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

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| Indicates change

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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**

E. Interface Drawing - **114-18679-3**

F. Wire cover options - **408-32185**

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 in the applicable or customer drawing.

3.2 Materials

Description 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 in 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 TE Connectivity 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: 50mm/min
Contact Insertion Force PG 8 E 8.1	Socket: **max. 15N**	Acc. **DIN IEC 60512-8**, Test 15d Testing speed: 50mm/min
Mating force of connector PG 7 E 7.4	Fully equiped housings for all positions 2-8pos. Connectors: **max. 75N**	Testing speed: 50mm/min
Keying and polarizing efficiency PG 7 E 7.1	Fully equiped housings for all positions 2-8pos. Connectors: **min. 80N**	Testing speed: 50mm/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: 50mm/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) 2-3pos. Connectors: **5 N ≤ F ≤ 50 N** 4-8pos. Connectors: **10 N ≤ F ≤ 50 N**	Suitable test apparatus with a constant speed of 50mm/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 50mm/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 50mm/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**
Resistance to chemicals PG 22 A + B	No functionally significant structural or dimensional change	• Cold-cleaning agent/cockpit cleaning agent - Commercially available • Penetrating oil Commercially available • Undiluted washer fluid anti-freeze Commercially available • Isopropanol Commercially available • Grease High melting point grease • Brake fluid DOT 4/DOT 55 • FAM test fuel(gasoline/premium) Commercially available • Diesel DIN EN 590 • Biodiesel DIN EN • Diesel additive AdBlue DIN 70070 • Engine oil 5W-30 Fully synthetic • Power steering fluid According to requirement • Automatic transmission fluid Fully synthetic • Radiator antifreeze Stable to -40 °C • Diluted sulfuric acid; density 1,28 g/ml Road salt solution Mixture PG18C+

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 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	7					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 affect 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="11">lvl. 3
Applications close to powertrain</td><td rowspan="11">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="11"></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

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

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
A7	Wire cover spec, Interface Drawing, PG22, Retainer moving force, Test speed	Sz. Nemes	2026.03.05