

STOCK CODE: 300351

CONNECTION TO FUTURE



Yonggui E-coupler Introduction



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Our Company

Yonggui Company (“YGC”) is a **high-tech enterprise** with 51 years expertise focused on the research and development, manufacturing, sales and technical support of connectors, connector systems and smart precision products. It was listed on **Shenzhen Stock Exchange** in September 2012. The products are distributed in the three major fields of **new energy and vehicle (58%)**, **railway and industrial (36%)**, **special market (6%)**.

Yonggui has **726 national patents**, and has obtained ISO 9001, ISO/TS 22163, CRCC, ETL, UL and IATF16949 certifications.



Market Value

¥6,882M (\$0.96B)



Consolidated sales

¥ 2,020M (\$281M)



Employee

~2534 (34% engineers)

50+ Years History of Entrepreneurship

World-Class Interconnect Supplier

1973

Foundation

1979

Build 1st
connector

2008

Sichuan
Yonggui Set up

2009

High speed
train entry

2012

IPO; Enter new
energy market



2014

Special
market entry

2017

JV with
Toyo (Japan)

 Toyo Denki

2018

Yonggui Group
establishment

2019+

Business
transforming
to new energy
focus

2023

Globalization

2024

Singapore
office &
Thailand
plant set up

Our Customers Around Global

China



Rest of APAC



Europe



America



Products – Railway Connectors

Electric coupler, integrated vehicle end connector



Control, high-low voltage, signal vehicle end connector



Control, network, division console connector



Control, network, AC connector



Integrated cabinet & Jumpers



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Yonggui electric coupler introduction



Yonggui began to engage in electrical coupler manufacturing in 2010, and currently has 32, 40, 46, 50, 60, 64, 70, 75, 76, 84, 96, 96, 105, 128, 136, 140, 164, 188, 196, 202 core counts of electrical coupler.

Yonggui gained 65% market share in China as the leading e-coupler supplier in China railway market and we have exported to more than 11 countries

Project Performance – Urban Rail

Domestic urban rail project	• Guangzhou Metro Line 3, Line 5, Line 7, Line 8, Line 9, Line 13, Line 18 and Line 14&21; • Shenzhen Metro Line 2&5, Line 3, Line 7&9, Line 10, Line 11, Line 20 and Shenzhen APM; • Nanjing Airport Line, Line 4, Line 2 and Line 7; • Shanghai Metro Line 1, Line 2, Line 1 renovation project, Line 2 renovation project, Line 5, Line 17, Line 18, Line 6&8 expansion; • Beijing Yanfang Line, Beijing Airport Line and APM repair Coupler; • Hangzhou Line 1, Hangzhou AH Project, Hanghai Electric Coupler, Hang9 Electric Coupler, Hanglin intercity project; • Chengdu Line 9, Line 17&18 and Chengdu City Bus; • Suzhou Line 2, Line 4; Dalian Line 1&2; • Shijiazhuang Line 1, 2, 3; • Nanning Line 2, Line 3, Line 4 and Line 5; • Wuxi Line 4; Jinan R1 line, Jinan R3 line; Nanchang Line 2; Kunming Line 6; Hefei Line 1 and 2; • Guiyang Line 1, Line 2; Changsha Line 3, Line 4; Ningbo Line 3, Line 4 and other projects
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Project Performance – EMU

China EMU project	• CRH5 EMU • CRH380 series EMU • BST807 EMU • 160 km power concentration, • Changzhuzhou-xiangtan intercity • Beijing-Zhang high-speed rail • 250km standard bullet train • 350km standard bullet train • 400km standard bullet train • 200km power concentration • drum type bullet train • double-decker bullet train projects
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Project Performance – Global Projects

Global project	• Kuala Lumpur Airport Line • Turkey Low Floor Electric Coupler • Pakistan Metro • Brazil Sao Paulo Metro Line 13 • Spain LUGANO Electric Coupler • Chile EMU Electric Coupler • Vienna project • Cairo Monorail • Turkey project • TSI European EMU • Mexico Monterrey • TSI European EMU (Romania) • other projects
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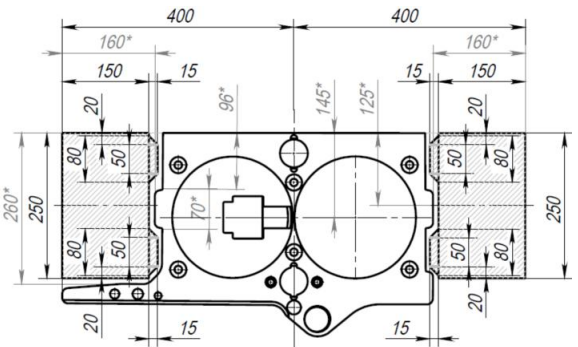
Maintenance service

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Customer input
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Structural design
- 03/ 其他性能
Other properties

序号 Serial number	分类 sort	条件 Conditions
1	电气车钩外 形尺寸 Electrical coupler dimensions	外形大小：符合EN16019中的10型离合器轮廓。电离合器应按照图1布置在自动离合器头部的两侧。 Shape size: In line with EN16019 type 10 clutch profile. The electric clutch shall be arranged on both sides of the automatic clutch head according to Figure 1.  The technical drawing shows a symmetrical electrical coupler assembly. The total width is 800 mm (400 mm on each side). The total height is 260 mm. Key dimensions include: 160° angle at the top corners, 150 mm horizontal distance from the center to the outer edge, 15 mm horizontal distance from the center to the inner edge, 20 mm vertical distance from the top edge to the first horizontal step, 80 mm vertical distance from the top edge to the second horizontal step, 50 mm vertical distance from the top edge to the third horizontal step, 96° angle at the top corners of the inner section, 145° angle at the top corners of the outer section, 125° angle at the top corners of the inner section, 70° angle at the top corners of the outer section, 15 mm horizontal distance from the center to the bottom edge, 20 mm vertical distance from the bottom edge to the first horizontal step, 80 mm vertical distance from the bottom edge to the second horizontal step, 50 mm vertical distance from the bottom edge to the third horizontal step, and 250 mm vertical distance from the top edge to the bottom edge.

序号 Serial number	分类 sort	条件 Conditions
2	控制信号 Control signal	点位数量61 Number of points 61
3		额定电压: 110V Rated voltage: 110V
4		最大接触电流: 30A Maximum contact current: 30A
5		最大工作电压: 250V Maximum operating voltage: 250V
6		接触电阻: $\leq 5\text{m}\Omega$ Contact resistance: $\leq 5\text{m}\Omega$
7		绝缘电阻: $\geq 5000\text{M}\Omega$ Insulation resistance: $\geq 5000\text{M}\Omega$
8		寿命次数: ≥ 20000 次 Life times: ≥ 20000 times
9		接触件表面涂覆: 镀金 Contact surface coating: gold plating
10		质保期: 3年 Warranty: 3 years

序号 Serial number	分类 sort	条件 Conditions
11	以太网信 号 Ethernet signal	4路8芯网络接口 Four 8-core network ports
12		网络传输性能: 0~600BASE-T Network transmission performance: 0~600BASE-T
13		最大接触电流2.5A Maximum contact current 2.5A
14		接触电阻: $\leq 5\text{m}\Omega$ Contact resistance: $\leq 5\text{m}\Omega$
15		最大工作电压: 250V Maximum operating voltage: 250V
16		绝缘电阻: $\geq 5000\text{M}\Omega$ Insulation resistance: $\geq 5000\text{M}\Omega$
17		寿命次数: ≥ 20000 次 Life times: ≥ 20000 times
18		接触件表面涂覆: 镀金 Contact surface coating: gold plating
19		质保期: 3年 Warranty: 3 years

序号 Serial number	分类 sort	条件 Conditions
20	SAN接口 网络信号 Network signal of the SAN interface	1路4芯网络接口 one 4-core network ports
21		网络传输性能: 0~100BASE-T Network transmission performance: 0~100BASE-T
22		最大接触电流4A Maximum contact current 4A
23		接触电阻: $\leq 5\text{m}\Omega$ Contact resistance: $\leq 5\text{m}\Omega$
24		最大工作电压: 250V Maximum operating voltage: 250V
25		绝缘电阻: $\geq 5000\text{M}\Omega$ Insulation resistance: $\geq 5000\text{M}\Omega$
26		寿命次数: ≥ 20000 次 Life times: ≥ 20000 times
27		质保期: 3年 Warranty: 3 years

序号 Serial number	分类 sort	条件 Conditions
28	防护等级 Class of protection	单体IP54, 连挂IP55 IP54 before connected, IP55 when connected
29	使用环境 Use environme nt	室外操作环境温度: ①工作温度: -40~+40°C; ②极限温度: -50~+45°C。 Outdoor operating temperature: ① Working temperature: -40~+40°C; ② Limit temperature: -50~+45°C.
30		工作环境温度: ①工作温度: -40~+40°C; ②极限温度: -40~+45°C。 Working environment temperature: ① Working temperature: -40~+40°C; ② Limit temperature: -40~+45°C.
31		海拔: ≤1000米 Altitude: ≤1000 m
32		工作环境湿度: ①15°C环境下80%; ②25°C环境下100% Working environment humidity: ① 80% at 15°C; ② 100% at 25°C

02/ 客户输入评审 Customer input review



序号 Serial number	分类 sort	条件 Conditions
33		振动条件: GOSTZ06Z1和GOST17516的机械性能组M25 Vibration conditions: Mechanical properties group M25 of GOSTZ06Z1 and GOST17516
34	其他 other	选材使用需要符合材料的标准和选型规范 The selection and use of materials need to meet the standards and selection specifications of materials
35		紧固件需要使用螺纹紧固剂进行防松并作防松标识 Fasteners should be held in place with thread fasteners and marked as such
36		金属零件的应用, 不允许使用没有防腐涂层的元件和紧固件, 除非在设计文件中特别规定 In the application of metal parts, components and fasteners without anti-corrosion coatings are not allowed unless specifically specified in the design document
37		金属零件的建议涂覆层: ①表面喷漆, 颜色RAL9005; ②12微米镀锌镀层/镀铬镀层; ③不锈钢可不进行表面涂覆。 Recommended coatings for metal parts: ① Surface spray paint, color RAL9005; ②12 micron galvanized coating/chromium plating coating; ③ Stainless steel can not be coated.

02/ 客户输入评审 Customer input review



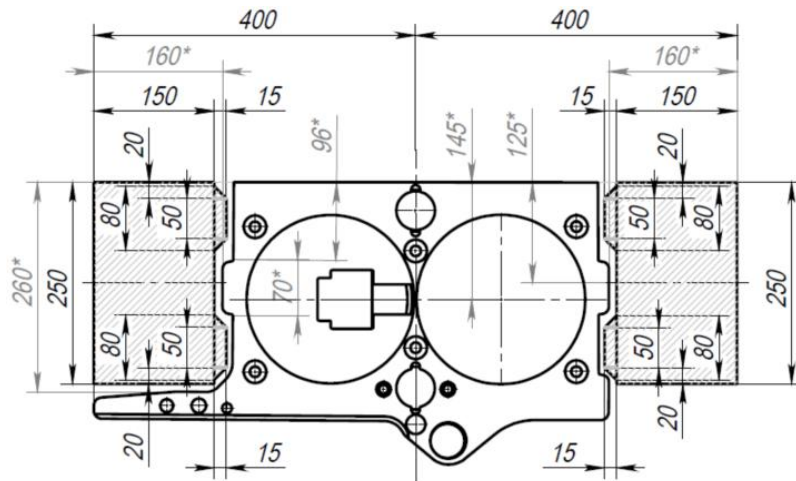
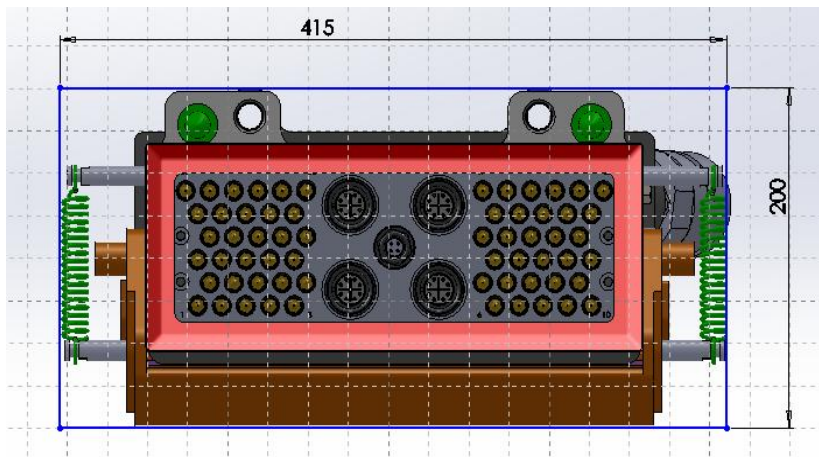
序号 Serial number	分类 sort	条件 Conditions
38		电气离合器的设计及其部件的位置, 设计时应考虑到在检查和维护时进行手动维护, 而无需拆卸离合器; 指示性, 信号标记和标记应采用无误感知信息的格式; 注:电接头应有“小心电压”标志 The design of the electrical clutch and the location of its components should be designed to allow for manual maintenance during inspection and maintenance without removing the clutch; Indicative, signal marking and marking shall be in the form of error-free perceptual information; Note: The electrical connector should be marked "Beware of voltage"
39		电气车钩应适应热融除雪,除雪过程中不应进水, 水温60°C, 距离1M, 水压0.4MPa The electric coupler should be adapted to hot melt snow removal, and should not enter water during snow removal. The water temperature is 60°C, the distance is 1M, and the water pressure is 0.4MPa
40		电气车钩应不受有洗涤剂影响 Electrical coupler should not be affected by detergent

1.外形结构设计:

Shape and structure design:

基于客户给出的信号数量及电气参数的要求：61路控制信号+5组8芯网络信号，控制信号需要满足30A的最大接触电流，我公司进行了初版的结构设计。

Based on the signal quantity and electrical parameter requirements given by the customer: 61 control contacts + 5 groups of 8-core network modules the control signal needs to meet the maximum contact current of 30A, our company carried out the initial structural design.



为尽可能满足客户安装适配需求，建议将控制信号接触件更换为 $\phi 3$ 规格，可缩减外形尺寸，缩减后外形尺寸下图所示。

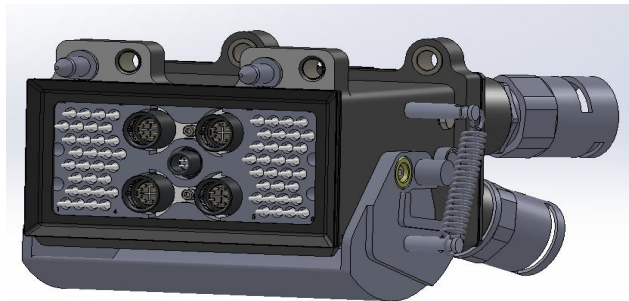
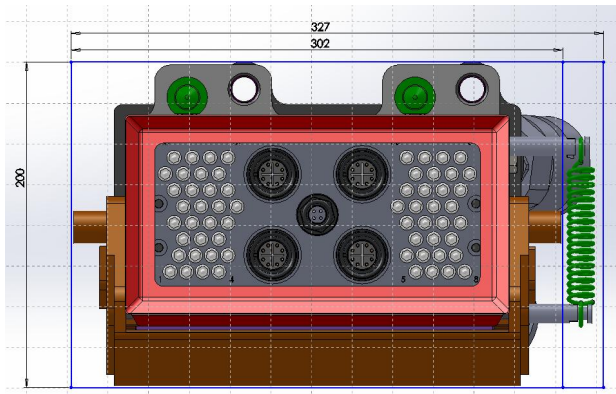
该外形尺寸虽然仍未能符合输入要求的尺寸限定，但与我公司YG278系列结构电气车钩外壳基本相同，该系列电气车钩在我国CRH380B和谐号动车组上广泛应用，适配10型机械钩，外壳防护等级满足单体IP54,连挂IP55。

我公司推测这种外壳是可以适配现有机械钩需求的，如有需要，我公司可提供一套外壳进行试装。

In order to meet the customer's installation and adaptation requirements as much as possible, it is recommended to replace the control signal contact with $\phi 3$ specifications, which can reduce the overall size. The reduced overall size is shown in the following figure.

Although this dimension still fails to meet the size limit of the input requirements, it is basically the same as the YG278 series structural electrical coupler shell of our company. This series of electrical coupler is widely used in China 's CRH380B Harmony number EMU, suitable for type 10 mechanical Couplers, and the protection level of the shell meets the IP54 before connected and IP55 after connected .

Our company speculated that this shell can be adapted to the existing mechanical Coupler needs, if necessary, our company can provide a set of shell for trial installation.



2.绝缘面板设计:

Insulation panel design:

如下图所示，绝缘面板采用61路控制接触件+4组8芯网络模块+1组4芯网络模块的设计排布，满足客户的使用要求。

接触件孔间距设计均满足IEC60664-1中额定电压250V的爬电距离，耐电压2000V的电气间隙设计要求。

绝缘体材质满足 $\geq 5000\text{M}\Omega$ 的绝缘电阻要求。

As shown in the following figure, the insulation panel adopts the design arrangement of 61 control contacts +4 groups of 8-core network modules +1 group of 4-core network modules to meet customer requirements.

The hole spacing design of contact parts meets the creepage distance of rated voltage 250V and the electrical gap design requirements of voltage 2000V in IEC60664-1.

The insulation material meets the insulation resistance requirements of $\geq 5000\text{M}\Omega$.

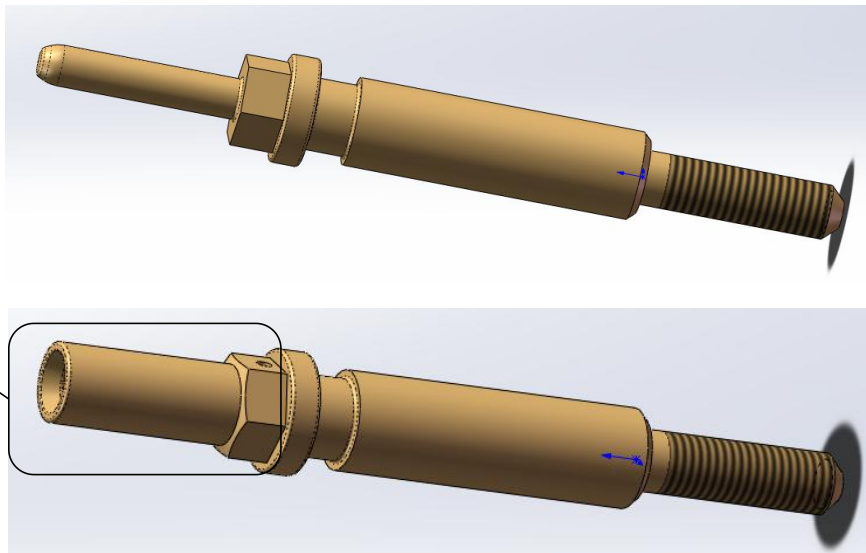
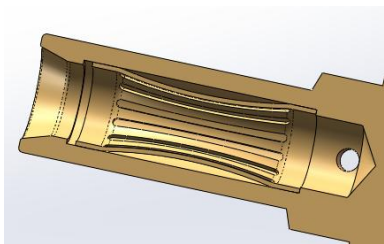


3.接触件设计:

Contact design

因客户尺寸排布需求，控制线路接触件采用 $\phi 3$ 尺寸规格的针孔式接触件，该接触件可进行前端拆卸，接触形式为冠簧接触，接触件材质为铜合金，表面镀金，接触电阻 $\leq 5\text{m}\Omega$ ，工作电压110V，但该接触件大小规格无法满足30A的最大工作电流，目前我公司给定电流大小为20A。

Due to the customer's size arrangement requirements, the control line contact adopts $\phi 3$ pinhole contact, which can be front-end disassembled. The contact form is crown spring contact, the contact material is copper alloy, the surface is gold-plated, the contact resistance is less than $5\text{m}\Omega$, and the working voltage is 110V. However, the size specification of the contact cannot meet the maximum working current of 30A. At present, the current of our product is 20A



该针孔已进行20000的寿命插拔试验，试验结果显示20000次寿命试验后，接触电阻无异常，接触件表面轻微磨损，仍能满足稳定的电信号传输。

The pin hole has been 20000 life plug test, the test results show that 20000 life test, the contact resistance is not abnormal, the surface of the contact is slightly worn, still can meet the stable electrical signal transmission.

4.网络模块设计:

Network module design:

8芯及4芯网络模块均采用前后端结构设计，可实现前端便捷维护更换。

接触件材质为铜合金，表面镀金，接触电阻 $< 5\text{ m}\Omega$ 。

Both 8-core and 4-core network modules are designed with front and rear end structure, enabling easy maintenance and replacement of the front end.

The contact material is copper alloy, the surface is gold-plated, and the contact resistance is less than $5\text{ m}\Omega$.



其中8芯网络模块满足1000BASE-T的网络传输性能，4芯网络模块满足100BASE-T的网络传输性能，已进行仿真测试/实物测试。

Among them, the 8-core network module meets the network transmission performance of 1000BASE-T, and the 4-core network module meets the network transmission performance of 100BASE-T, which has been simulated test/physical test.

网络模块已进行试验验证，验证结果显示30000次插拔后，接触电阻无异常，接触件表面轻微磨损，仍能满足稳定的网络信号传输。

The network module has been tested and verified, and the verification results show that after 30000 times of insertion and removal, the contact resistance is not abnormal, the surface of the contact is slightly worn, and it can still meet the stable network signal transmission.

04/ 其他性能 Other properties



- 1.满足85°C高温条件测试;
- 2.满足-40°C低温环境测试 (-50°C待验证) ;
- 3.满足-40~85高低温冲击测试;
- 4.满足40°C, 93%~95%湿度条件下恒定湿热测试;
- 5.满足96h盐雾试验测试;
- 6.满足55°C温度条件下的交变湿热测试;
- 7.满足IEC61373标准要求中的I类B级振动测试。

1. Meet the 85°C high temperature condition test;
2. Meet the -40°C low temperature environment test (-50°C to be verified);
3. Meet -40~85 high and low temperature impact test;
4. Meet the constant humidity and heat test at 40°C, 93%~95% humidity;
5. Meet 96h salt spray test;
6. Meet the alternating humidity and heat test at 55°C;
7. Meet the requirements of IEC61373 standard I class B vibration test.

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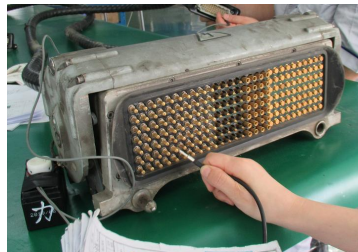
Electric Coupler Maintenance Service

Introduction of Maintenance Process

- **Confirmation of Technical Status**

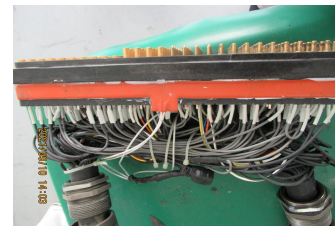
Check and record Following Items:

1. Wiring Principle,
2. Overall Size,
3. Electrical Performance,
4. Customer Label Content
5. Contact Status.



- **Disassembly and Clean**

Disassemble the E-coupler which was inspect with above items, the clean the parts, recover the appearance. The whole process of disassembly should be recorded.



- **Repair or Replacement of Core Elements**

Evaluation, repair, replacement for core elements (such as isolators, contacts, cable assembly) . The whole process should be recorded.



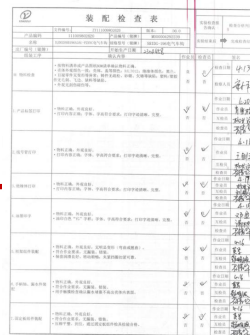
Electric Coupler Maintenance Service

Introduction of Maintenance Process

Re-Assembly and Step Confirmation

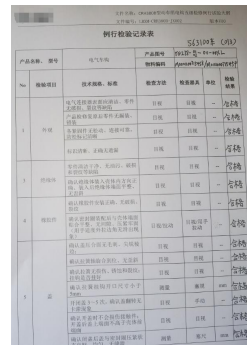
Re-assemble together of all elements and components which were refreshed according to reverse sequence of disassembly record. Confirm whole process with assembly record.

Assembly Checklist



The Assembly Checklist is a detailed form with multiple columns for different components and their assembly status. It includes checkboxes for 'checked' and 'not checked' and a section for 'remarks'.

Test Report



The Test Report is a form for recording test results. It includes columns for 'test item', 'test result', and 'remarks'. It also has a section for 'test date' and 'test location'.

Replacement Record



The Replacement Record is a form for recording the replacement of components. It includes columns for 'component name', 'quantity', and 'remarks'. It also has a section for 'replacement date' and 'replacement location'.

Routine Test and Document Files

Following test items should be performed:

1. Appearance Inspection
2. Electrical Performance
3. Mechanical Performance
4. Assembly Inspection

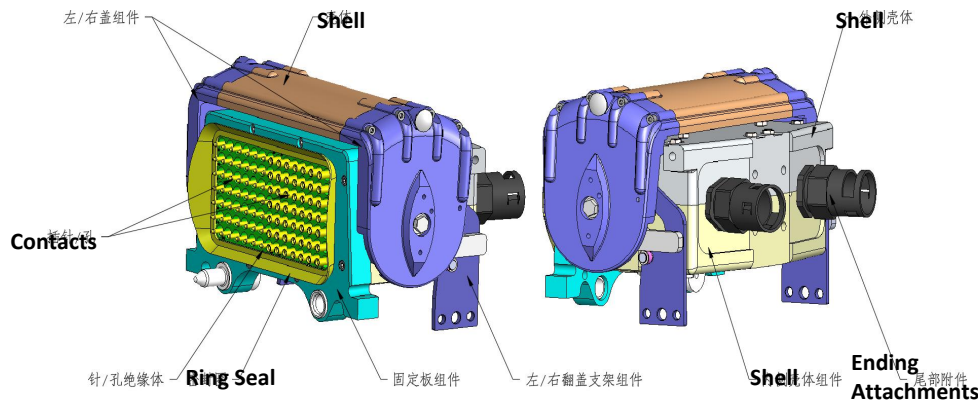
Test reports should be documented with replacement report and assembly checklist together for auditing.

After maintenance service, the E-coupler should meet the criteria of technical agreements.

Electric Coupler Maintenance Service

Introduction of Maintenance of China EMU's E-Coupler

- The **1st** maintenance cycle: **6 Years (Level 4)**
- The **2nd** maintenance cycle: **12 Years (Level 5)**
- The operation of the **2 cycles** are similar
 - a. Replacement of Ring Seal and accessories ;
 - b. Replacement of contacts and accessories;
 - c. Clean and Status Confirmation of Shell Components and Rear Ending Attachments
 - d. Test of Electrical and Mechanical Performance



Electric Coupler Maintenance Service

Introduction of Maintenance of Urban Railway System Coupler

- The **1st** maintenance cycle: **4-5 Years (Intermediate)**
- The **2nd** maintenance cycle: **8-10 Years (General)**

Intermediate Overhaul

- Replacement of Ring Seal and accessories ;
- Inspection of contacts and accessories;
- Clean and Status Confirmation of Shell Components and Rear Ending Attachments
- Test of Electrical and Mechanical Performance

General Overhaul

- Replacement of Ring Seal and accessories ;
- Replacement of contacts and accessories
- Replacement of fasteners and accessories;
- Clean and Status Confirmation of Shell Components and Rear Ending Attachments
- Test of Electrical and Mechanical Performance

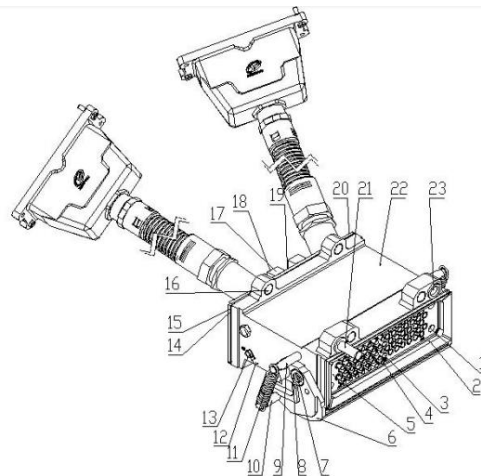
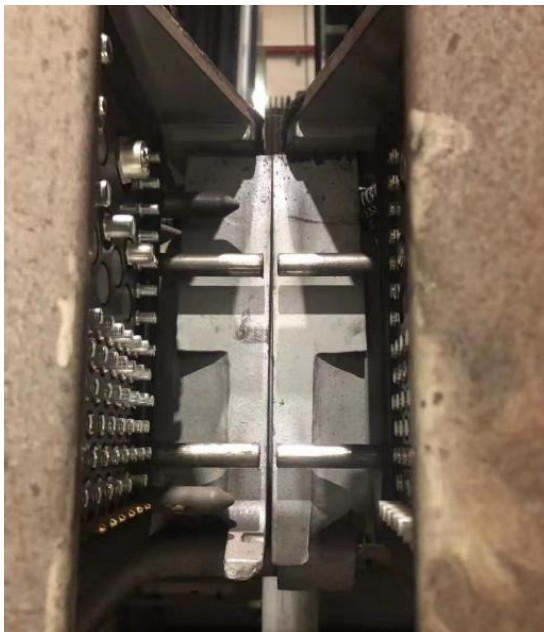
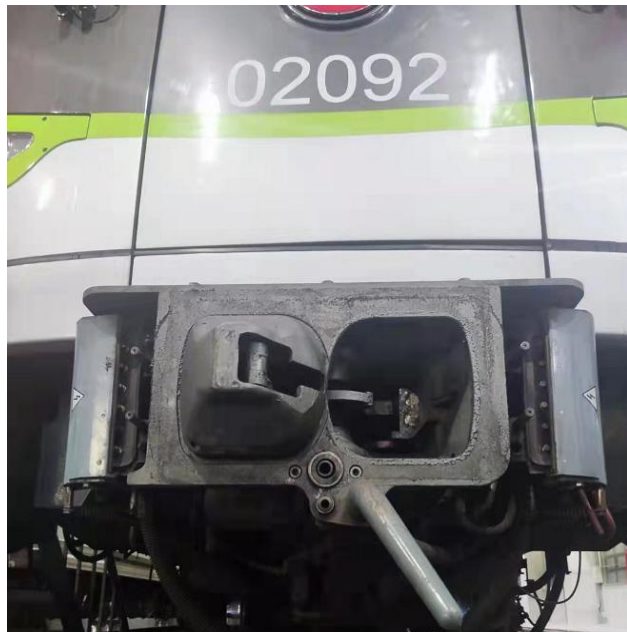


图 1. 电气车钩

件号	说明	件号	说明
件 1	内六角圆柱头螺钉 M6	件 13	六角头螺栓 M6
件 2	密封圈	件 14	密封垫
件 3	插针/插孔	件 15	固定挡板
件 4	动触头/定触头	件 16	套筒
件 5	绝缘体	件 17	固定块
件 6	前盖	件 18	内六角圆柱头螺钉 M6
件 7	内六角圆柱头螺栓 M8	件 19	连接轴
件 8	轴套	件 20	内六角圆柱头螺钉 M6
件 9	拉簧轴 IV	件 21	导向套/导向柱

Electric Coupler Maintenance Service

Introduction of Maintenance of Couplers of Overea Suppliers



**Service for VOITH Coupler
on Shanghai 1 & 2 Line :**

- 1. 32 Cores Left/Right
Automatic Electric Hook**
- 2. Semi-Auto Center-Position
Hook**

Electric Coupler Maintenance Service

Introduction of Maintenance of Couplers of Overea Suppliers



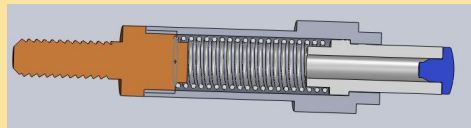
Service for Faiveley Coupler
Beijing Airport Line APM



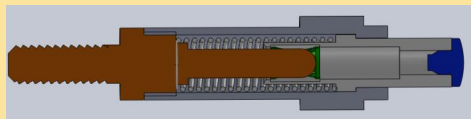
Service for Dellner Coupler
Shanghai 6 & 8 Line

Electric Coupler Maintenance Service

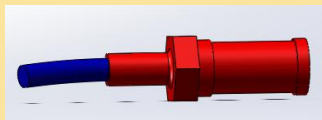
Introduction of Components Localization--Example



VOITH Design



YG Design

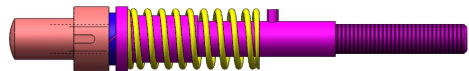


YG modified and optimized the original E-Coupler and developed many kinds of key parts such as contact , insulators, termination and sealing rings.
The performance test results passed and were successfully applied in Shanghai No.1 Line.

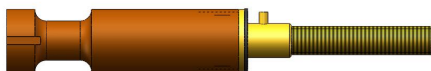
The E-coupler of Shanghai Line 1 was overhauled in 2014, and Shanghai Line 2 was overhauled in 2019.
No quality problems reported

Electric Coupler Maintenance Service

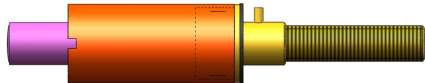
Introduction of Components Localization--Example



YG Manufacturing



YG Manufacturing



The structure and performance of key parts such as contacts, insulators, terminating modes and sealing rings are required to be completely equal to original parts in the service of Beijing Airport line APM. Ensure that There are fully compatibility to originals.

The E-coupler of BEIJING Airport Line APM was overhauled in 2019.

No quality problems reported

YONGGUI

CONNECTION TO FUTURE