



HVP-HD1000 Plug Connector Application Specification

HVP-HD1000 母端高压连接器 应用规范



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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 other wise compromised, please discontinue it use immediately.**
- ◆ **This connector should only be serviced by a trained and qualified technician.**

1. SCOPE 适用范围

1.1 Content 内容

This specification covers the requirements for application of the HVP-HD1000 High Voltage connector. The HVP-HD1000 connector system is designed to meet LV215 specifications (vibration refers to ISO16750-3 while salt spray refers to VDA233-102), there are 35mm²、50mm²、70 mm² three kinds of metric wire size (acc. to ISO 6722-1 class D, ISO 19642-9 class D). The connector incorporates conductive EMI shielding to reduce radiated emissions in the application.

The HVP-HD1000 header can be divided into two parts: 90Deg and 180Deg. Both of them have 1POS、2POS、3POS, equipped with twelve different keying or polarizing configurations. The connector system incorporates the 10mm round contacts, integrated High Voltage Interlock (HVIL) System and High Voltage Finger Protection(IPXXB). The outer plastic housing is molded in orange to denote a high voltage system.

该规范涵盖了HVP-HD1000高压连接器的应用要求。HVP-HD1000连接器系统的设计符合LV215规范(振动符合ISO16750-3, 盐雾符合VDA233-102), 有35mm²、50mm²以及70 mm²三种公制线径(符合ISO 6722-1 class D, ISO 19642-9 class D 标准)。该连接器采用导电EMI屏蔽, 以减少应用中的辐射。

HVP-HD1400连接器有90° 以及180° 两大类, 可分为1POS、2POS、3POS 三种, 拥有12种不同的键位。连接器系统包含10毫米圆形电源连接系统和高压互锁(HVIL)系统和高压手指防护(IPXXB)要求。外壳采用橙色模制, 表示高压系统。

1.2 Processing notes 加工说明

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 unspecified, unreleased tools or unreleased connector components.

加工者负责确保制造过程的质量和系统的正常功能。如果由于未遵守本规范或使用未定义的、未发布的工装或未发布的连接器组件而导致质量异常或损坏, 则不承担保修和责任。

2. APPLICABLE DOCUMENTS 适用文件

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 take preference.

以下提到的文件是本说明书的一部分。如果文档中包含的信息与本规范或提供的任何其他技术文档之间存在冲突, 则以最新有效的客户图纸优先。



2.1 TE Connectivity Documents 泰科电子文件

This Application Specification based on the latest valid customer drawings.

本应用规范基于最新的有效客户图纸。

2.1.1 Customer drawings 客户图纸

Table 1: Customer drawings / 客户图纸

Header side (Include interface) / 公端(包括应用面板)	
2394060	HVP-HD1000 1POS HEADER ASSY,180DEG
2394061	HVP-HD1000 2POS HEADER ASSY,180DEG
2394062	HVP-HD1000 3POS HEADER ASSY,180DEG
2394070	HVP-HD1000 1POS HEADER ASSY,90DEG
2394071	HVP-HD1000 2POS HEADER ASSY,90DEG
2394072	HVP-HD1000 3POS HEADER ASSY,90DEG
2407806	HVP-HD1000 HEADER SHIPPING CAP
Plug side / 母端	
2394085	HVP-HD1000 PLUG SUB-ASSY
2383445	CONTACT ASSY
2395861	SPACER
2383853	SHIELD SLEEVE
2383855	CRIMP ANVIL
2394111	SINGLE WIRE SEAL (SWS)
2394112	CABLE CLIP
2394113	CABLE COVER
2407805	HVP-HD1000 PLUG SUB-ASSY SHIPPING CAP

Application tools / 应用工装	
2348822	HV-20 HIGH VOLTAGE TERMINATION
2380202-1	HVP-HD1000 CONTACT CRIMPING - 35mm ²
2383669-1	HVP-HD1000 CONTACT CRIMPING - 50mm ²
2383670-1	HVP-HD1000 CONTACT CRIMPING - 70mm ²
2383671-1	HVP-HD1000 FERRULE CRIMPING - 35mm ²
2383672-1	HVP-HD1000 FERRULE CRIMPING - 50mm ²
2383673-1	HVP-HD1000 FERRULE CRIMPING - 70mm ²

2.1.2 Specifications 规范

Table 2: TE-specifications / 泰科规范

Specifications	Description
108-160337	Product specification 10MM contact system
108-160341	Product specification HVP-HD1000 connector
114-160182	Application specification HVP-HD1000 Plug
114-160181	Application specification HVP-HD1000 Header

2.1.3 Cable specification 线缆规格

The connector is designed and qualified with LV 215, there are 35mm²、50mm²、70 mm² three kinds of metric wire size (acc. to ISO 6722-1 class D, ISO 19642-9 class D). Cable Specification acc. to the appendix.

连接器设计符合LV 215标准规范,有 35mm²、50mm²、70mm² 三种公制线径电缆(符合ISO 6722-1 class D, ISO 19642-9 class D), 线缆规格见附录。

3. CONDITION OF DELIVERY AND PACKAGING 交货和包装状态

3.1 Components 零部件

Table 3: the required components for assembly of HVP-HD 1000 Plug / HVP-HD1000母组装所需零件

Description 描述	Picture 图片	PN for 35mm² 35mm²线 零件号	PN for 50mm² 50mm²线 零件号	PN for 70mm² 70mm²线 零件号
HVP-HD1000 PLUG SUB-ASSY (Finger Access)		2394085- 1-2394085- (Definite PN see customer drawing)		
HVP-HD1000 PLUG SUB-ASSY (Tool Access)		2-2394085- 3-2394085- (Definite PN see customer drawing)		
Contact Assy		2383445-1	2383445-2	2383445-3
Spacer		2395861-1	2395861-2	2395861-3
Shield Sleeve		2383853-6	2383853-4	2383853-2
Crimp Anvil		2383855-1	2383855-2	2383855-3


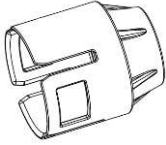

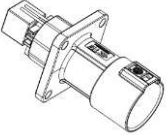
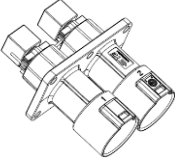
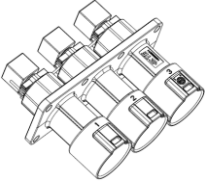

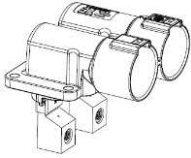
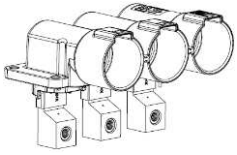

Single Wire Seal (SWS)		2394111-1	2394111-2	2394111-3
Cable Clip		2394112-1	2394112-2	2394112-3
Cable Cover		2394113-1	2394113-2	2394113-3
HVP-HD1000 PLUG SUB-ASSY SHIPPING CAP		2407805-1		

Table 4: HVP-HD1000 header ASSY / HVP-HD1000公端

Description 描述	Picture 图片	Base Number 基础料号
HVP-HD1000 1POS HEADER ASSY,180DEG		2394060
HVP-HD1000 2POS HEADER ASSY,180DEG		2394061
HVP-HD1000 3POS HEADER ASSY,180DEG		2394062

HVP-HD1000 1POS HEADER ASSY,90DEG		2394070
HVP-HD1000 2POS HEADER ASSY,90DEG		2394071
HVP-HD1000 3POS HEADER ASSY,90DEG		2394072
HVP-HD1000 HEADER SHIPPING CAP		2407806

3.2 Packaging and Storage 包装和贮存

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

为避免存储污染，产品应以“先进先出”的原则使用，请参见最新的有效客户图纸。

4. APPLICATION TOOLS 应用工装

The Application tools are only valid for the specified cables at appendix. More tooling information can be obtained through a local TE representative, or calling the product information Center after purchase.

应用工装仅对附录中的指定电缆有效。可通过当地TE代表获取更多工装信息，或者在购买后，拨打产品信息中心电话。

4.1 10MM round contact / 10MM 圆形端子

Table 5 : Required application tools contact crimp / 端子压接所需设备

Application tools / 应用工装	
2348822	HV-20 HIGH VOLTAGE TERMINATION
2380202-1	DIE SET HVP-HD1000 F 35MM2
2383669-1	DIE SET HVP-HD1000 F 50MM2
2383670-1	DIE SET HVP-HD1000 F 70MM2



Figure 1: 10MM contact crimping applicator

4.2 Shield sleeve 屏蔽

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

下表包含所需应用工装的订货号。

Table 6: Application tools / 应用工装

Application tools / 应用工装	
2383671-1	DIE SET HVP-HD1000 F 35MM2
2383672-1	DIE SET HVP-HD1000 F 50MM2
2383673-1	DIE SET HVP-HD1000 F 70MM2

5. ASSEMBLY INSTRUCTIONS 组装说明

The following procedures show the details of the cable assembly and insertion instructions of the cable assembly into the plug housing sub-assembly. 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.

下述步骤显示了线缆组件的细节和线缆组件插入母端壳体子组件的插入说明。该制程仅对附录中的指定线缆有效，并且仅这样的组合通过TE验证。在通过验证测试性能之后，可以使用替代电缆。

5.1 Overview of all parts should be assembled 全部部件总览图

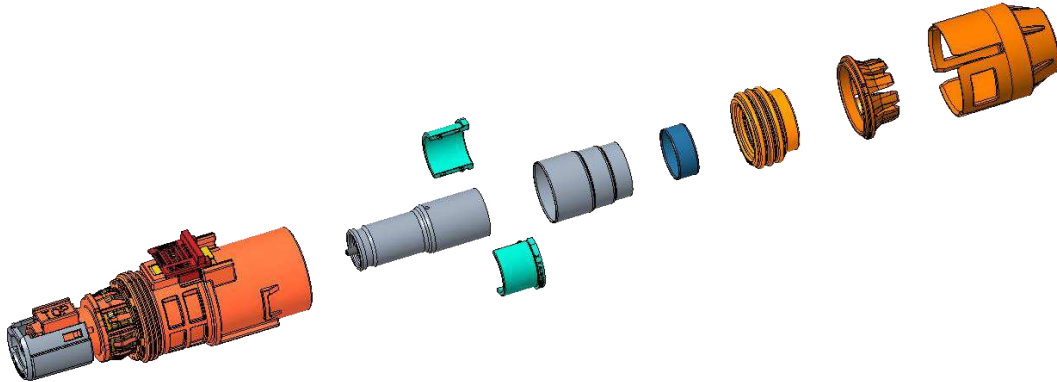


Figure 2: HVP-HD1000 Plug overview (Finger access)

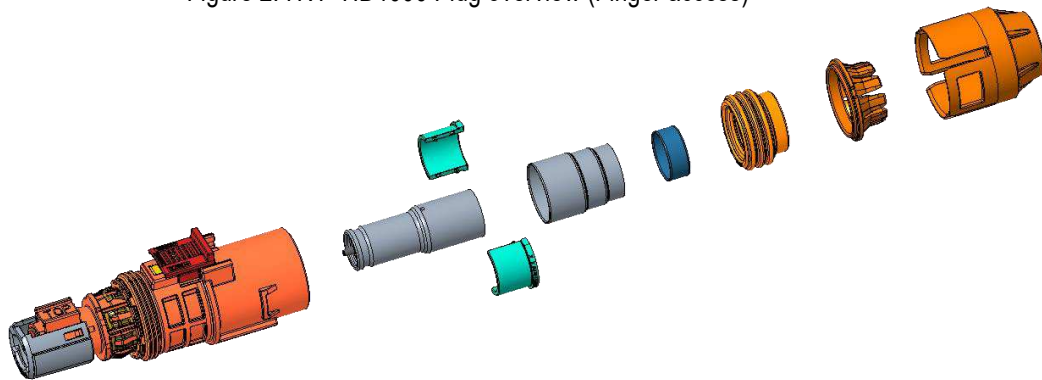


Figure 3: HVP-HD1000 Plug overview (Tool access)

For more details please check the draft NO. 2394115.

请查询2394115号图纸获得更多信息。

5.2 Cable components assembly 线缆组件组装

Safety alerts, continus or repeated contact with conductor and shielding is not allowed, protective gloves should be worn if necessary.

安全提醒，请勿长时间或重复与导体或屏蔽接触，必要时请穿戴防护手套。

5.2.1 Pre-load shield sleeve, SWS, cable clip, cable cover 预组装屏蔽，线缆密封圈，导线卡夹，导线尾盖

In order shown in figure 4, slide cable cover, cable clip, SWS and Shield sleeve onto cable sheath, so that they are not in crimp work area.

按照图4所示的顺序，滑动导线尾盖、导线卡夹、线缆密封圈和屏蔽到电缆护套上，使它们不在压接区域。

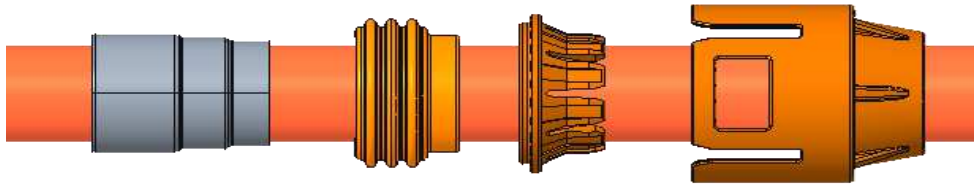


Figure 4 : Before processing slide components onto cable

5.2.2 Cable strip 线缆裁切

Strip and remove outer sheath, screening braid (if present screening foil), inner sheath and conductor from the end.

从末端切开并去除外护套，屏蔽编织物（如果存在屏蔽箔），内护套和导体。

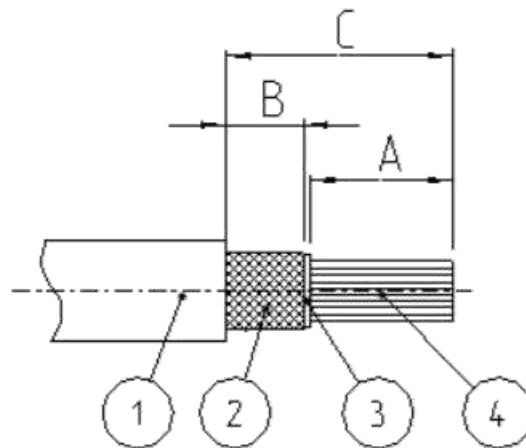


Figure 5: Cutting cable to length

Stripping dimensions for exposing cable.
线缆压接部分的剥线尺寸。



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

注意：切割过程中不得切割或破坏电缆护套和屏蔽编织层。

Table 7: Cutting dimensions / 剥线尺寸

(ID)	Cable Design	A[mm]			B[mm]	C[mm]		
		35mm ²	50mm ²	70mm ²		35mm ²	50mm ²	70mm ²
1	Outer sheath	--			--	45±1	47±1	49±1
2	Screening braid	--			(10)	--		
4	Conductor	17±1	19±1	21±1	--	--		



Attention: Shielding braid shall not be broken.

注意：屏蔽编织不得被破坏

Install the crimp anvil after stripping.

剥线完成后安装压接砧座。

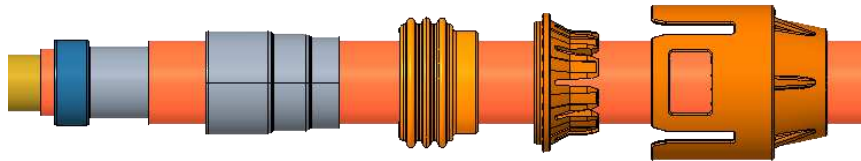


Figure 6 Install crimp anvil

5.2.3 Contact crimp and size measurement 端子压接和尺寸测量

Prepare the cable and contacts. Only wire and contacts that meet the requirements of the application specification can be used. Contact crimp height shown in Fig6. and must be checked acc. to Table 8. As measuring equipment for measuring the crimp height, a digital caliper with a measuring accuracy of 0.01mm is the minimum requirement. Measurement of crimp height has to be done as follows and always in the middle of the crimp area across whole crimp, see figure 8.

准备好导线和端子。只能使用符合应用规范要求的导线和端子。端子压接高度如图7所示。并且必须按照表8进行对照。作为测量压接高度的测量设备，测量精度为0.01毫米的数字卡尺是最低要求。压接高度的测量必须如下进行，并且总是在整个压接的压接区域的中间，参见图8。

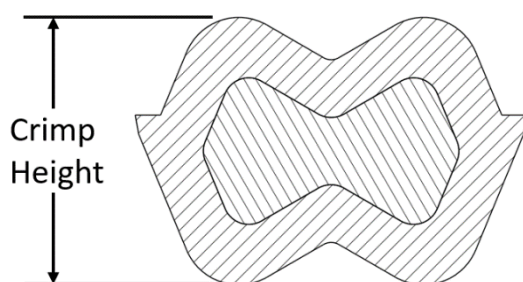


Figure 7: Crimping Section



Figure 8: Measuring Position

Table 8: Crimp Height / 压接高度

TE Contact P/N	Wire Size (mm ²)	Crimp Height	Applicator
2383445-1	35	8.3 ± 0.1	2380202-1
2383445-2	50	9.2 ± 0.1	2383669-1
2383445-3	70	10.4 ± 0.1	2383670-1



Figure 9: Contact crimp

5.2.4 Install spacer 组装垫片

Raising screening braid equally over perimeter.

沿四周等长的翻起屏蔽编织。

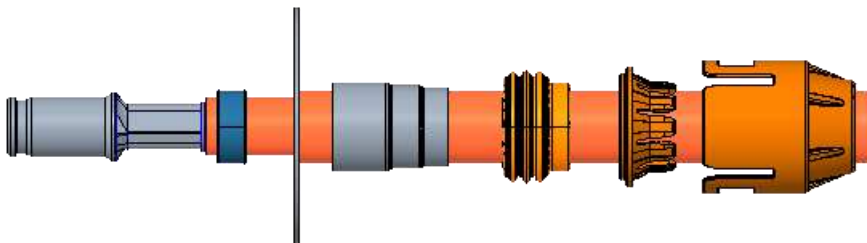


Figure 10: Install crimp anvil

Push the crimp anvil to the screening braid until they attach tightly.

将压接砧座推向屏蔽编织直到他们紧贴在一起。

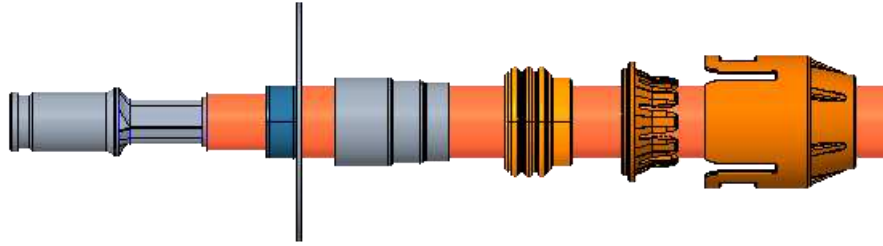


Figure 11: Push the crimp anvil to the final position

Mating two spacers at the position shown in figure 12, then turn over screening braid by lateral movement until cover the crimp anvil. Clipping the screening braid so that it won't cover the spacer.

在图12所示位置装配两个垫片，再横向翻折屏蔽编织直到覆盖压接砧座。修剪编织使其不覆盖垫片。

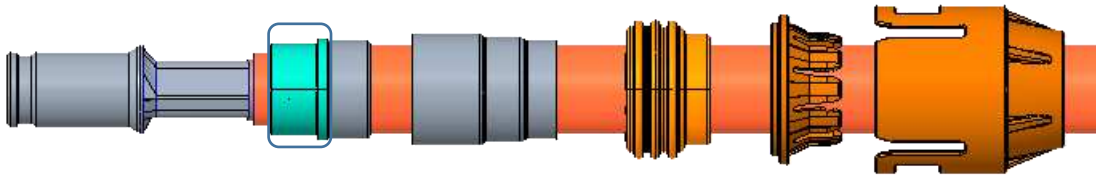


Figure 12: Install spacers

5.2.5 Shield sleeve crimp 屏蔽压接

Moving the shield sleeve ahead until it stops against screening braid.
向前移动屏蔽环直到它抵住屏蔽编织。

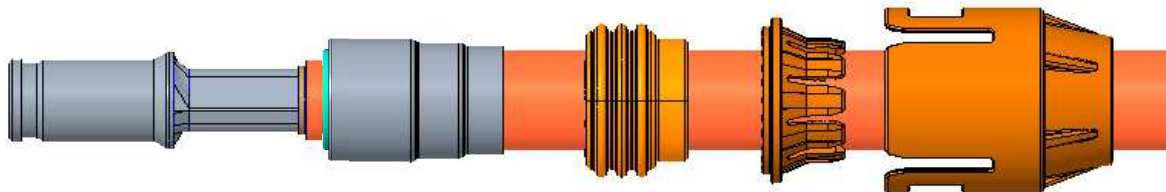


Figure 13: Move the shield sleeve



It is essential that there is no mistake in this step because there will be no chance to re-work the parts.
在这一步中没有错误是至关重要的，因为无法重新加工。

The following items at minimum must be inspected and verified before shield sleeve crimp process.

- 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 14, figure 15, figure 16 and table 9
- Allocation of screening braid should be equal over perimeter

在屏蔽压接前，必须至少检查并验证以下项目：

- 所有部件完整，部件以正确的方向和位置进行压接
- 屏蔽部件没有明显的开裂，也没有松散的电缆屏蔽线
- 每个压接尺寸依据图14,图15,图16和表9的六角形
- 屏蔽编织应该均匀分配在四周

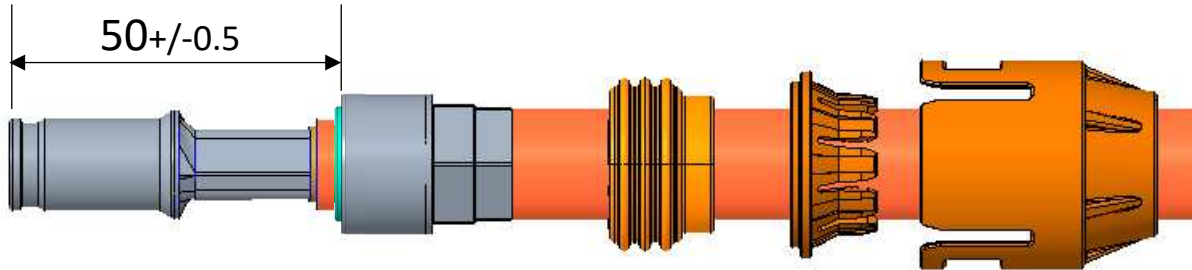


Figure 14: Shield crimp

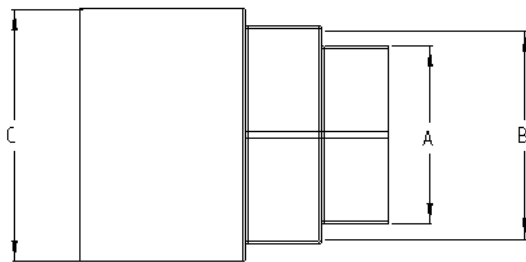


Figure 15: Crimp height

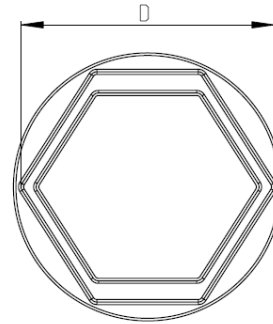


Figure 16: Crimp width

Shield sleeve crimp specification

屏蔽环压接说明

Table 9: Shield crimped dimensions (may be affected by the wire such as material, physical size. Below table value is recommended that based on HUBER+SUHNER wire.) / 屏蔽压接尺寸（可能受到线缆材料，物理尺寸等影响。下方表格尺寸是基于灏讯线缆的推荐值）

Cable Type	Cross Section (mm ²)	A ± 0.15 (mm)	B ± 0.15 (mm)	C (mm)	D (mm)
HUBER+SUHNER	35	12.55	13.9	≤21.1	≤22.6
HUBER+SUHNER	50	14.6	16.4	≤21.1	≤22.6
HUBER+SUHNER	70	16.75	17.4	≤21.1	≤22.6

5.3 Plug housing assy 母端壳体组装

5.3.1 Insert cable assembly into the Plug Housing 线缆组件装入母端壳体

Note the alignment of plug housing subassembly and cable assembly as shown figure 17.

注意，如图17所示，线缆组件与母端壳体组件方向对齐。

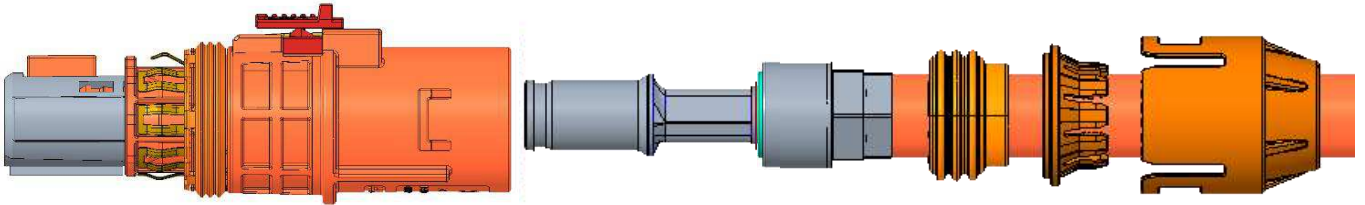


Figure 17: Oriented cable assembly to housing

Insert aligned the cable assembly into the plug subassembly, slide the cable clip with SWS and cable clip onto plug housing until it is fully locked and makes 'click'.

Press TPA to the full locked position.

The following items at minimum must be inspected and verified:

- Visual examination of correct orientation of single wire seal before sliding the cable clip.
- Visual examination of correct assembling cable cover into housing after assembly, make sure two bulges were locked.

将线缆组件插入母端壳体组件，滑动线缆卡夹将线缆密封圈和导线卡夹一起推到母端壳体处直到完全扣住并发出“咔嗒”声。

将TPA推到终锁位置。

必须至少检查并验证以下项目：

滑动线缆卡夹前目视检查线缆密封圈是否外翻，确认密封圈没有外翻后再推动线缆卡夹。

组装完成后目视检查线缆尾盖是否正确组装到主体外壳上，尾夹上的两个凸台必须都扣住主体。

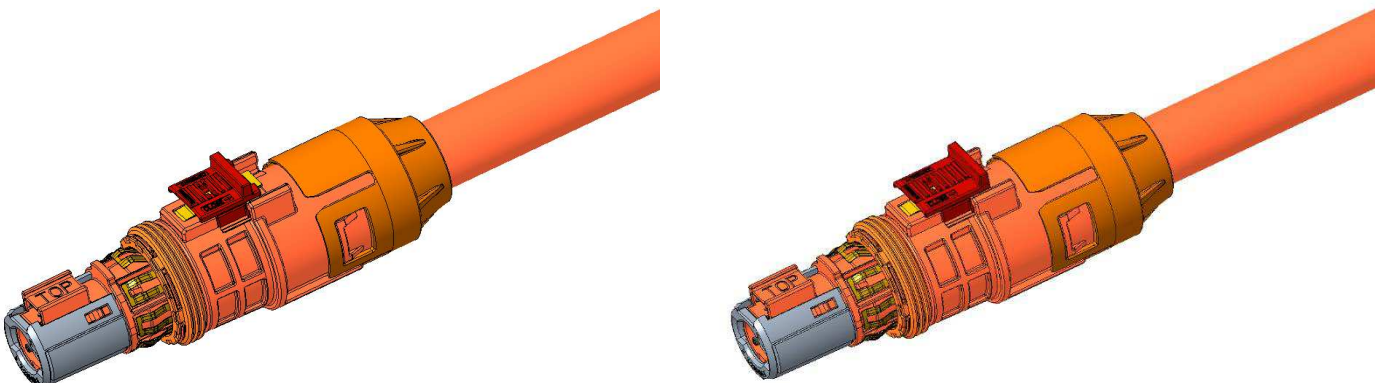


Figure 18: Complete installation (Finger Access and Tool Access)

6. FINAL EXAMINATION 终检

6.1 Visual examination 外观检查

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

在装配连接器后，必须根据客户图纸进行完整性、正确性检查，且不能损坏。

6.2 Electrical tests 电气测试

Electrical characteristic values according product specification TE-108-160341 / chapter 3.4 are ensured by applicator. The test parameter should be not exceeding the values shown in point 3.4/ TE-108-160341.

使用方依据产品规范TE-108-160341第3.4章保证电气特性。测试参数不应超出规范3.4章的值。

7. HEADER ASSY AND PLUG ASSY MATING/ UNMATING INSTRUCTIONS 公母端安装说明

7.1 Header assy and plug assy mating 公母端连接器互配

Delivery condition with CPA are in pre-lock position.

Visual examination of CPA position before mating with header.

CPA的交付条件是处于预锁位置。

公母端连接器互配前目视确认CPA的位置。

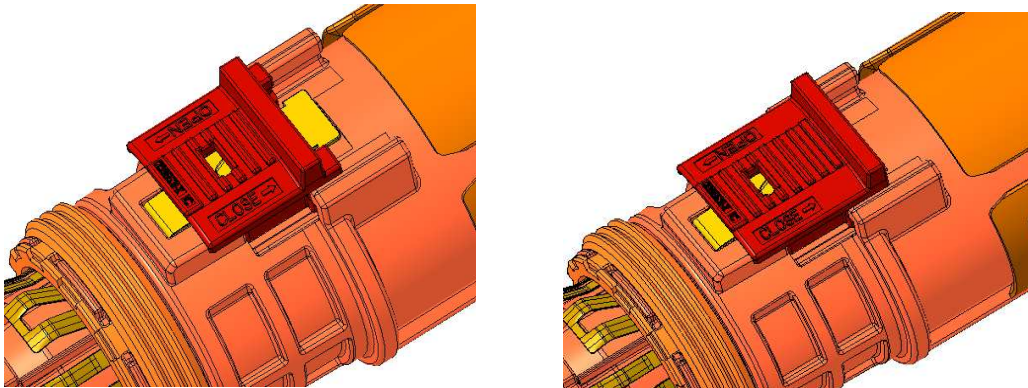


Figure 19: Delivery condition – CPA in pre-lock position (Tool access and Finger access)

Mating plug with header until the spring come up with sounds like ‘click’.

将公母头连接器对配直到弹片弹起并发出“咔哒”

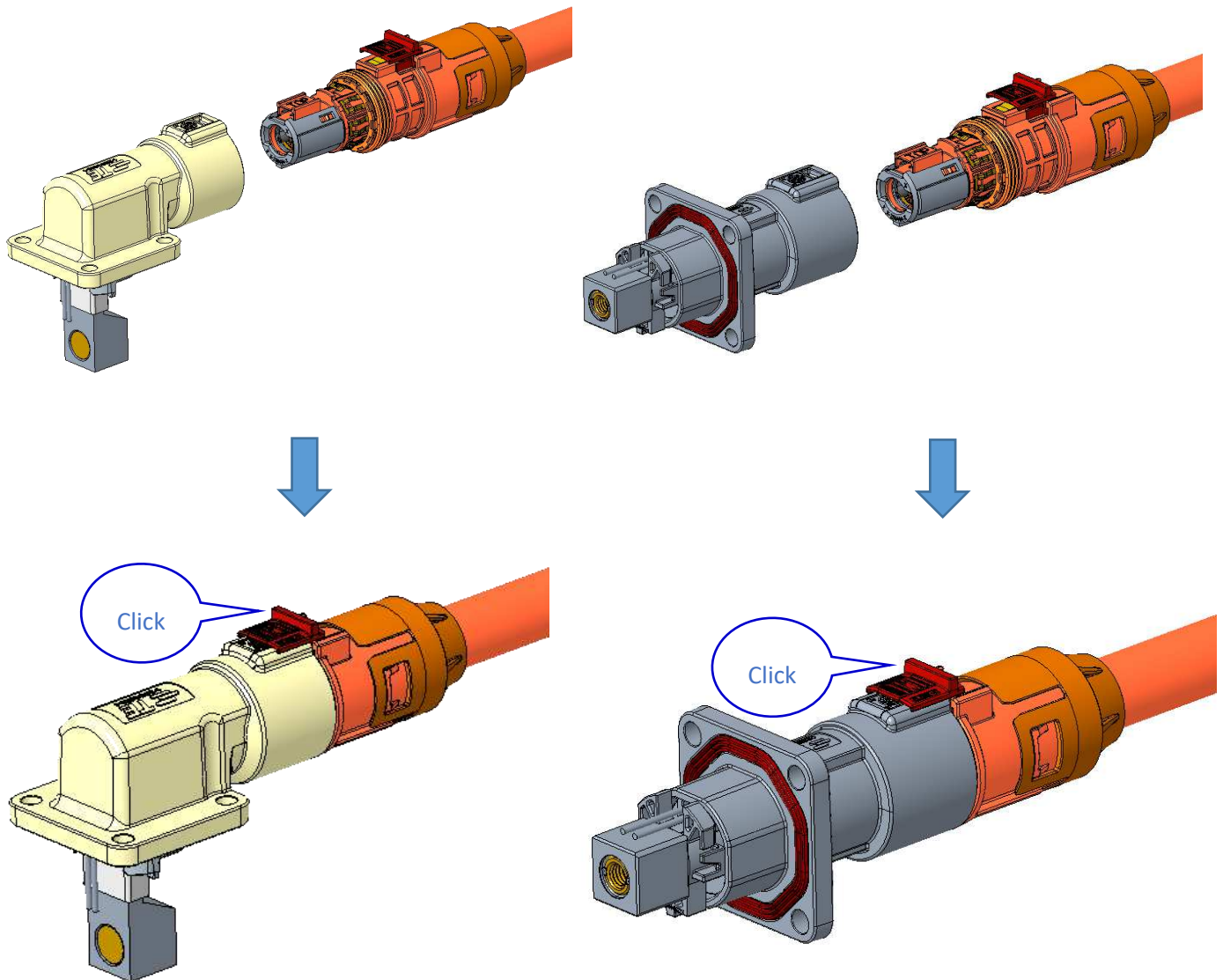


Figure 20: Header assembly and plug assembly mating condition (Tool access)

Please note, after header and plug are fully assembled, CPA should be pushed until it stops against the plug housing.

Pushing smoothly indicates that header and plug have been assembled in the correct position, otherwise the mating condition and CPA status should be checked.

请注意，公母头连接器对配完成后，推动CPA到终止位置。

推动顺利说明公母头连接器已对配到正确位置，反之需检查公母头连接器的对配状态和CPA状态。

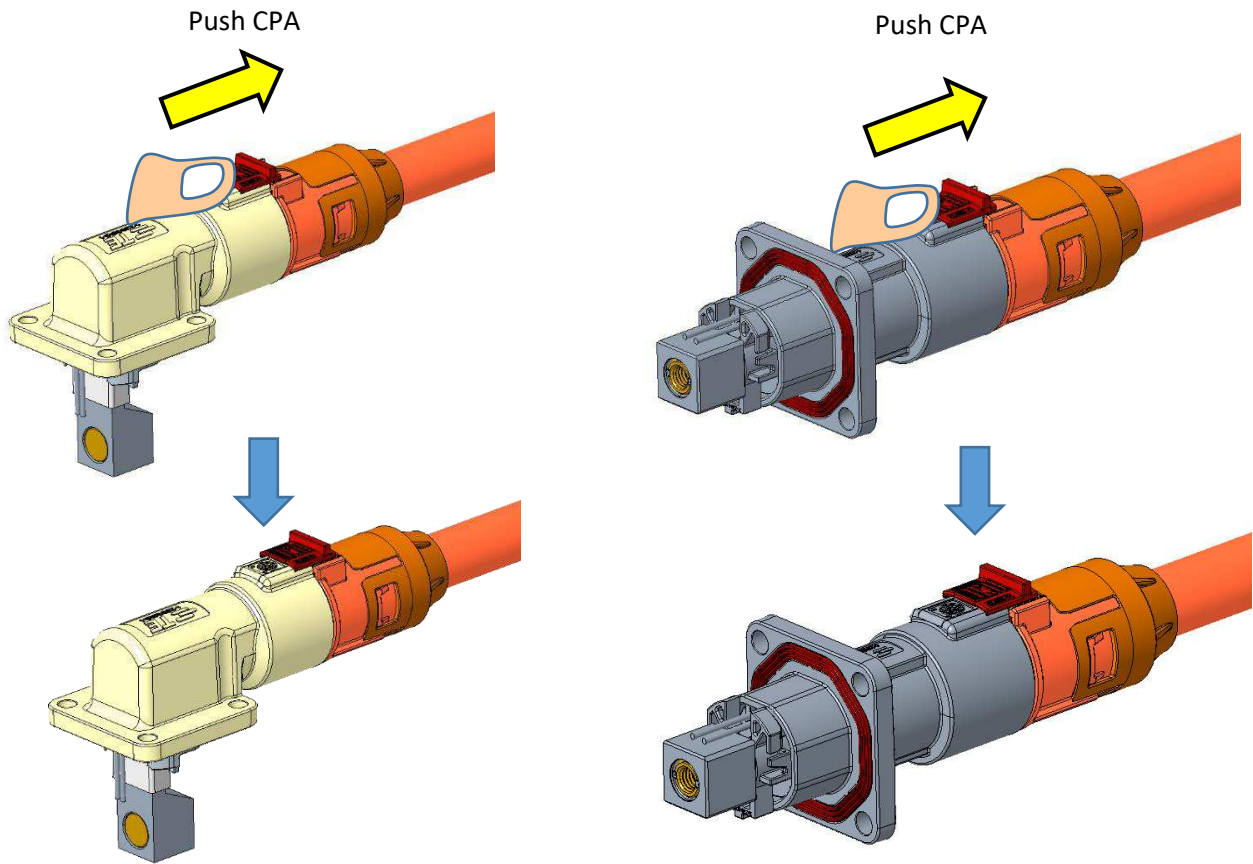


Figure 21: Push CPA to final lock position

Tips: Finger-access type takes the same steps as tool-access one in mating.

提示：适配时手指解锁与工具解锁采用同样的步骤。

7.2 Header assy and plug assy un-mating 公母端连接器解除互配

Push the CPA to pre-lock position.

将CPA推到预锁位置。

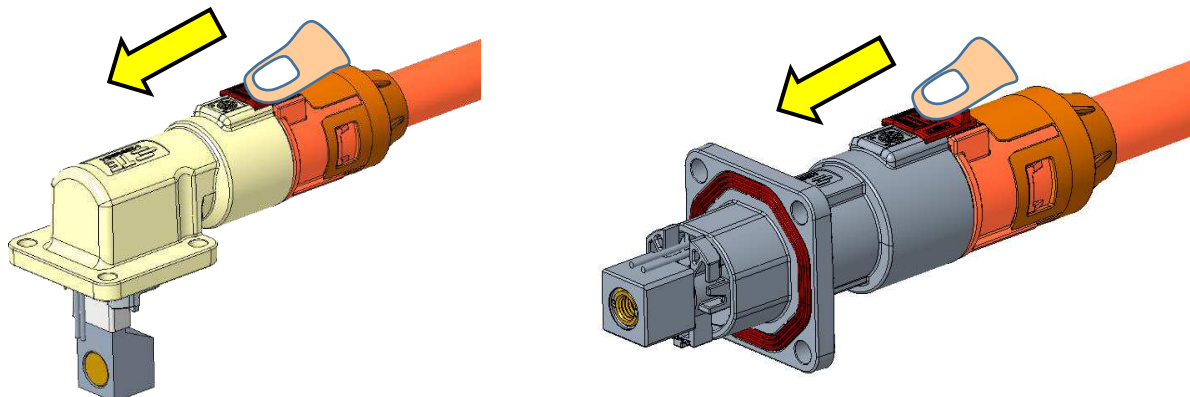


Figure 22: Push CPA to pre-lock position

Fully depress the spring, pull out the plug until it is fully separated from the header assembly.

按压spring，同时将母头连接器拔出公端连接器直到完全分离。

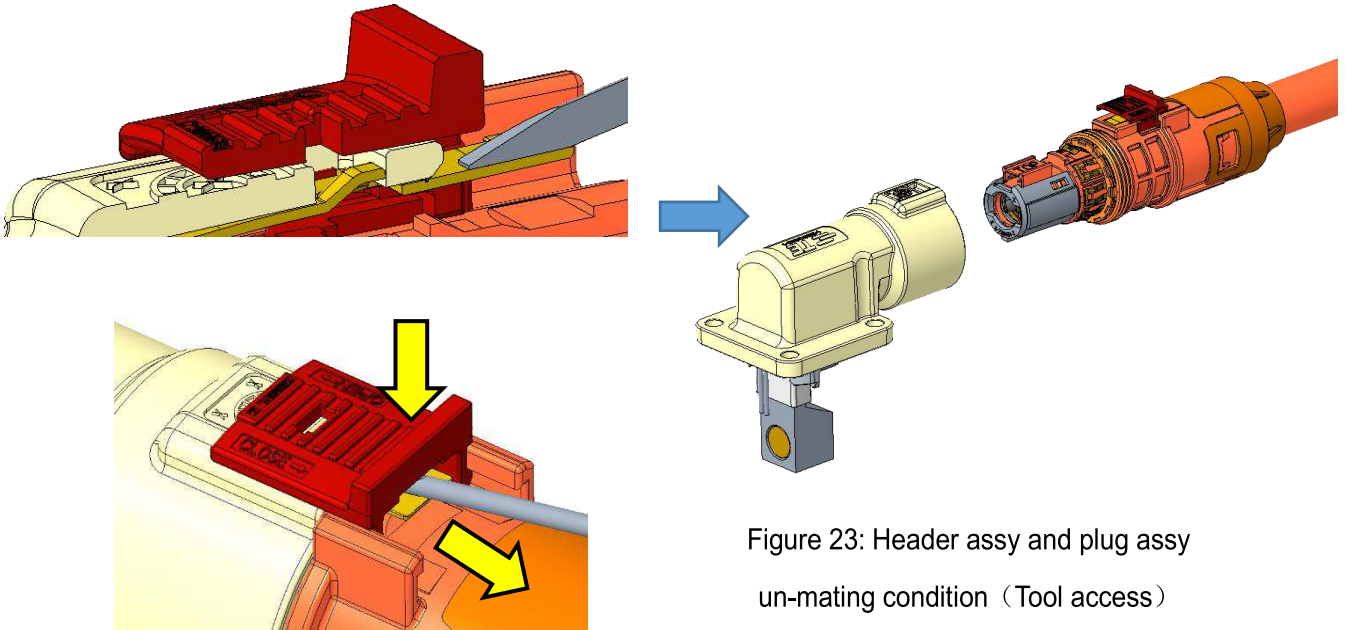


Figure 23: Header assy and plug assy un-mating condition (Tool access)

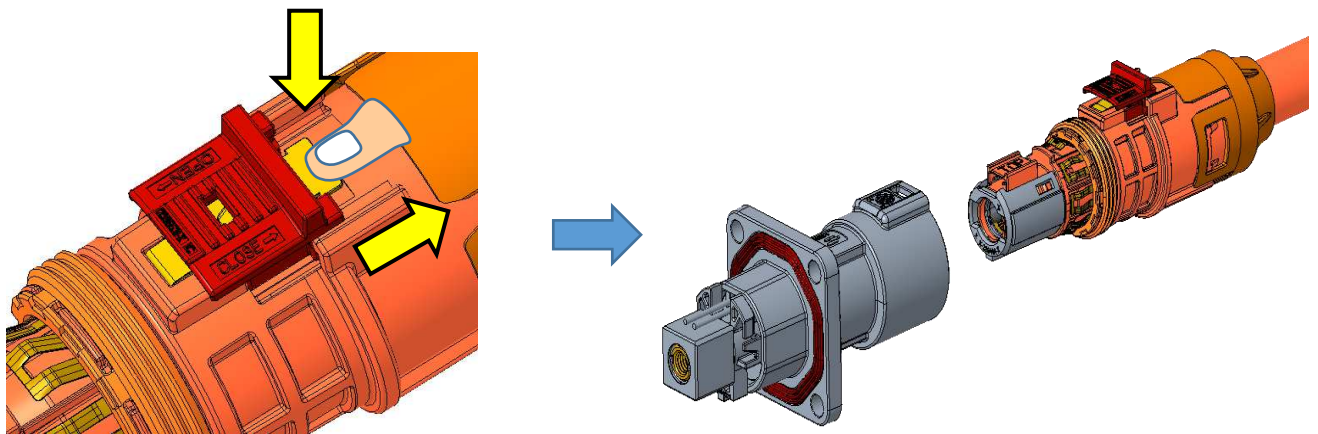


Figure 24: Header and plug assy un-mating condition

Tip: Both 90° header and 180° header take the same steps in un-mating, please refer to 1POS product when mating or un-mating 2POS、3POS ones.

提示：90度连接器和180度连接器解除适配步骤相同，2POS、3POS产品请参考1POS产品。

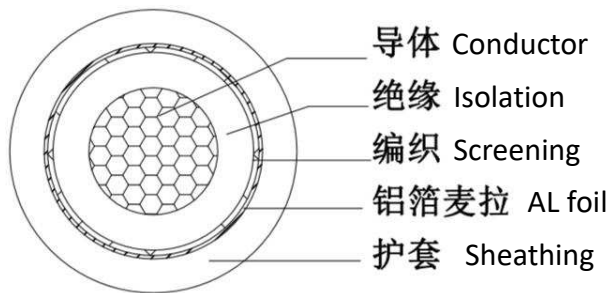
8. APPENDIX 附录

8.1 Data sheets 数据表

8.1.1 HUBER+SUHNER shield cable 35 / 50 / 70mm² 灏讯 35 / 50 / 70m²屏蔽线

HUBER+SUHNER 35mm²(part NO. 84100296)/50mm² (part NO. 84096257)/70mm²(part NO. 84100298) shield cable for HVP-HD1000 connector.

HVP-HD1000母端连接器采用灏讯35mm²(part NO. 84100296)/50mm² (part NO. 84096257)/70mm²(part NO. 84100298)屏蔽线



Region	Outer diameter(mm)		
	35mm ²	50mm ²	70mm ²
Conductor(MAX)	7.9	9.4	11.6
Isolation	9.7	11.5	13.7
Sheathing	12.7	14.9	17.0