


Blind Plug –For 14p/24p Through-wall-connector

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Blind Plug –For 14p/24p Through-wall-connector

1. Scope

1.1 Content

This Design Objective covers the requirements for product performance, test methods and quality assurance provisions of Blind Plug Design objective, these Blind Plugs will be used on commercial vehicle engines as 14p/24p through wall connector.

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 events of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the events of conflict between the requirements of this specification and the reference documents, this specification shall take precedence.

2.1 TE Documents

- A. 109-1: Test Specification, General Requirements for Test Methods.
- B. Customer drawings, naming and part numbers.
 - 1719887 14p Tab housing of through wall connector
 - 1703404 24p Tab housing of through wall connector
 - 1718290 Clip spring for 14 pos. Tab housing
 - 1703401 Clip spring for 24 pos. Tab housing
 - 1718277 Flat Contact 1.5x0.64
 - 2050856 Cavity Blind Plug for 14/24p through wall connector
- C. Product specifications
 - 108-94154 AMP MCP 1.5K™ Receptacle Housing 8-14pos. and Tab Housing for 1,5mm Tabs (oil tight)
- D. Application specifications
 - 114-18457 Interfaces drawing for con tact pin 1.5x0.64 mm

2.2 General Documents

- A. IEC 60068: Environmental testing, Part 2: Tests

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- Part 2-1** Test A: Cold
- Part 2-2** Test B: Dry Heat
- Part 2-2** Test B: Dry Heat
- Part 2-27** Test Ea and guidance: Shock

B. IEC 60512: Connectors for electronic equipment - Tests and measurements.

- Part 1:** General
- Part 1-1:** General examination - Test 1a: Visual examination
- Part 1-2:** General examination - Test 1b: Examination of dimension and mass
- Part 2-1:** Electrical continuity and contact resistance tests - Test 2a: Contact resistance - Millivolt level method
- Part 5-1:** Current-carrying capacity tests - Test 5a: Temperature rise
- Part 5-2:** Current-carrying capacity tests - Test 5b:

C. ISO 8092-2: Road vehicles - Connections for on-board electrical wiring harnesses -

- Part 2:** Definitions, test methods and general performance requirements

D. ISO 15170: Road vehicles – Four pole electrical connectors with pins and twist lock

- Part 2:** Tests and requirements

E. ISO 16750: Road vehicles – Environmental conditions and testing for electrical and electronic equipment –

- Part 1:** General
- Part 2:** Electrical loads
- Part 3:** Mechanical loads
- Part 4:** Climatic loads

F. ISO 20653: Road vehicles - Degrees of protection (IP- code) - Protection of electrical equipment against foreign objects, water and access

3. Requirements

3.1 Design and Construction

Products shall be of the design, construction and physical dimensions specified in the applicable product drawings.

3.2 Material

- A. Blind Plug
 - Material: PA66-GF30 Ult.A3EG6
- B. Contact:
 - Material: CuZn36Pb3 R400 to DIN EN 12164 CW603N R400
- C. Housing:

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-Material: PA66-GF25 0-0704791-1

D. Rubber:

-Material: Fluore Silicone (FSL) shore A 40±5 DIN53505

-Self-lubricant: Silicone Oil Additive 5% ±1%

3.3 Rating

A. Temperature range:

120h in air: -40°C to +130°C

2000h in oil: +130°C

B. Degree of Protection:

IP67

IP69K (with cover only)

3.4 Performance and Test Requirements

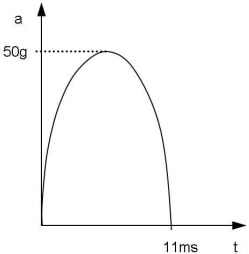
The products are designed to meet the mechanical, electrical and environmental performance specified in Table.1. All testes must be performed at the test condition per IEC 60512 unless otherwise specified.

3.4 Requirements and Test Procedures Summary

(Tabel.1)

Test Description	Requirement	Procedure
3.5.1 Visual and Air- Leakage Test	Appearance is OK. Leakage: Between -2.5mL/min to 2mL/min	Acc. to Suzhou Plant TE03W-1499 Pressure: -60KPa 至 -50KPa
MECHANICAL INSPECTIONS		
3.5.6 Plug retention in housing	No abnomality occur	Similar ISO 8092-2, chapter 4.7 hold up Force of 100N for 60 s
3.5.10 Free fall	No physical damage	Acc. to ISO 16750-3, chapter 4.3: Single fall, 2 transitions, 1m down to concrete floor
3.5.11 Resistance against impact	Mechanical features ensured after test	Similar to ISO 8092-2, chapter 4.20 height of fall: 1 m; cycles: 20 on steel plate

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<p>3.5.14 Combined vibration and temperature cycling with oil Influence+ and over pressure</p>	<p>No physical damage of housings and contacts, no derogation of function; no leakage</p>	<p>test VI ; similar to ISO 16750-3 (device in oil bath) Change the oil while change axes.</p> <p>Sinusoidal vibration: 20Hz<f<65Hz: amplitude = 1,44mm, 65Hz<f<260Hz: a=12g, 260Hz<f <350Hz: a=9g, 350Hz<f<520Hz: a=6g; periodic time: 94h for each of the 3 axes Random vibration: 10Hz<f<20Hz: 0,14-> 0,28g²/Hz, 20<f<30Hz: 0,28g²/Hz, 30Hz<f <180Hz: 0,28->0,0075g²/Hz, 180<f<300Hz: 0,0075g²/Hz, 300Hz<f<600Hz: 0,0075-> 0,2g²/Hz, 600<f<2000Hz: 0,2g²/Hz – total acceleration (RMS): 17,7g_{eff} ; periodic time: 94h for each of the 3 axes; sinusoidal and random vibration occur sequential for each axis; total vibration durance: 564h</p> <p>Temperature overlay: 1h +20°C to -40°C; 1,5h at -40°C; 1h -40°C to +20°C; 1,5h +20°C to +130°C; 1h50min at +130°C; 1h10min +130°C to +20°C</p> <p>Over pressure while total test duration: 0,1 bar</p>
<p>3.5.15 Mechanical shock with oil influence</p> 	<p>No physical damage of housings and contacts, no derogation of function; no leakage</p>	<p>Test Ea similar to IEC 60068-2-27 (device in oil bath): 3 successive shocks in both directions each of the 3 perpendicular axes -> 18 shocks with course acc. to figure 2</p> <p>Over pressure while total test duration: 0,1 bar</p>
<p>Environmental Requirements</p>		
<p>3.5.16 Cold test</p>	<p>The product requirements shall be maintained during the test.</p>	<p>Similar to ISO 16750-4, chapter 5.1.1 and acc. to IEC 60068-2-1, test Ad</p> <ul style="list-style-type: none"> • 120 h: -40 °C
<p>3.5.17 Dry heat test</p>	<p>The product requirements shall be maintained during the test. The test is Concluded with functional test in normal climate.</p>	<p>Similar to ISO 16750-4, chapter 5.1.2 and acc. to IEC 60068-2-2, test Bc</p> <ul style="list-style-type: none"> • 120 h: +130 °C
<p>3.5.18 Rapid change of temperature</p>	<p>Differing requirement: T_{max} = +130°C T_{min} = -40°C</p> <p>Duration of stay in thermal cabinet: T_h = 30 min</p>	<p>Acc. to ISO 16750-4, chapter 5.3.2 and IEC 60068-2-14, test Na</p> <p>10 temperature changes, reload time between thermal cabinets ≤ 30 s</p>

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3.5.19 Degree of protection	Valid for entire Interconnection -IP 67	Acc. to ISO 20653
3.5.20 Oil tightness	Valid only for the Tab housing	Storage of the Tab housing backside in engine oil DIESEL ENGINE OIL SAE:5W30 2000 h at 130 °C
3.5.21 Pressure tightness	Valid only for the Tab housing	Over-pressure test 30 s with 0,5 bar

4. Quality Assurance Provisions

4.1 Qualification Testing

A. Sample Selection

The samples shall be prepared in accordance with product drawings. They shall be selected at random from current production. Each test group must consist of 40 pieces of specimen.

B. Test Sequence

Qualification inspection must be conducted as the sequence specified in Table 2.

(Tabel.2)

Nr	Test	TG2	TG4	TG7	TG8
3.5.1	Visual and Air-Leakage Test	1	1	1	1
3.5.16	Operating temperature (pre-aging)				
3.5.17	Cold Test				2
3.5.18	Dry Heat Test				
	Rapid change of temperature				
3.5.6	Plug retention in housing	3			
3.5.14	Combined vibration and temperature cycling with oil influence and over pressure				3
3.5.15	Mechanical shock with oil influence				4
3.5.10	Free fall		2		
3.5.11	Resistance against impact		3		
3.5.19	Degree of protection	2			
3.5.20	Oil tightness			2	
3.5.21	Pressure tightness	4	4		

4.2 Requalification Testing

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

4.3 Acceptance

Acceptance is based on verification that product meets requirements of Table 1. Failures attributes to equipment, test setup, or operator deficiencies shall disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmitted.

4.4 Quality Conformance Inspection

The applicable Tyco quality inspection plan will 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.