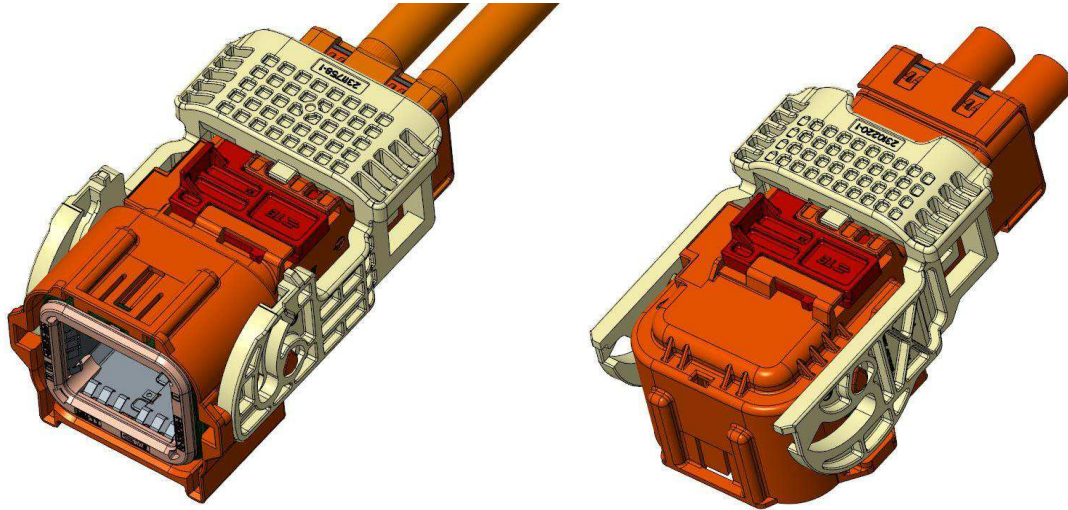

HVA1200, Connector, 2pos.

Application Specification 114-94518



1. SCOPE	5
1.1. Content	5
1.2. Processing Note.....	5
2. APPLICABLE DOCUMENTS	6
2.1. TE Connectivity Documents.....	6
2.1.1 Customer drawings	6
2.2. Specifications.....	7
2.2.1 Cable Specifications	7
2.2.2 Tested and released Cabeles	
3 SUPPLY CONDITIONS	8
3.1 Components	8
3.2 Packaging and Storage.....	10
4. APPLICATION TOOLS	10
4.1 PCON 12 terminal conductor crimp	10
4.2 Cable shielding crimp.....	10
5 ASSEMBLY INSTRUCTIONS	11
5.1 Overview of all parts should be assembled.....	11
5.2 Shielded cable and terminal assembly.....	12
5.2.1 Processing of cable.....	12
5.2.2 Components assembling before crimping.....	13
5.2.3 Contact crimping	13
5.2.4 Shielding crimping.....	14
5.3 Plug assembly.....	16
5.3.1 Cable assembly	16
5.3.2 Terminal removal	17
5.3.3 Assembly of family seal	17
5.3.4 Assembly of the cover.....	17
6 FINAL EXAMINATION.....	18
6.1 Visual Examination	18
6.2 Electrical Tests.....	18
7 LOCKING MECHANISMS WITH LEVER AND CPA.....	18
7.1 Mating to the pin header	18
7.2 Unmating from the pin header	19
7.3 Strain Relief	20
8 APPENDIX.....	21
8.1 Delta Qualification.....	21
8.1.1 Coficab FHLR91XC91	21
8.2 Data sheets.....	25

LIST OF FIGURES

Figure 1: PCON12-Crimping machine	7
Figure 2: DIE SET HVA1200 SHIELD 16mm ²	10
Figure 3: 2-pos. connector overview	11
Figure 4: Cable design and cutting length.....	12
Figure 5: Assembly sequence.....	13
Figure 6: Components configuration for contact crimp	13
Figure 7: Components structure	14
Figure 8: Inspection dimensions	14
Figure 9: Inspection dimensions	15
Figure 10: Braid extension	15
Figure 11: Braid spread	16
Figure 12: Assembly crimped cable	16
Figure 13: Family seal assembly.....	17
Figure 14: Cover assembly	17
Figure 15: Mating to the pin header	18
Figure 16: Umating from the pin header	19
Figure 17: Recommended requirement for strain relief	20

HISTORY OF CHANGES

REV	DESCRIPTION	DWN	APP	DATE
F	CORRECTION	JL	HR	25. MAY 2023
F1	Correction of Tolerances in 5.2.1	JL	HR	18. SEP 2023
G	ITEM 2.2.2 Tested Cables added	HR	HR	31. JAN 2024
G1	2.1.1 TE PN for Family Seal updated	JL	HR	06. FEB 2024
H	Note to stripping length 5.2.1 added	JL	HR	21. FEB 2024

1. SCOPE

1.1. Content

This specification describes the assembling and handling of the 2 pos. shielded HVA1200-Connector 180 deg and 90 deg design.

Required components and application tools

Processing steps for shielded cable assembly

Connector Assembly

1.2. Processing Note

The processor is responsible for ensuring the quality of the manufacturing process and the proper function of the system. The warranty and liability is excluded if quality deficiency or damages occurs by failing compliance to this specification or using not specified, not released tools and connector components.

2. APPLICABLE DOCUMENTS

The following mentioned general documents are part of this specification. In the events of conflict between the requirements of this specification and the customer drawing or of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. TE Connectivity Documents

2.1.1 Customer drawings

2 pos. HVA1200, 180° and 90° Connector	
2311753	2 pos, HVA1200, Rec Hsg 180°, Assy
2310213	2 pos, HVA1200, Rec Hsg 90°, Assy
Single Components used at 2 pos. HVA1200, 180° and 90° Connector	
2840877-4	Back Cover
G1 1-2840876-4	Family Seal
2310221-1	Inner Ferrule
2310222-1	Outer Ferrule
2310223-1	Ferrule Sleeve
1-2840575-2	PCON12 Terminal, 16 mm ² , 180 deg, Assy
1-2840573-2	PCON12 Terminal, 16 mm ² , 90 deg, Assy
Application tools	
2335500-1/-2 2348822-1/-2 with	PCON12-Crimping machine
2305470-1	HV-Die Holder



Figure 1: PCON12-Crimping machine

2.2. Specifications

2.2.1 Cable Specifications

Wire size	Conductor ³⁾ (Bare copper strands)				Screening braid ³⁾ (tinned copper)			Outer sheath ³⁾
	Diameter	No. of strands	Strand Ø max.	Inner sheath ³⁾ outer Ø	Strand Ø max.	Coverage min.	Foil overlap min.	
16 mm ²	<i>Qualified within HVA1200 product validation (wire acc. LV216-2)¹⁾</i>							
	5.8-0.6 mm	512	0.21 mm	7.2-0.6 mm	0.16 mm	85%	20%	10.2-0.6 mm
	<i>Qualified within PCON12 terminal validation²⁾</i>							
	see 114-162014 and 108-32671					Not qualified		

¹⁾Wires acc. LV216-2 mandatory. New wires have to be validated.

²⁾The wires need new validation of the shielding crimp (acc. TE 109-18212) if deviating from the LV216-2.

³⁾See Figure 4.

NOTE

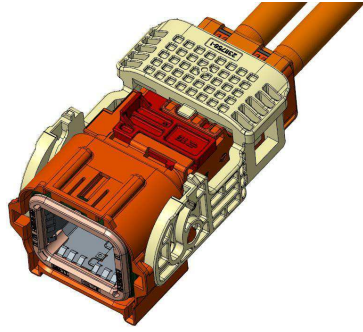
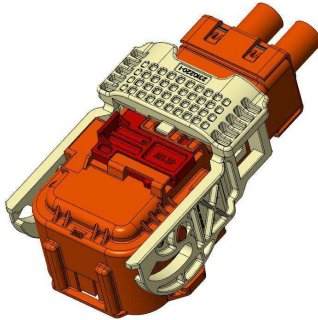
Full validation according to TE 109-18079 and 109-18212 needed for wires deviating from above mentioned specifications (with respect to the temperature range of the wire).

2.2.2 Tested and Released Cables:

1. COFICAB FHLR91XC91 >> Completed LV214/215 validation >> PVPR available
 2. COROPLAST FHLR2GCB2G >> LV214/215 Delta Validation >> PVPR available
 3. H+S RADOX 155 FHLR4GC13X >> LV214/215 Delta Validation >> PVPR available
- SealingTest IPX9K was performed with reduced aging temperature 125°C instead of 140°C**






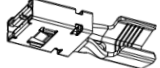
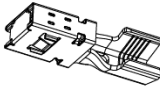
3 SUPPLY CONDITIONS

3.1 Components

TE-Order-No. / Picture	
<p style="text-align: center;">2311753</p> <p>2 pos. HVA1200, Rec Hsg 180°, sealed, Assy</p>	
<p style="text-align: center;">2310213</p> <p>2 pos. HVA1200, Rec Hsg 90°, sealed, Assy</p>	

The housing assembly is available for 4 codings, for the order with correct dash number please see TE customer drawing 2311753 (for 180° version) and 2310213 (for 90° version) last revision.

H

Used with	TE- Order- No.	Description	Quantity	Picture
90°and 180°	2840877-4	Back cover	1x	
90°and 180°	1-2840876-4	Family Seal	1x	
90°and 180°	2310221-1	Inner Ferrule	2x	
90°and 180°	2310222-1	Outer Ferrule	2x	
90°and 180°	2310223-1	Ferrule sleeve	2x	
180°	1-2840575-2	PCON12 Terminal, 16 mm², 180°	2x	
90°	1-2840573-2	PCON12 Terminal, 16 mm², 90°	2x	

3.2 Packaging and Storage

See latest valid customer drawings.

4. APPLICATION TOOLS

4.1 PCON 12 terminal conductor crimp

See latest valid TE application specification 114-162014

Wire size	10 mm ² - 16 mm ²	Tools
Wire Crimp	114-162014	

4.2 Cable shielding crimp

NOTE

Shielding crimping tool qualified with wire according LV216-2+

Wire Size	Crimp Machine	HV Die Holder	HV Die Set	Working Instruction No.
16 mm ²	AT-66¹⁾ 528008-4¹⁾ 1-528008-4¹⁾	541868-1¹⁾ 2326378-1²⁾	3-528041-7¹⁾ 2234157-1²⁾	not available
	HF-20 / HV-20²⁾ 2335500-1/-2²⁾ 2348822-1/-2²⁾	2305470-1²⁾	2234157-1²⁾ 9-2234157-1³⁾	

¹⁾ Only for existing applications. Not for new orders.

²⁾ To be ordered and used for new applications.

³⁾ This PN is the die set with die holder 2305470-1

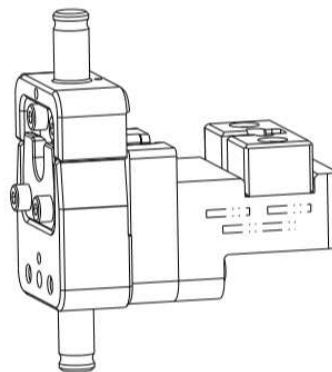


Figure 2: DIE SET HVA1200 SHIELD 16mm²

5 ASSEMBLY INSTRUCTIONS

The described application processing below shows the main application steps and is only valid for the specified cable.

5.1 Overview of all parts should be assembled

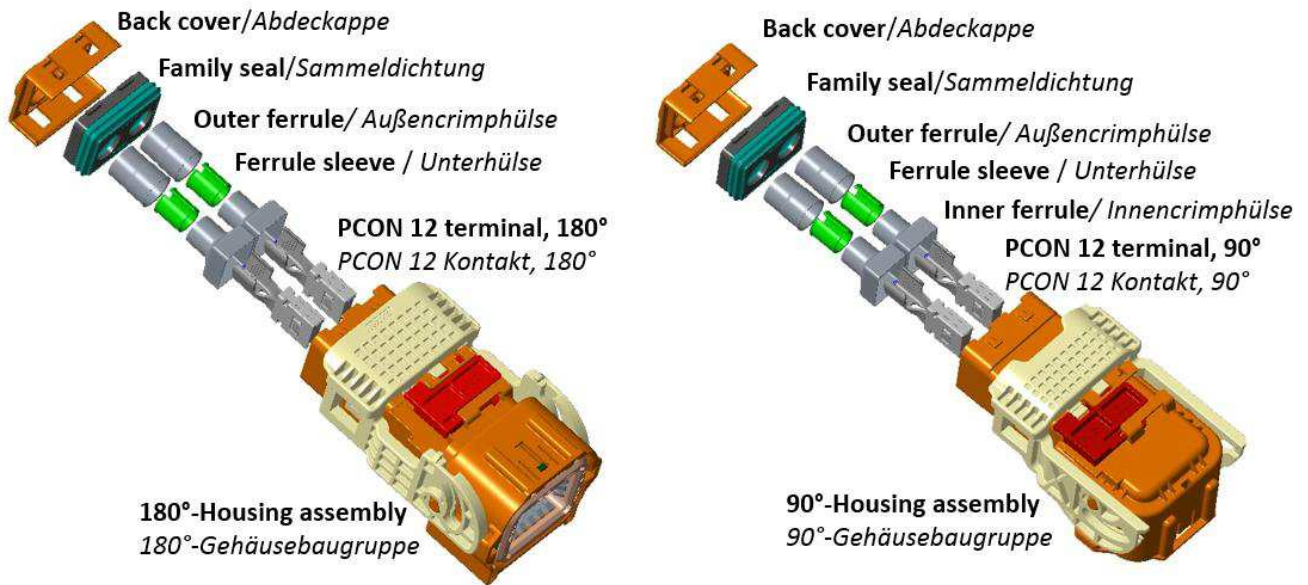


Figure 3: 2-pos. connector overview

5.2 Shielded cable and terminal assembly

 **Avoid prolonged or repeated skin contact with silver shieldings. (Wear protective gloves)**

5.2.1 Processing of cable

Before processing slide back cover, family seal and outer ferrule over cable sheath.

Stripping and Cutting cable to length

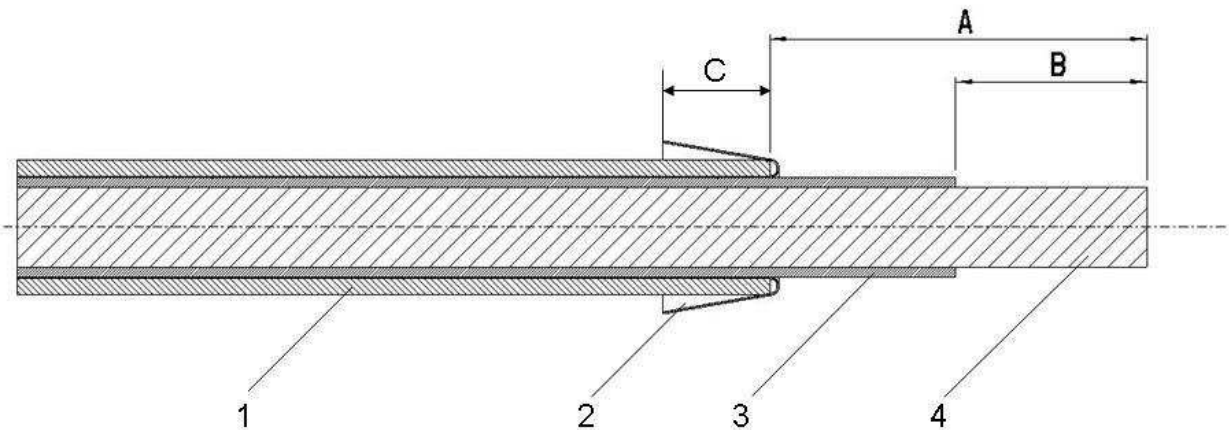


Figure 4: Cable design and cutting length

ID	Cable Design	A [mm]	B [mm]	C* [mm]
1	Outer sheath	33.0+1/-2mm	--	--
2	Screening braid	--	--	8.0+1mm
3	Inner sheath	--	10.0±1mm	--
4	Conductor	--	--	--

C* is to fix from the production department, that the braid extension after the crimping process is acc. To fig. 8-10, it is recommended by 8+1 mm before and 10+1 after disentanglement.

H B* Shielded cable therefore stripping length 10+/- 1mm.
Different from TE US specification 114-162014 (12 +/-0.2mm)

 **Attention: Insulation and shielding braid must not be damaged!**

5.2.2 Components assembling before crimping

Assembly the components acc. following sequence, take care for the right orientation of the part (see pictures):

- 1- Back cover
- 2- Family seal
- 3- Outer ferrule
- 4- Ferrule sleeve after the shield braid is turned back
- 5- Inner ferrule

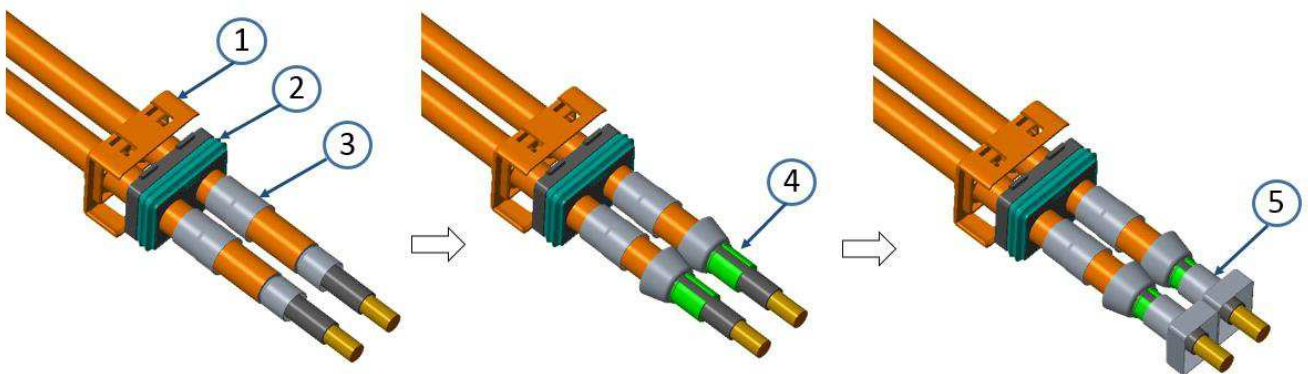


Figure 5: Assembly sequence

5.2.3 Contact crimping

See latest valid TE-Application specification 114-162014

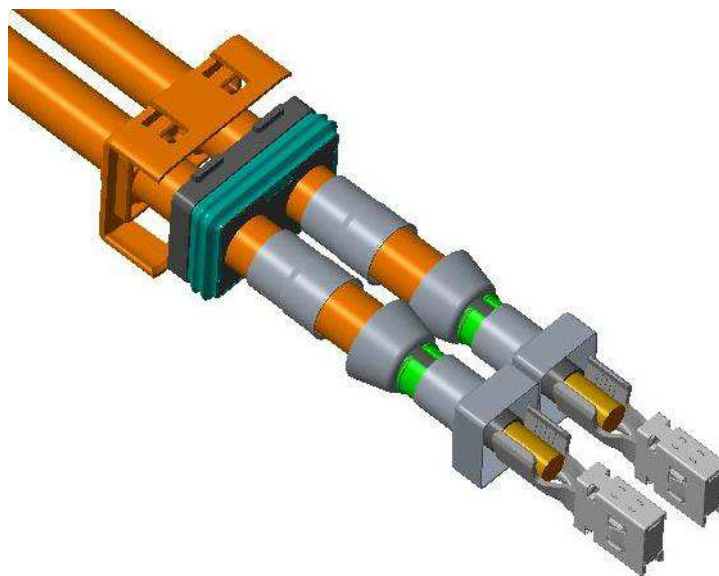


Figure 6: Components configuration for contact crimp

5.2.4 Shielding crimping

Screening bread open out and disentangle (Dimension see table 9)



Attention: Shielding braid shall not be broken.

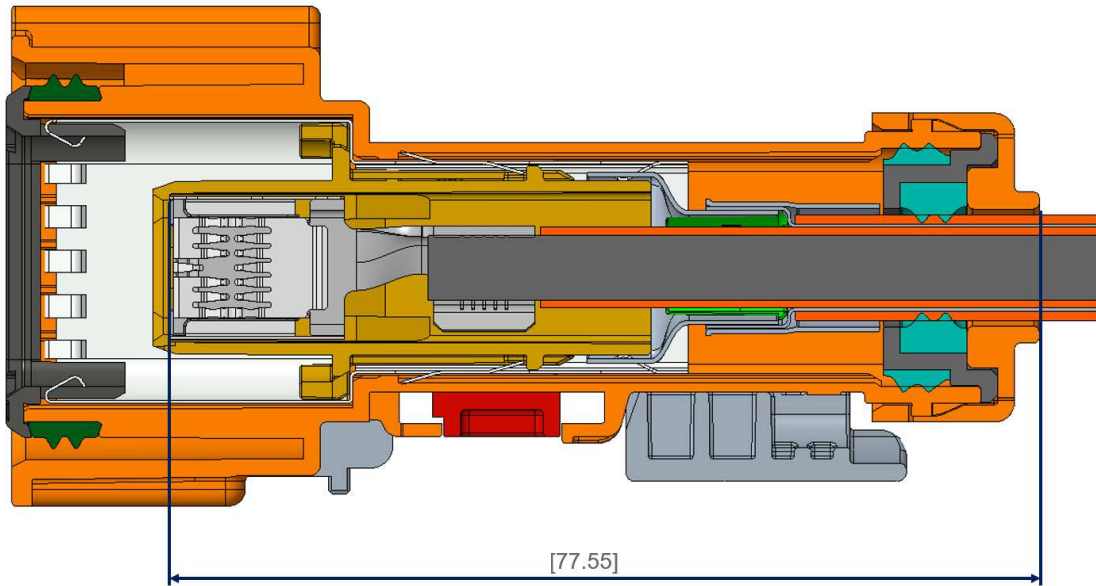


Figure 7: Components structure (all dimension in crimped state) (F1)

Insert cable assembly into locator and crimping shield. For correct handling and using of application tools see following guideline:

Visual examination and inspection dimensions

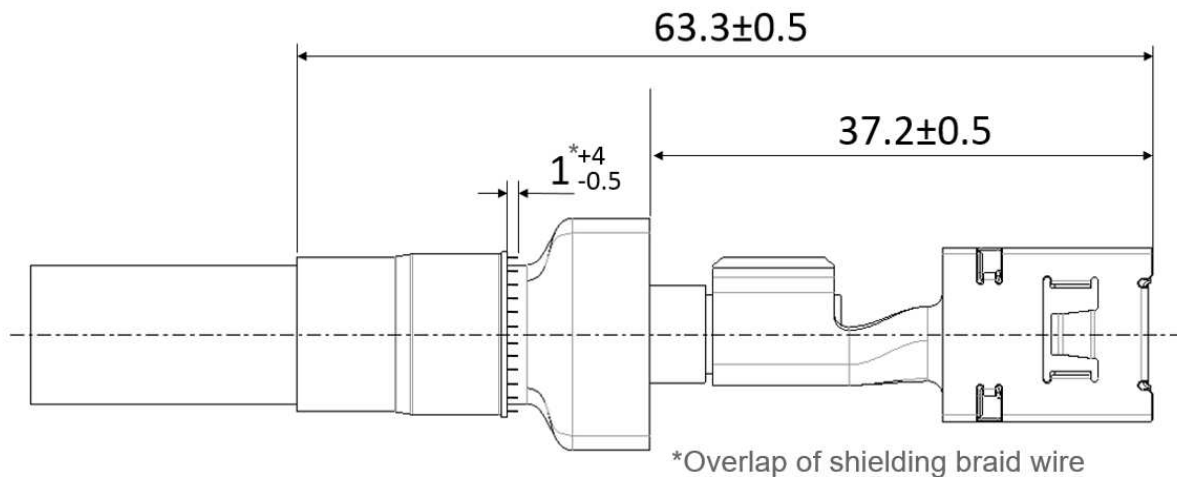


Figure 8: Inspection dimensions (all dimension in crimped state)

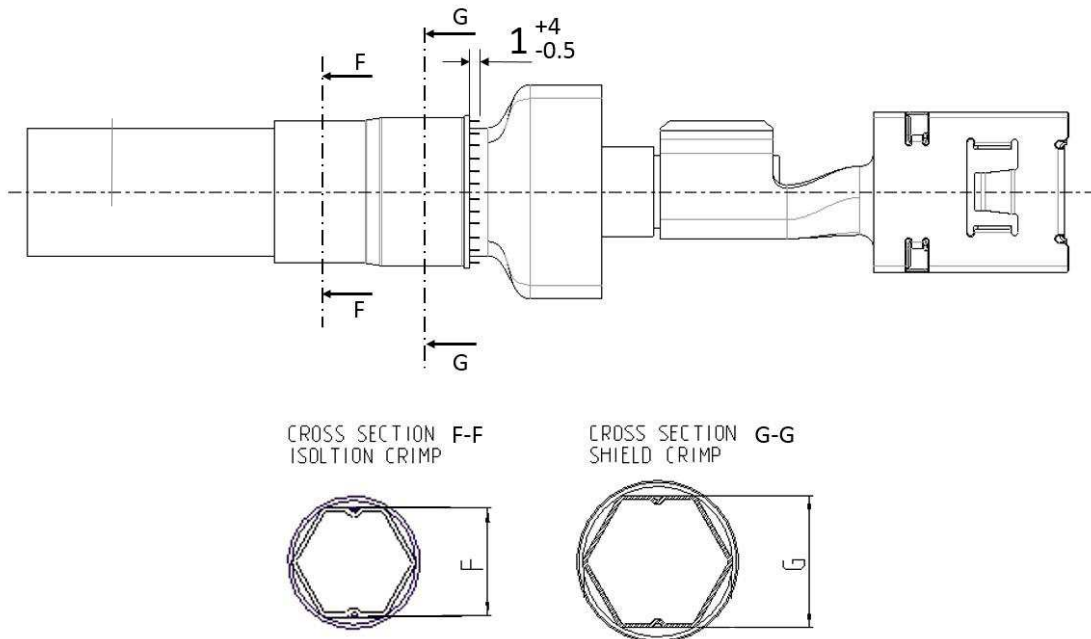


Figure 9: Inspection dimensions

Measured with the narrow outside jaws of calliper, directly on the crimping indentation
(see cross lines F-F and G-G)

$F = 9.8 \pm 0.2$
 $G = 10.65 \pm 0.2$

Additional post cutting of the shielding braid not permitted!

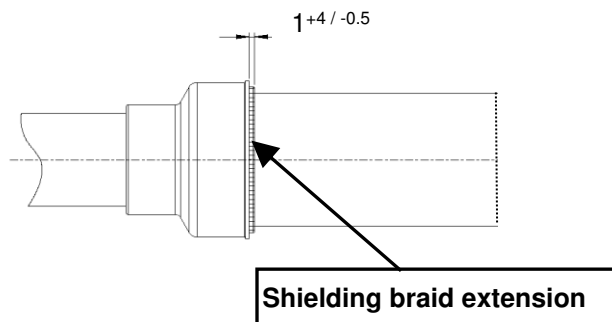


Figure 10: Braid extension



The end of the shielding braid must be visible and complete justified at the end of the crimp sleeve.
After disentanglement, the shielding braid must be consistently (homogeneous) spread around!

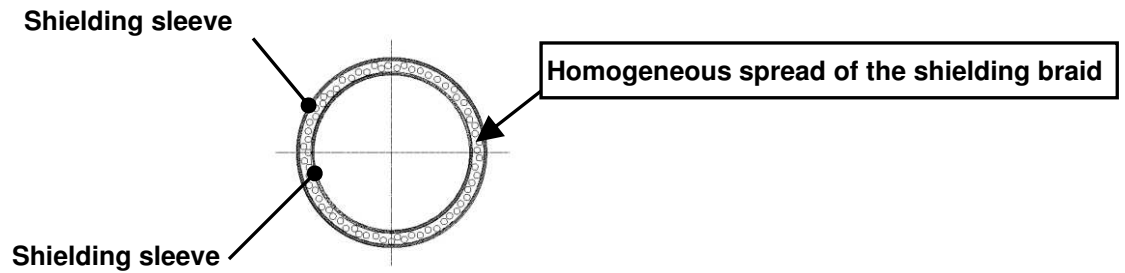


Figure 11: Braid spread

5.3 Plug assembly

The final assembly of HVA1200-connector should be done in follow sequence: assembling of the crimped cable assembly into the housing, assembling of the family seal and the back cover.

5.3.1 Cable assembly

The crimped cable assembly must be oriented plugged into the connector housing and locked with audible signals.

It is recommended to assemble each cable separately.

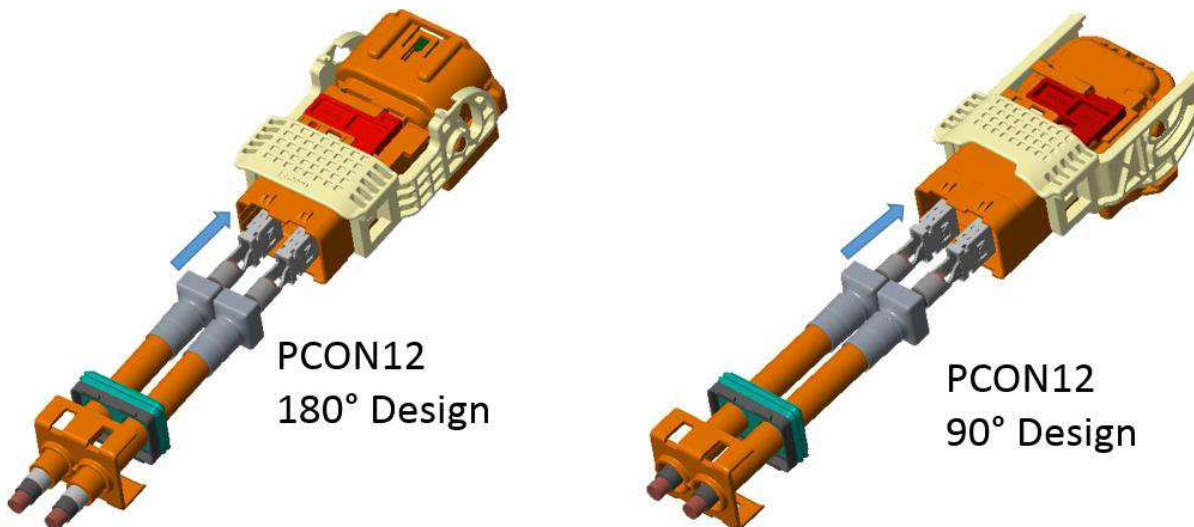


Figure 12: Assembly crimped cable

5.3.2 Terminal removal

Terminal cannot be removed after insertion.

5.3.3 Assembly of family seal

The family seal must be assembled at the end-position with correct orientation into the plug housing.

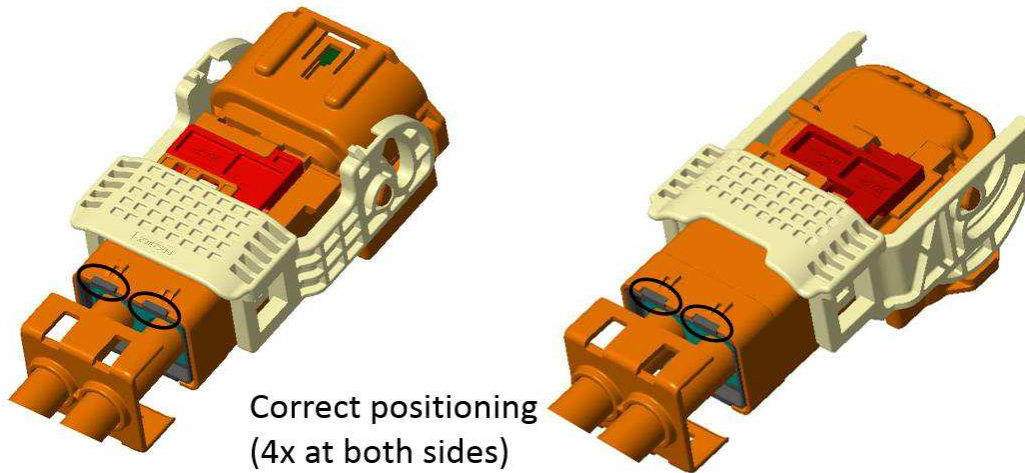


Figure 13: Family seal assembly

5.3.4 Assembly of the cover

The back cover must be assembled at the end-position with correct orientation and with audible signals (4x) into the plug housing.

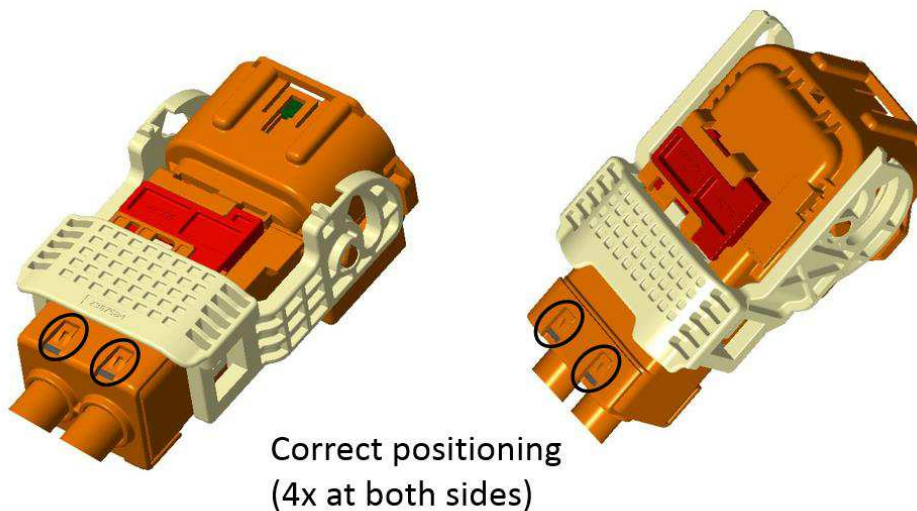


Figure 14: Cover assembly

6 FINAL EXAMINATION

6.1 Visual Examination

After processing the connector assembly has to be checked of completeness, correctness acc. customer drawings and free of damage.

6.2 Electrical Tests

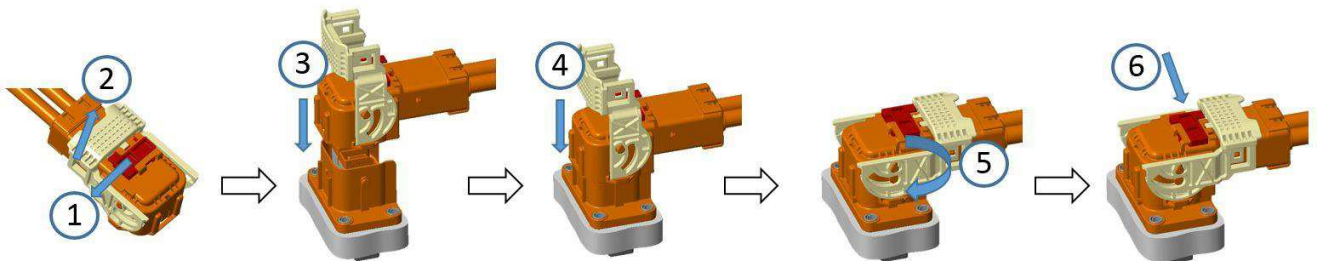
Electrical characteristic values according product specification TE-108-94749 are ensured by applicator. The test parameter should be not exceeding the values shown in point 3.3/TE-108-94749

7 LOCKING MECHANISMS WITH LEVER AND CPA

The following procedures show the details of mating and unmating instructions of the plug to the pin header.

7.1 Mating to the pin header

HVA1200, Connector, 90°



HVA1200, Connector, 180°

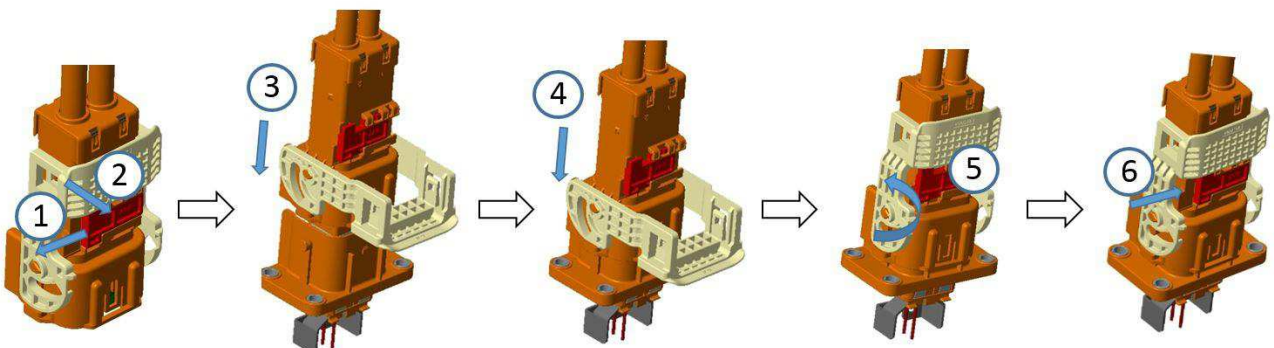


Figure 15: Mating to the pin header

Step 1: Release the CPA

Step 2: Open the lever by releasing of lateral locking and turning of the lever

Step 3: When positioning the plug to the pin header, make sure it is correctly aligned and avoid misalignment.

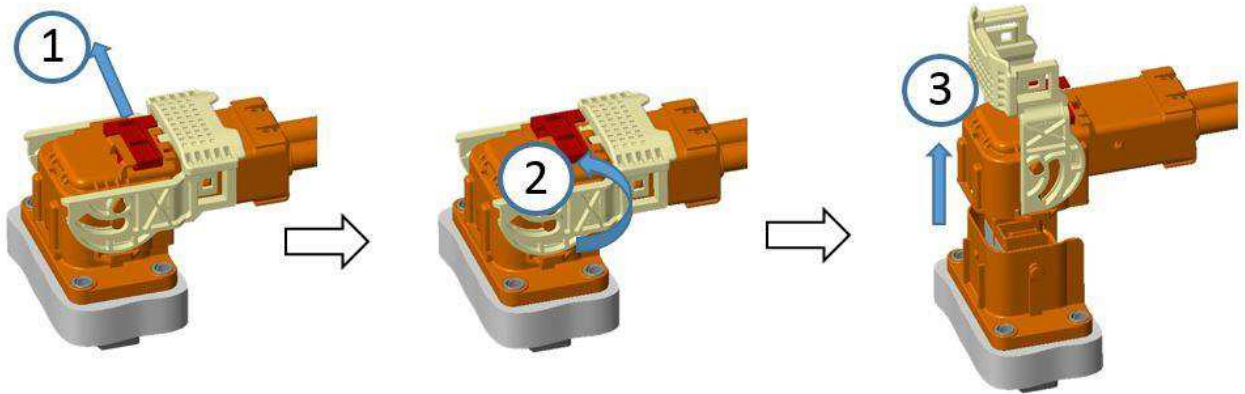
Step 4: Positioning the plug to the header to the pre-locking position

Step 5: Close the lever

Step 6: Close the CPA

7.2 Unmating from the pin header

HVA1200, Connector, 90°



HVA1200, Connector, 180°

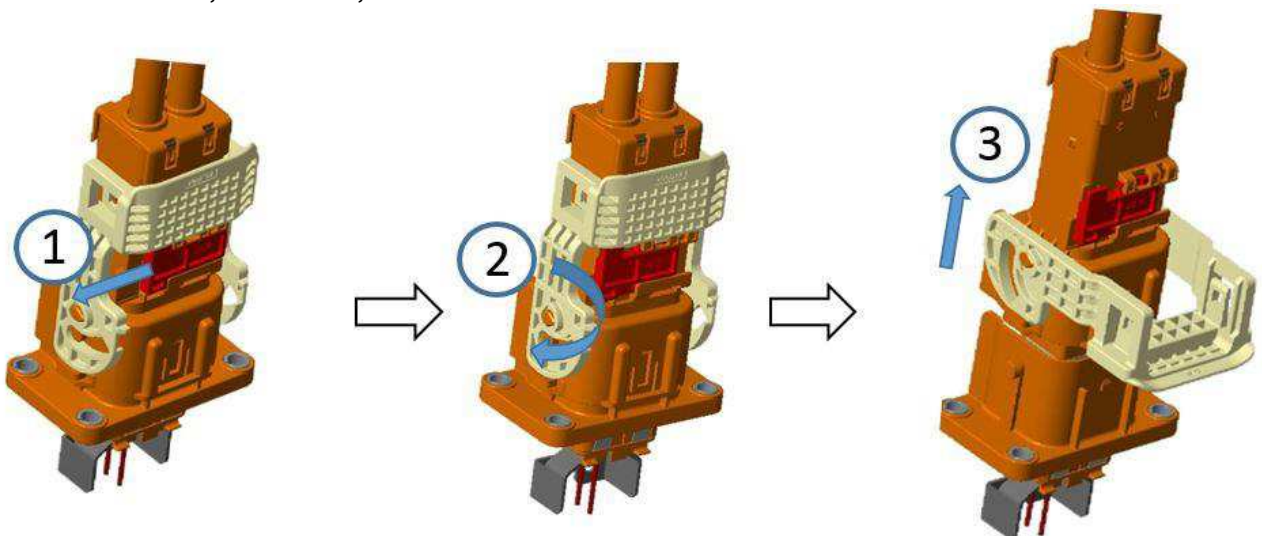


Figure 16: Unmating from the pin header

Step 1: Release the CPA

Step 2: Open the lever by releasing the side lock and turning it

Step 3: Unmating of the plug from the header. The lever must not be tilted!

7.3 Strain Relief

System is validated with strain relief at 100mm. Each application has to be evaluated independently with regards to the external influences on the system. Having strain relief, which moves with the connector body, close to the end of the connector will have a positive influence on the performance of the connector.

Having strain relief further from the end of the connector or that moves independent of the connector body will have a negative influence on the performance of the connector.

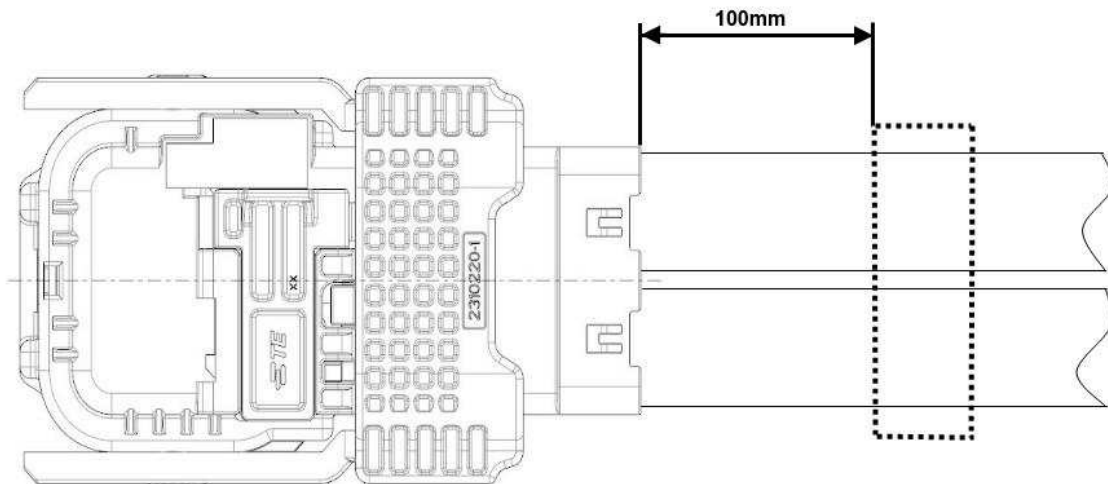


Figure 17: Recommended requirement for strain relief

8 APPENDIX

8.1 Delta Qualification

8.1.1 Coficab FHLR91XC91

USCAR 2 Rev. 6		TUAB Test Sequence
5.6.6 Pressure/Vacuum leak Condition: new	Submersion of the samples in salt water solution (~20°C): <ul style="list-style-type: none"> • Air Pressure Test up to 48 kPa: No bubbles for $t > 15s$ • Vacuum Test up to -48 kPa for $t = 15s$ To verify the absence of water the insulation resistance test was carried out: $U = 1000 \text{ VDC}$	Test passed
5.6.6 Pressure/Vacuum leak after High Temperature Exposure	Submersion of the samples in salt water solution (~20°C): <ul style="list-style-type: none"> • Air Pressure Test up to 48 kPa: No bubbles for $t > 15s$ • Vacuum Test up to -48 kPa for $t = 15s$ To verify the absence of water the insulation resistance test was carried out: $U = 1000 \text{ VDC}$	Test passed
5.6.5 Submersion	Test conditions: <ul style="list-style-type: none"> • Samples at 125 °C for 2 hours; • Within 30s after removing from the heat chamber, submerge for 30 min the samples in cold (0°C) 5% salt water solution to a depth of 30 – 40 cm To verify the absence of water the insulation resistance test was carried out: $U = 1000 \text{ VDC}$	Test passed

5.6.7 High pressure spray	Test conditions: <ul style="list-style-type: none"> • Temperature: 80 °C $\pm 5 \text{ °C}$ • Pressure: 80-100 bar • Flow rate: 14-16 l/min • Sample rotation: 360° • Position angle spray: 0°, 30°, 60°, 90° • Test duration per side: 30s per position of spray angle • Distance between nozzle and sample: • 100-150 mm To verify the absence of water the insulation resistance test was carried out: $U = 1000 \text{ VDC}$	Test passed
---------------------------	--	-------------

USCAR 2 and 37

Terminal Insertion/Extraction

Terminal Insertion	Terminal Engage force = $F_{max.} 75 \text{ N}$ Forward stop: apply a force $>50N$ beyond the pri-	Test passed
--------------------	---	-------------

	mary locking.	
Terminal Extraction	Terminal Disengage Primary Lock only = Fmin. 200 N	Test passed (180° Variant) Value Determination (90° Variant) 175.2 – 201.1
USCAR 2 Connector Mating/Unmating		
5.4.2 Connector Mating	Connector to Connector Engage/ Disengage force = Fmax. ≤75 N	Test passed
5.4.2 Connector Un-mating	Connector to Connector Engage/ Disengage force = Fmax. ≤75 N	Test passed
USCAR 2 RSAA Test Sequence		
5.6.6 Pressure/Vacuum leak Condition: new	Submersion of the samples in salt water solution (~20°C): • Air Pressure Test up to 48 kPa: No bubbles for t > 15s • Vacuum Test up to -48 kPa for t = 15s To verify the absence of water the insulation resistance test was carried out: U = 1000 VDC	Test passed

5.6.6 Pressure/Vacuum leak After Temperature/Humidity Cycling	Submersion of the samples in saltwater solution (~20°C): <ul style="list-style-type: none"> • Air Pressure Test up to 48 kPa: No bubbles for $t > 15s$ • Vacuum Test up to -48 kPa for $t = 15s$ To verify the absence of water the insulation resistance test was carried out: $U = 1000 \text{ VDC}$	Test passed
5.6.5 Submersion	Test conditions: <ul style="list-style-type: none"> • Samples at 125 °C for 2 hours. • Within 30s after removing from the heat chamber, submerge for 30 min the samples in cold (0°C) 5% saltwater solution to a depth of 30 – 40 cm To verify the absence of water the insulation resistance test was carried out: $U = 1000 \text{ VDC}$	Test passed
5.6.7 High pressure spray	Test conditions: <ul style="list-style-type: none"> • Temperature: 80 °C ± 5 °C • Pressure: 80-100 bar • Flow rate: 14-16 l/min • Sample rotation: 360° • Position angle spray: 0°,30°,60°,90° • Test duration per side: 30s per position of spray angle • Distance between nozzle and sample: • 100-150 mm To verify the absence of water the insulation resistance test was carried out: $U = 1000 \text{ VDC}$	Test passed
USCAR 21 Conductor Crimp – Pull-out Force Test		
4.4 Conductor Crimp Pull-out Force Test	Requirements: $F > 600 \text{ N}$ In accordance with SAE/USCAR-21 2020-01.	Test passed (90° Variant)
USCAR 37 Shield Termination - Ferrule retention force test		
5.2.4 – Shield termination ferrule retention force test	Requirements: $F \geq 150 \text{ N}$	Test passed
PG 13 - Housing influence on the derating		
E 13.2 Derating with housing	Derating see appendix 5.1	LV215-2 DIN EN 60512-5-1/2
E 0.2 Connection Resistance	Requirements at new : $R_{\text{connection}} \leq 0.43 \text{ m}\Omega$ Requirements aft test : $R_{\text{connection}} \leq 0.86 \text{ m}\Omega$ Requirements : $R_{\text{connection Shield}} \leq 4 \text{ m}\Omega$	Test passed

PG 17 – Dynamic Load		
E 0.2 Contact Resistance	<p>Rmax at new: $R \leq 0,43 \text{ m}\Omega$ Rmax after test: $R \leq 0,86 \text{ m}\Omega$ Permitted contact resistances (according to Spec. TE 108-94749 Rev.B): $R \leq 4 \text{ m}\Omega$ (Shield) Permitted contact resistances (according to Spec. LV 215: 2016-01): $R \leq 15 \text{ m}\Omega$ (HVIL)</p>	Test passed
Circuit Interrupt monitoring	<p>THE CIRCUIT IS CONSIDERED INTERRUPTED WHEN THE CONTACT RESISTANCE EXCEEDS $7 \text{ }\Omega$ FOR TIME $> 1 \text{ MS}$</p>	Test passed

8.2 Data sheets

For material data sheets of the connector components see PPAP documents.
 For data sheets of the applied wire please contact the respective wire supplier.

8.2.1 PG 13 – Housing Influence on Derating

PCON 12: 1-2840575-2 Rev. A

Material body: TWICK Copper UNS
 C11000 H02 Temper

Material spring: TWICK Copper
 C70250 TM04S / Ag

Material shield: CuNiSi R580S / Ag

Wire: 16.0 mm²

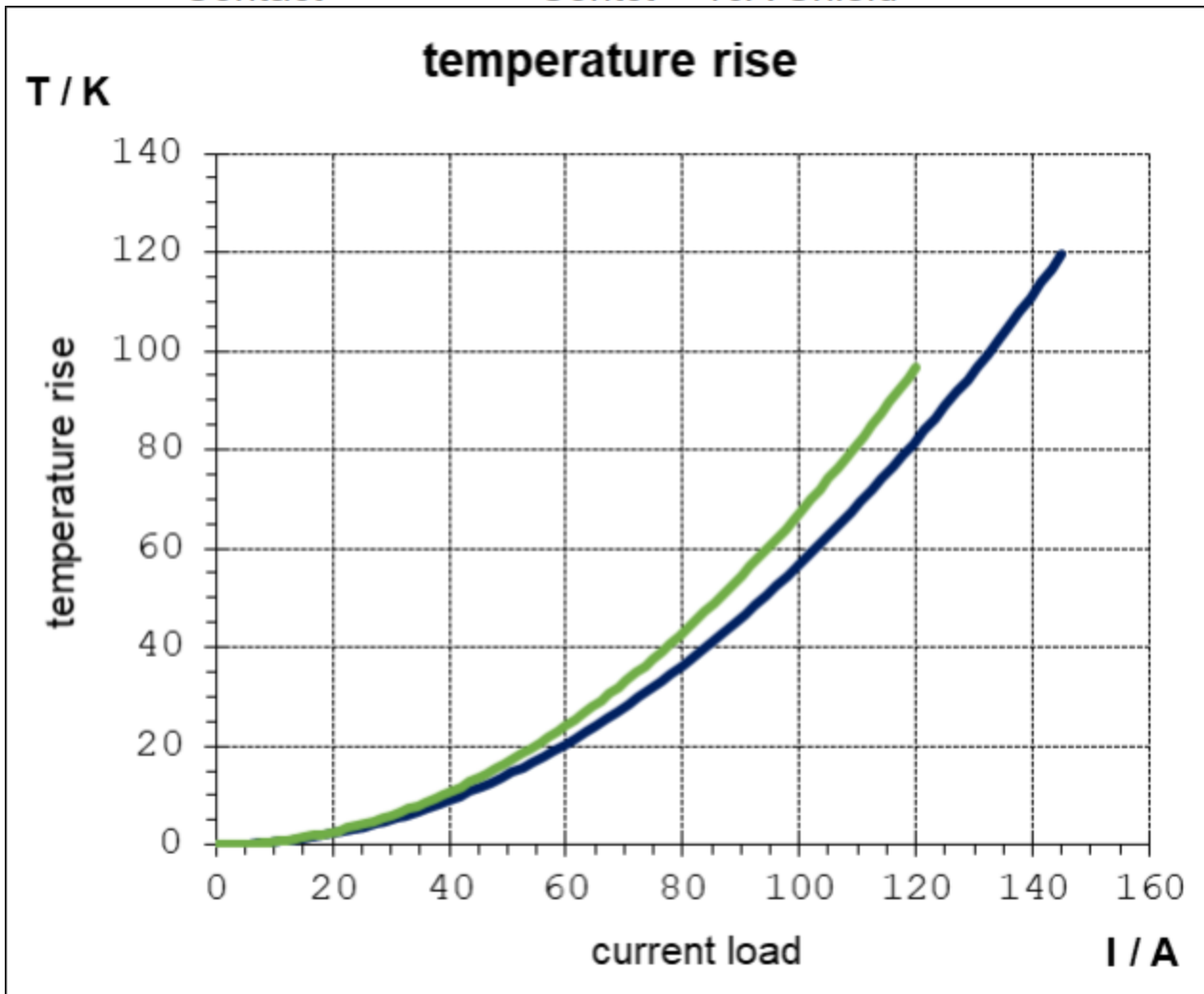
2 pos Hsg : 0-2311753-1 Rev B
 Material : PBT GF25 FR

Test setup: 3 hsg. fully equipped
 and energized

Tab 10.0x1.2mm: 2355170-0
 Material Tab: Cu-ETP DIN
 EN 1652 R290 / Ag
 Material shield: CuNiSi R580S / Ag

Header: 1-2310224-1 Rev A
 Material: PBT GF25 FR

— Contact — Contct + 10A Shield



— Contact — Contct + 10A Shield

