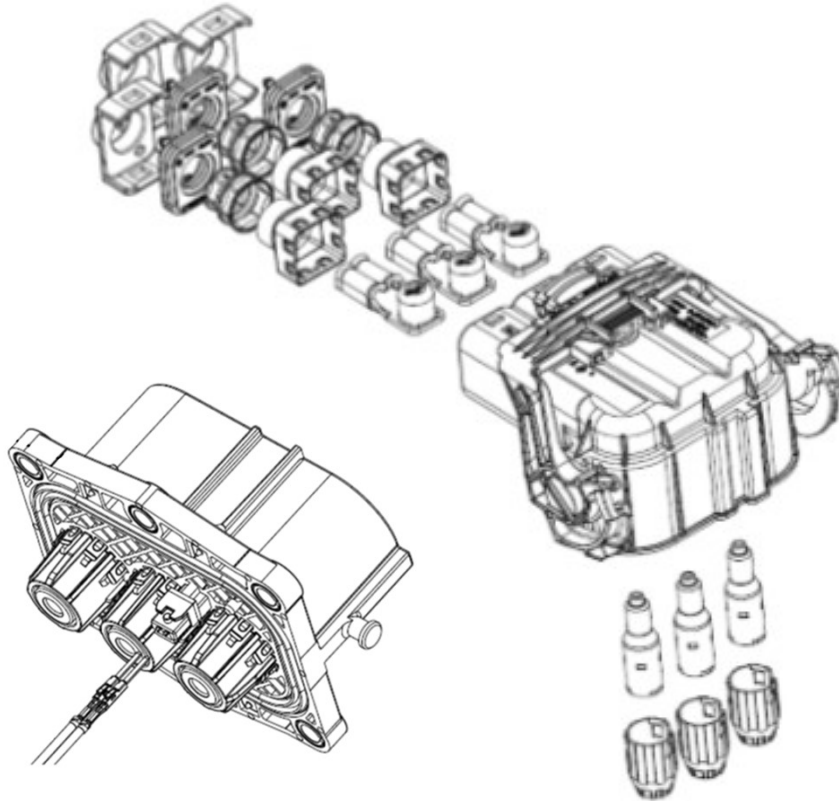


## HVP800 2PHI AND 3PHI 90° AMP+ High Current Connectors and Headers SPECIFICATION



				PR: Z.ZHANG DATE: 22APR2019	 <b>TE Connectivity Shanghai, China</b>		
B2	Add Force 35-50mm2 cable	KF.Y	23AUG24	CHK: E.JIANG DATE: 22APR2019			
B1	Add KBE35-50mm2 cable	L.Y	12APR22	B			
A	Initial Released	Z.Z	22APR19	APP: I.YIN DATE: 22APR2019	Document No.:	LOC:	REV:
LTR	<b>REVISION RECORD</b>	PR	DATE		114-32213	CH	B2

---

## HVP800 2PHI AND 3PHI 90°

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- This connector is intended for use in high-voltage applications. Special care must be applied to ensure that the connector functions as intended.
- If you suspect that the connector has been modified, damaged, contaminated or otherwise compromised, please discontinue its use immediately.
- This connector should only be serviced by a trained and qualified technician.

## 1. SCOPE

### 1.1 Content

This specification covers the requirements for application of the sealed 2-3 position HVP800 2PHI and 3PHI 90° high voltage connector. The HVP800 system is designed to meet AK4.3.3, LV215-1 specifications and for a metric wire size range of 25mm<sup>2</sup> up to 50mm<sup>2</sup> (acc. to LV216-2). The connector incorporates conductive EMI shields to reduce radiated emissions in the application.

The HVP800 90° connector is available for four different keying or polarizing configurations with a lever for low mating / unmating forces. The connector system incorporates the 8mm power contacts and an integrated High Voltage Interlock (HVIL) System. The housings are molded in orange to denote a high voltage system.

### 1.2 Processing notes

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

## 2. APPLICABLE DOCUMENTS

The following mentioned documents are part of this specification. If there is a conflict between the information contained in the documents and this specification or with any other technical documentation supplied, the last valid customer drawings takes preference.

### 2.1 TE Connectivity Documents

This Application Specification based on the latest valid customer drawings

#### 2.1.1 Customer Drawings

Table 1: Customer Drawings

<b>2pos Receptacle housing</b>	
2310922 2364813	2 Pos, 8mm HV, REC HSG 90°, Assy
<b>3pos Receptacle housing</b>	
2325010	3 Pos, 8mm HV, REC HSG 90°, Assy
<b>2pos Pin header</b>	
2322122 2355198	2 Pos. Dia 8mm Pin housing, Assy
<b>3pos Pin header</b>	
2325013 2364720	3 Pos. Dia 8mm Pin housing, Assy
<b>Single Components</b>	
2141155 2310488	Cover, Seal
2141156 2356073	Single Wire Seal
2141157 2307011	Shield Crimp Ferrule

2141158 2343612	Shielding Sleeve
2141159 2303272	Finger Protection Cap
2141211 2328073	Deep drawn socket, 90°, Assy
2141212 2328074	Deep drawn socket, Pin 90°, Assy
<b>Application tools</b>	
528008-4	HV-Crimping machine <sup>1</sup>
541868-1	Die-Set holder for HV-Crimping machine <sup>1</sup>
528040-2	Table frame for hand tool <sup>2</sup>
9-1579009-1	Hydraulic hand tool <sup>2</sup>
1-528041-5 1-528041-3 1-528041-2	Die-Set with locator

\* Others TE China HVP800 series part number also suitable for this specification.

<sup>1</sup> Application tools for machine processing

<sup>2</sup> Application tools for hand processing

## 2.1.2 Specifications

Table 2: TE-Specifications

<b>Specifications</b>	<b>Description</b>
108-32233	Product Specification HV 8mm 90°
108-94256	Product Specification HV 8mm 90° Contact
114-94083	Application Specification HV 8mm 90° Contact
114-18464	Application Specifications MCON-1.2 Contact System

## 2.2 General Documentation

### 2.2.1 Cable Specification

The connector is designed to meet LV216-2 specification for metric wire range 25 up to 50mm<sup>2</sup>.

Table 3: Cable Specification

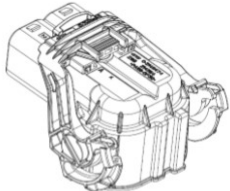
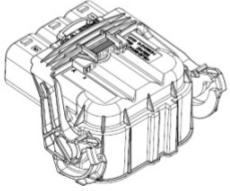
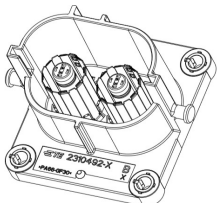
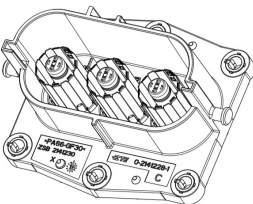
LV216-2 (600 Volt Cable)	Table A1 – Conductor Copper Type B
	Table A2 – Conductor Copper fine stranded / flexible Type B

## 3. CONDITION OF DELIVERY AND PACKAGING








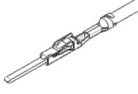
### 3.1 Components

Table 4 shows the required components for assembly 2-3pos HVP800 Receptacle Housing.

Table 4: Components

TE-No.	Description	Qty.	Picture
2310922 2364813	2pos, Rec Hsg 90°, Assy	1x	
2325010	3pos, Rec Hsg 90°, Assy	1x	
2322122 2355198	2pos, Pin Dia 8.0, Pin Hsg, Assy, Sld	1x	
2325013 2364720	3pos, Pin Dia 8.0, Pin Hsg, Assy, Sld	1x	



TE-No.	Description	Qty.	Picture
2141155(*) 2310488(*)	Cover, Seal	2x (3x)	
2141156(*) 2356073(*)	Single wire seal	2x (3x)	
2141157(*) 2307011(*)	Shield crimp ferrule,90°	2x (3x)	
2141158 2343612	Shielding sleeve, 90°	2x (3x)	
2141159 2303272	Finger protection cap	2x (3x)	
2141211 2328073	Deep drawn socket, 90°, Assy	2x (3x)	
2141212 2328074	Deep drawn socket, Pin 90°, Assy	2x (3x)	
1418760	Tab contact 1.2mm	2x	

(\*): depend on the cables cross section  
-1: for 50mm<sup>2</sup>; -2 for 35mm<sup>2</sup>; -3 for 25mm<sup>2</sup>

Remark: The above part numbers apply to this specification, but not limited to the above part numbers. For newly added part numbers, if the customer drawing defines that the part applied to this specification, it also is applicable.

### 3.2 Packaging and Storage

The products should be used on a “first in, first out” basis to avoid storage contamination, see latest valid customer drawings too.

## 4. APPLICATION TOOLS

The Application tools are only valid for the specified cables at appendix. More tooling information can be obtained through a local TE Representative or, after purchase, by calling the Product information Center at the number at the bottom of cover page.

### 4.1 HV 8mm contact

See latest valid TE-Application specification 114-94083

### 4.2 Shielding

The following table contains the required order numbers for application devices and tools.

Table 5: Application devices and tools

Wire size <sup>3</sup> [mm <sup>2</sup> ]	50	35	25
Die-Set, locator	1-528041-2	1-528041-3	1-528041-5
Hand processing	Table frame 528040-2		
	Hydraulic plier 9-1579009-1		
Machine processing	Die-Set holder for crimp machine 541868-1		
	Crimp machine 528008-4		

<sup>3</sup> Wire design according to LV216-2

## 5. ASSEMBLY INSTRUCTIONS (PLUG)

The following procedures show the details of the cable assembly and insertion instructions of the cable assembly into the Receptacle housing subassembly. The processing is only valid for the specified cable at appendix and only these combinations have been validated by TE. Alternative cables may be used after ensuring performance through validation testing.

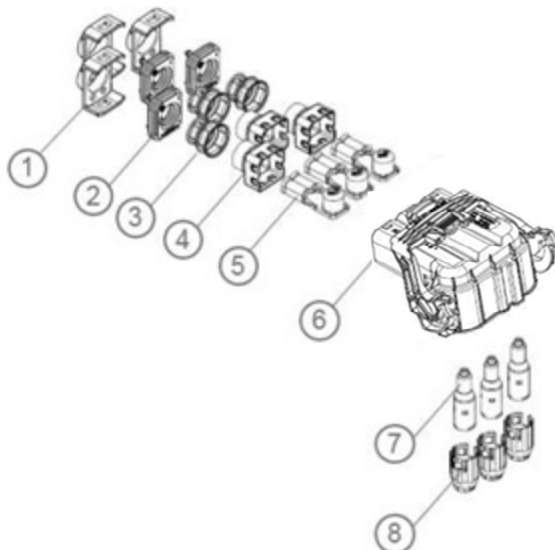


Figure 1: Exploded view Receptacle Housing assembly

Table 6: Components cable assembly

(ID)	TE-PN	Description
1	2141155 2310488	Protection cover
2	2141156 2356073	Single wire seal
3	2141157 2307011	Shield, crimp ferrule, 90°
4	2141158 2343612	Shielding sleeve, 90°
5	2141211 2328073	Deep drawn socket, 90°
6	2325010	3pos, 8mm HV, Rec Hsg, 90°, assy
7	2141212 2328074	Deep drawn socket, Pin 90°, assy
8	2141159 2303272	Finger protection cap

## 5.1 Shielded cable and terminal assembly

Safety information, avoid prolonged or repeated skin with silver shieldings (wear protective gloves).

Please note, the procedure of assembly the shielded cable is provided in two documents, the following steps show the assembly without contact processing.

In order shown in figure, slide protection cover, single wire seal, shield crimp ferrule 90° and shielding sleeve 90° onto cable sheath, so that they are not in crimp work area.

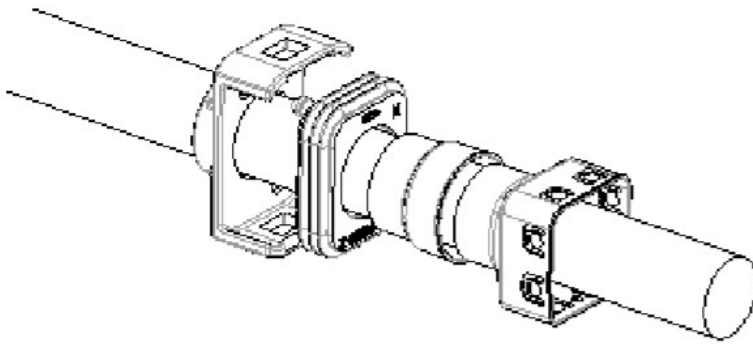


Figure 2: Before processing slide components onto cable sheath

Strip and remove outer sheath, screening braid (if present screening foil), inner sheath and conductor from the end as shown in figure 3.

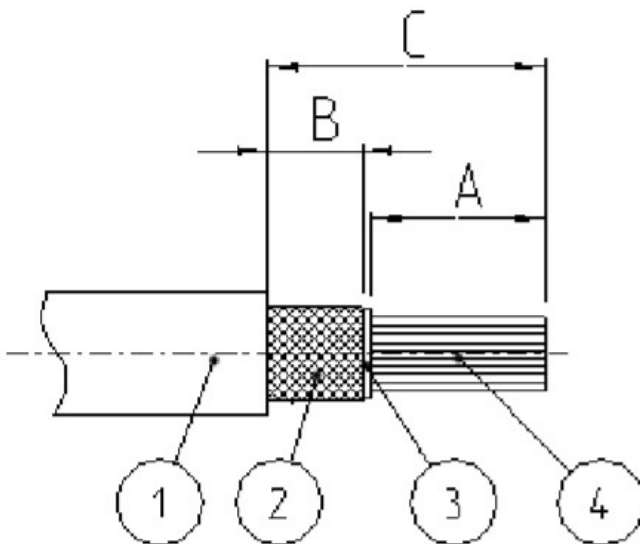


Figure 3: Cutting cable to length

Stripping dimensions for exposing cable.



Attention: Cable sheath and shielding braid shall not be cut or broken during the cutting procedure.

Table 7: Cutting dimensions

(ID)	Cable Design	A [mm]	B [mm]	C [mm]
1	Outer sheath	--	--	32±1
2	Screening braid	--	(11)	--
3	Inner sheath	See TE-Spec. 114-94083	--	--
4	Conductor	--	--	--

Comb out screening braid, this step must not be done for cables shown in chapter appendix.



Attention: Shielding braid shall not be broken.

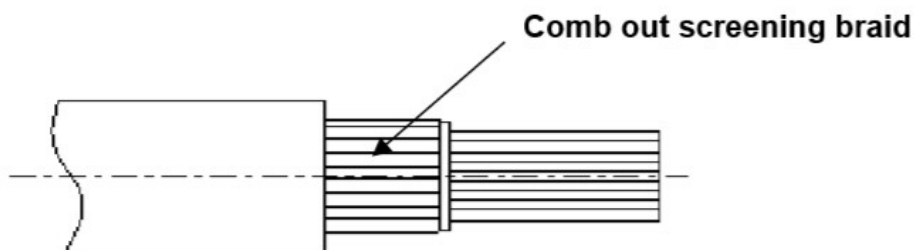


Figure 4: Comb out screening braid

### 5.1.1 Contact crimp

See latest valid TE-Application specification 114-94083

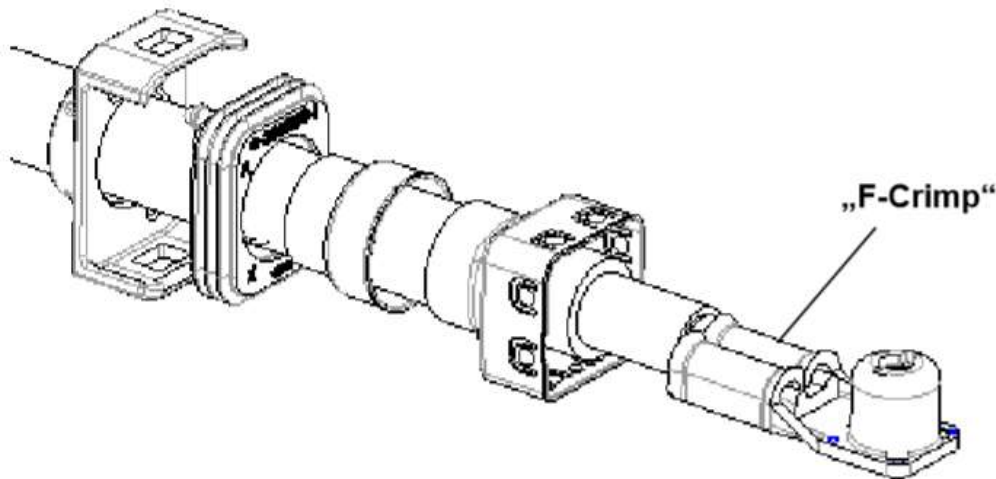


Figure 5: Contact crimp

### 5.1.2 Shielding crimp

Slide shielding sleeve 90° over screening braid until it stops against the contact as shown in figure 6.

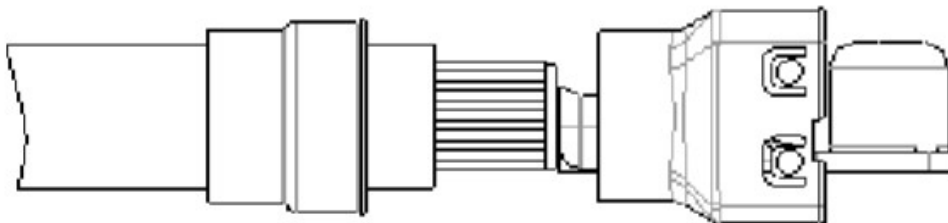


Figure 6: Prepare shielding parts for screening processing

Raising screening braid equally over perimeter.

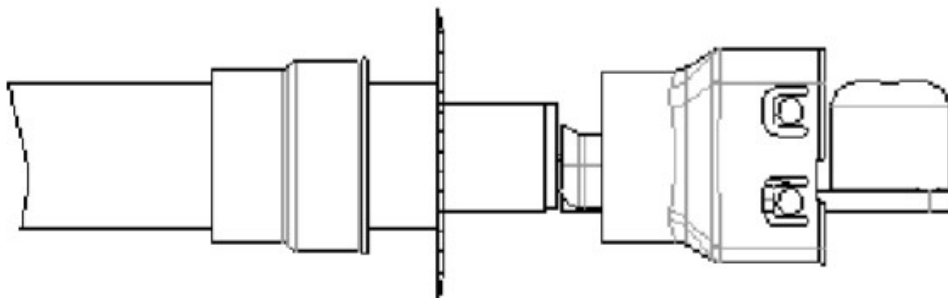


Figure 7: Processing screening braid

Insert shielding sleeve 90° oriented to contact until it stops against shield crimp ferrule 90° and turn over screening braid by lateral movement. Insert cable assembly into locator and crimp shielding parts.

**Crimp shielding sleeve oriented to contact**

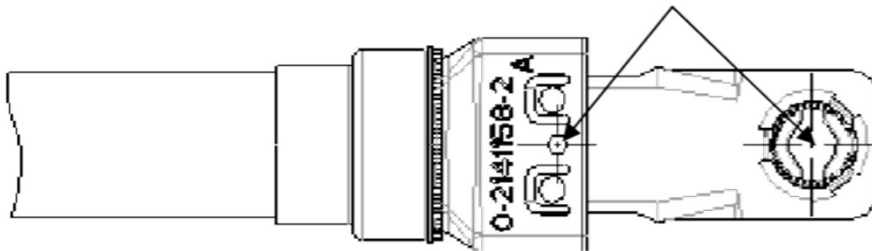


Figure 8: Shield crimp



It is essential that there are no mistakes in this step because there will be no chance to re-work the parts

The following items at minimum must be inspected and verified:

- All components are present and parts are crimped in correct orientation and location
- No visible cracking of the shielding parts and no loose cable shield strands
- Hex crimp dimensions per figure 10 and table 8
- Excess length of screening braid must be visible max. 5mm
- Allocation of screening braid should be equal over perimeter

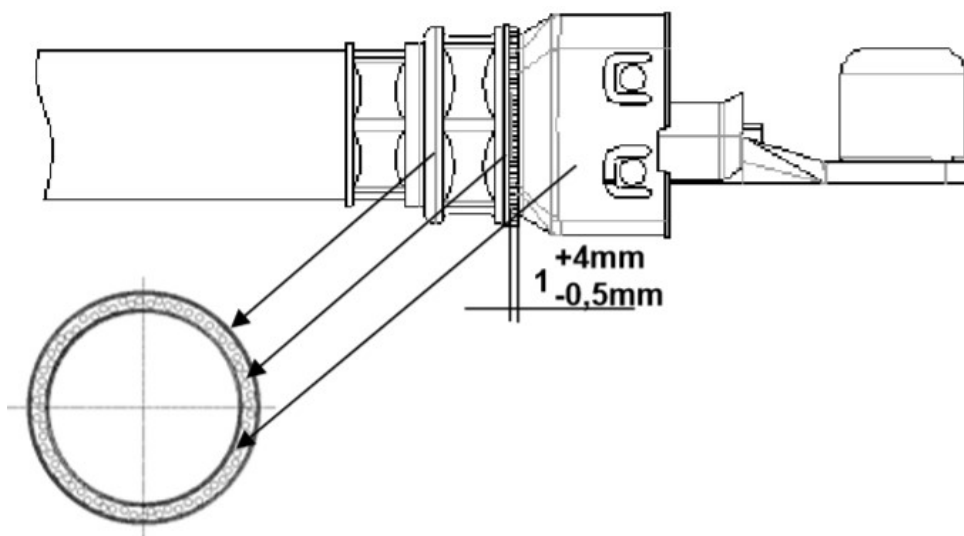
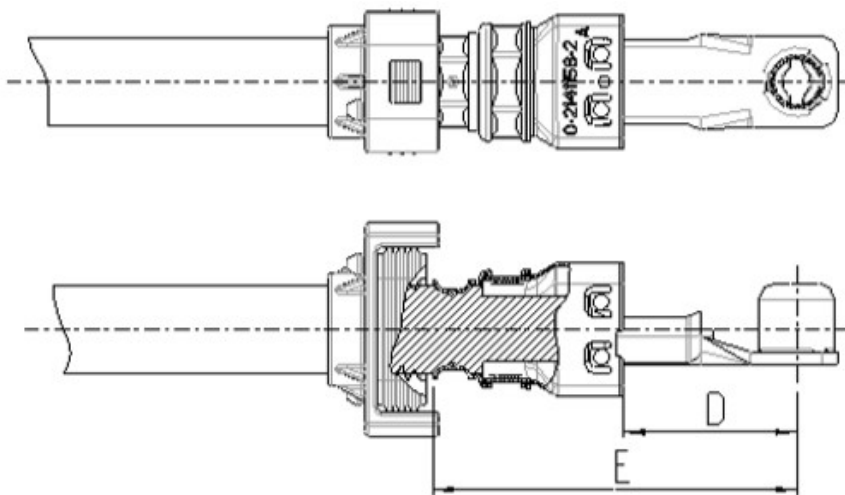


Figure 9: Visual Examination of shield crimp

The following Inspection dimensions at minimum must be verified:

Table 8: Inspection dimensions cable assembly

Wire type	Cross section [mm <sup>2</sup> ]	D ± 1.5 [mm]	E [mm]	F ± 0.2 [mm]	G ± 0.2 [mm]	H [mm]
Coroplast	25	28	Max. 59	12.2	16.6	Max. 21
	35			14.3		
	50			15.5		



Cross section: Insulation crimp

Cross section: Shield crimp

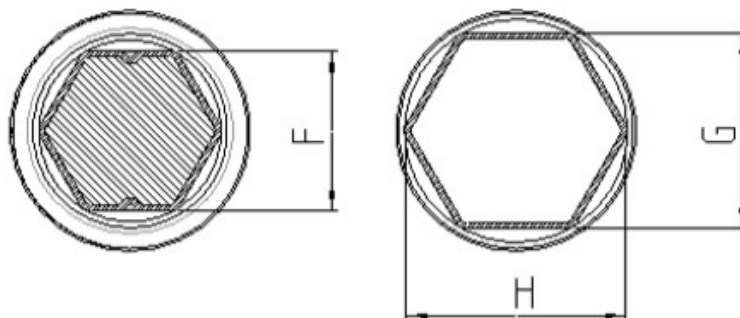


Figure 10: Inspection dimensions of shield crimp



## 5.2 Receptacle Housing

### 5.2.1 Insert cable assembly into the Receptacle Housing

Mounting single wire seal with cover seal as shown in figure 11.

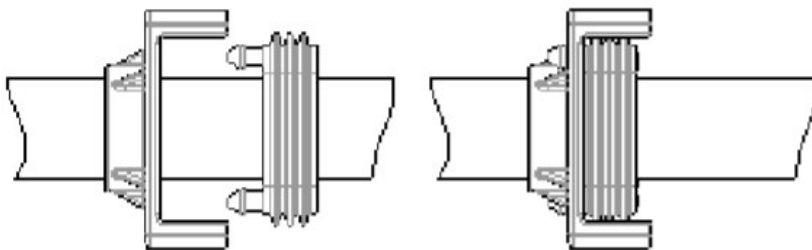


Figure 11: Mounting single wire seal on cover seal

Note the alignment of receptacle housing subassembly and cable assembly (figure 12).

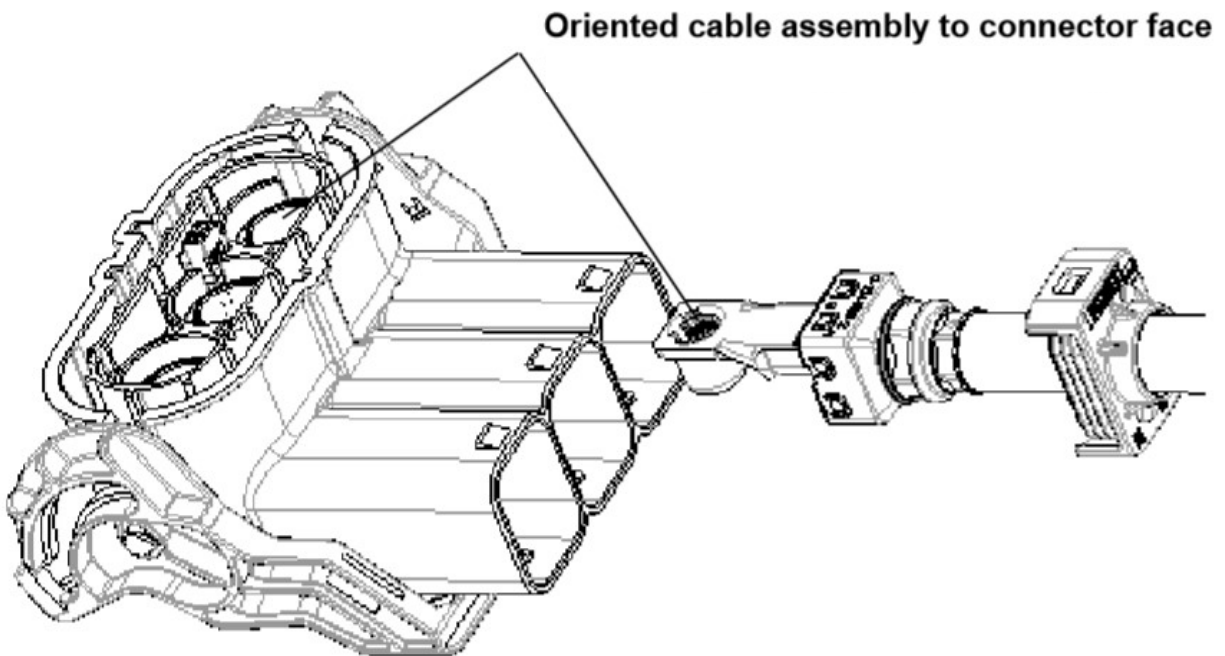


Figure 12: Oriented cable assembly to housing

Insert aligned the cable assembly into the receptacle subassembly until it stops against the inside of the housing.

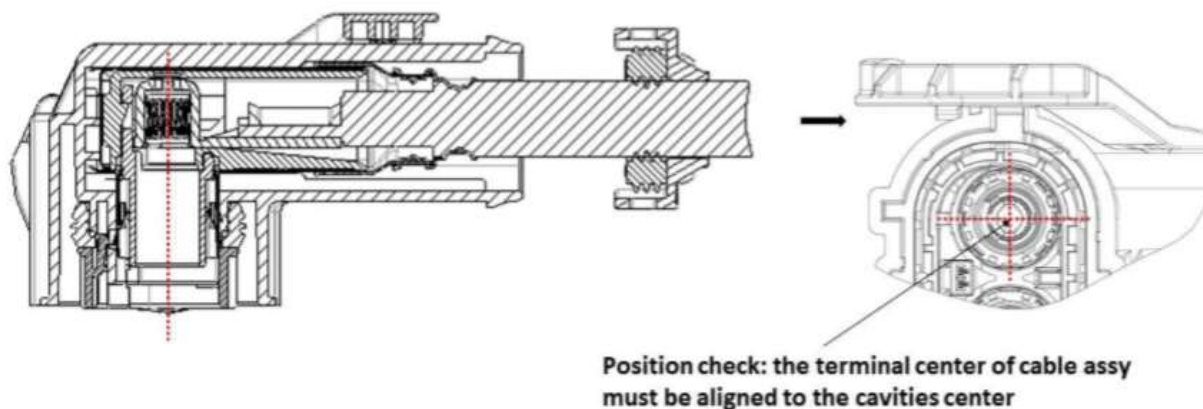


Figure 13: Insert cable assembly into the receptacle housing

### 5.2.2 Assembly single wire seal and protection wear

Slide single wire seal and protection cover onto receptacle housing until it is fully locked by audible latching. The following items at minimum must be inspected and verified:

Visual Examination of correct assembling single wire seal into housing

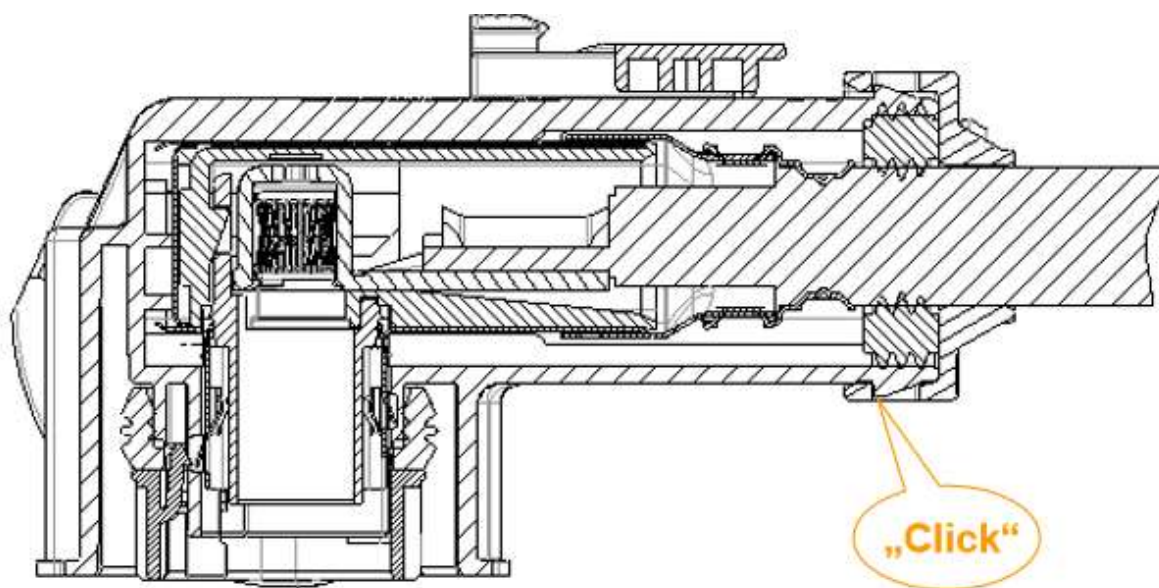


Figure 14: Assembly protection cover and single wire seal

### 5.2.3 Insert contact pin

Insert contact pin until it stops against the contact of the cable assembly.

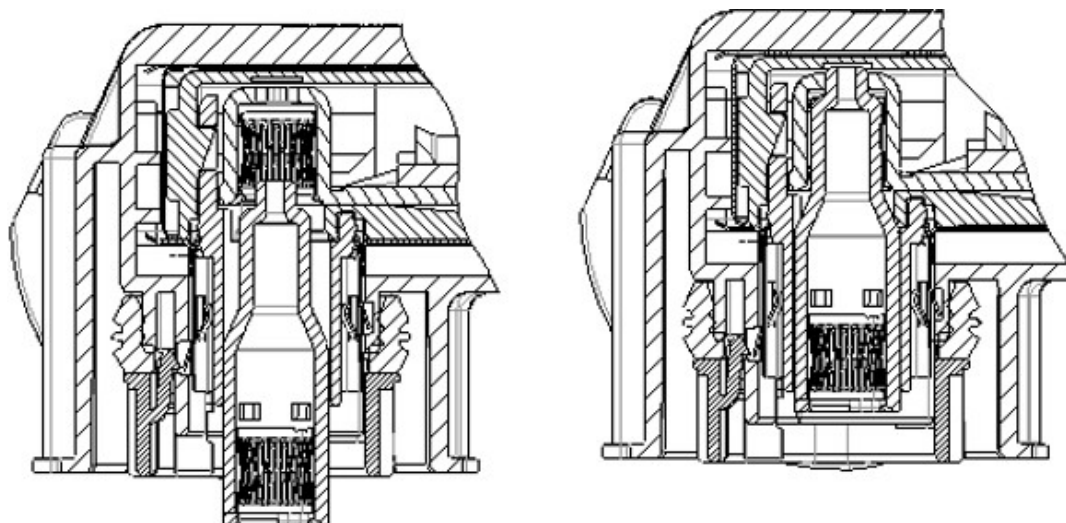


Figure 15: Insert contact pin

### 5.2.4 Mounting finger protection cap

Note the groove on the finger protection and the rib on the insulation part (only at pre-serial part). For better understanding insulation part is shown in exploded assembling position.

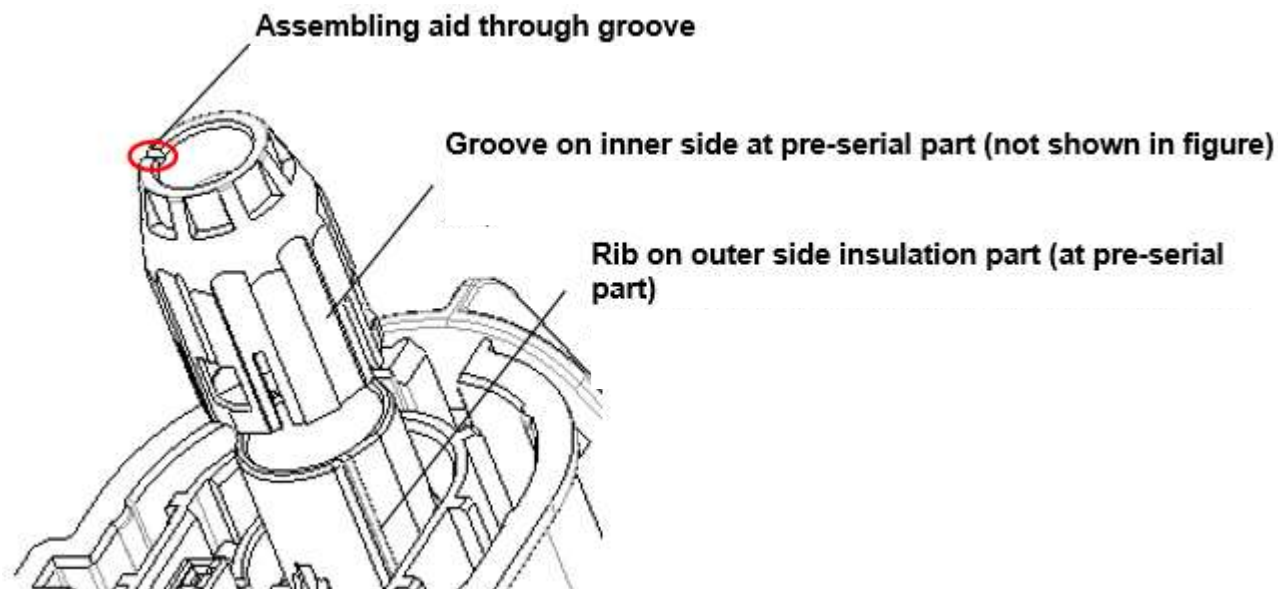


Figure 16: Finger protection cap aligned to insulation part

With the groove in the top (red marked, shown on fig. 18 too) and groove and rib inside (only at pre-serial parts, see fig. 16 too) aligned, insert finger protection cap into the receptacle housing subassembly until it is fully locked by audible latching. Note to show the latching mechanism isolation part is shown in incorrect assembling position.

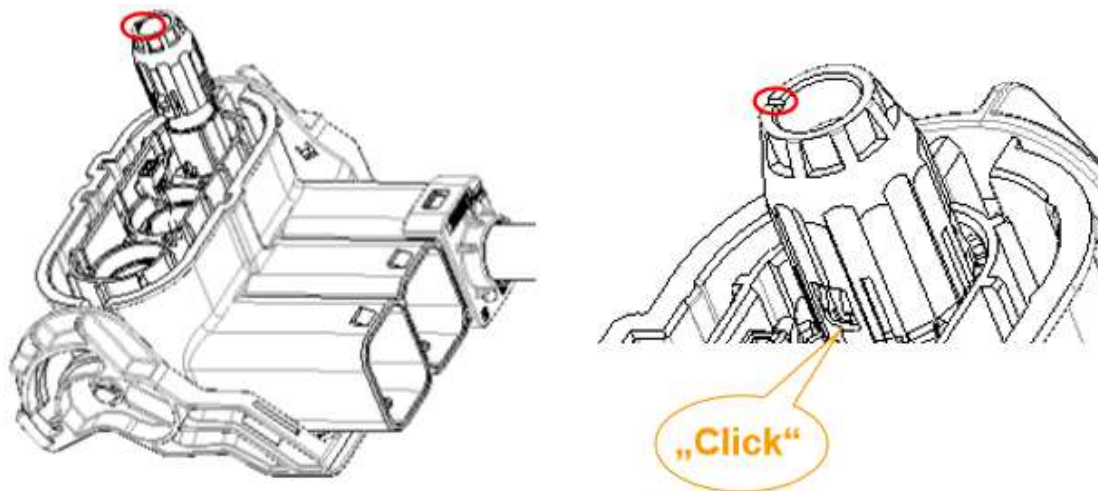


Figure 17: Mounting finger protection cap



Care should be taken to apply correct assembling of the finger protection cap.

The following items at minimum must be inspected and verified:

- All components are present
- Finger protection cap fully locked in place and correct orientation (check groove figure 18)
- Protection cover fully locked in place

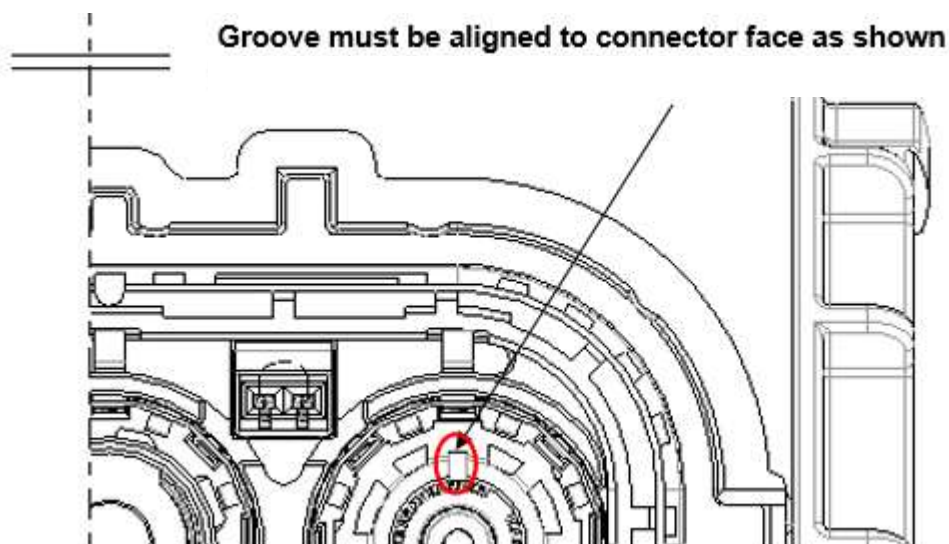


Figure 18: Visual Examination of assembled receptacle housing

## 5. ASSEMBLY INSTRUCTIONS (HEADER)

The following procedures show the details of the HVIL-System assembly and mounting instructions of the Pinheader on aggregate

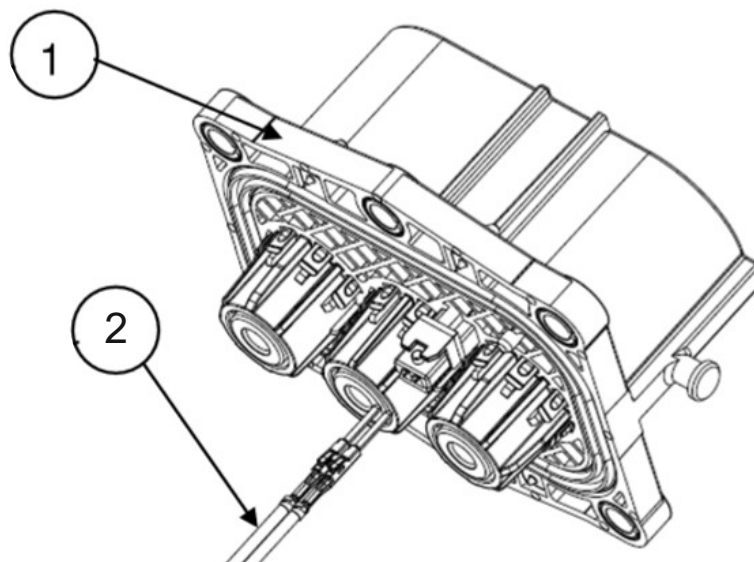


Figure 19: Exploded view Pinheader with HVIL-System

Table 9: Components cable assembly, 3pos.

(ID)	TE-PN	Description
1	2325013	3 Pos. Dia 8mm Pin header, Assy
2	1418760	MCON-1.2 Contact System

Table 10: Components cable assembly, 2pos.

(ID)	TE-PN	Description
1	2322122/2355198	2 Pos. Dia 8mm Pin header, Assy
2	1418760	MCON-1.2 Contact System

## 5.3 HVIL-System assembly

Strip the cable to length, insert the pin contacts over the exposed HVIL conductor strands and crimp refer to application specification 114-18464. Requirements from spec. 114-18464 at a minimum must be inspected and verified

### 5.3.1 Insert HVIL-contacts

Insert HVIL-contacts in correct orientation as shown in figure 3 into the housing until they are fully locked. Verify that the contact is completely inserted as shown in picture 4 by gently pulling back on the conductor

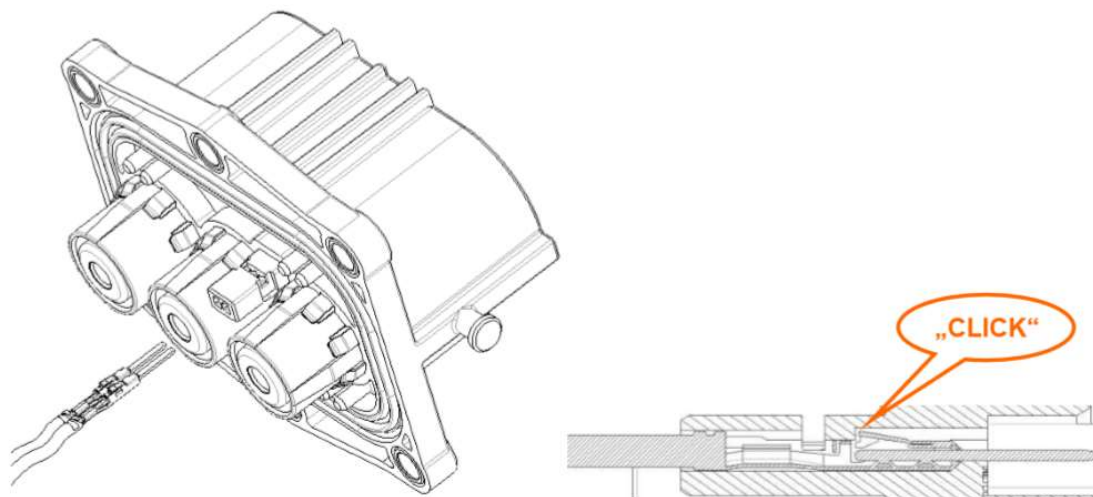


Figure 20: Insert contact in correct orientation

## 5.4 Mounting to Aggregate

Design of aggregate cut out see TE-Interface drawing 114-94032

Mounting header in correct orientation and with the right coding to aggregate shown in following picture. Requirements for fastening screw and recommended torque see customer drawings 2141227 and 2141230.

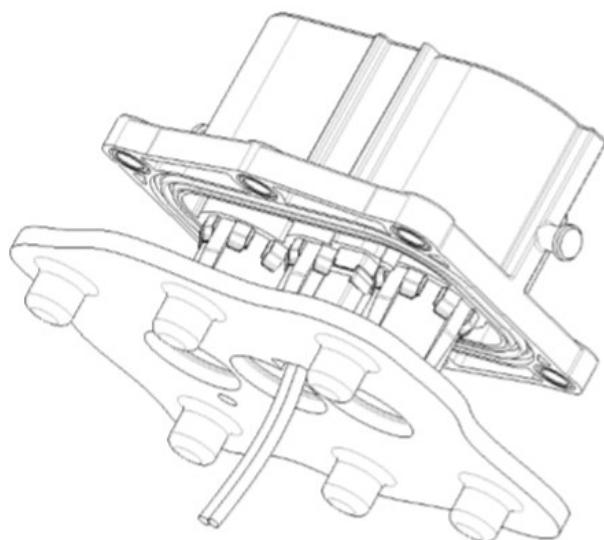


Figure 21: Mounting header to aggregate

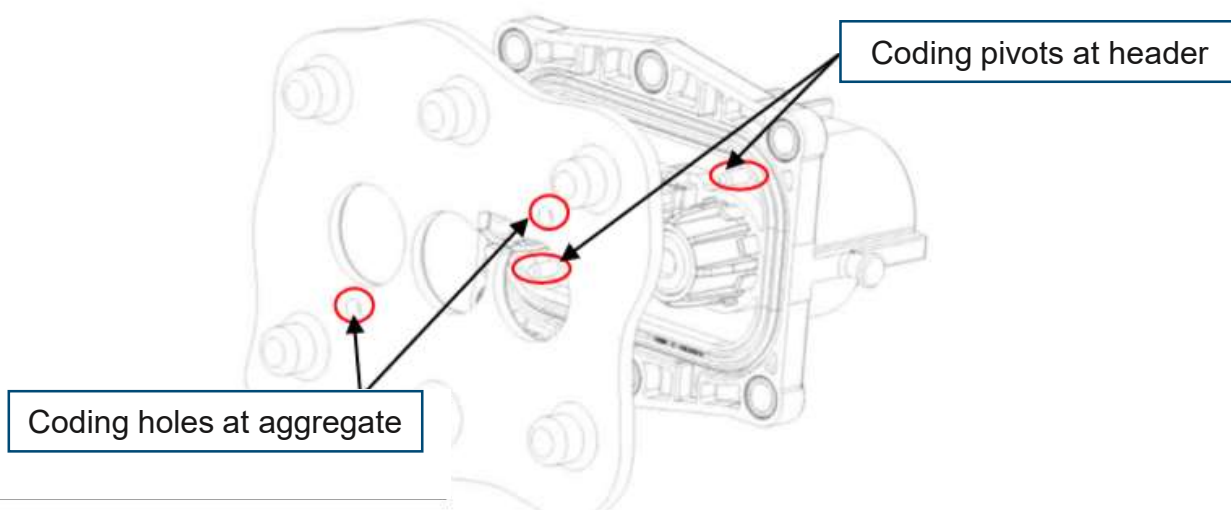


Figure 22: Mounting header to aggregate with the right coding

### 5.4.1 Power connection

For all design variants the requirements for power connection are according to customer drawings 2141227 and 2141230. Please note, design must fulfil the requirements for creepage and clearance distance acc. to DIN EN 60664-1. The lateral force which occurs during the assembling of ring tongue/busbar must not lead to the deviation of contacts position on the interface side to the plug.

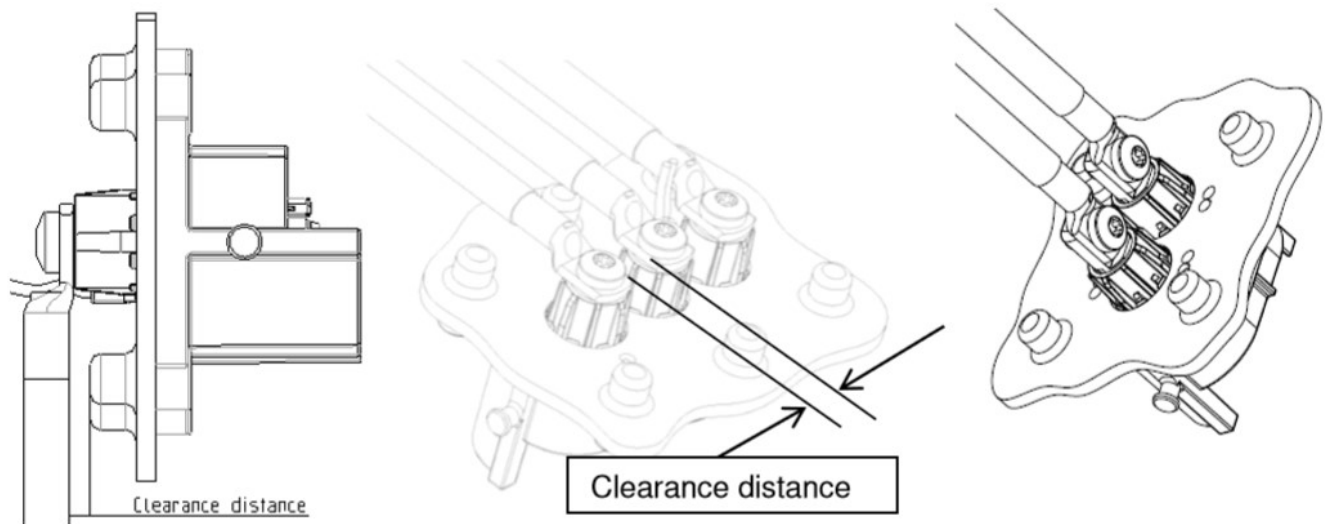


Figure 23: Power connection

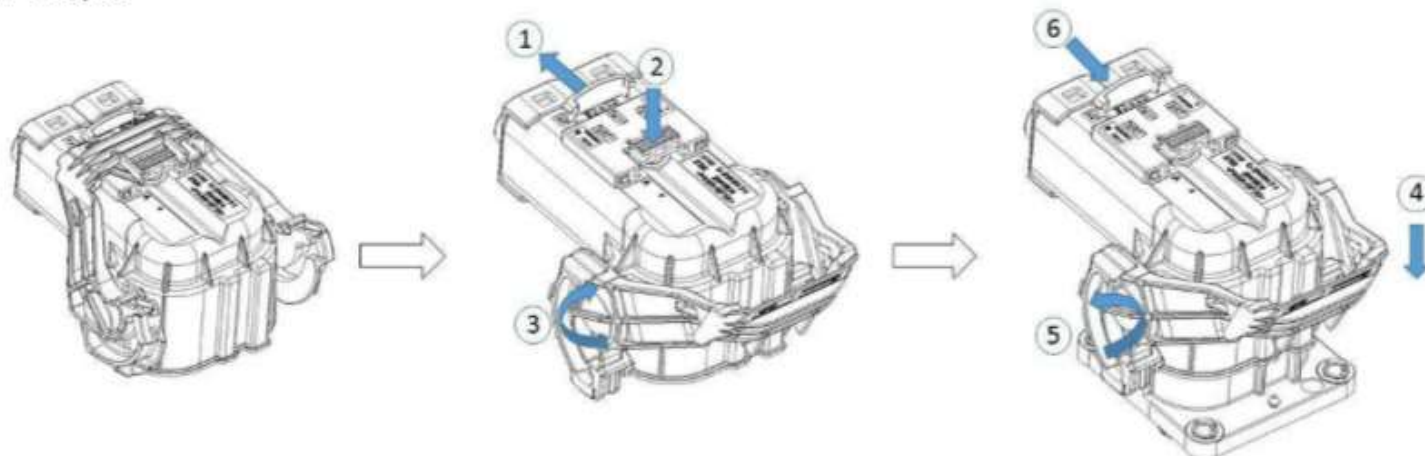


## 5.5 Plug/Header assembly

The following procedures show the details of matting and unmatting instructions of the plug to the pins header. Shown in an exemplary way with 2pos. connector system.

### 5.5.1 Matting to the pins header

HVP800, 90°



HVP800, 180°

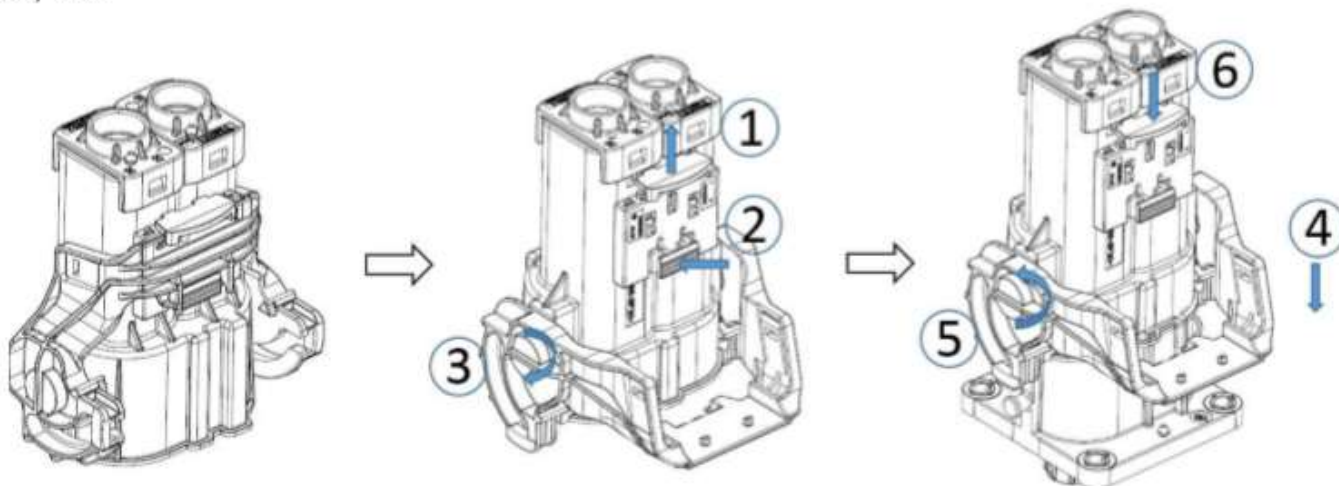


Figure 24: Matting to the pins header

Step 1: Release the CPA

Step 2: Release the lever by pressing down the CPA-adapter

Step 3: Open the lever

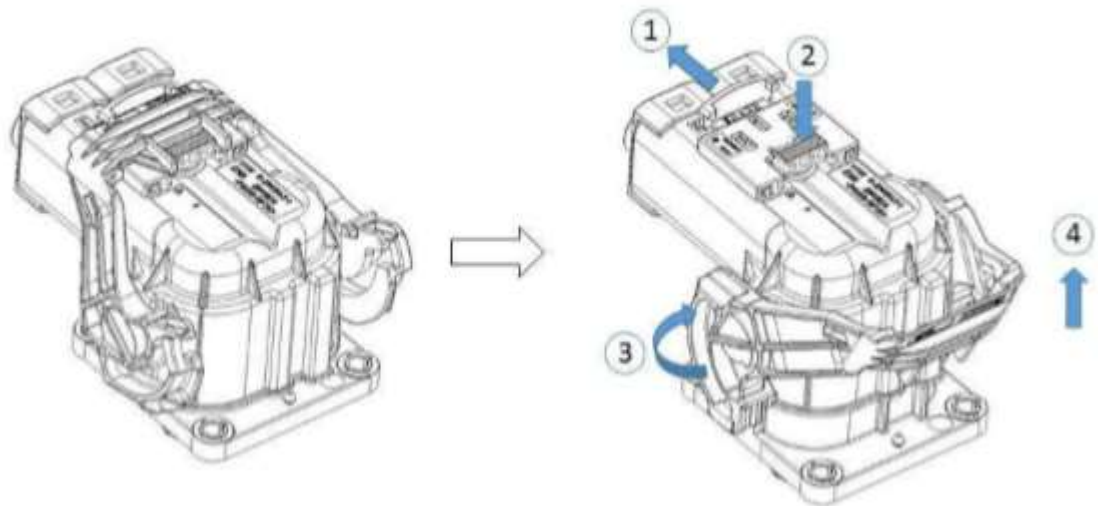
Step 4: Positioning the plug to the header take care for the correct orientation

Step 5: Close the lever

Step 6: Close the CPA

### 5.5.2 Matting to the pins header

HVP800, 90°



HVP800, 180°

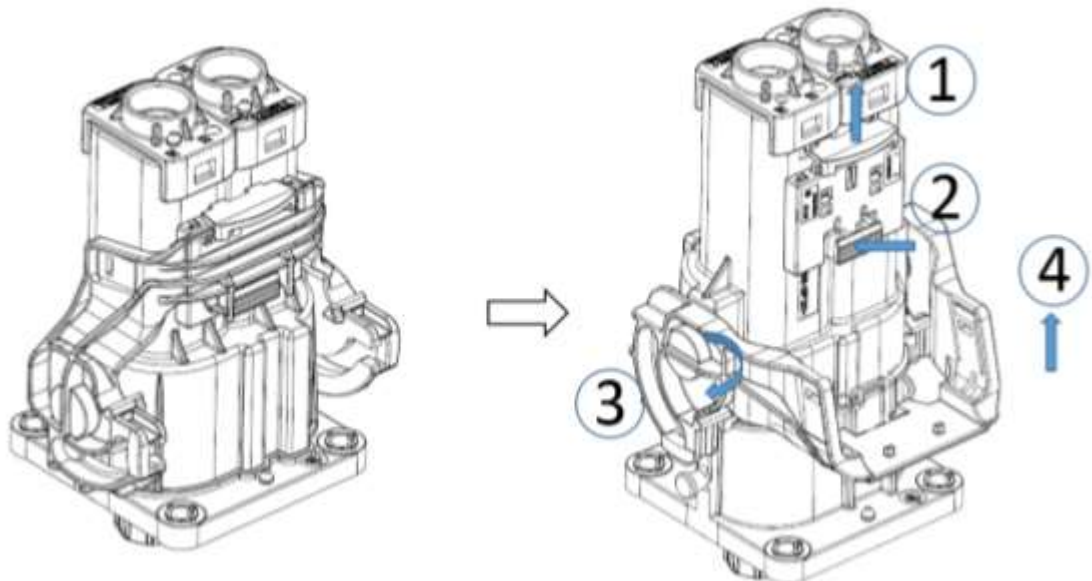


Figure 25: Unmating from the pins header

Step 1: Release the CPA

Step 2: Release the lever by pressing down the CPA-adapter

Step 3: Open the lever

Step 4: Unmating of the plug from the header

## 6. FINAL EXAMINATION

### 6.1 Visual Examination

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

### 6.2 Electrical Tests

Electrical characteristic values according product specification TE-108-32233 / chapter 3.3 are ensured by applicator. The test parameter should be not exceeding the values shown in point 3.3 / TE-108-32233.

## 7. LOCKING MECHANISMS WITH LEVER AND CPA

---

Delivery condition with lever and CPA in closed position. Release of the CPA by shifting CPA along the arrow-direction

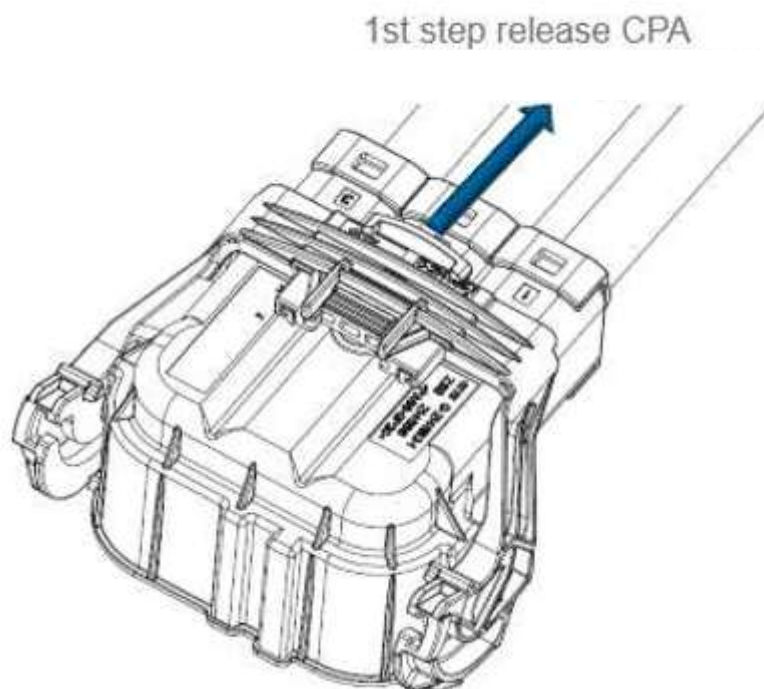


Figure 26: Delivery condition – CPA & lever closed

Release the lever by pressing down of the latch of CPA-Adapter.

2nd step release lever

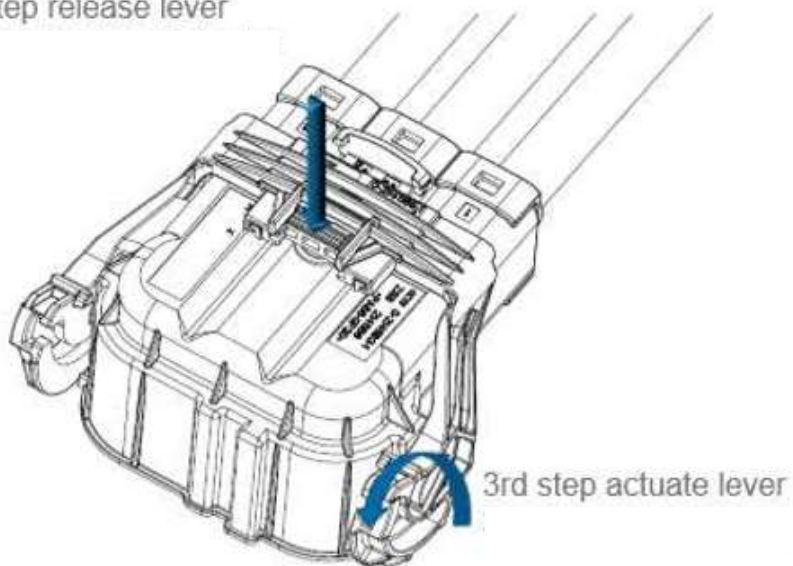


Figure 27: Release and actuate lever

Rotate lever into plug position until audible click.

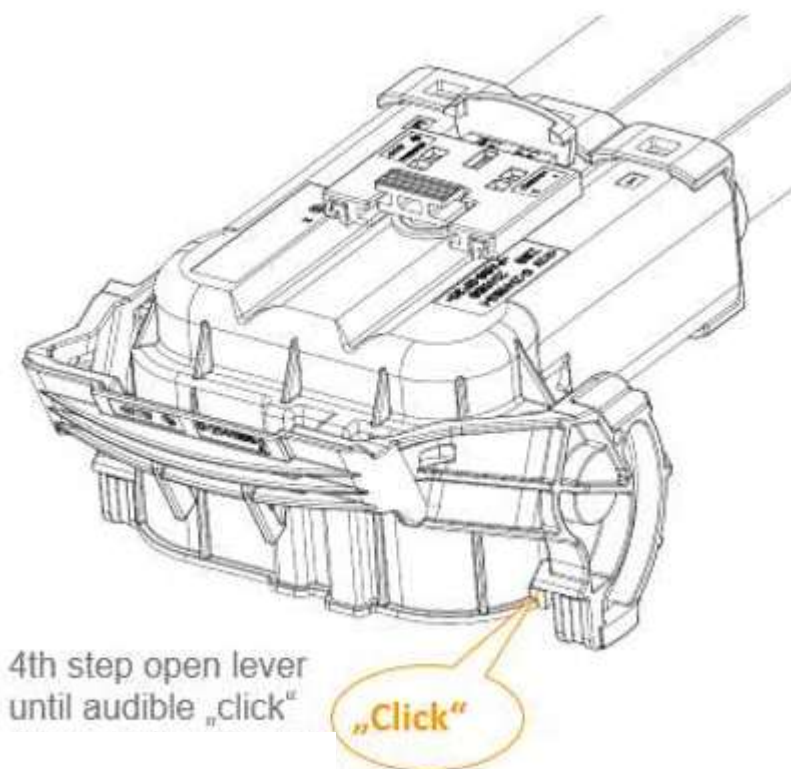


Figure 28: Plug position of lever

8. APPENDIX

8.1 Data sheets

8.1.1 Coroplast – No. 9-2611 for wire range 25- 50mm<sup>2</sup>

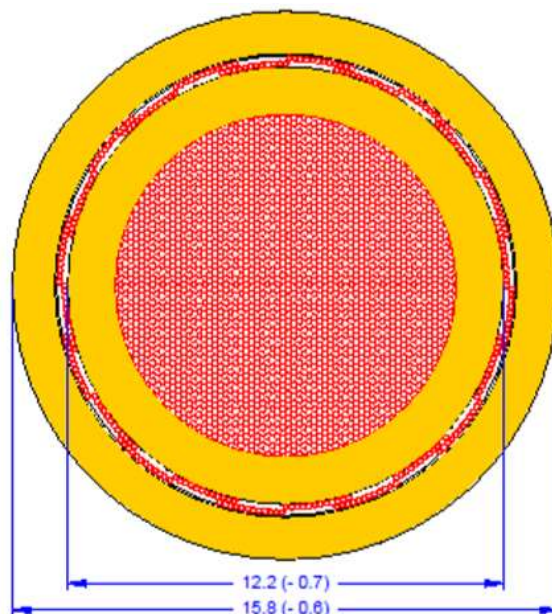
Technical Information

Coroplast Part No.: 9-2611 / 50mm<sup>2</sup>

Page: 1

Shielded cable for automotive electric powertrain

FLR2GCB2G 50mm<sup>2</sup> / 0.21



Version	Creator	Date of issue	Description
A1	Freyth	2010-10-08	First edition
A2	Wichmann	2010-10-18	Added VW N 107 756
A3	Wichmann	2010-11-16	Added resistance of shielding and weight of cable
A4	Wichmann	2010-11-26	Marking was...MAX 600 V AC...

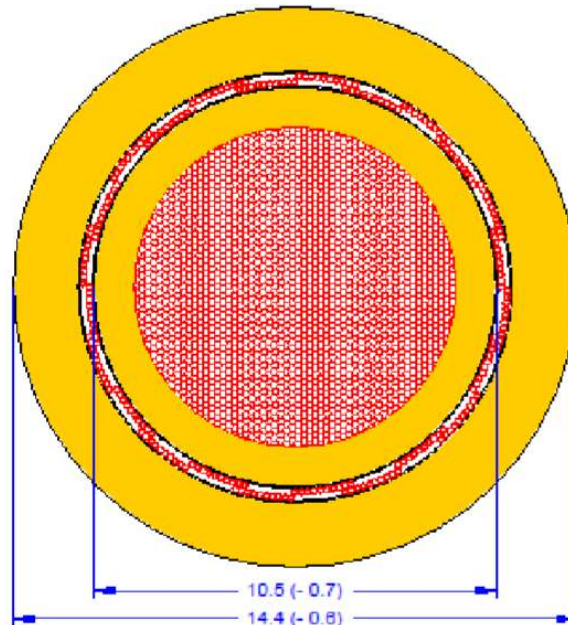
It is not permitted to pass this technical information to any third partners. An unauthorized transfer is prohibited and prosecutable according to Section 18UWG and Section 07 UrhG and could cause according to Section 10 UWG and Section 07 UrhG a claim for compensation. The product descriptions in our publications are correct to the best of our knowledge. They reflect the present state of the technology and our capabilities. The details are a general description of the characteristics of our products, which do not necessarily apply to every purpose or under all conditions. The descriptions do not release the user from the responsibility of testing of the products for suitability for the specific purpose. In cases of doubt, please contact our Service Department.

Technical Information

Coroplast Part No.: 9-2611 / 35mm<sup>2</sup>  
Page: 1

Shielded cable for automotive electric powertrain

FLR2GCB2G 35mm<sup>2</sup> / 0.21



Version	Creator	Date of issue	Description
A1	Freyth	2010-10-08	First edition
A2	Wichmann	2010-10-18	Added VW N 107 777
A3	Wichmann	2010-11-17	Added resistance of shielding and weight of cable
A4	Wichmann	2010-11-26	Marking was...MAX 600 V AC...

It is not permitted to pass this technical information to any third partners. An unauthorized transfer is prohibited and prosecutable according to Section 18UWG and Section 07 UrhG and could cause according to Section 10 UWG and Section 07 UrhG a claim for compensation. The product descriptions in our publications are correct to the best of our knowledge. They reflect the present state of the technology and our capabilities. The details are a general description of the characteristics of our products, which do not necessarily apply to every purpose or under all conditions. The descriptions do not release the user from the responsibility of testing of the products for suitability for the specific purpose. In cases of doubt, please contact our Service Department.

Coroplast Fritz Müller GmbH & Co. KG  
Klebebänder – Kabel – Leitungssatzsysteme  
Wittener Straße 27 I  
D-42279 Wuppertal



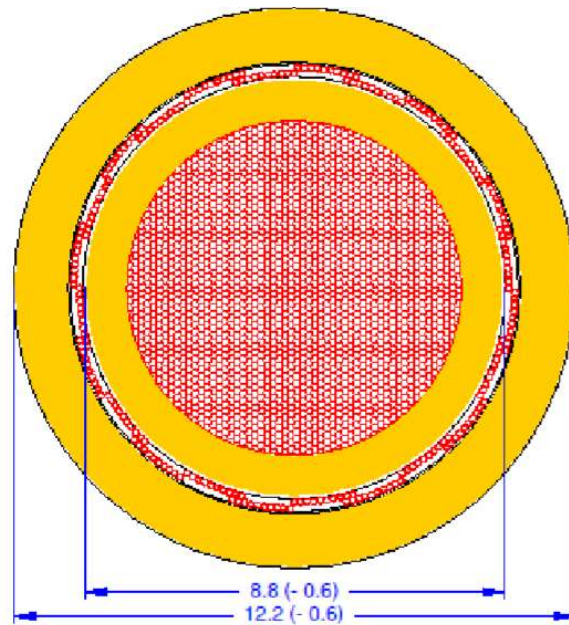
Kabel und Leitungen  
Wires & Cables  
fon +49 (0) 202 / 2681 - 228  
kabelundleitungen@coroplast.de

Technical Information

Coroplast Part No.: 9-2611 / 25mm<sup>2</sup>  
Page: 1

Shielded cable for automotive electric powertrain

FLR2GCB2G  
25mm<sup>2</sup> / 0.21 T180 0.6/0.9 kV



Version	Creator	Date of issue	Description
A1	Freyth	2010-10-06	First edition
A2	Wichmann	2010-10-18	Added VW N 107 776
A3	Wichmann	2010-11-17	Added resistance of shielding and weight of cable
A4	Wichmann	2010-11-26	Marking was...MAX 600 V AC...
A5	Leven	2011-06-07	Datasheet updated
A6	Wichmann	2011-09-15	Added characteristic capacitance, inductance, impedance conductor diameter was max. 7.2mm
A7	Leven	2011-11-07	Derating curves added
A8	Gehle	2012-09-19	Modified footer
A9	Wichmann	2012-12-04	Cable-nomenclature, marking and nominal voltage modified

It is not permitted to pass this technical information to any third partners. An unauthorized transfer is prohibited and prosecutable according to Section 18UWG and Section 07 UrhG and could cause according to Section 10 UWG and Section 07 UrhG a claim for compensation. The product descriptions in our publications are correct to the best of our knowledge. They reflect the present state of the technology and our capabilities. The details are a general description of the characteristics of our products, which do not necessarily apply to every purpose or under all conditions. The descriptions do not release the user from the responsibility of testing of the products for suitability for the specific purpose. In cases of doubt, please contact our Service Department.

8.1.2 KBE acc. LV216 for wire range 35-50mm<sup>2</sup>

## Technical Data Sheet

**FHLR2GCB2G 35mm<sup>2</sup>**
**P/N:**

### 1.0 Leiter

#### 1.0 Conductor

1.1 Leiterwerkstoff	Litze Cu-Blank
1.1 Material	Bare copper wire
1.2 Aufbau	1070(±5%)×0.21mm max.
1.2 Construction	1070(±5%)×0.21mm max.
1.3 Leiterwiderstand(DC, 20°C)	0.527mΩ/m max.
1.3 Resistance@20°C	0.527mΩ/m max.
1.4 Leiterdurchmesser	8.5mm max.
1.4 Conductor diameter	8.5mm max.

### 2.0 Isolierung

#### 2.0 Insulation

2.1 Isolationswerkstoff	SiliconkautschukSiR
2.1 Material	Silicon rubber SiR
2.2 Isolationswanddicke	0.64mm min.
2.2 Thickness	0.64mm min.
2.3 Aderdurchmesser	10.5-0.7mm
2.3 Outside diameter	10.5-0.7mm
2.4 Farbe	Orange
2.4 Color	Orange

### 3.0 Abschirmung

#### 3.0 Shielding

3.1 Werkstoff	Cu.-verzinkt
3.1 Material	Tinned copper
3.2 Einzelgröße	0.21mm max.
3.2 Single size	0.21mm max.
3.3 Optische Bedeckung	85% min.
3.3 Coverage	85% min.
3.4 Flechtwinkel	(57±3)°
3.4 Braiding angle	(57±3)°
3.5 Leiterwiderstand(DC, 20°C)	4.4mΩ/m max.
3.5 Resistance@20°C	4.4mΩ/m max.



## 4.0 Schirmfolie

### 4.0 Foiled Shielding

4.1 Werkstoff	ALU-kaschierte PET-Folie
4.1 Material	Al/PET foil
4.2 Überlappung	20% min.
4.2 Overlap rate	20% min.

## 5.0 Außenmantel

### 5.0 Jacket

5.1 Mantelwerkstoff	SiliconkautschukSiR
5.1 Material	Silicon rubber SiR
5.2 Isolationswanddicke	0.80mm min.
5.2 Thickness	0.80mm min.
5.3 Außendurchmesser	14.4-0.6mm
5.3 Outside diameter	14.4-0.6mm
5.4 Farbe	Orange
5.4 Color	Orange

## 6.0 Herstellerkennung

### 6.0 Marking

NBKBE FHLR2GCB2G 35mm<sup>2</sup> 4 ATTENTION HIGH VOLTAGE MAX  
600V AC/ 1000V DC 4

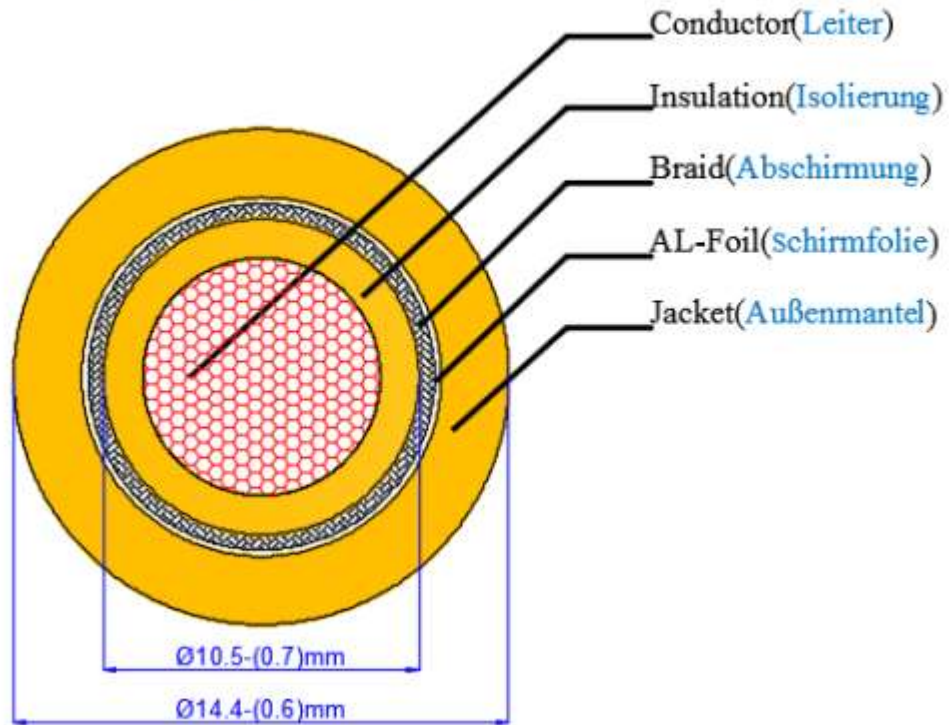
## 7.0 Prüfung

### 7.0 Examination

7.1 Temperaturbereich	-40~180°C(3000h)
7.1 Operating Temperature	-40~180°C(3000h)
7.2 Standard	LV216-2 Klasse E.
7.2 Standard	LV216-2 Class E
7.3 Kurzzeitalterung	205°C(240h)
7.3 Short term ageing	205°C(240h)
7.4 Prüfspannung	eff 8.0 kV (Funkenprüfung) eff 5.0 kV (5 min)
7.4 Test voltage	eff. 8.0KV (spark test) eff.5.0 KV(5min)
7.5 Nennspannung (AC / DC)	600/1000 V max.
7.5 Nominal voltage(AC/DC)	600/1000 V max.
7.6 Biegeradius	3 × Außen-ΦMin. (statische Verlegung) 6 × Außen-ΦMin. (dynamische Verlegung)
7.6 Bend radius	3×cable-Φmin. ( fixed installation) 6×cable-Φmin.( unfixed installation)

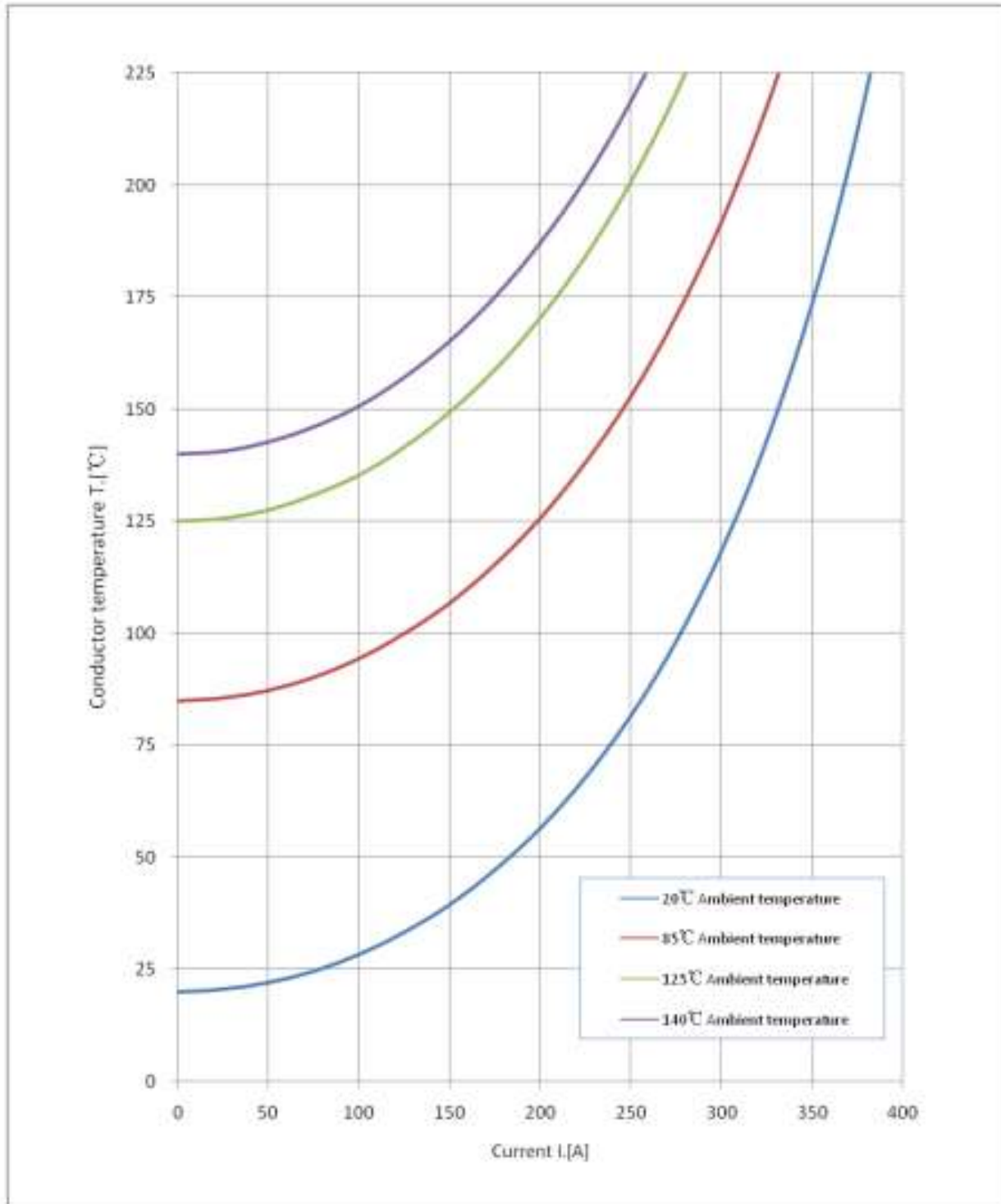
## 8.0 Querschnittszeichnung

### 8.0 Cross Section Drawing



## 9.0 Temperaturanstiegskurve

### 9.0 Temperature rise curve



## Technical Data Sheet

**FHLR2GCB2G 50mm<sup>2</sup>**
**P/N:**
**50mm<sup>2</sup>**

### 1.0 Conductor

1.1 Material	Bare copper wire
1.2 Construction	1600(±5%)×0.21mm max. 19/87/0.196(±0.008)mm*
1.3 Resistance	0.368mΩ/m max.
1.4 Conductor diameter	10.5mm max.

### 2.0 Bunch\*

2.1 Construction	87/0.196(±0.008)mm
2.2 Direction	S (left)

### 3.0 Cabling\*

3.1 Cabling(inner)	
3.1.1 Construction	7/87/0.196(±0.008)mm
3.1.2 Direction	Z (right)
3.2 Cabling(outer)	
3.2.1 Construction	12/87/0.196(±0.008)mm
3.2.2 Direction	Z (right)

### 4.0 Insulation

4.1 Material	SiR Rubber
4.2 Thickness	0.71mm min.
4.3 Outside diameter	12.2-0.7mm
4.4 Color	Orange

### 5.0 Braid

5.1 Material	Tinned copper
5.2 Single size	0.21mm max
5.3 Construction	24/8/0.20(±0.008)mm*
5.4 Coverage	85% min

### 6.0 Shield

6.1 Material	Al-PET foil
6.2 Overlap rate	20% min.

### 7.0 Jacket

7.1 Material	SiR Rubber
7.2 Thickness	0.80mm min.

 Prepared: Wang Jingcheng  
 Date: 2018-04-30

 Revision: 18/01  
 Customer Approval:

7.3 Outside diameter	15. 8-0.6mm
7.4 Color	Orange

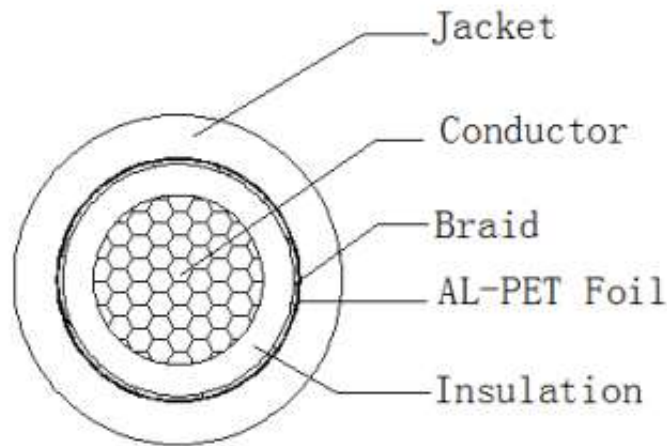
**8.0 Manufacturer's identification**

NBKBE FHLR2GCB2G 50mm<sup>2</sup> ⚡ ATTENTION HIGH VOLTAGE MAX  
 600V AC/ 900V DC ISO 6722 ⚡

**9.0 Examination**

9.1 Operating Temperature	-40~180℃(3000h)
9.2 Standard	LV216-2 Class E
9.3 Short term ageing	205℃ (240h)
9.4 Test voltage	eff. 8.0KV (spark test) eff.5.0 KV(5min)
9.5 Voltage	600V AC/900 V DC
9.6 Bend radius	4×cable-Φ min.( fixed installation) 8×cable-Φ min.( unfixed installation)
9.7 Weight of cable	approx.630g/m

**10.0 Cross Section Drawing**

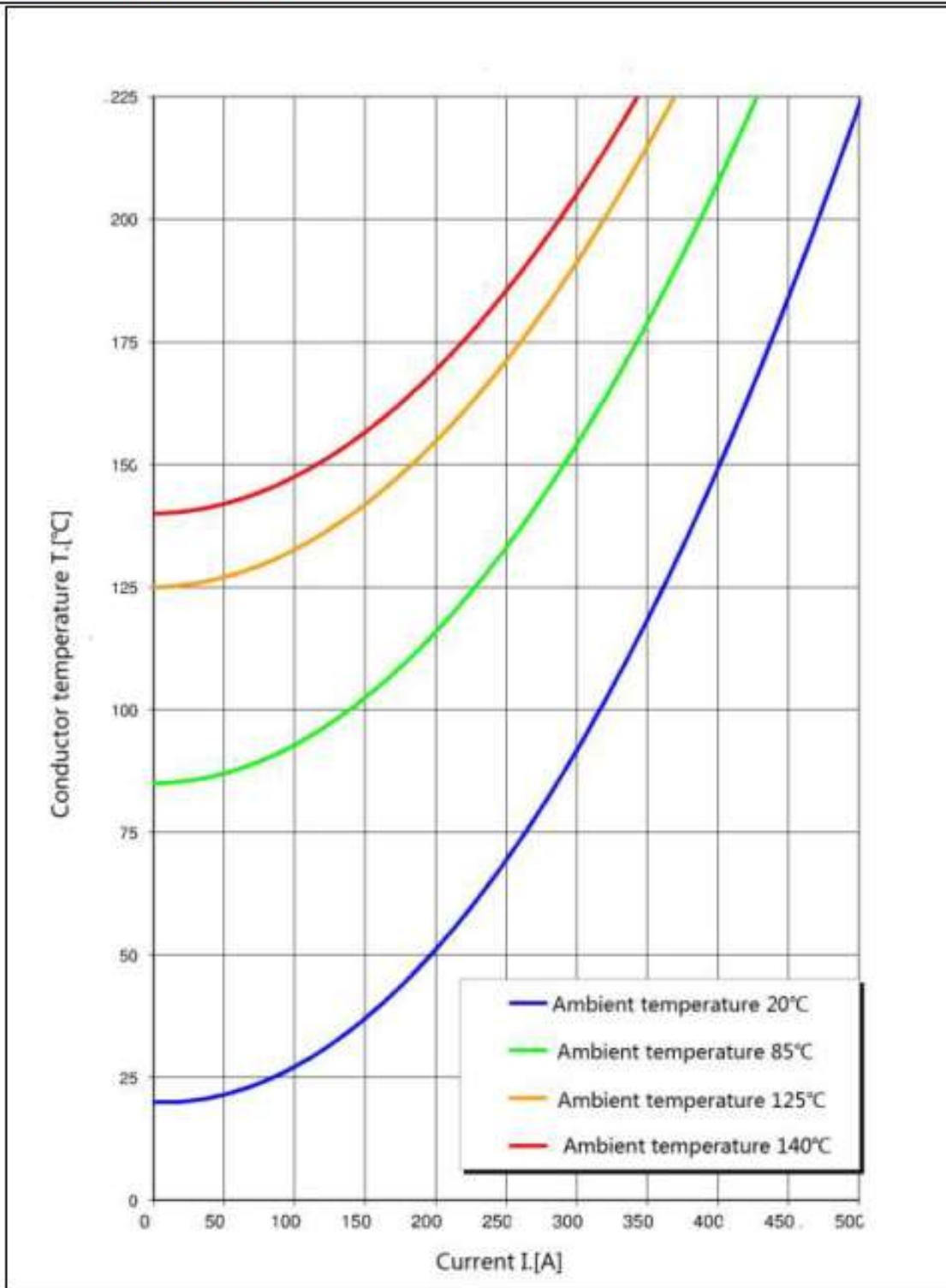


Notes: \* Production control requirements, not standard requirements

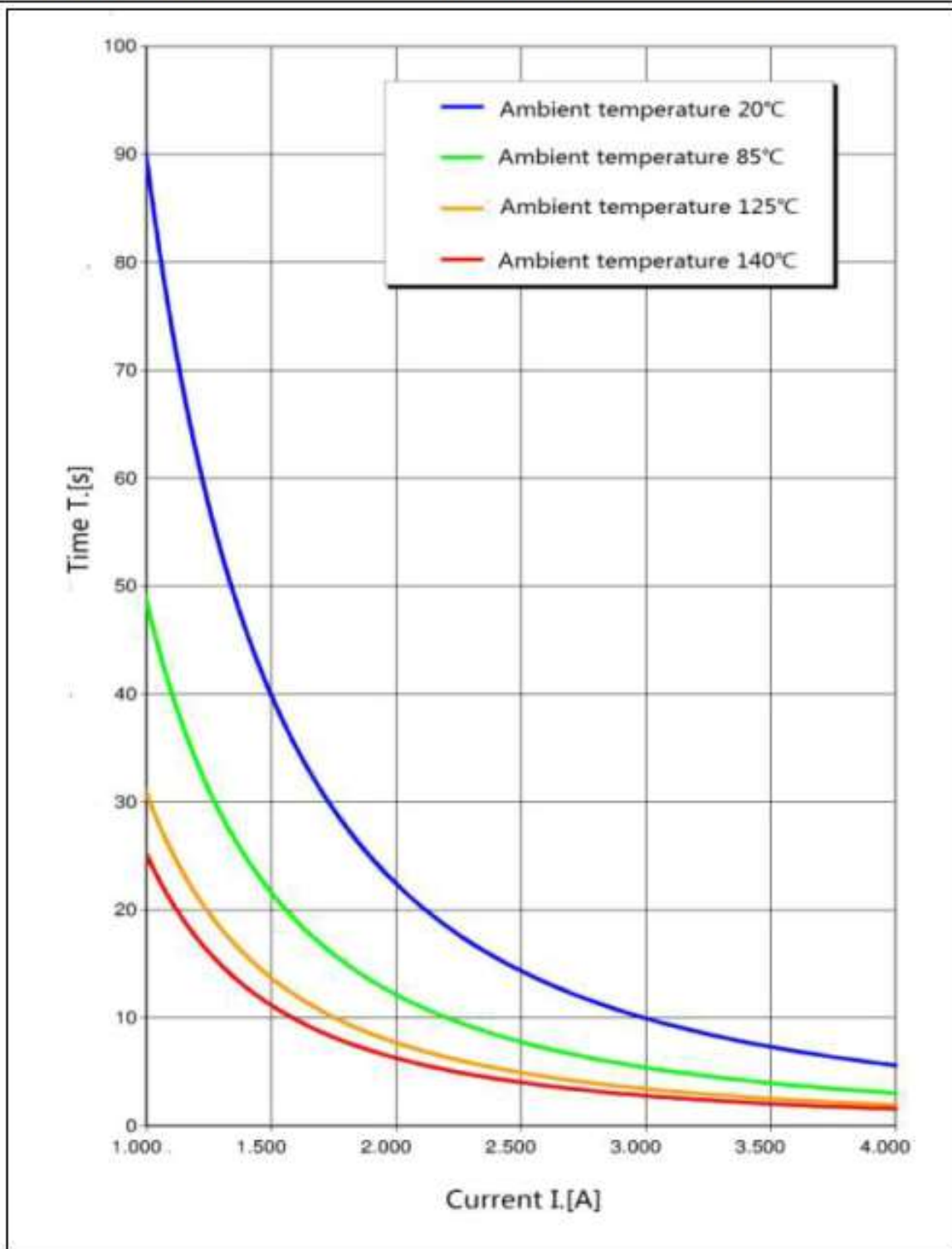
Prepared: Wang Jingcheng  
 Date: 2018-04-30

Revision: 18/01  
 Customer Approval:

### 11.0 Temperature rise curve



**12.0 Current-time curve of conductor temperature reaches +230°C**



Prepared: Wang Jingcheng  
Date: 2018-04-30

Revision: 18/01  
Customer Approval:

8.1.3 Force acc. LV216 for wire range 35-50mm<sup>2</sup>

# Technical Data Sheet



Product Specification of High Voltage Shielded Cable

FG-GY/JS-02-092 A/3

## 1. Scope

High Voltage Shielded cable, SIR thin wall insulation, automotive cable ,used for EV and HEV road vehicle energy system. Performance and requirement according to document LV216-2、 VW75210-2、 ISO19642-9 standard.

Nominal voltage range: AC 600 V/ DC 1000V

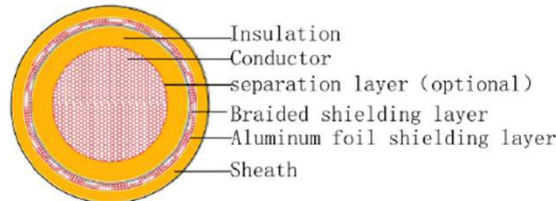
Temperature classes see Table 1

**Table 1 Temperature Class Rating**

Type	Standard	Class	Temperature (3 000 h ) T <sub>U</sub> to T <sub>0</sub>
FHLR2GCB2G	LV216-2/VW75210-2/ISO 19642-9	E	- 40 °C to 180 °C

## 2. Product Structure

Sketch map See Figure 1



**Figure 1 Product Structure**

### 2.1 Conductor

Conductor shall be consisted of soft annealed copper according to GB/T 3953 and ASTM B3 or EN 13602, Conductor size see table 2.

### 2.2 Insulation and Jacket Materials

Material: Use silicone rubber material that meets the requirements of ROHS environmental protection directive.

The size of cable see table 2.



# Technical Data Sheet



## Product Specification of High Voltage Shielded Cable

FG-GY/JS-02-092 A3

Color of insulation and sheath: Orange(similar to RAL 2003) or upon request.

### 2.3 Cable Insulation and Sheath Structure Size

2.3.1 See Table 2 for cable structure.

2.3.2 The ovality of cable sheath shall not be greater than 8%.

### 2.4 Shield

The shielding is made of tinned copper wire braid and aluminum-plastic composite tape, and the overlap is not less than 20%.

### 2.5 Bending Radius

Static laying:  $\geq 3 \times D$ .

Dynamic laying:  $\geq 6 \times D$ .

### 2.6 Identification Marks

The following contents shall be printed on the cable surface:

FORCE FHRLR2GCB2G SIZE SQMM ⚡ ATTENTION HIGH VOLTAGE MAX 600V AC/ 1000V DC ⚡

## 3. Performance Requirement

### 3.1 Electrical Characteristic

#### 3.1.1 Conductor Resistance

No single value shall be greater than the maximum value in table 2.

#### 3.1.2 Withstand Voltage

AC. 5Kv and hold 5min.

#### 3.1.3 Insulation Fault

AC 8kV

#### 3.1.4 Insulation Volume Resistivity

Not less than  $10^{11} \Omega \cdot \text{mm}$

### 3.2 Mechanical Properties in As-received Condition

The cable must be designed such that it can be processed flawlessly. The insulation must have no bubbles, cracks, lumps, or inclusions.

#### 3.2.1 Ease of Stripping the Cable Jacket

Requirements according to sample.

# Technical Data Sheet



## Product Specification of High Voltage Shielded Cable

FG-GY/JS-02-092 A/3

### 3.2.2 Abrasion Resistance of the Cable Jacket

Number of cycles according to sample; at least 1 500 cycles.

Table 2 structure size of cable

size mm <sup>2</sup>	Conductor				Single core				Shielded			Cable structure				Weight
	No.	Strand Diameter (mm)	Conductor diameter (mm)	conductor resistance at 20 °C (mΩ/m)	Thickness (mm)		Single core diameter (mm)		Coverage rates (%)	conductor resistance at 20 °C (mΩ/m)	Strand Diameter (mm)	Wall thickness (mm)		Outside cable diameter (mm)		Kg/km
		Max	Max	Max	Nom	Min	Min	Max	Min	Max	Max.	Nom	Min	Min	Max	
35	1128	0.21	8.3	0.527	0.80	0.64	9.80	10.40	85	4.4	0.21	--	0.80	13.80	14.40	518
50	1615	0.21	10.2	0.368	0.89	0.71	11.50	12.20	85	3.8	0.21	--	0.80	15.20	15.80	683

### 3.2.3 Resistance to Flame Propagation

Any combustion flame of insulating material shall extinguish within 30 s from the end of ignition and a minimum of 50 mm of insulation at the top of the test specimen shall remain unburned.

### 3.2.4 Heat Resistance

#### 3.2.4.1 Long-term Aging

# Technical Data Sheet



## Product Specification of High Voltage Shielded Cable

FG-GY/JS-02-092 A/3

The cable shall be aged for 3 000 h at the upper value of the temperature class rating--180°C. After winding, no conductor shall be visible.

During withstand voltage after environmental testing, breakdown shall not occur.

### 3.2.4.2 Short-term Aging.

The cable shall be aged for 240 h at the upper value of the 205°C. After winding, no conductor shall be visible. During withstand voltage after environmental testing, breakdown shall not occur.

### 3.3 Other Characteristic

See LV 216-2 or VW 75210-2 and ISO 19642-9 for requirements of silicone rubber insulated high-voltage cable.

### 4 Packing

See table 3. it is general requirement, it may be determined by both parties.

**Table 3 Packing Form and Requirements**

Size (mm <sup>2</sup> )	Delivered quantify in m (φ630 roller)	Delivered quantify in m (φ800 roller)	The minimum segment in m	permissible quantities per roller max
35	250	500	10	3
50	/	400	10	3

Prepared by : Yan Zhe

Reviewed by : Zhang Chuanshuai

Approved by : Zhou Li

Date : 04/30/2024

4 / 5

### Revision Record

Version	Date	Description	Revisor	Approver
A/1	03/20/2024	Add 40mm <sup>2</sup>	Yan Zhe	Zhou Li
A/2	04/18/2024	Add φ630 roller packing, update the sketch map	Yan Zhe	Zhou Li
A/3	04/30/2024	Add size2.5, 4, 6sqmm	Yan Zhe	Zhou Li