



PROCESS SPECIFICATION
HPS40-1 2+2
Female Connector MCC

EVS-100097



HIRSCHMANN
AUTOMOTIVE



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1. General

1.1 Introduction

This process specification is valid for all versions as per overview and describes the product structure as well as the manufacturing of the HPS40-1 2+2 female connector MCC.

System number	Coding	HVIL Version	Wire cross section	Contact system	CPA version
805-972-001	A	Yes	2.5 mm ² 4.0 mm ² 6.0 mm ²	K4/E4 (ODU)	without CPA
805-972-002	B	Yes			
805-972-003	C	Yes			
805-972-007	Z	Yes			
805-972-008	A	No			
805-972-009	B	No			
805-972-010	C	No			
805-972-014	Z	No			
805-972-021	A	Yes			
805-972-022	B	Yes			
805-972-023	C	Yes			
805-972-027	Z	Yes			
805-972-028	A	No			
805-972-029	B	No			
805-972-030	C	No			
805-972-034	Z	No			
805-972-035	A	Yes			
805-972-036	B	Yes			
805-972-037	C	Yes			
805-972-041	Z	Yes			
805-972-042	A	No			
805-972-043	B	No			
805-972-044	C	No			
805-972-048	Z	No			
				HCT4 (Hirschmann Automotive)	with CPA

The manufacturer is responsible for the qualitative processing and the described version of the mentioned products in this process specification. In case of an incorrect processing, dissenting from this process specification, there will be no right of recourse in case of appearing quality problems.



1.2 Other current documents

A	Data sheet ODU female terminal	009.377.001.000.000
B	ODU Process specification (CuZn)	006 081 002 000 000
C	ODU Process specification (CuTe)	006 095 002 000 000
D	Process specification Mini-Lamina-Contact MLK 1.2	DOC 00061540 RLD: 10 / March 2008
E	Data sheet shielded cable of Draka (2x 2.5 mm ² , 2x 4.0 mm ² ; 2x6.0 mm ²)	Data sheet No.: DF 047/2009 Release A/30.06.2009/Ot/Ko
F	Data sheet 2x 2.5 mm ² shielded cable of Kroschu	Kroschu No. 64995729
G	Data sheet 2x 4.0 mm ² shielded cable of Kroschu	Kroschu No. 64995730
H	Data sheet 2x 6.0 mm ² shielded cable of Kroschu	Kroschu No. 64995731
I	Data sheet 2x 2.5 mm ² shielded cable of Kroschu	Kroschu No. 64996345
J	Data sheet 2x 4.0 mm ² shielded cable (T180) of Kroschu	Kroschu No. 64996346
K	Data sheet 2x 6.0 mm ² shielded cable (T180) of Kroschu	Kroschu No. 64996347
L	Data sheet 2x 6.0 mm ² shielded cable (T180) of Kroschu	Kroschu No.: 64995979
M	Data sheet 2x 2.5 mm ² shielded cable of Coroplast	Coroplast Part No.: 9-2641 (2x 2.5 mm ²) Revision status: A4/29.01.2011
N	Data sheet 2x 4.0 mm ² shielded cable of Coroplast	Coroplast Part No.: 9-2641 (2x 4.0 mm ²) Revision status: A4/29.01.2011
O	Data sheet 2x 6.0 mm ² shielded cable of Coroplast	Coroplast Part No.: 9-2641 (2x 6.0 mm ²) Revision status: A2/16.11.2010
P	Data sheet 2x 2.5 mm ² shielded cable of Leoni	Leoni SAP No.: 76H00193A
Q	Data sheet 2x 4.0 mm ² shielded cable of Leoni	Leoni SAP No.: 76H00170A
R	Data sheet 2x 6.0 mm ² shielded cable of Leoni	Leoni SAP No.: 76H00194A
S	Data sheet 2x 2.5 mm ² shielded cable of G&G	G&G No.: X6918D5
T	Data sheet 2x 4.0 mm ² shielded cable of G&G	G&G No.: X6919D4
U	Data sheet 2x 6.0 mm ² shielded cable of G&G	G&G No.: X6920D4
V	Process specification HCT female terminal	EVS-100068



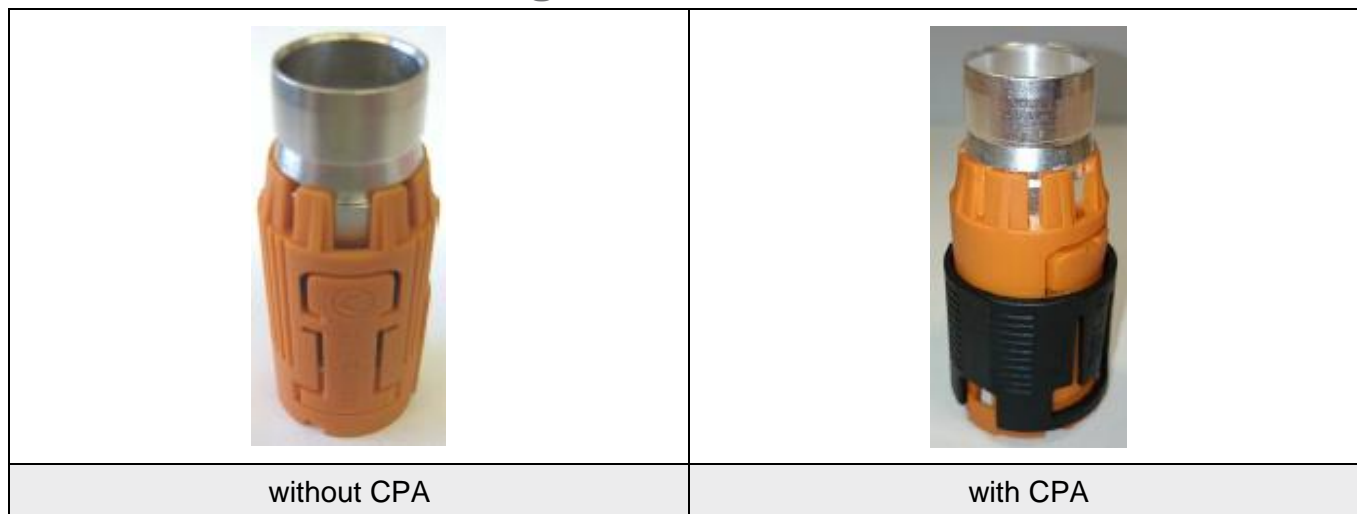
2 Product structure (single components)

2.1 Sheated cable (see table)

Wire manufacturer	Wire cross section		
	2.5 mm ²	4.0 mm ²	6.0 mm ²
Coficab	FHLR2G2GCB2G 600V T200		
	2GCB2G225ORIN	2GCB2G240ORIN	2GCB2G260ORIN
Draka	FLR91XBC33X 600V T125		
	DF047/2009	DF047/2009	DF047/2009
G&G	FLR31YBC11Y-B T125/3	FLR31YBC11Y (0,20) T125/2	
	X6918D5	X6918D5	X6920D4
Kroschu	FHLR32YBC11Y 2x2,5 0,26 T125 600/900V	FHLR32YBC11Y 2x4 0,21 T125 600/900V	FLR32Y-(ST) CB11Y 2x6 0,20 600V T125
	64995729	64995730	64995731
Kroschu	FHLR2GCB2G 600V T180		
	64996345	64996346	64996347
Leoni	FHLR2G2GCB2G (0,26) 600V T180	FHLR2G2GCB2G (0,31) 600V T180	
	76H00193A	76H00170A	76H00194A
Coroplast	FLR2G2GCB2G 600V T180		
	9-2641 (2x 2.5 mm ²)	9-2641 (2x 4.0 mm ²)	9-2641 (2x 6.0 mm ²)
Kroschu			FHLR2G2GCB2G 600V T180
			64995979



2.2 HPS40-1 2+2 locking sleeve

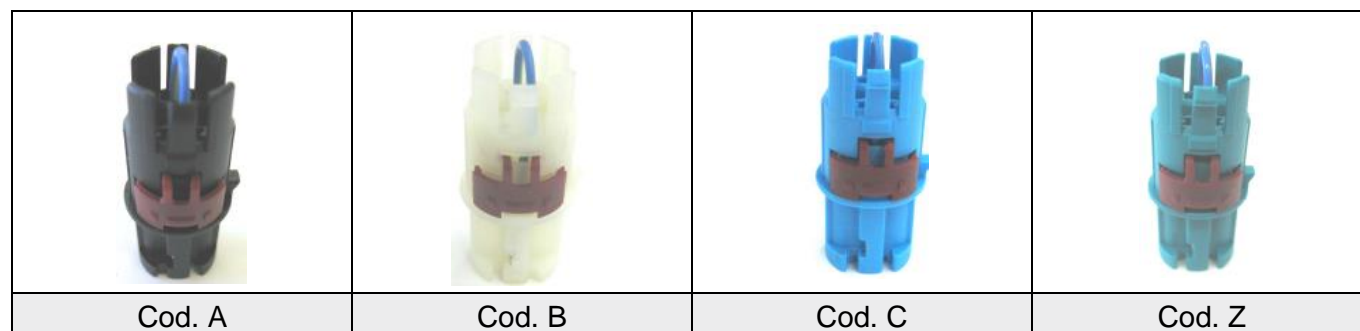


Hirschmann Automotive No.	Wire cross section	Product description
806-230-512	2.5 mm ² 4.0 mm ² 6.0 mm ²	locking sleeve 2+2 ODU
806-230-515		locking sleeve 2+2 HCT4
806-230-516		locking sleeve 2+2 HCT4 with CPA

Delivery condition: The locking sleeves are delivered in a PE-bag/ cardboard box.



2.3 HPS40-1 2+2 female contact carrier



Hirschmann Automotive No.	Coding	Colour	HVIL bridge	Wire cross section	Product description
806-229-531	A	Black	Yes	2.5 mm ² 4.0 mm ² 6.0 mm ²	for KE/E4 (ODU)
806-229-532	B	Natural/ White	Yes		
806-229-533	C	Blue	Yes		
806-229-537	Z	Water- blue	Yes		
806-229-540	A	Black	No		
806-229-541	B	Natural/ White	No		
806-229-542	C	Blue	No		
806-229-546	Z	Water- blue	No		
806-229-571	A	Black	Yes		for HCT4 (Hirschmann Automotive)
806-229-572	B	Natural/ White	Yes		
806-229-573	C	Blue	Yes		
806-229-577	Z	Water- blue	Yes		
806-229-580	A	Black	No		
806-229-581	B	Natural/ White	No		
806-229-582	C	Blue	No		
806-229-586	Z	Water- blue	No		

Delivery condition: The contact carriers are delivered as bulk good.



2.4 HPS40-1 2+2 shielding sleeve









-511

Hirschmann Automotive No.	Wire cross section
709-115-511	2.5 mm ² 4.0 mm ² 6.0 mm ²

Delivery condition: The shielding sleeves are delivered as bulk good.

2.5 HPS40-1 2+2 stress relief

					
-511	-512	-513	-514	-515	-516

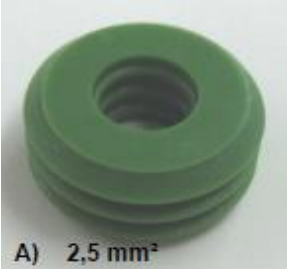
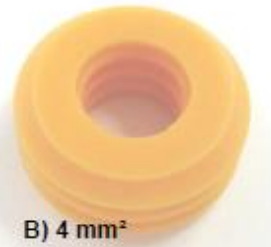
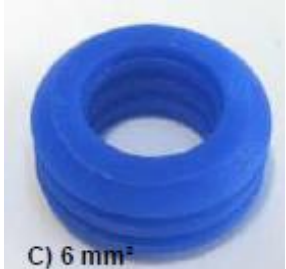
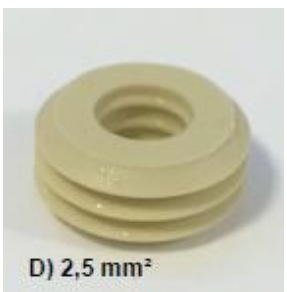

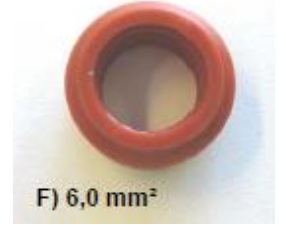
Hirschmann Automotive No.	Wire cross section
709-107-511	2.5 mm ² 4.0 mm ² 6.0 mm ²
709-107-512	
709-107-513	
709-107-514	
709-107-515	
709-107-516	

Wire manufacturer: The released HV cable for each stress relief is shown on the product drawing. (Hirschmann Automotive No. 805-972-...00)

Delivery condition: The stress reliefs are delivered as bulk good.



2.6 HPS40-1 2+2 wire seal

 A) 2,5 mm ²	 B) 4 mm ²	 C) 6 mm ²
 D) 2,5 mm ²	 E) 4,0 mm ²	 F) 6,0 mm ²
2.5 mm ²	4.0 mm ²	6.0 mm ²







Hirschmann Automotive No.	Colour	Wire cross section
709-113-511	Green	2.5 mm ² 4.0 mm ² 6.0 mm ²
709-113-512	Yellow	
709-113-513	Blue	
709-113-514	Beige	
709-113-515	Grey	
709-113-516	Red	

Wire manufacturer: The released HV cable for each seal is shown on the product drawing. (Hirschmann Automotive GmbH Nr. 805-972-...00).

Delivery condition: The seals are delivered as bulk good.



2.7 HPS40-1 2+2 Cover Cap

		
-511	-512	-513
		
-514	-515-	-516

Hirschmann Automotive No.	Wire cross section
705-749-511	2.5 mm ² 4.0 mm ² 6.0 mm ²
705-749-512	
705-749-513	
705-749-514	
705-749-515	
705-749-516	

Wire manufacturer: The released HV cable for each cover cap is shown on the product drawing. (Hirschmann Automotive GmbH Nr. 805-972-...00).

Delivery condition: The cover caps are delivered as bulk good.



2.8 female terminal K4 (ODU)

2.5 mm ²	4.0 mm ²	6.0 mm ²

ODU No.	Wire cross section	Material
178.590.140.201.000	2.5 mm ²	CuTe
178.591.140.201.000	4.0 mm ²	
178.592.140.201.000	6.0 mm ²	
178.940.100.201.000	2.5 mm ²	CuZn
178.941.100.201.000	4.0 mm ²	
178.942.100.201.000	6.0 mm ²	



2.9 female terminal HCT4

		
-502 (1.5 - 2.5 mm ²)	-504 (4.0 mm ²)	-505 (6.0 mm ²)

Hirschmann Automotive No.	Wire cross section
709-427-502	1.5– 2.5 mm ²
709-427-504	4.0 mm ²
709-427-505	6.0 mm ²

Delivery condition: The terminals are delivered on the coil on a roll.



3 Process steps

The following described process steps are used for the cross-sections 2.5 mm²/ 4.0 mm² and 6.0 mm². The version with the 2x 6.0 mm² Coroplast cable and the 6mm² cables (ATTENTION: diameter 12.8-0.6 mm) plus the terminal holder (Code A) were selected as reference samples.

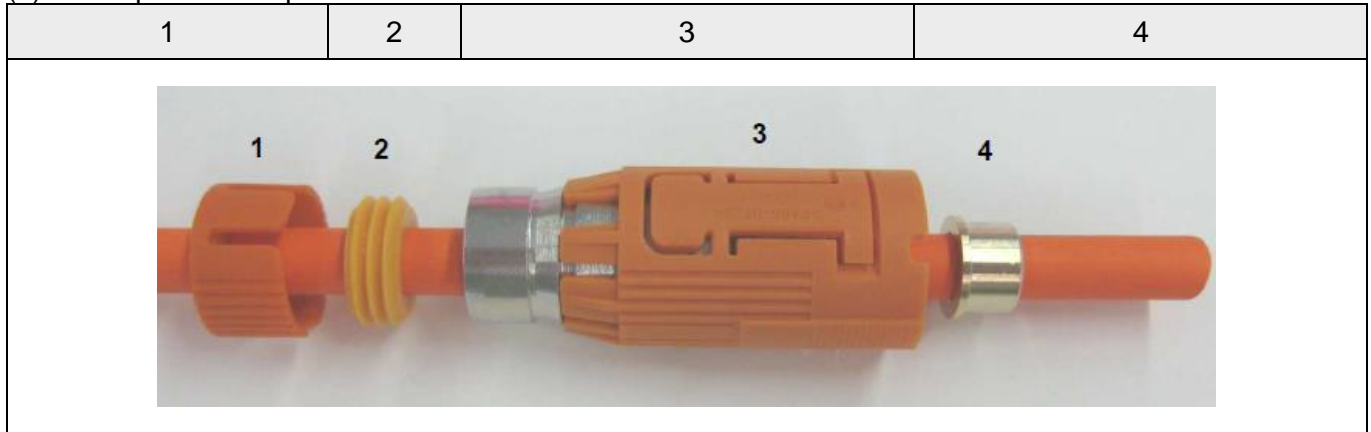
3.1 Cut the shielded cable



3.2 Assembly the single components

Push the cover cap (1), seal for wire (2), locking sleeve (3) and stress relief (4) onto the shielded cable.

Exception: 6.0 mm² cable (ATTENTION: with a diameter of 12.8-0.6 mm), do not assemble the stress relief (4) in this process step.





3.3 Strip insulation of shielded cable



Stripping length:



Wire cross section	Dimension L1 for ODU K4 terminal (mm)	Dimension L1 for Hirschmann Automotive HCT4 terminal incl. zero-cut (mm)
2.5 mm ²	24 ± 1	29.05 ± 1
4.0 mm ²	24 ± 1	29.05 ± 1
6.0 mm ²	24 ± 1	29.05 ± 1
6.0 mm ² Cable with Ø12,8-0,6 mm	25 ± 1	29.55 ± 1

Do not cause any mechanical damages during the manufacturing processes.



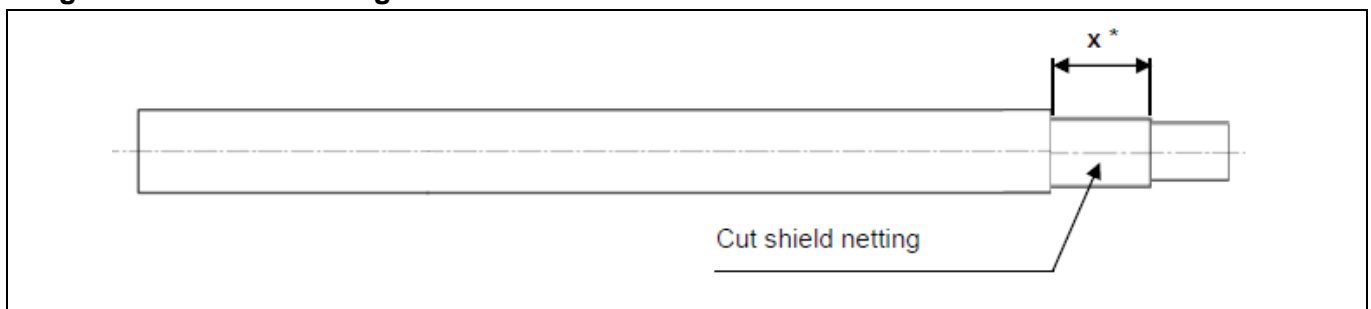
3.4 Wire processing I

Remove foil and assemble stress relief

		
Example: 6.0 mm ² Ø12.8-0.6 mm	Example: 6.0 mm ² Ø12.8-0.6 mm	Example: Draka 6.0 mm ²

Only for 6.0 mm² cable (ATTENTION: with a diameter of 12.8-0.6 mm). Remove the foil and assemble the stress relief in this process. With all other wires assembling the stress relief is already earlier possible.

Length of the shield netting:



*The dimension x can vary on the different production method selected by each manufacturer.



No residues or parts allowed on the cable after cutting the shield netting. This must be ensured with actions like the following:

- Prevention by removing the separated shield netting.
- Prevention by blowing-out or suction of residues / parts from the shield netting.

Furthermore, it must be guaranteed, that after the next work step, a 70% overlapping of the shield netting over the position on the stress relief is given.

3.5 Wire processing II

Shield netting, reversed backwards, foil and filling removed

	
<p>Example: 6.0 mm² Ø12.8-0.6 mm</p>	<p>Example: 6.0 mm² Ø12.8-0.6 mm</p>

Sample: Draka 4.0 mm²

		
<p>1</p>	<p>2</p>	<p>3 (max. L3 = 3.0 mm)</p>

For the assembling of the HCT4 terminal, the length of the filling L3 can be max. 3.0 mm.



Do not cause any mechanical damages on the single conductors during the manufacturing process. If necessary, the twisted shield netting can be dissolved (brushed off).



3.6 Wire processing III

Strip single conductors, assemble ODU female terminals


This production step is **not** needed for the HCT4 terminal system.

As a reference sample, the version with the CuZn material and the hexagon crimp according to the process specification 006 081 002 000 000 was selected.

Stripping length according to the ODU process specification. (006 081 002 000 000 respectively 006 095 002 000 000).	
	
4.0 mm ² (Draka-Leitung)	6.0 mm ² (Leitung Ø12.8 -0.6 mm)

The assembly process of the ODU female terminals is part of the ODU process specification (006 081 002 000 000 respectively 006 095 002 000 000) and will not be described in detail in the process specification.	
	
4.0 mm ² (Draka-Leitung)	6.0 mm ² (Leitung Ø12.8 -0.6 mm)

- Allowed misalignment of the ODU female terminals after assembling --> 0 bis 0.8 mm
- Allowed max. clearance (a) after stripping the insulation and crimping the contacts





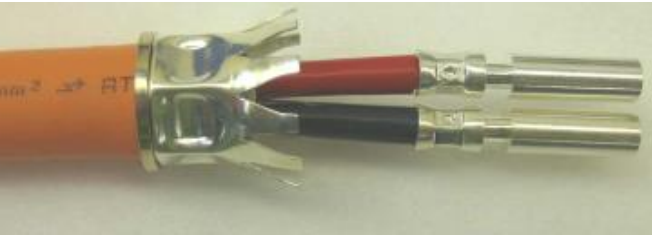

	$a \leq 1 \text{ mm}$
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3.7 Assembly I – Female terminal ODU

Move stress relief, shield netting and shield crimp socket to position and press them together.

If HCT4 terminals are selected, at this process step there are **no** terminals on the wire yet.

The single cores are cut straight. As an example, brushed shield strains and crossed shield strains are shown. This is not related to the contact system.

Stress relief - Shield needs to be laid out firm.	
ODU	HCT4
	
Shield crimp socket - Do not cause any mechanical damages on the crimp socket during the manufacturing process.	
ODU	HCT4
	
Hexagon geometry of pressing operation	
ODU	HCT4
	



- **Device for pressing operation**

The device for the pressing operation of the company "WKM" can be used for the exact positioning and pressing operation of the stress relief and the shield crimp socket.

Name of the device: HV - Kabelverpressungsvorrichtung
Order number: 13 88 02
Name of the device: Wechselmodul zur Leitungsvorbereitung HCT4

The above-mentioned device was developed and realized according to the process guidelines of Hirschmann Automotive GmbH. Single details, regarding the ordering, handling and process specification can be obtained directly at the manufacturer.

WKM - Maschinenbau GmbH
Oberes Ried 15
A-6833 Klaus
Tel. +43 5523 / 54907

The ordering of a device for pressing operation is part from the different manufacturers. Therefore, only the pressing operation data will be described in detail in this process specification HPS40-1 2+2 female connector MCC.

- **Pressing operation data**

Dimensional parameters:

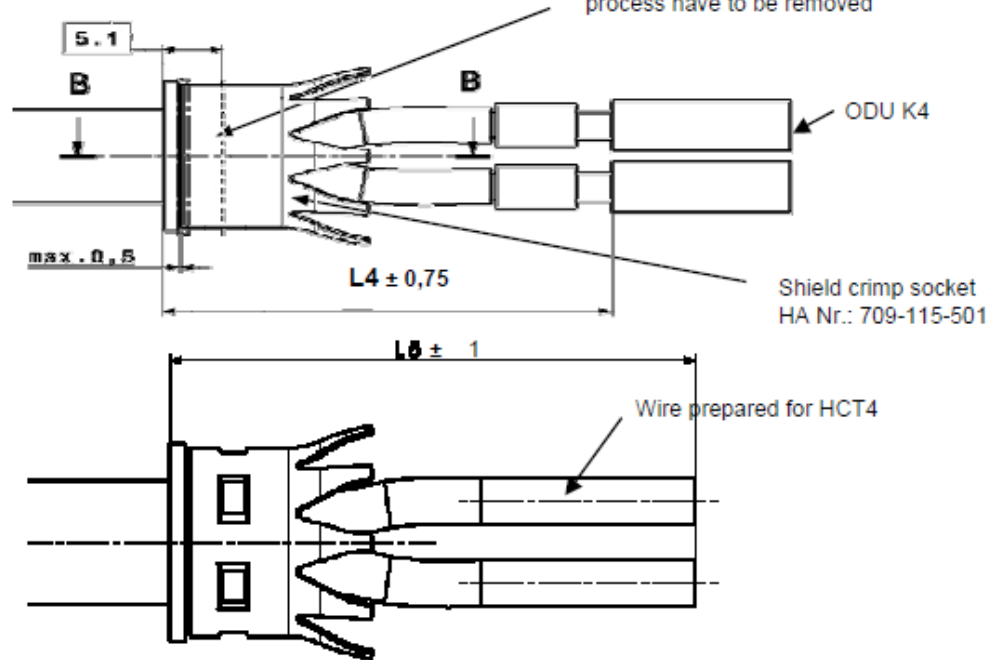
- a) **ODU K4 female terminal:**
The stress relief, shield netting and shield crimp socket must be positioned in the device in a correct and precise position in relation to the preassembled ODU female terminals.
(Dimension K4 = 38.60 ± 0.75 mm).
- b) **Hirschmann Automotive GmbH HCT4 female terminal:**
The stress relief, shield netting and shield crimp must be positioned in the device in a correct and precise position in relation to the preassembled ODU female terminals.
(Dimension L5 = 39.65 ± 1.00 mm).
- c) The circularity of the shield crimp socket must be guaranteed.
- d) Before and after pressing operation, the specified dimensions on the following drawing 1 must be kept.



Drawing 1

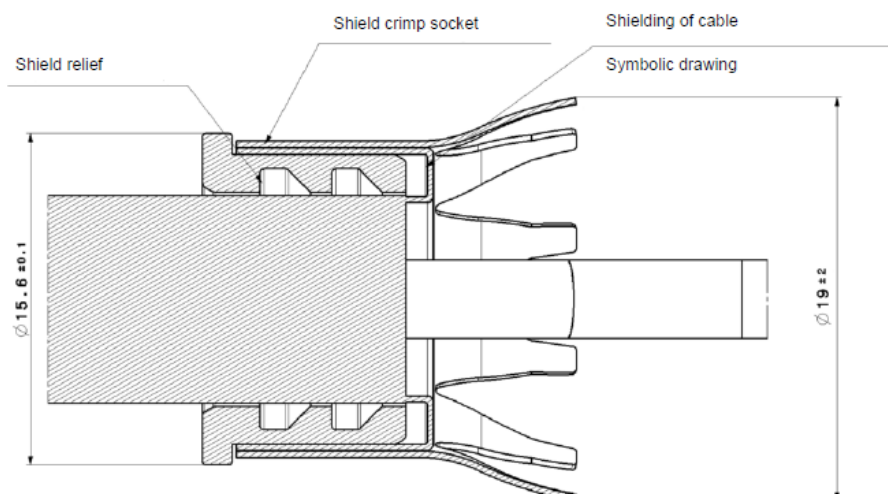
There is no loose shield netting allowed in this area.
Protruding shield netting longer 3mm has to be removed or shorten.

70% of the shield netting must overlap the position on the stress relief
Shield-strands which get cut during the process have to be removed



HCT4 incl. zero-cut add on	L5 = 39,65 mm
HCT4 excl. zero-cut add on	L5 = 35,65 mm
ODU K4	L4 = 38,60 mm

Section B-B
Scale: 5:1





- Pressing operation geometry

Hexagonal geometry of pressing operation

Position of pressing operation:

<p>Section B-B Scale: 5:1</p>	Wire cross section	Dimension c (mm)
	2.5 mm ²	5.7 ± 0.3
	4.0 mm ²	5.7 ± 0.3
	6.0 mm ²	5.7 ± 0.3

Depth of pressing operation:

	Shield relief to shielded cable with shield netting.
--	--

Wire manufacturer	Wire cross section		
	2.5 mm ²	4.0 mm ²	6.0 mm ²
G&G	13.20 ± 0.25	13.10 ± 0.30	12.85 ± 0.25
Kroschu T125	12.70 ± 0.25	13.10 ± 0.30	12.85 ± 0.25
Kroschu T180 (FHRL2GCB2G)	12.30 ± 0.20 (+0.5/-0.2) *	12.60 ± 0.20 (+0.5/-0.2)	12.40 ± 0.20 (+0.5/-0.2) *
Kroschu T180 (FHRL2G2GCB2G)	-	-	12.50 ± 0.25
Draka	13.20 ± 0.25	13.10 ± 0.30	12.85 ± 0.25
Leoni	12.70 ± 0.25	12.60 ± 0.30	12.50 ± 0.25
Coroplast	12.70 ± 0.20	12.55 ± 0.25	12.05 ± 0.25

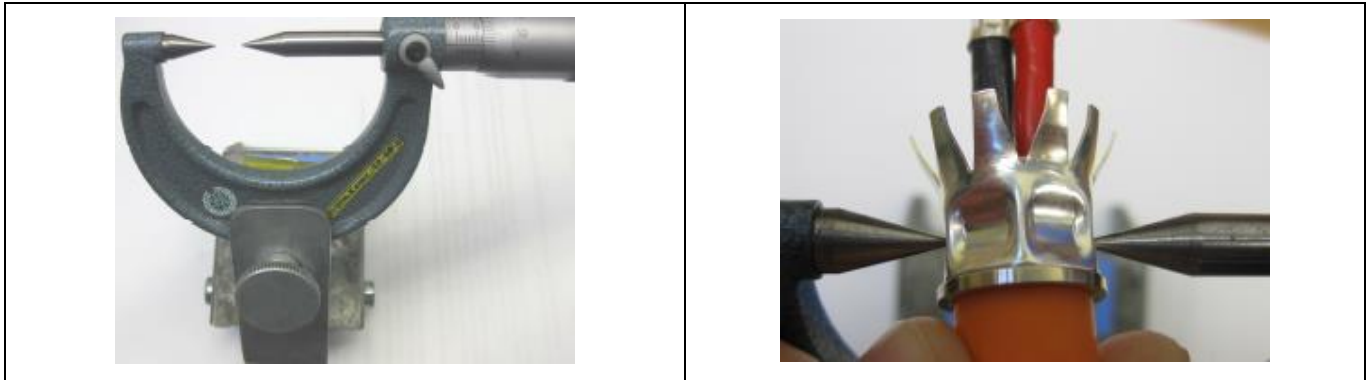
Dimension "d" in mm

*The upper tolerance of the pressing depth can be raised if it is not possible to change the settings on the machine. But then the manufacturer must make sure that the insulation of the wire is not getting pulled back of the strain relief while assembling it into the locking sleeve. Additionally, the locking position of the shield crimp socket must be reached.

- **Check measurement of the depth of the pressing operation**

Use the measurement device to ensure the depth of the pressing operation is correct: to check dimension “d”, all three depths (A-A, B-B and C-C) must be measured. All measurement values must be within the given tolerance.

The measuring must be done with a point micrometer
(Manufacturer Mitutoyo, measuring range 0-25 mm, measuring point 15°/R 0.30 mm).



Position measuring points: center to center



Pull-off-force without shield netting

Wire cross section	Pull-off force
2.5 mm ²	≥ 120 N
4.0 mm ²	≥ 120 N
6.0 mm ²	≥ 120 N

General specifications

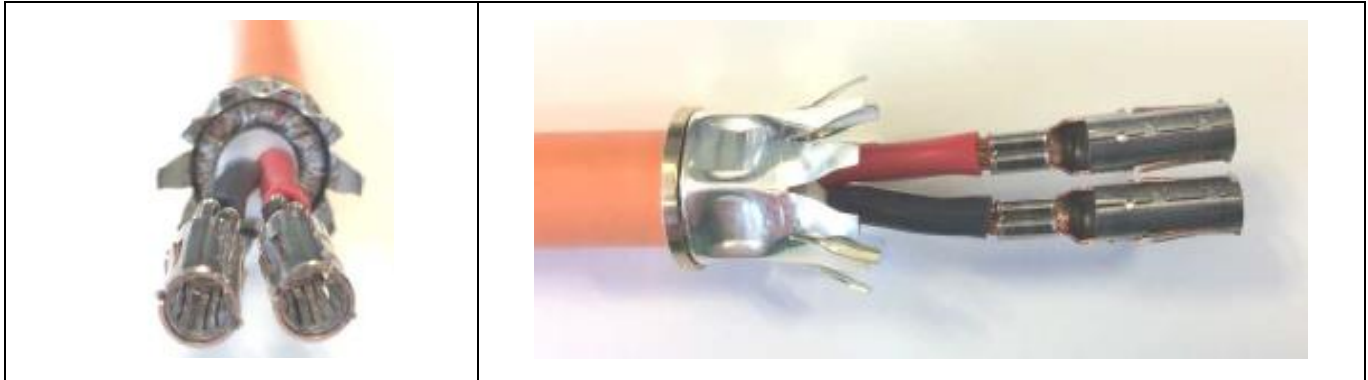
Do not cause any mechanical damages on the following parts during the pressing operation.

- Isolation of shielded cable
- Isolation of single conductors
- Shield relief
- Shield crimp socket
- Shield netting



3.8 Assembly II - Female terminal HCT4

This production step is **not** needed for the ODU terminal system.



- **Double stroke crimping machine**

The crimping device by the company “Schäfer” can be used for the exact positioning and crimping operation of the HCT4 female terminal.

<u>Name of the device:</u>	Double stroke crimping machine
<u>Article number:</u>	EPS2001-HCT4
<u>Name of the device:</u>	Crimp insert
<u>Article number:</u>	Must be taken from the “Process specification HCT4 female terminal EVS-100068”

The mentioned device was developed and realized according to the processing guidelines by Hirschmann Automotive GmbH. Single details, regarding the ordering, handling and process specification could be enquired directly by the supplier.

Schäfer Werkzeug- und Sondermaschinenbau GmbH
Dr.-Alfred-Weckesser-Str. 6
76669 Bad Schoenborn-La, Germany
Tel.: +49 7253 9421-0
Fax: +49 7253 9421-94
www.schaefer.biz

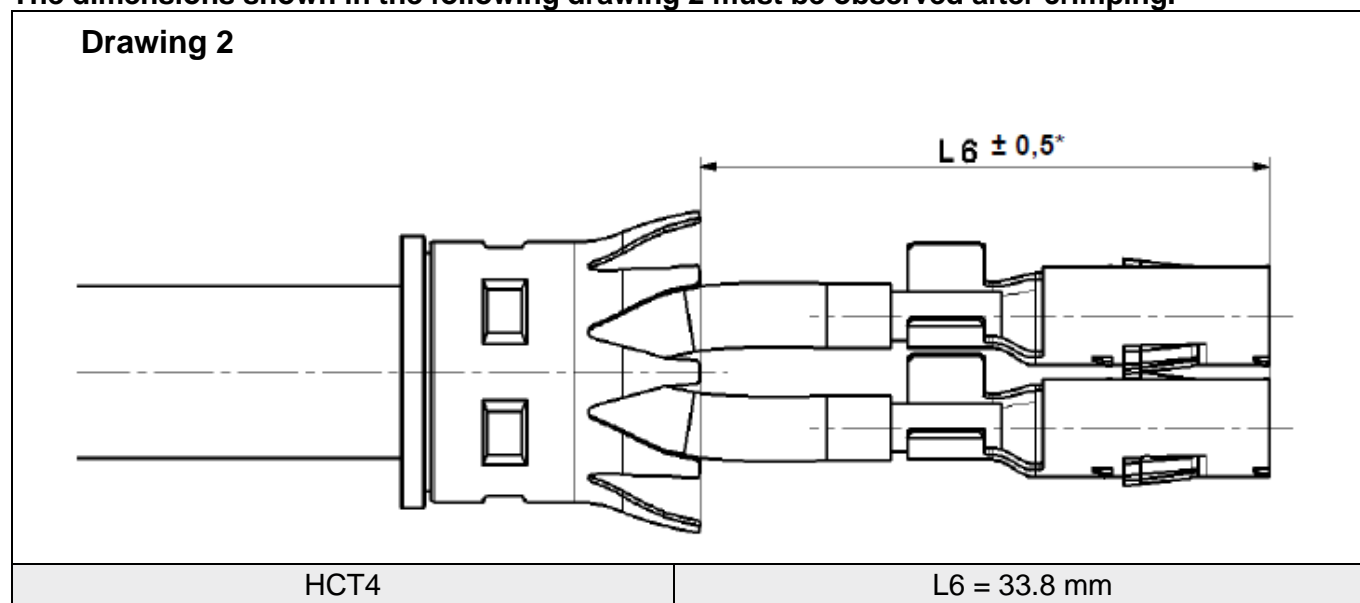
The ordering of a device for pressing operation is part from the different manufacturers. Therefore, only the crimp and position operation data will be described in this process specification HPS40-1 2+2 female connector MCC in detail.



- **Process data**

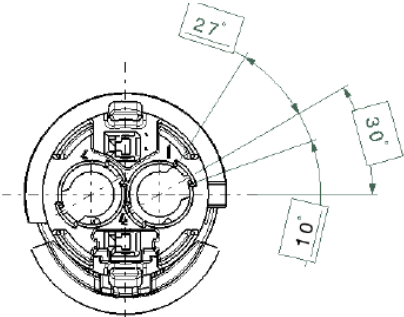
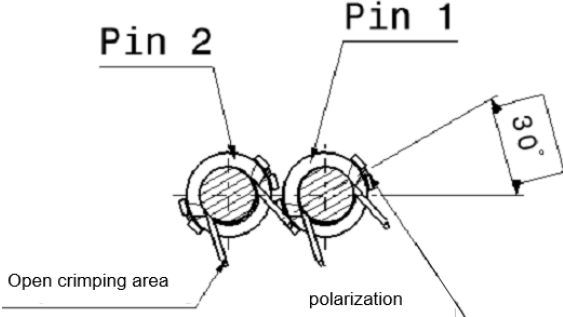
- a) The crimping operation data must be taken from the “process specification HCT4 female terminal EVS-100068”.
- b) The crimping of HCT4 female terminals is related to the shield crimp socket. The relevant wire related length dimension L6 will be created over tool changeable inserts on the crimp press machine. This must be ordered at company Schaefer separately. To mount the polarized HCT4 terminals smoothly into the contact holder, the terminals have to be crimped in the correct position to the wire.

The dimensions shown in the following drawing 2 must be observed after crimping.



* For all silicon core cables with silicon insulated single wire (as defined at chapter 2.3) the upper tolerance can be increased to +1.7 mm to enable an easier assembly process. The maximum length of 35.5 mm is not allowed to extend, because of the risk of cable damages in case of cable overlength inside of the connector. The minimal cable length must be checked and released with the used assembly equipment for the assembly step. (If necessary, the minimum cable length must be increased to warrant the locking position of the shield crimp socket.)



Insertion chamber female terminal HCT4	Nominal position of the terminals of the wire
<i>These angular dimensions are theoretical dimensions and only serve information.</i>	
	

To ensure the correct assembling, primary locking and secondary locking, the crimping of the terminal in the correct position to the wire is important. The nominal angle should be 30°. Depending on the wire the angular deviation can vary.

The allowed angular deviation will be specified by the geometry of the insertion chamber at the female contact carrier and the assembling force of the wire with the terminals into the contact carrier. This can be checked accompanied by the assembling process.



3.9 Assembly III

As an option, if necessary, a protective tube can be fitted over the HV single wire.



The protective tube must not exceed max. 11 mm (10 ± 1 mm) long and must meet a temperature stability of $-40 / +180$ ° C.



Tube proposal: Silicon glass fiber tube (inner diameter $6.5 \text{ mm} \pm 0.3 \text{ mm}$)

It must be avoided that even the shield crimp socket springs than the geometries of the contact holder are placed inside of the tube.



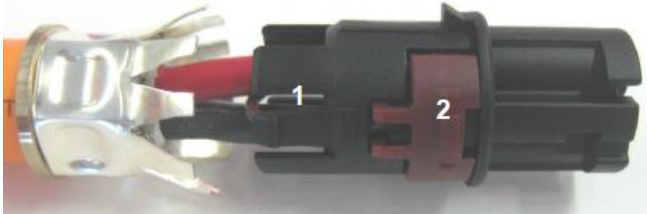
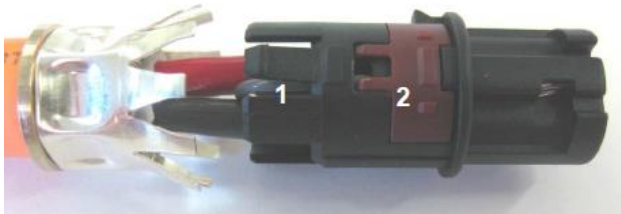


3.10 Assembly IV

Assemble ODU female terminals into HPS40-1 contact carrier (1).			
ODU	HCT4	Pin	Polarity/ Color
		1	+ / Red
		2	- / Can vary

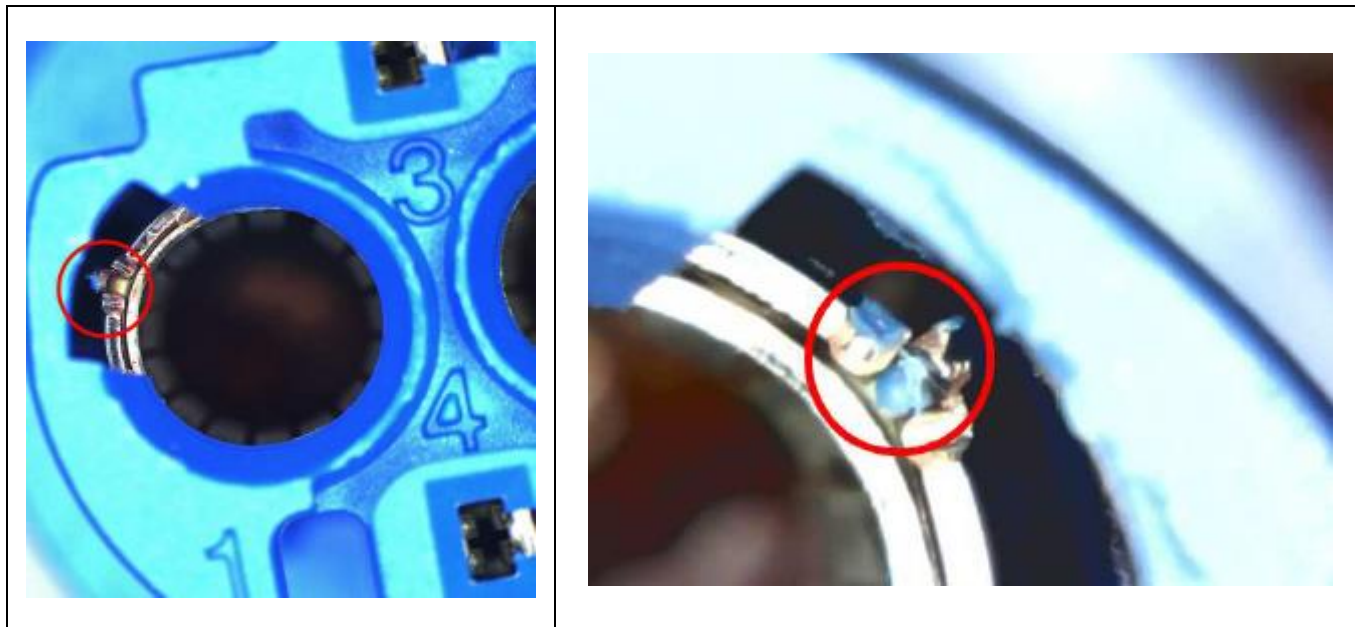
During the assembling of the ODU female terminals the secondary lock (2) will be moved in both sides. When the female terminal is in end position, the latch will move back, and the female terminals are in the pre-assembling position.

During assembling of the HCT4 female terminals the snap latch of the terminal will be moved inside. When the female terminals are in end position, the latch will move back, and the female terminals are in the pre-assembling position.

Pre-assembling position/ primary lock	Press secondary lock (2)
	



During the assembling process of the HCT4 terminal into the contact holder, a plastic chip can appear inside the contact chamber. Particles within the technical cleanliness are allowed and can be left in the connector.



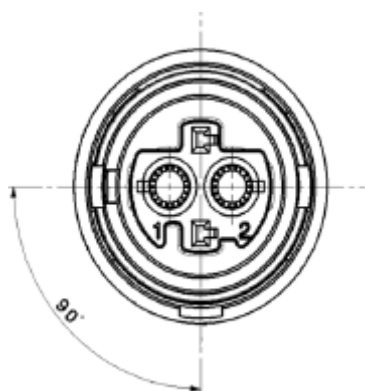
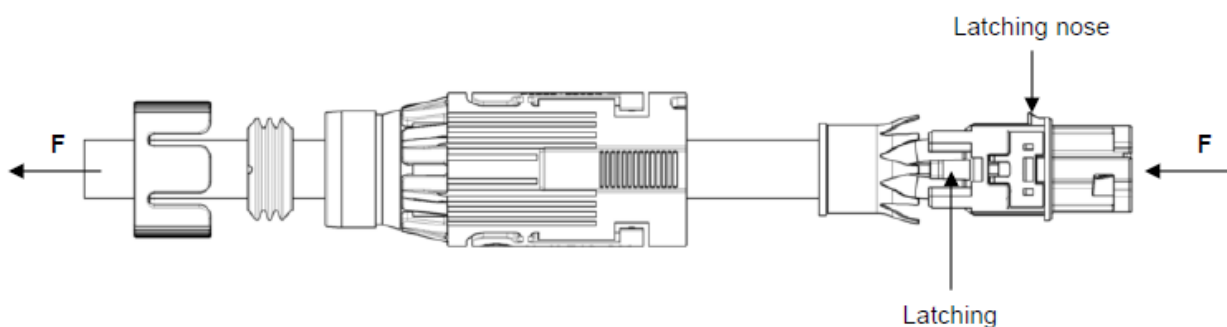
Pictures: HCT4 female contact holder, coding C with plastic chip

Wire manufacturer	Wire cross section		
	2.5 mm ²	4.0 mm ²	6.0 mm ²
Coroplast	FLR2G2GCB2G		
Draka	FLR91XBC33X 600V T125		
	DF047/2009	DF047/2009	DF047/2009
	24 N	30 N	36 N
G&G	FLR31YBC11Y-B T125/3	FLR31YBC11Y (0.20) T125/2	
	X6918D5	X6918D5	X6920D4
	24 N	30 N	36 N
Kroschu	FLR32Y-(ST) CB11Y (0.25) 600V T125	FLR32Y-(ST) CB11Y (0.20) 600V T125	
	64995729	64995730	64995731
	24 N	30 N	36 N
	FHLR2GCB2G 600V T180		
	64996345	64996346	64996347
	24 N	30 N	36 N
Leoni	FHLR2G2GCB2G (0.26) 600V T180	FHLR2G2GCB2G (0.31) 600V T180	
	76H00193A	76H00170A	76H00194A
	24 N	30 N	36 N



3.11 Positioning locking sleeve unit

Polarized and power-assisted assembly of the locking sleeve unit.



Polarization characteristics
Locking device unit and
terminal holder

The optimal mounting force and the distribution of the force acting, are depending on the different types of the wires. During the machine supported production, the max. forces must be considered, to prevent damage on other components.



Even a compression of the HV single wires and the related risk of damaging the HV wires must be avoided during the assembling process.

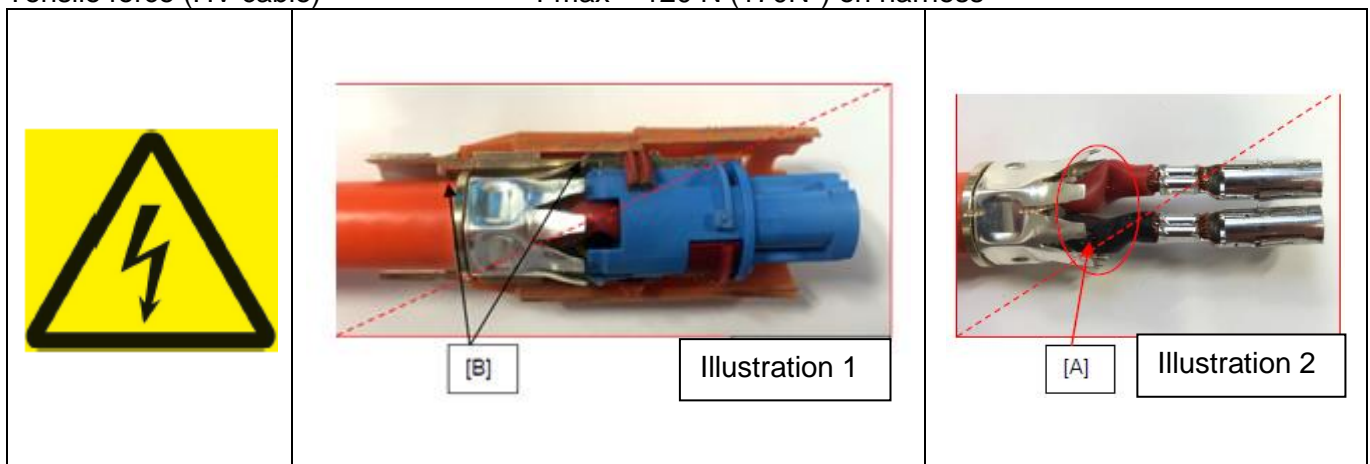
This can be achieved by a simultaneous pull + press and prevent the relative movement between terminal holder and cable. --> max. allowance of the compression of the HV single wire is 1 mm. Alternative it is possible to pull the cable until you reach the end position of the shield crimp socket. In a second step the contact holder must be pushed to achieve the final locking position.

Compressive force (contact holder)

$F_{max} = 200 \text{ N}$ on terminal holder unit

Tensile force (HV cable)

$F_{max} = 120 \text{ N}$ (170N*) on harness



This error caption may be caused by cable lengths which are too long or where the correct guiding process has not been adhered to, the consequences of which could be kinked or damaged [A] HV single wires (short circuit risk) and an incorrect (not locked) end position [B] of the shield crimp socket.

- The shield crimp socket, both latching hooks and the latching nose of the terminal holder unit, must be locked in the gaps of the locking device unit.
- Do not cause any mechanical damage on the shield crimp socket, the latching nose, neither on both latching hooks of the terminal holder unit. The sheath of the wire cannot be loosened of the stress relief.

*If necessary, the pulling force can be increased to 170N, if there is no damage on the wire, also the sheath of the wire cannot be loosened of the stress relief.



3.12 Assembly seal and cover cap

Seal (1) and cover cap (2) have not to be damaged during the assembly process.



Lock cover cap (2) in the cut-out (3) of the locking sleeve unit.
Cover cap (2) is not locked against rotation.



3.13 Delivery of produced harnesses

For a capable and controlled process delivery of the produced harnesses to quantitatively free defined bundles.

4 Technical information

4.1 General requirements

It is not allowed, that any damages appear on the single components during the whole production process.

4.2 Technical cleanliness

In generally, pay attention to the cleanliness at and inside of the connector. Metallic particles generated at the assembly process must be removed with a suitable measure. No metallic particles >1000µm allowed on the inside neither on the outside of the connector.

Metallic particles at each connector: CCC = N (J4/K0) according to VDA 19

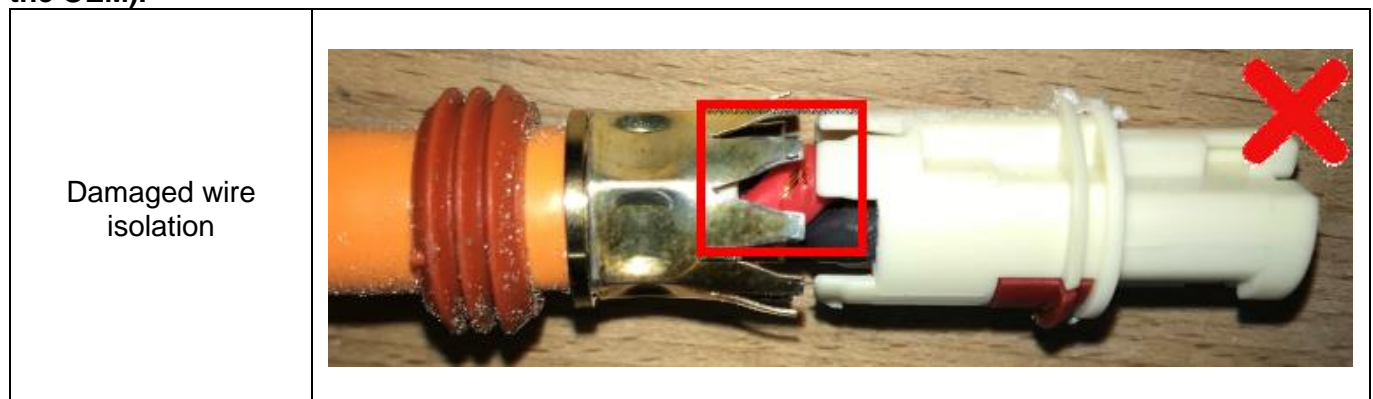
All other particles at each connector: CCC = N (J4/K0) according to VDA 19

4.3 Connector rotation angle

It is allowed to turn the assembled but not connected female connector up to max. +180° and back to max. -180° in reference to the Multicore wire. The wire length has no influence.

If the connector will be turned over the limit value and back within the limit values, the HV single wires can get compressed and damaged. An insulation failure or short-circuit between HV to HV or HV to shield can occur. The total amount of turning movements must be minimized. Approximately 6 single movements in total should not be exceeded.

If the possibility of turning the connector is used at the assembly process the OEM must be informed to avoid any using of this option over the limited values in total (including the turning at the OEM).





5 Change of documentation

Change description	Change date	Editor
First edition	05/ 2014	Kleiner T.
First release	01/ 2015	Weiss M.
Added CPA and HCT4 system Optimized dimensions for assembly	12/ 2015	Shaw S.
chapter 4.11 – safety notification added	02/ 2016	Weiss M.
chapter 4.11 – assembly details added	05/ 2016	Weiss M.
chapter 4.1 – assembly details added	04/ 2017	Breuss L.
chapter 4.7 – length HCT4 excl. zero cut added	08/ 2017	Hoor R.
chapter 3.7– changed pictures seal chapter 4.7 – adapted text loose shield netting chapter 4.10 – optional assembly protection tube chapter 4.15 – added connector rotation angle chapter 4.16 adapted technical cleanliness	01/ 2021	Shaw S.
chapter 4.7 – changed text chapter 4.8 – (English version) updated text of Drawing 2	10/ 2021	Shaw S
New design for the process specification	07/ 2022	Natter T.
Change of design	06/ 2023	Jussel E-M.
Adjusting data of the bottom line	07/ 2023	Jussel E-M.