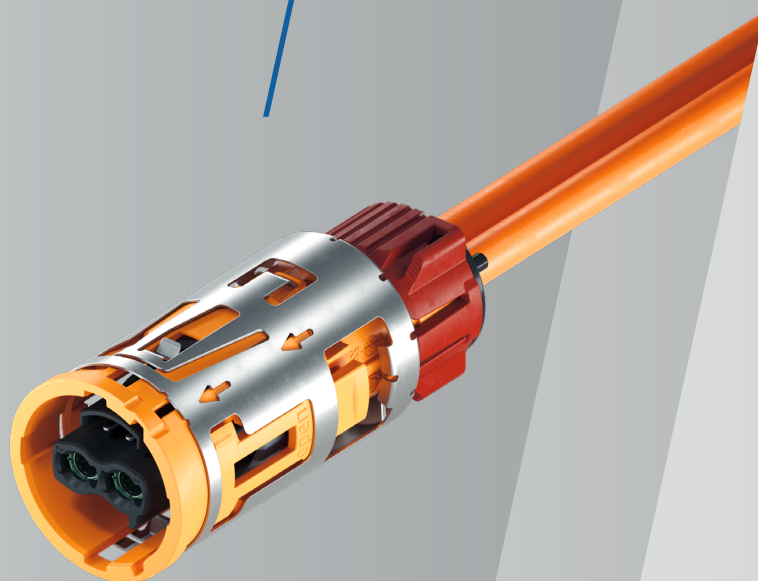




PROCESS SPECIFICATION
HPS40-2 2+2
Female Connector SCC

EVS-100111



HIRSCHMANN
AUTOMOTIVE

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1 General

1.1 Introduction

This process specification is valid for all variants describes the product structure as well as the assembly of the Hirschmann Automotive HPS40-2 2+2 female connector SCC.

System number	Coding	Wire cross section
807-655-501	A	4.0 mm ² 6.0 mm ²
809-886-501		
809-887-501		
807-655-502	B	
809-886-502		
809-887-502		
807-655-503	C	
809-886-503		
809-887-503		
807-655-504	D	
809-886-504		
809-887-504		
807-655-507	Z	
809-886-507		
809-887-507		

The manufacturer of the listed products is responsible for the qualitative processing and the accuracy of the version. In the case of improper processes or deviation from specification that results in quality issues, the right of complaint is void.

1.2 Customer releases

Customer: BMW BMW-Number.: 5 A37 9F8				NAEL: E 24550 – VS16 E 1E24 A – VS18 E 3S65 A – VS21 N OU53 B – VS23	
Special characteristics according to GS 91011:2019-8					
L	S	F	Characteristic	Specific Purpose	Place of implementation
L1	-	-	“d” Height of shield-crimping	Strain-relief, electrical shield connection - EMC	Tier 1
L2**	-	-	Retention force of shield crimping	Strain-relief, electrical shield connection - EMC	
-	-	F1	L12 depth of contact carrier	Pluggability	

**No 100% check possible since the specimens are destroyed during testing.

Proof of capability or continuous testing of all special characteristics must be aligned with BMW directly.

1.3 Other current documents

A	HCT4 Process specification (Ag)	EVS-100068
B	Datasheet Shielded SCC 4.0 mm ² Huber & Suhner	H&S Nr.: FLR91XC33X-1x4 T150
C	Datasheet Shielded SCC 4.0 mm ² Coficab	Coficab No.: FHLR91XCB91X T4
D	Datasheet Shielded SCC 4.0 mm ² Coroplast	Coroplast No.: 9-2611 (1x 4.0 mm ²)
E	Datasheet Shielded SCC 4.0 mm² Kroschu	Kroschu No.: 64998372
F	Datasheet Shielded SCC 4.0 mm ² Leoni	Leoni No.: FHLR2GCB2G 00003
G	Datasheet Shielded SCC 6.0 mm ² Coficab	Coficab No.: FHLR91XCB91X T4
H	Datasheet Shielded SCC 6.0 mm ² Coroplast	Coroplast No.: 9-2611 (1x 6.0 mm ²)
I	Datasheet Shielded SCC 6.0 mm ² Kroschu	Kroschu No.: 64998373
J	Datasheet Shielded SCC 6.0 mm ² Leoni	Leoni No.: FHLR2GCB2G 00004
K	Datasheet Shielded SCC 6.0 mm ² Gebauer & Griller	G&G Nr.: FHLALR2GCB2G 1X6,0(0,40)/T180
L	HCT4 Process specification (Al)	EVS-100145
M	Datasheet Shielded SCC 6.0 mm ² Coficab	Coficab No.: FHLR91XC91X T4
N	Datasheet Shielded SCC 6.0 mm ² Gebauer & Griller	G&G Nr.: FHLR2GCB2G 1X6,0/T180
O	Datasheet Shielded SCC 4.0 mm ² Gebauer & Griller	G&G Nr.: FHLR2GCB2G 1X4,0/T180
U	HCT4 Process specification (Al)	EVS-100145

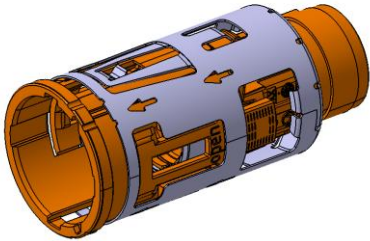
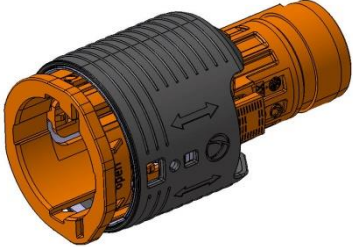
2 Product structure (single components)

2.1 Sheated cable (see table)

Wire manufacturer	Wire cross section	
	4.0 mm ²	6.0 mm ²
Leoni	FHLR2GCB2G 4,0/0,31/T180/ 600 VAC / 1,000 VDC	FHLR2GCB2G 6,0/0,31/T180/ 600 VAC / 1,000 VDC
Kroschu	FHLR2GCB2G 4.00 QMM/0.21/T180 600/1000V OR	FHLR2GCB2G 6.00 QMM/0.21/T180 600/1000V OR
Coroplast	FHLR2GCB2G 4.0 mm ² / 0,21 T180 0,6/1,0 kV	FHLR2GCB2G 6.0 mm ² / 0,21 T180 0,6/1,0 kV
Coficab	FHLR91XCB91X T4 4.0 mm ²	FHLR91XCB91X T4 6.0 mm ²
		FHLR91XC91X T4 6.0mm ²
Huber & Suhner	FLR91XC33X 1x4 T150 1x 4.0 mm ² RADOX 155S FLR	
Gebauer & Griller	FHLR2GCB2G 4,0/T180/ 600 VAC/ 1,000 VDC	FHLR2GCB2G 6,0/T180/ 600 VAC/ 1,000 VDC
		FHLALR2GCB2G X6,0 (0.40)/ T180

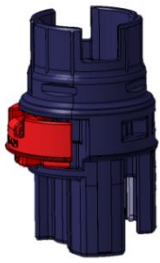
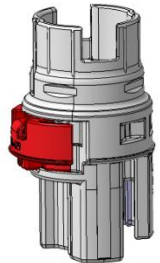
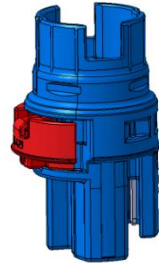
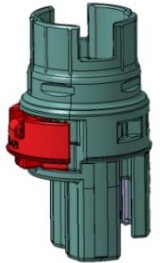
Only wires which are listed here and released by the respective OEM are allowed to use.

2.2 HPS40-2 2+2 locking sleeve

	
-501	-503
Hirschmann Automotive No.	Wire cross section
807-656-501	4.0 mm ² 6.0 mm ²
807-656-503	

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

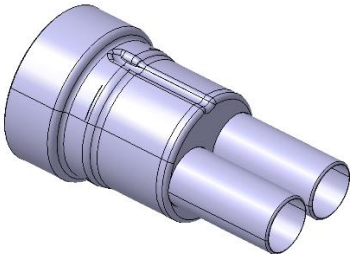
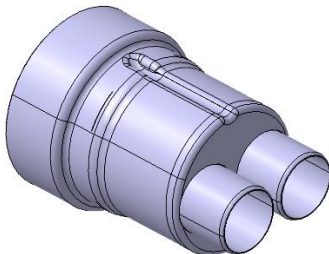
2.3 HPS40-2 2+2 female contact carrier

				
-501/-508 (Cod. A)	-502/-509 (Cod. B)	-503/-510 (Cod. C)	-504/-511 (Cod. D)	-507/-514 (Cod. Z)

Hirschmann Automotive No.	Coding	Colour	HVIL bridge	Wire cross section	Flammability according to UL94
807-657-501	A	Black	Yes	4.0 mm ² 6.0 mm ²	HB
807-657-502	B	Natural/ white	Yes		
807-657-503	C	Blue	Yes		
807-657-504	D	Purple	Yes		
807-657-507	Z	Water/ blue	Yes		
807-657-551	A	Black	Yes	4.0 mm ² 6.0 mm ²	V-0
807-657-552	B	Natural/ white	Yes		
807-657-553	C	Blue	Yes		
807-657-554	D	Purple	Yes		
807-657-557	Z	Water/ blue	Yes		
807-657-561	A	Black	No	4.0 mm ² 6.0 mm ²	V-0
807-657-562	B	Natural/ white	No		
807-657-563	C	Blue	No		
807-657-567	D	Purple	No		
807-657-567	Z	Water/ blue	No		
807-657-541	A	Black	Yes	4.0 mm ² 6.0 mm ²	V-0
807-657-542	B	Natural/ white	Yes		
807-657-543	C	Blue	Yes		
807-657-544	D	Purple	Yes		
807-657-547	Z	Water/ blue	Yes		

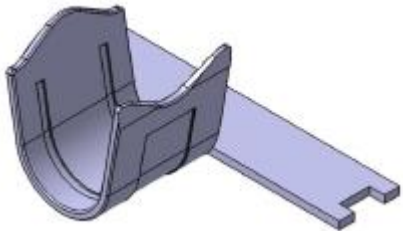
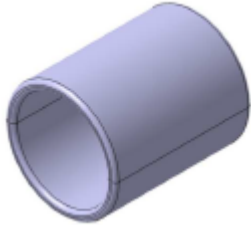
Delivery condition: The contact carriers are delivered as bulk good.

2.4 HPS40-2 2+2 shielding sleeve SCC

	
-504	-506
Hirschmann Automotive No.	Wire cross section
710-161-504	4.0 mm ²
710-161-506	6.0 mm ²

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

2.5 HPS40-2 2+2 stress relief

	
-502	-501

Hirschmann Automotive No.	Wire cross section
710-671-501	6.0 mm ²
710-195-502	4.0 mm ²

Wire manufacturer: On the product drawing (HA No. 807-655-...xx), you can find the released cables for each stress relief.

Delivery condition: The crimp ferrules are delivered on coils, the strain-reliefs as bulk good.

2.6 HPS40-2 X-Ring



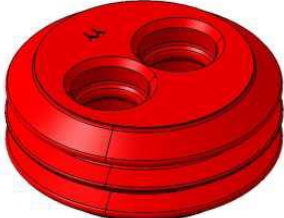
-501

Hirschmann Automotive No.	Wire cross section
710-675-501	6.0 mm ²

Wire manufacturer: On the product drawing (HA No. 807-655-...xx), you can find the released cables for each stress relief.

Delivery condition: The crimp ferrules are delivered on coils, the strain-reliefs as bulk good.

2.7 HPS40-2 2+2 wire seal SCC

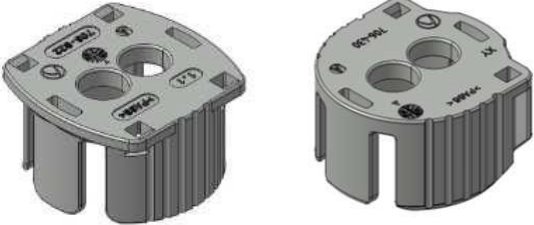
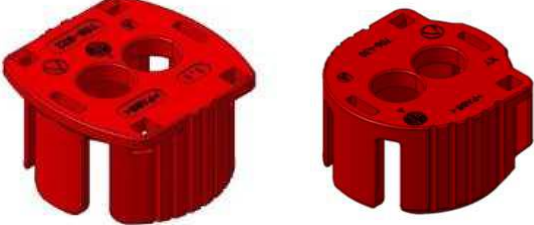
	
-502 (4.0 mm²)	-504 (6.0 mm²)

Hirschmann Automotive No.	Colour	Wire cross section
709-972-502	Grey	4.0 mm²
709-972-504	Red	6.0 mm²

Wire manufacturer: On the product drawing (HA No. 807-655-...XX), you can find the released cables for each seal.

Delivery condition: The seals are delivered as bulk good.

2.8 HPS40-2 2+2 cover cap SCC

	
-503, -504 (4.0 mm ²)	-505, -506 (6.0 mm ²)

Hirschmann Automotive No.	Colour	Wire cross section
706-430-504 706-822-503	Grey	4.0 mm ²
706-430-505 706-822-505	Red	6.0 mm ²

Wire manufacturer: On the product drawing (HA No. 807-655-...XX), you can find the released cables for each cover cap.

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

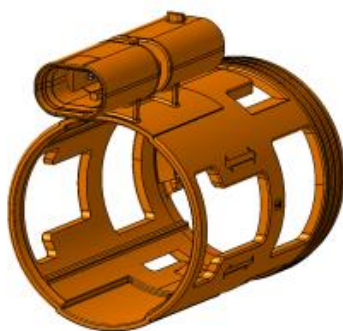
2.9 HCT4 2+2 female terminal

	
-504 (4.0 mm²)	-505 (6.0 mm²)
Hirschmann Automotive No.	Wire cross section
709-427-504	4.0 mm²
709-427-505	6.0 mm²

Delivery condition: The female terminal will be delivered at terminal strip on a spool.

3 Product structure (optional parts)

3.1 HPS40-2 2+2 CPA housing



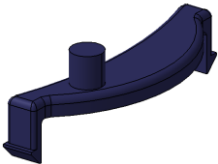
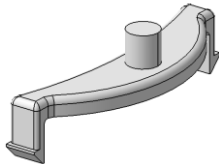
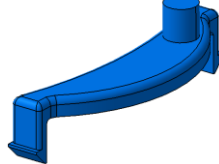
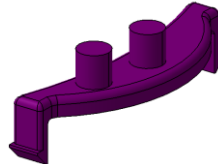
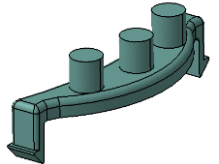
-501

Hirschmann Automotive No.	Wire cross section
810-287-501	4.0 mm ² 6.0 mm ²

Information: The CPA Housing will be used for the In-Line Connector with HVIL.

Delivery condition: The CPA Housing is delivered as bulk good.

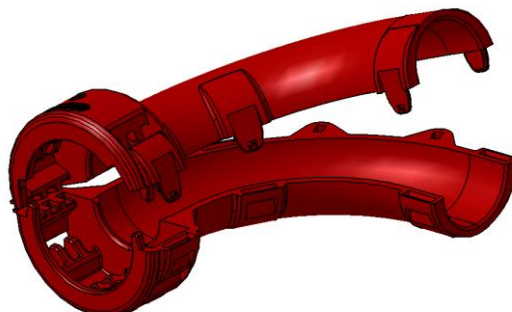
3.2 HPS40-2 2+2 coding clip

				
Cod. A	Cod. B	Cod. C	Cod. D	Cod. Z

Hirschmann Automotive No.	Coding	Colour	Wire cross section
706-505-501	A	Black	4.0 mm ² 6.0 mm ²
706-505-502	B	Natural / white	
706-505-503	C	Blue	
706-505-504	D	Purple	
706-505-507	Z	Water blue	

Delivery condition: The coding clips are delivered as bulk good.

3.3 HPS40-2 2+2 90° angle cap

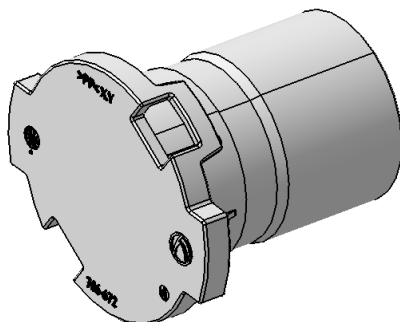


Hirschmann Automotive No.	Wire cross section
706-506-503	4.0 mm ² 6.0 mm ²

Information: The 90° angled cap can be used as an optional part instead of the cover cap.

Delivery condition: The 90° angled caps are delivered as bulk good.

3.4 HPS40-2 2+2 protection cap



**Hirschmann
Automotive No.**

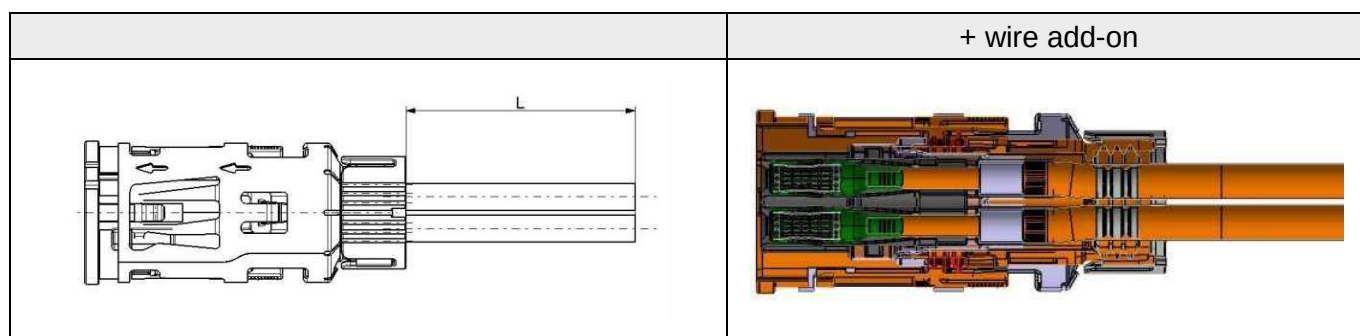
706-672-501

Delivery condition: The transport protection caps are delivered as bulk good.

4 Processing steps (4.0 mm²)

Use the following described processing steps as necessary for the wire cross sections 4.0 mm². As a reference sample, a terminal holder coding A and a 4.0 mm² wire was used.

4.1 Cut the shielded cable



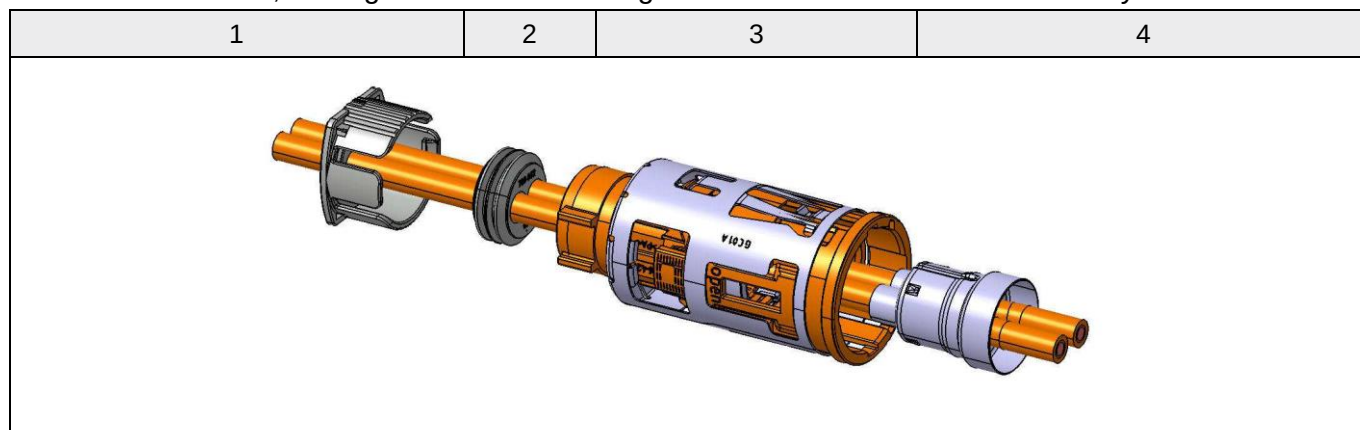
Add following lengths for the HPS40-2 2+2 female connector:

Wire cross section	Dimension L after zero-cut (mm)	Dimension L for the HCT4 terminal incl. zero-cut (mm)
4.0 mm ²	L + 50	L + 54

This dimension must be added to the planned length at cutting process of the wire for each female connector.

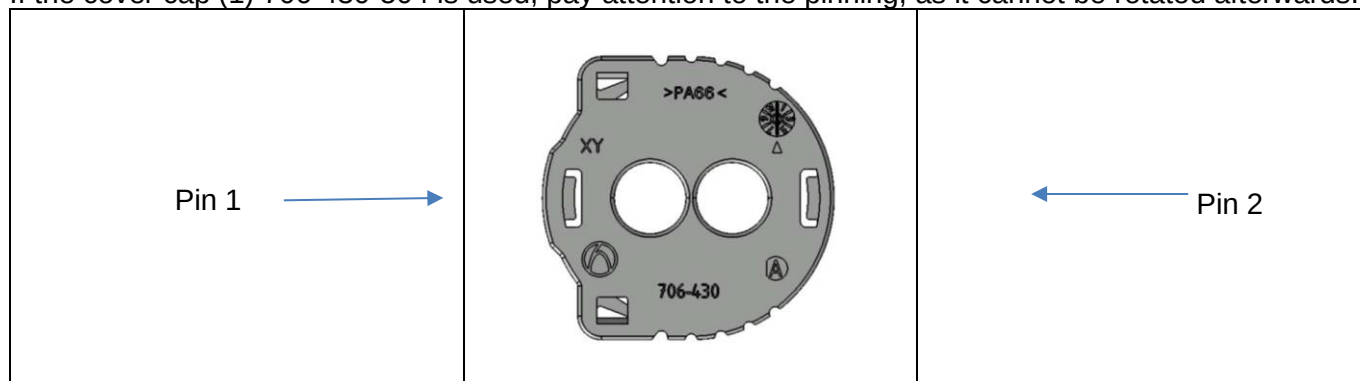
4.2 Assembly of the single components

Slide the cover cap (1), the seal (2), the female locking device (3) and the shielding sleeve (4) onto the shielded cable. Seal, locking device and shielding sleeve can be assembled either way.



Note: The locking device (3) and shielding sleeve (4) may as well be assembled onto the cable after step "crimping of HCT4-female terminals".

If the cover cap (1) 706-430-504 is used, pay attention to the pinning, as it cannot be rotated afterwards.



4.3 Strip off the shielded cable



Stripping length:

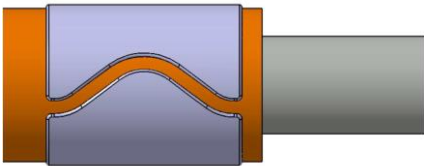
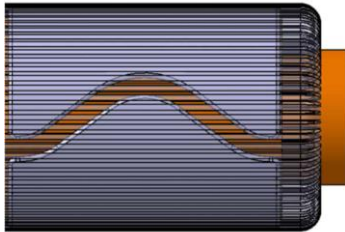


Wire cross section	Dimension L1 after zero-cut (mm)	Dimension L1 for the HCT4 terminal incl. zero-cut (mm)
4.0 mm ²	18.0 ± 1	22.0 ± 1

Do not damage the shielding during the processing operation.

4.4 Wire processing I

Crimp the crimp ferrule (4.0 mm²)

		
	Max. 2.0 mm	Reference for L5

The following process steps must be done, but the manufacturer can choose the sequence:

- Crimp the crimp ferrule
- Remove the foil
- Shorten the shielding

In this processing specification, the recommended sequence is shown. If required, the stripping of the cable can be done after the crimping of the crimp ferrule. Then, a maximum overlap of the inner jacket of 2.0 mm must be ensured. Nevertheless, it must be ensured that L5 is referenced to the ferrule.

- **Single stroke crimping machine**

For the positioning and the crimping process of the HCT4 female terminals, the crimping machine of the company "Schäfer" can be used:

Name of the device: Crimp-Device Crimp-Ferrule HPS40-2 SCC
Article number: EPS2001-HPS40-2 SCC

The individual details referring to commissioning, handling and process description of the device can be requested directly at the supplier:

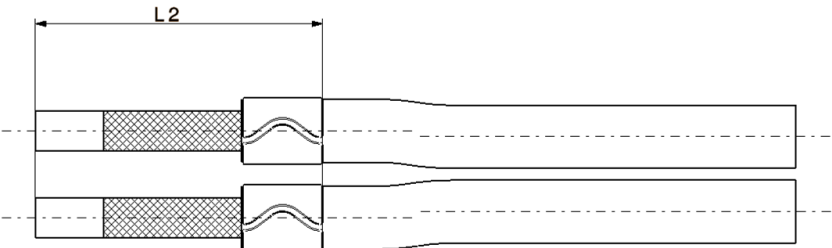
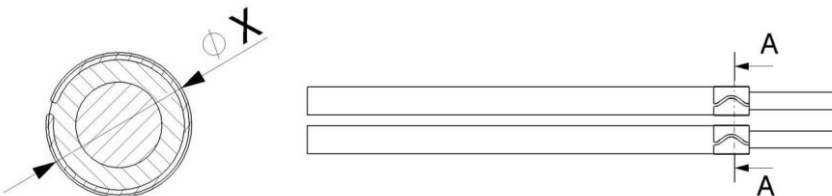
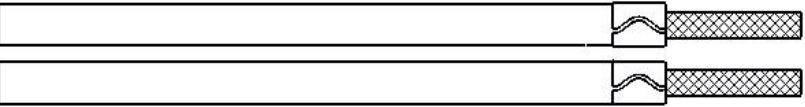
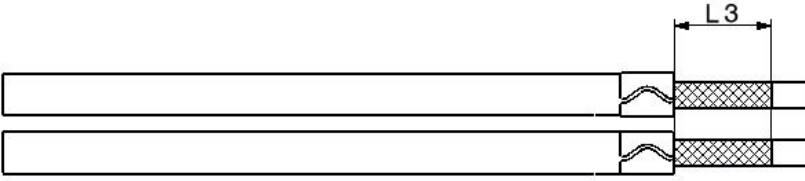
Schäfer Werkzeug- und Sondermaschinenbau GmbH
Dr.-Alfred-Weckesser-Str. 6
76669 Bad Schoenborn-La, Deutschland
Tel: +49 7253 9421-0
www.schaefer.biz

The commissioning of the crimping device must be done through the manufacturer. The manufacturer is at liberty to use a crimping device of his choice. The crimp process must meet the crimp and positioning data which are specified on the following pages.

- **Process data**

- The crimp ferrules need to be crimped in relation to the single wires. The measurement of $\varnothing X$ shall be done in crimping direction.

The dimensions on the following drawing need to be adhered to.

	L2: max. 25.5 mm after zero-cut max. 29.5 mm incl. zero-cut max. 31.0 mm if L5 is guaranteed by a dimensional reference-cut
	Wire cross section: 4.0 mm² Dimension $\varnothing X$: 6.1 ± 0.1
	An overlap of the foil in the area of the crimp max. 1.0 mm is allowed.
	Dimension of the shielding: Depending on the production method of each manufacturer, the dimension L3 can vary.

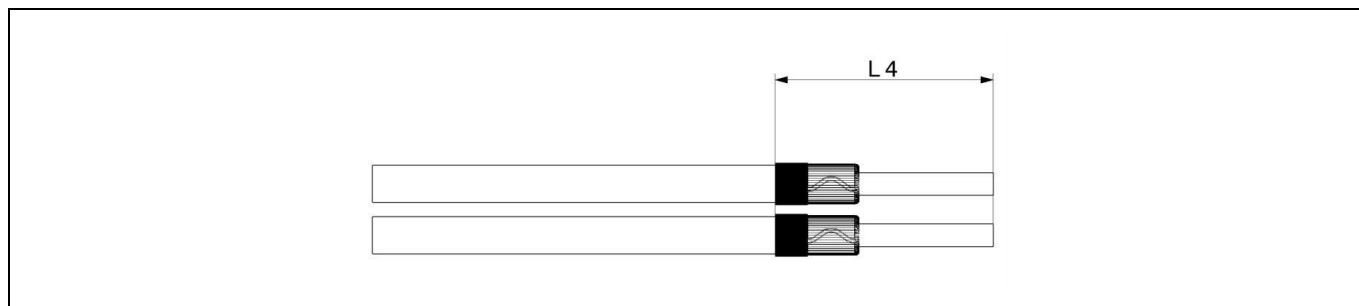
After cutting the shielding, there are no wire residues or parts of the shielding permitted on the cable. This must be ensured with actions like the following:

- Removing the residues of the shielding.
- Blowing out or by suction of the residues of the shielding.

In the next process step, make sure that the shielding is rising over the crimp 100%.

4.5 Wire processing II

Fold the shield backwards, hold the shield with tape



100% of the shield must be turned over the crimp. A targeted unbraiding of the shield is not necessary. By turning over the shield, a process related unbraiding is possible. After this the shield must be fixed with a fixing device behind the crimp. (For example: tape) The fixing tape needs to stay on, until the pressing procedure is done and can be left inside the connector. The max. width of the tape is **5.0 mm**. The fixing tape must be positioned immediately after the stress relief and must not reach the stress relief. No shielding allowed outside the fixing tape.

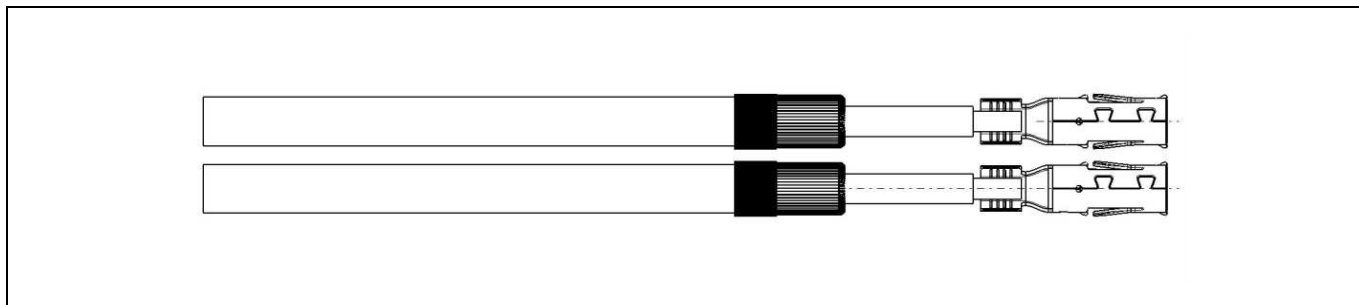
The max. position of the tape is showed with the dimension L4.

L4 = max. 35.0 mm after zero-cut (measurement in straightened length)
 = max. 39.0 mm incl. zero-cut (measurement in straightened length)

In this specification the PET- fabric tape 837X (838X) 5.0 mm of the company Coroplast is used. It is possible to use another product to fix the shield. The max. outer diameter after assembling is Ø 6.75 mm and the shield sleeve must be able to be mounted easily. The product must have min. 150° C thermal resistance.

Single strands of the shield which are not fixed with the tape and stick out must be removed before further process steps. Do not damage the single wires during the complete processing operation.

4.6 Crimp the HCT4 female terminal



- **Double stroke crimping machine**

For the positioning and the crimping process of the HCT4 female terminals, the crimping machine of the company "Schäfer" can be used:

<u>Name of the device:</u>	HPS40-2 Double stroke crimping machine
<u>Article number:</u>	EPS2001-HPS40-2
<u>Name of the device:</u>	Interchangeable crimping unit
<u>Article number:</u>	Shown in the process specification HCT4 female terminal „EVS-100068“

The individual details referring to commissioning, handling and process description of the device can be requested directly at the supplier:

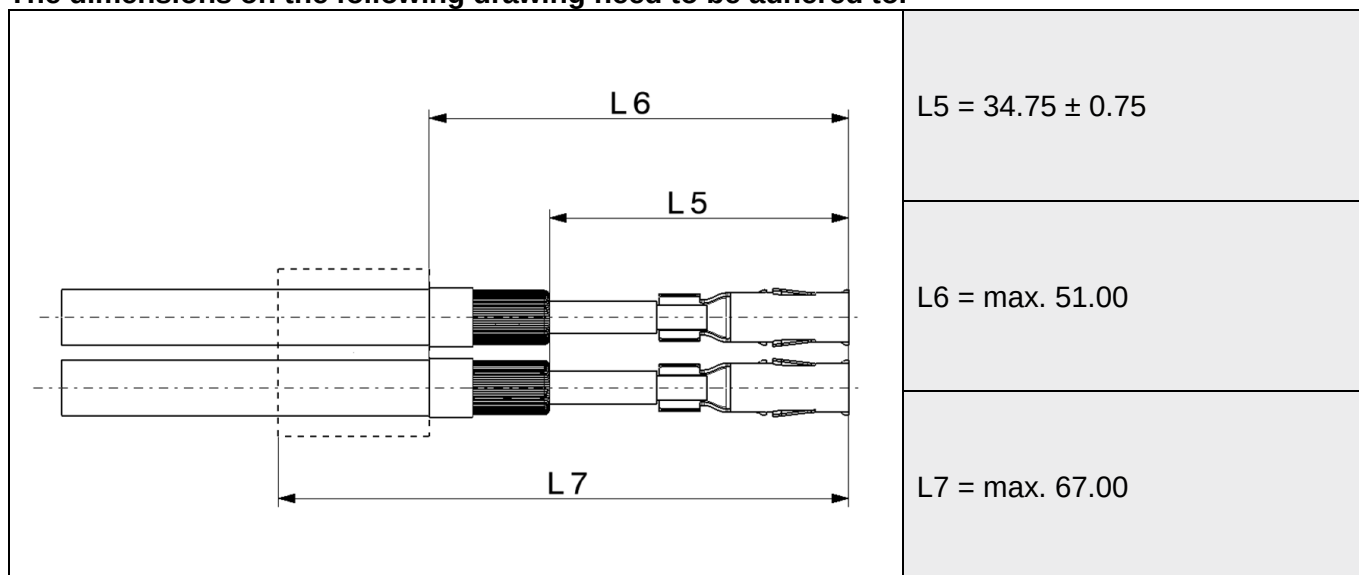
Schäfer Werkzeug- und Sondermaschinenbau GmbH
Dr.-Alfred-Weckesser-Str. 6
76669 Bad Schoenborn-La, Deutschland
Tel: +49 7253 9421-0
www.schaefer.biz

The commissioning of the crimping device must be done through the manufacturer. The manufacturer is at liberty to use a crimping device of his choice. The crimp process must meet the crimp and positioning data which are specified on the following pages.

- **Process data**

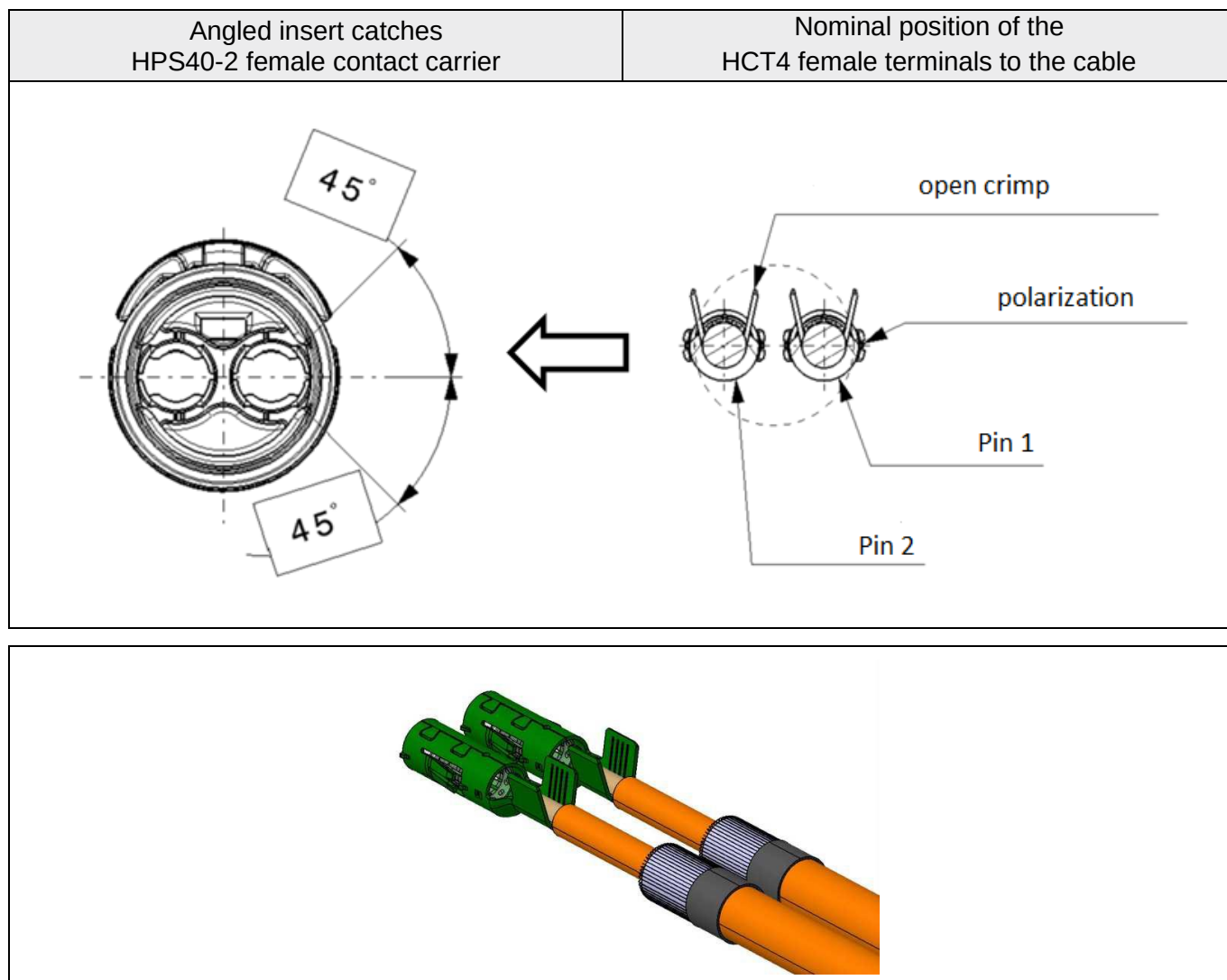
- b) The crimp data can be seen in the „Process specification HCT4 female terminal EVS-100068“.
- c) The HCT4 female terminals need to be crimped in relation to the single wires. For a smooth assembly into the contact holder, the terminals need to be crimped in the correct position.

The dimensions on the following drawing need to be adhered to.



The dimension L5 and L6 are just for information. The dimensions are caused from the dimension L1, L4 and the EVS-100068. The length difference between the female terminals shall not be greater than 0.5 mm. A mark on the insulation of the single wires or on the outer sheath which is caused due to fixing the wire at the crimping process is allowed. It must be ensured that the insulation will not be damaged because this will lead to an insulation resistance failure.

At the area of the wire seal it is not allowed to deform or damage the outer sheath which has negative influence on the sealing function. If agreed to by the OEM, either L2 or L5 must be proven, since they are correlating.

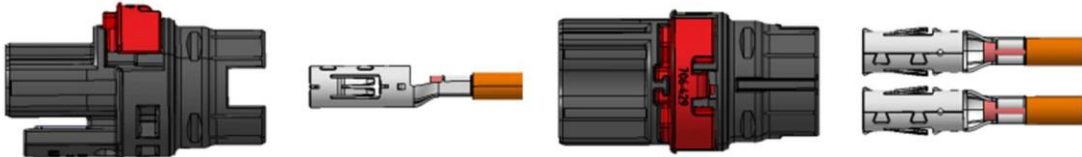
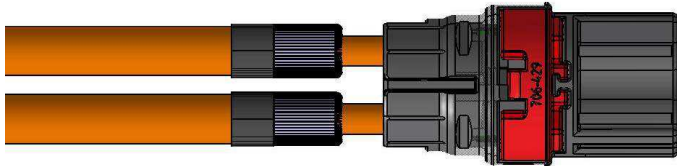


To do an orderly assembling / to ensure the primary locking and the secondary locking, the correct position of the terminals and the wire is very important and needs to be ensured. Usually, the horizontal version is intended.

The allowed angle deviation results from the geometry of the angled insert catches on the female contact holder and the max. assembling force of the cable with the terminals into the contact holder. This can be checked during the assembling process.

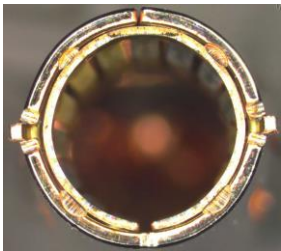
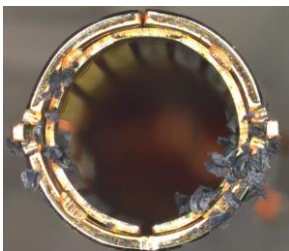
Note: As described, the locking device unit and shielding sleeve may as well be assembled onto the cable after step “crimping of HCT4-female terminals”.

4.7 Assembly I

Assemble HCT4 female terminals into the contact carrier (1). If two wires with the same color are used, the pinning has to be confirmed by electrical testing.		
		
	Pin	Polarity
	1	+
	2	-

While assembling the HCT4 female terminals, the latching lance of the HCT4 female terminals will be deflected. Once the end position is reached, the latching lance will audibly engage, and the female terminals will be primary locked. (The female terminals must be crimped.)

The mounting force of the female terminals into the contact holder must be proven if the crimping machine of the company "Schaefer" is not used or if the terminals are mounted fully automated inside the contact holder.

If the terminal is assembled wrong, this can cause a plastic burr inside the chamber and the terminal. The terminal holders and terminals must be checked:	
	
These terminal holders may no longer be used and must be scrapped! The terminals must be checked for plastic burrs and be cleaned before further assembly. If cleaning does not remove all residual plastic, the terminals must be scrapped!	
	
OK	NOK

The female terminals must be crimped.

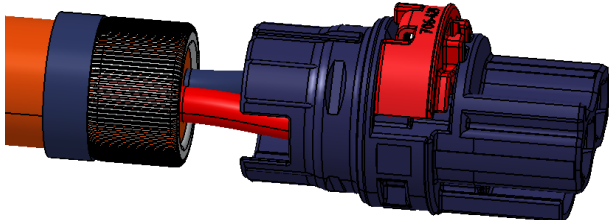
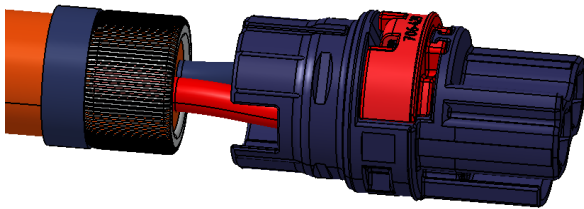
For automatic assembly of the HCT4 terminals into the terminal holder, either force- or distance surveillance must be proven.

Wire manufacturer	Wire cross section
	4.0 mm ²
Leoni	FHLR2GCB2G 4,0/ 0,31/ T180/ 600 VAC/ 1000 VDC
Kröschu	FHLR2GCB2G 4,0 QMM/ 0,21/ T180/ 600 1000 V OR
Coroplast	FHLR2GCB2G 4.0 mm ² 0,21/ T180/ 0,6/ 1,0 kV
	30 N
Coficab	FHLR91XCB91X T4 4.0 mm ²
	30 N
Huber & Suhner	FLR91XC33X 1x4 T150 1x 4.0 mm ² Radox 155S FLR
	30N
Gebauer & Griller	FHLR2GCB2G 4,0/ T180

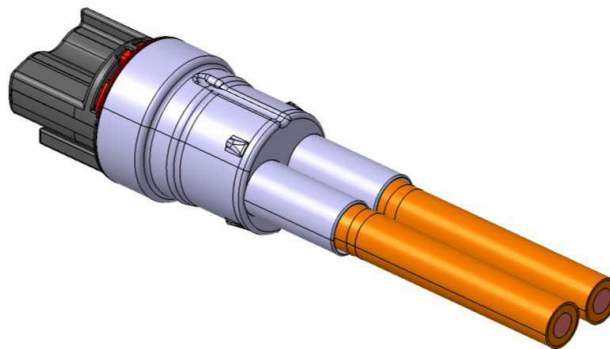
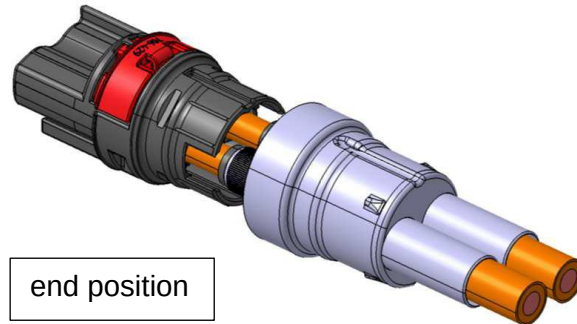
4.8 Assembly II

Assembly of the secondary lock (2)

The secondary locking can only be assembled if the terminals are in the end position. A visible difference of the terminals to each other can be possible in the contact cavity. Because of the position of the contacts on the wire, and the play of the contacts in the contact cavity it is possible and acceptable.

Secondary lock pre-locking/ HV terminals primary locked	Secondary lock end position
	

4.9 Push shielding sleeve onto contact carrier



- The wires shall be fixed during this process to prevent the cable and/or the strain-relief from being compressed or pushed inside the connector, for this can cause damage on the insulation and therefore a dielectric breakdown.
- Neither the wire nor any other component may be damaged by the clamping process.
- The shielding sleeve must be assembled until the end position is reached.
- It must be ensured that no single strands of the shield stick out before the shield sleeve is mounted. Demand-oriented, protruding single strands can be removed. This rework must be clarified with each OEM.



Risk of insulation failure!
The components must not be damaged.

4.10 Press shielding sleeve

- **Pressing device**

For the process of positioning and pressing of the stress relief and the shielding sleeve, the following pressing device of the company “Schäfer” can be used:

<u>Name of the device:</u>	Pressing device HPS40-2 SCC
<u>Article number:</u>	EPS3000-HPS40-2

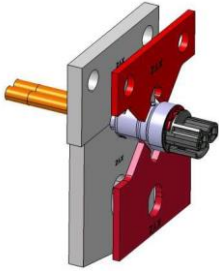
The details of the commissioning, handling and the process guideline of the device can be requested directly at the supplier:

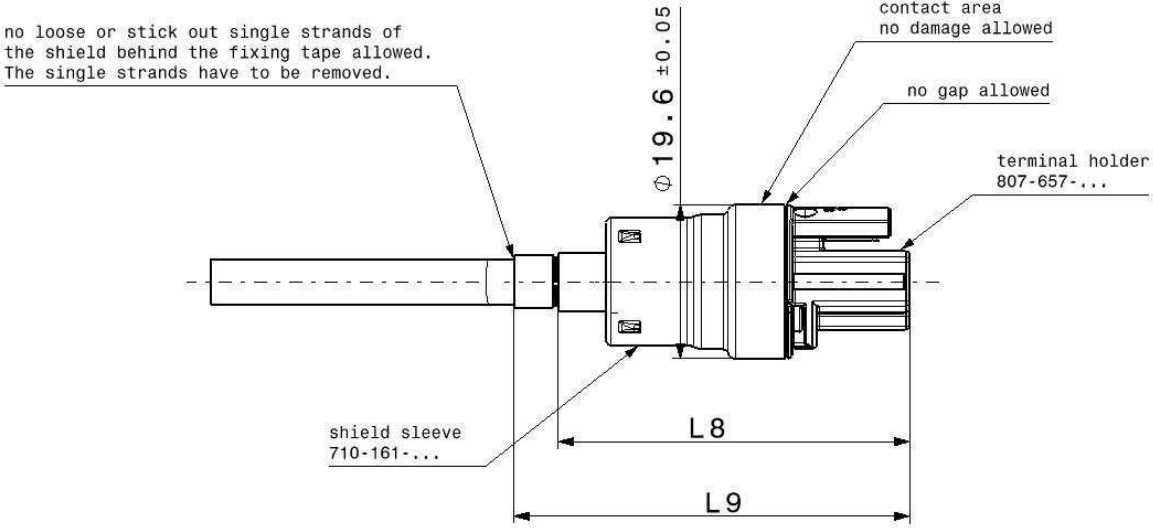
Schäfer Werkzeug- und Sondermaschinenbau GmbH
Dr.-Alfred-Weckesser-Str. 6
76669 Bad Schoenborn-La, Deutschland
Tel: +49 7253 9421-0
www.schaefer.biz

The commissioning of the pressing device must be done through the manufacturer. The manufacturer is at liberty to use a pressing device of his choice. The pressing process must meet the pressing and positioning data which are specified on the following pages.

• Pressing data

- The contact holder incl. the female contacts must be put into the device in the correct position.
- Make sure, the shielding sleeve is on the end position of the contact holder.
The tape must stick out of the end of the shielding sleeve.
- The circularity of the shielding sleeve in the terminal are has to be ensured.
- The measurements on the following drawing, must be adhered to, before and after pressing.
- Two pressing actions will be done in one step

	1.Shield pressing (shielding sleeve, shielding, stress relief and wire)
	2.Pressing of the contact holder (shielding sleeve and contact holder)


$L8 = 44.7 \pm 0.25 / L9 = 50.0 \pm 1.0$

The dimension L8 and L9 are just for information. The dimensions are caused from the dimension L1, L4 and the EVS-100068.

Do not damage the following parts during the pressing process.

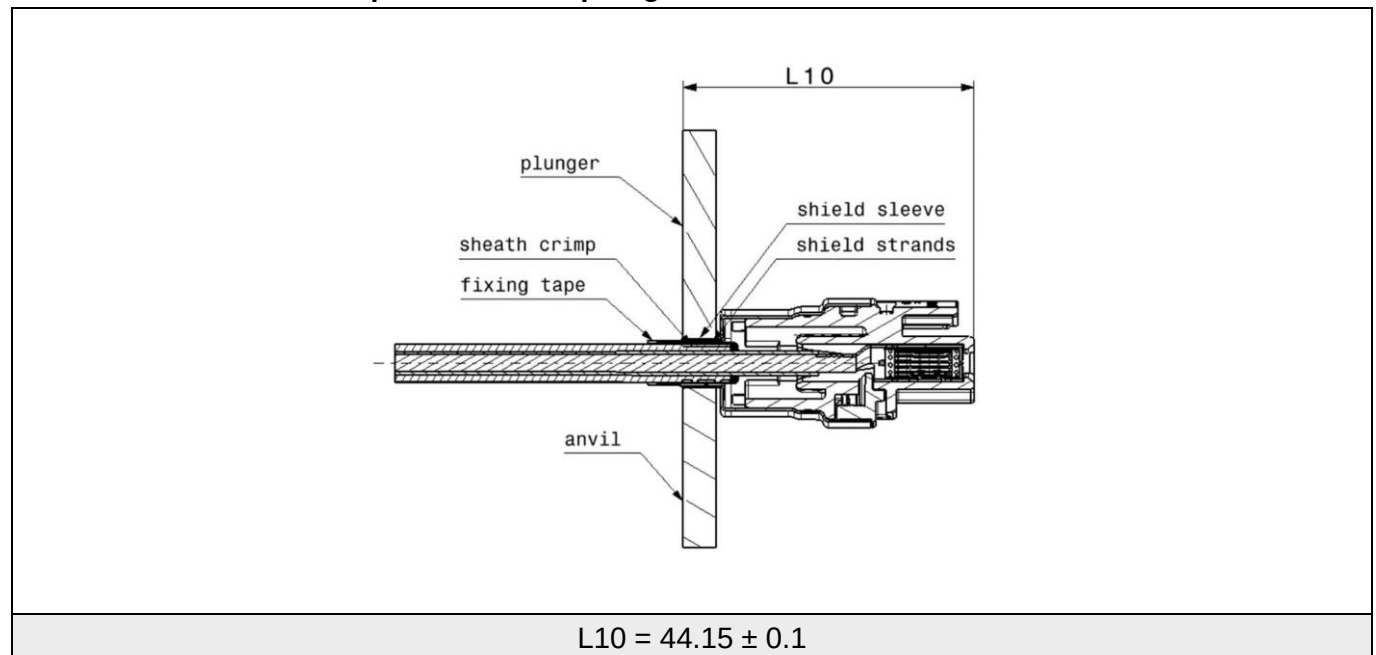
- Insulation of the wire
- Insulation of the single wires
- Stress relief
- Shield sleeve
- Shield strands of the wire

4.10.1 Shield pressing by two half-shells

- **Embossing position**

The exact geometry of the plunger and anvil is given. The position of the plunger and the anvil must be reversed to the front plane of the contact holder. The dimension L10 is the position of the plunger and the anvil. The chamber on both anvil and plunger must face toward the shield-sleeve.

The dimension L10 is the position of the plunger and the anvil.

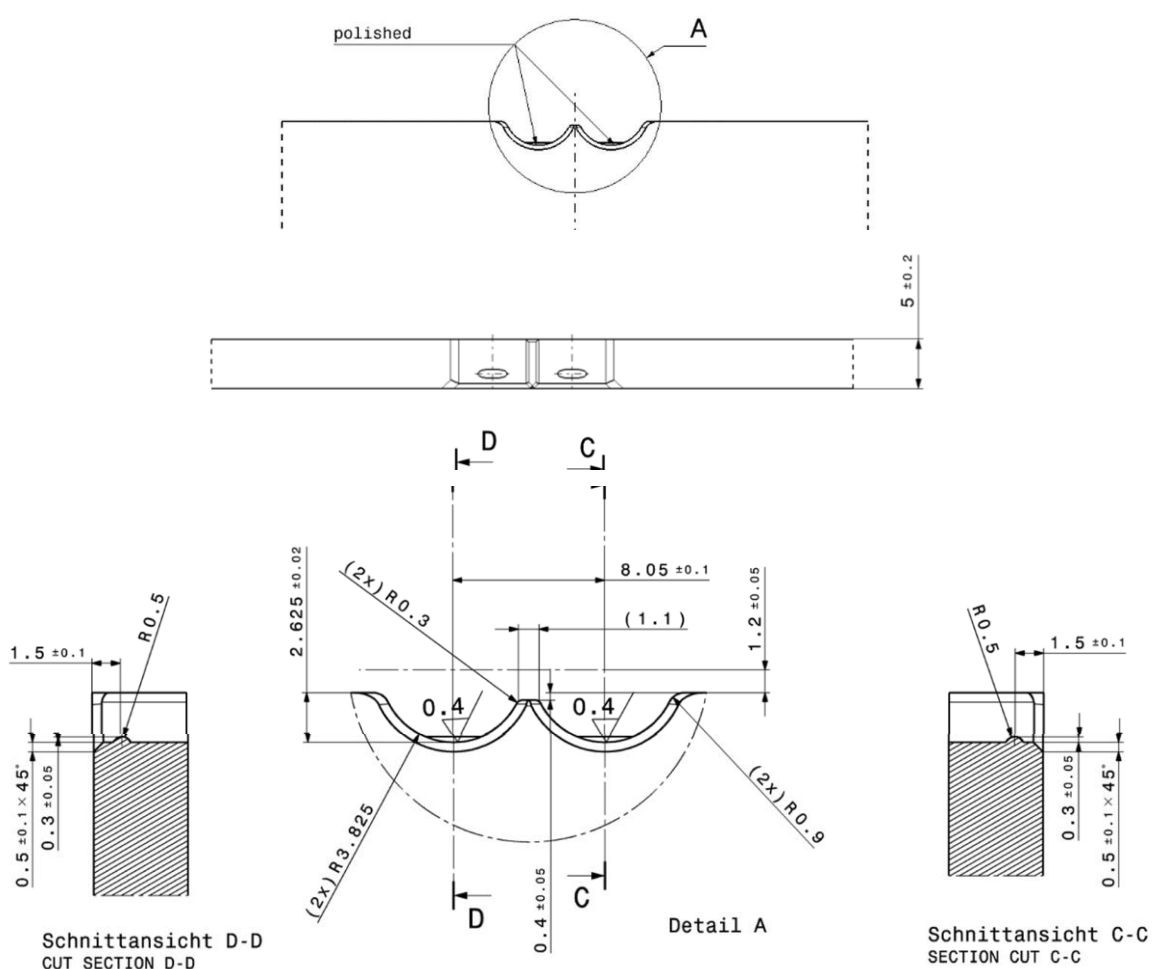




- Plunger and anvil geometry of the wire shield pressing – Version A

Plunger geometry of the wire shield pressing

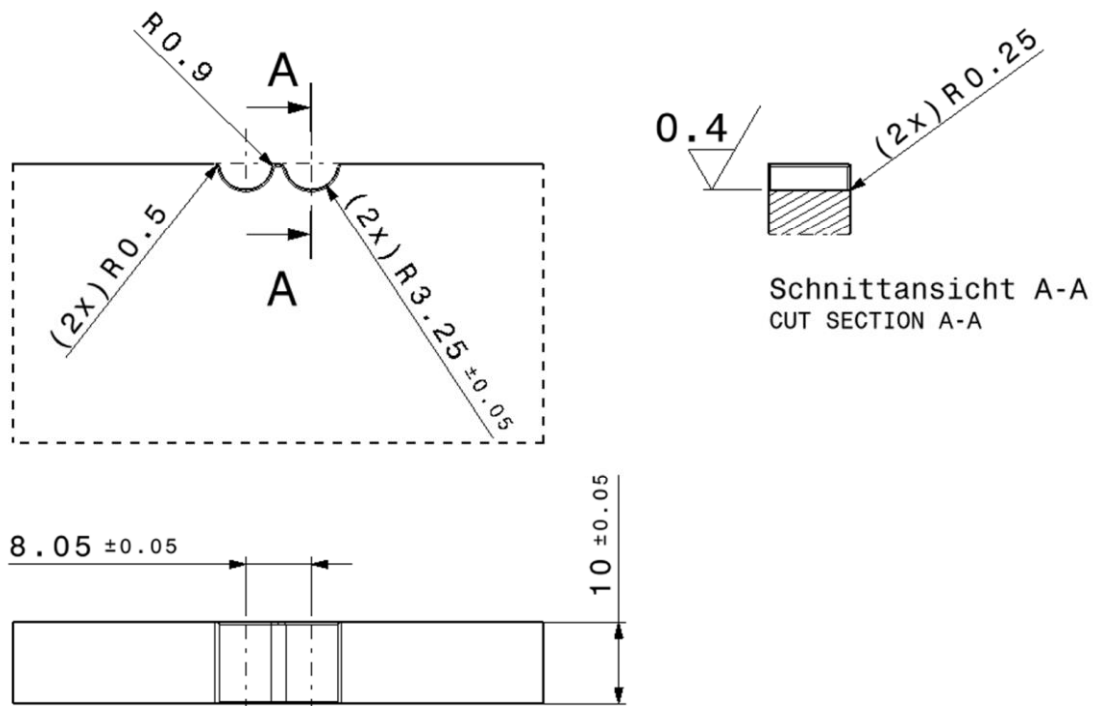
Material: 1.2721 vacuum hardened 58hrc



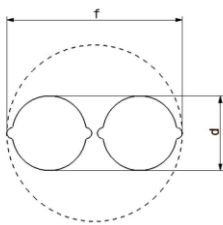
- Plunger and anvil geometry of the wire shield pressing – Version B

Plunger geometry of the wire shield pressing

Material: 1.2721 vacuum hardened 58hrc



- **Embossing height**

	The plunger and anvil are pressed together to 0.2 mm clearance. Due to this the dimension “d” will be given. See table of each cross section.
---	--

Wire manufacturer	Measurement “d” in mm
	4.0 mm ²
Kroschu T180	6.15 ± 0.1 (Version A) 6.8 ± 0.1 (Version B)
Leoni	
Coroplast	
Huber & Suhner	
Coficab	
Gebauer & Griller Cu	

During the pressing process a fold appears on two sides.

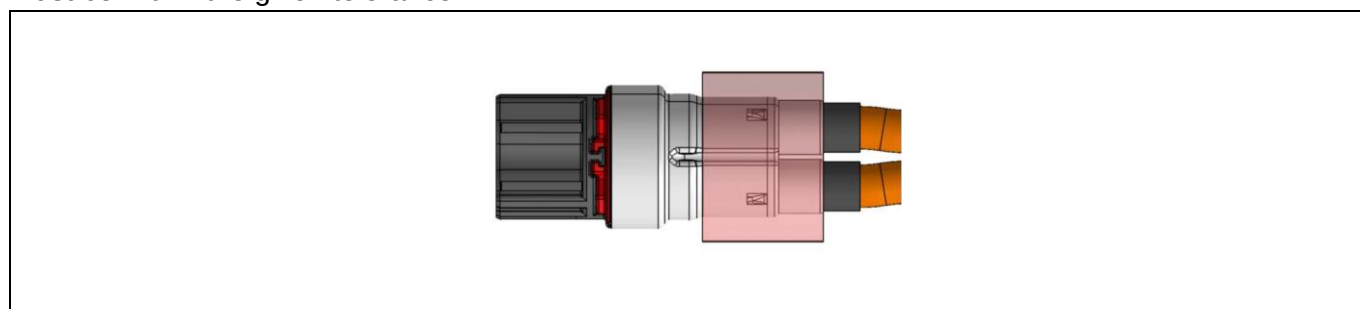
This fold is not allowed to be bigger than the diameter $\varnothing f = 17.2 \text{ mm}$ (17.1 ± 0.1) refer to the centerline of the connector.

In the area of the fold the material of the shield sleeve is not allowed to be cracked.

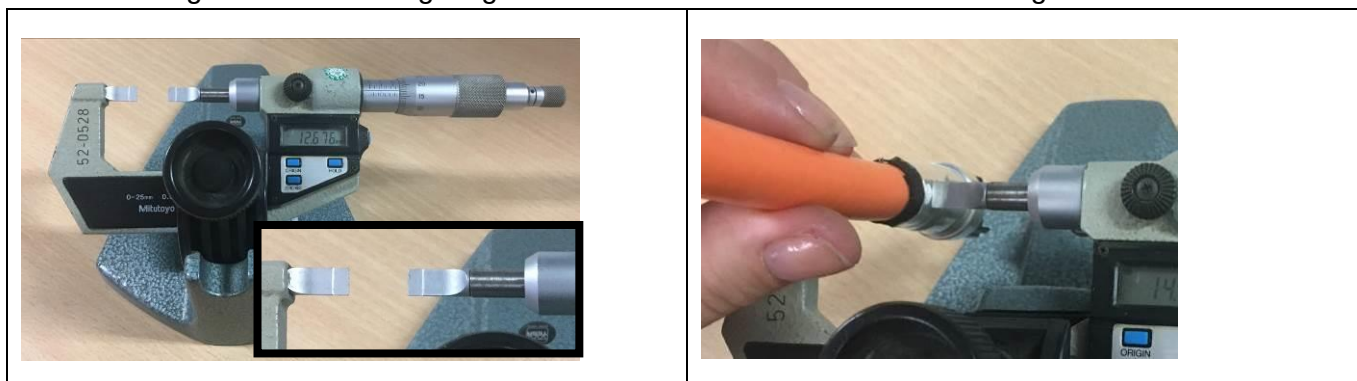
- **Check measurement of the embossing height “d” and the max. diameter “f”.**

To check the dimension “f”, a gauge with an inner diameter of 17.2 mm must be used. The diameter “f” has to be respected within the entire highlighted area.

To check the dimension “d”, the height needs to be measured acc. to the drawing. All the dimensions must be within the given tolerance.



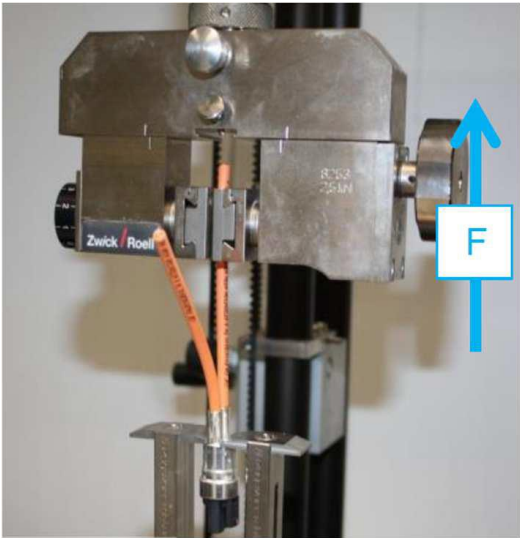
The measuring of the embossing height must be done with a suitable measuring device.



- **Pulling force of the wire**

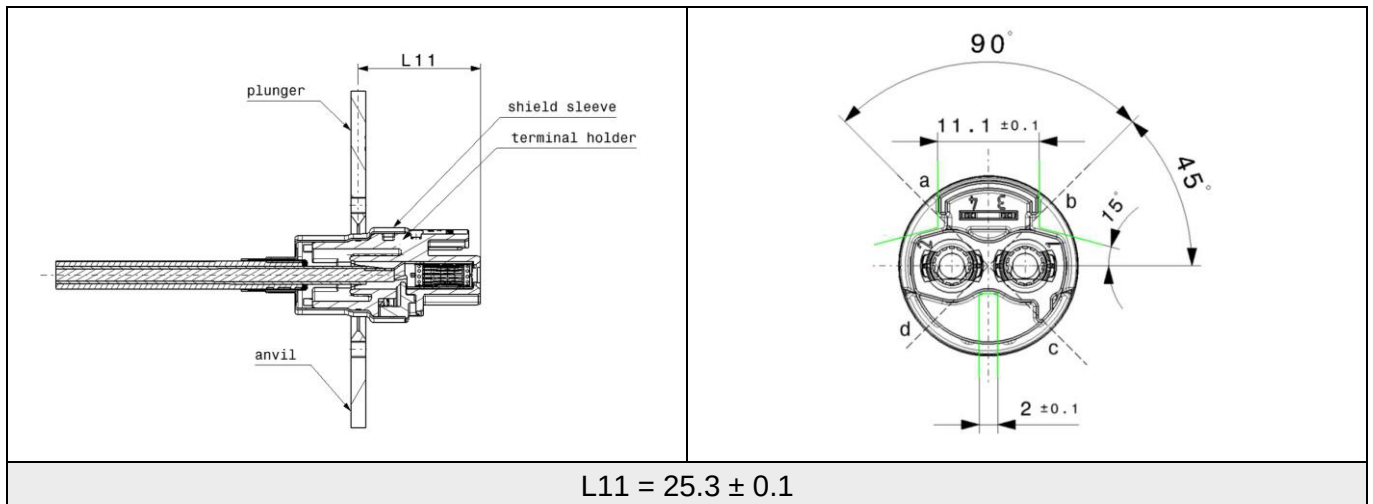
To measure the pull-out force, the wire must be clamped firmly into a clamping device. The distance between the clamping position of the wire and the fixing tape is about 70 mm. The connector must be fixed on the shield sleeve at the transition between the small and large sleeves.

HCT4 terminals must not be installed in the test specimens, to test the shield pressing only. In this state, the figure in the table must be reached. The single wires must be tested individually.

	Wire cross section	Pulling force
	4.0 mm ²	≥ 150 N

4.10.2 Pressing contact carrier

- **Embossing position**



The dimension L11 describes the position of the pressing. The position of the plunger and the anvil must be aligned in relation to the front plane of the terminal holder. The four embossing positions (a-d) must be aligned in relation to the terminal holder. Therefore the terminal holder must be secured against rotation. The green areas can be used as a jack for the contact holder.

The exact geometry of the plunger and anvil is given.

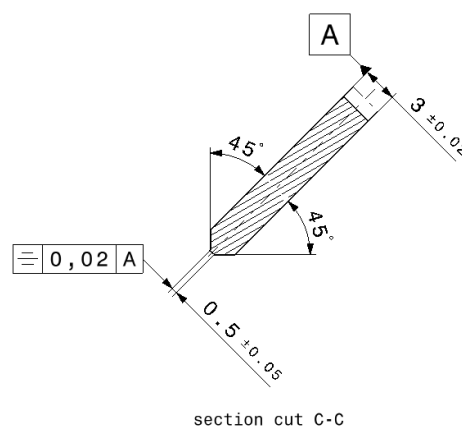
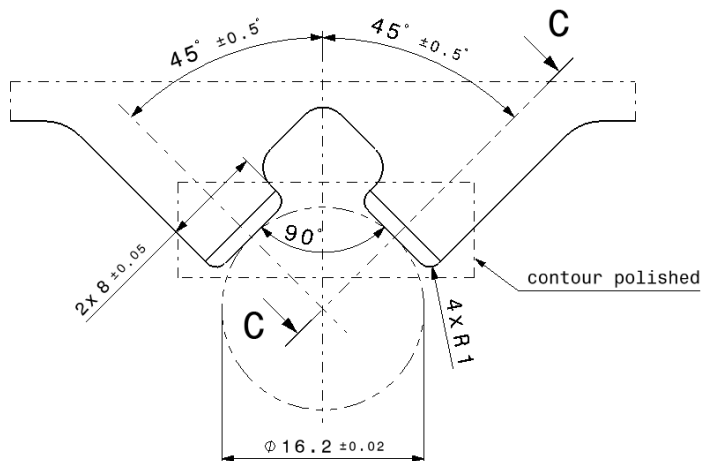


HIRSCHMANN
AUTOMOTIVE

- Geometry of the plunger and the anvil pressing on the contact carrier

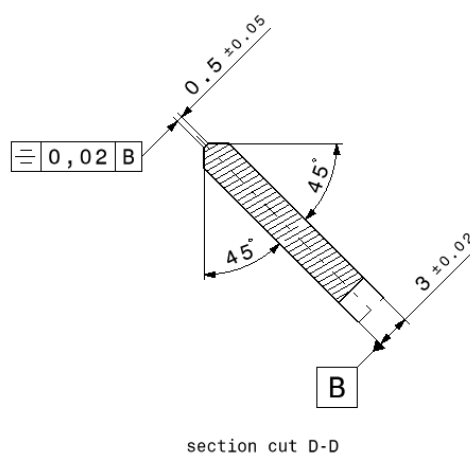
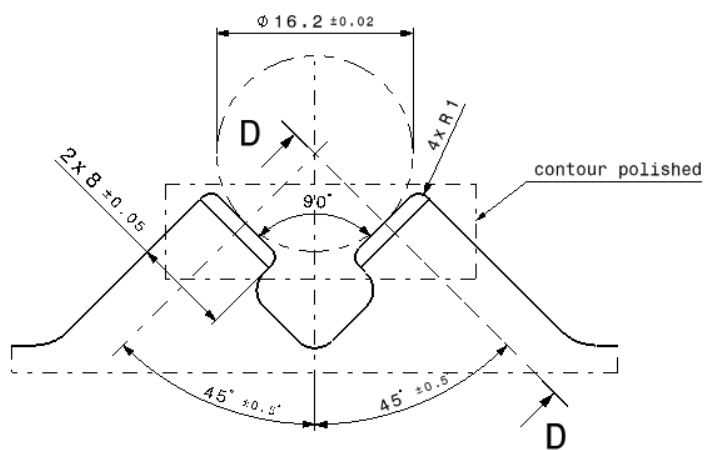
Plunger geometry of the terminal holder pressing

Material: 1.2721 vacuum hardened 58hrc

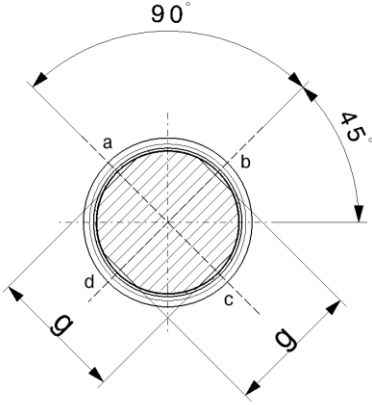


Anvil geometry of the terminal holder pressing

Material: 1.2721 vacuum hardened 58hrc



- **Embossing height “g”**

	The dimension “g” results from the embossing in between a-c and b-d. The embossing must be done at the same time.
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The dimension g is defined as following:

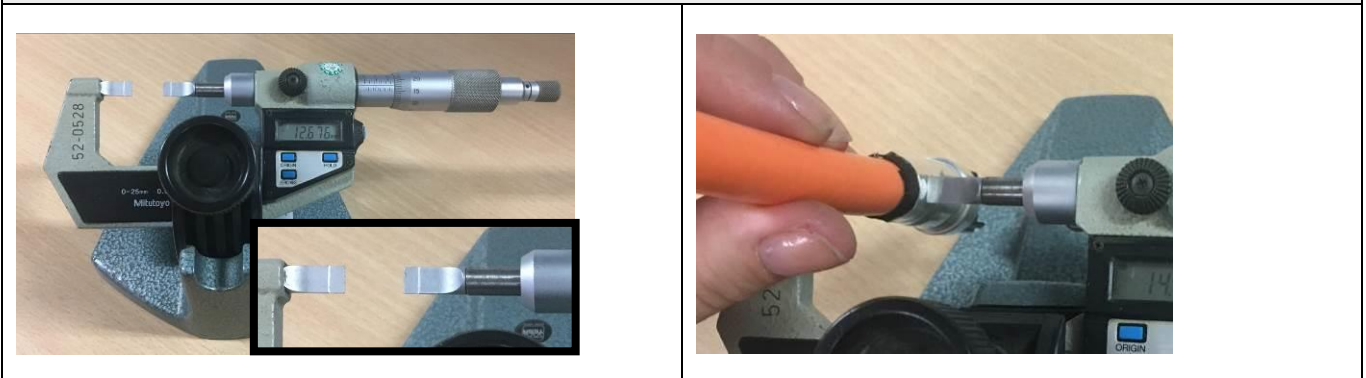
$$g = 16.40 \text{ mm} \pm 0.1$$

- **Check the measurement of the embossing height “g”:**

To check the dimension “g”, the height needs to be measured acc. to the drawing.
All the dimensions must be within the given tolerance.

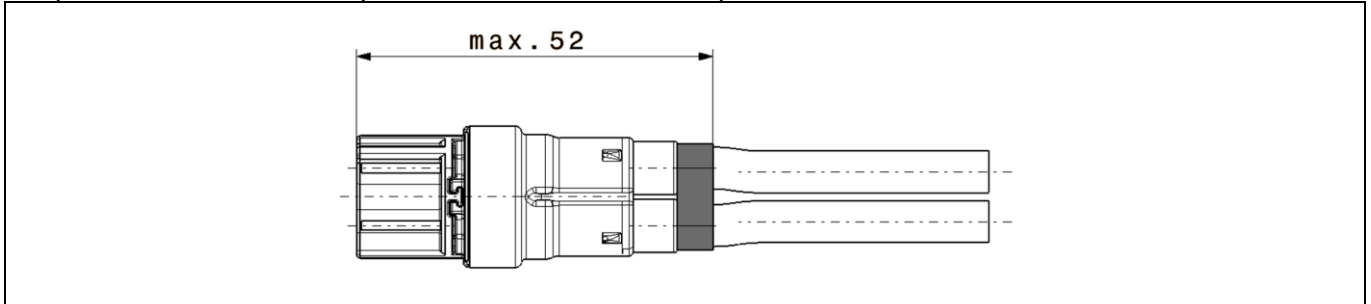
The measuring of the embossing height must be done with a suitable measuring device.

The thickness of the measuring blades must be lower than 0.6 mm.



4.11 Taping of the wires (optional)

To ensure that the welding of the shield-sleeve is not damaged, the two wires must be taped together. In this specification the PET- fabric tape 837X (838X) 5.0 mm of the company Coroplast is used. It is possible to use another product to fix the wires. The product must have min. 150 °C thermal resistance.

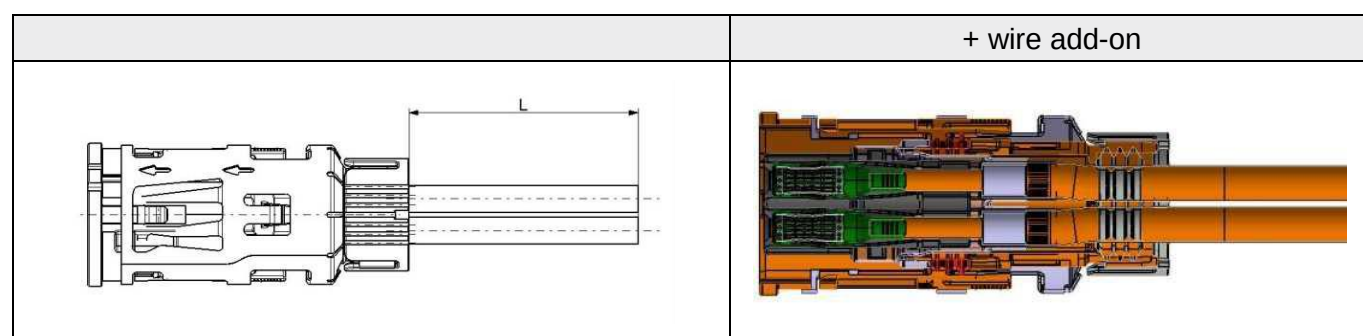


This process step can be skipped if it is ensured that the wires are not pulled apart in a different way.

5 Processing steps (6.0 mm²)

Use the following described processing steps as necessary for the wire cross sections 6.0 mm². As a reference sample, a terminal holder coding A and a 6.0 mm² wire was used.

5.1 Cut the shielded cable



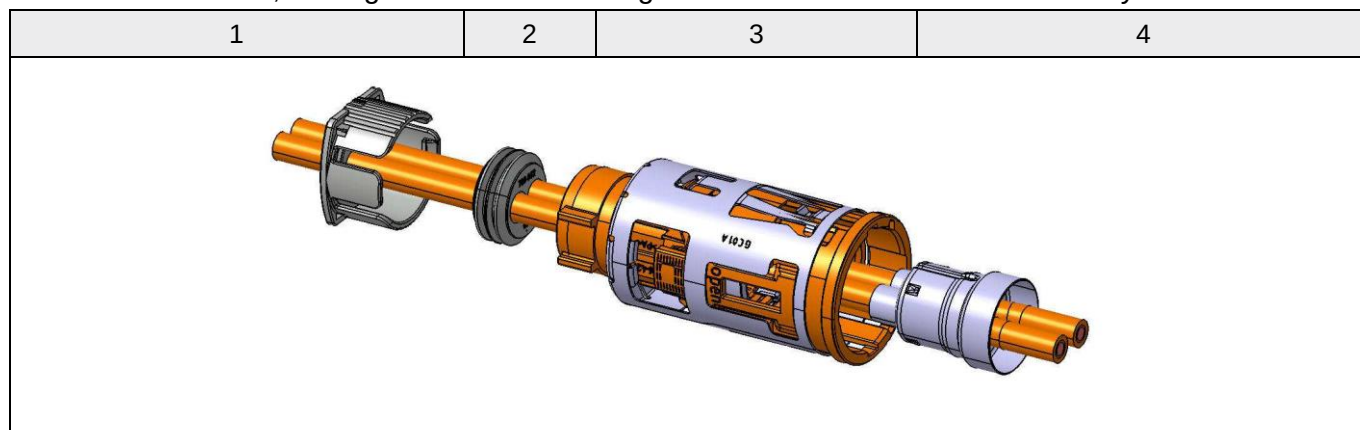
Add following lengths for the HPS40-2 2+2 female connector:

Wire cross section	Dimension L after zero-cut (mm)	Dimension L for the HCT4 terminal incl. zero-cut (mm)
6.0 mm ²	L + 50	L + 54

This dimension must be added to the planned length at cutting process of the wire for each female connector.

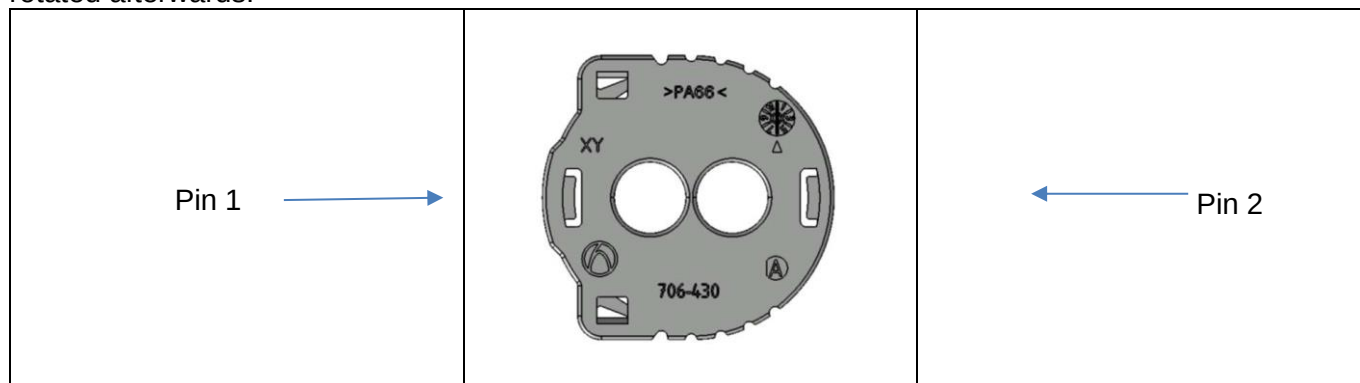
5.2 Assembly of the single components

Slide the cover cap (1), the seal (2), the female locking device (3) and the shielding sleeve (4) onto the shielded cable. Seal, locking device and shielding sleeve can be assembled either way.



Note: The locking device (3) and shielding sleeve (4) may as well be assembled onto the cable after step "crimping of HCT4-female terminals".

If the cover cap (1) 706-430-502 or 706-430-504 is used, pay attention to the pinning, as it cannot be rotated afterwards.



5.3 Strip off the shielded cable



Stripping length:

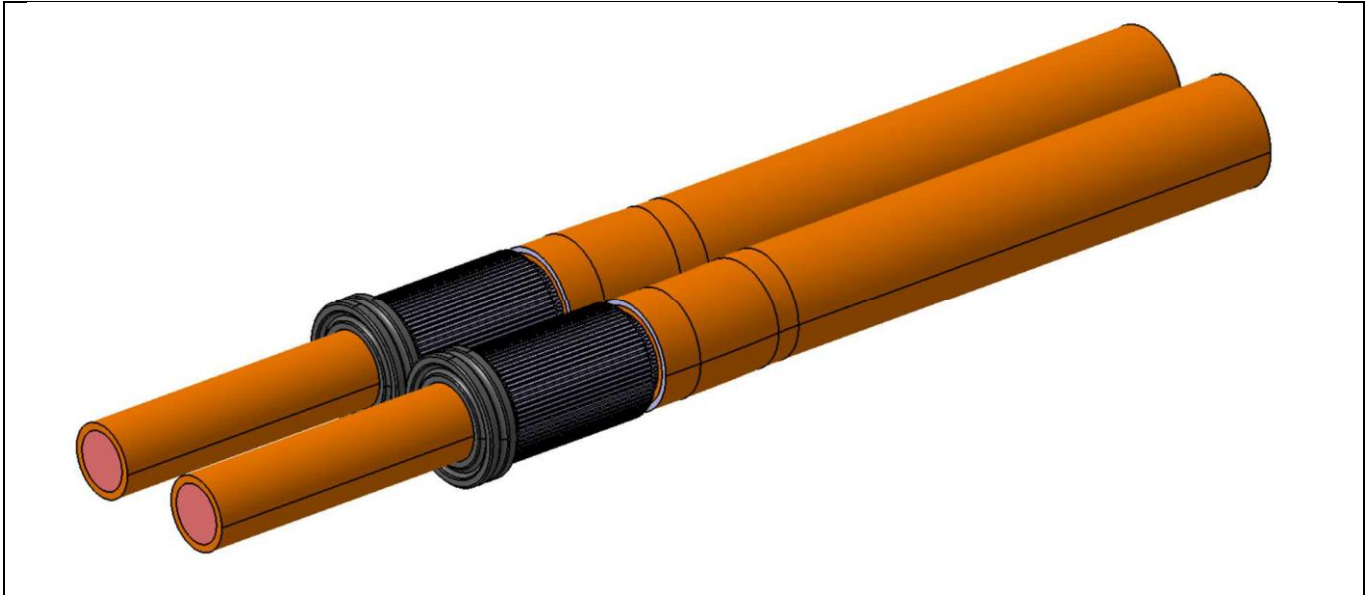


Wire cross section	Dimension L1 after zero-cut (mm)	Dimension L1 for the HCT4 terminal incl. zero-cut (mm)
6.0 mm ² (Cu)	30.5 ± 1	34.5 ± 1
6.0 mm ² (Al)	29.5 ± 1	33.5 ± 1

Do not damage the shielding during the processing operation.

5.4 Assembly I

Assemble strain-relief (6.0 mm²)

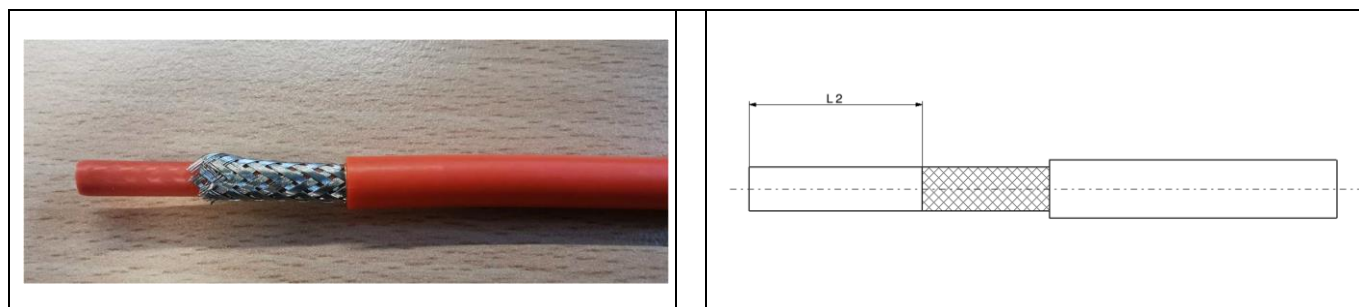


The following process steps must be done, but the manufacturer can choose the sequence:

- Assemble the strain-relief.
- Remove the foil (max. 1.0 mm revolving or single edges ≤ 3.0 mm).
- Shorten the shielding.

In this processing specification, the recommended sequence is shown.

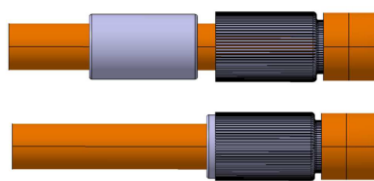
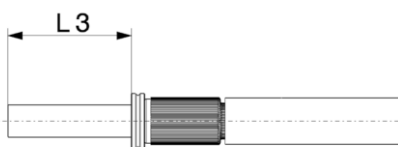
- **Process sequence**



Wire cross section	Dimension L2 after zero-cut (mm)	Dimension L2 for the HCT4 terminal incl. zero-cut (mm)
6.0 mm ² (Cu)	22.6 ± 1	26.6 ± 1
6.0 mm ² (Al)	21.6 ± 1	25.6 ± 1

After cutting the shielding, there are no wire residues or parts of the shielding allowed on the cable. This must be ensured with actions like the following:

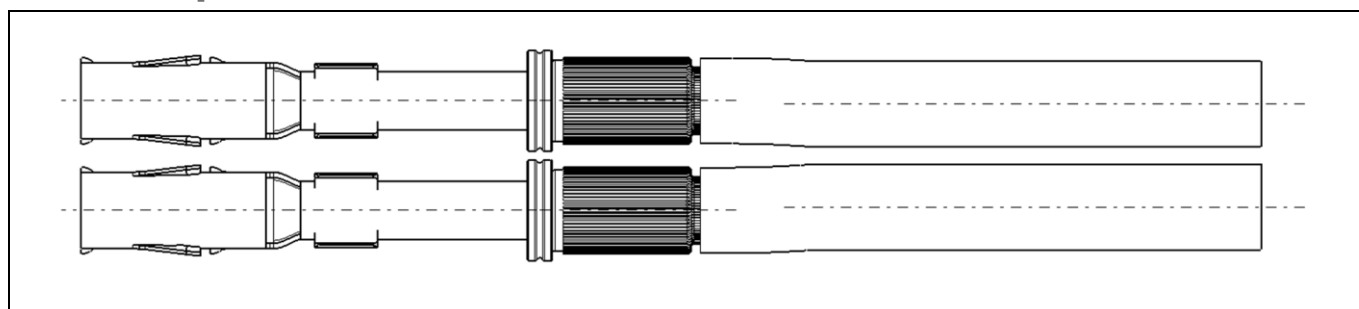
- Removing the residues of the shielding.
- Blowing out or by suction of the residues of the shielding.

		
Shielding needs to be spread slightly, strain-relief must be assembled.	Strain-relief needs to be fixed in place with X-ring. The assembly of the strain-relief and fixture with X-ring can be done in one step.	

Wire cross section	Dimension L3 after zero-cut (mm)	Dimension L3 for the HCT4 terminal incl. zero-cut (mm)
6.0 mm ² (Cu)	19.2	23.2
6.0 mm ² (Al)	18.2	22.2

- L3 ensures the correct position of the strain-relief.
- The strain-relief shall be assembled, so it will block on the final position.
- The X-ring shall be assembled, so it will block on the strain-relief.
- Don't damage the single wires during the complete processing operation

5.5 Crimp the HCT4 female terminal



- **Double stroke crimping machine**

For the positioning and the crimping process of the HCT4 female terminals, the crimping machine of the company "Schäfer" can be used:

<u>Name of the device:</u>	HPS40-2 Double stroke crimping machine
<u>Article number:</u>	EPS2001-HPS40-2
<u>Name of the device:</u>	Interchangeable crimping unit
<u>Article number:</u>	Shown in the process specification HCT4 female terminal „EVS-100068“

The individual details referring to commissioning, handling and process description of the device can be requested directly at the supplier:

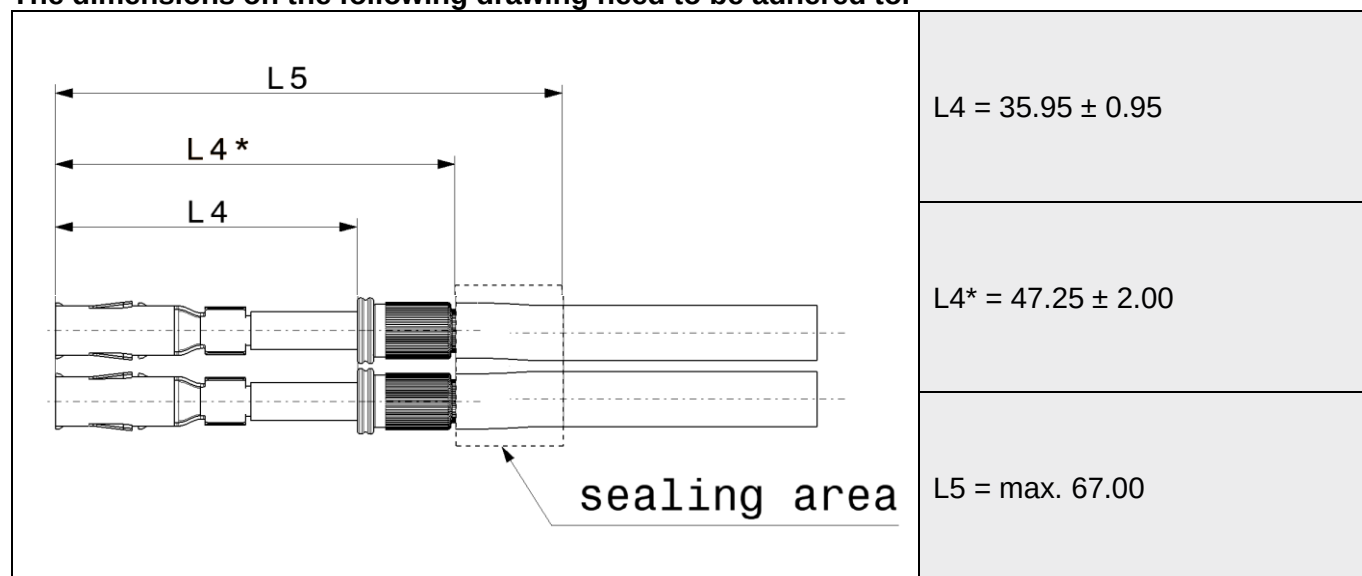
Schäfer Werkzeug- und Sondermaschinenbau GmbH
Dr.-Alfred-Weckesser-Str. 6
76669 Bad Schoenborn-La, Deutschland
Tel: +49 7253 9421-0
www.schaefer.biz

The commissioning of the crimping device must be done through the manufacturer. The manufacturer is at liberty to use a crimping device of his choice. The crimp process must meet the crimp and positioning data which are specified on the following pages.

- **Process data**

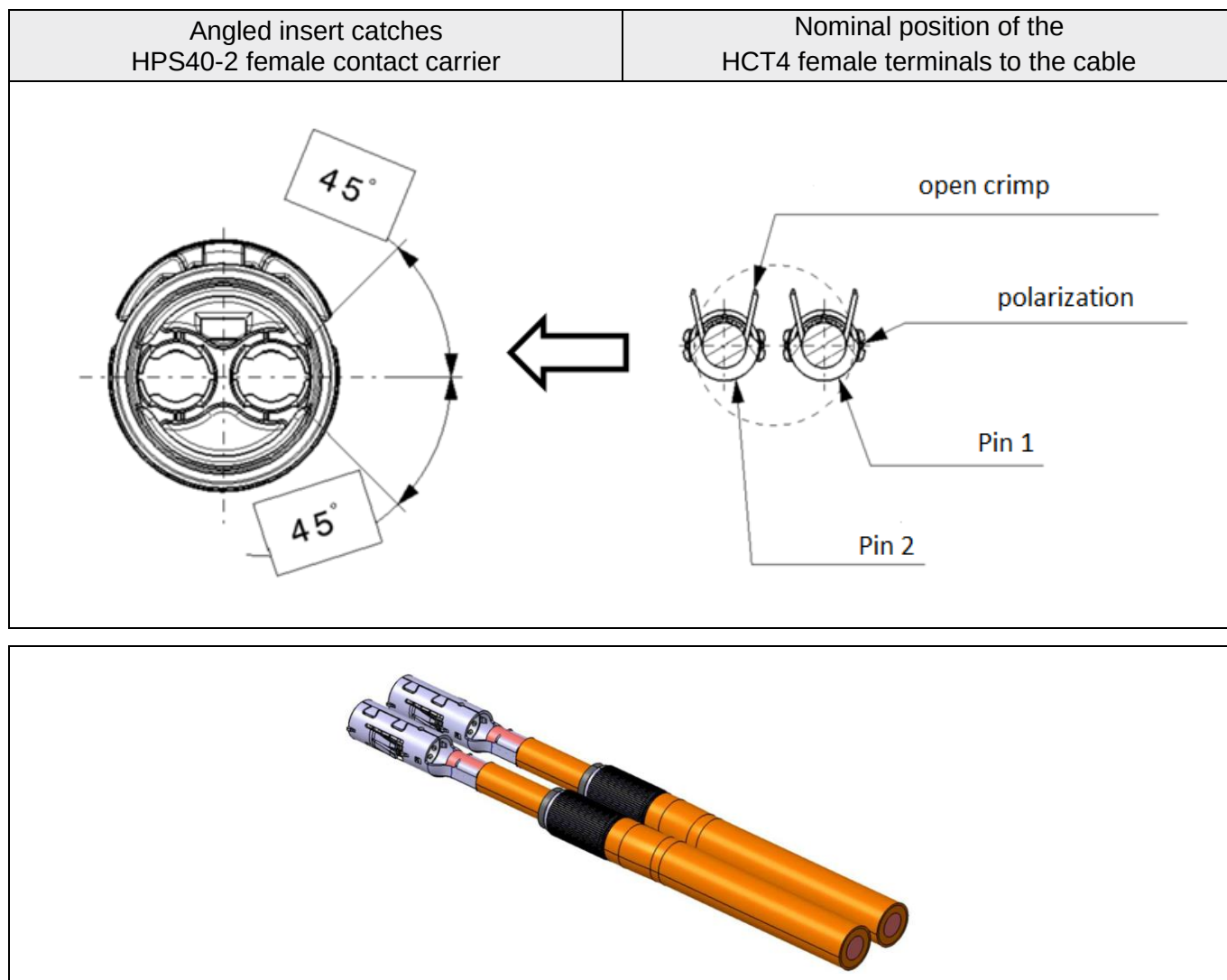
- d) The crimp data can be seen in the „Process specification HCT4 female terminal EVS-100068“.
- e) The HCT4 female terminals need to be crimped in relation to the single wires. For a smooth assembly into the contact holder, the terminals need to be crimped in the correct position. The dimension on the following drawing needs to be adhered to.
- f) If aluminum conductors are used, special processing steps and responsibility apply; see Appendix for Alu wiring EVS-100111-A1.
- g) If the contact carriers 807-657-561/ -562/ -563/ -564/ -567 are used, the stripping length mentioned in EVS-100068 can be extended by max. 2.0 mm.

The dimensions on the following drawing need to be adhered to.



The dimension L4 and L5 are just for information. The dimensions are caused from the dimension L1, L3 and the EVS-100068. If agreed to by the OEM, either L5, L4 or L4* must be proven, since they are correlating.

A mark on the insulation of the single wires or on the outer sheath which is caused due to fixing the wire at the crimping process is allowed. It must be ensured that the insulation will not be damaged because this will lead to an insulation resistance failure. At the area of the wire seal it is not allowed to deform or damage the outer sheath which has negative influence on the sealing function.

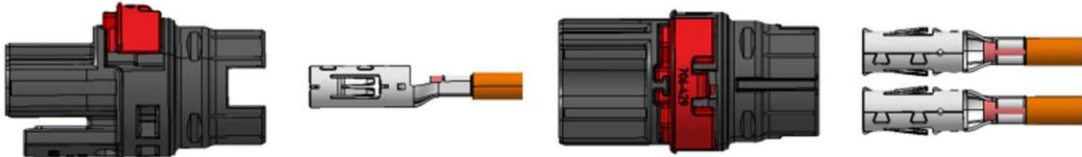
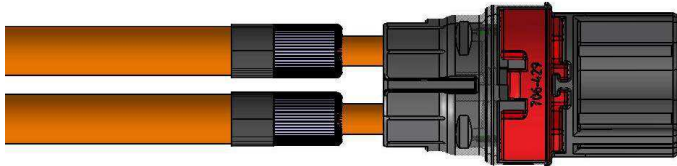


To do an orderly assembling / to ensure the primary locking and the secondary locking, the correct position of the terminals and the wire is very important and needs to be ensured. Usually, the horizontal version is intended.

The allowed angle deviation results from the geometry of the angled insert catches on the female contact holder and the max. assembling force of the cable with the terminals into the contact holder. This can be checked during the assembling process.

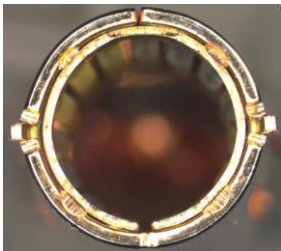
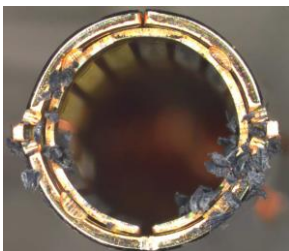
Note: As described, the locking device unit and shielding sleeve may as well be assembled onto the cable after step “crimping of HCT4-female terminals”.

5.6 Assembly II

Assemble HCT4 female terminals into the contact carrier (1). If two wires with the same color are used, the pinning must be confirmed by electrical testing.		
		
	Pin	Polarity
	1	+
	2	-

While assembling the HCT4 female terminals, the latching lance of the HCT4 female terminals will be deflected. Once the end position is reached, the latching lance will audibly engage, and the female terminals will be primary locked. (The female terminals must be crimped.)

The mounting force of the female terminals into the contact holder must be proven if the crimping machine of the company "Schaefer" is not used or if the terminals are mounted fully automated inside the contact holder.

If the terminal is assembled wrong, this can cause a plastic burr inside the chamber and the terminal. The terminal holders and terminals must be checked:	
	
These terminal holders may no longer be used and must be scrapped! The terminals must be checked for plastic burrs and be cleaned before further assembly. If cleaning does not remove all residual plastic, the terminals must be scrapped!	
	
OK	NOK

The female terminals must be crimped.

If aluminum conductors are used, special processing steps and responsibility apply; see Appendix for Alu wiring EVS-100111-A1.

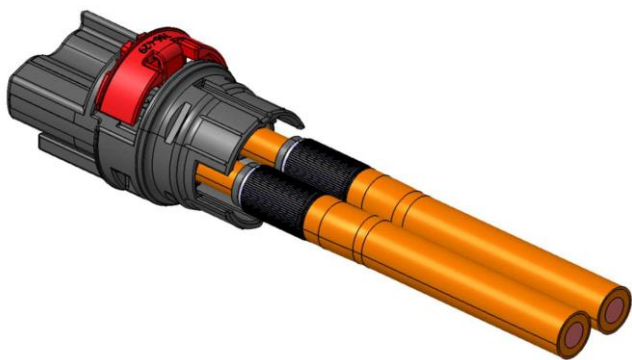
For automatic assembly of the HCT4 terminals into the terminal holder, either force or distance surveillance must be proven.

Wire manufacturer	Wire cross section
	6.0 mm ²
Leoni	FHLR2GCB2G 6,0/ 0,31/ T180/ 600 VAC/ 1000 VDC
Kroschu	FHLR2GCB2G 6,0 QMM/ 0,21/ T180/ 600 1000 V OR
	36 N
Coroplast	FHLR2GCB2G 6.0 mm ² 0,21/ T180/ 0,6/ 1,0 kV
	36 N
Coficab	FHLR91XCB91X T4 6.0mm ² / FHLR91XC91X T4 6.0mm ²
	36 N
Gebauer & Griller	FHLALR2GCB2G 1X 6,0 (0,40)/T180 FHLR2GCB2G 6,0/ T180
	36 N

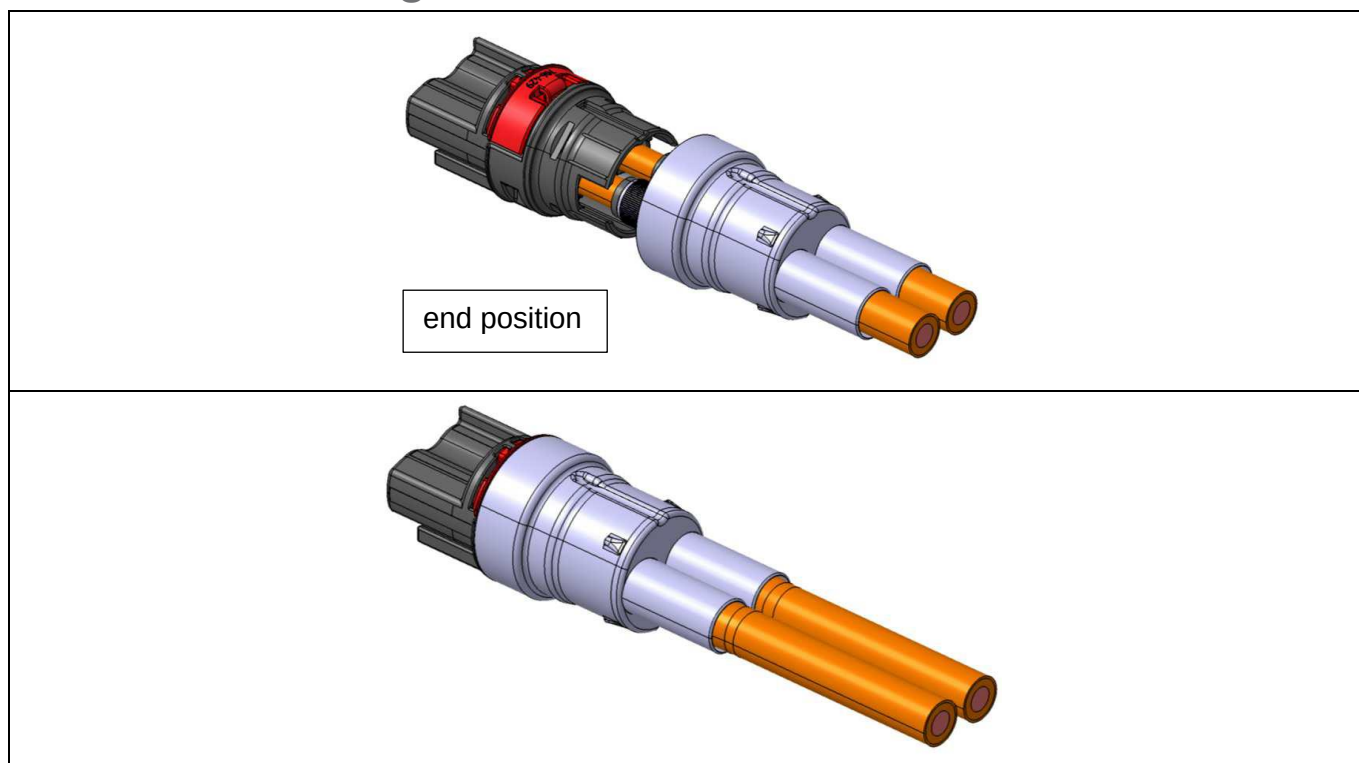
Assembly III

Assembly of the secondary lock (2)

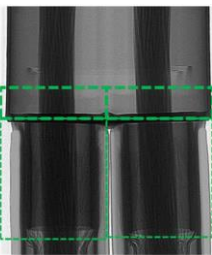
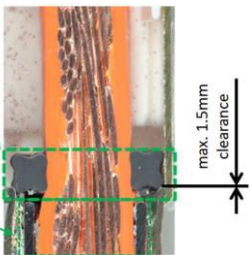
The secondary locking can only be assembled if the terminals are in the end position. A visible difference of the terminals to each other can be possible in the contact cavity. Because of the position of the contacts on the wire, and the play of the contacts in the contact cavity it is possible and acceptable.

Secondary lock pre-locking/ HV terminals primary locked	Secondary lock end position
	

5.7 Push shielding sleeve onto contact carrier



- The wires shall be fixed during this process to prevent the cable and/or the strain-relief from being compressed or pushed inside the connector, for this can cause damage on the insulation and therefore a dielectric breakdown.
- The implemented assembly process can be verified via x-ray analysis. Especially the compression of wires, positioning of the strain-relief and positioning of the x-ring can be confirmed. Also, other impacts from this and previously applied assembly steps can be checked.

 X-Ray picture	 Micro section	 Risk of insulation failure!
--	--	---

- The x-ring shall be adjacent to the shield-sleeve.
- Deviations of this figure must be double-checked with Hirschmann Automotive. The shielding sleeve must be assembled until the blocking position is reached.
- It must be ensured that no single strands of the shield stick out before the shield sleeve is mounted. Demand-oriented, protruding single strands can be removed. This rework must be clarified with each OEM.

5.8 Press shielding sleeve

- **Pressing device**

For the process of positioning and pressing of the stress relief and the shielding sleeve, the following pressing device of the company “Schäfer” can be used:

<u>Name of the device:</u>	Pressing device HPS40-2 SCC
<u>Article number:</u>	EPS3000-HPS40-2

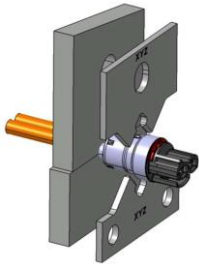
The details of the commissioning, handling and the process guideline of the device can be requested directly at the supplier:

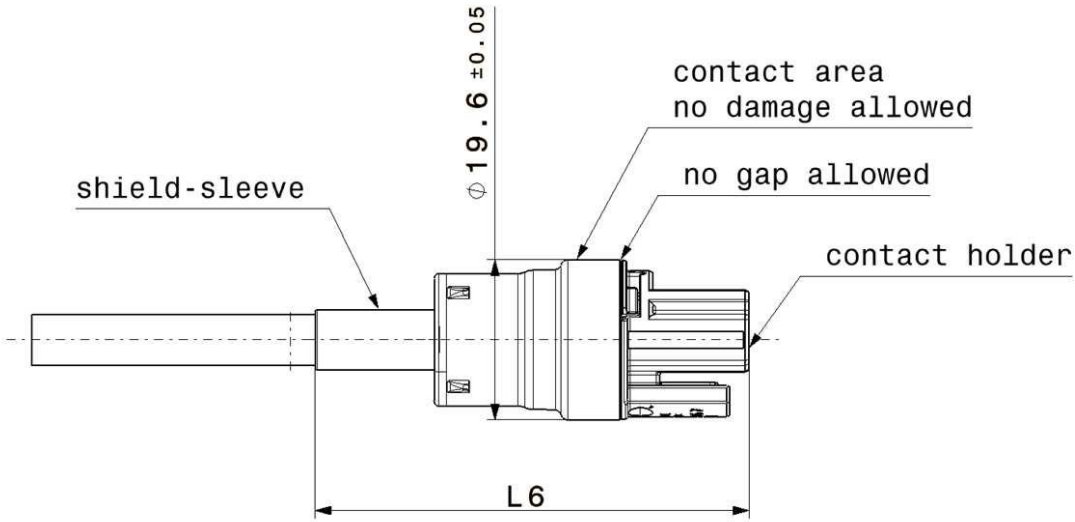
Schäfer Werkzeug- und Sondermaschinenbau GmbH
Dr.-Alfred-Weckesser-Str. 6
76669 Bad Schoenborn-La, Deutschland
Tel: +49 7253 9421-0
www.schaefer.biz

The commissioning of the pressing device must be done through the manufacturer. The manufacturer is at liberty to use a pressing device of his choice. The pressing process must meet the pressing and positioning data which are specified on the following pages.

- **Pressing data**

- f) The contact holder incl. the female contacts must be put into the device in the correct position.
- g) Make sure, the shielding sleeve is on the end position of the contact holder.
- h) The circularity of the shielding sleeve in the terminal are has to be ensured.
- i) The measurements on the following drawing, must be adhered to, before and after pressing.
- j) Two pressing actions will be done in one step

	1.Shield pressing (shielding sleeve, shielding, stress relief and wire)
	2.Pressing of the contact holder (shielding sleeve and contact holder)

 shield-sleeve 19.6 ± 0.05 contact area no damage allowed no gap allowed contact holder L6
L6 = 53.2 ± 0.25

The dimension L6 is just for information. The dimensions are caused from the dimension L1, L4 and the EVS-100068.

Do not damage the following parts during the pressing process.

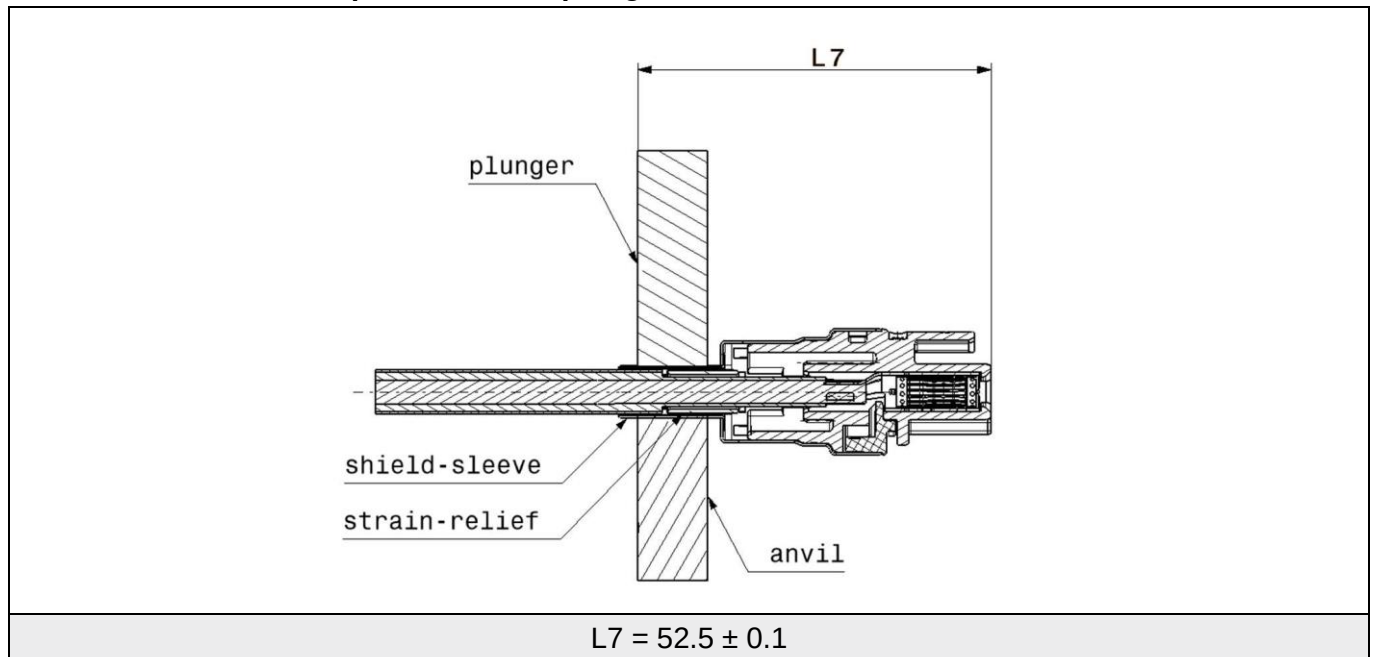
- Insulation of the wire
- Insulation of the single wires
- Stress relief
- Shield sleeve
- Shield strands of the wire

5.8.1 Shield pressing by two half-shells

- **Embossing position**

The exact geometry of the plunger and anvil is given. The position of the plunger and the anvil must be reversed to the front plane of the contact holder.

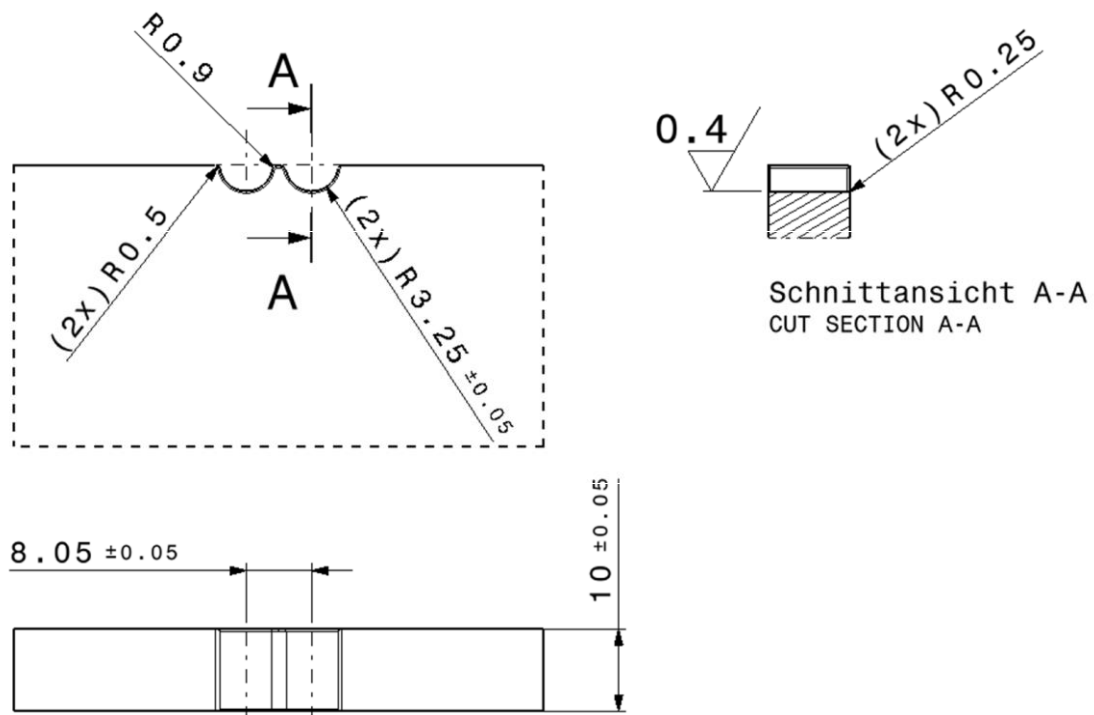
The dimension L7 is the position of the plunger and the anvil.



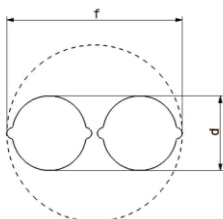
- Plunger and anvil geometry of the wire shield pressing

Plunger geometry of the wire shield pressing

Material: 1.2721 vacuum hardened 58hrc



- **Embossing height**

	The plunger and anvil are pressed together until block. Due to this the dimension “d” will be given. See table of each cross section.
---	--

Wire manufacturer	Measurement “d” in mm
	6.0 mm ²
Kroschu	6.8 ± 0.2
Leoni	
Coroplast	
Huber & Suhner	
Coficab	
Gebauer & Griller Cu	

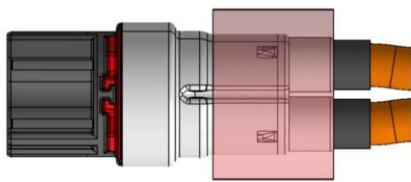
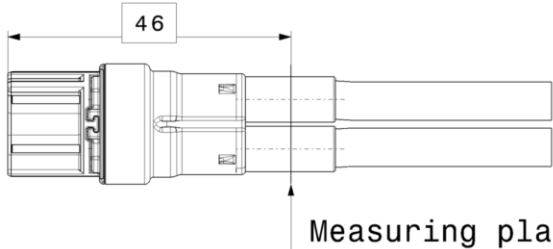
During the pressing process a fold appears on two sides.

This fold is not allowed to be bigger than the diameter $\varnothing f = 16.9 \text{ mm}$ refer to the centerline of the connector. In the area of the fold the material of the shield sleeve is not allowed to be cracked.

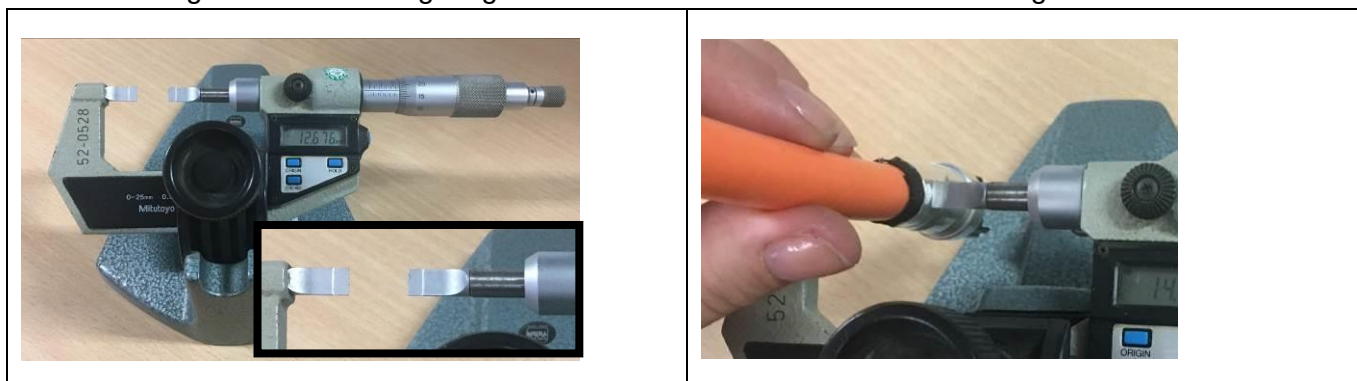
- **Check measurement of the embossing height “d” and the max. diameter “f”.**

To check the dimension “f”, a gauge with an inner diameter of 16.9 mm must be used. The diameter “f” must be respected within the entire highlighted area.

To check the dimension “d”, the height needs to be measured acc. to the drawing. All the dimensions must be within the given tolerance.

	 Measuring plane
---	---

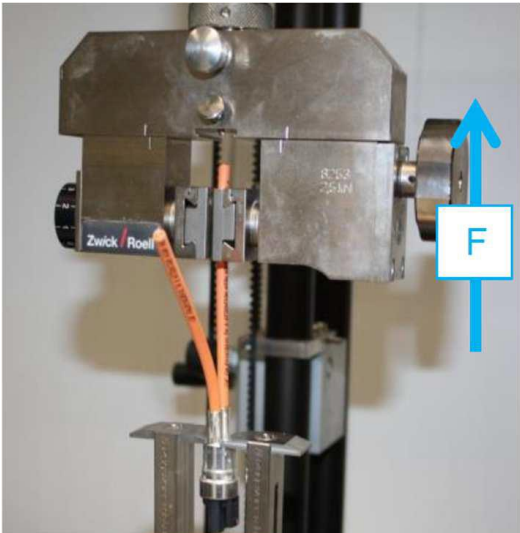
The measuring of the embossing height must be done with a suitable measuring device.



- **Pulling force of the wire**

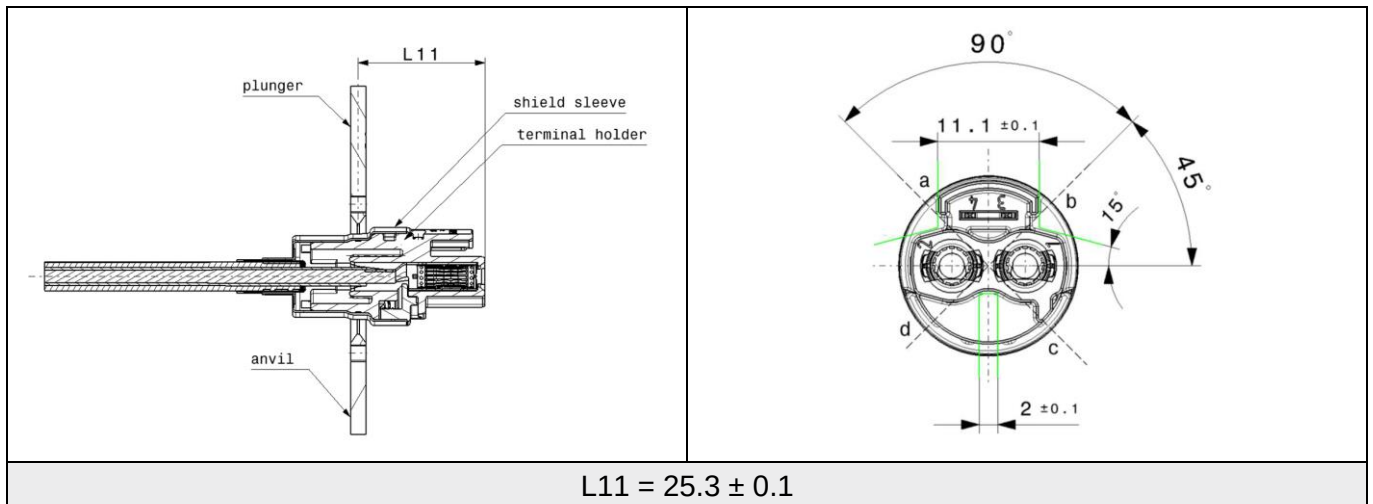
To measure the pull-out force, the wire must be clamped firmly into a clamping device. The distance between the clamping position of the wire and the fixing tape is about 70 mm. The connector must be fixed on the shield sleeve at the transition between the largest and the second largest diameter.

HCT4 terminals must not be installed in the test specimens, to test the shield pressing only. In this state, the figure in the table must be reached. The single wires must be tested individually.

	Wire cross section	Pulling force
	6.0 mm ²	≥ 150 N

5.8.2 Pressing contact carrier

- **Embossing position**



The dimension L11 describes the position of the pressing. The position of the plunger and the anvil must be aligned in relation to the front plane of the terminal holder. The four embossing positions (a-d) must be aligned in relation to the terminal holder. Therefore the terminal holder must be secured against rotation. The green areas can be used as a jack for the contact holder.

The exact geometry of the plunger and anvil is given.

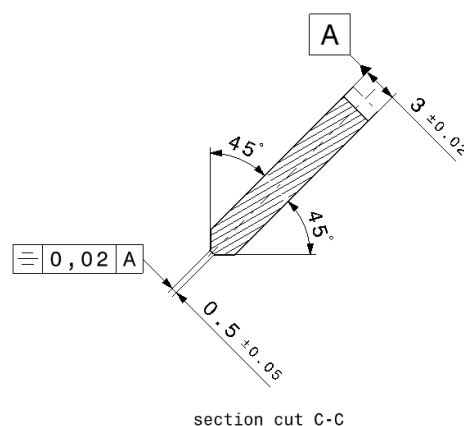
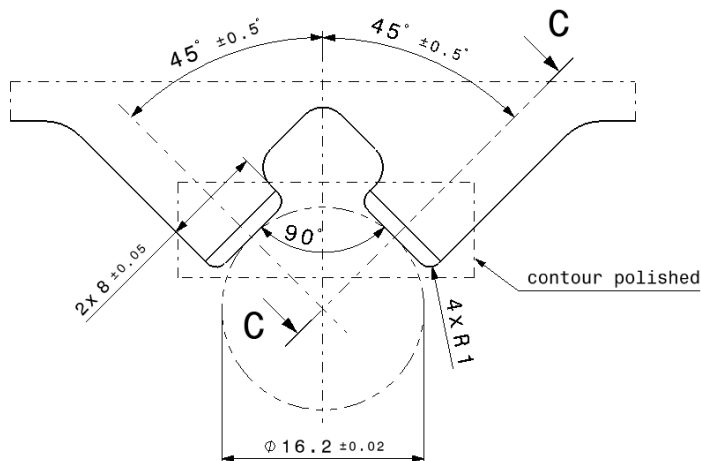


HIRSCHMANN
AUTOMOTIVE

- Geometry of the plunger and the anvil pressing on the contact carrier

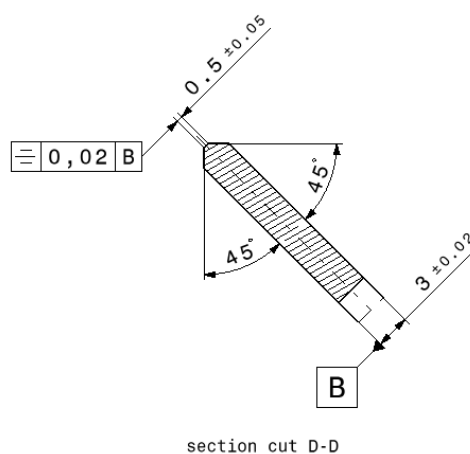
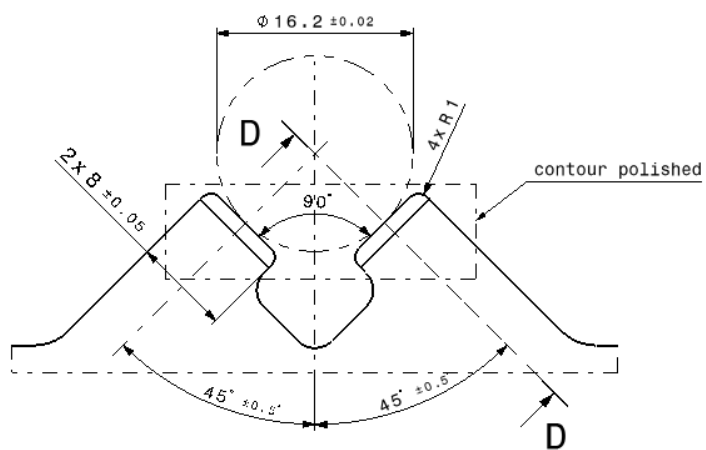
Plunger geometry of the terminal holder pressing

Material: 1.2721 vacuum hardened 58hrc

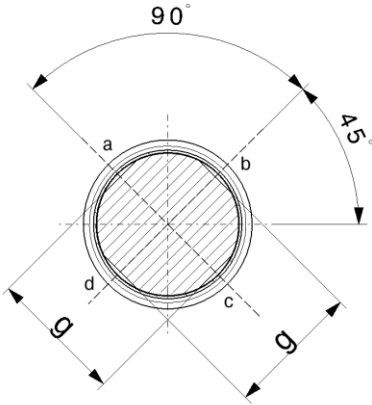


Anvil geometry of the terminal holder pressing

Material: 1.2721 vacuum hardened 58hrc



- **Embossing height “g”**

	The dimension “g” results from the embossing in between a-c and b-d. The embossing must be done at the same time.
---	---

The dimension g is defined as following:

$$g = 16.40 \text{ mm} \pm 0.1$$

- **Check the measurement of the embossing height “g”:**

To check the dimension “g”, the height needs to be measured acc. to the drawing.
All the dimensions must be within the given tolerance.

The measuring of the embossing height must be done with a suitable measuring device.
(Micrometer, measuring range: 0-60 mm).

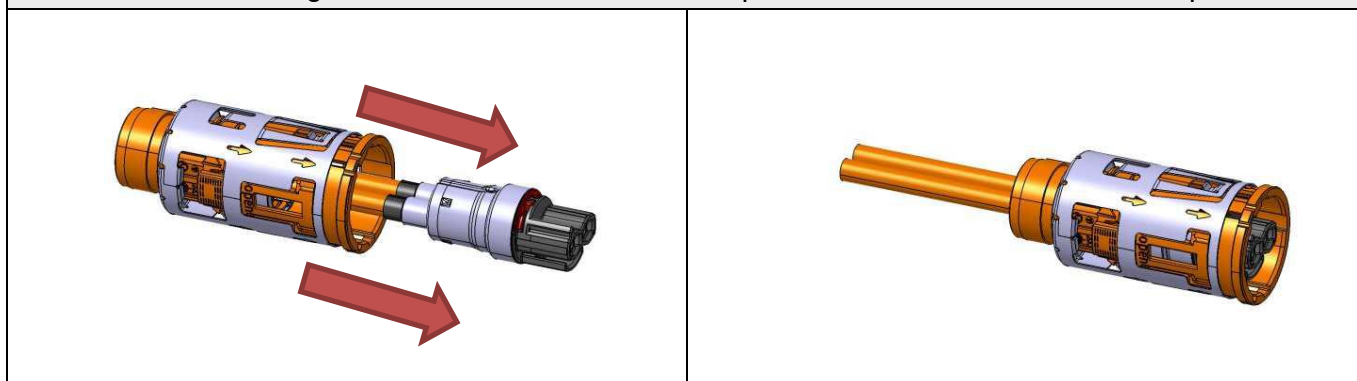
The thickness of the measuring blades must be lower than 0.3 mm.



6 Completion steps (4.0 mm²/ 6.0 mm²)

6.1 Positioning of the female locking device

The female locking device unit must be assembled power assisted, and in the correct position.



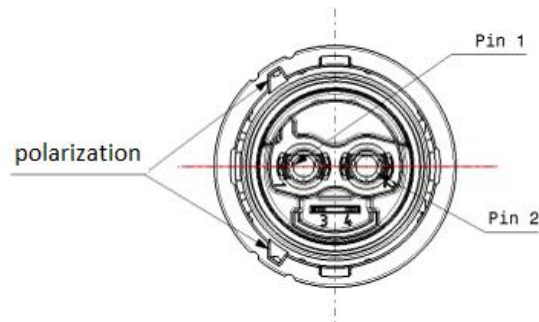
For the positioning and the assembling process of the female locking device unit onto the wire unit, the assembling device (Hand device) of the company “WKM” can be used.

Name of the device: Assembling device HPS40-2
Article number: HPS40-2

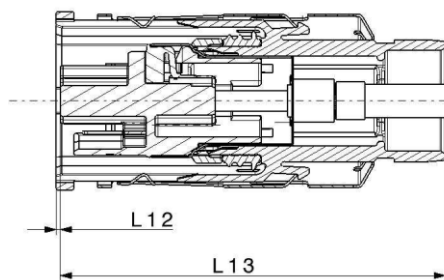
Based on the processing guidelines of Hirschmann Automotive, the device was designed and produced. The details of the commissioning, handling and the process guideline of the device can be requested directly at the supplier: Each manufacturer is responsible of the commissioning of the pressing device.

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

The commissioning of the pressing device must be done through the manufacturer. The manufacturer is at liberty to use a pressing device of his choice. The assembling process must meet the assembling data which are specified on the following pages.

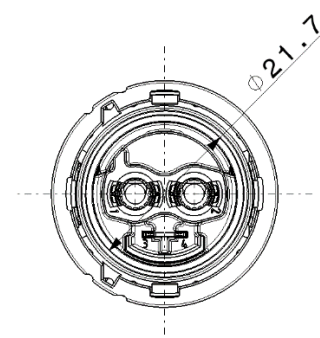
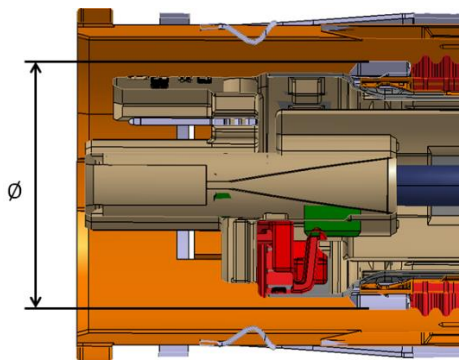


The contact holder incl. the shield sleeve needs to be assembled into the locking device unit in the correct position. Both polarizations need to be symmetric to the axis in between of the centre of Pin1 and Pin2. Also, the polarization must be on the side of Pin 1.



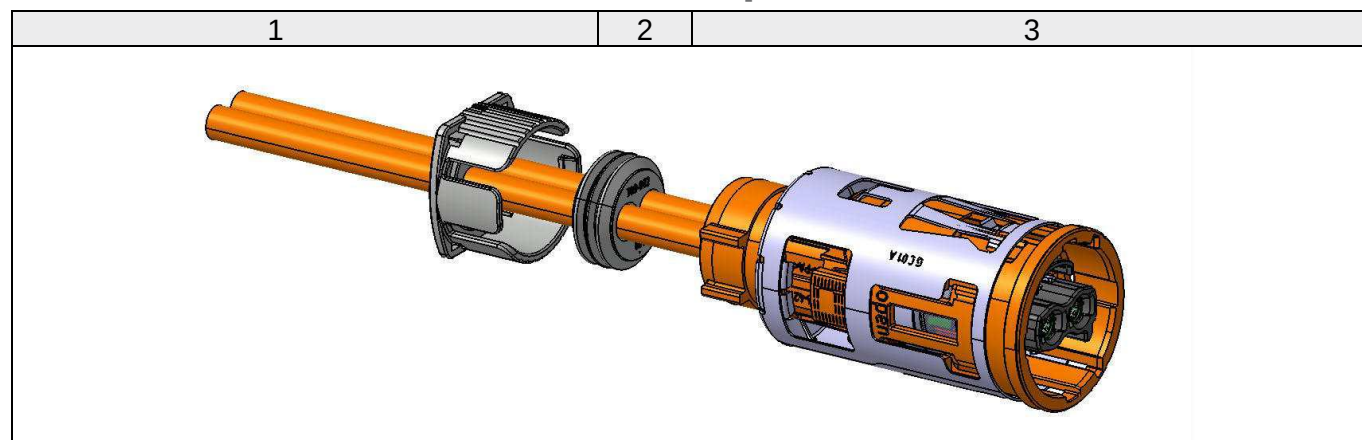
$L12 = 0.7 \pm 0.1$ **F1**
 $L13 = 66.7$ (Info)

The locking sleeve must be assembled onto the shield sleeve force-assisted until the dimension L12 is reached. The reference on the terminal holder is in the middle between Pin 1 and Pin 2.

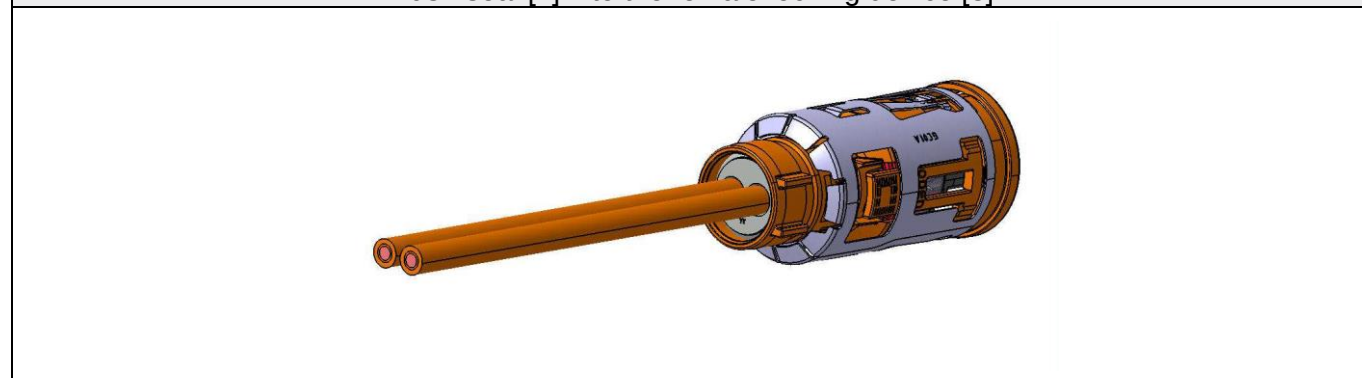


The dimension L13 is only for checking purposes. During the assembling process, there are no damages allowed on the shield sleeve, the contact holder, or the wire. There is no pull on the wire necessary. Especially do not pull out the cable sheath out of the stress relief.

6.2 Assemble seal and cover cap



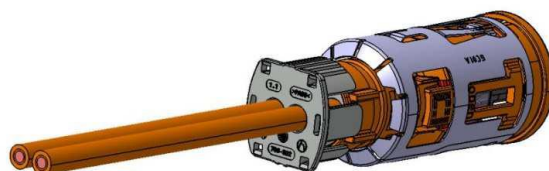
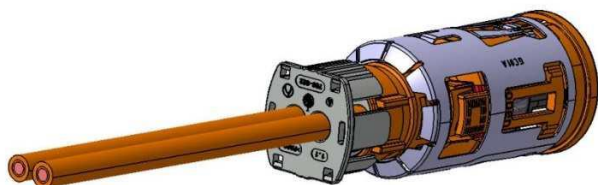
Push seal [2] into the female locking device [3]



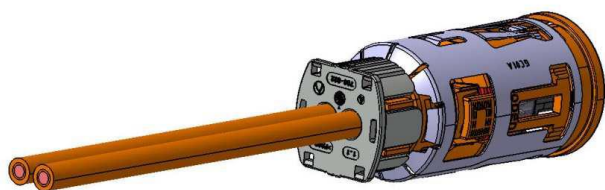
The cable seal can be slightly widened during assembly. It is possible to move the seal with the cover cap on the wire, but care must be taken that the seal does not twist and is not pinched or damaged. If the cover cap locks properly, the correct position of the seal is given, no additional pushing is required. The seal is lubricated, no additional lubricants are permitted. It is necessary to coordinate with the respective OEM whether a final inspection ensures

the correct and damage-free installation of the seal.

Snap the cover cap [1] into the recess of the female locking device [3]. The cap can be assembled either way, as it is 180° symmetrical.



Cover cap on end position

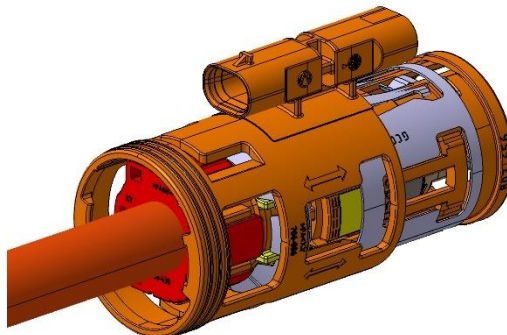


Do not damage the cover cap (1) or the seal (2) during assembly. If the cover cap is in end position the locking hooks on both sides must about straight on the female locking device unit. They are not allowed to stay in a deflected position.

If the 90° angled cap is used, the process steps of the cover cap (1) are omitted.

6.3 Positioning of the CPA Housing

The female locking device unit must be assembled power assisted, and in the correct position.



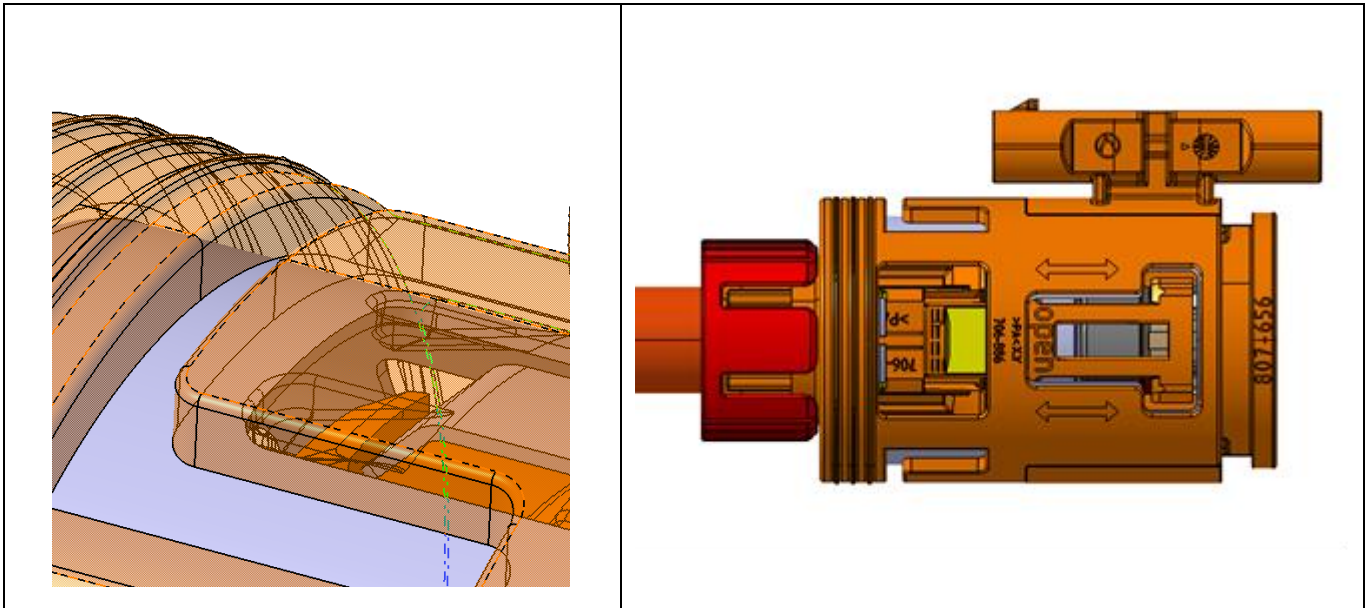
For the positioning and the assembling process of the female locking device unit onto the wire unit, the assembling device (Hand device) of the company "WKM" can be used.

Name of the device: Assembly device horizontal positioning assembly group
Article number: 197079

Based on the processing guidelines of Hirschmann Automotive, the device was designed and produced. The details of the commissioning, handling and the process guideline of the device can be requested directly at the supplier: Each manufacturer is responsible of the commissioning of the pressing device.

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

The commissioning of the pressing device must be done through the manufacturer. The manufacturer is at liberty to use a pressing device of his choice. The assembling process must meet the assembling data which are specified on the following pages.



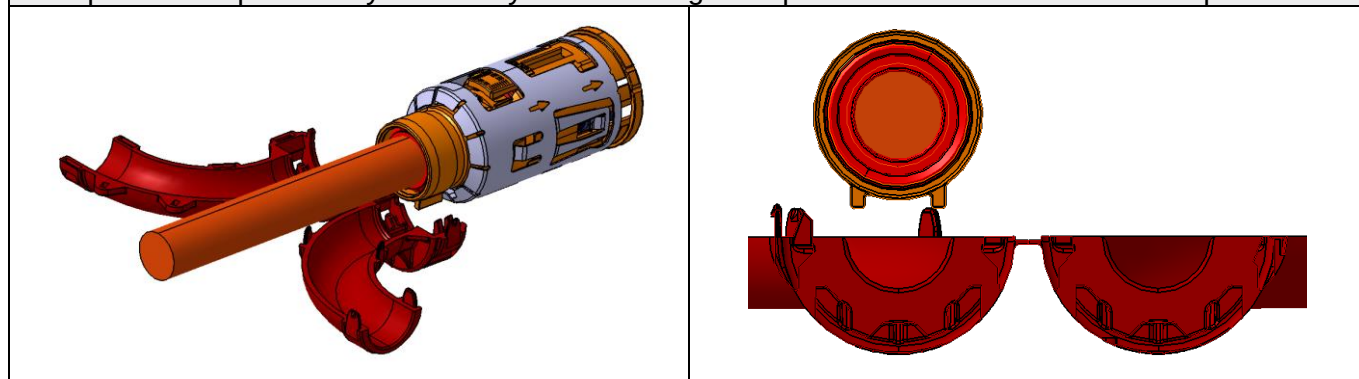
If the CPA Housing is in end position at least one of the locking hooks must about straight on the female locking device unit. They are not allowed to stay in a deflected position. They must be within the dimension L15 = max. 35.0 mm. Under certain circumstances (Tolerances) it needed to press on the locking hooks by hand.

Each manufacturer is free to carry out this work step in an earlier point in production. Appropriate actions for handling the component and the influence on the equipment of previous work steps must be considered.

7 Processing steps (optional parts)

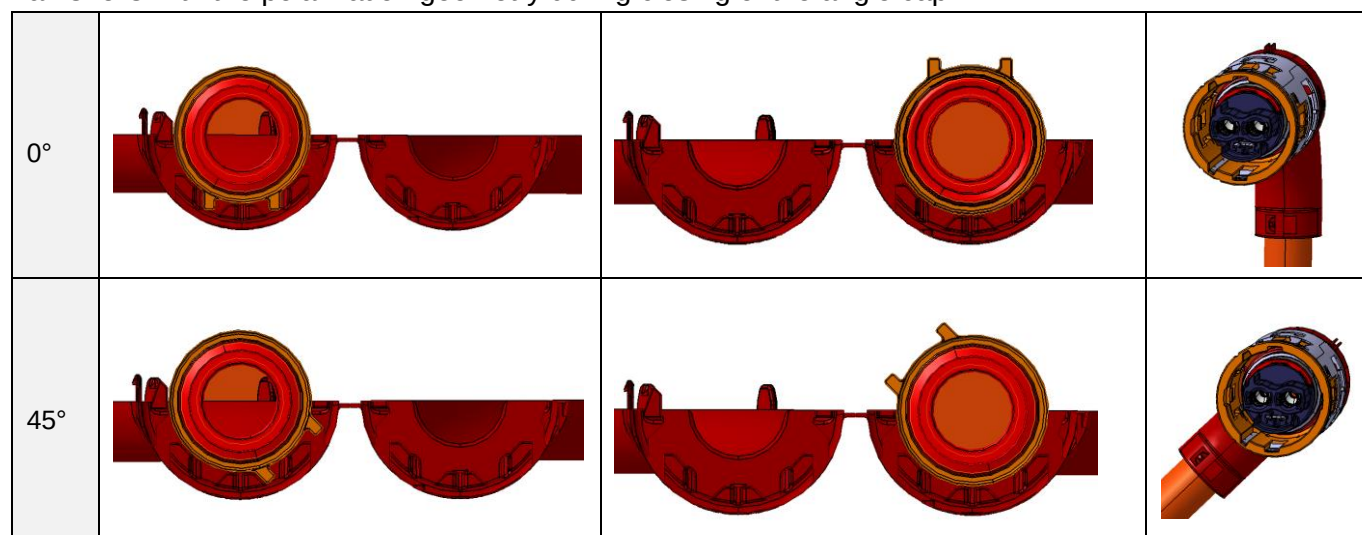
7.1 Assemble 90° angled cap

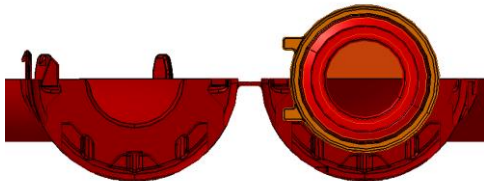
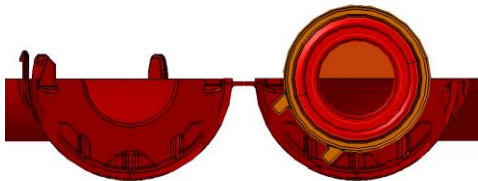
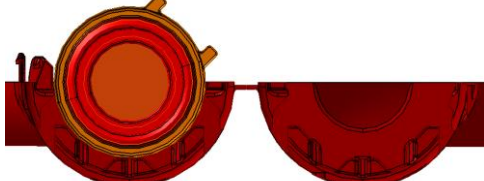
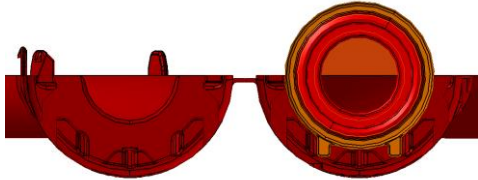
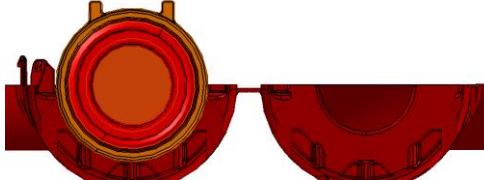
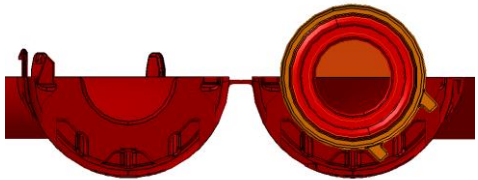
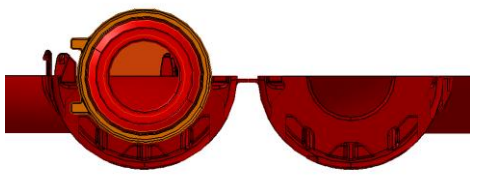
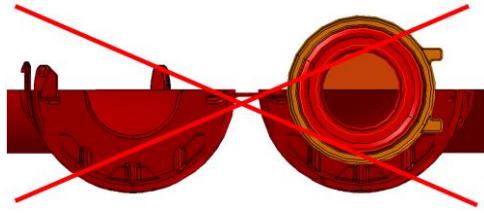
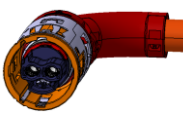
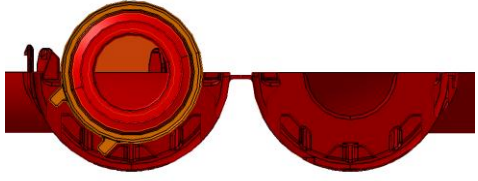
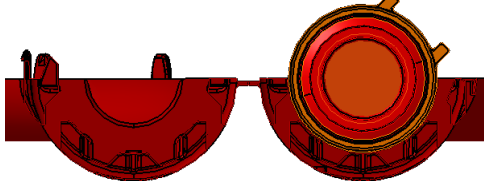
This process steps are only necessary if the 90° angled cap is used instead of the cover cap.



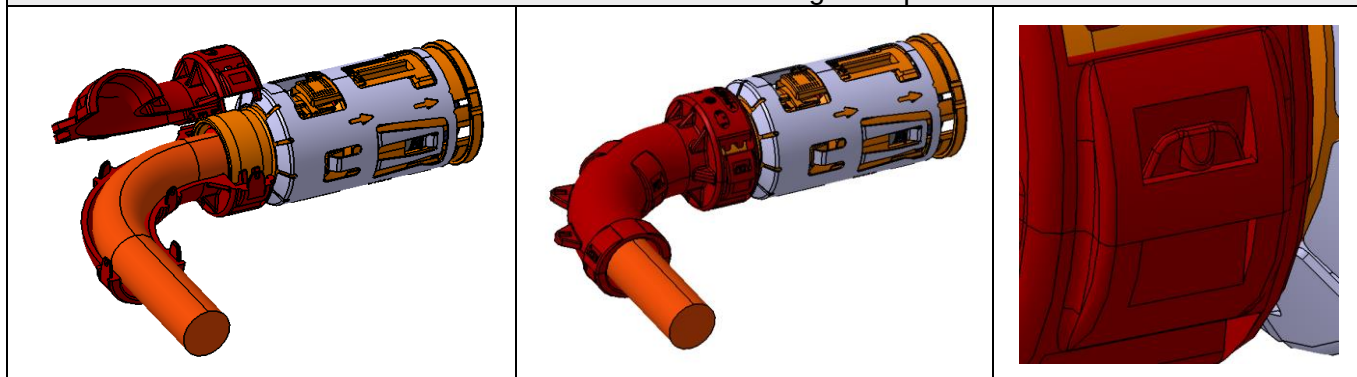
The orientation of the wire direction will be fixed with the polarization geometry of the connector housing. The wire direction of the angle cap is conceived to be set in 45° angles during the assembling process. The polarization geometry should be placed in one side of the half-shell to get a pre orientation. (left side) It is possible to place the connector into the angle cap without pre orientation (right side) but be aware during closing that the polarization geometry finds the correct position.

The position -90° can only be placed in one side, because on the other side there will be a collision of the half-shells with the polarization geometry during closing of the angle cap.



90°			
135°			
180°			
-135°			
-90°			
-45°			

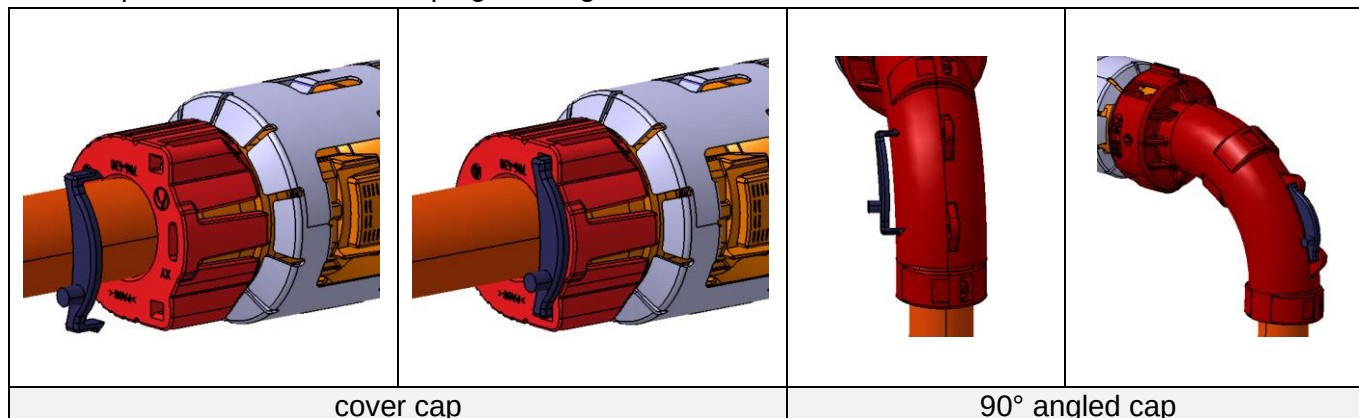
Bend the wire for 90° and insert it into the half-shell of the angled cap.



During closing the angled cap, make sure the wire insulation material doesn't get damaged. Take care that only the multi core cable is allowed under the angled cap. No Tape, protective tube, or other additional parts is allowed. All five latching hooks must be locked. Once the angled cap is closed, it is not possible to change the angle anymore.

7.2 Assemble coding clip (90° angled cap)

If the customer is requesting an additional coding identification, a coding clip can be assembled onto the cover cap or the 90° angled cap. The coding clip has the same colour as the contact holder and is used for a simpler identification of the plugs coding.

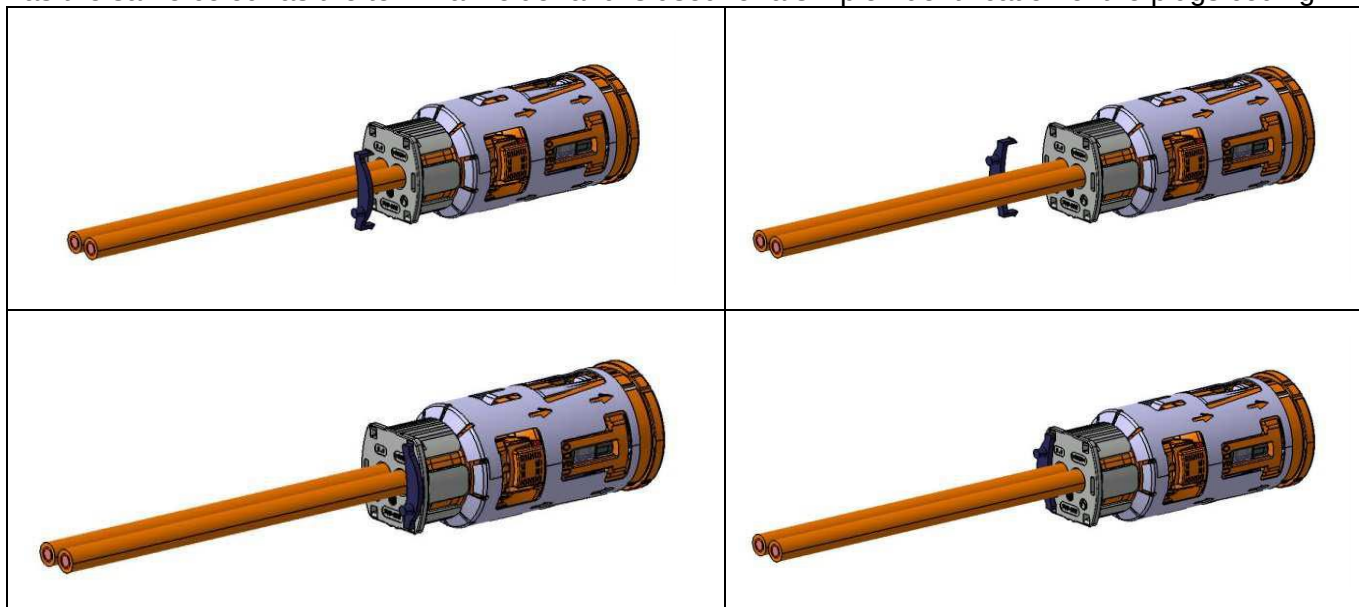


Ensure that the coding / color of the coding clip matches the coding / color of the built-in contact carrier. Therefor bars are attached to the coding clip according to a binary code which can be checked mechanically.

The design of the bars can be found in the individual drawing of the coding clip.

7.3 Assemble coding clip (180°)

Depending, if a coding clip is requested by the customer, a coding clip can be assembled onto the cover cap. Since it can be assembled in two positions, this must be clarified with the customer. The coding clip has the same colour as the terminal holder and is used for a simpler identification of the plugs coding.

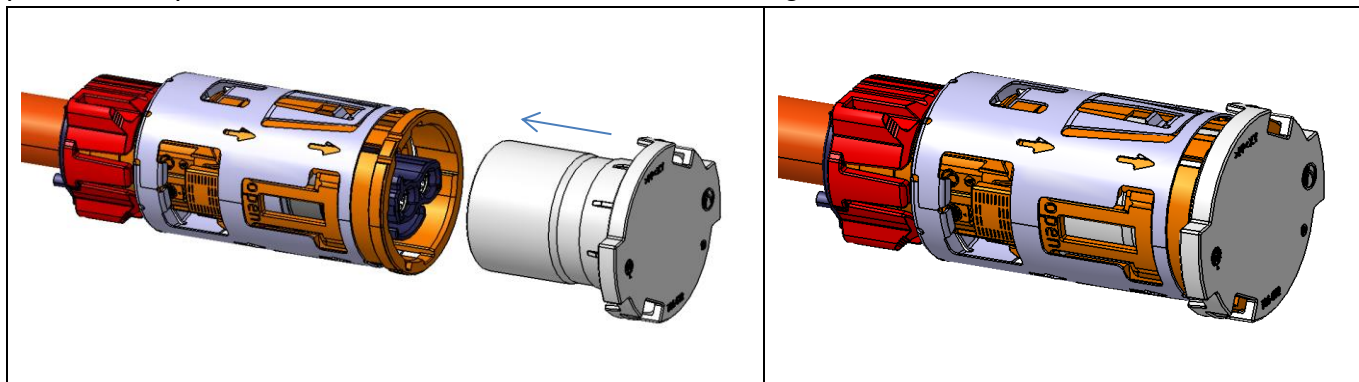


Ensure that the coding / color of the coding clip matches the coding / color of the built-in contact carrier. Therefor bars are attached to the coding clip according to a binary code which can be checked mechanically.

The design of the bars can be found in the individual drawing of the coding clip.

7.4 Assemble transport protection cap

If the customer is requesting an additional transport protection of the connector interface, a transport protection cap can be assembled onto the connector housing.



Insert the transport protection cap until both locking elements snap over the front collar of the connector housing. It is possible to turn the transport protection cap 360° during and after the assembling.

7.5 Stacking of produced harnesses

For an orderly and controlled stacking of the harnesses to quantitatively free defined bundles.

8 Technical information

8.1 General requirements

Damage on the single components is not allowed during the whole production process.

8.2 Technical cleanliness

In general, pay attention to the cleanliness on the connector and inside of the connector. Metallic particles generated during the assembly process, must be removed with a suitable device. Inside the connector and on the connector, there are no metallic particles > 1,000 µm allowed.

For metallic particle at each connector: CCC = N (J4/ K0) acc. to VDA Band 19

For all other particle at each connector: CCC = N (J10/ K0) acc. to VDA Band 19

BMW-specific requirements according to QV11111 for assembled connector can be seen in the following table. The surface information can be found in the customer drawings.

Technical cleanliness acc. to QV11111			
HV system (assembled final product without cable)			
Requirement class (t.b.d. -> BMW manufacturer)			
Reference size A (1,000 cm ²)			
Number of allowable particles by length size class			
		NOT shiny metallic	Shiny metallic
G	150 - 200 µm	-	-
H	200- 400 µm	1,200	1,200
I	400 – 600 µm	130	130
J	600 – 1,000 µm	60	15
K	1,000 – 1,500 µm	4	-

It is also important to protect the component from further contamination during transport. Appropriate packaging must be provided. A protective cap is available from Hirschmann Automotive as an option.

8.3 Degree of automation

There is a concept developed by the company Komax in which the process steps as shown in this process specification can be produced fully automatic in various stage of expansion. This concept was developed together with the company Hirschmann Automotive GmbH. Each manufacturer is responsible of the commissioning of the pressing device and can be requested direct at the company Komax.

KOMAX AG
Industriestraße 6
CH-6036 Dierikon
Phone: +41 41 455 04 55
www.komaxwire.com

Concept of automation HPS40-2

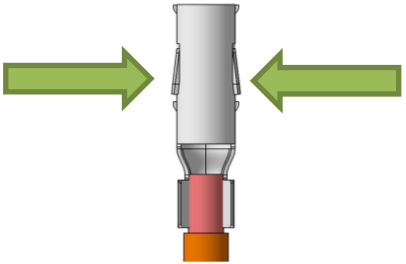
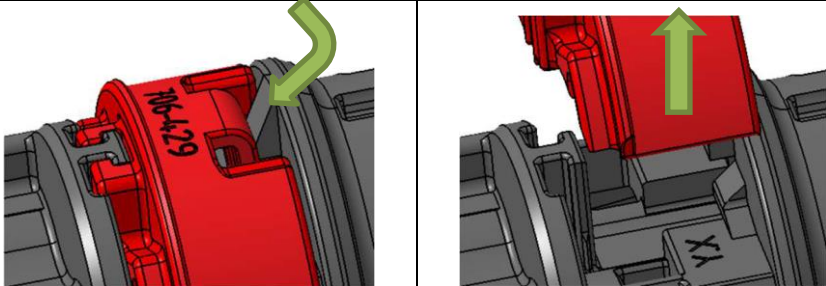
8.4 Additional technical information

8.4.1 Sample preparation for shield retention force

For testing the shield retention force, the samples must be prepared accordingly. If a production without terminals is not possible, further possibilities of manipulation are described as follows.

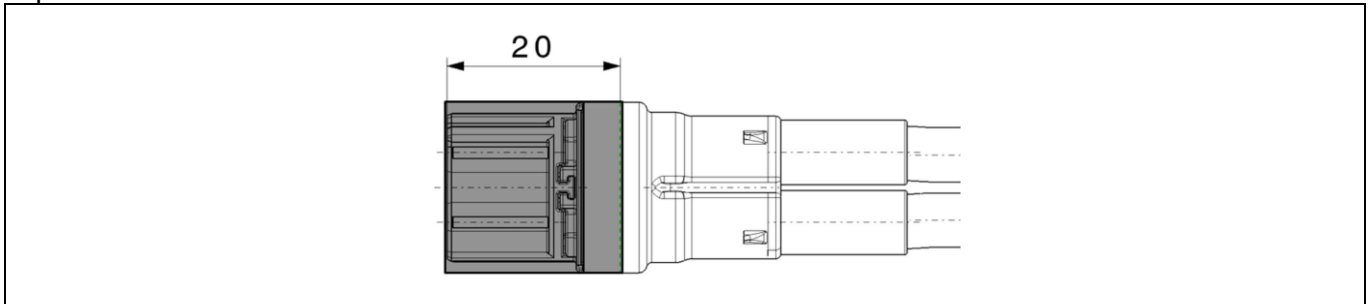
8.4.1.1 Manipulation of primary- and secondary lock

This variant is applicable if production without terminals is not possible.

	
Manipulation of HCT4 terminals	Manipulation of terminal carrier
Bend the primary locking latches inward. (e.g. with a screwdriver)	Bend the locking latch of the secondary lock inwards to remove the secondary lock.

8.4.1.2 Removal of terminals after shield crimping

This variant is applicable if production without terminals is not possible, and the manipulation cannot be implemented either.



Remove the grey portion of the connector (e.g. cutting / machining)

**The manipulated connectors are for testing only
and must not be used in vehicles!**



9 Change of documentation

Change description	Date	Editor
Updated 6.0 mm ² Version	11/ 2019	Hoor R.
Activated 6.0 mm ² cables; put L10 and L11 in brackets (3.0mm ² , 4.0 mm ² 5.0 mm ²); updated 6.0 mm ² version	12/ 2019	Hoor R.
Updated L1 / L2 / L3 / L7 / width of shield-crimping geometry	01/ 2020	Hoor R.
Added L4/L5 (6.0 mm ²); put L8 and L9 in brackets (6.0 mm ²), removed obsolete cables; added visual check of terminals	02/ 2020	Hoor R.
Added Aluminium-wire; adapted L7 (4.0 mm ²) and L5 (6.0 mm ²); defined measurement for ØX (4.0mm ²); permitted residual foil; added comment for L3; added L4* (6.0 mm ²); added comments for the assembly of the seal	04/ 2020	Hoor R.
added BMW-Document No.; permitted deviation of processing sequence for 4.0 mm ² / specified measurement of L5 for 4.0 mm ² / specified measurement of L12 for 4.0 mm ² and 6.0 mm ² / added process data for 6.0 mm ² aluminium conductors;	05/ 2020	Hoor R.
L3 was made theoretical, additional comments on the positioning of the strain-relief and x-ring were added; non-existing components for 3.0 mm ³ and 5mm ² were crossed out/ Coficab was reactivated added clamping of the wires during assembly of the shield sleeve	11/ 2020	Hoor R.
Added BMW F-characteristics; updated clamping Removed 3.0 mm ² and 5.0 mm ² / Corrected continuity errors (administrative) Added optional stripping length for new terminal holders (6.0mm ²)/ Added Appendix for sample preparation	01/ 2021	Hoor R.
Increased for 6.0 mm ² the tolerance and added measuring plane for shield-crimping (d)	04/ 2021	Bas Ü.
In chapter 1.5, a special configuration has been defined for the FHLR91XC91X T4 6.0 mm ² cable.	05/ 2021	Engstler D.
Added link to alu appendix, added alternative embossing geometry for 4.0 mm ² wires;	11/ 2021	Breuss L.
In chapter 1.5, the special configuration has been adapted for the FHLR91XC91X T4 6.0mm ² cable.	05/ 2022	Engstler D.
Deleted 1x4mm ² Kroschu cable Changed cleanliness requirement and added BMW specific requirement based on surface reference/ BMW special characteristics changed acc. to OEM requirement/ Added chapter 5.4.- 5.7(positioning CPA Housing for Inline SCC connector, 90° angled cap, coding clip on angled cap, transport protection);	10/ 2022	Breuss L.
Update design specification	06/ 2023	Jussel E-M.