



# Yonggui Charging System Solution

EV product center | Charging product line | 2023.07



永贵连接 | 连接专家  
Yonggui Connection | Connector Experts

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- 03** Consumer products
- 04** Product Application Presentation

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# Charging Product Portfolio

- 1.1 standard and application area
- 1.2 vehicle end charging product portfolio
- 1.3 pile end charging product portfolio





**GB/T 2015**  
China only

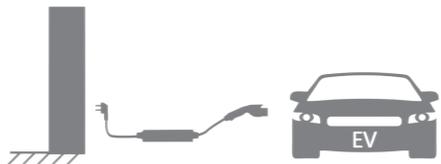


**CCS Type 1**  
Suitable for North America area



**CCS Type 2**  
Suitable for European Union area

◆Yonggui products have covered the following charging scenarios, and will continue to enrich the product categories in the scenario application, improve product design performance and use experience



Mode2, Case B connection



Mode3, Case B connection



Mode3, Case C connection



Mode4, Case C connection

## YGC-GBC series

Suitable for the electric vehicle AC/DC charging in China area.



GB mode 2 AC vehicle connector (separated type)



GB mode 2 AC vehicle connector (integrated)



GB AC discharge connector (separated type)



GB AC discharge connector (integrated)



GB AC vehicle inlet



GB DC vehicle inlet



GB quick-replacing DC vehicle inlet



GB AC/DC integrated vehicle inlet



GB mini DC vehicle connector



self-developed motor type interlock device



HELLA motor type interlock device



GB AC vehicle inlet (with lamp ring)

## YGC-ENC series

Suitable for the electric vehicle AC/DC charging in European Union area



EN Type2 AC vehicle connector



EN Type2 AC charging vehicle inlet (vehicle end)



EN CCS2 DC charging vehicle inlet

## YGC-SAEC series

Suitable for the electric vehicle AC/DC charging in North America area



AS Type1 AC vehicle inlet (vehicle end)



AS CCS1 DC vehicle inlet

## YGC-HPC series

Suitable for the electric vehicle high power charging (with liquid cooling vehicle connector) in China area



GB AC/DC integrated vehicle inlet (high power)



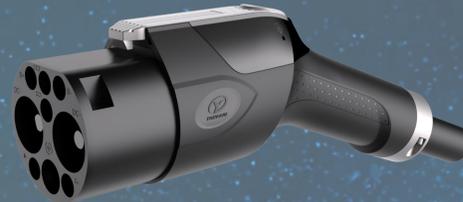
GB DC vehicle inlet (high power)

## YGC-GBC series

Suitable for the charging pile AC/DC charging in China area.



GB DC vehicle connector



GB mini DC vehicle connector



GB AC vehicle connector



GB DC pile end accessories



GB AC pile end accessories

## YGC-ENC series

Suitable for the charging pile AC/DC charging in European Union area



EN CCS2 DC vehicle connector



EN Type2 AC vehicle connector



EN AC socket-outlet



EN DC pile end accessories



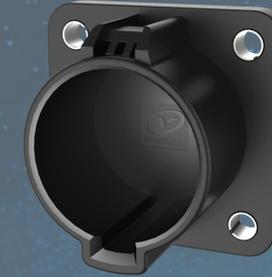
EN AC pile end accessories

## YGC-SAEC series

Suitable for the electric vehicle AC/DC charging in North America area



AS Type1 AC vehicle connector



AS AC pile end accessories

## YGC-HPC series

Suitable for the high power charging pile DC charging in different area



GB high power charging DC vehicle connector



EN high power charging DC vehicle connector



Chaoji high power charging DC vehicle connector

02

# Liquid cooled charging product

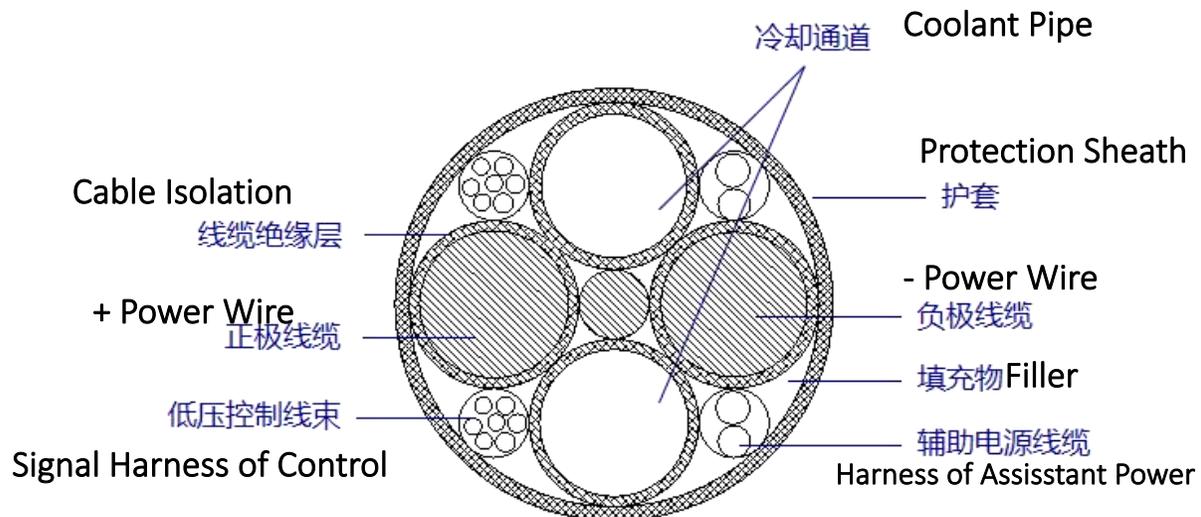
3.1 Brief of Liquid Cooling Technology

3.2 DC Liquid Cooling vehicle connector-CCS2

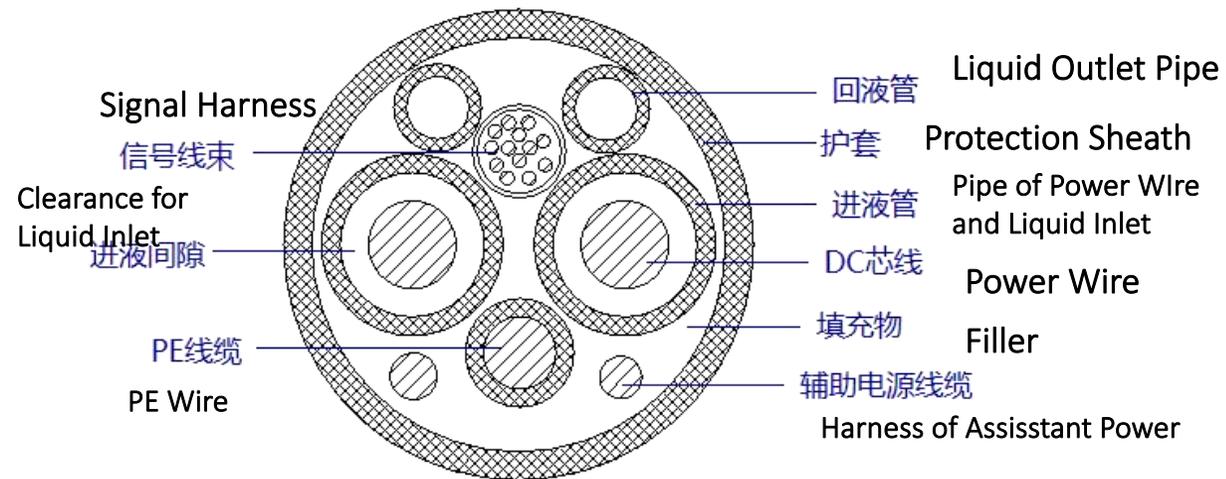
3.3 EN Cooling System Assembly and Coolant



## ◆Scheme I: Separation of Electro--Liquid



## ◆Scheme II: Non-Separating of Electro-Liquid

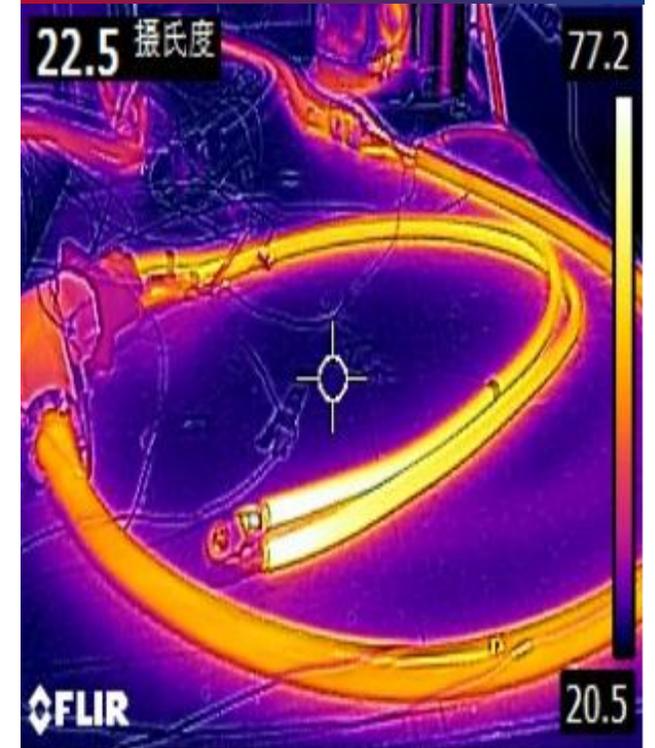


1. Above diagram only describes the general structure and principle of the cable, not represent the specific scheme.
2. The wire diameter of the power wire is the same, and the thickness of the sheath and insulation layer is the same. The wire diameter of scheme I is smaller (the internal space utilization rate is higher);
3. As the coolant in scheme II is in direct contact with the power cable, the heat exchange efficiency is higher, but the cooling medium needs to be insulated.

**Constant Temperature Aging Room + Programmable Hi-Current Test System**



**Temperature/Current Aging Test**



- For hi-power charging products, a hi-current testing system is introduced, which can edit charging strategy, set current/time program, and monitor and record the temperature of concern in real time;
- Adopt infrared thermal imager to assist in collecting and testing the heating condition of products;
- From the start of the high-power project, carry out uninterrupted bottom line testing experiments.



## Benefits

- 1、 Light Weight, Better Usage Experience
- 2、 Scientific and Future Sense Modeling
- 3、 Thinner & Lighter Cable,
- 4、 >12000 Life Cycles
- 5、 Mud Brine Insertion/Withdraw Test Passed
- 6、 Signal Integrated on PCB, Cleaner of Inside Wire Layout , More reliability

## Performance Datasheet

|                                      |  |
|--------------------------------------|--|
| Reference Norms                      | IEC 62196-1 IEC 62196-3 IEC 62196-3-1  |
| Mode                                 | Mode 4, Connection Case C  |
| Rated Voltage                        | 1000V DC   |
| Rated Current                        | 500A DC/600A DC  |
| Withstand Voltage                    | 1.DC+, DC- ≥3500V AC 1min<br>2.DC+, DC- Between PE≥3500V AC 1min   |
| Isolation                            | 1.DC+, DC-≥500MΩ; 1000V DC<br>2.DC+, DC- Between PE ≥500MΩ; 1000V DC  YGC1403 |
| Protection Level                     | Whole Assembly IP44;<br>Electro Section: IP67 (Except Mating Interface)  |
| Life Cycle                           | ≥12000   |
| Inertion Force                       | < 100N   |
| Ambient Temperature                  | -30°C ~+ 50°C  |
| Temp. Sensor                         | PT1000 or NTC  |
| Flame Retardant                      | UL 94 V-0  |
| Plating Type of Power Contact Points | Ag   |
| ODmeter of Cable                     | Φ30.5±1mm  |
| Radius of Bending                    | Min. Radius of Normal Flow 10D   |
| Cooling Pipe Mode                    | 1 inlet and 2 outlets  |
| Cooling Pipe Inner Diameter          | Inlet: Inner Diameter Φ6mm, ODmter Φ8mm;<br>Outlet: Inner DiameterΦ9mm, ODmeter Φ11mm  |
| Minimum Flow Rate                    | 1.8L/min   |
| Maximum Working Liquid Pressure      | 3.4Bar   |
| Coolant                              | Biodegradable organic  |
| Coolant Temperature                  | ≤Ambient Temp.+5°C   |

# YG1352A GB high power vehicle connector (water cooling)



## product advantages

1. Light weight and better use experience;
2. Product styling design is full of sense of science , technology and future;
- 3, the cable diameter is thinner, lighter and completely get rid of the "bulky" label;
- 4, 12000 times of life cycle, more durable;
5. Passed the mud brine insertion test, meeting more stringent operating conditions;
- 6.Integrated low-voltage signal of PCB board, internal wiring is more concise and the assembly is more reliable ;

## Technical Data

|                                      |  |
|--------------------------------------|--|
| Reference standard                   | GB/T 18487.1-2015 GB/T 20234.1-2015 GB/T 20234.3-2015  |
| charging mode                        | charging mode4, caseC  |
| rated voltage                        | 750V/1000V DC  |
| rated current                        | 500A DC  |
| withstand voltage                    | 1.between DC+ and DC- $\geq$ 3500V AC 1min;<br>2.between each DC+, DC and each PE, S+, S-, A+, A- $\geq$ 1500V AC 1min;<br>3.between PE and each S+, S-, A+, A- $\geq$ 1500V AC 1min;<br>4.between each S+, S-, A+, A- $\geq$ 1500V AC 1min;<br>5.between each DC+, DC- and temperature control $\geq$ 3500V AC 1min;<br>*note: a. choose one connection, CC1, CC2 or PE;<br>b. for the test above, the leakage current is <5mA. |
| insulation resistance                | 1.between DC+ and DC- $\geq$ 2000M $\Omega$ ;<br>2.between each DC+, DC and each PE, S+, S-, A+, A- $\geq$ 2000M $\Omega$ ;<br>3.between PE and each S+, S-, A+, A- $\geq$ 2000M $\Omega$ ;<br>4.between each S+, S-, A+, A- $\geq$ 2000M $\Omega$ ;<br>5.between each DC+, DC- and temperature control $\geq$ 2000M $\Omega$ ;<br>*note: a. choose one connection, CC1, CC2 or PE;<br>b. the test voltage is: 1000V DC.         |
| IP degree                            | IP54 separated ; IP55 mated electrical part: IP67 (except for the mating surface)  |
| life cycle                           | $\geq$ 10000   |
| mating force                         | < 140N   |
| ambient temperature                  | -30°C ~+ 50°C  |
| temperature sensor type              | PT1000   |
| flame retardant rating               | UL 94 V-0  |
| power point surface plating material | Ag   |
| cable OD                             | $\Phi$ 30 $\pm$ 0.6mm  |
| bending radius                       | Minimum radius 10D of normal flow; Minimum storage radius 5D (coiled wire)   |
| cooling circuit                      | 1 inlet and 1 outlet   |
| Cooling pipe diameter                | inner diameter $\Phi$ 4.5mm; ODmeter $\Phi$ 6.5mm  |
| minimum flow                         | 1L/min   |
| maximum working pressure             | 2.5Bar   |
| coolant                              | Vehicle coolant (glycol solution)  |
| coolant temperature                  | $\leq$ ambient temperature+5°C   |



# YG1352A GB high power vehicle connector (oil cooling)

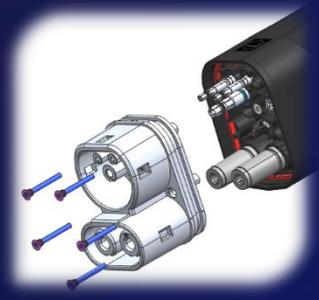
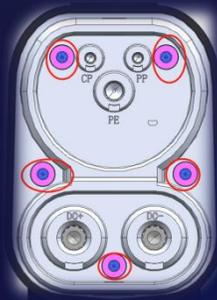


## Technical Data

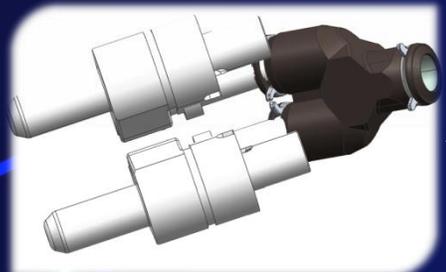
|                                      |  |
|--------------------------------------|--|
| Reference standard                   | GB/T 18487.1-2015 GB/T 20234.1-2015 GB/T 20234.3-2015  |
| charging mode                        | charging mode4, caseC  |
| rated voltage                        | 750V/1000V DC  |
| rated current                        | 600A DC  |
| withstand voltage                    | 1.between DC+ and DC- $\geq$ 3500V AC 1min;<br>2.between each DC+, DC- and each PE, S+, S-, A+, A- $\geq$ 1500V AC 1min;<br>3.between PE and each S+, S-, A+, A- $\geq$ 1500V AC 1min;<br>4.between each S+, S-, A+, A- $\geq$ 1500V AC 1min;<br>5.between each DC+, DC- and temperature control $\geq$ 3500V AC 1min;<br>*note: a. choose one connection, CC1, CC2 or PE;<br>b. for the test above, the leakage current is <5mA   |
| insulation resistance                | 1.between DC+ and DC- $\geq$ 2000M $\Omega$ ;<br>2.between each DC+, DC- and each PE, S+, S-, A+, A- $\geq$ 2000M $\Omega$ ;<br>3.between PE and each S+, S-, A+, A- $\geq$ 2000M $\Omega$ ;<br>4.between each S+, S-, A+, A- $\geq$ 2000M $\Omega$ ;<br>5.between each DC+, DC- and temperature control $\geq$ 2000M $\Omega$ ;<br>*note:<br>*note: a. choose one connection, CC1, CC2 or PE;<br>b. the test voltage is: 1000V DC |
| IP degree                            | IP54 separated ; IP55 mated electrical part: IP67 (except for the mating surface)  |
| life cycle                           | $\geq$ 10000   |
| mating force                         | < 140N   |
| ambient temperature                  | -30 $^{\circ}$ C ~+ 50 $^{\circ}$ C  |
| temperature sensor type              | PT1000   |
| flame retardant rating               | UL 94 V-0  |
| power point surface plating material | Ag   |
| cable OD                             | $\Phi$ 30 $\pm$ 0.6mm  |
| bending radius                       | Minimum radius 10D of normal flow; Minimum storage radius 5D (coiled wire)   |
| cooling circuit                      | 1 inlet and 2 outlets  |
| Cooling pipe diameter                | liquid inlet: inner diameter $\Phi$ 6mm, ODmeter $\Phi$ 8mm;<br>liquid outlet: inner diameter $\Phi$ 9mm, ODmeter $\Phi$ 11mm  |
| minimum flow                         | 1.8L/min   |
| maxi working pressure                | 2.5Bar   |
| coolant                              | Biodegradable organic preparation  |
| coolant temperature                  | $\leq$ ambient temperature+5 $^{\circ}$ C  |

## product advantages

1. Light weight and better use experience;
2. Product styling design is full of sense of science , technology and future;
- 3, the cable diameter is thinner, lighter and completely get rid of the "bulky" label;
- 4, 12000 times of life cycle, more durable;
5. Passed the mud brine insertion test, meeting more stringent operating conditions;
- 6.Integrated low-voltage signal of PCB board, internal wiring is more concise and the assembly is more reliable ;

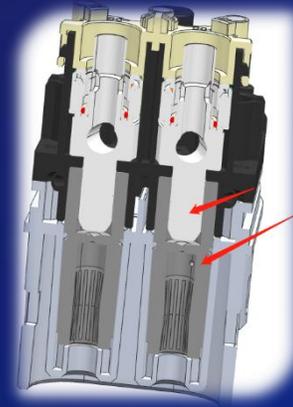


**\*② Utilization of Quick-Change of vehicle connector Head**

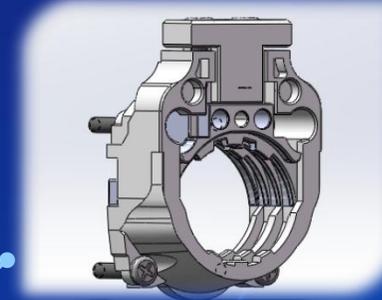


**\*① Cooling Component with Patent**

- One-In Two-Out Cooling Pipe, Minimization of Module Size
- Thread Connection Method

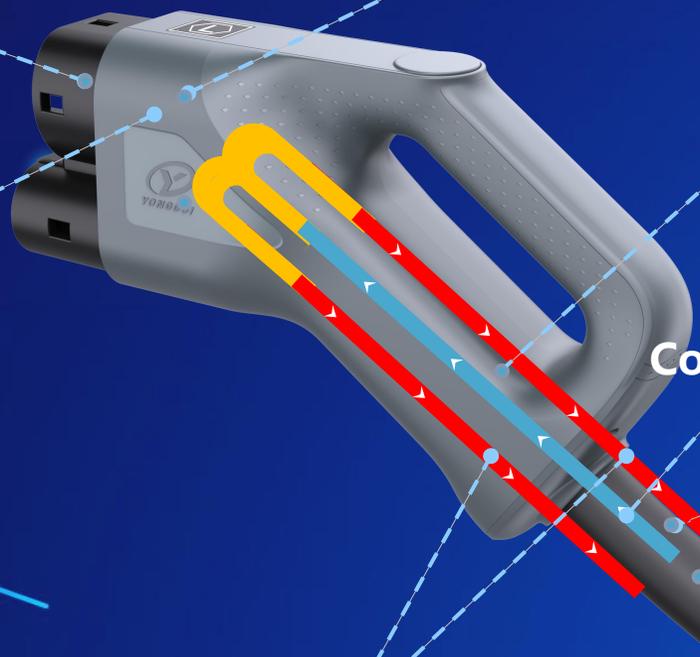


**\*③ Utilization of Quick - Change of Power Contacts**



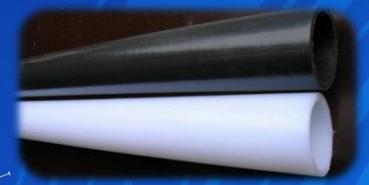
**\*④ Rear Cable Clip with Patent**

- Cable retention force >500N according to IEC requirement
- Hidden Type to ensure Coordination of appearance,
- Encapsulation for Signal Elements



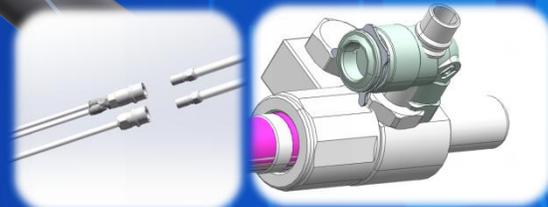
**Coolant Pipe: Inlet**

**Coolant Pipe: Outlet**



**\*⑤ Hi-Strength Coolant Pipe**

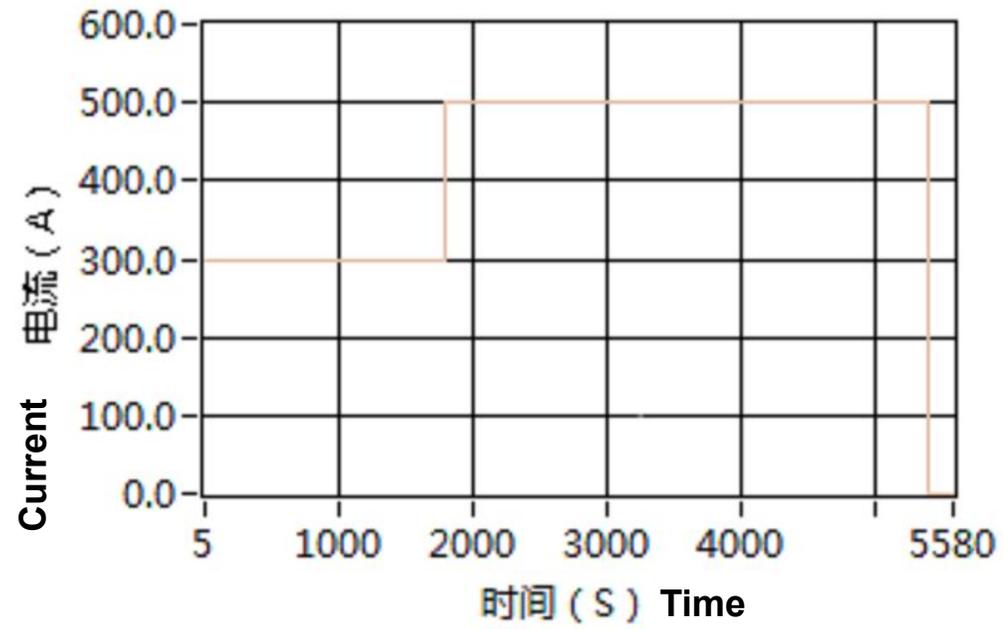
- Good Thermal-Stability, Small Deformation
- High Resistance of Liquid Pressure  $\geq 7\text{bar}$ ; But Pressure  $> 21\text{Bar}$



**\*⑥ Pile Solution**

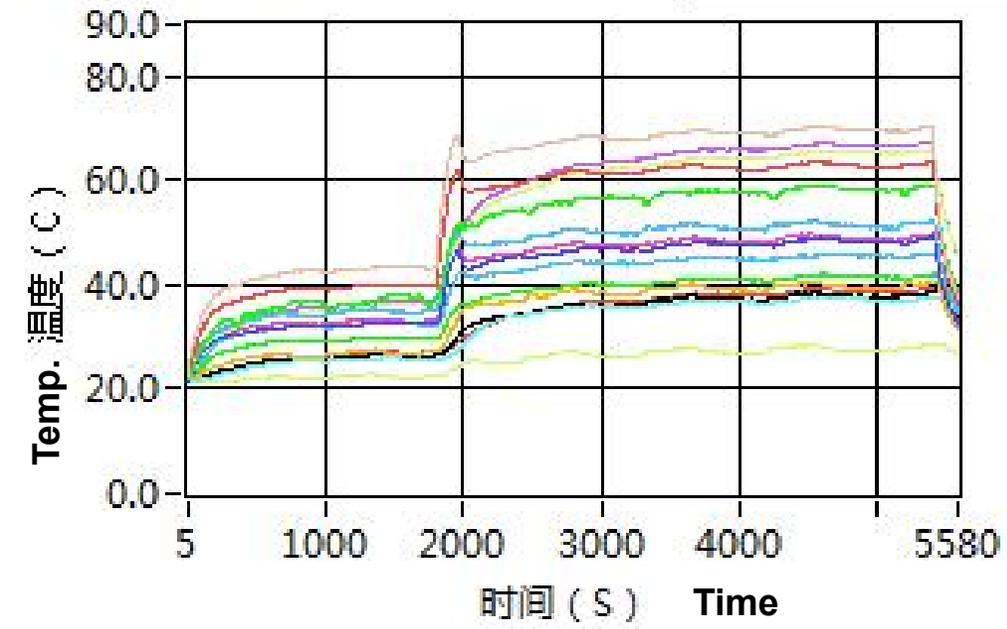
- Rapid Joint (Anti-Leakage Valve)
- 360° Joint for Coolant Rapid Connection

时间VS电流曲线 Time/Current Curve 曲线 0



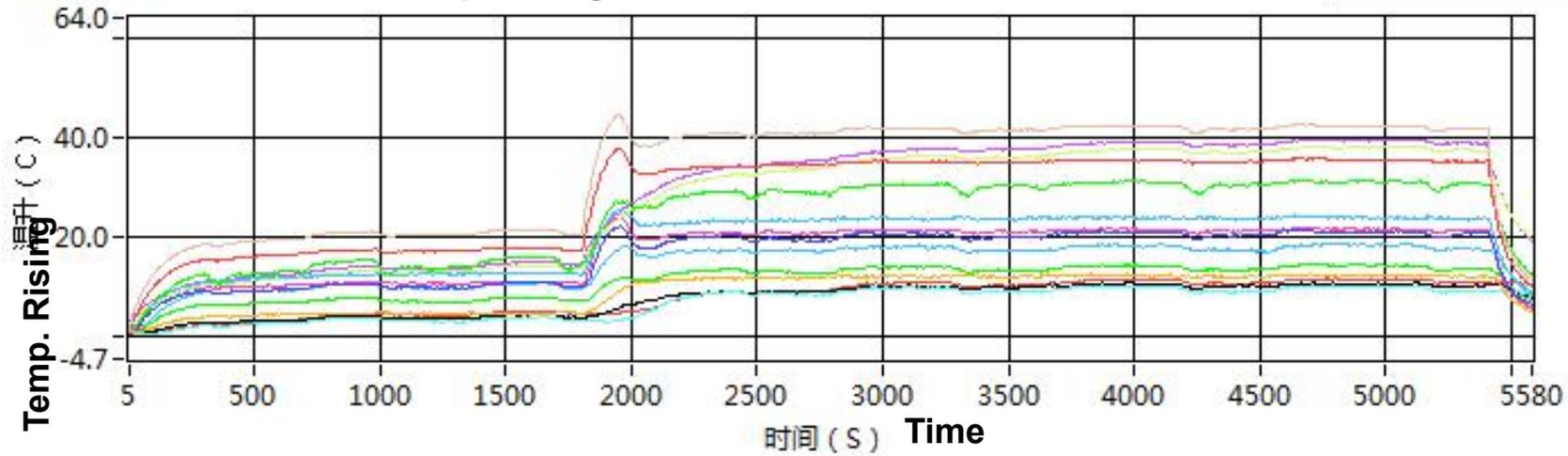
Current Loading

时间VS温度曲线 Time/Temp. Curve 曲线 0

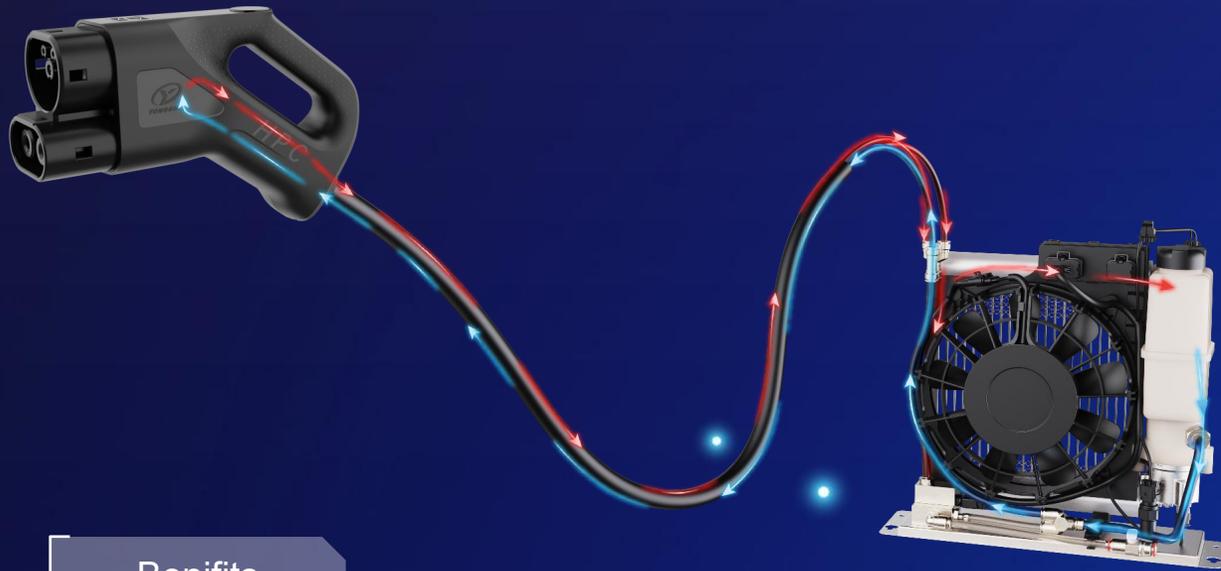


Temperature

时间VS温升曲线 Time/Temp. Rising Curve 曲线 0



Temp. Rising



## Benifits

1. Non-Conductive Coolant, Isolation on Whole System, High Safety;
2. Direct Touch Between Coolant and Thermal-Contact, Good Heat Conduction, Good Cooling Efficiency
3. High Component Intergration
4. Proper Dimension Design for Friendly Usage and Simplize Layout in Charging Pile

## Performance Datasheet

### YGC-ENLCS-O-600

|                |                        |
|----------------|------------------------|
| Charging Power | 600kw                  |
| Cooling Method | Non-Conductive Coolant |
| Charging Plug  | YGC-ENHPC-O-600, CCS2  |
| Cable Length   | 5m                     |

### Cooling System

|                        |                               |                        |                            |
|------------------------|-------------------------------|------------------------|----------------------------|
| Size                   | 435×155×400(mm)               | Working Pressure       | 0~0.7MPa                   |
| Inlet Voltage          | DC12V                         | Expansion Pot Volume   | 1.5 L                      |
| Coolant                | Biodegradable Organic Coolant | Noise                  | ≤60dB (A)                  |
| Liquid Pressure        | 0.6Mpa                        | Protection             | IP 68                      |
| Working Temperature    | -40°C-50°C                    | Weight                 | 7Kg                        |
| Heat Dissipation Power | 3.0KW@4L/min.<br>700m³/h      | Communication Protocol | Based on Modbus<br>485/232 |
| Power                  | ≤200W                         | Control Method         | Automatic                  |
| Cooling Flow Rate      | 4L/min@450Kpa                 | Life                   | 25000h                     |



## Benifits

1. Direct touchment of Heating Point, More Uniform Distribution, Higher Cooling Efficiency
2. Realization of Direct Touch Between Metal and Coolant due to Non-Conductive Feature of the Coolant
3. Good Heat-Stability and Oxidation Stability for Longer Life
4. Biodegradable to Avoid Environmental Pollution in the event of Leakage Accident

## Performance Datasheet

| Items       | Coolant Performance              | Test Method |
|-------------|----------------------------------|-------------|
| Chroma      | >+30                             | ASTM D156   |
| Density     | 808kg/m <sup>3</sup> , @15°C     | ASTM D4052  |
| Flash Point | 198°C                            | ASTM D92    |
| Pour Point  | -51°C                            | ASTM D97    |
| Viscosity   | 9.9mm <sup>2</sup> /s, @40°C     | ASTM D445   |
|             | 52.3mm <sup>2</sup> /s, @0°C     | ASTM D7042  |
|             | 1292.7mm <sup>2</sup> /s, @-40°C | ISO 3104    |
| Acid Value  | < 0.01                           | IEC 62021-1 |

03

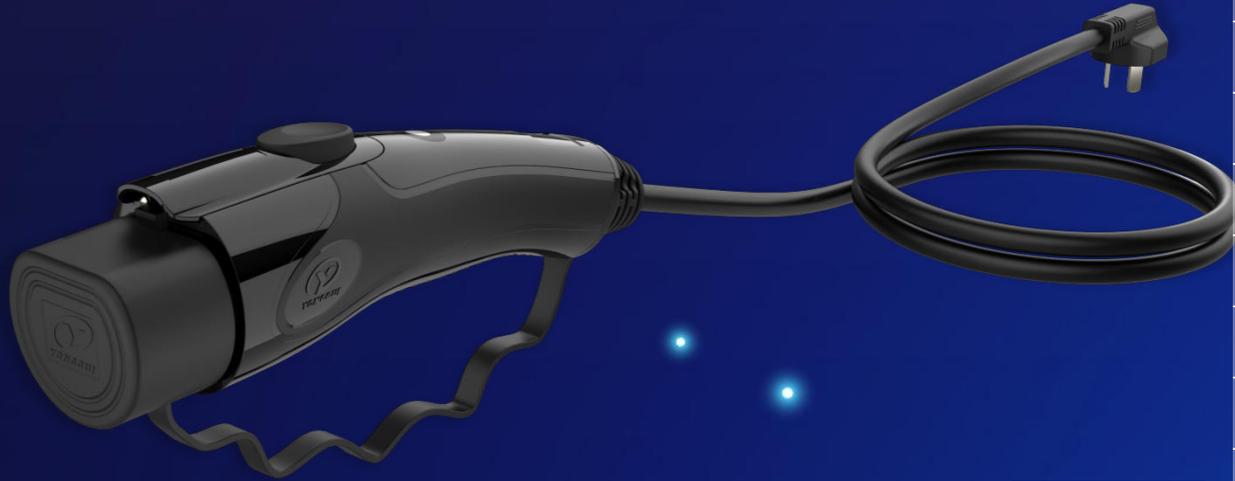
# Consumer products





# YG1348 GB AC vehicle connector

Mode 2 case B



## product advantages

1. The overall size is small and easy to store;
2. Altitude 4000m optional;
3. The control box is cancelled, making it more convenient to carry;
4. When the cable length is the same, the weight is reduced to 60% of the original;

## Technical Data

| items                                | 10A series   | 16A series  |
|--------------------------------------|--|---|
| power phases                         | 1 phase  | 1 phase   |
| executive standard                   | GB/T 18487.1-2015  | GB/T 20234.1-2015 GB/T 20234.2-2015                   |
| charging mode                        | charging mode2, caseB  |   |
| rated voltage                        | 220V AC  | 220V AC   |
| rated current                        | 8A AC  | 13A AC  |
| withstand voltage                    | between each L1、 N and PE≥2000V AC 1min                            |   |
| insulation resistance                | between each L1、 N and PE≥500MΩ (*note: test voltage is : 500V DC) |   |
| IP degree                            | IP54 separated ; IP55 mated  | electrical part: IP67 (except for the mating surface) |
| life cycle                           | ≥10000   |   |
| mating force                         | < 100N   |   |
| ambient temperature                  | -30°C ~ +50°C  |   |
| flame retardant rating               | UL94 V-0   |   |
| power point surface plating material | Ag   |   |
| cable OD                             | Φ11±0.3mm  | Φ11±0.3mm   |
| cable structure                      | 3×1.5  | 3×2.5   |



# YG1143 GB AC discharging connector



## Technical Data

| items                                |                           | 16A series   |
|--------------------------------------|---------------------------|--|
| power phases                         |                           | 1 phase  |
| executive standard                   |                           | GB/T 20234.1-2015 GB/T 20234.2-2015 GB/T 2099.7-2015   |
| discharge mode                       |                           | discharging mode 1.1, caseB  |
| rated voltage                        |                           | 220V AC  |
| rated current                        |                           | 16A AC   |
| withstand voltage                    |                           | 1.between L1 and N $\geq$ 2000V AC 1min;<br>2.between each L1、 N and PE $\geq$ 1500V AC 1min;<br>*note: choose one connection,CC or PE |
| insulation resistance                |                           | between each L1、 N、 PE $\geq$ 500M $\Omega$ ;<br>*note:<br>choose one connection,CC or PE<br>test voltage is: 500V DC.                 |
| IP degree                            | vehicle plug              | IP54 separated ; IP55 mated electrical part: IP67 (except for the mating surface)  |
|                                      | discharging vehicle inlet | IPXXB  |
| life cycle                           | vehicle plug              | $\geq$ 10000   |
|                                      | discharging vehicle inlet | $\geq$ 5000  |
| mating force                         |                           | < 100N   |
| ambient temperature                  |                           | -30 $^{\circ}$ C ~ +50 $^{\circ}$ C  |
| flame retardant rating               |                           | UL94 V-0   |
| power point surface plating material |                           | Ag   |
| cable OD                             |                           | $\Phi$ 8.5 $\pm$ 0.2mm   |
| cable structure                      |                           | 3 $\times$ 1.5   |

### product introduction

This product is used for external discharge of electric vehicles to provide power for third party loads.  
It is easy to use and the cable length can be customized.



# YG196-455 GB discharging connector

## Technical Data



### product introduction

This product is used for external discharge of electric vehicles to provide power. This product has indicator light, which can show different using status. This product has over temperature protection, leakage protection and over current protection and other safety protection functions. The gun housing adopts two-color collocation, beautiful and fashionable, the application of blue soft glue, provides its comfortable grip experience.

| items                                | 16A series  |  |
|--------------------------------------|---|--|
| power phases                         | 1 phase   |  |
| executive standard                   | GB/T 20234.1-2015   | GB/T 20234.2-2015 GB/T 2099.7-2015                     |
| discharge mode                       | discharging mode 1.1, case B  |  |
| rated voltage                        | 220V AC   |  |
| rated current                        | 16A AC  |  |
| withstand voltage                    | 1.between L1 and N≥2000V AC 1min;<br>2.between each L1、N and PE≥1500V AC 1min;<br>*note: choose one connection,CC or PE |  |
| insulation resistance                | between each L1、N、PE≥500MΩ;<br>*note:<br>choose one connection,CC or PE<br>the test voltage is: 500V DC.                |  |
| IP degree                            | vehicle plug  | IP54 separated ; IP55 mated                            |
|                                      | 3 holes vehicle inlet   | IP55 (close the protective cover of the vehicle inlet) |
| life cycle                           | vehicle plug  | ≥10000   |
|                                      | 3 holes vehicle inlet   | ≥5000  |
| mating force                         | < 100N  |  |
| ambient temperature                  | -30°C ~ +50°C   |  |
| flame retardant rating               | UL94 V-0  |  |
| power point surface plating material | Ag  |  |

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# Product Customer Applications



**Geely AC vehicle inlet**



**BYD AC vehicle inlet**



**EN Type2 AC socket-outlet**



**Jinkang AC/DC vehicle inlet**



**SGMW Mode2 AC vehicle connector**



**Xpeng AC vehicle connector**



**HONDA Mode 2 AC vehicle connector**



**HUAWEI AITO AC vehicle connector**



**HUAWEI discharge connector**



**BYD 3rd generation AC vehicle connector**



**BYD 4th generation AC vehicle connector**



**FAW AC vehicle connector with discharging function intergrated**



**ZEEKR HPC vehicle connector**



**AVATR HPC vehicle connector**



**HUAWEI HPC vehicle connector**



**LI Auto HPC vehicle connector**



**EN CCS2 HPC vehicle connector**



**South Grid Chaoji HPC vehicle connector**





The above are part of customers of Yonggui new energy charging products.

*YONGGUI*

CONNECTION TO FUTURE