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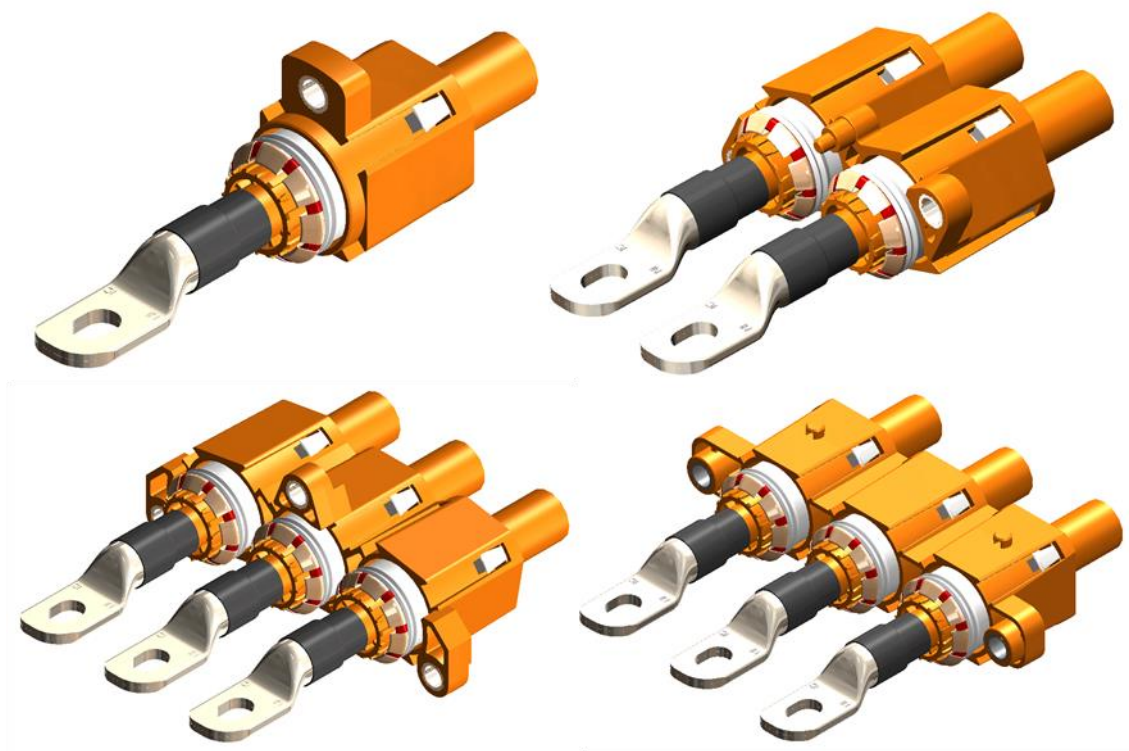
Distributed to 1st W/H Dvlp. 2st W/H Dvlp. Electronics Connector W/H Manufact. HIB PS Plan. YNA R&D YKE YEL-HH P.M. Only WHQ H.M. Only WHQ EDS HIB Prod.Eng. Wire P.S. Only EDS R&D KSG Eng'g	Engineering Standard	Establishment Revision Termination	3	Notice	Issued Date 2019/03/18 (year/month/day)	Approved D.Schimansky	Checked Z.Loncar	Checked -	Prepared B.Ivasovic
					No.	2019-03-18	2019-03-18		2019-03-18
Please be notified that an Engineering standard is (established, revised, terminated) as follows.									
According to this notice, please (replace, correct, add) within 2 days after receiving it.									
In case of replacement or termination, please return the old standard to us by / . (month, day)									
		Engineering Standard Name			YPES NO.		Date		
OLD		YPT-E RS LV-216 SYSTEM CONNECTOR, REV 2			15-1295E		2017/01/09		
NEW		YPT-E RS LV-216 SYSTEM CONNECTOR, REV 3			15-1295E		2019/03/18		
Keynotes									
Official version of Handling Manual									
for YPT-E RS LV-216 SYSTEM CONNECTOR, REV 3									
Reason Clamp updated to last version & other minor changes									

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YAZAKI



Assembly Manual for YPT-E RS LV-216 SYSTEM CONNECTOR



Prepared B. Ivasovic	Sign	Checked Z. Loncar	Sign	Approved D.Schimansky	Sign		
Date 18.03.2019.		Date 18.03.2019.		Date 18.03.2019.		Doc.No. YPES-15-1295E	Rev. 3
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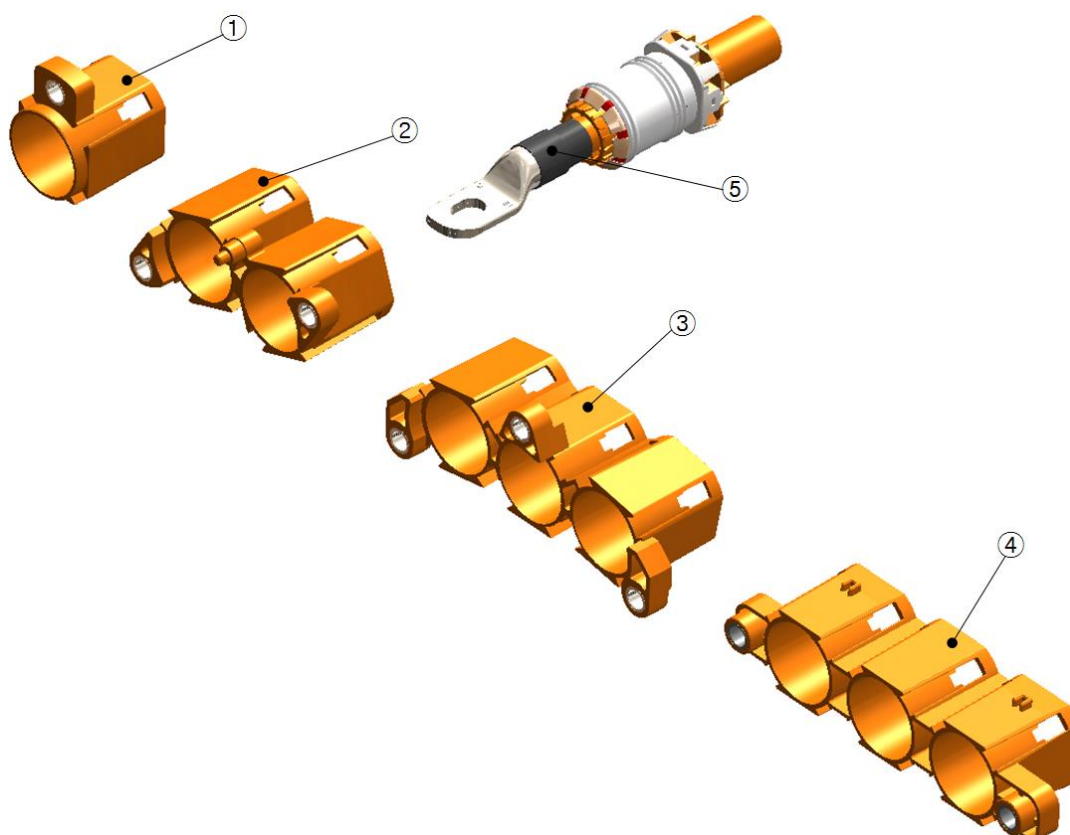
REVISION	DESCRIPTION	NAME	DATE
0	Creation	I. Trgovcic	08.05.2013
1	Added Recommended production equipment appendix and minor assembly changes	I. Trgovcic	08.12.2014
2	New Template and minor changes	I. Trgovcic	09.12.2016
3	Clamp updated to last version & other minor changes	B. Ivasovic	18.03.2019

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2 Product Overview

This handling manual contains the guidelines for the assembly and application of the YPT-E RS LV-216 SYSTEM CONNECTOR.

2.1 Exploded View



Picture 1: Connector exploded view 

2.2 Bill of materials

No.	PART NAME	YAZAKI PART NO.	APPLICABLE WIRE SIZE (Coroplast)	QTY 1P	QTY 2P	QTY 3P	MATERIAL (Color, Plating)
1a	CONNECTOR HOUSING Code "U"	7225-5576-50 	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV	1			PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				
1b	CONNECTOR HOUSING Code "V"	7225-5575-50 	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV	1			PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				
1c	CONNECTOR HOUSING Code "W"	7225-5574-50	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV	1			PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				
1d	CONNECTOR HOUSING Code "PLUS"	7225-5573-50 	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV	1			PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				

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No.	PART NAME	YAZAKI PART NO.	APPLICABLE WIRE SIZE (Coroplast)	QTY 1P	QTY 2P	QTY 3P	MATERIAL (Color, Plating)
1e	CONNECTOR HOUSING Code "MINUS"	7225-5572-50 [△]	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV	1			PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				
1f	CONNECTOR HOUSING Code "ZERO"	7225-5577-50	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV	1			PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				
2	CONNECTOR HOUSING 2P*	7225-5977-50 [△]	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV		1		PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				
3	CONNECTOR HOUSING 3P*	7225-5976-50 [△]	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV			1	PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				
4	CONNECTOR HOUSING 3P*	7125-5784-50 [△]	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV			1	PA66-GF30 (Orange)
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				
5	CONNECTOR ASSY CLAMP VERSION	7285-1195-51 [△]	FHLR2GCB2G16/0,21 T180 0,6/0,9 kV	1	2	3	N/A
			FHLR2GCB2G25/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G35/0,21 T180 0,6/0,9 kV				
			FHLR2GCB2G50/0,21 T180 0,6/0,9 kV				

Table 1: Component part numbers and materials for YPT-E RS LV-216 system eyelet connector clamp version.

*Note: 1P, 2P and 3P housings shown in Picture 1 and Table 1 have the same mounting procedures for their respective 1P, 2P and 3P assemblies, with the quantities shown in Table 1.

This component list might not contain all the YPT-E RS housings that can be affected by this handling manual, and therefore it can be valid for other type of YPT- E RS housings. For details see specific R drawing.

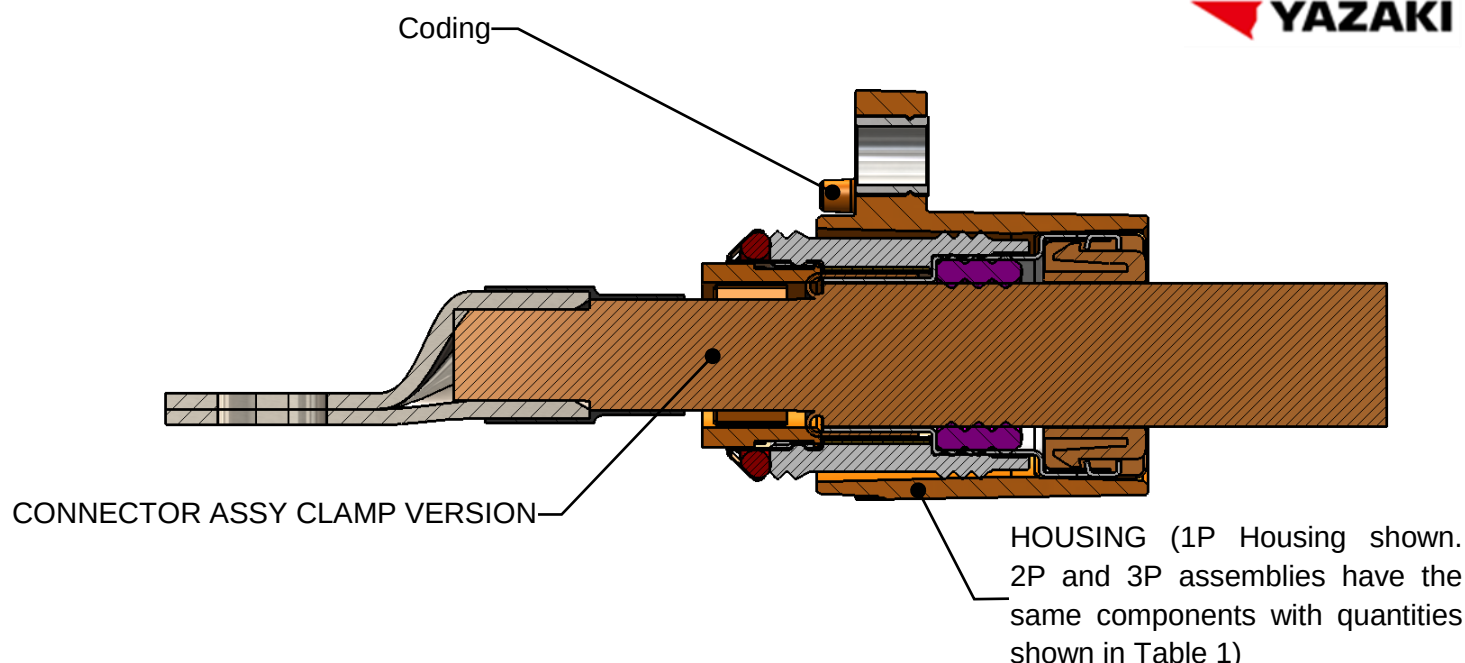
2.3 Associated Documents

- YAZAKI DRAWINGS

Housings	See related drawings for part numbers in Table 1
Subassembly	7285-1195-51:M [△]
Eyelet terminal	See supplier drawings (For part numbers see Table 1)

- SPECIFICATIONS: DPZ13-039-11-036, June 2014

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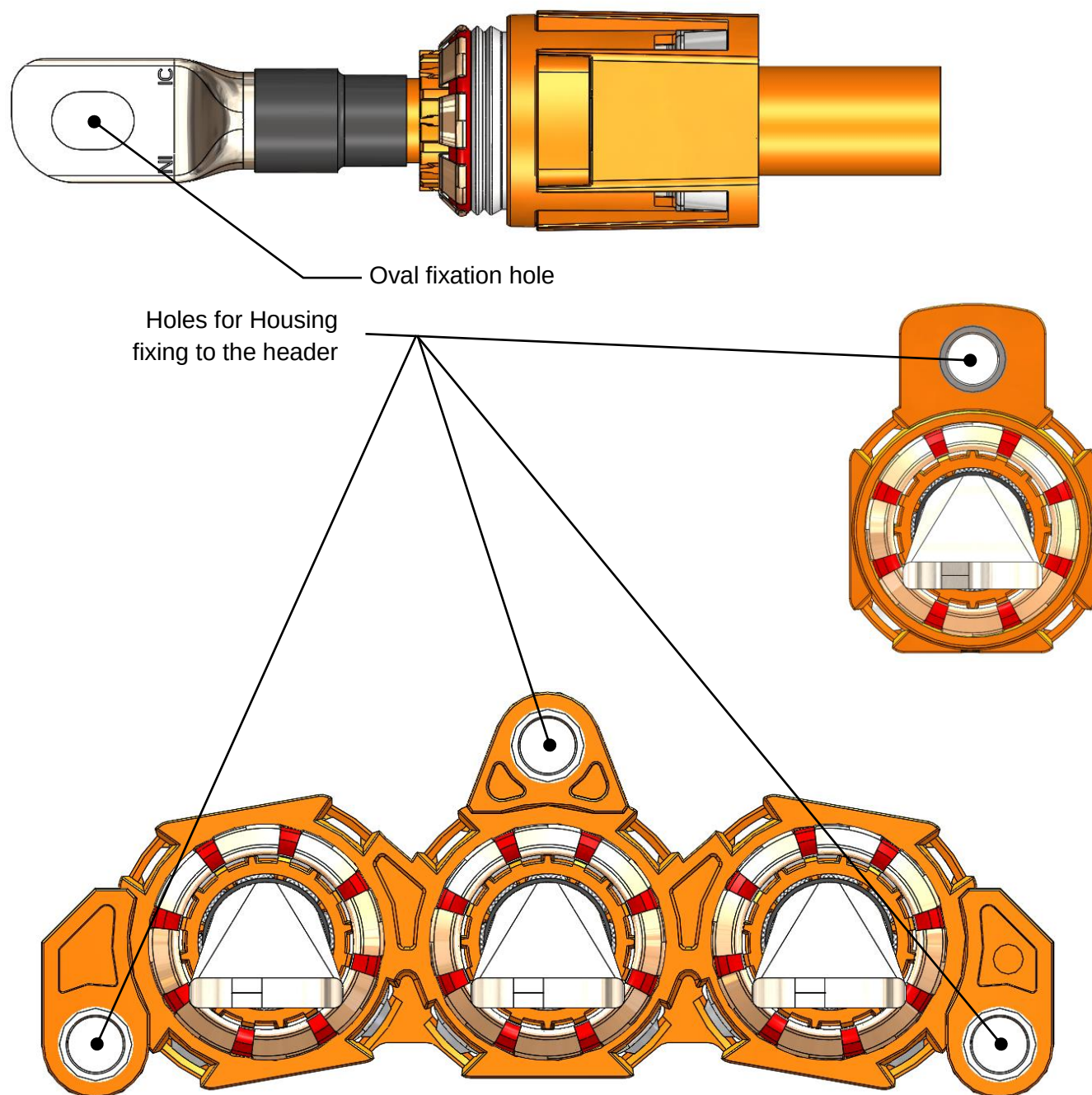
Picture 2: Connector cross section (1P assembly) ⚠

Part description and functions

PART	FUNCTION / DESCRIPTION
Housing	- Mechanical protection and pull out strength of the entire product - Coding as part of Housing Poka-yoke pins with different arrangements, for proper installation and prevention of miss mating. For the definition of coding and versions for the 1P assembly, See YAZAKI-Drawing: for 1P assembly 7225-5640-50 ETC., for 2P assembly 7285-0021-50 or for 3P assembly 7285-0029-50 and 7225-5784-50 ⚠. For interface definition check notes at mentioned drawings. ⚠ Note: This assembly list might not contain all the YPT-E RS subassembly drawings that can be affected by this handling manual. For details see your specific R drawing.
Connector assembly clamp version	- For detail information see handling manual YPES-15-1296E

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2.3.1 Fixation/installation features



Picture 3: Fixation features ²/₃

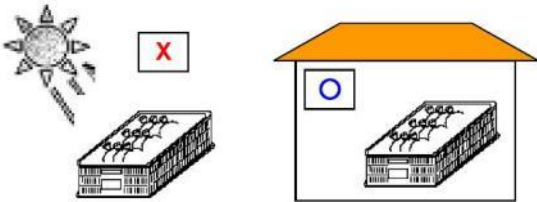
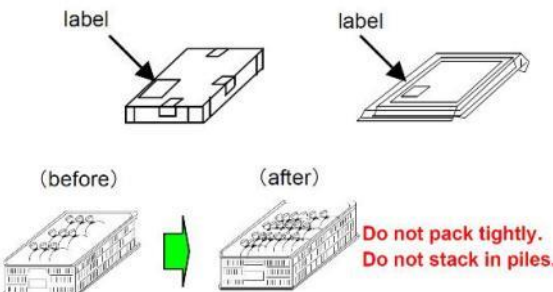
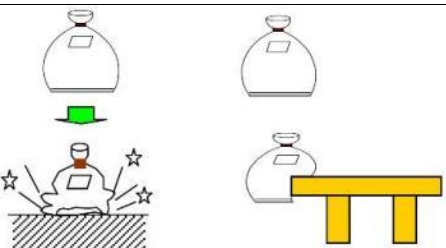
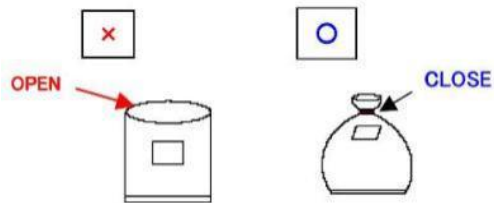
FEATURE	DESCRIPTION / FUNCTION
Oval fixation hole	Easier Eyelet terminal assembling and tolerance absorption
Holes for housing fixation to the header device	Provides fixation to the header

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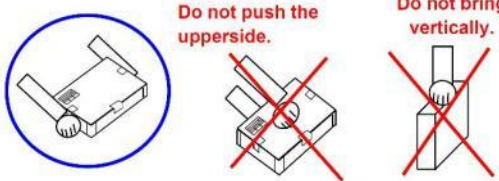
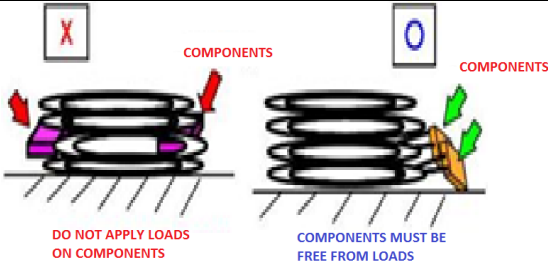
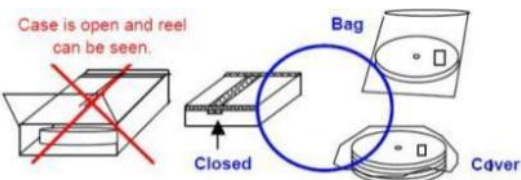
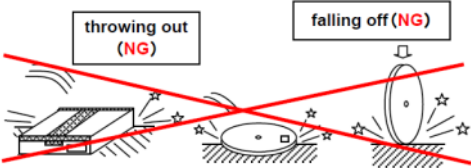
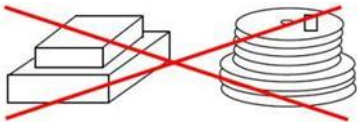
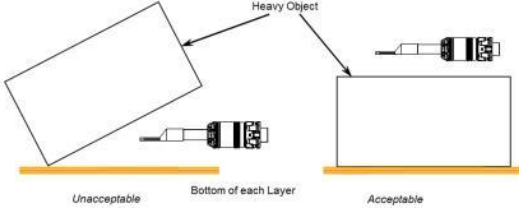
3 Handling of Components

3.1 Handling and Storage of single components

<u>Plastic housing</u> For part numbers see Table 1 or respective R drawing. <u>Metal housing</u> For part numbers see Table 1 or respective R drawing.	<i>When packing, isolate parts to prevent rubbing, or use corrugated layer dividers.</i>
---	---

No.	CONTROL PROCESS	ILLUSTRATION	INFLUENCE ON QUALITY
1	1) Please store plastic and carton cases used for storage at room temperature, avoiding moisture and direct sunlight. 2) Please equalize components temperature with room temperature.		1) There are risks of breakage and discoloration due to component material degradation. 2) There are risks of damage on single components.
2	1) Please turn the label on packages upward during storage. 2) Please do not apply pressure to the components in bag packages during storage. Please do not replace plastic cases and carton boxes with storage boxes.		There are risks of incorrect position of child parts, deformation or other problems.
3	When carrying packaging bags, please pay attention in order to avoid damage or impact to the products.		There are risks of deformation, breakage, incorrect position of child parts or loss of parts.
4	Please put a cover or close the bag to prevent dust accumulation.		There is a risk of contact defect due to adherence of dust. There is also a possibility of a sealing defect.

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No.	CONTROL PROCESS	ILLUSTRATION	INFLUENCE ON QUALITY
5	When carrying boxes or trays, please hold the underside of the container with both hands. Do not position the box vertically and not push the upper side of the box.	 Do not push the upside. Do not bring vertically.	There are risks of deformation, damage or loss of parts.
6	Please store your products in a way that does not apply a load on the components.	 COMPONENTS COMPONENTS DO NOT APPLY LOADS ON COMPONENTS COMPONENTS MUST BE FREE FROM LOADS	There are risks of deformation due to the pressure from the weight and risks of breakage due to shock.
7	1) For trays of terminals, please limit the height of tray packages piled-up up to 10 levels and turn the label side up during storage.		There are risks of deformation to the terminals and damage to the packaging
8	Please cover the containers or put them in a bag to prevent dust accumulation during storage.	 Case is open and reel can be seen. Bag Cover Closed	There are risks of contact defect due to adherence of dirt or dust to the terminals.
9	When carrying terminals, please pay attention in order to avoid damage or impact to the products.	 throwing out (NG) falling off (NG)	There are risks of deformation to the terminals
10	Please do not pile up different sized boxes.		There are risks of deformation of terminals and breakage of packaging
11	To prevent damages, standard packaging and handling actions and procedures have to be taken. Any heavy and / or bulky objects shall be placed on the bottom of the carton or divider to prevent weight of such item from being applied to the Inlet	 Heavy Object Unacceptable Bottom of each Layer Acceptable	There are risks of damaging the Type2 Connector assembly

Extra care shall be taken to prevent wire harnesses tangling, which may damage the connector when wire harness is removed from the carton at the vehicle assembly.

After transportation or storage, the connector shall be checked for damages.

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3.2 Notices for packing of wire harenesses

Like many fragile part the Connector may be damaged if external force is applied to the Connector during transportation or storage. It is necessary to take into consideration the minimum of packaging standard.

Extra care must be taken to prevent that dust is attached at sealing area of Unit Seal. Unit seal must have 7% of lubricating fluid content before final product packaging . Option for protection could be covering/wrapping the eyelet connector with the bubble foil which shall be attached until connector is assembled in the vehicle (see picture 4).



Picture 4: Eyelet connector covering/wrapping and placement in the box

To prevent damages, standard packaging and handling actions and procedures have to be taken.

Any heavy and / or bulky objects shall be placed on the bottom of the carton or use dividers to prevent weight of such item from being applied to the Connector (see Picture 4).

Special attention shall be taken when the wire harness is packed in order to distribute weights equally from upper layer harness to the lower layer harnesses. The Connector shall be positioned outside or in the center of the harness bundle, to prevent the weight of the harness from being applied to the Connector.

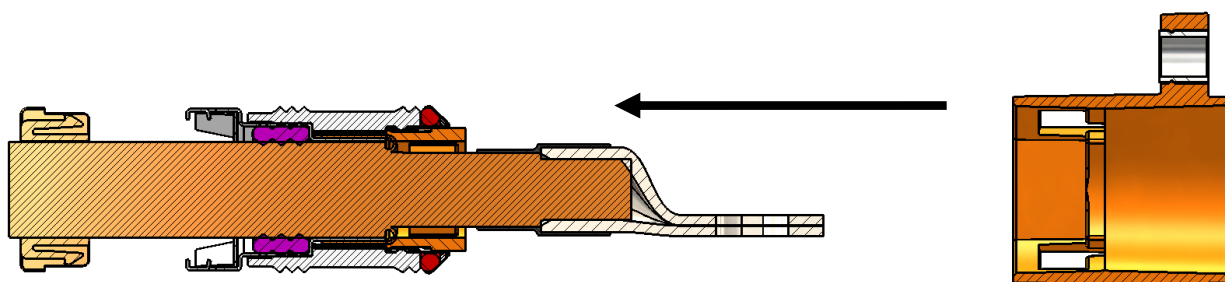
Wire harness bundle size must fit in the carton to prevent shifting of the wire harness during transportation or storage.

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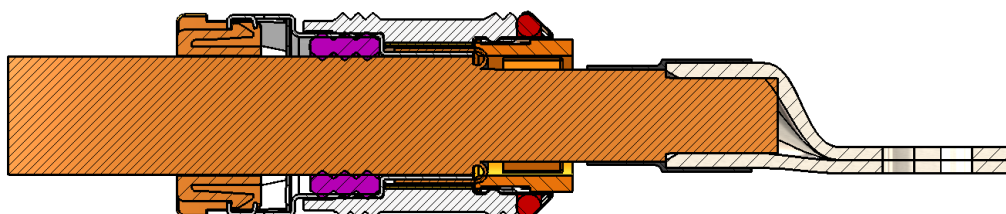
4 Assembly instructions, checkpoints and judgment criteria:

Use gloves during the entire assembly process. 

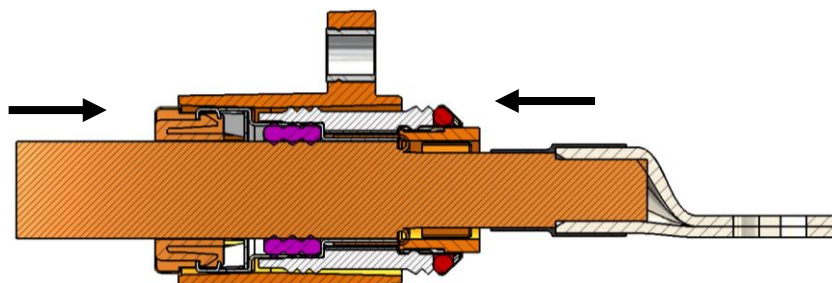
4.1 Housing assembly



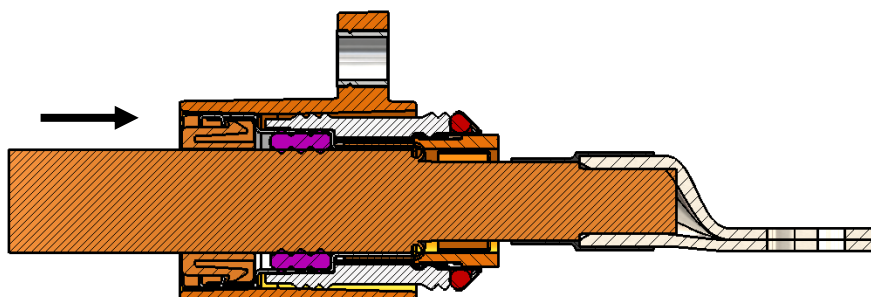
Picture 5a 



Picture 5b: Rubber stopper preset assembly  



Picture 6a: Rubber stopper preset (housing assembled)  



Picture 6b: Rubber stopper set assembly (housing assembled)  

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Part:

- Metal housing

For part numbers see Table 1 or respective R-drawing. In case of assembly with aluminum housings when using an automatic or semiautomatic insertion tool, rubber stopper should be inserted afterwards (Picture 5a). ⚠

- Plastic housing

For part numbers see Table 1 or respective R-drawing. In case of assembly with plastic housings rubber stopper comes in preset position. (Picture 5b) ⚠ When using an automatic or semiautomatic insertion tool, rubber stopper can be in set position. ⚠

Specification:

Housing is pushed from the front (eyelet terminal side) until it clicks, and gets assembled with the shield sleeve lances on **connector assembly clamp version**. (Picture 6a and 6b). ⚠

Inspection:

Check if surface of Unit seal is oily (moist) on **connector assembly clamp version** before assembly ⚠. Unit seal must have 7% of lubricating fluid content before final product packaging ⚠.

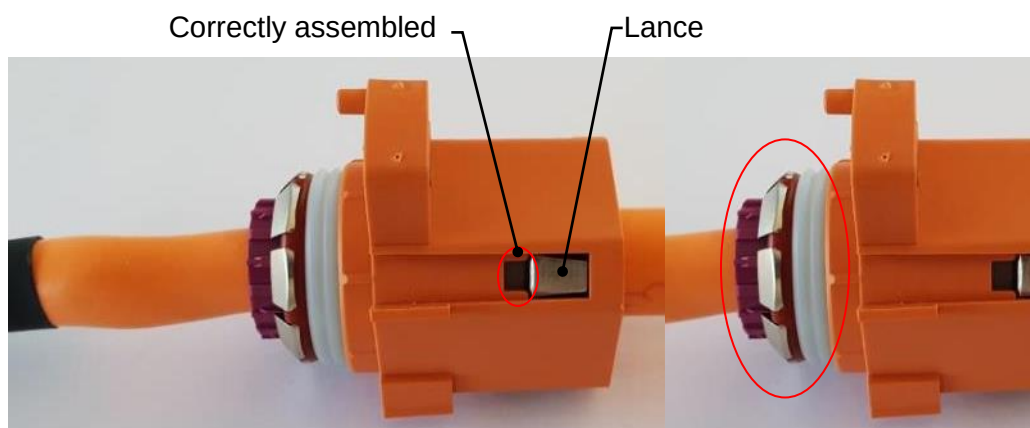
4.2 Rubber stopper assembly

Part:

Rubber stopper (For part number see Table 1)

Specification:

Push rubber stopper until all the lances click on the shield sleeve, and get fully assembled. (Picture 6b) ⚠



Picture 7a & 7b: Housing correctly inserted ⚠

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Inspection:

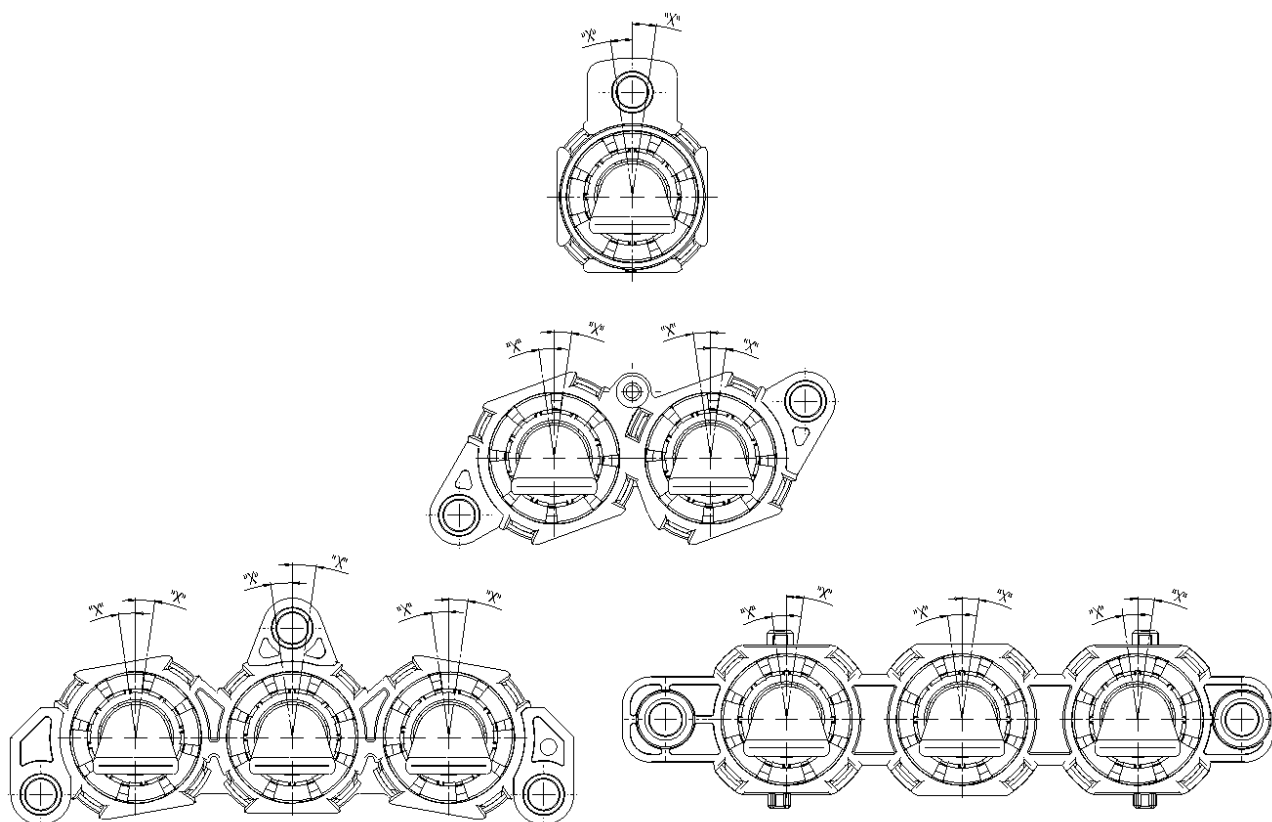
The housing and unit seal are correctly assembled if the unit seal is visible in area shown in the Picture 7a and if unit seal two lips are visible as shown in Picture 7b.

Cautions:

The housing or unit seal are incorrectly assembled if the unit seal lips are not visible.

4.3 Crimp and dimensional inspection

4.3.1 Eyelet Terminal angle deviation

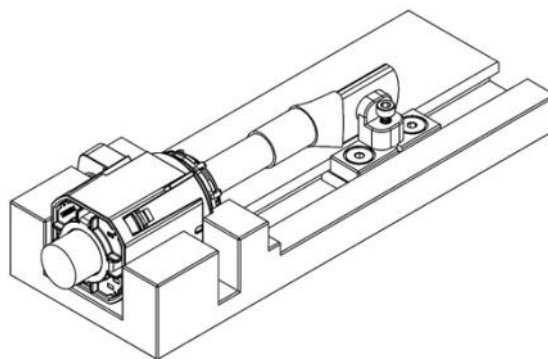


Picture 8: Eyelet Terminal angle deviation $\triangle 3$

Maximum angle deviation tolerance must be within $\pm 8^\circ$. The actual angle of the eyelet crimped on the wire depends of the application and it may differ from the ones shown on Picture 8. (for reference only, correct orientation is shown on W/H drawing).

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4.3.2 Crimp and Dimension inspection gauge



Picture 9: Eyelet terminal position gauge ⚠

The purpose of this gauge is to assure the main dimensions are between acceptable boundaries, before final checking.

This picture shows example of the gauge for the 1P connector assembly.

Similar to be used for 2P and 3P assemblies and depends on respective W/H drawing. ⚠

How to use

Insert the eyelet connector assembly in parallel against gauge surface.

Acceptable:

Eyelet connector assembly can be inserted smoothly.

Unacceptable:

Eyelet connector assembly cannot be inserted at all.

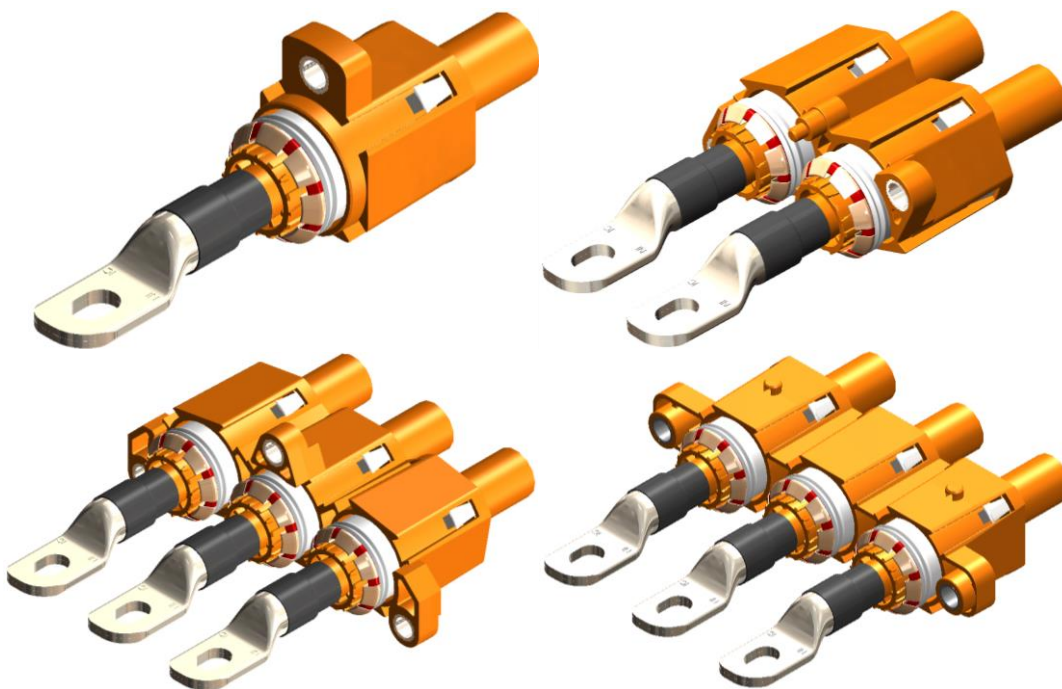
Inspection timing

Inspect every eyelet connector assembly at the beginning and at the end of each production lot. (Call the maintenance for adjustment when trouble occurs.)

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4.4 Visual inspection

Carry out visual inspection of the entire assembly. Assure that wire with Eyelet Terminal is not bent. Assure that unit seal is in correct position. Before packaging and prior to mounting, check position of the Unit seal. When cable bent extensively (the terminal side-end) there is a probability that Unit seal comes out from the Shield terminal and loses the main sealing function (See picture 10).



Picture 10: Assembled connector appearance (For reference only) 

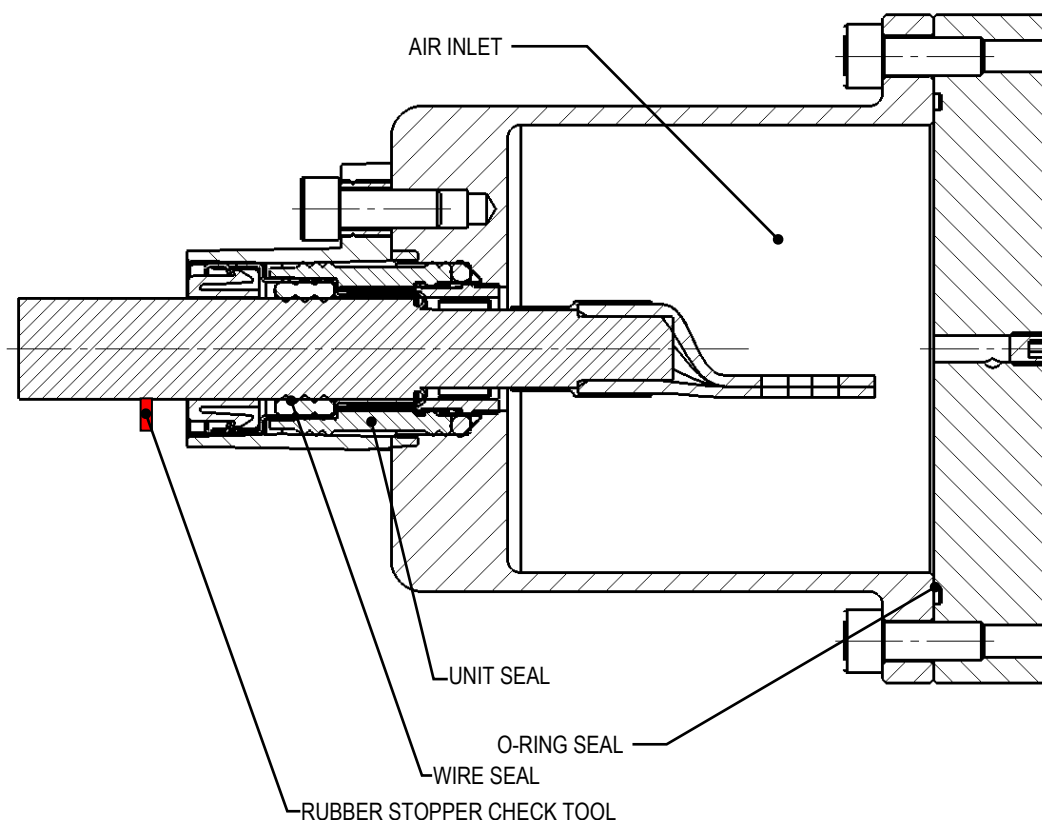


Picture 11: Improper assembly due to wire bending 

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4.5 End of line test

4.5.1 Air leak test



Picture 12: Air Leak test 

Equipment:

Air leakage device (2 pieces)

Caution:

- If rubber stopper is not present the test will fail because of the Rubber stopper check tool (see picture 12)
- The products which failed at air leak test should be scrapped. 
- 100% inspection should be taken. 

PRESSURE TEST:

Measuring method:

- Applied pressure (on one device): 50 kPa
- Applied pressure duration: until pressure in 2nd device achieves the same value as 1st.
- Observe pressure value during 30 s after both devices reach 50 kPa.
- If pressure drops less than 5 kPa, test is judged as passed.

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4.5.2 Insulation resistance test

Equipment:

Insulation resistance test device

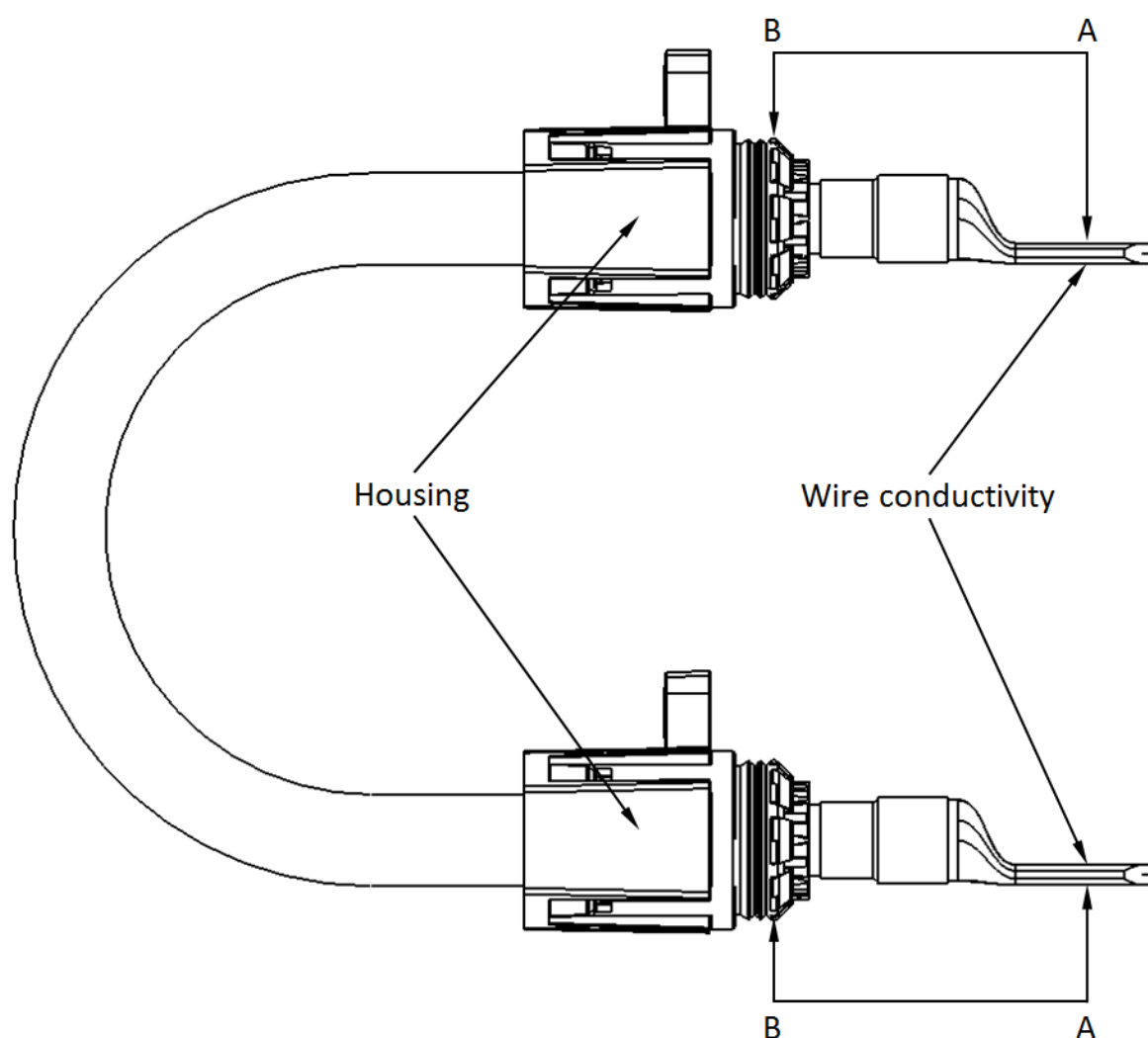
Measuring method:

- Measure between A and B.
- $U=500\text{ V DC}$

Requirement: $R=200\text{ M}\Omega\text{ MIN}$

Caution:

- The products which failed at insulation resistance test should be scrapped.
- 100% inspection should be taken.



Picture 13: Insulation resistance test 

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4.5.3 High Voltage withstand test

Equipment:

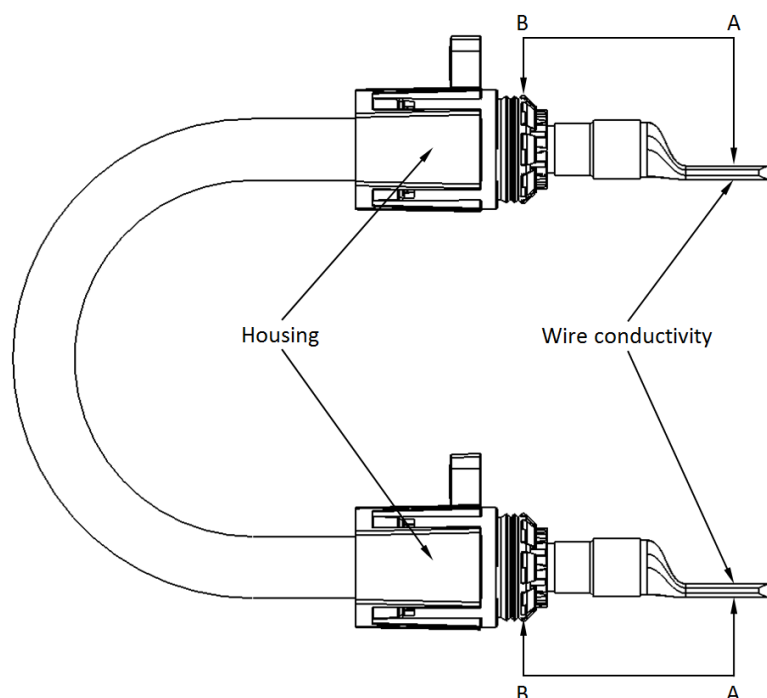
Voltage resistance test device

Measuring method:

- Measure between A and B
- Requirement :
 - U=5000 V AC – applied for 10 sec. ⚠
 - maximum current leakage 10mA. ⚠
- Neither dielectric breakdown nor flashover shall occur during the test ⚠

Caution:

- The products which failed at high voltage withstand test should be scrapped.
- 100% inspection should be taken.



Picture 14: High voltage withstand test ⚠ ⚠

4.5.4 Conductor resistance test

Equipment:

- Conductivity checker
- Resistance checker

Measuring method:

- Product resistance (3 Conductivity) = Terminal Crimp resistance + cable resistance + Opposite Crimp terminal resistance
- Terminal Crimp resistance value depends on wire cross section and wire length, based on Customer specification.

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Check for conductivity

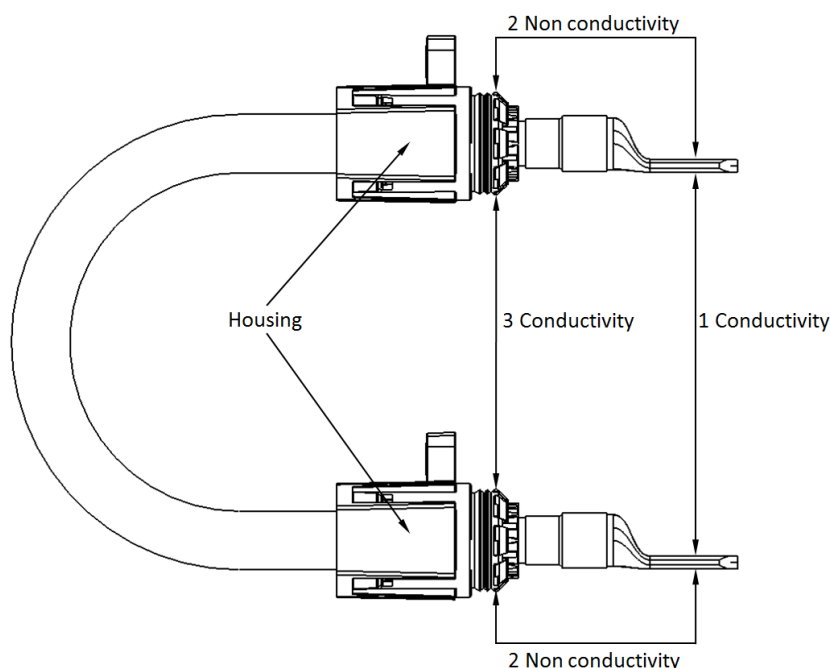
- 1 - between wire conductor and eyelet terminal
- 3 - between braided shield and shield terminal

Check for non-conductivity

- 2 - between braided shield and eyelet terminal (already checked in 4.5.2 and 4.5.3)

Caution:

- Check if conductivity is unstable, because of possibility of failure in shield crimping zone.
- The products which failed at conductor resistance & discontinuity test should be scrapped.
- 100% inspection should be taken



Picture 15: Conductor resistance & discontinuity test ⚠⚠

4.6 Final visual inspection

Carry out visual inspection of the assembled components:

- Assure that wire with Eyelet Terminal is not bent.
- Assure that are no scratches, deformations or other failures on components surfaces.
- Check if surface of Unit seal is oily (moist) ⚠.
- Unit seal must have 7% of lubricating fluid content after unwrapping of protective packaging just before assembly into housing/interface ⚠.
- Samples out of specifications must be scrapped.
- All samples decided for scrap should be analyzed in order to find out root cause of failure.
- If there is intention of reuse Housing from the scrap detailed inspection is necessary.

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4.7 Protection of unit seal

Extra care shall be taken to prevent that dust is attached at sealing area of Unit Seal. Option for protection could be covering/wrapping the eyelet connector with the bubble foil which shall be attached until connector is assembled in the vehicle (see picture 16).



Picture 16: Eyelet connector covering/wrapping and placement in the box

In order to retain the oiliness (moisture) of the unit seal, protect the connector by wrapping it as soon as all previous operations are finished, in case the product will be stored before insertion in cavity .



Picture 17: Protection of unit seal 

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