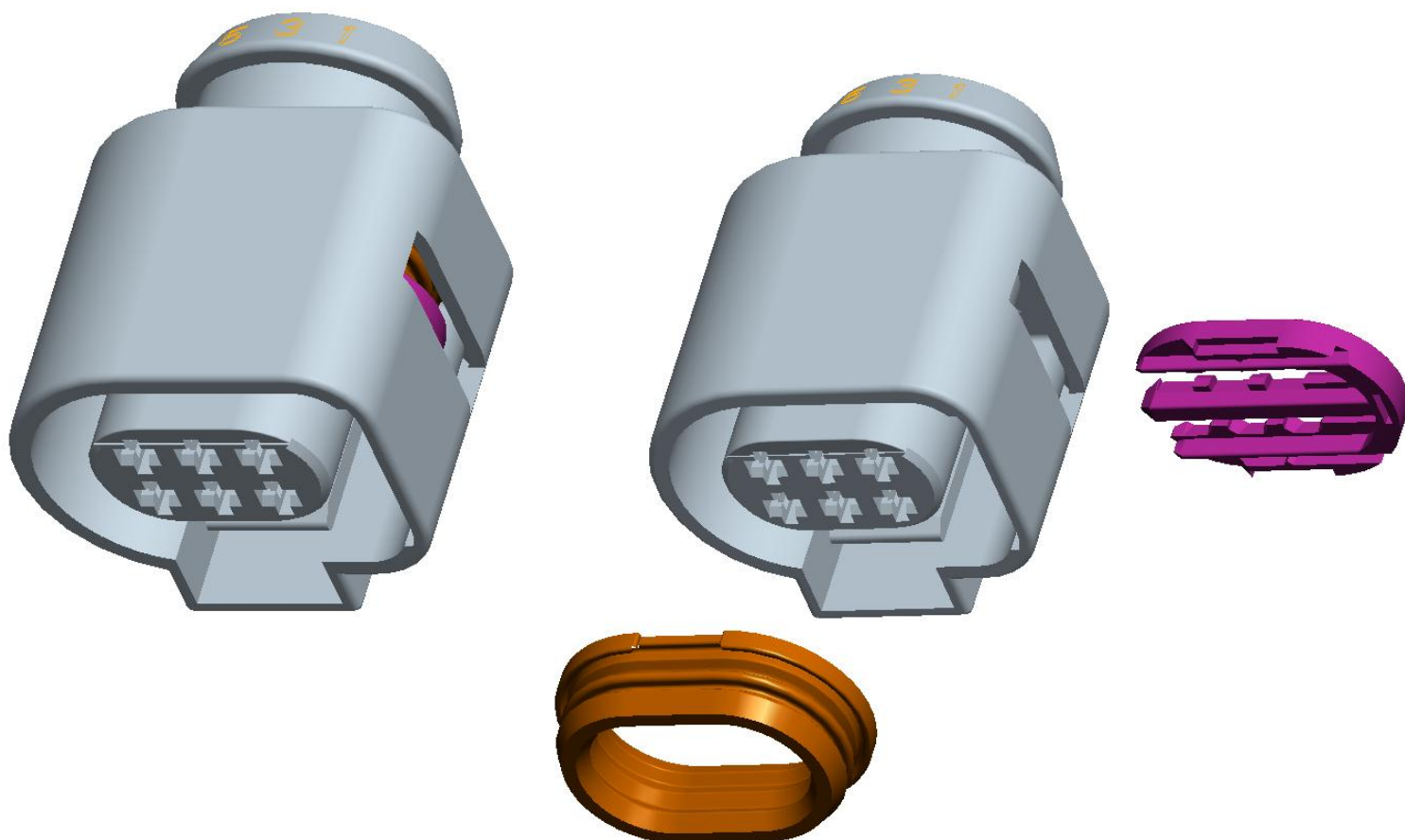


HOUSING ASSY 6 POSN MT2 REC.

Design Objectives

This specification covers the requirements for product performance, test methods and quality assurance provisions of automotive Housing Assy 6 Posn. MT2 Rec. shown in TE-Brazil product drawings. Contact TE-BR Engineering for further details



HOUSING ASSY 6 POSN MT2 REC. – TE PN 1599620-1

FIGURE 01

1. SCOPE

1.1 Content

This specification covers the requirements for product performance, test method and quality assurance provisions of:

TE P/N	TRADE MARK DESCRIPTION	WIRE RANGE (for contact only)
1599620-1	HOUSING ASS'Y 6 POS. REC. MICRO TIMER II	_____
1-1241061-1	HOUSING ASS'Y 6 POS. TAB. MICRO TIMER II	_____
964274-2	MICRO TIMER II CONTACT REC.	0,5 – 1,0 mm ²
964269-2	MICRO TIMER II CONTACT TAB.	0,5 – 1,0 mm ²
963530-1	SINGLE WIRE SEAL	1,4 – 1,9 mm
964972-1	SINGLE WIRE SEAL	1,9 – 2,4 mm

TABLE 01

1.2 Qualification

When tests are performed on the subject product line, the procedures specified in TE 109 Series Specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

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

2.1 TE Documents

- | | | |
|----|-----------|---|
| a) | 109-1 | General Requirements for Test Specifications; |
| b) | 108-18055 | Product specification for Micro Timer II Rec; |
| c) | 114-18081 | Application specification for Micro Timer II Rec; |
| d) | 108-1067 | Product specification for Micro Timer II Tab; |
| e) | 114-18082 | Application specification for Micro Timer II Tab; |
| f) | 411-37057 | Instruction Sheet. |

2.2 Other Documents

- a) VW 75174 LV 214 Motor vehicle connectors, connectors, test specification Rev. 2010/04

3. QUALITY ASSURANCE PROVISIONS

3.1 Sample Preparation

The test samples to be used for the tests shall be prepared by randomly selecting them from the current production, and the contacts shall be crimped in accordance with the relevant Application Specification. No sample shall be reused, unless otherwise specified.

3.2 Test conditions

All the tests shall be performed under the combination of the following test conditions, unless otherwise specified.

Room Temperature: $23 \pm 5^{\circ}\text{C}$
Relative Humidity: 45-75%
Atmospheric Pressure: 860 –1060 mbar

4. REQUIREMENTS

4.1 Design and Construction

Products shall be according to design, construction and physical dimensions specified on the applicable drawings.

4.2 Materials

According to product drawing.

4.3 Ratings

- a) Working Temperature: -40°C to 130°C ;
- b) Operating Voltage: 24Vdc;
- c) Continuous Current: Micro Timer II – 10A Max (see TE SPEC 108-18055);
- d) Vibration Level: On body or chassis.

4.4 Performance and Test Description

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Tables. All tests are performed at ambient environmental conditions per VW 75174 (LV 214) specification (Motor vehicle connectors, connectors, test specification Rev. 2010/04 - Volkswagen) unless otherwise specified.

4.5 Test Requirements and Procedures Summary

CONNECTOR ELECTRICAL, MECHANICAL AND ENVIRONMENTAL TESTS			
ITEM	TEST	REQUIREMENTS	PROCEDURES
4.5.1	PG0 Inspection of as-received condition	Visual inspection; Contact resistance 15mΩ. Insulation resistance > 100MΩ.	VW SPEC 75174 – Rev. 04/2010.
4.5.2	PG1 Dimensions	The measured values must correspond to the release drawing or product specifications.	VW SPEC 75174 – Rev. 04/2010.
4.5.3	PG3 Material and surface analysis, housings and single-wire seals	Confirmation that all materials are in conformance with applicable legal requirements and the drawings.	VW SPEC 75174 – Rev. 04/2010.
4.5.4	PG4 Contact engagement length	Contact engagement length: >1,00 mm for all contact points (see figure 03 – Appendix B).	VW SPEC 75174 – Rev. 04/2010.
4.5.5	PG6 Interaction between contact and housing	Visual inspection; Drop Test; TPA closing force with correct assembled terminals: < 50N; TPA open force with correct assembled terminals: > 5,0N; TPA closing force with one improperly inserted terminal: >60N.	VW SPEC 75174 – Rev. 04/2010.
4.5.6	PG7 Handling and functional reliability of the housing	Visual inspection; Connector to Connector Engagement Force: 75N maximum (with all the inserted terminals); Locked Connector Disengagement Force: 100N minimum.	VW SPEC 75174 – Rev. 04/2010.
4.5.7	PG8 Insertion and retention forces of the contact parts in the housing	Visual inspection; Terminal to Connector Engagement Force: For terminal Micro Timer II with size 1,0mm ² : 15N maximum; Terminal from Connector Extraction Force Primary Lock Only: For terminal Micro Timer II with size 1,0mm ² : 40N minimum; Secondary Lock Only: For terminal Micro Timer II with size 1,0mm ² : 55N minimum.	VW SPEC 75174 – Rev. 04/2010.

TABLE 02

CONNECTOR ELECTRICAL, MECHANICAL AND ENVIRONMENTAL TESTS			
ITEM	TEST	REQUIREMENTS	PROCEDURES
4.5.8	PG9 Insertion inclination/misuse safe	Examination is performed using CAD (see figure 02 – Appendix A).	VW SPEC 75174 – Rev. 04/2010.
4.5.9	PG13 Housing influence on the derating	Visual inspection; 100mA maximum;	VW SPEC 75174 – Rev. 04/2010.
4.5.10	PG17 Dynamic load	Visual inspection; Contact resistance 15mΩ; Vibration: Severity 2 with tin plated contacts: There shall be no loss of electrical continuity, i.e., resistance greater than 7 Ohms for longer than 1μs, throughout the entire Mechanical Shock and Vibration with Thermal Cycling Tests; Test samples shall not have any base metal apparent at the contact surface, or evidence of fretting corrosion, when viewed under 10 to 40X magnification.	VW SPEC 75174 – Rev. 04/2010.
4.5.11	PG20 Climate load of the housing	Visual inspection; Insulation resistance > 100MΩ; Drop test.	VW SPEC 75174 – Rev. 04/2010.
4.5.12	PG21 Long-term temperature aging	Visual inspection; Contact resistance 15mΩ; Drop test; Terminal from Connector Extraction Force Secondary Lock Only: For terminal Micro Timer II with size 1,0mm ² : 55N minimum.	VW SPEC 75174 – Rev. 04/2010.
4.5.13	PG22 Chemical resistance	Visual inspection; Insulation resistance > 100MΩ; There shall be no corrosion, discoloration, cracks, etc., which could affect the functionality of the part. Swelling or physical distortion shall not exceed the tolerances specified on the part drawing.	VW SPEC 75174 – Rev. 04/2010
4.5.14	PG23 Water leak tightness	Visual inspection; Insulation resistance > 100MΩ; No medium must penetrate into the connector.	VW SPEC 75174 – Rev. 04/2010.

TABLE 03

CONNECTOR ELECTRICAL, MECHANICAL AND ENVIRONMENTAL TESTS			
ITEM	TEST	REQUIREMENTS	PROCEDURES
4.5.15	PG28 Locking noise	. For this purpose, the signal-to-noise ratio between the locking noise and ambient noise must be at least 7 dB(A).	VW SPEC 75174 – Rev. 04/2010.
4.5.16	PG29 Retention force of the blind plugs	1,5 bar maximum.	VW SPEC 75174 – Rev. 04/2010.

TABLE 04

WARNING!

Tested products shall be conforming to the requirements of the visual inspection without physical damage, also meeting the requirements of the additional tests specified in the sequence tests specified in table 5.

4.6 Test Sequence

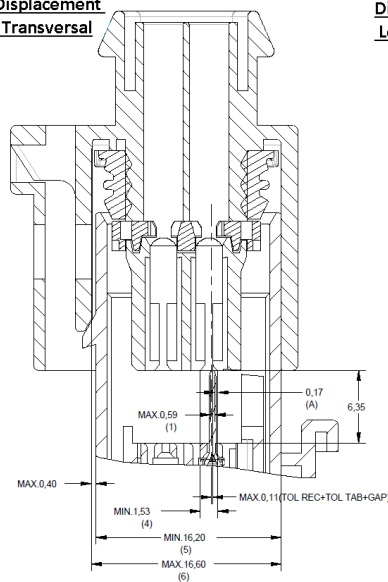
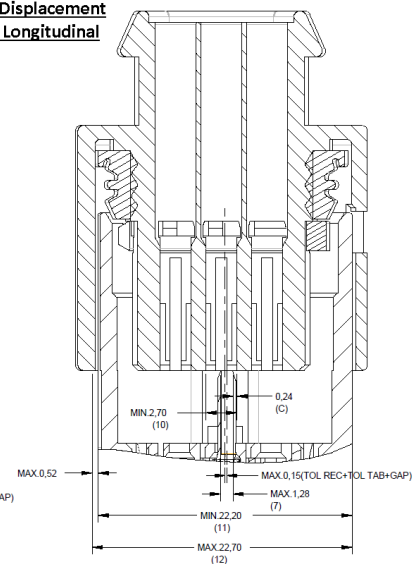
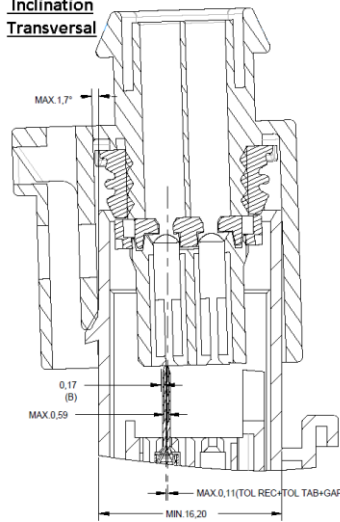
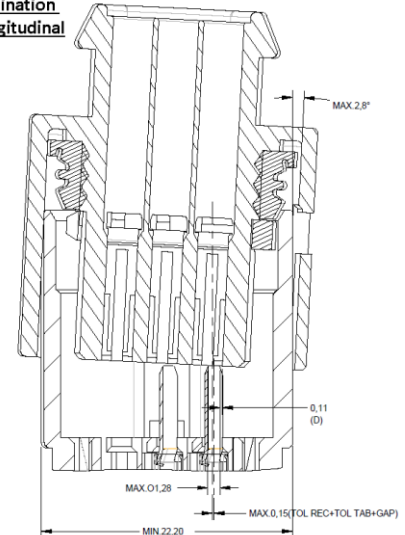
TEST	TEST GROUP															
	PG0	PG1	PG3	PG4	PG6	PG7	PG8	PG9	PG13	PG17	PG20	PG21	PG22A/B	PG23	PG28	PG29
	TEST SEQUENCE															
Visual Examination	1; 4	1; 3	1; 3	1; 3	1; 4	1; 5	1; 4	1; 3	1; 3	1; 7	1; 6	1; 9	1; 5	1; 7	1; 3	1; 3
Contact resistance	2									2; 5		2; 5				
Insulation resistance	3									3; 6	2; 4	3; 6	2; 4	2; 6		
Dimensions		2														
Material Test			2													
Contact engagement length				2												
Function of the primary lock and secondary lock					2											
Drop test					3						5	7				
Connector Polarization						2										
Connector to Connector Engagement Force						3										
Locked Connector Disengagement Force						4										
Terminal to Connector Engagement Force							2									
Terminal from Connector Extraction Force							3					8				
Insertion inclination								2								
Maximum Current Rating									2							
Vibration										4						
Temperature Humidity Cycling											3			3		
Thermal Aging												4		4		
Resistance to agents chemical													3			
Water leak tightness														5		
Locking noise															2	
Retention force of the blind plugs																2

TABLE 05


WARNING!

The numbers in the columns indicate the sequence in which the tests are performed.

Appendix A

**Displacement
Transversal****Displacement
Longitudinal****Inclination
Transversal****Inclination
Longitudinal****Transversal**(2) $\Phi 0,05$ TAB CAVITY POS. TOLERANCE(3) $\Phi 0,1$ REC CAVITY POS. TOLERANCE

1	TAB CHAMFER	$0,39 \pm 0,2$ (ESTIMATED)
2	TERMINAL TAB POS.	$\Phi 0,05$ 0,025
3	REC CAVITY POS.	$\Phi 0,1$ 0,05
4	REC CAVITY CHAMFER	$1,715 \pm 0,185$
5	CONN. TAB WIDTH	$16,25 \pm 0,05$
6	CONN. REC WIDTH	$16,55 \pm 0,05$
	TOLERANCE SUM	0,56

$$Z1 = \sqrt{0,2^2 + 0,025^2 + 0,05^2 + 0,185^2} = 0,316$$

$$Z2 = 0,05 + 0,05 = 0,1$$

$$Z = Z1 + Z2$$

$$Z = 0,316 + 0,1$$

$$Z = 0,416$$

$$\text{DIFFERENCE: } 0,56 - 0,416 = 0,144$$

$$(A) \text{ (WORST CASE)} = 0,17$$

$$(A) \text{ (DIFFERENCE)} = 0,17 + 0,144 = 0,314$$

$$(B) \text{ (WORST CASE)} = 0,17$$

$$(B) \text{ (DIFFERENCE)} = 0,17 + 0,144 = 0,314$$

Longitudinal(8) $\Phi 0,05$ TAB CAVITY POS. TOLERANCE(9) $\Phi 0,1$ REC CAVITY POS. TOLERANCE

7	TAB CHAMFER	$1,08 \pm 0,2$ (ESTIMATED)
8	TERMINAL TAB POS.	$\Phi 0,05$ 0,025
9	REC CAVITY POS.	$\Phi 0,1$ 0,05
10	REC CAVITY CHAMFER	$2,75 \pm 0,05$
11	CONN. TAB WIDTH	$22,25 \pm 0,05$
12	CONN. REC WIDTH	$22,6 \pm 0,1$
	TOLERANCE SUM	0,475

$$Z1 = \sqrt{0,2^2 + 0,025^2 + 0,05^2 + 0,05^2} = 0,213$$

$$Z2 = 0,05 + 0,1 = 0,15$$

$$Z = Z1 + Z2$$

$$Z = 0,213 + 0,15$$

$$Z = 0,363$$

$$\text{DIFFERENCE: } 0,475 - 0,363 = 0,112$$

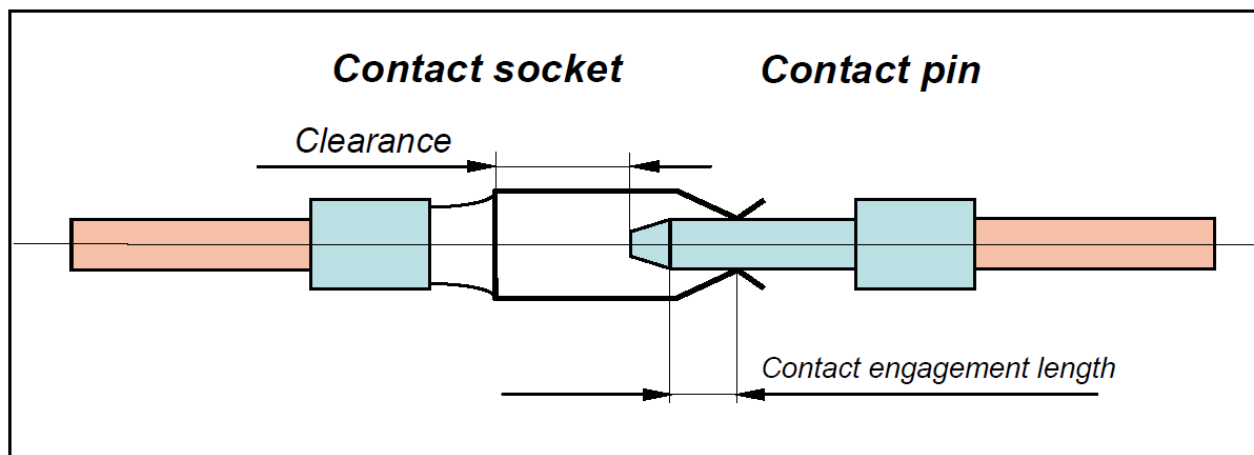
$$(C) \text{ (WORST CASE)} = 0,17$$

$$(C) \text{ (DIFFERENCE)} = 0,17 + 0,112 = 0,282$$

$$(D) \text{ (WORST CASE)} = 0,11$$

$$(D) \text{ (DIFFERENCE)} = 0,11 + 0,112 = 0,222$$

Appendix B



Contact engagement length of a pin-socket pair - VW 75174 LV 214 Rev. 2010/04 – PG 04
FIGURE 03

History					
Rev.	Date	Description	Prepared	Checked	Approved
A	02-may-2013	Released	G. Oliveira	N. Santos	D. Oliveira