2-8pos, MCON 1.2 – LL Connector, Sealed

1. SCOPE

1.1 Content

This specification covers the performance, tests and quality requirements for the 2-8pos. MCON 1.2 – LL Connector with SWS

1.2 Qualification

When tests are performed the defined 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 are part of this specification. In the case of conflict between the requirements of this specification and the product drawing or of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1 TE Connectivity Documents

A. **109-1: General Requirements for Test Specifications**

B. **Customer Drawing**

C. **Product Specifications for MCON-1.2 - Terminal - 108-18782**

D. **Application Specification for MCON-1.2 - Terminal - 114-18464**

2.2 Other Documents

A. **DIN IEC 512 - Electromechanical components for electronic equipment, basic testing**

B. **ISO 8092/2 - Road Vehicles-Connections for on-board electrical wiring harnesses Edition: February 1996**

C. **DIN IEC 68 - Electrical engineering, basic environmental testing procedures Edition: March 1983**

D. **DIN 40050 Part 9 - Road vehicles, degrees of protection (IP-Code), protection against foreign objects, water and contact, electrical equipment Edition: May 1993**

E. **Test guidelines for Road Vehicles-Connectors LV214 (VW75174) - Edition: 2010-04**

3. REQUIREMENTS

3.1 Design and Construction

Product shall be in accordance with the design, construction and physical dimensions specified on the applicable or customer drawing.

3.2 Materials

Descriptions for material is defined in customer drawings.

3.3 Ratings

A. Voltage acc. IEC 664 (DIN VDE 0110)

B. Current carrying capability of used contacts see specification 108-18782

C. Temperature -40 to / +130 °C *)

D. Degree of Protection IP X4K / X9K

E. Durability depends on terminals - See specification 108-18782

***) ambient temperature and heating up by current**

3.4 Performance and Test Description

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in paragraph 3.5. All tests are performed at environmental conditions per IEC 512 unless otherwise specified.

3.5 Test Requirements and Procedures Summary

3.5.1 General Requirements

Test Description	Requirement	Procedure
Visual- and dimensional examination ***PG0 / PG1***	**Meets requirements of product-customer-drawing**	**Acc. DIN IEC 60512-2** **Test 1a and 1b**
ELECTRICAL INSPECTIONS		
Current-temperature capability	**See Tyco Electronics-Specification 108-18782, MCON-1.2** **Dependent of the application and type, different values result for which reason reference should be made to examples in the specification.** **When a comparable example cannot be found, the application must be investigated and tested on an individual basis.**	
Max. temperature rise of contacts		
Change of temperature rise at the end of lifetime		
Voltage proof ***PG 0***	**Value and nature of the test voltage: 500V~** **No disruptive/breakdown**	**Acc. DIN IEC 60512-2, Test 4a** **Method to be used: C** **Time of testing: 60s**
Insulation resistance ***PG 0***	**Insulation resistance > 100 MΩ**	**Acc. DIN IEC 60512-2, Test 3a** **Method to be used: C** **Time of testing: 60s** **Test voltage: 500V=**

MECHANICAL INSPECTIONS		
Contact Retention Force ***PG 8*** ***E 8.2.1*** ***E 8.2.2***	**First locking device: min. 55N** **Second locking device: min. 55N** **The required retention forces are absolute values.**	**Acc. DIN IEC 60512-8, Test 15a** **Permissible shift of contacts:1mm** **Testing speed: 25mm/min**
Contact Insertion Force ***PG 8*** ***E 8.1***	**Socket: max. 15N**	**Acc. DIN IEC 60512-8, Test 15d** **Testing speed: 25mm/min**
Mating force of connector ***PG 7*** ***E 7.4***	**Fully equiped housings for all positions** **2-8pos. Connectors: max. 75N**	**Testing speed: 25mm/min**
Keying and polarizing efficiency ***PG 7*** ***E 7.1***	**Fully equiped housings for all positions** **2-8pos. Connectors: min. 80N**	**Testing speed: 25mm/min**
Draw-off strength of the housing with CPA closed ***PG 7*** ***E 7.2***	**Retention force (without damage or deformation of the housing)** **2-8pos. Connectors: min. 110N**	**Acc. DIN IEC 60512-8** **Permissible shift: 1,5mm** **Testing speed: 25mm/min**
Actuation forces for secondary lock, unequipped housing - TPA (Retainer) ***PG 6*** ***E 6.4***	**Closing force (Pre-set → Lock)** **2-8pos. Connectors: max.50N** **Opening force (Lock → Pre-set) (without damage or deformation of the locking device)** **2-8pos. Connectors: 10 N ≤ F ≤ 50 N**	**Suitable test apparatus with a constant speed of 25mm/min**
Actuation forces of CPA ***PG 7*** ***E 7.3***	**Closing force (Pre-set → Lock)** **2-8pos. Connectors: 5 N ≤ F ≤ 30 N** **Opening force (Lock → Pre-set)** **2-8pos. Connectors: 5 N ≤ F ≤ 30 N**	**Suitable test apparatus with a constant speed of 25mm/min**

Actuation forces of CPA ***PG 7*** ***E 7.3***	**Closing force (Pre-set → Lock) – Without counterpart (without damage or deformation of the CPA)** **2-8pos. Connectors: min. 60N**	**Suitable test apparatus with a constant speed of 25mm/min**
Vibration ***PG17***	**No physical damage** **No discontinuities greater than: t > 1 µs** **Change of contact resistance** *200 %* **Gold plated** *300 %* **Silver plated** *350 %* **Tinned**	**Dynamic Load, Sinusoidal** **DIN EN 60068-2-6** **Severity lvl: 3** **Dynamic Load, random vibration** **DIN EN 60068-2-64** **Severity lvl: 3**

ENVIRONMENTAL INSPECTIONS		
Rapid change of temperature ***B 19.1***	**No physical damage**	**Acc. DIN EN 60068 T2-14, Test Na** **Ta = -40°C Tb = +130°C** **ta = 0,25 h tb = 0,25 h** **Change-over time: t_{zyk} = 10s** **Number of cycles: 144**
Long-term temperature storage ***B 21A***	**No physical damage**	**Acc. DIN EN 60068 T2-2, Test Ba** **Temperature: T = 120 °C** **Duration time: 1000 h**
Protection against solid foreign objects and water ***PG 23***	**No medium shall penetrate into the connector. The functioning of latching and releasing elements must remain fully maintained.**	**1) Water bath test** **Air temperature: 130 °C** **Duration / 30 min. each** **Water temperature: 0 °C** **Duration / 15 min. each** **Cycles: 5** **Medium: low-surface-tension, 5% NaCl solution** **2) Immersion with pressure difference** **Absolute pressure** **900 mbar / test duration 5 min** **500 mbar / test duration 5 min** **Absolute pressure** **Pressure variation: 100 mbar/min** **3) Steam jet test** **Severity: IP X9K** **All three sides of the test specimen are to be subjected to the steam jet. The jet is to be directed especially to the sealing elements.** **Pressure: 80 bar** **Temperature: 80°C** **Duration: 30sec 0°/ 30°/ 60° /90°** **Distance between nozzle and specimen: 10 – 15 cm** **Acc.: ISO 20653**

		4) Water jet test **Severity: IP X4K** **All sides of the test specimen are to be subjected to the water jet. The jet is to be directed especially to the sealing elements.** **Pressure: 4 bar** **Temperature: 25°C** **Duration: 10 Min.** **Distance between nozzle and part: 20 cm** **Acc.: ISO 20653**

3.6 Qualification Test Sequence

3.6.1 Qualification Test Sequence - General Requirements

Test	PG	Test Group [1]										
		A	B	C	D	E	F	G	H	I	J	K
		Test Sequencer [2]										
Visual- and dimensional examination	1	1, 4	1, 3	1, 3	1, 3	1, 3	1, 3	1, 5	1,3	1,3 5	1,3	1,3
Voltage proof	0	2										
Insulation resistance	0	3						2, 4				
Contact retention in insert First locking device	8		2									
Contact retention in insert Second locking device	8			2								
Contact insertion force	8				2							
Mating forces of connector						2						
Draw-off strength of the housing with CPA	7						2					
Vibration	(17)							3				
Rapid change of temperature	19.1							3		2		
Long-term temperature storage	21										2	
Protection against solid foreign objects and water	23									4		
Engage- and disengage force of second locking device	7											2
Engage- and disengage force of the CPA	7								2			

1) See Para. 4.1 A 2) Numbers indicate sequence in which tests are performed

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.

Test Groups shall consist of:

Test Group A:	**5 connectors**	**1)**
Test Group B:	**4 connectors**	**1), 2)**
Test Group C:	**4 connectors**	**1), 2)**
Test Group D:	**4 connectors**	**1), 2)**
Test Group E:	**5 connectors**	
Test Group F:	**5 connectors**	
Test Group G:	**5 connectors**	**1)**
Test Group H:	**5 connectors**	
Test Group I:	**10 connectors**	**1)**
Test Group J:	**5 connectors**	**1)**
Test Group K:	**5 connectors**	

1) **Each connector fully loaded**
2) **Each tool cavity tested**

B Test Sequence

Qualification inspection shall be verified by testing samples as specified in paragraph 3.6.

4.2 Requalification Testing

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

3.6 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. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4 Quality Conformance Inspection

The applicable 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.

5. APPENDIX

Vibration specification

<table>
<tr><th>Severity</th><th>TC (Temperature cycle)</th><th colspan="2">Random vibration with TC</th><th colspan="2">Sine wave with with TC</th><th>No. Of shock</th></tr>
<tr><td rowspan="9">lvl. 3 Applications close to powertrain</td><td rowspan="9">0 min/20°C
60 min/-40°C
90 min/-40°C
240 min/120°C
420 min/120°C
480 min/20°C</td><td colspan="2">22h/axis
RMS value of accelaration: 105,5m/s2</td><td colspan="2">22h/axis</td><td rowspan="9"></td></tr>
<tr><td>Hz</td><td>(m/s²)²/Hz</td><td>Hz
100</td><td>mm
0,095</td></tr>
<tr><td>20</td><td>10</td><td>Hz</td><td>m/s2</td></tr>
<tr><td>95</td><td>10</td><td>200</td><td>150</td></tr>
<tr><td>110</td><td>0,01</td><td>220</td><td>150</td></tr>
<tr><td>380</td><td>0,01</td><td>221</td><td>100</td></tr>
<tr><td>410</td><td>20</td><td>400</td><td>100</td></tr>
<tr><td>800</td><td>10</td><td></td><td></td></tr>
<tr><td>1500</td><td>5</td><td></td><td></td></tr>
</table>

Accessories

<table>
<tr><th colspan="3">Wire</th><th colspan="4">Part numbers</th></tr>
<tr><th>Type
(DIN 76772)</th><th>Ø</th><th>mm²</th><th>MCON 1.2 LL</th><th colspan="2">Single wire seal</th><th colspan="2">Blind plug
PN / Color</th></tr>
<tr><td rowspan="5">FLR & ACW</td><td>1.2-1.4</td><td>0.35</td><td>7-1452665-3</td><td>Yellow</td><td>967067-2</td><td rowspan="5">967056-1</td><td rowspan="5">Blue</td></tr>
<tr><td>1.4-1.6</td><td>0.50</td><td>7-1452668-3</td><td>Green</td><td>967067-1</td></tr>
<tr><td>1.7-1.9</td><td>0.75</td><td>7-1452668-3</td><td>Green</td><td>967067-1</td></tr>
<tr><td>1.9-2.1</td><td>1.00</td><td>7-1452671-3</td><td>Green</td><td>967067-1</td></tr>
<tr><td>2.2-2.4</td><td>1,50</td><td>7-1452671-3</td><td>Green</td><td>2287497-1</td></tr>
</table>

Rev.	Change description	Resp.	DATE
A	Initial version	-	2006.11.06
A1	-	-	2008.10.07
A2	Mechanical req. updated	Sz. Nemes	2018.10.17
A3	Req. updated	Sz. Nemes	2022.09.14
A4	Info on wire, req. updated	Sz. Nemes	2023.11.09
A5	Vibration performance updated	Sz. Nemes	2025.04.01
A6	Revision corrected	Sz. Nemes	2025.04.03