.1.1                                 | C.P.A. device actuating force (with lever correctly closed)                      | With female connector lever completely closed, apply a load to C.P.A. device in order to close it (direction of load should be parallel to the C.P.A. displacement direction.                                             | ≤ 30 N                                                                                                          |         |         |
| 8.1<br>8.1.2                                 | C.P.A. device actuating force (with lever not correctly closed)                  | With female connector lever NOT completely closed, apply a load to C.P.A. device due to close it (direction of load should be parallel to the C.P.A. displacement direction.)                                             | ≥ 80 N                                                                                                          |         |         |
| 8.2<br>8.2.1                                 | C.P.A. device retention force (in open position)                                 | With connector equipped with cover and C.P.A., apply a pulling force to the C.P.A. in order to remove it from the cover                                                                                                   | ≥ 60 N                                                                                                          |         |         |
| 8.2<br>8.2.2                                 | C.P.A. retention force (in closed position)                                      | With connector equipped with cover and C.P.A. apply a load to the C.P.A. device in order to move it in its pre-locking position                                                                                           | ≤ 20 N                                                                                                          |         |         |

| #                                | Test                                                                          | Procedures                                                                                                                                                                                                                                                                                                                                    | Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ENVIROMENTAL REQUIREMENTS</b> |                                                                               |                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 9.1                              | Accelerating aging                                                            | <p>On mated connector submitted to the following cumulative tests:</p> <p><b>A-</b> 5 cycles composed of:<br/> 2 hrs at 125°C ±2°C<br/> 2 hrs at -30°C ±2°C</p> <p><b>B-</b> 5 cycles composed of:<br/> 2 hrs at 125°C ±2°C<br/> 2 hrs at 40°C ±2°C and 90-95% r.h.<br/> 2 hrs at -30°C ±2°C</p> <p><b>C-</b> 200 hrs at 125°C</p>            | <ul style="list-style-type: none"> <li>No deformation, scraping or breaking; color variations are allowed on plastic material</li> <li>Insulation resistance and discharge voltage within the limits specified</li> <li>Voltage drop max 50% decay is allowed from the original limit</li> <li>Initial contact resistance and resistance of short-circuit device: a max 50% decay is allowed from the original limit</li> <li>After 10 mating and un-mating: characteristics and mechanical tests within the original limits specified with 50% max variation allowed</li> </ul> |
| 9.2                              | Waterproof test of connection with peripheral gasket. (IP x.4)                | <p>Test according to IEC 529 par. 14.2.4<br/> Duration : 4 hours<br/> Samples mated with relevant counterpart<br/> This test must be carried out after cumulative aging test (par. 9.1)</p> <p>- This test must be carried out also on Header mating side without female counterparts.</p>                                                    | <ul style="list-style-type: none"> <li>Insulation resistance and discharge voltage within the prescribed limits</li> <li>No water infiltration inside the connector</li> <li>No water infiltration through the pin and tab cavities (For test on Header only)</li> </ul>                                                                                                                                                                                                                                                                                                         |
| 9.3                              | Waterproof test (on relevant header counterpart only). (IP x.5)               | <p>Test according to IEC 529 par. 14.2.5<br/> Duration: 3 min.<br/> The header counterpart must be submitted to water jet on female counterpart mating side; the other side must be close and sealed.<br/> This test must be carried out after cumulative aging test (par. 9.1)</p>                                                           | <ul style="list-style-type: none"> <li>No water infiltration through the pin and tab cavities</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 9.4                              | High pressure washing test (on connection fully loaded and closed). (IP x.9K) | <p>Test according to <u>DIN 40050</u> index 9K<br/> Duration: 30 sec for each nozzle.<br/> Samples: mated with relevant counterpart.<br/> Submit the connection completely loaded with terminals, fixed with tie, to the cumulative action of the four nozzle.<br/> This test must be carried out after cumulative ageing test (par. 9.1)</p> | <ul style="list-style-type: none"> <li>No water infiltration inside the connector</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 9.5                              | Low temperature resistance test                                               | <p>Keep mated samples to -40°C for 2 hrs, move to 0°C in a time of 3 min. max and let stabilize, then un-mate and re-mate the connectors one time</p>                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>No breaking between connection parts</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 9.6                              | Salt spray corrosion test                                                     | <p>150 hrs of exposure to salt mist at 35°C ±2°C, 5% of NaCl, pH 6.5÷7.2 class 2 (mated connector)</p>                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Voltage drop ≤ specified limits for new contact increased of 100%</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 9.7                              | Kesternich corrosion test                                                     | <p>4 cycles composed of:<br/> 8 hrs of exposure to an atmosphere with 0.66 % of SO<sub>2</sub> at +40°C ±2°C (method acc. To DIN 50118)<br/> 16 hrs in free air (mated connectors)</p>                                                                                                                                                        | <ul style="list-style-type: none"> <li>Voltage drop ≤ specified limits for new contact increased of 100%</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| #    | Test                                                                  | Procedures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Requirements                                                                                                                                                                                                                                                                                                                               |
|------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9.8  | Chemical agents resistance test                                       | <p>Test complete, mated connectors with 3 min. of immersion in the following fluids (not cumulative test, use different samples for each fluid) :</p> <ul style="list-style-type: none"> <li>- Gasoline at 23°C ± 5°C</li> <li>- Cleaning agent at 23° C ± 5°</li> <li>- Break fluid at 50°C ± 5° C</li> <li>- Anti-freeze mixture at 23°C ± 5°C</li> <li>- ASTM1 oil/engine oil at 100°C ± 3° C</li> <li>- Unleaded engine fuel at 23°C ± 5°C</li> <li>- Transmission fluid at 100° C ± 3°C</li> </ul> | <ul style="list-style-type: none"> <li>• No damages, deformations, cracks, breakage on the parts.</li> <li>• Contact retention in housing, connector mating / un-mating forces according to the specified limits.</li> </ul>                                                                                                               |
| 9.9  | Resistance to alternating cycles of temperature, current and humidity | <p>Submit mated samples to the following cumulative cycles:</p> <ul style="list-style-type: none"> <li>• 4 hrs at +80°C with current flow on 6 adjacent contacts at the maximum current for the wire size 45 min ON and 15 min. OFF.</li> <li>• 4 hrs at 40°C with 95% U.R. without current.</li> <li>• 4 hrs at -40°C without current</li> </ul>                                                                                                                                                       | <ul style="list-style-type: none"> <li>• No damages, deformations, cracks, breakage on the parts.</li> <li>• Insulation resistance, dielectric strength, voltage drop, Initial contact resistance, within the limits specified.</li> </ul>                                                                                                 |
| 9.10 | Random vibration in temperature                                       | <p>Temperature sequence during vibration as follows:</p> <p>-6h at +85°C<br/>-4h at +40°C<br/>-2h at -25°C</p> <p>PSD curve as per picture 1</p> <p>Duration: 180 hours / 1 axis only</p>                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>• No electric continuity missing (<math>R &gt; 100\Omega</math> in <math>&gt; 1\mu s</math> time) during test</li> <li>• Voltage drop: a max. 50% decay is allowed from the original limit</li> <li>• Mechanical characteristics within the prescribed limits with 50% variation allowed</li> </ul> |

Picture 1

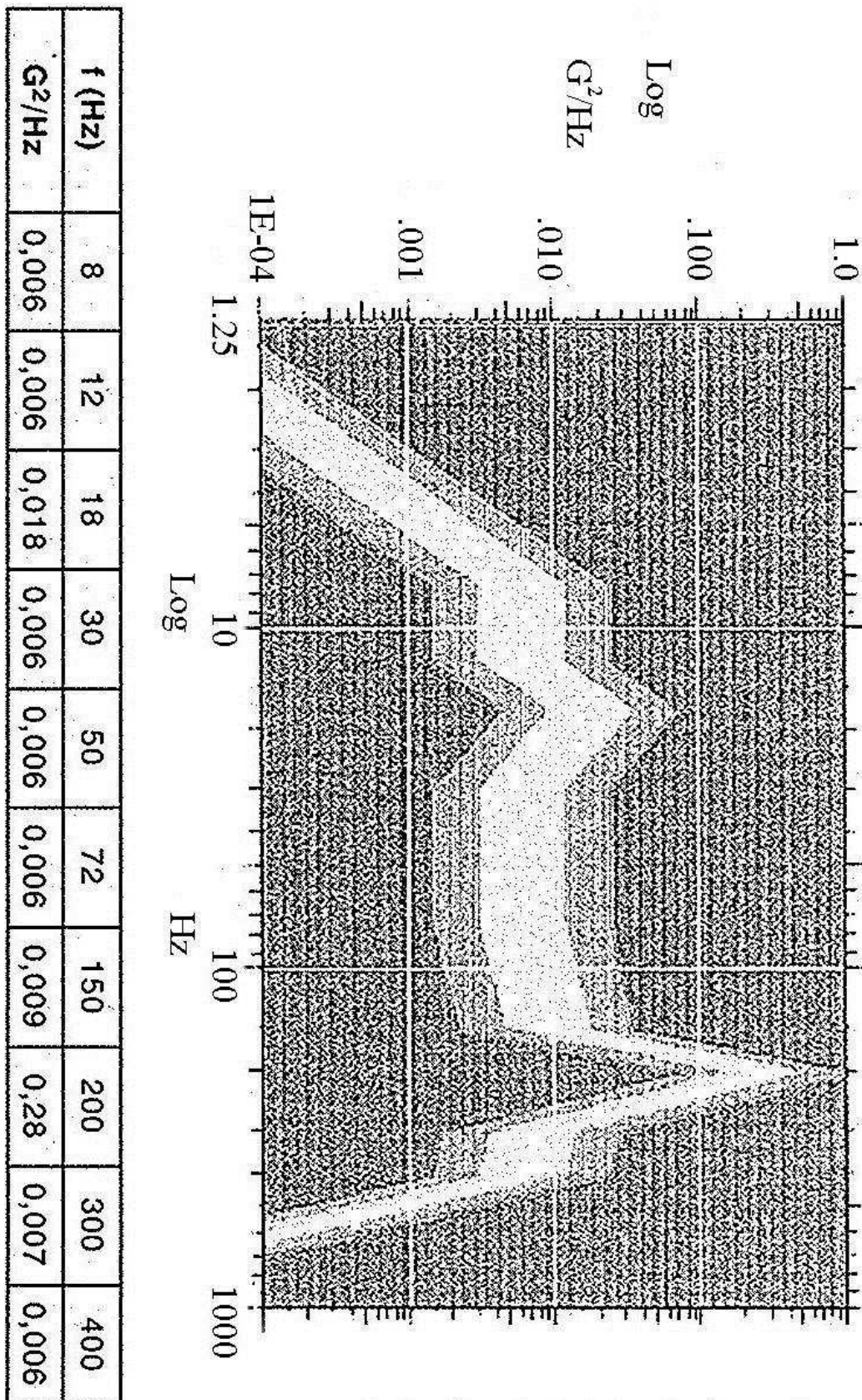


**TABLE I**  
**PRODUCT QUALIFICATION TEST SEQUENCE**  
**TEST GROUPS**

| ITEM  | DESCRIPTION                                                               | A | B   | C   | D   | E   | F   | G    | H   | I   | J   | K   | L   | M   | N   | O   | P   | Q   | R   |
|-------|---------------------------------------------------------------------------|---|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.1   | Visual aspect                                                             | 1 | 1,9 | 1,3 | 1,5 | 1,5 | 1,6 | 1,10 | 1,9 | 1,9 | 1,5 | 1,9 | 1,8 | 1,5 | 1,5 | 1,5 | 1,5 | 1,6 | 1,6 |
| 1.2   | Dimensions and tolerances                                                 | 2 |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| 1.3   | Marking                                                                   | 3 |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| 1.4   | Materials and coverings                                                   | 4 |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| 2.1   | Insulation resistance                                                     |   | 4   |     |     |     |     |      |     | 8   |     | 5   | 2,6 |     |     |     |     | 4   | 4   |
| 2.2   | Dielectric strength                                                       |   | 5   |     |     |     |     |      |     | 7   |     | 6   | 3,7 |     |     |     |     | 5   | 5   |
| 2.3   | Voltage drop                                                              |   | 3,8 |     | 2,4 | 2,4 |     |      |     | 2,5 | 2,4 | 4   |     | 2,4 | 2,4 |     |     |     |     |
| 2.4   | Contact resistance                                                        |   | 2,7 |     |     |     |     |      |     | 3,6 |     | 3   |     |     |     |     | 2,4 |     |     |
| 2.5   | High temperature resistance with current load                             |   |     |     | 3   |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| 2.6   | Current over-load                                                         |   |     |     |     | 3   |     |      |     |     |     |     |     |     |     |     |     |     |     |
| 3.1   | Pins and tabs retention force in header                                   |   |     |     |     |     | 2   |      |     |     |     |     |     |     |     |     |     |     |     |
| 4.1   | Single contact engaging and separating                                    |   | 6   |     |     |     |     |      | 2   |     |     |     |     |     |     |     |     |     |     |
| 4.2   | Contact insertion force into housing                                      |   |     |     |     |     | 3   |      |     |     |     |     |     |     |     |     |     |     |     |
| 4.3   | Pull out force of terminal from housing                                   |   |     |     |     |     | 4   |      |     |     |     |     |     |     |     | 4   |     |     |     |
| 4.4   | Crimp tensile                                                             |   |     | 2   |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |
| 5.1   | Connectors mating force                                                   |   |     |     |     |     |     | 2    |     |     |     | 7   |     |     |     | 3   |     |     |     |
| 5.2   | Front seal retention force                                                |   |     |     |     |     | 5   |      |     |     |     |     |     |     |     |     |     |     |     |
| 5.3   | Connector retention force                                                 |   |     |     |     |     |     |      | 3   |     |     |     |     |     |     |     |     |     |     |
| 5.4   | Mechanical retention of the connector                                     |   |     |     |     |     |     | 3    |     |     |     |     |     |     |     |     |     |     |     |
| 5.5   | Polarization effectiveness                                                |   |     |     |     |     |     | 4    |     |     |     |     |     |     |     |     |     |     |     |
| 6.1.1 | Operating force of secondary lock with all contacts correctly inserted    |   |     |     |     |     |     | 5    |     |     |     |     |     |     |     |     |     |     |     |
| 6.1.2 | Operating force of secondary lock with one contact not correctly inserted |   |     |     |     |     |     | 6    |     |     |     |     |     |     |     |     |     |     |     |
| 6.2   | Connector mating force with secondary lock not completely closed          |   |     |     |     |     |     | 7    |     |     |     | 8   |     |     |     |     |     |     |     |
| 7.1   | Slide retention force in open or pre-assembled position                   |   |     |     |     |     |     | 8    |     |     |     |     |     |     |     |     |     |     |     |
| 7.2   | Lever resistance to transversal load                                      |   |     |     |     |     |     | 9    |     |     |     |     |     |     |     |     |     |     |     |
| 7.3   | Lever locking resistance force (with C.P.A. device actuated)              |   |     |     |     |     |     |      | 4   |     |     |     |     |     |     |     |     |     |     |
| 8.1.1 | C.P.A. actuating force with lever completely closed                       |   |     |     |     |     |     |      | 5   |     |     |     |     |     |     |     |     |     |     |
| 8.1.2 | C.P.A. actuating force with lever NOT completely closed                   |   |     |     |     |     |     |      | 6   |     |     |     |     |     |     |     |     |     |     |
| 8.2.1 | C.P.A. retention force in open position                                   |   |     |     |     |     |     |      | 7   |     |     |     |     |     |     |     |     |     |     |
| 8.2.2 | C.P.A. retention force (closed position)                                  |   |     |     |     |     |     |      | 8   |     |     |     |     |     |     |     |     |     |     |
| 9.1   | Accelerating aging                                                        |   |     |     |     |     |     |      |     |     |     | 2   | 4   |     |     |     |     | 2   | 2   |
| 9.2   | Waterproof test of connection with peripheral gasket (IPx.4)              |   |     |     |     |     |     |      |     |     |     |     | 5   |     |     |     |     |     |     |
| 9.3   | Waterproof test on header counterpart (Ipx.5)                             |   |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     | 3   |     |
| 9.4   | High pressure washing test (9k)                                           |   |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     | 3   |
| 9.5   | Low temperature resistance test                                           |   |     |     |     |     |     |      |     |     | 3   |     |     |     |     |     |     |     |     |
| 9.6   | Salt spray corrosion test                                                 |   |     |     |     |     |     |      |     |     |     |     |     | 3   |     |     |     |     |     |
| 9.7   | Kesternich corrosion                                                      |   |     |     |     |     |     |      |     |     |     |     |     |     | 3   |     |     |     |     |
| 9.8   | Resistance to chemical agents                                             |   |     |     |     |     |     |      |     |     |     |     |     |     |     | 2   |     |     |     |
| 9.9   | Resistance to alternating cycles of temperature, current and humidity     |   |     |     |     |     |     |      |     | 4   |     |     |     |     |     |     |     |     |     |
| 9.10  | Random vibrations in temperature                                          |   |     |     |     |     |     |      |     |     |     |     |     |     |     |     | 3   |     |     |