

# Product Specification

- Product : QC4.10 Connector
- Customer : JA Solar
- Supplier : QC Solar

| Acknowledge Signature |               |                |                      |    |            |
|-----------------------|---------------|----------------|----------------------|----|------------|
| QC Acknowledge        |               |                | Customer Acknowledge |    |            |
| Approved<br>by        | Checked<br>by | Designed<br>by | Purchaser            | QA | Technicist |
|                       |               |                |                      |    |            |

**QC Solar (Suzhou) Corporation**

No. 31 Xinfu Road, SIP, Suzhou, China

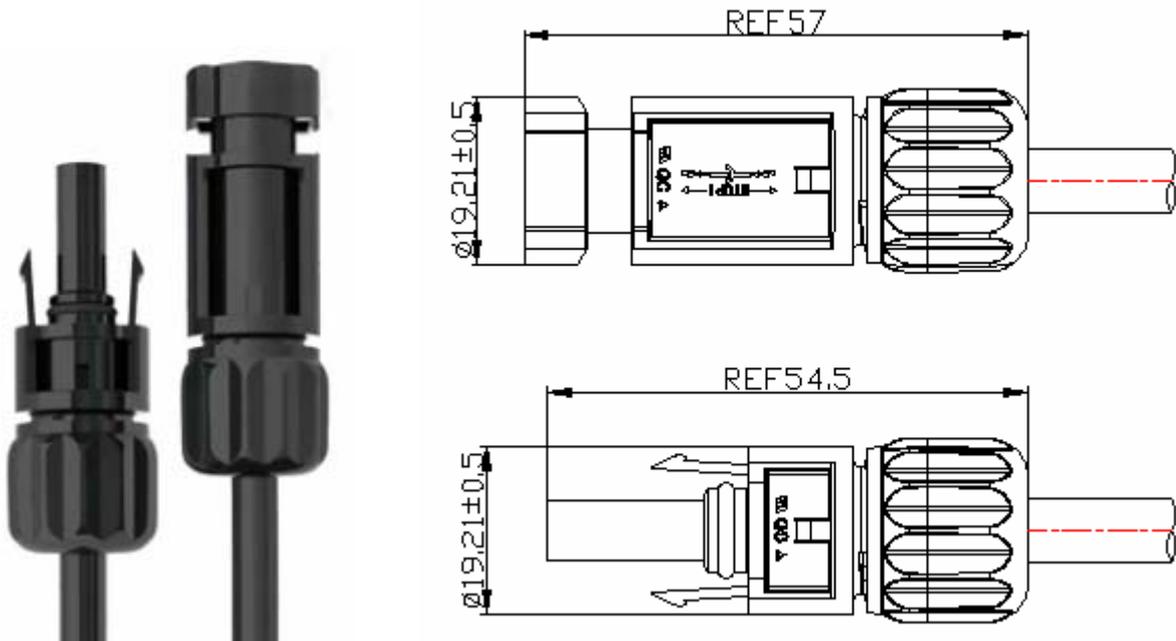
TEL :0512-62603391

FAX :0512-62603396

# Catalogue

|  |       |
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### 1. Product appearance and performance parameter:



TUV certification No.: R50188687

UL certification No.: E340004

Rated voltage: TUV1000V/UL600V

Rated current: 25A (2.5 mm<sup>2</sup>-6mm<sup>2</sup> cable)

Resistance: MAX:5m $\Omega$  (Except cable resistance)

Environment temperature: -40 $^{\circ}$ C  $\sim$  +85 $^{\circ}$ C

Connector pull-out force: Min 80N

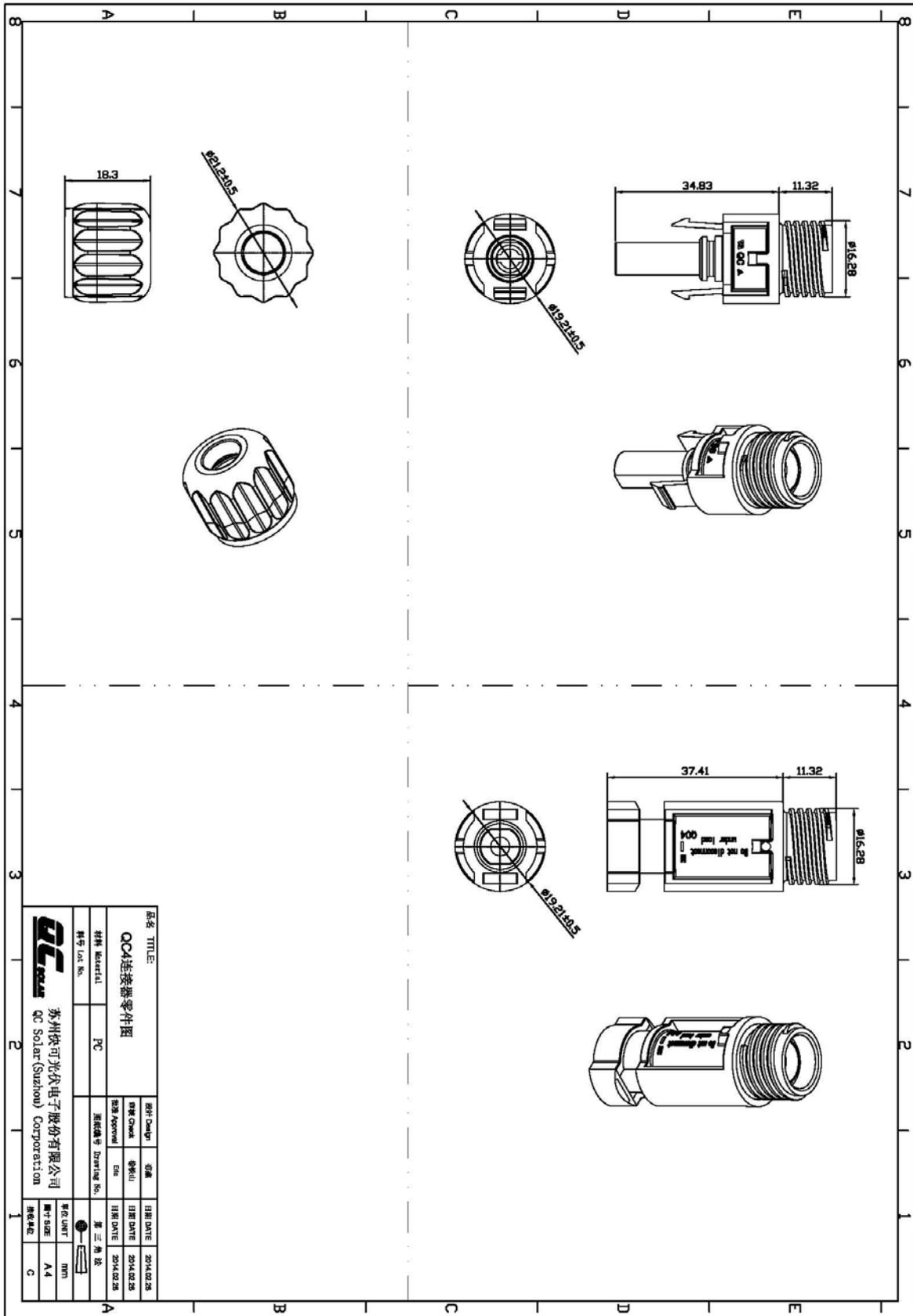
Insert and pull out for age test: 50 times

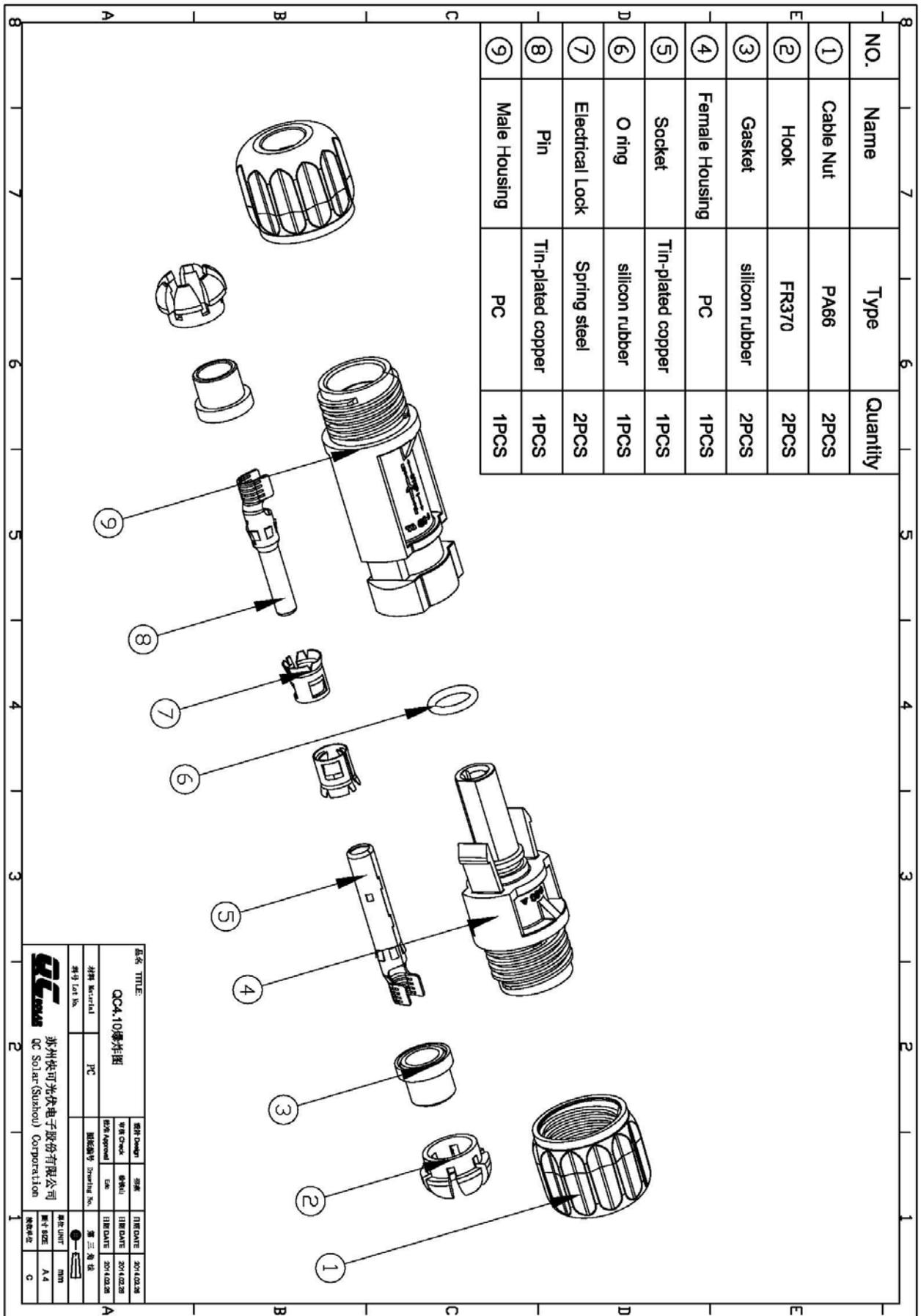
IP degree: IP67

2. BOM list:

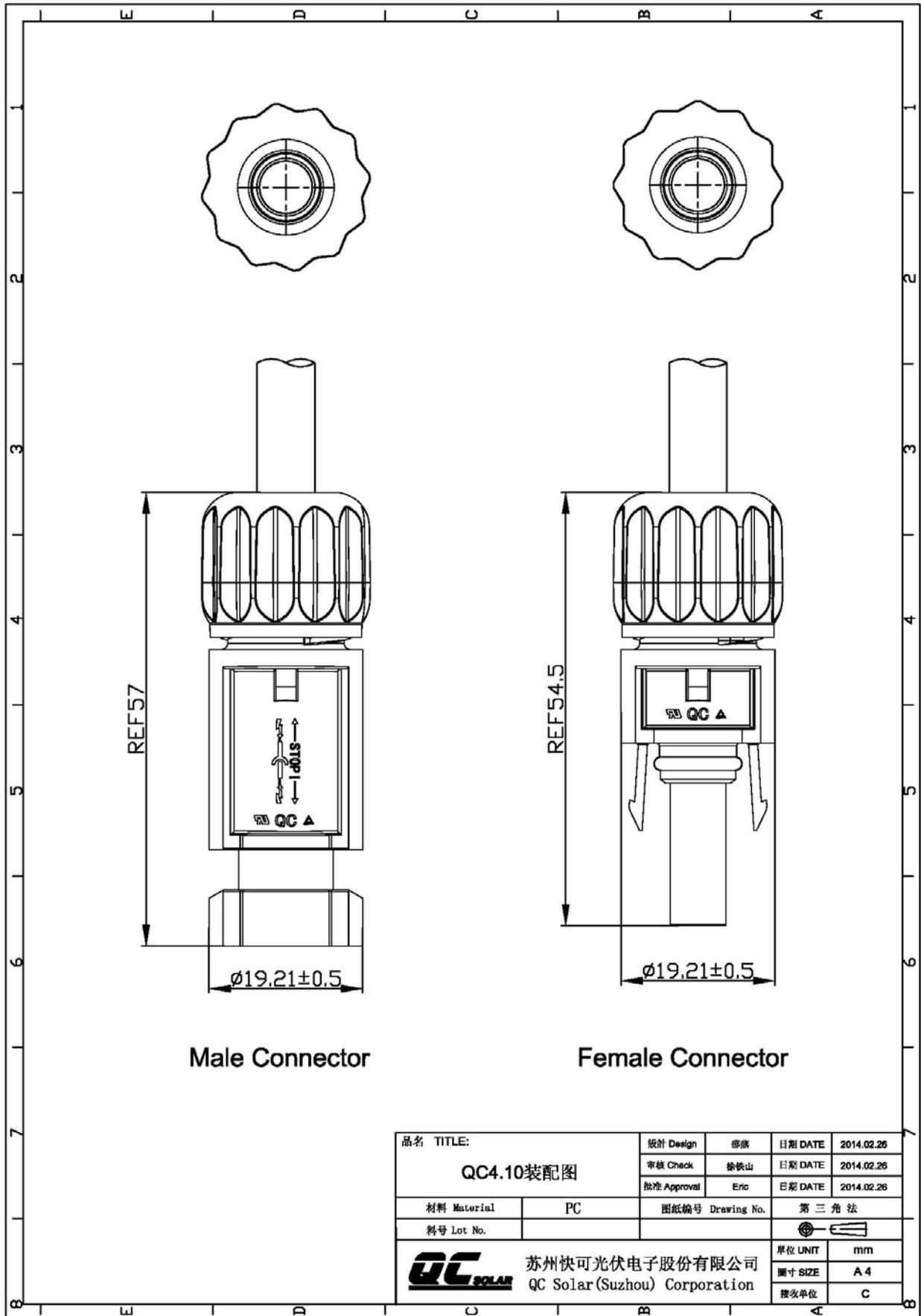
|  QC Solar (Suzhou) Corporation |                    |                   |          |                 |            |
|---|--------------------|-------------------|----------|-----------------|------------|
| Name  | QC4.10 connector   | Bill Of Materials |          | version         | A0         |
| Type  | QC4.10             | Bill Of Materials |          | page            | 1          |
| Customer  | JA Solar           | Bill Of Materials |          | date            | 2014.02.20 |
| number  | name               | material          | supplier | qty             | Remark     |
| 1   | QC4.10 negative    | PC                | /        | 1 pcs           |            |
| 2   | QC4.10 positive    | PC                | /        | 1 pcs           |            |
| 3   | QC4.10 plastic nut | PA66              | /        | 2 pcs           |            |
| 4   | QC4 pin            | copper tinned     | /        | 1 pcs           |            |
| 5   | QC4 socket         | copper tinned     | /        | 1 pcs           |            |
| 6   | Inner circlip      | steel             | /        | 2 pcs           |            |
| 8   | O-ring             | silicon           | /        | 1 pcs           |            |
| 9   | gasket             | silicon           | /        | 2 pcs           |            |
| 10  | positive label     | /                 | /        | 1 pcs           |            |
| 11  | negative label     | /                 | /        | 1 pcs           |            |
| 12  | warning label      | /                 | /        | 1 pcs           |            |
| 13  |                    |                   |          |                 |            |
| 14  |                    |                   |          |                 |            |
| 15  |                    |                   |          |                 |            |
| 16  |                    |                   |          |                 |            |
| 17  |                    |                   |          |                 |            |
| 18  |                    |                   |          |                 |            |
| 19  |                    |                   |          |                 |            |
| 20  |                    |                   |          |                 |            |
| All above material can meet ROHS requirement  |                    |                   |          |                 |            |
| Made by: 邵燕   |                    | Checked by: 徐铁山   |          | Approved by: 郭浪 |            |

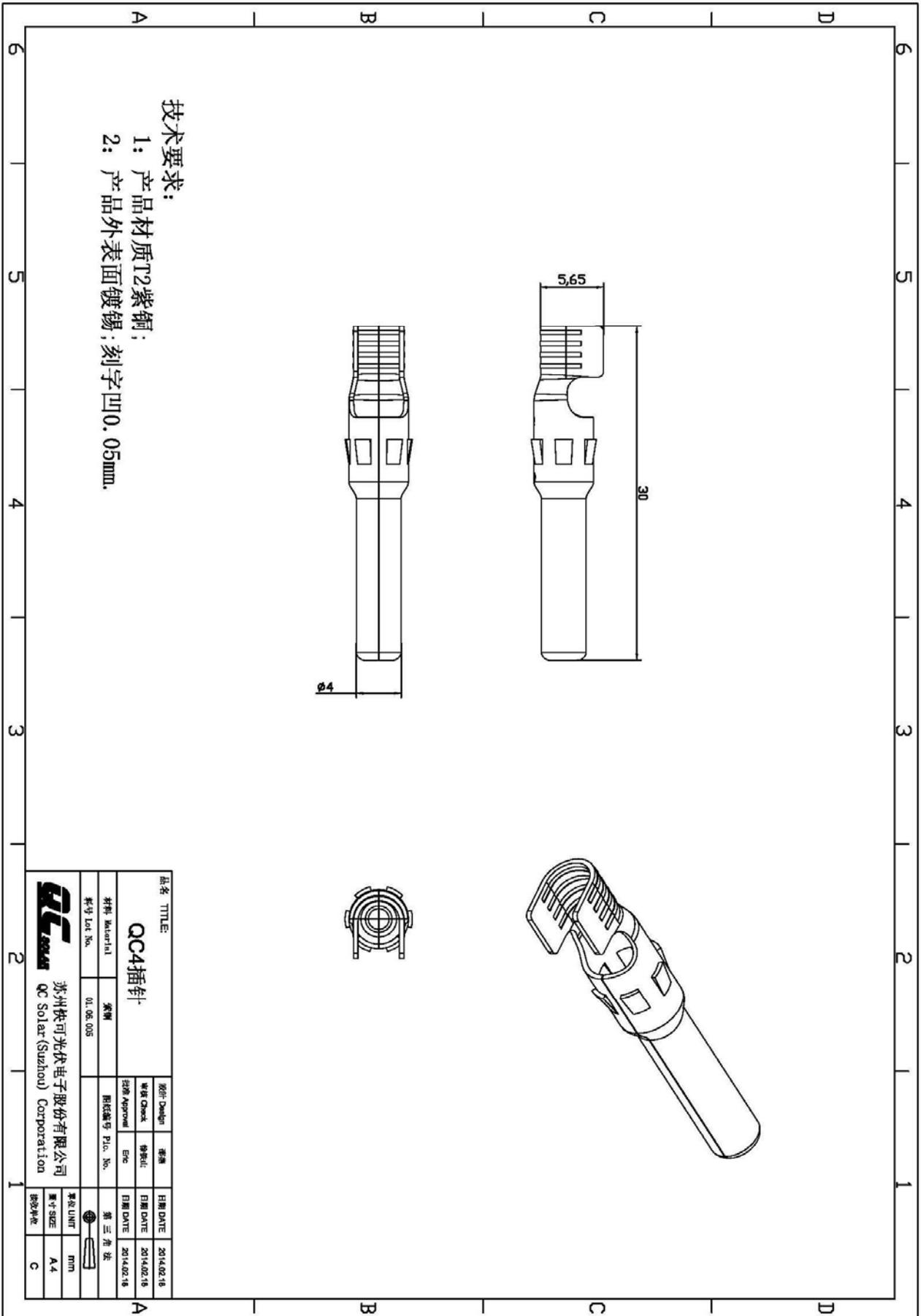
### 3. Drawing:





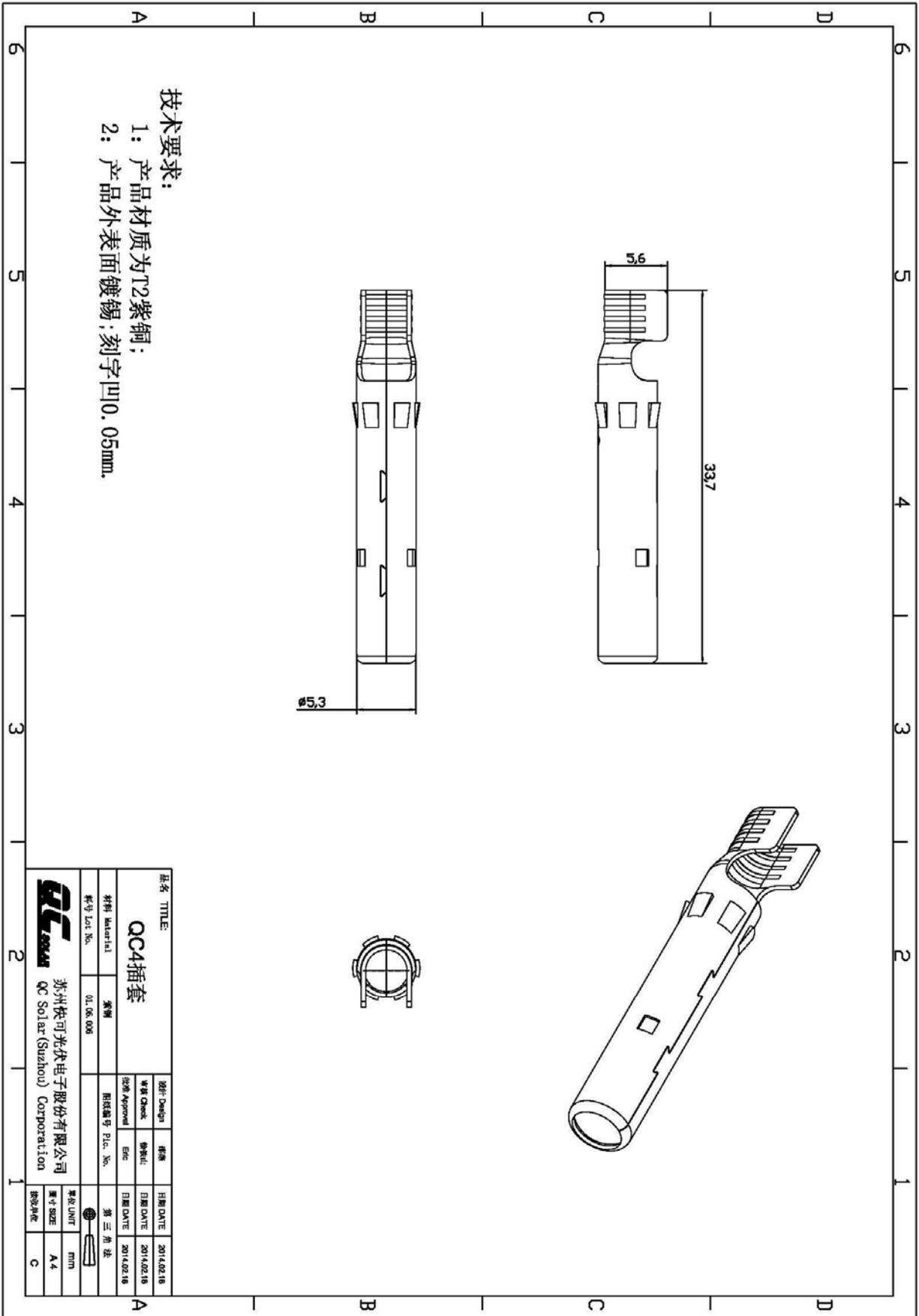
|                               |                               |                               |            |
|-------------------------------|-------------------------------|-------------------------------|------------|
| 品名 TITLE                      |                               | QC4.10爆炸图                     |            |
| 料号 Material No.               | PC                            | 图号 Drawing No.                | 第三版        |
| 设计 Design                     | 审核                            | 日期 DATE                       | 2014.02.28 |
| 检查 Check                      | 日期 DATE                       | 2014.02.28                    |            |
| 批准 Approval                   | 日期 DATE                       | 2014.02.28                    |            |
| QC Solar (Suzhou) Corporation | QC Solar (Suzhou) Corporation | QC Solar (Suzhou) Corporation |            |

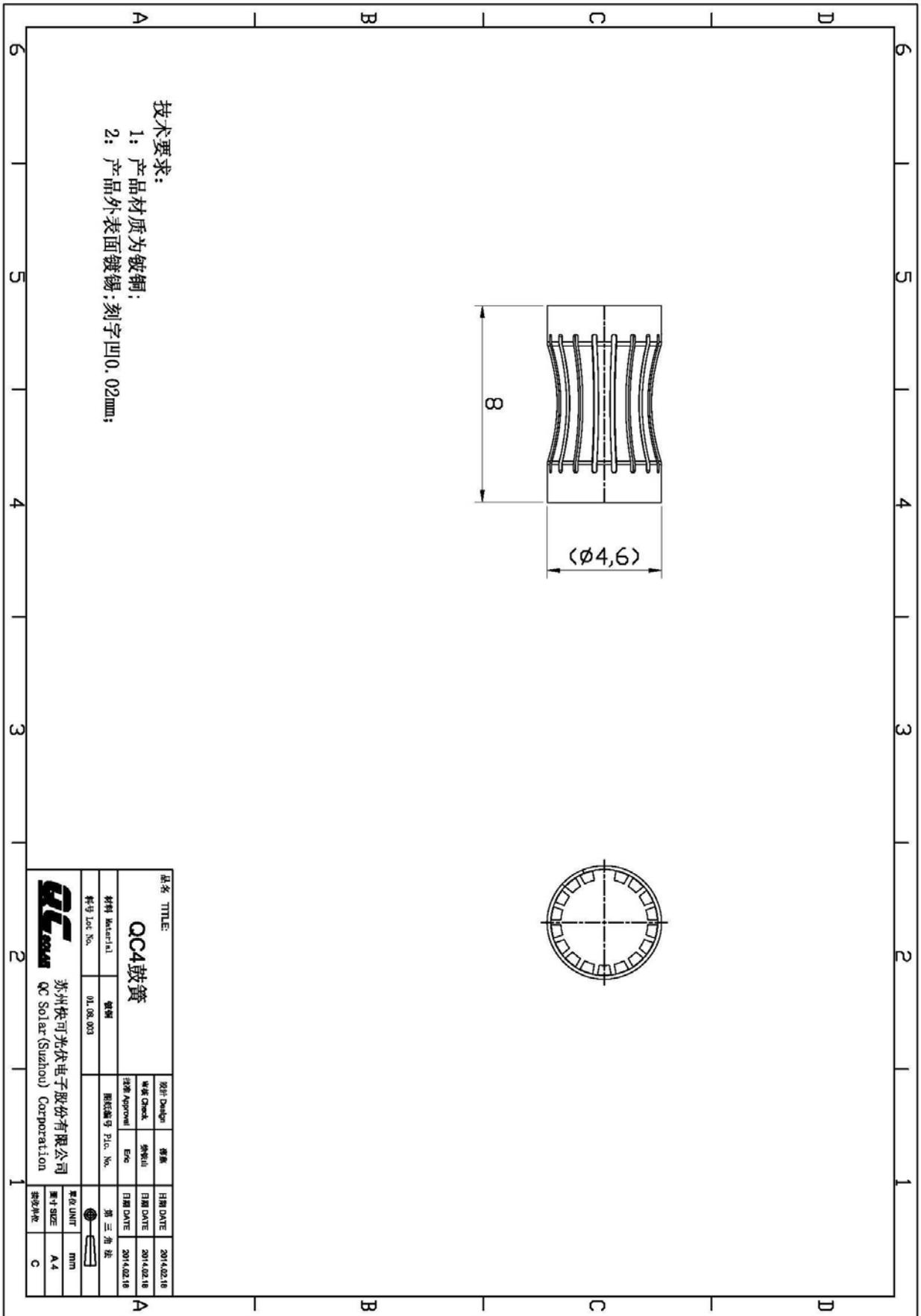




技术要求:  
 1: 产品材质T2紫铜;  
 2: 产品外表面镀锡; 刻字凹0.05mm.

|                               |          |           |      |         |            |
|-------------------------------|----------|-----------|------|---------|------------|
| 品名                            | TITLE:   | QC4插针     | 设计   | 日期 DATE | 2014.02.18 |
| 材料                            | Material | 紫铜        | 审核   | 日期 DATE | 2014.02.18 |
| 料号                            | Lot No.  | 01.06.005 | 批准   | 日期 DATE | 2014.02.18 |
| QC Solar (Suzhou) Corporation |          | 图控编号      | 图控编号 | 图控编号    | 图控编号       |
| 苏州快可光伏电子股份有限公司                |          | 第三角法      |      |         |            |
| QC Solar (Suzhou) Corporation |          | 单位        | mm   | 尺寸      | A 4        |
| QC Solar (Suzhou) Corporation |          | 比例        | 1:1  | 图号      | C          |





## 4. TUV certification:

| <b>Zertifikat</b>  |   | <b>Certificate</b>  |   |    |             |
|--|---|---|---|---|-------------|
| <b>Zertifikat Nr. Certificate No.</b>  | R 50215466  | <b>Blatt Page</b>   | 0001  |   |             |
| <b>Ihr Zeichen Client Reference</b>  | L.J.Y.  | <b>Unser Zeichen Our Reference</b>  | 01-TKQ- 15049597 004  | <b>Ausstellungsdatum</b>  | 28.04.2014  |
|  |   |   |   | <b>Date of Issue</b>  | (day/mo/yr) |
| <b>Genehmigungsinhaber License Holder</b>  |   |   | <b>Fertigungsstätte Manufacturing Plant</b>   |   |             |
| QC Solar (Suzhou) Corporation<br>No. 31, Xinfu Road, SIP<br>Suzhou 215123<br>P.R. China  |   |   | QC Solar (Suzhou) Corporation<br>No. 31, Xinfu Road, SIP<br>Suzhou 215123<br>P.R. China |   |             |
| <b>Prüfzeichen Test Mark</b>   |   | <b>Geprüft nach Tested acc. to</b>  |   |   |             |
|    |   | EN 50521:2008+A1  |   |   |             |
|  |   | Bauart geprüft<br>Sicherheit<br>Regelmäßige<br>Produktions-<br>Überwachung<br><br>www.tuv.com<br>ID 2000000000  |   |   |             |
| <b>Zertifiziertes Produkt (Geräteidentifikation)</b>   | <b>Certified Product (Product Identification)</b> |   |   | <b>Lizenzentgelte - Einheit</b>   |             |
|  |   |   |   | <b>License Fee - Unit</b>   |             |
| <b>Steckverbinder (Connector for Photovoltaic System)</b>  |   |   |   |   |             |
| Type Designation   | :   | QC4.10-ab (a=1 or 2 or 3 or 4;<br>b=1 or 2 or 3) (QC)   |   |   | 17          |
| Rated Voltage  | :   | 1000VDC for QC4.10-11; QC4.10-12;<br>QC4.10-13; QC4.10-21; QC4.10-22;<br>QC4.10-23;<br>1500VDC for QC4.10-31; QC4.10-32;<br>QC4.10-33; QC4.10-41; QC4.10-42;<br>QC4.10-43 |   |   |             |
| Rated Current  | :   | 30A for QC4.10-11; QC4.10-21;<br>QC4.10-31; QC4.10-41;<br>35A for QC4.10-12; QC4.10-22;<br>QC4.10-32; QC4.10-42;<br>40A for QC4.10-13; QC4.10-23;<br>QC4.10-33; QC4.10-43 |   |   |             |
| Continued on page 0002   |   |   |   |   |             |
| 17   |   |   |   |   |             |
| <p>Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.</p> <p>This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.</p> |   |   |   |   |             |
| <b>TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg</b><br>Tel.: (+49/221)8 06 - 13 71 e-mail: cert-validity@de.tuv.com<br>Fax: (+49/221)8 06 - 39 35 http://www.tuv.com/safety  |   |   |   | <br><b>Zertifizierungsstelle</b><br>Dipl.-Ing. (FH) Bernd Scheirer |             |

## 5. Patents:

证书号第1275970号



## 实用新型专利证书

实用新型名称: 大电流电缆户外连接器

发明人: 段正刚;王新林

专利号: ZL 2008 2 0186532.9

专利申请日: 2008年10月24日

专利权人: 苏州快可光伏电子有限公司

授权公告日: 2009年9月9日

本实用新型经过本局依照中华人民共和国专利法进行初步审查, 决定授予专利权, 颁发本证书并在专利登记簿上予以登记。专利权自授权公告之日起生效。

本专利的专利权期限为十年, 自申请日起算。专利权人应当依照专利法及其实施细则规定缴纳年费。缴纳本专利年费的期限是每年10月24日前一个月内。未按照规定缴纳年费的, 专利权自应当缴纳年费期满之日起终止。

专利书记载专利权登记时的法律状况。专利权的转移、质押、无效、终止、恢复和专利权人的姓名或名称、国籍、地址变更等事项记载在专利登记簿上。



局长 



2009年9月9日

第 1 页 (共 1 页)

## 6. Assembly instruction:



苏州快可光伏电子股份有限公司

### QC4.10 产品规格说明



**PV-母电缆连接器**  
PV-Female cable coupler

|       |   |
|-------|---|
| 名称    | QC4.10连接器   |
| 额定电压  | TUV1000V/UL1000V  |
| 额定电流  | 2.5mm <sup>2</sup> 4mm <sup>2</sup> 6mm <sup>2</sup><br>25A 30A 40A |
| 安全等级  | II  |
| 防护等级  | IP67 Closed   |
| 连接器电阻 | MAX: 5mΩ  |
| 防火等级  | UL94 V-0  |
| 环境温度  | -40℃~85℃  |

### QC4.10 Product Specifications

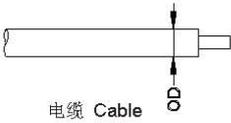


**PV-公电缆连接器**  
PV-Male cable coupler

|                         |   |
|-------------------------|---|
| Type                    | QC4.10 Connector  |
| Rated Voltage           | TUV1000V/UL1000V  |
| Rated Current           | 2.5mm <sup>2</sup> 4mm <sup>2</sup> 6mm <sup>2</sup><br>25A 30A 40A |
| Protection Class        | II  |
| Degree of Protection    | IP67 Closed   |
| Resistance of Connector | MAX: 5mΩ  |
| Flammability Class      | UL94 V-0  |
| Temperature Range       | -40℃~85℃  |

### QC4.10 型号

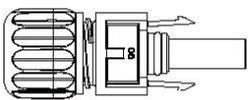
### QC4.10 Type



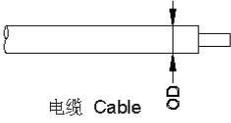
电缆 Cable



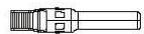
插套 Female Terminal



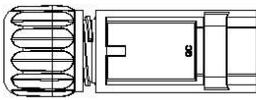
正极 Positive pole



电缆 Cable



插针 Male Terminal



负极 Cathode

| 连接器型号<br>Connector type | OD(mm)---电缆线直径<br>OD(mm)---Cable OD |        | 拧紧扭矩<br>Torque for close up | 参考间隙<br>Reference gap |
|-------------------------|-------------------------------------|--------|-----------------------------|-----------------------|
|                         | 最小 Min                              | 最大 Max |                             |                       |
| QC4.10-A                | 5                                   | 6      | 2.8±0.3N.m                  | 1.6±0.5mm             |
| QC4.10-B                | 6                                   | 6.9    | 3.5±0.3N.m                  | 1.6±0.5mm             |
| QC4.10-C                | 6.9                                 | 7.5    | 4.5±0.3N.m                  | 1.6±0.5mm             |

※ 本规范所定义扭矩为典型值, This standard as defined the torque is a typical value.  
 无论如何, 紧固扭矩都应该根据所用电缆线的不同, 调节到最佳值。Anyway, should according to different specific PV cable to tighten torque, adjust it to the best value.

表单编号: QC/JL-YF-040 (REV:A)

1/5



苏州快可光伏电子股份有限公司

## 安装使用说明书

### PV-母电缆连接器

### PV-公电缆连接器

- ▶ 在自行安装时，如果所用的零件和工具不是QC所规定的，或者忽略了准备和安装操作，我们将不保证产品安全性和技术参数一致性。

⚠ 为防止电击，在拆装时PV连接器必须断开电源。

⚠ 终端产品必须提供防电击功能。

- ▶ 不建议使用PVC电缆。

- ▶ 在负载情况下拔出：在有负载的情况下，不能拔出PV接头连接器！关掉DC/AC直流-交流变频器或打开DC交流电路断路器，使PV接头连接器处于无负载的状态，则可在允许范围内带电插拔。

- ▶ 建议不要使用H07RN-F无镀锡电缆，因为电缆铜线被氧化后，压接部位的接触电阻可能会超过允许值。

- ▶ 断开的连接器必须使用防护帽，以防止灰尘和水进入。

- ▶ 插合部件防水等级IP67。它们不能长久置于水下使用。不要将QC-PV连接器放在屋顶表面。

- ▶ 产品不得在含有烃、酚、酮、氨合物等与塑料有腐蚀的环境中使用时。安装过程中，禁止在连接器里添加或涂抹任何油脂及润滑剂。

## Assembly instructions

### PV-Female cable coupler

### PV-Male cable coupler

- ▶ During your self installation, if the used part and tool are not ruled by QC or if you ignore the preparation and operation, we won't insure the safety and compatible of the product technology your self installation.

⚠ For protecting against electric shock, pls cut off the power when installing PV connector.

⚠ The final products must be supplied with the function electric shock proof.

- ▶ PVC Cable are not recommended.

- ▶ Don't pull out the PV connector under loading. Turn off the DC/AC inverter or turn on DC circuit interrupter, making PV connector in unloading. Then insert and extract under voltage is permitted.

- ▶ H07RN cables without tinned are not recommended. Cause the contact resistance of crimping place will probably exceed the permitted value since the copper wires are oxidated.

- ▶ Sealing cap must be used for disconnected connector, avoiding dust and water.

- ▶ Waterproof degree for inserted parts is IP67. They can't be put under water for long time. Don't put QC-PV connector on the roof of surface.

- ▶ Do not use under hydrocarbon, phenol, ketone ammonia and plastic corrosive environment. During installation process, do not add any grease and lubricant in the connector.



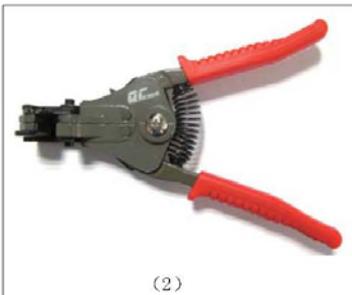
## 工具要求：

(1) 工具箱

## Requirements for tools:

(1) Tool box

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(2)

(2) 剥线钳

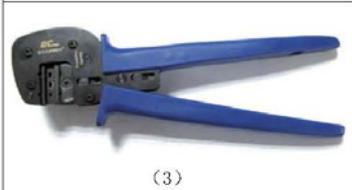
| 剥线钳型号  | 剥线范围               |       |
|--------|--------------------|-------|
| 2.5/14 | 2.5mm <sup>2</sup> | 14AWG |
| 4.0/12 | 4.0mm <sup>2</sup> | 12AWG |
| 6.0/10 | 6.0mm <sup>2</sup> | 10AWG |

订货号: 02.04.008

(2) Strip Clamp

| Type   | Crimping Range     |       |
|--------|--------------------|-------|
| 2.5/14 | 2.5mm <sup>2</sup> | 14AWG |
| 4.0/12 | 4.0mm <sup>2</sup> | 12AWG |
| 6.0/10 | 6.0mm <sup>2</sup> | 10AWG |

Order No. 02.04.008



(3)

(3) 铆接钳

| 铆接钳印字  | 铆接范围               |       |
|--------|--------------------|-------|
| 2.5/14 | 2.5mm <sup>2</sup> | 14AWG |
| 4.0/12 | 4.0mm <sup>2</sup> | 12AWG |
| 6.0/10 | 6.0mm <sup>2</sup> | 10AWG |

订货号: 02.04.007

(3) Rivet Clamp

| Mark   | Riveting Range     |       |
|--------|--------------------|-------|
| 2.5/14 | 2.5mm <sup>2</sup> | 14AWG |
| 4.0/12 | 4.0mm <sup>2</sup> | 12AWG |
| 6.0/10 | 6.0mm <sup>2</sup> | 10AWG |

Order No. 02.04.007



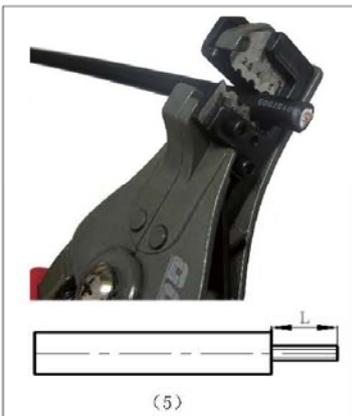
(4)

(4) 开口塑料扳手  
1套=2片

- ① 订货号: 06.49.007
- ② 订货号: 06.49.015

(4) Plastic spanner 1 set=2 pieces

- ① Order No. 06.49.007
- ② Order No. 06.49.015



(5)

组装步骤:

- (5) 剥线, 剥离电缆绝缘层。L=7±0.5mm。  
注意不要剪断绝缘层下的线芯。

Assembly step:

- (5) Strip the insulating layer of cable.  
L=7±0.5mm. Be attention and not  
to cut off the wire core.



(6)

- (6) 铆接插针插套。需保证金属件与电缆线的同心度。铆接后电缆线与金属件的拉力需≥310N。

- (6) Rivet terminal. Ensure the concentricity of metal parts and cable at same level, crimped metal parts and cable pull tension ≥310N.

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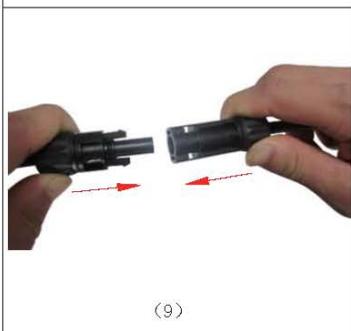
(7) 将铆接好的插头插入插座或插头的绝缘套，直到其啮合。轻轻拉动导线，检查金属件是否啮合牢固。

(7) Push the riveted pin into the insulator until they engage. Pull lightly on the lead to check that the metal part has engaged.



(8) 安装电缆后罩，先用手预拧紧，再用塑料扳手旋紧电缆后罩（间隙参考第一页间隙表）。拧后罩时，需保证电缆线与后罩同心。连接器后罩为可拆卸后罩。原厂塑料扳手可用于施工现场组装，不适用于工厂内部批量组装。

(8) Install the cable gland. First screw it by hands, then lock tightly by plastic spanner (pls refer the gap sheet for detailed gap from page one). Ensure the concentricity of cable and cable gland when screw cable gland. Cable gland is detachable, original factory plastic spanner can assembly in site, but not suitable for mass quantity assembly.



**在无安全锁扣的情况下插拔电缆连接器**

**插入**

(9) 将公母头对插，直到它们啮合，轻轻拉动以检查是否啮合牢固。

**Insert and extract the connector without safety lock clip**

**Insert**

(9) Plug the coupling together until they engage. And pull lightly to check correct engagement.



**拔出**

(10) 此插头连接只能用工具塑料扳手解锁。

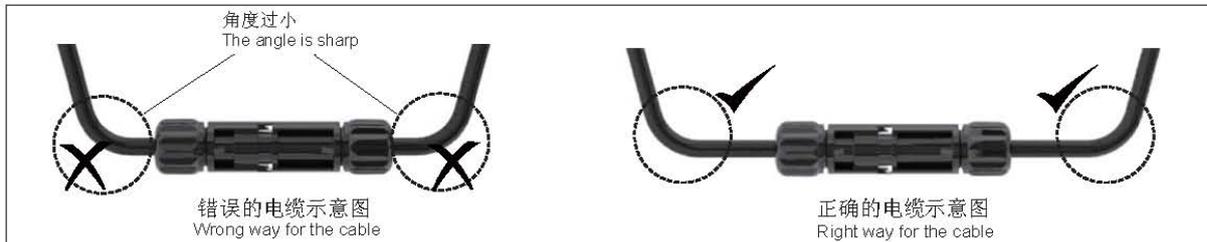
**Extract**

(10) This connection can only be unlocked with plastic spanner.



苏州快可光伏电子股份有限公司

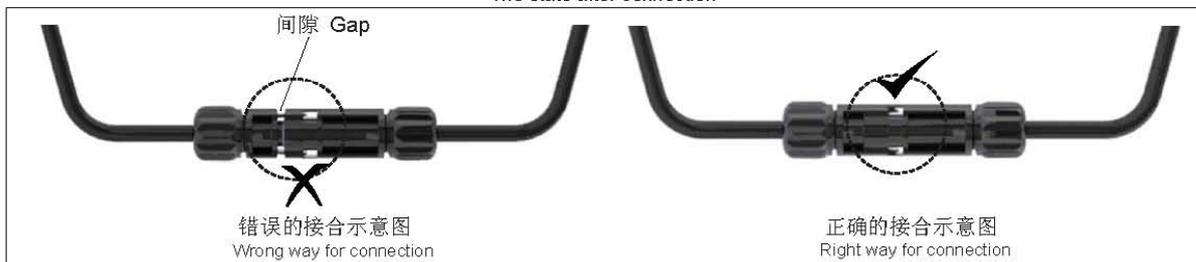
### 电缆接线 Cable's connection



\* 请参考电缆生产商的最小弯曲半径的详细要求

Please refer to the detailed instructions of the minimum bend radius given by manufacturer

### 接合状态 The state after connection



### 包装方式:

#### Packing way:

|   |   |   |  |  |
|---|---|---|--|--|
|   |   |   |  |  |
| <p>1. 用蓝色自封袋装500pcs 正极连接器,用透明自封袋装500pcs负极连接器。<br/>1.500pcs male connector packed into the blue ziplock bag, and 500 pcs female connector packed into the white ziplock bag.</p> | <p>2. 取正负极连接器各一袋放入纸箱中。<br/>2.Put one male and female bag into carton.</p> | <p>3. 取500pcs的插针和500pcs的插套, 放在正极连接器上。<br/>3.Put 500pcs male pin and 500 female pin on the male connector.</p> | <p>4. 用规格为360*320*260(mm)的纸箱进行封装。<br/>4.Seal the carton, The carton size is 360*320*260(mm).</p> | <p>5. 1000*1200(cm)木托盘包装, 每层装9箱, 共4层36箱。<br/>5.Pallet size 1000*1200(cm) 9 caroms/layer. And total 4 layers.</p> |

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## 7. Advantage introduction:

### 7.1. Independent intellectual design(Item 5th)

### 7.2. Test data ranks the top by Photon

**QC Solar Corp.**

## QC4

The connectors from QC Solar Corp., made in China, can be locked in place using latches. The preconfigured QC4 has a similar design to that of the MC4 and is optically distinguished from that product by its hexagonal cap nut.

Changes have obviously been implemented to the design or quality assurance process, as the QC4, which was already tested last year, performed significantly better this time in terms of its force measurements. While the release force is relatively high at 548.18 N, it is still below the minimum withdrawal force of 596.90 N; when subjected to a sudden tug, the locking mechanism is released and the cable remains in the connector's casing. Altogether, that sufficed for a good grade in the force test category.



▲ Different nuts: The QC4 is secured using a distinctive hexagonal cap nut.

Moreover, the connector also achieved predominantly good results within normal limits in the remaining categories, landing it a place in the top half of the tested products.



**Model name:**  
QC4-F (plug), QC4-M (socket)

### 7.3, Cable cut, striped and crimped by Komax full automation



cable cut



cable striped



cable crimped

### 7.4, Connector assembly by full automation

